CONSTRUCTION OF DISPUTED TERMS

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with preliminary constructions of the disputed terms with the aim of focusing the parties' arguments and facilitating discussion. Those preliminary constructions are set forth within the discussion of each term, below.

A. "first modulation method" and "second modulation [method]"

"first modulation method"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a first method for varying one or more characteristics of a carrier in accordance with information to be communicated"[2]	"a method of encoding data that is understood by a first type of receiver, but not by a second type of receiver"
"second modulation [method]"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a second method for varying one or more characteristics of a carrier in accordance with information to be communicated"[3]	"a method of encoding data that is understood by the second type of receiver, but not by the first type of receiver"

FOOTNOTES

2 Plaintiff **[*11]** previously proposed: "No construction necessary; plain and ordinary meaning applies. Alternatively, 'a first method for encoding data onto a carrier.'" Dkt. No. 81, Ex. A at 7.

3 Plaintiff previously proposed: "No construction necessary; plain and ordinary meaning applies. Alternatively, 'a second method for encoding data onto a carrier.'" Dkt. No. 81, Ex. A at 9.

Dkt. No. 97 at 6; Dkt. No. 102 at 2-3. The parties submit that the first of these terms appears in Claims 1, 2, 13, 19, 21, 22, 23, 32, 40, 41, 49, 54, 58, 59, 70, 76, 78, and 79 of the '580 Patent and Claims 1, 5, 15, 17, 18, 22, 25, 26, 37, 38, 39, 41, 47, 48, 49, and 52 of the '228 Patent. Dkt. No. 82, Ex. A at 7. The parties submit that the second of these terms appears in Claims 1, 13, 20, 22, 23, 32, 40, 49, 54, 58, 70, 77, and 79 of the '580 Patent and Claims 1, 10, 17, 18, 22, 23, 26, 37, 38, 41, 43, 47, and 49 of the '228 Patent. *Id.* at 9.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "first modulation method" means "a first method for varying one or more characteristics of a carrier signal in accordance with **[*12]** information to be communicated"; and "second modulation [method]" means "a second method for varying one or more characteristics of a carrier signal in accordance with information to be communicated." Plaintiff had no opposition to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "Defendants' constructions . . . confuse 'modulation' with 'encoding'" and import limitations from a preferred embodiment. Dkt. No. 97 at 6. Plaintiff also submits that examples of the characteristics of a carrier than can be modulated are amplitude, frequency, and phase. *Id.* In this regard, Plaintiff cites extrinsic dictionary definitions (quoted below) as well as statements by Defendant Samsung in an inter partes review ("IPR") filing. *Id.* at 7; *see id.*, Ex. 7, 3/20/2014 Petition for *Inter Partes* Review of U.S. Patent No. 8,023,580 at 9 (citing

The IEEE Standard Dictionary of Electrical and Electronics Terms 662 (6th ed. 1996)). Plaintiff also argues that the constituent terms "first" and "second" refer to repeated instances rather than to any distinction or incompatibility. *Id.* at 8. Plaintiff explains that this is a patent law convention and that **[*13]** this interpretation is consistent with usage of "first" and "second" in various claims as well as in the Summary section of the '580 Patent. *Id.* at 8-10.

As to Defendants' proposed constructions, Plaintiff argues that the patents-in-suit "never use the term 'encode' at all," and Plaintiff cites the provisional patent application to which the patents-in-suit claim priority as distinguishing between "modulation" and "encoding." *Id.* at 11-12. Plaintiff also argues that Defendants' proposal of incompatibility between the first and second modulation methods is found in a preferred embodiment but not in the claims. *Id.* at 12. Plaintiff submits that such a limitation appears only in dependent claims, namely Claims 18 and 75 of the '580 Patent. *Id.* at 13. Further, Plaintiff argues, Defendants' proposals would improperly exclude embodiments in which "modems may be capable of using several different modulation methods." *Id.* (quoting '580 Patent at 1:36-37; citing *id.* at 5:51-54). Plaintiff likewise argues that "the USPTO examiner recognized that the claimed 'first' and 'second' modulation methods could be understood by a common receiver—contrary to Defendants' constructions." Dkt. No. 97 at 14. **[*14]** Finally, Plaintiff urges that Defendants' proposals "would render claim limitations that explicitly require 'the first modulation method is different than the second modulation method' superfluous." *Id.* at 16 (citing '580 Patent at Claims 23, 32 & 40).

Defendants respond that "the sole disclosed embodiment of the invention has a 'Trib 1'[4] modem that understands 'type A' modulation but not '[t]ype B,' and a 'Trib 2' modem that understands 'type B' modulation but not 'type A.'" Dkt. No. 102 at 3; *see id.* at 6-9. Defendants note that the specification asserts (in Defendants' words) that "in the prior art, because all modems connected to a common circuit needed to use compatible modulation methods, tribs that supported only a low-performance modulation method (e.g. type B) would not work in systems that require a high-performance modulation (e.g. type A) for any tasks." *Id.* at 4. Defendants explain that "[i]f the tribs speak each other's language, the alleged invention would be unnecessary." *Id.* at 3; *see id.* at 5 ("If the type B trib could understand type A modulation, type A modulation would simply be used by both devices, as in the prior art.").

FOOTNOTES

4 The patents-in-suit disclose that in a **[*15]** "multipoint architecture," the term "trib" is a shortened form of the word "tributary" and refers to one of several modems that communicates with a single "master" modem. *See* '580 Patent at 1:56-58 & 3:40-44. The term "trib" appears to be synonymous with the term "slave" as used in the patents-in-suit. *See* Dkt. No. 97, Ex. 7, 3/20/2014 Petition for *Inter Partes* Review of U.S. Patent No. 8,023,580 at 11.

As to the prosecution history, Defendants highlight that the patentee deleted from the specification all disclosures of what Defendants refer to as a "bilingual" trib, *i.e.*, a trib with the ability to use two types of modulation. *Id.* at 9-10. Defendants also submit that the examiner statement cited by Plaintiff in its opening brief was made before the patentee deleted the disclosures of a bilingual trib. *Id.* at 10. Further, Defendants cite the prosecution history of ancestor United States Patent No. 6,616,838, during which the patentee stated: "The present invention is directed to the use of differing transceivers responsive to different modulation methods to the exclusion of other modulation methods . . . ." *Id.* at 11 (quoting Ex. 8, 9/27/2001 First Amendment and Response at p. 6 of **[*16]** 10).

As to their proposed constructions, Defendants note that "encoding" appeared in the constructions that Plaintiff had proposed prior to filing its opening claim construction brief. Dkt. No. 102 at 3 & 14. Defendants also argue: "First, contrary to [Plaintiff's] arguments, 'modulation' is 'encoding,' as [Plaintiff's] own dictionary confirms. Second, [Plaintiff's] construction injects the complex concept of carrier waves into the definition. That concept would not assist a jury." *Id.* at 14 (citations omitted). Finally, Defendants argue that the claim limitations requiring "different" modulation methods are "already superfluous." *Id.* at 15.

Plaintiff replies to Defendants' arguments as follows: (1) whether the claims adequately distinguish prior art is a matter of validity, not claim construction, and the patentee did not anywhere state that the point of novelty was that receivers understand only one modulation method; (2) the claims should not be limited to a particular embodiment and, moreover, the patents-in-suit incorporate related patent applications that disclose bilingual tribs (*see* Dkt. No. 103, Ex. 30 at RIP9770); (3) the patentee removed, from the specification, references **[*17]** to measuring transmission line characteristics, but the patentee did not disclaim all embodiments in which multiple modulation methods could be understood by a single trib; (4) Defendants' technology tutorial submitted to this Court (Dkt. No. 103, Ex. 28) confirms that "modulation" is different than "encoding"; (5) the doctrine of claim differentiation is not overcome by any disclosures in the specification; and (6) Defendants' proposals would render superfluous the claim limitations requiring that the "first" and "second" modulation methods be "different." Dkt. No. 103 at 2-5.

At the May 30, 2014 hearing, Defendants emphasized that the only disclosed embodiment uses monolingual tribs and that during prosecution the patentee deleted disclosure of bilingual tribs. The Court inquired where, if anywhere, the patentee stated that a trib can understand only one modulation method. Defendants responded that the patentee made that statement "by implication" by removing the disclosure of bilingual tribs. In this regard, Defendants cited the case of *Abbott Laboratories v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009). As to Plaintiff's claim differentiation arguments, Defendants urged that the **[*18]** dependent claim "tail" cannot wag the specification "dog." *See N. Am. Vaccine, Inc. v. Am. Cyanamid Co.*, 7 F.3d 1571, 1577 (Fed. Cir. 1993) ("The dependent claim tail cannot wag the independent claim dog.").

Plaintiff responded that the deletions were merely "housekeeping" and related primarily to test signals and to measuring transmission line characteristic rather than to the use of multilingual tribs. Plaintiff also reiterated that the patents-in-suit incorporate-by-reference related applications that disclose multilingual tribs. Finally, Plaintiff cited *01 Communique Laboratory, Inc. v. LogMeIn, Inc.*, 687 F.3d 1292 (Fed. Cir. 2012), for the proposition that if the prosecution history is subject to a reasonable, non-limiting interpretation, then there is no disclaimer.

(2) Analysis

Claim 1 of the '580 Patent is representative and recites (emphasis added):

> 1. A communication device capable of communicating according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave, the device comprising:
>
> a transceiver, in the role of the master according to the master/slave relationship, for **[*19]** sending at least transmissions modulated using at least two types of modulation methods, wherein the at least two types of modulation methods comprise *a first modulation method and a second modulation method, wherein the second modulation method is of a different type than the first modulation method*, wherein each transmission comprises a group of transmission sequences, wherein each group of transmission sequences is structured with at least a first portion and a payload portion wherein first information in the first portion indicates at least which of the *first modulation method* and the *second modulation method* is used for modulating second information in the payload portion, wherein at least one group of transmission sequences is addressed for an intended destination of the payload

portion, and wherein for the at least one group of transmission sequences:

> the first information for said at least one group of transmission sequences comprises a first sequence, in the first portion and modulated according to the *first modulation method*, wherein the first sequence indicates an impending change from the *first modulation method* to the *second modulation method*, and
>
> the second information **[*20]** for said at least one group of transmission sequences comprises a second sequence that is modulated according to the *second modulation method*, wherein the second sequence is transmitted after the first sequence.

As an initial matter, Defendants' proposed constructions appear to render redundant the recital of "wherein the second modulation method is of a different type than the first modulation method." Defendants have countered that "[t]he limitations of these claims requiring 'different' modulation methods are . . . already superfluous" because "[Plaintiff] admits that the terms 'first' and 'second' . . . are used to distinguish two items that (while similarly named) are, in fact, different." Dkt. No. 102 at 15. Nonetheless, such redundancy is disfavored when construing claims. *See Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so."); *see also Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562 (Fed. Cir. 1991) (noting that "[a]ll the limitations of a claim must be considered meaningful").

As for the specification, the Background section of the **[*21]** '580 Patent states that prior art systems required all modems to use a single, common modulation method:

> In existing data communications systems, a transmitter and receiver modem pair can successfully communicate only when the modems are compatible at the physical layer. That is, the modems must use *compatible modulation methods*. This requirement is generally true regardless of the network topology. For example, point-to-point, dial-up modems operate in either the industry standard V.34 mode or the industry standard V.22 mode. Similarly, in a multipoint architecture, all modems operate, for example, in the industry standard V.27bis mode. While the modems may be capable of using several different modulation methods, *a single common modulation is negotiated at the beginning of a data session to be used throughout the duration of the session*.

'580 Patent at 1:26-39 (emphasis added). The specification then discloses using different modulation methods:

> For example, some applications (e.g., internet access) require *high performance modulation*, such as quadrature amplitude modulation (QAM), carrier amplitude and phase (CAP) modulation, or discrete multitone (DMT) modulation, while other applications **[*22]** (e.g., power monitoring and control) require only modest data rates and therefore a *low performance modulation* method.
>
> * * *
>
> While it is possible to use high performance tribs running state of the art modulation methods such as QAM, CAP, or DMT to implement both the high and low data rate applications, *significant cost savings can be achieved if lower cost tribs using low performance modulation methods are used to implement the lower data rate applications*.

Id. at 2:1-8 & 5:17-22 (emphasis added).

> A block diagram of a master transceiver 64 in communication with a trib 66 in accordance with the principles of the present invention is shown in FIG. 3. * * *
>
> Trib 66 comprises CPU 82 in communication with modulator 84, demodulator 86, and memory 88. Memory 88, likewise holds software control program 92 and any data necessary for the operation of trib 66. Control programs 78 and 92, are executed by CPUs 68 and 82 and provide the control logic for the processes to be discussed herein. Control program 92 includes logic for *implementing a particular modulation method*, which, for purposes of illustration, is called type X[.] Inasmuch as master transceiver 64 is capable of running *either* a type A *or* **[*23]** a type B modulation method, type X refers to *one* of those two modulation methods.

Id. at 5:23-25 & 5:42-44 (emphasis added).

> [A]s shown in FIG. 5, master transceiver 64 establishes type A as the primary modulation in sequence 104. Note that because trib 66*b* responds only to type B modulation transmissions, only the type A tribs 66*a*-66*a* are receptive to transmission sequence 104.
>
> * * *
>
> Note that the trailing sequence 114 is ineffective in establishing the termination of a communication session between master transceiver 64 and a type B trib 66*b* because the trailing sequence is transmitted using type A modulation.

Id. at 5:65-6:2 & 6:25-29.

The specification does not, however, warrant Defendants' proposed finding that the invention is framed exclusively in the realm of monolingual tribs. Instead, the specification discloses that the advantage of using multiple modulation methods is applicable to multi-lingual tribs:

> The present invention has many advantages, a few of which are delineated hereafter as merely examples.
>
> One advantage of the present invention is that it provides to the *use of a plurality of modem modulation methods on the same communication medium.*
>
> Another advantage of the present **[*24]** invention is that a master transceiver can communicate seamlessly with tributary transceivers or modems using incompatible modulation methods.

'580 Patent at 2:50-57 (emphasis added).

As to the prosecution history, Defendants have focused on: (1) a statement regarding the "present invention" during prosecution of an ancestor patent; and (2) the patentee's deletion of certain paragraphs from the specification of the patents-in-suit.

First, Defendants have cited the prosecution history of ancestor United States Patent No. 6,616,838, during which the patentee stated: "The present invention is directed to the use of differing transceivers responsive to different modulation methods to the exclusion of other modulation methods . . . ." Dkt. No. 97, Ex. 17, 9/27/2001 First Amendment and Response at 6. Yet, the '580 Patent is a continuation of a continuation of a continuation-in-part of the '838 Patent. The multiple intervening applications render the cited prosecution statement too attenuated to be deemed definitive as to the patents-in-suit, particularly given that the patentee was adding the "exclusion" language to a claim and was referring to "[t]he present invention" in the context of that **[*25]** claim. *See id.* at 6 & A-1; *see also Invitrogen Corp. v. Clontech Labs., Inc.*, 429 F.3d 1052, 1078 (Fed. Cir. 2005) ("[T]he prosecution of one claim term in a parent application will generally not limit different claim language in a continuation application."); *cf. Regents of the Univ. of Minn. v. AGA Med. Corp.*, 717 F.3d 929, 943 (Fed. Cir. 2013) ("When the purported disclaimers made during prosecution are directed to specific claim terms that have been omitted or materially altered in subsequent applications (rather than to the invention itself), those disclaimers do not apply.") (quoting *Saunders Grp., Inc. v. Comfortrac, Inc.*, 492 F.3d 1326, 1333 (Fed. Cir. 2007)).

Second, Defendants have cited the patentee's deletion of matter from the specification of the patents-in-suit. In the case of *Abbott Laboratories v. Sandoz, Inc.*, cited by Defendants during the May 30, 2014 hearing, the court relied at least in part upon the patentee's omission of matter contained in a parent application:

> [T]he specification refers several times to "Crystal A of the compound (I) of the present invention" and offers no suggestion that the recited processes could produce non-Crystal A compounds, even though **[*26]** other types of cefdinir crystals, namely Crystal B, were known in the art. As noted earlier, the Crystal B formulation actually appears in the parent JP '199 application. Thus, Abbott knew exactly how to describe and claim Crystal B compounds. Knowing of Crystal B, however, Abbott chose to claim only the A form in the '507 patent. Thus, the trial court properly limited the term "crystalline" to "Crystal A."
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> * * *
>
> In limiting "crystalline" to "Crystal A" in claims 1-5, the Eastern District of Virginia did not improperly import the preferred embodiment into the claims. Initially, Crystal A is the only embodiment described in the specification. As discussed above, the specification's recitation of Crystal A as its sole embodiment does not alone justify the trial court's limitation of claim scope to that single disclosed embodiment. *See Liebel-Flarsheim [Co. v. Medrad, Inc.*], 358 F.3d [898,] 906 [(Fed. Cir. 2004)] ("[T]his court has expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment."). In this case, however, the rest of the intrinsic evidence, including the prosecution history **[*27]** and the priority JP '199 application, evince a clear intention to limit the '507 patent to Crystal A . . . .
>
> * * *
>
> The JP '199 application strongly suggests that the '507 patent intentionally excluded Crystal B compounds. As discussed above, the JP '199 application establishes unequivocally that Abbott knew and could describe both Crystal A and Crystal B. Abbott could have retained the disclosure of Crystal B to support the broader claims of the '507 patent, but instead disclosed and claimed A alone.
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> * * *
>
> Given the exclusive focus on Crystal A in the specification as well as the prosecution history of the '507 patent, the Eastern District of Virginia properly limited "crystalline" in claims 1-5 to "Crystal A."
>
> * * *
>
> The Eastern District of Virginia correctly construed the '507 patent's recitation of "crystalline" in each of the asserted claims as limited to Crystal A, as outlined in the specification. Because Abbott scrubbed all references to Crystal B in the '507 patent's specification, which were present in the '507 patent's parent foreign application, Abbott clearly demonstrated its intent to limit the '507 patent to Crystal A. This intent was further underscored by comments made during

> **[*28]** prosecution. As such, Abbott is unable to recapture Crystal B through broad claim language or under the doctrine of equivalents.

566 F.3d at 1289-90, 1299 (citation omitted).

Here, by contrast, the patentee's deletion of matter relates less directly to the limitation that Defendants seek to impose. The patentee deleted the following paragraphs during prosecution of the '580 Patent:

> [0042] In an alternative embodiment of the present invention, embedded modulations can be used as a way to *measure transmission line characteristics* between a master transceiver and tributary transceiver as shown in FIG 8. In this embodiment, *both a master transceiver 64 and a tributary transceiver 66a would have the ability to transmit using at least two modulation methods, type A and type B*. In the present example, the primary transmission type is type A. Thus, as shown in FIG. 8, the master transceiver 64 establishes type A as the primary modulation in sequence 150.
>
> [0043] To *switch from type A to type B modulation*, master transceiver 64 transmits a notification sequence 152 to the tributary 66a. Thus, the tributary 66a is notified of an impending change to modulation type B. The switch to type B modulation **[*29]** could be limited according to a specific time interval or for the communication of a particular quantity of data, such as a *test signal*. After notifying the tributary 66a of the change to type B modulation, the master transceiver 64[] transmits test signal sequence 151 using type B modulation.
>
> [0044] In this embodiment, the tributary transceiver can contain logic which enables the tributary 66a to *calculate at least one channel parameter from the test signal sequence 154*. Channel parameters typically include *transmission line characteristics*, such as, for example, loss versus frequency, non-linear distortion, listener echoes, talker echoes, bridge tap locations, impedance mismatches, noise profile, signal-to-noise ratio, group delay versus frequency, cross-talk presence, cross-talk type, etc. Moreover, the tributary transceiver 66a could be configured to communicate a channel parameter back to the master transceiver 64.
>
> [0045] After transmitting the *test signal* sequence 154 to the tributary transceiver 66a, the master transceiver 64 can transmit trailing sequence 156 to the tributary transceiver 66a using type A modulation to indicate the end of the transmission using type B modulation. **[*30]** The master transceiver 64 can then send information to the tributary transceiver 66a using primary modulation type A, as shown by training, data and trailing sequences 158, 160 and 162. Likewise, the tributary transceiver 66a can send information to the master transceiver 64 using primary modulation type A, as shown by training, data and trailing sequences 164, 166 and 168.
>
> [0046] In a further alternative embodiment, the master transceiver 64 or tributary transceiver 66a may identify a time period within which *test signal* sequences may be transmitted. This would eliminate the training and trailing sequences which alert the tributary transceiver 66a to the beginning of a new modulation method. The identification of the time period could be initiated by the master transceiver 64 or tributary transceiver 66a and could include a time period noted in the header of a transmission between the tributary transceiver 66a and master transceiver 64.

Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22) (emphasis added); *see id.* at 22 ("The MPEP suggests that the applicant modify the brief summary of the invention and restrict the descriptive subject matter 'so as to be **[*31]** in harmony with the claims.' *MPEP 1302.01*, General Review of Disclosure. Accordingly, Applicant has deleted paragraphs [0042] - [0046].") (square brackets in original); *see also* Dkt. No. 102, Ex. 4 at p.

20 of 44 (RIP19) (Figure 8, illustrating "Trib Type A + B"); Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 4 (RIP3520), 22 (RIP3538) & p. 34 of 34 (RIP3549) (replacing Figure 8).

This deletion of disclosure of "a tributary transceiver 66a [that has] the ability to transmit using at least two modulation methods" is notable, and Defendants argued at the May 30, 2014 hearing that a "test signal" is merely an example of a communication with a bilingual trib. Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22). Nonetheless, Plaintiff has persuasively argued that these paragraphs relate primarily to test signals and to measuring transmission line characteristics rather than to the use of bilingual tribs. The above-quoted *Sandoz* case cited by Defendants is therefore distinguishable, and the patentee's deletion of matter from the specification is of no limiting effect here. *See SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1286 (Fed. Cir. 2005) **[*32]** ("There is no clear and unmistakable disclaimer if a prosecution argument is subject to more than one reasonable interpretation, one of which is consistent with a proffered meaning of the disputed term.") (internal quotation marks omitted); *see also 01 Communique*, 687 F.3d at 1297 (quoting *SanDisk*).

Defendants also argued at the May 30, 2014 hearing that the patentee removed this matter because it was introduced in a parent continuation-in-part application. Defendants explained that if the claims of the patents-in-suit were found to rely upon this new matter, the claims would not receive benefit of the earliest priority date. Defendants concluded that the patentee deleted these paragraphs from the specification in order to eliminate this risk. Defendants' argument in this regard appears better suited to a written description challenge because validity analysis is not a regular part of claim construction. *See Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction."). Defendants' arguments regarding deletion of matter from the specification are therefore of minimal relevance during the present claim **[*33]** construction proceedings.

In sum, none of the prosecution history cited by Defendants contains any definitive statements that would warrant finding a disclaimer. *See Omega Eng'g v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) ("As a basic principle of claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public's reliance on *definitive* statements made during prosecution.") (emphasis added). Further, as explained above, the prosecution history is not otherwise sufficiently clear to justify Defendants' narrow interpretation of the present patents-in-suit.

As to the parties' proposed constructions, "[t]he use of the terms 'first' and 'second' is a common patent-law convention to distinguish between repeated instances of an element or limitation." *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2003). Nothing in the nature of "repeated instances" demands the incompatibility that Defendants have proposed. *Cf. id.* ("In the context of claim 1, the use of the terms 'first . . . pattern' and 'second . . . pattern' is equivalent to a reference to 'pattern A' and 'pattern B,' and should **[*34]** not in and of itself impose a serial or temporal limitation onto claim 1."). Although the above-quoted disclosures in the specification contemplate a trib that can use only one modulation method, nothing in the claim language warrants limiting the disputed terms to such a narrow construction.

The doctrine of claim differentiation also weighs against requiring incompatibility because such a limitation appears in dependent Claims 18 and 75 of the '580 Patent, which recite:

> 18. The device of claim 15, wherein the intended destination is the first type of receiver and unable to demodulate the second modulation method.
>
> * * *

75. The device of claim 72, wherein the intended destination is the first type of receiver and unable to demodulate the second modulation method.

The doctrine of claim differentiation weighs against any construction of the disputed terms that would render these dependent claims superfluous. *See Phillips*, 415 F.3d at 1315 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim."); *see also Liebel-Flarsheim*, 358 F.3d at 910 ("[W]here the limitation that is sought **[*35]** to be 'read into' an independent claim already appears in a dependent claim, the doctrine of claim differentiation is at its strongest."); *Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1233 (Fed. Cir. 2001) ("Claim differentiation, while often argued to be controlling when it does not apply, is clearly applicable when there is a dispute over whether a limitation found in a dependent claim should be read into an independent claim, and that limitation is the only meaningful difference between the two claims.").

Defendants have countered that "any presumption created by the doctrine of claim differentiation will be overcome by a contrary construction dictated by the written description or prosecution history." *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1305 (Fed. Cir. 2011) (citations and internal quotation marks omitted); *accord Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1381 (Fed. Cir. 2006) ("[C]laim differentiation can not broaden claims beyond their correct scope.") (citation and internal quotation marks omitted). On balance, *Retractable* is distinguishable because the above-discussed specification disclosures and prosecution **[*36]** history are not so clear as Defendants have urged. *See Retractable*, 653 F.3d at 1305 (noting that disclosures "recite that 'the invention' has a body constructed as a single structure, expressly distinguish the invention from the prior art based on this feature, and only disclose embodiments that are expressly limited to having a body that is a single piece").

As to the proper construction, Defendants' proposal of "type of receiver" is vague and confusing because it is unclear whether "type" refers to the modulation method or to some other, unspecified characteristic of the receivers.

Also, Plaintiff properly argues that "encoding" is different than "modulation." For example, Plaintiff submits that the word "encode" can be defined as "to encrypt" or as "to use a code, frequently one composed of binary numbers, to represent individual characters or groups of characters in a message." *Id.*, Ex. 4, *Modern Dictionary of Electronics* 341 (6th ed. 1997); *id.*, Ex. 5, *Microsoft Press Computer Dictionary* 175 (3d ed. 1997); *see id.*, Ex. 11, John G. Proakis & Masoud Salehi, *Communication Systems Engineering* 8-11 (1994); *see also id.*, Ex. 12, Bernard Sklar, *Digital Communications: Fundamentals and* **[*37]** *Applications* 6-7 (1988).

"Modulation," by contrast, is defined as a process of varying some characteristic of a carrier signal. *See* Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 662 (6th ed. 1996) ("The process by which some characteristic of a carrier is varied in accordance with a modulating wave"); *see also id.*, Ex. 4, *Modern Dictionary of Electronics* 633 (6th ed. 1997) ("The process, or results of the process, whereby some characteristic of one signal is varied in accordance with another signal. The modulated signal is called the carrier and may be modulated in three fundamental ways: by varying the amplitude (amplitude modulation) by varying the frequency (frequency modulation) or by varying the phase (phase modulation)."); *id.*, Ex. 5, *Microsoft Press Computer Dictionary* 313 (3d ed. 1997) ("The process of changing or regulating the characteristics of a carrier wave vibrating at a certain amplitude (height) and frequency (timing) so that the variations represent meaningful information."); *id.*, Ex. 6, D.K. Sharma, et al., *Analog & Digital Modulation Techniques: An Overview* 551 (2010) ("Modulation is the process of varying some parameter of a **[*38]** periodic waveform in order to use that signal to convey a message."); Dkt. No. 102, Ex. 9 at RIP13523 ("Modulation is the process of encoding source data onto a continuous constant frequency signal i.e. carrier signal with frequency fc."). The specification, too, refers to a carrier in relevant contexts. *See* '580 Patent at 1:57 & 2:4. Finally, during oral argument as to the "different type" terms, Defendants themselves referred to modulating data onto a carrier.

Thus, even though Plaintiff itself included the word "encoding" in previously proposed constructions, Defendants' proposals of "encoding" are rejected as tending to confuse rather than clarify the scope of the claims. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement.").

The Court, having rejected Defendants' proposed constructions for the reasons set forth above, hereby construes the disputed terms as set forth in the following chart:

Term	Construction
"first modulation method"	**"a first method for varying one or more characteristics of a carrier signal in accordance with information to be communicated"**
"second modulation method"	**"a second method for varying one or more characteristics of a carrier signal in accordance with information to be communicated"**

B. [*39] "modulation method [] of a different type" and "different types of modulation methods"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"different families of modulation techniques"	"modulation methods that are incompatible with one another"

Dkt. No. 97 at 17; Dkt. No. 102 at 16. The parties submit that these terms appear in Claims 1 and 58 of the '580 Patent and Claims 1, 22, and 26 of the '228 Patent. Dkt. No. 81, Ex. A at 5.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for these disputed terms: "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." Plaintiff had no opposition to the preliminary construction. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that during prosecution, the patentee defined these disputed terms by referring to "two types of modulation methods, *i.e.*, different families of modulation techniques." Dkt. No. 97 at 18. Plaintiff further argues that "Defendants' construction, which only requires 'incompatibility,' has no concept of a group of things having common characteristics. **[*40]** Such a construction effectively reads the word 'type' right out of the claims, rendering it superfluous." *Id.* at 19-20.

Defendants respond:

> As noted above [as to the "first" and "second" modulation methods], the whole purpose of the purported invention is to enable two (or more) trib modems to use different modulation methods on the same circuit. The crucial characteristic of the different modulation methods vis-à-vis one another is that they are incompatible. If they were compatible, there would be no problem for the patents to solve.

Dkt. No. 102 at 16. Defendants also note that the word "family" does not appear in the specification. *Id.* at 17. Defendants suggest that the patentee used the phrase "families of modulation techniques" only in prosecution history remarks—and not in the claims—because "[i]njecting that phrase into [a] claim would have rendered it plainly unsupported by the specification and opened this portion of the claim to a written description challenge." *Id.* at 18. Defendants argue that Plaintiff's authorities regarding the use of "i.e." are applicable only to use of "i.e" in the specification, not the prosecution history. *Id.* at 19. Defendants further argue that "Defendants' **[*41]** construction[] gives full meaning to the word 'type,' by requiring incompatibility." *Id.* Finally, Defendants submit that Plaintiff's proposal of "families" "only raises the further question of what constitutes a family of modulation methods." *Id.* at 20.

Plaintiff replies that the patentee's definition in the prosecution history is supported by disclosures of FSK (frequency-shift keying) and QAM (quadrature amplitude modulation) in the specification and in related applications cited by the specification. Dkt. No. 103 at 6. Plaintiff also argues that "nothing in the specification—certainly not the passages Defendants cite—reflects the kind of 'clear and unmistakable' intent necessary to depart from the ordinary meaning and define 'type' as 'incompatibility.'" *Id.* at 6-7 (citing *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012)).

At the May 30, 2014 hearing, Defendants argued that "family" is a much broader term than "type" because modulation methods could be grouped together in any number of ways, such as analog as opposed to digital or phase modulation as opposed to frequency modulation. Defendants also argued that Plaintiff's interpretation is inconsistent **[*42]** with dependent Claim 43 of the '228 Patent, which recites that "at least one" of the first and second modulation methods uses phase modulation.

Plaintiff responded by reiterating that Defendants' proposed construction fails to give meaning to the constituent term "type." Plaintiff also argued that Defendants' proposal is overly restrictive because it could be read to mean that different FM radio stations use "incompatible" methods merely because they transmit at different frequencies. Plaintiff urged that the claims contemplate the use of non-incompatible modulation methods so long as they are different.

(2) Analysis

The Summary section of the specification states: "Another advantage of the present invention is that a master transceiver can communicate seamlessly with tributary transceivers or modems using *incompatible modulation methods*." *Id.* at 2:55-57 (emphasis added). Nonetheless, "[t]he court's task is not to limit claim language to exclude particular devices because they do not serve a perceived 'purpose' of the invention. . . . An invention may possess a number of advantages or purposes, and there is no requirement that every claim directed to that invention be limited to encompass **[*43]** all of them." *E-Pass Techs., Inc. v. 3COM Corp.*, 343 F.3d 1364, 1370 (Fed. Cir. 2003); *accord Howmedica Osteonics Corp. v. Wright Med. Tech., Inc.*, 540 F.3d 1337, 1345 (Fed. Cir. 2008) (discussing *E-Pass*). Defendants' proposal that different "types" of modulation methods must be "incompatible" would improperly limit the claims to a preferred embodiment. *See Comark*, 156 F.3d at 1187.

Moreover, although it appears in the Summary of the specification as quoted above, the word "incompatible" is unclear and, as Plaintiff has argued, would tend to raise issues concerning the manner or degree of compatibility. Along those lines, uncertainty might arise as to whether modulation methods must be completely incompatible in all respects or could instead be partially compatible. At the May 30, 2014 hearing, the Court expressed concern as to the clarity of "incompatible." Defendants responded that the disputed terms require that the modulation methods be different "waveforms," different "ways to modulate" data onto a carrier, or simply "not the same." These suggestions, however, merely restate that the methods are "different." This adds little, if anything, to the disputed terms themselves, which **[*44]** recite "modulation method [] of a different type" and "different types of modulation methods." Defendants' proposal of "incompatible" is therefore rejected.

The Court turns to whether Plaintiff is correct that the patentee gave the disputed terms an "express definition." Dkt. No. 97 at 19.

"The specification acts as a dictionary 'when it expressly defines terms used in the claims or when it defines terms by implication.'" *Bell Atl. Network Servs.*, 262 F.3d at 1268 (quoting *Vitronics Corp.*, 90 F.3d at 1582). "When a patentee acts as his own lexicographer in redefining the meaning of particular claim terms away from their ordinary meaning, he must clearly express that intent in the written description. We have repeatedly emphasized that the statement in the specification must have sufficient clarity to put one reasonably skilled in the art on notice that the inventor intended to redefine the claim term." *Merck*, 395 F.3d at 1370 (citations omitted). "[A] patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history." *Vitronics*, 90 F.3d at 1582.

During **[*45]** prosecution, the patentee amended claims so as to add the word "type," and the patentee stated:

> Applicant thanks Examiner Ha for the indication that claims 1-18 and 37-57 are allowed (office action, p. 7). Applicant has further amended claims 1-2, 9-15, 18, 37-38, and 45-46 with additional recitations to more precisely claim the subject-matter. For example, the language of independent claim 1 has been clarified to refer to two *types* of modulation methods, *i.e.*, different families of modulation techniques, such as the FSK [(frequency shift keying)] family of modulation methods and the QAM [(quadrature amplitude modulation)] family of modulation methods.

Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536); *see id.* at 7 (RIP3523) (amending claims). Generally, "i.e." signals an explicit definition. *See, e.g., Abbott Labs. v. Novopharm Ltd.*, 323 F.3d 1324, 1327, 1330 (Fed. Cir. 2003) (finding that the patentee used "i.e." to define a term not known in the art at the relevant time); *but see Pfizer, Inc. v. Teva Pharms. USA, Inc.*, 429 F.3d 1364, 1373 (Fed. Cir. 2005) (specification referred to "saccharides (i.e. sugars)" but also contained further discussion under **[*46]** a section titled "Saccharides," and the court concluded that "the patentee clearly intended for this section to address the meaning of the same term").

The significance of the patentee's use of "i.e." in the prosecution history—as opposed to in the specification—is perhaps less clear. On one hand, some authorities caution against relying upon potentially "self-serving" statements in the prosecution history. *See Biogen, Inc. v. Berlex Labs.*, 318 F.3d 1132, 1140 (Fed. Cir. 2003) ("Representations during prosecution cannot enlarge the content of the specification, and the district court was correct in relying on the specification in analyzing the claims."); *see also Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1270 (Fed. Cir. 1986) ("For example, a Citation [of Prior Art] filed [with the PTO] during litigation might very well contain merely self-serving statements which likely would be accorded no more weight than testimony of an interested witness or argument of counsel. Issues of evidentiary weight are resolved on the circumstances of each case."). Also, as Defendants have pointed out, dependent Claim 43 of the '228 Patent is at least somewhat at odds with Plaintiff's interpretation **[*47]** to the extent that it would require that only one, instead of "at least one," of the first and second modulation methods can be phase modulation.

On the other hand, a "claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification *or prosecution history*." *CCS Fitness v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (emphasis added); *accord Home Diagnostics*, 381 F.3d at 1356; *Advanced Fiber Techs. (AFT) Trust v. J&L Fiber Servs., Inc.*, 674 F.3d 1365, 1374 (Fed. Cir. 2012); *see Vitronics*, 90 F.3d at 1582 (quoted above). Such authorities weigh in favor of construing the disputed term in accordance with the patentee's express definition in the prosecution history.

At the May 30, 2014 hearing, Defendants urged that because the patentee's definition was set forth after the examiner had indicated that the claims were allowable, the definition was self-serving and was not part of the usual back-and-forth negotiation that informs the meaning of claim terms. Plaintiff properly countered, however, that the patentee provided the definition in connection with amending **[*48]** some of the claims so as to introduce the word "types." *See* Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536) (quoted above); *see also id.* at 7 (RIP3523) (amending claims). Thus, to whatever extent Defendants are correct that the prosecution history can only define a term in the context of developing allowable claims, the patentee's definition in this case can properly be considered.

The patentee's express definition is also consistent with disclosure in the specification of various categories of modulation methods. *See* '580 Patent at 2:1-8 ("some applications (e.g., internet access) require high performance modulation, such as quadrature amplitude modulation (QAM), carrier amplitude and phase (CAP) modulation, or discrete multitone (DMT) modulation"); *see also id.* at 5:17-20 (similar).

Such a definition is also consistent with the extrinsic dictionary definitions submitted by Plaintiff, which define "type" as "a class, kind, or group set apart by common characteristics" and "family" as "a group of things having common characteristics." Dkt. No. 97, Ex. 22, *Merriam-Webster's Dictionary and Thesaurus* 291, 858 (2007); *see id.*, Ex. 23, *The* **[*49]** *American Century Thesaurus* 129 (1995) (listing "type" as a synonym for "family").

On balance, the patentee's lexicography should be given effect in the Court's construction. *See Vitronics*, 90 F.3d at 1582; *see also Abbott Labs.*, 323 F.3d at 1327, 1330; *CCS Fitness*, 288 F.3d at 1366; *Advanced Fiber Techs.*, 674 F.3d at 1374. As to Defendants' concerns, any dispute regarding whether accused modulation techniques are from different "families" is a factual dispute regarding infringement rather than a legal dispute for claim construction. *See PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) (noting that "the task of determining whether the construed claim reads on the accused product is for the finder of fact").

Nonetheless, although Plaintiff proposes merely "different families of modulation techniques," the patentee's definition in the prosecution history includes examples, namely "the FSK family of modulation methods and the QAM family of modulation methods."[5] Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536). These examples provide useful context for understanding the phrase "different families" and, having been provided as part of the **[*50]** patentee's definition, should be included in the Court's construction.

FOOTNOTES

5 The meanings of "FSK" and "QAM" do not appear to be in dispute.

The Court accordingly hereby construes **"modulation method [] of a different type"** and **"different types of modulation methods"** to mean **"different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods."**

C. "communication[s] device," "device that transmits," and "logic configured to transmit"

"communication[s] device"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary	Samsung:
meaning applies.	"a device that sends or receives information
	over wires"
Alternatively:	
"a device that sends or receives	BlackBerry:
information"	"a device that sends or receives information
	over wires in a circuit-switched network"

"communication[s] device"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"device that transmits"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary	Samsung:
meaning applies.	"a device that sends information over
	wires"
Alternatively:	
"a device that sends information"	BlackBerry:
	"a device that sends information over wires
	in a circuit-switched network"
"logic configured to transmit"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary	Samsung:
meaning applies.	"logic configured to send information over
	wires"
Alternatively:	
"logic configured to send information"	BlackBerry:
	"logic configured to send information over
	wires in a circuit-switched network"

Dkt. **[*51]** No. 97 at 20; Dkt. No. 102 at 23. The parties submit that the first of these terms appears in Claims 1, 23, 32, and 58 of the '580 Patent and all asserted claims of the '228 Patent. Dkt. No. 81, Ex. A at 11. The parties further submit that the second of these terms appears in Claim 40 of the '580 Patent and that the third appears in Claims 49 and 54 of the '580 Patent. *Id.* at 14 & 16.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "communication[s] device" means "a device that sends or receives information"; "device that transmits" means "a device that sends information"; and "logic configured to transmit" means "logic configured to send information." Plaintiff had no objection to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "[t]he words in these terms do not have specialized meanings, have not been otherwise defined by the patentee, and are easily understood based on their ordinary meaning." Dkt. No. 97 at 21. As to Defendants' proposals of "wires" and a "circuit-switched network," Plaintiff responds that such constructions **[*52]** are contrary to the recital in the claims of a generic "communication medium." *Id.* at 22. Plaintiff urges that the brief mention of wires in the specification is insufficient to redefine the disputed terms. *Id.* at 22-23. To the contrary, Plaintiff argues, during prosecution the patentee deleted text from the specification that referred to "lines." *Id.* at 23. Finally, Plaintiff notes that the words "circuit" and "switched" do not appear in the claims or the written description. *Id.* at 24.

Defendants respond that "[w]ireless networks are never mentioned in the patents-in-suit," despite wireless networks being well-known at the time the patent applications were filed, and "[t]he only example of a network mentioned in the text of the patents is a two-wired system of the prior art, upon which the alleged invention of the patents is an improvement." Dkt. No. 102 at 23; *see id.* at 24. Defendants also express concern that Plaintiff's proposed constructions "provide no boundaries, and as read could encompass a tin can connected to a string." *Id.* at

24. Finally, Defendant Blackberry proposes that the claimed invention is limited to circuit-switched networks because, "by design," "[d]evices on **[*53]** a packet-switched network can use different communication languages or modulation methods." *Id.* at 25. Blackberry cites several extrinsic treatises in support of this proposition and concludes that "[p]ut simply, in a packet-switched network there is no compatibility problem for the patents to solve, and the purported invention is unnecessary." *Id.* at 25-26.

Plaintiff replies that the patents-in-suit "do not limit the invention to wired or wireless 'modems'/'communication media' because both were well-known at the time." Dkt. No. 103 at 8 (citations and footnote omitted). Plaintiff also argues: "Defendants read too much into the Figures. Communications medium 94 is depicted as a line in Figs. 3-4, but that does not imply a wire any more than the absence of a line implies wireless." *Id.* at 8 n.7. As to Blackberry's proposal, Plaintiff replies that the patents-in-suit do not refer to "circuit-switched" or "packet-switched" networks because "the patents-in-suit are not concerned with low-level network switching protocols, but rather with 'sending transmissions modulated using at least two types of modulation methods.'" *Id.* (quoting '580 Patent at 2:30-31). Plaintiff also submits that "Blackberry **[*54]** has zero evidence to support its claim that devices on a packet-switched network can use different [] modulation methods by design." *Id.* (quoting Dkt. No. 102 at 25).

At the May 30, 2014 hearing, Defendants again highlighted the use of a solid line in the Figures to illustrate the communication medium. Defendants argued that the appropriate way to illustrate wireless communication would have been with an antenna or with a series of three closely-spaced curved lines. Defendants also noted that the provisional patent application refers to a "two-wire" modem. *See* Dkt. No. 97, Ex. 13 at 5. Finally, Defendant Blackberry presented no oral argument on its proposals of "circuit-switched" and instead submitted its proposed constructions on the briefing.

(2) Analysis

Although Plaintiff has proposed that no constructions are required, the parties have presented a "fundamental dispute regarding the scope of . . . claim term[s]," and the Court has a duty to resolve that dispute. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362-63 (Fed. Cir. 2008).

As a threshold matter, Defendants have not argued that their proposals of a wired network or a circuit-switched network are supported **[*55]** by anything within the claims at issue. The issue, then, is whether Defendants' proposed limitations are adequately supported by anything in the specification or the extrinsic evidence cited by the parties.

As to Defendants' proposals of requiring a wired network, the specification only once refers to wires:

> The foregoing discussion is based on a two-wire, half-duplex multipoint system. Nevertheless, it should be understood that the concept is equally applicable to four-wire systems.

'580 Patent at 4:51-54. This passage is insufficient to limit the claims to wired networks, particularly given that it refers to a discussion of only one or two of the Figures. *See id.* at 3:40-4:50; *see also Comark*, 156 F.3d at 1187. Moreover, Defendants have acknowledged that the "foregoing discussion" referred to in this passage is a discussion of "a two-wired system of the prior art." Dkt. No. 102 at 23.

In several other instances, the specification refers to a "communication medium," but those disclosures do not address whether the medium is wired or wireless. *See* '580 Patent at 2:52-54 ("One advantage of the present invention is that it provides to [*sic*, for] the use of a plurality of modem modulation **[*56]** methods on the same communication medium."), 3:40-44 ("With reference to FIG. 1, a prior art multipoint communication system 22 is shown to comprise a master modem or transceiver 24, which communicates with a plurality of tributary modems (tribs) or transceivers 26-26 over communication medium 28.") & 5:44-46 ("The master transceiver 64 communicates with trib 66 over communication medium 94.").

Defendants also argue that Figures 3 and 4 depict a wired network because the "communication medium 94" is illustrated by either solid line connectors (Figure 3) or a solid line (Figure 4). *See* Dkt. No. 102 at 24. First, as Plaintiff has urged, any argument that solid lines cannot represent a wireless network is conclusory speculation. Second, even if Figures 3 and 4 were interpreted as depicting a wired network, "patent coverage is not necessarily limited to inventions that look like the ones in the figures. To hold otherwise would be to import limitations [i]nto the claim[s] from the specification, which is fraught with danger." *MBO Labs. Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007).

Thus, the specification does not support limiting the claims to wired networks. This **[*57]** conclusion is reinforced by prosecution history in which the examiner rejected claims that recited a "communications device" and "logic configured to transmit" based on the "Siwiak" reference, which discloses a *wireless* communications system. Dkt. No. 97, Ex. 14, 9/1/2010 Office Action at 2-4 (RIP72-74); *id.*, Ex. 20 at 13 & 20 (RIP23 & RIP30) (application claims); *see id.*, Ex. 15, U.S. Pat. No. 5,537,398 (Siwiak) at 2:24-41 ("The messaging system includes a plurality of geographically distributed messaging transmitters, each comprising means for generating a radio frequency signal."); *see also Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir. 2005) ("Statements about a claim term made by an Examiner during prosecution of an application may be evidence of how one of skill in the art understood the term at the time the application was filed."). Finally, although the weight that the specification amendments should be given here is unclear, it is worth noting that the patentee *deleted* paragraphs from the specification that referred to "transmission *line* characteristics." *Id.*, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22) (emphasis added).

As to extrinsic **[*58]** evidence, Plaintiff has submitted two news articles from the relevant time period that use the phrase "wireless modem." Dkt. No. 103, Ex. 33, *Ericsson announces its M2190 OEM Wireless Modem, first PCMCIA modem for mobile data connectivity*, Business Wire, Nov. 2, 1994; *id.*, Ex. 34, *A Wireless Modem that Could Leave 'Em in the Dust*, BusinessWeek, Feb. 24, 1997. Use of the word "modem" in the patents-in-suit is therefore insufficient to require a wired network. Finally, Plaintiff has submitted a dictionary definition of "medium," in the context of "information transfer," as not being limited to wires but rather being any "vehicle capable of transferring data." Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 643 (6th ed. 1996).

In sum, Defendants have failed to justify limiting the claims to wired networks. The Court therefore turns to the additional proposals by Defendant Blackberry.

Blackberry has submitted extrinsic evidence in support its argument that the claimed invention only has relevance in circuit-switched networks, not packet-switched networks. Dkt. No. 102, Ex. 11, Gurdeep S. Hura & Mukesh Singhal, *Data and Computer Communications: Networking* **[*59]** *and Internetworking* 130-31 (2001) ("In the case of packet-switched networks, stations with different data rates can communicate with each other, and the necessary conversion between different data rates is done by the network, while in the case of circuit-switched networks, both stations must have the same data rate."); *id.*, Ex. 12, William Stallings, *Data and Computer Communications* 254-55 (5th ed. 1997) ("In [a] circuit-switching network, the connection provides for transmission at a constant data rate. Thus, each of the two devices that are connected must transmit and receive at the same data rate as the other . . . ."; "A packet-switching network can perform data-rate conversions. Two stations of different data rates can exchange packets because each connects to its node at its proper data rate."); *id.*, Ex. 13, Youlu Zheng & Shakil Akhtar, *Networks for Computer Scientists and Engineers* 125 (2002) ("Whereas . . . two networks connected by a circuit switch must operate at the same speed, packet switching can connect networks operating at different speeds.").

A circuit-switched network, at least in the context of Blackberry's proposals, appears to be a species of wired network. The **[*60]** Court therefore rejects Blackberry's proposals based on the Court's rejection of Defendants' proposals of "over wires," above.

Alternatively, even if Blackberry is proposing a circuit-switched network limitation that can be either wired or wireless, Blackberry's above-cited reliance on extrinsic evidence is disfavored. *See Phillips*, 415 F.3d at 1322 ("There is no guarantee that a term is used in the same way in a treatise as it would be by the patentee. In fact, discrepancies between the patent and treatises are apt to be common because the patent by its nature describes something novel.").

As to Blackberry's reliance on the purpose of the invention (avoiding the inefficiencies of requiring all devices to use the same modulation method), Blackberry is correct as a general matter that "the problem the inventor was attempting to solve, as discerned from the specification and the prosecution history, is a relevant consideration." *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1160 (Fed. Cir. 1997).

Nonetheless, "[t]he court's task is not to limit claim language to exclude particular devices because they do not serve a perceived 'purpose' of the invention. . . . An invention may possess **[*61]** a number of advantages or purposes, and there is no requirement that every claim directed to that invention be limited to encompass all of them." *E-Pass*, 343 F.3d at 1370; *accord Howmedica*, 540 F.3d at 1345 (discussing *E-Pass*).

Blackberry has also cited *Applied Materials, Inc. v. Advanced Semiconductor Materials America, Inc.*, 98 F.3d 1563, 1573 (Fed. Cir. 1996). In *Applied Materials*, the patent specification disclosed a problem of electrostatic contamination in the context of a "cold purge" from a chamber:

> As explained in the . . . specification, static charges are not a problem during subsequent purges of the chamber because after the initial steps the temperature of the chamber remains above about 180° C, the temperature above which static charges do not exist.
>
> In the invention of the . . . patent, static charges during the initial "cold" purges are eliminated by operating the lamps at a low level during the initial gas flow steps.
>
> * * *
>
> The district court found that "cold purge process" means temperatures below 180° C, and that the . . . invention was directed to the use of heat sufficiently high to remove electrostatic contamination in the initial purge steps, that is, heat above about **[*62]** 180° C, in a reactor whose operating conditions include temperatures below 180° C. "Cold purge" is interpreted in light of the problem the . . . patent solved: the elimination of electrostatic contamination during the initial purge step.

Id. at 1571, 1573. The limitation imposed in *Applied Materials* was thus founded on *intrinsic* disclosures regarding circumstances in which the stated problem presented itself. Here, by contrast, Blackberry relies upon *extrinsic* evidence in support of the proposed "circuit-switched" limitation. The patents-in-suit contain no reference to circuit-switched networks. *Applied Materials* is therefore distinguishable.

The Court accordingly rejects Defendants' proposed "over wires" and "circuit-switched" limitations. The parties are otherwise in agreement as to the proper meaning of the disputed terms, as set forth by Plaintiff's alternative proposed constructions. Although the plain and ordinary meaning of the disputed terms may well be readily understandable once Defendants' proposed limitations have been rejected, the existence of common ground in the parties' proposals is notable and should be given effect.

As to Defendants' statement that Plaintiff's proposals **[*63]** would "encompass a tin can connected to a string" (Dkt. No. 102 at 24), Defendants' concern is unwarranted because other claim language appropriately limits the scope of the claims. Further, to whatever extent Defendants' concern relates to validity, such arguments are of limited relevance during claim construction proceedings. *See Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction.").

For all of these reasons, the Court hereby construes the disputed terms as set forth in the following chart:

Term	Construction
"communication[s] device"	**"a device that sends or receives information"**
"device that transmits"	**"a device that sends information"**
"logic configured to transmit"	**"logic configured to send information"**

D. "training signal" and "trailing signal"

"training signal"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a transmission that signifies the beginning of a communication session"	"a distinct transmission that establishes properties of a subsequent data transmission and that can have a different intended destination from the subsequent data transmission"
"trailing signal"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a transmission that signifies the end of a communication session"	"a distinct transmission that follows a data transmission and that can have a different intended destination from the data transmission"

Dkt. **[*64]** No. 97 at 24; Dkt. No. 102 at 20. The parties submit that the first of these disputed terms appears in dependent Claims 29, 31, and 36 of the '228 Patent. Dkt. No. 81, Ex. A at 20. The parties submit that the second of these disputed terms appears in dependent Claim 51 of the '228 Patent. *Id.* at 21.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "training signal" means "a transmission that signifies the beginning of a transmission sequence and determines one or more properties of the transmission sequence"; and "trailing signal" means "a transmission that signifies the end of a transmission sequence." Plaintiff had no opposition to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that Defendants' proposals "improperly limit the claims to part of a preferred embodiment, in which some training and trailing signals 'can have a different intended destination from the subsequent data transmission.'" Dkt. No. 97 at 25. Plaintiff explains that "[w]hile in a preferred embodiment some of the training and trailing signals have a different **[*65]** intended destination than the data transmission, others do not." *Id.* at 26 (discussing '580 Patent at Figure 8). Plaintiff also argues that Defendants' proposal of "distinct" is vague and "has zero support in the record." Dkt. No. 97 at 25 & 27. Plaintiff submits that "[t]he specification focuses on the order and function of the components—not their 'distinctness.'" *Id.* at 27.

As to "training signal," Defendants respond that the "capab[ility] of having a different intended destination from the subsequent data transmission" is "central to the alleged invention." Dkt. No. 102 at 20. Defendants explain:

> [T]he purpose of the purported invention is to enable two (or more) tribs to use different modulation methods on the same circuit. The alleged invention accomplishes this via a training signal. When the master intends to send data to a type B trib, it first sends a training signal to the type A trib. []'580 patent[] at 6:3-6. The training signal notifies the type A trib that the master will switch to type B modulation. *Id.* In response to the training signal, the type A trib temporarily stops listening to signals on the line. *Id.* at 6:41-46. The master then transmits data to the type B trib **[*66]** using type B modulation. *Id.* at 6:8-12.
>
> Since the type A trib is not listening during the type B transmission, the type A trib — which does not understand type B modulation — does not attempt to decode the type B transmission. This avoids errors and delays caused by tribs trying to decode signals they do not understand. Moreover, the type B trib never receives the training signal, because it is only sent using type A modulation, which the type B trib does not understand. *See id.* at 5:67-6:2.

Dkt. No. 102 at 21. As to their proposal of a "distinct" transmission, Defendants argue that the specification "uniformly depicts the training signal as a discrete communication." *Id.* at 22 (citing '580 Patent at Fig. 5).

As to "trailing signal," Defendants respond that "the specification teaches that, just as the training signal notifies a type A trib of an impending change to type B modulation, the trailing signal notifies the type A trib that the type B data transmission is over. The trailing signal must be capable of having a different intended destination from the corresponding data transmission for the same reasons as the training signal." Dkt. No. 102 at 22 (citing '580 Patent at 6:16-19). **[*67]** Finally, Defendants emphasize that their proposals "state that the training and trailing signals '*can* have' different intended destinations from the intervening data transmissions, not that they must." *Id.* at 23.

Plaintiff replies that although one of the disclosed embodiments is consistent with Defendants' proposed constructions, Figure 8 illustrates a "communication session 170" in which "the training signal, communication signal, and trailing signal all have the same intended destination—the Type A transceiver." Dkt. No. 103 at 9. Finally, Plaintiff argues that "the specification focuses on the order and function of the transmitted components, not whether they are 'distinct.'" *Id.*

At the May 30, 2014 hearing, Defendants reiterated that the destinations need not necessarily be different. Nonetheless, Defendants explained, that capability is a limitation because the central purpose of a training signal is to instruct a trib to ignore a subsequent transmission. Defendants also submitted that they would be amenable to substituting the word "discrete" for the word "distinct" in Defendants' proposed constructions.

Plaintiff responded that a "training signal" can also be useful for enabling **[*68]** a master to change modulation methods when communicating with a bilingual trib, perhaps to overcome interference by using a more robust modulation method.

(2) Analysis

The disputed terms appear in Claims 29, 31, 36, and 51 of the '228 Patent, which recite (emphasis added):

> 29. The master communication device as in claim 26, wherein the first transmission sequence includes a *training signal*.
>
> * * *
>
> 31. The master communication device as in claim 29, wherein the *training signal* establishes signal level compensation.

> * * *
>
> 36. The master communication device as in claim 29, wherein the *training signal* includes parameters for the selection of optional features.
>
> * * *
>
> 51. The master communication device as in claim 26, wherein the master communication device is configured to transmit a *trailing signal* to complete the master communication transmission.

Nothing in these dependent claims requires that the recited "training signal" or "trailing signal" must be capable of having a different intended destination than the data transmission. Claims 31 and 36 depend from Claim 29, which in turn depends from independent Claim 26. Claim 26 recites the antecedent basis for "the first transmission sequence" recited **[*69]** in Claim 29 (emphasis added; formatting modified):

> 26. A master communication device configured to communicate according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device, the master communication device comprising:
>
> a transceiver configured to *transmit signals over a communications medium to a slave device using at least two different types of modulation methods* and to receive one or more responses over the communication medium that comprise at least respective response data that is modulated according to one of the at least two different types of modulation methods, the at least two different types of modulation methods comprising a first modulation method and a second modulation method,
>
> wherein the transmitted signals comprise first transmitted signals and second transmitted signals,
>
> *the first transmitted signals comprise at least two transmission sequences,*
>
> the at least two transmission sequences include *a first transmission sequence* and *a second transmission sequence,*
>
> the transceiver is configured to *transmit the first* **[*70]** *transmission sequence using the first modulation method*, and
>
> the transceiver is configured to *transmit the second transmission sequence using the second modulation method* wherein:
>
> *the first transmission sequence includes information that is indicative of an impending change in modulation method from the first modulation method to the second modulation method,*
>
> *the second transmission sequence includes a payload portion* that is transmitted after the first transmission sequence,
>
> *the first transmitted signals include first address information that is indicative of the slave device being an intended destination of the payload portion,*

> the second transmitted signals comprise at least a third transmission sequence and a fourth transmission sequence,
>
> the transceiver is configured to transmit the third transmission sequence using the first modulation method,
>
> the transceiver is configured to transmit the fourth transmission sequence using the first modulation method,
>
> the third transmission sequence includes information indicative that the fourth transmission sequence will be transmitted using the first modulation method,
>
> the fourth transmission sequence includes a second payload portion that is transmitted **[*71]** after the third transmission sequence, and
>
> the second transmitted signals include second address information that is indicative of a specified slave device being an intended destination of the second payload portion.

Claim 26 thus recites "first transmitted *signals*" that include a "first transmission *sequence*" using a first modulation method and a "second transmission *sequence*" using a second modulation method. The "first transmission sequence" indicates a change from the first modulation method to the second modulation method, and "the second transmission sequence includes a payload portion that is transmitted after the first transmission sequence." The "first transmitted *signals*" also "include first address information that is indicative of the slave device being an intended destination of the payload portion." Claim 26 further recites "second transmitted signals" with limitations comparable to those of the "first transmitted signals," except that both transmission sequences are transmitted using the first modulation method.

Nowhere does Claim 26 recite that the first transmission sequence must be able to have an intended destination different from that of the subsequent payload. Claim **[*72]** 26 thus contains no support for imposing any such limitation on the "training signal" that is recited in dependent Claims 29, 31, and 36. Similarly, nothing in the claims suggests any such limitation as to the "trailing signal" recited in Claim 51.

Defendants have submitted that, in some cases, disclosure of a critical feature for achieving a central objective can warrant limiting the claims accordingly. *See Alloc*, 342 F.3d at 1369-70 (noting that the "specification . . . criticizes prior art floor systems without play" and finding that the "specification read as a whole leads to the inescapable conclusion that the claimed invention must include play in every embodiment"); *see also Honeywell Int'l, Inc. v. ITT Indus.*, 452 F.3d 1312, 1318 (Fed. Cir. 2006) ("The written description's detailed discussion of the prior art problem addressed by the patented invention, viz., leakage of non-metal fuel filters in EFI [(electronic fuel injection)] systems, further supports the conclusion that the fuel filter is not a preferred embodiment, but an only embodiment.").

This is not such a case. The specification uses the terms "training signal," "training sequence," "trailing signal," and "trailing **[*73]** sequence" several times but does not mandate that such signals or sequences be capable of having a different intended destination than a data transmission. For example, the specification discloses:

> [B]efore any communication can begin in [prior art] multipoint system 22, the master transceiver and the tribs 26-26 must agree on a common modulation method. If a common modulation method is found, the master transceiver 24 and a single trib 26 will then exchange sequences of signals that are particular subsets of all signals that can be communicated via the agreed upon common modulation method. These sequences are commonly referred to as *training signals* and can be

used for the following purposes: 1) to confirm that the common modulation method is available, 2) to establish received signal level compensation, 3) to establish time recovery and/or carrier recovery, 4) to permit channel equalization and/or echo cancellation, 5) to exchange parameters for optimizing performance and/or to select optional features, and 6) to confirm agreement with regard to the foregoing purposes prior to entering into data communication mode between the users. In a multipoint system, the address of the trib **[*74]** with which the master is establishing communication is also transmitted during the training interval. At the end of a data session a communicating pair of modems will typically exchange a sequence of signals known as *trailing signals* for the purpose of reliably stopping the session and confirming that the session has been stopped. In a multipoint system, failure to detect the end of a session will delay or disrupt a subsequent session.

Referring now to FIG. 2, an exemplary multipoint communication session is illustrated through use of a ladder diagram. This system uses polled multipoint communication protocol. That is, a master controls the initiation of its own transmission to the tribs and permits transmission from a trib only when that trib has been selected. At the beginning of the session, the master transceiver 24 establishes a common modulation as indicated by sequence 32 that is used by both the master 24 and the tribs 26a, 26b for communication. Once the modulation scheme is established among the modems in the multipoint system, [t]he master transceiver 24 transmits a *training sequence 34* that includes the address of the trib that the master seeks to communicate with. In this **[*75]** case, the *training sequence 34* includes the address of trib 26a. As a result, trib 26b ignores *training sequence 34*. After completion of the *training sequence 34*, master transceiver 24 transmits data 36 to trib 26a followed by *trailing sequence 38, which signifies the end of the communication session*. Similarly, with reference to FIG. 8, the sequence 170 illustrates a Type A modulation *training signal*, followed by a Type A modulation data signal. Note that trib 26b ignores data 36 and *trailing sequence 38* as it was not requested for communication during *training sequence 34*.

At the end of *trailing sequence 38*, trib 26a transmits *training sequence 42 to initiate a communication session* with master transceiver 24. Because master transceiver 24 selected trib 26a for communication as part of *training sequence 34*, trib 26a is the only modem that will return a transmission. Thus, trib 26a transmits data 44 destined for master transceiver 24 followed by *trailing sequence 46 to terminate the communication session.*

The foregoing procedure is repeated except master transceiver identifies trib 26b in *training sequence 48*. In this case, trib 26a ignores the *training sequence 48* and the subsequent **[*76]** transmission of data 52 and *trailing sequence 54* because it does not recognize its address in *training sequence 48*. Master transceiver 24 transmits data 52 to trib 26b followed by *trailing sequence 54* to terminate the communication session. Similarly, with reference to FIG. 8, sequence 172 illustrates a Type A modulation signal, with notification of a change[] to Type[] B, followed by a Type[] B modulation data signal. To send information back to master transceiver 24, trib 26b transmits *training sequence 56* to establish a communication session. Master transceiver 24 is conditioned to expect data only from trib 26b because trib 26b was selected as part of *training sequence 48*. Trib 26b transmits data 58 to master transceiver 24 terminated by *trailing sequence 62*.

'228 Patent at 4:3-5:7 (emphasis added).

Referring now to FIG. 4, a multipoint communication system 100 is shown comprising a master transceiver 64 along with a plurality of tribs 66-66. In this example, two tribs 66a-66a run a type A modulation method while one trib 66b runs a type B modulation method. The present invention permits a secondary or

> embedded modulation method (e.g., type B) to replace the standard modulation method **[*77]** (e.g., type A) after an initial *training sequence*. This allows the master transceiver 64 to communicate seamlessly with tribs of varying types.
>
> * * *
>
> To switch from type A modulation to type B modulation, master transceiver 64 transmits a *training sequence 106* to type A tribs 66a in which these tribs are notified of an impending change to type B modulation. The switch to type B modulation could be limited according to a specific time interval or for the communication of a particular quantity of data. After notifying the type A tribs 66a of the change to type B modulation, master transceiver 64, using type B modulation, transmits data along with an address in sequence 108, which is destined for a particular type B trib 66b. In an example, embedded modulation permits a secondary modulation to replace the usual primary modulation for a user data segment located after a primary training sequence. For example, master transceiver 64 may change to modulation Type B and may convey user information to type B trib 66b.

Id. at 6:4-13 & 6:27-44 (emphasis added).

> *To initiate a communication session* with a type A trib 66a, *master transceiver 64 transmits a training sequence 126* in which an address of **[*78]** a particular type A trib 66a is identified. The identified type A trib 66a recognizes its own address and transitions to state 128 to receive data from master transceiver 64 as part of sequence 132.
>
> After completing transmission sequence 132, which may include a user data segment transmitted using the usual primary (e.g., type A) modulation, master transceiver 64 transmits a *trailing sequence 134* using type A modulation signifying the *end of the current communication session.*

Id. at 7:11-21 (emphasis added). Contrary to Defendants' arguments, the specification does not establish that the sole purpose of a training signal, for example, must be to notify a trib that the trib will not understand the subsequent data transmission because that data is intended for a different trib. *See* Dkt. No. 102 at 21-22.

As to extrinsic evidence, Plaintiff has cited a dictionary definition of "header" as: "Identification or control information placed at the beginning of a file or message. *Contrast*: trailer." Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 479 (1996). Plaintiff has also cited definitions of "trailer" as: "Identification or control information placed at **[*79]** the end of a file or message. *Contrast*: header"; and "The contiguous control bits following a transmission that contain information used for such purposes as bit error detection and end-of-transmission indication. *Contrast*: header." *Id.* at 1126.

The claims, specification, and extrinsic evidence are therefore all consistent with Plaintiff's proposal that a "training signal" marks the beginning of a communication session and a "trailing signal" marks the end of a communication session.

As to Defendants' proposals, Defendants have not argued that "training signal" and "trailing signal" are coined terms that the patentee defined in relation to what Defendants have argued is the sole purpose of the invention. To the extent that the specification discloses training and trailing signals that have destinations different from those of associated data transmissions, that capability is a feature of preferred embodiments and should not be imported into the claims. *See Comark*, 156 F.3d at 1187 ("[The specification] simply details how the video delay circuit is to be used in a single embodiment of the invention."). The Court therefore rejects Defendants' argument that the "training signal" and "trailing **[*80]** signal" must be capable of having a different intended destination than an associated data transmission.

Similarly, as noted above, Defendants have relied upon items 106, 126, and 138 in Figure 5 to support their argument that the "training signal" and "trailing signal" must be "distinct" or "discrete" transmissions. Figure 5 is reproduced here:

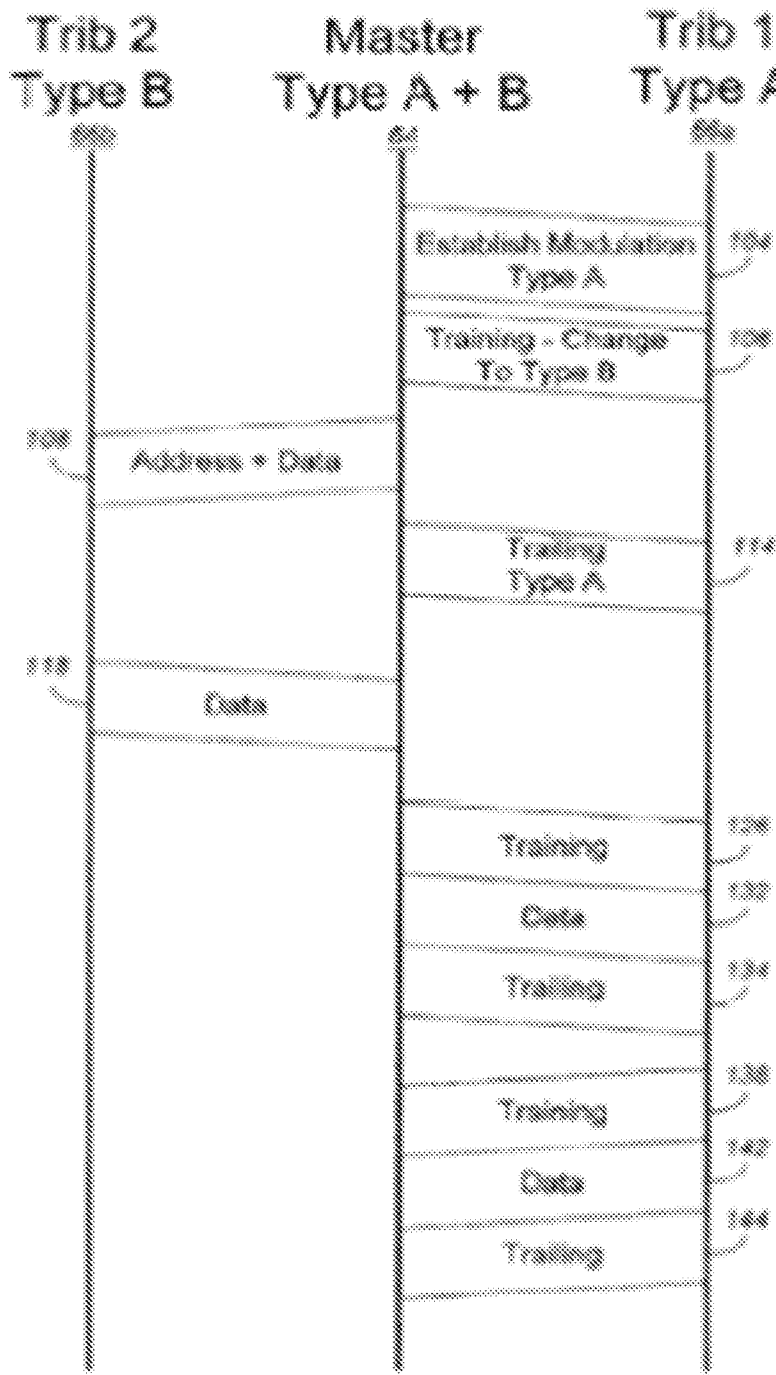

FIG. 5

Defendants have failed to demonstrate that this illustration of a preferred embodiment is limiting. *See MBO Labs.*, 474 F.3d at 1333 ("patent coverage is not necessarily limited to inventions that look like the ones in the figures"). Defendants' proposals in this regard are therefore rejected.

As to the proper constructions, Plaintiff's use of the word "signifies" is supported by the specification, particularly as to the term "trailing signal." *See* '228 Patent at 4:43-45 ("master transceiver 24 transmits data 36 to trib 26a followed by trailing sequence 38, which signifies the end of the communication session") & 7:19-21 ("master transceiver 64 transmits a trailing sequence 134 using type A modulation signifying the end of the current communication session"). The above-quoted disclosures demonstrate that a "training signal" should be construed **[*81]** in a similar manner.

Finally, at the May 30, 2014 hearing, Plaintiff had no objection to Defendants' proposal that a "training signal" must "establish[] properties of a subsequent data transmission."

The Court accordingly hereby construes the disputed terms as set forth in the following chart:

Term	Construction
"training signal"	**"a transmission that signifies the beginning of a transmission sequence and determines one or more properties of the transmission sequence"**
"trailing signal"	**"a transmission that signifies the end of a transmission sequence"**

E. "signal level compensation"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"adjusting signal parameters in the receiver"[6]	"adjusting the amplitude characteristics of a receiver"

FOOTNOTES

6 Plaintiff previously proposed: "adjusting signal parameters in the receiver to minimize receiving errors." Dkt. No. 81, Ex. A at 19.

Dkt. No. 97 at 27; Dkt. No. 102 at 26. The parties submit that this term appears in Claim 31 of the '228 Patent. Dkt. No. 81, Ex. A at 19.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for this disputed term: "adjusting signal parameters in **[*82]** the receiver." Plaintiff had no opposition to the Court's preliminary construction. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "just as there are many different 'signal levels'—Defendants' dictionary acknowledges 'voltage, current, power, phase shift, or frequency,' to name a few—there are many different ways to compensate those signal levels. For example, the frequency or phase shift of a signal may be compensated independent of the signal's amplitude." Dkt. No. 97 at 28.

Defendants respond that "[t]echnical dictionaries [(quoted below)] define 'signal level' as the strength or power of a signal." Dkt. No. 102 at 26. Defendants argue that Plaintiff's proposed construction "fails to give meaning to the word 'level.'" *Id.* at 27. Defendants explain that "frequency represents the number of signal cycles in a given time period, and phase reflects the signal's position on the x-axis (time). These are not measures of the signal's 'level,' *i.e.*, its strength or power." *Id.* Defendants argue that their multiple, unambiguous dictionary definitions outweigh Plaintiff's "lone and secondary definition." *Id.* at 28.

Plaintiff replies that the extrinsic dictionary definitions **[*83]** cited by the parties do not limit "signal level" to "amplitude." Dkt. No. 103 at 10.

At the May 30, 2014 hearing, Defendants acknowledged that frequency and phase are characteristics that may be said to have a "level," but Defendants maintained that a person of ordinary skill in the art at the relevant time would have understood "signal level" as referring to amplitude. Plaintiff responded that none of the evidence cited by Defendants refers to "amplitude." Defendants replied that they would have no objection to a construction that referred to "strength" instead of "amplitude." Defendants nonetheless reiterated that in no event should the disputed term encompass frequency or phase.

(2) Analysis

Claim 31 of the '228 Patent recites:

> 31. The master communication device as in claim 29, wherein the training signal establishes signal level compensation.

Claim 31 depends from Claim 29 and, in turn, Claim 26, but nothing in these claims informs the meaning of "signal level compensation." Likewise, the specification identifies "signal level compensation" as one of the uses of training signals (*see* '580 Patent at 3:53-56), but the specification does not otherwise discuss the term.

Plaintiff submits **[*84]** a technical dictionary definition of "compensation" as: "The controlling elements which compensate for, or offset, the undesirable characteristics of the process to be controlled in the system." *Id.*, Ex. 4, *Modern Dictionary of Electronics* 184 (6th ed. 1997). This aspect of the disputed term does not appear to be in dispute. Instead, the parties disagree on the scope of the term "signal level."

Plaintiff has cited a technical dictionary definition of "signal level" as: "The magnitude of a signal parameter or element, such as the magnitude of the electric field strength, voltage, current, power, phase shift, or frequency." Dkt. No. 97, Ex. 27, *Communications Standard Dictionary* 906 (3d ed. 1996). As Defendants have noted, however, that same dictionary alternatively defines "signal level" as: "A measure of the power of a signal at a specified point in a communications system." *Id.*

Defendants have also submitted additional dictionaries that define "signal level" in terms of power. Dkt. No. 102, Ex. 14, *Dictionary of Communications Technology* 401 (2d ed. 1995) ("The strength of a signal, generally expressed in either units of voltage or power."); *id.*, Ex. 15, *Newton's Telecom Dictionary* **[*85]** 544 (11th ed. 1996) ("The strength of a signal, generally expressed in either absolute units of voltage or power, or in units relative to the strength of the signal at its source."); *id.*, Ex. 16, *Dictionary of Telecommunications* 250 (1981) ("The magnitude of a signal at a point in a telecommunication circuit. This can be expressed as an absolute power level in decibels relative to one milliwatt (dBm).") (italics omitted).

In reply, Plaintiff has cited extrinsic articles that refer to signal "frequency level" and signal "phase level." Dkt. No. 103, Ex. 38, Hamid Nawab, et al., *Diagnosis Using the Formal Theory of a Signal-Processing System* 373 (1987); *id.*, Ex. 39, Marco Antonio Chamon & Gerard Salut, *Particle Filtering of Radar Signals for Non-Cooperating Target Imaging* 1041 (1998); *see id.*, Ex. 40, U.S. Pat. No. 3,953,798 at 3:56-63. Plaintiff argues these articles establish that frequency and phase can each have a "level."

These competing definitions and usages demonstrate why extrinsic sources must be considered with caution. *See Phillips*, 415 F.3d at 1321 ("[H]eavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the **[*86]** artisan into the meaning of the term in the abstract, out of its particular context, which is the specification. * * * [T]here may be a disconnect between the patentee's responsibility to describe and claim his invention, and the dictionary editors' objective of aggregating all possible definitions for particular words."); *see also id.* at 1322 ("There is no guarantee that a term is used in the same way in a treatise as it would be by the patentee. In fact, discrepancies between the patent and treatises are apt to be common because the patent by its nature describes something novel.").

On balance, because the specification refers to "phase . . . modulation" as well as "amplitude modulation" (*see id.* at 2:5-6), the Court rejects Defendants' reliance on extrinsic evidence and accordingly rejects Defendants' proposal to limit the disputed term to amplitude. *See Phillips*, 415 F.3d at 1321.

The Court therefore hereby construes **"signal level compensation"** to mean **"adjusting signal parameters in the receiver."**

F. "a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion of the first communication"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
No construction necessary; plain and ordinary meaning applies.	"a first portion of the first communication indicating that the second modulation method will be used instead of the first modulation method for modulating the payload data in the payload portion of the first communication"

Dkt. **[*87]** No. 97 at 29; Dkt. No. 102 at 28. The parties submit that this term appears in Claim 22 of the '228 Patent. Dkt. No. 81, Ex. A at 21.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for this disputed term: "Plain meaning."

(1) The Parties' Positions

Plaintiff argues that "[t]he plain and ordinary meaning of the instant term is apparent on its face and from the context of the surrounding claim language." Dkt. No. 97 at 29. Plaintiff further argues that Defendants' proposed construction "inject[s] an 'instead of the first modulation method' limitation" that "is unnecessary, because it does not help to clarify or explain the meaning of the instant term." *Id.* at 30.

Defendants respond that "[t]he specification discloses a training signal that indicates a *change* to a different modulation method." Dkt. No. 102 at 28. Defendants argue: "Claim 22 therefore must be construed to require an indication of an impending *change* to a second modulation method (*i.e.*, that "the second modulation method will be used instead of the first modulation method"), not simply that a second modulation method will be used." *Id.* at 29.
[*88] Defendants conclude that "[p]ermitting the claim to encompass a mere indication of the forthcoming modulation method, rather than a *change* to that method, would result in a failure of both the written description and enablement requirements under [35 U.S.C.] Section 112 (a)." *Id.* at 30.

Plaintiff replies that "Defendants' construction adds unnecessary verbiage to an unambiguous claim." Dkt. No. 103 at 10.

At the May 30, 2014 hearing, Plaintiff acknowledged that the disputed term and the surrounding claim language require a change from one modulation method to another modulation method. Plaintiff maintained that because this is clear on the face of the claim, no construction is necessary. Plaintiff concluded that Defendants' proposed construction should be rejected as tending to introduce a new limitation or as otherwise confusing the meaning of the claim. Defendants responded that clarification is warranted because the entire purpose of the purported invention is to notify and then to change modulation methods.

(2) Analysis

The Summary of the Invention refers to a "change in modulation":

> The present invention disclosed herein includes methods and systems for communication of data according **[*89]** to a communications method in which a master transceiver communicates with one or more slave transceivers according to a master/slave relationship.
>
> * * *
>
> The second message may comprise third information (e.g., first information of the second message/high data rate message), and the third information may be modulated according to the *first modulation method*. The third information may be indicative of an impending *change in modulation to a second modulation method* for transmission of fourth information (e.g., second information of the second message/high data rate message).

'228 Patent at 2:27-31 & 2:51-56 (emphasis added). The specification similarly discloses:

> To *switch from type A modulation to type B modulation*, master transceiver 64 transmits a training sequence 106 to type A tribs 66a in which these tribs are notified of an impending *change* to type B modulation. The *switch to type B modulation* could be limited according to a specific time interval or for the communication of a particular quantity of data. After notifying the type A tribs 66a of the change to type B modulation, master transceiver 64, using type B modulation, transmits data along with an address in sequence 108, which **[*90]** is destined for a particular type B trib 66b. In an example, embedded modulation permits a *secondary modulation to replace the usual primary modulation* for a user data segment located after a primary training sequence. For example, master transceiver 64 may *change* to modulation Type B and may convey user information to type B trib 66b. The type B trib 66b targeted by the master transceiver 64 will transition to state 112 as shown in FIG. 6 upon detecting its own address where it processes the data transmitted in sequence 108.

Id. at 6:27-44 (emphasis added); *see id*. at Figs. 5, 7 & 8 (illustrating "Change to Type B").

Claim 22 of the '228 Patent, which is the only claim that contains the disputed term, recites (emphasis added):

> 22. A communication device configured to communicate according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave, the device comprising:
>
> a transceiver in the role of the master according to the master/slave relationship that is configured to send at least a plurality of communications, wherein each communication from among said plurality of communications **[*91]** comprises at least a respective *first portion* and a respective payload portion, wherein each communication from among said plurality of communications is addressed for an intended destination of the respective payload portion of that communication, and wherein *for each communication from among said plurality of communications*:
>
>> said respective *first portion is modulated according to a first modulation method* from among at least two types of modulation methods, wherein the at least two types of modulation methods comprise the first modulation method and a second modulation

> method, wherein the second modulation method is of a different type than the first modulation method,
> said respective first portion comprises an indication of which of the first modulation method and the second modulation method is used for modulating respective payload data in the respective payload portion, and
> the payload data is modulated according to at least one of the first modulation method or the second modulation method in accordance with what is indicated by the respective first portion;

> the transceiver further configured to send at least a first communication of the plurality of communications such that payload **[*92]** data included in a payload portion of the first communication is modulated according to the second modulation method based on *a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion of the first communication*, wherein the payload data is included in the first communication after the first portion of the first communication;
>
> the transceiver further configured to send at least a second communication of the plurality of communications such that payload data included in a payload portion of the second communication is modulated according to the first modulation method based on a first portion of the second communication indicating that the first modulation method will be used for modulating the payload data in the payload portion of the second communication.

On balance, the recital that the "first portion is modulated according to a first modulation method"—coupled with the recital in the disputed term that "the second modulation method will be used for modulating the payload data in the payload portion of the first communication"—is clear on its face.

Further, as noted above, Plaintiff has **[*93]** agreed that the disputed term and the surrounding claim language require a change from one modulation method to another modulation method.

Defendants' proposed clarification is therefore unnecessary and would tend to confuse rather than clarify the scope of the claim. *See U.S. Surgical*, 103 F.3d at 1568 ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro*, 521 F.3d at 1362 ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction.").

The Court accordingly hereby expressly rejects Defendants' proposed construction and hereby construes **"a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion [*94] of the first communication"** to have its **plain meaning.**

CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit.

The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 10th day of July, 2014.

/s/ Roy S. Payne

ROY S. PAYNE

UNITED STATES MAGISTRATE JUDGE

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Treatment	Title	Date	Type	Depth	Headnote(s)
Examined by	**1. SAMSUNG ELECTRONICS CO. LTD., SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG TELECOMMUNICATIONS AMERICA, LLC, AND SAMSUNG AUSTIN SEMICONDUCTOR, LLC, PETITIONER, v. REMBRANDT WIRELESS TECHNOLOGIES, LP, PATENT OWNER.** 2015 WL 5719797, *1+ , Patent Tr. & App. Bd. Samsung Electronics Co. Ltd., Samsung Electronics America, Inc., Samsung Telecommunications America, LLC, and Samsung Austin Semiconductor, LLC (collectively, "Petitioner") filed...	Sep. 24, 2015	Administrative Decision		—
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Treatment	Title	Date	Type	Depth	Headnote(s)
Examined by	**5. SAMSUNG ELECTRONICS CO. LTD., SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG TELECOMMUNICATIONS AMERICA, LLC, AND SAMSUNG AUSTIN SEMICONDUCTOR, LLC, PETITIONER, v. REMBRANDT WIRELESS TECHNOLOGIES, LP, PATENT OWNER.** 2014 WL 7015247, *1+ , Patent Tr. & App. Bd. Samsung Electronics Co. Ltd., Samsung Electronics America, Inc., Samsung Telecommunications America, LLC, and Samsung Austin Semiconductor, LLC (collectively, "Petitioner")...	Dec. 10, 2014	Administrative Decision		—
Examined by	**6. SAMSUNG ELECTRONICS CO. LTD., SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG TELECOMMUNICATIONS AMERICA, LLC, AND SAMSUNG AUSTIN SEMICONDUCTOR, LLC, PETITIONER, v. REMBRANDT WIRELESS TECHNOLOGIES, LP, PATENT OWNER.** 2014 WL 7015248, *1+ , Patent Tr. & App. Bd. Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., Samsung Telecommunications America, LLC, and Samsung Austin Semiconductor, LLC (collectively, "Petitioner")...	Dec. 10, 2014	Administrative Decision		—
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Treatment	Title	Date	Type	Depth	Headnote(s)
Examined by	**16. Patent Owner Preliminary Response to Petition Pursuant to 37 C.F.R. s 42.107** Out Of Plan SAMSUNG ELECTRONICS CO. LTD.; Samsung Electronics America, Inc.; Samsung Telecommunications America, LLC; and Samsung Austin Semiconductor, LLC, Petit... 2014 WL 4647755, *1+ , Patent Tr. & App. Bd. (Administrative Filing)	Sep. 18, 2014	Administrative Filing		—
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—	**61. MULTIPOINT SYSTEM FOR FACILITATING DATA COMMUNICATIONS AMONG MODEMS IN POINT-TO-POINT NETWORK, HAS MASTER TRANSCEIVER TRANSMITTING TRAILING SEQUENCE IN ONE OF MODULATION METHODS E.G. SHIFT KEYING MODULATION METHOD, AFTER TRAINING SEQUENCE** Out Of Plan DWPI 2012-F08686	Dec. 05, 1997	DWPI	—	—

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—	**62.** MULTIPOINT COMMUNICATION SYSTEM, HAS TRANSCEIVER TRANSMITTING TRAINING SEQUENCE IN MODULATION PROCESS, WHERE SEQUENCE INDICATES IMPENDING CHANGE FROM ONE PROCESS TO ANOTHER PROCESS AND TRAILING SEQUENCE TRANSMITTED AFTER TRAINING SEQUENCE Out Of Plan DWPI 2014-K80666	Dec. 05, 1997	DWPI	—	—
—	**63.** MULTIPOINT COMMUNICATION SYSTEM FOR FACILITATING COMMUNICATION AMONG E.G. TRIBUTARY OR TRIB MODEMS IN NETWORK TO PROVIDE PHONE SERVICE, HAS SIMPLE CABLE PHONE AND INTERACT DEVICE FOR SENDING SIGNAL TO TERMINATION SYSTEM AND HEAD ENDS Out Of Plan DWPI 2015-194092+	Dec. 05, 1997	DWPI	—	—
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—	**80.** SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS Out Of Plan US PAT APP 20140153621 , U.S. PTO Application A device may be capable of communicating using at least two type types of modulation methods. Methods and systems are provided for communication of data according to a...	June 05, 2014	Patents	—	—
—	**81.** PATENT-E.D. TEX.: SAMSUNG LOSES BID FOR POST-TRIAL JUDGMENT OF NON-INFRINGEMENT OF REMBRANDT PATENTS Out Of Plan Samsung was not entitled to a post-trial judgment of non-infringement of two Rembrandt Wireless patents, both of which described a wireless communications system that used multiple...	2016	Other Secondary Source	—	—
—	**82.** PATENT-E.D. TEX.: SAMSUNG'S EFFORT TO REDUCE $15.7M AWARD FAILS IN BLUETOOTH INFRINGEMENT CASE Out Of Plan Samsung was not entitled to a post-trial judgment to set aside a $15.7 million damages award that a jury delivered after finding that Samsung had infringed two Rembrandt Wireless...	2016	Other Secondary Source	—	—
—	**83.** WORTH NOTING-OTHER IP LAW DEVELOPMENTS Out Of Plan A periodic roundup of other items of interest to the Intellectual Property community: PATENT—E.D. Tex.: A federal jury in Marshall, Texas, has determined that Samsung must pay...	2015	Other Secondary Source	—	—

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	110797-0019-502	7821

15027 7590 09/22/2016

Condo Roccia Koptiw LLP
1800 JFK Boulevard
Suite 1700
Philadelphia, PA 19103

EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
09/22/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Commissioner for Patents
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(THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS)

ROPES & GRAY LLP PRUDENTIAL TOWER
IPRM DOCKETING - FLOOR 43
800 BOYLSTON STREET
BOSTON, MA 02199-3600

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/013,809*.

PATENT NO. *8457228*.

ART UNIT *3992*.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Ex Parte Reexamination Interview Summary – Pilot Program for Waiver of Patent Owner's Statement	**Control No.** 90/013,809	**Patent Under Reexamination is Requested** 8457228
	Examiner WEAVER, SCOTT	**Art Unit** 3992

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address. --

All participants (USPTO official and patent owner):

(1) PATRICIA VOLPE, OCRU (3)

(2) JOSEPH R. KLINICKI, 68505 (4)

Date of Telephonic Interview:09/20/2016.

A. The USPTO official requested waiver of the patent owner's statement pursuant to the pilot program for waiver of patent owner's statement in *ex parte* reexamination proceedings.*

☐ The patent owner **agreed** to waive its right to file a patent owner's statement under 35 U.S.C. 304 in the event reexamination is ordered for the above-identified patent.

☒ The patent owner **did not agree** to waive its right to file a patent owner's statement under 35 U.S.C. 304 at this time.

☐ USPTO personnel were unable to reach the patent owner.**

B. The Patent Owner of record telephoned the Office and indicated they would like to participate in the pilot program for waiver of patent owner's statement in *ex parte* reexamination proceedings.*

☐ The Patent owner of record telephoned the Office and **agreed** to waive its right to file a patent owner's statement under 35 U.S.C. 304 in the event reexamination is ordered for the above-identified patent.

The patent owner is not required to file a written statement of this telephone communication under 37 CFR 1.560(b) or otherwise. However, any disagreement as to this interview summary must be brought to the immediate attention of the USPTO, and no later than one month from the mailing date of this interview summary. Extensions of time are governed by 37 CFR 1.550(c).

*For more information regarding this pilot program, see *Pilot Program for Waiver of Patent Owner's Statement in Ex Parte Reexamination Proceedings*, 75 *Fed. Reg.* 47269 (August 5, 2010), available on the USPTO Web site at http://www.uspto.gov/patents/law/notices/2010.jsp.

**The patent owner may contact the USPTO personnel at (571) 272-7705 or at the telephone number provided below if the patent owner decides to waive the right to file a patent owner's statement under 35 U.S.C. 304.

/PATRICIA VOLPE/ (571)272-6825
Signature and telephone number of the USPTO official, who contacted, was contacted by, or attempted to contact the patent owner.

cc: Requester (if third party requester)

POWER OF ATTORNEY and CORRESPONDENCE ADDRESS INDICATION FORM		
	Application/Patent Number	**13/198,568 / 8,457,228**
	Filing Date	**August 4, 2011**
	First Named Inventor	**Gordon F. Bremer**
	Art Unit	**2633**
	Examiner Name	**Dac V. Ha**
	Attorney Docket Number	**3277-114**
	Title	**System and Method of Communication Using at Least Two Modulation Methods**

The below-named Assignee of record of the entire interest in the subject application, through its authorized representative identified below, hereby revokes all previous powers of attorney given in the above-identified application and hereby appoints the practitioners associated with the Customer Number 06449 as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

Statement under 37 CFR 3.73(b)

A chain of title from the inventors, of the patent application/patent identified above, to the current assignee as follows:

1. Assignment From: Summit Technology Systems, LP
   To: Rembrandt Wireless Technologies, LP
   The document was recorded in the U.S. Patent and Trademark Office at Reel 027085, Frame 0636.

ACKNOWLEDGEMENT AND CONSENT BY ASSIGNEE TO OBTAIN INSTRUCTIONS FROM ANOTHER PARTY

Assignee, through its undersigned authorized representative, hereby acknowledges that the practitioners appointed herein may obtain instructions as to any action to be taken in the U.S. Patent and Trademark Office on any application to which this power of attorney may be directed, or on any patent which may issue on any such application, from assignee's third-party agents or attorneys, or other designee, who have been authorized by assignee to convey such instructions, and assignee expressly consents to this arrangement. In the event of a change in the persons from whom instructions are to be taken, the practitioners appointed herein shall be so notified by the assignee.

Assignee Name	**Rembrandt Wireless Technologies, LP**, by its general partner,
Signature of Authorized Representative	Rembrandt Virginia Management, LLC
Typed or Printed Name	Alex Lemoiner
Typed or Printed Title	Secretary
Date	9/27/2016

Electronic Acknowledgement Receipt

EFS ID:	27050751
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	15027
Filer:	Martin M. Zoltick/Tamika Miles
Filer Authorized By:	Martin M. Zoltick
Attorney Docket Number:	110797-0019-502
Receipt Date:	27-SEP-2016
Filing Date:	12-SEP-2016
Time Stamp:	18:00:51
Application Type:	Reexam (Patent Owner)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	Power_of_Attorney.pdf	164218 9c670c514a002acc127484a350e668145a65926a	no	1

Warnings:

Information:	
Total Files Size (in bytes):	164218

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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BIB DATA SHEET

CONFIRMATION NO. 7821

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
90/013,809	09/12/2016 RULE	375	3992	110797-0019-502

APPLICANTS

INVENTORS

8457228, Residence Not Provided;
REMBRANDT WIRELESS TECHNOLOGIES, LP, ARLINGTON, VA;
SAMSUNG ELECTRONICS CO., LTD. (3RD PTY REQ.), GYEONGGI-DO, KOREA, REPUBLIC OF;
SAMSUNG ELECTRONICS AMERICA, INC. (3RD PTY REQ.), RIDGEFIELD PARK, NJ;
ROPES & GRAY LLP PRUDENTIAL TOWER, BOSTON, MA

**** CONTINUING DATA** **************************

This application is a REX of 13/198,568 08/04/2011 PAT 8457228
which is a CON of 12/543,910 08/19/2009 PAT 8023580
which is a CON of 11/774,803 07/09/2007 PAT 7675965
which is a CON of 10/412,878 04/14/2003 PAT 7248626
which is a CIP of 09/205,205 12/04/1998 PAT 6614838
which claims benefit of 60/067,562 12/05/1997

**** FOREIGN APPLICATIONS** *************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

		STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
Foreign Priority claimed ☐ Yes ☐ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and Acknowledged ______ Examiner's Signature	☐ Met after Allowance ______ Initials			52	3

ADDRESS

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005
UNITED STATES

TITLE

SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

FILING FEE RECEIVED		
12000	FEES: Authority has been given in Paper No.__________ to charge/credit DEPOSIT ACCOUNT No.__________ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other ________ ☐ Credit

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
90/013,809	09/12/2016	8457228	110797-0019-502

CONFIRMATION NO. 7821

POWER OF ATTORNEY NOTICE

OC000000086120405

15027
Condo Roccia Koptiw LLP
1800 JFK Boulevard
Suite 1700
Philadelphia, PA 19103

Date Mailed: 09/29/2016

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/27/2016.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/rbell/

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
90/013,809	09/12/2016	8457228	110797-0019-502

CONFIRMATION NO. 7821

POA ACCEPTANCE LETTER

OC000000086120436

6449
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

Date Mailed: 09/29/2016

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/27/2016.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/rbell/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In *Ex Parte* Reexamination of	:	Group Art Unit: 2633
Gordon F. BREMER	:	
Patent No.: 8,457,228 B2	:	Control No.: 90/013,809
Issued: June 4, 2013	:	

Reexam Request Filed: September 12, 2016

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

Attn: Mail Stop "*Ex Parte* Reexam"
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION REQUESTING THE DIRECTOR TO EXERCISE HER DISCRETIONARY AUTHORITY UNDER 35 U.S.C. § 325(d)
PURSUANT TO 37 C.F.R. § 1.181(a)(2) AND/OR § 1.182

Pursuant to 37 C.F.R. §1.181(a)(2) and/or § 1.182, Rembrandt Wireless Technologies, LP ("Rembrandt") respectfully requests the Director to exercise her discretionary authority under 35 U.S.C. § 325(d) to reject the Request for *Ex Parte* Reexamination of claim 21 of U.S. Patent No. 8,457,228 ("Request") filed by Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. (collectively "Samsung"). By its plain language, the second sentence of § 325(d) applies to such Requests in the same way that it applies to AIA review proceedings:

> **In determining whether to institute *or order* a proceeding under this chapter, *chapter 30 [the ex parte reexamination chapter]*, or chapter 31, the Director may take into account whether, and reject the petition *or request* because, the same or substantially the same prior art or arguments previously were presented to the Office [emphasis added].**

This Petition is timely filed, i.e., within two months of Samsung's filing of the Request and prior to the Office acting on the Request. To the extent the Office believes any rules, such as 37 C.F.R. § 1.530 or § 1.33, prevent consideration of Rembrandt's Petition, Rembrandt further petitions the Director to suspend such rules under the power granted to the Director by 37 C.F.R. § 1.183.

Samsung's present request is the ***eighth*** challenge it has made in the Office to U.S. Patent No. 8,457,228 (the "'228 Patent") and the ***fourth*** challenge it has made to claim 21 in particular (the claim challenged in its present Request).[1] A brief history of Samsung's challenges to the claims of the '228 Patent in the Office,[2] including those to claim 21, is as follows:

On June 4, 2014, Samsung filed *six* petitions for *inter partes* review of claims of the '228 Patent. Three of these six petitions were denied with respect to all challenged claims because Samsung failed to show a reasonable likelihood it would prevail on any of the grounds raised. See IPR2014-00889, Paper 8, at 11(Dec. 10, 2014)(denied as to claims 1-3, 5 and 10-21); IPR2014-00890, Paper 8, at 10 (Dec. 10, 2014)(denied as to claims 22, 23 and 25); and IPR2014-00891, Paper 8, at 12 (Dec. 10, 2014)(denied as to claims 26-29, 31, 36-41, 43 and 47-52). In the three others filed the same day, the petition was either granted with respect to some

---

[1] Samsung has also filed a Request for *Ex Parte* Reexamination of claims 2 and 59 of U.S. Patent No. 8,023,580 (the "'580 Patent"), the parent of the '228 Patent. With respect to the '580 Patent, Samsung's Request is its *seventh* challenge to the claims of that patent. See IPR2014-00514, -00515, -00518, -00519, 2015-00114 and -00118. Rembrandt has also filed a petition under 37 CFR § 1.181(a)(3) and § 1.182 asking the Director to reject Samsung's Request for *Ex Parte* Reexamination of claims 2 and 59 the '580 Patent for substantially the same reasons it is requesting the Director to do so here.

[2] The '580 Patent and the '228 Patent are also the subject of a lawsuit in which Rembrandt served the complaint on June 5, 2013 and asserted infringement by Samsung. *Rembrandt Wireless Technologies, LP v. Samsung Electronics Co.*, No. 2:13-cv-00213 (E.D. Tex.). Samsung *unsuccessfully* challenged the validity of claims 2 and 59 of the '580 Patent and of claim 21 of the '228 Patent in that lawsuit as well. That case is now on appeal at the Federal Circuit, No. 16-1729.

claims (IPR2014-00892, Paper 8, at 15 (Dec. 10, 2014)(granted as to claims 1-3, 5 and 10-20, but denied as to claim 21)), or granted with respect to other claims (IPR2014-00893, Paper 8, at 14 (Dec. 10, 2014)(granted as to claims 22, 23 and 25) and IPR2014-00895, Paper 8, at 16 (Dec. 10, 2014)(granted as to claims 26-29, 31, 36-41, 43 and 47-52)). Two of Samsung's six petitions filed on June 4, 2014 included a challenge of claim 21, and in *both* instances its petitions for review claim 21 were denied. IPR2014-00889, Paper 8, at 11, and IPR2014-00892, Paper 8, at 15. In each of these two cases, the Board determined that Samsung had not demonstrated a reasonable likelihood of prevailing as to claim 21. *Id.*

Having failed in its first round of challenges with respect to claim 21 of the '228 Patent, Samsung filed a seventh petition for *inter partes* review of the '228 patent on January 9, 2015, presenting an additional reference (Siwiak) to support its allegations of obviousness. See IPR2015-00555, Paper 20, at 2 (June 19, 2015). In its seventh petition attacking the '228 Patent, Samsung limited its challenge to claim 21. This time the Board denied Samsung's petition through the exercise of the Director's discretion under 35 U.S.C. § 325(d). In so doing, the PTAB explained:

> The difference between what Petitioner presents in this proceeding and what Petitioner presented in IPR '892 with respect to claim 21 of the '228 patent is that Petitioner now offers Siwiak as support for the asserted obviousness of placing address data in a message header as taught by Boer. … Petitioner, however, presents no argument or evidence that Siwiak was not known or available to it at the time of filing IPR '892. …
>
> Petitioner is requesting, essentially, a second chance to challenge the claims. We, however, are not persuaded that a second chance would help "secure the just, speedy, and inexpensive resolution of every proceeding." 37 C.F.R. § 42.1(b). Permitting second chances in cases like this one ties up the Board's limited resources; we must be mindful not only of this proceeding, but

> of "every proceeding." *Id.*; *see also ZTE Corp. v. ContentGuard Holdings, Inc.*, Case IPR2013-00454, slip op. at 5–6 (Board Sept. 25, 2013) (Paper 12) ("The Board is concerned about encouraging, unnecessarily, the filing of petitions which are partially inadequate.") ….
>
> In this proceeding … we are not apprised of a reason that merits a second chance. Petitioner simply presents arguments now that it could have made in IPR '892, had it merely chosen to do so. [IPR2015-00555, Paper 20, at 7-9. *See also Samsung v. Rembrandt Wireless Tech., LP*, IPR2015-00114, Paper 14 at 7 (Jan. 28, 2015); *Samsung v. Rembrandt Wireless Tech., LP*, IPR2015-00118, Paper 14 at 6-7 (Jan. 28, 2015).]

The Board has consistently denied such "follow-on" petitions as representing impermissible "second bites at the apple," which use the prior institution decision "to bolster challenges that were advanced, unsuccessfully, in [an earlier petition]," *Unilever Inc. v. Proctor & Gamble*, IPR2014-00506, Paper 17 at 8 (July 7, 2014), "as a roadmap to remedy [petitioner's] prior, deficient challenge," *Butamax v. Gevo, Inc.*, IPR2014-00581, Paper 8 at 12-13 (Oct. 14, 2014), or "as an entry ticket, and a how-to guide … to challenge those claims which [petitioner] unsuccessfully challenged in the first petition," *ZTE Corp. v. ContentGuard*, IPR2013-00454, Paper 12 at 6 (Sept. 25, 2013).

Indeed, in rebuffing such attempts to remedy earlier failures, the Board has especially weighed whether a petitioner has demonstrated that the art or arguments were not known or available to it at the time of filing the earlier petition. *See, e.g.*, *Unilever Inc. v. Proctor & Gamble*, IPR2014-00506, Paper 17 at 6, 8 (July 7, 2014) ("Unilever, however, presents no argument or evidence that the seven newly cited references were not known or available to it at the time of filing of [an earlier petition] …Based on the information presented, we are persuaded that the instant Petition uses our prior Decision on Institution to bolster challenges that were advanced, unsuccessfully, in the [earlier petition]."); *Butamax v. Gevo, Inc.*, IPR2014-00581, Paper 8 at 12-13 (Oct. 14, 2014) ("Our discretion to deny these grounds is further guided by several additional facts. First, we note that Butamax does not contend that the newly cited references were not known or available to it at the time it filed the [earlier petition]. *See Unilever, Inc. v. Procter & Gamble Co.*, Case IPR2014-00506, slip op. at 6 (Board July 7, 2014) (Paper 17) (considering, in exercising § 325(d) discretion, whether new references were previously known).").

In Samsung's present Request, Samsung does not argue that the newly cited references presented in its Request were not available to it at the time of its multiple earlier IPRs, and there is no reason why Samsung should be afforded a "second bite" here.

Denying Samsung's present Request is consistent with the legislative intent behind § 325(d), which is to prevent gamesmanship through the filing of multiple proceedings in a piecemeal manner. *See* 157 Cong. Rec. S1042 (daily ed. Mar. 1, 2011) (Statement of Sen. Kyl) (Sen. Kyl stating that § 325(d) "allows the Patent Office to reject any request for a proceeding, *including a request for ex parte reexamination,* if the same or substantially the same prior art or arguments previously were presented to the Office with respect to that patent.") (emphasis added)). *See also Butamax*, IPR2014-00581, Paper 8, at 13 ("Our discretion to deny these grounds is further guided by several additional facts. First, we note that Butamax does not contend that the newly cited references were not known or available to it at the time it filed the [earlier petition]…. Allowing similar, serial challenges to the same patent, by the same petitioner, risks harassment of patent owners and frustration of Congress's intent in enacting the Leahy-Smith America Invents Act. *See* H.R. Rep. No. 112-98, pt.1, at 48 (2011) ('While this amendment is intended to remove current disincentives to current administrative processes, the changes made by it are not to be used as tools for harassment or a means to prevent market entry through repeated litigation and administrative attacks on the validity of a patent. Doing so would frustrate the purpose of the section as providing quick and cost effective alternatives to litigation.')"). *See also Conopco, Inc. dba Unilever v. Proctor & Gamble*, IPR2014-00628, Paper 21 at 11 ("the interests of fairness, economy, and efficiency support declining review – a result that discourages the filing of a first petition that holds back….").

Granting Samsung's Request in this proceeding would incentivize patent challengers to file serial petitions and requests and increase the burden on both the Office and patent owners in having to respond to renewed attacks from unhappy challengers seeking a reconsideration of the Office's decisions denying institution and/or reexamination, based on arguments that the challenger could have set forth from the beginning. Clearly, this was not the intent of Congress.

When Congress established *ex parte* reexamination and the AIA review proceedings, Congress wanted to provide a more efficient system for challenging patents and a way to reduce litigation costs. However, in petitioning for multiple IPRs and now requesting *ex parte* reexamination for claims it failed to establish unpatentability in the IPRs, Samsung was not and is not seeking such efficiency and cost reduction. Samsung could have filed its IPRs (as well as its *ex parte* reexamination requests) early in the district court litigation process, and moved to stay the district court litigation. It chose not to do so. Rather, Samsung allowed the district court litigation to advance and waited until the last possible day to file its first six IPRs challenging the '228 Patent claims – making a stay of the litigation unlikely and ensuring that the IPRs would not reach the stage of a final written decision until *after* the district court case was tried in February 2015. This timing eliminated any risk that Samsung would be estopped (by a final decision from the Office) from contesting validity at trial, and secured for Samsung another venue in which it could seek to invalidate the patent in the event it lost at trial. Contrary to the intent of Congress, Samsung has timed its multiple challenges in the Office in a manner that actually decreases efficiency and increases litigation costs.

Having failed yet a *third* time in challenging claim 21 of the '228 Patent through *inter partes* review, Samsung now makes a *fourth* attempt by turning to another Office proceeding, *ex parte* reexamination. Samsung presents no argument or evidence that was not known or available to it at the time it filed the multiple *inter partes* reviews described above.[3]

Thus, for the reasons given above, including those the Board gave in denying institution of IPR2015-00555 through the exercise of the Director's discretion under § 325(d) (quoted above), Patent Owner Rembrandt respectfully requests that the Director exercise her discretion in this case to reject Samsung's Request for *Ex Parte* Reexamination of U.S. Patent No. 8,457,228.

Any fee required for submission of this Petition may be charged to Counsel's Deposit Account Number 02-2135.

Respectfully submitted,

Date: September 30, 2016 By: */ Nancy J. Linck /*

Nancy J. Linck, Reg. No. 31,920
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W., Suite 800
Washington, DC 20005
Phone: 202-783-6040
Facsimile: 202-783-6031

Attorney for Petitioner
Rembrandt Wireless Technologies, LP

---

[3] *Cf. Praxair Distribution, Inc. v. iNO Therapeutics LLC*, IPR2016-00781, Paper 10, at 7 (Aug. 25, 2016) (exercising its discretion to deny an *inter partes* petition under § 325(d), the PTAB determined that "reasonably could have been raised," in the context of § 315(e)(1), included prior art "'which a skilled searcher conducting a diligent search reasonably could have been expected to discover.' 157 Cong. Rec. S1375 (daily ed. Mar. 8, 2011) (statement of Sen. Kyl)".). This reasoning should apply equally to late-cited prior art that reasonably could have been raised in an earlier Office proceeding.

CERTIFICATE OF SERVICE

It is hereby certified that on this 30th day of September, 2016, the foregoing **PETITION REQUESTING THE DIRECTOR TO EXERCISE HER DISCRETIONARY AUTHORITY UNDER 35 U.S.C. § 325(d) PURSUANT TO 37 C.F.R. § 1.181(a)(2) AND/OR § 1.182** was served, by first-class U.S. Mail, on the attorney of record for the third-party Requesters Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., at the following address:

J. Steven Baughman, Esq.
Ropes & Gray LLP
IPRM – Floor 43
Prudential Tower
800 Boylston Street
Boston, Massachusetts 02199-3600
Phone: 202-508-4606
Facsimile: 202-383-8371

/ Nancy J. Linck /
Nancy J. Linck
Reg. No. 31,920

Electronic Acknowledgement Receipt

EFS ID:	27090166
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	6449
Filer:	Martin M. Zoltick/Tamika Miles
Filer Authorized By:	Martin M. Zoltick
Attorney Docket Number:	110797-0019-502
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Petition.pdf	144171 1e56a60b70d59cc6ae43ec5f0458f6708bde7913	yes	8

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Petition for review by the Office of Petitions	1	7
	Reexam Certificate of Service	8	8
Warnings:			
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	Total Files Size (in bytes):	144171	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Gordon F. Bremer	§	Control No. 90/013,809
U.S. Patent No. 8,457,228	§	Attorney Docket No.: 110797-0019-502
Formerly Application No. 13/198,568	§	Customer No.: 28120
Issue Date: June 4, 2013	§	Examiner: Scott Louis Weaver
Filing Date: August 4, 2011	§	Requesters: Samsung Electronics Co., Ltd.,
Former Group Art Unit: 2633	§	Samsung Electronics America, Inc.
Former Examiner: Dac Ha	§	

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

MAIL STOP *EX PARTE* REEXAM
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

THIRD PARTY REQUESTERS' OPPOSITION TO PATENT OWNER'S PETITION TO REJECT REEXAMINATION REQUEST

Rembrandt's petition to reject the *ex parte* reexamination request in this proceeding should be denied. Rembrandt's petition is an improper submission not permitted under the rules for reexamination and not invited by the Director. Moreover, in a co-pending reexamination of a related patent involving the same prior art, the Examiner granted that request for reexamination *before* Rembrandt filed petitions to reject both requests, making findings that contradict arguments made by Rembrandt's petitions. Rembrandt does not even attempt to show, as required by § 325(d), that the cited reexamination references or arguments are "the same or substantially the same" as any prior challenges—and they are not. Rembrandt's petition should be rejected as an improper and meritless attempt to derail this reexamination.

I. BACKGROUND

On September 12, 2016, Samsung filed requests for *ex parte* reexamination of U.S. Patent Nos. 8,457,228 (the "'228 patent") and 8,023,580 (the "'580 patent"). The '228 patent is a continuation of the '580 patent, and the challenged claims of both patents involve substantially the same subject matter: "a data communications system in which a plurality of modulation methods are used to facilitate communication among a plurality of modem types." '228 patent at 1:21-25. Each request cites the same six references, five of which the PTO has never considered in connection with the challenged patents.[1] Furthermore, each request details the patent's history before the PTO, including original prosecution and all post-grant proceedings. *E.g.*, Request at 7-16. The Office has not conducted any prior or concurrent reexaminations and has never instituted any post-grant trial on the challenged claims.

On September 27, 2016, only fifteen days after Samsung filed both reexamination requests, the Examiner for the '580 patent ordered reexamination of all challenged claims. *See* Order Granting Request for *Ex Parte* Reexamination, Control No. 90/013,808 ("'580 Order"). In doing so, the Examiner reviewed in detail the prosecution history and each *inter partes* review involving the '580 patent. *See id.* at 5-8. After analyzing this record, the Examiner found that:

> Based on the prosecution histories of the 580 patent ***and the IPR proceedings*** in which the independent claims 1 and 58 were found unpatentable, the Examiner finds that a reference or a combination of references teaching or suggesting at least the following features . . . in the context of data communication and modulators and demodulators using two modulation methods would be a ***new, non-cumulative teaching not previously considered*** before the Office during the

---

[1] None of the cited Snell, Yamano, Harris 4064.4, Harris AN9614, and Kamerman references was considered or applied during prosecution of the '228 patent, its parent applications, or during *inter partes* review of the '228 patent. *See* Request for *Ex Parte* Reexamination of U.S. Patent No. 8,457,228 ("Request") at 5-7. The sixth reference, Upender, was before the Office during prior *inter partes* review proceedings (*id.* at 6), but only to establish motivation to combine the master/slave relationship of the admitted prior art with a different prior art reference (Boer) (*see id.* at 1-2, 5-7, 13-14).

> examination of the 580 patent ***and the prior IPR proceedings*** and therefore may raise a substantial new question of patentability.

Id. at 7-8 (emphases added). Accordingly, the Examiner agreed with Samsung that the cited Snell reference raises multiple SNQs in combination with additional cited references, and further determined *sua sponte* that Snell raises an SNQ by itself. *See id.* at 11.

On September 30, 2016—three days *after* reexamination of the '580 patent was granted—Rembrandt filed petitions seeking rejection of the reexamination requests for both patents. *See* Rembrandt Petition ("Petition"). Each petition is based solely on the provision of § 325(d) that permits the Director to "take into account whether . . . the same or substantially the same prior art or arguments previously were presented to the Office." *See id.* at 1.

II. REMBRANDT'S PETITION IS BASELESS AND SHOULD BE DENIED

Rembrandt's petition has no procedural basis under Office rules. The Petition is also meritless because the Office has already ordered reexamination of related claims based on the *same* references, thereby finding that the prior art and arguments in these reexaminations present new and non-cumulative teachings that were not previously considered by the Patent Office.

A. The Petition is Improper and Untimely

Rembrandt's Petition is an improper attempt by the Patent Owner to influence this *ex parte* reexamination. The Office's rules plainly prohibit any patent owner statements prior to the Examiner's decision on a reexamination request: "The patent owner has no right to file a statement subsequent to the filing of the request under 35 U.S.C. 302 but prior to the order for reexamination." MPEP § 2249. After an order granting reexamination and before further examination, a patent owner may file a single statement limited to "why the subject matter as claimed is not anticipated or rendered obvious." 37 C.F.R. § 1.530(c). Rembrandt's Petition does not address the prior art or any substantive arguments. While Rembrandt invokes § 325(d) as a basis for rejecting the Request, the governing rules—as with other questions concerning the grant or denial of a reexamination request—do not call for the patent owner's input regarding § 325(d) at this stage, and the Director has not invited any briefing or submissions on this issue in reexamination. For this reason alone, the Petition is an improper patent owner submission.[2]

Moreover, the Petition should be rejected because reexamination has already been ordered for the '580 patent before the Petition was filed. As explained above, the '228 and '580 patents are related, involve the same subject matter, and are challenged with the same six prior art references. The Examiner for the '580 patent has already determined that the cited references raise substantial new questions of patentability—the same should be true for the '228 patent. Therefore, Rembrandt's demand that the Director "reject the Request for *Ex Parte* Reexamination" is not only improper, but also comes after the Examiner in the co-pending reexamination of the '580 patent has already drawn conclusions contradicting Rembrandt's argument regarding § 325(d).

B. Rembrandt Fails to Show That any Art or Arguments are the Same or Substantially the Same as Previous Submissions

Despite invoking § 325(d) as the sole basis for denying reexamination, Rembrandt wholly ignores the statutory test of whether "the same or substantially the same prior art or arguments" are involved. The Petition does not even identify a single reference cited in the Request—much less explain how any are substantially the same as those presented previously. In fact, Rembrandt cannot make this showing because five of the six references are entirely new

[2] Samsung contends that Rembrandt's submission is procedurally improper. To the extent the Office permits Rembrandt's Petition in this reexamination, Samsung respectfully requests that the Office also grant Samsung's petition to oppose Rembrandt's arguments.

materials never before considered by the Office.[3] Indeed, Rembrandt concedes that "Samsung's present Request" presents "newly cited references." Petition at 5.

Moreover, in the '580 patent reexamination, the Examiner already resolved any doubt about the presence of "the same or substantially the same" challenges here by ordering reexamination of the '580 patent's claims involving substantially the same subject matter. As explained above, the Examiner determined that the cited prior art (common to both reexaminations) presents "a ***new, non-cumulative*** teaching not previously considered before the Office and therefore may raise a substantial new question of patentability." '580 Order at 7-8 (emphasis added). Rembrandt's baseless arguments about purported delay and multiple proceedings are also misplaced—the Examiner expressly reviewed the entire history of the '580 patent, including "the IPR proceedings" (*id.* at 7), and nonetheless ordered that the newly presented art warrants reexamination. Accordingly, the Office has already determined that § 325(d) does not apply to this proceeding.

Rembrandt refers to PTAB decisions that purportedly support its position, but each is readily distinguishable. In each case, the Board expressly identified the use of the same or substantially the same references or arguments. In *Unilever Inc. v. Procter & Gamble*, the Board applied § 325(d) to deny institution of an *inter partes* review because six of thirteen asserted references were raised in a prior petition and "the claim charts essentially are identical in both petitions." IPR2014-00506, Paper 17, at 6-7 (P.T.A.B. July 7, 2014). Here, in this reexamination, the claim charts differ entirely, five of six cited references are new, and the '580 patent Examiner has already found that the art presents new, non-cumulative teachings. Similarly, in *Butamax Advanced Biofuels LLC v. Gevo, Inc.*, the PTAB denied institution

[3] There is no estoppel under § 315(e) because the challenged claim has not been the subject of any final written decisions in prior proceedings.

because four of six prior art references appeared in a prior petition, and the art cited for obviousness "overlaps completely" with previously asserted grounds. IPR2014-00581, Paper 8, at 12 (P.T.A.B. Oct. 14, 2014). In *ZTE Corp. v. ContentGuard Holdings Inc.*, the *inter partes* review petition started "on weak footing" because it was untimely and subject to an unsuccessful joinder motion. IPR2013-00454, Paper 12, at 5-6 (P.T.A.B. Sept. 25, 2013). Moreover, "half of the grounds of invalidity" were "based on the same prior art references" presented in an earlier petition. *Id.* at 7. Likewise, *Praxair Distribution, Inc. v. iNO Therapeutics LLC* involved a situation where petitioners' "underlying argument" about the teachings of the prior art was "essentially the same" as that raised in a prior petition. IPR2016-00781, Paper 10, at 12 (P.T.A.B. Aug. 25, 2016). Again, no such overlap of art or arguments exists here, and Rembrandt has not even attempted to show that the same or substantially the same art or arguments were previously asserted.

Rembrandt also incorrectly suggests that the Board previously denied institution of a prior petition against the '228 patent based on late citation of a reference. Petition at 3-4. Critically, Rembrandt misleadingly omits the portion of the Board's decision stating that the reference at issue (Siwiak) was *not* a new reference but one that had actually been previously cited in an earlier petition (bolded portion omitted by Rembrandt):

> Petitioner, however, presents no argument or evidence that Siwiak was not known or available to it at the time of filing IPR '892. **In fact, Petitioner applied Siwiak in proposed grounds of rejection against claim 21 of the '228 patent in another petition filed the same day as that in the IPR '892 proceeding. *See* IPR2014-00889, Paper 2 at 58–60. On this record, we exercise our discretion and 'reject the petition' because 'the same or substantially the same prior art' previously was 'presented to the Office' in the IPR '892 proceeding.**

Samsung Elecs. Co. v. Rembrandt Wireless Techs., LP, IPR2015-00555, Paper 20, at 7-8 (P.T.A.B. June 19, 2015); *compare* Petition at 3. Thus, Rembrandt leaves out the fact that

Siwiak was cited as prior art in both an earlier and later petition. Moreover, Siwiak was one of only two references cited in the later petition. *See id.* at 5. The Board expressly relied on these facts in applying § 325(d). Rembrandt has not, and cannot, make such a showing here.

III. CONCLUSION

For the foregoing reasons, Samsung respectfully requests that the Office deny Patent Owner's September 30, 2016 petition.

Dated: October 13, 2016

Respectfully submitted,

/J. Steven Baughman/
J. Steven Baughman
Registration No. 47,414
James F. Mack
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Attorneys/Agents for Requesters
Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Gordon F. Bremer	§	Control No. 90/013,809
U.S. Patent No. 8,457,228	§	Attorney Docket No.: 110797-0019-502
Formerly Application No. 13/198,568	§	Customer No.: 28120
Issue Date: June 4, 2013	§	Examiner: Scott Louis Weaver
Filing Date: August 4, 2011	§	Requesters: Samsung Electronics Co., Ltd.,
Former Group Art Unit: 2633	§	Samsung Electronics America, Inc.
Former Examiner: Dac Ha	§	

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

MAIL STOP *EX PARTE* REEXAM
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF SERVICE

It is certified that copies of the following documents have been served in their entireties on the patent owner at the correspondence address of record as provided for in 37 C.F.R. § 1.33(c):

1. Third Party Requesters' Petition To Respond To Patent Owner's Petition To Reject Reexamination Request.

2. Third Party Requesters' Opposition To Patent Owner's Petition To Reject Reexamination Request.

The copy has been served on October 13, 2016 by causing the aforementioned documents to be deposited with the United States Postal Service as first class mail postage pre-paid in an envelope addressed to:

Rothwell, Figg, Ernst & Manbeck, P.C.
607 14th Street, N.W.
Suite 800
Washington, DC 20005

/ James F. Mack /
James F. Mack

ROPES & GRAY LLP

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Gordon F. Bremer	§	Control No. 90/013,809
U.S. Patent No. 8,457,228	§	Attorney Docket No.: 110797-0019-502
Formerly Application No. 13/198,568	§	Customer No.: 28120
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Former Examiner: Dac Ha	§	

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

MAIL STOP *EX PARTE* REEXAM
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

THIRD PARTY REQUESTERS' PETITION TO RESPOND TO PATENT OWNER'S PETITION TO REJECT REEXAMINATION REQUEST

Pursuant to 37 C.F.R. § 1.183, third-party requesters Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. ("Samsung") respectfully petition the Director for permission to oppose Patent Owner Rembrandt Wireless Technologies, LP's ("Rembrandt") September 30, 2016 petition requesting that the Director exercise her discretionary authority under 35 U.S.C. § 325(d) to reject the reexamination request in this proceeding.

Extraordinary circumstances justify allowing Samsung to submit an opposition to the Patent Owner's petition. Office rules do not permit the Patent Owner to submit arguments challenging a request for reexamination at this stage. Samsung has no means for addressing this petition other than seeking permission to respond. Moreover, the petition advances an application of § 325(d) that is unsupported by the statute and warrants briefing. Rembrandt fails to show that Samsung's cited prior art or arguments in this reexamination are "the same or substantially the same" as those previously presented to the Office, as required by § 325(d). Moreover, Patent Owner filed its petition after the Examiner in the co-pending reexamination of related U.S. Patent No. 8,023,580 determined that the same cited references do, in fact, present new, non-cumulative technological teachings and multiple substantial new questions of patentability. Accordingly, Samsung seeks permission to oppose the Patent Owner's petition and hereby submits the proposed Opposition.

Samsung hereby requests that any fees required for timely consideration of this petition and Opposition be charged to Deposit Account No. 18-1945, under Order No. 110797-0019-502, from which the undersigned is authorized to draw. If there are any questions, counsel for Samsung may be contacted through the direct telephone number provided below.

Dated: October 13, 2016

Respectfully submitted,

/J. Steven Baughman/
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Attorneys/Agents for Requesters
Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.

Electronic Acknowledgement Receipt

EFS ID:	27210948
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	6449
Filer:	Jon Steven Baughman/ginny blundell
Filer Authorized By:	Jon Steven Baughman
Attorney Docket Number:	3277-0114US-RXM2
Receipt Date:	13-OCT-2016
Filing Date:	12-SEP-2016
Time Stamp:	21:02:14
Application Type:	Reexam (Third Party)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Reexam - Opposition filed in response to petition	110797-0019-502_Opposition_to_Reject_Reexam_Request.pdf	151506 4c4c913dae03918db35bbddbed0cc320ede9eaa8	no	7

Warnings:

Information:					
2	Reexam Certificate of Service	110797-0019-502_COS.pdf	81033 d85160ef03711677b49a50838bde88250a93e8c6	no	2
Warnings:					
Information:					
3	Receipt of Petition in a Reexam	110797-0019-502_Petition.pdf	110346 adde04d8a22cd4ddf710e5aa8321c91460c22f71	no	3
Warnings:					
Information:					
			Total Files Size (in bytes):	342885	

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New International Application Filed with the USPTO as a Receiving Office
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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	3277-0114US-RXM2	7821

6449 7590 10/17/2016

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
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EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
10/17/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Commissioner for Patents
United States Patent and Trademark Office
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Alexandria, VA 22313-1450
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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/013,809*.

PATENT NO. *8,457,228*.

ART UNIT *3992*.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

ORDER GRANTING REQUEST FOR EX PARTE REEXAMINATION - CONTINUED

I. ACKNOWLEDGMENTS

On Sep. 12, 2016, third-party requester (**"Requester"**) filed a request (**"Request"**) for *ex parte* reexamination of claim 21 of US Patent # 8,457,228 (**"228 patent"**) which issued to Bremer.

The ‘228 patent issued on June 4, 2013, and was filed on August 4, 2011 and assigned application number 13/198,568 **(" ‘568 application").**

II. INFORMATION DISCLOSURE STATEMENT

An information disclosure statement was submitted by the Requester on Sep. 12, 2016 (Sep 2016 IDS). The Sep 2016 IDS is in compliance with the provisions of 37 C.F.R. § 1.97. Accordingly, the Sep 2016 IDS has been considered by the Examiner.

III. PRIORITY CLAIMS

The ‘228 patent is a continuation of US Patent Application 12/543,910 filed on Aug. 19, 2009, now patent US 8,023,580 (‘580 Patent).

The ‘580 patent is a continuation of US Patent Application 11/774,803, filed on Jul. 9, 2007, now patent US 7,675,965, which is continuation of US Patent Application 10/412,878, filed on Apr. 14, 2003, now patent US 7,248,626, which is continuation-in-part of application 09/205,205, filed on Dec. 4, 1998, now patent US 6,614,838.

Application 09/205,205 claims priority to US provisional application 60/067,562 filed on Dec. 5, 1997.

There is no claim to foreign priority.

Because the effective filing date of the 228 patent is not on or after March 16, 2013, the AIA First Inventor to File ("AIA-FITF") provisions do not apply. Instead, the earlier 'First to Invent' provisions apply.

Based upon a review of the ‘228 patent and prosecution history, the Examiner finds that there are no prior or concurrent *ex parte* or supplemental reexaminations for the '228 patent.

A co-pending request for ex parte reexamination (90/013,808) of the ‘580 patent has been filed on September 12, 2016.

IV. PRIOR ART

A. References Cited in the Request

1. U.S. Patent No. 5,982,807, to Snell, J., filed on Mar. 17, 1997 and issued on Nov. 9, 1999, ("Snell").

2. U.S. Patent No. 6,075,814, filed on May 9, 1997 and issued on Jun. 13, 2000, to Yamano et al. ("Yamano").

3. "Using the PRISM™ Chip Set for Low Data Rate Applications," Andren, C. et al., Harris Semiconductor Application Note No. AN9614, March 1996 ("Harris AN9614").

4. "HSP3824 Direct Sequence Spread Spectrum Baseband Processor," Harris Semiconductor File No. 4064.4, Oct. 1996 ("Harris 4064.4").

5. Kamerman, A., "Throughput Density Constraints for Wireless LANs Based on DSSS," IEEE 4th International Symposium on Spread Spectrum Techniques and Applications Proceedings, Mainz, Germany, Sept. 22-25, 1996, pp. 1344-1350 vol.3 ("Kamerman").

6. Upender et al., "Communication Protocols for Embedded Systems," Embedded Systems Programming, Vol. 7, Issue 11, November 1994. - ("Upender").

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B. Availability of references

References, 1 and 2, Snell and Yamano, were filed before the priority dates of claim 21 of the 228 patent, therefore qualify as prior art under 35 U.S.C. 102(e). References 3 and 4, Harris AN9614 and Harris 4064.4, are incorporated by reference in Snell (col. 5, lines 2-7 and 11-17) and therefore are prior art under at least 35 U.S.C. 102(e) as Snell.
2References 5-6, Kamerman and Upender, publication dates pre-date the priority date of claim 21of the '228 patent and therefore qualify as prior art under 35 U.S.C. 102(a).

Each of references 1-5 has not been previously cited or considered and is considered new. Reference 6 was relied on as a teaching reference but is being considered in a new light.

Because Snell was not cited or before the Office during prosecution of the application which became the '228 patent, Snell in combination with references 2-6 have not been considered before the Office prior to the instant reexamination. Accordingly, Snell in combination with references 2-6 can be used to raise a substantially new question of patentability in this *ex parte* reexamination proceeding.

V. Background and Prosecution History of the '228 Patent

1. Continuity Data

U.S. patent No. 8,457,228 to Bremer subject of the instant 90/013,809, Request for ex parte re-examination was filed on August 4, 2011 and assigned application No. 13/198,568.

The 13/198,568 application was filed as Continuation of application 12/543,910, which was filed on August 8, 2009, now Patent No. 8,023,580 (corresponding to Reexam 90/013,808)

The 12/543,910 application was filed as Continuation of application 11/774,803 which was filed on July 9, 2007, now Patent No. 7,675,965.

The 11/774,803 application was filed as a continuation of application No. 10/412,878 which was filed on April 14, 2003, now Patent No. 7,248,626.

The 10/412,878 application was filed as a continuation-in-part of application No. 09/205,205, which was filed on December 4, 1998, now Patent No. 6,614,838.

The 09/205,205 application claims priority to provisional application No. 60/067,562 filed on December 5, 1997.

2. Background of the '228 Patent

The '228 patent is a system in which a master transceiver 64 is capable of transmitting and receiving data using different modulation methods (the patent identifies as "type A" modulation and "type B" modulation). *Id.* at 5:47-57.
Master transceiver 64 can communicate with tribs, *e.g.,* trib 66, each of which communicates using either a type A or type B modulation method, but not both. *Id.* at 5:58-6:3. Figure 4 shows an exemplary network in which master transceiver 64 can communicate using either a type A or type B modulation method. *Id* at 6:4-8. Trib 66a communicates using a type A modulation method, while trib 66b communicates using a type B modulation method. *Id*
The master transceiver can communicate with both type A and type B tribs by providing in the first sequence *(i.e.,* header) of a message an indication of the modulation method that is used for the second sequence *(i.e.,* data portion) of the message. *Id* at 6:8-36.
For example, a master can communicate with a type A trib by transmitting a training sequence using type A modulation followed by a second sequence also in type A modulation. *Id* at 7:11-16.
To send a message to a type B trib (that uses type B modulation), the master transmits a training sequence, again using type A modulation, that provides notification of an impending change to type B modulation. *Id* at 6:27-30. The second sequence is then transmitted using type B modulation. *Id* at 6:32-44.

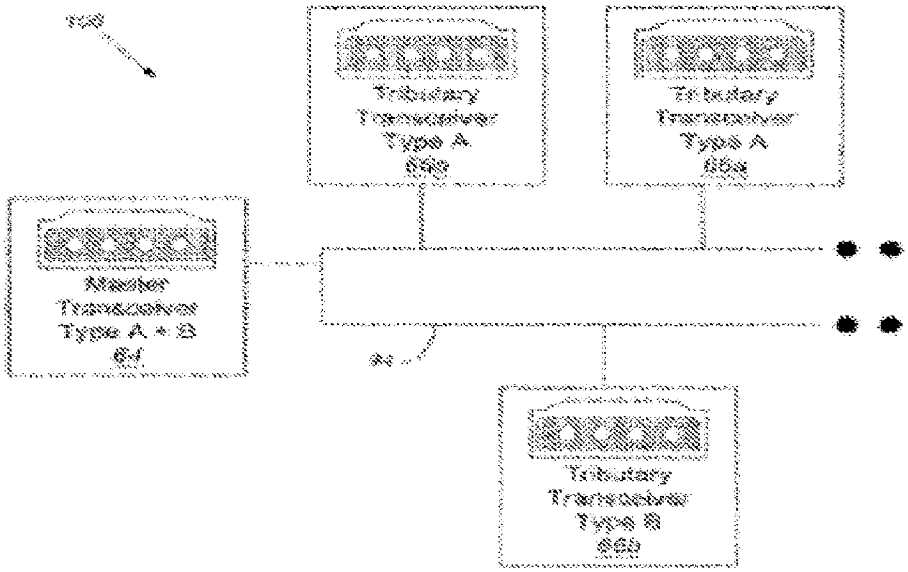


FIG. 4

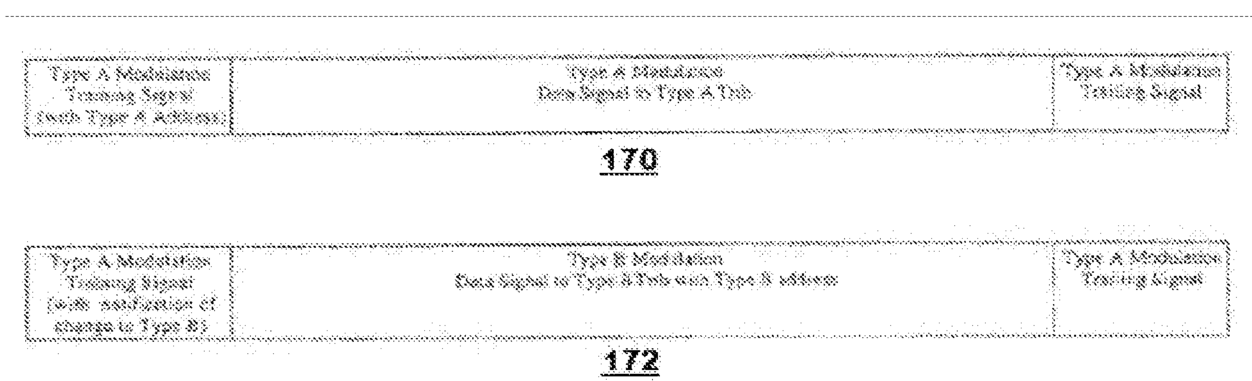


Figure 8 from the '228 patent reproduced above depicts an exemplary message format.

Patent claim 21 of the '228 patent depends from independent claim 1, claim 21 includes all limitations of the claim from which it depends and reads as follows:

> **1.** A master communication device configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device, the master communication device comprising:

a master transceiver configured to transmit a first message over a communication medium from the master transceiver to the one or more slave transceivers,

wherein the first message comprises:
first information modulated according to a first modulation method,
second information, including a payload portion, modulated according to the first modulation method,

wherein the second information comprises data intended for one of the one or more slave transceivers and

first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information; and

said master transceiver configured to transmit a second message over the communication medium from the master transceiver to the one or more slave transceivers

wherein the second message comprises:
third information modulated according to the first modulation method,
wherein the third information comprises information that is indicative of an impending change in modulation to a second modulation method, and
fourth information, including a payload portion, transmitted after transmission of the third information,
the fourth information being modulated according to the second modulation method,
the second modulation method being of a different type than the first modulation method,
wherein the fourth information comprises data intended for a single slave transceiver of the one or more slave transceivers, and
second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information; and
wherein the second modulation method results in a higher data rate than the first modulation method.

21. The master communication device as in claim **1,** wherein **the first information that is included in the first message comprises the first message address data.**

3. Prosecution History:

a. The 13/198,568 application

During Prosecution of the 13/198,568 application, claims 1-20 were rejected on the ground of non-statutory obviousness type double patenting with patent # 8,023,580 (subject of Reexamination # 90/013,808) – the noted claims were indicated as being broader than the patented claims in the ‘580 patent, a rejection based on the cited prior art was not provided (Office Action April 30, 2012). Applicant canceled original claims and filed new claims 21-61, (October 19, 2012 Response).

Independent Claim 21 (patent claim 1) included "first message address data". Applicant provided reasons that claim 21 was allowable over the art of record including reiterating the claim 21 including the limitation "the first message includes first message address data that is indicative of one or more slave transceivers as an intended destination of the second information;…"

A supplemental notice of allowance (November 5, 2012) indicated claims 21-61 allowable, with no examiners reasons for allowance.

An amendment to claims 21-61 was provided in a request for an RCE (February 5, 2013) and included deletion of "data" from claim 21; 'data' had previously also been recited in claim 41. Claim 41 in the February 5, 2013 amendment is the current claim 21 subject of the instant reexamination request. Applicants provided summary of the claim 1 as defining over the art of record though no art in particular was used in a rejection.

An Examiners statement of reasons for allowance was not provided in the Notice of allowance (April 11, 2013).

b. IPR 2014 -00890 (IPR '890)
Filed June 4, 2014, this petition for *inter partes* review of claims 1-3, 5, 10 and 11-21 was not instituted, public availability issues of the cited prior art was reason for denial of review.

c. IPR 2014 -00892 (IPR '892)
Filed June 4, 2014, for *inter partes* review of claims 1-3, 5, and 20-21 of the '228 patent. The '892 Decision entered December 10, 2014, indicates a review of claims 1- 3, 5, 10-20 was instituted based on Applicants admitted prior art (APA) in view of Boer (APA/Boer).

The PTAB declined to institute an inter partes review of claim 21in IPR 2014 -00892 based on APA/Boer finding that petitioner did not show that the prior art taught "the first information that is included in the first message comprises the first message address data," and that the Petition's "conclusory allegation of design choice does not provide the required articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." IPR2014-00892, Pap. 8 at 14-15.

d. IPR 2015 -00555 (IPR '555)
Filed January 9, 2015, for *inter partes* review of claim 21 of the '228 patent. The IPR '555 decision entered June 19, 2015 indicated a review was not instituted as 'the same or substantially the same prior art arguments had been presented in IPR '892 and barring joinder the petition was time barred.

VI. ***Determination of Substantial New Question of Patentability***

Substantial New Question of Patentability

For "a substantial new question of patentability'" (SNQ) to be present, it is only necessary that:

A. The prior art patents and or printed publications raise a substantial question of patentability regarding at least one claim, i.e., the teaching of the prior art patents and printed publications is such that a reasonable examiner would consider the teaching to be important in deciding whether or not the claim is patentable; it is not necessary that the prior art establish a prima facie case of unpatentability; and

B. The same question of patentability as to the claim has not been decided by the Office in a previous examination or pending reexamination of the patent or in a final holding of invalidity by the Federal Courts in a decision on the merits involving the claim.

For any reexamination ordered on or after November 2, 2002, reliance on previously Cited/considered art, i.e., "'old art, "" does not necessarily preclude the existence of a substantial new question of patentability (SNQ) that is based exclusively on that old art. Rather, determinations on whether a SNQ exists in such an instance shall be based upon a fact-specific inquiry done on a case-by-case basis. See MPEP 2642.

The SNQ Requirement

A printed publication raises a SNQ where there is a substantial likelihood that a reasonable examiner would consider the printed publication important in deciding whether or not the claim is patentable, unless the same SNQ has already been decided as to the claim in a final holding of invalidity by the Federal court system or by the Office in a previous examination. MPEP § 2242.

It is not sufficient that a request for reexamination merely proposes one or more rejections of a patent claim or claims as a basis for reexamination. It must first be demonstrated that a patent or printed publication that is relied upon in a proposed rejection presents a new, non-cumulative technological teaching that was not previously considered and discussed on the record during the prosecution of the application that resulted in the patent for which reexamination is requested, and during the prosecution of any other prior proceeding involving the patent for which reexamination is requested. MPEP § 2216. Where a second request for reexamination is filed while a first reexamination proceeding is pending, the second request is decided based on the claims in effect at the time of the determination. 37 CFR 1.515(a). MPEP § 2216.

The substantial new question of patentability may be based on art previously considered by the Office if the reference is presented in a new light or a different way that escaped review during earlier examination. MPEP § 2216.

1. Based on the prosecution history of the ‘228 patent including the *inter partes* proceedings noted above which are relevant to claim 21 and in which the independent claim 1 was found unpatentable, a reference or combination of references teaching either a destination address in the header of a first message as indicated the feature not addressed in IPR 2014-00892, or the following features of claim 21, would be considered a new, non-cumulative teaching not previously before the Office during the examination of the '228 patent and the prior IPR proceedings and therefore would raise a substantial new question of patentability:

> The master transceiver (as recited in claim 1) that transmits the first message which includes …**first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information and** wherein (as recited in claim 21) … **the first information that is included in the first message comprises the first message address data.**

VI. Proposed Substantial new Questions (SNQ's) raised in the Request

The request alleges that an SNQ is raised as to Claim 21 based on Snell in various combinations with the above identified prior art cited in the request as follows:

> **SNQ-1: Unpatentability of Claim 21 Under 35 U.S.C. § 103 Over Snell, Yamano and Kamerman.**
>
> **SNQ-2: Unpatentability of Claim 21 Under 35 U.S.C. § 103 Over Snell, Harris 4064.4, Harris AN9614, Yamano and Kamerman**
>
> **SNQ-3: Unpatentability of Claim 21 Under 35 U.S.C. § 103 Over Snell, Harris 4064.4, the Admitted Prior Art, Upender, Yamano, and Kamerman**

The request shows:

Snell discloses a transceiver that serves as an access point for communicating data with other transceivers connected to a wireless local area network (WLAN). Snell at col. 4, lines 42-47 and col. 5, lines 18-21. Snell's transceiver transmits data packets intended for another transceiver, where the communication may switch on-the-fly between a "first modulation method" (e.g., BPSK) and a "second modulation method" (e.g., QPSK) that is "of a different type than the first modulation method."

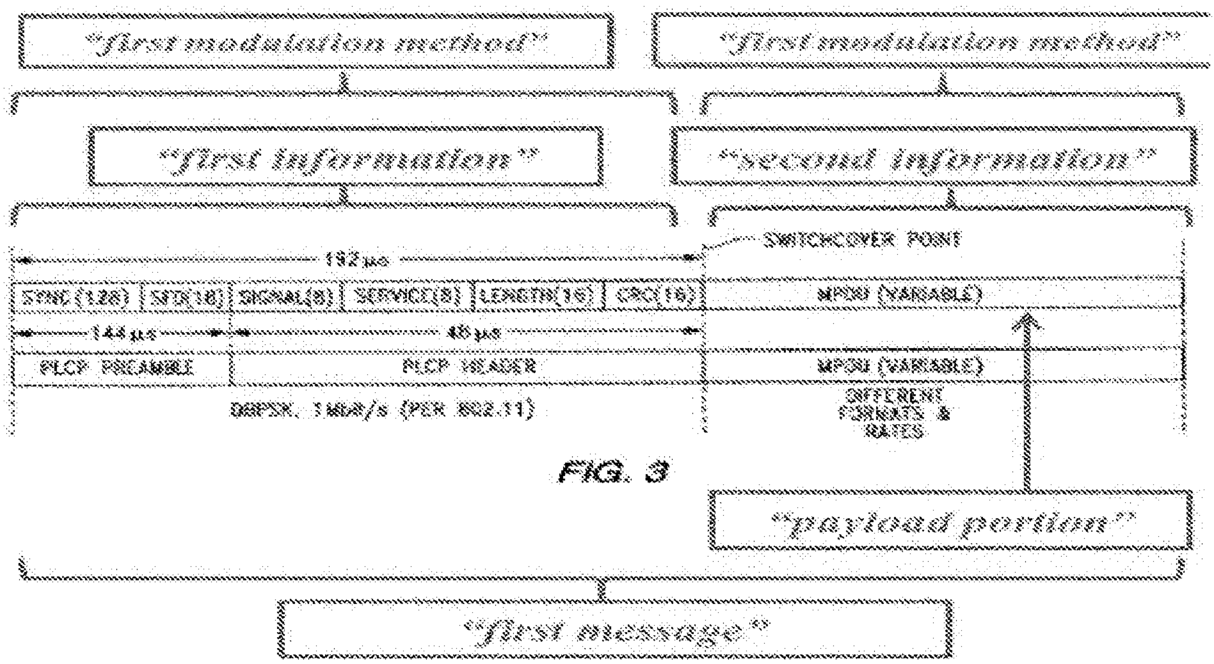
Snell discloses the transceiver capable of transmitting data packets with preamble, header, and data portions, where the preamble and header are transmitted using BPSK modulation, and the data portion is transmitted using either BPSK or QPSK modulation (different modulation methods). *See,* Snell at Fig. 3, 6:35-36, 6:52-63.

Snell discloses that each data packet transmission is structured with a PLCP preamble and PLCP header and a "payload portion" *(e.g.,* MPDU data). *Id* at 6:35-36, 6:64-66, 7:5-14, Fig. 3.

The PLCP preamble contains SYNC and SFD fields, and the PLCP header contains SIGNAL, SERVICE, LENGTH, and CRC fields. *Id* at Fig. 3, 6:48-7:14. The MPDU data is the data to be transmitted to the receiving transceiver. *Id* at 7:5-6, 7:6-14, Fig. 3.

Snell discloses the use of sequences in the header portion that indicate which type of modulation is being used for transmitting the data portion, 6:52-63. Snell also discloses (through its incorporation of Harris AN96l4) the ability to use its teachings with a polled (master/slave) protocol. Harris AN9614 at 3.

The request provides an annotated figure 3 to show relevant reading of the first and second information portions of a first message as reproduced below from page 47 of the request.



Snell Figure 3 (annotated).

"The modulator may also preferably include header modulator means for modulating data packets to include *a header at a predetermined modulation and a third data rate defining a third format .... The third format is preferably differential BPSK."* Snell at 2:61-3:5.

Yamano discloses the placement of address data in the first information portion of a message. Specifically, Yamano discloses a packet structure with a preamble and a data portion, where the preamble includes a destination address of the receiving device.

For example, Yamano discloses transmitting a "first message" *(e.g.,* data packet including a preamble and main body) that includes "first message address information that is indicative" *(e.g.,* "destination address" in the preamble) of the transceiver that is the "intended destination of the second information." *"Packet 700* includes a *preamble 701* and a *main body 702."* Yamano at 19:63-64.

"For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) *packet source and destination addresses,* (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20:1-7.

Kamerman discloses an automatic rate adaptation scheme for transmitting a first data packet where the data is modulated using a first modulation method, such as BPSK (corresponding to a lower data transfer rate), and next transmitting a second data packet where the data is modulated using a second modulation method, such as QPSK (corresponding to a higher data transfer rate). Kamerman at 6, 11-12.

It is agreed that Snell in combination with Yamano, and Kamerman raise a substantial new question of patentability (SNQ) in combination because one of ordinary skill would have found each of the references, Snell, Yamano and Kamerman important in teaching the combination of technological features which were indicated important to the patentability of the subject claim 21.

Snell was not previously cited or considered by the Office alone or in combination with the cited art.

Yamano was not previously cited or considered by the Office alone or in combination with Snell.

Kamerman was not previously cited or considered by the Office alone or in combination with Snell.

Thus, a reasonable examiner would consider the combination of Snell, Yamano, and Kamerman as asserted in the instant request, important in deciding whether or not the subject claim 21 is patentable.

Because the combination of Snell with the cited Yamano and Kamerman references disclose the limitations of claim 21 of the 228 patent which were found important to the patentability of claim 21 during prosecution of the application which became the 228 patent as well as by the PTAB in IPR 2014 -00892, there is a substantial likelihood that a reasonable examiner would consider this combination important in deciding whether or not claim 21 of the 228 patent is patentable. Accordingly, the combination of Snell, Yomano and Kamerman as cited in the request raises a substantial new question of patentability as to claim 21 of the '228 patent.

Snell in combination with Yamano, and Kamerman raise a substantial new question of patentability because the references teach technical features in combination which were missing from the art applied during prosecution. Each reference is new prior art and the combination was not applied during the original examination.

The combination presents new, non-cumulative technological teaching important to the original claims in effect at the time of this request for reexamination. These technological teachings were not previously considered and discussed on the record during the prosecution of the original application that resulted in the patent for which reexamination is requested nor during the prosecution of any other prior proceeding involving the patent for which reexamination is requested.

Thus, a reasonable examiner would view the new technological teachings of Snell in combination with Yamano, and Kamerman important in deciding patentability of the claims being considered, thus raising the SNQ regarding claim 21 of the '228 patent.

Other issues alleged by the Requester relating to Snell in combination with Yamano, and Kamerman in other combinations with Harris 4064.4, Harris AN9614, the Admitted Prior Art, Upender, as cited in the request with respect to claim 21, raise an SNQ for the same reasoning set forth above with respect to Snell, Yamano and Kamerman.

Conclusion

Scope of Reexamination

Since requester did not request reexamination of claims 1-20, 22-52 and did not assert the existence of a substantial new question of patentability (SNQ) for such claims (see 35 U.S.C. § 311(b)(2); see also 37 CFR 1.915b and 1.923), such claims will not be reexamined. This matter was squarely addressed in *Sony Computer Entertainment America Inc., et al. v. Jon W. Dudas*, Civil Action No. 1:05CV1447 (E.D.Va. May 22, 2006), Slip Copy, 2006 WL 1472462. (Not Reported in F.Supp.2d.) The District Court upheld the Office's discretion to not reexamine claims in an *inter partes* reexamination proceeding other than those claims for which reexamination had specifically been requested. The Court stated:

> To be sure, a party may seek, and the PTO may grant, *inter partes* review of each and every claim of a patent. Moreover, while the PTO in its discretion may review claims for which *inter partes* review was not requested, nothing in the statute compels it to do so. To ensure that the PTO considers a claim for *inter partes* review, § 311(b)(2) requires that the party seeking reexamination demonstrate why the PTO should reexamine each and every claim for which it seeks review. Here, it is undisputed that Sony did not seek review of every claim under the '213 and '333 patents. Accordingly, Sony cannot now claim that the PTO wrongly failed to reexamine claims for which Sony never requested review, and its argument that AIPA compels a contrary result is unpersuasive.

(Slip copy at page 9.)

The *Sony* decision's reasoning and statutory interpretation apply analogously to *ex parte* reexamination, as the same relevant statutory language applies to both *inter partes* and *ex parte* reexamination. 35 U.S.C. § 302 provides that the *ex parte* reexamination "request must set forth the pertinency and manner of applying cited prior art <u>to every claim for which reexamination is requested</u>" (emphasis added), and 35 U.S.C. § 303 provides that "the Director will determine whether a substantial new question of patentability affecting <u>any claim of the patent</u> concerned is <u>raised by the request</u>..." (Emphasis added). These provisions are analogous to the language of 35 U.S.C. § 311(b)(2) and 35 U.S.C. § 312 applied and construed in *Sony*, and would be construed in the same manner. As the Director can decline to reexamine non-requested claims in an *inter partes* reexamination proceeding, the Director can likewise do so in *ex parte* reexamination proceeding. See *Notice of Clarification of Office Policy To Exercise Discretion in Reexamining Fewer Than All the Patent Claims* (signed Oct. 5, 2006) 1311 OG 197 (Oct. 31, 2006). See also MPEP § 2240, Rev. 5, Aug. 2006.

Therefore, claims 1-20, 22-52 will not be reexamined in this *ex parte* reexamination proceeding.

Claim 21 of the ‘228 patent will be reexamined.

Service of Papers

After the filing of a request for reexamination by a third party requester (if any), a document filed by either the patent owner or the third party requester (if any) must be served on the other party (or parties where two or more third party requester proceedings are merged) in the reexamination proceeding in the manner provided in 37 CFR 1.248. See 37 CFR 1.550(f).

Extensions of Time

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Amendment in Reexamination Proceedings

Patent owner is notified that any proposed amendment to the specification and/or claims in this reexamination proceeding must comply with 37 CFR 1.530(d)-(j), must be formally presented pursuant to 37 CFR 1.52(a) and (b), and must contain any fees required by 37 CFR 1.20(c).

Submissions

In order to ensure full consideration of any amendments, affidavits or declarations or other documents as evidence of patentability, such documents must be submitted in response to the first Office action on the merits (which does not result in a close of prosecution). Submissions after the second Office action on the merits, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, after final rejection and by 37 CFR 41.33 after appeal, which will be strictly enforced.

Notification of Concurrent Proceedings

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving the instant patent under reexamination throughout the course of this reexamination proceeding. The third party requester (if any) is also reminded of the ability to similarly appraise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

All correspondence relating to this *ex parte* reexamination proceeding should be directed as follows:

By EFS: Registered users may submit via the electronic filing system EFS-Web, at https://efs.uspto.gov/efile/myportal/efs-registered

By Mail to: Mail Stop *Ex Parte* Reexam
Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

By FAX to: (571) 273-9900
Central Reexamination Unit

By hand to: Customer Service Window
Randolph Building
401 Dulany St.
Alexandria, VA 22314

For EFS-Web transmission, 37 CFR 1.8(a)(1)(i) (C) and (ii) states that correspondence (except for a request for reexamination and a corrected or replacement request for reexamination) will be considered timely if (a) it is transmitted via the Office's electronic filing system in accordance with 37 CFR 1.6(a)(4), and (b) includes a certificate of transmission for each piece of correspondence stating the date of transmission, which is prior to the expiration of the set period of time in the Office action.

Any inquiry concerning this communication should be directed to Scott Weaver at telephone number 571-272-7548.

Signed:

/Scott L. Weaver/
Scott L. Weaver
CRU Primary Examiner,
Art Unit 3992
(571) 272-7548

Conferee:

/Kenneth J. Whittington/
CRU Primary Examiner,
AU 3992

Conferee:

/Hetul Patel/
Supervisory Patent Examiner, Art Unit 3992

# Order Granting Request For *Ex Parte* Reexamination	**Control No.** 90/013,809	**Patent Under Reexamination** 8457228
	Examiner SCOTT L. WEAVER	**Art Unit** 3992

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

The request for *ex parte* reexamination filed 12 September 2016 has been considered and a determination has been made. An identification of the claims, the references relied upon, and the rationale supporting the determination are attached.

Attachments: a)☐ PTO-892, b)☒ PTO/SB/08, c)☐ Other: ______

1. ☒ The request for *ex parte* reexamination is GRANTED.

RESPONSE TIMES ARE SET AS FOLLOWS:

For Patent Owner's Statement (Optional): TWO MONTHS from the mailing date of this communication (37 CFR 1.530 (b)). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**

For Requester's Reply (optional): TWO MONTHS from the **date of service** of any timely filed Patent Owner's Statement (37 CFR 1.535). **NO EXTENSION OF THIS TIME PERIOD IS PERMITTED.** If Patent Owner does not file a timely statement under 37 CFR 1.530(b), then no reply by requester is permitted.

/SCOTT L WEAVER/ Primary Examiner, Art Unit 3992	/KENNETH J WHITTINGTON/ Primary Examiner, Art Unit 3992	

cc:Requester (if third party requester)

Reexamination	**Application/Control No.** 90013809	**Applicant(s)/Patent Under Reexamination** 8457228
	Certificate Date	**Certificate Number**

Requester Correspondence Address: ☐ **Patent Owner** ☒ **Third Party**
ROPES & GRAY LLP IPRM DOCKETING - FLOOR 43 PRUDENTIAL TOWER 800 BOYLSTON STREET BOSTON, MA 02199-3600

LITIGATION REVIEW ☒	SLW (examiner initials)	10/06/2016 (date)
Case Name		Director Initials
IPR2015 - 00555		
IIPR2014-00889		
IPR2014-00890		
IPR2014-00891		
IPR2014-00892		
IPR2014-00893		
IPR2014-00895		

COPENDING OFFICE PROCEEDINGS	
TYPE OF PROCEEDING	**NUMBER**
1. Ex Parte Reexaminaiton	90/013808

PTO/SB/08a (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known	
Application Number	RE of Patent No. 8,457,228
Issue Date	June 4, 2013
First Named Inventor	Gordon F. Bremer
Art Unit	2633
Examiner Name	Dac V. Ha
Attorney Docket Number	110797-0019-502

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/SLW/	Ex. D	US-5,982,807	11-09-1999	Snell	
/SLW/	Ex. H	US-6,075,814	06-13-2000	Yamano et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	/Scott L. Weaver/	Date Considered	10/06/2016

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	RE of Patent No. 8,457,228
				Issue Date	June 4, 2013
				First Named Inventor	Gordon F. Bremer
				Art Unit	2633
(Use as many sheets as necessary)				Examiner Name	Dac V. Ha
Sheet	2		2	Attorney Docket Number	110797-0019-502

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/SLW/	Ex. E	Andren and Fakatselis, "Using the PRISM™ Chip Set for Low Data Rate Applications," Harris Semiconductor Application Note 9614 (March 1996), pp. 1-3.	
/SLW/	Ex. F	Harris Semiconductor – "HSP3824, Direct Sequence Spread Spectrum Baseband Processor," Harris Semiconductor File Number 4064.4 (October 1996), pp. 1-40.	
/SLW/	Ex. G	Declaration of Jon Mears, Exhibit A thereto (Upender et al., "Communication Protocols for Embedded Systems," *Embedded Systems* Programming, Vol. 7, Issue 11, November 1994), pp. 1-12.	
	Ex. I	Kamerman, A., "Throughput Density Constraints for Wireless LANs Based on DSSS", *Spread Spectrum Techniques and Applications Proceedings, IEEE 4th International Symposium on*, Mainz, Germany, Sept. 22-25, 1996, pp. 1344-1350 vol.3	

Examiner Signature	/Scott L. Weaver/	Date Considered	10/06/2016

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Ex Parte Reexamination of	:	Group Art Unit: 2633
Gordon F. BREMER	:	
Patent No.: 8,457,228 B2	:	Control No.: 90/013,809
Issued: June 4, 2013	:	

Reexam Request Filed: September 12, 2016

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

Attn: Mail Stop "*Ex Parte* Reexam"
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PATENT OWNER'S REQUEST FOR A TWO-MONTH EXTENSION OF TIME UNDER 37 C.F.R. § 1.550(c) TO FILE ITS PATENT OWNER'S STATEMENT PURSUANT TO 35 U.S.C. § 304

Pursuant to 37 CFR § 1.550(c), Patent Owner Rembrandt respectfully requests a two-month extension of time to file its Patent Owner's Statement in *Ex Parte* Reexamination of U.S. Patent 8,457,228 (the "'228 Reexamination"). The additional time is necessary for Counsel to fully review the voluminous record relevant to this reexamination and prepare an informed Patent Owner's Statement. Present Counsel for Patent Owner was just recently engaged to handle this and a second related *ex parte* reexamination[1] and did not obtain an acknowledgement

[1] *Ex Parte* Reexamination of U.S. 8,023,580 (90/013,808) (the"'580 Reexamination"). Via a second petition, Rembrandt is also requesting an extension of time in the '580 Reexamination.

of Power of Attorney until September 30, 2016 (less than three weeks prior to the grant of the '228 Reexamination).[2]

Samsung's request comprises almost 1,000 pages (including the exhibits). In addition, the history of Samsung's prior challenges to claim 21 of the '228 Patent dates back to June 4, 2014. At that time, Samsung filed 6 IPRs against the '228 Patent. Then, due to its unsuccessful challenges of, *inter alia*, claim 21, Samsung again challenged this claim by filing an additional IPR on January 9, 2015. That challenge also failed. Given the magnitude of the '228 Request, the significant number of documents filed in the multiple IPRs and issued by the Board, and the paucity of time Rembrandt had to review the '228 Request prior to its grant, Patent Owner Rembrandt respectfully requests a two-month extension of time to review the multitude of potentially relevant documents so that it can properly prepare Patent Owner's Statement.

While Rembrandt recognizes the need to handle reexaminations with "special dispatch," there is no reason to deny Rembrandt a fair opportunity to respond to Samsung's very tardy challenge to the patentability of claim 21. Thus, to the extent Samsung has argued that this matter is particularly urgent (see Request at i-ii), Rembrandt notes that Samsung has offered no reason why it could not have submitted the references submitted in this *ex parte* reexamination as early as June 4, 2014, when it first challenged the patentability of claim 21. Thus, Samsung's plea for expediting this case more than is called for by the "special dispatch" requirement should be ignored.

[2] The grant of the '228 Request was mailed on Oct. 17, 2016, a little more than one month after the Request was filed on September 12, 2016. The new Power of Attorney was not acknowledged until September 30, 2016, less than 3 weeks prior to the grant of the '228 Reexamination.

The petition fee of $200 set forth in 37 C.F.R. § 1.17(g) for filing a petition for an extension of time under 37 C.F.R. § 1.1550(c) together with any additional fees that may be due with respect to this paper may be charged to Counsel's Deposit Account No. 02-2135.

Respectfully submitted,

Date: November 1, 2016

By: /Nancy J. Linck/

Nancy J. Linck, Reg. No. 31,920
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W., Suite 800
Washington, DC 20005
Phone: 202-783-6040
Facsimile: 202-783-6031

Attorney for Petitioner
Rembrandt Wireless Technologies, LP

CERTIFICATE OF SERVICE

It is hereby certified that on this 1st day of November, 2016, the foregoing **PATENT OWNER'S REQUEST FOR A TWO-MONTH EXTENSION OF TIME UNDER 37 C.F.R. § 1.550 TO FILE IT'S PATENT OWNER'S STATEMENT PURSUANT TO 35 U.S.C. § 304** was served, by first-class U.S. Mail, on the attorney of record for the third-party Requesters Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., at the following address:

J. Steven Baughman, Esq.
Ropes & Gray LLP
IPRM – Floor 43
Prudential Tower
800 Boylston Street
Boston, Massachusetts 02199-3600
Phone: 202-508-4606
Facsimile: 202-383-8371

/ Nancy J. Linck /
Nancy J. Linck
Reg. No. 31,920

Electronic Acknowledgement Receipt

EFS ID:	27387285
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	6449
Filer:	Edward Anthony Figg/Judith Pennington
Filer Authorized By:	Edward Anthony Figg
Attorney Docket Number:	3277-0114US-RXM2
Receipt Date:	01-NOV-2016
Filing Date:	12-SEP-2016
Time Stamp:	16:12:39
Application Type:	Reexam (Patent Owner)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		228EOTRequest.pdf	38302 c3baf03c3d5f1f0a900ff27cac699fa97459934d	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Reexam Request for Extension of Time	1	3
	Reexam Certificate of Service	4	4
Warnings:			
Information:			
	Total Files Size (in bytes):	38302	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	3277-0114US-RXM2	7821

6449 7590 11/04/2016
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
11/04/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patents and Trademark Office
P.O.Box 1450
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www.uspto.gov

THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS
ROPES & GRAY LLP
PRUDENTIAL TOWER IPRM DOCKETING - FLOOR 43
800 BOYLSTON STREET
BOSTON, MA 02199-3600

Date:
MAILED
NOV 0 4 2016
CENTRAL REEXAMINATION UNIT

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. : 90013809
PATENT NO. : 8457228
ART UNIT : 3992

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified ex parte reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the ex parte reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Decision on Petition for Extension of Time in Reexamination	Application No. 90/013,809	Applicant(s) 8457228	
	Examiner Weaver, Scott	Art Unit 3992	

1. THIS IS A DECISION ON THE PETITION FILED November 1, 2016.

2. THIS DECISION IS ISSUED PURSUANT TO:
   A. ☒ 37 CFR 1.550(c) – The time for taking any action by a patent owner in a third party requested *ex parte* reexamination proceeding will be extended only for sufficient cause and for a reasonable time specified.
   B. ☐ 37 CFR 1.550(c) – The time for taking action by a patent owner in a patent owner requested *ex parte* reexamination proceeding will only be extended for more than two months for sufficient cause and for a reasonable time specified.
   C. ☐ 37 CFR 1.956 – The time for taking any action by a patent owner in an *inter partes* reexamination proceeding will be extended only for sufficient cause and for a reasonable time specified.

   The petition is before the Central Reexamination Unit for consideration.

3. FORMAL MATTERS
   Patent owner requests that the period for filing its patent owner's statement be extended by 2 months.
   A. Petition fee per 37 CFR §1.17(g)):
      i. ☒ Petition includes authorization to debit a deposit account.
      ii. ☐ Petition includes authorization to charge a credit card account.
      iii. ☐ Other _____.
   B. ☒ Proper certificate of service was provided. (Not required in reexamination where patent owner is requester.)
   C. ☒ Petition was timely filed.
   D. ☒ Petition properly signed.

4. DECISION (See MPEP 2265 and 2665)
   A. ☐ Granted or ☒ Granted-in-part for one (1) month. The period for response will expire on **January 17, 2017**.
   No extraordinary circumstances were shown. See MPEP 2265 VI.
   B. ☐ Dismissed because:
      i. ☐ Formal matters (See unchecked box(es) (A, B, C and/or D) in section 4 above).
      ii. ☐ Petitioner failed to provide a factual accounting of reasonably diligent behavior by all those responsible for preparing a response to the outstanding Office action within the statutory time period.
      iii. ☐ Petitioner failed to explain why, in spite of the action taken thus far, the requested additional time is needed.
      iv. ☐ The statements provided fail to establish sufficient cause to warrant extension of the time for taking action (See attached).
      v. ☐ The petition is moot.
      vi. ☐ Other/comment: _____

5. CONCLUSION
   Telephone inquiries with regard to this decision should be directed to Michael Fuelling at 571-270-1367. In his/her absence, calls may be directed to Alexander Kosowski in the Central Reexamination Unit.

/Michael Fuelling/
Supervisory Patent Reexamination Specialist

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	3277-0114US-RXM2	7821

6449 7590 11/28/2016
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
11/28/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

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THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS
ROPES & GRAY LLP
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800 BOYLSTON STREET
BOSTON, MA 02199-3600

Date:
MAILED
" 28 2016
CENTRAL REEXAMINATION UNIT

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. : 90013809
PATENT NO. : 8457228
ART UNIT : 3992

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified ex parte reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the ex parte reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Commissioner for Patents
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Rothwell, Figg, Ernst & Manbeck, P.C. (For Patent Owner)
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NOV 2 0 2016

Ropes & Gray LLP (For Requester)
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Prudential Tower
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Boston, MA 02199-3600

CENTRAL REEXAMINATION UNIT

In re Bremer
Ex Parte Reexamination Proceeding
Control No. 90/013,809
Filed: September 12, 2016
For: U.S. Patent No.: 8,457,228

DECISION DISMISSING PETITIONS

This decision addresses the following papers:

- Patent owner's September 30, 2016 petition entitled "Petition Requesting the Director to Exercise Her Discretionary Authority under 35 U.S.C. § 325(d) Pursuant to 37 C.F.R. § 181(a)(2) and/or § 1.182", which is taken as a combined petition including: 1) a petition under 37 CFR 1.183 requesting waiver of the rules, and entry and consideration of patent owner's petition under 37 CFR 1.182; 2) a petition under 37 CFR 1.182 to vacate the order granting reexamination mailed on October 17, 2016 and to issue an order denying reexamination (patent owner's September 30, 2016 combined petition);

- Requester's October 13, 2016 opposition entitled "Third Party Requester's Opposition to Patent Owner's Petition to Reject Reexamination Request", which is an opposition to patent owner's September 30, 2016 petition (requester's October 13, 2016 opposition);

- Requester's October 13, 2016 petition under 37 CFR 1.183 entitled "Third Party Requester's Petition to Respond to Patent Owner's Petition to Reject Reexamination Request", which requests permission from the Director to oppose patent owner's September 30, 2016 petition (requester's October 13, 2016 petition under 37 CFR 1.183); and

- Patent owner's October 25, 2016 paper entitled "Patent Owner's Reply to Third Party Requester's Opposition to Patent Owner's Petition Requesting the Director to Exercise Her Discretionary Authority under 35 U.S.C. § 325(d) Pursuant to 37 C.F.R. § 181(a)(2) and/or § 1.182", which is a response by the patent owner to requester's October 13, 2016 opposition (patent owner's October 25, 2016 paper).

Patent owner's September 30, 2016 combined petition, requester's October 13, 2016 opposition, requester's October 13, 2016 petition under 37 CFR 1.183, patent owner's October 25, 2016 paper, and the record as a whole, are before the Office of Patent Legal Administration for consideration.

SUMMARY

Patent owner's September 30, 2016 petition under 37 CFR 1.183 is **granted to the extent that** patent owner's September 30, 2016 petition under 37 CFR 1.182 has been **entered and considered**.

Patent owner's September 30, 2016 petition under 37 CFR 1.182 is **dismissed**.

The October 17, 2016 order granting reexamination **will not be vacated**. Prosecution in the present reexamination proceeding **will continue**.

Requester's October 13, 2016 petition under 37 CFR 1.183 is **dismissed as moot**. Requester's October 13, 2016 opposition has been entered and considered.

Patent owner's October 25, 2016 paper entitled "Patent Owner's Reply to Third Party Requester's Opposition to Patent Owner's Petition Requesting the Director to Exercise Her Discretionary Authority under 35 U.S.C. § 325(d) Pursuant to 37 C.F.R. § 181(a)(2) and/or § 1.182" is **improper** and **will not be considered**. Patent owner's October 25, 2016 paper is being *sua sponte* **expunged** from the record by marking the papers "closed" and "non-public," and will not constitute part of the record of the present reexamination proceeding.

REVIEW OF THE RELEVANT FACTS

- On June 4, 2013, U.S. Patent No. 8,457,227 (the '228 patent) issued to Gordon F. Bremer.

- On September 12, 2016, the third party requester filed a request for *ex parte* reexamination of the '228 patent, requesting reexamination of claim 21. The reexamination proceeding was assigned control no. 90/013,809 (the present proceeding) and was accorded a filing date of September 12, 2016.

- On September 30, 2016, the patent owner filed the present petition entitled "Petition Requesting the Director to Exercise Her Discretionary Authority under 35 U.S.C. § 325(d) Pursuant to 37 C.F.R. § 181(a)(2) and/or § 1.182" (patent owner's September 30, 2016 combined petition).

- On October 13, 2016, the requester filed an opposition to patent owner's September 30, 2016 petition (requester's October 13, 2016 opposition).

- Also on October 13, 2016, the requester filed a petition entitled "Third Party Requester's Petition to Respond to Patent Owner's Petition to Reject Reexamination Request", which requests permission from the Director to oppose patent owner's September 30, 2016 petition (requester's October 13, 2016 petition under 37 CFR 1.183).

- On October 17, 2016, reexamination of claim 21 of the '228 patent was ordered in the present proceeding.

- On October 25, 2016, the patent owner filed a paper entitled "Patent Owner's Reply to Third Party Requester's Opposition to Patent Owner's Petition Requesting the Director to Exercise Her Discretionary Authority under 35 U.S.C. § 325(d) Pursuant to 37 C.F.R. § 181(a)(2) and/or § 1.182", which is a response by patent owner to requester's October 13, 2016 opposition (patent owner's October 25, 2016 paper).

DECISION

Patent Owner's September 30, 2016 Combined Petition

The patent owner requests the Office to "reject" the request filed in the present proceeding for *ex parte* reexamination of claim 21 of the '228 patent, pursuant to 35 U.S.C. 325(d). The present petition is taken as a combined petition including: 1) a petition under 37 CFR 1.183 requesting waiver of the rules, and entry and consideration of patent owner's petition under 37 CFR 1.182; and 2) a petition under 37 CFR 1.182 to vacate the order granting reexamination mailed on October 17, 2016 and to issue an order denying reexamination, on the basis set forth in 35 U.S.C. 325(d) that the request is allegedly limited to the same or substantially the same prior art or arguments previously presented to the Office.

Patent Owner's September 30, 2016 Petition under 37 CFR 1.183

The patent owner requests the Office under 37 CFR 1.183 to waive any rules or requirements which would prevent consideration of its September 30, 2016 petition under 37 CFR 1.182. In the present case, patent owner's September 30, 2016 petition under 37 CFR 1.182, and requester's October 13, 2016 opposition thereto, are **not timely filed**. Any papers filed prior to the decision on the request which are directed to the merits of the reexamination will not be considered and will be expunged from the record.[1] See MPEP 2225. For example, a petition to vacate the order granting reexamination as *ultra vires* on the basis that the request does not raise a substantial new question of patentability, may only be filed *after* the decision on the request is rendered. See, e.g., MPEP 2246. Papers direct to the merits of the reexamination include petitions alleging that the request is limited to the same or substantially the same prior art or arguments previously presented to the Office as specified in 35 U.S.C. 325(d), and any opposition thereto.

However, in view of the specific facts and circumstances of the present case, particularly the fact that the present petition under 37 CFR 1.182 requesting the Office to "reject" the request for *ex parte* reexamination pursuant to 35 U.S.C. 325(d) is a case of first impression, patent owner's petition under 37 CFR 1.183 is **granted**. The prohibition set forth in MPEP 2225 which prohibits the filing of patent owner's September 30, 2016 petition under 37 CFR 1.182 and

[1] Some exceptions, which are enumerated in MPEP 2225, apply.

requester's October 13, 2016 opposition thereto, is **hereby waived**. Patent owner's September 30, 2016 petition, and requester's October 13, 2016 opposition thereto, **have been entered and considered**.

Patent Owner's September 30, 2016 Petition under 37 CFR 1.182

The present petition is taken as a petition under 37 CFR 1.182 to vacate the order granting reexamination mailed on October 17, 2016 and to issue an order denying reexamination, on the basis set forth in 35 U.S.C. 325(d) that the request is allegedly limited to the same or substantially the same prior art or arguments previously presented to the Office.

35 U.S.C. 325(d) provides, in pertinent part (emphasis added):

> In determining whether to . . . order a proceeding under . . . chapter 30, . . . the Director may take into account whether, and reject the . . . request because, the same or substantially the same prior art or arguments previously were presented to the Office.

The patent owner points to the legislative history of 35 U.S.C. 325(d) to show that the provisions of the statute apply to requests for *ex parte* reexamination, citing 157 Cong. Rec. S1042 (Daily Ed. Mar. 1, 2011)(Statement of Sen. Kyl) (emphasis added):

> [35 U.S.C. 325(d)] allows the Patent Office to reject any request for a proceeding, **including a request for ex parte reexamination**, if the same or substantially the same prior art or arguments previously were presented to the Office with respect to that patent.

The patent owner, however, does not argue that the same or substantially the same prior art or arguments previously were presented to the Office. In fact, the patent owner concedes that the request presents "newly cited references",[2] also as argued by the requester in its October 13, 2016 opposition.[3] Furthermore, the patent owner does not provide any discussion regarding whether the arguments presented in the request are the same or substantially the same as those previously presented to the Office. More importantly, however, even if some or all of the arguments are later shown to be the same or substantially the same as those previously presented to the Office, the patent owner has not shown that the prior art relied upon in the request is cumulative to the prior art of record, or, for that matter, that the request does not raise a substantial new question of patentability for other reasons.

The standard for determining whether a request for *ex parte* reexamination is granted is whether a substantial new question of patentability affecting any claim of the patent concerned is raised by the request. See 35 U.S.C. 303(a) and 304. 35 U.S.C. 325(d) does not *require* the Office to reject a request for reexamination. The statute merely permits the Office, within the Office's discretion, to reject the request if the same or substantially the same prior art or arguments

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[2] See page 5 of patent owner's September 30, 2016 combined petition. In addition, the requester notes, in its October 13, 2016 opposition, that the Upender reference was before the Office during prior *inter partes* review proceedings, but only to establish motivation to combine the admitted prior art with a different prior art reference (the Boer reference). See footnote 1 of requester's October 13, 2016 opposition.

[3] See page 5 of requester's October 13, 2016 opposition.

previously were presented to the Office with respect to that patent. 35 U.S.C. 304, however, *requires* the Office to order reexamination if the Office finds that a substantial new question of patentability affecting any claim of the patent concerned is raised by the request. See 35 U.S.C. 304, which provides, in pertinent part (emphasis added):

> If . . . the Director finds that a substantial new question of patentability affecting any claim of a patent is raised, **the determination will include an order for reexamination** of the patent for resolution of the question.

A reference raises a substantial new question of patentability where 1) the reference contains a new, non-cumulative technological teaching that was not previously considered and discussed on the record during the prior examination of the patent; and 2) there is a substantial likelihood that a reasonable examiner would consider the teaching of the reference important in determining the patentability of a claim of the patent under reexamination. See MPEP 2216. See also MPEP 2242, which provides, in pertinent part:

> If the prior art patents and printed publications raise a substantial question of patentability of at least one claim of the patent, then a substantial new question of patentability as to the claim is present, unless the same question of patentability has already been: (A) decided in a final holding of invalidity by a federal court in a decision on the merits involving the claim, after all appeals; (B) decided in an earlier concluded examination or review of the patent by the Office; or (C) raised to or by the Office in a pending reexamination or supplemental examination of the patent.

The patent owner does not argue that the request does not raise a substantial new question of patentability. Instead, the patent owner argues that the requester has not explained why the art could not have been presented earlier. The patent owner points to a total of seven petitions for *inter partes* reviews (IPRs) of the '228 patent: IPR2014-00889, IPR2014-00890, IPR2014-00891, IPR2014-00892, IPR2014-00893, IPR2014-00895, and IPR2015-00555. In four of them, institution was denied. In the remaining three (IPR2014-00892, IPR2014-00893 and IPR2014-00895) final written decisions were rendered before the present request for reexamination was filed; however, none of the three *inter partes* reviews involved a review of claim 21 of the '228 patent, which is the only claim under reexamination in the present proceeding. Only three of the *inter partes* reviews included challenges to claim 21, and in each case, review of claim 21 was denied.[4]

The patent owner argues that the third party requester has not shown that the art or arguments were known or available to the requester at the time of filing the earlier petitions for *inter partes* review.[5] The patent owner points out that the Patent Trial and Appeals Board (Board), when determining whether to institute an *inter partes* review, has analyzed whether a petitioner has shown whether the art or arguments were known or available to the requester at the time of filing the earlier *inter partes* reviews.

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[4] See IPR2014-00889, IPR2014-00892, and IPR2015-00555.

[5] See, e.g., pages 4, 5 and 7 of patent owner's September 30, 2016 combined petition.

The present proceeding, however, is an *ex parte* reexamination proceeding, not an *inter partes* review. The standard for determining whether a request for *ex parte* reexamination is granted is whether a substantial new question of patentability affecting any claim of the patent concerned is raised by the request, as stated previously.

The patent owner argues that permitting the requester to request *ex parte* reexamination in the present proceeding "would incentivize patent challengers to file serial petitions and requests and increase the burden on the both the Office and patent owners in having to respond to renewed attacks."[6] In other words, the patent owner is essentially arguing that permitting the filing of the present request for *ex parte* reexamination would encourage harassment of the patent owner.

The legislative history of the *ex parte* reexamination statute, however, reflects an intent by Congress that the *ex parte* reexamination process would not create new opportunities to harass the patent owner. See, e.g., H.R. Rep. No. 1307 (part I), 96th Cong., 2d Sess. 7 (Statement of Congressman Kastenmeier, September 9, 1980):

> This "substantial new question" requirement would protect patentees from having to respond to, or participate in unjustified reexaminations.

The legislative history of the 2002 amendment to the reexamination statute also states that the amendment "preserves the 'substantial new question standard' that is an important safeguard to protect all inventors against frivolous action and against harassment," and "also preserves the discretion of the Patent and Trademark Office in evaluating these cases."[7] See also *Industrial Innovation & Patent & Copyright Law Amendments: Hearings on H.R. 6933, 6934, 3806, & 214 Before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the House Committee on the Judiciary*, 96th Cong., 2nd Sess. 594 (1980) (statement of Sidney Diamond, Commissioner of Patents & Trademarks, April 24, 1980):

> [The proposed *ex parte* reexamination statute] carefully protects patent owners from reexamination proceedings brought for harassment or spite. The possibility of harassing patent holders is a classic criticism of some foreign reexamination systems and we made sure it would not happen here.

To prevent the use of the reexamination process to harass the patent owner, Congress included the requirement that a substantial new question of patentability based on patents and printed publications must be raised by the request. See also *Patlex v. Mossinghoff*, 771 F.2d 480, 483-484 (Fed. Cir. 1985)(italics in original), where the Federal Circuit, in quoting the statement of Commissioner Diamond immediately above, stated:

> Study of the genesis of the reexamination statute leaves no doubt that the major purpose of the threshold determination whether or not to reexamine is to provide a safeguard to the patent holder . . . That is the only purpose of the procedure established by *35 U.S.C. § 303*: "carefully" to protect holders of issued patents from being subjected to unwarranted reexaminations.

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[6] See page 6 of patent owner's September 30, 2016 combined petition.

[7] 147 Cong. Rec H 5358, 107th Congress, (September 5, 2001).

Furthermore, the purpose of reexamination is to permit the Office to reexamine the patent on the basis of prior art which was not previously considered during an earlier examination or review of the patent. There is a strong public interest that all of the prior art be considered. See, for example, *In re Etter*, 225 USPQ 1 (Fed. Cir. 1985), in which the Federal Circuit, when discussing whether the § 282 presumption of validity has application in reexamination proceedings, stated:

> Reexamination is thus neutral, the patentee and the public having an equal interest in the issuance and maintenance of valid patents.

In this instance, prior art relied upon in the request for reexamination was found by the examiner to raise a substantial new question of patentability. Reexamination was then ordered, as required by 35 U.S.C. 304. The examiner issued a 15-page order for reexamination detailing the substantial new questions of patentability presented in the request, and it is in the public interest to resolve those questions. The public has a right to the resolution of any legitimate substantial new question of patentability affecting the claims under reexamination.

For all of the reasons stated above, patent owner's September 30, 2016 petition under 37 CFR 1.182 is **dismissed**.

The October 17, 2016 order granting reexamination **will not be vacated**. Prosecution in the present reexamination proceeding **will continue**.

Requester's October 13, 2016 Petition under 37 CFR 1.183

The requester requests the Office to permit the requester to file an opposition to patent owner's September 30, 2016 petition. The requester asserts that extraordinary circumstances justify entry and consideration of requester's opposition, which was concurrently filed with its petition under 37 CFR 1.183.

Patent owner's September 30, 2016 petition, however, is taken as a petition to vacate the order granting reexamination on the basis that the request for reexamination allegedly is limited to the same or substantially the same prior art or arguments previously presented to the Office. An opposition by the requester to such a petition has a right of entry in the same manner as an opposition by the requester to a petition to vacate the order granting reexamination as *ultra vires* on the basis that the request does not raise a substantial new question of patentability (see MPEP 2246).

For this reason, requester's October 13, 2016 petition is **dismissed as moot**. Furthermore, the prohibition set forth in MPEP 2225 which prohibits the filing of patent owner's September 30, 2016 petition under 37 CFR 1.182 and requester's October 13, 2016 opposition thereto, has been waived by this decision, as discussed previously.[8] For this reason, requester's October 13, 2016 opposition has been entered and considered.

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[8] See the discussion earlier in this decision under the heading "Patent Owner's September 30, 2016 Petition under 37 CFR 1.183".

Patent Owner's October 25, 2016 Paper

Patent owner's October 25, 2016 paper entitled "Patent Owner's Reply to Third Party Requester's Opposition to Patent Owner's Petition Requesting the Director to Exercise Her Discretionary Authority under 35 U.S.C. § 325(d) Pursuant to 37 C.F.R. § 181(a)(2) and/or § 1.182" is a response to requester's opposition to patent owner's September 30, 2016 petition, and for this reason, is **improper** and **will not be considered**. See MPEP 2267, subsection II, which provides, in pertinent part (emphasis added):

> In those rare instances where an opposition to a patent owner petition is filed, after such opposition is filed by a third party requester (regardless of whether such opposition has an entry right or not), **any further paper in opposition/rebuttal/response to the third party opposition paper will not be considered and will be expunged**. There must be a limitation on party iterations of input, especially given the statutory mandate for special dispatch in reexamination.

Pursuant to MPEP 2267, patent owner's October 25, 2016 paper is being *sua sponte* **expunged** from the record by marking the papers "closed" and "non-public," and will not constitute part of the record of the present reexamination proceeding.

CONCLUSION

- Patent owner's September 30, 2016 under 37 CFR 1.183 is **granted to the extent that** patent owner's September 30, 2016 petition under 37 CFR 1.182 has been **entered and considered**.

- Patent owner's September 30, 2016 petition under 37 CFR 1.182 to vacate the order granting reexamination and issue an order denying reexamination in the present reexamination proceeding is **dismissed.**

- The order granting reexamination mailed on October 17, 2016 **will not be vacated**. Prosecution in the present reexamination proceeding **will continue**.

- Requester's October 13, 2016 petition under 37 CFR 1.183 is **dismissed as moot**. Requester's October 13, 2016 opposition has been entered and considered.

- Patent owner's October 25, 2016 paper entitled "Patent Owner's Reply to Third Party Requester's Opposition to Patent Owner's Petition Requesting the Director to Exercise Her Discretionary Authority under 35 U.S.C. § 325(d) Pursuant to 37 C.F.R. § 181(a)(2) and/or § 1.182" is **improper** and **will not be considered**. Patent owner's October 25, 2016 paper is being *sua sponte* **expunged** from the record by marking the papers "closed" and "non-public," and will not constitute part of the record of the present reexamination proceeding.

- The present proceeding is being forwarded to the Central Reexamination Unit to continue prosecution.

- Any inquiry concerning this communication should be directed to the undersigned at (571) 272-7724.

/Cynthia L. Nessler/

Cynthia L. Nessler
Senior Legal Advisor
Office of Patent Legal Administration

11/22/2016

CERTIFICATE OF SERVICE

It is hereby certified that on this 3rd day of April, 2017, the foregoing **PETITION REQUESTING THE DIRECTOR TO EXERCISE HER SUPERVISORY AUTHORITY PURSUANT TO 37 C.F.R. § 1.181(a)(1) AND/OR § 1.182** was served, by first-class U.S. Mail, on the attorney of record for the third-party Requesters Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., at the following address:

J. Steven Baughman, Esq.
Ropes & Gray LLP
IPRM – Floor 43
Prudential Tower
800 Boylston Street
Boston, Massachusetts 02199-3600
Phone: 202-508-4606
Facsimile: 202-383-8371

/Michael V. Battaglia/
Michael V. Battaglia
Reg. No. 64,932

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In *Ex Parte* Reexamination of : Group Art Unit: 3992

Gordon F. BREMER :

Patent No.: 8,457,228 B2 : Control No.: 90/013,809

Issued: June 4, 2013 :

Reexam Request Filed: September 12, 2016

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

Attn: Mail Stop "*Ex Parte* Reexam"
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION REQUESTING THE DIRECTOR TO EXERCISE HER SUPERVISORY AUTHORITY PURSUANT TO 37 C.F.R. § 1.181(a)(1) AND/OR § 1.182

Pursuant to 37 C.F.R. § 1.181(a)(1) and/or § 1.182, Rembrandt Wireless Technologies, LP ("Rembrandt") respectfully requests the Director to exercise her supervisory authority under Rule 181(a)(1) to require that the non-final Office Action (mailed March 9, 2017) rejecting claim 21 of U.S. Patent No. 8,457,228 ("the '228 Patent") in the above-referenced *ex parte* reexamination ("the '228 Reexamination") be vacated and reissued. Rembrandt respectfully further requests that the Director require the March 9, 2017 Office Action to be stricken from the record. Rembrandt's request is based on the limits and requirements of *ex parte* reexamination and examination generally, which Rembrandt believes have not been observed in the outstanding Office Action. These limitations and requirements are: (1) With respect to original claims, *ex parte* reexamination is limited to examination "on the basis of patents or printed publications," MPEP 2258 (quoting 37 CFR 1.552(a)), and therefore does not permit examination on, *inter alia*, § 112 issues or other objections to the specification in the absence of amendments during reexamination. (2) As acknowledged in the March 9, 2017 Office Action at 3, a claim in *ex parte* reexamination that has not expired must be given its "broadest reasonable interpretation in light of the specification," MPEP 2111. Rembrandt is entitled to know what that interpretation is. The Office Action does not identify what it considers to be the broadest reasonable interpretation but rather relies on two different interpretations to reject the same claim, labelled A and B. There is no provision in the *ex parte* reexamination statutes, regulations, or the MPEP that permits more than one such interpretation for any given claim.

<u>Statement of Facts Relevant to Petition</u>

1) On September 12, 2016, following its repeated failure to successfully attack claim 21 of the '228 Patent in multiple IPRs and after the conclusion of a district court action involving the '228 Patent that has been pending since March 2013 and is now awaiting a decision from the Federal Circuit, Samsung requested this *ex parte* reexamination attacking the same claim it was unable to defeat during the IPRs and during the district court litigation.

2) On September 30, 2016, Rembrandt filed a petition asking the Director to exercise her discretion under 35 U.S.C.§325(d) to deny the petition based on multiple proceedings attacking the same claim and lack of any reason why Samsung should have yet another opportunity to attack the same claim. That petition was dismissed on November 28, 2016.

3) On October 17, 2016, the Office granted Samsung's Request.

4) On March 9, 2017, the Office issued a non-final Office Action that is outside the scope of *ex parte* reexamination. In the absence of any amendments, *ex parte* reexamination is limited to reexamination based on patents and printed publications. The March 9, 2017 Office Action

exceeds its authority by (a) reexamining and objecting to the drawings of the '228 Patent and demanding that Rembrandt amend the '228 Patent by providing substitute drawings and labelling Figure 2 with "a legend such as --Prior Art --" (March 9, 2017 Office Action at 7); (b) reexamining and objecting to the specification as "failing to provide proper antecedent basis for the claimed subject matter" (*id.* at 8 (citing 37 CFR § 1.75(d)(1) and MPEP § 608.01)); and (c) reexamining the claims under 35 U.S.C. § 112 and asserting that "claim 21 is a single means claim" (*id.* at 5). Rembrandt is not aware of any basis in law for such actions during an *ex parte* reexamination.

5) The March 9, 2017 Office Action also relies on two different claim interpretations to reject claim 21 and thus does not provide the Office's broadest reasonable interpretation of these claims. (March 9, 2017 Office Action at 3-7). Based on "Interpretation A" (*id.* at 8), the Office Action rejects claim 21 under 35 U.S.C. § 102(e) based on Snell (*id.* at 8-9) and under 35 U.S.C. § 103(a) based on a combination of three references (*id.* at 9-11). Based on "Interpretation B" (*id.* at 11), the Office Action rejects claim 21 based on the three different combinations of from three to six references proposed by Samsung (*id.* at 11-75). There cannot be more than one broadest reasonable construction of the claims, and it is inappropriate to require Rembrandt to address multiple or hypothetical constructions in response to an Office Action.

6) On February 9, 2017, Rembrandt filed a Petition Requesting the Director to Exercise Her Supervisory Authority Pursuant to 37 C.F.R. § 1.181(a)(1) and/or § 1.182 in the *ex parte* reexamination (control no. 90/013,808) of U.S. Patent No. 8,023,580 ("the '580 Reexamination"). The '580 Patent is the parent of the '228 Patent. The February 9, 2017 petition will hereinafter be referred to as "the '580 Petition." The '580 Petition requested

revision and reissuance of the Office Action mailed January 24, 2017, in the *ex parte* reexamination of the '580 Patent. The '580 Petition was based on, *inter alia*, (i) a discussion in the January 24, 2017 Office Action of issues outside the scope of *ex parte* reexamination including § 112 issues, objections to the specification, and objections to the drawings ('580 Petition at 5-8) and (ii) the failure of the January 24, 2017 Office Action, which set forth alternative claim interpretations "Interpretation A" and "Interpretation B" (January 24, 2017 Office Action at 6-9), to identify the broadest reasonable interpretation ('580 Petition at 8).

7) On March 27, 2017, the CRU issued a "Decision *Sua Sponte* Vacating Non Final Office Action" ("CRU Decision"), which found that the January 24, 2017 Office Action "includes a discussion of issues outside the scope of *ex parte* reexamination and therefore, the January 24, 2017 Office action does not comply with 37 CFR 1.552." The CRU Decision vacated the January 24, 2017 Office Action and indicated that "[t]he Office Action will form no part of the record and will not be available to the public."

8) On March 31, 2017, the Office issued a new Office Action in the '580 Reexamination. Unlike the January 24, 2017 Office Action, the March 31, 2017 Office Action does not include objections to the specification and drawings, does not expressly characterize its two claim interpretations as A and B but still maintains both in the alternative, and has revised the grounds of rejection, including withdrawing one ground that was based on prior art previously considered by the Office in its entirety. *Compare* January 24, 2017 Office Action *with* March 31, 2017 Office Action.

<u>Rembrandt's Petition Should Be Granted Because the Office Action Exceeds The Limited Scope of *Ex Parte* Reexamination</u>

The scope of *ex parte* reexamination is set forth in 37 CFR 1.552:

> (a) Claims in an *ex parte* reexamination proceeding will be examined on the basis of patents or printed publications and, *with respect to subject matter added or*

deleted in the reexamination proceeding, on the basis of the requirements of 35 U.S.C. 112.

(b) Claims in an *ex parte* reexamination proceeding will not be permitted to enlarge the scope of the claims of the patent.

(c) *Issues other than those indicated in paragraphs (a) and (b) of this section will **not** be resolved in a reexamination proceeding….* [emphasis added].

Like the now vacated January 24, 2017 Office Action, the March 9, 2017 Office Action in the '228 Reexamination "includes a discussion of issues outside the scope of *ex parte* reexamination" (quotation from the CRU Decision in the '580 reexamination). Also like the situation in the '580 Reexamination, no subject matter has been "added or deleted" in the '228 Reexamination, and, therefore, ***no*** authority exists to examine "on the basis of the requirements of 35 USC 112," even if a formal rejection has not been entered. Only new or amended claims are to be examined under § 112. MPEP 2258 (quoting 37 CFR 1.552(a)).[1] By raising § 112 issues and objecting to the specification and to the drawings (see Fact 4 above), again, the Office has exceeded its limited authority to examine the claims based on "patents and printed publications," and is clearly *ultra vires*.

Unless the March 9, 2017 Office Action is vacated and removed from the record, as was the January 24, 2017 Office Action in the '580 Reexamination, Rembrandt will be prejudiced by its issuance. Like the now vacated January 24, 2017 Office Action, the outstanding Office Action includes an objection to the specification "as failing to provide proper antecedent basis

[1] MPEP 2258 makes clear that such action is not appropriate by providing: "If such issues are raised *by the patent owner or third party requester* during a reexamination proceeding, the existence of such issues will be *noted* by the examiner in the next Office action …." *Id.* (quoting 37 CFR 1.552(c) (emphasis added)). In this case, neither the patent owner nor the third party requester raised any § 112 issues, and, even if either party had raised such an issue, the MPEP limits the examiner's action to *noting* them – not conducting a § 112 examination and drawing conclusions regarding the result of such an examination as was done here.

for the claimed subject matter" (March 9, 2017 Office Action at 8) and an objection to the drawings which "will not be held in abeyance" (*id.* at 7), both of which are beyond the scope of *ex parte* reexamination. Rembrandt will be prejudiced if it is forced to respond to these objections or risk a final rejection on such grounds. In the absence of amendments to the specification or new or amended claims, there is no basis in law for making such objections during *ex parte* reexamination. These objections on the record, if left unrebutted, have the potential to undermine Rembrandt's ability to enforce its patent rights. For this reason alone, the March 9, 2017 Office Action should be vacated and reissued, and the original March 9, 2017 Office Action should be stricken from the record. Without such relief, Rembrandt will be prejudiced by being forced to respond to the Office's objections, and, thus, further resources of the Office and Rembrandt will be spent needlessly on issues outside the scope of this *ex parte* reexamination.

In addition to the improper objections to the specification and drawings, the outstanding Office Action includes an *ultra vires* determination in the Office's statement that "claim 21 is a single means claim" (March 9, 2017 Office Action at 5), which is tantamount to an assertion that claim 21 is not fully enabled under 35 U.S.C. § 112, first paragraph. (See MPEP § 2181(V) ("A single means claim does not comply with … pre-AIA 35 U.S.C. 112, first paragraph requiring that the enabling disclosure of the specification be commensurate in scope with the claim under consideration.")). By law, the Office has no authority to conduct such an examination of claim 21 or make such a determination with respect to whether claim 21 is a single means claim (i.e., whether claim 21 is enabled).[2] Here again, Rembrandt will be prejudiced if it is forced to respond to this determination. As with the objections to the specification and drawings, if the Office's single means claim determination is not rebutted, it has the potential to undermine Rembrandt's ability to enforce its patent rights. For these further reasons, the March 9, 2017 Office Action should be vacated and reissued without such improper analyses and determinations that go beyond the scope of *ex parte* reexamination, and the original March 9, 2017 Office Action should be stricken from the record. Again, further resources of the Office and Rembrandt should not be spent on issues that are clearly the outside the scope of this *ex parte* reexamination.

Rembrandt respectfully requests that Director exercise her supervisory authority to order that the pending non-final Office Action be vacated and reissued to address these issues and that the March 9, 2017 Office Action be stricken from the record.

<u>Rembrandt's Petition Should Be Granted Based on The Office's Failure to Identify the Broadest Reasonable Interpretation of Claim 21</u>

The Office has failed to identify what it considers to be the broadest reasonable interpretation of claim 21. Instead, the March 9, 2017 Office Action relies on two different interpretations -- Interpretation A to reject the claim under §§ 102(e) & 103 and on Interpretation B to make three additional rejections under § 103. See Fact 5 above. There can be *only one*

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[2] In this regard, MPEP 2258 clearly provides as follows:

> In reexaminations ordered under 35 U.S.C. 304, where new claims are presented or where any part of the disclosure is amended, the claims of the reexamination proceeding, are to be examined for compliance with 35 U.S.C. 112. *Consideration of 35 U.S.C. 112 issues should, however, be limited to the amendatory (e.g., new language) matter*. For example, a claim which is amended or a new claim which is presented containing a limitation not found in the original patent claim should be considered for compliance under 35 U.S.C. 112 only with respect to that limitation. *To go further would be inconsistent with the statute to the extent that 35 U.S.C. 112 issues would be raised as to matter in the original patent claim.* [emphasis added].

Claims 2 and 59 are original, unamended claims.

broadest reasonable interpretation for any given claim, and Rembrandt is entitled to know what the Office's interpretation is before a response to the Office Action is required. Thus, Rembrandt respectfully requests the Director to order that the March 9, 2017 Office Action be vacated and reissued to indicate what claim interpretation the Office has determined is the broadest reasonable interpretation.

Rembrandt's Petition in the '580 Reexamination

As indicated in the fact section above, Rembrandt filed a substantially identical petition in the '580 Reexamination. See Fact 6 above. This petition mirrors the '580 Petition because both are based (at least in part) on (i) a discussion in the first Office Action of issues outside the scope of *ex parte* reexamination including § 112 issues, objections to the specification, and objections to the drawings and (ii) the Office Action's failure to identify the broadest reasonable interpretation, instead setting forth alternative claim interpretations, which were labeled as "Interpretation A" and "Interpretation B" in both cases. See Fact 6 above.

In the CRU Decision in the '580 Reexamination, the Office found that the January 24, 2017 Office Action "includes a discussion of issues outside the scope of *ex parte* reexamination and therefore, the January 24, 2017 Office action does not comply with 37 CFR 1.552." See Fact 7 above. The CRU Decision vacated the January 24, 2017 Office Action and indicated that "[t]he Office Action will form no part of the record and will not be available to the public." See Fact 7 above. Rembrandt respectfully submits that the facts above dictate the same result in the case.

In addition, Rembrandt notes that second Office Action issued in the '580 Patent (i.e., the March 31, 2017 Office Action) no longer includes (i) an objection to the specification, and (ii) an objection to the drawings, and modifies the grounds of rejection, including eliminating that based on prior art that was previously considered by the Office. See Fact 8 above. With respect to Rembrandt's request that the Office provide what it has determined to be the broadest reasonable interpretation of the subject claims, while the March 31, 2017 Office Action in the '580 Reexamination has removed the labels "Interpretation A" and "Interpretation B", it continues to rely on two different claim interpretations in the alternative rather than identifying the one the Office considers to be the broadest reasonable interpretation. As noted in the '580 Petition and in this petition, Rembrandt believes failing to inform Rembrandt of the Office's broadest reasonable interpretation is in error (for the reasons given above). Thus, in the '228 Reexamination, Rembrandt respectfully requests that the March 9, 2017 Office Action be vacated and reissued without "a discussion of issues outside the scope of *ex parte* reexamination," including without objections to the specification and drawings, and based on a single broadest reasonable interpretation. Rembrandt further requests that the grounds of rejection, written in view of the above inappropriate analysis, be reconsidered in their entirety, as was done in the '580 Reexamination.

This Petition is timely filed, i.e., within two months of the non-final Office Action mailed March 9, 2017. To the extent the Office believes any rules prevent consideration of this petition, Rembrandt further petitions the Director to suspend such rules under the power granted to the Director by 37 C.F.R. § 1.183.

Any fee required for submission of this Petition may be charged to Counsel's Deposit Account Number 02-2135.

Respectfully submitted,

Date: April 3, 2017 By: /Michael V. Battaglia/

Michael V. Battaglia
Reg. No. 64,932
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
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Attorney for Petitioner
Rembrandt Wireless Technologies, LP

cc: Nancy J. Linck, Ph.D.
Counsel for Rembrandt Wireless Technologies, LP

Electronic Acknowledgement Receipt

EFS ID:	28815189
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	6449
Filer:	Michael Vincent Battaglia/Judith Pennington
Filer Authorized By:	Michael Vincent Battaglia
Attorney Docket Number:	3277-0114US-RXM2
Receipt Date:	03-APR-2017
Filing Date:	12-SEP-2016
Time Stamp:	14:53:32
Application Type:	Reexam (Patent Owner)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Petition.pdf	64690 dfa0ca851b8af3585aab3bc336e4966c8eb77b64	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Reexam Certificate of Service	11	11
	Reexam Miscellaneous Incoming Letter	1	10
Warnings:			
Information:			
	Total Files Size (in bytes):	64690	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	3277-0114US-RXM2	7821

6449 7590 04/05/2017
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
04/05/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patents and Trademark Office
P.O.Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS
ROPES & GRAY LLP
PRUDENTIAL TOWER IPRM DOCKETING - FLOOR 43
800 BOYLSTON STREET
BOSTON, MA 02199-3600

Date: MAILED

APR 05 2017

CENTRAL REEXAMINATION UNIT

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. : 90013809
PATENT NO. : 8457228
ART UNIT : 3992

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified ex parte reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the ex parte reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

For Patent Owner

MAILED

APR 0 5 2017

CENTRAL REEXAMINATION UNIT

ROPES & GRAY, LLP
Prudential Tower IPRM Docketing- Floor 43
800 Boylson Street
Boston, MA 02199-3600

For 3rd Party Requester

Ex Parte Reexamination Proceeding
Control No. 90/013,809
Filed: September 12, 2016
For: U.S. Patent No. 8,457,228

DECISION *SUA SPONTE*
VACATING EXAMINER'S
ANSWER

The purpose of this communication is to inform the parties to this *ex parte* reexamination proceeding that the non-final Office action mailed on March 9, 2017 is hereby vacated for the following reason:

A review of the March 9, 2017 Office action indicates that the Office Action includes a discussion of issues outside the scope of *ex parte* reexamination and therefore, the March 9, 2017 Office action does not comply with 37 CFR 1.552. Accordingly, the March 9, 2017 non final Office action is hereby vacated. The Office Action will form no part of the record and will not be available to the public. This decision will be made of record in the reexamination file and the proceeding will be returned to the Examiner in order to take further action. A new Office action will issued in due course.

Any inquiry concerning this communication should be directed to Hetul Patel, Supervisory Patent Reexamination Specialist of the Central Reexamination Unit, at telephone (571)272-4184.

John R. Cottingham,
Director, Central Reexamination Unit

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In *Ex Parte* Reexamination of : Group Art Unit: 3992

Gordon F. BREMER :

Patent No.: 8,457,228 B2 : Control No.: 90/013,809

Issued: June 4, 2013 :

Reexam Request Filed: September 12, 2016

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

Mail Stop *Ex Parte* Reexam
ATTN: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION PURSUANT TO 37 C.F.R. § 1.565(A)

Pursuant to 37 C.F.R. § 1.565(a), Patent Owner Rembrandt respectfully submits a copy of a Federal Circuit decision (attached as Exhibit A) for prompt entry into the record of the reexamination file. The decision (i.e., *Rembrandt Wireless Technologies, LP, v. Samsung Electronics Co., Ltd.*, No. 2016-1729 (Fed. Cir. April 17, 2017)) involves U.S. Patent No. 8,457,228 and is to the merits of the patent claims. Patent Owner respectfully requests that the examiner consider the content of the decision when the reexamination proceeding comes up for action on the merits. *See* MPEP § 2282.

Any fee required for submission of this Petition may be charged to Counsel's Deposit Account Number 02-2135.

Respectfully submitted,

Date: April 20, 2017 By: /Michael V. Battaglia/

Michael V. Battaglia, Reg. No. 64,932
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Attorney for Petitioner
Rembrandt Wireless Technologies, LP

cc: Nancy J. Linck, Ph.D.
Counsel for Rembrandt Wireless Technologies, LP

CERTIFICATE OF SERVICE

It is hereby certified that on this 20th day of April, 2017, the foregoing **SUBMISSION PURSUANT TO 37 C.F.R. § 1.565(A)** was served, by first-class U.S. Mail, on the attorney of record for the third-party Requesters Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., at the following address:

J. Steven Baughman, Esq.
Ropes & Gray LLP
IPRM – Floor 43
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800 Boylston Street
Boston, Massachusetts 02199-3600
Phone: 202-508-4606
Facsimile: 202-383-8371

/Michael V. Battaglia/
Michael V. Battaglia
Reg. No. 64,932

cc: Nancy J. Linck, Ph.D.
Counsel for Rembrandt Wireless Technologies, LP

Exhibit A

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

NOTICE OF ENTRY OF JUDGMENT ACCOMPANIED BY OPINION

OPINION FILED AND JUDGMENT ENTERED: 04/17/2017

The attached opinion announcing the judgment of the court in your case was filed and judgment was entered on the date indicated above. The mandate will be issued in due course.

Information is also provided about petitions for rehearing and suggestions for rehearing en banc. The questions and answers are those frequently asked and answered by the Clerk's Office.

Each side shall bear its own costs.

Regarding exhibits and visual aids: Your attention is directed Fed. R. App. P. 34(g) which states that the clerk may destroy or dispose of the exhibits if counsel does not reclaim them within a reasonable time after the clerk gives notice to remove them. (The clerk deems a reasonable time to be 15 days from the date the final mandate is issued.)

FOR THE COURT

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

16-1729 - Rembrandt Wireless v. Samsung Electronics
United States District Court for the Eastern District of Texas, Case No. 2:13-cv-00213-JRG

United States Court of Appeals for the Federal Circuit

REMBRANDT WIRELESS TECHNOLOGIES, LP,
Plaintiff-Appellee

v.

SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG TELECOMMUNICATIONS AMERICA, LLC,
Defendants-Appellants

SAMSUNG AUSTIN SEMICONDUCTOR, L.L.C., RESEARCH IN MOTION CORPORATION, RESEARCH IN MOTION LTD.,
Defendants

2016-1729

Appeal from the United States District Court for the Eastern District of Texas in No. 2:13-cv-00213-JRG, Judge J. Rodney Gilstrap.

Decided: April 17, 2017

MICHAEL F. HEIM, Heim, Payne & Chorush, LLP, Houston, TX, argued for plaintiff-appellee. Also represented by ERIC J. ENGER, MIRANDA Y. JONES; DEMETRIOS ANAIPAKOS, AMIR H. ALAVI, JAMIE ALAN AYCOCK, ALISA A.

LIPSKI, Ahmad, Zavitsanos, Anaipakos, Alavi & Mensing PC, Houston, TX.

JESSE J. JENNER, Ropes & Gray LLP, New York, NY, argued for defendants-appellants. Also represented by DOUGLAS HALLWARD-DRIEMEIER, Washington, DC; GABRIELLE E. HIGGINS, East Palo Alto, CA; BRIAN P. BIDDINGER, Quinn Emanuel Urquhart & Sullivan, LLP, New York, NY.

Before TARANTO, CHEN, and STOLL, *Circuit Judges*.

STOLL, *Circuit Judge*.

A jury found that Samsung infringed Rembrandt's asserted patents, which the jury also found not invalid over prior art cited by Samsung. The jury awarded Rembrandt $15.7 million in damages. After trial, Samsung moved for judgment as a matter of law on obviousness and damages, which the district court denied. Samsung appeals the district court's denial of JMOL, as well as the district court's claim construction order and an order denying Samsung's motion to limit Rembrandt's damages for alleged failure to mark patented articles.

Because we agree with the district court's challenged claim construction and its denial of Samsung's JMOL motions, we affirm those decisions. We disagree, however, with the district court's denial of Samsung's motion based on the marking statute, and we vacate that decision and remand for proceedings consistent with this opinion.

BACKGROUND

Rembrandt Wireless Technologies, LP, sued Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Telecommunications America, LLC in the United States District Court for Eastern District of Texas on March 15, 2013 for infringement of two patents that share a specification: U.S. Patent No. 8,023,580 and a continuation patent, U.S. Patent No. 8,457,228. These patents claim priority to a provisional application filed on December 5, 1997, and relate to "a system and method of communication in which multiple modulation methods are used to facilitate communication among a plurality of modems in a network, which have heretofore been incompatible." '580 patent col. 2 ll. 17–20. The patents explain that in the prior art "a transmitter and receiver modem pair can successfully communicate only when the modems are compatible at the physical layer." *Id.* at col. 1 ll. 27–29. As a result, "communication between modems is generally unsuccessful unless a common modulation method is used." *Id.* at col. 1 ll. 45–47. Particularly with modems communicating via master/slave protocol, the patents explain that "[i]f one or more of the trib modems [slaves] are not compatible with the modulation method used by the master, those tribs will be unable to receive communications from the master." *Id.* at col. 1 ll. 58–61. To overcome the challenges described in the prior art, the patents propose using the first section of a transmitted message (the message "header") to indicate the modulation method being used for the substance of the message (the message "payload").

Claim 2 of the '580 patent, which is dependent upon claim 1, is representative:

> 1. A communication device capable of communicating according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave, the device comprising:
>
> > a transceiver, in the role of the master according to the master/slave relationship, for sending at least transmissions modulated using at least *two types of modula-*

> *tion methods, wherein the at least two types of modulation methods comprise a first modulation method and a second modulation method, wherein the second modulation method is of a different type than the first modulation method,* wherein each transmission comprises a group of transmission sequences, wherein each group of transmission sequences is structured with at least a first portion and a payload portion wherein first information in the first portion indicates at least which of the first modulation method and the second modulation method is used for modulating second information in the payload portion, wherein at least one group of transmission sequences is addressed for an intended destination of the payload portion, and wherein for the at least one group of transmission sequences:
>
> the first information for said at least one group of transmission sequences comprises a first sequence, in the first portion and modulated according to the first modulation method, wherein the first sequence indicates an impending change from the first modulation method to the second modulation method, and
>
> the second information for said at least one group of transmission sequences comprises a second sequence that is modulated according to the second modulation method, wherein the second sequence is transmitted after the first sequence.

2. The device of claim 1, wherein the transceiver is configured to transmit a third sequence after

> the second sequence, wherein the third sequence is transmitted in the first modulation method and indicates that communication from the master to the slave has reverted to the first modulation method.

Id. at col. 7 l. 53 – col. 8 l. 24 (emphasis added to show dispute). Relevant here, the district court construed "modulation method [] of a different type" as "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." *Rembrandt Wireless Techs., LP v. Samsung Elecs. Co.*, No. 2:13-CV-213-JRG-RSP, 2014 WL 3385125, at *15 (E.D. Tex. July 10, 2014) (*Claim Construction Order*).

Rembrandt alleged at trial that Samsung devices incorporating the Bluetooth enhanced data rate ("EDR") standard infringed its patents. After a five-day trial, the jury found that Samsung infringed Rembrandt's patents, and that the patents were valid over the prior art Samsung presented. The jury awarded Rembrandt $15.7 million in damages. The district court denied Samsung's post-trial motions for judgment as a matter of law—on both liability and on damages—and entered final judgment.

Samsung appeals, and we have jurisdiction under 28 U.S.C. § 1295(a)(1).

DISCUSSION

Samsung appeals several issues: (1) the district court's construction of the "different types" limitation; (2) the district court's denial of JMOL of obviousness; (3) the district court's denial of Samsung's *Daubert* motion, motions for a new trial, and motion for JMOL on damages; and (4) the district court's denial of Samsung's motion to limit damages based on Rembrandt's purported failure to mark products embodying the '580 patent. Samsung does not appeal the jury's finding of infringement. We address each issue in turn.

I. Claim Construction

Samsung disputes the district court's construction of "modulation method [] of a different type." The district court construed this limitation as "different families of modulation techniques, such as the FSK [frequency-shift keying] family of modulation methods and the QAM [quadrature amplitude modulation] family of modulation methods." *Claim Construction Order*, 2014 WL 3385125, at *15. We review claim constructions based solely on the intrinsic record, as here, de novo. *Shire Dev., LLC v. Watson Pharm., Inc.*, 787 F.3d 1359, 1364 (Fed. Cir. 2015) (quoting *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 840–42 (2015)).

The district court arrived at its construction relying on the applicant's characterization of the "different types" term in the prosecution history. During prosecution of the '580 parent patent, the applicant inserted the "different types" limitation into its claims after the examiner had already issued a notice of allowance. In the applicant's contemporaneous remarks to the examiner, he indicated that he inserted the limitation into the independent claims to "more precisely claim the subject-matter." J.A. 2234. The applicant explained:

> Applicant has further amended [its] claims . . . with additional recitations to more precisely claim the subject matter. For example, the language of independent claim 1 has been clarified to refer to two *types* of modulation methods, i.e., different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods.

Id.

Samsung disputes the court's construction, arguing that it improperly affords dispositive weight to a single self-serving statement in the prosecution history made after the examiner had allowed certain claims. Samsung contends that the plain claim language requires only that the different types of modulation methods be "incompatible" with one another. According to Samsung, the claims cover devices that modulate signals using the same family of modulation methods (for example, FSK modulation), but operating with different amplitudes between modems. Samsung asserts that, because modulating using different amplitudes makes the devices incompatible, this arrangement embodies "different types" of modulation.

We disagree with Samsung and adopt the construction entered by the district court. While the specification is the principal source of the meaning of a disputed term, the prosecution history may also be relevant. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). Here, the clearest statement in the intrinsic record regarding the meaning of the "different types" limitation is the descriptive statement the applicant made to the examiner when he inserted the limitation into the claims. Samsung's arguments to the contrary do not diminish this unambiguous statement in the prosecution history.

For example, Samsung avers that we should not give the prosecution history statement definitional weight because it uses the phrase "i.e.," which Samsung argues introduces an exemplary item in a set. A patentee's use of "i.e.," in the intrinsic record, however, is often definitional. *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1334 (Fed. Cir. 2009) ("[U]se of 'i.e.' signals an intent to define the word to which it refers."); *see also Abbott Labs. v. Novopharm Ltd.*, 323 F.3d 1324, 1330 (Fed. Cir. 2003) (holding that a patentee "explicitly defined" a term by using "i.e." followed by an explanatory phrase). Indeed, the term "i.e." is Latin for *id est*, which means "that is."

On a related note in the context of disavowal, we have explained that "[w]hether a statement to the PTO that includes 'i.e.' constitutes a clear and unmistakable disavowal of claim scope depends on the context." *Braintree Labs., Inc. v. Novel Labs., Inc.*, 749 F.3d 1349, 1355 (Fed. Cir. 2014). The context here strongly supports the conclusion that Rembrandt used "i.e." to define the "different types" limitation because Rembrandt used it to describe to the examiner a new limitation it had inserted to further limit its claims.

Samsung directs us to cases where we have held that "i.e." was not used to define, particularly in instances where interpreting "i.e." as definitional would be internally inconsistent, *see Pfizer, Inc. v. Teva Pharm., USA, Inc.*, 429 F.3d 1364, 1373 (Fed. Cir. 2005), or where it would read out preferred embodiments, *see Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1326 (Fed. Cir. 2012). Samsung argues that interpreting the "i.e." statement as definitional here would create an internal inconsistency with claim 43, which recites that "at least one of said modulation methods implements phase modulation." Samsung asserts that because claim 43 refers to "at least one" of the methods using phase modulation, more than one of them could use phase modulation, even though under the district court's construction that would mean they are not in different families.

We are not convinced that there would necessarily be a conflict with claim 43 under the adopted construction. As Rembrandt points out, claim 26—from which claim 43 depends—also uses the "at least" language to describe "at least two different types of modulation methods," which cuts against Samsung's inference. In any event, we do not find that this parsing of the claims overcomes the definitional statement the applicant provided in the prosecution history. *See ERBE Elektromedizin GmbH v. Canady Tech. LLC*, 629 F.3d 1278, 1286–87 (Fed. Cir. 2010) (rejecting patent owner's claim differentiation argument based on disclaimer in the prosecution history). Nor do we find that the specification is at odds with the prosecution history definition. The specification repeatedly refers to different types of modulation methods, but it does not provide examples of what would constitute different methods or otherwise define this limitation.

Samsung also mentions that in related IPR proceedings, the Patent Trial and Appeal Board adopted the broader construction Samsung argues for here. As Samsung admits, however, this construction does not bind our court. And the Board in IPR proceedings operates under a broader claim construction standard than the federal courts. *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142, 2146 (2016). We also note that even after adopting Samsung's construction, the Board refused to deem Rembrandt's patents unpatentable over the prior art, which is ultimately what Samsung seeks under its proposed construction.

We therefore agree with the construction entered by the district court that the term "modulation method [] of a different type" means "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." *Claim Construction Order*, 2014 WL 3385125, at *15.

II. Obviousness

Samsung argues that even under the district court's construction of "different types," it proved by clear and convincing evidence that Rembrandt's patents are invalid for obviousness under 35 U.S.C. § 103 and that the jury verdict of nonobviousness must be overturned as a matter of law.[1]

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[1] Given the effective filing dates of the '580 and '228 patents' claims, the version of 35 U.S.C. § 103 that applies

We review the district court's post-trial denial of judgment as a matter of law under the law of the regional circuit, here the Fifth Circuit. *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1328 (Fed. Cir. 2008). Fifth Circuit law has us review the denial of JMOL de novo, asking, as the district court did, whether a "reasonable jury would not have a legally sufficient evidentiary basis to find for the party on that issue." *Cambridge Toxicology Grp. v. Exnicios*, 495 F.3d 169, 179 (5th Cir. 2007) (quoting Fed. R. Civ. P. 50(a)(1)). When a jury returns a general verdict regarding obviousness, a legal question with factual underpinnings, "[w]e first presume that the jury resolved the underlying factual disputes in favor of the verdict winner and leave those presumed findings undisturbed if they are supported by substantial evidence. Then we examine the legal conclusion de novo to see whether it is correct in light of the presumed jury fact findings." *Circuit Check Inc. v. QXQ Inc.*, 795 F.3d 1331, 1334 (Fed. Cir. 2015) (quoting *Jurgens v. McKasy*, 927 F.2d 1552, 1557 (Fed. Cir. 1991)).

To allege obviousness, Samsung presented at trial a prior art combination consisting of U.S. Patent No. 5,706,428 ("Boer") as the primary reference and an article by Bhargav P. Upender and Philip J. Koopman, Jr. ("Upender") as a secondary reference. According to Samsung, the DBPSK and PPM/DQPSK modulation methods discussed in Boer are in "different families," and are therefore different types of modulation methods under the district court's construction. Samsung's expert, Dr. Goodman, testified that, much like the QAM and PSK modulation methods that the district court specifically noted were in different families, Boer's cited modulation

here is the one in force preceding the changes made by the America Invents Act. *See* Leahy–Smith America Invents Act, Pub. L. No. 112-29, § 3(n), 125 Stat. 284, 293 (2011).

methods alter different sets of characteristics: PPM/DQPSK alters phase and position, but DBPSK alters only phase.

On the other hand, Rembrandt's infringement expert,[2] Dr. Morrow, testified that, in his experience, modulation methods are in different families if they have "no overlapping characteristics." J.A. 1083, 18:13–24. Rembrandt therefore argued that PPM/DQPSK and DBPSK were not in different families because they both altered phase.

The jury was, of course, free to credit Dr. Morrow's testimony and reject Dr. Goodman's. *MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1168 (Fed. Cir.) ("[W]hen there is conflicting testimony at trial, and the evidence overall does not make only one finding on the point reasonable, the jury is permitted to make credibility determinations and believe the witness it considers more trustworthy."), *cert. denied*, 136 S. Ct. 270 (2015). Samsung argues, however, that Dr. Morrow's testimony, and Rembrandt's argument based on it, constitute an improper reinterpretation of the court's "different types" construction. Samsung urges that modulation methods can have some overlapping characteristics and still be in different families, as required by the court's construction. Samsung couches this argument as a claim construction

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[2] Rembrandt did not present a validity expert, and Samsung suggests it was improper for Rembrandt to rely on its infringement expert's testimony for issues of validity. We disagree. Dr. Morrow's testimony regarding whether two modulation techniques are in the same or different families is equally applicable to the infringement and validity issues. Samsung does not argue that the testimony was improperly admitted into evidence or that the testimony was admitted only for limited purposes not including use for validity.

issue. We disagree. As the district court correctly noted, any dispute regarding whether particular modulation techniques are in different families is a factual one. "[A] sound claim construction need not always purge every shred of ambiguity," including potential ambiguity arising from "the words a court uses to construe a claim term." *Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318 (Fed. Cir. 2016) (citation omitted), *cert. denied*, 137 S. Ct. 640 (2017). "Such an endeavor could proceed ad infinitum." *Id.*

Contrary to the way Samsung has cast the issue, whether Boer meets the "different types" limitation under the court's construction is a factual question. Particularly with regard to obviousness, it is a factual question going to the scope and content of the prior art. *See Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17 (1966). We review such factual questions underlying obviousness for substantial evidence. *Circuit Check*, 795 F.3d at 1334. Taken with Dr. Morrow's testimony, the fact that Boer's DBPSK and PPM/DQPSK modulation methods both alter phase is substantial evidence to support the jury's presumed fact finding that Boer did not teach the "different types" limitation.

Substantial evidence likewise supports the jury's presumed finding that there was no motivation to combine Boer with Upender, as Rembrandt had argued. The '580 and '228 patents claim a master/slave communication protocol, whereas Boer discloses devices communicating under the CSMA/CA protocol.[3] Samsung had argued that combining Boer with Upender—which discusses and compares several communication protocols, including

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[3] Upender defines CSMA/CA as Carrier Sense Multiple Access with Collision Avoidance.

master/slave[4]—would render Rembrandt's patents obvious. Rembrandt countered that one of skill in the art would not have been motivated to combine the references because Upender teaches away from substituting Boer's CSMA/CA approach with master/slave. Specifically, Upender analyzes the tradeoffs between different communication protocols based on various attributes, such as efficiency, robustness, and cost. Upender concludes that CSMA/CA is at least as good—and most often, better—than master/slave in every respect. We conclude that this disclosure provides substantial evidence to support the jury's presumed finding that one of ordinary skill in the art would not have been motivated to replace the CSMA/CA protocol already in place in Boer with a master/slave arrangement as taught by Upender.

Samsung misses the mark by arguing that we must find a motivation to combine if we agree with it that there is not substantial evidence to support a finding that Upender teaches away from substituting CSMA/CA with master/slave. Whether a reference teaches away is doctrinally distinct from whether there is no motivation to combine prior art references. *See Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1051 n.15 (Fed. Cir. 2016) (en banc) (identifying motivation to combine and teaching away as "two discrete bases" supporting district court's denial of JMOL); *see also Star Sci., Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1374–75 (Fed. Cir. 2011). Surely a showing that a prior art reference teaches away from a given combination is evidence that one of skill in the art would not have been motivated to make that combination to arrive at the claimed invention. But the absence of a formal teaching away in one reference does

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[4] Upender refers to master/slave as the "polling" protocol, but both parties agree that the two are synonymous for the purposes of this case.

not automatically establish a motivation to combine it with another reference in the same field.

As such, the jury did not need to find that Upender taught away from using master/slave in order to find that there would be no motivation to replace CSMA/CA in Boer with master/slave. Even if Upender "does not teach away, its statements regarding users['] prefer[ences] . . . are relevant to a finding regarding whether a skilled artisan would be motivated to combine" Upender with Boer. *Apple*, 839 F.3d at 1051 n.15. Therefore, because Upender strongly suggests that master/slave is inferior to CSMA/CA, substantial evidence supports the jury's presumed factual finding that one of skill in the art would not have been motivated to combine Boer with Upender's teaching of master/slave.

The jury's presumed findings that Boer does not teach the "different types" limitation and that one of skill in the art would not have been motivated to combine Boer with Upender undermine Samsung's obviousness challenge against all of the infringed independent claims. Because substantial evidence supports both of these findings, we need not address Samsung's additional obviousness arguments for the infringed dependent claims. *See In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) ("Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious."). We therefore affirm the district court's denial of JMOL that the infringed claims are invalid as obvious.

III. Damages

On appeal, Samsung also challenges the jury's royalty award of $15.7 million. Samsung first asserts that the district court erred in resolving certain damages-related evidentiary disputes. Applying Fifth Circuit law, we review these rulings for an abuse of discretion. *i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 852

(Fed. Cir. 2010) (applying Fifth Circuit law), *aff'd*, 564 U.S. 91 (2011).

First, Samsung argues that the district court should have excluded the testimony of Rembrandt's damages expert, Mr. Weinstein, based on the allegedly flawed methodology he used to calculate his proposed reasonable royalty rate. In an effort to determine the incremental value associated with implementing the infringing EDR functionality, Mr. Weinstein compared the prices of two Bluetooth chips Samsung purchased from Texas Instruments—one with EDR functionality and the other without. After calculating the price premium Samsung had paid to procure the EDR chips as compared to the non-EDR chips, Mr. Weinstein concluded that the reasonable royalty rate would be between 5 and 11 cents per infringing unit, resulting in a total damages range of $14.5–$31.9 million.

We see no reversible error in the district court's denial of Samsung's motion to exclude Mr. Weinstein's testimony. Samsung complains that the time periods that Mr. Weinstein chose to compare the two sets of chips were ones where Samsung purchased many more non-EDR chips than EDR chips, making the relative cost of EDR chips artificially high due to mismatched economies of scale. Rembrandt responds that Mr. Weinstein testified in his deposition that the seller of the chips, Texas Instruments, suggested to him that the data from these time periods were most suitable for his purposes. Rembrandt also explains that Mr. Weinstein aptly focused on the earliest periods where significant sales of infringing chips were made because the added value of technology fades with time. We find these explanations plausible, as they show that Mr. Weinstein's royalty calculations were properly "based on the incremental value that the patented invention adds to the end product." *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014). We also note that while Mr. Weinstein compared the chips for a time period when the non-EDR and EDR chip price differential was on the high end of the spectrum, Samsung was free to cross-examine Mr. Weinstein on this issue and the jury's award of $15.7 million fell within the low end of Mr. Weinstein's $14.5–$31.9 million suggested damages range.

Samsung also takes issue with Mr. Weinstein's attribution of the chips' cost differential solely to the addition of the EDR functionality, which it asserts was not the only technological difference between the two sets of chips. Rembrandt responds that all of the technical expert testimony in the case shows that the major difference between the chips was the incorporation of EDR and that Samsung could have cross-examined Rembrandt's damages expert on this point, but did not. Regardless, Samsung's criticism of Mr. Weinstein's selected benchmark "goes to evidentiary weight, not [its] admissibility." *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1319 (Fed. Cir. 2014), *overruled on other grounds by Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (en banc). Ultimately, we do not find that the district court abused its discretion in permitting Mr. Weinstein to use the methodology he adopted.

Mr. Weinstein used a settlement agreement Rembrandt entered into with BlackBerry, which was a defendant in this suit before settling, and a licensing agreement Rembrandt entered into with Zhone Technologies, Inc., to confirm his proposed royalty rate. On appeal, Samsung argues that it was improper for Mr. Weinstein to consider the BlackBerry agreement at all because it is not representative of an arms-length agreement between the parties and, therefore, is inappropriate for use in determining the reasonable royalty rate. We hold that the district court did not abuse its discretion in allowing Mr. Weinstein to discuss the BlackBerry agreement, as our cases allow relevant settlement agreements to be considered in determining a reasonable royalty rate.

Summit 6, LLC v. Samsung Elecs. Co., 802 F.3d 1283, 1299–1300 (Fed. Cir. 2015). The BlackBerry settlement agreement was relevant here because it contained a license of the very patents Samsung was found to infringe. We are also not convinced by Samsung's argument that Mr. Weinstein should not have cited the agreement at all because BlackBerry would not agree to a particular per-sale allocation clause Rembrandt wanted to include in the agreement. Even though BlackBerry did not agree to that express term, Mr. Weinstein explained his understanding of the agreement to be that BlackBerry effectively paid Rembrandt a per-sale amount consistent with his proposed royalty rate, he was cross-examined on that point, and the jury was free to consider that testimony.

Samsung also avers that the district court improperly redacted pertinent information from the BlackBerry settlement agreement and the Zhone licensing agreement that would have been necessary for the jury to understand the context of those agreements. Particularly, Samsung asserts that by redacting the agreements, the jury was unable to see how Mr. Weinstein allocated payments made by BlackBerry and Zhone to arrive at his proposed royalty rate. We disagree. It was within the district court's discretion to redact information from these agreements to prevent exposing confidential business information and to avoid jury confusion, and we will not disrupt that decision as an abuse of discretion.

Finally, Samsung argues that substantial evidence does not support the jury's damages award of $15.7 million. Because we have rejected Samsung's challenges to Mr. Weinstein's expert presentation on damages, and because the jury's award fell within the $14.5–$31.9 million range he suggested, we hold that substantial evidence supports the jury's damages award as it relates to all of Samsung's infringing sales. As will be discussed in the next section, however, we remand this case for the district court to consider in the first instance whether

Samsung is liable for pre-notice damages due to Rembrandt's purported failure to mark certain licensed products. If the district court determines that Samsung is not liable for pre-notice damages, the jury's damages award should be adjusted to strip out the royalties from pre-notice sales. The parties agreed at oral argument that this adjustment involves a pure accounting function that the district court could perform based on the sales data already in the record and without holding a new damages trial. *See* Oral Arg. at 21:11–22:41 (Samsung), 45:56–46:46 (Rembrandt), http://oralarguments.cafc.uscourts.gov /default.aspx?fl=2016-1729.mp3.

IV. Marking

Samsung argues that the district court erred in refusing to bar Rembrandt's recovery of pre-notice damages based on Rembrandt's failure to mark products covered by a claim Rembrandt later disclaimed.[5] We agree with Samsung that Rembrandt cannot use disclaimer to avoid the marking requirement in 35 U.S.C. § 287, and vacate the judgment of the district court as it relates to marking.

A.

Before trial, Samsung moved to limit Rembrandt's potential damages award based on its failure to mark products covered by previously-asserted claim 40 of the '580

[5] Rembrandt argues as a threshold matter that Samsung did not properly preserve this issue by raising it at trial and, thus, waived it on appeal. We disagree. The district court ruled on this issue as a matter of law before trial, and Samsung continually objected to that legal ruling before the district court. Therefore, the issue has not been waived and is ripe for appeal. *See Lighting Ballast Control LLC v. Philips Elecs. N. Am. Corp.*, 790 F.3d 1329, 1338 (Fed. Cir. 2015), *cert. denied*, 136 S. Ct. 1226 (2016).

patent. Specifically, Rembrandt had licensed the '580 patent to Zhone Technologies, Inc., and Samsung alleged that Zhone sold unmarked products embodying asserted claim 40 of the '580 patent. The license agreement between Rembrandt and Zhone did not require Zhone to mark its products with the patent number. Pursuant to the patent marking statute, 35 U.S.C. § 287, Samsung sought to limit Rembrandt's damages to those incurred after Samsung received notice of Rembrandt's patents, which, according to Samsung, occurred when Rembrandt filed its complaint. Eight days later, Rembrandt withdrew claim 40 from its infringement allegations and filed a statutory disclaimer pursuant to 35 U.S.C. § 253(a) and 37 C.F.R. § 1.321(a), disclaiming claim 40 in the U.S. Patent and Trademark Office.

The district court denied Samsung's motion to bar Rembrandt's recovery of pre-notice damages based on Rembrandt's disclaimer of claim 40. The court accepted Rembrandt's argument that any prior obligation to mark products embodying claim 40 vanished once it disclaimed claim 40. Adopting the Magistrate Judge's recommendation, the District Judge relied on the proposition that "[u]nder Federal Circuit precedent, a disclaimed patent claim is treated as if it never existed." J.A. 337, 342 (citing *Genetics Inst., LLC v. Novartis Vaccines & Diagnostics, Inc.*, 655 F.3d 1291 (Fed. Cir. 2011)).

B.

The patent marking statute provides that "[p]atentees, and persons making, offering for sale, or selling within the United States any patented article for or under them, or importing any patented article into the United States, may give notice to the public that the same is patented" by marking the article in a method provided by the statute. 35 U.S.C § 287(a). Marking under the statute is permissive, not mandatory. While permissive, there is a consequence if the patent owner chooses not to mark: "In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice." *Id.* "A licensee who makes or sells a patented article does so 'for or under' the patentee, thereby limiting the patentee's damage recovery when the patented article is not marked." *Amsted Indus. Inc. v. Buckeye Steel Castings Co.*, 24 F.3d 178, 185 (Fed. Cir. 1994) (citing *Devices for Med., Inc. v. Boehl*, 822 F.2d 1062, 1066 (Fed. Cir. 1987)).

Consistent with Supreme Court precedent, we have repeatedly emphasized that the marking statute serves to protect the public. The marking statute protects the public's ability to exploit an unmarked product's features without liability for damages until a patentee provides either constructive notice through marking or actual notice. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 162 (1989) ("The notice requirement is designed 'for the information of the public,' [and] . . . [t]he public may rely upon the lack of notice in exploiting shapes and designs accessible to all." (quoting *Wine Ry. Appliance Co. v. Enter. Ry. Equip. Co.*, 297 U.S. 387, 397 (1936))). The essence of "the marking statute is to encourage the patentee to give notice to the public of the patent." *Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.*, 559 F.3d 1308, 1316 (Fed. Cir. 2009) (quoting *Am. Med. Sys., Inc. v. Med. Eng'g Corp.*, 6 F.3d 1523, 1538 (Fed. Cir. 1993)). More specifically, "[t]he marking statute serves three related purposes: 1) helping to avoid innocent infringement; 2) encouraging patentees to give notice to the public that the article is patented; and 3) aiding the public to identify whether an article is patented." *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443 (Fed. Cir. 1998) (internal citations omitted).

Rembrandt's position, adopted by the district court, effectively provides an end-run around the marking statute and is irreconcilable with the statute's purpose. Allowing Rembrandt to use disclaimer to avoid the consequence of its failure to mark undermines the marking statute's public notice function.

In denying Samsung's motion, the district court relied on the proposition that a disclaimed patent claim is treated as if it "had never existed in the patent," *Guinn v. Kopf*, 96 F.3d 1419, 1422 (Fed. Cir. 1996) (citing *Altoona Publix Theatres, Inc. v. Am. Tri-Ergon Corp.*, 294 U.S. 477, 492 (1935)), and allowed Rembrandt's disclaimer to retroactively excuse its failure to mark. But while we have held that a disclaimer relinquishes the rights of the patent owner, we have never held that the patent owner's disclaimer relinquishes the rights of the public. Indeed, our precedent and that of other courts have not readily extended the effects of disclaimer to situations where others besides the patentee have an interest that relates to the relinquished claims. *See Kearney & Trecker Corp. v. Cincinnati Milacron Inc.*, 562 F.2d 365, 372 (6th Cir. 1977) (recognizing accused infringer's inequitable conduct defense against original patent claims after reissue claims secured through inequitable conduct were disclaimed); *Nat'l Semiconductor Corp. v. Linear Tech. Corp.*, 703 F. Supp. 845, 850 (N.D. Cal. 1988) (allowing antitrust and patent misuse counterclaims premised on disclaimed claims to proceed). *Cf. Guinn*, 96 F.3d at 1422 (holding disclaimer of an allegedly interfering claim did not divest the Board of jurisdiction over interference proceeding). As our marking cases make clear, the marking statute's focus is not only the rights of the patentee, but the rights of the public. *See, e.g.*, *Crown Packaging*, 559 F.3d at 1316; *Nike*, 138 F.3d at 1443; *Bonito Boats*, 489 U.S. at 162. Considering these rights held by the public, we hold that disclaimer cannot serve to retroactively dissolve the § 287(a) marking requirement for a patentee to collect pre-notice damages.

C.

Separate from its disclaimer argument, Rembrandt also argued to the district court that the marking statute should attach on a claim-by-claim, rather than on a patent-by-patent, basis. Applying Rembrandt's claim-by-claim approach in this case, for example, would permit Rembrandt to recover pre-notice damages for Samsung's infringement of claims other than claim 40, which is the only claim that Samsung alleges the unmarked Zhone product embodied. Samsung disagreed with Rembrandt's position at the district court, arguing that the marking statute attaches on a patent-by-patent basis. Put another way, Samsung argued that because Rembrandt's licensee Zhone sold a product embodying one claim of the '580 patent (claim 40), Rembrandt may not recover pre-notice damages for any infringed claim of the patent.

The Magistrate Judge, after deciding Samsung's motion to limit damages on the disclaimer ground, expressly declined to rule on this theory, as did the District Judge. *Rembrandt Wireless Techs., LP v. Samsung Elecs. Co.*, No. 2:13-CV-213-JRG-RSP, 2015 WL 627971, at *1, *3 & n.4 (E.D. Tex. Feb. 9, 2015). On appeal, Rembrandt did not present this argument as an alternative basis for affirming the district court's marking decision. Oral Arg. at 45:04–45:55, http://oralarguments.cafc.uscourts.gov/default.aspx?fl=2016-1729.mp3. Rembrandt did concede, however, that the Zhone product practices claim 40, and thus that question is no longer a "live dispute" in this case. *Id.* at 43:38–45:43.

The patent-by-patent versus claim-by-claim marking dispute between the parties raises a novel legal issue not squarely addressed by our past decisions. Although Rembrandt did not raise this issue on appeal, it has not waived this argument. *See WesternGeco L.L.C. v. ION*

Geophysical Corp., 837 F.3d 1358, 1364 n.3 (Fed. Cir. 2016) (holding arguments are not waived if they involve issues both not decided by district court and "properly considered moot" until reversal of another district court ruling). But as we have remarked in earlier cases regarding legal issues not addressed by the parties:

> It is tempting to explore these unanswered questions, both because they are interesting and because the parties and the trial court might benefit from early answers. But, that is a temptation to be resisted. None are questions directly raised in this appeal, and the parties have not briefed or argued them. We thus leave to the trial court in the first instance the responsibility to address such questions . . . .

Cardiosom, L.L.C. v. United States, 656 F.3d 1322, 1329 (Fed. Cir. 2011); *see also In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1321 (Fed. Cir. 2011) (remanding legal issue not briefed on appeal for district court to address on remand). We therefore remand to the district court to address in the first instance whether the patent marking statute should attach on a patent-by-patent or claim-by-claim basis.

CONCLUSION

We have considered Samsung's remaining arguments and find them unpersuasive. Accordingly, we affirm the challenged portion of the district court's claim construction order and the district court's denial of Samsung's JMOL motions. We vacate the district court's denial of Samsung's motion to limit damages, and remand that issue for proceedings consistent with this opinion.

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

Each party shall bear its own costs.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

INFORMATION SHEET

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There is no automatic right of appeal to the Supreme Court of the United States from judgments of the Federal Circuit. You must file a petition for a writ of certiorari which the Supreme Court will grant only when there are compelling reasons. (See Rule 10 of the Rules of the Supreme Court of the United States, hereinafter called Rules.)

Time. The petition must be filed in the Supreme Court of the United States within 90 days of the entry of judgment in this Court or within 90 days of the denial of a timely petition for rehearing. The judgment is entered on the day the Federal Circuit issues a final decision in your case. [The time does not run from the issuance of the mandate, which has no effect on the right to petition.] (See Rule 13 of the Rules.)

Fees. Either the $300 docketing fee or a motion for leave to proceed in forma pauperis with an affidavit in support thereof must accompany the petition. (See Rules 38 and 39.)

Authorized Filer. The petition must be filed by a member of the bar of the Supreme Court of the United States or by the petitioner representing himself or herself.

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Number of Copies. Forty copies of a petition must be filed unless the petitioner is proceeding in forma pauperis, in which case an original and ten copies of the petition for writ of certiorari and of the motion for leave to proceed in forma pauperis. (See Rule 12.)

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No documents are filed at the Federal Circuit and the Federal Circuit provides no information to the Supreme Court unless the Supreme Court asks for the information.

Access to the Rules. The current rules can be found in Title 28 of the United States Code Annotated and other legal publications available in many public libraries.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

Questions and Answers

Petitions for Rehearing (Fed. Cir. R. 40) and Petitions for Hearing or Rehearing En Banc (Fed. Cir. R. 35)

Q. When is a petition for rehearing appropriate?

A. Petitions for panel rehearing are rarely successful because they most often fail to articulate sufficient grounds upon which to grant them. For example, a petition for panel rehearing should not be used to reargue issues already briefed and orally argued; if a party failed to persuade the court on an issue in the first instance, a petition for panel rehearing should not be used as an attempt to get a second "bite at the apple." This is especially so when the court has entered a judgment of affirmance without opinion under Fed. Cir. R. 36. Such dispositions are entered if the court determines the judgment of the trial court is based on findings that are not clearly erroneous, the evidence supporting the jury verdict is sufficient, the record supports the trial court's ruling, the decision of the administrative agency warrants affirmance under the appropriate standard of review, or the judgment or decision is without an error of law.

Q. When is a petition for hearing or rehearing en banc appropriate?

A. En banc decisions are extraordinary occurrences. To properly answer the question, one must first understand the responsibility of a three-judge merits panel of the court. The panel is charged with deciding individual appeals according to the law of the circuit as established in the court's precedential opinions. While each merits panel is empowered to enter precedential opinions, the ultimate duty of the court en banc is to set forth the law of the Federal Circuit, which merit panels are obliged to follow.

Thus, as a usual prerequisite, a merits panel of the court must have entered a precedential opinion in support of its judgment for a suggestion for rehearing en banc to be appropriate. In addition, the party seeking rehearing en banc must show that either the merits panel has failed to follow identifiable decisions of the U.S. Supreme Court or Federal Circuit precedential opinions or that the merits panel has followed circuit precedent, which the party seeks to have overruled by the court en banc.

Q. How frequently are petitions for rehearing granted by merits panels or petitions for rehearing en banc accepted by the court?

A. The data regarding petitions for rehearing since 1982 shows that merits panels granted some relief in only three percent of the more than 1900 petitions filed. The relief granted usually involved only minor corrections of factual misstatements, rarely resulting in a change of outcome in the decision.

En banc petitions were accepted less frequently, in only 16 of more than 1100 requests. Historically, the court itself initiated en banc review in more than half (21 of 37) of the very few appeals decided en banc since 1982. This sua sponte, en banc review is a by-product of the court's practice of circulating every precedential panel decision to all the judges of the Federal Circuit before it is published. No count is kept of sua sponte, en banc polls that fail to carry enough judges, but one of the reasons that virtually all of the more than 1100 petitions made by the parties since 1982 have been declined is that the court itself has already implicitly approved the precedential opinions before they are filed by the merits panel.

Q. Is it necessary to have filed either of these petitions before filing a petition for certiorari in the U.S. Supreme Court?

A. No. All that is needed is a final judgment of the Court of Appeals. As a matter of interest, very few petitions for certiorari from Federal Circuit decisions are granted. Since 1982, the U.S. Supreme Court has granted certiorari in only 31 appeals heard in the Federal Circuit. Almost 1000 petitions for certiorari have been filed in that period.

Electronic Acknowledgement Receipt

EFS ID:	28983244
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	6449
Filer:	Michael Vincent Battaglia
Filer Authorized By:	
Attorney Docket Number:	3277-0114US-RXM2
Receipt Date:	20-APR-2017
Filing Date:	12-SEP-2016
Time Stamp:	15:55:06
Application Type:	Reexam (Patent Owner)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Submission_Pursuant_to_1_565_A.pdf	106910 d881b70e349900ea7ade1408abb095285f731363	yes	3

	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Miscellaneous Incoming Letter		1	2	
	Reexam Certificate of Service		3	3	
Warnings:					
Information:					
2	Reexam Miscellaneous Incoming Letter	Exhibit_A.pdf	297060 224477f237552149350eb90c8673f60e282564bd	no	28
Warnings:					
Information:					
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	3277-0114US-RXM2	7821

6449 7590 05/03/2017

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EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
05/03/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. 90/013,809.

PATENT NO. 8457228.

ART UNIT 3992.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Office Action in Ex Parte Reexamination	Control No. 90/013,809	Patent Under Reexamination 8457228	
	Examiner SCOTT L. WEAVER	Art Unit 3992	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

a.☐ Responsive to the communication(s) filed on ______ .
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ______.

b.☐ This action is made FINAL.

c.☒ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter.
Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**
If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Information Disclosure Statement, PTO/SB/08.
3. ☐ Interview Summary, PTO-474.
4. ☐ ______.

Part II SUMMARY OF ACTION

1a. ☒ Claims 21 are subject to reexamination.
1b. ☒ Claims 1-20, 22-52 are not subject to reexamination.
2. ☐ Claims ______ have been canceled in the present reexamination proceeding.
3. ☐ Claims ______ are patentable and/or confirmed.
4. ☒ Claims 21 are rejected.
5. ☐ Claims ______ are objected to.
6. ☐ The drawings, filed on ______ are acceptable.
7. ☐ The proposed drawing correction, filed on ______ has been (7a) ☐ approved (7b) ☐ disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the certified copies have
   1 ☐ been received.
   2 ☐ not been received.
   3 ☐ been filed in Application No. ______ .
   4 ☐ been filed in reexamination Control No. ______.
   5 ☐ been received by the International Bureau in PCT application No. ______.
   * See the attached detailed Office action for a list of the certified copies not received.
9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.
10. ☐ Other: ______

cc: Requester (if third party requester)

REEXAMINATION OF U.S. PATENT 8,457,228

I. ACKNOWLEDGMENTS

On Sep. 12, 2016, third-party requester (**"Requester"**) filed a request (**"Request"**) for *ex parte* reexamination of claim 21 of US Patent # 8,457,228 (**"228 patent"**) issued to Bremer. The '228 patent issued on June 4, 2013, and was filed on August 4, 2011 and assigned application number 13/198,568 **(" '568 application").**

On October 17, 2016, the Office mailed an order granting reexamination of claim 21 of the 228 patent.

II. INFORMATION DISCLOSURE STATEMENT

An information disclosure statement was submitted by the Requester on Sep. 12, 2016 (Sep 2016 IDS). The Sep 2016 IDS is in compliance with the provisions of 37 C.F.R. § 1.97. Accordingly, the Sep 2016 IDS has been considered by the Examiner and was made of record in the Order Granting Request for Ex Parte Reexamination.

III. PRIORITY CLAIMS

The '228 patent is a continuation of US Patent Application 12/543,910 filed on Aug. 19, 2009, now patent US 8,023,580 ('580 Patent).

The '580 patent is a continuation of US Patent Application 11/774,803, filed on Jul. 9, 2007, now patent US 7,675,965, which is continuation of US Patent Application 10/412,878, filed on Apr. 14, 2003, now patent US 7,248,626, which is continuation-in-part of application 09/205,205, filed on Dec. 4, 1998, now patent US 6,614,838.

Application 09/205,205 claims priority to US provisional application 60/067,562 filed on Dec. 5, 1997.

There is no claim to foreign priority.

Because the effective filing date of the **'228** patent is not on or after March 16, 2013, the AIA First Inventor to File ("AIA-FITF") provisions do not apply. Instead, the earlier 'First to Invent' provisions apply.

Based upon a review of the '228 patent and prosecution history, the Examiner finds that there are no prior or concurrent *ex parte* or supplemental reexaminations for the '228 patent.

A co-pending request for ex parte reexamination (90/013,808) of the '580 patent has been filed on September 12, 2016.

IV. PRIOR ART

A. References Cited in the Request

1. U.S. Patent No. **5,982,807**, to **Snell,** J., filed on Mar. 17, 1997 and issued on Nov. 9, 1999, ("**Snell**").

2. U.S. Patent No. **6,075,814**, filed on May 9, 1997 and issued on Jun. 13, 2000, to **Yamano** et al. ("**Yamano**").

3. "Using the PRISM™ Chip Set for Low Data Rate Applications," Andren, C. et al., Harris Semiconductor Application Note No. AN9614, March 1996 ("**Harris AN9614**").

4. "HSP3824 Direct Sequence Spread Spectrum Baseband Processor," Harris Semiconductor File No. 4064.4, Oct. 1996 ("**Harris 4064.4**").

5. **Kamerman, A**., "Throughput Density Constraints for Wireless LANs Based on DSSS," IEEE 4th International Symposium on Spread Spectrum Techniques and Applications Proceedings, Mainz, Germany, Sept. 22-25, 1996, pp. 1344-1350 vol.3 ("**Kamerman**").

6. **Upender** et al., "Communication Protocols for Embedded Systems," Embedded Systems Programming, Vol. 7, Issue 11, November 1994. - ("**Upende**r").

.

B. References Cited in 2014IPR-00892

1. U.S. Patent No. 5,706,428, to Boer et al. filed on Mar. 14, 1996 and issued Jan.6, 1998 (“**Boer**”)

IV. CLAIM INTERPRETATION

During re-examination, claims are given the broadest reasonable interpretation consistent with the specification and limitations in the specification are not read into the claims. See MPEP § 2111 et seq.

A. Lexicographic Definitions

A first exception occurs when there is lexicographic definition in the specification. After careful review of the original specification, the prosecution history, and unless expressly noted otherwise by the Examiner below, the Examiner finds that she is unable to locate any lexicographic definitions (either express or implied) with reasonable clarity, deliberateness, and precision. Because the Examiner is unable to locate any lexicographic definitions with reasonable clarity, deliberateness, and precision, the Examiner concludes that Applicants are not their own lexicographer. See MPEP §2111.01 IV.

B. 35 U.S.C. § 112 6th Paragraph

A second exception is when a claimed phrase is interpreted in accordance with 35 U.S.C. § 112 6th paragraph. See MPEP § 2181 *et seq*. The statute, 35 U.S.C. § 112, ¶6 states:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.
>
> -- 35 U.S.C. § 112 6th Paragraph.

To invoke 35 U.S.C. § 112 6th paragraph, a claimed phrase must be an element in a claim for a combination. Claim 21 of the '228 patent depends from independent claim 1, claim 21 thus includes all limitations of the claim from which it depends and reads as follows:

> **1.** A master communication device configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device,
> the master communication device comprising:
>
> a master transceiver configured to transmit a first message over a communication medium from the master transceiver to the one or more slave transceivers,
> wherein the first message comprises:
>
> first information modulated according to a first modulation method,

second information, including a payload portion, modulated according to the first modulation method,

wherein the second information comprises data intended for one of the one or more slave transceivers and

first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information; and

said master transceiver configured to transmit a second message over the communication medium from the master transceiver to the one or more slave transceivers
wherein the second message comprises:

third information modulated according to the first modulation method,

wherein the third information comprises information that is indicative of an impending change in modulation to a second modulation method, and

fourth information, including a payload portion, transmitted after transmission of the third information,

the fourth information being modulated according to the second modulation method,
the second modulation method being of a different type than the first modulation method,
wherein the fourth information comprises data intended for a single slave transceiver of the one or more slave transceivers, and

second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information; and

wherein the second modulation method results in a higher data rate than the first modulation method.

21. The master communication device as in claim **1,** wherein **the first information that is included in the first message comprises the first message address data.**

The limitations of claim 21 including the limitations of claim 1 comprise a single means, i.e., a transceiver. According to 35 U.S.C. 112 6th paragraph, only limitations or elements in a claim for a combination may invoke 112 6^{th} paragraph, the Examiner concludes that claim 21 does **not invoke 35 USC 112 6^{th} paragraph.**

As recited in claim 1 above, claim 1 only includes "a transceiver." The clauses "configured to communicate…" and "configured to transmit…" are an intended use. Original Claim 21 only recites a limitation of the first information. Therefore as long as a transceiver can transmit messages it will meet the limitations of claim 21 which depends from claim 1.

C. Sources.

Except for either (a) any lexicographic definitions noted in § IV.A of this Office action; or (b), any entire claim phases that *invoke* 35 U.S.C. § 112 6th paragraph as noted in § IV.B of this Office action; the **following interpretations are adopted under the broadest reasonable interpretation standard (BRI)**. The scope of claim 21 is the same regardless of whether claim terms are interpreted under the BRI or *Phillips* standard. The following provided as *express notice* of how particular terms are being interpreted under the broadest reasonable interpretation standard. These interpretations are only a guide to claim terminology since claim terms must be interpreted in context of the surrounding claim language. In accordance with *In re Morris*, 127 F.3d 1048, 1056, 44 USPQ2d 1023, 1029 (Fed. Cir. 1997), **the following "sources" support a broadest reasonable interpretation of the claims. The following list is not intended to be exhaustive**:

1. Modulation -- the process by which some characteristic of a carrier is varied in accordance with a modulation wave (IPR2014-00892, Pap. 46 at p. 7; Request, p. 19; IEEE170-1964 - IEEE Standard Definitions of Terms for Modulation Systems, 1964, page 6).

2. **First and Second 'Modulation Method'**– modulation methods that are incompatible with one another (IPR2014-00892), Pap. 46 at p. 13, Request, pp. 12-13 and pp. 19-23).

3. **Transceiver** – Term for a combination transmitter/receiver (Snell, col. 1, lines 34-36); a radio that can send and receive messages (Merriam-Webster.com).

D. Product-by-Process Claims

A third exception is for product-by-process claims, claim 21 is a product claim.[1]

Additionally, "the PTO and the CCPA acknowledged product-by-process claims as an exception to the general rule requiring claims to define products in terms of structural characteristics." *Atlantic Thermoplastics Co. v. Faytex Corp.*, 970 F.2d 834, 845, 23 USPQ2d 1481, 1490 (Fed. Cir. 1992) (hereinafter *"Atlantic Thermoplastics v. Faytex I"*). Furthermore, the Federal Circuit "acknowledges that it has in effect recognized . . . product-by-process claims as exceptional." *Atlantic Thermoplastics v. Faytex I*, 970 F.2d at 847, 23 USPQ2d at 1491.

Claim 21 *does not* contain any product-by-process limitations whether in a conventional format or otherwise. If Applicant disagrees, the Examiner respectfully requests Applicant in his or her next response to expressly point out any product-by-process claim(s) and their limitations so that they may be afforded their exceptional status and treated accordingly. Applicant is reminded that "even though product-by-process claims are limited by and defined by the process,

[1] "Product claims are claims that are directed to either machines, manufactures, or compositions of matter." MPEP § 2103 I C.

determination of patentability is based on the product itself." *In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).[2] Failure by Applicant in his or her next response to also address this issue in accordance with 37 C.F.R. §1.111(b) or to be non-responsive to this issue entirely will be considered intent by Applicant *not* to recite any product-by-process limitations. Unless expressly noted otherwise by the Examiner, the preceding discussion on product-by-process principles applies to all Examined Claims.

V. CLAIM REJECTIONS - 35 USC § 102

The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21 is rejected under pre-AIA 35 U.S.C. 102 (e) as being anticipated by Snell.

> *In this rejection under 35 USC §102, the claims are interpreted based on a reasonable and broad interpretation wherein the additional functional language in the claim is not given patentable weight. As recited in claim 1 above, claim 1 includes "a transceiver." The clauses "configured to communicate..." and "configured to transmit..." are an intended use of the transceiver. Original Claim 21 recites a limitation of the first information. Therefore as long as a transceiver can transmit messages it will meet the limitations of claim 21 which depends from claim 1.*

Regarding claim 1, Snell teaches a communication device (Abstract, Figs. 1-2 and 5-8) configured to (capable of) communicate according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave (the transceiver of Snell is capable of such communication), Snell incorporates by reference each of Harris AN9164 and Harris 4064.4 which show the communication via polled protocol, the device comprising:

a transceiver (Fig. 1), in the role of the master according to the master/slave relationship, for (all limitations after "configured to" are intended, and therefore are not given patentable weight) a master transceiver configured to transmit a first message over a communication

[2] See also MPEP § 2113.

medium from the master transceiver to the one or more slave transceivers, wherein the first message comprises: first information modulated according to a first modulation method second information, including a payload portion, modulated according to the first modulation method, wherein the second information comprises data intended for one of the one or more slave transceivers and first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information; and said master transceiver configured to transmit a second message over the communication medium from the master transceiver to the one or more slave transceivers wherein the second message comprises: third information modulated according to the first modulation method, wherein the third information comprises information that is indicative of an impending change in modulation to a second modulation method, and fourth information, including a payload portion, transmitted after transmission of the third information, the fourth information being modulated according to the second modulation method, the second modulation method being of a different type than the first modulation method, wherein the fourth information comprises data intended for a single slave transceiver of the one or more slave transceivers, and second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information; and wherein the second modulation method results in a higher data rate than the first modulation method.

Regarding claim 21, Snell teaches the device of claim 1, wherein the transceiver is configured in claim 1 to transmit (capable of transmitting) message address information.

VI. CLAIM REJECTIONS - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

A.) Claim 21 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Applicants Admitted Prior Art (APA) in view of Boer and further in view of Yamano.

Claim 1 was reviewed (IPR 2014-00892) and it was found that there was a reasonable likelihood that petitioner would prevail in challenging claim 1 for obviousness over APA and Boer[3], a Final Written Decision was entered on September 24, 2015 (IPR2014-00892, Paper 46), as such, Claim 1 is rejected for the reasons indicated in the Final Written Decision entered on September 24, 2105 (IPR2014-00892, Paper 46) as obvious over APA and Boer.

[3] IPR2014-00892

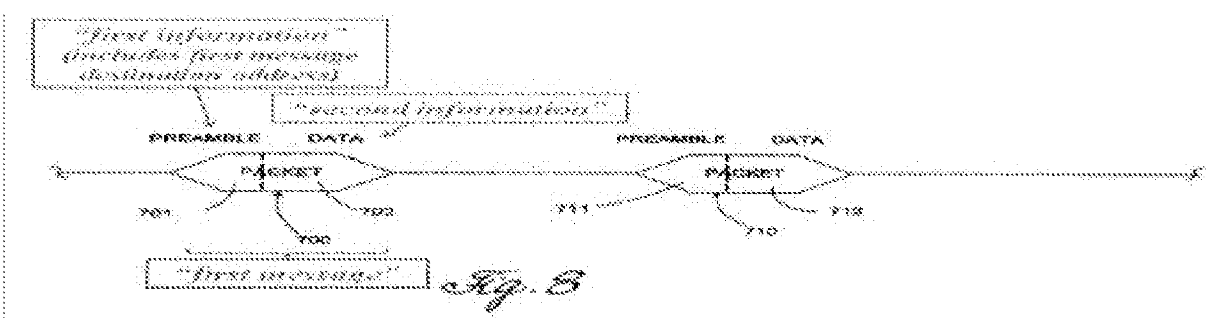
While the APA in view of Boer was deemed an appropriate rejection on claim 1 including the limitations that the first message include first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information; The APA in view of Boer did not teach as pertains to claim 21 "The master communication device as in claim 1, wherein the first information that is included in the first message comprises the first message address data."

Yamano teaches that packets can be advantageously addressed for an intended destination.
Yamano discloses transmitting a "first message" *(e.g.,* data packet including a preamble and main body) that includes "first message address information that is indicative" *(e.g.,* "destination address" in the preamble) of the transceiver that is the "intended destination of the second information."

"Packet 700 includes a *preamble 701* and a *main body 702."* Yamano at 19:63-64.

"For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) ***packet source and destination addresses,*** (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20:1-7.

Yamano also discloses that the preamble precedes the main body (containing data), as shown in Figure 8. Yamano teaches that the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information. *See, e.g.,* Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.



Yamano at Fig. 8 (annotated).

Yamano expressly teaches that including a destination address in the preamble portion of the data packet, which precedes the data portion, will advantageously reduce processing requirements of receiving devices because the receiving device can filter out packets

> which it does not need to demodulate. Yamano at 20:54-59 ("When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits."). (Yamano at 19:63-20:7, Fig. 8).
>
> **It would have been obvious to one of ordinary skill in the art at the time the invention was made** to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing the modified Boer APA data packet to advantageously specify which receiver the data is intended for and to beneficially reduce the processing requirements at the receiving device, as taught by Yamano. "When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

In the following rejections under 35 USC §103, all limitations are interpreted **under a broadest reasonable interpretation**, see section IV.C. above.[4] The scope of claim 21 is the same regardless of whether claim terms are interpreted under the BRI or *Phillips* standard.

B.) This rejection considers the Snell incorporation by reference of Harris AN9614 and Harris 4064.4. Snell expressly incorporates by reference "the entire disclosure" of Harris AN9614 (Snell at 5:2-7). Snell expressly incorporates by reference "the entire disclosure" of Harris 4064.4 (Snell at 5:8-17, 5:31-33).

Claim 21 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Snell in view of Yamano and further in view of Kamerman.

1. A master communication device configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device,

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[4] Examiners are unaware of any requirement that there should be a single Broadest Reasonable Interpretation (BRI). If Patent owner is aware of any statue, rules, or case law requiring such, examiners request Patent Owner present such authority in the next response. The broadest reasonable interpretation does not mean the broadest possible interpretation. Rather, the meaning given to a claim term must be consistent with the ordinary and customary meaning of the term (unless the term has been given a special definition in the specification), and must be consistent with the use of the claim term in the specification and drawings. Further, the broadest reasonable interpretation of the claims must be consistent with the interpretation that those skilled in the art would reach. (MPEP) § 2111. The scope of the claim 21 is same regardless of whether claim terms are interpreted under the BRI or *Phillips* standard.

> Snell discloses a **master communication device (transceiver 30)** that serves as an access point for communicating data with other transceivers connected to a wireless local area network (WLAN) and is **configured to communicate with one or more slave transceivers (end users connect to LAN through transceivers)** according to a master/slave relationship in which **a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device.** *See, e.g.*, Snell at 1:34-46,1:47-50,1:55-57, 2:27-30, 4:42-47, 5:18-21; Harris AN9614 at 3.
>
> Snell at 4:42-47 ("Referring to FIG. 1, a ***wireless transceiver 30*** in accordance with the invention is first described. The *transceiver 30 may be readily used for WLAN applications* in the 2.4 GHZ ISM band in accordance with the proposed IEEE 802.11 standard. Those of skill in the art will readily recognize other applications for the transceiver 30 as well."
>
> "In a typical WLAN, ***an access point provided by a transceiver***, **that is, a combination transmitter and receiver,** connects to the wired network from a fixed location. Accordingly, the access transceiver receives, buffers, and transmits data between the WLAN and the wired network. *A single access transceiver can support a small group of collocated users within a range of less than about one hundred to several hundred feet. The* ***end users connect to the WLAN through transceivers*** which are typically implemented as PC cards in a notebook computer, or ISA or PCI cards for desktop computers. Of course the transceiver may be integrated with any device, such as a hand-held computer." Snell at 1:34-46.

With respect to the 'slave communication from a slave device to the master communication device occurring in response to a master communication from the master communication device to the slave device', Snell teaches the master (access point transceiver) communicates with slave transceivers on the WLAN via **polled protocol**. A **polled protocol** is a master/slave protocol as confirmed by the '228 patent, '228 patent at 4:30-34 where the slave is given permission to transmit on the network.

> Snell incorporates by reference Harris AN9614[5], which discloses that the communications between transceivers can operate according to a polled (*i.e.*,

[5] Snell expressly incorporates by reference "the entire disclosure" of Harris AN9614 (Snell at 5:2-7). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

master/slave) protocol, which is a master/slave communication system.[6] *See e.g.*, Harris AN9614 at 3.

"[T]he controller can keep adequate time to operate either a polled or a time allocated scheme. In these modes, the radio is powered off most of the time and only awakens when communications is expected. This station would be awakened periodically to listen for a beacon transmission. The beacon serves to reset the timing and to alert the radio to traffic. If traffic is waiting, the radio is instructed when to listen and for how long. In **a polled scheme**, the remote radio can respond to the poll with its traffic if it has any. With these techniques, the average power consumption of the radio can be reduced by more than an order of magnitude while meeting all data transfer objectives." Harris AN9614 at 3.

the master communication device comprising:
a master transceiver configured to transmit a first message over a communication medium from the master transceiver to the one or more slave transceivers,

An access point (**wireless transceiver 30, figure 1, 4:42-47 corresponds to a master communication device**) connected to a LAN (WLAN), the transceiver communicates with one or more transceivers connected to the LAN, communication on the LAN to and from external networks is provided through the access point as in typical LAN (1:34-46).

Snell discloses the "transceiver" 30 that serves as an access point for communicating "data intended for one of the one or more [other] transceivers" connected to a wireless local area network (WLAN). Snell's transceiver transmits data packets intended for another transceiver, where the communication may switch on-the-fly between a "first modulation method" *(e.g.,* BPSK) and a "second modulation method" *(e.g.,* QPSK) that is "of a different type than the first modulation method." *Id* at 2:61-63

For example, Snell discloses a "transceiver" (a master transceiver 30 with respect to an access point in a local area network) that serves as an access point for communicating data with other transceivers connected to a wireless local area network (WLAN) (end user transceivers connected to the WLAN are slave transceivers). Snell 1:34-46, 1:47-50, 4:42-47, 5:18-21.

"In a typical WLAN, *an access point provided by a transceiver,* that is, a combination transmitter and receiver, connects to the wired network from a fixed location. Accordingly, the **access transceiver receives, buffers, and transmits data between the WLAN and the wired network**. *A single access transceiver can support a small group*

[6] A polled protocol is a master/slave protocol, as confirmed by the '228 patent. '228 patent at 4:30-34. *See also* IPR2014-00892, Pap. 46 at 16 ("In [a polling] protocol, a centrally assigned master periodically sends a polling message to the slave nodes, giving them explicit permission to transmit on the network."); '228 Prosecution History at 352; IPR2014-00892, Ex.1323 (Goodman Declaration) Para124.

of collocated users within a range of less than about one hundred to several hundred feet. The end users connect to the WLAN through transceivers..." Snell at 1:34-46.

Snell references processors enabling the disclosed transceiver functions and incorporates by reference Harris AN9614 and Harris 4064.4 (Snell at 5:8-17, 5:31-33).

"Like the HSP3824 baseband processor, the high data rate baseband processor 40 of the invention contains all of the functions necessary for a full or half duplex packet baseband *transceiver*." Snell at 5:18-21.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

See also, e.g., Snell at 2:27-30 ("It is another object of the invention to provide *a spread spectrum transceiver* and associated method to permit operation at higher data rates and which may switch on-the-fly between different data rates and/or formats."); Snell at 1:47-50 ("The assignee of the present invention has developed and manufactured a set of integrated circuits for a WLAN under the mark PRISM 1 which is compatible with the proposed IEEE 802.11 standard."); Snell at 4:42-47 ("Referring to FIG. 1, a *wireless transceiver 30* in accordance with the invention is first described. The *transceiver 30 may be readily used for WLAN applications* in the 2.4 GHZ ISM band in accordance with the proposed IEEE 802.11 standard. Those of skill in the art will readily recognize other applications for the transceiver 30 as well."

wherein the first message comprises:
first information modulated according to a first modulation method,

Snell discloses that the master transceiver transmits **a first message** (PLCP header and PLCP preamble, figure 3 annotated below) which comprises first information **modulated according to a first modulation method (BPSK),** *See, e.g.,* Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14, 7:6- 8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.

second information, including a payload portion, modulated according to the first modulation method,

Snell discloses that the master transceiver transmits **second information**, including a payload portion (MPDU, figure 3), **modulated according to the first modulation method (BPSK),** *See, e.g.,* Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14, 7:6- 8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.

wherein the second information comprises data intended for one of the one or more slave transceivers and

Snell discloses that the second information (MPDU) comprises **data intended for one of the one or more slave transceivers**. *See, e.g.,* Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14, 7:6-8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.

With reference to Figure 3 (annotated below) which depicts a message from the master transceiver, a first message includes a PLCP header and PLCP preamble, the MPDU corresponds to second information which is transmitted to the respective slave transceiver.

Snell discloses the transceiver transmitting a "first message" comprising "first information" (*e.g.*, PLCP preamble and PLCP header) "modulated according to a first modulation method" (*e.g.*, BPSK) and "second information, including a payload portion" (*e.g*, MPDU data) "modulated according to the first modulation method" (*e.g*, BPSK) (as depicted in Figure 3 below). Snell alternatively discloses modulating the "first information" (*e.g*, PLCP preamble and PLCP header) and "second information, including a payload portion" (*e.g*, MPDU data) according to <u>DBPSK</u> which also is a "first modulation method."

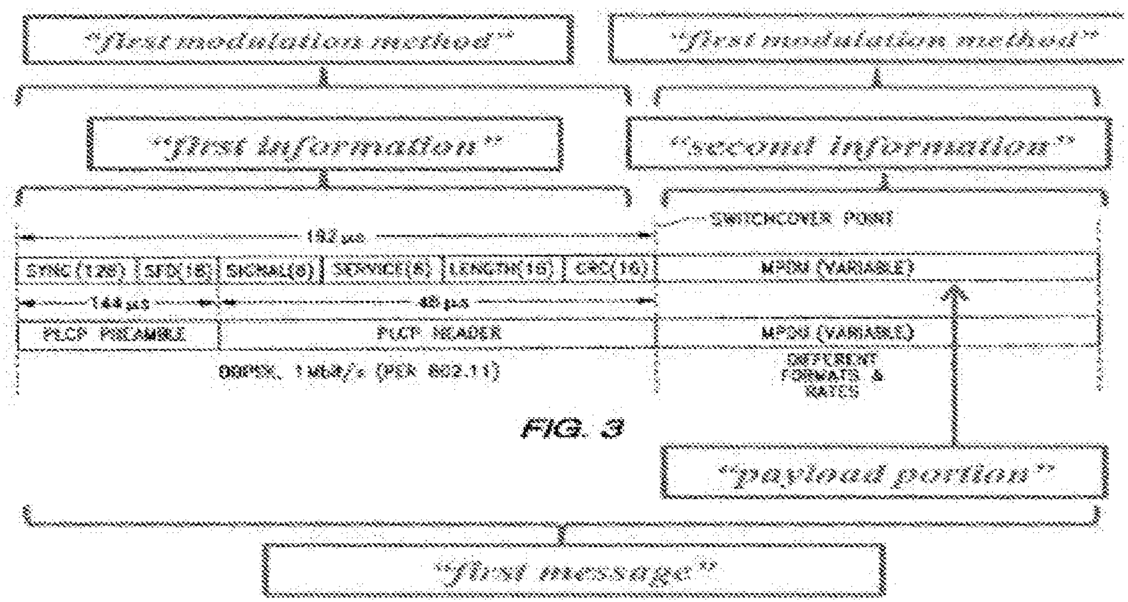


FIG. 3

Snell at Fig. 3 (annotated).

"The ***header may always be BPSK***." Snell at 6:35-36.

Snell discloses that the "**SIGNAL" in the PLCP header indicates** (*e.g.*, using "OAh") the **modulation type** (*e.g.*, BPSK) **used for modulating the MPDU data portion.**

"Now relating to the PLCP header 91, the SIGNAL is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

Snell at 6:52-59.

"SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and is the variable data scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. The **variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate,** and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

"The modulator preferably comprises means for *operating in one of a biphase PSK (BPSK) modulation mode at a first data rate defining a first format,* and a quadrature PSK (QPSK) mode at a second data rate defining a second format." Snell at 2:56-59.

"In particular, the HSP3824 baseband processor manufactured by Harris Corporation *employs quadrature or bi-phase phase shift keying (QPSK or BPSK) modulation schemes."* Snell at 1:58-61.

See also, e.g., Snell at Abstract ("The modulator and demodulator are each preferably operable *in one of a bi-phase PSK (BPSK) mode* at a first data rate and *a quadrature PSK (QPSK) mode* at a second data rate. These formats may also be switched on-the-fly in the demodulator."), 2: 15-17 ("**Moreover, a WLAN application, for example, may require a change between *BPSK and QPSK* during operation,** that is, on-the-fly.").

***"The PLCP preamble and PLCP header are always* at 1 Mbit/s, *Diff encoded*,** scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"The modulator may also preferably include header modulator means for modulating data packets to include *a header at a predetermined modulation and a third data rate defining a third format .... The third format is preferably differential BPSK."* Snell at 2:61-3:5.
"The reference phase for the first symbol of the *MPDU* is the output phase of the last symbol of the header/or *Diff Encoding."* Snell at 7:6-8.

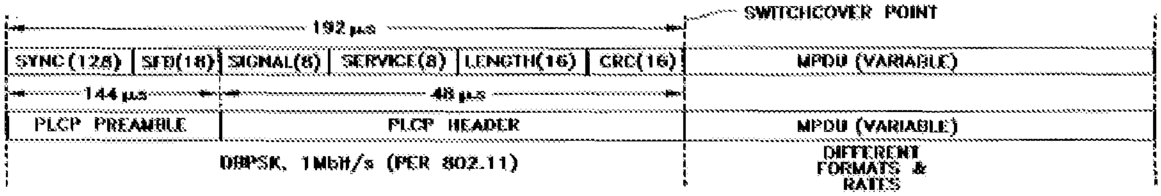


FIG. 3

Snell Figure 3

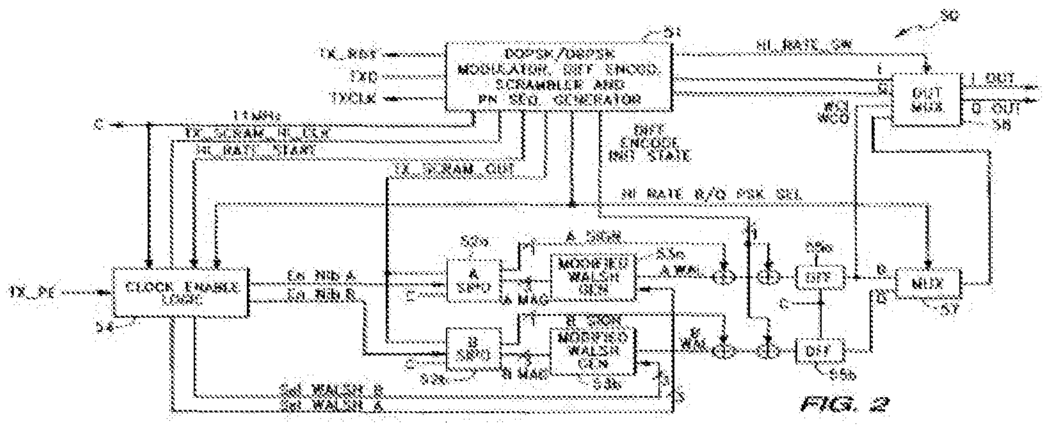


FIG. 2

Snell Figure 2

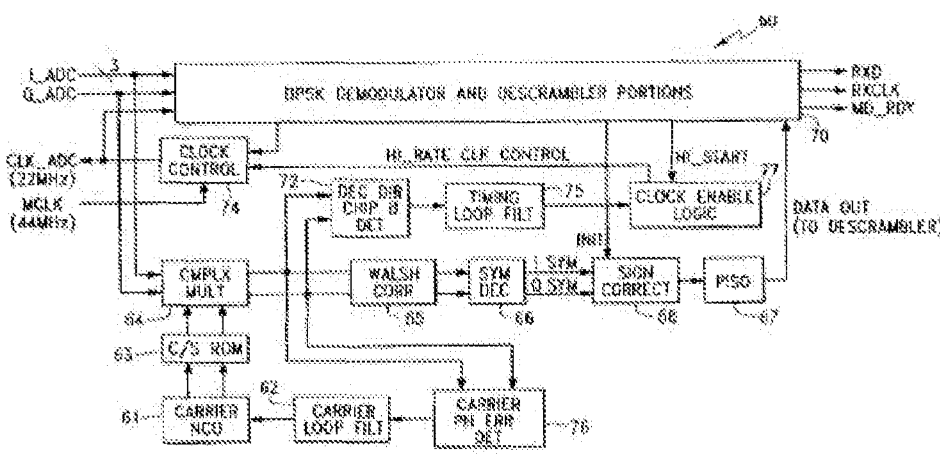


FIG. 5

Snell Figure 5

Snell incorporates by reference Harris 4064.4,[7] which discloses:

[7] Snell expressly incorporates by reference "the entire disclosure" of Harris 4064.4 (Snell at 5:8-

> *"The preamble and header are always transmitted as DBPSK* waveforms while the ***data packets can be configured to be either DBPSK* or DQPSK**." Harris 4064.4 at 14.
>
> "The *preamble is always transmitted as a DBPSK* waveform with a programmable length of up to 256 symbols long." Harris 4064.4 at 15.
>
> ***"Signal Field (8 Bits) - This field indicates whether the data packet that follows the header is modulated as DBPSK* or DQPSK.** In mode 3 the HSP3824 receiver looks at the signal field to determine whether it needs to switch from DBPSK demodulation into DQPSK demodulation at the end of the always DBPSK preamble and header fields." Harris 4064.4 at 15.
>
> "Mode 3 - In this mode the preamble is programmable up to 256 bits (all l's). The header in this mode is using all available fields. ***In mode 3 the signal field defines the modulation type of the data packet (DBPSK* or DQPSK**) so the receiver does not need to be preprogrammed to anticipate one or the other. In this mode the device checks the Signal field for the data packet modulation and it switches to DQPSK if it is defined as such in the signal field. *Note that the* ***preamble and header are always DBPSK*** the modulation definition applies only for the data packet." Harris 4064.4 at 16.
>
> *See also, e.g.,* Harris 4064.4 at 14 ("The HSP3824 transmitter is designed as a Direct [8] Sequence Spread Spectrum DBPSK/DQPSK modulator."), Harris 4064.4 at 14 ("The modulator is capable of switching rate automatically in the case where the preamble and header information are DBPSK modulated, and the data is DQPSK modulated."), Harris 4064.4 at FIGURE 10.

first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information; and

> **Snell does not expressly disclose** *the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information.*
>
> **Yamano** teaches that packets can be advantageously addressed for an intended destination. Yamano discloses transmitting a "first message" *(e.g.,* data packet including a preamble and main body) that includes "first message address information that is

17, 5:31-33). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

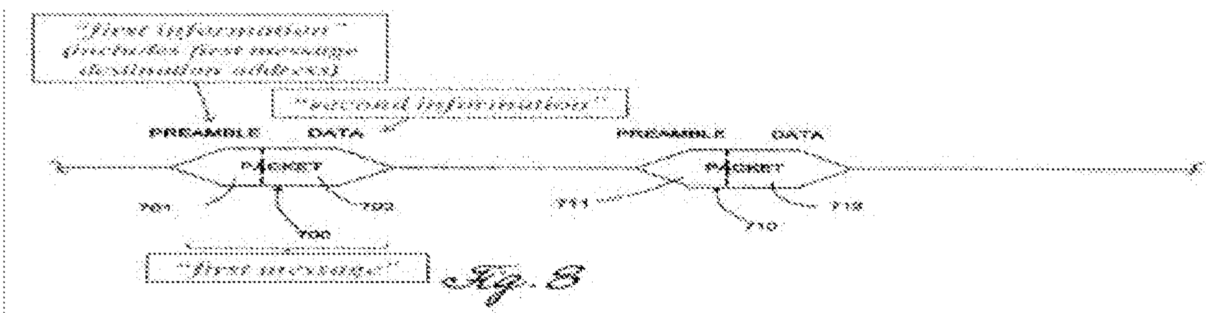
[8] Snell expressly incorporates by reference "the entire disclosure" of Harris 4064.4 (Snell at 5:8-17, 5:31-33). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

indicative" *(e.g.,* "destination address" in the preamble) of the transceiver that is the "intended destination of the second information."

"Packet 700 includes a *preamble 701* and a *main body 702."* Yamano at 19:63-64.

"For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) ***packet source and destination addresses,*** (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20:1-7.

Yamano also discloses that the **preamble precedes the main body** (containing data), as shown in Figure 8. Yamano teaches that **the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information**. *See, e.g.,* Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.



Yamano at Fig. 8 (annotated).

Snell and Yamano are in the same field of art, with both relating to transmitting data packets over a network *(see, e.g.,* Snell at 1:55-58, 2:61-63, 2:66-3:3, 5:18-21, 6:48-63, Fig. 3; Yamano at 1: 1-29, 19:54-20:33, Fig. 8), at varying rates *(see, e.g.,* Snell at 2: 15-17, 6:52-59; Yamano at 19:54-56). Yamano expressly teaches that including a destination address in the preamble portion of the data packet, which precedes the data portion, will advantageously reduce processing requirements of receiving devices because the receiving device can filter out packets which it does not need to demodulate. Yamano at 20:54-59 ("When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits.").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing Snell's data packet comprising preamble, header, and MPDU data portions to advantageously specify which receiver the data is intended for and to beneficially reduce the processing requirements at the receiving device, as taught by Yamano. "When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

In addition, Snell teaches structuring its data packet to include a preamble, header, and MPDU data portion *(see, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-14, Fig. 3), and Yamano teaches structuring its data packet to also include a preamble and data portion, and to place the destination address in the preamble portion (Yamano at 19:63-20:7, Fig. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a destination address in the preamble portion of a data packet, as taught by Yamano, in implementing Snell's system for transmitting data packets between transceivers, as Snell teaches that its data packet already includes a preamble portion-and in combination, each element (Yamano' s teaching of placing a destination address in the preamble and Snell's teaching of a system for communicating data packets modulated according to different modulation methods between transceivers) performs the same function as it would separately, yielding nothing more than predictable results. *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 417 (2007). One of ordinary skill in art at the time the invention was made would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, a person of ordinary skill would have been motivated and found it obvious and straightforward to use the teachings of Yamano including a destination address in the preamble of a data packet in implementing Snell's communication system.

Snell in view of Yamano thus teach that the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information. *See, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-10, Fig. 3; Harris 4064.4 at 14; Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

said master transceiver configured to transmit a second message over the communication medium from the master transceiver to the one or more slave transceivers wherein the second message comprises:

third information modulated according to the first modulation method,
wherein the third information comprises information that is indicative of an impending change in modulation to a second modulation method, and

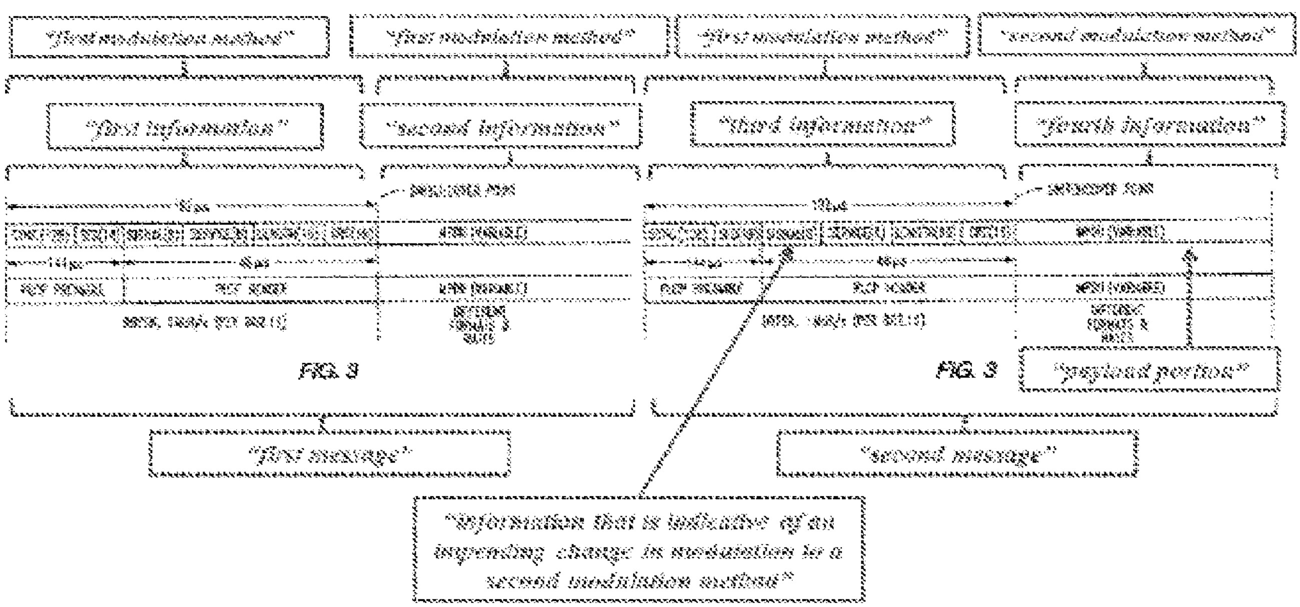
fourth information, including a payload portion, transmitted after transmission of the third information,
the fourth information being modulated according to the second modulation method,
the second modulation method being of a different type than the first modulation method,

wherein the fourth information comprises data intended for a single slave transceiver of the one or more slave transceivers, and

As noted above, Snell discloses that the transceiver transmits data packets to multiple different end user slave transceivers, as such multiple messages of format shown in figure 3 are provided to the slave transceivers and where the communication may switch on-the-fly between a "first modulation method" *(e.g.,* BPSK) and a "second modulation method" *(e.g.,* QPSK) that is "of a different type than the first modulation method." **Snell thus teaches transmitting a "first message" and a "second message" as shown in annotated Figure 3 below.** *See, e.g.,* Snell at 1:34-46, 1:47-50, 1:55-57, 2:27-30, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-
66, 7:1-2, 7:5-14, Fi s. 2, 3, 5; Harris AN9614 at 3; Harris 4064.4 at**14-16, Fig. 10**

For example, Snell discloses a "transceiver" that serves as an access point for communicating "data intended for a [transceiver]" connected to a wireless local area network (WLAN). *See* claim 1 preamble.

Snell also discloses that the transceiver transmits data packets to another transceiver, where the communication may switch on-the-fly between a "first modulation method" *(e.g.,* BPSK) and a "second modulation method" *(e.g.,* QPSK) that is "of a different type than the first modulation method." Snell thus teaches transmitting a "first message" and a "second message" as shown in annotated Figure 3 below.



Snell Figure 3 Annotated (page 54 Request)

Snell teaches communicating multiple data packets with the ability to "switch on-the-fly between different data rates and/or formats" as noted above, based on this disclosure, a person of ordinary skill in the art would have understood that Snell teaches that a series of packets may be sent that switch from using a first modulation method to using a second modulation method for the payload portion of the data packet. For example, the "first message" in Snell comprises "first information" *(e.g.,* PLCP preamble and PLCP header) that is "modulated according to a first modulation method" *(e.g.,* BPSK) where the "first information" *(e.g.,* "SIGNAL" field in PLCP header) indicates *(e.g.,* using "OAh") the modulation type *(e.g.,* BPSK) used for modulating "second information" *(e.g.,* MPDU data). In the "first message," the "SIGNAL" field in the PLCP header uses a code *(e.g.,* "OAh") that indicates that the "second information" *(e.g.,* MPDU data) is modulated "according to the first modulation method" *(e.g.,* BPSK at 1 Mbit/s).

Snell's transceiver can transmit a "second message" comprising "third information" *(e.g.,* PLCP preamble and PLCP header) "modulated according to the first modulation method" *(e.g.,* BPSK) where the "third information comprises information" *(e.g.,* "SIGNAL" field in PLCP header) "that is indicative of an impending change in modulation" *(e.g.,* using "l 4h") "to a second modulation method" *(e.g.,* QPSK) used for modulating "fourth information." For example, in the "second message," the "SIGNAL" field in the PLCP header uses a code *(e.g.,* "14h") that indicates that the "fourth information" *(e.g.,* MPDU data) is modulated "according to the second modulation method" *(e.g.,* QPSK at 2 Mbit/s), wherein the "second modulation method" is of a "different type than the first modulation method." This "SIGNAL" is "indicative of an impending change" from the "first modulation method" to the "second modulation method" because it is indicating a change from, for example, QPSK modulation to BPSK modulation. In addition, transmitting the data using the "second modulation method"- QPSK-results in a data rate of 2 Mbit/s which is higher than transmitting the data using the "first modulation method " BPSK at 1 Mbit/s.

"The modulator may also preferably include header modulator means for modulating *data packets."* Snell at 2:61-63.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum, *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

"It is another object of the invention to provide a spread spectrum transceiver and associated method to permit operation at higher data rates and *which may switch on-the-fly between different data rates and/or formats."* Snell at 2:27-30.

"The variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and *while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly."* Snell at 7: 10-14.

"The *header* may always be *BPSK."* Snell at 6:35-36.

"Now relating to the *PLCP header* 91, *the SIGNAL* is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and *is the variable data* scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. *The variable data may be modulated and demodulated in different formats* than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

Snell describes that the "first modulation method" may be BPSK and the "second modulation method" may be QPSK, which is of a different "type" than the first modulation method, and alternatively describes that the "first modulation method" may be differential BPSK ("DBPSK") and that the "second modulation method" may be differential QPSK ("DQPSK"), which is also of a different "type" than the first modulation method.

Thus, Snell alternatively describes modulating the "first information" *(e.g.,* PLCP preamble and PLCP header) according to a "first modulation method" *(e.g.,* DBPSK) and "second information" *(e.g.,* MPDU data) according to either a "first modulation method" *(e.g.,* DBPSK) or "second
modulation method" *(e.g.,* QBPSK).

"The PLCP preamble and PLCP header are always at 1 Mbit/s, *Diff encoded,* scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"The modulator may also preferably include header modulator means for modulating data packets to include *a header at a predetermined modulation and a third data rate defining a third format .... The third format is preferably differential BPSK."* Snell at 2:61-3:5.

"The reference phase for the first symbol of the *MPDU* is the output phase of the last symbol of the header/or *Diff Encoding."* Snell at 7:6-8. *See also, e.g.,* Snell at Figs. 2, 3, 5.

Snell incorporates by reference Harris 4064.4, 17 which discloses: *"The preamble and header are always transmitted as DBPSK* waveforms while the *data packets can be configured to be either DBPSK or DQPSK."* Harris 4064.4 at 14.

"The *preamble is always transmitted as a DBPSK* waveform with a programmable length of up to 256 symbols long." Harris 4064.4 at 15.

"Signal Field (8 Bits) - This field indicates whether the data packet that follows the header is modulated as DBPSK or DQPSK. In mode 3 the HSP3824 receiver looks at the signal field to determine whether it needs to switch from DBPSK demodulation into DQPSK demodulation at the end of the always DBPSK preamble and header fields." Harris 4064.4 at 15.

"Mode 3 - In this mode the preamble is programmable up to 256 bits (all l's). The header in this mode is using all available fields. *In mode 3 the signal field defines the modulation type of the data packet (DBPSK* or *DQPSK)* so the receiver does not need to be preprogrammed to anticipate
one or the other. In this mode the device checks the Signal field for the data packet modulation and it switches to DQPSK if it is defined as such in the signal field. *Note that the preamble and header are always DBPSK* the modulation definition applies only for the data packet." Harris 4064.4 at 16.

See also, e.g., Harris 4064.4 at 14 ("The HSP3824 transmitter is designed as a Direct Sequence Spread Spectrum *DBPSKIDQPSK* modulator."), Harris 4064.4 at 14 ("The modulator is capable of switching rate automatically in the case where the preamble and header information are
DBPSK modulated, and the data is *DQPSK* modulated."), Harris 4064.4 at FIGURE 10.

Kamerman *discloses transmitting a first message including second information modulated at a first modulation method and transmitting a second message including fourth information modulated at a second modulation method*. *See, e.g.,* **Kamerman at 6, 11, 12.**

For example, Kamerman discloses an automatic rate selection scheme for falling forward from a "first modulation method" *(e.g.,* BPSK) corresponding to a lower data rate *(e.g.,* 1 Mbit/s) to a "second modulation method" *(e.g.,* QPSK) corresponding to a higher data rate *(e.g.,* 2 Mbit/s) after a number of successive correctly acknowledge packet transmissions, for instance, where there is a low load in neighbor cells and a reliable connection.

"Then there is looked to *automatic rate control* to keep the co-channel interference at a tolerable level." Kamerman at 6.

"IEEE 802.11 DS specifies bit rates of 1 and 2 Mbps. The allowable SNR and CSIR values for reliable transmission of data packets are dependent on the bit rate." Kamerman at 11.

"IEEE 802.11 DS specifies BPSK and QPSK, in addition there could be applied proprietary modes with M-PSK and QAM schemes that provide higher bit rates by encoding more bits per symbol. ... An automatic rate selection scheme based on the reliability of the individual uplink and downlink could be applied. The basic rate adaptation scheme could be: after unacknowledged packet transmissions the rate falls back, and *after a number (e.g. JO) of successive correctly acknowledged packet transmissions the bit rate goes up."* Kamerman at 11.

"At lower load in the neighbor cells the highest bit rate can be used more often. At higher load the transmissions from the access point to stations at the outer part of the cells, will be done often at fall back rates due to mutilation of transmissions by interference. In practice the network load
for LANs at nowadays client-server applications is very bursty, with sometimes transmission bursts over an individual links and low activity during the major part of the time. *Therefore the higher bit rate can be used during the most of the time, and at high load in the neighbor cells (as
will evoked by test applications) there will be switched to fall back rates in the outer part of the cell."* Kamerman at 11.

"The application of proprietary bit rates of 3 and 4 Mbps in addition to the basic 1 and 2 Mbps, can be combined with an automatic rate selection. This automatic rate selection *gives fall forward at reliable connections* and fall back at strong co-channel interference." Kamerman at 12

It was well-known in the art, as demonstrated by Kamerman, to transmit a first data packet where the data is modulated using a first modulation method, such as BPSK (corresponding to a lower data transfer rate), and to next transmit a second data packet where the data is modulated using a second modulation method, such as QPSK (corresponding to a higher data transfer rate).

One of ordinary skill in the art at the time the invention was made would have been motivated and found it obvious and straight forward to use Kamerman's teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system for communicating data packets modulated according to different modulation methods (modified by the teaching of Yamano, as discussed above) to advantageously maximize the data transfer rate and adapt to changing channel conditions (as also taught by Kamerman). In particular, Kamerman expressly teaches that it is beneficial to transmit the data of a first data packet using a first modulation method corresponding to a lower data transfer rate *(e.g.,* BPSK modulation at 1 mbps) during higher load conditions when a more robust signal is needed due to "mutilation of transmissions by interference," and to next transmit the data of a second data packet using a second modulation method corresponding to a higher data transfer rate *(e.g.,* QPSK modulation at 2 mbps) *(i.e.,* falling forward) to maximize the data transfer rate during lower load conditions when the connection is more reliable. *See* Kamerman at 6 ("Then there is looked to *automatic rate control* to keep the co-channel interference at a tolerable level."), 11 ("The basic rate adaptation scheme could be: after unacknowledged packet transmissions the rate falls back, and *after a number (e.g. 10) of successive correctly acknowledged packet transmissions the bit rate goes up."),* 11 *("At lower load in the neighbor cells the highest bit rate can be used more often.* At higher load the transmissions from the access point to stations at the outer part of the cells, will be done at fallback rates due to mutilation of transmissions by interference. In practice the network load for LANs at nowadays client-server applications is very bursty, with sometimes transmission bursts over an individual links and low activity during the major part of the time. Therefore the higher bit rate can be used during the most of the time, and at high load in the neighbor cells ... there will be switched to fall back rates in the outer part of the cell."), 12 ("This automatic rate selection gives fall forward at reliable connections and fall back at strong cochannel interference. Therefore it gives adaptation of the bit rate to the interference as it occurs in time depending on positions as load.").

Moreover, Snell and Kamerman are in the same field of art, with both relating to communications between transceivers that use BPSK and QPSK modulation methods to transfer data at different rates according to the draft IEEE 802.11 standard available at that time. *See, e.g.,* Snell at 1:47-63 ("The assignee of the present invention has developed and manufactured a set of integrated circuits for a WLAN under the mark PRISM 1 *which is compatible with the proposed IEEE 802.11 standard .... "),* 5:31-33 ("The present invention provides an extension of the PRISM 1 product from 1 *Mbit/s BPSK and 2 Mbit/s QPSK .. .* "); Kamerman at 6 ("This paper considers the critical parameters for *wireless LANs that operate conform to the IEEE 802.11 DSSS (direct sequence spread spectrum) standard ... "),* 11 ("IEEE 802.11 DS specifies bit rates of 1 and 2 Mbps.", 11 ("IEEE 802.11 DS specifies BPSK and QPSK ... ").

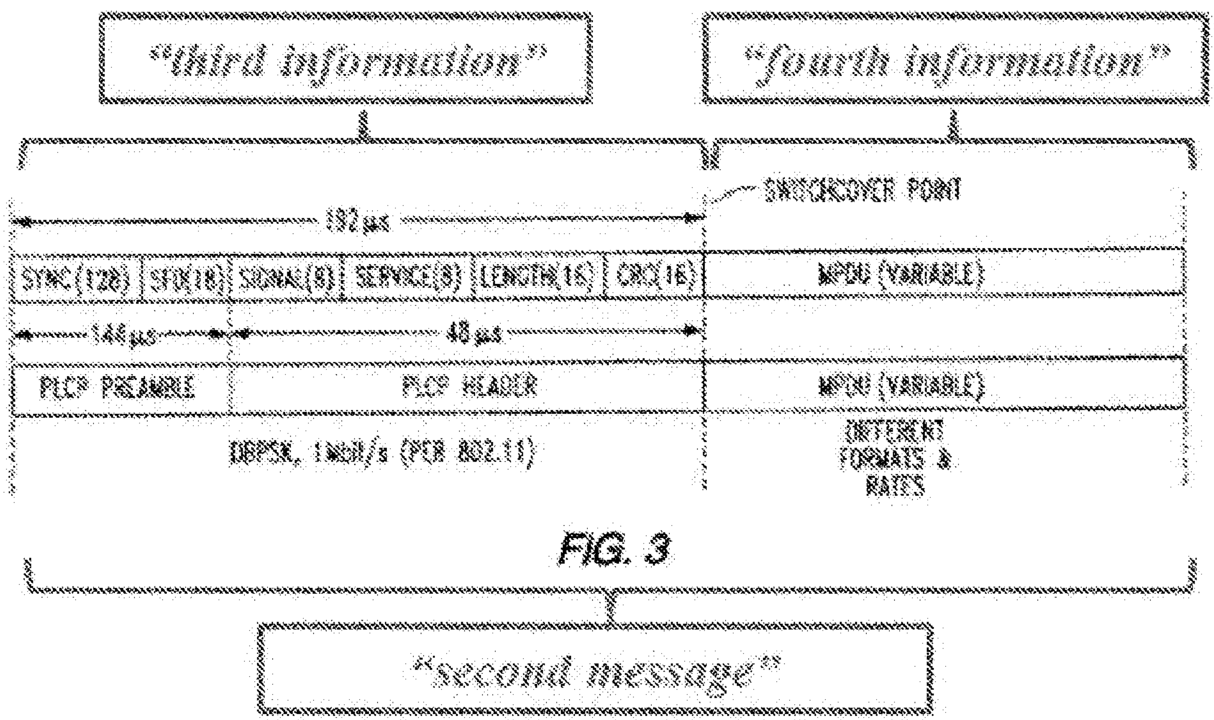
It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kamerman' s teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system (modified in light of Yamano) for communicating data packets modulated according to different modulation methods, as both Snell and Kamerman are directed to IEEE 802.11 systems utilizing BPSK and QPSK modulation corresponding, respectively, to a lower and higher data transfer rates-and in combination, each element (Kamerman's teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method and Snell's system for communicating data packets modulated according to different modulation methods) performs the same function as it would separately, yielding nothing more than predictable results. *KSR,* 550 U.S. at 417. One of ordinary skill in the art would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected and would have been motivated and found it obvious and straightforward to use

Kamerman' s teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system (modified in light of Yamano) for communicating data packets modulated according to different modulation methods.

second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information; and

Snell in view of Yamano discloses that the second message comprises second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information. *See, e.g.,* Snell at 1:55-57, 2:61-63, 6:35-36, 6:64-66, 7:5-14, Fig. 3; Harris 4064.4 at 14; Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

For example, Snell discloses transmitting a "second message" including a PLCP preamble and PLCP header, and MPDU data, as shown in Figure 3 below.



Snell at Fig. 3 (annotated).

"The modulator may also preferably include header modulator means for modulating *data packets*" Snell at 2:61-63.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum, *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

"The *header* may always be BPSK." Snell at 6:35-36.

"The *PLCP preamble and PLCP header* are always at 1 Mbit/s, Diff encoded, scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"*MPDU* is serially provided by Interface 80 and *is the variable data* scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. *The variable data* may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

Snell incorporates by reference Harris 4064.4,[19] which discloses:

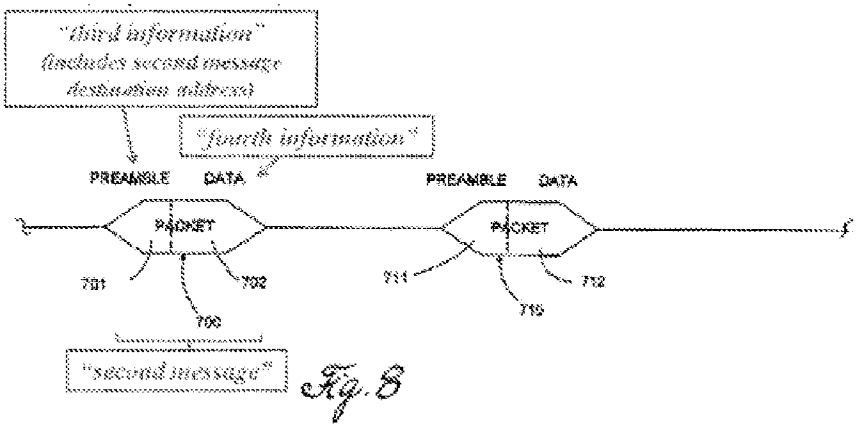
"The *preamble and header* are always transmitted as DBPSK waveforms while the *data packets* can be configured to be either DBPSK or DQPSK." Harris 4064.4 at 14.

Yamano discloses that the second message comprises second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information.
See, e.g., Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

For example, Yamano discloses that a packet includes a preamble and main body, and that the preamble can include a destination address.

"*Packet 700* includes a *preamble 701* and a *main body 702.*" Yamano at 19:63-64.

"For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) *packet source and destination addresses,* (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20:1-7 (emphasis added).



Yamano at Figure 8 (annotated).

"When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing Snell's data packet comprising preamble, header, and MPDU data portions to advantageously specify which receiver the data is intended for and to beneficially reduce the processing requirements at the receiving device, as taught by Yamano. "When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

In addition, Snell teaches structuring its data packet to include a preamble, header, and MPDU data portion *(see, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-14, Fig. 3), and Yamano teaches structuring its data packet to also include a preamble and data portion, and to place the destination address in the preamble portion (Yamano at 19:63-20:7, Fig. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a destination address in the preamble portion of a data packet, as taught by Yamano, in implementing Snell's system for transmitting data packets between transceivers, as Snell teaches that its data packet already includes a preamble portion-and in combination, each element (Yamano' s teaching of placing a destination address in the preamble and Snell's teaching of a system for communicating data packets modulated according to different modulation methods between transceivers) performs the same function as it would separately, yielding nothing more than predictable results. *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 417 (2007). One of ordinary skill in art at the time the invention was made would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, a person of ordinary skill would have been motivated and found it obvious and straightforward to use the teachings of Yamano including a destination address in the preamble of a data packet in implementing Snell's communication system.

wherein the second modulation method results in a higher data rate than the first modulation method.

Snell discloses that the second modulation method results in a higher data rate than the first modulation method. *See, e g.* , Snell at 5:31-33, 6:52-59, 6:64-66, 7:1-2, 7:5-14, Fig. 3; Harris 4064.4 at 16 (Table 7).

For example, Snell discloses that the second modulation method *(e.g.,* QPSK, or alternatively, DQPSK) results in a higher data rate *(e.g.,* 2 Mbit/s) than the first modulation method *(e.g.,* BPSK, or alternatively, DBPSK) which results in a data rate of 1 Mbit/s. "The present invention provides an extension of the PRISM 1 product from *1 Mbit/s BPSK and 2 Mbit/s QPSK* to 5.5 Mbit/s BPSK and 11 Mbit/s QPSK." Snell at 5:31-33

"The PLCP preamble and PLCP header are always at *I Mbit/s,* Diff encoded, scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"Now relating to the PLCP header 91, the SIGNAL is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

Snell at 6:52-59

"SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and is the variable data scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. The variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14. *See also, e.g.,* Snell at Fig. 3; Harris 4064.421 at 16 (Table 7).

21. The master communication device as in claim 1, wherein the first information that is included in the first message comprises the first message address data.

> Snell in view of Yamano and further in view of Kamerman as recited above disclose that the **first information that is included in the first message comprises the first message address** as indicated in the rejection of claim 1 above with reference to the first message address of the destination, therefore the first message address data is included in the actual message when transmitted by the master to the slave transceiver.
>
> Yamano expressly teaches that including a destination address in the preamble portion of the data packet, which precedes the data portion, will advantageously reduce processing requirements of receiving devices because the receiving device can filter out packets which it does not need to demodulate. Yamano at 20:54-59 ("When the preamble in a burst-mode packet *includes the destination address of the packet*, the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits.").

C.) Claim 21 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Snell in view of Harris 4064.4, further in view of Harris AN9614, further in view of Yamano and further in view of Kamerman.

1. A master communication device configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device,

> Snell discloses a master communication device (transceiver 30) that serves as an access point for communicating data with other transceivers connected to a wireless local area network (WLAN) and is configured to communicate with one or more slave transceivers (end users connect to LAN through transceivers) according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device. *See, e.g.*, Snell at 1:34-46,1:47-50,1:55-57, 2:27-30, 4:42-47, 5:18-21; Harris AN9614 at 3.
>
> Snell at 4:42-47 ("Referring to FIG. 1, a ***wireless transceiver 30*** in accordance with the invention is first described. The *transceiver 30 may be readily used for WLAN applications* in the 2.4 GHZ ISM band in accordance with the proposed IEEE

802.11 standard. Those of skill in the art will readily recognize other applications for the transceiver 30 as well."

"In a typical WLAN, ***an access point provided by a transceiver*****, that is, a combination transmitter and receiver,** connects to the wired network from a fixed location. Accordingly, the access transceiver receives, buffers, and transmits data between the WLAN and the wired network. *A single access transceiver can support a small group of collocated users within a range of less than about one hundred to several hundred feet. The* ***end users connect to the WLAN through transceivers*** which are typically implemented as PC cards in a notebook computer, or ISA or PCI cards for desktop computers. Of course the transceiver may be integrated with any device, such as a hand-held computer." Snell at 1:34-46.

With respect to the 'slave communication from a slave device to the master communication device occurring in response to a master communication from the master communication device to the slave device', Snell teaches the master (access point transceiver) communicates with slave transceivers on the WLAN via **polled protocol**. A **polled protocol** is a master/slave protocol as confirmed by the '228 patent, '228 patent at 4:30-34 where the slave is given permission to transmit on the network.

Snell incorporates by reference Harris AN9614[9], which discloses that the communications between transceivers can operate according to a polled (*i.e.*, master/slave) protocol, which is a master/slave communication system.[10] *See e.g.*, Harris AN9614 at 3.

"[T]he controller can keep adequate time to operate either a polled or a time allocated scheme. In these modes, the radio is powered off most of the time and only awakens when communications is expected. This station would be awakened periodically to listen for a beacon transmission. The beacon serves to reset the timing and to alert the radio to traffic. If traffic is waiting, the radio is instructed when to listen and for how long. In **a polled scheme**, the remote radio can respond to the poll with its traffic if it has any. With these techniques, the average power consumption of the radio can be reduced by more

[9] Snell expressly incorporates by reference "the entire disclosure" of Harris AN9614 (Snell at 5:2-7). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

[10] A polled protocol is a master/slave protocol, as confirmed by the '228 patent. '228 patent at 4:30-34. *See also* IPR2014-00892, Pap. 46 at 16 ("In [a polling] protocol, a centrally assigned master periodically sends a polling message to the slave nodes, giving them explicit permission to transmit on the network."); '228 Prosecution History at 352; IPR2014-00892, Ex.1323 (Goodman Declaration) Para124.

than an order of magnitude while meeting all data transfer objectives." Harris AN9614 at 3.

the master communication device comprising:
a master transceiver configured to transmit a first message over a communication medium from the master transceiver to the one or more slave transceivers,

An access point (wireless transceiver 30, figure 1, 4:42-47 corresponds to a master communication device) connected to a LAN (WLAN), the transceiver communicates with one or more transceivers connected to the LAN, communication on the LAN to and from external networks is provided through the access point as in typical LAN (1:34-46).

Snell discloses the "transceiver" 30 that serves as an access point for communicating "data intended for one of the one or more [other] transceivers" connected to a wireless local area network (WLAN). Snell's transceiver transmits data packets intended for another transceiver, where the communication may switch on-the-fly between a "first modulation method" *(e.g.,* BPSK) and a "second modulation method" *(e.g.,* QPSK) that is "of a different type than the first modulation method." *Id* at 2:61-63

For example, Snell discloses a "transceiver" (a master transceiver 30 with respect to an access point in a local area network) that serves as an access point for communicating data with other transceivers connected to a wireless local area network (WLAN) (end user transceivers connected to the WLAN are slave transceivers). Snell 1:34-46, 1:47-50, 4:42-47, 5:18-21.

"In a typical WLAN, *an access point provided by a transceiver,* that is, a combination transmitter and receiver, connects to the wired network from a fixed location. Accordingly, the **access transceiver receives, buffers, and transmits data between the WLAN and the wired network**. *A single access transceiver can support a small group of collocated users within a range of less than about one hundred to several hundred feet. The end users connect to the WLAN through transceivers...*" Snell at 1:34-46.

Snell references processors enabling the disclosed transceiver functions and incorporates by reference Harris AN9614 and Harris 4064.4. (Snell at 5:8-17, 5:31-33

"Like the HSP3824 baseband processor, the high data rate baseband processor 40 of the invention contains all of the functions necessary for a full or half duplex packet baseband *transceiver.*" Snell at 5:18-21.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

See also, e.g., Snell at 2:27-30 ("It is another object of the invention to provide *a spread spectrum transceiver* and associated method to permit operation at higher data rates and which may switch on-the-fly between different data rates and/or formats."); Snell at 1:47-50 ("The assignee of the present invention has developed and manufactured a set of integrated circuits for a WLAN under the mark PRISM 1 which is compatible with the proposed IEEE 802.11 standard."); Snell at 4:42-47 ("Referring to FIG. 1, a *wireless transceiver 30* in accordance with the invention is first described. The *transceiver 30 may be readily used for WLAN applications* in the 2.4 GHZ ISM band in accordance with the proposed IEEE 802.11 standard. Those of skill in the art will readily recognize other applications for the transceiver 30 as well."

To the extent, however, that it is deemed that Harris 4064.4 and Harris AN9614 should be treated as independent references from Snell, one of ordinary skill in the art at the time the invention was made would have been motivated and found it obvious and straightforward to use Harris 4064.4' s teachings of modulating the preamble and header portions of a data packet using DBPSK modulation and modulating the payload portion of the data packet using DBPSK or DQPSK modulation (as indicated by the SIGNAL field in the header portion) to advantageously provide for switching between DBPSK and DQPSK modulation types in implementing an IEEE 802.11 system (*see* Harris 4064.4 at 1, 3) such as disclosed in Snell. Harris 4064.4 is incorporated by reference into Snell (Snell at 5: 13-17), both references are directed to the PRISM chipset and HSP 3824 baseband processor (Harris 4064.4 at l; Snell at 1:47-63, 5:8-17,5 :31-33), and Harris 4064.4 is a publication of Harris Corporation, the same original assignee of Snell.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Harris 4064.4 with the teachings of Snell, in light of the foregoing including Snell's express direction to apply the teachings of Harris 4064.4, and further because, in combination, each element (Harris 4064.4's teaching of modulating the preamble and header portions of a data packet using DBPSK modulation and modulating the payload portion of the data packet using DBPSK or DQPSK modulation and Snell's communication system for transmitting data packets modulated using different modulation methods) performs the same function as it would separately, yielding nothing more than predictable results. *KSR,* 550 U.S. at 417. One of ordinary skill in the art would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected and for these reasons, would have been motivated and found it obvious and straightforward to use Harris 4064.4's teachings in implementing Snell's communication system.

One of ordinary skill in the art would have additionally been motivated and found it obvious and straightforward to use Harris AN9614's teaching of a polled (master/slave) protocol in implementing the communication system taught by Snell (in light of Harris 4064.4). Harris AN961 4 is incorporated by reference into Snell (Snell at 5 :2-7), both references are directed to the PRISM chipset and HSP 3824 baseband processor (Harris

AN9614 at 1, 2; Snell at 1:47-63, 5:8-17, 5:31-33), and Harris AN9614 is a publication of Harris Corporation, the same original assignee of Snell. Moreover, AN9614 expressly teaches that it is beneficial to use a polled (master/slave) protocol because "the average power consumption of the radio can be reduced by more than an order of magnitude while meeting all data transfer objectives." Harris AN9614 at 3.

Polling (master/slave) enables this reduction in power consumption because "the system can be set at its sleep mode most of the time to achieve low power consumption. It only needs to operate at full power consumption during the transmission of a packet or during the expected window for received packets." Harris AN9614 at 3. In addition to Snell's express suggestion to apply Harris AN9614's disclosures, one of ordinary skill in the art would have been motivated to use Harris AN9614's teaching of a polled (master/slave) protocol in implementing Snell's communication system (implemented in light of Harris 4064.4, *see supra)* because a polled (master/slave) communication system advantageously provides a simple protocol that has good determinacy *(e.g.,* a reduction in collisions). It would have been routine for one of ordinary skill in the art to use a polled (master/slave) protocol in implementing Snell's communication system (as implemented in light of Harris 4064.4), as master/slave communication systems were common and well-known in the art *(see* '228 patent at 3: 64- 5:7), and thus implementing a polled (master/slave) protocol in Snell's transceiver (which serves as an access point to support communications with multiple other transceivers - Snell at I :34-46) would involve nothing more than using common and known techniques to improve a similar system in the same way to yield predictable results. *KSR,* 550 U.S. at 416. One of ordinary skill in the art would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, one of ordinary skill in the art would have been motivated and found it obvious and straightforward to implement a polled (master/slave) protocol in implementing Snell's system (as implemented in light of Harris 4064.4).

wherein the first message comprises:
first information modulated according to a first modulation method,

Snell discloses that the master transceiver transmits a first message (PLCP header and PLCP preamble, figure 3 annotated below) which comprises first information modulated according to a first modulation method (BPSK), *See, e.g.,* **Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14,** 7:6- **8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.**

second information, including a payload portion, modulated according to the first modulation method,

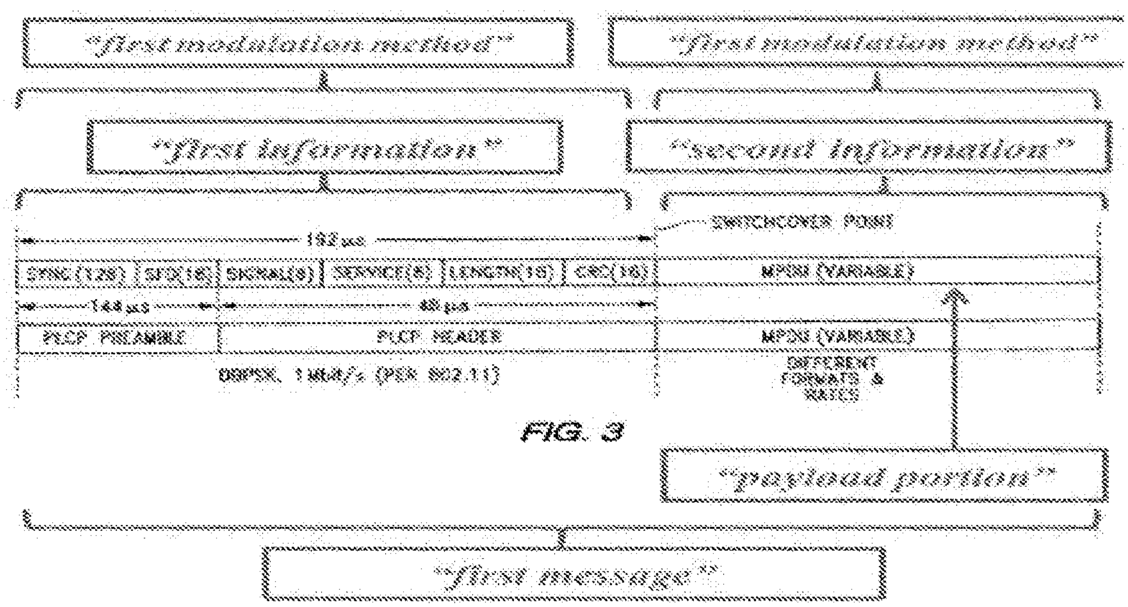
Snell discloses that the master transceiver transmits second information, including a payload portion (MPDU, figure 3), modulated according to the first modulation method (BPSK), *See, e.g.,* **Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14,** 7:6- **8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.**

wherein the second information comprises data intended for one of the one or more slave transceivers and

Snell discloses that the second information (MPDU) comprises data intended for one of the one or more slave transceivers. *See, e.g.,* **Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14,** 7:6- **8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.**

With reference to Figure 3 (annotated below) which depicts a message from the master transceiver, a first message includes a PLCP header and PLCP preamble, the MPDU corresponds to second information which is transmitted to the respective slave transceiver.

Snell discloses the transceiver transmitting a "first message" comprising "first information" (*e.g.*, PLCP preamble and PLCP header) "modulated according to a first modulation method" (*e.g.*, BPSK) and "second information, including a payload portion" (*e.g*, MPDU data) "modulated according to the first modulation method" (*e.g*, BPSK) (as depicted in Figure 3 below). Snell alternatively discloses modulating the "first information" (*e.g*, PLCP preamble and PLCP header) and "second information, including a payload portion" (*e.g*, MPDU data) according to DBPSK which also is a "first modulation method."



Snell at Fig. 3 (annotated).

"The ***header may always be BPSK.***" Snell at 6:35-36.

Snell discloses that the **"SIGNAL" in the PLCP header indicates** (*e.g.*, using "OAh") the **modulation type** (*e.g.*, BPSK) **used for modulating the MPDU data portion.**

"Now relating to the PLCP header 91, the SIGNAL is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

Snell at 6:52-59.

"SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and is the variable data scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. The **variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate,** and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

"The modulator preferably comprises means for *operating in one of a biphase PSK (BPSK) modulation mode at a first data rate defining a first format,* and a quadrature PSK (QPSK) mode at a second data rate defining a second format." Snell at 2:56-59.

"In particular, the HSP3824 baseband processor manufactured by Harris Corporation *employs quadrature or bi-phase phase shift keying (QPSK or BPSK) modulation schemes."* Snell at 1:58-61.

See also, e.g., Snell at Abstract ("The modulator and demodulator are each preferably operable *in one of a bi-phase PSK (BPSK) mode* at a first data rate and *a quadrature PSK (QPSK) mode* at a second data rate. These formats may also be switched on-the-fly in the demodulator."), 2: 15-17 ("**Moreover, a WLAN application, for example, may require a change between *BPSK and QPSK* during operation,** that is, on-the-fly.").

"The PLCP preamble and PLCP header are always* at 1 Mbit/s, *Diff encoded, scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"The modulator may also preferably include header modulator means for modulating data packets to include *a header at a predetermined modulation and a third data rate defining a third format .... The third format is preferably differential BPSK."* Snell at 2:61-3:5. "The reference phase for the first symbol of the *MPDU* is the output phase of the last symbol of the header/or *Diff Encoding."* Snell at 7:6-8.

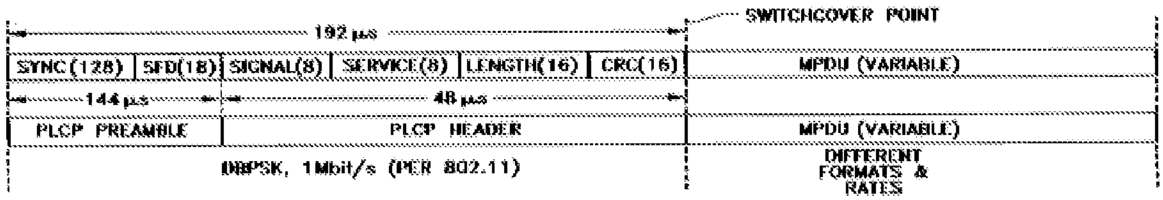


FIG. 3

Snell Figure 3

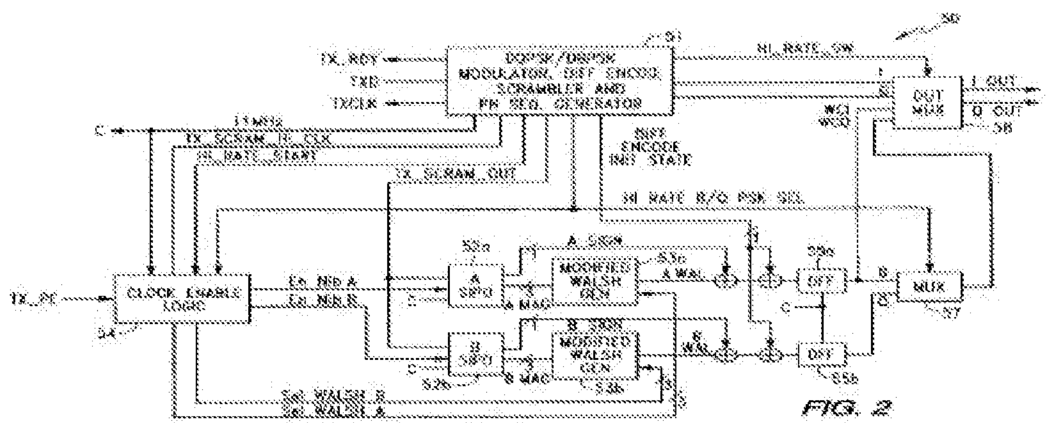


FIG. 2

Snell Figure 2

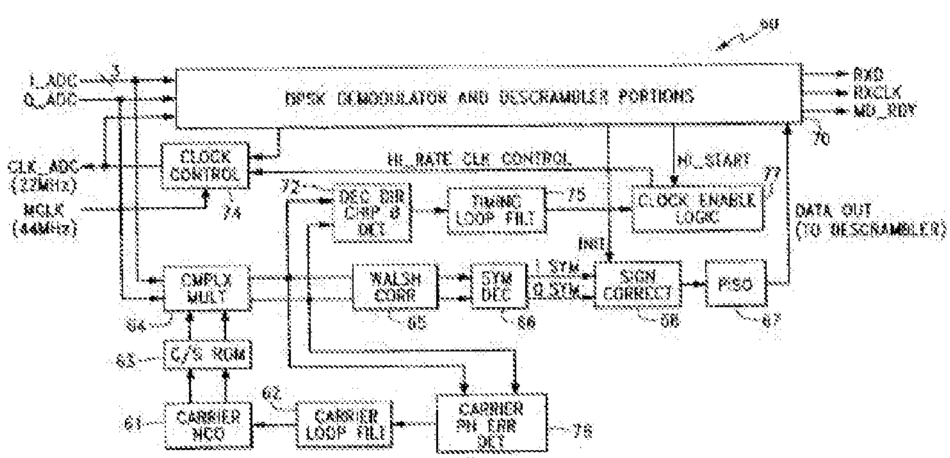


FIG. 5

Snell Figure 5

Snell incorporates by reference Harris 4064.4,[11] which discloses:

"The preamble and header are always transmitted as DBPSK waveforms while the ***data packets can be configured to be either DBPSK*** **or DQPSK**." Harris 4064.4 at 14.

"The *preamble is always transmitted as a DBPSK* waveform with a programmable length of up to 256 symbols long." Harris 4064.4 at 15.

"Signal Field (8 Bits) - This field indicates whether the data packet that follows the header is modulated as DBPSK or DQPSK. In mode 3 the HSP3824 receiver looks at the signal field to determine whether it needs to switch from DBPSK demodulation into DQPSK demodulation at the end of the always DBPSK preamble and header fields." Harris 4064.4 at 15.

"Mode 3 - In this mode the preamble is programmable up to 256 bits (all l's). The header in this mode is using all available fields. *In mode 3 the signal field defines the modulation type of the data packet (DBPSK* or DQPSK) so the receiver does not need to be preprogrammed to anticipate one or the other. In this mode the device checks the Signal field for the data packet modulation and it switches to DQPSK if it is defined as such in the signal field. *Note that the preamble and header are always DBPSK* the modulation definition applies only for the data packet." Harris 4064.4 at 16.

See also, e.g., Harris 4064.4 at 14 ("The HSP3824 transmitter is designed as a Direct [12] Sequence Spread Spectrum DBPSK/DQPSK modulator."), Harris 4064.4 at 14 ("The modulator is capable of switching rate automatically in the case where the preamble and header information are DBPSK modulated, and the data is DQPSK modulated."), Harris 4064.4 at FIGURE 10.

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[11] Snell expressly incorporates by reference "the entire disclosure" of Harris 4064.4 (Snell at 5:8-17, 5:31-33). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

[12] Snell expressly incorporates by reference "the entire disclosure" of Harris 4064.4 (Snell at 5:8-17, 5:31-33). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information; and

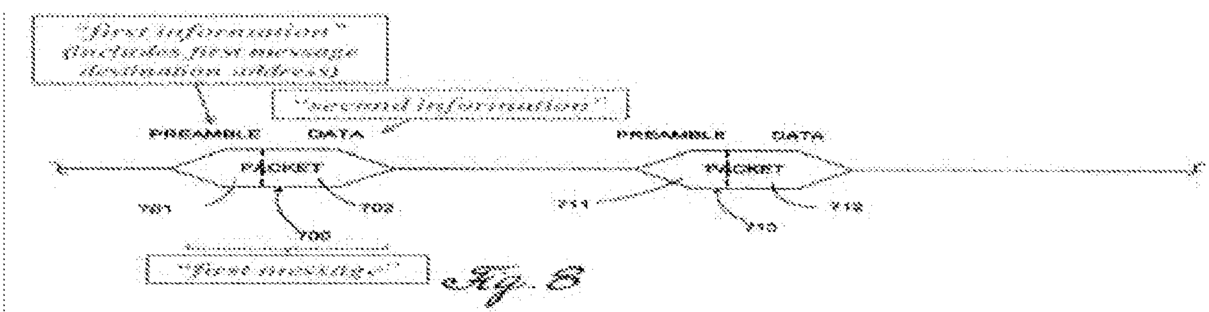
Snell does not expressly disclose *the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information.*

Yamano teaches that packets can be advantageously addressed for an intended destination.
Yamano discloses transmitting a "first message" *(e.g.,* data packet including a preamble and main body) that includes "first message address information that is indicative" *(e.g.,* "destination address" in the preamble) of the transceiver that is the "intended destination of the second information."

"Packet 700 includes a *preamble 701* and a *main body 702."* Yamano at 19:63-64.

"For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) ***packet source and destination addresses,*** (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20:1-7.

Yamano also discloses that the preamble precedes the main body (containing data), as shown in Figure 8. Yamano teaches that the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information. *See, e.g.,* Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.



Yamano at Fig. 8 (annotated).

Snell and Yamano are in the same field of art, with both relating to transmitting data packets over a network *(see, e.g.,* Snell at 1:55-58, 2:61-63, 2:66-3:3, 5:18-21, 6:48-63, Fig. 3; Yamano at 1: 1-29, 19:54-20:33, Fig. 8), at varying rates *(see, e.g.,* Snell at 2: 15-17, 6:52-59; Yamano at 19:54-56). Yamano expressly teaches that including a destination address in the preamble portion of the data packet, which precedes the data portion, will advantageously reduce processing requirements of receiving devices because the receiving device can filter out packets which it does not need to demodulate. Yamano at 20:54-59 ("When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits.").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing Snell's data packet implemented in light of Harris 4064.4 and Harris AN9614 comprising preamble, header, and MPDU data portions to advantageously specify which receiver the data is intended for and to beneficially reduce the processing requirements at the receiving device, as taught by Yamano. "When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

In addition, Snell teaches structuring its data packet to include a preamble, header, and MPDU data portion *(see, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-14, Fig. 3), and Yamano teaches structuring its data packet to also include a preamble and data portion, and to place the destination address in the preamble portion (Yamano at 19:63-20:7, Fig. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a destination address in the preamble portion of a data packet, as taught by Yamano, in implementing Snell's system implemented in light of Harris 4064.4 and Harris AN9614 for transmitting data packets between transceivers, as Snell teaches that its data packet already includes a preamble portion-and in combination, each element (Yamano' s teaching of placing a destination address in the preamble and Snell's teaching of a system for communicating data packets modulated according to different modulation methods between transceivers) performs the same function as it would separately, yielding nothing more than predictable results. *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 417 (2007). One of ordinary skill in art at the time the invention was made would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, a person of ordinary skill would have been motivated and found it obvious and straightforward to use the teachings of Yamano including a destination address in the preamble of a data packet in implementing Snell's communication system.

Snell in view of Harris 4064.4, in further view of Harris AN9614 and further in view of Yamano thus teach that the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information. *See, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-10, Fig. 3; Harris 4064.4 at 14; Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

said master transceiver configured to transmit a second message over the communication medium from the master transceiver to the one or more slave transceivers wherein the second message comprises:

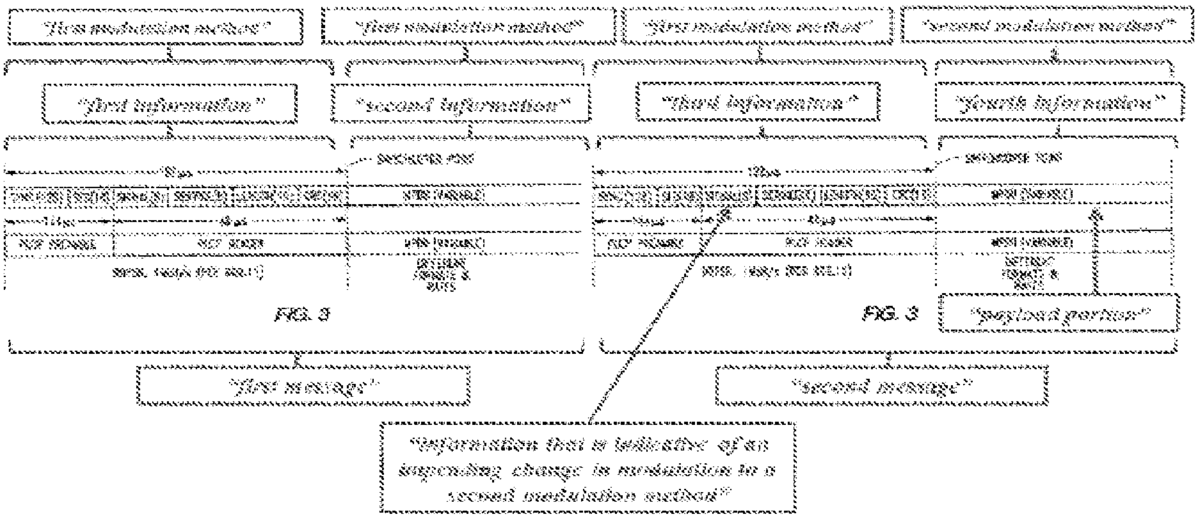
**third information modulated according to the first modulation method,
wherein the third information comprises information that is indicative of an impending change in modulation to a second modulation method, and**

**fourth information, including a payload portion, transmitted after transmission of the third information,
the fourth information being modulated according to the second modulation method,
the second modulation method being of a different type than the first modulation method,
wherein the fourth information comprises data intended for a single slave transceiver of the one or more slave transceivers, and**

As noted above, Snell discloses that the transceiver transmits data packets to multiple different end user slave transceivers, as such multiple messages of format shown in figure 3 are provided to the slave transceivers and where the communication may switch on-the-fly between a "first modulation method" *(e.g.,* BPSK) and a "second modulation method" *(e.g.,* QPSK) that is "of a different type than the first modulation method." **Snell thus teaches transmitting a "first message" and a "second message" as shown in annotated Figure 3 below.** *See, e.g.,* Snell at 1:34-46, 1:47-50, 1:55-57, 2:27-30, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-
66, 7:1-2, 7:5-14, Fi s. 2, 3, 5; Harris AN9614 at 3; Harris 4064.4 at**14-16, Fig. 10**

For example, Snell discloses a "transceiver" that serves as an access point for communicating "data intended for a [transceiver]" connected to a wireless local area network (WLAN). *See* claim 1 preamble.

Snell also discloses that the transceiver transmits data packets to another transceiver, where the communication may switch on-the-fly between a "first modulation method" *(e.g.,* BPSK) and a "second modulation method" *(e.g.,* QPSK) that is "of a different type than the first modulation method." Snell thus teaches transmitting a "first message" and a "second message" as shown in annotated Figure 3 below.



Snell Figure 3 Annotated (page 54 Request)

Snell teaches communicating multiple data packets with the ability to "switch on-the-fly between different data rates and/or formats" as noted above, based on this disclosure, a person of ordinary skill in the art would have understood that Snell teaches that a series of packets may be sent that switch from using a first modulation method to using a second modulation method for the payload portion of the data packet. For example, the "first message" in Snell comprises "first information" *(e.g.,* PLCP preamble and PLCP header) that is "modulated according to a first modulation method" *(e.g.,* BPSK) where the "first information" *(e.g.,* "SIGNAL" field in PLCP header) indicates *(e.g.,* using "OAh") the modulation type *(e.g.,* BPSK) used for modulating "second information" *(e.g.,* MPDU data). In the "first message," the "SIGNAL" field in the PLCP header uses a code *(e.g.,* "OAh") that indicates that the "second information" *(e.g.,* MPDU data) is modulated "according to the first modulation method" *(e.g.,* BPSK at 1 Mbit/s).

Snell's transceiver can transmit a "second message" comprising "third information" *(e.g.,* PLCP preamble and PLCP header) "modulated according to the first modulation method" *(e.g.,* BPSK) where the "third information comprises information" *(e.g.,* "SIGNAL" field in PLCP header) "that is indicative of an impending change in modulation" *(e.g.,* using "l 4h") "to a second modulation method" *(e.g.,* QPSK) used for modulating "fourth information." For example, in the "second message," the "SIGNAL" field in the PLCP header uses a code *(e.g.,* "14h") that indicates that the "fourth information" *(e.g.,* MPDU data) is modulated "according to the second modulation method" *(e.g.,* QPSK at 2 Mbit/s), wherein the "second modulation method" is of a "different type than the first modulation method." This "SIGNAL" is "indicative of an impending change" from the "first modulation method" to the "second modulation method" because it is indicating a change from, for example, QPSK modulation to BPSK modulation. In addition, transmitting the data using the "second modulation method"- QPSK-results in a data rate of 2 Mbit/s which is higher than transmitting the data using the "first modulation method " BPSK at 1 Mbit/s.

"The modulator may also preferably include header modulator means for modulating *data packets."* Snell at 2:61-63.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum, *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

"It is another object of the invention to provide a spread spectrum transceiver and associated method to permit operation at higher data rates and *which may switch on-the-fly between different data rates and/or formats."* Snell at 2:27-30.

"The variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and *while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly."* Snell at 7: 10-14.

"The *header* may always be *BPSK."* Snell at 6:35-36.

"Now relating to the *PLCP header* 91, *the SIGNAL* is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and *is the variable data* scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. *The variable data may be modulated and demodulated in different formats* than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

Snell describes that the "first modulation method" may be BPSK and the "second modulation method" may be QPSK, which is of a different "type" than the first modulation method, and alternatively describes that the "first modulation method" may be differential BPSK ("DBPSK") and that the "second modulation method" may be differential QPSK ("DQPSK"), which is also of a different "type" than the first modulation method.

Thus, Snell alternatively describes modulating the "first information" *(e.g.,* PLCP preamble and PLCP header) according to a "first modulation method" *(e.g.,* DBPSK) and "second information" *(e.g.,* MPDU data) according to either a "first modulation method" *(e.g.,* DBPSK) or "second modulation method" *(e.g.,* QBPSK).

"The PLCP preamble and PLCP header are always at 1 Mbit/s, *Diff encoded,* scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"The modulator may also preferably include header modulator means for modulating data packets to include *a header at a predetermined modulation and a third data rate defining a third format .... The third format is preferably differential BPSK."* Snell at 2:61-3:5.

"The reference phase for the first symbol of the *MPDU* is the output phase of the last symbol of the header/or *Diff Encoding."* Snell at 7:6-8. *See also, e.g.,* Snell at Figs. 2, 3, 5.

Snell incorporates by reference Harris 4064.4, 17 which discloses: *"The preamble and header are always transmitted as DBPSK* waveforms while the *data packets can be configured to be either DBPSK or DQPSK."* Harris 4064.4 at 14.

"The *preamble is always transmitted as a DBPSK* waveform with a programmable length of up to 256 symbols long." Harris 4064.4 at 15.

"Signal Field (8 Bits) - This field indicates whether the data packet that follows the header is modulated as DBPSK or DQPSK. In mode 3 the HSP3824 receiver looks at the signal field to determine whether it needs to switch from DBPSK demodulation into DQPSK demodulation at the end of the always DBPSK preamble and header fields." Harris 4064.4 at 15.

"Mode 3 - In this mode the preamble is programmable up to 256 bits (all l's). The header in this mode is using all available fields. *In mode 3 the signal field defines the modulation type of the data packet (DBPSK* or *DQPSK)* so the receiver does not need to be preprogrammed to anticipate one or the other. In this mode the device checks the Signal field for the data packet modulation and it switches to DQPSK if it is defined as such in the signal field. *Note that the preamble and header are always DBPSK* the modulation definition applies only for the data packet." Harris 4064.4 at 16.

See also, e.g., Harris 4064.4 at 14 ("The HSP3824 transmitter is designed as a Direct Sequence Spread Spectrum *DBPSKIDQPSK* modulator."), Harris 4064.4 at 14 ("The modulator is capable of switching rate automatically in the case where the preamble and header information are DBPSK modulated, and the data is *DQPSK* modulated."), Harris 4064.4 at FIGURE 10.

Kamerman *discloses transmitting a first message including second information modulated at a first modulation method and transmitting a second message including* *fourth information modulated at a second modulation method*. *See, e.g.,* **Kamerman at 6, 11, 12.**

For example, Kamerman discloses an automatic rate selection scheme for falling forward from a "first modulation method" *(e.g.,* BPSK) corresponding to a lower data rate *(e.g.,* 1 Mbit/s) to a "second modulation method" *(e.g.,* QPSK) corresponding to a higher data rate *(e.g.,* 2 Mbit/s) after a number of successive correctly acknowledge packet transmissions, for instance, where there is a low load in neighbor cells and a reliable connection.

"Then there is looked to *automatic rate control* to keep the co-channel interference at a tolerable level." Kamerman at 6.

"IEEE 802.11 DS specifies bit rates of 1 and 2 Mbps. The allowable SNR and CSIR values for reliable transmission of data packets are dependent on the bit rate." Kamerman at 11.

"IEEE 802.11 DS specifies BPSK and QPSK, in addition there could be applied proprietary modes with M-PSK and QAM schemes that provide higher bit rates by encoding more bits per symbol. ... An automatic rate selection scheme based on the reliability of the individual uplink and downlink could be applied. The basic rate adaptation scheme could be: after unacknowledged packet transmissions the rate falls back, and *after a number (e.g. JO) of successive correctly acknowledged packet transmissions the bit rate goes up."* Kamerman at 11.

"At lower load in the neighbor cells the highest bit rate can be used more often. At higher load the transmissions from the access point to stations at the outer part of the cells, will be done often at fall back rates due to mutilation of transmissions by interference. In practice the network load for LANs at nowadays client-server applications is very bursty, with sometimes transmission bursts over an individual links and low activity during the major part of the time. *Therefore the higher bit rate can be used during the most of the time, and at high load in the neighbor cells (as will evoked by test applications) there will be switched to fall back rates in the outer part of the cell."* Kamerman at 11.

"The application of proprietary bit rates of 3 and 4 Mbps in addition to the basic 1 and 2 Mbps, can be combined with an automatic rate selection. This automatic rate selection *gives fall forward at reliable connections* and fall back at strong co-channel interference." Kamerman at 12

It was well-known in the art, as demonstrated by Kamerman, to transmit a first data packet where the data is modulated using a first modulation method, such as BPSK (corresponding to a lower data transfer rate), and to next transmit a second data packet where the data is modulated using a second modulation method, such as QPSK (corresponding to a higher data transfer rate).

One of ordinary skill in the art at the time the invention was made would have been motivated and found it obvious and straight forward to use Kamerman's teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system for communicating data packets modulated according to different modulation methods (modified by the teaching of Yamano, as discussed above) to advantageously maximize the data transfer rate and adapt to changing channel conditions (as also taught by Kamerman). In particular, Kamerman expressly teaches that it is beneficial to transmit the data of a first data packet using a first modulation method corresponding to a lower data transfer rate *(e.g.,* BPSK modulation at 1 mbps) during higher load conditions when a more robust signal is needed due to "mutilation of transmissions by interference," and to next transmit the data of a second data packet using a second modulation method corresponding to a higher data transfer rate *(e.g.,* QPSK modulation at 2 mbps) *(i.e.,* falling forward) to maximize the data transfer rate during lower load conditions when the connection is more reliable. *See* Kamerman at 6 ("Then there is looked to *automatic rate control* to keep the co-channel interference at a tolerable level."), 11 ("The basic rate adaptation scheme could be: after unacknowledged packet transmissions the rate falls back, and *after a number (e.g. 10) of successive correctly acknowledged packet transmissions the bit rate goes up."),* 11 *("At lower load in the neighbor cells the highest bit rate can be used more often.* At higher load the transmissions from the access point to stations at the outer part of the cells, will be done at fallback rates due to mutilation of transmissions by interference. In practice the network load for LANs at nowadays client-server applications is very bursty, with sometimes transmission bursts over an individual links and low activity during the major part of the time. Therefore the higher bit rate can be used during the most of the time, and at high load in the neighbor cells ... there will be switched to fall back rates in the outer part of the cell."), 12 ("This automatic rate selection gives fall forward at reliable connections and fall back at strong cochannel interference. Therefore it gives adaptation of the bit rate to the interference as it occurs in time depending on positions as load.").

Moreover, Snell and Kamerman are in the same field of art, with both relating to communications between transceivers that use BPSK and QPSK modulation methods to transfer data at different rates according to the draft IEEE 802.11 standard available at that time. *See, e.g.,* Snell at 1:47-63 ("The assignee of the present invention has developed and manufactured a set of integrated circuits for a WLAN under the mark PRISM 1 *which is compatible with the proposed IEEE 802.11 standard .... "),* 5:31-33 ("The present invention provides an extension of the PRISM 1 product from 1 *Mbit/s BPSK and 2 Mbit/s QPSK .. .* "); Kamerman at 6 ("This paper considers the critical parameters for *wireless LANs that operate conform to the IEEE 802.11 DSSS (direct sequence spread spectrum) standard ... "),* 11 ("IEEE 802.11 DS specifies bit rates of 1 and 2 Mbps.", 11 ("IEEE 802.11 DS specifies BPSK and QPSK ... ").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kamerman' s teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system (modified in light of Yamano) for communicating data packets modulated according to different modulation methods, as both Snell and Kamerman are directed to IEEE 802.11 systems utilizing BPSK and QPSK modulation corresponding, respectively, to a lower and higher data transfer rates-and in combination, each element (Kamerman's teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method and Snell's system for communicating data packets modulated according to different modulation methods) performs the same function as it would separately, yielding nothing more than predictable results. *KSR,* 550 U.S. at 417. One of ordinary skill in the art would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected and would have been motivated and found it obvious and straightforward to use Kamerman' s teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system (modified in light of Yamano) for communicating data packets modulated according to different modulation methods.

second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information; and

Snell in view of Yamano discloses that the second message comprises second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information. *See, e.g.,* Snell at 1:55-57, 2:61-63, 6:35-36, 6:64-66, 7:5-14, Fig. 3; Harris 4064.4 at 14; Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

For example, Snell discloses transmitting a "second message" including a PLCP preamble and PLCP header, and MPDU data, as shown in Figure 3 below.

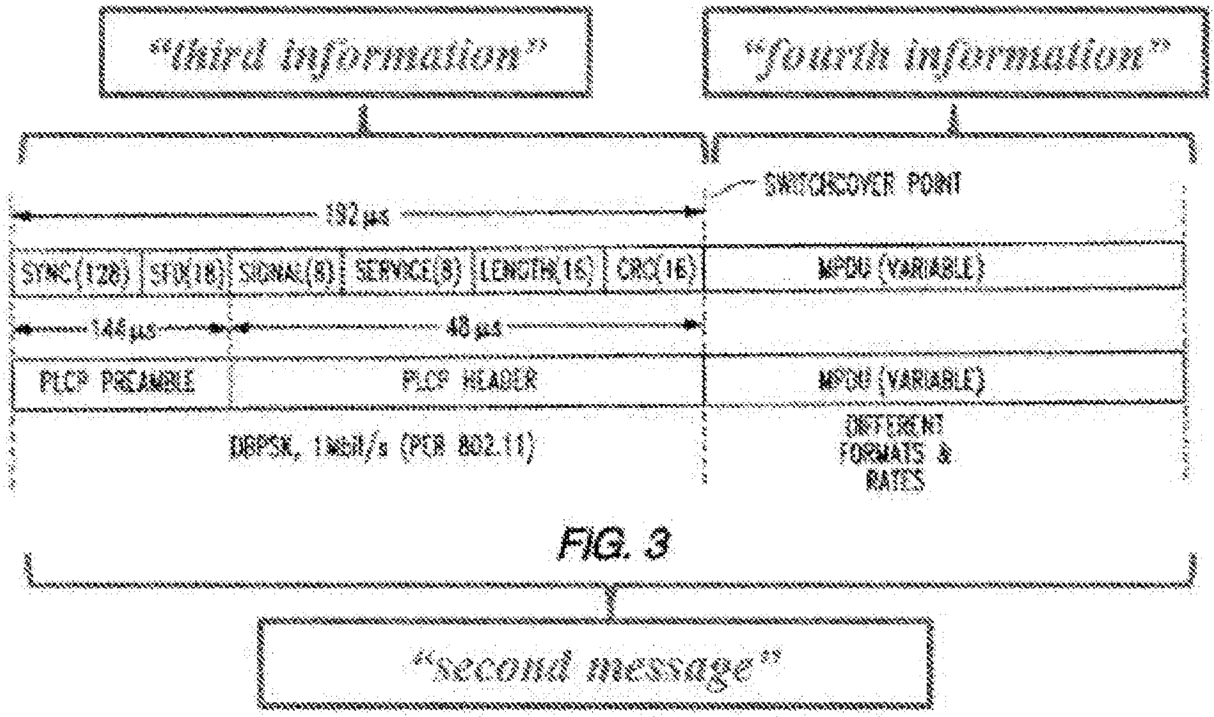


FIG. 3

Snell at Fig. 3 (annotated).

"The modulator may also preferably include header modulator means for modulating *data packets*" Snell at 2:61-63.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum, *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

"The *header* may always be BPSK." Snell at 6:35-36.

"The *PLCP preamble and PLCP header* are always at 1 Mbit/s, Diff encoded, scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"*MPDU* is serially provided by Interface 80 and *is the variable data* scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. *The variable data* may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

Snell incorporates by reference Harris 4064.4,[19] which discloses:

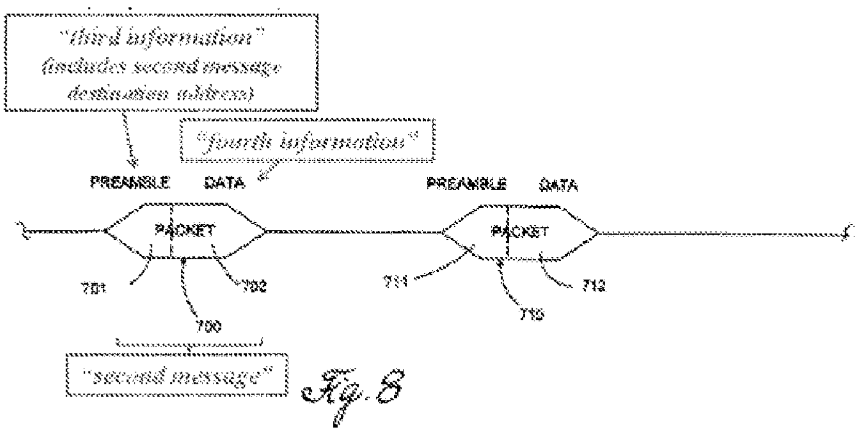
"The *preamble and header* are always transmitted as DBPSK waveforms while the *data packets* can be configured to be either DBPSK or DQPSK." Harris 4064.4 at 14.

Yamano discloses that the second message comprises second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information. *See, e.g.,* Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

For example, Yamano discloses that a packet includes a preamble and main body, and that the preamble can include a destination address.

"Packet 700 includes a *preamble 701* and a *main body 702."* Yamano at 19:63-64.

"For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) *packet source and destination addresses,* (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20:1-7 (emphasis added).



Yamano at Figure 8 (annotated).

"When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing Snell's data packet comprising preamble, header, and MPDU data portions to advantageously specify which receiver the data is intended for and to beneficially reduce the processing requirements at the receiving device, as taught by Yamano. "When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

In addition, Snell teaches structuring its data packet to include a preamble, header, and MPDU data portion *(see, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-14, Fig. 3), and Yamano teaches structuring its data packet to also include a preamble and data portion, and to place the destination address in the preamble portion (Yamano at 19:63-20:7, Fig. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a destination address in the preamble portion of a data packet, as taught by Yamano, in implementing Snell's system for transmitting data packets between transceivers, as Snell teaches that its data packet already includes a preamble portion-and in combination, each element (Yamano' s teaching of placing a destination address in the preamble and Snell's teaching of a system for communicating data packets modulated according to different modulation methods between transceivers) performs the same function as it would separately, yielding nothing more than predictable results. *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 417 (2007). One of ordinary skill in art at the time the invention was made would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, a person of ordinary skill would have been motivated and found it obvious and straightforward to use the teachings of Yamano including a destination address in the preamble of a data packet in implementing Snell's communication system.

wherein the second modulation method results in a higher data rate than the first modulation method.

Snell discloses that the second modulation method results in a higher data rate than the first modulation method. *See, e g.* , Snell at 5:31-33, 6:52-59, 6:64-66, 7:1-2, 7:5-14, Fig. 3; Harris 4064.4 at 16 (Table 7).

For example, Snell discloses that the second modulation method *(e.g.,* QPSK, or alternatively, DQPSK) results in a higher data rate *(e.g.,* 2 Mbit/s) than the first modulation method *(e.g.,* BPSK, or alternatively, DBPSK) which results in a data rate of 1 Mbit/s.
"The present invention provides an extension of the PRISM 1 product from *I Mbit/s BPSK and 2 Mbit/s QPSK* to 5.5 Mbit/s BPSK and 11 Mbit/s QPSK." Snell at 5:31-33

"The PLCP preamble and PLCP header are always at *I Mbit/s,* Diff encoded, scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"Now relating to the PLCP header 91, the SIGNAL is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

Snell at 6:52-59

"SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and is the variable data scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. The variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14. *See also, e.g.,* Snell at Fig. 3; Harris 4064.421 at 16 (Table 7).

21. The master communication device as in claim 1, wherein the first information that is included in the first message comprises the first message address data.

Snell modified in view of Harris 4064.4, in view of Harris AN 9614, in view of Yamano and further in view of Kamerman as recited above disclose that the first information that is included in the first message comprises the first message address as indicated in the rejection of claim 1 above with reference to the first message address of the destination, therefore the first message address data is included in the actual message when transmitted by the master to the slave transceiver.

Yamano expressly teaches that including a destination address in the preamble portion of the data packet, which precedes the data portion, will advantageously reduce processing requirements of receiving devices because the receiving device can filter out packets which it does not need to demodulate. Yamano at 20:54-59 ("When the preamble in a burst-mode packet *includes the destination address of the packet*, the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits.").

D.) Claim 21 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Snell in view of Harris 4064.4, further in view of the Admitted Prior Art, further in view of Upender, further in view of Yamano and further in view of Kamerman.

1. A master communication device configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device,
the master communication device comprising:
a master transceiver configured to transmit a first message over a communication medium from the master transceiver to the one or more slave transceivers,

Snell discloses a master communication device (transceiver 30) that serves as an access point for communicating data with other transceivers connected to a wireless local area network (WLAN) and is configured to communicate with one or more slave transceivers (end users connect to LAN through transceivers) according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device. *See, e.g.*, Snell at 1:34-46,1:47-50,1:55-57, 2:27-30, 4:42-47, 5:18-21; Harris AN9614 at 3.

Snell at 4:42-47 ("Referring to FIG. 1, a ***wireless transceiver 30*** in accordance with the invention is first described. The *transceiver 30 may be readily used for WLAN applications* in the 2.4 GHZ ISM band in accordance with the proposed IEEE 802.11 standard. Those of skill in the art will readily recognize other applications for the transceiver 30 as well."

"In a typical WLAN, ***an access point provided by a transceiver*****, that is, a combination transmitter and receiver,** connects to the wired network from a fixed location. Accordingly, the access transceiver receives, buffers, and transmits data between the WLAN and the wired network. *A single access transceiver can support a small group of collocated users within a range of less than about one hundred to several hundred feet.* *The* ***end users connect to the WLAN through transceivers*** which are typically implemented as PC cards in a notebook computer, or ISA or PCI cards for desktop computers. Of course the transceiver may be integrated with any device, such as a hand-held computer." Snell at 1:34-46.

"Like the HSP3824 baseband processor, the high data rate baseband processor 40 of the invention contains all of the functions necessary for a full or half duplex packet baseband *transceiver*." Snell at 5:18-21.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

> *See also, e.g.*, Snell at 2:27-30 ("It is another object of the invention to provide *a spread spectrum transceiver* and associated method to permit operation at higher data rates and which may switch on-the-fly between different data rates and/or formats."); Snell at 1:47-50 ("The assignee of the present invention has developed and manufactured a set of integrated circuits for a WLAN under the mark PRISM 1 which is compatible with the proposed IEEE 802.11 standard."); Snell at 4:42-47 ("Referring to FIG. 1, a *wireless transceiver 30* in accordance with the invention is first described. The *transceiver 30 may be readily used for WLAN applications* in the 2.4 GHZ ISM band in accordance with the proposed IEEE 802.11 standard. Those of skill in the art will readily recognize other applications for the transceiver 30 as well."
>
> Snell incorporates by reference Harris AN9614[13], which discloses that the communications between transceivers can operate according to a polled (*i.e.*, master/slave) protocol, which is a master/slave communication system.[14] *See e.g.*, Harris AN9614 at 3.
>
> "[T]he controller can keep adequate time to operate either a polled or a time allocated scheme. In these modes, the radio is powered off most of the time and only awakens when communications is expected. This station would be awakened periodically to listen for a beacon transmission. The beacon serves to reset the timing and to alert the radio to traffic. If traffic is waiting, the radio is instructed when to listen and for how long. In **a polled scheme**, the remote radio can respond to the poll with its traffic if it has any. With these techniques, the average power consumption of the radio can be reduced by more than an order of magnitude while meeting all data transfer objectives." Harris AN9614 at 3.

With respect to the '<u>slave communication from a slave device to the master communication device occurring in response to a master communication from the master communication device to the slave device</u>',

> **Applicants' Admitted Prior Art[15] discloses a communication device capable of communication according to a master/slave relationship in which a slave**

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[13] Snell expressly incorporates by reference "the entire disclosure" of Harris AN9614 (Snell at 5:2-7). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

[14] A polled protocol is a master/slave protocol, as confirmed by the '228 patent. '228 patent at 4:30-34. *See also* IPR2014-00892, Pap. 46 at 16 ("In [a polling] protocol, a centrally assigned master periodically sends a polling message to the slave nodes, giving them explicit permission to transmit on the network."); '228 Prosecution History at 352; IPR2014-00892, Ex.1323 (Goodman Declaration) Para124.

[15] In IPR2014-00892, the Board found that the '228's disclosed multipoint communication systems or master/slave systems, depicted in '228 patent, Figures 1and2 and 3:64-5:7 is material that may be used as prior art against the patent under §103. IPR2014-00892, Pap. 46 (Final Written Decision) at 13-14; *see Pharmastem Therapeutics, Inc. v.*

communication from a slave to a master occurs in response to a master communication from the master to the slave. *See, e.g.,* **'228 at 3:64- 5:7, Figs. 1, 2.**

For example, the '228 patent discloses a prior art system with master and tributary (slave) transceivers, as shown in Figures 1 and 2 (depicted below).

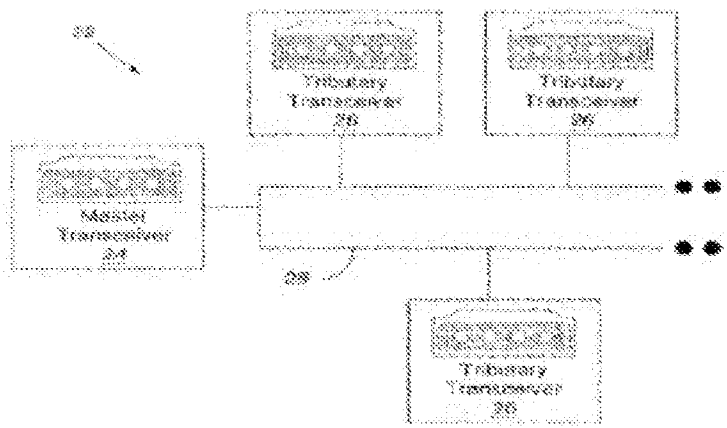


FIG. 1
Prior Art

'228 at Fig. 1.

Viacell, Inc., 491 F.3d 1342, 1362 (Fed. Cir. 2007) ("Admissions in the specification regarding the prior art are binding on the patentee for purposes of a later inquiry into obviousness."); *Constant v. Advanced Micro-Devices, Inc.,* 848 F.2d 1560, 1570 (Fed.Cir.1988) ("A statement in the patent that something is in the prior art is binding on the applicant and patentee for determinations of anticipation and obviousness."). As explained in Section 111.E, a POSIT A would have been motivated and found it obvious and straightforward to use the Applicant's Admitted Prior Art of a master/slave communication system *(see* '228 patent at 3:64-5:7, Figs. 1, 2) in implementing Snell's communication system (as implemented in light of Harris 4064.4).

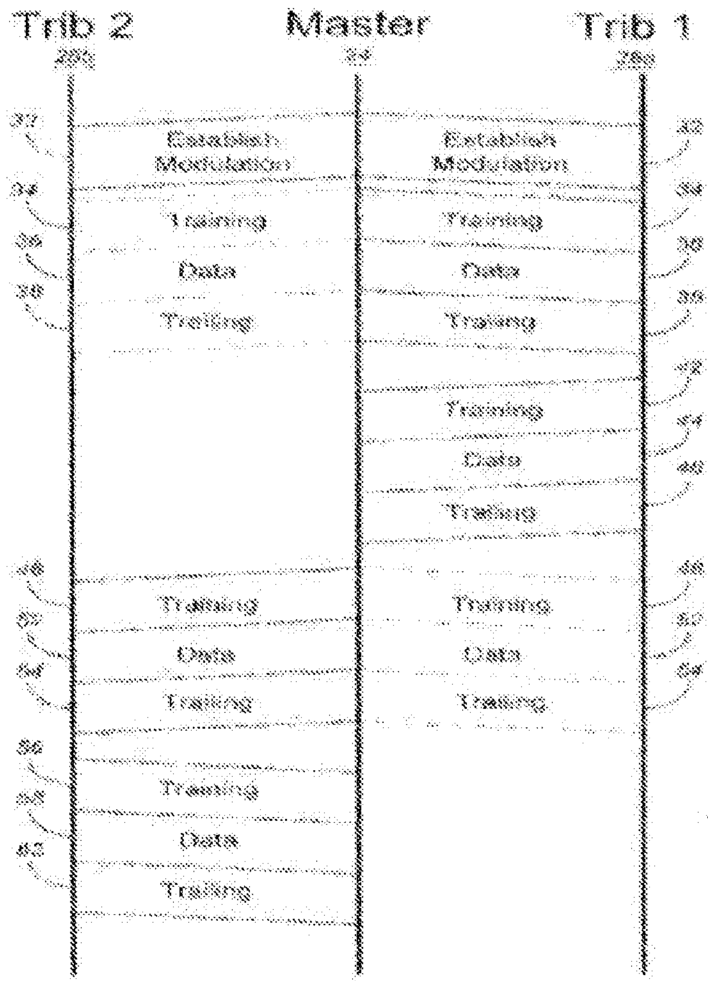


FIG. 2

'228 at FIG 2.

> "With reference to *FIG. 1, a prior art multipoint communication system 22 is shown to comprise a master modem or transceiver 24, which communicates with a plurality of tributary modems (tribs) or transceivers 26-26 over communication medium 28.* Note that all tribs 26-26 are identical in that they share a common modulation method with the master transceiver 24. Thus, before any communication can begin in multipoint system 22, the master transceiver and the tribs 26-26 must agree on a common modulation method. If a common modulation method is found, the master transceiver 24 and a single trib 26 will then exchange sequences of signals that are particular subsets of all signals that can be communicated via the agreed upon common modulation method. These sequences are commonly referred to as training signals and can be used for the following purposes: 1) to confirm that the common modulation method is available, 2) to establish received signal level compensation, 3) to establish time recovery and/or carrier recovery, 4) to permit channel equalization and/or echo cancellation, 5) to exchange parameters for optimizing performance and/or to select optional features, and 6) to confirm agreement with regard to the foregoing

purposes prior to entering into data communication mode between the users. In a multipoint system, the address of the trib with which the master is establishing communication is also transmitted during the training interval. At the end of a data session a communicating pair of modems will typically exchange a sequence of signals known as trailing signals for the purpose of reliably stopping the session and confirming that the session has been stopped. In a multipoint system, failure to detect the end of a session will delay or disrupt a subsequent session. Referring now to FIG. 2, an exemplary multipoint communication session is illustrated through use of a ladder diagram. *This system uses polled multipoint communication protocol. That is, a master controls the initiation of its own transmission to the tribs and permits transmission from a trib only when that trib has been selected.* At the beginning of the session, the master transceiver 24 establishes a common modulation as indicated by sequence 32 that is used by both the master 24 and the tribs 26a, 26b for communication. Once the modulation scheme is established among the modems in the multipoint system, The master transceiver 24 transmits a training sequence 34 that includes the address of the trib that the master seeks to communicate with. In this case, the training sequence 34 includes the address of trib 26a. As a result, trib 26b ignores training sequence 34. After completion of the training sequence 34, master transceiver 24 transmits data 36 to trib 26a followed by trailing sequence 38, which signifies the end of the communication session. Similarly, with reference to FIG. 8, the sequence 170 illustrates a Type A modulation training signal, followed by a Type A modulation data signal. Note that trib 26b ignores data 36 and trailing sequence 38 as it was not requested for communication during training sequence 34. At the end of trailing sequence 38, trib 26a transmits training sequence 42 to initiate a communication session with master transceiver 24. *Because master transceiver 24 selected trib 26afor communication as part of training sequence 34, trib 26a is the only modem that will return a transmission.* Thus, trib 26a transmits data 44 destined for master transceiver 24 followed by trailing sequence 46 to terminate the communication session.

The foregoing procedure is repeated except master transceiver identifies trib 26b in training sequence 48. In this case, trib 26a ignores the training sequence 48 and the subsequent transmission of data 52 and trailing sequence 54 because it does not recognize its address in training sequence 48. Master transceiver 24 transmits data 52 to trib 26b followed by trailing sequence 54 to terminate the communication session. Similarly, with reference to FIG. 8, sequence 172 illustrates a Type A modulation signal, with notification of a changes to Types B, followed by a Types B modulation data signal. To send information back to master transceiver 24, trib 26b transmits training sequence 56 to establish a communication session. *Master transceiver 24 is conditioned to expect data only from trib 26b because trib 26b was selected as part of training sequence 48.* Trib 26b transmits data 58 to master transceiver

wherein the first message comprises:
first information modulated according to a first modulation method,

Snell discloses that the master transceiver transmits a first message (PLCP header and PLCP preamble, figure 3 annotated below) which comprises first information modulated according to a first modulation method (BPSK), *See, e.g.,* **Snell at Abstract, 1:34-46,**

1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14, 7:6- **8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.**

second information, including a payload portion, modulated according to the first modulation method,

Snell discloses that the master transceiver transmits second information, including a payload portion (MPDU, figure 3), modulated according to the first modulation method (BPSK), *See, e.g.,* **Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14,** 7:6- **8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.**

wherein the second information comprises data intended for one of the one or more slave transceivers and

Snell discloses that the second information (MPDU) comprises data intended for one of the one or more slave transceivers. *See, e.g.,* **Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66, 7:1-2, 7:5-14,** 7:6- **8, Figs. 2, 3; Harris AN9614 at 3; Harris 4064.4 at 14, 15, 16, Fig. 10.**

With reference to Figure 3 (annotated below) which depicts a message from the master transceiver, a first message includes a PLCP header and PLCP preamble, the MPDU corresponds to second information which is transmitted to the respective slave transceiver.

Snell discloses the transceiver transmitting a "first message" comprising "first information" (*e.g.*, PLCP preamble and PLCP header) "modulated according to a first modulation method" (*e.g.*, BPSK) and "second information, including a payload portion" (*e.g*, MPDU data) "modulated according to the first modulation method" (*e.g*, BPSK) (as depicted in Figure 3 below). Snell alternatively discloses modulating the "first information" (*e.g*, PLCP preamble and PLCP header) and "second information, including a payload portion" (*e.g*, MPDU data) according to DBPSK which also is a "first modulation method."

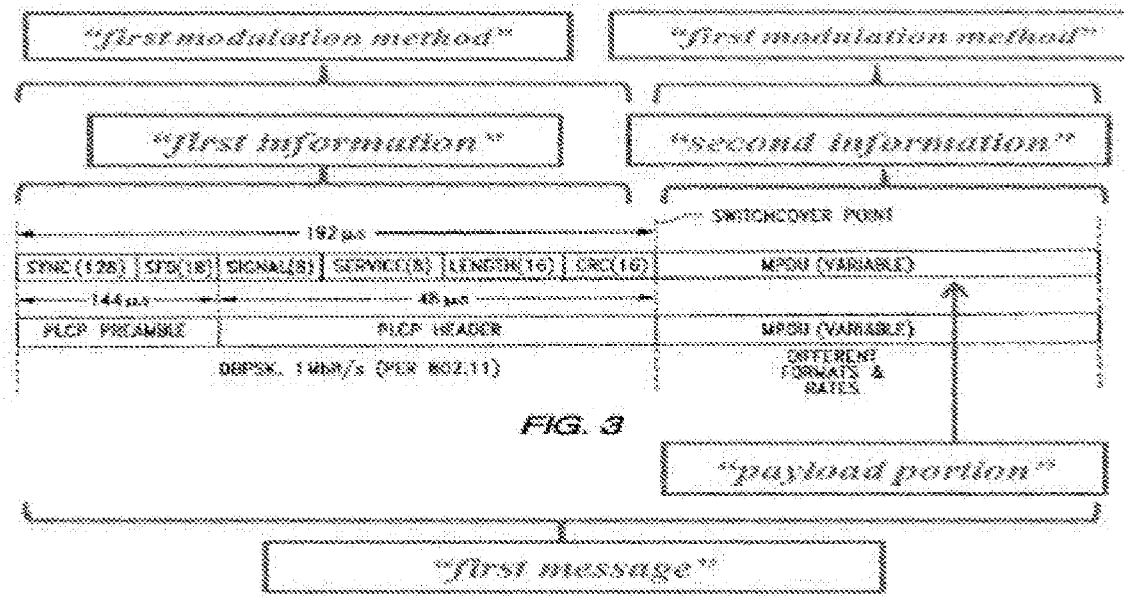


FIG. 3

Snell at Fig. 3 (annotated).

"The ***header may always be BPSK***." Snell at 6:35-36.

Snell discloses that the "**SIGNAL" in the PLCP header indicates** (*e.g.*, using "OAh") the **modulation type** (*e.g.*, BPSK) **used for modulating the MPDU data portion**.

"Now relating to the PLCP header 91, the SIGNAL is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

Snell at 6:52-59.

"SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and is the variable data scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. The **variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate,** and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

"The modulator preferably comprises means for *operating in one of a biphase PSK (BPSK) modulation mode at a first data rate defining a first format,* and a quadrature PSK (QPSK) mode at a second data rate defining a second format." Snell at 2:56-59.

"In particular, the HSP3824 baseband processor manufactured by Harris Corporation *employs quadrature or bi-phase phase shift keying (QPSK or BPSK) modulation schemes."* Snell at 1:58-61.

See also, e.g., Snell at Abstract ("The modulator and demodulator are each preferably operable *in one of a bi-phase PSK (BPSK) mode* at a first data rate and *a quadrature PSK (QPSK) mode* at a second data rate. These formats may also be switched on-the-fly in the demodulator."), 2: 15-17 ("**Moreover, a WLAN application, for example, may require a change between *BPSK and QPSK* during operation,** that is, on-the-fly.").

"The PLCP preamble and PLCP header are always* at 1 Mbit/s, *Diff encoded, scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"The modulator may also preferably include header modulator means for modulating data packets to include *a header at a predetermined modulation and a third data rate defining a third format .... The third format is preferably differential BPSK."* Snell at 2:61-3:5. "The reference phase for the first symbol of the *MPDU* is the output phase of the last symbol of the header/or *Diff Encoding."* Snell at 7:6-8.

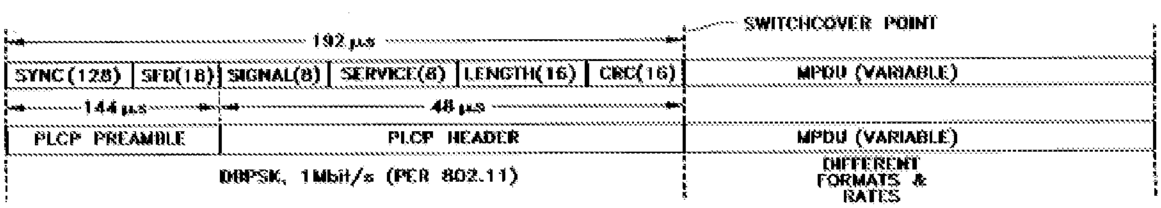


FIG. 3

Snell Figure 3

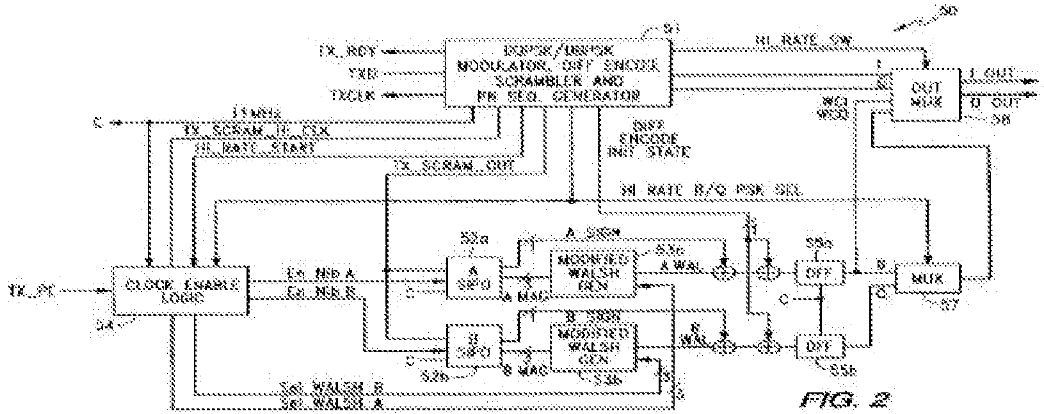


FIG. 2

Snell Figure 2

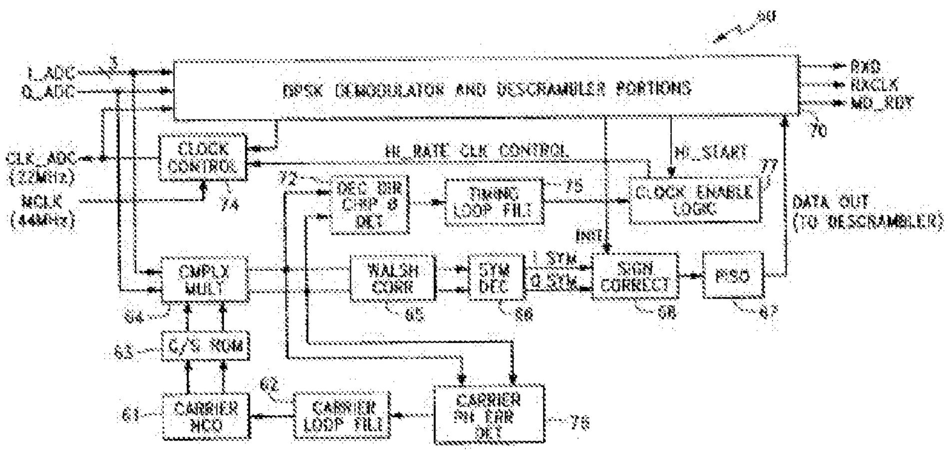


FIG. 5

Snell Figure 5

Snell incorporates by reference Harris 4064.4,[16] which discloses:

"The preamble and header are always transmitted as DBPSK waveforms while the ***data packets can be configured to be either DBPSK*** **or DQPSK**." Harris 4064.4 at 14.

"The *preamble is always transmitted as a DBPSK* waveform with a programmable length of up to 256 symbols long." Harris 4064.4 at 15.

[16] Snell expressly incorporates by reference "the entire disclosure" of Harris 4064.4 (Snell at 5:8-17, 5:31-33). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

> *"Signal Field (8 Bits) - This field indicates whether the data packet that follows the header is modulated as DBPSK* or DQPSK. In mode 3 the HSP3824 receiver looks at the signal field to determine whether it needs to switch from DBPSK demodulation into DQPSK demodulation at the end of the always DBPSK preamble and header fields." Harris 4064.4 at 15.
>
> "Mode 3 - In this mode the preamble is programmable up to 256 bits (all l's). The header in this mode is using all available fields. *In mode 3 the signal field defines the modulation type of the data packet (DBPSK* or DQPSK) so the receiver does not need to be preprogrammed to anticipate one or the other. In this mode the device checks the Signal field for the data packet modulation and it switches to DQPSK if it is defined as such in the signal field. *Note that the preamble and header are always DBPSK* the modulation definition applies only for the data packet." Harris 4064.4 at 16.
>
> *See also, e.g.,* Harris 4064.4 at 14 ("The HSP3824 transmitter is designed as a Direct [17] Sequence Spread Spectrum DBPSK/DQPSK modulator."), Harris 4064.4 at 14 ("The modulator is capable of switching rate automatically in the case where the preamble and header information are DBPSK modulated, and the data is DQPSK modulated."), Harris 4064.4 at FIGURE 10.

To the extent that it is deemed that Harris 4064.4 should be treated as independent reference from Snell, one of ordinary skill in the art at the time the invention was made would have been motivated and found it obvious and straightforward to use Harris 4064.4' s teachings of modulating the preamble and header portions of a data packet using DBPSK modulation and modulating the payload portion of the data packet using DBPSK or DQPSK modulation (as indicated by the SIGNAL field in the header portion) to advantageously provide for switching between DBPSK and DQPSK modulation types in implementing an IEEE 802.11 system *(see* Harris 4064.4 at 1, 3) such as disclosed in Snell. Harris 4064.4 is incorporated by reference into Snell (Snell at 5: 13-17), both references are directed to the PRISM chipset and HSP 3824 baseband processor (Harris 4064.4 at l; Snell at 1:47-63, 5:8-17,5 :31-33), and Harris 4064.4 is a publication of Harris Corporation, the same original assignee of Snell.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Harris 4064.4 with the teachings of Snell, in light of the foregoing including Snell's express direction to apply the teachings of Harris 4064.4, and further because, in

[17] Snell expressly incorporates by reference "the entire disclosure" of Harris 4064.4 (Snell at 5:8-17, 5:31-33). *See Harari v. Lee,* 656 F.3d 1331, 1335-36 (Fed. Cir. 2011) ("the entire '579 application disclosure was incorporated by the broad and unequivocal language: 'The disclosures of the two applications are hereby incorporate[d] by reference.'"); *see also Advanced Display Sys., Inc. v. Kent State Univ.,* 212 F.3d 1272, 1282 (Fed.Cir.2000) ("material not explicitly contained in the single, prior art document may still be considered for purposes of anticipation if that material is incorporated by reference into the document.").

combination, each element (Harris 4064.4's teaching of modulating the preamble and header portions of a data packet using DBPSK modulation and modulating the payload portion of the data packet using DBPSK or DQPSK modulation and Snell's communication system for transmitting data packets modulated using different modulation methods) performs the same function as it would separately, yielding nothing more than predictable results. *KSR,* 550 U.S. at 417. One of ordinary skill in the art would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected and for these reasons, would have been motivated and found it obvious and straightforward to use Harris 4064.4's teachings in implementing Snell's communication system.

One of ordinary skill in the art would have additionally been motivated and found it obvious and straightforward to use Harris AN9614's teaching of a polled (master/slave) protocol in implementing the communication system taught by Snell (in light of Harris 4064.4). Harris AN96l 4 is incorporated by reference into Snell (Snell at 5 :2-7), both references are directed to the PRISM chipset and HSP 3824 baseband processor (Harris AN9614 at 1, 2; Snell at 1:47-63, 5:8-17, 5:31-33), and Harris AN9614 is a publication of Harris Corporation, the same original assignee of Snell. Moreover, AN9614 expressly teaches that it is beneficial to use a polled (master/slave) protocol because "the average power consumption of the radio can be reduced by more than an order of magnitude while meeting all data transfer objectives." Harris AN9614 at 3. Polling (master/slave) enables this reduction in power consumption because "the system can be set at its sleep mode most of the time to achieve low power consumption. It only needs to operate at full power consumption during the transmission of a packet or during the expected window for received packets." Harris AN9614 at 3. In addition to Snell's express suggestion to apply Harris AN9614's disclosures, one of ordinary skill in the art would have been motivated to use Harris AN9614's teaching of a polled (master/slave) protocol in implementing Snell's communication system (implemented in light of Harris 4064.4, *see supra)* because a polled (master/slave) communication system advantageously provides a simple protocol that has good determinacy *(e.g.,* a reduction in collisions). It would have been routine for one of ordinary skill in the art to use a polled (master/slave) protocol in implementing Snell's communication system (as implemented in light of Harris 4064.4), as master/slave communication systems were common and well-known in the art *(see* '228 patent at 3: 64- 5:7), and thus implementing a polled (master/slave) protocol in Snell's transceiver (which serves as an access point to support communications with multiple other transceivers - Snell at I :34-46) would involve nothing more than using common and known techniques to improve a similar system in the same way to yield predictable results. *KSR,* 550 U.S. at 416. One of ordinary skill in the art would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, one of ordinary skill in the art would have been motivated and found it obvious and straightforward to implement a polled (master/slave) protocol in implementing Snell's system (as implemented in light of Harris 4064.4).

It would have further been obvious to one of ordinary skill in the art at the time the invention was made and one would have been motivated and found it obvious and straightforward to use the Applicant's Admitted Prior Art of a master/slave communication system *(see* '228 patent at 3:64-5:7, Figs. 1, 2) in implementing Snell's communication system because a polled (master/slave) communication system was a popular communication protocol with recognized benefits prior to the earliest claimed priority date.

Snell is in the same field of art as the Admitted Prior Art, with both relating to a communication system among transceivers. *See, e.g.,* Snell at 1 :34-46; Harris AN9614 at 3 *(see also* Snell at 5 :2-7); '228 patent at 3:64-4:1. Snell further incorporates by reference Harris AN9614 (Snell at 5:2-7), which is an application note for the Harris PRISM chipset and HSP3824 baseband processor described in Snell. Harris AN9614 at 1 ("Using the *PRISM™ Chip Set ... "),* 2 *("The HSP3824* performs the baseband demodulation function."); Snell at 5:30-32 *("The present invention provides an extension of the PRISM I product ...* "), 5: 11-13 *("The conventional Harris PRISM I chip set includes* a low data rate DSS baseband processor available under the designation *HSP3824).* Harris AN9614 expressly teaches that the communications between Snell's transceivers may operate according to a "polled" (master/slave) protocol. *See, e.g.,* Harris AN96 l 4 ("the controller can keep adequate time to operate either a *polled* or time allocated *scheme.").* Similarly, the admitted prior art in the '228 patent also describes using a *"polled* multipoint communication protocol," which is a master/tributary *(i.e.,* master/slave) system. '228 patent at 4:30-33. As shown in Fig. 1 below, the admitted prior art of the '228 patent discloses a master transceiver 24 that communicates with a plurality of tributary transceivers 26. '228 patent at 3:64-4:3, Fig. 1.

Upender is in the same field of art as Snell, with both relating to protocols for communications over a network. *See, e.g.,* Upender at 7 ("let's examine various *commonly available media access protocols"),* 7 *("In this protocol,* a centrally assigned master sends a polling message to the slave nodes, giving them explicit permission *to transmit on the network.").* Upender further confirms that a person of ordinary skill in the art would be motivated to use a master/slave protocol in implementing the teachings of Snell (as implemented in light of Harris 4064.4). Upender discusses a finite list of well-known communications protocols applicable for use in a network setting, including a polled (master/slave) protocol, and expressly teaches benefits of using a polled (master/slave) protocol. For example, Upender teaches that *"[p]olling is one of the more popular protocols* for embedded systems *because of it simplicity and determinacy.* In this protocol, a centrally assigned master periodically polls the slave nodes for information." Upender at 7; *see also* IPR2014-00892, Pap. 46 at 16-17 (citing Upender at 7 and finding that "Upender teaches that master/slave protocols were widely used and a good choice for simple systems"); '228 Prosecution History at 352-353August 26, 2016;IPR2014-00892, Ex. 1323 (Declaration of David Goodman) 1-125. While Upender discloses tradeoffs of using a master/slave protocol as compared with other communication protocols *(see* Upender at 11, Table 1),

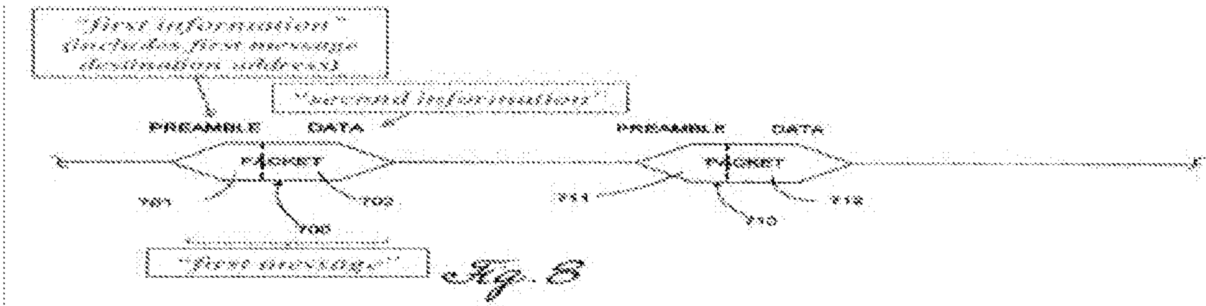
Upender expressly teaches that a protocol for a particular application should be selected in light of the respective costs and benefits of available protocols, noting that the discussion of the strengths and weaknesses of the different protocols "should allow you to select the best protocol to match your needs". Upender at 10-11; *see also* IPR2014-00892, Pap. 46 at 17 (citing Upender at 10-11 and finding that Upender does not "teach away" from using the master/slave protocol); '228 Prosecution History at 353. Upender's express teaching that a polled (master/slave) protocol is advantageous for its "simplicity and determinacy," would have motivated one of ordinary skill to use such a protocol in implementing Snell's communication system, particularly in any system in which simplicity and determinacy areimportant considerations. Upender at 7; *see also* IPR2014-00892, Pap. 46 at 16-18; '228 Prosecution History at 352-354. Upender further teaches that a polled (master/slave) protocol is *"ideal for a centralized data-acquisition system* where peer-to-peer communication and global prioritization are not required," such as Snell's centralized data-acquisition system comprising an access point transceiver supporting a group of transceivers which does not require communicating using peer-to-peer communication or global prioritization. *See* Snell at 1 :34-46.

In addition, the Admitted Prior Art demonstrates that polled (master/slave) protocols were well-known *(see* '228 patent at 3:64-4:1), as also further confirmed by Upender *(see* Upender at 7 ("let's examine various *commonly available media access protocols"),* 7 *("polling [(master/slave)} is one of the more popular protocols"),* and thus implementing a polled (master/slave) protocol in Snell's transceiver (as implemented in light of Harris 4064.4), which serves as an access point to support communications with multiple other transceivers and is also operable according to a polled (master/slave) protocol, would involve nothing more than using common and known techniques to improve a similar system in the same way to yield predictable results. *KSR,* 550 U.S. at 416. One of ordinary skill would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, one of ordinary skill would have been motivated and found it obvious and straightforward to implement the admitted prior art of a master/slave communication system in implementing Snell's system (as implemented in light of Harris 4064.4).

first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information; and

> **Snell does not expressly disclose** *the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information.*
>
> Yamano teaches that packets can be advantageously addressed for an intended destination. Yamano discloses transmitting a "first message" *(e.g.,* data packet including a preamble and main body) that includes "first message address information that is indicative" *(e.g.,* "destination address" in the preamble) of the transceiver that is the "intended destination of the second information."
>
> *"Packet 700* includes a *preamble 701* and a *main body 702."* Yamano at 19:63-64.
>
> "For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) ***packet source and destination addresses,*** (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20:1-7.

Yamano also discloses that the preamble precedes the main body (containing data), as shown in Figure 8. Yamano teaches that the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information. *See, e.g.,* Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.



Yamano at Fig. 8 (annotated).

Snell and Yamano are in the same field of art, with both relating to transmitting data packets over a network *(see, e.g.,* Snell at 1:55-58, 2:61-63, 2:66-3:3, 5:18-21, 6:48-63, Fig. 3; Yamano at 1: 1-29, 19:54-20:33, Fig. 8), at varying rates *(see, e.g.,* Snell at 2: 15-17, 6:52-59; Yamano at 19:54-56). Yamano expressly teaches that including a destination address in the preamble portion of the data packet, which precedes the data portion, will advantageously reduce processing requirements of receiving devices because the receiving device can filter out packets which it does not need to demodulate. Yamano at 20:54-59 ("When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits.").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing Snell's data packet implemented in light of Harris 4064.4 and Harris AN9614 comprising preamble, header, and MPDU data portions to advantageously specify which receiver the data is intended for and to beneficially reduce the processing requirements at the receiving device, as taught by Yamano. "When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

In addition, Snell teaches structuring its data packet to include a preamble, header, and MPDU data portion *(see, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-14, Fig. 3), and Yamano teaches structuring its data packet to also include a preamble and data portion, and to place the destination address in the preamble portion (Yamano at 19:63-20:7, Fig. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a destination address in the preamble portion of a data packet, as taught by Yamano, in implementing Snell's system implemented in light of Harris 4064.4 and Harris AN9614 for transmitting data packets between transceivers, as Snell teaches that its data packet already includes a preamble portion-and in combination, each element (Yamano' s teaching of placing a destination address in the preamble and Snell's teaching of a system for communicating data packets modulated according to different modulation methods between transceivers) performs the same function as it would separately, yielding nothing more than predictable results. *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 417 (2007). One of ordinary skill in art at the time the invention was made would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, a person of ordinary skill would have been motivated and found it obvious and straightforward to use the teachings of Yamano including a destination address in the preamble of a data packet in implementing Snell's communication system.

Snell in view of Harris 4064.4 and Harris AN9614 in view of Yamano thus teach that the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information. *See, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-10, Fig. 3; Harris 4064.4 at 14; Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

said master transceiver configured to transmit a second message over the communication medium from the master transceiver to the one or more slave transceivers wherein the second message comprises:

third information modulated according to the first modulation method,
wherein the third information comprises information that is indicative of an impending change in modulation to a second modulation method, and

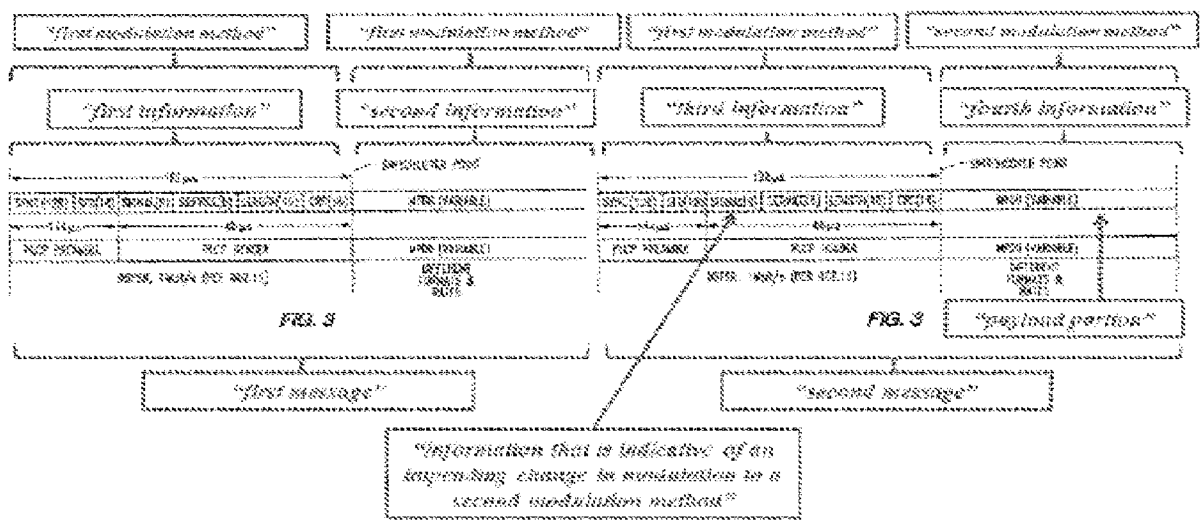
fourth information, including a payload portion, transmitted after transmission of the third information,
the fourth information being modulated according to the second modulation method,
the second modulation method being of a different type than the first modulation method,
wherein the fourth information comprises data intended for a single slave transceiver of the one or more slave transceivers, and

As noted above, Snell discloses that the transceiver transmits data packets to multiple different end user slave transceivers, as such multiple messages of format shown in figure 3 are provided to the slave transceivers and where the communication may switch on-the-fly between a "first modulation method" *(e.g.,* BPSK) and a "second modulation method"

(*e.g.,* QPSK) that is "of a different type than the first modulation method." **Snell thus teaches transmitting a "first message" and a "second message" as shown in annotated Figure 3 below.** *See, e.g.,* Snell at 1:34-46, 1:47-50, 1:55-57, 2:27-30, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-
66, 7:1-2, 7:5-14, Fi s. 2, 3, 5; Harris AN9614 at 3; Harris 4064.4 at**14-16, Fig. 10**

For example, Snell discloses a "transceiver" that serves as an access point for communicating "data intended for a [transceiver]" connected to a wireless local area network (WLAN). *See* claim 1 preamble.

Snell also discloses that the transceiver transmits data packets to another transceiver, where the communication may switch on-the-fly between a "first modulation method" (*e.g.,* BPSK) and a "second modulation method" (*e.g.,* QPSK) that is "of a different type than the first modulation method." Snell thus teaches transmitting a "first message" and a "second message" as shown in annotated Figure 3 below.



Snell Figure 3 Annotated (page 54 Request)

Snell teaches communicating multiple data packets with the ability to "switch on-the-fly between different data rates and/or formats" as noted above, based on this disclosure, a person of ordinary skill in the art would have understood that Snell teaches that a series of packets may be sent that switch from using a first modulation method to using a second modulation method for the payload portion of the data packet. For example, the "first message" in Snell comprises "first information" (*e.g.,* PLCP preamble and PLCP header) that is "modulated according to a first modulation method" (*e.g.,* BPSK) where the "first information" (*e.g.,* "SIGNAL" field in PLCP header) indicates (*e.g.,* using "OAh") the modulation type (*e.g.,* BPSK) used for modulating "second information" (*e.g.,* MPDU data). In the "first message," the "SIGNAL" field in the PLCP header uses a code (*e.g.,* "OAh") that indicates that the "second information" (*e.g.,* MPDU data) is modulated "according to the first modulation method" (*e.g.,* BPSK at 1 Mbit/s).

Snell's transceiver can transmit a "second message" comprising "third information" *(e.g.,* PLCP preamble and PLCP header) "modulated according to the first modulation method" *(e.g.,* BPSK) where the "third information comprises information" *(e.g.,* "SIGNAL" field in PLCP header) "that is indicative of an impending change in modulation" *(e.g.,* using "l 4h") "to a second modulation method" *(e.g.,* QPSK) used for modulating "fourth information." For example, in the "second message," the "SIGNAL" field in the PLCP header uses a code *(e.g.,* "14h") that indicates that the "fourth information" *(e.g.,* MPDU data) is modulated "according to the second modulation method" *(e.g.,* QPSK at 2 Mbit/s), wherein the "second modulation method" is of a "different type than the first modulation method." This "SIGNAL" is "indicative of an impending change" from the "first modulation method" to the "second modulation method" because it is indicating a change from, for example, QPSK modulation to BPSK modulation. In addition, transmitting the data using the "second modulation method"- QPSK-results in a data rate of 2 Mbit/s which is higher than transmitting the data using the "first modulation method " BPSK at 1 Mbit/s.

"The modulator may also preferably include header modulator means for modulating *data packets."* Snell at 2:61-63.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum, *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

"It is another object of the invention to provide a spread spectrum transceiver and associated method to permit operation at higher data rates and *which may switch on-the-fly between different data rates and/or formats."* Snell at 2:27-30.

"The variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and *while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly."* Snell at 7: 10-14.

"The *header* may always be *BPSK."* Snell at 6:35-36.

"Now relating to the *PLCP header* 91, *the SIGNAL* is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and *is the variable data* scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output

phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. *The variable data may be modulated and demodulated in different formats* than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

Snell describes that the "first modulation method" may be BPSK and the "second modulation method" may be QPSK, which is of a different "type" than the first modulation method, and alternatively describes that the "first modulation method" may be differential BPSK ("DBPSK") and that the "second modulation method" may be differential QPSK ("DQPSK"), which is also of a different "type" than the first modulation method.

Thus, Snell alternatively describes modulating the "first information" *(e.g.,* PLCP preamble and PLCP header) according to a "first modulation method" *(e.g.,* DBPSK) and "second information" *(e.g.,* MPDU data) according to either a "first modulation method" *(e.g.,* DBPSK) or "second modulation method" *(e.g.,* QBPSK).

"The PLCP preamble and PLCP header are always at 1 Mbit/s, *Diff encoded,* scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"The modulator may also preferably include header modulator means for modulating data packets to include *a header at a predetermined modulation and a third data rate defining a third format .... The third format is preferably differential BPSK."* Snell at 2:61-3:5.

"The reference phase for the first symbol of the *MPDU* is the output phase of the last symbol of the header/or *Diff Encoding."* Snell at 7:6-8. *See also, e.g.,* Snell at Figs. 2, 3, 5.

Snell incorporates by reference Harris 4064.4, 17 which discloses: *"The preamble and header are always transmitted as DBPSK* waveforms while the *data packets can be configured to be either DBPSK or DQPSK."* Harris 4064.4 at 14.

"The *preamble is always transmitted as a DBPSK* waveform with a programmable length of up to 256 symbols long." Harris 4064.4 at 15.

"Signal Field (8 Bits) - This field indicates whether the data packet that follows the header is modulated as DBPSK or DQPSK. In mode 3 the HSP3824 receiver looks at the signal field to determine whether it needs to switch from DBPSK demodulation into DQPSK demodulation at the end of the always DBPSK preamble and header fields." Harris 4064.4 at 15.

"Mode 3 - In this mode the preamble is programmable up to 256 bits (all l's). The header in this mode is using all available fields. *In mode 3 the signal field defines the modulation* *type of the data packet (DBPSK* or *DQPSK)* so the receiver does not need to be preprogrammed to anticipate one or the other. In this mode the device checks the Signal field for the data packet modulation and it switches to DQPSK if it is defined as such in the signal field. *Note that the preamble and header are always DBPSK* the modulation definition applies only for the data packet." Harris 4064.4 at 16.

See also, e.g., Harris 4064.4 at 14 ("The HSP3824 transmitter is designed as a Direct Sequence Spread Spectrum *DBPSKIDQPSK* modulator."), Harris 4064.4 at 14 ("The modulator is capable of switching rate automatically in the case where the preamble and header information are DBPSK modulated, and the data is *DQPSK* modulated."), Harris 4064.4 at FIGURE 10.

Kamerman *discloses transmitting a first message including second information modulated at a first modulation method and transmitting a second message including fourth information modulated at a second modulation method***.** *See, e.g.,* **Kamerman at 6, 11, 12.**

For example, Kamerman discloses an automatic rate selection scheme for falling forward from a "first modulation method" *(e.g.,* BPSK) corresponding to a lower data rate *(e.g.,* 1 Mbit/s) to a "second modulation method" *(e.g.,* QPSK) corresponding to a higher data rate *(e.g.,* 2 Mbit/s) after a number of successive correctly acknowledge packet transmissions, for instance, where there is a low load in neighbor cells and a reliable connection.

"Then there is looked to *automatic rate control* to keep the co-channel interference at a tolerable level." Kamerman at 6.

"IEEE 802.11 DS specifies bit rates of 1 and 2 Mbps. The allowable SNR and CSIR values for reliable transmission of data packets are dependent on the bit rate." Kamerman at 11.

"IEEE 802.11 DS specifies BPSK and QPSK, in addition there could be applied proprietary modes with M-PSK and QAM schemes that provide higher bit rates by encoding more bits per symbol. ... An automatic rate selection scheme based on the reliability of the individual uplink and downlink could be applied. The basic rate adaptation scheme could be: after unacknowledged packet transmissions the rate falls back, and *after a number (e.g. JO) of successive correctly acknowledged packet transmissions the bit rate goes up."* Kamerman at 11.

"At lower load in the neighbor cells the highest bit rate can be used more often. At higher load the transmissions from the access point to stations at the outer part of the cells, will be done often at fall back rates due to mutilation of transmissions by interference. In practice the network load for LANs at nowadays client-server applications is very bursty, with sometimes transmission bursts over an individual links and low activity during the

major part of the time. *Therefore the higher bit rate can be used during the most of the time, and at high load in the neighbor cells (as will evoked by test applications) there will be switched to fall back rates in the outer part of the cell."* Kamerman at 11.

"The application of proprietary bit rates of 3 and 4 Mbps in addition to the basic 1 and 2 Mbps, can be combined with an automatic rate selection. This automatic rate selection *gives fall forward at reliable connections* and fall back at strong co-channel interference." Kamerman at 12

It was well-known in the art, as demonstrated by Kamerman, to transmit a first data packet where the data is modulated using a first modulation method, such as BPSK (corresponding to a lower data transfer rate), and to next transmit a second data packet where the data is modulated using a second modulation method, such as QPSK (corresponding to a higher data transfer rate).

One of ordinary skill in the art at the time the invention was made would have been motivated and found it obvious and straight forward to use Kamerman's teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system for communicating data packets modulated according to different modulation methods (further modified by the teaching of Yamano, as discussed above) to advantageously maximize the data transfer rate and adapt to changing channel conditions (as also taught by Kamerman). In particular, Kamerman expressly teaches that it is beneficial to transmit the data of a first data packet using a first modulation method corresponding to a lower data transfer rate *(e.g.,* BPSK modulation at 1 mbps) during higher load conditions when a more robust signal is needed due to "mutilation of transmissions by interference," and to next transmit the data of a second data packet using a second modulation method corresponding to a higher data transfer rate *(e.g.,* QPSK modulation at 2 mbps) *(i.e.,* falling forward) to maximize the data transfer rate during lower load conditions when the connection is more reliable. *See* Kamerman at 6 ("Then there is looked to *automatic rate control* to keep the co-channel interference at a tolerable level."), 11 ("The basic rate adaptation scheme could be: after unacknowledged packet transmissions the rate falls back, and *after a number (e.g. 10) of successive correctly acknowledged packet transmissions the bit rate goes up."),* 11 *("At lower load in the neighbor cells the highest bit rate can be used more often.* At higher load the transmissions from the access point to stations at the outer part of the cells, will be done at fallback rates due to mutilation of transmissions by interference. In practice the network load for LANs at nowadays client-server applications is very bursty, with sometimes transmission bursts over an individual links and low activity during the major part of the time. Therefore the higher bit rate can be used during the most of the time, and at high load in the neighbor cells ... there will be switched to fall back rates in the outer part of the cell."), 12 ("This automatic rate selection gives fall forward at reliable connections and fall back at strong cochannel interference. Therefore it gives adaptation of the bit rate to the interference as it occurs in time depending on positions as load.").

Moreover, Snell and Kamerman are in the same field of art, with both relating to communications between transceivers that use BPSK and QPSK modulation methods to transfer data at different rates according to the draft IEEE 802.11 standard available at that time. *See, e.g.,* Snell at 1:47-63 ("The assignee of the present invention has developed and manufactured a set of integrated circuits for a WLAN under the mark PRISM 1 *which is compatible with the proposed IEEE 802.11 standard .... "),* 5:31-33 ("The present invention provides an extension of the PRISM 1 product from 1 *Mbit/s BPSK and 2 Mbit/s QPSK .. .* "); Kamerman at 6 ("This paper considers the critical parameters for *wireless LANs that operate conform to the IEEE 802.11 DSSS (direct sequence spread spectrum) standard ... "),* 11 ("IEEE 802.11 DS specifies bit rates of 1 and 2 Mbps.", 11 ("IEEE 802.11 DS specifies BPSK and QPSK ... ").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kamerman' s teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system (modified in light of Yamano) for communicating data packets modulated according to different modulation methods, as both Snell and Kamerman are directed to IEEE 802.11 systems utilizing BPSK and QPSK modulation corresponding, respectively, to a lower and higher data transfer rates-and in combination, each element (Kamerman's teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method and Snell's system for communicating data packets modulated according to different modulation methods) performs the same function as it would separately, yielding nothing more than predictable results. *KSR,* 550 U.S. at 417. One of ordinary skill in the art would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected and would have been motivated and found it obvious and straightforward to use Kamerman' s teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system (modified in light of Yamano) for communicating data packets modulated according to different modulation methods.

second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information; and

Snell in view of Yamano discloses that the second message comprises second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information. *See, e.g.,* Snell at 1:55-57, 2:61-63, 6:35-36, 6:64-66, 7:5-14, Fig. 3; Harris 4064.4 at 14; Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

For example, Snell discloses transmitting a "second message" including a PLCP preamble and PLCP header, and MPDU data, as shown in Figure 3 below.

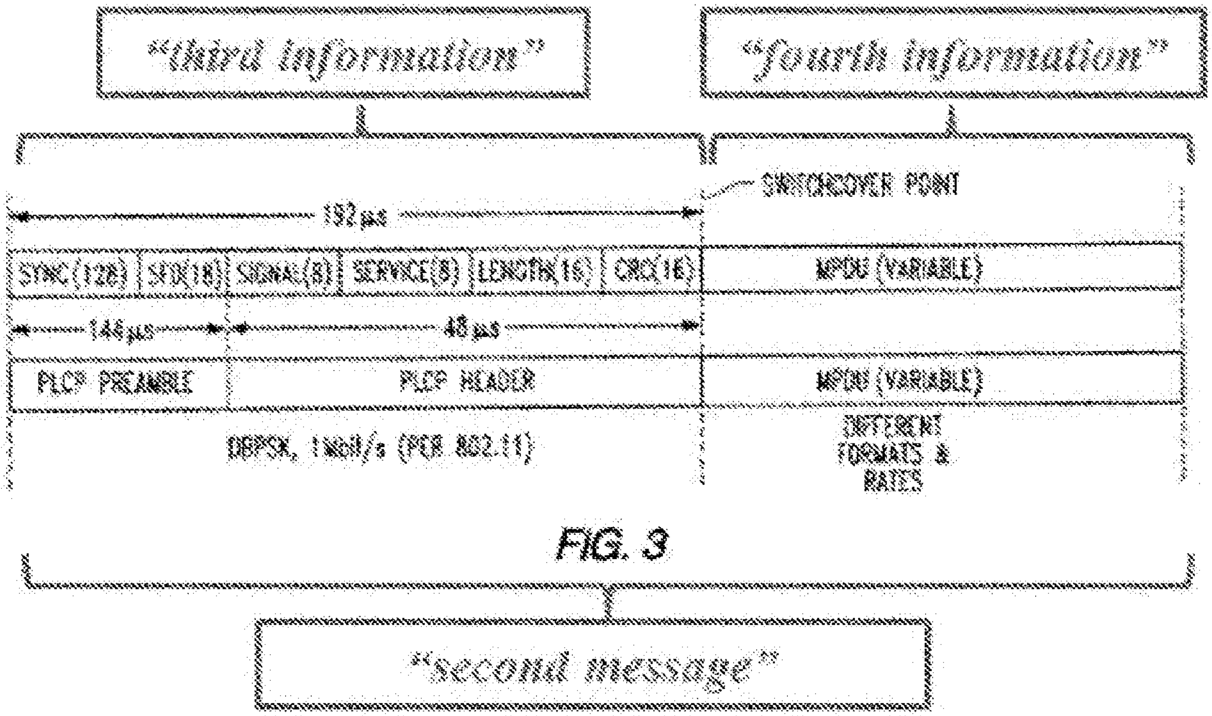


FIG. 3

Snell at Fig. 3 (annotated).

"The modulator may also preferably include header modulator means for modulating *data packets*" Snell at 2:61-63.

"The PRISM 1 chip set provides all the functions necessary for full or half duplex, direct sequence spread spectrum, *packet communications* at the 2.4 to 2.5 GHz ISM radio band." Snell at 1:55-57.

"The *header* may always be BPSK." Snell at 6:35-36.

"The *PLCP preamble and PLCP header* are always at 1 Mbit/s, Diff encoded, scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"*MPDU* is serially provided by Interface 80 and *is the variable data* scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. *The variable* *data* may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14.

Snell incorporates by reference Harris 4064.4,[19] which discloses:

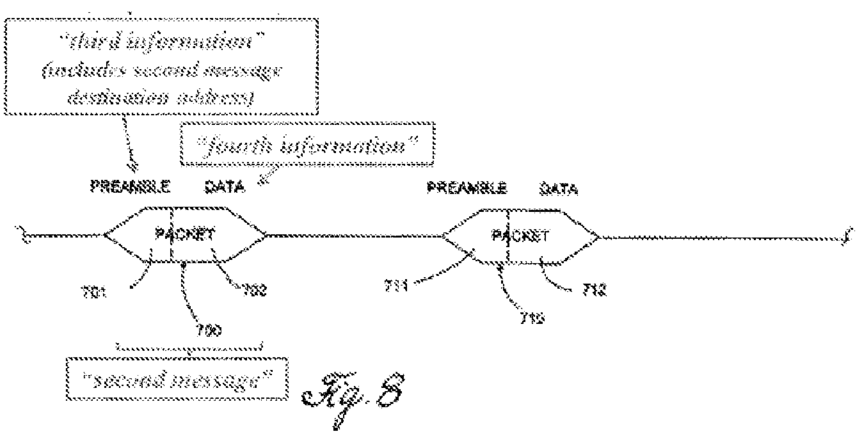
"The *preamble and header* are always transmitted as DBPSK waveforms while the *data packets* can be configured to be either DBPSK or DQPSK." Harris 4064.4 at 14.

Yamano discloses that the second message comprises second message address information that is indicative of the single slave transceiver being an intended destination of the fourth information. *See, e.g.,* Yamano at 19:63-64, 20:1-7, 20:54-59, Fig. 8.

For example, Yamano discloses that a packet includes a preamble and main body, and that the preamble can include a destination address.

"*Packet 700* includes a *preamble 701* and a *main body 702.*" Yamano at 19:63-64.

"For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) *packet source and destination addresses,* (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20:1-7 (emphasis added).



Yamano at Figure 8 (annotated).

"When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing Snell's data packet comprising preamble, header, and MPDU data portions to advantageously specify which receiver the data is intended for and to beneficially reduce the processing requirements at the receiving device, as taught by Yamano. "When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits." Yamano at 20:54-59.

In addition, Snell teaches structuring its data packet to include a preamble, header, and MPDU data portion *(see, e.g.,* Snell at 6:35-36, 6:64-66, 7:5-14, Fig. 3), and Yamano teaches structuring its data packet to also include a preamble and data portion, and to place the destination address in the preamble portion (Yamano at 19:63-20:7, Fig. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a destination address in the preamble portion of a data packet, as taught by Yamano, in implementing Snell's system for transmitting data packets between transceivers, as Snell teaches that its data packet already includes a preamble portion-and in combination, each element (Yamano' s teaching of placing a destination address in the preamble and Snell's teaching of a system for communicating data packets modulated according to different modulation methods between transceivers) performs the same function as it would separately, yielding nothing more than predictable results. *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 417 (2007). One of ordinary skill in art at the time the invention was made would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, a person of ordinary skill would have been motivated and found it obvious and straightforward to use the teachings of Yamano including a destination address in the preamble of a data packet in implementing Snell's communication system.

wherein the second modulation method results in a higher data rate than the first modulation method.

Snell discloses that the second modulation method results in a higher data rate than the first modulation method. *See, e g.* , Snell at 5:31-33, 6:52-59, 6:64-66, 7:1-2, 7:5-14, Fig. 3; Harris 4064.4 at 16 (Table 7).

For example, Snell discloses that the second modulation method *(e.g.,* QPSK, or alternatively, DQPSK) results in a higher data rate *(e.g.,* 2 Mbit/s) than the first modulation method *(e.g.,* BPSK, or alternatively, DBPSK) which results in a data rate of 1 Mbit/s.

"The present invention provides an extension of the PRISM 1 product from *I Mbit/s BPSK and 2 Mbit/s QPSK* to 5.5 Mbit/s BPSK and 11 Mbit/s QPSK." Snell at 5:31-33

"The PLCP preamble and PLCP header are always at *I Mbit/s,* Diff encoded, scrambled and spread with an 11 chip barker." Snell at 6:64-66.

"Now relating to the PLCP header 91, the SIGNAL is:

0Ah	1 Mbit/s BPSK,
14h	2 Mbit/S QPSK,
37h	5.5 Mbit/s BPSK, and
6Eh	11 Mbit/s QPSK.

"

Snell at 6:52-59

"SIGNAL is indicated by 2 control bits and then formatted as described." Snell at 7:1-2.

"MPDU is serially provided by Interface 80 and is the variable data scrambled for normal operation. The reference phase for the first symbol of the MPDU is the output phase of the last symbol of the header for Diff Encoding. The last symbol of the header into the scrambler 51 must be followed by the first bit of the MPDU. The variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly." Snell at 7:5-14. *See also, e.g.,* Snell at Fig. 3; Harris 4064.421 at 16 (Table 7).

21. The master communication device as in claim 1, wherein the first information that is included in the first message comprises the first message address data.

Snell modified in view of Harris 4064.4, in view of Applicants admitted prior art (APA) , in view of Upender, in view of Yamano and further in view of Kamerman as recited above disclose that the first information that is included in the first message comprises the first message address as indicated in the rejection of claim 1 above with reference to the first message address of the destination, therefore the first message address data is included in the actual message when transmitted by the master to the slave transceiver.

Yamano expressly teaches that including a destination address in the preamble portion of the data packet, which precedes the data portion, will advantageously reduce processing requirements of receiving devices because the receiving device can filter out packets which it does not need to demodulate. Yamano at 20:54-59 ("When the preamble in a burst-mode packet *includes the destination address of the packet*, the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits.").

Service of Papers

After the filing of a request for reexamination by a third party requester, any document filed by either the patent owner or the third party requester must be served on the other party (or parties where two or more third party requester proceedings are merged) in the reexamination proceeding in the manner provided in 37 CFR 1.248. See 37 CFR 1.550(f).

Extensions of Time

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Amendment in Reexamination Proceedings

Patent owner is notified that any proposed amendment to the specification and/or claims in this reexamination proceeding must comply with 37 CFR 1.530(d)-(j), must be formally presented pursuant to 37 CFR 1.52(a) and (b), and must contain any fees required by 37 CFR 1.20(c).

Submissions

In order to insure full consideration of any amendments, affidavits or declarations or other documents as evidence of patentability, such documents must be submitted in response to the first Office action on the merits (which does not result in a close of prosecution). Submissions after the second Office action on the merits, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, after final rejection and by 37 CFR 41.33 after appeal, which will be strictly enforced.

Notification of Concurrent Proceedings

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a), to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving the Patent under reexamination throughout the course of this reexamination proceeding. Likewise, if present, The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Conclusion

This *ex parte* reexamination proceeding has been filed by a third party requester, or has been merged with another proceeding filed by a third party requester. Accordingly, the parties to this reexamination proceeding are reminded that, in accordance with 37 CFR 1.550(f) , any document filed by either the patent owner or the third party requester must be served on the other party in the reexamination proceeding (or parties, where two or more third party requester proceedings are merged), **in the manner provided by 37 CFR 1.248**. If the document filed with the Office does not include a proper certificate of service, the document may be refused consideration by the Office. See MPEP 2220 and 2266.03.

37 CFR 1.550(f) provides:

> *"The reexamination requester will be sent copies of Office actions issued during the ex parte reexamination proceeding. After filing of a request for ex parte reexamination by a third party requester, any document filed by either the patent owner or the third party requester must be served on the other party in the reexamination proceeding in the manner provided by § 1.248. The document must reflect service or the document may be refused consideration by the Office."*

All correspondence relating to this ex parte reexamination proceeding should be directed:

By Mail to: Mail Stop Ex Parte Reexam
Central Reexamination Unit
Commissioner for Patents
United States Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

By FAX to: (571) 273-9900
Central Reexamination Unit

By hand: Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Registered users of EFS-Web may alternatively submit such correspondence via the electronic filing system EFS-Web, at https://efs.uspto.gov/efile/myportal/efs-registered. EFS-Web offers the benefit of quick submission to the particular area of the Office that needs to act on the correspondence.

Also, EFS-Web submissions are “soft scanned” (i.e., electronically uploaded) directly into the official file for the reexamination proceeding, which offers parties the opportunity to review the content of their submissions after the “soft scanning” process is complete.
Any inquiry concerning this communication or earlier communications from the examiner, or as to the status of this proceeding, should be directed to the Central Reexamination Unit at telephone number (571) 272-7705.

/Scott L. Weaver/
Primary Examiner, Art Unit 3992

Conferees:

/Kenneth J. Whittington/
Primary Examiner, Art Unit 3992

/Hetul Patel/
Supervisory Patent Examiner, Art Unit 3992

Search Notes	**Application/Control No.** 90013809	**Applicant(s)/Patent Under Reexamination** 8457228
	Examiner SCOTT L WEAVER	**Art Unit** 3992

CPC- SEARCHED

Symbol	Date	Examiner
H04W84/20	4/20/17	SLW
H04L5/1453	4/20/17	SLW
H04L27/0008	4/20/17	SLW

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner

SEARCH NOTES

Search Notes	Date	Examiner
Review Applicaiton File Histories 8,457,228 and related Continuation parent cases	4/20/17	SLW

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

Index of Claims

	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90013809	8457228
	Examiner	Art Unit
	SCOTT L WEAVER	3992

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/02/2017								
	1									
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	4									
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Index of Claims	Application/Control No. 90013809	Applicant(s)/Patent Under Reexamination 8457228
	Examiner SCOTT L WEAVER	Art Unit 3992

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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/02/2017								
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	40									
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	3277-0114US-RXM2	7821

6449 7590 05/03/2017
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EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
05/03/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patents and Trademark Office
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Alexandria, VA 22313-1450
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THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS
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800 BOYLSTON STREET
BOSTON, MA 02199-3600

Date:

MAY

CENTRAL REEXAMINATION UNIT

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. : 90013809
PATENT NO. : 8457228
ART UNIT : 3992

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified ex parte reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the ex parte reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Decision on Petition(s) Decided Under 37 C.F.R. 1.181	Control No.:90/013,809

MAY 03 2017

CENTRAL REEXAMINATION UNIT

1. THIS IS A DECISION ON THE PETITIONS Filed by:
☒ Patent Owner ☐ Third Party Requester on April 3, 2017.

and the OPPOSITION PETITION Filed by:
☐ Patent Owner ☐ Third Party Requester on ___________.

2. THIS DECISION IS ISSUED PURSUANT TO 37 CFR 1.181.

The petition is before the Director of the Central Reexamination Unit for consideration.

3. RELIEF REQUESTED

The relief requested is: to strike from the record the March 9, 2017 Office action and to reissue a new non-final Office action.

4. FORMAL MATTERS

A. ☒ Petition fee per 37 CFR §1.20(c)(6):
   i. ☒ Petition includes authorization to debit a deposit account.
   ii. ☐ Petition includes authorization to charge a credit card account.
   iii. ☐ Other:

B. ☒ Proper certificate of service was provided. (Not required in reexamination where patent owner is requester.)

C. ☒ Petition properly signed.

5. The Petitions filed April 3, 2017 is **Dismissed** for the following reasons:
   i. ☐ Formal matters (See unchecked box(es) (A, B and/or C) in section 4 above).
   ii. ☐ The petitions are premature since there has been no decision by the Office as to whether the submissions by ☐ Patent Owner ☐ Third Party Requester are in compliance with Office Rules and procedures.
   iii. ☐ The petition is untimely since the petition was filed more than 2 months from the action by the Office dated _______ from which relief is requested (37 CFR 1.181(f)).
   iv. ☒ The petition is **moot** since the ultimate relief requested by petitioner was already granted in the *sua sponte* decision mailed April 5, 2017 which vacated the March 9, 2017 Office action and the new non-final Office action mailed May 3, 2017.
   v. ☐ Other/comment:

6. ☐ The Opposition Petition filed _________ by _________is **Dismissed** in view of the dismissal of the petition for the reasons identified above.

7. **STATUS: A new non-final Office action was mailed to Patent Owner on May 3, 2017.**

Telephone inquiries with regard to this decision should be directed to Hetul Patel at 571-272-4184 in the Central Reexamination Unit.

/Hetul Patel/ [*Signature*]	Supervisory Patent Reexamination Specialist Central Reexamination Unit, AU 3992 (Title)

U.S. Patent and Trademark Office
PTOL-2307 (Rev. 04-2012)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In *Ex Parte* Reexamination of	:	Group Art Unit: 3992
Gordon F. BREMER	:	
Patent No.: 8,457,228 B2	:	Control No.: 90/013,809
Issued: June 4, 2013	:	

Reexam Request Filed: September 12, 2016

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

Attn: Mail Stop "*Ex Parte* Reexam"
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PATENT OWNER'S REQUEST FOR AN EXTENSION OF TIME UNDER 37 C.F.R. § 1.550(c) TO FILE ITS RESPONSE TO THE MAY 3, 2017 OFFICE ACTION PURSUANT TO 35 U.S.C. § 305

Pursuant to 37 C.F.R. § 1.550(c), Patent Owner Rembrandt respectfully requests an extension of time to file its Response in *Ex Parte* Reexamination of U.S. Patent 8,457,228 ("'228 Patent") to the Office Action mailed May 3, 2017 ("May 3 Office Action.") More specifically, Rembrandt requests an extension of time until two months after Patent Owner's Response to the May 3 Office Action is due. This is Rembrandt's first request for an extension of time to respond to the May 3 Office Action.

Patent Owner requires additional time to prepare an adequate response to the May 3 Office Action. That Office Action is highly complex and voluminous. The text of the Office Action itself spans 78 single-spaced pages. In addition to those pages, the Office Action also incorporates the reasoning of the Final Decision in IPR2014-00892 (23 pages) and numerous portions of a Declaration of Dr. David Goodman (which is not of record in this reexamination).

On top of the sheer volume of material set forth or referenced therein, the Office Action *simultaneously* advances three different constructions of the challenged claim, i.e., (i) a single means claim construction, (ii) a claim construction where the majority of limitations have no patentable weight because they are functional, and (iii) a construction where more limitations are accorded patentable weight. Note 4 of the May 3 Office Action defends this multiplicity of claim construction positions, stating "Examiners are unaware of any requirement that there should be a single Broadest Reasonable Interpretation." Without getting into the merits of whether there can be more than one broadest reasonable interpretation of a claim, the existence of such multiple constructions makes responding to the May 3 Office Action substantially more complex.

The prior art rejections in the May 3 Office Action also extend far beyond the substantial new questions identified in the reexamination grant. For example, the first rejection in the Office Action is based on a combination of the Boer, Yamano and the so-called Admitted Prior Art. This rejection was not part of the reexamination request and was not identified in the Order Granting Reexamination. Thus, it was not anticipated by the Patent Owner and raises issues of its propriety that must be addressed. Responding to this rejection on top of what was included in the reexamination grant makes the process of preparing a response more complicated and thus very time consuming.

Moreover, by itself, the fourth rejection in the May 3 Office Action is extremely complex. That rejection relies on 6 different references (Snell, Harris 4064.4, the so-called Admitted Prior Art, Upender, Yamano and Kamerman) which are combined in numerous alternative scenarios. Preparing a comprehensive response to such a rejection, which is really many individual rejections each of which is phrased in the alternative, requires additional time.

Finally, Patent Owner has a response due in reexamination no. 90/013,808 on June 30, 2017 – just a few days before the current due date for responding to the May 3 Office Action (July 3, 2017). That other reexamination involves the parent of the '228 patent, and is being handled by the same counsel as the present reexamination. Given the voluminous nature of the May 3 Office Action, and the fact that Patent Owner's counsel is simultaneously burdened with preparing a response in reexamination no. 90/013,808, more time is required in this reexamination for Patent Owner to adequately prepare a response to the May 3, 2017 Office Action.

While Patent Owner recognizes the need to handle reexaminations with "special dispatch," there is no reason to deny Patent Owner a fair opportunity to respond to yet another challenge to the patentability of its claim 21. Thus, to the extent Samsung has argued that this matter is particularly urgent (see Request at i-ii), Patent Owner notes that Samsung has offered no reason why it could not have submitted the references submitted in this *ex parte* reexamination as early as March 20, 2014, when Samsung first challenged the patentability of claim 21. Thus, Samsung's plea for expediting this case more than is called for by the "special dispatch" requirement should be ignored.

<u>Statement of Facts Relevant to Petition</u>

In addition to the facts identified above, the following facts are relevant to the PTO's consideration of Patent Owner's request for an extension of time to respond to the May 3 Office Action.

1) On September 12, 2016, following its repeated failure to successfully attack claim 21 of the '228 Patent in multiple IPRs and after the conclusion of a district court action involving the '228 Patent that has been pending since March 2013, Samsung requested this *ex parte* reexamination attacking the same claims it was unable to defeat during the IPRs or during the district court litigation ("Samsung's Request").
2) On September 30, 2016, Rembrandt filed a petition asking the Director to exercise her discretion under 35 U.S.C.§325(d) to deny the petition based on multiple proceedings attacking the same claim and the lack of any reason why Samsung should have yet another opportunity to attack the same claims. That petition was dismissed on November 28, 2016.
3) On October 17, 2016, the Office granted Samsung's Request.
4) On March 9, 2017, the Office issued a non-final Office Action ("March 9 Office Action.")
5) On April 3, 2017, Rembrandt filed its Petition Requesting the Director To Exercise Her Supervisory Authority Pursuant to 37 C.F.R. § 1.181(a)(1) and/or § 1.182. In the April 3 Petition, Rembrandt requested that the Director require that the March 9 Office Action be vacated because, *inter alia*, it contained a discussion of matters outside the scope of *ex parte* reexamination.
6) On April 5, 2017, the CRU issued a letter vacating the March 9, 2017 Office Action.
7) On May 3, 2017, the Office issued a new Office Action, which rejects claim 21 of the '228 patent as (i) anticipated by Snell, (ii) obvious over the so-called Admitted Prior Art, Boer and

Yamano, (iii) obvious over Snell, Yamano and Kamerman, and (iv) obvious over Snell, Harris 4064.4, the so-called Admitted Prior Art, Upender, Yamano and Kamerman.

For the reasons discussed above, Patent Owner is requesting a two month extension to respond to the May 3 Office Action.

The petition fee of $200 set forth in 37 C.F.R. § 1.17(g) for filing a petition for an extension of time under 37 C.F.R. § 1.1550(c) together with any additional fees that may be due with respect to this paper may be charged to Counsel's Deposit Account No. 02-2135.

Respectfully submitted,

Date: May 23, 2017 By: /Michael V. Battaglia/

Michael V. Battaglia, Reg. No. 64,932
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
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Attorney for Petitioner
Rembrandt Wireless Technologies, LP

cc: Nancy J. Linck, Ph.D.
Counsel for Rembrandt Wireless Technologies, LP

CERTIFICATE OF SERVICE

It is hereby certified that on this 23rd day of May, 2017, the foregoing **PATENT OWNER'S REQUEST FOR AN EXTENSION OF TIME UNDER 37 C.F.R. § 1.550 TO FILE ITS RESPONSE PURSUANT TO 35 U.S.C. § 305** was served, by first-class U.S. Mail, on the attorney of record for the third-party Requesters Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., at the following address:

J. Steven Baughman, Esq.
Ropes & Gray LLP
IPRM – Floor 43
Prudential Tower
800 Boylston Street
Boston, Massachusetts 02199-3600
Phone: 202-508-4606
Facsimile: 202-383-8371

/Michael V. Battaglia/
Michael V. Battaglia
Reg. No. 64,932

cc: Nancy J. Linck, Ph.D.
Counsel for Rembrandt Wireless Technologies, LP

Electronic Patent Application Fee Transmittal

Application Number:	90013809
Filing Date:	12-Sep-2016
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Filer:	Michael Vincent Battaglia/Judith Pennington
Attorney Docket Number:	3277-0114US-RXM2

Filed as Large Entity

Filing Fees for **ex parte reexam**

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PETITION FEE- 37 CFR 1.17(G) (GROUP II)	1463	1	200	200
Miscellaneous:				
		Total in USD ($)		**200**

Electronic Acknowledgement Receipt

EFS ID:	29288103
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	6449
Filer:	Michael Vincent Battaglia/Judith Pennington
Filer Authorized By:	Michael Vincent Battaglia
Attorney Docket Number:	3277-0114US-RXM2
Receipt Date:	23-MAY-2017
Filing Date:	12-SEP-2016
Time Stamp:	14:57:33
Application Type:	Reexam (Patent Owner)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$200
RAM confirmation Number	052417INTEFSW00001449022135
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		809EOTRequest.pdf	48947 2de38473be2d975746886eb615a1448455a599e1	yes	7

Multipart Description/PDF files in .zip description

Document Description	Start	End
Reexam Request for Extension of Time	1	6
Reexam Certificate of Service	7	7

Warnings:

Information:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
2	Fee Worksheet (SB06)	fee-info.pdf	30710 8880188e734e51b23911b5199a223fbdcd119364	no	2

Warnings:

Information:

Total Files Size (in bytes):	79657

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	3277-0114US-RXM2	7821

6449 7590 05/24/2017

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
05/24/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patents and Trademark Office
P.O.Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS
ROPES & GRAY LLP
PRUDENTIAL TOWER IPRM DOCKETING - FLOOR 43
800 BOYLSTON STREET
BOSTON, MA 02199-3600

Date: MAILED

MAY 24 2017

CENTRAL REEXAMINATION UNIT

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. : 90013809
PATENT NO. : 8457228
ART UNIT : 3992

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified ex parte reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the ex parte reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Decision on Petition for Extension of Time in Reexamination	Application No. 90/013,809	Applicant(s) 8,457,228	
	Examiner Weaver, Scott	Art Unit 3992	

1. THIS IS A DECISION ON THE PETITION FILED May 23, 2017.

2. THIS DECISION IS ISSUED PURSUANT TO:
   - A. ☒ 37 CFR 1.550(c) – The time for taking any action by a patent owner in a third party requested *ex parte* reexamination proceeding will be extended only for sufficient cause and for a reasonable time specified.
   - B. ☐ 37 CFR 1.550(c) – The time for taking action by a patent owner in a patent owner requested *ex parte* reexamination proceeding will only be extended for more than two months for sufficient cause and for a reasonable time specified.
   - C. ☐ 37 CFR 1.956 – The time for taking any action by a patent owner in an *inter partes* reexamination proceeding will be extended only for sufficient cause and for a reasonable time specified.

   The petition is before the Central Reexamination Unit for consideration.

3. FORMAL MATTERS

Patent owner requests that the period for responding to the Office action mailed on May 3, 2017 which set a 2 (two) month period for filing a response thereto, be extended by an additional two (2) months.

- A. Petition fee per 37 CFR §1.17(g)):
  - i. ☒ Petition includes authorization to debit a deposit account.
  - ii. ☐ Petition includes authorization to charge a credit card account.
  - iii. ☐ Other _____.
- B. ☒ Proper certificate of service was provided. (Not required in reexamination where patent owner is requester.)
- C. ☒ Petition was timely filed.
- D. ☒ Petition properly signed.

4. DECISION (See MPEP 2265 and 2665)
   - A. ☐ Granted or ☒ Granted-in-part for **one (1) month**, because petitioner provided a factual accounting that established sufficient cause. (See 37 CFR 1.550(c) and 37 CFR 1.956).
     - i. ☒ Other/comment: (See attached)
   - B. ☐ Dismissed because:
     - i. ☐ Formal matters (See unchecked box(es) (A, B, C and/or D) in section 4 above).
     - ii. ☐ Petitioner failed to provide a factual accounting of reasonably diligent behavior by all those responsible for preparing a response to the outstanding Office action within the statutory time period.
     - iii. ☐ Petitioner failed to explain why, in spite of the action taken thus far, the requested additional time is needed.
     - iv. ☐ The statements provided fail to establish sufficient cause to warrant extension of the time for taking action (See attached).
     - v. ☐ The petition is moot.
     - vi. ☐ Other/comment: _____

5. CONCLUSION: **The petition for a two (2) month extension of time is granted-in-part for 1 (one) month.**

Telephone inquiries with regard to this decision should be directed to Stephen Stein at 571-272-1544 in the CRU.

/Stephen Stein/
Supervisory Patent Reexamination Specialist
Central Reexamination Unit

The May 23, 2017 petition for an extension of time requests two (2) additional month to respond to the final Office Action mailed May 3, 2017.

The petition speaks to the considerations of providing Patent Owner additional time to prepare an adequate response to the May 3 Office Action in light of the fact that (1) Office Action is highly complex and voluminous, (2) the Office action takes alternative claim constructions, (3) the Office Action provides rejections that were not presented in the reexamination request, (4) the Office Action includes a prior art rejection that is "extremely complex" and (5) the Patent owner has a response due in a another reexamination proceeding a few days before the due date to respond in the instant reexamination proceeding (See pages 1-3 of Patent Owner's May 23, 2017 petition for an extension of time).

All these considerations are noted; however, they must be balanced with the statutory requirement of special dispatch under 35 USC 305.

Pursuant to MPEP § 2265 (in-part) "[I]n third party requested *ex parte* reexaminations, a first request for an extension of time will generally be granted if a sufficient cause is shown, and for a reasonable time specified — usually one month. The reasons stated in the request will be evaluated by the CRU SPRS or TC Director, and the requests will be favorably considered where there is a factual accounting of reasonably diligent behavior by all those responsible for preparing a response within the statutory time period. Second or subsequent requests for an extension of time **and requests for an extension of more than one month in third party requested reexaminations will only be granted in extraordinary situations"** e.g., death or incapacitation of the patent owner. (See MPEP § 2265).

The circumstances presented in the petition, while rising to the level of "sufficient cause", rise to the level of an "extraordinary situation".

It is agreed however, that patent owner needs to be given opportunity to complete all aspects of investigation prior to responding to the Office action in an *ex parte* reexamination proceedings.

Therefore, the Request for an extension of time is hereby granted-in-part for 1 month.

Patent Owner's response to the May 3, 2017 Office Action is due August 3, 2017.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In *Ex Parte* Reexamination of	:	Group Art Unit: 3992
Gordon F. BREMER	:	
Patent No.: 8,457,228 B2	:	Control No.: 90/013,809
Issued: June 4, 2013	:	

Reexam Request Filed: September 12, 2016

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

Attn: Mail Stop "*Ex Parte* Reexam"
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION REQUESTING THE DIRECTOR TO EXERCISE HER (I) SUPERVISORY AUTHORITY PURSUANT TO 37 C.F.R. § 1.181(a)(1) AND/OR § 1.182, AND (II) DISCRETION PURSUANT TO 35 U.S.C. 325(D)

Rembrandt Wireless Technologies, LP ("Rembrandt") respectfully requests the Director to exercise her supervisory authority under Rule 1.181(a)(3) and/or Rule 182 to vacate the non-final Office Action mailed May 3, 2017 (the "May 3 Office Action"). The Office Action rejected Claim 21 (the sole claim challenged in this reexamination) as obvious over Boer, the so-called Admitted Prior Art ("APA") and Yamano (collectively, "the Boer Rejection"). May 3 Office Action, at 8-10. However, neither the Reexamination Order, nor the May 3 Office Action, made the threshold finding that the Boer Rejection presented a substantial new question of patentability. The failure of the Office to even assert, let alone find, that the Boer Rejection represents a substantial new question of patentability, renders the May 3 Office Action *ultra vires*.

In addition to vacating the May 3 Office Action, the portion of this reexamination relating to the Boer Rejection should be terminated under 35 U.S.C. §325(d) because it merely rehashes prior art and arguments substantively identical to those previously presented in the '555 IPR. *See* the discussion *infra* at 8-11. The Office has been presented with voluminous arguments on multiple occasions asserting that Claim 21 is obvious over combinations that include Boer and the APA and has expended substantial resources previously rejecting all such arguments during the IPR proceedings. *See* facts 3-9 *infra* at 3-4. It is not in the Office's interest to expend still further resources revisiting "the same or substantially the same prior art" in these reexamination proceedings.

<u>Statement of Facts Relevant to Petition</u>

1) Rembrandt sued Samsung (the Requester in these reexamination proceedings) for infringement of U.S. Patent 8,457,228 (the '228 Patent) and U.S. Patent 8,023,580 (the '580 Patent), the parent of the '228 Patent, on June 5, 2013. On September 16, 2015, a jury found claim 21 of the '228 Patent and claims 2 and 59 of the '580 Patent valid and infringed (which the district court upheld in denying a JMOL). The Federal Circuit affirmed the district court's validity findings on April 17, 2017.

2) Between June 4, 2014 and January 9, 2015, Samsung filed *thirteen* IPRs challenging the validity of the '228 Patent and '580 Patent. None was successful with respect to claim 21 of the '228 Patent or claims 2 and 59 of the '580 Patent.

3) With respect to the '228 Patent alone, on June 4, 2014, Samsung filed *six* IPR Petitions: IPR2014-00889; -00890; -00891; -00892; -00893 and -00895. Two of the six original IPR Petitions (IPR2014-00889 and IPR2014-00892) included the following obviousness challenges to Claim 21:

   a) APA in view of Boer ('892 IPR);

   b) 802.11 "Standard" in view of either the APA or Siwiak ('889 IPR); and

   c) 802.11 "Standard" in view of APA or Siwiak, further in view of Boer ('889 IPR).

4) On December 10, 2014, the Board denied institution with respect to claim 21 in the '892 IPR, because Samsung failed to demonstrate a reasonable likelihood of prevailing on obviousness based on APA and Boer. *Samsung Electronics Col. LTD. et al. v. Rembrandt Wireless Technologies, LP.*, IPR2014-00892, Paper No. 8 at 13-15 (PTAB December 10, 2014). In the same decision, the Board instituted review with respect to certain other claims in the '228 Patent. *Id.* at 15.

5) On December 10, 2014, the Board also denied institution with respect to all challenged claims of the '228 Patent (including claim 21) in the '889 IPR, because Samsung failed to establish that the "Standard" (in fact, it was actually a confidential draft of the standard) was a "printed publication" and, thus, prior art. *Samsung Electronics Col. LTD. et al. v. Rembrandt Wireless Technologies, LP.*, IPR2014-00889, Paper No. 8 at 7-11 (PTAB December 10, 2014).

6) On December 23, 2014, Samsung filed a "Request for Rehearing" in the '892 IPR, arguing that the Board erred in deciding not to institute an IPR with respect to claim 21 based on Boer and the APA. *Samsung Electronics Col. LTD. et al.*, IPR2014-00892, Paper No. 14 (December 23, 2014). In that request, Samsung rehashed its prior argument that the APA

taught placing address information in the header, and that it would have been obvious to move Boer's address information to the header based on the APA. *Id.* at 8-10.

7) On January 9, 2015, while its Request for Rehearing was still being considered by the Board, Samsung filed yet a *seventh* IPR directed to the '228 Patent. *Samsung Electronics Col. LTD. et al. v. Rembrandt Wireless Technologies, LP.*, IPR2015-00555, Paper No. 1 (January 9, 2015) ("'555 Pet."). In that proceeding (IPR2015-00555), Samsung asserted that claim 21 was obvious based on Boer, the APA and Siwiak. *Id.* at 15-57. Samsung argued that Boer and the APA taught all of the limitations of claim 21 and that Siwiak, which showed address information in the packet header, provided a motivation for placing address information in the header, namely, allowing the receiving modem to avoid demodulation of packet payloads not addressed to the modem. *Id.* at 21-22.

8) On January 27, 2015, the Board denied the Request for Rehearing in the '892 IPR. *Samsung Electronics Col. LTD. et al.*, IPR2014-00892, Paper No. 17 (January 27, 2015).

9) On June 19, 2015, the Board denied institution of the '555 IPR pursuant to 35 U.S.C. §325(d). *Samsung Electronics Col. LTD. et al.*, IPR2015-00555, Paper No. 20 at 7-9 (PTAB June 19, 2015). In so doing, the Board stated:

> The difference between what Petitioner presents in this proceeding and what Petitioner presented in IPR '892 with respect to claim 21 of the '228 patent is that Petitioner now offers Siwiak as support for the asserted obviousness of placing address data in a message header as taught by Boer. … On this record, we exercise our discretion and "reject the petition" because "the same or substantially the same prior art" previously was "presented to the Office" in the IPR '892 proceeding. *Id.* at 7-8.

10) On September 12, 2016, following its repeated failures to invalidate claim 21 in three IPRs, and after the conclusion of the district court action in which the court entered a final judgment that upheld the validity of claim 21 over a combination that included the very

references relied on in the Boer Rejection, Samsung requested this *ex parte* reexamination again attacking claim 21.

11) On September 27, 2016, the Office granted Samsung's Request (the "Grant") finding three substantial new questions of patentability based on the following obviousness combinations:

    a. Snell, Yamano and Kamerman;

    b. Snell, Harris 4064.4, Harris AN9614, Yamano and Kamerman; and

    c. Snell, Harris 4064.4, the Admitted Prior Art, Upender, Yamano, and Kamerman.

    The Grant did not find any substantial new question based in whole or in part on the Boer reference.

12) On March 9, 2017, the Office issued a non-final Office Action that was outside the scope of *ex parte* reexamination. For example, the March 9 Office Action exceeded its authority by (a) reexamining the claims under 35 U.S.C. § 112; and (b) reexamining and objecting to the drawings. That Office Action did not include the Boer Rejection.

13) On April 3, 2017, Rembrandt filed a Petition Requesting the Director Exercise Her Supervisory Authority and strike the March 9 Office Action from the record because, *inter alia*, it exceeded the limits of *ex parte* reexamination.

14) On April 5, 2017, the Director of the CRU issued a Decision vacating the March 9 Office Action and striking it from the record, on the ground that it "includes a discussion of issues outside the scope of *ex parte* reexamination."

15) On May 3, 2017, the Office issued a further non-final action. Significantly, *without even asserting (or finding) that it presented an SNQ*, the May 3 Office Action began by rejecting claim 21 based on the Boer Rejection. May 3 Office Action, at 8-10.

The May 3 Office Action Must Be Vacated Because the Office Has Failed to Make the Required Threshold Finding that the Boer Rejection Presents an SNQ

As a jurisdictional matter, *ex parte* reexamination based on the Boer Rejection can only proceed if the Office *first* makes the threshold finding that the Boer Rejection presents an SNQ. Neither the Grant, nor the May 3 Office Action, makes such a finding. As a result, the May 3 Office Action must be vacated, because, absent a threshold finding by the Office that the Boer Rejection presents an SNQ, reexamination based on the Boer Rejection is *ultra vires*.[1] As noted in *In re Recreative Technologies Corp*., 83 F.3d 1394, 1397 (Fed. Cir. 1996):

> As explained in the legislative history, matters that were decided in the original examination would be barred from reexamination:
>
> > This "substantial new question" requirement would protect patentees from having to respond to, or participate in unjustified reexaminations. ***Further, it would act to bar reconsideration of any argument already decided by the Office, whether during the original examination or an earlier reexamination***.

Id. at 7, *reprinted in* 1980 U.S.C.C.A.N. at 6466 (emphasis added). The court in *Recreative Technologies* continued:

> In this case, the Commissioner points out that the Manual of Patent Examining Procedure authorizes the procedure that was followed. Section 2258 of the M.P.E.P. states that
>
> > [O]nce initiated, the scope of reexamination includes reexamination of the patent in view of any pertinent patents or printed publications, including issues previously addressed by the Office.
>
> Thus the Commissioner argues that it is within the examiner's authority to apply the old ground of rejection on the Ota reference, as the only ground of rejection.

---

[1] "When a petition under 37 CFR 1.181 is filed to vacate a reexamination order under 35 U.S.C. 304 [as an *ultra vires* action by the Office], the third party requester … may file a single submission in opposition to the petition." MPEP § 2246(II). However, an opposition by the Requester to this petition would have no right of entry based because this petition does not seek to vacate a reexamination order but rather an Office Action. Also, the Requester did not allege that Boer alone or in combination with one or more other references raised a substantial new question of patentability (SNQ). *See* Request *passim*. Thus, this petition addressing the Boer Rejection does not relate to an SNQ that the Requester alleged to exist.

> We cannot agree. This is the very action against which the statute protects. The Commissioner's argument that reexamination, once begun, can be limited to grounds previously raised and finally decided, cannot be accommodated by the statute, and is directly contravened by the legislative history. Although Congress may entrust the administrative agency with administration of a statute, the agency cannot depart from the statutory purpose.
>
> [The courts] must reject administrative constructions of the statute, whether reached by adjudication or by rulemaking, that are inconsistent with the statutory mandate or that frustrate the policy that Congress sought to implement.
>
> *Patlex,* 771 F.2d at 487, 226 USPQ at 989 (quoting *Federal Election Commission v. Democratic Senatorial Campaign Committee,* 454 U.S. 27, 31–32, 102 S.Ct. 38, 41–42, 70 L.Ed.2d 23 (1981)).
>
> ….
>
> The statutory instruction that a new question of patentability must be raised is explicit in 35 U.S.C. § 303. ***Reexamination is barred for questions of patentability that were decided in the original examination***. That power cannot be acquired by internal rule of procedure or practice. The policy balance reflected in the reexamination statute's provisions cannot be unilaterally realigned by the agency.[2] To the extent that M.P.E.P. § 2258 enlarges the statutory authorization, it is void. *See Patlex,* 771 F.2d at 487 (quoting *Mourning v. Family Publications Service, Inc.,* 411 U.S. 356, 369, 93 S.Ct. 1652, 1660, 36 L.Ed.2d 318 (1973) (quoting *Thorpe v. Housing Authority of the City of Durham,* 393 U.S. 268, 280–81, 89 S.Ct. 518, 525–26, 21 L.Ed.2d 474 (1969) (regulation promulgated under statutory authority not valid if not reasonably related to the purposes of the enabling legislation))).

83 F.3d at 1397-98 (emphasis added). *See also In re Portola Packaging, Inc.*, 110 F.3d 786, 791 (Fed. Cir. 1997)("Even when the door to the reexamination gate is opened, the PTO is not freed from the limitations Congress placed on the reexamination process. Whatever the basis on which reexamination is granted, it was intended to deal only with substantial new questions of patentability."); *Ex parte Hisamitsu Pharmaceutical Co.,* 2014 WL 955762, slip op. at 2 (PTAB 2014)("Applicant argues that the Tsubota reference does not support a substantial new question of patentability ("SNQ"), which is required for each rejection during Reexamination under 35 U.S.C. §303(a)").

The Portion of this Reexamination Relating to the Boer Rejection Should Be Terminated Under 35 U.S.C. §325(d)

By its plain language, the second sentence of § 325(d) applies to *ex parte* reexaminations in the same way that it applies to AIA review proceedings:

> In determining whether to institute *or order* a proceeding under this chapter, *chapter 30 [the ex parte reexamination chapter]*, or chapter 31, the Director may take into account whether, and reject the petition *or request* because, the same or substantially the same prior art or arguments previously were presented to the Office.

35 U.S.C. §325(d) (emphasis added). *See Ariosa Diagnostics v. Verinata Health, Inc.*, IPR2013-00276 and -00277, Paper 63, at 5-12 (PTAB May 24, 2016)(applying section 325(d) to terminate reexamination); *Ariosa Diagnostics v. Illumina, Inc.*, IPR2014-01093, Paper 81, at 6-15 (PTAB May 24, 2016)(same).

The portion of these proceedings relating to the Boer Rejection should be terminated under 35 U.S.C. §325(d) because that rejection revisits prior art and arguments that are substantively identical to those previously presented. The only difference between the obviousness combination advanced in the '555 IPR and that in the Boer Rejection is the substitution of Yamano for Siwiak. *Compare* '555 Pet. at 15-57 (January 9, 2015) *with* May 3 Office Action at 8-10. However, as shown below, Yamano and Siwiak are both cited to show address information in the packet header, and the purported motivation for modifying Boer based on Yamano (as alleged in the Boer Rejection) is the same as that previously advanced for modifying Boer based on Siwiak in the '555 IPR:

Application of Siwiak in '555 IPR	Application of Yamano in Boer Rejection
"… Siwiak utilizes a message format having header and data fields (*see, e.g.*, Ex. 1324, Fig. 2). *Siwiak discloses placing address fields in the first portion of a packetized message*, …" ('555 Pet., at 18 (emphasis added).)	"Yamano discloses transmitting a "first message" (e.g., data packet including a preamble and main body) that includes "first message address information that is indicative" (e.g., "*destination address in the preamble*) …" "For example, *preamble 701 can include information which identifies* … packet source and *destination address* …" (May 3 Office Action, at 9 (emphasis added).)
"One advantage of choosing to place the address in the header is power savings. For example, *a transceiver may stop demodulating a message once it determines the packet is addressed to a different receiver*, thereby saving the power that would be required to decode the remainder of the packet. By placing the address early in the packet (i.e. in the header), receivers can sleep sooner … Siwiak explicitly describes this motivation. In Siwiak, a unit only demodulates the portion of a message header that follows the "addresses" field when one of the addresses is "assigned to the particular unit" performing the demodulation. Siwiak at 3:61-65 … Units that are not addressed do not demodulate the remainder of the message…" ('555 Pet., at 21-22 (emphasis added).)	**"It would have been obvious to one of ordinary skill in the art at the time the invention was made** to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing the modified Boer APA data packet to advantageously specify which receiver the data is intended for and to *beneficially reduce the processing requirements at the receiving device, as taught by Yamano*. "When the preamble in a burst-mode packet *includes the destination address of the packet,* the receiver circuits can monitor the destination address of the packet, and in response, *filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits*." Yamano at 20:54-59. (May 3 Office Action, at 10 (emphasis added).)

Simply put, since the Boer Rejection presents "the same or substantially the same prior art or arguments" previously presented to the Office in the '555 IPR, the Boer Rejection should be terminated under 35 U.S.C. §325(d). Terminating further challenges based on the Boer Rejection is consistent with the legislative intent behind § 325(d), because allowing similar, serial challenges to the same patent, risks harassment of Rembrandt and frustrates Congress's intent in enacting the Leahy-Smith America Invents Act. *See* H.R. Rep. No. 112-98, pt.1, at 48 (2011) ("While this amendment is intended to remove current disincentives to current administrative processes, the changes made by it are not to be used as tools for harassment or a means to prevent market entry through repeated litigation and administrative attacks on the validity of a patent. Doing so would frustrate the purpose of the section …. ").

Earlier in these reexamination proceedings, Rembrandt presented similar arguments in its § 325(d) petition, which was considered by the Office of Patent Legal Administration (OPLA) as a request to vacate the order granting reexamination of the '228 Patent. OPLA dismissed the petition without making any § 325(d) inquiry by reasoning that (i) reexamination "***requires*** the Office to order reexamination if the Office finds that a substantial new question of patentability … is raised," and (ii) the discretionary provisions of § 325(d) do not apply unless the patent owner establishes that there is no substantial new question of patentability ("SNQ"). (Petition Decision, Control No. 90/013,809 (mailed 11/28/16)(quoting 35 U.S.C. § 304). OPLA's position that §325(d) discretion only applies in reexaminations when the patent owner establishes that there is no SNQ cannot be reconciled with *Ariosa Diagnostics v. Illumina, Inc.*, IPR2014-01093, Paper 81, at 7 (PTAB May 24, 2016)("Under section 325(d), second sentence, however, the Office could nevertheless refuse a subsequent request for *ex parte reexamination* with respect to such an issue, *even if it raises a substantial new question of patentability*, because the issue previously was *presented* to the Office in the petition for *inter partes* or post-grant review,") or the position of the Director before the Federal Circuit that the Office has authority to terminate a reexamination under section 325(d) *even if it raises an SNQ*. *See* Brief for the Intervenor, Director of USPTO in *Ariosa Diagnostics v. Illumina, Inc.*, Fed. Cir. Appeal Nos. 2016-2388, 2017-1020, filed April 26, 2017, at 12, 23-24 ("[u]nder section 325(d), second sentence … the Office could … refuse a subsequent request for *ex parte* reexamination with respect to such an issue, even if it raises a substantial new question of patentability, because the issue previously was presented to the Office in the petition for *inter partes* or post-grant review.")

Therefore, Rembrandt respectfully requests that the Director exercise her discretion under §325(d) and terminate the portion of this reexamination relating to the Boer Rejection because it presents "the same or substantially the same prior art or arguments" previously presented to the Office in the '555 IPR. Rembrandt makes this request under §325(d) in addition to requesting that the May 3 Office Action be vacated on the ground that the Boer Rejection is *ultra vires*, so as to avoid the potential reemergence of that rejection in any future Office Action, and the expenditure of further resources that would occur in such an event.

This Petition is timely filed, i.e., within two months of the non-final Office action mailed May 3, 2017. To the extent the Office believes any rules prevent consideration of this petition, Rembrandt further petitions the Director to suspend such rules under the power granted to the Director by 37 C.F.R. § 1.183.

Any fee required for submission of this Petition may be charged to Counsel's Deposit Account Number 02-2135.

Respectfully submitted,

Date: June 8, 2017

By: /Michael V. Battaglia/

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Attorney for Petitioner Rembrandt Wireless Technologies, LP

cc: Nancy J. Linck, Ph.D.
Counsel for Rembrandt Wireless Technologies, LP

CERTIFICATE OF SERVICE

It is hereby certified that on this 8th day of June, 2017, the foregoing **PETITION REQUESTING THE DIRECTOR TO EXERCISE HER (I) SUPERVISORY AUTHORITY PURSUANT TO 37 C.F.R. § 1.181(a)(1) AND/OR § 1.182, AND (II) DISCRETION PURSUANT TO 35 U.S.C. 325(D)** was served, by first-class U.S. Mail, on the attorney of record for the third-party Requesters Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., at the following address:

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/Michael V. Battaglia/
Michael V. Battaglia
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Electronic Patent Application Fee Transmittal

Application Number:	90013809
Filing Date:	12-Sep-2016
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Filer:	Michael Vincent Battaglia/Judith Pennington
Attorney Docket Number:	3277-0114US-RXM2

Filed as Large Entity

Filing Fees for **ex parte reexam**

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Petitions to the Chief	1405	1	400	400
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**400**

Electronic Acknowledgement Receipt

EFS ID:	29437472
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	6449
Filer:	Michael Vincent Battaglia/Judith Pennington
Filer Authorized By:	Michael Vincent Battaglia
Attorney Docket Number:	3277-0114US-RXM2
Receipt Date:	08-JUN-2017
Filing Date:	12-SEP-2016
Time Stamp:	15:17:53
Application Type:	Reexam (Patent Owner)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$400
RAM confirmation Number	060917INTEFSW00001851022135
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		RX2Petition.pdf	80568 f93ddafd8e73233555436b0a47c56d31d155633f	yes	13

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Receipt of Petition in a Reexam	1	12
Reexam Certificate of Service	13	13

Warnings:

Information:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
2	Fee Worksheet (SB06)	fee-info.pdf	30565 59fedb14685c2068733b583a8c8a83cbe89fb7b8	no	2

Warnings:

Information:

Total Files Size (in bytes):	111133

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In *Ex Parte* Reexamination of	:	Group Art Unit: 3992
Gordon F. BREMER	:	
Patent No.: 8,457,228 B2	:	Control No.: 90/013,809
Issued: June 4, 2013	:	

Reexam Request Filed: September 12, 2016

For: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

Attn: Mail Stop "*Ex Parte* Reexam"
Central Reexamination Unit
Office of Patent Legal Administration
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PATENT OWNER'S SECOND REQUEST FOR AN EXTENSION OF TIME UNDER 37 C.F.R. § 1.550(c) TO FILE ITS RESPONSE TO THE MAY 3, 2017 OFFICE ACTION PURSUANT TO 35 U.S.C. § 305

Pursuant to 37 C.F.R. § 1.550(c), Patent Owner Rembrandt respectfully requests a very short extension of time to file its response in *Ex Parte* Reexamination of U.S. Patent 8,457,228 ("'228 Patent") to the Office Action mailed May 3, 2017 ("May 3 Office Action") because of an extraordinary situation. Specifically, Rembrandt requests a 10-day extension of time for its Patent Owner's Response to the May 3 Office Action, which is presently due August 3, 2017. This is Rembrandt's second request for an extension of time to respond to the May 3 Office Action. A first request for a 2 month extension was granted-in-part, extending the initial deadline by 1 month to August 3, 2017.

Patent Owner requires additional time to prepare an adequate response to the May 3 Office Action due to the fact that both outside counsel responsible for preparing the response will be absent for a substantial portion of the remaining time period to prepare the response. In fact, Nancy Linck, counsel having primary responsibility for the response, will be out of the country from July 24 to August 6 and, thus, out of the country until three days *after* the response is due on August 3, 2017. She is unlikely to have good WiFi connection during that time. In addition, counsel working with Dr. Linck, Michael V. Battaglia, began his paternity leave on July 5, 2017, following the birth of his daughter on July 4, 2017. While at this time Mr. Battaglia does not expect to be absent for more than two weeks, his absence, coupled with that of Dr. Linck's, will make it extremely difficult to complete preparation of the response such that it adequately addresses the single-spaced 79-page Office Action and its five grounds of rejection based on up to six references.

Despite diligent efforts, Dr. Linck and Mr. Battaglia were unable to complete a response to the May 3 Office Action in advance of Mr. Battaglia's paternity leave due to the preparation of a response in related Reexamination No. 90/013,808 (that involving U.S. Patent No. 8,023,580). That response was filed on June 30, 2017. Because the '580 Patent is the parent of the '228 Patent, it is also being handled by Dr. Linck and Mr. Battaglia. The proximity of the two filings was part of the basis for Patent Owner's initial request for a 2-month extension, which was granted only in part. *See* Office Communication, May 24, 2017, p. 2 ("the Request for an extension of time is hereby granted-in-part for 1 month").

Following the filing of the response in the '808 reexamination, both Dr. Linck and Mr. Battaglia immediately turned to the preparation of a response to the May 3 Office Action in this case and have been working diligently on that response since June 30. In fact, Dr. Linck has been working exclusively on it since then. While Dr. Linck will continue to work on the response until she departs on July 24 and Mr. Battaglia will continue to do so when he returns from paternity leave, it is particularly important that Dr. Linck have time to review and finalize the response on her return on August 6. A short, 10-day extension would allow her to do so.

Patent Owner respectfully submits that these unique circumstances – Dr. Linck's overseas trip coupled with Mr. Battaglia's paternity leave – have created an extraordinary situation that warrants a 10-day extension. *See* MPEP § 2265. Patent Owner recognizes that reexaminations are handled with "special dispatch," and thus, has sought only the minimum extension necessary to accommodate this situation. Patent Owner notes that related litigation was ongoing for many years before this reexamination was requested and has now been completed in the district court and the Federal Circuit with respect to all validity issues. See the timeline in the attached Exhibit.

For the reasons discussed above, Patent Owner is requesting a 10-day extension to respond to the May 3 Office Action.

The petition fee of $200 set forth in 37 C.F.R. § 1.17(g) for filing a petition for an extension of time under 37 C.F.R. § 1.1550(c) together with any additional fees that may be due with respect to this paper may be charged to Counsel's Deposit Account No. 02-2135.

Respectfully submitted,

Date: July 7 2017

By: /Michael H. Jones/

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cc: Nancy J. Linck, Ph.D.
Counsel for Rembrandt Wireless Technologies, LP

CERTIFICATE OF SERVICE

It is hereby certified that on this 7th day of July, 2017, the foregoing **PATENT OWNER'S SECOND REQUEST FOR AN EXTENSION OF TIME UNDER 37 C.F.R. § 1.550 TO FILE ITS RESPONSE PURSUANT TO 35 U.S.C. § 305** was served, by first-class U.S. Mail, on the attorney of record for the third-party Requesters Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc., at the following address:

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/Michael H. Jones/
Michael H. Jones
Reg. No. 76,120

cc: Nancy J. Linck, Ph.D.
Counsel for Rembrandt Wireless Technologies, LP

EXHIBIT

Timeline of Rembrandt Litigation, IPRs and Reexaminations

District Court Litigation:

March 15, 2013: Rembrandt sued Samsung for infringement of the '580 Patent. *Rembrandt Wireless Tech., LP v. Samsung Elect. Co. Ltd.*, No. 2:13-cv-00213 (E.D. Tex. 2013).

June 5, 2013: Rembrandt filed an Amended Complaint alleging infringement of the '228 Patent.

July 10, 2014: The district court judge issued his claim construction memorandum and order.

February 9-13, 2015: *Rembrandt Wireless Tech. v. Samsung Elect. Co.* was tried before a jury. In the case, Rembrandt asserted claims 2 and 59 of the '580 Patent and claim 21 of the '228 Patent. On February 13, 2015, the jury rendered its verdict finding that all asserted claims were infringed and had not been proven invalid.

February 17, 2016: The district court denied Samsung's motion for JMOL (liability issues). The district court then severed the issue of post-trial relief and assigned case no. 2:16-cv-00170 to that severed issue.

April 17, 2017: The Federal Circuit affirmed the district court's claim construction in the *Rembrandt Wireless Tech. v. Samsung Elect. Co.* case and affirmed the jury's determination that claims 2 and 59 of the '580 Patent and claim 21 of the '228 Patent are not invalid. Samsung did not challenge the jury's infringement findings on appeal. The case was remanded on an issue of damages. *Rembrandt Wireless Techs., LP v. Samsung Elect. Co. Ltd.*, No. 16-1729 (Fed. Cir. 2016).

June 22, 2017: The Federal Circuit denied Samsung's petitions for panel rehearing and rehearing *en banc*.

***Inter Partes* Review Proceedings:**

March 20, 2014: Samsung filed 4 IPRs against the '580 Patent, IPR2014-00514, -00515, -00518, -00519.

In IPR2014-00514, Samsung asserted that claims 1, 2, 4, 5, 10, 13, 19-22, 49, 52-54, 57-59, 61, 62, 66, 70, and 76-79 of the '580 Patent were unpatentable under § 102(b)/103 based on a draft version of the 802.11 standard (the "Draft Standard") and under § 103(a) based on the Draft

Standard and U.S. 5,706,428 ("Boer"). On September 9, 2014, the PTAB denied the petition because Samsung did not establish that the Draft Standard was a printed publication, and the "Petition fails to demonstrate a reasonable likelihood of prevailing on the grounds that the challenged claims are anticipated by, or obvious over, Draft Standard or obvious over Draft Standard and Boer." On October 24, 2014, the PTAB denied Samsung's Rehearing Request.

In IPR2014-00515, Samsung asserted that claims 23, 25, 29, 30, 32, 34, 38, 40, 41, 43, 44, and 47 of the '580 Patent were anticipated by or obvious in view of the Draft Standard. On September 9, 2014, the PTAB denied the petition because Samsung did not establish that the Draft Standard was a printed publication. On October 24, 2014, the PTAB denied Samsung's Rehearing Request.

In IPR2014-00518, Samsung asserted that claims 1, 2, 4, 5, 10, 13, 19-22, 49, 52-54, 57-59, 61, 62, 66, 70, and 76-79 of the '580 Patent were unpatentable under 35 U.S.C. § 103(a) over Admitted Prior Art ("APA") and Boer (also in view of Upender). On September 23, 2014, the PTAB instituted the IPR to review claims 1, 4, 5, 10, 13, 20-22, 54, 57, 58, 61, 62, 66, 70, and 76-79 but did *not* institute review of claims 2, 19, 49, 52, 53, and 59. With respect to claims 2, 49, and 59, the PTAB was "not persuaded there is a reasonable likelihood that Petitioner would prevail in its challenge." On September 17, 2015, in its final decision, the PTAB concluded that claims 1, 4, 5, 10, 13, 20-22, 54, 57, 58, 61, 62, 66, 70, and 76-79 were unpatentable under § 103(a) over APA and Boer (combination motivated by Upender).

In IPR2014-00519, Samsung asserted that claims 23, 25, 30, 32, 34, 40, 41, 43, and 44 of the '580 Patent were unpatentable under § 102(e) based on Boer and that claims 29, 38, and 47 were unpatentable under § 103(a) based on Boer and APA (also in view of Upender). On September 23, 2014, the PTAB instituted the IPR to review claims 32, 34, 38, 40, 43, 44, and 47 but *not* claims 23, 25, 29, 30, and 41 because Samsung "ha[d] not shown a reasonable likelihood that it would prevail in demonstrating" that those claims are unpatentable on any ground." On September 17, 2015, in its final decision, the PTAB terminated the trial with respect to claims 32, 34, 40, 43, and 44 (disclaimed) and concluded that claims 38 and 47 of the '580 Patent were unpatentable over APA and Boer (combination motivated by Upender).

June 4, 2014: Samsung files 6 IPRs against the '228 Patent, IPR2014-00889, 00890, 00891, 00892, 00893, 00895

In IPR2014-00889, Samsung asserted that claims 1-3, 5, 10, and 11-21of the '228 Patent were unpatentable based on the Draft Standard, Boer, and U.S. 5,537,398 ("Siwiak"). On December 10, 2014, the PTAB denied the petition because Samsung did not establish that the Draft Standard was a printed publication and thus had not shown a reasonable likelihood of prevailing on the grounds asserted.

In IPR2014-00890, Samsung asserted that claims 22, 23, and 25 of the '228 Patent were unpatentable based on the Draft Standard and Boer. On December 10, 2014, the PTAB denied Samsung's petition because Samsung failed to establish that the Draft Standard was a "printed publication" and, thus, had not shown a reasonable likelihood of prevailing on the grounds asserted based on the Draft Standard alone or in combination with Boer.

In IPR2014-00891, Samsung alleged that claims 26-29, 31, 36-41, 43, and 47-52 of the '228 Patent were unpatentable. To support its allegations, Samsung relied on the Draft Standard alone, combined with Boer, combined with the APA, and combined with Boer and APA. On December 10, 2014, the PTAB denied Samsung's petition concluding that Samsung "has not shown a reasonable likelihood that it would prevail in demonstrating that: (1) claims 26-29, 37-41, 43, and 47-52 of the '228 Patent are unpatentable as anticipated or obvious in view of Draft Standard; (2) claims 26-29, 36- 41, 43, and 47-52 of the '228 Patent are unpatentable as obvious in view of Draft Standard and Boer; (3) claims 29, 31, 36, and 51 of the '228 Patent are unpatentable as obvious in view of Draft Standard and APA; or (4) claims 29, 31, 36, and 51 of the '228 Patent are unpatentable as obvious in view of Draft Standard, Boer, and APA."

In IPR2014-00892, Samsung alleged that claims 1-3, 5, and 10-21 of the '228 Patent were unpatentable under 35 U.S.C. § 103(a) over the APA and Boer. Upender was cited as Ex. 1322 to provide motivation to combine. On December 10, 2014, the PTAB instituted the IPR to review claims 1-3, 5, and 10-20 but *not* claim 21 because the petition did not demonstrate a reasonable likelihood of prevailing on the obviousness ground of unpatentability as to claim 21. In its final decision, the PTAB concluded that claims 1-3, 5, and 10-20 were unpatentable for obviousness over APA and Boer (using Ex. 1322 to find motivation to combine APA and Boer). On January 27, 2015, the PTAB denied Samsung's Rehearing Request with respect to claim 21.

In IPR2014-00893, Samsung alleged that claims 22, 23, and 25 of the '228 Patent were unpatentable under § 103(a) based on the APA and Boer (using Upender (now Ex. 1422) to combine APA and Boer). Samsung relied on Upender to support its allegation that there was motivation to combine. On December 10, 2014, the PTAB instituted the IPR. In its final decision, the PTAB concluded that claims 22, 23, and 25 were unpatentable for obviousness over APA and Boer (using Upender to find motivation to combine APA and Boer).

In IPR2014-00895, Samsung alleged that claims 26-29, 31, 36-41, 43, and 47-52 of the '228 Patent were unpatentable under § 103(a) based on the APA and Boer. Samsung also relied on Upender (Ex. 1522) to provide motivation to combine APA and Boer. The PTAB instituted the IPR to review all challenged claims. In its final decision, the PTAB concluded that these claims were unpatentable under § 103(a) based on the APA and Boer (and relying on Upender to make the claimed combination).

October 21, 2014: Samsung filed two additional IPRs against the '580 Patent, namely, IPR2015-00114 and IPR2015-00118. These IPRs challenged the claims for which the PTAB failed to institute in IPR2104-00518 and IPR2015-00519. Since the IPRs were outside the 1 year window, they were accompanied by motions seeking to join the new IPRs to IPR2014-00518 and IPR2014-00519 respectively.

In IPR2015-00114, Samsung again challenged claims 2, 19, 49, 52, 53, 59 of the '580 Patent under § 103(a) based on APA and Boer (and citing Upender for motivation to combine these references). On January 28, 2015, the PTAB denied institution under § 325(d) and denied the joinder motion.

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January 9, 2015: Samsung filed an additional IPR against the '228 Patent, namely, IPR2015-00555. In this IPR, Samsung challenged claim 21, i.e., the claim for which the PTAB failed to institute in IPR2014-00892, under § 103(a) based on the APA, Boer, and Siwiak. Samsung also sought joinder with IPR2014-00892. On June 19, 2015, the PTAB denied institution under Section 325(d) and denied the joinder motion.

***Ex Parte* Reexaminations:**

September 12, 2016: Samsung filed 2 requests for reexamination, 90/013,808 attacking claims 2 and 59 of the '580 Patent and 90/013,809 attacking claim 21 of the '228 Patent.

September 27, 2016: The Office ordered reexamination in the '808 case ('580 Patent).

September 30, 2016: Rembrandt filed petitions in both reexaminations asking the Director to exercise her authority under Section 325(d) and pointing to the PTAB's numerous refusals under Section 325(6) to consider additional IPRs.

October 17, 2016: The Office ordered reexamination in the '809 case ('228 Patent).

November 28, 2016: Rembrandt's two Section 325(d) petitions were dismissed based on the Office's position that Rembrandt had not established there was no substantial new question of patentability.

January 24, 2017: The Office issued a non-final Office Action in the '808 case ('580 Patent) which, *inter alia*, raised issues beyond the scope of reexamination.

February 9, 2017: Rembrandt filed a petition in the '808 case ('580 Patent) asking the Director to withdraw the January 24, 2017 non-final Office Action and revise and reissue another non-final Office Action.

March 9, 2017: The Office issued a non-final Office Action in the '809 case ('228 Patent) which, *inter alia*, raised issues beyond the scope of reexamination.

March 27, 2017: The CRU Director issued a "Decision Sua Sponte Vacating Non Final Office Action" in the '808 case ('580 Patent) because it "include[d] a discussion of issues outside the scope of ex parte reexamination …." The Decision also indicated the Office Action "will form no part of the record and will not be available to the public."

March 31, 2017: The Office issued another non-final Office Action in the '808 case ('580 Patent). Rembrandt's response is due June 30, 2017.

April 3, 2017: Rembrandt's February 9, 2017 petition in the '808 case ('580 Patent) was dismissed as "moot" in view of the CRU Director's withdrawal of the January 24, 2017 Office Action and issuance of another Office Action on March 31, 2017.

April 3, 2017: Rembrandt filed a petition in the '809 case ('228 Patent) asking the Director to withdraw the March 9, 2017 non-final Office Action and revise and reissue another non-final Office Action.

April 5, 2017: The CRU Director issued a "Decision Sua Sponte Vacating Examiner's Answer [*sic*: Non Final Office Action]" in the '809 case ('228 Patent) because it "include[d] a discussion of issues outside the scope of ex parte reexamination …." The Decision also indicated the Office Action "will form no part of the record and will not be available to the public."

May 2, 2017: Rembrandt filed a petition in the '808 case ('580 Patent) asking the Director to either (a) terminate the reexamination proceeding because the Office views the claims as indefinite and proceeding would necessarily be based on speculative assumption as to the meaning of the claims or (b) vacate the March 31, 2017 non-final Office Action and revise and reissue another non-final Office Action because the Office Action exceeds the limited scope of *ex parte* reexamination and fails to adequately detail the pertinence and manner of applying the cited art. This petition is still pending.

May 3, 2017: The Office issued another non-final Office Action in the ‘809 case (‘228 Patent). That same day, Rembrandt’s April 3, 2017 petition was dismissed as “moot” in view of the CRU Director’s withdrawal of the March 9, 2017 Office Action and issuance of another Office Action on May 3, 2017. Rembrandt’s response is due August 3, 2017.

June 8, 2017: Rembrandt filed a petition in the ‘809 case (‘228 Patent) asking the Director to vacate the May 3, 2017 non-final Office Action as *ultra vires* because the Office has not made the threshold finding that the rejection based on Boer, the so-called Admitted Prior Art (“APA”), and Yamano (“the Boer Rejection”) presented a substantial new question of patentability. In addition, the petition asked the Director to terminate the portion of the reexamination relating to the Boer Rejection under 35 U.S.C. §325(d) because it merely rehashes prior art and arguments substantively identical to those presented previously in IPR2015-00555. This petition is pending.

June 14, 2017: Rembrandt sent a letter to the Acting Director, requesting that he exercise his discretion under 35 U.S.C. §325(d) to withdraw the reexamination orders in the ‘808 case (‘580 Patent) and the ‘809 case (‘228 Patent) and terminate the reexaminations.

June 22, 2017: The CRU Director issued a decision dismissing Rembrandt’s May 2, 2017 petition in the ‘808 case.

June 23, 2017: Samsung filed a response to Rembrandt’s June 14, 2017 letter to the Acting Director.

June 30, 2017: Rembrandt filed a response to the 3-31-2017 Office Action in the ‘808 case.

Electronic Patent Application Fee Transmittal

Application Number:	90013809
Filing Date:	12-Sep-2016
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Filer:	Martin M. Zoltick/Tamika Miles
Attorney Docket Number:	3277-0114US-RXM2

Filed as Large Entity

Filing Fees for **ex parte reexam**

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PETITION FEE- 37 CFR 1.17(G) (GROUP II)	1463	1	200	200
Miscellaneous:				
		Total in USD ($)		**200**

Electronic Acknowledgement Receipt

EFS ID:	29721982
Application Number:	90013809
International Application Number:	
Confirmation Number:	7821
Title of Invention:	SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS
First Named Inventor/Applicant Name:	8457228
Customer Number:	6449
Filer:	Martin M. Zoltick/Tamika Miles
Filer Authorized By:	Martin M. Zoltick
Attorney Docket Number:	3277-0114US-RXM2
Receipt Date:	07-JUL-2017
Filing Date:	12-SEP-2016
Time Stamp:	17:34:56
Application Type:	Reexam (Patent Owner)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$200
RAM confirmation Number	071017INTEFSW00004482022135
Deposit Account	022135
Authorized User	tamika miles

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Peition_for_Extension_of_Time.pdf	114273 d42e75c3ee1d4b9b99bb52c306a535871cbf5989	yes	4

Multipart Description/PDF files in .zip description

Document Description	Start	End
Receipt of Petition in a Reexam	1	3
Reexam Certificate of Service	4	4

Warnings:

Information:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
2	Reexam Miscellaneous Incoming Letter	EXHIBIT.pdf	137142 fa31b480af3109fcf77f813310e6e4195f3f8346	no	6

Warnings:

Information:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
3	Fee Worksheet (SB06)	fee-info.pdf	30563 cb47fe58221c50c7d4eff48b2bc6ed3a787e8ad6	no	2

Warnings:

Information:

Total Files Size (in bytes):	281978

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Decision on Petition for Extension of Time in Reexamination	Application No. 90/013,809	Applicant(s) 8,457,228	
	Examiner Weaver, Scott	Art Unit 3992	

1. THIS IS A DECISION ON THE PETITION FILED July 7, 2016

2. THIS DECISION IS ISSUED PURSUANT TO:
   A. ☒ 37 CFR 1.550(c) – The time for taking any action by a patent owner in a third party requested *ex parte* reexamination proceeding will be extended only for sufficient cause and for a reasonable time specified.
   B. ☐ 37 CFR 1.550(c) – The time for taking action by a patent owner in a patent owner requested *ex parte* reexamination proceeding will only be extended for more than two months for sufficient cause and for a reasonable time specified.
   C. ☐ 37 CFR 1.956 – The time for taking any action by a patent owner in an *inter partes* reexamination proceeding will be extended only for sufficient cause and for a reasonable time specified.

   The petition is before the Central Reexamination Unit for consideration.

3. FORMAL MATTERS

Patent owner requests that the period for responding to the Office action mailed on May 3, 2017 which set a 2 (two) month period for filing a response thereto, and which previously was granted a one (1) month extension of time, be extended by an additional ten (10) days,

   A. Petition fee per 37 CFR §1.17(g)):
      i. ☒ Petition includes authorization to debit a deposit account.
      ii. ☐ Petition includes authorization to charge a credit card account.
      iii. ☐ Other _____.
   B. ☒ Proper certificate of service was provided. (Not required in reexamination where patent owner is requester.)
   C. ☒ Petition was timely filed.
   D. ☒ Petition properly signed.

4. DECISION (See MPEP 2265 and 2665)
   A. ☒ Granted or ☐ Granted-in-part for **ten (10) days**, because petitioner provided a factual accounting that established extraordinary cause. (See 37 CFR 1.550(c) and 37 CFR 1.956).
      i. ☒ Other/comment: (See attached)
   B. ☐ Dismissed because:
      i. ☐ Formal matters (See unchecked box(es) (A, B, C and/or D) in section 4 above).
      ii. ☐ Petitioner failed to provide a factual accounting of reasonably diligent behavior by all those responsible for preparing a response to the outstanding Office action within the statutory time period.
      iii. ☐ Petitioner failed to explain why, in spite of the action taken thus far, the requested additional time is needed.
      iv. ☐ The statements provided fail to establish sufficient cause to warrant extension of the time for taking action (See attached).
      v. ☐ The petition is moot.
      vi. ☐ Other/comment: _____

5. CONCLUSION: **The petition for a 10 (ten) day extension of time is granted. Patent Owner's response to the May 3, 2017 Office Action is now due August 13, 2017.**

Telephone inquiries with regard to this decision should be directed to Stephen Stein at 571-272-1544 in the CRU.

/Stephen Stein/
Supervisory Patent Reexamination Specialist
Central Reexamination Unit

The July 7, 2017 petition for an extension of time requests ten (10) additional days to respond to the Office Action mailed May 3, 2017. A previous one (1) month extension of time was granted on May 24, 2017 which extended the time to file a response to the May 3, 2017 Office action to August 3, 2017.

The petition speaks to the extraordinary considerations of providing Patent Owner additional 10 day extension of time to prepare an adequate response to the May 3, 2017 Office Action in light of the fact that (1) one of Patent Owner's representatives will be out of the country with limited WIFI connectivity and (2) Patent Owner's co-counsel has begun a paternity leave. (See pages 2-3 of Patent Owner's July 7, 2017 petition for an extension of time).

All these considerations are noted and must be balanced with the statutory requirement of special dispatch under 35 USC 305.

Pursuant to MPEP § 2265 (in-part) "[I]n third party requested *ex parte* reexaminations, a first request for an extension of time will generally be granted if a sufficient cause is shown, and for a reasonable time specified — usually one month. The reasons stated in the request will be evaluated by the CRU SPRS or TC Director, and the requests will be favorably considered where there is a factual accounting of reasonably diligent behavior by all those responsible for preparing a response within the statutory time period. Second or subsequent requests for an extension of time and requests for an extension of more than one month in third party requested reexaminations will only be granted in extraordinary situations" e.g., death or incapacitation of the patent owner. (See MPEP § 2265).

The circumstances presented in this second petition, rise to the level of "extraordinary situation" which would warrant the granting of additional short extension of time of 10 days.

<u>**Therefore, the Request for an extension of time is hereby granted for 10 days**</u>.

<u>**Patent Owner's response to the May 3, 2017 Office Action is now due August 13, 2017.**</u>

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/013,809	09/12/2016	8457228	3277-0114US-RXM2	7821

6449 7590 07/28/2017

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
WEAVER, SCOTT LOUIS	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
07/28/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patents and Trademark Office
P.O.Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS
ROPES & GRAY LLP
PRUDENTIAL TOWER IPRM DOCKETING - FLOOR 43
800 BOYLSTON STREET
BOSTON, MA 02199-3600

Date:
JUL 27 2017

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. : 90013809
PATENT NO. : 8457228
ART UNIT : 3992

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified ex parte reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the ex parte reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Decision Expunging/Returning Papers in Reexamination	Control No.: 90/013,809

1. ☒ <u>THIS</u> IS A DECISION EXPUNGING THE PAPERS FILED <u>June 23, 2017</u> by <u>Third Party Requester</u> from the record of the reexamination proceeding(s). Since each expunged paper does not form part of the record, it is being expunged by marking it "closed" and "not public" in the Office's Image File Wrapper (IFW) system.
   ☐ THIS IS A DECISION RETURNING/DESTROYING THE PAPER(S) FILED ____________________ by______.

2. The papers being ☒ expunged ☐ returned ☐ destroyed are:

   <u>**Third Party Requester's June 23, 2017 submissions entitled "Third Party Requesters' to Respond to Patent Owner's Letter to the Director" with Exhibit A and "Third Party Requester's Response to Patent Owner's Letter to the Director".**</u>

   This decision will be made of record in the reexamination file(s).

3. THE ABOVE-IDENTIFIED PAPERS LACK A RIGHT OF ENTRY BECAUSE:
   A. ☐ Patent Owner may not file papers in the record prior to the order granting/denying reexamination (*ex parte*) or first action (*inter partes*). 37 CFR §§1.530(a) and 1.939(b).
   B. ☒ <u>Third party requester in an *ex parte* reexamination may not file papers in the reexamination file subsequent to the request, except a reply to a proper patent owner statement under 37 CFR 1.530 *or a notice of concurrent proceedings as described in MPEP 2282*. See 37 CFR §§1.535 and 1.550(g)</u>.
   C. ☐ Third party requester in an *inter partes* reexamination may not file papers in the record, except as specified in the rules, 37 CFR §§1.947, 1.951(b) and 1.983, and 37 CFR §§ 41.61-79, other than a notice of concurrent proceedings as described in MPEP 2686. See 37 CFR1.939.
   D. ☐ Parties other than patent owner and a third party requester may not file documents in the record except a notice of concurrent proceedings. See 37 CFR §§1.550(h) and 1.939(a).
   E. ☐ The notice of concurrent proceedings exceeds the permitted scope. See MPEP 2282, 2686.
   F. ☒ Other: <u>It is noted that the requester's papers purportedly were filed to respond to a patent owner letter. As no such letter was filed in this proceeding, the issue of whether the requester may file a response in opposition to such a paper is not relevant.</u>

4. CONCLUSION
   Telephone inquiries with regard to this decision should be directed to Stephen Stein at 571-272-1544, in the Central Reexamination Unit.

/Stephen J. Stein/
[*Signature*]

SPE, Central Reexamination Unit
(Title)

EXHIBIT A

Timeline of Rembrandt Litigation, IPRs and Reexaminations

District Court Litigation:

March 15, 2013: Rembrandt sued Samsung for infringement of the '580 Patent. *Rembrandt Wireless Tech., LP v. Samsung Elect. Co. Ltd.*, No. 2:13-cv-00213 (E.D. Tex. 2013).

June 5, 2013: Rembrandt filed an Amended Complaint alleging infringement of the '228 Patent.

July 10, 2014: The district court judge issued his claim construction memorandum and order.

February 9-13, 2015: *Rembrandt Wireless Tech. v. Samsung Elect. Co.* was tried before a jury. In the case, Rembrandt asserted claims 2 and 59 of the '580 Patent and claim 21 of the '228 Patent. On February 13, 2015, the jury rendered its verdict finding that all asserted claims were infringed and had not been proven invalid.

February 17, 2016: The district court denied Samsung's motion for JMOL (liability issues). The district court then severed the issue of post-trial relief and assigned case no. 2:16-cv-00170 to that severed issue.

April 17, 2017: The Federal Circuit affirmed the district court's claim construction in the *Rembrandt Wireless Tech. v. Samsung Elect. Co.* case and affirmed the jury's determination that claims 2 and 59 of the '580 Patent and claim 21 of the '228 Patent are not invalid. Samsung did not challenge the jury's infringement findings on appeal. The case was remanded on an issue of damages. *Rembrandt Wireless Techs., LP v. Samsung Elect. Co. Ltd.*, No. 16-1729 (Fed. Cir. 2016).

June 22, 2017: The Federal Circuit denied Samsung's petitions for panel rehearing and rehearing *en banc*.

***Inter Partes* Review Proceedings:**

March 20, 2014: Samsung filed 4 IPRs against the '580 Patent, IPR2014-00514, -00515, -00518, -00519.

In IPR2014-00514, Samsung asserted that claims 1, 2, 4, 5, 10, 13, 19-22, 49, 52-54, 57-59, 61, 62, 66, 70, and 76-79 of the '580 Patent were unpatentable under § 102(b)/103 based on a draft version of the 802.11 standard (the "Draft Standard") and under § 103(a) based on the Draft Standard and U.S. 5,706,428 ("Boer"). On September 9, 2014, the PTAB denied the petition because Samsung did not establish that the Draft Standard was a printed publication, and the

"Petition fails to demonstrate a reasonable likelihood of prevailing on the grounds that the challenged claims are anticipated by, or obvious over, Draft Standard or obvious over Draft Standard and Boer." On October 24, 2014, the PTAB denied Samsung's Rehearing Request.

In IPR2014-00515, Samsung asserted that claims 23, 25, 29, 30, 32, 34, 38, 40, 41, 43, 44, and 47 of the '580 Patent were anticipated by or obvious in view of the Draft Standard. On September 9, 2014, the PTAB denied the petition because Samsung did not establish that the Draft Standard was a printed publication. On October 24, 2014, the PTAB denied Samsung's Rehearing Request.

In IPR2014-00518, Samsung asserted that claims 1, 2, 4, 5, 10, 13, 19-22, 49, 52-54, 57-59, 61, 62, 66, 70, and 76-79 of the '580 Patent were unpatentable under 35 U.S.C. § 103(a) over Admitted Prior Art ("APA") and Boer (also in view of Upender). On September 23, 2014, the PTAB instituted the IPR to review claims 1, 4, 5, 10, 13, 20-22, 54, 57, 58, 61, 62, 66, 70, and 76-79 but did *not* institute review of claims 2, 19, 49, 52, 53, and 59. With respect to claims 2, 49, and 59, the PTAB was "not persuaded there is a reasonable likelihood that Petitioner would prevail in its challenge." On September 17, 2015, in its final decision, the PTAB concluded that claims 1, 4, 5, 10, 13, 20-22, 54, 57, 58, 61, 62, 66, 70, and 76-79 were unpatentable under § 103(a) over APA and Boer (combination motivated by Upender).

In IPR2014-00519, Samsung asserted that claims 23, 25, 30, 32, 34, 40, 41, 43, and 44 of the '580 Patent were unpatentable under § 102(e) based on Boer and that claims 29, 38, and 47 were unpatentable under § 103(a) based on Boer and APA (also in view of Upender). On September 23, 2014, the PTAB instituted the IPR to review claims 32, 34, 38, 40, 43, 44, and 47 but *not* claims 23, 25, 29, 30, and 41 because Samsung "ha[d] not shown a reasonable likelihood that it would prevail in demonstrating" that those claims are unpatentable on any ground." On September 17, 2015, in its final decision, the PTAB terminated the trial with respect to claims 32, 34, 40, 43, and 44 (disclaimed) and concluded that claims 38 and 47 of the '580 Patent were unpatentable over APA and Boer (combination motivated by Upender).

June 4, 2014: Samsung files 6 IPRs against the '228 Patent, IPR2014-00889, 00890, 00891, 00892, 00893, 00895

In IPR2014-00889, Samsung asserted that claims 1-3, 5, 10, and 11-21of the '228 Patent were unpatentable based on the Draft Standard, Boer, and U.S. 5,537,398 ("Siwiak"). On December 10, 2014, the PTAB denied the petition because Samsung did not establish that the Draft Standard was a printed publication and thus had not shown a reasonable likelihood of prevailing on the grounds asserted.

In IPR2014-00890, Samsung asserted that claims 22, 23, and 25 of the '228 Patent were unpatentable based on the Draft Standard and Boer. On December 10, 2014, the PTAB denied

Samsung's petition because Samsung failed to establish that the Draft Standard was a "printed publication" and, thus, had not shown a reasonable likelihood of prevailing on the grounds asserted based on the Draft Standard alone or in combination with Boer.

In IPR2014-00891, Samsung alleged that claims 26-29, 31, 36-41, 43, and 47-52 of the '228 Patent were unpatentable. To support its allegations, Samsung relied on the Draft Standard alone, combined with Boer, combined with the APA, and combined with Boer and APA. On December 10, 2014, the PTAB denied Samsung's petition concluding that Samsung "has not shown a reasonable likelihood that it would prevail in demonstrating that: (1) claims 26-29, 37-41, 43, and 47-52 of the '228 Patent are unpatentable as anticipated or obvious in view of Draft Standard; (2) claims 26-29, 36- 41, 43, and 47-52 of the '228 Patent are unpatentable as obvious in view of Draft Standard and Boer; (3) claims 29, 31, 36, and 51 of the '228 Patent are unpatentable as obvious in view of Draft Standard and APA; or (4) claims 29, 31, 36, and 51 of the '228 Patent are unpatentable as obvious in view of Draft Standard, Boer, and APA."

In IPR2014-00892, Samsung alleged that claims 1-3, 5, and 10-21 of the '228 Patent were unpatentable under 35 U.S.C. § 103(a) over the APA and Boer. Upender was cited as Ex. 1322 to provide motivation to combine. On December 10, 2014, the PTAB instituted the IPR to review claims 1-3, 5, and 10-20 but *not* claim 21 because the petition did not demonstrate a reasonable likelihood of prevailing on the obviousness ground of unpatentability as to claim 21. In its final decision, the PTAB concluded that claims 1-3, 5, and 10-20 were unpatentable for obviousness over APA and Boer (using Ex. 1322 to find motivation to combine APA and Boer). On January 27, 2015, the PTAB denied Samsung's Rehearing Request with respect to claim 21.

In IPR2014-00893, Samsung alleged that claims 22, 23, and 25 of the '228 Patent were unpatentable under § 103(a) based on the APA and Boer (using Upender (now Ex. 1422) to combine APA and Boer). Samsung relied on Upender to support its allegation that there was motivation to combine. On December 10, 2014, the PTAB instituted the IPR. In its final decision, the PTAB concluded that claims 22, 23, and 25 were unpatentable for obviousness over APA and Boer (using Upender to find motivation to combine APA and Boer).

In IPR2014-00895, Samsung alleged that claims 26-29, 31, 36-41, 43, and 47-52 of the '228 Patent were unpatentable under § 103(a) based on the APA and Boer. Samsung also relied on Upender (Ex. 1522) to provide motivation to combine APA and Boer. The PTAB instituted the IPR to review all challenged claims. In its final decision, the PTAB concluded that these claims were unpatentable under § 103(a) based on the APA and Boer (and relying on Upender to make the claimed combination).

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January 9, 2015: Samsung filed an additional IPR against the '228 Patent, namely, IPR2015-00555. In this IPR, Samsung challenged claim 21, i.e., the claim for which the PTAB failed to institute in IPR2014-00892, under § 103(a) based on the APA, Boer, and Siwiak. Samsung also sought joinder with IPR2014-00892. On June 19, 2015, the PTAB denied institution under Section 325(d) and denied the joinder motion.

***Ex Parte* Reexaminations:**

September 12, 2016: Samsung filed 2 requests for reexamination, 90/013,808 attacking claims 2 and 59 of the '580 Patent and 90/013,809 attacking claim 21 of the '228 Patent.

September 27, 2016: The Office ordered reexamination in the '808 case ('580 Patent).

September 30, 2016: Rembrandt filed petitions in both reexaminations asking the Director to exercise her authority under Section 325(d) and pointing to the PTAB's numerous refusals under Section 325(6) to consider additional IPRs.

October 17, 2016: The Office ordered reexamination in the '809 case ('228 Patent).

November 28, 2016: Rembrandt's two Section 325(d) petitions were dismissed based on the Office's position that Rembrandt had not established there was no substantial new question of patentability.

January 24, 2017: The Office issued a non-final Office Action in the '808 case ('580 Patent) which, *inter alia*, raised issues beyond the scope of reexamination.

February 9, 2017: Rembrandt filed a petition in the '808 case ('580 Patent) asking the Director to withdraw the January 24, 2017 non-final Office Action and revise and reissue another non-final Office Action.

March 9, 2017: The Office issued a non-final Office Action in the '809 case ('228 Patent) which, *inter alia*, raised issues beyond the scope of reexamination.

March 27, 2017: The CRU Director issued a "Decision Sua Sponte Vacating Non Final Office Action" in the '808 case ('580 Patent) because it "include[d] a discussion of issues outside the scope of ex parte reexamination …." The Decision also indicated the Office Action "will form no part of the record and will not be available to the public."

March 31, 2017: The Office issued another non-final Office Action in the '808 case ('580 Patent). Rembrandt's response is due June 30, 2017.

April 3, 2017: Rembrandt's February 9, 2017 petition in the '808 case ('580 Patent) was dismissed as "moot" in view of the CRU Director's withdrawal of the January 24, 2017 Office Action and issuance of another Office Action on March 31, 2017.

April 3, 2017: Rembrandt filed a petition in the '809 case ('228 Patent) asking the Director to withdraw the March 9, 2017 non-final Office Action and revise and reissue another non-final Office Action.

April 5, 2017: The CRU Director issued a "Decision Sua Sponte Vacating Examiner's Answer [*sic*: Non Final Office Action]" in the '809 case ('228 Patent) because it "include[d] a discussion of issues outside the scope of ex parte reexamination …." The Decision also indicated the Office Action "will form no part of the record and will not be available to the public."

May 2, 2017: Rembrandt filed a petition in the '808 case ('580 Patent) asking the Director to either (a) terminate the reexamination proceeding because the Office views the claims as indefinite and proceeding would necessarily be based on speculative assumption as to the meaning of the claims or (b) vacate the March 31, 2017 non-final Office Action and revise and reissue another non-final Office Action because the Office Action exceeds the limited scope of *ex parte* reexamination and fails to adequately detail the pertinence and manner of applying the cited art.

May 3, 2017: The Office issued another non-final Office Action in the '809 case ('228 Patent). That same day, Rembrandt's April 3, 2017 petition was dismissed as "moot" in view of the CRU Director's withdrawal of the March 9, 2017 Office Action and issuance of another Office Action on May 3, 2017.

June 8, 2017: Rembrandt filed a petition in the '809 case ('228 Patent) asking the Director to vacate the May 3, 2017 non-final Office Action as *ultra vires* because the Office has not made the threshold finding that the rejection based on Boer, the so-called Admitted Prior Art ("APA"), and Yamano ("the Boer Rejection") presented a substantial new question of patentability. In addition, the petition asked the Director to terminate the portion of the reexamination relating to the Boer Rejection under 35 U.S.C. §325(d) because it merely rehashes prior art and arguments substantively identical to those presented previously in IPR2015-00555. This petition is pending.

June 14, 2017: Rembrandt sent a letter to the Acting Director, requesting that he exercise his discretion under 35 U.S.C. §325(d) to withdraw the reexamination orders in the '808 case ('580 Patent) and the '809 case ('228 Patent) and terminate the reexaminations.

June 22, 2017: The CRU Director issued a decision dismissing Rembrandt's May 2, 2017 petition in the '808 case.

July 18, 2017: The Office issued a final Office Action in the '808 case ('580 Patent). Rembrandt's response is due September 18, 2017.

Exhibit C

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

REMBRANDT WIRELESS TECHNOLOGIES, LP,	§ § §	
v.	§ §	CASE NO. 2:13-CV-213-JRG-RSP
SAMSUNG ELECTRONICS CO., LTD., et al.	§ §	

**CLAIM CONSTRUCTION
MEMORANDUM AND ORDER**

On May 30, 2014, the Court held a hearing to determine the proper construction of the disputed claim terms in United States Patents No. 8,023,580 and 8,457,228. After considering the arguments made by the parties at the hearing and in the parties' claim construction briefing (Dkt. Nos. 97, 102, and 103),[1] the Court issues this Claim Construction Memorandum and Order.

[1] Citations to documents (such as the parties' briefs and exhibits) in this Claim Construction Memorandum and Order refer to the page numbers of the original documents rather than the page numbers assigned by the Court's electronic docket unless otherwise indicated. Defendants are Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., Samsung Telecommunications America, LLC, Samsung Austin Semiconductor, LLC (collectively referred to as "Samsung"), Blackberry Corp., and Blackberry Ltd. (collectively referred to as "Blackberry"; formerly known as Research In Motion Corp. and Research In Motion Ltd., respectively) (all collectively referred to as "Defendants").

Table of Contents

BACKGROUND

Plaintiff brings suit alleging infringement of United States Patents No. 8,023,580 ("the '580 Patent") and 8,457,228 ("the '228 Patent") (collectively, the "patents-in-suit").

The patents-in-suit are both titled "System and Method of Communication Using At Least Two Modulation Methods." The '580 Patent issued on September 20, 2011, and bears a filing date of August 19, 2009. The '228 Patent issued on June 4, 2013, and bears a filing date of August 4, 2011. The '228 Patent is a continuation of the '580 Patent. Both patents-in-suit bear an earliest priority date of December 5, 1997.

In general, the patents-in-suit relate to modulation methods for communications. Plaintiff argues that the patents-in-suit relate to the well-known "Bluetooth" wireless communication standards. *See* Dkt. No. 97 at 1. The Abstract of the '580 Patent is representative and states:

> A device may be capable of communicating using at least two type types [*sic*] of modulation methods. The device may include a transceiver capable of acting as a master according to a master/slave relationship in which communication from a slave to a master occurs in response to communication from the master to the slave. The master transceiver may send transmissions discrete transmissions [*sic*] structured with a first portion and a payload portion. Information in the first portion may be modulated according to a first modulation method and indicate an impending change to a second modulation method, which is used for transmitting the payload portion. The discrete transmissions may be addressed for an intended destination of the payload portion.

LEGAL PRINCIPLES

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. *See id.* at 1313; *see also C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns*

Group, Inc., 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312-13; *accord Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314-15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *accord Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id.* The specification may also resolve the meaning of ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex*, 299 F.3d at 1325. But, "[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims." *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *accord Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent."). "[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

Although extrinsic evidence can be useful, it is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips*, 415 F.3d at 1317 (citations and internal quotation marks omitted). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

CONSTRUCTION OF DISPUTED TERMS

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with preliminary constructions of the disputed terms with the aim of focusing the parties' arguments and facilitating discussion. Those preliminary constructions are set forth within the discussion of each term, below.

A. "first modulation method" and "second modulation [method]"

"first modulation method"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a first method for varying one or more characteristics of a carrier in accordance with information to be communicated"[2]	"a method of encoding data that is understood by a first type of receiver, but not by a second type of receiver"
"second modulation [method]"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a second method for varying one or more characteristics of a carrier in accordance with information to be communicated"[3]	"a method of encoding data that is understood by the second type of receiver, but not by the first type of receiver"

Dkt. No. 97 at 6; Dkt. No. 102 at 2-3. The parties submit that the first of these terms appears in Claims 1, 2, 13, 19, 21, 22, 23, 32, 40, 41, 49, 54, 58, 59, 70, 76, 78, and 79 of the '580 Patent and Claims 1, 5, 15, 17, 18, 22, 25, 26, 37, 38, 39, 41, 47, 48, 49, and 52 of the '228 Patent. Dkt.

[2] Plaintiff previously proposed: "No construction necessary; plain and ordinary meaning applies. Alternatively, 'a first method for encoding data onto a carrier.'" Dkt. No. 81, Ex. A at 7.

[3] Plaintiff previously proposed: "No construction necessary; plain and ordinary meaning applies. Alternatively, 'a second method for encoding data onto a carrier.'" Dkt. No. 81, Ex. A at 9.

No. 82, Ex. A at 7. The parties submit that the second of these terms appears in Claims 1, 13, 20, 22, 23, 32, 40, 49, 54, 58, 70, 77, and 79 of the '580 Patent and Claims 1, 10, 17, 18, 22, 23, 26, 37, 38, 41, 43, 47, and 49 of the '228 Patent. *Id.* at 9.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "first modulation method" means "a first method for varying one or more characteristics of a carrier signal in accordance with information to be communicated"; and "second modulation [method]" means "a second method for varying one or more characteristics of a carrier signal in accordance with information to be communicated." Plaintiff had no opposition to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "Defendants' constructions . . . confuse 'modulation' with 'encoding'" and import limitations from a preferred embodiment. Dkt. No. 97 at 6. Plaintiff also submits that examples of the characteristics of a carrier than can be modulated are amplitude, frequency, and phase. *Id.* In this regard, Plaintiff cites extrinsic dictionary definitions (quoted below) as well as statements by Defendant Samsung in an inter partes review ("IPR") filing. *Id.* at 7; *see id.*, Ex. 7, 3/20/2014 Petition for *Inter Partes* Review of U.S. Patent No. 8,023,580 at 9 (citing *The IEEE Standard Dictionary of Electrical and Electronics Terms* 662 (6th ed. 1996)). Plaintiff also argues that the constituent terms "first" and "second" refer to repeated instances rather than to any distinction or incompatibility. *Id.* at 8. Plaintiff explains that this is a patent law convention and that this interpretation is consistent with usage of "first" and "second" in various claims as well as in the Summary section of the '580 Patent. *Id.* at 8-10.

As to Defendants' proposed constructions, Plaintiff argues that the patents-in-suit "never use the term 'encode' at all," and Plaintiff cites the provisional patent application to which the patents-in-suit claim priority as distinguishing between "modulation" and "encoding." *Id.* at 11-12. Plaintiff also argues that Defendants' proposal of incompatibility between the first and second modulation methods is found in a preferred embodiment but not in the claims. *Id.* at 12. Plaintiff submits that such a limitation appears only in dependent claims, namely Claims 18 and 75 of the '580 Patent. *Id.* at 13. Further, Plaintiff argues, Defendants' proposals would improperly exclude embodiments in which "modems may be capable of using several different modulation methods." *Id.* (quoting '580 Patent at 1:36-37; citing *id.* at 5:51-54). Plaintiff likewise argues that "the USPTO examiner recognized that the claimed 'first' and 'second' modulation methods could be understood by a common receiver—contrary to Defendants' constructions." Dkt. No. 97 at 14. Finally, Plaintiff urges that Defendants' proposals "would render claim limitations that explicitly require 'the first modulation method is different than the second modulation method' superfluous." *Id.* at 16 (citing '580 Patent at Claims 23, 32 & 40).

Defendants respond that "the sole disclosed embodiment of the invention has a 'Trib 1'[4] modem that understands 'type A' modulation but not '[t]ype B,' and a 'Trib 2' modem that understands 'type B' modulation but not 'type A.'" Dkt. No. 102 at 3; *see id.* at 6-9. Defendants note that the specification asserts (in Defendants' words) that "in the prior art, because all modems connected to a common circuit needed to use compatible modulation methods, tribs that supported only a low-performance modulation method (e.g. type B) would not work in systems

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[4] The patents-in-suit disclose that in a "multipoint architecture," the term "trib" is a shortened form of the word "tributary" and refers to one of several modems that communicates with a single "master" modem. *See* '580 Patent at 1:56-58 & 3:40-44. The term "trib" appears to be synonymous with the term "slave" as used in the patents-in-suit. *See* Dkt. No. 97, Ex. 7, 3/20/2014 Petition for *Inter Partes* Review of U.S. Patent No. 8,023,580 at 11.

that require a high-performance modulation (e.g. type A) for any tasks." *Id.* at 4. Defendants explain that "[i]f the tribs speak each other's language, the alleged invention would be unnecessary." *Id.* at 3; *see id.* at 5 ("If the type B trib could understand type A modulation, type A modulation would simply be used by both devices, as in the prior art.").

As to the prosecution history, Defendants highlight that the patentee deleted from the specification all disclosures of what Defendants refer to as a "bilingual" trib, *i.e.*, a trib with the ability to use two types of modulation. *Id.* at 9-10. Defendants also submit that the examiner statement cited by Plaintiff in its opening brief was made before the patentee deleted the disclosures of a bilingual trib. *Id.* at 10. Further, Defendants cite the prosecution history of ancestor United States Patent No. 6,616,838, during which the patentee stated: "The present invention is directed to the use of differing transceivers responsive to different modulation methods to the exclusion of other modulation methods . . . ." *Id.* at 11 (quoting Ex. 8, 9/27/2001 First Amendment and Response at p. 6 of 10).

As to their proposed constructions, Defendants note that "encoding" appeared in the constructions that Plaintiff had proposed prior to filing its opening claim construction brief. Dkt. No. 102 at 3 & 14. Defendants also argue: "First, contrary to [Plaintiff's] arguments, 'modulation' is 'encoding,' as [Plaintiff's] own dictionary confirms. Second, [Plaintiff's] construction injects the complex concept of carrier waves into the definition. That concept would not assist a jury." *Id.* at 14 (citations omitted). Finally, Defendants argue that the claim limitations requiring "different" modulation methods are "already superfluous." *Id.* at 15.

Plaintiff replies to Defendants' arguments as follows: (1) whether the claims adequately distinguish prior art is a matter of validity, not claim construction, and the patentee did not anywhere state that the point of novelty was that receivers understand only one modulation method; (2) the claims should not be limited to a particular embodiment and, moreover, the patents-in-suit incorporate related patent applications that disclose bilingual tribs (*see* Dkt. No. 103, Ex. 30 at RIP9770); (3) the patentee removed, from the specification, references to measuring transmission line characteristics, but the patentee did not disclaim all embodiments in which multiple modulation methods could be understood by a single trib; (4) Defendants' technology tutorial submitted to this Court (Dkt. No. 103, Ex. 28) confirms that "modulation" is different than "encoding"; (5) the doctrine of claim differentiation is not overcome by any disclosures in the specification; and (6) Defendants' proposals would render superfluous the claim limitations requiring that the "first" and "second" modulation methods be "different." Dkt. No. 103 at 2-5.

At the May 30, 2014 hearing, Defendants emphasized that the only disclosed embodiment uses monolingual tribs and that during prosecution the patentee deleted disclosure of bilingual tribs. The Court inquired where, if anywhere, the patentee stated that a trib can understand only one modulation method. Defendants responded that the patentee made that statement "by implication" by removing the disclosure of bilingual tribs. In this regard, Defendants cited the case of *Abbott Laboratories v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009). As to Plaintiff's claim differentiation arguments, Defendants urged that the dependent claim "tail" cannot wag the specification "dog." *See N. Am. Vaccine, Inc. v. Am. Cyanamid Co.*, 7 F.3d 1571, 1577 (Fed. Cir. 1993) ("The dependent claim tail cannot wag the independent claim dog.").

Plaintiff responded that the deletions were merely "housekeeping" and related primarily to test signals and to measuring transmission line characteristic rather than to the use of multilingual tribs. Plaintiff also reiterated that the patents-in-suit incorporate-by-reference related applications that disclose multilingual tribs. Finally, Plaintiff cited *01 Communique Laboratory, Inc. v. LogMeIn, Inc.*, 687 F.3d 1292 (Fed. Cir. 2012), for the proposition that if the prosecution history is subject to a reasonable, non-limiting interpretation, then there is no disclaimer.

(2) Analysis

Claim 1 of the '580 Patent is representative and recites (emphasis added):

> 1. A communication device capable of communicating according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave, the device comprising:
>
> a transceiver, in the role of the master according to the master/slave relationship, for sending at least transmissions modulated using at least two types of modulation methods, wherein the at least two types of modulation methods comprise *a first modulation method and a second modulation method, wherein the second modulation method is of a different type than the first modulation method*, wherein each transmission comprises a group of transmission sequences, wherein each group of transmission sequences is structured with at least a first portion and a payload portion wherein first information in the first portion indicates at least which of the *first modulation method* and the *second modulation method* is used for modulating second information in the payload portion, wherein at least one group of transmission sequences is addressed for an intended destination of the payload portion, and wherein for the at least one group of transmission sequences:
>
> the first information for said at least one group of transmission sequences comprises a first sequence, in the first portion and modulated according to the *first modulation method*, wherein the first sequence indicates an impending change from the *first modulation method* to the *second modulation method*, and
>
> the second information for said at least one group of transmission sequences comprises a second sequence that is modulated according to the *second modulation method*, wherein the second sequence is transmitted after the first sequence.

As an initial matter, Defendants' proposed constructions appear to render redundant the recital of "wherein the second modulation method is of a different type than the first modulation method." Defendants have countered that "[t]he limitations of these claims requiring 'different' modulation methods are . . . already superfluous" because "[Plaintiff] admits that the terms 'first' and 'second' . . . are used to distinguish two items that (while similarly named) are, in fact, different." Dkt. No. 102 at 15. Nonetheless, such redundancy is disfavored when construing claims. *See Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so."); *see also Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562 (Fed. Cir. 1991) (noting that "[a]ll the limitations of a claim must be considered meaningful").

As for the specification, the Background section of the '580 Patent states that prior art systems required all modems to use a single, common modulation method:

> In existing data communications systems, a transmitter and receiver modem pair can successfully communicate only when the modems are compatible at the physical layer. That is, the modems must use *compatible modulation methods*. This requirement is generally true regardless of the network topology. For example, point-to-point, dial-up modems operate in either the industry standard V.34 mode or the industry standard V.22 mode. Similarly, in a multipoint architecture, all modems operate, for example, in the industry standard V.27bis mode. While the modems may be capable of using several different modulation methods, *a single common modulation is negotiated at the beginning of a data session to be used throughout the duration of the session*.

'580 Patent at 1:26-39 (emphasis added). The specification then discloses using different modulation methods:

> For example, some applications (e.g., internet access) require *high performance modulation*, such as quadrature amplitude modulation (QAM), carrier amplitude and phase (CAP) modulation, or discrete multitone (DMT) modulation, while other applications (e.g., power monitoring and control) require only modest data rates and therefore a *low performance modulation* method.
>
> * * *
>
> While it is possible to use high performance tribs running state of the art modulation methods such as QAM, CAP, or DMT to implement both the high and low data rate applications, *significant cost savings can be achieved if lower cost tribs using low performance modulation methods are used to implement the lower data rate applications*.

Id. at 2:1-8 & 5:17-22 (emphasis added).

> A block diagram of a master transceiver 64 in communication with a trib 66 in accordance with the principles of the present invention is shown in FIG. 3. * * *
>
> Trib 66 comprises CPU 82 in communication with modulator 84, demodulator 86, and memory 88. Memory 88, likewise holds software control program 92 and any data necessary for the operation of trib 66. Control programs 78 and 92, are executed by CPUs 68 and 82 and provide the control logic for the processes to be discussed herein. Control program 92 includes logic for *implementing a particular modulation method*, which, for purposes of illustration, is called type X[.] Inasmuch as master transceiver 64 is capable of running *either* a type A *or* a type B modulation method, type X refers to *one* of those two modulation methods.

Id. at 5:23-25 & 5:42-44 (emphasis added).

> [A]s shown in FIG. 5, master transceiver 64 establishes type A as the primary modulation in sequence 104. Note that because trib 66*b* responds only to type B modulation transmissions, only the type A tribs 66*a*-66*a* are receptive to transmission sequence 104.
>
> * * *
>
> Note that the trailing sequence 114 is ineffective in establishing the termination of a communication session between master transceiver 64 and a type B trib 66*b* because the trailing sequence is transmitted using type A modulation.

Id. at 5:65-6:2 & 6:25-29.

The specification does not, however, warrant Defendants' proposed finding that the invention is framed exclusively in the realm of monolingual tribs. Instead, the specification discloses that the advantage of using multiple modulation methods is applicable to multi-lingual tribs:

> The present invention has many advantages, a few of which are delineated hereafter as merely examples.
>
> One advantage of the present invention is that it provides to the *use of a plurality of modem modulation methods on the same communication medium*.
>
> Another advantage of the present invention is that a master transceiver can communicate seamlessly with tributary transceivers or modems using incompatible modulation methods.

'580 Patent at 2:50-57 (emphasis added).

As to the prosecution history, Defendants have focused on: (1) a statement regarding the "present invention" during prosecution of an ancestor patent; and (2) the patentee's deletion of certain paragraphs from the specification of the patents-in-suit.

First, Defendants have cited the prosecution history of ancestor United States Patent No. 6,616,838, during which the patentee stated: "The present invention is directed to the use of differing transceivers responsive to different modulation methods to the exclusion of other modulation methods . . . ." Dkt. No. 97, Ex. 17, 9/27/2001 First Amendment and Response at 6. Yet, the '580 Patent is a continuation of a continuation of a continuation-in-part of the '838 Patent. The multiple intervening applications render the cited prosecution statement too attenuated to be deemed definitive as to the patents-in-suit, particularly given that the patentee was adding the "exclusion" language to a claim and was referring to "[t]he present invention" in the context of that claim. *See id.* at 6 & A-1; *see also Invitrogen Corp. v. Clontech Labs., Inc.*, 429 F.3d 1052, 1078 (Fed. Cir. 2005) ("[T]he prosecution of one claim term in a parent application will generally not limit different claim language in a continuation application."); *cf. Regents of the Univ. of Minn. v. AGA Med. Corp.*, 717 F.3d 929, 943 (Fed. Cir. 2013) ("When the purported disclaimers made during prosecution are directed to specific claim terms that have been omitted or materially altered in subsequent applications (rather than to the invention itself), those disclaimers do not apply.") (quoting *Saunders Grp., Inc. v. Comfortrac, Inc.*, 492 F.3d 1326, 1333 (Fed. Cir. 2007)).

Second, Defendants have cited the patentee's deletion of matter from the specification of the patents-in-suit. In the case of *Abbott Laboratories v. Sandoz, Inc.*, cited by Defendants during the May 30, 2014 hearing, the court relied at least in part upon the patentee's omission of matter contained in a parent application:

> [T]he specification refers several times to "Crystal A of the compound (I) of the present invention" and offers no suggestion that the recited processes could produce non-Crystal A compounds, even though other types of cefdinir crystals, namely Crystal B, were known in the art. As noted earlier, the Crystal B formulation actually appears in the parent JP '199 application. Thus, Abbott knew exactly how to describe and claim Crystal B compounds. Knowing of Crystal B, however, Abbott chose to claim only the A form in the '507 patent. Thus, the trial court properly limited the term "crystalline" to "Crystal A."
>
> * * *
>
> In limiting "crystalline" to "Crystal A" in claims 1-5, the Eastern District of Virginia did not improperly import the preferred embodiment into the claims. Initially, Crystal A is the only embodiment described in the specification. As discussed above, the specification's recitation of Crystal A as its sole embodiment does not alone justify the trial court's limitation of claim scope to that single disclosed embodiment. *See Liebel-Flarsheim* [*Co. v. Medrad, Inc.*], 358 F.3d [898,] 906 [(Fed. Cir. 2004)] ("[T]his court has expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment."). In this case, however, the rest of the intrinsic evidence, including the prosecution history and the priority JP '199 application, evince a clear intention to limit the '507 patent to Crystal A . . . .
>
> * * *
>
> The JP '199 application strongly suggests that the '507 patent intentionally excluded Crystal B compounds. As discussed above, the JP '199 application establishes unequivocally that Abbott knew and could describe both Crystal A and Crystal B. Abbott could have retained the disclosure of Crystal B to support the broader claims of the '507 patent, but instead disclosed and claimed A alone.
>
> * * *
>
> Given the exclusive focus on Crystal A in the specification as well as the prosecution history of the '507 patent, the Eastern District of Virginia properly limited "crystalline" in claims 1-5 to "Crystal A."
>
> * * *
>
> The Eastern District of Virginia correctly construed the '507 patent's recitation of "crystalline" in each of the asserted claims as limited to Crystal A, as outlined in the specification. Because Abbott scrubbed all references to Crystal B in the '507

> patent's specification, which were present in the '507 patent's parent foreign application, Abbott clearly demonstrated its intent to limit the '507 patent to Crystal A. This intent was further underscored by comments made during prosecution. As such, Abbott is unable to recapture Crystal B through broad claim language or under the doctrine of equivalents.

566 F.3d at 1289-90, 1299 (citation omitted).

Here, by contrast, the patentee's deletion of matter relates less directly to the limitation that Defendants seek to impose. The patentee deleted the following paragraphs during prosecution of the '580 Patent:

> [0042] In an alternative embodiment of the present invention, embedded modulations can be used as a way to *measure transmission line characteristics* between a master transceiver and tributary transceiver as shown in FIG 8. In this embodiment, *both a master transceiver 64 and a tributary transceiver 66a would have the ability to transmit using at least two modulation methods, type A and type B.* In the present example, the primary transmission type is type A. Thus, as shown in FIG. 8, the master transceiver 64 establishes type A as the primary modulation in sequence 150.
>
> [0043] To *switch from type A to type B modulation*, master transceiver 64 transmits a notification sequence 152 to the tributary 66a. Thus, the tributary 66a is notified of an impending change to modulation type B. The switch to type B modulation could be limited according to a specific time interval or for the communication of a particular quantity of data, such as a *test signal.* After notifying the tributary 66a of the change to type B modulation, the master transceiver 64[] transmits test signal sequence 151 using type B modulation.
>
> [0044] In this embodiment, the tributary transceiver can contain logic which enables the tributary 66a to *calculate at least one channel parameter from the test signal sequence 154.* Channel parameters typically include *transmission line characteristics*, such as, for example, loss versus frequency, non-linear distortion, listener echoes, talker echoes, bridge tap locations, impedance mismatches, noise profile, signal-to-noise ratio, group delay versus frequency, cross-talk presence, cross-talk type, etc. Moreover, the tributary transceiver 66a could be configured to communicate a channel parameter back to the master transceiver 64.
>
> [0045] After transmitting the *test signal* sequence 154 to the tributary transceiver 66a, the master transceiver 64 can transmit trailing sequence 156 to the tributary transceiver 66a using type A modulation to indicate the end of the transmission using type B modulation. The master transceiver 64 can then send information to the tributary transceiver 66a using primary modulation type A, as shown by

> training, data and trailing sequences 158, 160 and 162. Likewise, the tributary transceiver 66a can send information to the master transceiver 64 using primary modulation type A, as shown by training, data and trailing sequences 164, 166 and 168.
>
> [0046] In a further alternative embodiment, the master transceiver 64 or tributary transceiver 66a may identify a time period within which *test signal* sequences may be transmitted. This would eliminate the training and trailing sequences which alert the tributary transceiver 66a to the beginning of a new modulation method. The identification of the time period could be initiated by the master transceiver 64 or tributary transceiver 66a and could include a time period noted in the header of a transmission between the tributary transceiver 66a and master transceiver 64.

Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22) (emphasis added); *see id.* at 22 ("The MPEP suggests that the applicant modify the brief summary of the invention and restrict the descriptive subject matter 'so as to be in harmony with the claims.' *MPEP 1302.01*, General Review of Disclosure. Accordingly, Applicant has deleted paragraphs [0042] – [0046].") (square brackets in original); *see also* Dkt. No. 102, Ex. 4 at p. 20 of 44 (RIP19) (Figure 8, illustrating "Trib Type A + B"); Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 4 (RIP3520), 22 (RIP3538) & p. 34 of 34 (RIP3549) (replacing Figure 8).

This deletion of disclosure of "a tributary transceiver 66a [that has] the ability to transmit using at least two modulation methods" is notable, and Defendants argued at the May 30, 2014 hearing that a "test signal" is merely an example of a communication with a bilingual trib. Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22). Nonetheless, Plaintiff has persuasively argued that these paragraphs relate primarily to test signals and to measuring transmission line characteristics rather than to the use of bilingual tribs. The above-quoted *Sandoz* case cited by Defendants is therefore distinguishable, and the patentee's deletion of matter from the specification is of no limiting effect here. *See SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1286 (Fed. Cir. 2005) ("There is no clear and unmistakable disclaimer if a prosecution argument is subject to more than one reasonable interpretation, one of which is consistent with a proffered meaning of the disputed term.") (internal quotation marks omitted); *see also 01 Communique*, 687 F.3d at 1297 (quoting *SanDisk*).

Defendants also argued at the May 30, 2014 hearing that the patentee removed this matter because it was introduced in a parent continuation-in-part application. Defendants explained that if the claims of the patents-in-suit were found to rely upon this new matter, the claims would not receive benefit of the earliest priority date. Defendants concluded that the patentee deleted these paragraphs from the specification in order to eliminate this risk. Defendants' argument in this regard appears better suited to a written description challenge because validity analysis is not a regular part of claim construction. *See Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction."). Defendants' arguments regarding deletion of matter from the specification are therefore of minimal relevance during the present claim construction proceedings.

In sum, none of the prosecution history cited by Defendants contains any definitive statements that would warrant finding a disclaimer. *See Omega Eng'g v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) ("As a basic principle of claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public's reliance on *definitive* statements made during prosecution.") (emphasis added). Further, as explained above, the prosecution history is not otherwise sufficiently clear to justify Defendants' narrow interpretation of the present patents-in-suit.

As to the parties' proposed constructions, "[t]he use of the terms 'first' and 'second' is a common patent-law convention to distinguish between repeated instances of an element or limitation." *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir.

2003). Nothing in the nature of "repeated instances" demands the incompatibility that Defendants have proposed. *Cf. id.* ("In the context of claim 1, the use of the terms 'first . . . pattern' and 'second . . . pattern' is equivalent to a reference to 'pattern A' and 'pattern B,' and should not in and of itself impose a serial or temporal limitation onto claim 1."). Although the above-quoted disclosures in the specification contemplate a trib that can use only one modulation method, nothing in the claim language warrants limiting the disputed terms to such a narrow construction.

The doctrine of claim differentiation also weighs against requiring incompatibility because such a limitation appears in dependent Claims 18 and 75 of the '580 Patent, which recite:

> 18. The device of claim 15, wherein the intended destination is the first type of receiver and unable to demodulate the second modulation method.
>
> * * *
>
> 75. The device of claim 72, wherein the intended destination is the first type of receiver and unable to demodulate the second modulation method.

The doctrine of claim differentiation weighs against any construction of the disputed terms that would render these dependent claims superfluous. *See Phillips*, 415 F.3d at 1315 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim."); *see also Liebel-Flarsheim*, 358 F.3d at 910 ("[W]here the limitation that is sought to be 'read into' an independent claim already appears in a dependent claim, the doctrine of claim differentiation is at its strongest."); *Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1233 (Fed. Cir. 2001) ("Claim differentiation, while often argued to be controlling when it does not apply, is clearly applicable when there is a dispute over whether a limitation found in a dependent claim should be read into an independent claim, and that limitation is the only meaningful difference between the two claims.").

Defendants have countered that "any presumption created by the doctrine of claim differentiation will be overcome by a contrary construction dictated by the written description or prosecution history." *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1305 (Fed. Cir. 2011) (citations and internal quotation marks omitted); *accord Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1381 (Fed. Cir. 2006) ("[C]laim differentiation can not broaden claims beyond their correct scope.") (citation and internal quotation marks omitted). On balance, *Retractable* is distinguishable because the above-discussed specification disclosures and prosecution history are not so clear as Defendants have urged. *See Retractable*, 653 F.3d at 1305 (noting that disclosures "recite that 'the invention' has a body constructed as a single structure, expressly distinguish the invention from the prior art based on this feature, and only disclose embodiments that are expressly limited to having a body that is a single piece").

As to the proper construction, Defendants' proposal of "type of receiver" is vague and confusing because it is unclear whether "type" refers to the modulation method or to some other, unspecified characteristic of the receivers.

Also, Plaintiff properly argues that "encoding" is different than "modulation." For example, Plaintiff submits that the word "encode" can be defined as "to encrypt" or as "to use a code, frequently one composed of binary numbers, to represent individual characters or groups of characters in a message." *Id.*, Ex. 4, *Modern Dictionary of Electronics* 341 (6th ed. 1997); *id.*, Ex. 5, *Microsoft Press Computer Dictionary* 175 (3d ed. 1997); *see id.*, Ex. 11, John G. Proakis & Masoud Salehi, *Communication Systems Engineering* 8-11 (1994); *see also id.*, Ex. 12, Bernard Sklar, *Digital Communications: Fundamentals and Applications* 6-7 (1988).

"Modulation," by contrast, is defined as a process of varying some characteristic of a carrier signal. *See* Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 662 (6th ed. 1996) ("The process by which some characteristic of a carrier is varied in accordance with a modulating wave"); *see also id.*, Ex. 4, *Modern Dictionary of Electronics* 633 (6th ed. 1997) ("The process, or results of the process, whereby some characteristic of one signal is varied in accordance with another signal. The modulated signal is called the carrier and may be modulated in three fundamental ways: by varying the amplitude (amplitude modulation) by varying the frequency (frequency modulation) or by varying the phase (phase modulation)."); *id.*, Ex. 5, *Microsoft Press Computer Dictionary* 313 (3d ed. 1997) ("The process of changing or regulating the characteristics of a carrier wave vibrating at a certain amplitude (height) and frequency (timing) so that the variations represent meaningful information."); *id.*, Ex. 6, D.K. Sharma, et al., *Analog & Digital Modulation Techniques: An Overview* 551 (2010) ("Modulation is the process of varying some parameter of a periodic waveform in order to use that signal to convey a message."); Dkt. No. 102, Ex. 9 at RIP13523 ("Modulation is the process of encoding source data onto a continuous constant frequency signal i.e. carrier signal with frequency fc."). The specification, too, refers to a carrier in relevant contexts. *See* '580 Patent at 1:57 & 2:4. Finally, during oral argument as to the "different type" terms, Defendants themselves referred to modulating data onto a carrier.

Thus, even though Plaintiff itself included the word "encoding" in previously proposed constructions, Defendants' proposals of "encoding" are rejected as tending to confuse rather than clarify the scope of the claims. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement.”).

The Court, having rejected Defendants’ proposed constructions for the reasons set forth above, hereby construes the disputed terms as set forth in the following chart:

Term	Construction
“first modulation method”	**“a first method for varying one or more characteristics of a carrier signal in accordance with information to be communicated”**
“second modulation method”	**“a second method for varying one or more characteristics of a carrier signal in accordance with information to be communicated”**

B. “modulation method [] of a different type” and “different types of modulation methods”

Plaintiff’s Proposed Construction	**Defendants’ Proposed Construction**
“different families of modulation techniques”	“modulation methods that are incompatible with one another”

Dkt. No. 97 at 17; Dkt. No. 102 at 16. The parties submit that these terms appear in Claims 1 and 58 of the ‘580 Patent and Claims 1, 22, and 26 of the ‘228 Patent. Dkt. No. 81, Ex. A at 5.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for these disputed terms: “different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods.” Plaintiff had no opposition to the preliminary construction. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that during prosecution, the patentee defined these disputed terms by referring to "two types of modulation methods, *i.e.*, different families of modulation techniques." Dkt. No. 97 at 18. Plaintiff further argues that "Defendants' construction, which only requires 'incompatibility,' has no concept of a group of things having common characteristics. Such a construction effectively reads the word 'type' right out of the claims, rendering it superfluous." *Id.* at 19-20.

Defendants respond:

> As noted above [as to the "first" and "second" modulation methods], the whole purpose of the purported invention is to enable two (or more) trib modems to use different modulation methods on the same circuit. The crucial characteristic of the different modulation methods vis-à-vis one another is that they are incompatible. If they were compatible, there would be no problem for the patents to solve.

Dkt. No. 102 at 16. Defendants also note that the word "family" does not appear in the specification. *Id.* at 17. Defendants suggest that the patentee used the phrase "families of modulation techniques" only in prosecution history remarks—and not in the claims—because "[i]njecting that phrase into [a] claim would have rendered it plainly unsupported by the specification and opened this portion of the claim to a written description challenge." *Id.* at 18. Defendants argue that Plaintiff's authorities regarding the use of "i.e." are applicable only to use of "i.e" in the specification, not the prosecution history. *Id.* at 19. Defendants further argue that "Defendants' construction[] gives full meaning to the word 'type,' by requiring incompatibility." *Id.* Finally, Defendants submit that Plaintiff's proposal of "families" "only raises the further question of what constitutes a family of modulation methods." *Id.* at 20.

Plaintiff replies that the patentee's definition in the prosecution history is supported by disclosures of FSK (frequency-shift keying) and QAM (quadrature amplitude modulation) in the specification and in related applications cited by the specification. Dkt. No. 103 at 6. Plaintiff also argues that "nothing in the specification—certainly not the passages Defendants cite—reflects the kind of 'clear and unmistakable' intent necessary to depart from the ordinary meaning and define 'type' as 'incompatibility.'" *Id.* at 6-7 (citing *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012)).

At the May 30, 2014 hearing, Defendants argued that "family" is a much broader term than "type" because modulation methods could be grouped together in any number of ways, such as analog as opposed to digital or phase modulation as opposed to frequency modulation. Defendants also argued that Plaintiff's interpretation is inconsistent with dependent Claim 43 of the '228 Patent, which recites that "at least one" of the first and second modulation methods uses phase modulation.

Plaintiff responded by reiterating that Defendants' proposed construction fails to give meaning to the constituent term "type." Plaintiff also argued that Defendants' proposal is overly restrictive because it could be read to mean that different FM radio stations use "incompatible" methods merely because they transmit at different frequencies. Plaintiff urged that the claims contemplate the use of non-incompatible modulation methods so long as they are different.

(2) Analysis

The Summary section of the specification states: "Another advantage of the present invention is that a master transceiver can communicate seamlessly with tributary transceivers or modems using *incompatible modulation methods*." *Id.* at 2:55-57 (emphasis added). Nonetheless, "[t]he court's task is not to limit claim language to exclude particular devices because they do not serve a perceived 'purpose' of the invention. . . . An invention may possess a number of advantages or purposes, and there is no requirement that every claim directed to that invention be limited to encompass all of them." *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 (Fed. Cir. 2003); *accord Howmedica Osteonics Corp. v. Wright Med. Tech., Inc.*, 540 F.3d 1337, 1345 (Fed. Cir. 2008) (discussing *E-Pass*). Defendants' proposal that different "types" of modulation methods must be "incompatible" would improperly limit the claims to a preferred embodiment. *See Comark*, 156 F.3d at 1187.

Moreover, although it appears in the Summary of the specification as quoted above, the word "incompatible" is unclear and, as Plaintiff has argued, would tend to raise issues concerning the manner or degree of compatibility. Along those lines, uncertainty might arise as to whether modulation methods must be completely incompatible in all respects or could instead be partially compatible. At the May 30, 2014 hearing, the Court expressed concern as to the clarity of "incompatible." Defendants responded that the disputed terms require that the modulation methods be different "waveforms," different "ways to modulate" data onto a carrier, or simply "not the same." These suggestions, however, merely restate that the methods are "different." This adds little, if anything, to the disputed terms themselves, which recite "modulation method [] of a different type" and "different types of modulation methods." Defendants' proposal of "incompatible" is therefore rejected.

The Court turns to whether Plaintiff is correct that the patentee gave the disputed terms an "express definition." Dkt. No. 97 at 19.

"The specification acts as a dictionary 'when it expressly defines terms used in the claims or when it defines terms by implication.'" *Bell Atl. Network Servs.*, 262 F.3d at 1268 (quoting *Vitronics Corp.*, 90 F.3d at 1582). "When a patentee acts as his own lexicographer in redefining the meaning of particular claim terms away from their ordinary meaning, he must clearly express that intent in the written description. We have repeatedly emphasized that the statement in the specification must have sufficient clarity to put one reasonably skilled in the art on notice that the inventor intended to redefine the claim term." *Merck*, 395 F.3d at 1370 (citations omitted). "[A] patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history." *Vitronics*, 90 F.3d at 1582.

During prosecution, the patentee amended claims so as to add the word "type," and the patentee stated:

> Applicant thanks Examiner Ha for the indication that claims 1-18 and 37-57 are allowed (office action, p. 7). Applicant has further amended claims 1-2, 9-15, 18, 37-38, and 45-46 with additional recitations to more precisely claim the subject-matter. For example, the language of independent claim 1 has been clarified to refer to two *types* of modulation methods, *i.e.*, different families of modulation techniques, such as the FSK [(frequency shift keying)] family of modulation methods and the QAM [(quadrature amplitude modulation)] family of modulation methods.

Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536); *see id.* at 7 (RIP3523) (amending claims). Generally, "i.e." signals an explicit definition. *See, e.g.*, *Abbott Labs. v. Novopharm Ltd.*, 323 F.3d 1324, 1327, 1330 (Fed. Cir. 2003) (finding that the patentee used "i.e." to define a term not known in the art at the relevant time); *but see Pfizer, Inc. v. Teva Pharm., USA, Inc.*, 429 F.3d 1364, 1373 (Fed. Cir. 2005) (specification referred to "saccharides (i.e. sugars)" but also contained further discussion under a section titled "Saccharides," and the court concluded that "the patentee clearly intended for this section to address the meaning of the same term").

The significance of the patentee's use of "i.e." in the prosecution history—as opposed to in the specification—is perhaps less clear. On one hand, some authorities caution against relying upon potentially "self-serving" statements in the prosecution history. *See Biogen, Inc. v. Berlex Labs.*, 318 F.3d 1132, 1140 (Fed. Cir. 2003) ("Representations during prosecution cannot enlarge the content of the specification, and the district court was correct in relying on the specification in analyzing the claims."); *see also Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1270 (Fed. Cir. 1986) ("For example, a Citation [of Prior Art] filed [with the PTO] during litigation might very well contain merely self-serving statements which likely would be accorded no more weight than testimony of an interested witness or argument of counsel. Issues of evidentiary weight are resolved on the circumstances of each case."). Also, as Defendants have pointed out, dependent Claim 43 of the '228 Patent is at least somewhat at odds with Plaintiff's interpretation to the extent that it would require that only one, instead of "at least one," of the first and second modulation methods can be phase modulation.

On the other hand, a "claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification *or prosecution history*." *CCS Fitness v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (emphasis added); *accord Home Diagnostics*, 381 F.3d at 1356; *Advanced Fiber Techs. (AFT) Trust v. J&L Fiber Servs., Inc.*, 674 F.3d 1365, 1374 (Fed. Cir. 2012); *see Vitronics*, 90 F.3d at 1582 (quoted above). Such authorities weigh in favor of construing the disputed term in accordance with the patentee's express definition in the prosecution history.

At the May 30, 2014 hearing, Defendants urged that because the patentee's definition was set forth after the examiner had indicated that the claims were allowable, the definition was self-serving and was not part of the usual back-and-forth negotiation that informs the meaning of claim terms. Plaintiff properly countered, however, that the patentee provided the definition in connection with amending some of the claims so as to introduce the word "types." *See* Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536) (quoted above); *see also id.* at 7 (RIP3523) (amending claims). Thus, to whatever extent Defendants are correct that the prosecution history can only define a term in the context of developing allowable claims, the patentee's definition in this case can properly be considered.

The patentee's express definition is also consistent with disclosure in the specification of various categories of modulation methods. *See* '580 Patent at 2:1-8 ("some applications (e.g., internet access) require high performance modulation, such as quadrature amplitude modulation (QAM), carrier amplitude and phase (CAP) modulation, or discrete multitone (DMT) modulation"); *see also id.* at 5:17-20 (similar).

Such a definition is also consistent with the extrinsic dictionary definitions submitted by Plaintiff, which define "type" as "a class, kind, or group set apart by common characteristics" and "family" as "a group of things having common characteristics." Dkt. No. 97, Ex. 22, *Merriam-Webster's Dictionary and Thesaurus* 291, 858 (2007); *see id.*, Ex. 23, *The American Century Thesaurus* 129 (1995) (listing "type" as a synonym for "family").

On balance, the patentee's lexicography should be given effect in the Court's construction. *See Vitronics*, 90 F.3d at 1582; *see also Abbott Labs.*, 323 F.3d at 1327, 1330; *CCS Fitness*, 288 F.3d at 1366; *Advanced Fiber Techs.*, 674 F.3d at 1374. As to Defendants' concerns, any dispute regarding whether accused modulation techniques are from different "families" is a factual dispute regarding infringement rather than a legal dispute for claim construction. *See PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) (noting that "the task of determining whether the construed claim reads on the accused product is for the finder of fact").

Nonetheless, although Plaintiff proposes merely "different families of modulation techniques," the patentee's definition in the prosecution history includes examples, namely "the

FSK family of modulation methods and the QAM family of modulation methods."[5] Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536). These examples provide useful context for understanding the phrase "different families" and, having been provided as part of the patentee's definition, should be included in the Court's construction.

The Court accordingly hereby construes **"modulation method [] of a different type"** and **"different types of modulation methods"** to mean **"different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods."**

C. "communication[s] device," "device that transmits," and "logic configured to transmit"

"communication[s] device"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary meaning applies. Alternatively: "a device that sends or receives information"	Samsung: "a device that sends or receives information over wires" BlackBerry: "a device that sends or receives information over wires in a circuit-switched network"

"device that transmits"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary meaning applies. Alternatively: "a device that sends information"	Samsung: "a device that sends information over wires" BlackBerry: "a device that sends information over wires in a circuit-switched network"

[5] The meanings of "FSK" and "QAM" do not appear to be in dispute.

"logic configured to transmit"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary meaning applies. Alternatively: "logic configured to send information"	Samsung: "logic configured to send information over wires" BlackBerry: "logic configured to send information over wires in a circuit-switched network"

Dkt. No. 97 at 20; Dkt. No. 102 at 23. The parties submit that the first of these terms appears in Claims 1, 23, 32, and 58 of the '580 Patent and all asserted claims of the '228 Patent. Dkt. No. 81, Ex. A at 11. The parties further submit that the second of these terms appears in Claim 40 of the '580 Patent and that the third appears in Claims 49 and 54 of the '580 Patent. *Id.* at 14 & 16.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "communication[s] device" means "a device that sends or receives information"; "device that transmits" means "a device that sends information"; and "logic configured to transmit" means "logic configured to send information." Plaintiff had no objection to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "[t]he words in these terms do not have specialized meanings, have not been otherwise defined by the patentee, and are easily understood based on their ordinary meaning." Dkt. No. 97 at 21. As to Defendants' proposals of "wires" and a "circuit-switched network," Plaintiff responds that such constructions are contrary to the recital in the claims of a generic "communication medium." *Id.* at 22. Plaintiff urges that the brief mention of wires in the specification is insufficient to redefine the disputed terms. *Id.* at 22-23. To the contrary, Plaintiff argues, during prosecution the patentee deleted text from the specification that referred to "lines." *Id.* at 23. Finally, Plaintiff notes that the words "circuit" and "switched" do not appear in the claims or the written description. *Id.* at 24.

Defendants respond that "[w]ireless networks are never mentioned in the patents-in-suit," despite wireless networks being well-known at the time the patent applications were filed, and "[t]he only example of a network mentioned in the text of the patents is a two-wired system of the prior art, upon which the alleged invention of the patents is an improvement." Dkt. No. 102 at 23; *see id.* at 24. Defendants also express concern that Plaintiff's proposed constructions "provide no boundaries, and as read could encompass a tin can connected to a string." *Id.* at 24. Finally, Defendant Blackberry proposes that the claimed invention is limited to circuit-switched networks because, "by design," "[d]evices on a packet-switched network can use different communication languages or modulation methods." *Id.* at 25. Blackberry cites several extrinsic treatises in support of this proposition and concludes that "[p]ut simply, in a packet-switched network there is no compatibility problem for the patents to solve, and the purported invention is unnecessary." *Id.* at 25-26.

Plaintiff replies that the patents-in-suit "do not limit the invention to wired or wireless 'modems'/'communication media' because both were well-known at the time." Dkt. No. 103 at 8 (citations and footnote omitted). Plaintiff also argues: "Defendants read too much into the Figures. Communications medium 94 is depicted as a line in Figs. 3-4, but that does not imply a wire any more than the absence of a line implies wireless." *Id.* at 8 n.7. As to Blackberry's proposal, Plaintiff replies that the patents-in-suit do not refer to "circuit-switched" or "packet-switched" networks because "the patents-in-suit are not concerned with low-level network switching protocols, but rather with 'sending transmissions modulated using at least two types of modulation methods.'" *Id.* (quoting '580 Patent at 2:30-31). Plaintiff also submits that "Blackberry has zero evidence to support its claim that devices on a packet-switched network can use different [] modulation methods by design." *Id.* (quoting Dkt. No. 102 at 25).

At the May 30, 2014 hearing, Defendants again highlighted the use of a solid line in the Figures to illustrate the communication medium. Defendants argued that the appropriate way to illustrate wireless communication would have been with an antenna or with a series of three closely-spaced curved lines. Defendants also noted that the provisional patent application refers to a "two-wire" modem. *See* Dkt. No. 97, Ex. 13 at 5. Finally, Defendant Blackberry presented no oral argument on its proposals of "circuit-switched" and instead submitted its proposed constructions on the briefing.

(2) Analysis

Although Plaintiff has proposed that no constructions are required, the parties have presented a "fundamental dispute regarding the scope of . . . claim term[s]," and the Court has a duty to resolve that dispute. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362-63 (Fed. Cir. 2008).

As a threshold matter, Defendants have not argued that their proposals of a wired network or a circuit-switched network are supported by anything within the claims at issue. The issue, then, is whether Defendants' proposed limitations are adequately supported by anything in the specification or the extrinsic evidence cited by the parties.

As to Defendants' proposals of requiring a wired network, the specification only once refers to wires:

> The foregoing discussion is based on a two-wire, half-duplex multipoint system. Nevertheless, it should be understood that the concept is equally applicable to four-wire systems.

'580 Patent at 4:51-54. This passage is insufficient to limit the claims to wired networks, particularly given that it refers to a discussion of only one or two of the Figures. *See id.* at 3:40-4:50; *see also Comark*, 156 F.3d at 1187. Moreover, Defendants have acknowledged that the "foregoing discussion" referred to in this passage is a discussion of "a two-wired system of the prior art." Dkt. No. 102 at 23.

In several other instances, the specification refers to a "communication medium," but those disclosures do not address whether the medium is wired or wireless. *See* '580 Patent at 2:52-54 ("One advantage of the present invention is that it provides to [*sic*, for] the use of a plurality of modem modulation methods on the same communication medium."), 3:40-44 ("With reference to FIG. 1, a prior art multipoint communication system 22 is shown to comprise a master modem or transceiver 24, which communicates with a plurality of tributary modems (tribs) or transceivers 26-26 over communication medium 28.") & 5:44-46 ("The master transceiver 64 communicates with trib 66 over communication medium 94.").

Defendants also argue that Figures 3 and 4 depict a wired network because the "communication medium 94" is illustrated by either solid line connectors (Figure 3) or a solid line (Figure 4). *See* Dkt. No. 102 at 24. First, as Plaintiff has urged, any argument that solid lines cannot represent a wireless network is conclusory speculation. Second, even if Figures 3 and 4 were interpreted as depicting a wired network, "patent coverage is not necessarily limited to inventions that look like the ones in the figures. To hold otherwise would be to import limitations [i]nto the claim[s] from the specification, which is fraught with danger." *MBO Labs. Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007).

Thus, the specification does not support limiting the claims to wired networks. This conclusion is reinforced by prosecution history in which the examiner rejected claims that recited a "communications device" and "logic configured to transmit" based on the "Siwiak" reference, which discloses a *wireless* communications system. Dkt. No. 97, Ex. 14, 9/1/2010 Office Action at 2-4 (RIP72-74); *id.*, Ex. 20 at 13 & 20 (RIP23 & RIP30) (application claims); *see id.*, Ex. 15, U.S. Pat. No. 5,537,398 (Siwiak) at 2:24-41 ("The messaging system includes a plurality of geographically distributed messaging transmitters, each comprising means for generating a radio frequency signal."); *see also Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir. 2005) ("Statements about a claim term made by an Examiner during prosecution of an application may be evidence of how one of skill in the art understood the term at the time the application was filed."). Finally, although the weight that the specification amendments should be given here is unclear, it is worth noting that the patentee *deleted* paragraphs from the specification that referred to "transmission *line* characteristics." *Id.*, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22) (emphasis added).

As to extrinsic evidence, Plaintiff has submitted two news articles from the relevant time period that use the phrase "wireless modem." Dkt. No. 103, Ex. 33, *Ericsson announces its M2190 OEM Wireless Modem, first PCMCIA modem for mobile data connectivity*, Business Wire, Nov. 2, 1994; *id.*, Ex. 34, *A Wireless Modem that Could Leave 'Em in the Dust*, BusinessWeek, Feb. 24, 1997. Use of the word "modem" in the patents-in-suit is therefore insufficient to require a wired network. Finally, Plaintiff has submitted a dictionary definition of "medium," in the context of "information transfer," as not being limited to wires but rather being any "vehicle capable of transferring data." Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 643 (6th ed. 1996).

In sum, Defendants have failed to justify limiting the claims to wired networks. The Court therefore turns to the additional proposals by Defendant Blackberry.

Blackberry has submitted extrinsic evidence in support its argument that the claimed invention only has relevance in circuit-switched networks, not packet-switched networks. Dkt. No. 102, Ex. 11, Gurdeep S. Hura & Mukesh Singhal, *Data and Computer Communications: Networking and Internetworking* 130-31 (2001) ("In the case of packet-switched networks, stations with different data rates can communicate with each other, and the necessary conversion between different data rates is done by the network, while in the case of circuit-switched networks, both stations must have the same data rate."); *id.*, Ex. 12, William Stallings, *Data and Computer Communications* 254-55 (5th ed. 1997) ("In [a] circuit-switching network, the connection provides for transmission at a constant data rate. Thus, each of the two devices that are connected must transmit and receive at the same data rate as the other . . . ."; "A packet-switching network can perform data-rate conversions. Two stations of different data rates can exchange packets because each connects to its node at its proper data rate."); *id.*, Ex. 13, Youlu Zheng & Shakil Akhtar, *Networks for Computer Scientists and Engineers* 125 (2002) ("Whereas . . . two networks connected by a circuit switch must operate at the same speed, packet switching can connect networks operating at different speeds.").

A circuit-switched network, at least in the context of Blackberry's proposals, appears to be a species of wired network. The Court therefore rejects Blackberry's proposals based on the Court's rejection of Defendants' proposals of "over wires," above.

Alternatively, even if Blackberry is proposing a circuit-switched network limitation that can be either wired or wireless, Blackberry's above-cited reliance on extrinsic evidence is disfavored. *See Phillips*, 415 F.3d at 1322 ("There is no guarantee that a term is used in the same way in a treatise as it would be by the patentee. In fact, discrepancies between the patent and treatises are apt to be common because the patent by its nature describes something novel.").

As to Blackberry's reliance on the purpose of the invention (avoiding the inefficiencies of requiring all devices to use the same modulation method), Blackberry is correct as a general matter that "the problem the inventor was attempting to solve, as discerned from the specification and the prosecution history, is a relevant consideration." *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1160 (Fed. Cir. 1997).

Nonetheless, "[t]he court's task is not to limit claim language to exclude particular devices because they do not serve a perceived 'purpose' of the invention. . . . An invention may possess a number of advantages or purposes, and there is no requirement that every claim directed to that invention be limited to encompass all of them." *E-Pass*, 343 F.3d at 1370; *accord Howmedica*, 540 F.3d at 1345 (discussing *E-Pass*).

Blackberry has also cited *Applied Materials, Inc. v. Advanced Semiconductor Materials America, Inc.*, 98 F.3d 1563, 1573 (Fed. Cir. 1996). In *Applied Materials*, the patent specification disclosed a problem of electrostatic contamination in the context of a "cold purge" from a chamber:

> As explained in the . . . specification, static charges are not a problem during subsequent purges of the chamber because after the initial steps the temperature of the chamber remains above about 180° C, the temperature above which static charges do not exist.
>
> In the invention of the . . . patent, static charges during the initial "cold" purges are eliminated by operating the lamps at a low level during the initial gas flow steps.
>
> * * *
>
> The district court found that "cold purge process" means temperatures below 180° C, and that the . . . invention was directed to the use of heat sufficiently high to remove electrostatic contamination in the initial purge steps, that is, heat above

> about 180° C, in a reactor whose operating conditions include temperatures below 180° C. "Cold purge" is interpreted in light of the problem the . . . patent solved: the elimination of electrostatic contamination during the initial purge step.

Id. at 1571, 1573. The limitation imposed in *Applied Materials* was thus founded on *intrinsic* disclosures regarding circumstances in which the stated problem presented itself. Here, by contrast, Blackberry relies upon *extrinsic* evidence in support of the proposed "circuit-switched" limitation. The patents-in-suit contain no reference to circuit-switched networks. *Applied Materials* is therefore distinguishable.

The Court accordingly rejects Defendants' proposed "over wires" and "circuit-switched" limitations. The parties are otherwise in agreement as to the proper meaning of the disputed terms, as set forth by Plaintiff's alternative proposed constructions. Although the plain and ordinary meaning of the disputed terms may well be readily understandable once Defendants' proposed limitations have been rejected, the existence of common ground in the parties' proposals is notable and should be given effect.

As to Defendants' statement that Plaintiff's proposals would "encompass a tin can connected to a string" (Dkt. No. 102 at 24), Defendants' concern is unwarranted because other claim language appropriately limits the scope of the claims. Further, to whatever extent Defendants' concern relates to validity, such arguments are of limited relevance during claim construction proceedings. *See Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction.").

For all of these reasons, the Court hereby construes the disputed terms as set forth in the following chart:

<u>Term</u>	<u>Construction</u>
"communication[s] device"	**"a device that sends or receives information"**
"device that transmits"	**"a device that sends information"**
"logic configured to transmit"	**"logic configured to send information"**

D. "training signal" and "trailing signal"

"training signal"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a transmission that signifies the beginning of a communication session"	"a distinct transmission that establishes properties of a subsequent data transmission and that can have a different intended destination from the subsequent data transmission"
"trailing signal"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a transmission that signifies the end of a communication session"	"a distinct transmission that follows a data transmission and that can have a different intended destination from the data transmission"

Dkt. No. 97 at 24; Dkt. No. 102 at 20. The parties submit that the first of these disputed terms appears in dependent Claims 29, 31, and 36 of the '228 Patent. Dkt. No. 81, Ex. A at 20. The parties submit that the second of these disputed terms appears in dependent Claim 51 of the '228 Patent. *Id.* at 21.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "training signal" means "a transmission that signifies the beginning of a transmission sequence and determines one or more properties of the transmission sequence"; and "trailing signal" means "a transmission that signifies the end of a transmission sequence." Plaintiff had no opposition to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that Defendants' proposals "improperly limit the claims to part of a preferred embodiment, in which some training and trailing signals 'can have a different intended destination from the subsequent data transmission.'" Dkt. No. 97 at 25. Plaintiff explains that "[w]hile in a preferred embodiment some of the training and trailing signals have a different intended destination than the data transmission, others do not." *Id.* at 26 (discussing '580 Patent at Figure 8). Plaintiff also argues that Defendants' proposal of "distinct" is vague and "has zero support in the record." Dkt. No. 97 at 25 & 27. Plaintiff submits that "[t]he specification focuses on the order and function of the components—not their 'distinctness.'" *Id.* at 27.

As to "training signal," Defendants respond that the "capab[ility] of having a different intended destination from the subsequent data transmission" is "central to the alleged invention." Dkt. No. 102 at 20. Defendants explain:

> [T]he purpose of the purported invention is to enable two (or more) tribs to use different modulation methods on the same circuit. The alleged invention accomplishes this via a training signal. When the master intends to send data to a type B trib, it first sends a training signal to the type A trib. []'580 patent[] at 6:3-6. The training signal notifies the type A trib that the master will switch to type B modulation. *Id.* In response to the training signal, the type A trib temporarily stops listening to signals on the line. *Id.* at 6:41-46. The master then transmits data to the type B trib using type B modulation. *Id.* at 6:8-12.
>
> Since the type A trib is not listening during the type B transmission, the type A trib — which does not understand type B modulation — does not attempt to decode the type B transmission. This avoids errors and delays caused by tribs trying to decode signals they do not understand. Moreover, the type B trib never

> receives the training signal, because it is only sent using type A modulation, which the type B trib does not understand. *See id.* at 5:67-6:2.

Dkt. No. 102 at 21. As to their proposal of a "distinct" transmission, Defendants argue that the specification "uniformly depicts the training signal as a discrete communication." *Id.* at 22 (citing '580 Patent at Fig. 5).

As to "trailing signal," Defendants respond that "the specification teaches that, just as the training signal notifies a type A trib of an impending change to type B modulation, the trailing signal notifies the type A trib that the type B data transmission is over. The trailing signal must be capable of having a different intended destination from the corresponding data transmission for the same reasons as the training signal." Dkt. No. 102 at 22 (citing '580 Patent at 6:16-19). Finally, Defendants emphasize that their proposals "state that the training and trailing signals '*can* have' different intended destinations from the intervening data transmissions, not that they must." *Id.* at 23.

Plaintiff replies that although one of the disclosed embodiments is consistent with Defendants' proposed constructions, Figure 8 illustrates a "communication session 170" in which "the training signal, communication signal, and trailing signal all have the same intended destination—the Type A transceiver." Dkt. No. 103 at 9. Finally, Plaintiff argues that "the specification focuses on the order and function of the transmitted components, not whether they are 'distinct.'" *Id.*

At the May 30, 2014 hearing, Defendants reiterated that the destinations need not necessarily be different. Nonetheless, Defendants explained, that capability is a limitation because the central purpose of a training signal is to instruct a trib to ignore a subsequent transmission. Defendants also submitted that they would be amenable to substituting the word "discrete" for the word "distinct" in Defendants' proposed constructions.

Plaintiff responded that a "training signal" can also be useful for enabling a master to change modulation methods when communicating with a bilingual trib, perhaps to overcome interference by using a more robust modulation method.

(2) Analysis

The disputed terms appear in Claims 29, 31, 36, and 51 of the '228 Patent, which recite (emphasis added):

> 29. The master communication device as in claim 26, wherein the first transmission sequence includes a *training signal*.
>
> * * *
>
> 31. The master communication device as in claim 29, wherein the *training signal* establishes signal level compensation.
>
> * * *
>
> 36. The master communication device as in claim 29, wherein the *training signal* includes parameters for the selection of optional features.
>
> * * *
>
> 51. The master communication device as in claim 26, wherein the master communication device is configured to transmit a *trailing signal* to complete the master communication transmission.

Nothing in these dependent claims requires that the recited "training signal" or "trailing signal" must be capable of having a different intended destination than the data transmission. Claims 31 and 36 depend from Claim 29, which in turn depends from independent Claim 26. Claim 26 recites the antecedent basis for "the first transmission sequence" recited in Claim 29 (emphasis added; formatting modified):

> 26. A master communication device configured to communicate according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device, the master communication device comprising:

a transceiver configured to *transmit signals over a communications medium to a slave device using at least two different types of modulation methods* and to receive one or more responses over the communication medium that comprise at least respective response data that is modulated according to one of the at least two different types of modulation methods, the at least two different types of modulation methods comprising a first modulation method and a second modulation method,

wherein the transmitted signals comprise first transmitted signals and second transmitted signals,

the first transmitted signals comprise at least two transmission sequences,

the at least two transmission sequences include *a first transmission sequence* and *a second transmission sequence*,

the transceiver is configured to *transmit the first transmission sequence using the first modulation method*, and

the transceiver is configured to *transmit the second transmission sequence using the second modulation method* wherein:

the first transmission sequence includes information that is indicative of an impending change in modulation method from the first modulation method to the second modulation method,

the second transmission sequence includes a payload portion that is transmitted after the first transmission sequence,

the first transmitted signals include first address information that is indicative of the slave device being an intended destination of the payload portion,

the second transmitted signals comprise at least a third transmission sequence and a fourth transmission sequence,

the transceiver is configured to transmit the third transmission sequence using the first modulation method,

the transceiver is configured to transmit the fourth transmission sequence using the first modulation method,

the third transmission sequence includes information indicative that the fourth transmission sequence will be transmitted using the first modulation method,

the fourth transmission sequence includes a second payload portion that is transmitted after the third transmission sequence, and

the second transmitted signals include second address information that is indicative of a specified slave device being an intended destination of the second payload portion.

Claim 26 thus recites "first transmitted *signals*" that include a "first transmission *sequence*" using a first modulation method and a "second transmission *sequence*" using a second modulation method. The "first transmission sequence" indicates a change from the first modulation method to the second modulation method, and "the second transmission sequence includes a payload portion that is transmitted after the first transmission sequence." The "first transmitted *signals*" also "include first address information that is indicative of the slave device being an intended destination of the payload portion." Claim 26 further recites "second transmitted signals" with limitations comparable to those of the "first transmitted signals," except that both transmission sequences are transmitted using the first modulation method.

Nowhere does Claim 26 recite that the first transmission sequence must be able to have an intended destination different from that of the subsequent payload. Claim 26 thus contains no support for imposing any such limitation on the "training signal" that is recited in dependent Claims 29, 31, and 36. Similarly, nothing in the claims suggests any such limitation as to the "trailing signal" recited in Claim 51.

Defendants have submitted that, in some cases, disclosure of a critical feature for achieving a central objective can warrant limiting the claims accordingly. *See Alloc*, 342 F.3d at 1369-70 (noting that the "specification . . . criticizes prior art floor systems without play" and finding that the "specification read as a whole leads to the inescapable conclusion that the claimed invention must include play in every embodiment"); *see also Honeywell Int'l, Inc. v. ITT Indus.*, 452 F.3d 1312, 1318 (Fed. Cir. 2006) ("The written description's detailed discussion of the prior art problem addressed by the patented invention, viz., leakage of non-metal fuel filters in EFI [(electronic fuel injection)] systems, further supports the conclusion that the fuel filter is not a preferred embodiment, but an only embodiment.").

This is not such a case. The specification uses the terms "training signal," "training sequence," "trailing signal," and "trailing sequence" several times but does not mandate that such signals or sequences be capable of having a different intended destination than a data transmission. For example, the specification discloses:

[B]efore any communication can begin in [prior art] multipoint system 22, the master transceiver and the tribs 26-26 must agree on a common modulation method. If a common modulation method is found, the master transceiver 24 and a single trib 26 will then exchange sequences of signals that are particular subsets of all signals that can be communicated via the agreed upon common modulation method. These sequences are commonly referred to as *training signals* and can be used for the following purposes: 1) to confirm that the common modulation method is available, 2) to establish received signal level compensation, 3) to establish time recovery and/or carrier recovery, 4) to permit channel equalization and/or echo cancellation, 5) to exchange parameters for optimizing performance and/or to select optional features, and 6) to confirm agreement with regard to the foregoing purposes prior to entering into data communication mode between the users. In a multipoint system, the address of the trib with which the master is establishing communication is also transmitted during the training interval. At the end of a data session a communicating pair of modems will typically exchange a sequence of signals known as *trailing signals* for the purpose of reliably stopping the session and confirming that the session has been stopped. In a multipoint system, failure to detect the end of a session will delay or disrupt a subsequent session.

Referring now to FIG. 2, an exemplary multipoint communication session is illustrated through use of a ladder diagram. This system uses polled multipoint communication protocol. That is, a master controls the initiation of its own transmission to the tribs and permits transmission from a trib only when that trib has been selected. At the beginning of the session, the master transceiver 24 establishes a common modulation as indicated by sequence 32 that is used by both the master 24 and the tribs 26a, 26b for communication. Once the modulation scheme is established among the modems in the multipoint system, [t]he master transceiver 24 transmits a *training sequence 34* that includes the address of the trib that the master seeks to communicate with. In this case, the *training sequence 34* includes the address of trib 26a. As a result, trib 26b ignores *training sequence 34*. After completion of the *training sequence 34*, master transceiver 24 transmits data 36 to trib 26a followed by *trailing sequence 38, which signifies the end of the communication session*. Similarly, with reference to FIG. 8, the sequence 170 illustrates a Type A modulation *training signal*, followed by a Type A modulation data signal. Note that trib 26b ignores data 36 and *trailing sequence 38* as it was not requested for communication during *training sequence 34*.

At the end of *trailing sequence 38*, trib 26a transmits *training sequence 42 to initiate a communication session* with master transceiver 24. Because master transceiver 24 selected trib 26a for communication as part of *training sequence 34*, trib 26a is the only modem that will return a transmission. Thus, trib 26a transmits data 44 destined for master transceiver 24 followed by *trailing sequence 46 to terminate the communication session.*

> The foregoing procedure is repeated except master transceiver identifies trib 26b in *training sequence 48*. In this case, trib 26a ignores the *training sequence 48* and the subsequent transmission of data 52 and *trailing sequence 54* because it does not recognize its address in *training sequence 48*. Master transceiver 24 transmits data 52 to trib 26b followed by *trailing sequence 54* to terminate the communication session. Similarly, with reference to FIG. 8, sequence 172 illustrates a Type A modulation signal, with notification of a change[] to Type[] B, followed by a Type[] B modulation data signal. To send information back to master transceiver 24, trib 26b transmits *training sequence 56* to establish a communication session. Master transceiver 24 is conditioned to expect data only from trib 26b because trib 26b was selected as part of *training sequence 48*. Trib 26b transmits data 58 to master transceiver 24 terminated by *trailing sequence 62*.

'228 Patent at 4:3-5:7 (emphasis added).

> Referring now to FIG. 4, a multipoint communication system 100 is shown comprising a master transceiver 64 along with a plurality of tribs 66-66. In this example, two tribs 66a-66a run a type A modulation method while one trib 66b runs a type B modulation method. The present invention permits a secondary or embedded modulation method (e.g., type B) to replace the standard modulation method (e.g., type A) after an initial *training sequence*. This allows the master transceiver 64 to communicate seamlessly with tribs of varying types.
>
> * * *
>
> To switch from type A modulation to type B modulation, master transceiver 64 transmits a *training sequence 106* to type A tribs 66a in which these tribs are notified of an impending change to type B modulation. The switch to type B modulation could be limited according to a specific time interval or for the communication of a particular quantity of data. After notifying the type A tribs 66a of the change to type B modulation, master transceiver 64, using type B modulation, transmits data along with an address in sequence 108, which is destined for a particular type B trib 66b. In an example, embedded modulation permits a secondary modulation to replace the usual primary modulation for a user data segment located after a primary training sequence. For example, master transceiver 64 may change to modulation Type B and may convey user information to type B trib 66b.

Id. at 6:4-13 & 6:27-44 (emphasis added).

> *To initiate a communication session* with a type A trib 66a, *master transceiver 64 transmits a training sequence 126* in which an address of a particular type A trib 66a is identified. The identified type A trib 66a recognizes its own address and transitions to state 128 to receive data from master transceiver 64 as part of sequence 132.

> After completing transmission sequence 132, which may include a user data segment transmitted using the usual primary (e.g., type A) modulation, master transceiver 64 transmits a *trailing sequence 134* using type A modulation signifying the *end of the current communication session*.

Id. at 7:11-21 (emphasis added). Contrary to Defendants' arguments, the specification does not establish that the sole purpose of a training signal, for example, must be to notify a trib that the trib will not understand the subsequent data transmission because that data is intended for a different trib. *See* Dkt. No. 102 at 21-22.

As to extrinsic evidence, Plaintiff has cited a dictionary definition of "header" as: "Identification or control information placed at the beginning of a file or message. *Contrast*: trailer." Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 479 (1996). Plaintiff has also cited definitions of "trailer" as: "Identification or control information placed at the end of a file or message. *Contrast*: header"; and "The contiguous control bits following a transmission that contain information used for such purposes as bit error detection and end-of-transmission indication. *Contrast*: header." *Id.* at 1126.

The claims, specification, and extrinsic evidence are therefore all consistent with Plaintiff's proposal that a "training signal" marks the beginning of a communication session and a "trailing signal" marks the end of a communication session.

As to Defendants' proposals, Defendants have not argued that "training signal" and "trailing signal" are coined terms that the patentee defined in relation to what Defendants have argued is the sole purpose of the invention. To the extent that the specification discloses training and trailing signals that have destinations different from those of associated data transmissions, that capability is a feature of preferred embodiments and should not be imported into the claims. *See Comark*, 156 F.3d at 1187 ("[The specification] simply details how the video delay circuit is to be used in a single embodiment of the invention."). The Court therefore rejects Defendants' argument that the "training signal" and "trailing signal" must be capable of having a different intended destination than an associated data transmission.

Similarly, as noted above, Defendants have relied upon items 106, 126, and 138 in Figure 5 to support their argument that the "training signal" and "trailing signal" must be "distinct" or "discrete" transmissions. Figure 5 is reproduced here:

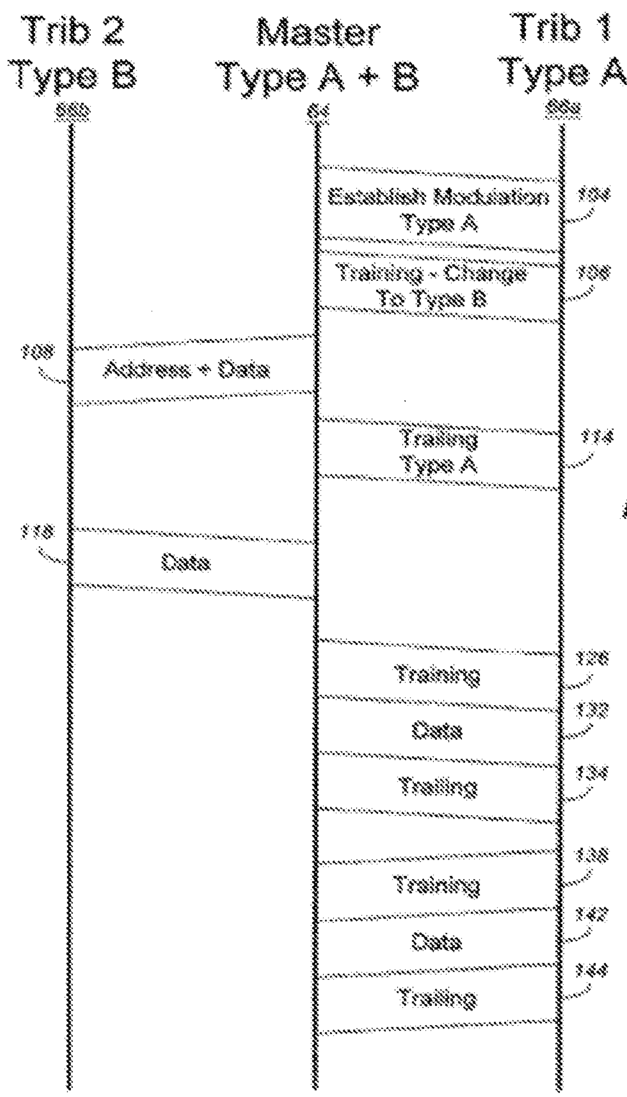

FIG. 5

Defendants have failed to demonstrate that this illustration of a preferred embodiment is limiting. *See MBO Labs.*, 474 F.3d at 1333 ("patent coverage is not necessarily limited to inventions that look like the ones in the figures"). Defendants' proposals in this regard are therefore rejected.

As to the proper constructions, Plaintiff's use of the word "signifies" is supported by the specification, particularly as to the term "trailing signal." *See* '228 Patent at 4:43-45 ("master transceiver 24 transmits data 36 to trib 26a followed by trailing sequence 38, which signifies the end of the communication session") & 7:19-21 ("master transceiver 64 transmits a trailing sequence 134 using type A modulation signifying the end of the current communication session"). The above-quoted disclosures demonstrate that a "training signal" should be construed in a similar manner.

Finally, at the May 30, 2014 hearing, Plaintiff had no objection to Defendants' proposal that a "training signal" must "establish[] properties of a subsequent data transmission."

The Court accordingly hereby construes the disputed terms as set forth in the following chart:

Term	Construction
"training signal"	**"a transmission that signifies the beginning of a transmission sequence and determines one or more properties of the transmission sequence"**
"trailing signal"	**"a transmission that signifies the end of a transmission sequence"**

E. "signal level compensation"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"adjusting signal parameters in the receiver"[6]	"adjusting the amplitude characteristics of a receiver"

Dkt. No. 97 at 27; Dkt. No. 102 at 26. The parties submit that this term appears in Claim 31 of the '228 Patent. Dkt. No. 81, Ex. A at 19.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for this disputed term: "adjusting signal parameters in the receiver." Plaintiff had no opposition to the Court's preliminary construction. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "just as there are many different 'signal levels'—Defendants' dictionary acknowledges 'voltage, current, power, phase shift, or frequency,' to name a few—there are many different ways to compensate those signal levels. For example, the frequency or phase shift of a signal may be compensated independent of the signal's amplitude." Dkt. No. 97 at 28.

Defendants respond that "[t]echnical dictionaries [(quoted below)] define 'signal level' as the strength or power of a signal." Dkt. No. 102 at 26. Defendants argue that Plaintiff's proposed construction "fails to give meaning to the word 'level.'" *Id.* at 27. Defendants explain that "frequency represents the number of signal cycles in a given time period, and phase reflects the signal's position on the x-axis (time). These are not measures of the signal's 'level,' *i.e.*, its

[6] Plaintiff previously proposed: "adjusting signal parameters in the receiver to minimize receiving errors." Dkt. No. 81, Ex. A at 19.

strength or power." *Id.* Defendants argue that their multiple, unambiguous dictionary definitions outweigh Plaintiff's "lone and secondary definition." *Id.* at 28.

Plaintiff replies that the extrinsic dictionary definitions cited by the parties do not limit "signal level" to "amplitude." Dkt. No. 103 at 10.

At the May 30, 2014 hearing, Defendants acknowledged that frequency and phase are characteristics that may be said to have a "level," but Defendants maintained that a person of ordinary skill in the art at the relevant time would have understood "signal level" as referring to amplitude. Plaintiff responded that none of the evidence cited by Defendants refers to "amplitude." Defendants replied that they would have no objection to a construction that referred to "strength" instead of "amplitude." Defendants nonetheless reiterated that in no event should the disputed term encompass frequency or phase.

(2) Analysis

Claim 31 of the '228 Patent recites:

> 31. The master communication device as in claim 29, wherein the training signal establishes signal level compensation.

Claim 31 depends from Claim 29 and, in turn, Claim 26, but nothing in these claims informs the meaning of "signal level compensation." Likewise, the specification identifies "signal level compensation" as one of the uses of training signals (*see* '580 Patent at 3:53-56), but the specification does not otherwise discuss the term.

Plaintiff submits a technical dictionary definition of "compensation" as: "The controlling elements which compensate for, or offset, the undesirable characteristics of the process to be controlled in the system." *Id.*, Ex. 4, *Modern Dictionary of Electronics* 184 (6th ed. 1997). This aspect of the disputed term does not appear to be in dispute. Instead, the parties disagree on the scope of the term "signal level."

Plaintiff has cited a technical dictionary definition of "signal level" as: "The magnitude of a signal parameter or element, such as the magnitude of the electric field strength, voltage, current, power, phase shift, or frequency." Dkt. No. 97, Ex. 27, *Communications Standard Dictionary* 906 (3d ed. 1996). As Defendants have noted, however, that same dictionary alternatively defines "signal level" as: "A measure of the power of a signal at a specified point in a communications system." *Id.*

Defendants have also submitted additional dictionaries that define "signal level" in terms of power. Dkt. No. 102, Ex. 14, *Dictionary of Communications Technology* 401 (2d ed. 1995) ("The strength of a signal, generally expressed in either units of voltage or power."); *id.*, Ex. 15, *Newton's Telecom Dictionary* 544 (11th ed. 1996) ("The strength of a signal, generally expressed in either absolute units of voltage or power, or in units relative to the strength of the signal at its source."); *id.*, Ex. 16, *Dictionary of Telecommunications* 250 (1981) ("The magnitude of a signal at a point in a telecommunication circuit. This can be expressed as an absolute power level in decibels relative to one milliwatt (dBm).") (italics omitted).

In reply, Plaintiff has cited extrinsic articles that refer to signal "frequency level" and signal "phase level." Dkt. No. 103, Ex. 38, Hamid Nawab, et al., *Diagnosis Using the Formal Theory of a Signal-Processing System* 373 (1987); *id.*, Ex. 39, Marco Antonio Chamon & Gerard Salut, *Particle Filtering of Radar Signals for Non-Cooperating Target Imaging* 1041 (1998); *see id.*, Ex. 40, U.S. Pat. No. 3,953,798 at 3:56-63. Plaintiff argues these articles establish that frequency and phase can each have a "level."

These competing definitions and usages demonstrate why extrinsic sources must be considered with caution. *See Phillips*, 415 F.3d at 1321 ("[H]eavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification. * * * [T]here may be a disconnect between the patentee's responsibility to describe and claim his invention, and the dictionary editors' objective of aggregating all possible definitions for particular words."); *see also id.* at 1322 ("There is no guarantee that a term is used in the same way in a treatise as it would be by the patentee. In fact, discrepancies between the patent and treatises are apt to be common because the patent by its nature describes something novel.").

On balance, because the specification refers to "phase . . . modulation" as well as "amplitude modulation" (*see id.* at 2:5-6), the Court rejects Defendants' reliance on extrinsic evidence and accordingly rejects Defendants' proposal to limit the disputed term to amplitude. *See Phillips*, 415 F.3d at 1321.

The Court therefore hereby construes **"signal level compensation"** to mean **"adjusting signal parameters in the receiver."**

F. "a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion of the first communication"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
No construction necessary; plain and ordinary meaning applies.	"a first portion of the first communication indicating that the second modulation method will be used instead of the first modulation method for modulating the payload data in the payload portion of the first communication"

Dkt. No. 97 at 29; Dkt. No. 102 at 28. The parties submit that this term appears in Claim 22 of the '228 Patent. Dkt. No. 81, Ex. A at 21.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for this disputed term: "Plain meaning."

(1) The Parties' Positions

Plaintiff argues that "[t]he plain and ordinary meaning of the instant term is apparent on its face and from the context of the surrounding claim language." Dkt. No. 97 at 29. Plaintiff further argues that Defendants' proposed construction "inject[s] an 'instead of the first modulation method' limitation" that "is unnecessary, because it does not help to clarify or explain the meaning of the instant term." *Id.* at 30.

Defendants respond that "[t]he specification discloses a training signal that indicates a *change* to a different modulation method." Dkt. No. 102 at 28. Defendants argue: "Claim 22 therefore must be construed to require an indication of an impending *change* to a second modulation method (*i.e.*, that "the second modulation method will be used instead of the first modulation method"), not simply that a second modulation method will be used." *Id.* at 29. Defendants conclude that "[p]ermitting the claim to encompass a mere indication of the forthcoming modulation method, rather than a *change* to that method, would result in a failure of both the written description and enablement requirements under [35 U.S.C.] Section 112(a)." *Id.* at 30.

Plaintiff replies that "Defendants' construction adds unnecessary verbiage to an unambiguous claim." Dkt. No. 103 at 10.

At the May 30, 2014 hearing, Plaintiff acknowledged that the disputed term and the surrounding claim language require a change from one modulation method to another modulation method. Plaintiff maintained that because this is clear on the face of the claim, no construction is necessary. Plaintiff concluded that Defendants' proposed construction should be rejected as tending to introduce a new limitation or as otherwise confusing the meaning of the claim. Defendants responded that clarification is warranted because the entire purpose of the purported invention is to notify and then to change modulation methods.

(2) Analysis

The Summary of the Invention refers to a "change in modulation":

> The present invention disclosed herein includes methods and systems for communication of data according to a communications method in which a master transceiver communicates with one or more slave transceivers according to a master/slave relationship.
>
> * * *
>
> The second message may comprise third information (e.g., first information of the second message/high data rate message), and the third information may be modulated according to the *first modulation method*. The third information may be indicative of an impending *change in modulation to a second modulation method* for transmission of fourth information (e.g., second information of the second message/high data rate message).

'228 Patent at 2:27-31 & 2:51-56 (emphasis added). The specification similarly discloses:

> To *switch from type A modulation to type B modulation*, master transceiver 64 transmits a training sequence 106 to type A tribs 66a in which these tribs are notified of an impending *change* to type B modulation. The *switch to type B modulation* could be limited according to a specific time interval or for the communication of a particular quantity of data. After notifying the type A tribs 66a of the change to type B modulation, master transceiver 64, using type B modulation, transmits data along with an address in sequence 108, which is destined for a particular type B trib 66b. In an example, embedded modulation permits a *secondary modulation to replace the usual primary modulation* for a user data segment located after a primary training sequence. For example, master transceiver 64 may *change* to modulation Type B and may convey user information to type B trib 66b. The type B trib 66b targeted by the master transceiver 64 will transition to state 112 as shown in FIG. 6 upon detecting its own address where it processes the data transmitted in sequence 108.

Id. at 6:27-44 (emphasis added); *see id.* at Figs. 5, 7 & 8 (illustrating "Change to Type B").

Claim 22 of the '228 Patent, which is the only claim that contains the disputed term, recites (emphasis added):

> 22. A communication device configured to communicate according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave, the device comprising:
>
> a transceiver in the role of the master according to the master/slave relationship that is configured to send at least a plurality of communications, wherein each communication from among said plurality of communications comprises at least a respective *first portion* and a respective payload portion, wherein each communication from among said plurality of communications is addressed for an intended destination of the respective payload portion of that communication, and wherein *for each communication from among said plurality of communications*:
>
> said respective *first portion is modulated according to a first modulation method* from among at least two types of modulation methods, wherein the at least two types of modulation methods comprise the first modulation method and a second modulation method, wherein the second modulation method is of a different type than the first modulation method,
>
> said respective first portion comprises an indication of which of the first modulation method and the second modulation method is used for modulating respective payload data in the respective payload portion, and
>
> the payload data is modulated according to at least one of the first modulation method or the second modulation method in accordance with what is indicated by the respective first portion;
>
> the transceiver further configured to send at least a first communication of the plurality of communications such that payload data included in a payload portion of the first communication is modulated according to the second modulation method based on *a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion of the first communication*, wherein the payload data is included in the first communication after the first portion of the first communication;
>
> the transceiver further configured to send at least a second communication of the plurality of communications such that payload data included in a payload portion of the second communication is modulated according to the first modulation method based on a first portion of the second communication indicating that the first modulation method will be used for modulating the payload data in the payload portion of the second communication.

On balance, the recital that the "first portion is modulated according to a first modulation method"—coupled with the recital in the disputed term that "the second modulation method will be used for modulating the payload data in the payload portion of the first communication"—is clear on its face.

Further, as noted above, Plaintiff has agreed that the disputed term and the surrounding claim language require a change from one modulation method to another modulation method.

Defendants' proposed clarification is therefore unnecessary and would tend to confuse rather than clarify the scope of the claim. *See U.S. Surgical*, 103 F.3d at 1568 ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro*, 521 F.3d at 1362 ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction.").

The Court accordingly hereby expressly rejects Defendants' proposed construction and hereby construes **"a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion of the first communication"** to have its **plain meaning**.

CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit.

The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 10th day of July, 2014.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE

Exhibit E

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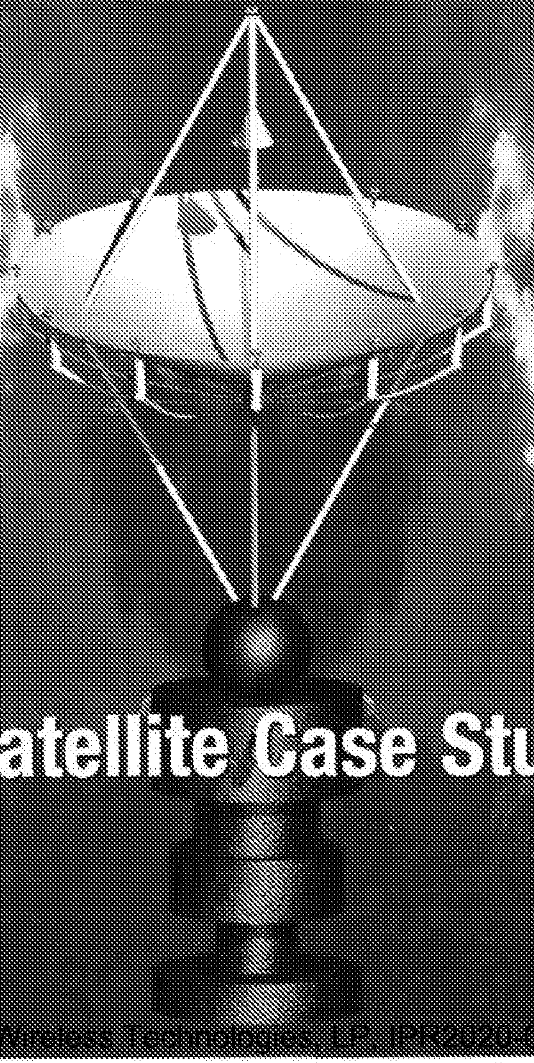

A Satellite Case Study

Embedded Systems Programming
VOL. 7 NO. 11 NOVEMBER 1994

ON THE COVER:

If your geosynchronous service calls are getting too expensive, try shifting to Ada. Cover by Rupert Adley.

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by BHARGAV UPENDER and PHILIP KOOPMAN

Communication Protocols for Embedded Systems

There's more to connecting multiple CPUs than just stringing wires or cable. Your choice of network protocol, in particular, will determine system performance.

The past few years have seen a growing trend to dramatically increase the embedded electronics content of automobiles, elevators, building climate control systems, jet aircraft engines, and other traditionally electro-mechanically controlled systems. In many large systems, this increasing electronics content is accompanied by a proliferation of subsystems with separate CPUs.

The increase in the number of processors in a system is often driven by computation and I/O growth. In some development environments, the increase may also be driven by a need to ease system integration burdens among multiple design groups or to provide system flexibility through "smart sensors" and "smart actuators." Whatever the reasons, once there is more than one CPU in a system, there must be some means of communication to coordinate action.

While some high-end embedded systems communicate over a VME backplane or similar arrangement, the embedded systems we're working on use physically distributed CPUs involving some sort of local area network (LAN), also called a multiplexed network or a communication bus. At the heart of the LAN is the media access protocol, which picks the next transmitter for access to the shared network medium, typically a wire, fiber, or RF frequency.

In this article, we will discuss the special considerations for networking real-time embedded systems, and look at several media access protocols that demonstrate fundamentally different ways of accessing the shared medium. The protocols are: connection-oriented protocols, polling, time division multiple access (TDMA), token ring, token bus, binary countdown, carrier sense multiple access with collision detection (CSMA/CD), and carrier sense multiple access with collision avoidance (CSMA/CA). For each of these, we will evaluate the strengths and weaknesses against special considerations. A protocol tradeoff chart will enable you to select a protocol to fit your needs. While no protocol is perfect for all purposes, a variation of CSMA/CA offers the most versatility for many embedded systems.[1]

SPECIAL CONSIDERATIONS

In practice, we have found that embedded real-time networks require high efficiency, deterministic latency, operational robustness, configuration flexibility, and low cost per node.

Because cost limits the network bandwidth available to many applications, protocol efficiency (message bits delivered compared to raw network bandwidth) is very important. The embedded systems we have studied are characterized by a predominance of short, periodic messages. So, an obvious optimization is to reduce overhead bits used for message packaging and routing. (It is not unusual for eight bits of data to be packed in a message that is 32 or even 64 bits long.)

Once message overhead has been reduced as much as possible, media access overhead must be reduced. For the most part, this is accomplished by minimizing the network bandwidth consumed by arbitration (such as passing a token or resolving collision conflict). Because worst-case behavior is typically important, efficiency should be evaluated for both light and heavy traffic. For example, CSMA/CD (often used in workstation LANs) is highly efficient for light traffic but gives poor performance if heavily loaded, while token bus protocols have the reverse properties.

Determinacy, or the ability to calculate worst-case response time, is important for meeting the real-time constraints of many embedded control applications. A prioritization capability is usually included in systems to improve determinacy of messages for time-critical tasks such as exception handling and high-speed loop control. Priorities can be assigned by node number or message type. Additionally, protocols can support local or global priority mechanisms. In local prioritization, each node gets a turn at the network in sequence and sends its highest priority queued message (thus potentially forcing a very high-priority message to wait for other nodes to have their turns first). In global prioritization, the highest priority message in the entire system is always transmitted first. This mechanism, which is fundamentally enabled by the media access protocol, is highly desirable for many safety-critical applications.

Many applications require robust

Because worst-case behavior is typically important, efficiency should be evaluated for both light and heavy traffic.

operation under extreme conditions. We call a protocol robust if it can quickly detect and recover from errors (duplicate or lost tokens, for example), added nodes, and deleted nodes. In some systems, it's important to quickly recover from a reset or power glitch that forces a restart of the network.

Varied operating environments may dictate use of a media access protocol that is flexible in supporting multiple media and mixed topologies. Portions of a system may require expensive fiber in noisy environments, while other portions can tolerate low-cost twisted pair wires in benign environments. A bus topology may be optimum for wires, but a ring or star topology may be needed for fiber.

A vital consideration is the cost per node. In this article, the order of the media access discussion progresses from very simple to complex, high-performance protocols. Simple protocols require less hardware and software resources and are therefore likely to be less expensive. For extremely cost-sensitive high-volume applications, these protocols are good candidates. However, for growing applications, more advanced protocols provide a stronger foundation. In general, costs are decreasing over time due to

advances in IC manufacturing technology and the increasing availability of off-the-shelf protocols. Consequently, we envision advanced cost-effective protocols used in many embedded applications.

MEDIA ACCESS PROTOCOLS

Now that we have a feel for the issues in embedded networks, let's examine various commonly available media access protocols. While many variations and combinations are possible, we'll discuss the plain versions of each protocol.

Before LANs became popular, connection-oriented protocols were heavily used to connect remote terminals to mainframes. These protocols support only two nodes per physical transmission medium and are typically connected via modem with serial lines. Figure 1 shows an example of a four-processor network using this protocol. Communication between nodes not physically connected requires multiple transmissions through intermediate nodes. These protocols are deterministic between directly connected nodes. For indirectly connected nodes, latency can be high.

For an embedded system with modest communication requirements, this might be a cost-effective protocol (readily available hardware and software from mature technology). For demanding applications, nodes that handle a lot of pass-through traffic can become swamped, prohibiting use of low-cost nodes in a large system. Sometimes, this type of protocol is combined with a more complex communication system to provide backward compatibility to older systems or to allow simple remote modem access to the system (such as BACnet). This type of protocol is used by the X.25 public network standard (network services offered by telephone companies) and IBM's system network architecture (SNA).[2]

Polling is one of the more popular protocols for embedded systems because of its simplicity and determinacy. In this protocol, a centrally assigned master periodically sends a polling message to the slave nodes, giving them explicit permission to transmit on the network.

Figure 2 shows the polling order (dotted lines) of a simple four-node bus network. The majority of the protocol software is stored in the master and the communication work of slave nodes is minimal (therefore, the network costs tend to be smaller). This protocol is ideal for a centralized data-acquisition system where peer-to-peer communication and global prioritization are not required. However, the single-point-of-failure from the master node (or the cost of installing redundant master hardware) is often unacceptable. Additionally, the polling process consumes considerable bandwidth regardless of network load (poor efficiency). These protocols have been standardized by the military (MIL-STD-1553B) for aircraft subsystem communications. Some variants of this protocol allow inter-slave communication through the master as well as improved robustness by using multiple masters (as does Profibus).

TIME DIVISION MULTIPLE ACCESS

Time division multiple access (TDMA) is heavily used in satellite communications but is applicable to LANs as well.[3] In this protocol, a network master broadcasts a frame sync signal before each round of messages to synchronize clocks of all the nodes. After the sync, each node transmits during its uniquely allocated time slice, as shown in Figure 3. Performance is similar to polling, but with greater efficiency at heavy loads

FIGURE 1
An example network using connection-oriented protocols.

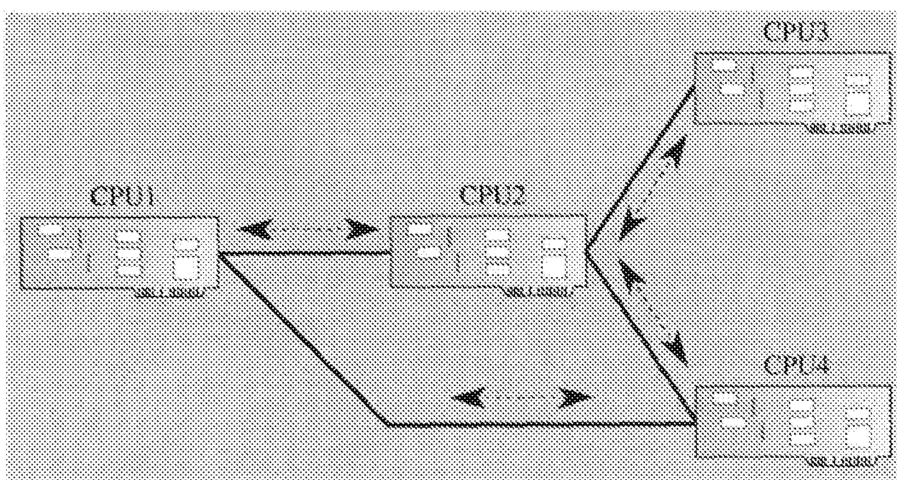
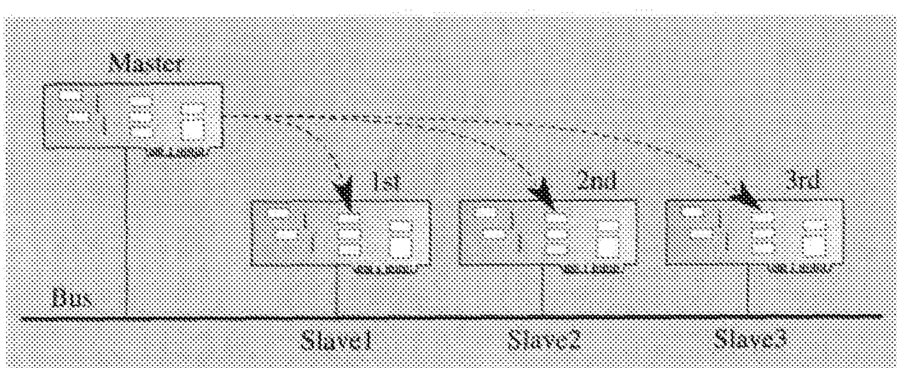


FIGURE 2
Master node sequentially polling slave nodes for information..



due to elimination of individual polling messages. Costs for slave nodes are greater with TDMA than with polling, because each slave node must have a stable time base to measure slices. An additional weakness for TDMA is the need for fixed-length messages to fit into time slices. In some TDMA variations, unused slices are truncated by tacit agreement among nodes. Time-based protocols have been popular in aerospace applications. For example, digital autonomous terminal access communications (DATAC) is being used by NASA and Boeing.

In a token ring network, the nodes are connected in a ring-like structure using point-to-point links as shown in Figure 4. A special token signal is passed from node to node around the ring. When a node has something to send, it stops the token circulation, sends its message all the way around the ring, and passes the token on. Since worst-case token waiting time can easily be calculated, this protocol is deterministic. Under light traffic, token ring has moderate token passing overhead. However, the protocol provides efficient throughput under heavy traffic conditions since idle token passing is minimized.

A frequent implementation strategy is to have a one-bit delay at each node, so a token can visit all nodes in N+T bit times, where N is the number of nodes and T is the number of bits in the token. Global prioritization is accomplished by altering the priority field of the token as it visits the nodes. This field enables only the nodes with a high priority to send messages on the network. Initialization of the token message and detection of accidentally duplicated or lost tokens adds complexity and cost to the protocol.

A break in the cable or a failed node disabling the entire network is a common concern for many users. Consequently, node bypass hardware and dual rings are used to address this concern at additional cost. Because the ring connections themselves are point-to-point, it is well suited for fiber optics. So, many LANs and wide area networks (WANs) are moving to this type of protocol. For example, fiber distributed data interface (FDDI) uses dual counter-rotating rings to achieve higher reliability than bus or star topologies.

TOKEN BUS

The operation of a token bus is very similar to a token ring—a token is passed from node to node in a virtual ring as in Figure 5. The holder of the token has the access to the network. Like token ring, token bus works well under heavy traffic with a high degree of determinacy. However, token bus broadcasts the message simultaneously to all nodes instead of passing it bit-by-bit along a physical ring. The minimum time for a token to traverse the logical ring of nodes is thus N*T bit times instead of N+T bit times as in token ring (because there is no parallelism in the connections). This makes global prioritization of messages largely impractical.

Unlike unidirectional token ring, a break in the cable or a failed node does not necessarily disable the entire network. A lengthy reconfiguration process, where each node identifies its neighbors, is used to maintain the virtual ring when nodes are added or

FIGURE 3
The time slices of TDMA protocols.

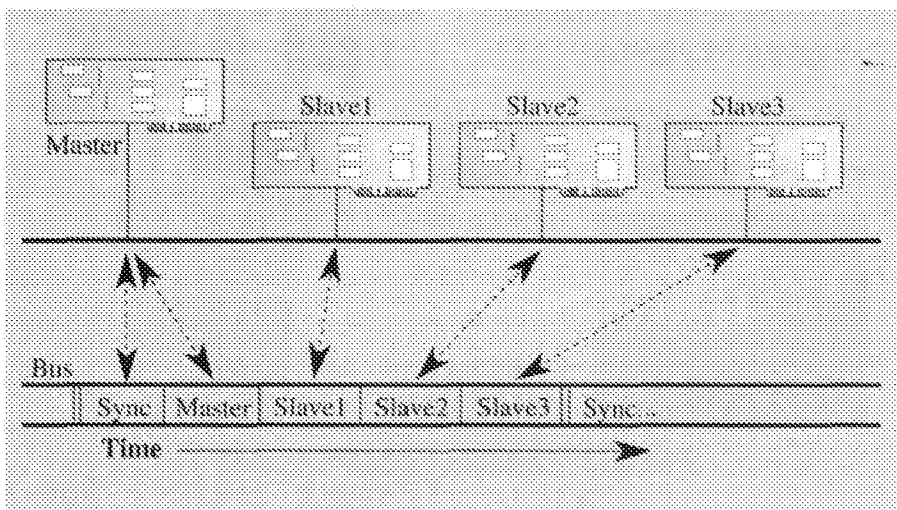
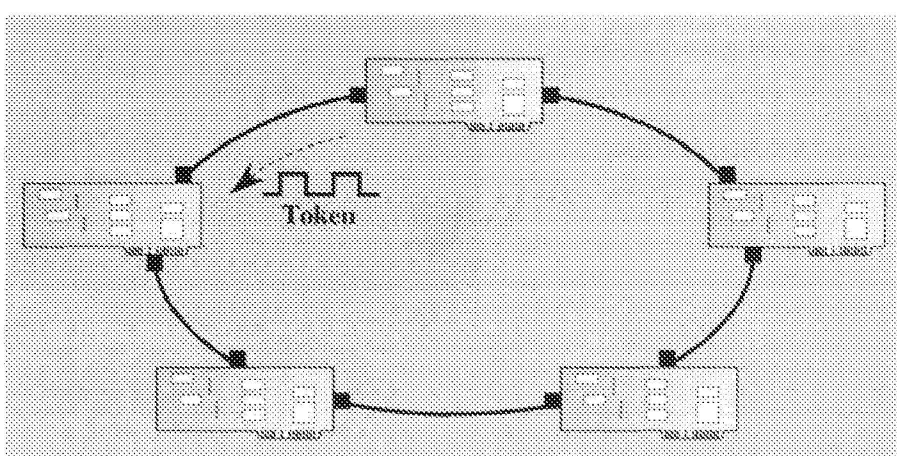


FIGURE 4
Token passing in the token ring networks.



deleted from the network. Because bus-like topologies are well suited for manufacturing plants, manufacturing automation protocol (MAP) adopted this protocol. Additionally, attached resource computer network (ARCnet)[4] uses this protocol for LAN connectivity and process control. Adaptive Networks' PLC-192 power line carrier chip uses a hybrid token bus protocol: under light traffic, nodes dynamically join and leave from the logical ring—under heavy traffic, all nodes join the ring to maintain stability.

In binary countdown, also known as the bit dominance protocol, all nodes wait for an idle channel before transmitting a message. Competing nodes (transmitting simultaneously) resolve contention by broadcasting a signal based on their unique node identification value. The transmission medium must have the characteristic that one value (say, a "1") overrides the opposite value (a "0"). During this transmission, a node drops out of the competition if it detects a dominant signal opposite to its own, as shown in Figure 6. Thus, if a "1" signal is dominant, the highest numbered transmitting node wins the competition and gains ownership of the channel.

Global prioritization can be achieved by arbitrating over message ID values rather than the node IDs. Since the arbitration is part of the message, this protocol has good throughput and high efficiency. Additionally, the protocol is more robust because node configuration (transmission order) is not required, and inactive nodes are ignored. However, since all messages are prioritized, there is no simple way to guarantee equally fair access among all nodes under heavily loaded conditions. Also, some transmission techniques (such as current-mode transformer coupling commonly used in high-noise environments) aren't compatible with the bit dominance requirement. Using this protocol, Bosch developed the controller area network (CAN) specification for automotive applications. The Society of Automotive Engineers standard SAE J-1850 also uses this protocol.

CARRIER SENSE MULTIPLE ACCESS

Carrier sense multiple access with collision detection (CSMA/CD) has been widely researched with a large number of published variations. In the simplest case, a node waits for the network to go idle before transmission (as in binary countdown). If multiple stations transmit almost simultaneously (within a round-trip transmission delay on the network), the messages collide, as in Figure 7. The nodes must detect this collision and resolve it by waiting for a random time before retrying.

The key advantage to this protocol is that, in principle, it supports an unlimited number of nodes that don't require preallocated slots or inclusion in token passing activities. CSMA/CD allows nodes to enter and leave the network without requiring network initialization and configuration. For light traffic conditions, overhead is very small. However, under heavy traffic, the overhead is unbounded due to high probability of repeated collisions. Consequently, this protocol has poor determinacy and low efficiency. Furthermore, detecting collisions may require analog circuitry, adding to the system expense. In fact, if the network environment is very noisy or the wiring runs are long and of poor quality, collision detection may not work at all. The popular Ethernet protocol used in workstation LANs is based on this protocol.

Many hybrid protocols combine the light traffic efficiency of CSMA/CD with the heavy traffic efficiency of

FIGURE 5
Token passing in token bus protocols.

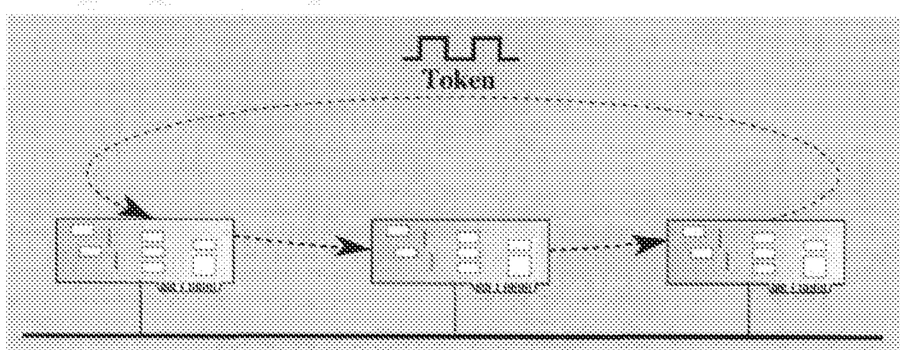
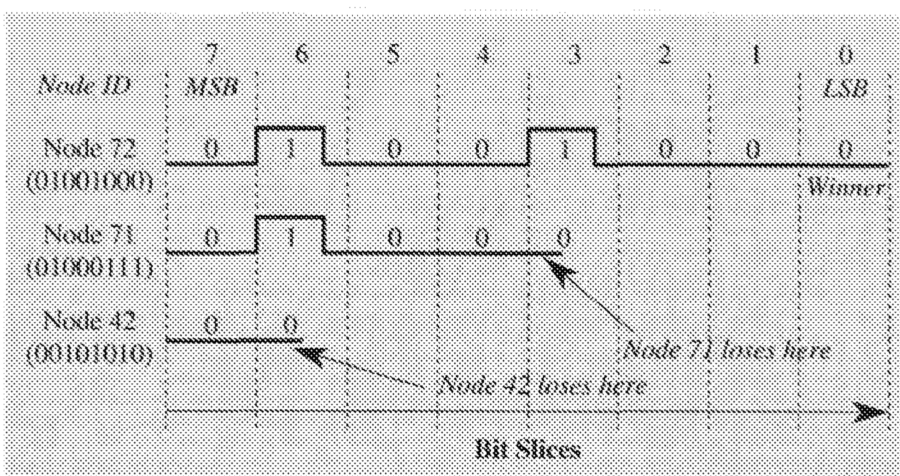


FIGURE 6
Arbitration in binary countdown protocols.



token-based protocols. The resulting protocols are often called carrier sense multiple access with collision avoidance (CSMA/CA). As in CSMA/CD, nodes transmit after detecting an idle channel. However, if two or more stations collide, a jam signal is sent on the network to notify all nodes of collision, synchronize clocks, and start contention time slots. Each contention time slot, typically just over a network round-trip propagation delay time, is assigned to a particular station. Each station is allowed to initiate transmission during its contention slot. Figure 8 shows a slot progression for a three node network. In this example, transmitters 2 and 3 collide and initiate a jam. Contention slots follow the jam signal. Since processor 1 has nothing to send, slot1 goes idle. Transmitter 2 starts sending its message during slot2. Other stations detect the message, and stop the slot progression.

After the end of the message, all nodes initiate new contention slots. However, to ensure fairness and determinacy, the slots are rotated (change positions) after each transmission. Additionally, the priority slots (pslots) can precede each slot progression to support global prioritization for high-priority messages. The network returns to an idle state when all the slots go unused.

The contention slots in CSMA/CA protocol help avoid collisions. In general, there are two distinct variations of CSMA/CA protocols. If the number of slots equals the number of stations, the protocol is called reservation CSMA (RCSMA). The RCSMA variation works efficiently under all traffic conditions.[6] However, because of the one-to-one relation of the node to the slot, RCSMA is not practical for a network with a large number of nodes. In another variation, the number of slots is less than the number of stations, and the slot assignments are randomly allocated to minimize collisions. Echelon's local operating network (LON) uses the latter variation and dynamically varies the number of slots based on

FIGURE 7
Collisions in CSMA/CD networks.

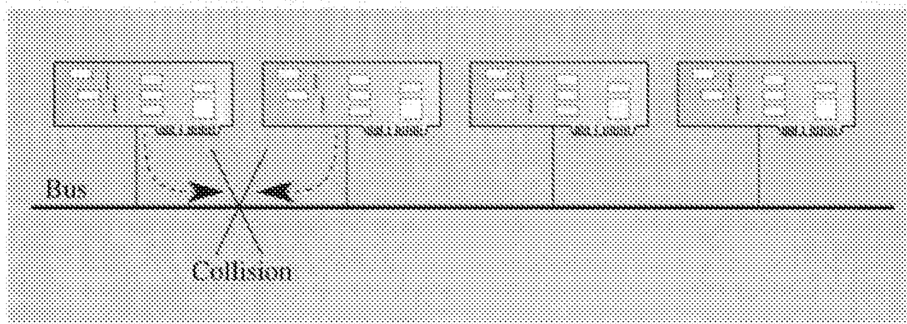
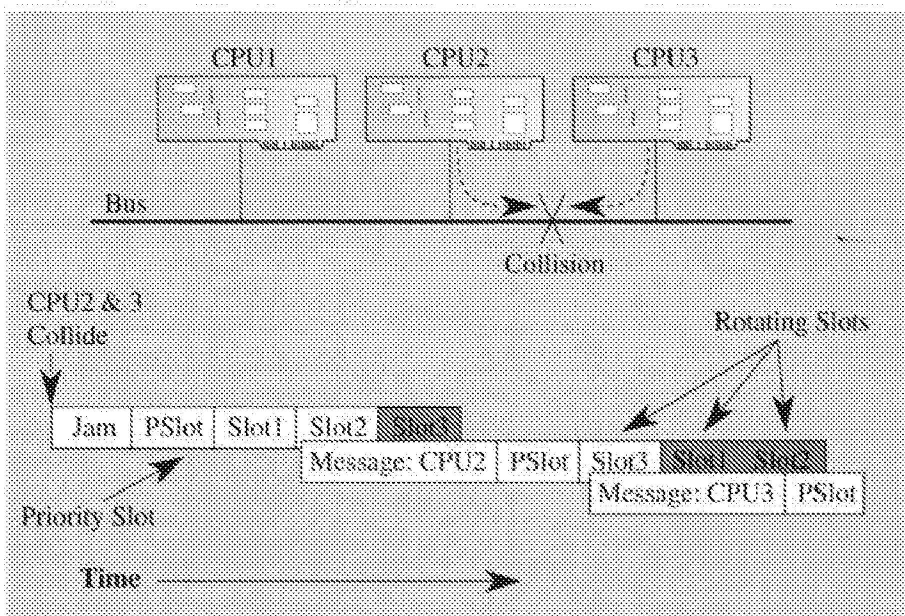


FIGURE 8
Slot progression in CSMA/CA protocols.



expected traffic prediction.[7] Unlike CSMA/CD, there are ways to eliminate the need for collision detection hardware, such as sending dummy messages that keep slots going in the absence of network traffic.

PROTOCOL TRADEOFFS

We have described the major media access protocols and noted clear differences. Table 1 summarizes some of the common traits and our assessment of their strengths and weaknesses for embedded real-time applications. The important points to take into consideration when evaluating alternatives are:

- Polling, TDMA, and connection-based protocols are simple, but may not provide sufficient flexibility for advanced systems.
- Token-based protocols are predictable, but can have high overhead and require complex software to maintain robustness.
- Binary count-down protocols rely heavily on the bit dominance characteristics of the physical medium.
- CSMA/CD is a poor choice for hard real-time systems with heavy traffic.

For our embedded systems, we have found that CSMA/CA, particularly RCSMA, is a good choice. While your application will no doubt have characteristics that are somewhat different

TABLE 1
Media access tradeoffs.

↑ Good — Ok ↓ Poor	Efficiency Light Traffic	Efficiency Heavy Traffic	Determinacy	Prioritization	Robustness	Physical Layer Flexibil.	Low Cost/ Node
Connection	—	↓	↑	—	↑	↓	—
Polling	↓	—	↑	↓	↓	↑	—
TDMA	↓	↑	↑	↓	↓	↑	↓
Token Ring	↑	↑	↑	↑	—	—	—
Token Bus	—	↑	↑	—	—	↑	—
Binary Cnt.	↑	↑	—	—	↑	↓	↑
CSMA/CD	↑	↓	↓	—	↑	↑	—
CSMA/CA	↑	↑	↑	↑	↑	↑	↑

than ours, this article's discussion of the special considerations and media access protocol strengths and weaknesses should allow you to select the best protocol to match your needs. We believe the electronic contents of embedded systems will continue to grow, and communication networks provide strong foundation for supporting this growth. ■ESP

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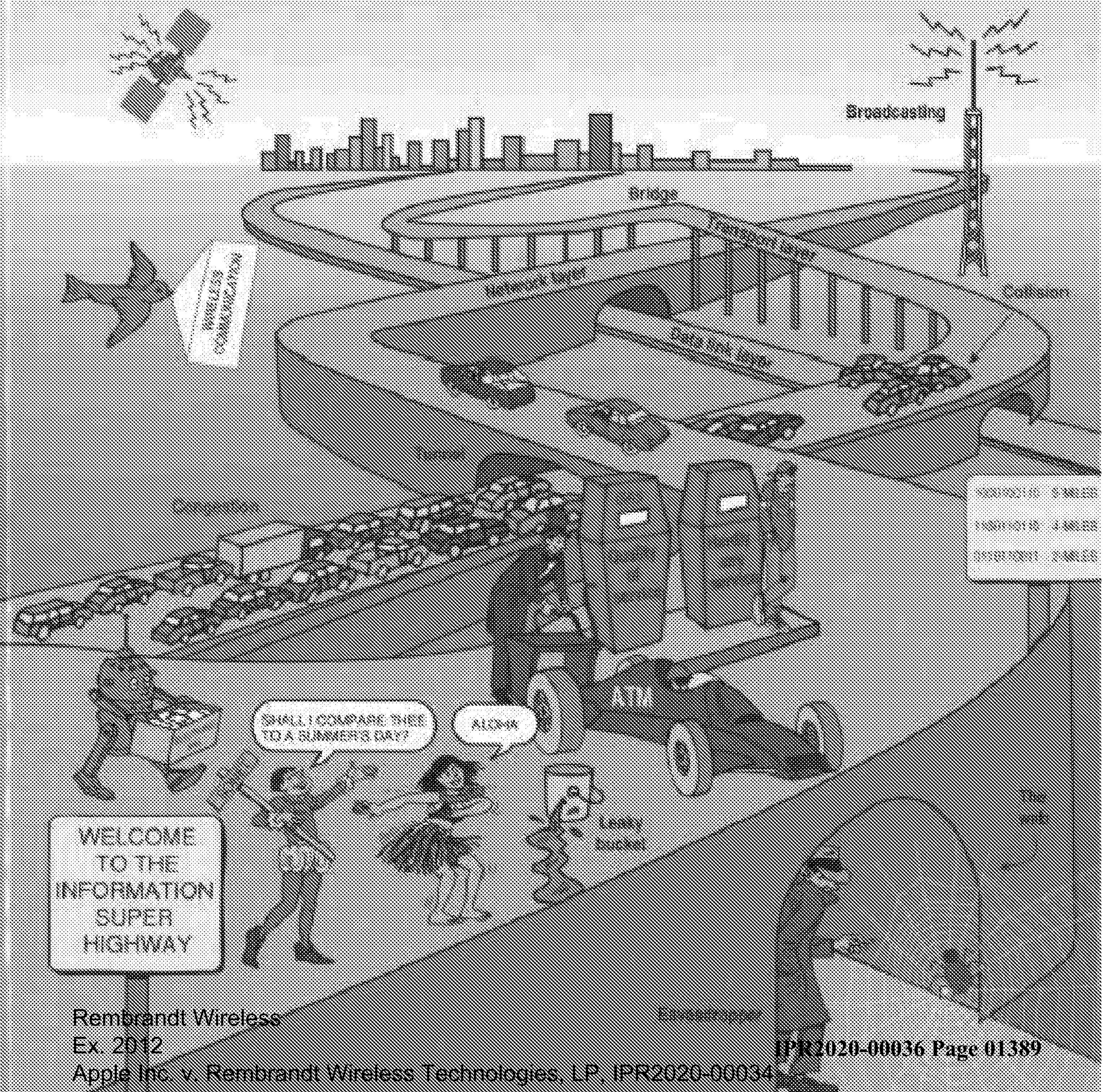
Exhibit F

THIRD EDITION

COMPUTER NETWORKS

ANDREW S. TANENBAUM



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1.3.1. Protocol Hierarchies

To reduce their design complexity, most networks are organized as a series of **layers** or **levels**, each one built upon the one below it. The number of layers, the name of each layer, the contents of each layer, and the function of each layer differ from network to network. However, in all networks, the purpose of each layer is to offer certain services to the higher layers, shielding those layers from the details of how the offered services are actually implemented.

Layer *n* on one machine carries on a conversation with layer *n* on another machine. The rules and conventions used in this conversation are collectively known as the layer *n* **protocol**. Basically, a protocol is an agreement between the communicating parties on how communication is to proceed. As an analogy, when a woman is introduced to a man, she may choose to stick out her hand. He, in turn, may decide either to shake it or kiss it, depending, for example, on whether she is an American lawyer at a business meeting or a European princess at a formal ball. Violating the protocol will make communication more difficult, if not impossible.

A five-layer network is illustrated in Fig. 1-9. The entities comprising the corresponding layers on different machines are called **peers**. In other words, it is the peers that communicate using the protocol.

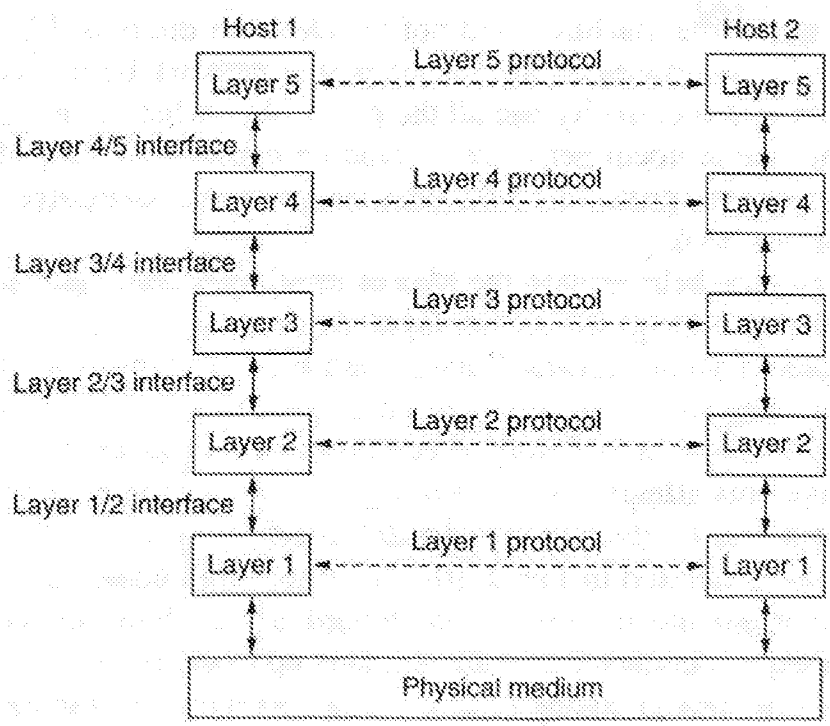


Fig. 1-9. Layers, protocols, and interfaces.

In reality, no data are directly transferred from layer *n* on one machine to layer *n* on another machine. Instead, each layer passes data and control information to the layer immediately below it, until the lowest layer is reached. Below layer 1 is the **physical medium** through which actual communication occurs. In Fig. 1-9, virtual communication is shown by dotted lines and physical communication by solid lines.

Between each pair of adjacent layers there is an **interface**. The interface defines which primitive operations and services the lower layer offers to the upper one. When network designers decide how many layers to include in a network and what each one should do, one of the most important considerations is defining clean interfaces between the layers. Doing so, in turn, requires that each layer perform a specific collection of well-understood functions. In addition to minimizing the amount of information that must be passed between layers, clean-cut interfaces also make it simpler to replace the implementation of one layer with a completely different implementation (e.g., all the telephone lines are replaced by satellite channels), because all that is required of the new implementation is that it offers exactly the same set of services to its upstairs neighbor as the old implementation did.

A set of layers and protocols is called a **network architecture**. The specification of an architecture must contain enough information to allow an implementer to write the program or build the hardware for each layer so that it will correctly obey the appropriate protocol. Neither the details of the implementation nor the specification of the interfaces are part of the architecture because these are hidden away inside the machines and not visible from the outside. It is not even necessary that the interfaces on all machines in a network be the same, provided that each machine can correctly use all the protocols. A list of protocols used by a certain system, one protocol per layer, is called a **protocol stack**. The subjects of network architectures, protocol stacks, and the protocols themselves are the principal topics of this book.

An analogy may help explain the idea of multilayer communication. Imagine two philosophers (peer processes in layer 3), one of whom speaks Urdu and English and one of whom speaks Chinese and French. Since they have no common language, they each engage a translator (peer processes at layer 2), each of whom in turn contacts a secretary (peer processes in layer 1). Philosopher 1 wishes to convey his affection for *oryctolagus cuniculus* to his peer. To do so, he passes a message (in English) across the 2/3 interface, to his translator, saying "I like rabbits," as illustrated in Fig. 1-10. The translators have agreed on a neutral language, Dutch, so the message is converted to "Ik hou van konijnen." The choice of language is the layer 2 protocol and is up to the layer 2 peer processes.

The translator then gives the message to a secretary for transmission, by, for example, fax (the layer 1 protocol). When the message arrives, it is translated into French and passed across the 2/3 interface to philosopher 2. Note that each protocol is completely independent of the other ones as long as the interfaces are not changed. The translators can switch from Dutch to say, Finnish, at will, provided that they both agree, and neither changes his interface with either layer 1 or

4. CONNECT.confirm – You hear the ringing stop.
5. DATA.request – You invite her to tea.
6. DATA.indication – She hears your invitation.
7. DATA.request – She says she would be delighted to come.
8. DATA.indication – You hear her acceptance.
9. DISCONNECT.request – You hang up the phone.
10. DISCONNECT.indication – She hears it and hangs up too.

Figure 1-15 shows this same sequence of steps as a series of service primitives, including the final confirmation of disconnection. Each step involves an interaction between two layers on one of the computers. Each *request* or *response* causes an *indication* or *confirm* at the other side a little later. In this example, the service users (you and Aunt Millie) are in layer $N+1$ and the service provider (the telephone system) is in layer N.

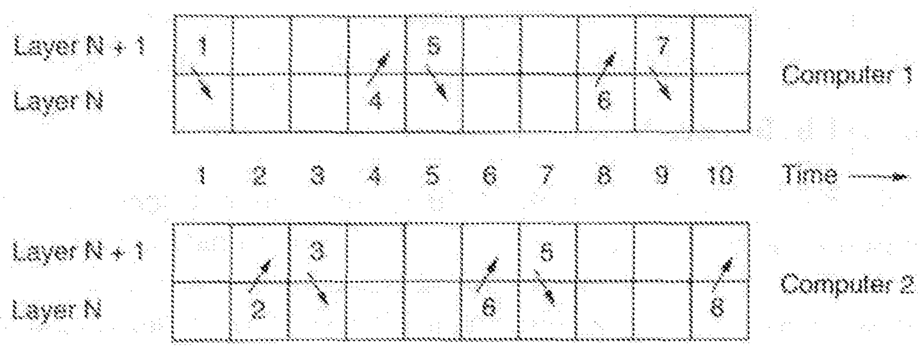


Fig. 1-15. How a computer would invite its Aunt Millie to tea. The numbers near the tail end of each arrow refer to the eight service primitives discussed in this section.

1.3.6. The Relationship of Services to Protocols

Services and protocols are distinct concepts, although they are frequently confused. This distinction is so important, however, that we emphasize it again here. A *service* is a set of primitives (operations) that a layer provides to the layer above it. The service defines what operations the layer is prepared to perform on behalf of its users, but it says nothing at all about how these operations are implemented. A service relates to an interface between two layers, with the lower layer being the service provider and the upper layer being the service user.

A *protocol*, in contrast, is a set of rules governing the format and meaning of the frames, packets, or messages that are exchanged by the peer entities within a layer. Entities use protocols in order to implement their service definitions. They are free to change their protocols at will, provided they do not change the service visible to their users. In this way, the service and the protocol are completely decoupled.

An analogy with programming languages is worth making. A service is like an abstract data type or an object in an object-oriented language. It defines operations that can be performed on an object but does not specify how these operations are implemented. A protocol relates to the *implementation* of the service and as such is not visible to the user of the service.

Many older protocols did not distinguish the service from the protocol. In effect, a typical layer might have had a service primitive SEND PACKET with the user providing a pointer to a fully assembled packet. This arrangement meant that all changes to the protocol were immediately visible to the users. Most network designers now regard such a design as a serious blunder.

1.4. REFERENCE MODELS

Now that we have discussed layered networks in the abstract, it is time to look at some examples. In the next two sections we will discuss two important network architectures, the OSI reference model and the TCP/IP reference model.

1.4.1. The OSI Reference Model

The OSI model is shown in Fig. 1-16 (minus the physical medium). This model is based on a proposal developed by the International Standards Organization (ISO) as a first step toward international standardization of the protocols used in the various layers (Day and Zimmermann, 1983). The model is called the **ISO OSI (Open Systems Interconnection) Reference Model** because it deals with connecting open systems—that is, systems that are open for communication with other systems. We will usually just call it the OSI model for short.

The OSI model has seven layers. The principles that were applied to arrive at the seven layers are as follows:

1. A layer should be created where a different level of abstraction is needed.
2. Each layer should perform a well defined function.
3. The function of each layer should be chosen with an eye toward defining internationally standardized protocols.
4. The layer boundaries should be chosen to minimize the information flow across the interfaces.
5. The number of layers should be large enough that distinct functions need not be thrown together in the same layer out of necessity, and small enough that the architecture does not become unwieldy.

Below we will discuss each layer of the model in turn, starting at the bottom layer. Note that the OSI model itself is not a network architecture because it does not specify the exact services and protocols to be used in each layer. It just tells what each layer should do. However, ISO has also produced standards for all the layers, although these are not part of the reference model itself. Each one has been published as a separate international standard.

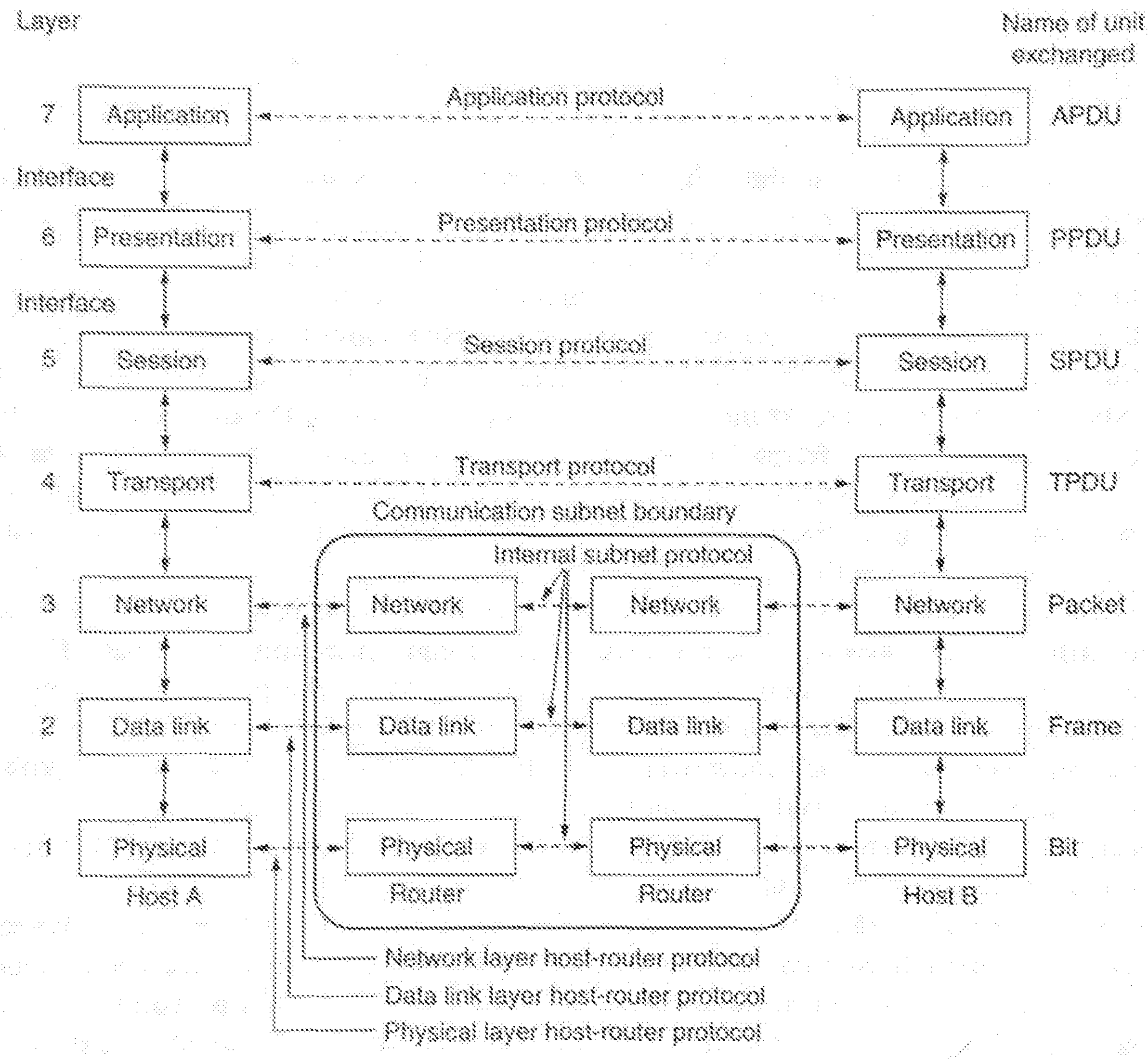


Fig. 1-16. The OSI reference model.

The Physical Layer

The **physical layer** is concerned with transmitting raw bits over a communication channel. The design issues have to do with making sure that when one side sends a 1 bit, it is received by the other side as a 1 bit, not as a 0 bit. Typical questions here are how many volts should be used to represent a 1 and how many for a 0, how many microseconds a bit lasts, whether transmission may proceed simultaneously in both directions, how the initial connection is established and how it is torn down when both sides are finished, and how many pins the network connector has and what each pin is used for. The design issues here largely deal with mechanical, electrical, and procedural interfaces, and the physical transmission medium, which lies below the physical layer.

The Data Link Layer

The main task of the **data link layer** is to take a raw transmission facility and transform it into a line that appears free of undetected transmission errors to the network layer. It accomplishes this task by having the sender break the input data up into **data frames** (typically a few hundred or a few thousand bytes), transmit the frames sequentially, and process the **acknowledgement frames** sent back by the receiver. Since the physical layer merely accepts and transmits a stream of bits without any regard to meaning or structure, it is up to the data link layer to create and recognize frame boundaries. This can be accomplished by attaching special bit patterns to the beginning and end of the frame. If these bit patterns can accidentally occur in the data, special care must be taken to make sure these patterns are not incorrectly interpreted as frame delimiters.

A noise burst on the line can destroy a frame completely. In this case, the data link layer software on the source machine can retransmit the frame. However, multiple transmissions of the same frame introduce the possibility of duplicate frames. A duplicate frame could be sent if the acknowledgement frame from the receiver back to the sender were lost. It is up to this layer to solve the problems caused by damaged, lost, and duplicate frames. The data link layer may offer several different service classes to the network layer, each of a different quality and with a different price.

Another issue that arises in the data link layer (and most of the higher layers as well) is how to keep a fast transmitter from drowning a slow receiver in data. Some traffic regulation mechanism must be employed to let the transmitter know how much buffer space the receiver has at the moment. Frequently, this flow regulation and the error handling are integrated.

If the line can be used to transmit data in both directions, this introduces a new complication that the data link layer software must deal with. The problem is that the acknowledgement frames for *A* to *B* traffic compete for the use of the line with data frames for the *B* to *A* traffic. A clever solution (piggybacking) has been devised; we will discuss it in detail later.

Broadcast networks have an additional issue in the data link layer: how to control access to the shared channel. A special sublayer of the data link layer, the medium access sublayer, deals with this problem.

than on the interoffice fiber trunks. The conclusion is: transmission errors are going to be a fact of life for many years to come.

As a result of the physical processes that generate them, errors on some media (e.g., radio) tend to come in bursts rather than singly. Having the errors come in bursts has both advantages and disadvantages over isolated single-bit errors. On the advantage side, computer data are always sent in blocks of bits. Suppose that the block size is 1000 bits, and the error rate is 0.001 per bit. If errors were independent, most blocks would contain an error. If the errors came in bursts of 100 however, only one or two blocks in 100 would be affected, on the average. The disadvantage of burst errors is that they are much harder to detect and correct than are isolated errors.

3.2.1. Error-Correcting Codes

Network designers have developed two basic strategies for dealing with errors. One way is to include enough redundant information along with each block of data sent to enable the receiver to deduce what the transmitted character must have been. The other way is to include only enough redundancy to allow the receiver to deduce that an error occurred, but not which error, and have it request a retransmission. The former strategy uses **error-correcting codes** and the latter uses **error-detecting codes**.

To understand how errors can be handled, it is necessary to look closely at what an error really is. Normally, a frame consists of m data (i.e., message) bits and r redundant, or check bits. Let the total length be n (i.e., $n = m + r$). An n-bit unit containing data and checkbits is often referred to as an n-bit **codeword**.

Given any two codewords, say, 10001001 and 10110001, it is possible to determine how many corresponding bits differ. In this case, 3 bits differ. To determine how many bits differ, just EXCLUSIVE OR the two codewords, and count the number of 1 bits in the result. The number of bit positions in which two codewords differ is called the **Hamming distance** (Hamming, 1950). Its significance is that if two codewords are a Hamming distance d apart, it will require d single-bit errors to convert one into the other.

In most data transmission applications, all 2^m possible data messages are legal, but due to the way the check bits are computed, not all of the 2^n possible codewords are used. Given the algorithm for computing the check bits, it is possible to construct a complete list of the legal codewords, and from this list find the two codewords whose Hamming distance is minimum. This distance is the Hamming distance of the complete code.

The error-detecting and error-correcting properties of a code depend on its Hamming distance. To detect d errors, you need a distance $d + 1$ code because with such a code there is no way that d single-bit errors can change a valid codeword into another valid codeword. When the receiver sees an invalid codeword, it

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Control No.	: 90/013,809	Art Unit	: 3992
Patent No.	: 8,457,228	Examiner	: Scott L. Weaver
Filed	: September 12, 2016	Conf. No.	: 7821
Customer No.	: 06449	Atty. No.	: 3277-114.RXM2

Title: SYSTEM AND METHOD OF COMMUNICATION USING AT LEAST TWO MODULATION METHODS

37 C.F.R. § 1.132 DECLARATION OF DR. ROBERT AKL

I. INTRODUCTION

A. Engagement

1. My name is Robert Akl, and I have been retained by counsel for Rembrandt Wireless Technologies, LP ("Rembrandt") as an expert declarant in this reexamination. I have been asked by counsel to opine on a number of subjects relevant to this reexamination, including the patentability of claim 21 of US Patent No. 8,457,228 ("the '228 Patent") from the perspective of one of ordinary skill in the relevant art prior to December 5, 1997 (when Provisional Patent Application No. 60/067,562 was filed, and to which the '228 Patent claims priority).

2. Specifically, I have been asked by counsel to review the Request for Ex Parte Reexamination of the '228 Patent ("'228 Request"), the Office's Order Granting Request for Ex Parte Reexamination of the '228 Patent (dated 10/17/16) ("Order"), the Office's Office Action in the '228 Reexamination (dated 5-3-17) ("May 3 Office Action") and the references relied on in the 10-17-16 Order and/or May 3 Office Action, including U.S. Patent No. 5,982,807 ("Snell"), U.S. Patent No. 6,075,814 ("Yamano"), "Using the PRISM™ Chip Set for Low Data Rate Applications," Harris Semiconductor Application Note No. AN9614 ("Harris AN9614"), "HSP3824 Direct Sequence Spread Spectrum Baseband Processor," Harris Semiconductor File No. 4064.4, ("Harris 4064.4"), Kamerman, A., "Throughput Density Constraints for Wireless LANs Based on DSSS," IEEE 4th International Symposium on Spread Spectrum Techniques and

Applications Proceedings, Mainz, Germany, Sept. 22-25, 1996, pp. 1344-1350 vol. 3 ("Kamerman"), and Upender et al., "Communication Protocols for Embedded Systems," Embedded Systems Programming, Vol. 7, Issue 11, Nov. 1994 ("Upender"); Samsung's petitions for IPR of the '228 Patent, including those in IPR2014-00889 ("'889 IPR"), IPR2014-00892 ("'892 IPR"), and IPR2015-00555 ("'555 IPR"); the PTAB's Institution Decisions in a number of IPRs, including the '892 IPR and the '555 IPR; the PTAB's Final Written Decision in the '892 IPR, U.S. Patent No. 5,706,428 ("Boer"), the alleged Admitted Prior Art ("APA"), U.S. Patent No. 5,537,398 to Siwiak ("Siwiak"), and the prosecution history leading to the issuance of the '228 Patent, including the prosecution history of the '580 Patent (parent to the '228 Patent), and to offer rebuttal opinions when, based on my expertise in the relevant art, I disagree with the determinations of the Office.

3. I am being compensated at my normal hourly consulting rate ($650 per hour) for time spent on this matter. I have no financial interest in the outcome of this reexamination, and my compensation is in no way affected by its outcome.

B. Qualifications

4. I have summarized in this section my educational background, work experience, and other relevant qualifications. A true and accurate copy of my curriculum vitae is attached as Appendix A to my declaration.

5. I earned my Bachelor of Science degrees in Electrical Engineering and Computer Science *summa cum laude* with a grade point average of 4.0/4.0 and a ranking of first in my undergraduate class from Washington University in Saint Louis in 1994. In 1996, I earned my Master of Science degree in Electrical Engineering from Washington University in Saint Louis with a grade point average of 4.0/4.0. I earned my Doctorate of Science in Electrical Engineering

from Washington University in Saint Louis in 2000, again with a grade point average of 4.0/4.0, with my dissertation on "Cell Design to Maximize Capacity in Cellular Code Division Multiple Access (CDMA) Networks."

6. While a graduate student, I worked at MinMax Corporation in St. Louis, where I designed software packages that provided tools to flexibly allocate capacity in a CDMA communications network and maximize the number of subscribers. As part of this work, I validated the hardware architecture for an Asynchronous Transfer Mode (ATM) switch capable of channel group switching, as well as performed logical and timing simulations, and developed the hardware architecture for the ATM switch. I also worked with Teleware Corporation in Seoul, South Korea, where I designed and developed algorithms that were commercially deployed in a software package suite for analyzing the capacity in a CDMA network implementing the IS-95 standard to maximize the number of subscribers.

7. After obtaining my Doctorate of Science degree, I worked as a Senior Systems Engineer at Comspace Corporation from October of 2000 to December of 2001. In this position, I designed and developed advanced data coding and modulation methods for improving the reliability and increasing the available data rates for cellular communications. I coded and simulated different encoding and modulation techniques using amplitude and phase characteristics and multi-level star constellations. This work further entailed the optimization of soft decision parameters and interleavers for additive white Gaussian and Rayleigh faded channels. In addition, I also extended the control and trunking of Logic Trunked Radio (LTR) to include one-to-one and one-to-many voice and data messaging.

8. In January of 2002, I joined the faculty of the University of New Orleans in Louisiana as an Assistant Professor in the Department of Electrical Engineering. While on this faculty, I

designed and taught two new courses called "Computer Systems Design I and II." I also developed a Computer Engineering Curriculum with strong hardware-design emphasis, formed a wireless research group, and advised graduate and undergraduate students.

9. In September of 2002, I received an appointment as an Assistant Professor in the Department of Computer Science and Engineering at the University of North Texas (UNT), in Denton, Texas. In May of 2008, I became a tenured Associate Professor in the Department of Computer Science and Engineering. As a faculty member, I have taught courses and directed research in wireless communications, including 2G, 3G, 4G, CDMA/WCDMA, GSM, UMTS, LTE, wireless sensors, Bluetooth, VoIP, multi-cell network optimization, call admission control, channel coding, ad-hoc networks, and computer architecture. I am the director of the Wireless Sensor Lab ("WiSL"). Several of my research projects were funded by industry. One such project funded by Raytheon encompassed using Bluetooth sensors that allow soldiers to communicate silently in close range engagement and convey hand signals and gestures wirelessly to a head's up display in the absence of line-of-sight. In January of 2015, I was promoted to Associate Chair of Graduate Studies in the Department of Computer Science and Engineering.

10. In addition to advising and mentoring students at UNT, I was asked to join the faculty of the University of Arkansas in Little Rock as an Adjunct Assistant Professor from 2004 to 2008 in order to supervise the research of two Ph.D. graduate students who were doing research in wireless communications. At UNT, I have advised and supervised more than 250 undergraduate and graduate students, many of whom received a master's or doctorate degree under my guidance.

11. In addition to my academic work, I have remained active in the communication industry through my consulting work. In 2002, I consulted for Input/Output Inc. and designed and implemented algorithms for optimizing the frequency selection process used by sonar for scanning the bottom of the ocean. In 2004, I worked with Allegiant Integrated Solutions in Ft. Worth, Texas to design and develop an integrated set of tools for fast deployment of wireless networks. Among other features, these tools optimize the placement of Access Points and determine their respective channel allocations to minimize interference and maximize capacity. I also assisted the Collin County Sheriff's Office (Texas) in a double homicide investigation, analyzing cellular record data to determine user location.

12. I have authored and co-authored approximately 75 journal publications, conference proceedings, technical papers, book chapters, and technical presentations, in a broad array of communications-related technology, including networking and wireless communication. I have also developed and taught over 100 courses related to communications and computer system designs, including a number of courses on LTE, VoIP, wireless communication, communications systems, sensor networks, computer systems design, and computer architecture. These courses have included introductory courses on communication networks and signals and systems, as well as more advanced courses on wireless communications. A complete list of my publications and the courses I have developed and/or taught is also contained in my curriculum vitae.

13. My professional affiliations include services in various professional organizations and serving as a reviewer for a number of technical publications, journals, and conferences. I have also received a number of awards and recognitions, including the IEEE Professionalism Award (2008), UNT College of Engineering Outstanding Teacher Award (2008), and Tech Titan of the Future (2010) among others, which are listed in my curriculum vitae. I have also served as an

expert in certain legal proceedings. Appendix A contains a list of cases in which I have testified (either via deposition, hearing or trial) during the past four years.

II. MATERIALS REVIEWED AND RELIED ON IN FORMING MY OPINIONS

14. In preparing the opinions and discussion included in this declaration, I have reviewed and considered the documents identified in ¶ 2 above and any others expressly cited in this declaration. I have also relied on my years of education, teaching, research, and experience, and my understanding of the applicable legal principles.

III. SUMMARY OF OPINIONS

15. From the perspective of one of ordinary skill in the relevant art (also referred to as "a person skilled in the art") prior to December 5, 1997, I offer the following opinions (discussed in detail below): (1) The disclosure in the documents relied on in the 10-17-16 Order and/or in the May 3 Office Action, individually or in the combinations relied on by the Office, are no more relevant to the patentability of claim 21of the '228 Patent than Boer in the combinations previously relied on by Samsung (which the PTAB previously considered when it refused to initiate *inter partes* review of claim 21), and thus do not present a substantial new question of patentability. *See* ¶¶ 41-70 below. (2) There is insufficient evidence that either Harris AN9614 or Harris 4064.4 was published prior to the priority date of the '228 Patent, rendering them unavailable to be incorporated by reference, and, even if they were successfully incorporated, Snell's reference to Harris AN9614 does not specifically identify the material relied on by the Office. *See* ¶¶ 71-77 below. (3) None of the art relied on in the May 3 Office Action, considered alone or in the combinations relied on by the Office, anticipates or would have rendered obvious claim 21 of the '228 Patent for the reasons given below.

IV. LEGAL PRINCIPLES

16. I am not an attorney. I have been advised of the following general principles of patent law to be considered in formulating my opinions as to the patentability of claim 21 of the '228 Patent. I have applied these principles to the facts set forth in this report in rendering my opinions.

17. I understand that determining the patentability of a patent claim requires a two-step analysis. First, the meaning and scope of the patent claim is interpreted, or construed, and then the construed claim is compared to the prior art.

A. Claim Construction

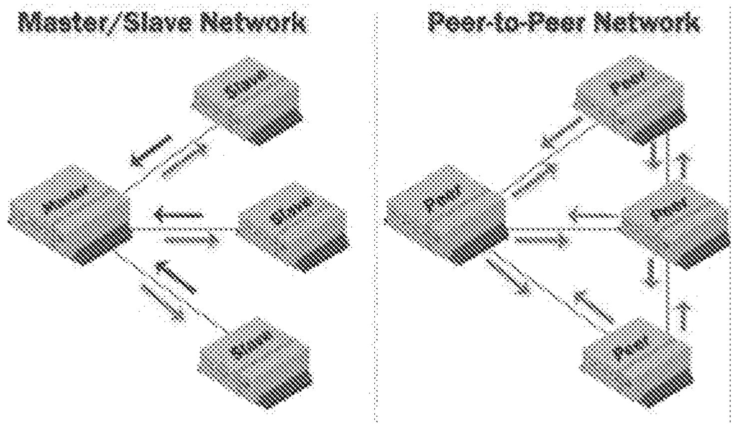
18. With respect to the first step, I understand that claims are to be interpreted from the perspective of one of ordinary skill in the art at the time of the invention and have considered such an interpretation in forming my opinions on patentability. I further understand that, in a reexamination of an issued patent, the claims are to be given their broadest reasonable interpretation when read in light of the specification and the patent's prosecution history. Based on this understanding, I have reviewed the claims, the specification, and the prosecution history. My analysis is informed by the plain and ordinary meaning the claim terms would have to one of ordinary skill in the art at the time of the invention, when read in the context of the claims, the specification and its prosecution history.

19. From the perspective of one of ordinary skill in the relevant art, I interpret the following terms as follows:

20. **"First and Second 'Modulation Method'"** -- On page 6 of the May 3 Office Action, the Office interpreted "First and Second 'Modulation Method'" to mean "modulation methods that are incompatible with one another." I disagree with this interpretation. The claim language requires that the first and second modulation methods be "of a different type." See claim 1 from

which claim 21 depends. Based on "the clearest statement in the intrinsic record" – which is found in the prosecution history -- the broadest reasonable interpretation of this claim language requires that the claimed first and second modulation methods must be in "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." *Rembrandt Wireless Tech. v. Samsung Elec. Co.*, No. 2016-1729, slip op. at 9 (Fed. Cir. April 17, 2017) (rehearing denied). Ignoring "types," as construed in the litigation would result in a claim construction that is overly broad and not consistent with how one skilled in the art would understand the term in view of the teachings in the prosecution history. My opinion is strengthened by the fact that claim 40 in the parent '580 Patent is not limited by the term "types" and only requires that the methods be different. A skilled artisan would understand that the term "types" was used to further limit other claims, including claim 21 of the '228 Patent, and would look to the prosecution history to understand how the term "types" further limits the claims.

21. **Master/Slave** – I have defined master/slave by giving the term its plain and ordinary meaning as one skilled in the art would have understood it in the context of the '228 Patent. In the field of data communications, the electrical devices can be arranged in various network configurations. The '228 Patent and its claims are directed to a network historically-referred to in the computer industry as a *master/slave* network because one centralized "master" device controls all network communications with the other subordinate "slave" or "tributary" devices. The slave devices do not directly communicate with one another, but instead only communicate with the master. This is very different from a *peer-to-peer* network, in which network control is distributed amongst the devices in the network and each device communicates directly with its peers:



Persons of ordinary skill at the relevant time would have recognized that the plain and ordinary meaning of a "master" is "a device which controls all communications with other devices (*i.e.*, slaves) in a network" and the plain and ordinary meaning of a "slave" is "a device whose network communications are controlled by a master."

22. My definitions are consistent with the specification of the '228 Patent. The '228 Patent is replete with usage of the terms "master" and "slave" in the context of the master/slave relationship. For example, the device disclosed in the '228 Patent includes "[a] master communication device configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to a master communication device occurs in response to a master communication from the master communication device to the slave device." '228 Patent at 10: 18-23. "[A] master controls the initiation of its own transmission to the tribs and permits transmission from a trib only when that trib has been selected." *Id.* at 4:31-33. Similarly, the Summary of the Invention section of the '228 Patent states that "[c]ommunication form the one or more slave transceivers may be in response to a communication from the master to at least one of the one or more slave transceivers." *Id.* at 2:24-29.

23. My definitions are supported by numerous technical sources. For example, the IEEE Wireless Dictionary states:

> "master: In the context of wireless protocols, this refers to a device that controls the operation of a network. ..."
>
> "slave: In the context of wireless protocols, a device that is dependent on another device for control, usually called the master. ..."

E.g., IEEE Wireless Dictionary at 55, 80; *see also* Comprehensive Dictionary of Electrical Engineering (1999) at 397 ("master: the system component responsible for controlling a number of others (called slaves)."); Modern Dictionary of Electronics (1997) at 932 ("slave: a component in a system that does not act independently, but only under the control of other similar components.").

24. Understanding the claimed master/slave configuration is key to understanding the problem Gordon Bremer identified and solved. The Summary section of the '228 Patent states:

> The present invention disclosed herein includes methods and systems for communication of data according to a communications method in which a *master* transceiver communicates with one or more slave transceivers according to a *master/slave relationship*. Communication from the one or more *slave* transceivers may be in response to a communication from the master to at least one of the one or more *slave* transceivers. Example communication methods may include transmitting at least a first message, which may be low data rate message, of a plurality of data messages. The plurality of data messages may be transmitted over a communication medium from the *master* transceiver to the one or more *slave* transceivers. ... The first message may include first message address data that may be indicative of an identity of one of the one or more *slave* transceivers as an intended destination of the second information. Example communication methods may include transmitting a second message, which may be a high data rate message, of the plurality of data messages. ... The second message may comprise the fourth information ... The fourth information may be intended for a single *slave* transceiver of the one or more *slave* transceivers. The higher data rate data may be transmitted at a higher data rate than the low data rate application data. The second message may indicate an identity of the single *slave* transceiver as being an intended destination of the fourth information using second message address data included in the second message. ['228 Patent at 2:27-3:6 (emphasis added).]

25. I observe that the '228 Patent uses the term "master" 150 times, the term "slave" 64 times, and the term "trib" 90 times. Further, the master/slave configuration is explicitly recited in claim 21. *E.g.*, '228 claim 1 (from which claim 21 depends) ("a master communication device

configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device."). Persons of ordinary skill would have recognized from the above disclosures that the claimed master/slave configuration is an important part of claim 21.

26. **Incompatible** – While not a claim term, the '228 Patent uses the term "incompatible" to describe the problem Gordon Bremer identified and solved. I have defined "incompatible" (which was not previously defined by the Office) by giving the term its plain and ordinary meaning as one skilled in the art would understand it *in the context of the '228 Patent*. In that context, first and second modulation methods are incompatible when one modem using the first method cannot communicate with a second modem using the second method. *See* the '228 Patent at 1:58-2:23. Importantly, incompatibility as used in the '228 Patent cannot be considered in a vacuum but must be considered in the context in which it is being used.

27. For purposes of my analyses supporting my opinions in this declaration, I have applied these definitions.

B. Anticipation

28. In reexamination, it is my understanding that anticipation under 35 U.S.C. § 102 requires the Office to prove by a preponderance of the evidence that a single prior art reference disclose, expressly or inherently, every limitation of the claimed invention. The relevant subsections of §102 are reproduced below:

> A person shall be entitled to a patent unless --
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or …
>
> (e) the invention was described in ... (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent ....

29. I understand that, in general, the anticipation analysis under 35 U.S.C. § 102 is limited to the use of a single reference. I further understand that portions of additional documents may be relied upon as part of the anticipation analysis if the primary reference incorporates the additional documents by reference. In order for the primary reference to incorporate additional documents by reference, the additional documents must meet certain legal requirements and the primary reference must identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the additional documents. A mere reference to another document is insufficient to incorporate that document by reference.

30. I understand that the phrase "printed publication" as used in § 102(a) and (b) means sufficiently accessible to the public interested in the art, and depends on dissemination and accessibility.

C. Obviousness

31. It is my understanding that a claim is unpatentable for obviousness under 35 U.S.C. § 103(a) if one or more prior art references alone or in combination would have suggested the claimed invention to one of ordinary skill in the relevant art at the time the invention was made. I further understand that, in a reexamination, the burden of proving unpatentability is on the Office and must be established by a preponderance of the evidence. The relevant standard for obviousness is as follows:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject

> matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made. [35 U.S.C. §103(a).]

32. I further understand that, in determining whether or not a patented invention would have been obvious, the following factors should be considered: (a) the scope and content of the prior art; (b) the differences between the prior art and the claims at issue; (c) the level of ordinary skill in the art; and (d) whatever "secondary considerations" may be present.

33. I understand that certain "secondary considerations" may be relevant in determining whether or not an invention would have been obvious, and that these secondary considerations may include commercial success of a product using the invention, if that commercial success is due to the invention; long-felt need for the invention; evidence of copying of the claimed invention; industry acceptance; initial skepticism; failure of others; praise of the invention; and the taking of licenses under the patents by others.

34. I understand that a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. While multiple prior art references or elements may, in some circumstances, be combined to render a patent claim obvious, I understand that I should consider whether an "apparent reason" would have existed to combine the prior art references or elements in the way the patent claims. To determine whether such an "apparent reason" would have existed, it is often be necessary to look to, among other things, the problem identified and solved by the claimed invention, the outcome of a proposed combination and whether that outcome would have been predictable, the interrelated teaching of multiple patents, the effects of demands known to the design community or present in the marketplace, and to the background knowledge possessed by a person having ordinary skill in the art.

35. I also understand that when the prior art "teaches away" from modifying or combining prior art references or certain known elements, i.e., discourages such a modification or combination, the discovery of a successful means of combining them is more likely to be non-obvious. A prior art reference may be said to "teach away" from a patent when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the patent or would be led in a direction divergent from the path that was taken by the patent. Additionally, a prior art reference may "teach away" from a claimed invention when modifying or substituting an element in a prior art device would render the claimed invention inoperable or negatively impact the value of the prior art device. The fact that a reference does not "teach away" from combining references does not mean that a skilled artisan would have been motivated to make the combination. Whether there would have been motivation to combine two references or modify a reference is a separate and distinct inquiry.

36. I also understand that it is not permissible to use hindsight in assessing whether a claimed invention would have been obvious. Rather, I understand that, to assess obviousness, you must place yourself in the shoes of a person having ordinary skill in the relevant art at the time the claimed invention was made and ignore the knowledge you currently now have of the claimed invention. Thus, the claims of a patent cannot be used as a roadmap to combine or modify prior art references.

D. Inherent Disclosure

37. I understand that a reference that does not expressly disclose a claim limitation may nevertheless "inherently" disclose the limitation if the missing matter is necessarily present in the system or method described in the reference. I further understand that the disclosure must be sufficient to show that the natural result flowing from the operation of the system or method

disclosed in the reference would require the missing matter or result in the performance of a missing step.

E. Person of Ordinary Skill in the Art of the '228 Patent

38. In my opinion, a person of ordinary skill in the art of the '228 Patent on December 5, 1997 would have a bachelor's degree in electrical engineering that included coursework in communications systems and networking, and two years of work experience in electronic communications. In determining who would be one of such ordinary skill, I considered at least the following criteria: (a) the type of problems encountered in the art; (b) prior art solutions to those problems; (c) the rapidity with which innovations are made; (d) the sophistication of the technology; and (e) the education level of active workers in the field.

F. Priority Date

39. I understand that in some situations a later-filed patent application can claim priority to an earlier-filed application. If a patent application claims priority to a prior application, the later-filed application may be entitled to the benefit of the earlier-filed application. For a later-filed patent application to be entitled to the benefit of an earlier filing date, the claims of the later-filed application must be supported by the written description in the earlier application in sufficient detail such that a person skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought.

G. Admitted Prior Art

40. I understand that an inventor can refer to another's work as "prior art" in a patent specification, in which case that admission may cause that work to become prior art for purposes of a patentability analysis. This has been referred to as the "doctrine of prior art by admission." However, I understand that the doctrine of prior art by admission is inapplicable when the

subject matter at issue is the inventor's own work. Rather, the doctrine of prior art by admission only applies when the inventor refers to the work of another as "prior art."

V. <u>THE SUBSTANTIAL NEW QUESTION OF PATENTABILITY ISSUE</u>

41. I understand that a reexamination cannot be ordered unless there is a substantial new question of patentability ("SNQ") not previously considered by the Office. In that regard, I further understand that "[i]t must first be demonstrated that a patent or printed publication that is relied on in a proposed rejection presents a new, non-cumulative technological teaching that was not previously considered and discussed on the record during the prosecution of the application that resulted in the patent for which reexamination is requested, and during the prosecution of any other prior proceeding involving the patent for which reexamination is requested." MPEP § 2216. Thus, merely substituting previously uncited art (e.g., Snell (including Harris AN9614), Yamano, and Kamerman) that is no more relevant to the claims' patentability than that already considered (e.g., Boer, APA, and Siwiak) and applying it in the same way does not raise an SNQ.

42. I understand that, in its Order, the Office identified the following alleged prior art:

i. U.S. Patent No. 5,982,807, filed on Mar. 17, 1997 and issued on Nov. 9, 1999, to Snell, J. ("Snell").

ii. U.S. Patent No. 6,075,814, filed on May 9, 1997 and issued on Jun. 13, 2000, to Yamano, L., et al. ("Yamano").

iii. Andren, C. et al., "Using the PRISM™ Chip Set for Low Data Rate Applications," Harris Semiconductor Application Note No. AN9614, March 1996 ("Harris AN9614").

iv. "HSP3824 Direct Sequence Spread Spectrum Baseband Processor," Harris Semiconductor File No. 4064.4, Oct. 1996 ("Harris 4064.4").

v. Kamerman, A., "Throughput Density Constraints for Wireless LANs Based on DSSS," IEEE 4th International Symposium on Spread Spectrum Techniques and Applications Proceedings, Mainz, Germany, Sept. 22-25, 1996, pp. 1344-1350 vol.3 ("Kamerman").

vi. Upender et al., "Communication Protocols for Embedded Systems," Embedded Systems Programming, Vol. 7, Issue 11, November 1994 - ("Upender").

Order, at 3.

43. I further understand that, without comparing the teachings of this cited art with those of the art previously considered in any of the multiple IPRs challenging the '228 Patent or during the examination of the '228 application, the Office determined:

> Each of references 1-5 has not been previously cited or considered and is considered new. Reference 6 was relied on as a teaching reference but is being considered in a new light.
>
> Because Snell was not cited or before the Office during prosecution of the application which became the '228 patent, Snell in combination with references 2-6 have not been considered before the Office prior to the instant reexamination. Accordingly, Snell in combination with references 2-6 can be used to raise a substantially new question of patentability in this *ex parte* reexamination proceeding.

Order, at 3.

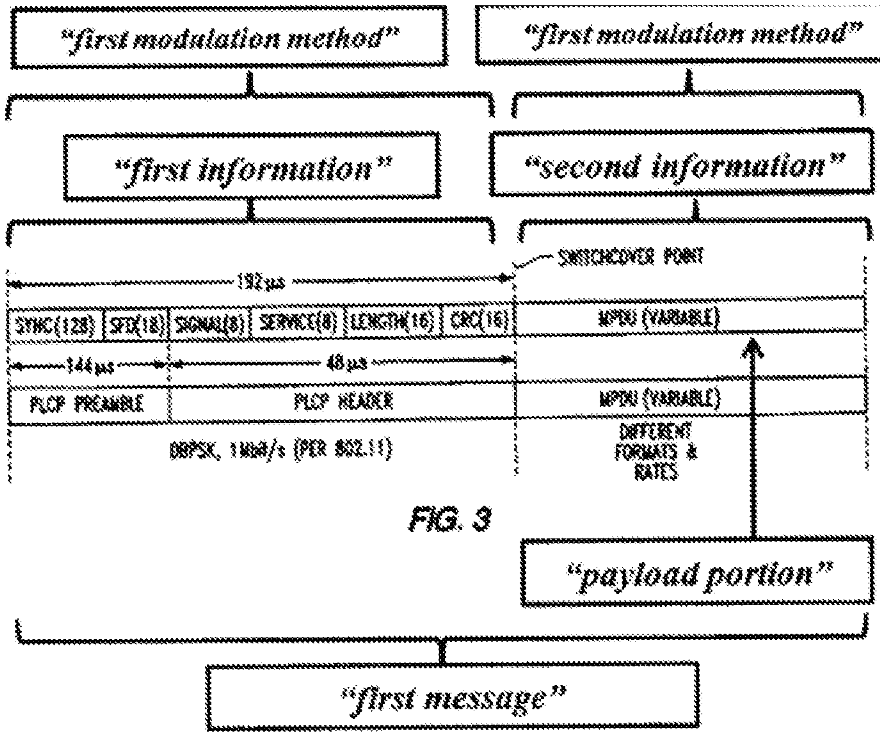
44. I further understand that, based on Snell, Yamano, and Kamerman, the Office identified the following three SNQs:

1) Unpatentability of claim 21of the '228 Patent under 35 U.S.C. §103 based on Snell in combination with Yamano and Kamerman;
2) Unpatentability of claim 21 of the '228 Patent under 35 U.S.C. §103 based on Snell in combination with Harris 4064.4, Harris AN9614, Yamano, and Kamerman; and
3) Unpatentability of claim 21 of the '228 Patent under 35 U.S.C. §103 based on Snell, Harris 4064.4, the Admitted Prior Art, Upender, Yamano, and Kamerman.

Order, at 9-12.

45. The Office's two-page discussion of the Snell, Yamano, and Kamerman disclosures, in its entirety, reads:

> **Snell** discloses a transceiver that serves as an access point for communicating data with other transceivers connected to a wireless local area network (WLAN). Snell at col. 4, lines 42- 47 and col. 5, lines 18-21. Snell's transceiver transmits data packets intended for another transceiver, where the communication may switch on-the-fly between a "first modulation method" (e.g., BPSK) and a "second modulation method" (e.g., QPSK) that is "of a different type than the first modulation method."
> Snell discloses the transceiver capable of transmitting data packets with preamble, header, and data portions, where the preamble and header are transmitted using BPSK modulation, and the data portion is transmitted using either BPSK or QPSK modulation (different modulation methods). *See,* Snell at Fig. 3, 6:35-36, 6:52-63.
>
> Snell discloses that each data packet transmission is structured with a PLCP preamble and PLCP header and a "payload portion" *(e.g.,* MPDU data). *Id* at 6:35-36, 6:64-66, 7:5-14, Fig. 3.
>
> The PLCP preamble contains SYNC and SFD fields, and the PLCP header contains SIGNAL, SERVICE, LENGTH, and CRC fields. *Id* at Fig. 3, 6:48-7:14. The MPDU data is the data to be transmitted to the receiving transceiver. *Id* at 7:5-6, 7:6-14, Fig. 3.
>
> Snell discloses the use of sequences in the header portion that indicate which type of modulation is being used for transmitting the data portion, 6:52-63. Snell also discloses (through its incorporation of Harris AN9614) the ability to use its teachings with a polled (master/slave) protocol. Harris AN9614 at 3.
>
> The request provides an annotated figure 3 to show relevant reading of the first and second information portions of a first message as reproduced below from page 47 of the request.



Snell Figure 3 (annotated).[[1]]

"The modulator may also preferably include header modulator means for modulating data packets to include a header at a predetermined modulation and a third data rate defining a third format .... The third format is preferably differential BPSK." Snell at 2:61-3:5.

Yamano discloses the placement of address data in the first information portion of a message. Specifically, Yamano discloses a packet structure with a preamble and a data portion, where the preamble includes a destination address of the receiving device.

For example, Yamano discloses transmitting a "first message" *(e.g.,* data packet including a preamble and main body) that includes "first message address information that is indicative" *(e.g.,* "destination address" in the preamble) of the transceiver that is the "intended destination of the second information." *"Packet 700* includes a *preamble 701* and a *main body* 702." Yamano at 19:63-64.

"For example, *preamble 701* can include information which identifies: (1) a version or type field for the preamble, (2) *packet source and destination*

[1] Samsung relied on a more extensive annotated Fig. 3 in its Reexamination Request. Request, at at 26, 54, 79, 111. That annotated version of Snell's Fig. 3 is substantially identical to an annotated version of Boer's Fig. 4 previously presented to the Office on several occasions. See Samsung's Petition in the '892 IPR, at 39. The two annotated versions are compared in Exhibit D.

addresses, (3) the line code (i.e., the modem protocol being used), (4) the data rate, (5) error control parameters, (6) packet length and (7) a timing value for the expected reception slot of a subsequent packet." Yamano at 20: 1-7.

> **Kamerman** discloses an automatic rate adaptation scheme for transmitting a first data packet where the data is modulated using a first modulation method, such as BPSK (corresponding to a lower data transfer rate), and next transmitting a second data packet where the data is modulated using a second modulation method, such as QPSK (corresponding to a higher data transfer rate). Kamerman at 6, 11- 12.

Order, at 9-11 (emphases by the Office).

46. I observe that, without explaining how any of the art relied on to support its alleged SNQs, i.e., Snell (including incorporation by reference of Harris AN9614), Yamano, and Kamerman, presents a "new, non-cumulative teaching" not previously before the Office during prior IPR proceedings and examination of the application leading to the '228 Patent, *i.e.*, APA, Boer, and Siwiak, the Office draws the following conclusions:

> … Snell in combination with Yamano, and Kamerman raise a substantial new question of patentability (SNQ) in combination because one of ordinary skill would have found each of the references, Snell, Yamano and Kamerman important in teaching the combination of technological features which were indicated important to the patentability of the subject claim 21.
>
> Snell was not previously cited or considered by the Office alone or in combination with the cited art.
>
> Yamano was not previously cited or considered by the Office alone or in combination with Snell.
>
> Kamerman was not previously cited or considered by the Office alone or in combination with Snell.
>
> Thus, a reasonable examiner would consider the combination of Snell, Yamano, and Kamerman as asserted in the instant request, important in deciding whether or not the subject claim 21 is patentable.
>
> Because the combination of Snell with the cited Yamano and Kamerman references disclose the limitations of claim 21 of the 228 patent which were found important to the patentability of claim 21 during prosecution of the application which became the 228 patent as well as by the PTAB in IPR 2014 -00892, there is a substantial likelihood that a reasonable examiner would consider this

> combination important in deciding whether or not claim 21 of the 228 patent is patentable. Accordingly, the combination of Snell, Yamano and Kamerman as cited in the request raises a substantial new question of patentability as to claim 21 of the '228 patent.
>
> Snell in combination with Yamano, and Kamerman raise a substantial new question of patentability because the references teach technical features in combination which were missing from the art applied during prosecution. Each reference is new prior art and the combination was not applied during the original examination.
>
> The combination presents new, non-cumulative technological teaching important to the original claims in effect at the time of this request for reexamination. These technological teachings were not previously considered and discussed on the record during the prosecution of the original application that resulted in the patent for which reexamination is requested nor during the prosecution of any other prior proceeding involving the patent for which reexamination is requested.
>
> Thus, a reasonable examiner would view the new technological teachings of Snell in combination with Yamano, and Kamerman important in deciding patentability of the claims being considered, thus raising the SNQ regarding claim 21 of the '228 patent.

Order, at 11.

47. I have compared the relied-on teachings of Snell (including Harris AN9614 and Harris 4064.4), Yamano, and Kamerman with those in Boer, the APA, and Siwiak previously considered by the Office, and conclude they are no more than cumulative as I explain below in paragraphs 48 to 70.[2] Because the Office has not identified anything substantially new in the relied-on art and is viewing the art in the same way as Boer, the APA, and Siwiak were previously considered, in my opinion none of the cited references supports any of the Office's substantial new questions in this reexamination.

A. Snell (Including Harris AN9614) Compared to the APA and Boer

48. Based on my comparison of Snell with Boer, I concluded Snell is cumulative to Boer, a reference that the PTAB fully considered in a number of IPRs of the '228 Patent, including the

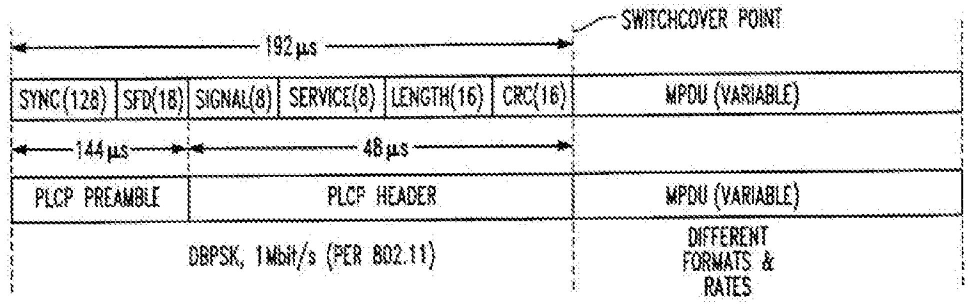
[2] *See also* their side-by-side comparison in Exhibit B.

'892 IPR.[3] Both references propose similar extensions to what became known as the 802.11 standard (or WiFi), namely adding two higher data rates to the 1MB/s and 2MB/s data rates in the standard. Both Snell and Boer use the packet structure defined by the standard, including packet headers with the same fields.

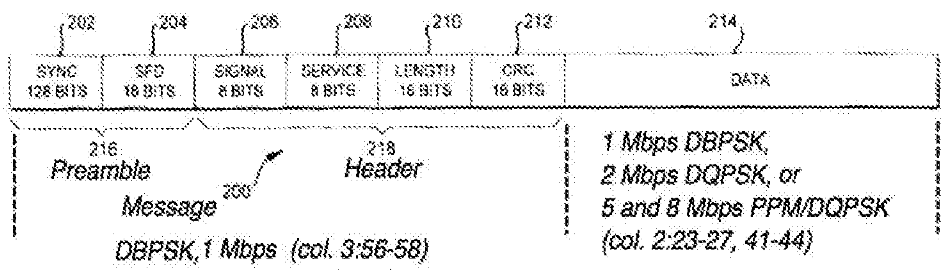
49. The Office relies heavily on Snell's Fig. 3 and its description of these packet structures as providing the additional limitations of claim 21. Order at 9-10 (citing to Fig. 3 five times in its one page analysis of Snell and including "an annotated figure 3." That figure is a portion of a more extensive annotated version of figure 3 presented elsewhere in the Request. See Request, at 26, 54, 79, 111. The substantial identity of Boer and Snell is illustrated in the comparison of the more extensive figure 3 with the annotated version of Boer's Fig. 4 Samsung submitted in the '892 IPR Petition, at 39 (*See* Exhibit D)). I observe that substantially identical packet structures, described in Boer and Boer's Fig. 4, were considered by the PTAB in a number of IPRs challenging the '228 Patent and found unlikely to render unpatentable claim 21of the '228 Patent in the '892 IPR. *See* '892 IPR Institution Decision, Paper 8, at 9-11 & 13-15 (December 10, 2014).

50. Another comparison of Snell's Fig. 3 with Boer's Fig. 4 in a simpler format (without Samsung's multiple reproductions of the figure and with the numbers in Fig. 4 identified by Patent Owner) is presented below:

[3] Boer was cited by Samsung in six IPRs against the '228 Patent, i.e., IPR2014-00889, -00890, -00892, -00893, -00895, and IPR2015-00555. It also was cited in five IPRs against the '580 Patent (the parent of the '228 Patent). Thus, the PTAB was very familiar with Boer and Samsung's arguments based on Boer.



(Snell) *FIG. 3*



(Boer) FIG.4

Like the comparison in Exhibit D, this simpler comparison illustrates that Snell adds nothing to Boer and thus that Snell is cumulative to Boer. In fact, the Snell disclosure relied on by the Office in its Order is substantially identical to the disclosure in Boer previously considered by the PTAB. *See* Exhibit B comparing the portions of Snell cited by the Office with substantially identical portions of Boer.

51. As part of its description of Snell, the Office states: "Snell also discloses (through its incorporation of Harris AN9614) the ability to use its teachings with a polled (master/slave) protocol. Harris AN9614 at 3." Order at 9-10. I understand that there is no evidence that Harris AN9614 was published in the patent law sense, and thus it could not be legally incorporated into Snell. In any case, based on my review of Harris AN9614 in the context of Snell, I conclude that the discussion of a "polling scheme" in Harris AN9614 does not disclose and would not have

suggested a master/slave system.[4] Harris AN9614 would have, at most, suggested polling in the context of peer-to-peer communications given that both the Snell and Harris AN9614 disclosures are of such communications rather than master/slave communications as is taught and claimed in the '228 Patent. *See* ¶¶ 71-77 & 109-115 below for a further discussion of this issue.

52. Finally, even assuming that Harris AN9614 were properly incorporated by reference *and* would have suggested a master/slave system, I have compared its disclosure to that in the APA[5] and conclude it is less relevant than the APA disclosure which expressly discloses a master/slave system.

53. Based on the above, I conclude that Snell (including Harris AN9614 and Harris 4064.4) is no more than cumulative to the APA and Boer.

B. The APA and Boer Were Previously Considered by the PTAB

54. I have considered the PTAB's discussion of Boer and the APA in its '892 Institution Decision, including Boer's Fig. 4, with respect to the patentability of claim 21 and its conclusion that there was not "a reasonable likelihood of prevailing on the obviousness ground of unpatentability as to claim 21 based on APA and Boer." That discussion includes the following:

> Petitioner contends that the '228 patent contains material that may be used as prior art against the patent under 35U.S.C.§103(a). Figure1of the patent is labeled as "Prior Art." Pet. 5; Ex. 1301, Fig. 1. Further, the '228 patent's specification refers to "prior art" multipoint communication system 22 comprising master modem or transceiver 24, which communicates with a plurality of tributary modems ("tribs") or transceivers 26. Pet. 6; Ex. 1301, col.3, l.64–col.4, l.1. …

[4] Moreover, to the extent the Office is drawing inferences from the disclosure of Harris AN9614 based on the '228 Patent's disclosure (*e.g.*, that Harris AN9614's "polled scheme" is equivalent to master/slave), such inferences are not well supported and incorrect, as explained below in ¶¶ 113-120.

[5] My use of the abbreviation "APA" is not meant to suggest that the APA is, in fact, admitted prior art. Rather I use the abbreviation merely to refer to what the Office alleges is admitted prior art. Based on my review of the '228 Patent and my understanding of what is required to render an applicant's disclosure prior art, I conclude that is that it is not.

… Petitioner has met its initial burden … in demonstrating that the subject matter of the '228 Patent's Figure 1, and accompanying description, constitutes "prior art" ….

….

Boer describes a wireless LAN that includes first stations that operate at 1 or 2 Mbps (Megabits per second) data rate and second stations that operate at 1,2, 5, or 8 Mbps data rate. Exhibit 1304, Abstract.

Figure 1 of Boer is reproduced below.

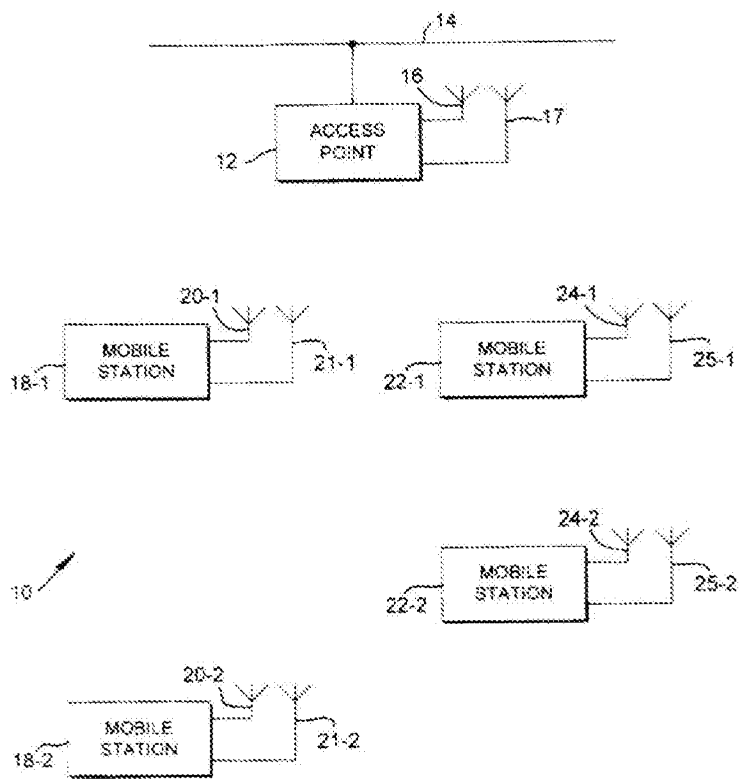


FIG.1

Figure 1 is said to be a block diagram of a wireless LAN embodying Boer's invention. Ex. 1304, col. 1, ll. 53–54. LAN 10 includes access point 12, serving as a base station. The network includes mobile stations18-1and 18-2 that are capable of transmitting and receiving messages at a data rate of 1or 2 Mbps using DSSS (direct sequence spread spectrum) coding. When operating at 1 Mbps, a station uses DBPSK (differential binary phase shift keying) modulation. When operating at 2 Mbps, a station uses DQPSK (differential quadrature phase shift keying) modulation. *Id.* at col. 2, ll. 6–27. Mobile stations 22-1and 22-2 are capable of operating at the1and 2 Mbps data rates using the same modulation and coding as stations 18-1 and 18-2. In addition, stations 22-1and 22-2 can operate at 5 and 8 Mbps data rates using PPM/DQPSK (pulse position modulation–differential quadrature phase shift keying) in combination with the DSSS coding. *Id.* at col.2, ll. 34–44. ['892 Institution Decision, at 8-11.]

. . . .

Claim 21, which depends directly from claim 1, recites that the first information that is included in the first message "comprises the first message address data." Petitioner maps the claimed "first information" as corresponding to header 218 of message 200 depicted in Figure 4 of Boer.

Pet. 39, 41; Ex.1304, col.3, ll.42–55. Petitioner admits that Boer does not teach placing its address information in header 218 (Ex.1304, Fig.4). Pet. 39. Boer teaches that DATA field 214 (Fig.4), which is deemed to correspond to the "second information," contains a destination address. Pet. 38–39; Ex. 1304, col. 6, ll. 28–31.

Petitioner submits that the '228 patent "admits" that placing address information in the training sequence of a message is prior art. Pet. 39. Petitioner does not indicate how such an admission might be relevant to claim 21. The '228 patent teaches that in a multipoint system the address of the trib with which the master is establishing communication is also transmitted during the training interval. Ex. 1301, col. 4, ll. 19–22. The "training signals" that are exchanged during the training interval, however, are "sequences of signals of particular subsets of all signals that can be communicated via the agreed upon common modulation method." *Id.* at col. 4, ll. 5–10. Petitioner does not identify any teaching of placing address data in the message header.

Petitioner concludes that "[a] person having ordinary skill in the art would have been motivated to combine the APA with Boer due to the similarities between the packet structures and because where the address fields are placed is a matter of design choice." Pet. 39, citing Ex. 1323 ¶ 212. Petitioner has not identified a teaching in the applied prior art of placing address data in the header of a message. Nor has Petitioner provided evidence sufficient to demonstrate that the ordinary artisan would have considered placing the address data as claimed to be a mere matter of "design choice." Petitioner's conclusory allegation of "design choice" does not provide the required "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007).

For the foregoing reasons we are not persuaded that Petitioner has established a reasonable likelihood that it would prevail in its challenge of claim 21.

'892 Institution Decision at 8-11, 13-15.

55. Based on my comparison of the Snell teachings relied on in the Order with those of Boer and the APA considered by the PTAB in the '892 Institution Decision, I conclude they are substantially the same with respect to claim 21 and thus do not provide any new, non-cumulative teaching that was not previously considered by the PTAB.

C. Yamano Compared To Siwiak

56. I observe that the Office relies on Yamano as disclosing "the placement of address data in the first information portion of a message." Order, at 10. Based on my comparison of the teachings of Yamano relied on in the Order with those in Siwiak, I conclude that Yamano is cumulative to Siwiak. *See* Exhibit B comparing the portions of Yamano relied on by the Office with the Siwiak teachings.

D. The PTAB's Previous Consideration of Siwiak

57. I have reviewed the discussion of Siwiak in the '555 IPR Petition and observe that Samsung previously presented Siwiak to the PTAB in substantially the same way it presented Yamano in its '228 reexamination request:

> … Siwiak discloses a "high speed simulcast multi-rate data messaging and paging system." Ex. 1324, 1:6-8. Siwiak utilizes a message format having header and data fields. Siwiak illustrates this message format in Fig. 2:

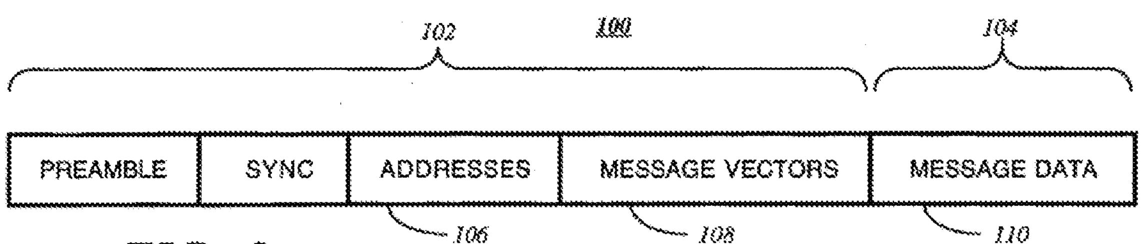


FIG. 2

> Ex. 1324, Fig. 2.
>
> As is seen in its Fig. 2, Siwiak discloses a message 100 having a "first transmission portion" 102 (i.e. a header) and "second transmission portion" 104 (which contains "message data 110"). Ex. 1324, 2:57-65 ("As illustrated in FIG.

> 2, the paging system includes a **transmission format protocol 100** which has two portions. The **first transmission portion 102** is sent in a first modulation format, for example FM. The first transmission portion allows the subscriber unit receivers to work in a lower power consumption mode which enhances battery life. The **second transmission portion 104** is sent in a second modulation format, preferably OFDM, which requires the receiver to work in a higher power mode."). Ex. 1325, ¶11. Thus Siwiak discloses a packetized communication system having a message format having a header that precedes a data field. *Id.* ...
>
> Claim 1 requires that a master transmit a "first message" having "first information modulated according to a first modulation method" and "second information, including a payload portion." Claim 21 depends from claim 1, and requires that "the first information that is included in the first message comprises the first message address data." The "first information" recited in claims 1 and 21 is a header of a message, and it must contain "the first message address data." …
>
> In the ['892] Institution Decision, The Board construed claim 21 to require that the "first message address data" be located in the header of a message. Inst. Dec., Decision at 14. The first transmission portion 102 of Siwiak includes the address of an intended destination of the transmission 100. Ex. 1325, ¶13. *See also* Ex. 1324, 2:30-57 ("The transmitters each include means for modulating, in a first modulation format, such as FM, **a first transmission portion including address** and other information, such as message characterization information . . . . The **address uniquely identifies the data communication receiver** (or a group of data communication receivers) **to which the message is directed**, and the message characterization information identifies an information service, among other things."); *see also*, *id.* at 4:31-39 ("As shown in FIG. 2, when a message transmission is initiated on the channel, the first transmission portion 102, modulated in the well-known FM format, is transmitted on the channel. **The first transmission portion 102** includes a preamble and synchronization bits, **followed by the pager address in the address block 106** and message vectors 108 which contain the information as to the modulation format of the message data 110 in the second transmission portion 104."). Ex. 1325, ¶13.

'555 IPR Petition, at 23-25 (emphases Samsung's). Based on my comparison of these arguments to those it made based on Yamano in Samsung's reexamination request, I conclude they are substantially identical.[6]

---

[6] I further observe that Samsung also presented Siwiak (with a draft IEEE 802.11 standard and Boer) in IPR2014-00889. Again, Siwiak was presented in the substantially the same way in this earlier challenge to claim 21: "Another example is U.S. Patent 5,537,398 [Siwiak], Ex. 1007, which discloses placing address fields in the first portion of a packetized message, where the first portion uses one modulation method and the second portion uses another modulation method. See Ex. 1007, 4:31-39 and Fig. 2 (where "first transmission portion 102" includes "addresses"

58. I have also considered the PTAB's discussion of Samsung's arguments based on Siwiak in the '555 IPR Institution Decision in view of its '892 IPR Institution Decision (which the PTAB relied on in its '555 IPR Institution Decision). I conclude that the PTAB considered Samsung's arguments based on Siwiak and refused to institute the '555 IPR because "the same or substantially the same prior art" previously was "presented to the Office" in the IPR '892 proceeding and Samsung's '555 petition presented merely "the same or substantially the same prior art or arguments" previously presented in IPR '892:

> The difference between what Petitioner presents in this proceeding and what Petitioner presented in IPR '892 with respect to claim 21 of the '228 patent is that Petitioner now offers Siwiak as support for the asserted obviousness of placing address data in a message header as taught by Boer. Pet. 24–57; Mot. Join. 5–6. Petitioner, however, presents no argument or evidence that Siwiak was not known or available to it at the time of filing IPR '892. In fact, Petitioner applied Siwiak in proposed grounds of rejection against claim 21 of the '228 patent in another petition filed the same day as that in the IPR '892 proceeding. See IPR2014-00889, Paper 2 at 58–60. On this record, *we exercise our discretion and "reject the petition" because "the same or substantially the same prior art" previously was "presented to the Office" in the IPR '892 proceeding.* 35 U.S.C. § 325(d); *see also Unilever, Inc., v. The Proctor & Gamble Co.*, Case IPR2014-00506, slip op. at 6 (PTAB July 7, 2014) (Paper 17) (informative) (seven new references added to six that were applied in earlier petition).
>
> Petitioner is requesting, essentially, a second chance to challenge the claims. We, however, are not persuaded that a second chance would help "secure the just, speedy, and inexpensive resolution of every proceeding." 37 C.F.R. § 42.1(b). Permitting second chances in cases like this one ties up the Board's limited resources; we must be mindful not only of this proceeding, but of "every proceeding." *Id.* ...
>
> In this proceeding, however, we are not apprised of a reason that merits a second chance. Petitioner simply presents arguments now that it could have made in IPR '892, had it merely chosen to do so. In view of the foregoing, and

---

modulated using "a first modulation format, for example FM," and "second transmission portion 104" is modulated using "a second modulation format, preferably OFDM")." Samsung '889 Petition, at 59. The PTAB did not institute the IPR: "The Petition fails to demonstrate a reasonable likelihood of prevailing on the grounds that the challenged claims are … obvious over Draft Standard *and prior art references* [Boer and Siwiak]." '889 Institution Decision, at 11 (Dec. 10, 2014).

> especially in light of the fact that, barring joinder, this petition is time-barred under 35 U.S.C. § 315(b), *we exercise our discretion under 35 U.S.C. § 325(d) to deny the petition, because it presents merely "the same or substantially the same prior art or arguments" presented to us in IPR '892.*

'555 Institution Decision, at 7-9 (emphasis added).[7]

59. I observe that the Order does not identify any new, non-cumulative teaching in Yamano when compared to the teachings in Siwiak that was not previously considered by the PTAB. Based on my review of the two references, Samsung's arguments based on Siwiak, and the PTAB's conclusions in the '555 IPR regarding Siwiak, I conclude that no such teaching has been or can be identified based on Siwiak.

E. The Examiner's Previous Consideration of Siwiak During Prosecution Of The '228 Application

60. I have reviewed the prosecution history of the '228 Patent, including the Examiner's previous consideration of Siwiak and observe that Siwiak was also considered during prosecution of U.S. Patent No. 8,023,580 ("'580 Patent"), the parent of the '228 Patent. I observe that the '580 application was filed on August 19, 2009 with a number of claims, including dependent claim 34. This claim included the limitation "wherein the first data comprises an address." In an Office Action mailed September 1, 2010, Examiner Ha rejected a number of the claims, including claim 34, under 35 U.S.C. § 102(b) based on Siwiak, finding

[7] I further observe that the motivation offered in the Office Action for combining Yamano with Snell, i.e., the filtering of "packets that do not need to be demodulated," (May 3 Office Action, 9-10) was also presented based on Siwiak in Samsung's '555 challenge: "One advantage of choosing to place the address in the header is power savings. For example, a transceiver may stop demodulating a message once it determines the packet is addressed to a different receiver, thereby saving the power that would be required to decode the remainder of the packet. By placing the address early in the packet (i.e. in the header), receivers can sleep sooner … Siwiak explicitly describes this motivation. …" ('555 Pet., at 21-22 (emphasis added).) Again, the PTAB "reject[ed] the petition" because "the same or substantially the same prior art" previously was "presented to the Office" in the IPR '892 proceeding." '555 Institution Decision, at 7-8.

inter alia that, with respect to claim 34, "Siwiak … discloses 'the first data comprises an address' in col. 4, ll. 31-39; Fig. 2." September 1 Office Action, at 4.

61. The '228 application was filed less than one year after Examiner Ha issued his September 1 Office Action in the '580 application. In the first Office Action (mailed April 30, 2012), Examiner Ha expressly identified Siwiak as "pertinent to applicant's disclosure" (the only reference so identified) and listed it on an 892 form. April 30 Office Action, at 4. All of the rejections in the April 30 Office Action were based on obviousness type double patenting in view of the '580 Patent. In response, applicants amended the claims. In doing so, applicant added, among others, dependent claim 41 which included the limitation "wherein the first information that is included in the first message comprises the first message address data." October 19, 2012 Response, at 10. The same response included a terminal disclaimer which overcame the double patenting rejections. In spite of his understanding that "Siwiak … discloses 'the first data comprises an address' in col. 4, ll. 31-39; Fig. 2," Examiner Ha did not reject claim 41 (or any other claim) based on Siwiak.

62. Based on the above, I conclude that Examiner Ha previously considered Siwiak for the same purpose that Yamano is now being considered, *i.e.*, the alleged disclosure of the additional limitation found in claim 21 ("the first information that is included in the first message comprises the first message address data").

F. Kamerman Compared to Boer

63. With respect to Kamerman, as an initial matter I note that Kamerman was Boer's co-inventor, and his presentation followed the filing of the Boer patent application.[8] From the

[8] The Kamerman paper is dated August, 1996, a few months after he, Boer and others filed the Boer patent:

perspective of one skilled in the relevant art, I would expect such a presentation to disclose a less detailed version of the automatic rate control algorithm than that disclosed in Boer. *See* Boer, col. 7, l. 12-col. 8. l. 16 (quoted below). More specifically, just as in Boer, Kamerman's presentation describes an automatic rate control scheme in which the data rate is reduced when there are unacknowledged transmissions, and the data rate is raised after correctly acknowledged transmissions. Thus, in my opinion, Snell in view of Kamerman is at best cumulative of the previously-considered disclosure in Boer. In particular, Kamerman discloses:

> An automatic rate selection scheme based on the reliability of the individual uplink and downlink could be applied. The basic rate adaptation scheme could be: after unacknowledged packet transmissions the rate falls back, and after a number (e.g. 10) of successive correctly acknowledged packet transmissions the bit rate goes up. … At lower load in the neighbor cells the highest bit rate can be used more often. At higher load the transmissions from the accesspoint to stations at the outer part of the cells, will be done often at fallback rates due to mutilation of transmissions by interference. In practice the network load for LANs at nowadays client-server applications is very bursty, with sometimes transmission bursts over an individual links and low activity during the major part of the time. Therefore the higher bit rate can be used during the most of the time, and at high load in the neighbor cells (as will evoked by test applications) there will be switched to fall back rates in the outer part of the cell.

United States Patent [19]
Boer et al.

[11] **Patent Number: 5,706,428**
[45] **Date of Patent: Jan. 6, 1998**

[54] **MULTIRATE WIRELESS DATA COMMUNICATION SYSTEM**

[75] Inventors: **Jan Boer**, Odijk; **Wilhelmus Josephus Diepstraten**, Diessen; **Adriaan Kamerman**, Nieuwegein; **Hendrik van Bokhorst**, Nijkerk; **Hans van Driest**, Bilthoven, all of Netherlands

[73] Assignee: **Lucent Technologies Inc.**, Murray Hill, N.J.

[21] Appl. No.: **615,408**

[22] Filed: **Mar. 14, 1996**

"Welcome to IEEE P802.11"; Working Group for Wireless Local Area Networks; Set-up on Dec. 17, 1996, update of May 20, 1997.

"Bell Labs Unveils 10-Megabit Wireless-Network Technology, Offering Five Times Today's Highest Data-Transmission Capacity"; ICA New Product Announcement, Apr. 22, 1997.

Primary Examiner—James P. Trammell
Assistant Examiner—Shah Kaminis
Attorney, Agent, or Firm—Christopher N. Malvone

[57] **ABSTRACT**

In my experience, inventors like Kamerman are permitted to talk about an invention disclosed in a patent application once the application was filed. Such a procedure is typical with large companies like Lucent Technologies (assignee of the Boer patent and Kamerman's employer).

. . . .

… The application of proprietary bit rates of 3 and 4 Mbps in addition to the basic 1 and 2 Mbps, can be combined with an automatic rate selection. This automatic rate selection gives fall forward at reliable connections and fall back at strong cochannel interference.

Kamerman at 11-12.

64. My opinion that Boer discloses the same automatic rate control algorithm is supported by the following disclosure in Boer:

> Referring now to Fig. 7, there is shown a flowchart 500 illustrating an automatic data rate update procedure for the data rate to be used in the transmit mode … the flowchart proceeds to block 508 where a determination is made as to whether the ACK has been received and within a predetermined time-out time. If yes, the flowchart proceeds to block 510, where a successive correct (SC) count value is incremented. Next, as seen in block 512, a check is made as to whether the SC count value is greater than a predetermined value, selected as value 9, by way of example. In other words, a check is made as to whether more than nine successive ACK messages have been correctly and timely received. If yes, the flowchart proceeds to block 514 where a check is made as to whether the local SNR (signal-to-noise ratio) value is greater than a predetermined value, suitable for data rate incrementation. (The SNR is the ratio of received signal strength during the reception of the ACK message to the average silence level during periods at which no carrier signal is being received). If the SNR value is suitable, then the flowchart proceeds to block 516, where a data rate incrementation is implemented (if the maximum data rate is not already being used), and the SC (successive correct) count value is reset to zero. Thereafter, the data rate value and SC count value are stored (block 518), and the flowchart ends at block 520.
>
> Returning to block 508, if an ACK message is not received correctly and within the predetermined time interval, then the flowchart proceeds to block 522 where the SC count value is reset to zero and the data rate is decremented (if the minimum data rate is not already being used), and the flowchart proceeds over line 524 to block 518 where the new data rate and SC count value are stored. …
>
> Returning now to block 504, if it is determined that the data rate is 5 or 8 Mbps, then the flowchart proceeds to block 506, where a determination is made as to whether the system is configured for overruling the preferred data rate by a data rate defined by monitoring the receipt of ACK messages. If no, the flowchart proceeds to block 508, previously discussed. If yes, the flowchart proceeds to block 526, where a determination is made as to whether the preferred data rate defined in the short ACK message 400 (Fig. 6) is greater than the actual data rate of the original message being acknowledged. If so, the flowchart proceeds to

block 516 where the data rate is incremented and SC count value is reset to zero. . . . .

To summarise the procedure described above with reference to the flowchart 500, it will be appreciated that an automatic data rate selection procedure has been described. ... If a station 22 doesn't receive the expected ACK message in return correctly and in due time, it will retransmit the original message packet at a lower data rate. If a station 22 does receive the expected ACK messages correctly and in due time from a particular station for a predetermined number of successive times, then it will transmit the next message to that station at a higher data rate. In this way the stations 22 adapt the operating data rate dependent on channel conditions (degradation by noise--SNR, time dispersion in the channel--delay spread) and co-channel interference (SIR).

Boer, col. 7, l. 12-col. 8. l. 16. For a complete comparison of the Office's citations to Kamerman in the Order, see Exhibit B ("Table Comparing Snell, Yamano, and Kamerman to the APA, Boer and Siwiak").

65. Thus, based on my comparison of Kamerman with Boer (including my review of the comparison in Exhibit B), it is my opinion that Kamerman's presentation merely summarizes Boer et al.'s work described in Boer, does not provide any new, non-cumulative teaching relevant to the patentability of claim 21, and cannot raise an SNQ.

G. The Other Art Cited by the Office in its Order

66. In its Order, the Office relies on Snell (including Harris AN9614), Yamano, and Kamerman to support its three alleged SNQs. Additionally, the Order cites Harris 4064.4, the APA, and Upender. In a number of IPRs of the '228 Patent, the APA and Upender were previously cited and were fully considered by the Office. *See, e.g.*, '892 Institution Decision, at 8-11. *See also* Exhibit A disclosing the bases for multiple IPRs. With respect to Harris 4064.4, I understand the evidence does not establish that it is prior art and therefore cannot be relied on or incorporated by reference in Snell. *See* the discussion below at ¶¶ 72-73, 109. In any case, I have been asked to assume that Harris 4064.4 is prior art and compare its teachings with those of Boer. I have made that assumption and comparison and conclude Harris 4064.4 does not provide

any new, technological teaching and thus would not support an SNQ, even if one were to be proposed based on this reference. *See* the discussion below at ¶¶ 76-77, 110-115.

67. Harris 4064.4 discloses a preamble and header that are always transmitted as DBPSK waveforms, a data portion transmitted as either DBPSK or DQPSK, and a SIGNAL field that indicates whether the data portion is modulated as DBPSK or DQPSK. Harris 4064.4 at Fig. 10, 14-16. Boer discloses a preamble 216 and header 218 that always are sent using DBPSK and a data field 214 transmitted in DBPSK, DQPSK, or PPM/QPSK, and SIGNAL and SERVICE fields that indicate whether the data field 214 is modulated in DBPSK, DQPSK, or PPM/QPSK. Boer at Fig. 4, Abstract, 3:42-49, 3:56-62, 4:4-11, 6:5-21.

68. Based on my comparison of Harris 4064.4 with Boer, I opine that Harris 4064.4 is at best cumulative of Boer. The DBPSK and DQPSK of Boer were previously considered as allegedly corresponding to the claimed "first modulation method" and "second modulation method," respectively, and the SIGNAL and SERVICE fields of Boer were relied on as allegedly corresponding to the claimed "first sequence." '518 Institution Decision, at 9-11, 13-15. Thus, Snell (even with Harris 4064.4 incorporated by reference) would not have raised an SNQ.

H. Boer, the APA, and Yamano Compared to Boer, the APA, and Siwiak

69. I understand that the Office did not determine whether Boer, the APA, and Yamano raised an SNQ but rather made a rejection based on this combination without making that threshold determination. See the Office's rejection "A." May 3 Office Action, at 8-10 (referred to as "the Boer Rejection"). I have been asked to consider whether such a combination of art would support an SNQ. Based on my review of the references relied on to support the Boer Rejection, compared to previously considered Boer, the APA, and Siwiak, I conclude that they would not do so. As noted previously, Boer and the APA were considered repeatedly in the many IPRs attacking the '228 Patent, including claim 21. *See* ¶¶ 48-49, 54 above. Likewise,

Siwiak was presented in two IPRs and considered in at least one them, the '555 IPR. *See* ¶¶ 57-59 above. It also was considered during prosecution of the '228 Patent. *See* ¶¶ 60-62 above. Based on that review, I conclude that the combination of Boer, the APA, and Siwiak would not support an SNQ.

I. Snell (including Harris AN9614 and Harris 4064.4) Compared to the APA and Boer

70. I understand that the Office did not determine whether Snell (including Harris AN9614 and Harris 4064.4) raised an SNQ but rather made a rejection based on this combination without making that threshold determination. *See* the Office's § 102(e) rejection in the May 3 Office Action, at 7-8. I have been asked to consider whether such a combination of art would support an SNQ. Based on my review of these references compared to previously considered Boer and the APA, I conclude that they would not do so. My comparison of Snell (including Harris AN9614) is discussed above. *See* ¶¶ 48-53 above. As noted previously, Snell (including Harris AN9614) adds nothing to Boer and the APA, and Boer and the APA were considered repeatedly in the many IPRs attacking the '228 Patent, including claim 21. *See* ¶¶ 48-49, 54 above. Likewise, I have compared Harris 4064.4 to Boer and concluded it is no more than cumulative to Boer. *See* ¶¶ 66-68. Based on that review, I conclude that the combination, Snell (including Harris AN9614 and Harris 4064.4) would not support an SNQ.

VI. <u>THE INCORPORATION BY REFERENCE ISSUE</u>

71. The Office relies on incorporation by reference of Harris AN9614 and Harris 4064.4 ("Harris Documents") into Snell in its attempt to address some of the deficiencies of Snell, Yamano, and Kamerman. *See, e.g.*, May 3 Office Action, at 7, & 10.

72. I understand that, in the circumstances of this case, a non-patent document *must be published*, i.e., available to those of ordinary skill in the relevant art to be incorporated by

reference based on the requirements of 37 C.F.R. § 1.57(e) limit the material that may be incorporated by reference:

> (e) Other material ("Nonessential material") may be incorporated by reference to U.S. patents, U.S. patent application publications, foreign patents, foreign published applications, prior and concurrently filed commonly owned U.S. applications, or non-patent publications. …."

C.F.R. § 1.57(e) (emphasis added).

73. I further understand that, if a non-patent document was not published before the filing date of a patent application attempting incorporation by reference of the non-patent document, any attempt to do so must fail. In this regard, in spite of my expertise in the relevant art, prior to the *Rembrandt v. Samsung* litigation, I was not aware of either Harris Document. Further, based on my experience in the art, from the face of these documents it cannot be discerned whether they were created solely for use internally within the Harris Corporation, or alternatively for use by the public.

74. Also, with respect to incorporation by reference, I understand that to "incorporate material by reference, the host document must identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents." *Advanced Display Systems, Inc. v. Kent State University*, 212 F.3d 1272 (Fed.Cir. 2000). In that regard, I have reviewed the portion of Snell at col. 5, lines 2-5, which provides as follows:

> Various filters 36, and the illustrated voltage controlled oscillators 37 may also be provided as would be readily understood by those skilled in the art and as further described in the Harris PRISM 1 chip set literature, such as the application note No. AN9614, March 1996, the entire disclosure of which is incorporated herein by reference.

75. I have also reviewed Harris AN9614. In my opinion, a person of ordinary skill in the art would interpret Snell's reference to "filters" and "voltage controlled oscillators" described in

Harris AN9614 to refer to the discussion of (1) "External IF Filtering" on pages 1-2 of the application note, (2) "Limitations of HFA3724 LPFs" on page 2 of the application note, and (iii) clock oscillators on page 2 of application note. A person of ordinary skill in the art would not interpret Snell's reference to "filters" and "voltage controlled oscillators" described in Harris AN9614 to refer to the statements on page 3 of Harris AN9614, as that page is directed to a different topic, *i.e.*, "High Rate Burst Transmissions With Low Average Rate."

76. In any case, to the extent the Harris Documents are determined to have been legally incorporated by reference, they add nothing to Boer and the APA. *See* ¶¶ 55-62 above.

77. Harris AN9614 merely makes vague reference to a "polled scheme" without indicating what configuration the document is referring to. Because the Harris Documents merely further describe PRISM™ (Harris's commercial device claimed in Snell, see Snell, at col. 1, ll. 47-54; col. 5, ll.11-16), one of ordinary skill in the relevant art would have understood Harris AN9614's reference to a "polled scheme" to be referring to such a scheme in the context of PRISM's peer-to-peer communications and not to undisclosed master/slave communications. My opinion is further supported by the fact that PRISM, as described in Harris 4064.4, includes clear channel assessment (CCA) which is used "to avoid data collisions" (Snell, col. 5, ll. 23-29) as "a carrier sense multiple access (CSMA) networking scheme." Harris 4064.4, at 18, col. 2.

VII. THE '228 PATENT TECHNOLOGY

A. Brief Explanation of the State of Master/Slave Art Prior to the '228 Invention

78. According to the '228 Patent, prior art master/slave systems could only communicate when all network devices used a single common type of modulation method. *See* '228 Patent at 1:29-67, 3:64-4:5. Thus, if a slave using an additional type of modulation method were added to the network, the new slave could not easily communicate with the master using the different

modulation type because it would not be compatible with the common type of modulation method. *Id.* Annotated figure 1 of the patents shows such a prior art master/slave system, where all devices in the network communicate using only a single common type of modulation method (such as the amplitude modulation used by AM radio), even though some of the devices may be capable of communication via other types of modulation methods:

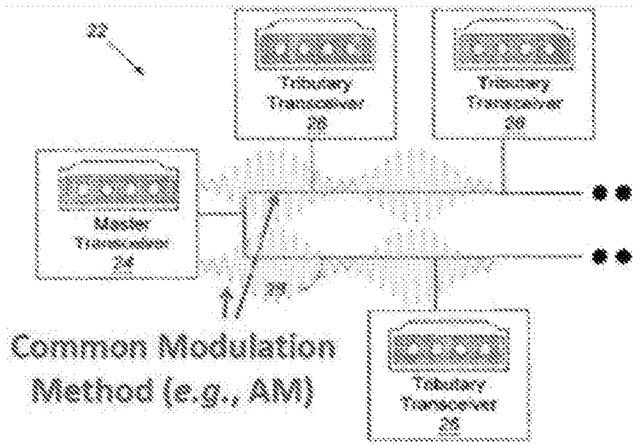


FIG. 1
Prior Art

79. The state of master/slave art prior to the '228 invention is described in the '228 Patent at 3:64-5:7, with reference to Fig. 2.

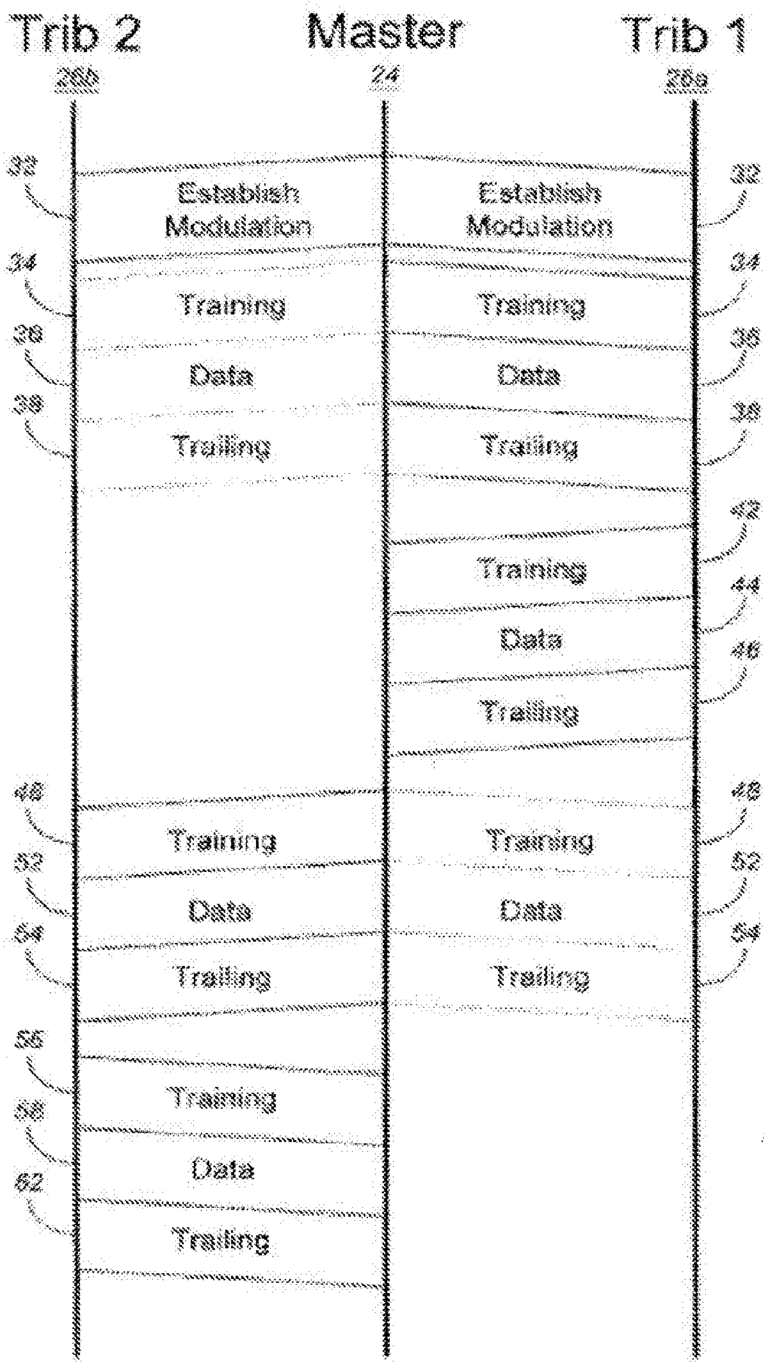


FIG. 2

80. Briefly, Fig. 2 discloses a polled multipoint master/slave system. At the beginning of a session, the master established a common modulation type for communication with all its slaves (32 in Fig. 2). All slaves were identical in that they shared a common modulation with the master.

81. The master then communicated with its slaves, one at a time, by sending a training sequence with the address of the slave with which it wants to communicate, followed by data, and finally a trailing sequence to end the communication (34-38 in Fig. 2). A slave could not initiate a communication, but, if the slave was polled by the master, it could respond to the master in a similar fashion (42-46 in Fig. 2). When the master had completed its communications with the first slave, it could then communicate with a second slave using the *same* negotiated common modulation (48-54 in Fig. 2).

B. The Problem Identified in the '228 Patent

82. Again, with reference to Fig. 2, the problem Gordon Bremer identifies and addresses in his detailed description is as follows:

> Consider the circumstance in which master transceiver 24 and trib 26b share a common modulation type A while trib 26a uses a second modulation type B. When master transceiver attempts to establish A as a common modulation during sequence 32, trib 26a will not be able to understand that communication. Moreover, trib 26a will not recognize its own address during training interval 34 and will therefore ignore data 36 and trailing sequence 38. Master transceiver 24 may time out waiting for a response from trib 26a because trib 26a will never transmit training sequence 42, data 44, and trailing sequence 46 due to the failure of trib 26a to recognize the communication request (training sequence 34) from master transceiver 24. Thus, if the tribs in a multipoint communication system use a plurality of modulation methods, the overall communication efficiency will be disrupted as specific tribs will be unable to decipher certain transmissions from the master transceiver and any unilateral transmission by a trib that has not been addressed by the master transceiver will violate the multipoint protocol. ['228 Patent at 5:13-31.]

83. Summarizing the incompatibility problem Gordon Bremer identified:

a) If the master in the APA wanted to communicate with a slave using a second modulation method that was incompatible with that used to communicate with its other slaves, it was necessary to tear down the session and begin a new session. Doing so was disruptive.

b) If the APA master attempted to communicate using an incompatible modulation type without beginning a new session, the other slaves would not understand the attempted communications and would not respond to any polling directed at them, resulting in repeated attempts by the Master to communicate. In addition, the slaves may be confused by the transmissions and make improper communication attempts.

84. One of ordinary skill in the relevant art would have understood that Fig. 2 and its description do not disclose or suggest the incompatibility problem identified by Gordon Bremer, or even the goal of using incompatible modulations in one master/slave session.

C. The '228 Solution to These Incompatibility Problems in a Master/Slave Setting

85. In the context of the master/slave system described above, Gordon Bremer invented "a system and method of communication in which multiple modulation methods are used to facilitate communication among a plurality of modems in a network, which have heretofore been incompatible." '228 Patent at 2:20-23. Mr. Bremer solved the above-described incompatibility problem with his claimed master/slave communication system in which slaves can communicate over a network through a master using multiple types of modulation methods, thereby permitting selection of the modulation type best suited for a particular application. *Id.* at 2:27-3:14, 5:32-46.

86. The claimed invention of the '228 Patent is further described with reference to Figure 2 and in Figures 3-8 and the written description. Specifically, Figures 3 and 4 show block diagrams of the master transceiver and tributary transceivers, while Figure 5 shows a ladder diagram illustrating the operation of those transceivers. Figures 6 and 7 show state diagrams for exemplary tributary transceivers. And Figure 8 shows a signal diagram for exemplary transmissions.

87. Annotated Fig. 4 shows an embodiment of the patented technology where some devices in the network communicate using one type of modulation method (*e.g.*, amplitude modulation used by AM radio), while other devices communicate using a different type of modulation method (*e.g.*, the frequency modulation used by FM radio):

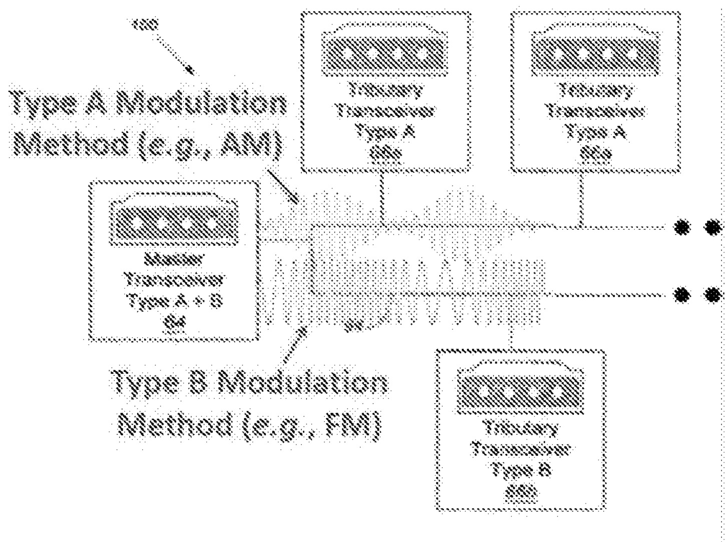
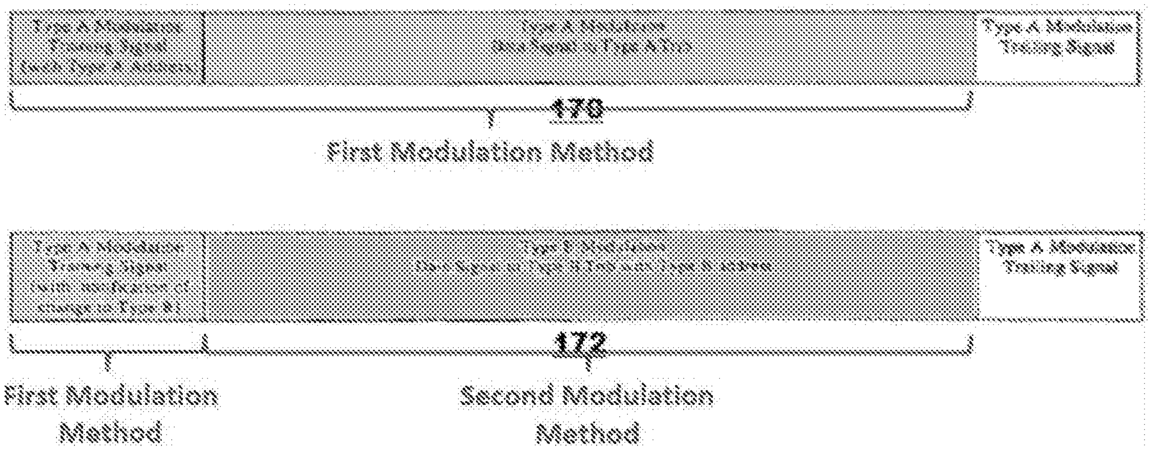


FIG. 4

'228 Patent at 6:4-13. Such a system provides for greater efficiency, seamless communication with all devices, backward-compatibility, and decreased costs. *Id.* at 3:9-14; *see also* 2:1-18, 5:32-46.

88. Annotated Fig. 8 shows two communications intended for different slaves. The first communication 170 uses a first type of modulation method for both the initial training signal and the subsequent data signal, while communication 172 uses the first type of modulation method for the training signal and the second type of modulation method for the data signal:



'228 Patent at Fig. 8, 4:45-48, 4:66-5:1. Information in the training signal indicates whether there will be an impending change from the first type of modulation method to the second type of modulation method. *Id.* (training signal includes "notification of change to Type B" modulation method). Mr. Bremer's solution is captured and claimed in his "switches" from one modulation type to another and is described with reference to Fig. 5:

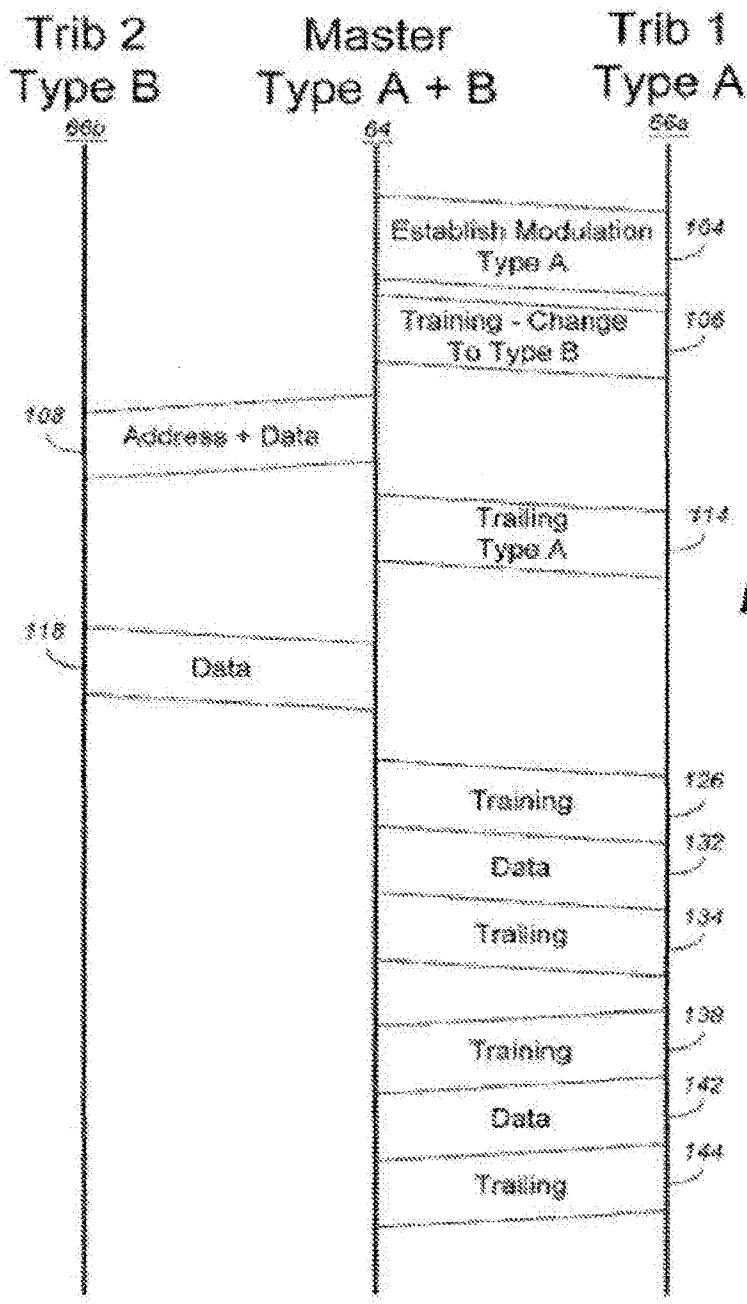


FIG. 5

89. With reference to Fig. 5, for the Master ("Type A + B") to communicate in the normal fashion with a Type A trib ("Trib 1 Type A") using a negotiated first modulation type A (a modulation type that trib A understands), the Master transmits a "first message" (sequences 126, 132, 134). The "first message" includes (1) "first information" (training sequence126) modulated according to the first modulation type A method and (2) "second information"

(transmission sequence 132) modulated according to the first modulation type A method and including data intended for the Type A trib. The "first information" includes first message address information that is indicative of the Type A trib being an intended destination of the "second information." '228 Patent at 7:11-13 ("a training sequence 126 in which an address of a particular type A trib 66a is identified").

90. For the Master ("Master Type A + B") to then communicate with a Type B trib ("Trib 2 Type B") using a second modulation type B method (one that Type B trib can understand but Type A cannot), the Master transmits a "second message" (sequences 106, 108, 114). The "second message" includes "third information" (training sequence 106) modulated according to the first modulation type A method and including information that is indicative of an impending change in modulation to the second modulation type B method. '228 Patent at 6:27-30 ("To switch from type A modulation to type B modulation, master transceiver 64 transmits a training sequence 106 to type A tribs in which these tribs are notified of an impending change to type B modulation."). The "second message" also includes "fourth information" (transmission sequence 108) that is transmitted after transmission of the "third information," is modulated according to the second modulation type B method, and includes data intended for the Type B trib. '228 Patent at 6:32-36 ("After notifying the type A tribs 66a of the change to type B modulation, master transceiver 64, using type B modulation, transmits data along with an address in sequence 108, which is destined for a particular type B trib 66b."). In addition, the "second message" includes second message address information that is indicative of the single Type B trib being an intended destination of the fourth information. *Id.*

91. The '228 specification describes the claimed switches as follows:

> To switch from type A modulation to type B modulation, master transceiver 64 transmits a training sequence 106 to type A tribs 66a in which these

tribs are notified of an impending change to type B modulation. ... After notifying the type A tribs 66a of the change to type B modulation, master transceiver 64, using type B modulation, transmits data along with an address in sequence 108, which is destined for a particular type B trib 66b. .... [6:27-36]

> ... If, however, master transceiver transmits a training sequence in which the type A tribs 66a-66a are notified of a change to type B modulation as indicated by sequence 106, then a transition is made to state 124 where all type B transmissions are ignored until a type A modulation trailing sequence (e.g., sequence 114) is detected. Upon detecting the type A trailing sequence, a type A trib 66a returns to state 122 where it awaits a training sequence. [7:3-10]

> To initiate a communication session with a type A trib 66a, master transceiver 64 transmits a training sequence 126 in which an address of a particular Type A trib 66a is identified. The identified Type A trib 66a recognizes its own address and transitions to state 128 to receive data from master transceiver 64 as part of sequence 132. [7:11-16].

92. Thus, the combination of Gordon Bremer's claimed first through fourth information in the first and second messages captures his solution to the incompatibility problem, *i.e.*, switching from one modulation type to another incompatible modulation type when switching from one trib type to another. None of the cited references discloses or would have suggested either the problem Mr. Bremer set out to solve in the master/slave setting, *i.e.*, the problem created by the need to communicate with slaves (tribs) that do not share a common modulation method and thus are incompatible, or his solution to that problem. *See* '228 Patent at 6:14-7:39 (describing Fig. 5).

VIII. <u>Overview of the Art Relied on by the Office to Support Its Anticipation and Obviousness Rejections</u>

93. I observe the Office has rejected claim 21 under § 102(e) as anticipated by Snell (relying on Snell's incorporation by reference of Harris AN9614 and Harris 4064.4 (collectively the "Harris Documents")), May 3 Office Action, at 7-8, and, in addition, has rejected claim 21 under 35 U.S.C. §103(a) as obvious based on the following references:

> A.) "Applicants Admitted Prior Art (APA) in view of Boer and further in view of Yamano." May 3 Office Action, at 8 (Rejection A);

B) "Snell in view of Yamano and further in view of Kamerman" (again relying on Snell's incorporation by reference of the Harris Documents)). May 3 Office Action, at 10 (Rejection B);

C.) "Snell in view of Harris 4064.4, further in view of Harris AN9614, further in view of Yamano and further in view of Kamerman." May 3 Office Action, at 30 (Rejection C); and

D.) "Snell in view of Harris 4064.4, further in view of the Admitted Prior Art, further in view of Upender, further in view of Yamano and further in view of Kamerman." May 3 Office Action, at 51 (Rejection D).

94. Based on my review of the cited art (including the Harris Documents), I conclude that none of the cited art relied on by the Office to support its anticipation rejection and its obviousness rejections is directed to a master/slave system in which different types of modulation methods -- or even incompatible ones -- are used by a master to communicate with its slaves. Boer, Snell, Yamano, and Kamerman (and the Harris Documents) each are directed to peer-to-peer communications in which the modems, or stations, share a common modulation and thus are compatible with each other. Thus, these references were attempting to solve different problems created by their peer-to-peer configuration -- e.g., increasing data rates while avoiding interference and collisions --and not the incompatibility problem in a master/slave configuration that Gordon Bremer identified and solved in the '228 Patent. That is at least because master/slave and peer-to-peer configurations, or protocols, provide "*fundamentally different ways* of accessing the shared medium." Upender at 46 (emphasis added). *See also* the discussion at ¶¶ 119-120 below. My reasoning is confirmed by the Federal Circuit's determination that Upender would have discouraged combining Boer and the APA. *Rembrandt Wireless Tech. v. Samsung Elec. Co.*, No. 16-1729, slip op. at 12-14 ("because Upender strongly suggests that master/slave is inferior to CSMA/CA, substantial evidence supports the jury's presumed factual finding that one of skill in the art would not have been motivated to combine Boer with Upender's teaching of

master/slave."). The same analysis would apply to any suggestion to adapt the peer-to-peer systems of Snell, Kamerman, or Yamano to a master/slave system.

95. Summarizing the fundamental differences between the '228 claimed invention and the relied-on art, I note that Boer, Snell, Yamano, and Kamerman:

a) Focus on peer-to-peer communications, such as those used in CSMA and CDMA, in which a *single* modem, or station, may, e.g., "switch on-the-fly between different data rates and/or formats." (Snell, col. 2, ll. 27-30). *See also* Boer, col. 4, ll. 26-27 ("LAN 10 operates on a CSMA/CA (carrier sense multiple access with collision avoidance) protocol"); Kamerman at 6 ("CSMA/CA protocol is designed to reduce the collision probability between multiple stations accessing the medium"); Yamano at col. 1, ll. 9-13 ("present invention relates to the reduction of the required amount of signal processing in a modulator/demodulator (modem) which is transferring packet-based data or other information...").

b) Do not have a master, or any other device, that negotiates a modulation type, polls slaves (or stations) and initiates all communications with the system's slaves (or stations). *See* the cited references *passim*.

c) Do not have slaves that may only respond when polled by a master. Instead, once part of the network, any of the stations in the cited references can initiate communications with any other station using a data rate it knows will work (in the absence of interference/collisions). *See, e.g.*, Kamerman, at 6 ("The basic medium access behavior allows interoperability between compatible PHYs through the use of CSMA/CA").

d) Identify and solve very different problems –e.g., collision or interference avoidance—than those Bremer identified and solved using very different solutions. *See, e.g.*, Snell, col. 5, ll. 23-29 (providing "a clear channel assessment (CCA) to avoid data collisions"); Boer, col. 4, ll. 27-40 ("collisions are not completely avoided by this CSMA/CA protocol, but the chance of a collision is rendered very small"); Kamerman, at 11 ("At higher load the transmissions from the access point to stations at the outer part of the cells, will be done often at fallback rates due to mutilation of transmissions by interference."). Notably, interference and collision avoidance is completely unnecessary in a master/slave setting because the master controls all communications. Thus, there would have been no motivation to employ the prior art solutions used to avoid such interference or collisions in order to solve Bremer's incompatibility problem in a master/slave setting.

96. Thus, in my opinion, the problems addressed by Boer, Snell, Yamano, and Kamerman would not have been relevant to those identified and addressed by the '228 Patent and would not have motivated a skilled artisan to employ the solution described and claimed in the '228 Patent. Just like Boer, Snell was interested in providing a transceiver that could operate at higher data rates than previously provided while avoiding collisions by only transmitting when the communication channel was clear. *See* Snell, col. 2, ll. 22-25; col. 3, ll. 41-44; col. 5, ll. 23-29. *See also* Kamerman at 11. As noted previously, such a problem does not occur in a master/slave setting because the master controls communications with its slaves. In contrast and as explained above, Mr. Bremer invented a way for the master to communicate with slaves that utilized incompatible modulation types without tearing down the system to make a switch from one modulation type to another.

97. None of Boer, Snell, Yamano, or Kamerman even recognizes an incompatibility problem that needed solving. For example, Snell's switches, just like Boer's, were for very different reasons, i.e., to address/minimize collisions and interferences. Because of these substantial differences, one skilled in the art would not have been motivated to combine Boer, Snell, Yamano, and Kamerman – if at all -- in a way that would have yielded Bremer's claimed invention without using the claimed invention as a roadmap. More specifically, primarily because of these substantial differences, one skilled in the art would not have been motivated to solve the '228 problem in a master/slave setting in the way Mr. Bremer did. That solution included, among other things, the claimed first and second modulation types and the claimed messages, arranged as claimed. None of the Office's relied-on art, alone or together, discloses or would have suggested these claim elements.

98. Upender and the APA do not address the deficiencies of Boer, Snell, Kamerman, and Yamano. While they generally disclose a master/slave system, they do not disclose and would not have suggested adapting any of the peer-to-peer systems in a way that would satisfy the master/slave limitations of claim 21.

99. Finally, even if the Harris Documents were legally incorporated by reference in Snell (which I understand they were not), they do not address the shortcomings of Snell, Kamerman, and Yamano, as they are also directed to peer-to-peer systems (those of PRISM™) and do not disclose and would not have suggested adapting a peer-to-peer system to the claimed master/slave system. *See* my analysis of the Harris Documents at ¶¶ 76-77, 110-115.

IX. <u>The Anticipation Rejection</u>

100. Based on my review of the Anticipation Rejection and Snell, I conclude that the following three limitations are missing from all of the relied-on art supporting these rejections and would not have been obvious in view of that art. The three missing limitations are (i) the

"master/slave relationship," (ii) "the second modulation method [that is] of a different type than the first modulation method," and (iii) the "first message" and "second message."

101. I note that the missing limitations are found at least in the following claim language:

(i) "A master communication device configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device;"

(ii) first, second, and third information "modulated according to the first modulation method" and "fourth information … modulated according to the second modulation method, the second modulation method being a different type than the first modulation method;" and

(iii) "a master transceiver configured to transmit a first message … , wherein the first message comprises: first information modulated according to a first modulation method, [and] second information … modulated according to the first modulation method … ; and said master transceiver configured to transmit a second message … wherein the second message comprises: third information modulated according to the first modulation method, wherein the third information comprises information that is indicative of an impending change in modulation to a second modulation method, and fourth information … modulated according to the second modulation method … wherein the first information that is included in the first message comprises the first message address data."

The primary reference, Snell (even including Harris 4064.4 and Harris AN9614), does not disclose, inherently or expressly, any of these three limitations.

A. The Claimed Master/Slave Relationship (Anticipation Rejection)

102. I observe that, in its Anticipation Rejection of claim 21, the Office drew the following conclusion:

> Snell teaches a communication device (Abstract, Figs. 1-2 and 5-8) configured to (capable of) communicate according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave (the transceiver of Snell is capable of such communication), the device comprising: a transceiver (Fig. 1), in the role of the master according to the master/slave relationship … ."

May 3 Office Action at 7 (without citations to support this conclusion).

103. I note that cited portions of Snell and the Harris Documents do not mention the words "master" or "slave," or "master/slave relationship." Further, I understand that there is not sufficient evidence to establish that Harris AN9614 is prior art and thus, legally, could not have been incorporated by reference. Finally, I observe that the portions of Harris AN9614 that Snell attempted to incorporate by reference have nothing to do with a master/slave relationship and are found on the first two pages of Harris AN9614, not page 3 (the page relied on by the Office). *See supra* at ¶¶ 74-75.

104. A "master/slave relationship" is not inherent in Harris AN9614's "polling scheme" either, because polling can and does take place in peer-to-peer systems. In fact, a person of ordinary skill in the art would have understood that Harris AN9614 uses the polled scheme in the context of peer-to-peer communications (which is the topic being discussed in Snell and Harris AN9614), not master/slave communications. Not even with hindsight would one of ordinary skill in the relevant art have surmised the polled scheme of Harris AN9614 as being used in a context other than peer-to-peer communications.

1. Snell's Carrier Sense Transceiver and The Claimed Master/Slave System (Anticipation Rejection)

105. The primary reference, Snell, discloses a transceiver 30, Snell at Fig. 1, 4:42-43, designed for peer-to-peer communications, such as carrier sense multiple access with collision avoidance (CSMA/CA) communications. *See* Snell at 5:26-29 (disclosing that Snell's transceiver includes

a "CCA circuit block 44" that "provides a clear channel assessment (CCA) to avoid data collisions," *i.e.*, collisions which do not occur in a master/slave setting). *See also id.* at Fig. 1.

106. Systems that implement a CSMA/CA protocol for collision avoidance are fundamentally different than a master/slave system. In a CSMA/CA system, any device on the network can initiate a communication whenever the device determines that no other communications are occurring. In contrast, I observe that claim 21 of the '228 Patent is limited to master/slave communications, in which slave devices can only communicate on a network when prompted by a master. Because of this fundamental difference, the problem the '228 Patent set out to solve within the context of a more rigid master/slave setting was not one faced by Snell, and the solution claimed in the '228 Patent is not one disclosed or suggested by Snell. *See the discussion supra* at ¶¶ 94-97. Thus, Snell does not disclose, inherently or expressly, any master/slave communications, let alone the master/slave relationship required by claim 21 of the '228 Patent, without using the claimed invention as a roadmap.[9] Without using the claimed invention as a roadmap, one skilled in the art simply would not know how to configure Snell's transceiver to address the problem Gordon Bremer identified and solved.

107. I observe that, with respect to the Office's Anticipation Rejection based on Snell, the Office concludes that "the transceiver of Snell is capable of such communication [according to a master/slave relationship]." May 3 Office Action at 7. The Office posits that "Snell incorporates

[9] The same is true of Kamerman and Yamano in that they also describe peer-to-peer communications– again, fundamentally different than the claimed master/slave system in the '228 Patent. Kamerman expressly relates to "wireless LANs that operate to conform to the IEEE 802.11 DSSS (direct sequence spread spectrum) standard." Kamerman at 6 (disclosing that IEEE 802.11 is compatible with a "CSMA/CS (carrier sensor multiple access with collision avoidance" protocol). *See also id.* at 8 ("IEEE 802.11 CSMA/CA"), *id.* at 12 ("[t]he CSMA/CA behavior of wireless LANs operating to conform to IEEE 802.11 DS"). *See* Yamano, at col. 19, ll. 21-36 (recommending using 'a carrier sense multiple access (CSMA) scheme"). Yamano and Kamerman are silent regarding any master/slave communications.

by reference each of Harris AN9614 and Harris 4064.4, which show the communication via polled protocol." *Id.*

108. I further observe that the Office does not explain how the transceiver of Snell (as opposed to the transceiver of Harris AN9614 or Harris 4064.4[10]) without modification is capable of functioning "according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device," as is required by claim 21.

2. "Incorporation by Reference" of Harris AN9614

109. The Anticipation Rejection relies on Harris AN9614 being incorporated by reference into Snell. May 3 Office Action at 7, 31. However, I understand that there is not sufficient evidence to establish that Harris AN9614 was published before the December 5, 1997, priority date of the '228 Patent and therefore is not prior art and could not have been properly incorporated by reference into Snell. I further understand that the "polled scheme" discussion in Harris AN9614 was not incorporated by reference because Snell did not identify that specific material with detailed particularity. Based on my review, the material from Harris AN9614 referenced in Snell

[10] The transceiver of Snell is different than the transceivers of Harris AN9614 and Harris 4064.4. For example, Snell discloses "a set of integrated circuits for a WLAN under the mark PRISM 1 which is compatible with the proposed IEEE 802.11 standard." Snell at 1:47-50. "While the PRISM 1 chip set is operable at 2 Mbit/s for BPSK and 4 Mbit/s for QPSK, these data rates may not be sufficient for higher data rate applications." *Id.* at 1:61-63. Snell discloses that "[t]he present invention provides an *extension* of the PRISM 1 product from 1 Mbit/s BPSK and 2 Mbit/s QPSK to 5.5 Mbit/s BPSK and 11 Mbit/s QPSK." *Id.* at 5:30-32 (emphasis added). In contrast, Harris AN9614 describes the PRISM 1 chip set without the extension described in Snell. *See* Snell at 1:50-54, 5:5-7. Harris AN9614 discloses that an unextended PRISM 1 chip may operate a "polled" scheme. Harris AN9614 at 3. Snell and Harris AN9614 do not disclose and would not have suggested that the extended PRISM 1 chip is capable of operating the polled scheme of Harris AN9614. *See* Snell *passim.* Given Snell's statements that the extended PRISM 1 chip set would operate using carrier sense methods (as opposed to polling), *see* Snell at 5:23-29, and the fact that Snell operated at multiple higher data rates (rather than the single low data rate associated with the polling discussed in Harris AN9614), Snell at 5:30-32, there would have been no reason for the extended PRISM 1 chip set to include any "polling" functionality.

discusses filters and oscillators – topics that have nothing to do with the "polled scheme" and that appear in a different section of Harris AN9614. *See* Snell, at col. 5, ll. 2-7 ("Various filters 36, and the illustrated voltage controlled oscillators 37 may also be provided as would be readily understood by those skilled in the art and as further described in the Harris PRISM 1 chip set literature, such as the application note No. AN9614, March 1996, the entire disclosure of which is incorporated herein by reference."). The sections of Harris AN9614 discussing filters and oscillators appear in Harris AN9614, at pages 1 and 2 and not the page cited by the Office, *i.e.*, page 3. In fact, page 3 of Harris AN9614 turns to a new topic, *i.e.*, "High Rate Burst Transmissions With Low Average Rate."

110. I have been asked to assume that, contrary to the above, Harris AN9614 was prior art and, thus, could have been incorporated by reference and Snell identified the "polled scheme" of Harris AN9614 with detailed particularity as the specific material it incorporates, and consider whether the "polled scheme" discussion of Harris AN9614 discloses or would have suggested the claimed "master/slave relationship." I have done so and conclude Harris AN9614 does not disclose, inherently or expressly, the claimed "master/slave relationship" for the reasons given in paragraphs 111-115.

3. Inherency and Harris AN9614's "Polled Scheme"

111. I observe that, according to the Office, "[a] polled protocol is a master/slave protocol." May 3 Office Action at 11-12, 31. *See also id.* at 33-34 ("polled (master/slave) protocol"). One of ordinary skill in the art would not so conclude. The master/slave limitations in the challenged claims do not necessarily flow from the teachings of Snell (even presuming that Harris AN9614 had been properly incorporated) because polling can and does take place in peer-to-peer systems (like the CCA systems described at col. 5, lines 26-29 of Snell), which by definition are not master/slave systems.

112. For example, node A and node B could communicate according to a polled scheme in which (1) node A polls node B to request information from node B, (2) after node B sends the requested information to node A, node B polls node A to request information from node A, and (3) node A sends the requested information to node B. In this way, nodes A and B would use a polled scheme to communicate, but neither of nodes A and B would be a master or slave. See "Telecommunications network," at 2, Britannica Online Encyclopedia ("A decentralized form of polling is called token passing. In this system, a special "token" packet is passed from node to node. Only the node with the token is authorized to transmit; all others are listeners.").

113. Further, the Office's equation of Harris AN9614's "polled scheme" with a master/slave configuration is based on a faulty understanding of the scope of "polling" in the relevant art and an incorrect reading of Harris AN9614 and the '228 Patent. While polling can take place in a master/slave system, *see* '228 Patent at 4:30-33 (describing its master/slave protocol as a "polled multipoint communications protocol"), polling is not used exclusively in master/slave protocols. Instead, polling is a more general term in the relevant art, and a master/slave protocol is but one protocol in which polling can be used. In fact, there is no suggestion in Harris AN9614 that its "polled scheme" is taking place in anything other than the peer-to-peer communications protocol being discussed in Harris AN9614. *See* Harris AN9614 at 3. *See* also my discussion of the need to maintain a peer-to-peer system in order to maintain compatibility with the IEEE 802.11 standard, at ¶¶ 171-179.

114. Again, I note that page 3 of Harris AN9614 does not mention "master" or "master/slave" but instead states:

> With a low power watch crystal, the controller [of the PRISM chip set] can keep adequate time to operate either a polled or a time allocated scheme. In these modes, the radio is powered off most of the time and only awakens when communications is expected. This station would be awakened periodically to

> listen for a beacon transmission. The beacon serves to reset the timing and to alert the radio to traffic. If traffic is waiting, the radio is instructed when to listen and for how long. In a polled scheme, the remote radio can respond to the poll with its traffic if it has any.

Harris AN9614 at 3. Given the brevity of this discussion, and the fact that both Snell and Harris AN9614 are focused on peer-to-peer communications, one of ordinary skill in the relevant art would conclude that the discussion of a "polled scheme" in Harris AN9614 refers to polling as part of peer-to-peer communications, not master/slave communications. One of ordinary skill in the art would not have understood the Harris AN9614 discussion as suggesting more.

115. Thus, Harris AN9614 does not inherently disclose that its polled scheme includes "a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device," as required by claim 21 of the '228 Patent.

B. The Claimed At Least Two Different Types of Modulation Methods

116. Claim 21 requires that "the second modulation method be[] of a *different type* than the first modulation method." Snell does not disclose two different types of modulation methods. As I explain above, the proper construction of "different types of modulation methods" is "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." *Rembrandt Wireless Tech. v. Samsung Elec. Co.*, Docket No. 2016-1729, slip op. at 7 (Fed. Cir. April 17, 2017) ("the clearest statement in the intrinsic record regarding the meaning of the "different types" limitation is the descriptive statement the applicant made to the examiner when he inserted the limitation into the claims. Samsung's arguments to the contrary do not diminish this unambiguous statement in the prosecution history."). *See supra* at ¶ 20 (where I discuss the broadest reasonable interpretation of the claims).

117. I observe that, in the Office's Anticipation Rejection based on Snell, the Office does not identify what disclosure in Snell allegedly corresponds to the "different type[s]" of modulation methods. *See* May 3 Office Action at 7 (incorrectly alleging that "all limitations after 'configured to' are intended" and not giving "patentable weight" to them). Therefore, I conclude that the Office's Anticipation Rejection is based on an unreasonably broad interpretation.

118. Further, even under the Office's overly broad claim construction in which it defines "different type[s]" of modulation methods to mean "modulation methods that are incompatible with one another," May 3 Office Action at 6, this claim limitation is not disclosed by Snell (or the Harris Documents). In fact, none of the cited references (i.e., Snell, Yamano, Kamerman, Harris AN9614, and Harris 4064.4) discloses or would have suggested any incompatibility problem. I observe that the Office does not define the term "incompatible," but, in the context of the '228 Patent, first and second modulation methods may be incompatible when, for example, one modem using the first method cannot communicate with a second modem using the second method, *i.e.*, when no common modulation method is shared. *See* '228 Patent at 1:47-67. Importantly, whether two modulation methods are incompatible, as used in the '228 Patent, cannot be considered in a vacuum but must be considered in the context in which term or phrase is used.

119. Snell does not disclose the invention claimed in the '228 Patent, at least in part, because Snell was not faced with the incompatibility problem solved by Gordon Bremer. *See* my discussion of the problem Gordon Bremer solved, in ¶¶ 82-92. That incompatibility problem was identified and solved in a master/slave setting, as described in the '228 Patent, and was specific to a master/slave setting when a master attempts to communicate with a slave using an incompatible modulation method. Snell's peer-to-peer communications system was not faced

with that problem. Instead Snell was faced with different problems that resulted from the fundamentally different ways that peer-to-peer systems accessed the shared medium. Those "fundamentally different ways" involve peer-to-peer communications, such as CSMA and CDMA types, instead of those between a master and a slave. *See* the discussion at ¶¶ 94-97.

120. More specifically, the problems Snell was facing and attempting to address as the result of peer-to-peer communications, while at the same time attempting to increase date rates for communications between the stations, were, e.g., collisions, interference, and the like. *See, e.g.*, Snell at 1:64-2:19 (describing a problem with prior art DSSS), 2:22-30 (summarizing Snell's solution to the problem), 3:40-43 (discussing the need for a "clear channel"), 5:23-29 (identifying how "to avoid data collisions"), 5:54-59 (identifying how to "combat multi-path and reduce the effects of interference"). *See also* Yamano at 11:62-12:9 (explaining the interference problem), 19:21-36 (explaining how to address the collision problem using CSMA system); Kamerman at 6 (explaining how CSMA/CA "is designed to reduce the collision probability between multiple stations"), 11 (discussing the problem "due to mutilation of transmissions by interference").

121. For these reasons, even under the Office's overly broad claim construction, Snell neither identifies nor addresses incompatible modulation methods, as are addressed in the '228 Patent in a master/slave setting when attempting to allow a master to communicate using different, incompatible modulation methods. Thus, Snell does not disclose the problem of incompatible modulation methods, let alone the claimed solution to that problem provided in the '228 Patent. Without recognition of the incompatibility problem created by incompatible modulation methods in a master/slave setting, one skilled in the art would not have turned to any of the peer-to-peer disclosures in the cited references to solve that problem.

C. The Claimed First and Second Messages (Anticipation Rejection)

122. Claim 21 requires a master transceiver configured to transmit (1) "a first message" comprising "first information" and "second information" and (2) "a second message" comprising "third information" and "fourth information." Based on my review of Snell, I conclude that it does not disclose, inherently or expressly, the claimed master transceiver configured to transmit the first and second messages.

123. Again, at least one reason why Snell does not disclose the claimed invention is because of the fundamentally different systems and the very different problems/solutions presented due to those fundamental differences. *See* the discussion in ¶¶ 94-97.

X. <u>Obviousness Rejections A-D</u>

124. Based on my review of the Office's obviousness rejections (Rejections A, B, C and D) and the references the Office cites to support these rejections, I conclude that a person of ordinary skill in the art would not have been motivated to modify Snell or Boer in the manner proposed by the Office.

125. First, there would have been no motivation to adapt Boer or Snell to a master/slave system for the reasons I've described in ¶¶ 127-145. Only through employing hindsight would one of ordinary skill have concluded that adapting the peer-to-peer systems of Snell and Boer to a master/slave system would have been obvious. With respect to Boer in Rejection A and Snell in Rejection D, I understand that the alleged APA cannot be relied upon as providing motivation because it is the work of Gordon Bremer and thus not prior art. With respect to Snell in Rejections B-D, Harris AN9614 cannot be relied upon as providing the motivation because (a) it has not been shown to be a prior art publication, (b) it was not properly incorporated by reference in Snell, (c) it does not expressly or inherently suggest using a master/slave protocol, and (d) even if it did disclose a master/slave protocol, it was in the context of a single low data rate

scheme as opposed to the multiple higher data rate schemes described in Snell. *See* ¶¶ 71-77, 109-115. Also, contrary to what the Office found, I conclude that the Upender reference would have actually discouraged a skilled artisan from using a master/slave protocol in implementing the teachings of Boer and Snell. *See* ¶¶ 134-144. Moreover, I observe that there was no recognition in the cited art of the problem identified and solved by the '228 Patent. *See* ¶ 129-130, 145. Therefore, a person of ordinary skill would have had no reason to further modify the cited art in the manner proposed by the Office and claimed in claim 21. *See* ¶¶ 127-145.

126. Second, a person of ordinary skill in the art would have had no motivation to modify Boer or Snell by inserting address information into the preamble as proposed because that modification would have resulted in an inoperable system, would have resulted in removal of error correction functionality, and/or would have been considered a serious design blunder. *See* ¶¶ 147-168. In addition, a person of ordinary skill would have had no motivation to modify Boer or Snell by inserting address information into the preamble as proposed because it would have rendered the system unsatisfactory for its intended purpose. *See* ¶¶ 169-180.

A. The Adaptation of Snell or Boer to a Master/Slave System (Rejections A-D)

127. I note that the Office relies on Boer and the APA in Rejection A; on Snell, Yamano, Kamerman, Harris AN9614, and Harris 4064 in each of Rejection B and C; and on Snell (with Harris AN9614 through incorporation by reference), Yamano, Kamerman, Harris 4064, Upender, and the APA in Rejection D. Based on my review of Rejections A, B, C and D and the art the Office relies on to support these rejections, I conclude that they share a common, significant deficiency – none of the cited references would have motivated a skilled artisan to adapt Snell or Boer to a master/slave system.

128. None of Boer, Snell, Yamano, and Kamerman discloses communications in a master/slave setting at all, even if Harris AN9614 and Harris 4064.4 had been successfully

incorporated by reference into Snell. *See* ¶¶ 129-133. Rejections A-D rely on impermissible hindsight reasoning to conclude that adapting the peer-to-peer systems of Snell and Boer to a master/slave system would have been obvious. *See* ¶¶ 129-130. Even if the Harris Documents were prior art at the time of the invention, neither discloses a master/slave system. *See* ¶¶ 131-133. The "polled scheme" briefly discussed in Harris AN9614 does not disclose a master/slave system, is mentioned in the context of a single low data rate scheme that would not experience the problem the '228 solved, and in any case is not particularly identified as being incorporated by reference. *See* ¶¶ 76-77, 110-115, 131-133. Furthermore, with respect to Rejections A and D, I understand that the APA does not qualify as prior art. I additionally conclude that Upender would have discouraged a skilled artisan from adapting Snell to a master/slave system. *See* ¶¶ 134-144.

1. Use of Hindsight to Adapt the Peer-to-Peer Systems of Snell and Boer to a Fundamentally Different Master/Slave System (Rejections A-D)

129. I observe that Snell and Boer do not disclose communication according to a master/slave relationship and instead disclose peer-to-peer communications, such as carrier sense multiple access with collision avoidance (CSMA/CA) communications. *See* Snell at 5:26-29 (disclosing that Snell's transceiver includes a "CCA circuit block 44" that "provides a clear channel assessment (CCA) to avoid data collisions," *i.e.*, collisions which do not occur in a master/slave setting); Boer at 4:25-27 ("it should be understood that the LAN 10 operates on a CSMA/CA (carrier sense multiple access with collision avoidance) protocol"). Systems that implement a CSMA/CA protocol for collision avoidance are fundamentally different than a master/slave system. In a CSMA/CA system, any device on the network can initiate a communication whenever the device determines that no other communications are occurring. In stark contrast,

claim 21 of the '228 Patent is limited to master/slave communications, in which slave devices can only communicate on a network when prompted by a master.

130. Because of this fundamental difference, the problem the '228 Patent set out to solve within the context of a more rigid master/slave setting was not one faced by Snell or Boer, and the solution claimed in the '228 Patent is not one disclosed or suggested by Snell or Boer. *See* ¶¶ 94-97. Thus, Snell and Boer do not disclose and would not have suggested master/slave communications, let alone the master/slave relationship required by claim 21 of the '228 Patent, without using the claimed invention as a roadmap.[11] *See* ¶¶ 78-92 (describing the technology of the '228 Patent). Thus, all the rejections (Rejections A-D) are based on hindsight – with the claimed invention of the '228 Patent used as a roadmap. Without such a roadmap, a skilled artisan simply would not know how to configure the transceivers of Snell and Boer to address the problem Gordon Bremer identified and solved.

2. The "Polled Scheme" Disclosure in Harris AN9614 and Data Rate Schemes (Rejections B-D)

131. I observe that the "polled scheme" disclosure in Harris AN9614 at page 3 is not of a communications system using multiple modulation methods, as claimed in the '228 Patent. In addition to the limitations described above, Harris AN9614's "polled scheme" appears in a section of Harris AN9614 dedicated to describing a protocol where burst transmissions are used

[11] The same is true of Kamerman and Yamano in that they also describe peer-to-peer communications-- again, fundamentally different than the claimed master/slave system in the '228 Patent. Kamerman expressly relates to "wireless LANs that operate to conform to the IEEE 802.11 DSSS (direct sequence spread spectrum) standard." Kamerman at 6 (disclosing that IEEE 802.11 is compatible with a "CSMA/CS (carrier sensor multiple access with collision avoidance"' protocol). *See also id.* at 8 ("IEEE 802.11 CSMA/CA"), *id.* at 12 ("[t]he CSMA/CA behavior of wireless LANs operating to conform to IEEE 802.11 DS"). *See* Yamano, at col. 19, ll. 21-36 (recommending using 'a carrier sense multiple access (CSMA) scheme"). Yamano and Kamerman are silent regarding any master/slave communications.

for achieving a "Low Average Data Rate" by operating the PRISM 1 chip at a single, low data rate of 1 MBPS:

> The system approach is to accept the 1 MBPS data rate of the radio as long as the achievable range is acceptable, and use it in a short burst mode which is consistent with its packet nature. With a low power watch crystal, the controller can keep adequate time to operate either in a polled or time allocated scheme. In these modes, the radio is powered off most of the time and only awakens when communications is expected. … With these techniques, the average power consumption of the radio can be reduced by more than an order of magnitude while meeting all data transfer objectives.

Harris AN9614 at 3.

132. Based on my review of Harris AN9614, I conclude that there is nothing in Harris AN9614 suggesting that its 1 MBPS system should or even could be used in combination with the higher data rate schemes described in the body of Snell. Put another way, there is nothing in Harris AN9614 suggesting that its 1 MBPS polled scheme was intended to be used to accomplish, for example, the scheme depicted at col. 6, lines 55-60 of Snell, which the Office has mapped to other elements in claim 21.

133. Rather Harris AN9614 suggests adapting its "high data rate configuration" to one using 1 MBPS only in order to avoid "the design considerations … of concern" with high data rate configurations. *See* Harris AN9614 at 3. Significantly, this suggestion is directly contrary to Snell's goal of obtaining higher variable data rates "from 1 Mbit/s BPSK and 2 Mbit/s QPSK to 5.5 Mbit/s BPSK and 11 Mbit/s QPSK." Snell at 5:30-32. Thus, one of ordinary skill in the art reading Snell and Harris AN9614 would have understood the discussion in Harris AN9614 of a polled scheme to be inapplicable to the multi-data rate scheme that is the focus of Snell. Accordingly, even if Harris AN9614 legally qualified as a publication, and the "polled scheme" of Harris AN9614 were incorporated by reference into Snell, and the disclosure of a polled scheme in Harris AN9614 would have suggested a "master/slave relationship," the combination

of Snell with Harris AN9614 would not have yielded or suggested the communications system claimed in the '228 Patent that requires at least two modulation methods.

3. The Impact of Upender on Adapting Snell to a Master/Slave System (Rejection D)

134. I note the Office found that "Upender's express teaching that a polled (master/slave) protocol is advantageous for its 'simplicity and determinacy,' would have motivated one of ordinary skill to use such a system in implementing Snell's communication system …," May 3 Office Action, at 63-64 (citing Upender at 7). Based on my review of Upender and contrary to the Office's finding, I conclude that the teachings of Upender would have discouraged one of ordinary skill from adapting Snell to a master/slave system.

135. My conclusion is supported by the Federal Circuit's finding in the companion district court case:

> Substantial evidence likewise supports the jury's presumed finding that there was no motivation to combine Boer with Upender, as Rembrandt had argued. The '580 and '228 patents claim a master/slave communication protocol, whereas Boer discloses devices communicating under the CSMA/CA protocol. Samsung had argued that combining Boer with Upender—which discusses and compares several communication protocols, including master/slave—would render Rembrandt's patents obvious. Rembrandt countered that one of skill in the art would not have been motivated to combine the references because Upender teaches away from substituting Boer's CSMA/CA approach with master/slave. Specifically, Upender analyzes the tradeoffs between different communication protocols based on various attributes, such as efficiency, robustness, and cost. Upender concludes that CSMA/CA is at least as good—and most often, better—than master/slave in every respect. We conclude that this disclosure provides substantial evidence to support the jury's presumed finding that one of ordinary skill in the art would not have been motivated to replace the CSMA/CA protocol already in place in Boer with a master/slave arrangement as taught by Upender.
>
> ….
>
> Samsung misses the mark by arguing that we must find a motivation to combine if we agree with it that there is not substantial evidence to support a finding that Upender teaches away from substituting CSMA/CA with master/slave. Whether a reference teaches away is doctrinally distinct from whether there is no motivation to combine prior art references. *See Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d

> 1034, 1051 n.15 (Fed. Cir. 2016) (en banc) (identifying motivation to combine and teaching away as "two discrete bases" supporting district court's denial of JMOL); *see also Star Sci., Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1374–75 (Fed. Cir. 2011). ...
>
> ... [T]he jury did not need to find that Upender taught away from using master/slave in order to find that there would be no motivation to replace CSMA/CA in Boer with master/slave. Even if Upender "does not teach away, its statements regarding users['] prefer[ences] . . . are relevant to a finding regarding whether a skilled artisan would be motivated to combine" Upender with Boer. *Apple*, 839 F.3d at 1051 n.15. Therefore, because Upender strongly suggests that master/slave is inferior to CSMA/CA, substantial evidence supports the jury's presumed factual finding that one of skill in the art would not have been motivated to combine Boer with Upender's teaching of master/slave.

Slip op. at 12-14.[12]

136. Based on my comparison of Boer and Snell (*see* ¶¶ 48-53), the Federal Circuit's determinations as to what Upender would have suggested with respect to combining Boer and Upender applies equally to the Office's proposed adaptation of Snell to a master/slave protocol based on Upender, due to the substantial identity of the Boer and Snell teachings. *See id.*; Exhibit B). Just like Boer, Snell relates to a CSMA/CA-type system. While the Snell patent does not expressly identify such a system, one of ordinary skill would have read Snell, Kamerman and Boer together, and understood that Snell's 802.11 system (like Boer's 802.11 system) used such a system. As the Office points out,[13] Snell's system operates "in accordance with the proposed

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[12] I note that the PTAB rendered its Final Decision in the '892 IPR prior to the above-quoted Federal Circuit decision, and thus did not have the benefit of the Federal Circuit's insight. While the PTAB decision was not appealed and therefore stands with respect to claim 1, that decision does not impact the patentability of claim 21 in view of the art now relied on by the Office. In this case, the Federal Circuit's later determination should be adopted as controlling.

[13] The May 3 Office Action, at 25, reads:

> Moreover, Snell and Kamerman are in the same field of art, with both relating to communications between transceivers that use BPSK and QPSK modulation methods to transfer data at different rates according to the draft IEEE 802.11 standard available at that time. See, e.g., Snell at 1:47-63 ("The assignee of the present invention has developed and manufactured a set of integrated circuits for a

IEEE 802.11 standard." Snell, at 4:45-46. Kamerman also makes clear that the proposed IEEE 802.11 standard used CSMA/CA. Kamerman, at 1344 ("IEEE 802.11 supports DSSS (direct sequence spread spectrum) … The basic medium access behavior allows interoperability … through the use of CSMA/CA."). Thus, in this regard (as well as many others identified in ¶¶ 48-53 and in Exhibit B), I conclude that Snell is cumulative to Boer.

137. The Upender teachings support my understanding of the impact of those teachings, as well as the Federal Circuit's determination that "one of skill in the art would not have been motivated to combine Boer with Upender's teaching of master/slave" (and therefore that one of skill in the art would not have been motivated to combine Snell with Upender's teaching of master/slave). While Upender identifies a number of media access protocols, Upender notes that they "demonstrate fundamentally different ways of accessing the shared medium." Upender at 46. For this very reason (among others), Upender would not have suggested combining the fundamentally different protocols or adapting one to another. Rather the article merely states that "this article's discussion of the special considerations and media access protocol strengths and weaknesses should allow you to select the best protocol to match your needs." Upender at

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WLAN under the mark PRISM 1 which is compatible with the proposed IEEE 802.11 standard .... "), 5:31-33 ("The present invention provides an extension of the PRISM 1 product from 1 Mbitls BPSK and 2 Mbitls QPSK . . . "); Kamerman at 6 ("This paper considers the critical parameters for wireless LANs that operate conform to the IEEE 802.11 DSSS (direct sequence spread spectrum) standard ... "), 11 ("IEEE 802.11 DS specifies bit rates of 1 and 2 Mbps. ", 11 ("IEEE 802.11 DS specifies BPSK and QPSK ... ").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kamerman' s teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system (modified in light of Yamano) for communicating data packets modulated according to different modulation methods, as both Snell and Kamerman are directed to IEEE 802.11 systems ….

57.[14] I discuss the fundamental differences between peer-to-peer protocols and master/slave and the very different problems faced by each in ¶¶ 94-99.

138. As the Federal Circuit observed, "Upender strongly suggests that master/slave is inferior to CSMA/CA." In fact, Upender's "Media access tradeoffs" Table supports this conclusion:

TABLE 1
Media access tradeoffs.

↑ Good — Ok ↓ Poor	Efficiency Light Traffic	Efficiency Heavy Traffic	Deter-minacy	Priori-tization	Robust-ness	Physical Layer Flexibil.	Low Cost/ Node
Connection	—	↓	↑	—	↑	↓	—
Polling	↓	—	↑	↓	↓	↑	—
TDMA	↓	↑	↑	↓	↓	↑	↓
Token Ring	↑	↑	↑	↑	—	—	—
Token Bus	—	↑	↑	—	—	↑	—
Binary Cnt.	↑	↑	—	—	↑	↓	↑
CSMA/CD	↑	↓	↓	—	↑	↑	—
CSMA/CA	↑	↑	↑	↑	↑	↑	↑

Notably, Upender does not identify a single characteristic for master/slave ("Polling") that its rates better than that for CSMA/CA. In fact, Upender rates *five* characteristics for "Polling" more poorly than it rates those for CSMA/CA. A fair reading of Upender in its entirety, including its Table 1, dictates the conclusion that "CSMA/CA is at least as good—and most often, better— than master/slave in every respect," as noted by the Federal Circuit. *Rembrandt Wireless*, slip op. at 13.

[14] The Office acknowledges this teaching without explaining how it would have suggested combining two "fundamentally different" protocols: "Upender expressly teaches that a protocol for a particular application should be selected in light of the respective costs and benefits of available protocols, noting that the discussion of the strengths and weaknesses of the different protocols 'should allow you to select the best protocol to match your needs'." May 3 Office Action, at 63-64 (quoting Upender at 10-11).

139. I note that, to support its position that Upender would have provided motivation to adapt Snell's CSMA/CA protocol to a master/slave protocol, the Office cites IPR2014-00892, Pap. 46 at 17 (citing Upender at 10-11 and finding that Upender does not "teach away" from using the master/slave protocol). May 3 Office Action, at 63. As the Federal Circuit observed in the opinion quoted above: "Even if Upender "does not teach away, its statements regarding users['] prefer[ences] . . . are relevant to a finding regarding whether a skilled artisan would be motivated to combine" Upender with Boer. *Apple*, 839 F.3d at 1051 n.15." *Rembrandt Wireless*, slip op. at 14. Thus, to the extent Upender does not "teach away" (a position with which I disagree), that finding is not sufficient to conclude that Upender would have motivated the skilled artisan to adapt Snell to a master/slave protocol, *i.e.*, to take a protocol strongly favored by Upender and adapt it to one clearly disfavored.

140. As further support for its position, the Office relies on "Upender's express teaching that a polled (master/slave) protocol is advantageous for its 'simplicity and determinacy,' would have motivated one of ordinary skill to use such a protocol in implementing Snell's communication system, particularly in any system in which simplicity and determinacy are important considerations." May 3 Office Action, at 63 (citing Upender at 7). In fact, I observe that Upender rates "simplicity and determinacy" the same for CSMA/CA and "Polling." *See* the Table above. Further, the Office does not explain what would have motivated a skilled artisan to sacrifice the many superior characteristics provided by a CSMA/CA-type protocol (such as that of Snell) or how doing so would have impacted the very characteristics the Office alleges Snell contributes to the claimed invention.

141. The Office continues: "Upender further teaches that a polled (master/slave) protocol is *'ideal for a centralized data-acquisition system* where peer-to-peer communication and global

prioritization are not required,' such as Snell's centralized data-acquisition system comprising an access point transceiver supporting a group of transceivers which does not require communicating using peer-to-peer communication or global prioritization. *See* Snell at 1:34-46." May 3 Office Action, at 64 (emphasis by Office). I observe that the section of Snell relied on by the Office is in the "Background of the Invention" and is discussing the prior art, not the more advanced protocol of Snell relied on by the Office to meet certain claim limitations in claim 21, *i.e.*, a protocol that implements PRISM 1 and that "is compatible with the proposed 802.11 standard." Snell at 1:47-49. The protocol of the Snell invention is clearly a CSMA/CA-type peer-to-peer protocol. *See* the discussion above; Snell at 5:8-36 (discussing collisions that are only a concern in a peer-to-peer protocol).

142. Based on my analysis above, I opine that it is unreasonable for the Office to conclude that "Upender's express teaching that a polled (master/slave) protocol is advantageous for its 'simplicity and determinacy,' would have motivated one of ordinary skill to use such a system in implementing Snell's communication system ...." May 3 Office Action at 63. The Upender teachings support just the opposite conclusion, as the Federal Circuit determined.

4. The Impact of Upender on Adapting Boer to a Master/Slave System (Rejection A)

143. To support Rejection A, I note that the Office relies on the analysis in the Final Decision in IPR2014-00892 to show that claim 1 of the '228 Patent (from which claim 21 depends) would have been obvious over the APA and Boer. However, as noted above, I understand that the APA does not describe the work of another and should not have been relied upon. In addition, although not acknowledged in the Office Action, the Board in IPR2014-00892 also relied on Upender to show that there was motivation to adapt Boer to a master/slave system. Final Written Decision in IPR2014-00892 (Paper 46), at 16-19.

144. Again, I observe that, subsequent to the Board rendering its Final Decision, the Federal Circuit found substantial evidence supported the jury's finding that Upender would not have motivated a person of ordinary skill to adapt Boer's CSMA/CA protocol to a master/slave protocol. In my opinion, the Board's finding re the impact of Upender – without the benefit of the Federal Circuit's determination – is contrary to the facts and should not be adopted with respect to the patentability of claim 21. The Federal Circuit's later determination that Upender would not have motivated a POSITA to adapt Boer to a master/slave system should be adopted by the Office as it reflects how one of ordinary skill would have understood Upender.

5. The Impact of the Problem Identified and Solved in the '228 Patent on Adapting Boer or Snell to a Master/Slave System (Rejections A-D)

145. Based on my review of the claimed invention and its description (*see* ¶¶ 78-92), I conclude that it would not have been obvious to combine the art as the Office has proposed in a way that would have yielded the invention claimed in the '228 Patent. That is because there was no recognition of the problem identified and solved in the '228 Patent – a problem specific to the master/slave setting when a master attempts to communicate with a slave using an incompatible modulation method. The named inventors of the systems described in the references were not faced with that problem and, thus, would have had no reason to invent the solution of the '228 patent. Instead they were faced with different problems that resulted from the fundamentally different ways their systems accessed the shared medium. As previously noted, those "fundamentally different ways" involved peer-to-peer communications, such as CSMA and CDMA types, instead of those between a master and a slave.

B. The Adaptation Boer or Snell to a Master/Slave System Followed by Combining Each with Yamano (Rejections A-D)

146. Claim 21 of the '228 patent requires a master transceiver configured to transmit a first message that comprises (1) "first information" and (2) "second information," wherein "the first

information … comprises the first message address data" that "is indicative of the one of the one or more slave transceivers being an intended destination of the second information." I observe that, in Rejections A-D, the Office posits, based on Yamano, that it would have been obvious to move destination address data to the preambles of Boer and Snell (i.e., to the alleged "first information" of Boer and Snell). May 3 Office Action at 9-10 (Rejection A), 18-19 & 28-29 (Rejection B), 40 & 49-50 (Rejection C), 65-66 & 74-75 (Rejection D). However, based on my review of the cited references, a person of ordinary skill in the art would not have found the proposed combinations obvious because they would have rendered the systems of Boer and Snell inoperable, resulted in the removal of error detection functionality, and/or would have been considered a serious design blunder. In addition, the proposed combinations would have rendered the systems of Snell and Boer unsatisfactory for their intended purpose.

1. Moving Address Information from the Data Link Layer (Where It Resides in Snell/Boer) to the Physical Layer Preamble

147. Snell and Boer proposed similar extensions to what became known as the 802.11 standard (or WiFi), namely adding two higher data rates to the 1MB/s and 2MB/s data rates in the proposed standard. [15] Both references use the packet structure defined by the proposed standard, including packet headers with the same fields, and would have been considered

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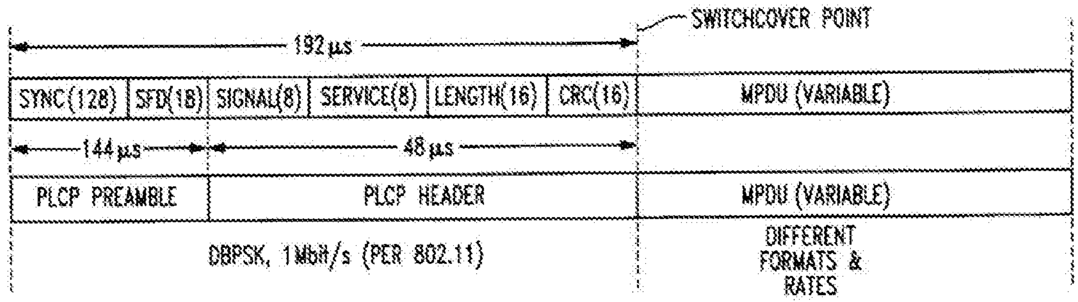
[15] *See, e.g.*, Boer at 1:16-25 (". . . there is being produced IEEE standard 802.11 . . . This standard specifies two possible data rates for data transmission, namely 1 Mbps (Megabit per second) and 2 Mbps. . . . However, it may be advantageous to provide systems operating at higher data rates . . . It is an object of the present invention to provide a method operating a wireless local area network station which enables communication between stations operation at different data rates."); and Snell at 1:47-50 (describing "a set of integrated circuits for a WLAN under the mark PRISM 1 which is compatible with the proposed IEEE 802.11 standard"); Snell at 5:30-32 (disclosing "an extension of the PRISM 1 product from 1 Mbit/s BPSK and 2 Mbit/s QPSK to 5.5 Mbit/s BPSK and 11 Mbit/s QPSK"); and Snell at 4:42-43, 5:30-32 (describing "a wireless transceiver 30" that "may be readily used for WLAN applications in the 2.4 GHz ISM band in accordance with the proposed IEEE 802.11 standard.").

together by one of ordinary skill at the time. Snell's Fig. 3 (virtually identical to Boer's Fig. 4) is shown below:



(Snell) *FIG. 3*

148. As shown above, the first portion of the packet (sent using "DBPSK, 1 Mbit/s") includes a "PLCP Preamble" and the "PLCP Header." "PLCP" is an acronym for physical layer convergence protocol. The second portion of the packet is identified with the acronym "MPDU," which stands for MAC protocol data units, where "MAC" refers to the media access control sublayer. In 1997, a person of ordinary skill would have understood that the physical layer (associated with the first portion of the packet) referred to the first layer of the seven-layer OSI model (described above), and that the MAC sublayer (associated with the second portion of the packet) referred to a sublayer of the second layer (the data link layer) of the OSI model. It was well known at the time that the MAC sublayer was responsible for communicating a device address (or MAC address), and one of ordinary skill would have read Snell and Boer together and understood that they included a MAC address in the media access control layer portion of the packet. *See, e.g.*, Boer at col. 6, lines 28-31 ("The C-MST[16] 132 determines if an incoming message is addressed to its own station, using a destination address included in data field 214.").

149. Neither Snell nor Boer meets the additional limitation of claim 21 because those references position their address information in the MAC sublayer of the data link layer. This

[16] At col. 3, lines 1-2, Boer defines "C-MST" as a "MAC control state machine."

arrangement fails to meet the limitation of claim 21 because, the PLCP header and PLCP preamble -- which the Office has mapped to the claimed "first information [in the first message] modulated according to a first modulation method" -- do not have the "first message address data" required by claim 21. An example of the Office's mapping of PLCP header and PLCP preamble to the claimed "first information [in the first message] modulated according to a first modulation method" is set forth below:

> **wherein the first message comprises:**
> **first information modulated according to a first modulation method,**
>
> Snell discloses that the master transceiver transmits **a first message** (PLCP header and PLCP preamble, figure 3 annotated below) which comprises first information **modulated according to a first modulation method (BPSK),** *See, e.g.*, Snell at Abstract, 1:34-46, 1:47-50, 1:55-57, 1:58-61, 2:27-30, 2:56-59, 2:61-3:5, 4:42-47, 5:18-2, 6:35-36, 6:52-59, 6:64-66.

May 3 Office Action at 13 (Rejection B). The Office Action uses an identical mapping for Rejection C (May 3 Office Action, at 34), and Rejection D (May 3 Office Action, at 56-57). The same mapping is also used for Rejection A.[17]

150. Mapping the "first information [in the first message] modulated according to a first modulation method" to the PLCP header and PLCP preamble in Snell and Boer results in a serious deficiency with respect to meeting the additional limitation of claim 21, because neither the PLCP header nor the PLCP preamble includes the required "first message address data." Recognizing this deficiency, the Office reasons that it would have been obvious to move the address information in Snell and Boer from the data link layer to the PLCP Preamble (in the physical layer). For example, the Office Action reasoned as follows:

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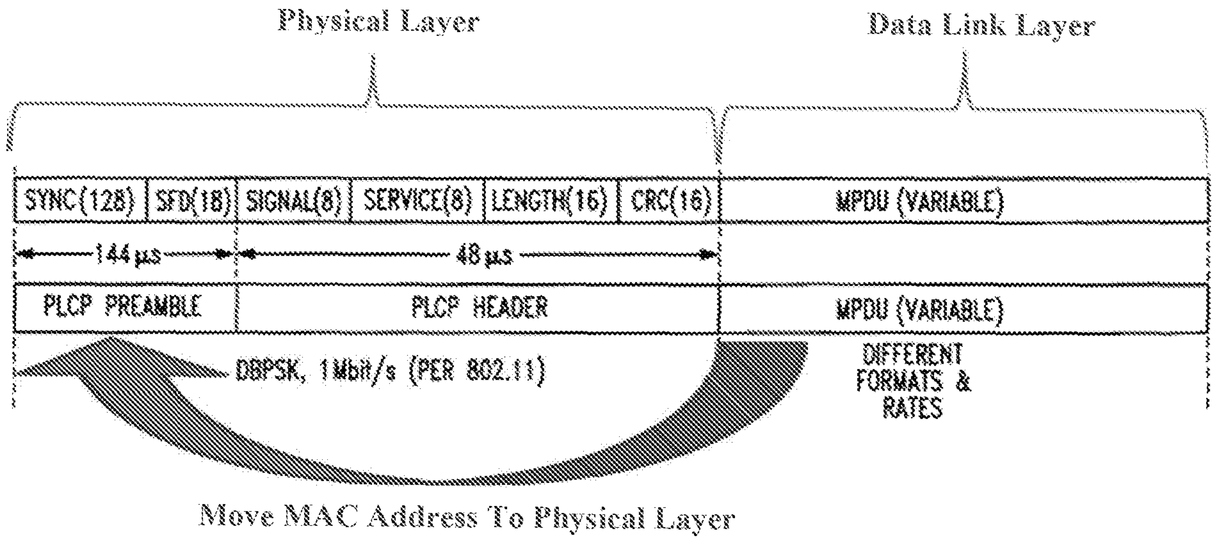
[17] For rejection A, the Office relies on the Final Written Decision in IPR2014-00892 for this mapping. May 3 Office Action at 8. The Final Written Decision in turn relies on the discussion and claim charts in the '892 Petition. *See* '892 Final Written Decision at 16. The '892 Petition maps the "first information modulated according to a first modulation method" to the SIGNAL, SERVICE, LENGTH and CRC fields of Boer's header 218, which are identical to the SIGNAL, SERVICE, LENGTH and CRC fields of Snell's PLCP header. '892 Petition at 22.

> Snell and Yamano are in the same field of art, with both relating to transmitting data packets over a network at varying rates. Yamano expressly teaches that including a destination address in the preamble portion of the data packet …
>
> It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Yamano' s teaching of including a destination address in the preamble portion of a data packet in implementing Snell's data packet comprising preamble, header, and MPDU data portions …, as taught by Yamano. …
>
> In addition, Snell teaches structuring its data packet to include a preamble, header, and MPDU data portion, and Yamano teaches structuring its data packet to also include a preamble and data portion, and to place the destination address in the preamble portion.
>
> It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a destination address in the preamble portion of a data packet, as taught by Yamano, in implementing Snell's system for transmitting data packets between transceivers, as Snell teaches that its data packet already includes a preamble portion and in combination, each element (Yamano' s teaching of placing a destination address in the preamble and Snell's teaching of a system for communicating
>
> data packets modulated according to different modulation methods between transceivers) performs the same function as it would separately…. For these reasons, a person of ordinary skill would have been motivated and found it obvious and straightforward to use the teachings of Yamano including a destination address in the preamble of a data packet in implementing Snell's communication system. (citations omitted).

May 3 Office Action at 18-19 (Rejection B); *see also* May 3 Office Action at 28-29 (Rejection B). The Office uses substantially identical reasoning for Rejection A (May 3 Office Action at 9-10), Rejection C (May 3 Office Action at 40, 49-50), and Rejection D (May 3 Office Action at 65-66, 74-75).

151. The Office's proposed modification – moving the address information from the data link layer to the PLCP Preamble -- is shown diagrammatically below:



152. If one of ordinary skill attempted to move address information into the PLCP Preamble as the Office has suggested, the result would have been an inoperable system. The PLCP Preamble includes only two fields: (1) a "SYNC" field (used for synchronization) which "is all 1's" (Snell, 6:51), and (2) an "SFD" (or start frame delimiter) that is "F3A0h" (Snell, 6:52). There is no place in this preamble for an address, and if one of the existing fields were replaced with an address field, the system would become inoperative because it requires both synchronization between devices (accomplished by the SYNC field) and a mechanism such as the SFD (start frame delimiter) field to demarcate the start of each frame. The system would also become inoperative if a new "address field" were positioned before the SYNC field or after the SFD field in the PLCP Preamble, because the preamble must begin with a SYNC field and end with a SFD field to be considered valid. Moreover, to the extent the Office were to argue that a new "address field" could have been inserted between the SYNC and SFD fields in the PLCP Preamble, the system would still have been inoperative because, as one of ordinary skill would have understood, the system would not be designed to process data (such as address data) that is positioned before the start frame delimiter.

2. Moving Address Information from the Data Link Layer (Where It Resides in Snell/Boer) to the Physical Layer Preamble

153. I identify another problem with positioning the address field in the PLCP Preamble. If the address were so positioned, the system would lack any capability to detect errors in the address value. Neither Snell nor Boer includes a CRC field (or any other error detection capability) in the PLCP Preamble. While both references include a CRC field in the PLCP Header for detecting errors, that CRC value is only calculated based on the fields in the PLCP Header (and not the fields in the PLCP Preamble). Placement of the address in the PLCP Preamble as suggested by the Office Action would have exposed the resulting system to errors in the address value that could not be detected (let alone corrected).

154. In his 1996 textbook Andrew S. Tanenbaum, a leading authority on computer communications and networks,[18] remarked on the problem of transmission errors in wireless systems (which would have included systems like Snell and Boer). With respect to such systems, Tanenbaum stated that "transmission errors are going to be a fact of life for many years to come." Tanenbaum, at 184. In such an environment, no person of ordinary skill would have been motivated to position an address value at a position where error detection capabilities were absent.

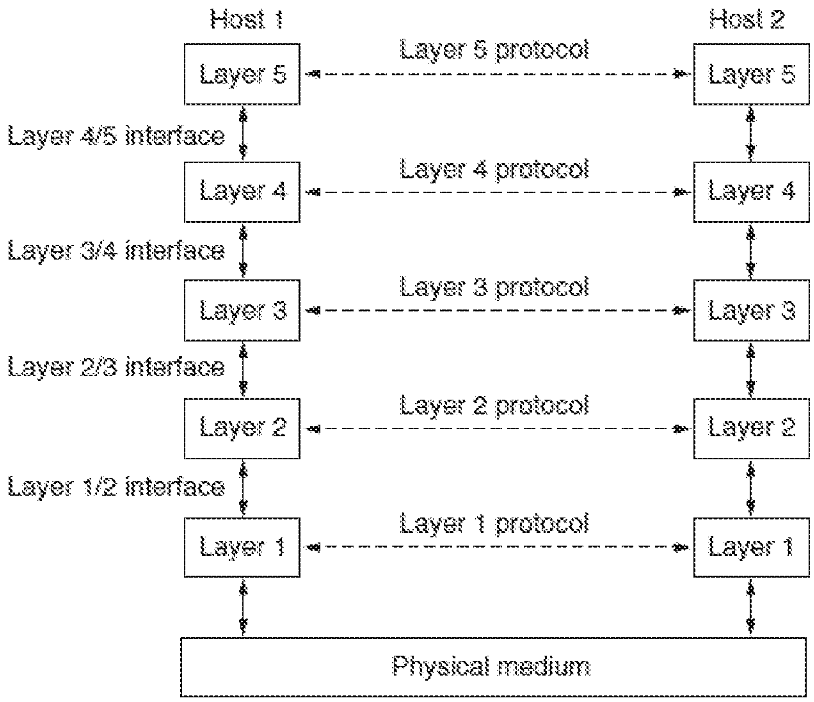
155. Even if it is were possible to move address information into the PLCP Preamble and have an operative system, such a modification would have been regarded as a "serious [design]

[18] Tanenbaum is well known for his computer science textbooks, which are regarded as standard texts in the field. His textbooks include: *Computer Networks*, co-authored with David J. Wetherall (1st ed. 1981, 2nd ed. 1988, 3rd ed. 1996, 4th ed. 2002, 5th ed. 2010); *Operating Systems: Design and Implementation*, co-authored with Albert Woodhull; *Modern Operating Systems*; *Distributed Operating Systems*; *Structured Computer Organization; Distributed Systems: Principles and Paradigms*, co-authored with Maarten van Steen. His books have appeared in over 175 editions and are used at universities around the world. *See*, en.wikipedia.org/wiki/Andrew_S._Tanenbaum.

blunder" by one of ordinary skill in the art. Tanenbaum, at 28 (quoted more extensively below). Understanding why such a modification would have been a serious blunder requires a more thorough understanding of the state of the network communication art at the time, which is set forth below.

a. The State of the Art of Layered Network Protocol Hierarchies in 1997

156. In order to reduce design complexity and improve interoperability, by 1997 most networks were organized as a series of layers or levels, each one built upon the one below. Tanenbaum, at 17. The purpose of each layer is to offer certain services to the higher layers, shielding those layers from the details of how the offered services are actually implemented. *Id.* Each layer is like a virtual machine, offering services to the layer above it. *Id.* The fundamental idea is that a particular piece of software (or hardware) provides a service to its users but keeps the details of its internal state and algorithms hidden from them. *Id.* For illustration purposes, a generic five-layer protocol hierarchy is shown below. Virtual communication is shown by dotted lines and physical communication by solid lines:



157. Layer n on one machine (Host 1) carries on a virtual conversation with layer n on another machine (Host 2). The rules and conventions used in this conversation are collectively known as the layer n protocol. Basically, a protocol is an agreement between the communicating parties on how communication is to proceed. Violating the protocol would make communication more difficult, if not impossible. In reality, no data are directly transferred from layer n on one machine to layer n on another machine. Instead, each layer passes data and control information to the layer below it, until the lowest layer is reached.

158. Layer interfaces are used to pass information between adjacent layers. As Andrew S. Tanenbaum wrote just a year before the priority date explained, it is important for each layer interface to be "clean," such that a change can be affected in some layer without the layers above it and below it even noticing:

> Between each pair of adjacent layers there is an **interface**. The interface defines which primitive operations and services the lower layer offers to the upper one. When network designers decide how many layers to include in a network and what each one should do, one of the most important considerations is defining

> clean interfaces between the layers. Doing so, in turn, requires that each layer perform a specific collection of well-understood functions. In addition to minimizing the amount of information that must be passed between layers, clean-cut interfaces also make it simpler to replace the implementation of one layer with a completely different implementation (e.g., all the telephone lines are replaced by satellite channels), because all that is required of the new implementation is that it offers exactly the same set of services to its upstairs neighbor as the old implementation did.

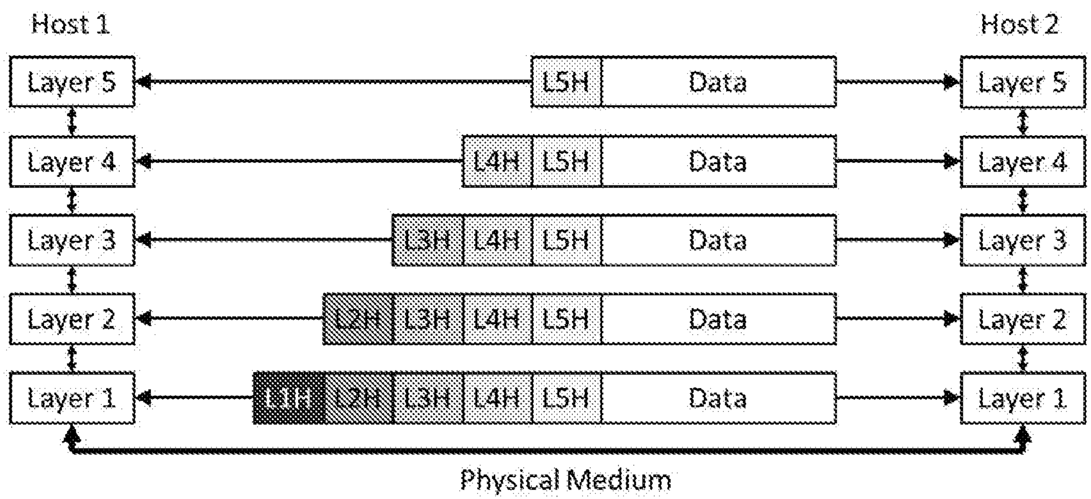
Tanenbaum, at 18.

159. Thus, an aspect central to layered architectures is the design constraint requiring layer independence, which permits a change in some layer without the layers above and below it even noticing. Layer independence results in the decoupling of "services" and "protocols." Significantly, any violation of such decoupling was regarded as a "serious blunder" by network designers at the time. As Tanenbaum (writing a year before the priority date) explained:

> Services and protocols are distinct concepts, although they are frequently confused. This distinction is so important, however, that we emphasize it again here. A *service* is a set of primitives (operations) that a layer provides to the layer above it. The service defines what operations the layer is prepared to perform on behalf of it users, but it says nothing at all about how these operations are implemented. A service relates to an interface between two layers, with the lower layer being the service provider and the upper layer being the service user.
>
> A *protocol*, in contrast, is a set of rules governing the format and meaning of the frames, packets, or messages that are exchanged by the peer entities within a layer. Entities use protocols in order to implement their service definitions. They are free to change their protocols at will, provided they do not change the service visible to their users. In this way, the service and the protocol are completely decoupled.
>
> * * *
>
> Many older protocols did not distinguish the service from the protocol. In effect, a typical layer might have had a service primitive SEND PACKET with the user providing a pointer to a fully assembled packet. This arrangement meant that all changes to the protocol were immediately visible to the users. Most network designers now regard such a design as a serious blunder.

Tanenbaum, at 27-28.

160. Finally, layered protocol hierarchies typically used data encapsulation to logically separate (or abstract) functions in each network layer. During encapsulation, each layer adds a header containing control information to the information from the layer above. Below is a diagram showing such encapsulation for the generic five-layer protocol hierarchy (discussed above). The header for each layer n is denoted "LnH":



b. The State of the Art of the OSI Model in 1997

161. The OSI model was a well-known seven-layer hierarchical networking framework developed in the late 1970s and early 1980s. As was the case with protocol hierarchies in general, in the OSI model, each layer is logically separated from higher and lower layers with clean, well-defined interfaces, only exchanging messages within a layer, and providing services to the next higher layer. A diagram of the seven-layer OSI model is shown below:

Application	Layer 7
Presentation	Layer 6
Session	Layer 5
Transport	Layer 4
Network	Layer 3
Data Link	Layer 2
Physical	Layer 1

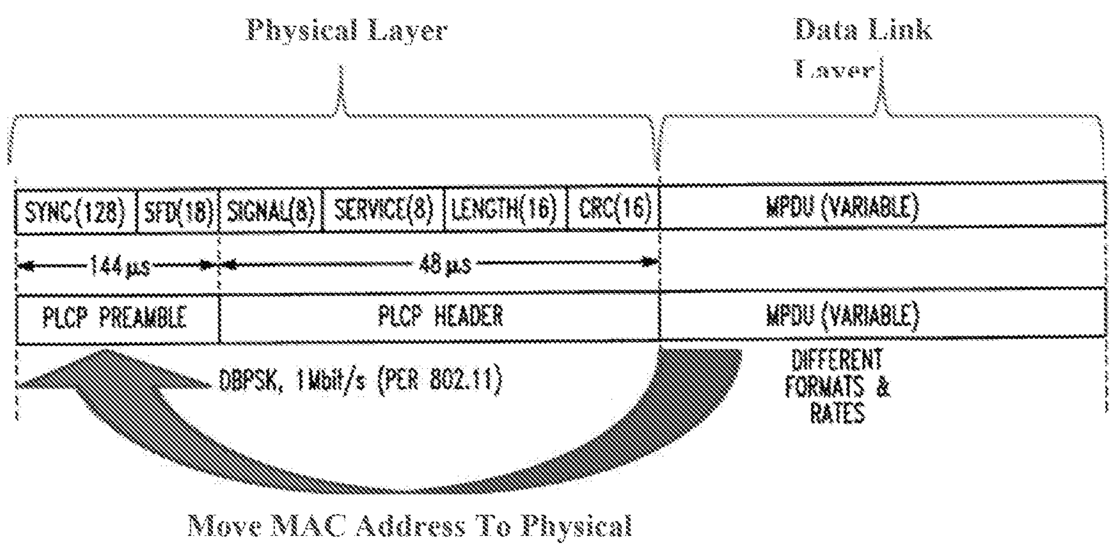
162. In the OSI model, each layer has different and distinct network responsibilities. The first two layers (i.e., the physical layer and the data link layer) are pertinent to the Office's rejection of claim 21, and are discussed in more detail below. The task of the physical layer [layer 1] is to transmit "raw bits over a communication channel." Tanenbaum, at 29. Typical issues dealt with by the physical layer include:

- how many volts should be used to represent a 1 and how many for a 0,
- how many microseconds a bit lasts,
- whether transmission may proceed simultaneously in both directions,
- how the initial connection is established and how it is torn down …,
- how many pins the network connector has and what each pin is used for.

Tanenbaum, at 30. The datalink layer (Layer 2) includes two sublayers: the MAC sublayer which is closest to the physical layer, and the logical link control layer which is positioned between the MAC sublayer and the network layer (Layer 3). The primary responsibility of the MAC sublayer is to define a device address, called a MAC address, unique to each individual network interface. Thus, in the OSI model, device addressing occurs at the data link layer rather than at the physical layer.

c. **Moving Address Information from the Data Link Layer (Where It Resides in Snell and Boer) to the Physical Layer**

163. As mentioned above (*see* ¶ 148), in both Snell and Boer the address information is included in a header in the MAC sublayer of the data link layer. This arrangement fails to meet the limitations of claim 21 because, the PLCP header and PLCP preamble (which the Office has mapped to the claimed "first information [in the first message] modulated according to a first modulation method") do not have the "first message address data" recited in claim 21. Recognizing this deficiency, the Office Action proposes that it would have been obvious to move the address information in Snell and Boer from the data link layer to the PLCP Preamble (in the physical layer), as shown diagrammatically below:



164. One of ordinary skill in the relevant art would not have implemented this proposed modification because the physical layer lacks functionality to know about MAC addresses, and if the MAC address does not go to the data link layer then that layer will not have the information it needs. More fundamentally, however, this proposed modification would amount to a merging of the physical and data link layers, and the coupling of services with protocols – a change that would have been regarded at the time as a "serious [design] blunder." Tanenbaum, at 28. The

disparagement of such a modification in the contemporaneous literature represents a classic teaching away.

165. The reason that Bremer arrived at his system is because he identified and solved a fundamentally different problem than faced in any of the cited references. *See* ¶¶ 94-99. As described in the '228 Patent, and in stark contrast to the combination proposed by the Office, Bremer was concerned with modems that communicated using different modulation types at the physical layer.[19] For example, Bremer envisioned a network where slaves that communicated at the physical layer using PSK could coexist in the same session with other slaves that communicated at the physical layer using QAM. '228 Patent, at 1:29-46, 2:1-23, 5:31-46. This stands in stark contrast to references like Snell and Boer, where all of the modems start off with the capability of communicating at the physical layer using the same modulation method, *e.g.*, BPSK. Far from the "serious design blunder" suggested by the Office Action, Bremer identified an elegant solution to a problem that was previously not even identified in the art.

d. Address Filtering with Snell/Boer and Its Implementation at the Data Link Layer

166. A person of ordinary skill would have understood that in Snell and Boer, the MAC portion of the packet contains device address information.[20] In keeping with the encapsulation

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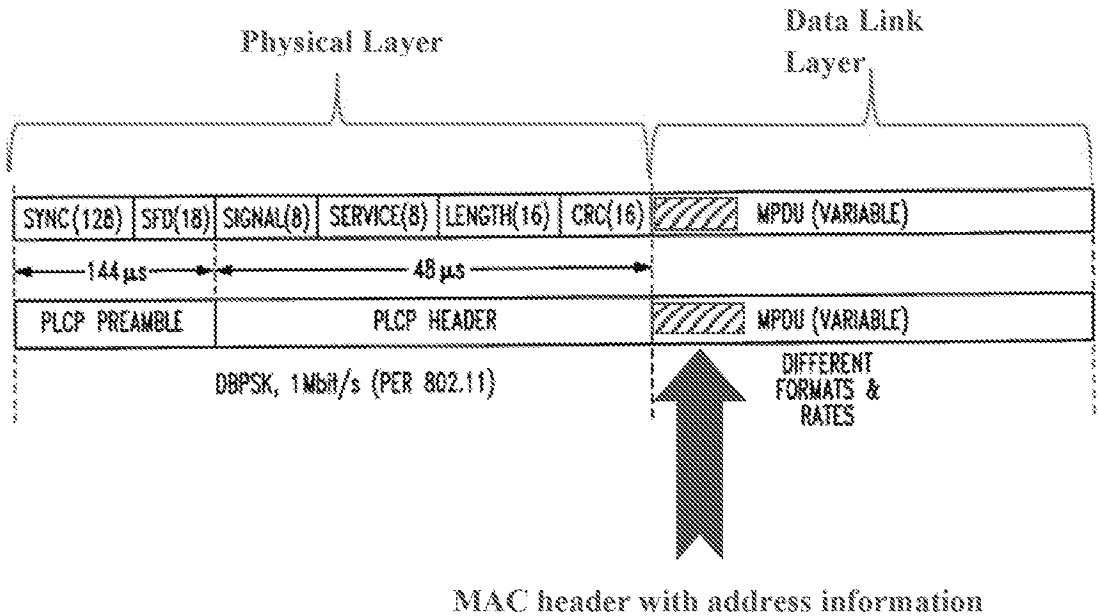
[19] *See* '228 Patent, Background, at 1:29-44 ("In existing data communications systems, a transmitter and receiver modem pair can successfully communicate only when the modems are compatible at the physical layer. … While the modems may be capable of using several different modulation methods, a single common modulation is negotiated at the beginning of a data session to be used throughout the duration of the session. Should it become necessary to change modulation methods, the existing data session is torn down, and a new session is negotiated using the new modulation method.").

[20] *See, e.g.*, Boer at col. 6, lines 28-31 ("The C-MST 132 determines if an incoming message is addressed to its own station, using a destination address included in data field 214."). At col. 3, lines 1-2, Boer defines "C-MST" as a "MAC control state machine."

scheme used in the OSI model, one of ordinary skill would have expected to find this address information in the header of the MAC sublayer in both Snell and Boer, as shown below.



167. If a person of ordinary skill had been motivated to implement the type of packet filtering suggested by the Office (*e.g.*, filtering packets which do not need to be demodulated),[21] a person of ordinary skill would have sought to implement this functionality at the data link layer in both Snell and Boer (rather than at the physical layer). Such an implementation would have permitted the filtering to occur after the address information was demodulated by the MAC sublayer, and could have been implemented without changing the functionality of the physical layer or violating any of the fundamental design tenants of the OSI model described above. Indeed, one need not even speculate about where (in the OSI stack) one of ordinary skill would have sought to implement such address filtering, because Boer et al. explains that it was in fact implemented

[21] *See* May 3 Office Action at, e.g., 9-10 ("Yamano expressly teaches that including a destination address in the preamble portion of the data packet, which precedes the data portion, will advantageously reduce processing requirements of receiving devices because the receiving device can filter out packets which it does not need to demodulate.")

at the MAC sublayer.[22] I observe that such an implementation does not meet claim 21 because, in that case, the PLCP header and PLCP preamble (which the Office has mapped to the claimed "first information [in the first message] modulated according to a first modulation method") would not have the "first message address data" required by claim 21.

e. The Cited References Would Not Have Enabled a POSITA to Make and Use the Invention

168. Moreover, the problems associated with moving address information into the preamble of Snell or Boer (*see* ¶¶ 153-167) are evidence that the prior art would not have enabled a POSITA to make and use the invention, which requires that "the first information … comprise[] the first message address data" that "is indicative of the one of the one or more slave transceivers being an intended destination of the second information."

3. Adding a Destination Address to the Preamble of Snell or Boer and Their Goal of Increasing the Data Rate

169. Based on my review of Snell and Boer, I note that both are silent regarding address information indicative of a destination slave transceiver for the second information.[23] The Office instead relies on Yamano as disclosing a destination address,[24] positing that "[i]t would have

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[22] *See, e.g.*, Boer at 6: 28-37 ("The C-MST 132 determines if an incoming message is addressed to its own station, using a destination address included in the data field 214 of the message 200. If the address matches … then assuming there is no error, the C-MST forwards the data field 214 for further processing in the station."). If the address did not match, the packet would not be processed further.

[23] *See* Boer and Snell *passim*. *See also* May 3 Office Action at 9 ("APA in view of Boer did not teach as pertains to claim 21 "The master communication device as in claim 1, wherein the first information that is included in the first message comprises the first message address data.""), 17 ("Snell does not expressly disclose the first message comprises first message address information that is indicative of the one of the one or more slave transceivers being an intended destination of the second information."), 39, and 64.

[24] May 3 Office Action at 9-10 (citing Yamano at Fig. 8, 19:63-64, 20:1-7, 20:54-59), 39-40 (citing Yamano at Fig. 8, 19:63-64, 20:1-7, 20:54-59), and 17-19. At the cited portions, Yamano discloses that its packet is in the preamble, *i.e.*, a packet 700 having a preamble 701 that "can

been obvious … to use Yamano's teaching of including a destination address in the preamble portion of a data packet in implementing" the Snell/Boer data packet "to advantageously specify which receiver the data is intended for and to beneficially reduce the processing requirements at the receiving device, as taught by Yamano." May 3 Office Action at 10 and 18-19 (citing Yamano at 20:54-59). *See also id.* at 30, 40, 51.

170. I respectfully disagree. The goal of both Snell and Boer is to increase the data rate at which information is communicated.[25] However, the preambles of both Snell and Boer are transmitted at the lowest (i.e., 1 Mbit/s) data rate.[26] Therefore, adding a destination address to the preambles of Snell and Boer would increase the amount of information transmitted at the lowest data rate, frustrating their common goal of increasing the data rate. For at least this

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include information which identifies … packet source and destination addresses." Yamano at 20:1-7. *See also id.* at 20:54-59 (disclosing that, "[w]hen the preamble in a burst-mode packet includes the destination address of the packet, the receiver circuits can monitor the destination address of the packet, and in response, filter packets which do not need to be demodulated, thereby reducing the processing requirements of the receiver circuits."), Fig. 8.

[25] *See, e.g.,* Boer at 1:16-29 (". . . there is being produced IEEE standard 802.11 . . . This standard specifies two possible data rates for data transmission, namely 1 Mbps (Megabit per second) and 2 Mbps. . . . However, it may be advantageous to provide systems operating at higher data rates . . . It is an object of the present invention to provide a method operating a wireless local area network station which enables communication between stations operation at different [i.e., higher] data rates." (parenthetical added)); and Snell at 2:24-25 ("permitting operation at higher data rates than conventional transceivers"), 2:28-29 ("permit operation at higher data rates"); 5:30-34 ("The present invention provides an extension of the PRISM 1 product from 1 Mbit/s BPSK and 2 Mbit/s QPSK to 5.5 Mbit/s BPSK and 11 Mbit/s QPSK" and "allows the same RF circuits to be used for higher data rates."), 7:10-14 ("increase the data rate").

[26] Boer at 3:56-59 ("With regard to the message 200, FIG. 4, it should be understood that the preamble 216 and header 218 are always transmitted at the 1 Mbps rate using DBPSK modulation.") and *Snell* at 6:64-66 ("The PLCP preamble and PLCP header are always at 1 Mbit/s, Diff encoded, scrambled and spread with an 11 chip barker. SYNC and SFD are internally generated."). *See also id.* at Fig. 3, 6:51-59, 7:10-14.

reason, it would not have been obvious to one of ordinary skill in the relevant art to combine Yamano's teaching of a destination address in a preamble with Snell or Boer.

4. Combining Boer with APA and Yamano or Snell with Yamano and Kamerman and Their Goal of Remaining Compliant with IEEE 802.11

171. As explained above, the disclosures of both Snell and Boer relate to an extension of the proposed IEEE 802.11 standard.[27] Significantly, while Snell and Boer may have been privy to the proposed standard through the involvement of their employers (Harris and Lucent) on the standard committee, there is no evidence that the proposed standard itself was publicly known at that time. In fact, the Office has already found that, as of the priority date of the '228 patent, the draft IEEE 802.11 standard was not available to anyone outside the IEEE 802.11 Working Group:

> Notably absent ... from the Petition and Mr. O'Hara's declaration are any assertions or evidence in support of the availability of Draft Standard to the public interested in the art. We do not find sufficient argument or evidence to indicate that the July 8–12 meeting of the 802.11 Working Group (or any other 802.11 Working Group meeting) was advertised or otherwise announced to the public. Nor do we find sufficient argument or evidence that any individual who was interested in the art would have known about Draft Standard such that he or she would have known to request a copy or ask to be added to an email list for access to the document.

[27] *See, e.g.*, Boer at 1:16-25 (". . . there is being produced IEEE standard 802.11 . . . This standard specifies two possible data rates for data transmission, namely 1 Mbps (Megabit per second) and 2 Mbps. . . . However, it may be advantageous to provide systems operating at higher data rates . . . It is an object of the present invention to provide a method operating a wireless local area network station which enables communication between stations operation at different data rates."); and Snell at 1:47-50 (describing "a set of integrated circuits for a WLAN under the mark PRISM 1 which is compatible with the proposed IEEE 802.11 standard"); Snell at 5:30-32 (disclosing "an extension of the PRISM 1 product from 1 Mbit/s BPSK and 2 Mbit/s QPSK to 5.5 Mbit/s BPSK and 11 Mbit/s QPSK"); and Snell at 4:42-43, 5:30-32 (describing "a wireless transceiver 30" that "may be readily used for WLAN applications in the 2.4 GHz ISM band in accordance with the proposed IEEE 802.11 standard.").

Samsung Electronics Co. LTD v. Rembrandt Wireless Technologies, LP, IPR2014-00889, Paper No. 8 at 7-10 (PTAB December 10, 2014).[28]

172. In view of the above, it is clear that the Office's assertion that the draft IEEE 802.11 standard was "available at that time"[29] (May 3 Office Action at 25, 46) is not correct. Moreover, it is my understanding that the question of the lack of public availability of the draft standard has already been decided by the Office, and cannot be revisited in these reexamination proceedings.

173. Without access to the proposed IEEE 802.11 standard, one of ordinary skill reading Snell or Boer would have known only that the proposed standard used a collision avoidance protocol (like CSMA), as that is the only protocol disclosed in Snell and Boer. Boer at 4:25-40 ("Referring to FIG. 1, it should be understood that the LAN 10 operates on a CSMA/CA (carrier sense multiple access with collision avoidance) protocol."); Snell at 5:23-29. Such a conclusion would have been buttressed by Kamerman, which similarly described the proposed standard only in the context of a CSMA/CA (carrier sense multiple access with collision avoidance) protocol. Kamerman at 006, 008, 012.

174. I observe that, despite the indications in Boer tying the proposed IEEE 802.11 standard to a collision avoidance protocol, it is the Office's position that, prior to combining Boer and Yamano, Boer would have been converted to a master/slave system (although it is not clear how

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[28] *See also Samsung Electronics Co. LTD v. Rembrandt Wireless Technologies, LP*, IPR2014-00514, Paper No. 18 at 7-8 (PTAB September 9, 2014); *Samsung Electronics Co. LTD. v. Rembrandt Wireless Technologies, LP*, IPR2014-00515, Paper No. 18 at 6-10 (PTAB September 9, 2014); *Samsung Electronics Co. LTD v. Rembrandt Wireless Technologies, LP*, IPR2014-00890, Paper No. 8 at 7-10 (PTAB December 10, 2014); *Samsung Electronics Co. LTD v. Rembrandt Wireless Technologies, LP*, IPR2014-00891, Paper No. 8 at 8-12 (PTAB December 10, 2014).

[29] "Snell and Kamerman are in the same field of art, with both relating to communications between transceivers that use BPSK and QPSK modulation methods to transfer data at different rates according to the draft IEEE 802.11 standard available at that time." May 3 Office Action at 25, 46.

that would be done). Assuming that were done, there would be no reasonable expectation that the Boer transceiver adapted to a master/slave system and combined with Yamano would function in accordance with the draft IEEE 802.11 standard, particularly when Boer discussed the proposed standard only in connection with collision avoidance protocols associated with peer-to-peer systems.

175. Similarly, despite the indications in both Snell and Kamerman tying the proposed IEEE 802.11 standard to a collision avoidance protocol, it is the Office's position that, prior to combining Snell and Kamerman, Snell would have been converted to a master/slave system (although, again, it is not clear how that would be done). Assuming that were done, there would be no reasonable expectation that the Snell transceiver adapted to a master/slave system would function in accordance with the draft IEEE 802.11 standard, particularly when both Snell and Kamerman discussed the proposed standard only in connection with collision avoidance protocols associated with peer-to-peer systems.

176. In other words, it would not have been obvious to combine Boer with Yamano or Snell with Yamano and Kamerman after adapting Snell and Boer to a master/slave system because there is no evidence that Snell or Boer would remain compliant with the draft IEEE 802.11 standard. That would have discouraged the skilled artisan from making the suggested combination, as one of the intended purposes of Snell and Boer was to maintain compatibility with the proposed IEEE 802.11 standard. *See* Boer at 1:16-25; Snell at 1:47-50 ("PRISM 1 … is compatible with the proposed IEEE 802.11 standard"), 4:42-46 (a wireless transceiver 30 used "in accordance with the proposed IEEE 802.11 standard"), 5:30-32 ("[t]he present invention provides an extension of the PRISM 1 product"). Without access to any teachings of the proposed IEEE 802.11 standard, one of ordinary skill in the art would not have any reasonable

expectation that the Snell/Boer transceiver would still act in accordance with the proposed IEEE 802.11 standard if it were modified to act in a master/slave relationship instead of a peer-to-peer relationship, such as a carrier sense multiple access with collision avoidance (CSMA/CA) relationship, and further modified in view of Yamano.

177. Accordingly, one of ordinary skill in the relevant art would have been discouraged from modifying the Snell/Boer transceiver as suggested by the Office without a reasonable expectation that it would function as intended, *i.e.*, in accordance with the proposed IEEE 802.11 standard. Thus, it would not have been obvious to modify the Snell/Boer transceiver to act in the role of the master according to a master/slave relationship and then combine Boer as modified with Yamano or Snell as modified with Yamano and Kamerman.

178. Similarly, given that peer-to-peer communication systems, such as that described in Snell and Boer, are fundamentally different than master/slave systems (see ¶¶ 94-99), one of ordinary skill in the art would have been further discouraged from making the proposed modifications of Snell and Boer as that fundamental difference would have weighed against having any reasonable expectation that Boer or Snell, as modified, would still act in accordance with the proposed IEEE 802.11 standard or would have provided predictable results.

179. Thus, even if Snell and Boer were adapted to a master/slave system as the Office suggests (in spite of no motivation to do so), there is no evidence they could have been combined with Yamano and/or Kamerman and still conform to the draft IEEE 802.11 standard. In fact, the skilled artisan would have been discouraged from making such adaptations followed by the proposed combinations due to the potential loss of compliance with the standard (as well as the potential inoperability, removal of error detection functionality, frustration of goal of increasing data rate, and the suggestion that doing so would be a "serious design blunder").

XI. Rejection A (Boer in view of Yamano)

180. The Office has rejected claim 21 of the '228 Patent as allegedly unpatentable over Boer in view of Yamano (Rejection A). May 3 Office Action at 8-10. In this rejection, the Office rejected claim 1 "for the reasons indicated in the Final Written Decision entered on September 24, 2105 [*sic*] (IPR2014-00892, Paper 46) as obvious over APA and Boer," May 3 Office Action at 8, and then asserted that "[i]t would have been obvious … to use Yamano's teaching of including a destination address in the preamble portion of a data packet in implementing the modified Boer APA data packet." *Id.* at 10.

181. Based on my reviews of the references cited to support Rejection A, I conclude that Rejection A is improper for the reasons I set forth above in ¶¶ 124-179. That is, Rejection A is improper because it would not have been obvious to (1) adapt Boer to a master/slave system (¶¶ 127-145), or (2) move destination address data to the preamble of Boer (¶¶ 146-179). Rejection A is additionally improper because (1) the Office relies improperly on portions of the '228 Patent as disclosing the claimed "master/slave relationship," and (2) the cited references do not disclose and would not have suggested the claimed "the second modulation method [that is] of a different type than the first modulation method."

A. The Claimed Master/Slave Relationship

182. In Rejection A, the Office relies on the PTAB's reasoning in the Final Written Decision in the '892 IPR, which is based on Figures 1 and 2 and col. 3:64-5:7 of the '228 Patent being Admitted Prior Art. '892 Final Decision at 13-14.[30] In particular, the PTAB relies on the APA "for teaching of master/slave communications systems." *Id.* at 16. However, I observe that a number of the relied-on portions of the '228 Patent clearly do not qualify as admitted prior art.

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[30] In the '892 IPR, the PTAB did not have the benefit of the Bremer Declaration (and it supporting evidence) when making its determination regarding the alleged APA.

For example, the relied-on portions of the '228 Patent include descriptions of Fig. 8, which illustrate an embodiment of the invention. In addition, I understand that the relied-on portions of the '228 Patent are not the work of another but rather that of Gordon Bremer. Moreover, based on my review of the sections relied on by the Office, the APA should not negate patentability because a number of those sections represent the inventor's own foundational work product, from which he identified both a problem and a solution to that problem. The other references in Rejection A (*i.e.*, Boer and Yamano) do not disclose and would not have suggested the claimed master/slave relationship. *See* Boer at 4:25-27 ("it should be understood that the LAN 10 operates on a CSMA/CA (carrier sense multiple access with collision avoidance) protocol"); Yamano at 19:21-53 ("the transmitter circuits … can transmit packets whenever necessary," which "may introduce collisions between packet information sent by the transmitter circuits"). Therefore, I conclude that Rejection A is improper.

B. The Claimed Different Types of Modulation Methods

183. Claim 21 requires that "the second modulation method be[] of a different type than the first modulation method." Rejection A is improper because it adopts the reasoning of the PTAB in the Final Written Decision in the '892 IPR, which incorrectly interpreted "different type[s]" of modulation methods as "modulation methods that are incompatible with one another." '892 Final Decision at 13. Based on this incorrect interpretation, the PTAB found the DBPSK and either the DQPSK or the PPM/DQPSK of Boer correspond to the claimed "different type[s]" of modulation methods. *Id.* at 19.

184. As explained above (¶ 40), and confirmed by the Federal Circuit, the proper construction of "different types of modulation methods" is "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." *Rembrandt Wireless Tech. v. Samsung Elec. Co.*, Docket No. 2016-1729, slip op. at 7 (Fed. Cir.

April 17, 2017). *See also* ¶ 40 (discussing the broadest reasonable interpretation of the claims). Under the proper construction, the DBPSK and either the DQPSK or the PPM/DQPSK of Boer do not correspond to the claimed "different type[s]" of modulation methods as DBPSK, DQPSK, and PPM/DQPSK are all in the same PSK family. As such, even if the alleged APA, Boer, and Yamano were combined in the proposed manner, the combination would not include the claimed "different type[s]" of modulation methods.

185. Further, even under the PTAB's overly broad claim construction in which it defines "different type[s]" of modulation methods to mean "modulation methods that are incompatible with one another," '892 Final Decision at 13, Rejection A fails because Boer does not disclose and would not have suggested any incompatibility problem. The Office does not define the term "incompatible," but, in the context of the '228 Patent, first and second modulation methods may be incompatible when, for example, one modem using the first method cannot communicate with a second modem using the second method, *i.e.*, when no common modulation method is shared. *See* '228 Patent at 1:47-67. Importantly, whether two modulation methods are incompatible, as used in the '228 Patent, cannot be considered in a vacuum but must be considered in the context in which term or phrase is used. In the case of Boer, there is no issue of incompatible modulation methods because Boer relates to a peer-to-peer communication system and lacks an incompatibility problem. *See* Boer at 4:25-27 ("it should be understood that the LAN 10 operates on a CSMA/CA (carrier sense multiple access with collision avoidance) protocol"). Accordingly, the DBPSK and either the DQPSK or the PPM/DQPSK of Boer are not incompatible with one another.

XII. Rejections B (Snell in view of Yamano and Kamerman) and C (Snell in view of Harris 4064.4, Harris AN9614, Yamano, and Kamerman)

186. The Office has rejected claim 21 of the '228 Patent, *inter alia*, as allegedly unpatentable over Snell in view of Yamano and Kamerman (Rejection B) and allegedly unpatentable over Snell in view of Harris 4064.4, Harris AN9614, Yamano, and Kamerman (Rejection C). I have reviewed the references supporting Rejections B and C and conclude the rejections are improper for the reasons set forth above in ¶¶ 124-179. That is, Rejections B and C are improper because it would not have been obvious to (1) adapt Snell to a master/slave system (¶¶ 127-145), or (2) move destination address data to the preamble of Snell (¶¶ 146-179). Rejections B and C are also improper because the cited references do not disclose and would not have suggested any of the following three claim limitations: (1) the "master/slave relationship," (2) "the second modulation method [that is] of a different type than the first modulation method," and (3) the "first message" and "second message."

A. The Claimed Master/Slave Relationship

187. Claim 21 requires "[a] master communication device configured to communicate with one or more slave transceivers according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device." To support Rejections B and C, which are based on Snell, Yamano, Kamerman, and the Harris Documents,[31] to address the master/slave relationship requirement, the Office posited:

> Snell discloses a master communication device (transceiver 30) that serves as an access point for communicating data with other transceivers connected to a wireless local area network (WLAN) and is configured to communicate with one

[31] I note that, with respect to Rejection B, the Office relies on the Harris Documents as incorporated by reference into Snell. May 3 Office Action at 10. With respect to Rejection C, the Office relies (additionally or alternatively) on the Harris Documents as "independent references from Snell." *Id.* at 33.

or more slave transceivers (end users connect to LAN through transceivers) according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device. *See, e.g.*, Snell at 1:34-46, 1:47-50, 1:55-57, 2:27-30, 4:42-47, 5:18-21; Harris AN9614 at 3.

...

With respect to the '<u>slave communication from a slave device to the master communication device occurring in response to a master communication from the master communication device to the slave device</u>', Snell teaches the master (access point transceiver) communicates with slave transceivers on the WLAN via **polled protocol**. A **polled protocol** is a master/slave protocol as confirmed by the '228 patent, '228 patent at 4:30-34 where the slave is given permission to transmit on the network.

Snell incorporates by reference Harris AN96145 [], which discloses that the communications between transceivers can operate according to a polled (i.e., master/slave) protocol, which is a master/slave communication system.[6 [or 11]] *See e.g.*, Harris AN9614 at 3.

[Footnotes 6 and 11:] A polled protocol is a master/slave protocol, as confirmed by the '228 patent. '228 patent at 4:30-34. *See also* IPR2014-00892, Pap. 46 at 16 ("In [a polling] protocol, a centrally assigned master periodically sends a polling message to slave nodes, giving them explicit permission to transmit on the network."); '228 Prosecution History at 352; IPR2014-00892, Ex. 1323 (Goodman Declaration) Para124.

May 3 Office Action at 11-12, 30-31 (emphasis in original). In addition, to support Rejection C, the Office posits:

One of ordinary skill in the art would have additionally been motivated and found it obvious and straightforward to use Harris AN9614's teaching of a polled (master/slave) protocol in implementing the communication system taught by Snell (in light of Harris 4064.4). Harris AN9614 is incorporated by reference into Snell (Snell at 5:2-7), both references are directed to the PRISM chipset and HSP 3824 baseband processor (Harris AN9614 at 1, 2; Snell at 1:47-63, 5:8-17, 5:31-33), and Harris AN9614 is a publication of Harris Corporation, the same original assignee of Snell. Moreover, AN9614 expressly teaches that it is beneficial to use a polled (master/slave) protocol because "the average power consumption of the radio can be reduced by more than an order of magnitude while meeting all data transfer objectives." Harris AN9614 at 3.

Polling (master/slave) enables this reduction in power consumption because "the system can be set at its sleep mode most of the time to achieve low

> power consumption. It only needs to operate at full power consumption during the transmission of a packet or during the expected window for received packets." Harris AN9614 at 3. In addition to Snell's express suggestion to apply Harris AN9614's disclosures, one of ordinary skill in the art would have been motivated to use Harris AN9614's teaching of a polled (master/slave) protocol in implementing Snell's communication system (implemented in light of Harris 4064.4, *see supra)* because a polled (master/slave) communication system advantageously provides a simple protocol that has good determinacy *(e.g.*, a reduction in collisions). It would have been routine for one of ordinary skill in the art to use a polled (master/slave) protocol in implementing Snell's communication system (as implemented in light of Harris 4064.4), as master/slave communication systems were common and well-known in the art (*see* '228 patent at 3: 64- 5:7), and thus implementing a polled (master/slave) protocol in Snell's transceiver (which serves as an access point to support communications with multiple other transceivers - Snell at 1:34-46) would involve nothing more than using common and known techniques to improve a similar system in the same way to yield predictable results. *KSR*, 550 U.S. at 416. One of ordinary skill in the art would have thus recognized that this combination (yielding the claimed limitation) would have worked as expected. For these reasons, one of ordinary skill in the art would have been motivated and found it obvious and straightforward to implement a polled (master/slave) protocol in implementing Snell's system (as implemented in light of Harris 4064.4).

May 3 Office Action at 33-34.

188. Based on my review of the references relied on to support Rejections B and C, I conclude that they cannot stand, at least because they rely on the "polled scheme" discussion on page 3 of Harris AN9614 as being incorporated by reference into Snell, May 3 Office Action at 10, 31, and Rejection C relies (additionally or alternatively) on Harris AN9614 as an "independent reference[] from Snell." *Id.* at 33. As an initial matter, I understand that Snell did not successfully incorporate Harris AN9614 (or at least the "polled scheme" discussion on page 3). *See* ¶¶ 71-77, 109-115. In addition, for the reasons I set forth above in ¶¶ 103, 106, 110-115, neither Snell nor Harris AN9614 discloses or would have suggested the claimed master/slave relationship (or even mentions the words "master" or "slave"). Read in context, Harris AN9614 discloses its "polled scheme" in the context of peer-to-peer communications (which is the topic being discussed in Snell and Harris AN9614), not master/slave communications. For this reason

alone, only with hindsight would one of ordinary skill in the relevant art have surmised the polled scheme of Harris AN9614 as being used in any context other than peer-to-peer communications.

B. The Claimed Different Types of Modulation Methods

189. Claim 21 requires that "the second modulation method be[] of a different type than the first modulation method." As explained above, and confirmed by the Federal Circuit, the proper construction of "different types of modulation methods" is "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." *Rembrandt Wireless Tech. v. Samsung Elec. Co.*, Docket No. 2016-1729, slip op. at 7 (Fed. Cir. April 17, 2017). *See also* ¶ 20 (discussing the broadest reasonable interpretation of the claims).

190. In the Office's Rejections B and C, the Office posits that the "different type" limitation is met by the two PSK formats disclosed, namely the BPSK and QPSK formats of Snell, the DBPSK and DQPSK formats of Snell, or the DBPSK and DQPSK formats of Harris 4064.4. *See* May 3 Office Action at 20 ("Snell discloses … a 'first modulation method' (*e.g.*, BPSK) and a 'second modulation method' (*e.g.*, QPSK) that is 'of a different type than the first modulation method.'"), 22 ("Snell .. alternatively describes that the 'first modulation method' may be differential BPSK ('DBPSK') and that the 'second modulation method' may be differential QPSK ('DQPSK'), which is also a different 'type' than the first modulation method."), 22-23 (quoting Harris 4064.4's disclosure of DBPSK and DQPSK). Based on my review of the cited references, I conclude that the Office's position is not correct under the proper construction of "different type," as there can be no dispute that BPSK and QPSK (and DBPSK and DQPSK) [32]

[32] With respect to DBPSK and DQPSK, the inclusion of "D" (Differential) does not change the family in which the modulation method falls. They remain in the same family.

are in the same PSK family. None of the cited references (*i.e.*, Yamano, Kamerman, Harris AN9614, and Harris 4064.4) cures this deficiency.

191. Further, even under the Office's overly broad claim construction in which it defines "different type[s]" of modulation method to mean "modulation methods that are incompatible with one another," May 3 Office Action at 6, the Office's rejection fails. None of the cited references (*i.e.*, Snell, Yamano, Kamerman, Harris AN9614, and Harris 4064.4) discloses or would have suggested any incompatibility problem. The Office does not define the term "incompatible," but, in the context of the '228 Patent, first and second modulation methods may be incompatible when, for example, one modem using the first method cannot communicate with a second modem using the second method, *i.e.*, when no common modulation method is shared. *See* '228 Patent at 1:47-67. Importantly, whether two modulation methods are incompatible, as used in the '228 Patent, cannot be considered in a vacuum but must be considered in the context in which term or phrase is used. *See id.*

192. The lack of any incompatibility problem faced in the cited references explains why none of Snell, Yamano, Kamerman, Harris AN9614, and Harris 4064.4 discloses the invention claimed in the '228 Patent. That incompatibility problem was identified and solved in a master/slave setting, as described in the '228 Patent, and was specific to a master/slave setting when a master attempts to communicate with a slave using an incompatible modulation method. The peer-to-peer communications systems described in the cited references were not faced with that problem. Instead they were faced with different problems that resulted from the fundamentally different ways their peer-to-peer systems accessed the shared medium. Those "fundamentally different ways" involve peer-to-peer communications, such as CSMA and CDMA types, instead of those between a master and a slave. *See* ¶¶ 94-99, 119-120.

193. More specifically, the problems Snell, Yamano, Kamerman, and Harris 4064.4 were facing and attempting to address as the result of peer-to-peer communications, while at the same time attempting to increase date rates for communications between the stations, were, e.g., collisions, interference, and the like. *See, e.g.*, Snell at 1:64-2:19 (describing a problem with prior art DSSS), 2:22-30 (summarizing Snell's solution to the problem), 3:40-43 (discussing the need for a "clear channel"), 5:23-29 (identifying how "to avoid data collisions"), 5:54-59 (identifying how to "combat multi-path and reduce the effects of interference"); Yamano at 11:62-12:9 (explaining the interference problem), 19:21-36 (explaining how to address the collision problem using CSMA system); Kamerman at 6 (explaining how CSMA/CA "is designed to reduce the collision probability between multiple stations"), 11 (discussing the problem "due to mutilation of transmissions by interference").

194. For these reasons, even under the Office's overly broad claim construction, the cited references neither identify nor address incompatible modulation methods, as are addressed in the '228 Patent in a master/slave setting when attempting to allow a master to communicate using different, incompatible modulation methods. Thus, they do not disclose and would not have suggested the problem of incompatible modulation methods, let alone the claimed solution to that problem provided in the '228 Patent. Without recognition of the incompatibility problem created by incompatible modulation methods in a master/slave setting, one skilled in the art would not have turned to any of the peer-to-peer disclosures in the cited references to solve that problem.

C. The Claimed First and Second Messages

195. Claim 21 requires a master transceiver configured to transmit (1) "a first message" comprising "first information" and "second information" and (2) "a second message" comprising "third information" and "fourth information." Based on my review of the cited references, they

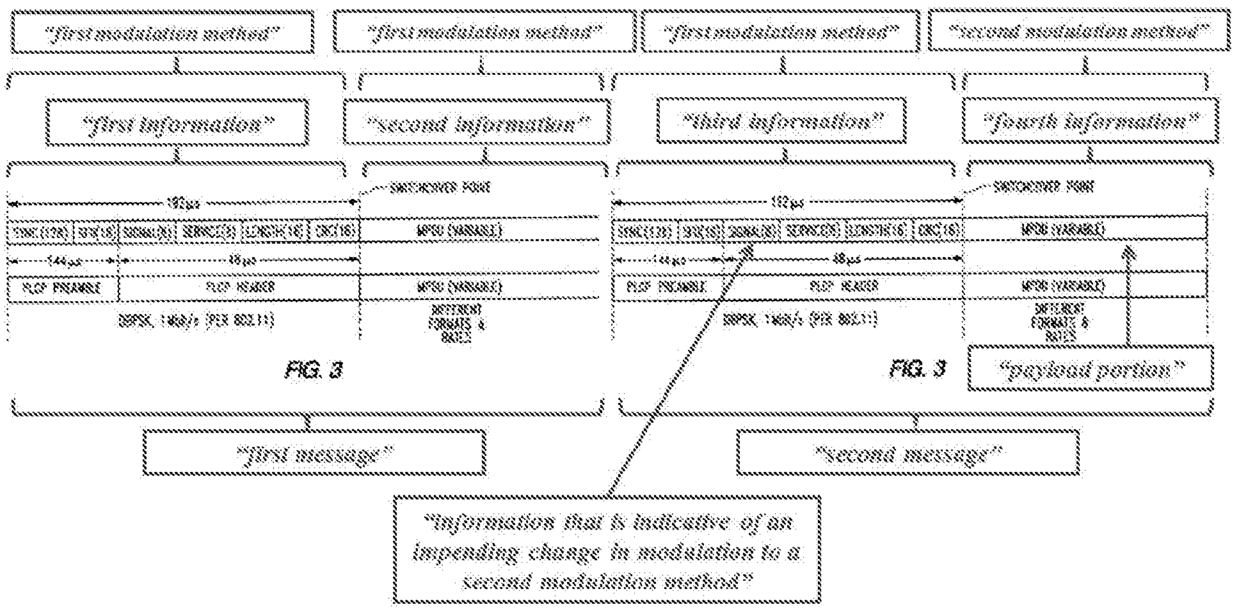
do not disclose and would not have suggested the claimed master transceiver configured to transmit the first and second messages.

196. At least one reason why Snell, Yamano, Kamerman, Harris AN9614, and Harris 4046.4 do not teach and would not have suggested the claimed invention is because of the "fundamentally different ways of accessing the shared medium," Upender at 46, and the very different problems/solutions presented due to those fundamental differences. *See* the discussion at ¶¶ 94-99, 137. In my opinion, only through a contrived application of disclosures in the prior art peer-to-peer communication systems is the Office able to arrive at the invention claimed in the '228 Patent, which includes a master transmitter configured to transmit the claimed "fourth information" intended for a slave transceiver and modulated according to the second modulation method that is incompatible with the modulation method used by other slave transceivers in the master/slave system.

197. I observe that, although Snell discloses a peer-to-peer communication system (¶¶ 94-95, 105-106), the Office posits:

> … Snell discloses that the transceiver transmits data packets to multiple different end user slave transceivers, as such multiple messages of format shown in figure 3 are provided to the slave transceivers and where the communication may switch on-the-fly between a 'first modulation method' (*e.g.*, BPSK) and a 'second modulation method' (*e.g.*, QPSK) that is 'of a different type than the first modulation method.' **Snell thus teaches transmitting a 'first message' and a 'second message' as shown in annotated Figure 3 below.** *See, e.g.*, Snell at 1:34-46, 1:47-50, 1:55-57, 2:27-30, 2:61-66, 7:1-2, 7:5-14, Fi s. [*sic*] 2, 3, 5; Harris AN9614 at 3; Harris 4064.4 at 14-16, Fig. 10.

May 3 Office Action at 20, 41 (emphasis in original). The "annotated" version of Fig. 3 is reproduced below:



198. In particular, the Office creates two instances of Fig. 3 of Snell and then uses hindsight to assign "0Ah" and "14h" to the SIGNAL fields of the PLCP header of the first and second instances of Fig. 3, respectively. *See* May 3 Office Action at 20-21, 41-42. The Office posits that the first and second instances of Fig. 3 correspond to the claimed "first message" and "second message," respectively. *Id.* The Office posits that the PLCP preamble and PLCP header (with SIGNAL field using 0Ah) of the first instance of Fig. 3 correspond to the claimed "first information," that the MPDU data of the first instance of Fig. 3 corresponds to the claimed "second information," that the PLCP preamble and PLCP header (with SIGNAL field using 14h) of the second instance of Fig. 3 correspond to the claimed "third information," and that the MPDU data of the second instance of Fig. 3 corresponds to the claimed "fourth information." *Id.*

199. However, based on my review of Snell, I conclude that Snell never teaches and would not have suggested the specific first and second instances of Fig. 3 (*i.e.*, a first instance having a code 0Ah in the SIGNAL field and a second instance having a code 14h in the SIGNAL field) relied upon by the Office. That is, nowhere does Snell explicitly or inherently teach two

different instances of Fig. 3—much less a first instance of Fig. 3 with an MPDU data field modulated using BPSK and an immediately subsequent second instance of Fig. 3 with an MPDU data field MPDU data field modulated using QPSK. Snell does not disclose and would not have suggested different versions of its Fig. 3 combined in the way the Office has attempted to combine them without using hindsight, *i.e.*, in view of the teachings of the '228 Patent.

200. Moreover, Snell discloses "switch[ing] on-the-fly between different data rates and/or formats," Snell at 2:29-30, but not in the manner claimed or for the reason behind the claim 21 of the '228 patent. More specifically, the ability of Snell's transceiver to "switch on-the-fly" is not a teaching of sending multiple messages in the signal format shown in Fig. 3 that switch from using a first modulation method for the MPDU data portion of a first message to using a second modulation method for the MPDU data portion of the second message, as the Office posits. *See* Snell at Fig. 3. To the contrary, the on-the-fly switching of Snell relates to a modulation switch between the PLCP header and the MPDU variable data portion within a single message having the format shown in Fig. 3. *See* Snell at Fig. 3 (clearly showing the "switchover point" to be between the PLCP header and the MPDU variable data portion *within* the illustrated signal format), 3:18-20 ("The carrier tracking loops permit switching to the desired format *after the header* and on-the-fly." (emphasis added)), 7:10-14 ("The variable data may be modulated and demodulated in different formats than the header portion to thereby increase the data rate, and while a switchover as indicated by the switchover point in FIG. 3, occurs on-the-fly."). Snell does not disclose and would not have suggested first and second messages each having the signal format shown in Fig. 3 and having MPDU data portions modulated using different methods. Snell certainly does not disclose and would not have suggested the specific first and second instances of Fig. 3 that the Office created using the claimed invention as a roadmap.

201. Accordingly, I conclude that Snell does not disclose and would not have suggested that Snell's transceiver is a master transceiver configured to transmit (1) "a first message" comprising "first information" and "second information" and (2) "a second message" comprising "third information" and "fourth information," as required by claim 21 of the '228 Patent.

202. Neither Yamano nor Kamerman discloses or would have suggested the claimed first and second messages including the claimed first through fourth information. Yamano is only applied for its disclosure of a destination address in an effort to provide the claimed first and second message address information, *see* May 3 Office Action at 17-19, 27-28, 30, 39-40, 49-51, so it will not be further discussed here.

203. As to Kamerman, the Office concludes that "[o]ne of ordinary skill in the art … would have been motivated and found it obvious and straight forward to use Kamerman's teaching of transmitting a first data packet where the data is modulated using a first modulation method and next transmitting a second data packet where the data is modulated using a second modulation method in implementing Snell's system for communicating data packets modulated according to different modulation methods … to advantageously maximize the data transfer rate and adapt to changing channel conditions (as also taught by Kamerman)." May 3 Office Action at 24, 46 (citing Kamerman at 6, 11-12).

204. Kamerman discloses a transmission rate that "falls back" during higher load conditions and that "goes up" during load conditions that occur "most of the time." Kamerman at 11. There is no teaching or suggestion that it would "fall back" to address an incompatibility issue when a master – which it does not have and would not have suggested – wants to communicate with a slave –which it does not have and would not have suggested. Further, Kamerman is completely silent about how the transceiver would indicate changes to the transmission rate.

205. Notably, maximizing the data transfer rate and adapting to changing channel conditions in a peer-to-peer communications system – an objective of Kamerman -- would not have provided the solution to the master/slave incompatibility problem identified and claimed in the '228 Patent, *i.e.*, it would not have provided "a master transceiver" configured to transmit (1) "a first message" comprising "first information" and "second information" and (2) "a second message" comprising "third information" and "fourth information," wherein "the third information comprises information that is indicative of an impending change in modulation to a second modulation method," as required by claim 21 of the '228 Patent.

206. Instead, if Snell were modified in the proposed manner (*i.e.*, implementing Kamerman's automatic rate selection in Snell's system), Snell's transceiver would increase the transmission rate during lower load periods (e.g., as indicated by "a number … of successive correctly acknowledged packet transmissions") and would decrease the transmission rate during higher load periods (e.g., as indicated by "unacknowledged packet transmissions"). *See* Kamerman at 11. Such modification would not have provided the claimed first and second messages with the claimed first through fourth information, as Kamerman's rationale as to when to change modulation methods has nothing to do with making a change in modulation method so that a master can communicate with a particular slave using a different modulation method to address a potential incompatibility issue. For that reason alone, one of ordinary skill would not have been motivated by Kamerman to vary the modulation method when needed to address the '228 Patent incompatibility problem as done in the '228 Patent, *i.e.*, to provide "a master transceiver" configured to transmit (1) "a first message" comprising "first information" and "second information" and (2) "a second message" comprising "third information" and "fourth information," wherein "the third information comprises information that is indicative of an

impending change in modulation to a second modulation method," as required by claim 21 of the '228 Patent.

XIII. Rejection D (Snell (including Harris AN9614) in view of Harris 4064.4, the alleged APA, Upender, Yamano, and Kamerman

207. I observe that the Office is relying on 7 references/documents to support its Rejection D of claim 21 of the '228 Patent, i.e., Snell (including Harris AN9614) in view of Harris 4064.4, the alleged APA, Upender, Yamano, and Kamerman. While I understand the use of multiple documents to support a rejection is permitted, in my opinion the Office has not identified what would have motivated the skilled artisan in the way the Office has done through the use of hindsight. May 3 Office Action at 51-76.

208. Based on my review of the references relied on to support Rejection D, I conclude it is improper for the reasons set forth above in ¶¶ 124-179. That is, I conclude Rejection D is improper because it would not have been obvious to (1) adapt Snell to a master/slave system (¶¶ 127-145), or (2) move destination address data to the preamble of Snell (¶¶ 146-179). Rejection D is also improper because (1) the Office relies improperly on portions of Harris AN9614 and the '228 Patent as disclosing the claimed "master/slave relationship" and (2) the cited references do not disclose and would not have suggested the claimed "the second modulation method [that is] of a different type than the first modulation method."

A. The Claimed Master/Slave Relationship

209. I observe that, to support Rejection D, the Office relies on Snell and Harris AN9614 as disclosing the claimed "master/slave relationship." May 3 Office Action at 53-53 (citing Snell at 1:34-46, 1:47-50, 1:55-57, 2:27-30, 4:42-47, 5:18-21; Harris AN9614 at 3). For the reasons set forth above in ¶¶ 103, 106, 110-115, the cited portions of Snell and Harris AN9614 do not disclose and would not have suggested the claimed master/slave relationship. With respect to

Harris AN9614, I understand that (1) Harris AN9614 is not prior art and thus, legally, could not have been incorporated by reference, and I observe that (2) the portions of Harris AN9614 that Snell attempted to incorporate by reference have nothing to do with a master/slave relationship and are found on the first two pages of Harris AN9614, not the page relied on by the Office. *See* ¶¶ 71-75, 109. In addition, the claimed "master/slave relationship" is neither the same as nor inherent in the "polled scheme" of Harris AN9614. *See* ¶¶ 76-77, 110-115. Significantly, based on my review of Harris AN9614, it uses the polled scheme in the context of peer-to-peer communications (as opposed to master/slave communications). *See* ¶¶ 104, 188.

210. I further note that the Office additionally relies on the APA (*i.e.*, Figures 1 and 2 and col. 3:64-5:7 of the '228 Patent) as disclosing the claimed master/slave relationship. May 3 Office Action at 53-56. However, I understand that the relied-on portions of the '228 Patent do not qualify as admitted prior art. *See* ¶ 40.

211. The Office posits that, based on the teachings of Harris AN9614, the APA, and Upender, it would have been obvious to implement the communication system of Snell using a master/slave communication protocol. May 3 Office Action at 62-64. Based on my understanding of the law and my independent review of the references supporting the Office's position, I respectfully disagree at least for the following reasons: (1) There is not sufficient evidence that Harris AN9614 is prior art, (2) the relied-on portions of the '228 Patent do not qualify as Admitted Prior Art, (3) Upender would have discouraged one of ordinary skill from modifying Snell in the proposed manner (¶¶ 134-142), (4) the "polled scheme" disclosure in Harris AN9614 is limited to "single rate" applications as opposed to applications involving more than one modulation method (¶¶ 131-133), and (5) the peer-to-peer systems of Snell, Kamerman,

and Yamano are fundamentally different than a master/slave system and were not faced with the incompatibility problem solved by the '228 Patent (¶¶ 94-97, 129-130, 145).

B. The Claimed Different Types of Modulation Methods

212. Claim 21 requires that "the second modulation method be[] of a different type than the first modulation method." As explained above, and confirmed by the Federal Circuit, the proper construction of "different types of modulation methods" is "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." *Rembrandt Wireless Tech. v. Samsung Elec. Co.*, Docket No. 2016-1729, Slip op. at 6-9 (Fed. Cir. April 17, 2017). *See* ¶ 20 (discussing the broadest reasonable interpretation of the claims).

213. I note that, in the Office's Rejection D, the Office posits that the "different type" limitation is met by two PSK formats, namely the BPSK and QPSK formats of Snell, the DBPSK and DQPSK formats of Snell, or the DBPSK and DQPSK formats of Harris 4064.4. *See* May 3 Office Action at 67 ("Snell discloses … a 'first modulation method' (*e.g.*, BPSK) and a 'second modulation method' (*e.g.*, QPSK) that is 'of a different type than the first modulation method.'"), 69 ("Snell … alternatively describes that the 'first modulation method' may be differential BPSK ('DBPSK') and that the 'second modulation method' may be differential QPSK ('DQPSK'), which is also a different 'type' than the first modulation method."), 69-70 (quoting Harris 4064.4's disclosure of DBPSK and DQPSK). Based on my analysis of the claim language and my review of the references and documents relied on to support the Office's position, I conclude that the Office's position is not correct under the proper construction of "different type," as there can be no dispute that BPSK and QPSK (and DBPSK and DQPSK) are in the same PSK family.

214. Further, even under the Office's overly broad claim construction in which it defines "different type[s]" of modulation method to mean "modulation methods that are incompatible

with one another," May 3 Office Action at 6, the Office's rejection fails for the reasons set forth above in ¶¶ 191-194.

C. No First and Second Messages

215. Claim 21 requires a master transceiver configured to transmit (1) "a first message" comprising "first information" and "second information" and (2) "a second message" comprising "third information" and "fourth information." I observe that the Office again relies on a contrived application of the peer-to-peer communication systems of the cited references, which is shown in the "annotated" version of Fig. 3 of Snell. May 3 Office Action at 66-72. Based on my review of the references relied on to support Rejection D, I conclude the cited references do not disclose and would not have suggested the claimed master transceiver configured to transmit the first and second messages. *See* ¶¶ 195-206 above. For instance, based on my review of Snell, I conclude that Snell never teaches and would not have suggested the specific first and second instances of Fig. 3 (*i.e.*, a first instance having a code 0Ah in the SIGNAL field and a second instance having a code 14h in the SIGNAL field) relied upon by the Office, the remaining references do not remedy the deficiencies of Snell, and it would not have been obvious to modify Snell in the proposed manner.

XIV. <u>CONCLUSION</u>

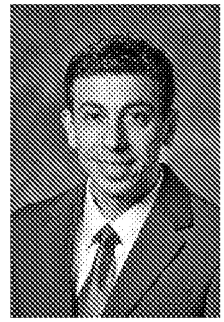
216. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the '228 Patent.

Date: 8/13/2017

Dr. Robert Akl

Appendix A
to Akl
Declaration

Robert Akl, D.Sc.



Professional Summary

Dr. Akl has over 20 years of industry and academic experience. He is currently a Tenured Associate Professor at the University of North Texas and a Senior Member of IEEE. He has designed, implemented, and optimized both hardware and software aspects of several wireless communication systems for CDMA, WiFi, and sensor networks. Dr. Akl has broad expertise in wireless communication, Bluetooth, CDMA/WCDMA network optimization, GSM, LTE, VoIP, telephony, computer architecture, and computer networks. He is a very active researcher and is well published and cited. He has been awarded many research grants by leading companies in the industry and the National Science Foundation. He has developed and taught over 100 courses in his field. Dr. Akl has received several awards and commendation for his work, including the 2008 IEEE Professionalism Award and was the winner of the 2010 Tech Titan of the Future Award.

Dr. Akl has extensive experience with patents in the wireless and networking industry. In the past ten years, he has worked as a technical expert in dozens of patent related matters, involving thousands of hours of research, investigation, and study. He has repeatedly been qualified as an expert by Courts, and has provided numerous technology tutorials to Courts, and given testimony by deposition and at trial. He has worked with companies large and small, both for and against the validity and infringement of patents, and has also helped counsel and Courts to understand technology that often seems complex. In doing so, he has become familiar with, and actively worked with, the legal principles that underlie patentability and validity and claim interpretation in the wireless and networking industries.

Areas of Expertise

2G, 3G, 4G, CDMA/WCDMA, GSM, UMTS, LTE, Ad-hoc Networks, Bluetooth, Call Admission Control, Channel Coding, Compression, Computer Architecture, Multi-cell Network Optimization, Packet-networks, Telephony, VoIP, Wi-Fi, Wireless Communication, Wireless Sensors.

Education

Year	College/University	Degree	GPA
2000	Washington University in Saint Louis	D.Sc. in Electrical Engineering	**4.0 / 4.0**
1996	Washington University in Saint Louis	M.S. in Electrical Engineering	**4.0 / 4.0**
1994	Washington University in Saint Louis	B.S. in Electrical Engineering	**4.0 / 4.0**
1994	Washington University in Saint Louis	B.S. in Computer Science	**4.0 / 4.0**

Graduated *summa cum laude* and ranked first in undergraduate class.
Dissertation: "Cell Design to Maximize Capacity in Cellular Code Division Multiple Access (CDMA) Networks." Advisors: Dr. Manju Hegde and Dr. Paul Min.

Litigation Support and Expert Witness Experience

L1. 2017 **Finnegan Henderson Farabow Garrett & Dunner LLP**
Case: Motorola Solutions, Inc. v. Hytera Communications Corp. Ltd. et al.
In the Matter of Certain Two-way Radio Equipment Systems, Related Software and Components Thereof, ITC Investigation No. 337-TA-1053
Matter: Patent infringement, two-way radio
Project: Consulting

L2. 2017 **Haynes and Boone, LLP**
Case: Rackspace US, Inc. v. Realtime Data LLC
IPR2017-xxxx
Matter: *Inter Partes* Review, data compression
Project: Declarations to support IPR petition

L3. 2017 **Pillsbury Winthrop Shaw Pittman LLP**
Case: HTC Corp and ZTE (USA) v. Cellular Communications Equipment
IPR2017-01508, IPR2017-01509
Matter: *Inter Partes* Review, LTE, power control, emergency notification
Project: Two declarations to support two IPR petitions

L4. 2017 **Alston & Bird LLP**
Case: Itron, Inc. and Duke Energy Corp. v. Smart Meter Technologies
IPR2017-01199
Matter: *Inter Partes* Review, power meter
Project: Declaration to support IPR petition

L5. 2017 **Haynes and Boone, LLP**
Case: Ericsson Inc. v. Regents of the University of Minnesota
IPR2017-01186, IPR2017-01200, IPR2017-01213
Matter: *Inter Partes* Review, OFDM and MIMO
Project: Three declarations to support three IPR petitions

L6. 2017 **Quinn Emanuel Urquhart & Sullivan, LLP**
Case: GENBAND US, LLC v. Metaswitch Networks Ltd, et al.
Eastern district of Texas, Marshal division, Case No. 2:16-cv-582-JRG-RSP
Matter: Patent infringement, Internet protocols and VoIP
Project: Expert report regarding essentiality

L7. 2017 **Mayer Brown LLP**
Case: Uniloc USA, Inc. et al. v. Avaya Inc., and ShoreTel, Inc., et al.
Eastern district of Texas, Tyler division, Case Nos. 6:15-cv-1168-JRG
Matter: Patent infringement, instant messaging and conference calling

Project: Source code review, non-infringement consulting

L8. 2017 **Fish & Richardson P.C.**
Case: Nokia Solutions and Networks US LLC, et al. v. Huawei Technologies Co. Ltd., et al.
Eastern district of Texas, Marshal division, Case Nos. 2:16-cv-753-JRG-RSP, 2:16-cv-754
Matter: Patent infringement, 4G LTE
Project: Claim construction, two declarations

L9. 2017 **Rothwell Figg Ernst & Manbeck, PC**
Case: Samsung v. Rembrandt Wireless
Matter: *Ex Parte* Reexamination, Bluetooth
Project: Declaration to support patent owner response

L10. 2016 **Sidley Austin LLP**
Case: Huawei Technologies Co., et al. v. Samsung Electronics Co, et al. and Samsung Research America v. Hisilicon Technologies Co, LTD
Northern district of California, San Francisco division, Case No. 3:16-cv-2787-WHO
Matter: Patent infringement, 3G/4G LTE
Project: Source code review, declaration to support claim construction

L11. 2016 **Bragalone Conroy PC**
Case: Securus Technologies, Inc. v. Global Tel*Link Corporation
CBM2017-00034
Matter: Covered Business Method Review, call monitoring and recording
Project: Declaration to support CBM petition

L12. 2016 **Braxton, Hilton & Perrone PLLC**
Case: Biosonix, LLC. v. Hydrowave, LLC et al.
Eastern district of Texas, Case No. 2:16-cv-139-RC
Matter: Patent infringement, underwater transceivers
Project: Claim construction, Markman hearing testimony

L13. 2016 **Gray Reed & McGraw**
Case: Optis Cellular Technology, LLC and PanOptis Patent Management, LLC. v. Blackberry Corporation, et al.
Eastern district of Texas, Marshal division, Case No. 2:16-cv-59-JRG-RSP, Case No. 2:16-cv-61-JRG-RSP, Case No. 2:16-cv-62-JRG-RSP
Matter: Patent infringement, LTE
Project: Claim construction, three declarations regarding claim construction, deposition

L14. 2016 **Davidson Berquist Jackson & Gowdey**
Case: SIPCO, LLC et al v. Emerson Electric Co. et al
Eastern district of Texas, Tyler division, Case No. 6:15-cv-907
Emerson Electric Co. et al v. SIPCO, LLC et al.
Northern district of Georgia, Atlanta division, Case No. 1:15-cv-00319-AT
Matter: Patent infringement, links in wireless networks and remote monitoring
Project: Source code review, invalidity consulting

L15. 2016 **McKool Smith**
Case: Regents of University of Minnesota v. AT&T Mobility LLC, et al.
District of Minnesota, Case No. 0:14-cv-04666-JRT-TNL
Matter: Patent infringement, LTE and MIMO
Project: Non-infringement and invalidity consulting, declaration

L16. 2016 **EIP US LLP**
Case: GENBAND US, LLC et al. v. Metaswitch Networks Ltd
IPR2015-01456, IPR2015-01457
Matter: *Inter Partes* Review, media gateways
Project: Two declarations to support Patent Owner, two depositions

L17. 2016 **Haynes and Boone, LLP**
Case: Cox Communications, Inc. v. AT&T Intellectual Property I, II, LP
IPR2015-01187, IPR2015-01227, IPR2015-01273, IPR2015-01536
Matter: *Inter Partes* Review, cable networks
Project: Four declarations to support Patent Owner, four depositions

L18. 2016 **Mayer Brown LLP**
Case: Odyssey Wireless v. Motorola Mobility LLC
Eastern district of North Carolina, Western division, Case No. 5:14-cv-491-D
Southern district of California, Case No. 3:15-cv-01741-H-RBB
Matter: Patent infringement, LTE
Project: Source code review, non-infringement consulting

L19. 2016 **Cooley LLP**
Case: Saint Lawrence Comm. LLC v. Motorola Mobility LLC, ZTE (USA) Inc.
Eastern district of Texas, Marshal division, Case No. 2:15-cv-000351-JRG, Case No. 2:15-cv-000349-JRG
Matter: Patent infringement, speech compression, coding and decoding
Project: Invalidity expert report, expert report regarding AMR-WB standard, expert report regarding Opus and Silk, supplemental expert report regarding invalidity, two-day depositions, jury trial testimony for Motorola