CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: January 11, 2012 Name: James A. Collins Signature: /James A. Collins/

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Raymond S. Ling et al.		
Appln. No.:	12/132,487	Examiner:	Robert R. Niquette
Filed:	June 3, 2008	Art Unit:	3695
For:	VEHICLE MONITORING SYSTEM	Conf. No.:	7812
Attorney Docket No.:	12654/42		

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Request to Correct of Inventorship Under 37 C.F.R. § 1.48; Statement Under 35 U.S.C. § 116 and 37 C.F.R. 1.48(a); Declaration for Patent Application; Statement Under 37 CFR 3.73(b); and Assignment .

Fee calculation:

☐ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☒ A petition or processing fee in an amount of $130.00 under 37 CFR § 1.17(i).

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☒ Please charge Deposit Account No. 23-1925 in the amount of $130.00 for Request to Correct of Inventorship.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

January 11, 2012
Date

/James A. Collins/
James A. Collins (Reg. No. 43,557)

-I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR § 1.8.

/James A. Collins/
James A. Collins, Reg. No. 43,557

January 11, 2012
Date of Signature & Date of Transmission

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Ling et al.		
Appln. No.:	12/132,487	Examiner:	Robert R. Niquette
Filed:	June 3, 2008	Art Unit:	3695
For:	Vehicle Monitoring System	Conf. No.:	7812
Attorney Docket No:	12654-42		

REQUEST TO CORRECT OF INVENTORSHIP UNDER 37 C.F.R. § 1.48

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Progressive Casualty Insurance Company (hereinafter "Progressive") by and through the undersigned counsel, hereby submits this request to correct inventorship for the above referenced application under 37 C.F.R. § 1.48. The requirements of section 37 C.F.R. § 1.48 are set forth below.

(1) It is requested that Robert John McMillan be added as an inventor to the above referenced application.

(2) A statement from Robert John McMillan stating that the error in inventorship occurred without deceptive intent on his part and his executed oath is submitted herewith.

(3) Re-executed oaths from actual inventors Raymond Scott Ling, Richard Ashton Hutchinson, Wilbert John Steigerwald, William Andrew Say, Patrick Lawrence O'Malley, Dane Allen Shrallow, and William Curtis Everett are submitted herewith.

(4) The Director is hereby authorized to charge payment of the processing fee set forth in § 1.17(i) associated with this request (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment to Deposit Account No. 23-1925.

(5) On August 8, 2008, assignments from Raymond Scott Ling, Richard Ashton Hutchinson, Wilbert John Steigerwald, William Andrew Say, Patrick Lawrence O'Malley, Dane Allen Shrallow, and William Curtis Everett were recorded in the United States Patent and Trademark Office at reel 021360 and frame 0881. On January 10, 2012, an assignment from Robert John McMillan was submitted to the United States Patent and Trademark Office (a copy is attached to this submission with the 37 C.F.R. § 3.73(b) assignee statement).

(6) The assignee, Progressive, hereby consents to the addition of Robert John McMillan, as an inventor to the above reference application by submitting a Statement Under 37 C.F.R. § 3.73(b), attached to this request.

Respectfully submitted,

/James A. Collins/

James A. Collins
Registration No. 43,557
Attorney for Applicant

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR § 1.8.

/James A. Collins/
James A. Collins, Reg. No. 43,557

Date of Signature & Date of Transmission

Attorney Docket No. 12654/42

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

In re Application of: Raymond S. Ling et al.	)	Examiner: Robert Niquette
Serial Number: 12/132,487	)	Group Art Unit: 3695
Title: Vehicle Monitoring System	)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

STATEMENT UNDER 35 U.S.C. § 116 AND 37 C.F.R. 1.48(a)

I, Robert John McMillan, hereby declare that I am an inventor of the above mentioned patent application. The inventorship error occurred without deceptive intention on my part.

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 18 U.S.C. §1001,

and that such willful false statements may jeopardize the validity of the above mentioned patent application or any patent issuing thereon.

12-30-2011
Date

Signature

DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled, **VEHICLE MONITORING SYSTEM**, the specification of which:

☐ is attached hereto.

☒ was filed on June 3, 2008 as Application Serial No. 12/132,487.

☐ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability as defined in Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

(Number)	(Country)	(Day/Month/Year Filed)	Priority Claimed Yes	Priority Claimed No
			☐	☐

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)	(Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)	(Filing Date)	(Status-patented, pending, abandoned)
10/764,076	January 23, 2004	pending
09/571,650	May 15, 2000	patented
09/135,034	August 17, 1998	patented
08/592,958	January 29, 1996	patented

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 were 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 application or any patent issued thereon.

Inventor's Signature _____ Date: 12/22/2011
Full name Raymond Scott Ling
Residence (city, state) Westlake, OH
Citizenship USA
Post Office Address 28205 Edgepark Blvd.

Inventor's Signature _____ Date: _____
Full name Richard Ashton Hutchinson
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Wilbert John Steigerwald III
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name William Andrew Say
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Patrick Lawrence O'Malley
Residence (city, state)
Citizenship
Post Office Address

Inventor's Signature _____ Date: 12/22/2011
Full name Dane Allen Shrallow
Residence (city, state) Solon, OH
Citizenship USA
Post Office Address 33680 Shadowbrook Drive

Inventor's Signature _____ Date: _____
Full name William Curtis Everett
Residence (city, state)
Citizenship USA
Post Office Address

Case No. 12654/42

Inventor's Signature _____ Date _____
Full name Raymond Scott Ling
Residence (city, state) _____
Citizenship USA
Post Office Address _____

Inventor's Signature _____ Date: 12-23-2011
Full name Richard Ashton Hutchinson
Residence (city, state) CHAGRIN FALLS, OHIO
Citizenship USA
Post Office Address 511 N. MAIN STREET

Inventor's Signature _____ Date: _____
Full name Wilbert John Steigerwald III
Residence (city, state) _____
Citizenship USA
Post Office Address _____

Inventor's Signature _____ Date: _____
Full name William Andrew Say
Residence (city, state) _____
Citizenship USA
Post Office Address _____

Inventor's Signature _____ Date: _____
Full name Patrick Lawrence O'Malley
Residence (city, state) _____
Citizenship _____
Post Office Address _____

Inventor's Signature _____ Date: _____
Full name Dane Allen Shrallow
Residence (city, state) _____
Citizenship USA
Post Office Address _____

Inventor's Signature _____ Date: _____
Full name William Curtis Everett
Residence (city, state) _____
Citizenship USA
Post Office Address _____

Case No. 12654/42

Inventor's Signature _____ Date: _____
Full name Raymond Scott Ling
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Richard Ashton Hutchinson
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature [signature] Date: 12/22/2011
Full name Wilbert John Steigerwald III
Residence (city, state) KIRTLAND, OHIO 44094
Citizenship USA
Post Office Address 10731 BEECHWOOD DRIVE

Inventor's Signature [signature] Date: 12/22/2011
Full name William Andrew Say
Residence (city, state) Macedonia, Ohio 44056
Citizenship USA
Post Office Address 1104 Bull Creek Ln.

Inventor's Signature _____ Date: _____
Full name Patrick Lawrence O'Malley
Residence (city, state)
Citizenship
Post Office Address

Inventor's Signature _____ Date: _____
Full name Dane Allen Shrallow
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name William Curtis Everett
Residence (city, state)
Citizenship USA
Post Office Address

Case No. 12654/42

Inventor's Signature _____ Date: _____
Full name Raymond Scott Ling
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Richard Ashton Hutchinson
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Wilbert John Steigerwald III
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name William Andrew Say
Residence (city, state)
Citizenship USA
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Inventor's Signature _____ Date: 12-22-11
Full name Patrick Lawrence O'Malley
Residence (city, state) Kirtland, OH
Citizenship US
Post Office Address 7123 Giuliano Dr., Kirtland, OH 44094

Inventor's Signature _____ Date: _____
Full name Dane Allen Shrallow
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name William Curtis Everett
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Raymond Scott Ling
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Richard Ashton Hutchinson
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Wilbert John Steigerwald III
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name William Andrew Say
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature _____ Date: _____
Full name Patrick Lawrence O'Malley
Residence (city, state)
Citizenship
Post Office Address

Inventor's Signature _____ Date: _____
Full name Dane Allen Shrallow
Residence (city, state)
Citizenship USA
Post Office Address

Inventor's Signature William C. Everett Date: 12/22/11
Full name William Curtis Everett
Residence (city, state) CHAGRIN FALLS, OHIO
Citizenship USA
Post Office Address 11615 Ascot Lane, 44023

Inventor's Signature	Date: 12-30-2011
Full name	Robert John McMillan
Residence (city, state)	Divide, CO
Citizenship	USA
Post Office Address	4145 Omer Rd. Divide, CO. 80814

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Ling et al.

Application No./Patent No.: 12/132,487 Filed/Issue Date: June 3, 2008

Titled: Vehicle Monitoring System

Progressive Casualty Insurance Company, a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. [X] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is ____. ___ %); or

3. [ ] the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made) the patent application/patent identified above, by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. [X] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Ling, Hutchinson, Steigerwald, Say, O'Malley, To: Progressive Casualty Insurance Company
The document was recorded in the United States Patent and Trademark Office at
Reel 021360, Frame 0881, or for which a copy thereof is attached.

2. From: Shrallow, Everett To: Progressive Casualty Insurance Company
The document was recorded in the United States Patent and Trademark Office at
Reel 021360, Frame 0881, or for which a copy thereof is attached.

3. From: McMillan To: Progressive Casualty Insurance Company
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet(s).

[X] As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Dane A. Shrallow — January 11, 2012
Signature — Date

Dane A. Shrallow — Secretary
Printed or Typed Name — Title

ASSIGNMENT

WHEREAS, Robert John McMillan hereinafter called the "Assignor", has made the invention described in the United States patent application entitled **VEHICLE MONITORING SYSTEM**, for a full description of which reference is here made to an application for Letters Patent of the United States filed on June 3, 2008 and assigned Application Serial No. 12/132,487

WHEREAS, Progressive Casualty Insurance Company, a corporation organized and existing under the laws of the State of Ohio, having a place of business at 6300 Wilson Mills Road, N72, Mayfield Village, OH 44143, hereinafter called the "Assignee", desires to acquire the entire right, title and interest in and to the invention and the patent application identified above, and all patents which may be obtained for said invention, as set forth below;

NOW, THEREFORE, in consideration of the sum of One Dollar ($1.00), and other valuable and legally sufficient consideration, the receipt of which by the Assignor from the Assignee is hereby acknowledged, the Assignor has sold, assigned and transferred, and by these presents does sell, assign and transfer to the Assignee, the entire right, title and interest for the United States in and to the invention and the patent application identified above, and any patents that may issue for said invention in the United States; together with the entire right, title and interest in and to said invention and all patent applications and patents therefor in all countries foreign to the United States, including the full right to claim for any such application all benefits and priority rights under any applicable convention; together with the entire right, title and interest in and to all continuations, divisions, renewals and extensions of any of the patent applications and patents defined above; together with the right to recover all damages, including, but not limited to, a reasonable royalty, by reason of past, present, or future infringement or any other violation of patent or patent application rights; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term or terms for all such patents.

The Assignor hereby covenants and agrees, for both the Assignor and the Assignor's legal representatives, that the Assignor will assist the Assignee in the prosecution of the patent application identified above; in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; in vesting in the

Assignee like exclusive title in and to all such other patent applications and patents; and in the prosecution of any interference which may arise involving said invention, or any such patent application or patent; and that the Assignor will execute and deliver to the Assignee any and all additional papers which may be requested by the Assignee to carry out the terms of this Assignment.

The Commissioner of Patents and Trademarks is hereby authorized and requested to issue patents to the Assignee in accordance with the terms of this Assignment.

IN TESTIMONY WHEREOF, the Assignor has executed this agreement.

DATED: 12-30-2011

Robert John McMillan

Electronic Patent Application Fee Transmittal

Application Number:	12132487
Filing Date:	03-Jun-2008
Title of Invention:	VEHICLE MONITORING SYSTEM
First Named Inventor/Applicant Name:	Raymond Scott Ling
Filer:	James A. Collins/Tina Sieczkowski
Attorney Docket Number:	12654/42

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**130**

Electronic Acknowledgement Receipt	
EFS ID:	11813786
Application Number:	12132487
International Application Number:	
Confirmation Number:	7812
Title of Invention:	VEHICLE MONITORING SYSTEM
First Named Inventor/Applicant Name:	Raymond Scott Ling
Customer Number:	10999
Filer:	James A. Collins/Jesus Rodriguez
Filer Authorized By:	James A. Collins
Attorney Docket Number:	12654/42
Receipt Date:	11-JAN-2012
Filing Date:	03-JUN-2008
Time Stamp:	17:28:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$130
RAM confirmation Number	4721
Deposit Account	231925
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	
Charge any Additional Fees required under 37 C.F.R. Section 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	Miscellaneous Incoming Letter	transforreqtocorinvent.PDF	45377 e52028033f74506ee66d4e3453466f8c42ec49a1	no	1
Warnings:					
Information:					
2	Request under Rule 48 correcting inventorship	reqtocorinvent.PDF	73492 5098ae6683ff6237035b12fd0cc35873d79c...	no	2
Warnings:					
Information:					
3	Request under Rule 48 correcting inventorship	statementunder35usc116.PDF	44201 a9e3ea4bcbb919d4376a70bcc8577f4a317b7dbc	no	2
Warnings:					
Information:					
4	Oath or Declaration filed	declaration.PDF	216389 0b8caa8ca387d443fa151a75484d0500a5acdd5b	no	7
Warnings:					
Information:					
5	Assignee showing of ownership per 37 CFR 3.73(b).	statement37cfr.PDF	142001 f5eb52128c433d5c2db9f2ab120108557dc025d7	no	3
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	30049 7f81090ec49514b5b29ea339a2064a5603fbc53b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	551509		

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.

CERTIFICATE OF ELECTRONIC TRANSMISSION

I hereby certify that this correspondence is being electronically deposited with the United States Patent and Trademark Office through the Electronic Filing System on: Date: November 29, 2011 Name: Joseph S. Hanasz (Reg. No. 54,720)

Signature: /Joseph S. Hanasz/

Our Case No: 12654/42

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

In re Application of:	)	
	)	
Ling, et al.	)	Examiner: Robert R. Niquette
	)	
Serial No.: 12/132,487	)	Group Art Unit: 3695
	)	
Filing Date: June 3, 2008	)	Confirmation No.: 7812
	)	
For: Vehicle Monitoring System	)	
	)	
	)	

RESPONSE TO OFFICE ACTION

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Non-final Office Action mailed June 29, 2011, please consider the following claims and remarks.

Claims begin on page 2 of this paper.

Remarks begin on page 28 of this paper.

CLAIMS

1. (Withdrawn) A risk management device comprising:

an automotive device that provides an interface that filters data that is sent and received across an in-vehicle bus by selectively acquiring vehicle data related to a level of insurable risk or safety of operation, the interface acquires the selected vehicle data from one or more in-vehicle sensors;

a memory that stores the selected vehicle data with relationship data within the vehicle that establishes a connection between the selected vehicle data and one or more risk factors, safety standards, or operating characteristics, together with a unique identifier and a user account; and

a wireless service provider interface that provides access to the selected vehicle data and relationship data retained in the memory, where the wireless service provider interface is responsive to a request to transfer the selected vehicle data and selected relationship data retained in the memory to a remote server.

2. (Withdrawn) The risk management device of claim 1 where the wireless service provider interface is compliant with a wireless transaction facilitator that throttles the transmission rates across the wireless network based on an available bandwidth of the wireless network.

3. (Withdrawn) The risk management device of claim 1 further comprising a dynamic memory allocation processor that allocates a portion of the memory to retain a copy of a legacy version of firmware that comprises input/output instructions when an updated firmware is received through the wireless network and written to the memory, the dynamic memory allocation processor de-allocates the portion of the memory when an error-free version of the updated firmware is stored or installed in the risk management device.

4. (Withdrawn) The risk management device of claim 1 where the wireless network comprises a mobile broadband wireless network that provides full data exchange mobility to two or more vehicles.

5. (Withdrawn) The risk management device of claim 1 where the interface, the memory, and the wireless service provider interface are linked within a portable device.

6. (Withdrawn) The risk management device of claim 1 where the wireless service provider interface comprises a single-chip cellular baseband processor.

7. (Withdrawn) The risk management device of claim 6 where the single-chip cellular baseband processor is Global System for Mobile Communication compliant, Code Division Multiple Access compliant, or General Packet Radio Service compliant.

8. (Withdrawn) The risk management device of claim 6 where the single-chip cellular baseband processor is Global System for Mobile Communication compliant and General Packet Radio Service compliant.

9. (Withdrawn) The risk management device of claim 6 where the single-chip cellular baseband processor comprises integrated interface drivers that enable auxiliary components comprising loudspeakers, display, and memory modules to connect directly to the single-chip.

10. (Withdrawn) The risk management device of claim 1 where the wireless service provider interface comprises an embedded antenna element positioned adjacent to the interface and the memory.

11. (Withdrawn) The risk management device of claim 10 where the embedded antenna element comprises a circuit board element.

12. (Withdrawn) The risk management device of claim 1 where the wireless service provider interface is further responsive to a trigger event by transmitting an alert to a third party when a driving incident occurs.

13. (Withdrawn) The risk management device of claim 12 where the driving incident comprises exceeding a speed threshold, traveling outside of a designated area, or a lock out condition.

14. (Withdrawn) The risk management device of claim 13 where the wireless service provider interface is further responsive to receive a communication from a third party and the alert comprises a text or an aural message.

15. (Withdrawn) The risk management device of claim 3 where the wireless service provider interface is compliant with two or more multiple packet architectures that are automatically detected and one or more multiple packet architectures that are automatically selected through two or more handshakes.

16. (Withdrawn) The risk management device of claim 15 where the automatic detection and automatic selection includes Internet Protocol roaming that maintains connectivity as the vehicle moves from a first coverage area of a selected network to a second coverage area of a second selected network.

17. (Withdrawn) The risk management device of claim 15 where the wireless service provider interface is responsive to a monitored event-driven request to transfer the selected vehicle data and selected relationship data retained in the memory to a remote server when the wireless service provider indicates the capacity to transfer data across the wireless network.

18. (Withdrawn) The risk management device of claim 15 where a unique identifier comprises a unique identifier to the risk management device.

19. (Withdrawn) The risk management device of claim 15 where a unique identifier comprises a unique vehicle identifier.

20. (Withdrawn) The risk management device of claim 15 further comprising a transceiver tuned to receive continuously transmitted trilateral encoded signals through a bandwidth that is separate from the wireless network.

21. (Withdrawn) A system that monitors data transferred among components within a vehicle that is used to determine one or more levels of risk or is used to determine a cost of insurance comprising:

a vehicle bus that sends and receives data between two or more in-vehicle controllers;

an in-vehicle monitor that filters the data that is sent and received across the vehicle bus by selectively polling one or more of the in-vehicle controllers to transmit vehicle data related to a level of risk in operating the vehicle, the selected vehicle data is acquired at a predetermined interval or upon an event;

a processor programmed to store the selected vehicle data in an in-vehicle memory inaccessible to the two or more in-vehicle controllers, the memory retains relationship data that links the selected vehicle data to a vehicle identifier and a wireless network;

a wireless transceiver configured to encrypt and encode the relationship data and the selectively acquired vehicle data and transmit the encoded data through a mobile communication network that provides access to a distributed network.

22. (Withdrawn) The system that monitors data transferred among components within a vehicle of claim 21 where the wireless transceiver is configured to transmit the encoded data through a pulse position protocol without varying the power level or phase of a transmitting signal.

23. (Withdrawn) The system that monitors data transferred among components within a vehicle of claim 21 where the wireless transceiver is compliant with a wireless transaction facilitator that throttles the transmission rates across the mobile communication network based on an available bandwidth of the mobile communication network.

24. (Withdrawn) The system that monitors data transferred among components within a vehicle of claim 21 further comprising a dynamic memory allocation processor that allocates a portion of the memory to retain a copy of a legacy version of firmware that comprises input/output instructions when an updated firmware is transferred to the in-vehicle memory through the mobile communication network, the dynamic memory allocation processor de-allocates the portion of the in-vehicle memory when an error-free version of the updated firmware is stored or installed in the risk management system or when a copy of the legacy version of the software is restored.

25. (Withdrawn) The system that monitors data transferred among components within a vehicle of claim 21 where the mobile communication network comprises a mobile broadband communication network that provides full data exchange mobility to one, two or more vehicles in motion.

26. (Withdrawn) The system that monitors data transferred among components within a vehicle of claim 21 where the wireless service provider interface is compliant with two or more multiple packet architectures that are automatically detected and one or more multiple packet architectures that are automatically selected when a series of signals acknowledge that a communication or transfer of information may occur are received by the wireless transceiver.

27. (Withdrawn) The system that monitors data transferred among components within a vehicle of claim 21 where the wireless transceiver is responsive to an internal event-driven request to transfer the selected vehicle data and the selected relationship data retained in the in-vehicle memory to a remote server when the wireless service provider indicates an available channel capacity to transfer the selected vehicle data and the selected relationship data across the mobile communication network within a predetermined time period.

28. (Withdrawn) The system that monitors data transferred among components within a vehicle of claim 21 further comprising a location processor that processes external navigation signals that are stored in the in-vehicle memory and are transmitted through the mobile communication network.

29. (Withdrawn) The system that monitors data transferred among components within a vehicle of claim 21 further comprising a receiver tuned to receive continuously transmitted trilateral encoded signals through a bandwidth that is separate from the mobile communication network.

30. (Withdrawn) The risk management system of claim 21 where the in-vehicle monitor, the processor, and the wireless transceiver are linked within a portable device.

31. (Withdrawn) The risk management system of claim 21 where the wireless transceiver comprises a single-chip cellular baseband processor.

32. (Withdrawn) The risk management system of claim 31 where the single-chip cellular baseband processor is Global System for Mobile Communication compliant, Code Division Multiple Access compliant, or General Packet Radio Service compliant.

33. (Withdrawn) The risk management system of claim 31 where the single-chip cellular baseband processor is Global System for Mobile Communication compliant and General Packet Radio Service compliant.

34. (Withdrawn) The risk management system of claim 31 where the single-chip cellular baseband processor comprises integrated interface drivers that enable auxiliary components comprising loudspeakers, display, and memory modules to connect directly to the single-chip.

35. (Withdrawn) The risk management system of claim 21 where the wireless transceiver comprises an embedded antenna element positioned adjacent to the in-vehicle monitor, the processor, and the memory.

36. (Withdrawn) The risk management system of claim 35 where the embedded antenna element comprises a circuit board element.

37. (Withdrawn) The risk management system of claim 21 where the wireless transceiver is further configured to respond to a trigger event by transmitting an alert to a third party when a driving incident occurs.

38. (Withdrawn) The risk management system of claim 37 where the driving incident comprises exceeding a speed threshold, traveling outside of a designated area, or a lock out condition.

39. (Withdrawn) The risk management system of claim 38 where the wireless transceiver is further configured to receive a communication from a third party and the alert comprises a text or an aural message.

40. (Previously Presented) A system that monitors and facilitates a review of data collected from a vehicle that is used to determine a level of safety or cost of insurance comprising:

a processor that collects vehicle data from a vehicle bus that represents aspects of operating the vehicle;

a memory that stores selected vehicle data related to a level of safety or an insurable risk in operating a vehicle;

a wireless transmitter configured to transfer the selected vehicle data retained within the memory to a distributed network and a server;

a database operatively linked to the server to store the selected vehicle data transmitted by the wireless transmitter, the database comprising a storage system remote from the wireless transmitter and the memory comprising records with operations for searching the records and other functions;

where the server is configured to process selected vehicle data that represents one or more aspects of operating the vehicle with data that reflects how the selected vehicle data affects a premium of an insurance policy, safety or level of risk; and

where the server is further configured to generate a rating factor based on the selected vehicle data stored in the database.

41. (Previously Presented) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 where the wireless transmitter is configured to transfer the selected vehicle data retained within the memory through a pulse position protocol without varying the power level or phase of a transmitting signal.

42. (Original) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 where the wireless transmitter is compliant with a wireless transaction facilitator that throttles the transmission rates across the wireless network based on an available bandwidth of the wireless network.

43. (Original) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 further comprising a dynamic memory allocation processor that allocates a portion of the memory to retain a copy of a legacy version of firmware that comprises input/output instructions when an updated firmware is transferred to the memory through the wireless network, the dynamic memory allocation processor de-allocates the portion of the memory when an error-free version of the updated firmware is stored or installed in the system or when a copy of the legacy version of the software is restored to control the processor of the system.

44. (Original) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 where the wireless network comprises a mobile broadband communication network that provides full data exchange mobility up to vehicle speeds of about 100 miles per hour.

45. (Original) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 where the wireless transmitter is compliant with two or more multiple packet architectures that are automatically detected and one or more multiple packet architectures that are automatically selected when a series of signals acknowledge that a communication or transfer of information or data may occur.

46. (Original) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 where the wireless transmitter is responsive to an in-vehicle event-driven request to transfer the selected vehicle data retained in the memory to a remote server when the wireless network indicates an available channel capacity to transfer the selected vehicle data across the wireless network.

47. (Original) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 further comprising a receiver tuned to receive continuously transmitted trilateral encoded signals through a bandwidth that is separate from the wireless network.

48. (Original) The risk management system of claim 40 where the processor, the memory, and the wireless transmitter are in communication within a portable device.

49. (Original) The risk management system of claim 40 where the wireless transmitter comprises a single-chip cellular baseband processor.

50. (Original) The risk management system of claim 49 where the single-chip cellular baseband processor is Global System for Mobile Communication compliant, Code Division Multiple Access compliant, or General Packet Radio Service compliant.

51. (Original) The risk management system of claim 49 where the single-chip cellular baseband processor is Global System for Mobile Communication compliant and General Packet Radio Service compliant.

52. (Original) The risk management system of claim 49 where the single-chip cellular baseband processor comprises integrated interface drivers that enable auxiliary components comprising loudspeakers, display, and memory modules to connect directly to the single-chip.

53. (Original) The risk management system of claim 40 where the wireless transmitter comprises an embedded antenna element adjacent to the processor and the memory.

54. (Original) The risk management system of claim 53 where the embedded antenna element comprises a circuit board element.

55. (Original) The risk management system of claim 40 where the wireless transmitter is further configured to respond to a trigger event by transmitting an alert to a third party when a driving incident occurs.

56. (Original) The risk management system of claim 55 where the driving incident comprises exceeding a speed threshold, traveling outside of a designation, or a lock out condition.

57. (Original) The risk management system of claim 56 where the wireless transmitter comprises a transceiver configured to receive a communication from a third party and the alert comprises a text or an aural message.

58. (Withdrawn) A system that monitors data collected from a vehicle bus that is used to determine a cost of insurance comprising:

a data monitor that monitors a vehicle bus that transfers data among electronic components within a vehicle;

a storage device that receives vehicle data from the vehicle bus to a first memory within the vehicle;

a second memory within the storage device that receives metadata that is logically linked to the vehicle data written to the storage device within the vehicle each time the vehicle data is written to the storage device;

a processor in communication with the storage device through a network of computers associated with an identifying number on a distributed network;

a database operatively linked to the storage device to store the vehicle data and the metadata written to the storage device, the database comprising a storage system comprising records with operations for searching and other functions; and

where the vehicle data is accessible through software retained in a computer readable storage medium that allows a user to access insurance files related to an existing insurance policy or a renewal of an insurance policy;

where the processor is programmed to generate a rating factor based on the vehicle data and metadata written to the database.

59. (Withdrawn) The system of claim 58 where the second processor is further programmed to generate a display in which a vehicle operator may review the vehicle data stored in the database related to the operator's vehicle accelerations, decelerations, seat belt usage, vehicle speed, time of day, date, location, identity, vehicle identity, tire pressure, telephone usage, entertainment status, vehicle mileage, or turn signal usage.

60. (Withdrawn) The system of claim 58 where the second processor is further programmed to compare a category of the vehicle data to a similar category of data monitored in other vehicles.

61. (Withdrawn) The system of claim 58 where the second processor and the database reside at a Web site operatively linked to the first processor through the Internet, the Web site being programmed to deliver customized insurance data related to a usage based insurance and an operator of the vehicle.

62. (Withdrawn) The system of claim 58 where the second processor is programmed to determine a cost of renewing insurance based on the vehicle data and metadata written to the database.

63. (Withdrawn) The system of claim 58 where the second processor is programmed to determine a prospective cost of insurance based on receiving the vehicle data and meta data written to the storage device at a Web site.

64. (Withdrawn) The system of claim 58 further comprising a third processor in communication with the data monitor, the third processor integrated within an electronic management system within the vehicle.

65. (Withdrawn) The system of claim 58 where the data monitor is compliant with an OBD protocol or an SAE J-1962 protocol.

66. (Withdrawn) The system of claim 58 where the second processor is programmed to access the database of vehicle data and metadata and process at least a portion of the vehicle data to generate a cost of insurance.

67. (Withdrawn) The system of claim 58 where the second processor is programmed to access the database of vehicle data and metadata and process at least a portion of the vehicle data to generate a prospective cost of insurance.

68. (Withdrawn) The system of claim 67 where the cost of insurance comprises a cost of renewing an existing insurance policy.

69. (Withdrawn) The system of claim 67 where the vehicle data is generated by one or more devices that monitor, measure, and control the operation of the vehicle.

70. (Withdrawn) A data logging device that tracks the operation of a vehicle, comprising:

a storage device comprising a first memory portion that may be read from and is written to in a vehicle and a second memory portion that may be read from and is written to in the vehicle, the second memory portion retains attributes of datum or data logically associated with the data stored in the first memory portion;

a processor that reads data from an in-vehicle automotive bus that transfers data from vehicle sensors to other automotive components, the processor writes data that reflect a level of safety to the first memory portion and the second memory portion; and

a communication device that links the storage device to a network of computers associated with a publicly accessible distributed network, the communication device is accessible through software retained on a computer readable storage medium that allows a user to access insurance files related to an insurance policy and allows the user to access other software related to the insurance files,

where the first memory portion and the second memory portion retain data when an external power source is not coupled to the first memory portion and the second memory portion, respectively, and are inaccessible to an in-vehicle OEM system or an automotive scan tool.

71. (Withdrawn) A data logging device that tracks the operation of a vehicle, comprising:

a first storage device comprising a first memory portion that may be read from and is written to in a vehicle;

a second storage device comprising a second memory portion that may be read from and is written to in the vehicle that retains attributes of data logically associated with one or more data elements stored in the first storage device;

a central processing unit that reads data from an automotive bus that transfers data from vehicle sensors to other automotive components and writes data to the first memory portion;

a circuit that generates a steady stream of pulses that synchronizes the transfer of data from the automotive bus to the first memory portion; and

a communication device that links the storage device to a network of computers associated with an identifying number on a publicly accessible distributed network and is accessible through software that allows a user to access insurance files related to an existing insurance policy or a renewal of an insurance policy and allows the user to access other software related to the insurance files,

where the first memory portion and the second memory portion retain data when an external power source is not coupled to the first memory portion and the second memory portion, respectively.

72. (Withdrawn) The data logging device of claim 71 where the circuit that generates the steady stream of pulses is remote from the vehicle.

73. (Withdrawn) The data logging device of claim 72 where the circuit that generates the steady stream of pulses generates the attributes of data associated with one or more data items stored in the first storage device.

74. (Withdrawn) A data logging device that tracks the operation of a vehicle, comprising:

a storage device comprising a first memory portion that is read from and is written to in a vehicle and a second memory portion that is read from and is written to in the vehicle that retains attributes of data logically associated with one or more data items stored in the first storage device;

a central processing unit that reads data from an automotive bus that transfers data from vehicle sensors to other automotive components and writes data to the first memory portion; and

a wireless communication device that links the storage device to a network of computers associated with an identifying number on a publicly accessible distributed network and is accessible through software retained on a computer readable storage medium that allows a user to access insurance files related to an existing insurance policy or a renewal of an insurance policy and allows the user to access other software related to the insurance files,

where the first memory portion and the second memory portion retain data when an external power source is not coupled to the first memory portion and the second memory portion, respectively; and

where the software is configured to allow a party to change some or all of the data written to the storage device and where a second software retained on a computer readable storage medium remote from the vehicle is configured to allow the party to transmit the unchanged data and transmit the changed data to a Web server at the party's discretion.

75. (Withdrawn) A device that monitors the operation of a vehicle, comprising:

a vehicle bus that transfers data from vehicle sensors within a vehicle;

a first processor in communication with the vehicle bus and operative to track one or more of vehicle speed data, position data, and aggressive driving behavior data from the vehicle bus;

a global positioning receiver in communication with the first processor that processes position data, time data, and velocity data;

an on board vehicle diagnostic connector interfaced to the vehicle bus and the first processor; and

a data logger interfaced to the on board diagnostic connector and operative to receive the one or more of vehicle speed data, position data, and aggressive driving behavior data in a memory in the data logger,

where the data logger is operative to upload the one or more of vehicle speed data, position data, and aggressive driving behavior data from the memory to a second processor remote from the first processor,

where the second processor is programmed to generate Internet documents based on the uploaded data and an assigned level of risk.

76. (Withdrawn) The device of claim 75 where the aggressive driving behavior data comprises data that exceeds a first predetermined threshold or does not exceed a second predetermined threshold.

77. (Withdrawn) The device of claim 75 where the data logger comprises a machine interface operative to communicate with the first processor and the second processor and a virtual interface operative to interface a computer.

78. (Withdrawn) The device of claim 75 where the data logger is operative to store metadata in a second memory of the data logger each time any of the vehicle speed data, the position data, or aggressive driving behavior data is written to the memory.

79. (Withdrawn) The device of claim 75 where the data logger uploads vehicle speed data or position data to an Internet site.

80. (Withdrawn) The device of claim 75 where the data logger uploads vehicle speed data, aggressive driving behavior data, and/or position data to an Internet site.

81. (Withdrawn) The device of claim 75 where the data logger comprises a removable storage device and a non-removable storage device.

82. (Withdrawn) A system that determines a cost of insurance comprising:

a device that writes and records one or more characteristics related to a level of risk of operating a vehicle through an automotive communication link;

means for a party associated with the vehicle to review the recorded characteristics and review how the recorded characteristics affect a vehicle safety, a level of risk, or a cost of insurance;

means to enable the transmission of the recorded characteristics to an insurer through a wireless network;

means to transmit the recorded characteristics to the insurer automatically through a distributed network from the vehicle;

means for assigning a level of risk to the operation of the vehicle based on the recorded characteristics; and

means for determining a cost of an insurance policy based on the assigned level of risk.

83. (Withdrawn) The system of claim 82 where the means for assigning the level of risk to the operation of the vehicle based on the recorded characteristics and the means for the party associated with the vehicle to review the recorded characteristics and review how the recorded characteristics affect a cost of insurance reside on a computer remote from the publicly accessible distributed network and remote from a Web server.

84. (Withdrawn) The system of claim 82 further comprising software retained on a computer readable storage medium that compares at least one of the recorded characteristics to at least one characteristic of one or more parties.

85. (Withdrawn) The system of claim 82 further comprising software retained on a computer readable storage medium that compares at least one of the recorded characteristics to an averaged characteristic of a plurality of parties.

86. (Withdrawn) The system of claim 82 further comprising a wireless interface configured to link the device that writes and records characteristics related to the level of risk of operating the vehicle to the means for the party associated with the vehicle to review the recorded characteristics and review how the recorded characteristics affect the cost of insurance.

87. (Withdrawn) The system of claim 82 further comprising a graphical user interface in communication with the means for the party associated with the vehicle to review the recorded characteristics and review how the recorded characteristics affect a cost of insurance.

88. (Withdrawn) The system of claim 82 where the device that writes and records characteristics related to the level of risk of operating the vehicle through the automotive communication link comprises a portable plug-in module that does not lose its content when the portable plug-in module is not connected to an external power source and the portable plug-in module comprises a storage medium that may only be erased in blocks.

89. (Withdrawn) The system of claim 82 further comprising an application that translates data received from the device that writes and records characteristics related to the level of risk of operating the vehicle from a first format to a second format and transmits the translated data to an insurer's Web site that is remote from the application by specifying a protocol to transmit the translated data and by identifying a server that serves the insurer's Web site.

90. (Withdrawn) The system of claim 89 where the application comprises software retained on a computer readable storage medium executed by a processor that generates user-centric screens that summarize a user's driving behavior by processing one or more types of coded data received through a second separate wireless communication link, where the software is configured to allow the party to change a portion of the data or change all of the data transmitted to the insurer's Web site.

91. (Withdrawn) The system of claim 82 where the means for determining the cost of the insurance policy based on the assigned level of risk comprises means for determining a prospective cost adjustment for an existing insurance policy or a renewal of an insurance policy based on the assigned level of risk.

92. (Withdrawn) A method of monitoring, communicating, and reviewing data collected from a vehicle that is used to determine a cost of insurance comprising:

monitoring one or more devices that monitor, measure, or control the operation of the vehicle;

writing data from one or more selected devices within a vehicle to an in-vehicle storage device, the data being related to the level of risk of operating the vehicle;

transmitting a portion of the data written to the storage device through a wireless link to a server that is remote from the vehicle by specifying a communication protocol to transmit the portion of data and by identifying a destination; and

calculating a premium of an insurance policy based on the portion of data transmitted through the wireless link.

93. (Withdrawn) The method of claim 92 further comprising transmitting, to a party associated with the vehicle, data associated with a premium of the insurance policy, a surcharge to the premium of the insurance policy or a discount to the premium of the insurance policy.

94. (Withdrawn) The method of claim 93 further comprising developing an operational profile of an insured party that comprises comparing data about the insured party with data from one or more other vehicle operators based on a selected characteristic of some of the one or more other vehicle operators.

95. (Withdrawn) The method of claim 94 further comprising classifying groups of vehicle operators based on one or more characteristics of the operators.

96. (Withdrawn) The method of claim 95 where the premium for the insurance policy comprises a premium for renewing the insurance policy.

97. (Withdrawn) The method of claim 95 where the premium for the insurance policy comprises a current or prospective premium for an existing insurance policy.

98. (Withdrawn) The method of claim 93 further comprising writing metadata about each of the data written to the storage device and transmitting the metadata written to the storage device through the publicly accessible distributed network to the server that is remote from the vehicle.

99. (Withdrawn) The method of claim 92 further comprising calculating a current or a prospective cost of insurance based on a portion of data written to the storage device.

100. (Withdrawn) The method of claim 92 further comprising transmitting a portion of the data written to the storage device to a publicly accessible distributed network through the wireless network that provides substantial mobility up to vehicle speeds of about 55 miles per hour.

101. (Withdrawn) The method of claim 92 further comprising developing an operational profile of an insured party comprising characteristics related to a level of risk of operating a vehicle.

102. (Withdrawn) The method of claim 101 where the operational profile further comprises characteristics associated with a driver of the vehicle.

103. (Withdrawn) The method of claim 92 where the storage device is operative to interface an on-board diagnostic port coupled to a vehicle bus that is coupled to a first processor local to the vehicle and is further operative to interface a second processor remote from the vehicle.

104. (Withdrawn) A method of monitoring and reviewing data collected from a vehicle bus that is used to determine a cost of insurance comprising:

monitoring a vehicle bus that transfers data among electronic components within a vehicle;

writing data received from the vehicle bus to a device that retains content when not connected to an external power source at a rate the data is received;

executing a first program that enables the wireless transmission of a portion of the data written to the device through a publicly accessible network to a server that is remote from the vehicle by specifying a communication protocol to transmit the portion of data;

executing a second program that calculates a premium of an insurance policy based on the portion of data; and

executing a third program that generates a document summarizing the premium of the insurance policy;

where the first program, the second program, and the third program are stored on a distributed computer readable storage medium.

105. (Withdrawn) The method of claim 104 where writing data comprises logging data in a plug-in module configured to interface a processor coupled to an on board diagnostic port in the vehicle, where the plug-in module is operative to store a number of miles traveled in a predetermined time period.

106. (Withdrawn) The method of claim 104 where writing data comprises writing vehicle speed data, vehicle acceleration data, vehicle deceleration data, turn signal usage data, seat belt usage data, time of day data, date data, location data, operator identity data, vehicle identity data, tire pressure data, telephone usage data, entertainment status data, revolutions per minute data, trip start data, trip end data, relative speed data, or vehicle mileage data in the device.

107. (Withdrawn) The method of claim 106 where writing data further comprises writing data that indicates a level of willingness of a party to monitor an aspect of the vehicle operation.

108. (Withdrawn) The method of claim 106 where writing data further comprises writing data that records a connection event of the device or a disconnection event of the device.

109. (Withdrawn) The method of claim 104 where the second program comprises software that enables the user to observe a vehicle's position determined by processing two kinds of coded signals received from a source external to the vehicle.

110. (Withdrawn) The method of claim 104 where the calculation of the premium of the insurance policy, or a surcharge or a discount to the premium of the insurance policy, is determined only when requested by a party associated with the vehicle or a party associated with the insurance policy.

111. (Withdrawn) The method of claim 104 further comprising processing the data received from the vehicle bus and displaying a cost of insurance based on the data written to the device.

112. (Withdrawn) The method of claim 104 further comprising modifying the data received from the vehicle bus and processing the modified data to determine a cost of insurance based on the modified data when requested by a party associated with the vehicle or a party associated with the insurance policy, where the data comprises vehicle speed data, vehicle acceleration data, vehicle deceleration data, turn signal usage data, seat belt usage data, time of day data, date data, location data, operator identity data, vehicle identity data, tire pressure data, telephone usage data, entertainment status data, revolutions per minute data, trip start data, trip end data, relative speed data, or vehicle mileage data.

113. (Withdrawn) The method of claim 104 further comprising receiving a continuously transmitted code from a communication link remote from the vehicle bus and remote from the publicly accessible network and writing a portion of the continuously transmitted code in the device.

114. (Withdrawn) The method of claim 113 further comprising receiving a portion of the data written to the device at an insurer's Web site, and transmitting second data based on the received data to a client application that generates a Web document that comprises variable content.

115. (Withdrawn) The method of claim 104 further comprising receiving software updates to the device through a Web site and the wireless network.

116. (Withdrawn) A method of monitoring and reviewing data collected from a vehicle that is used to determine a cost of insurance comprising:

collecting vehicle data from a vehicle bus that represents aspects of operating the vehicle;

writing the collected vehicle data to a storage device inaccessible to original equipment manufacturer's systems;

transferring the collected vehicle data written to the storage device to a processor that is remote from the vehicle; and

displaying the collected vehicle data that represents the aspect of operating the vehicle with data that reflects how the collected vehicle data affects a safety score, rating factor or a premium or an adjustment to a premium of an insurance policy.

117. (Withdrawn) The method of claim 116 further comprising entering additional vehicle data that reflects a different aspect of operating the vehicle and displaying how the additional vehicle data would affect the safety of operating a vehicle or the premium of the insurance policy.

118. (Withdrawn) The method of claim 116 where collecting vehicle data comprises reading powertrain sensor data from a vehicle bus that transfers data from electronic components of the vehicle.

119. (Withdrawn) The method of claim 116 where collecting data further comprises reading sensor data through an on board diagnostic connector of the vehicle.

120. (Withdrawn) The method of claim 116 further comprising determining a rating factor based on an analysis of the collected vehicle data.

121. (Withdrawn) The method of claim 116 further comprising analyzing the collected vehicle data and determining a safety score based on the analysis of the collected vehicle data.

122. (Withdrawn) The method of claim 116 further comprising receiving the collected vehicle data, determining an insurance risk rating, and analyzing the collected vehicle data to determine the premium of the insurance policy or adjust the premium of the insurance policy, where the collected vehicle data comprises mileage data and the pricing is based, in whole or in part, on miles driven.

123. (Withdrawn) The method of claim 117 where entering additional vehicle data further comprises manually entering data or manually modifying data through a graphical user interface.

124. (Withdrawn) The method of claim 116 where the act of displaying the cost data comprises generating a document that summarizes the premium of the insurance policy or generating a document that summarizes a surcharge or discount to the premium of the insurance policy.

125. (Withdrawn) The method of claim 116 further comprising executing software that is operative to receive the collected vehicle data that represents aspects of operating the vehicle at a Web server; generating a Web page that comprises a risk rating and portions of the collected vehicle data at the Web server; and transmitting the Web page to a computer remote from the Web server and the vehicle by specifying a protocol to transmit the data and by identifying the computer.

126. (Withdrawn) The method of claim 125 further comprising executing software at the computer remote from the vehicle and the Web server that allows the operator to change data related to the operation of the vehicle; transmitting the changed data to the Web server by specifying a protocol to transmit the changed data and by identifying the Web server; generating a second Web page that comprises updated insurance cost data based on the changed data; and transmitting the second Web page to the computer remote from the Web server and the vehicle by specifying a protocol to transmit the updated insurance cost data and by specifying an address of the computer.

127. (Withdrawn) The method of claim 126 where the second Web page comprises a second risk rating.

128. (Withdrawn) A method of providing a cost, or an adjustment to the cost, of an insurance policy comprising:

monitoring a vehicle bus that transfers data among electronic components within a vehicle;

writing mileage data from the vehicle bus to a device that retains content when not connected to an external power source at a predetermined interval or at a same rate the mileage data is received;

executing a first program retained on a computer readable storage medium that enables a user to wirelessly transmit the mileage data written to the device from the vehicle through a publicly accessible network to a server that is remote from the vehicle and the device; and

determining a cost of insurance based on the mileage data transmitted to a second program resident to the server.

129. (Withdrawn) The method of claim 128 where the cost of insurance is further based on one or more additional sets of data selected from the group consisting of: vehicle speed data, brake data, turn signal data, seat belt usage data, clock data, vehicle user data, and vehicle identification data.

130. (Withdrawn) The method of claim 129 where the cost of insurance is further based on any one or more of vehicle acceleration data, vehicle deceleration data, location data, environmental conditions data, relative speed data, or relative distance data.

131. (Previously Presented) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 where the server is further configured to calculate an insured's premium under the insured's insurance policy based on the rating factor, or a surcharge or a discount to the insured's premium, based on the rating factor.

132. (Previously Presented) The system that monitors and facilitates a review of data collected from a vehicle of claim 40 where the server is further configured to process selected vehicle data that represents one or more aspects of operating the vehicle with data that reflects how the selected vehicle data affects an insured's premium under an insured's insurance policy.

133. (Withdrawn) The system of claim 58 where the processor is further programmed to calculate a premium of an insurance policy, or a surcharge or a discount to the premium of the insurance policy, based on the vehicle data and the metadata stored in the database.

134. (Withdrawn) The system of claim 58 where the processor comprises a plurality of processors.

REMARKS

I. Priority Date

The present application claims priority back to U.S. Pat. App. No. 08/592,958, filed January 29, 1996 (Now U.S. Pat. No. 5,797,134). The Office Action relies on Colemere (U.S. Pat. No. 5,835,008) to reject all the pending claims. The Colemere patent issued from a non-provisional application filed November 27, 1996, which is almost 10 months after the filing date of the earliest priority application in the priority chain of the present application. The Colemere patent does claim priority to a provisional application filed November 28, 1995 (60/007,650). A copy of this provisional application is provided in the Fifth Supplemental Information Disclosure Statement filed herewith. However, the content of the Colemere patent is not available as "prior art" against any claims of the present application that find support in the original priority application filed January 29, 1996 unless the relevant content of the Colemere patent was also included in the November 28, 1995 provisional application.

Some content of the Colemere patent is not included in the Colemere provisional application. As one example, the Colemere patent states: "Insurance companies can use the data provided by the information system to better assess liability and adjust the payout of money accordingly, especially for situations where there was no other evidence or where fraud may occur." The Office Action relies on this passage for several claimed features. However, after review, this passage was not located in the Colemere provisional application. Therefore, the proper priority date of this disclosure for anticipation purposes is the filing date of the non-provisional application, which is after the filing date of the earliest priority application in the priority chain of the present application. To the extent the Office Action is relying on this passage of the Colemere patent for any rejection, the Colemere patent is not proper prior art against any claim of the present application that finds support in the original priority application filed January 29, 1996. Furthermore, for any other claims of the present application, the Colemere reference does not anticipate the claims for the additional reasons discussed below.

II. 35 U.S.C. § 102 Claim Rejection: Claims 40-57, 131, and 132

Claim 40 is directed to a system that monitors and facilitates a review of data collected from a vehicle that is used to determine a level of safety or cost of insurance. The system includes a processor that collects vehicle data, a memory that stores selected vehicle data, a

wireless transmitter configured to transfer the selected vehicle data to a server, and a database. The database is a storage system remote from the wireless transmitter and the memory. The database comprises records with operations for searching the records and other functions. The server is configured to generate a rating factor based on the selected vehicle data stored in the database.

Colemere discloses a system that monitors the position and motions of a driver's feet to provide information that can be used by the driver, other drivers, vehicle systems, and traffic management authorities. *See* Abstract. Insurance companies may also use the data to better assess liability and adjust the payout of money accordingly. *See* column 12, lines 20-24. The system includes sensors 500, a processor 501, and a recorder 505. The sensors 500 provide the position of the driver's feet. *See* column 15, lines 2-3. The processor 501 keeps track of the position of the feet, provides calculations, determines which information is sent to which driver presentation or vehicle system, and decides when to transfer information to remote systems. *See* column 15, lines 11-15. The recorder 505 stores the system data. *See* column 15, lines 18-21.

For Colemere to anticipate claim 40 under 35 U.S.C. § 102, Colemere must disclose every element of the claim. *See* MPEP 2131. However, Colemere does not disclose every element of claim 40. For example, Colemere does not disclose at least (1) a database operatively linked to the server to store the selected vehicle data transmitted by the wireless transmitter, the database comprising a storage system remote from the wireless transmitter and the memory comprising records with operations for searching the records and other functions; and (2) where the server is further configured to generate a rating factor based on the selected vehicle data stored in the database.

First, Colemere does not disclose the claimed database features. As one example, Colemere does not disclose the database comprising a storage system remote from the wireless transmitter and the memory. The Office Action relies on at least some of the same features of Colemere for both the claimed memory and the claimed database. Specifically, the Office Action appears to rely on the recorder 505 of Colemere (by common citations to column 15, lines 18-21 and claim 16 of Colemere) for both these claimed features. However, claim 40 recites that the database is remote from the memory, thus the recorder 505 of Colemere cannot be used for both the claimed memory and the claimed database. The Office Action's additional citations to Colemere for the claimed database (e.g., column 7, line 51 to column 8, line 14)

relate to the wireless transmission of data to remote locations. However, these passages do not provide any details that could show the claimed database at these remote locations. For example, the cited passages of Colemere are completely silent regarding a database comprising records with operations for searching the records and other functions.

Second, Colemere does not disclose the claimed rating factor generation feature. The Office Action relies on column 12, lines 19-23 of Colemere for anticipating this feature. This passage discloses that insurance companies can use the data from the foot position tracking system to better assess liability and adjust the payout of money accordingly. However, assessing liability or adjusting the payout of money is only relevant to determining fault and settling an insurance claim after an accident occurs, not for establishing a rating factor based on the risk presented by the driver. The Office Action does not explain how assessing liability or adjusting a payout of money by the insurance company would disclose generating a "rating factor" for an insured driver based on the selected vehicle data. At best, this reference in Colemere merely suggests using the data to identify who is liable for an accident (e.g., the identification of "Bob Smith" as the liable party), or whether the money to be paid out can be adjusted based on the liability determination (e.g., deciding to pay out nothing because "Bob Smith," who is insured by a different company, was deemed liable). The identification of "Bob Smith" as the liable driver or deciding not to pay his claim does not disclose generating a "rating factor" upon which to determine a cost of insurance.

In contrast, the description of the present application shows examples of "rating factors" generated from the monitored data, such as, among other examples, the safety score 856 in Figure 8 or the daytime mileage adjustment 1026, the nighttime mileage adjustment 1028, and the high risk mileage adjustment 1030 in Figure 10. *See* paragraphs 114 and 118 of the present application. In short, Colemere does not disclose a server that is configured to generate a rating factor based on the selected vehicle data stored in the database.

For at least the reasons discussed above, Applicants respectfully request the withdrawal of this rejection of claim 40. Claims 41-57, 131, and 132 are dependent claims and include all of the features of independent claim 40. Therefore, these claims are allowable for at least the same reasons as claim 40 and thus Applicants request the withdrawal of this rejection of claims 41-57, 131, and 132.

Furthermore, the pending dependent claims are allowable over Colemere for at least the following additional reasons:

A. Claim 41

Claim 41 recites that the wireless transmitter is configured to transfer the selected vehicle data retained within the memory through a pulse position protocol without varying the power level or phase of a transmitting signal. The Office Action cites various passages of Colemere for this claim, but these passages describe nothing about a "pulse position protocol" or whether Colemere's system transmits the data "without varying the power level or phase of a transmitting signal." The Office Action does not address this lack of disclosure in Colemere or even make clear that the missing description is necessarily present. Therefore, because Colemere does not disclose every feature of claim 41, Colemere cannot anticipate claim 41. If the Office maintains this rejection of claim 41 in view of Colemere, Applicants respectfully request a detailed explanation of how the cited passages disclose the use of a "pulse position protocol" or transmission of data "without varying the power level or phase of a transmitting signal."

B. Claim 42

Claim 42 recites that the wireless transmitter is compliant with a wireless transaction facilitator that throttles the transmission rates across the wireless network based on an available bandwidth of the wireless network. The Office Action cites various passages of Colemere for this claim, but these passages are completely silent regarding data transmission rates, throttling transmission rates, or throttling transmission rates based on an available bandwidth of a wireless network. The Office Action does not address or overcome this lack of disclosure in Colemere. Therefore, because Colemere does not disclose every feature of claim 42, Colemere cannot anticipate claim 42. If the Office maintains this rejection of claim 42 in view of Colemere, Applicants respectfully request a detailed explanation of how the cited passages disclose the use of a "wireless transaction facilitator" or any other component that throttles the transmission rate across the wireless network based on an available bandwidth of the wireless network.

C. Claim 43

Claim 43 includes a dynamic memory allocation processor that allocates a portion of the memory to retain a copy of a legacy version of firmware that comprises input/output instructions when an updated firmware is transferred to the memory through the wireless network. Claim 43 also recites that the dynamic memory allocation processor de-allocates the portion of the

memory when an error-free version of the updated firmware is stored or installed in the system or when a copy of the legacy version of the software is restored to control the processor of the system. The Office Action cites various passages of Colemere for this claim, but these passages are completely silent regarding firmware, the handling of legacy versions of firmware, updated firmware, or the allocation and de-allocation of memory for firmware. The Office Action does not address or overcome this lack of disclosure in Colemere. Therefore, because Colemere does not disclose every feature of claim 43, Colemere cannot anticipate claim 43. If the Office maintains this rejection of claim 43 in view of Colemere, Applicants respectfully request a detailed explanation of how the cited passages disclose allocating a portion of memory to retain a copy of a legacy version of firmware when an updated firmware is transferred to the memory, and de-allocating the allocated memory when an error-free version of the updated firmware is stored or installed in the system or when a copy of the legacy version of the software is restored to control the processor of the system.

D. Claim 44

Claim 44 recites that the wireless network comprises a mobile broadband communication network that provides full data exchange mobility up to vehicle speeds of about 100 miles per hour. The Office Action cites various passages of Colemere for this claim, but these passages are completely silent regarding "data exchange mobility" and whether Colemere's system provides full data exchange mobility up to vehicle speeds of about 100 miles per hour. The Office Action does not address or overcome this lack of disclosure in Colemere. Therefore, because Colemere does not disclose every feature of claim 44, Colemere cannot anticipate claim 44. If the Office maintains this rejection of claim 44 in view of Colemere, Applicants respectfully request a detailed explanation of how the cited passages disclose the use of a mobile broadband communication network that provides full data exchange mobility up to vehicle speeds of about 100 miles per hour.

E. Claim 45

Claim 45 recites that the wireless transmitter is compliant with two or more multiple packet architectures that are automatically detected and one or more multiple packet architectures that are automatically selected when a series of signals acknowledge that a communication or transfer of information or data may occur. The Office Action cites various passages of Colemere for this claim, but these passages are completely silent regarding whether

Colemere's system includes a transmitter that is compliant with two or more multiple packet architectures, whether any automatic architecture detection occurs, whether any automatic selection occurs, or whether any series of signals acknowledge that a communication or transfer may occur. The Office Action does not address or overcome this lack of disclosure in Colemere. Therefore, because Colemere does not disclose every feature of claim 45, Colemere cannot anticipate claim 45. If the Office maintains this rejection of claim 45 in view of Colemere, Applicants respectfully request a detailed explanation of how the cited passages disclose compliance with two or more multiple packet architectures, automatic detection of the architectures, and automatic selection of an architecture when a series of signals acknowledge that a communication or transfer of information or data may occur.

F. Claim 46

Claim 46 recites that the wireless transmitter is responsive to an in-vehicle event-driven request to transfer the selected vehicle data retained in the memory to a remote server when the wireless network indicates an available channel capacity to transfer the selected vehicle data across the wireless network. The Office Action cites various passages of Colemere for this claim, but these passages are completely silent regarding any indication of an available channel capacity to transfer selected vehicle data across a wireless network. The Office Action does not address or overcome this lack of disclosure in Colemere. Therefore, because Colemere does not disclose every feature of claim 46, Colemere cannot anticipate claim 46. If the Office maintains this rejection of claim 46 in view of Colemere, Applicants respectfully request a detailed explanation of how the cited passages disclose a wireless transmitter that is responsive to an in-vehicle event-driven request to transfer the selected vehicle data retained in the memory to a remote server when the wireless network indicates an available channel capacity to transfer the selected vehicle data across the wireless network.

G. Claim 47

Claim 47 includes a receiver tuned to receive continuously transmitted trilateral encoded signals through a bandwidth that is separate from the wireless network. The Office Action cites various passages of Colemere for this claim, but these passages are completely silent regarding "trilateral encoded signals" or transmitting signals through a bandwidth that is separate from the wireless network. The Office Action does not address or overcome this lack of disclosure in Colemere. Therefore, because Colemere does not disclose every feature of claim 47, Colemere

cannot anticipate claim 47. If the Office maintains this rejection of claim 47 in view of Colemere, Applicants respectfully request a detailed explanation of how the cited passages disclose receiving trilateral encoded signals transmitted through a bandwidth that is separate from the wireless network.

H. Claim 50

Claim 50 recites that the single-chip cellular baseband processor is Global System for Mobile Communication compliant, Code Division Multiple Access compliant, or General Packet Radio Service compliant. The Office Action does not provide any citation to Colemere for this claim. Rather, the Office Action merely asserts that the claimed feature is a "matter of design choice." Whether or not a claim may be properly rejected under the "matter of design choice" rationale is a question of obviousness under 35 U.S.C. § 103[1] and is not appropriate for an anticipation rejection under 35 U.S.C. § 102. *See, e.g.,* MPEP 2144.04. By not relying on any feature of Colemere for this claim, the Office Action essentially admits that Colemere does not disclose the claimed feature. Therefore, because Colemere does not disclose every feature of claim 50, Colemere cannot anticipate claim 50.

I. Claim 51

Claim 51 recites that the single-chip cellular baseband processor is Global System for Mobile Communication compliant and General Packet Radio Service compliant. The Office Action does not provide any citation to Colemere for this claim. Rather, the Office Action merely asserts that the claimed feature is a "matter of design choice." Whether or not a claim may be properly rejected under the "matter of design choice" rationale is a question of obviousness under 35 U.S.C. § 103[2] and is not appropriate for an anticipation rejection under 35

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[1]Even in an obviousness analysis under 35 U.S.C. § 103, the Office Action must present a "convincing line of reasoning" as to why one of ordinary skill in the art would have found the claimed feature to be obvious as a matter of design choice. *Ex parte Gunasekar*, Appeal 2009-008345 (BPAI Aug. 31, 2011). The Office Action here provides only a bare conclusory statement that the claimed feature is a matter of design choice, without providing any line of reasoning in support of this statement. The statement in the Office Action that "[t]he instant invention can function regardless of what standard of compliance is employed" is irrelevant to the question of whether the claimed feature would be anticipated as the Office Action asserts or in the alternative obvious to one of ordinary skill in the art.

[2] Furthermore, factual findings made by Office personnel are necessary underpinnings to establish obviousness. MPEP 2141.

U.S.C. § 102. *See, e.g.*, MPEP 2144.04. By not relying on any feature of Colemere for this claim, the Office Action essentially admits that Colemere does not disclose the claimed feature. Therefore, because Colemere does not disclose every feature of claim 51, Colemere cannot anticipate claim 51.

J. Claim 56

Claim 56 recites transmitting an alert to a third party when a driving incident occurs, where the driving incident comprises exceeding a speed threshold, traveling outside of a designation, or a lock out condition. The Office Action relies on column 2, lines 53-65 of Colemere for this claim. This passage discloses that other drivers will be informed of possible maneuvers of the driver based on monitored foot motions of the driver and other data that would normally indicate that a change in vehicle speed or direction may be about to take place. However, Colemere does not disclose alerting a third party based on occurrence of a speed threshold being exceeded, occurrence of travel outside of a designation, or occurrence of a lock out condition. Colemere's system notifies other drivers based on the foot position of the monitored driver. For example, if a foot is hovering over the brake pedal, then the system may assume the vehicle is about to decrease speed. However, Colemere's foot position assumptions do not indicate that the vehicle is exceeding a speed threshold, the vehicle is traveling outside of a designation, or the vehicle is in a lock out condition. Therefore, because Colemere does not disclose every feature of claim 56, Colemere cannot anticipate claim 56.

K. Claim 131

Claim 131 recites that the server is further configured to calculate an insured's premium under the insured's insurance policy based on the rating factor, or a surcharge or a discount to the insured's premium, based on the rating factor. The Office Action relies on column 12, lines 19-23 of Colemere for this claim. This passage discloses that insurance companies can use the data from the foot position tracking system to better assess liability and adjust the payout of money. For example, in the event of an accident, the insurance company could use the foot position information to help determine who may have been at fault for the accident. The determination of fault may control how much, if anything, the insurance company has to pay out. Colemere does not disclose anything about the calculation of an insured's premium under an insured's insurance policy. An insurance premium is money that is flowing into the insurance company, not money that is being paid out by the insurance company. Therefore, Colemere does not disclose

calculating an insured's premium under the insured's insurance policy based on the rating factor, or a surcharge or a discount to the insured's premium, based on the rating factor.

L. Claim 132

Claim 132 recites that the server is further configured to process selected vehicle data that represents one or more aspects of operating the vehicle with data that reflects how the selected vehicle data affects an insured's premium under an insured's insurance policy. The Office Action relies on column 12, lines 19-23 of Colemere for this claim. As discussed above in connection with claim 131, Colemere does not disclose anything regarding insurance premiums. Therefore, Colemere does not disclose processing selected vehicle data that represents one or more aspects of operating the vehicle with data that reflects how the selected vehicle data affects an insured's premium under an insured's insurance policy.

III. Related Applications/Patents

Applicants respectfully request the Examiner to review the claims and the prosecution history, including any Office Actions issued by the U.S. Patent and Trademark Office and any responses filed by Applicants, for Serial No. 08/592,958 (now U.S. Pat. No. 5,797,134); Serial No. 09/135,034 (now U.S. Pat. No. 6,064,970); Serial No. 09/571,650 (now U.S. Pat. No. 6,868,386); Serial No. 10/764,076 (a Notice of Allowance was mailed November 10, 2011); Serial No. 11/868,827; and the reexamination of U.S. Pat. No. 6,064,970 (Serial No. 90/011,252).

IV. Interview Request

If the current rejections are not withdrawn in view of the remarks above, Applicants respectfully request a telephone interview with Examiner Niquette and Primary Examiner Kyle prior to issuance of the next Office Action.

CONCLUSION

Applicants respectfully submit that the claims are in condition for allowance. If any issues remain, Applicants request that the Examiner call the undersigned attorney to expedite the prosecution of this application.

Respectfully submitted,

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I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
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November 29, 2011
Date of Deposit
Joseph S. Hanasz
Name of applicant, assignee or Registered Representative
/Joseph S. Hanasz/
Signature
November 29, 2011
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Raymond Scott Ling et al.		
Appln. No.:	12/132,487	Examiner:	Robert R. Niquette
Filed:	June 3, 2008	Art Unit:	3695
For:	VEHICLE MONITORING SYSTEM	Confirmation No.:	7812
Attorney Docket No:	12654-42		

FIFTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

This application claims priority under 35 USC §120 to the following United States patent applications: 08/592,958; 09/135,034; 09/571,650; and 10/764,076. In accordance with 37 CFR §1.98(d), copies of the references cited herein which were submitted to, or cited by, the office, in compliance with 37 CFR §1.98(a)-(c) in the earlier application may not be provided herewith. The Examiner is directed to those references cited in all Information Disclosure Statements filed in the priority United States patent applications cited above in addition to the references cited herein.

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicants hereby cite the following reference(s):

U.S. PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**NAME**
US 4,710,694	12/01/1987	Sutphin et al.
US 4,742,290	05/03/1988	Sutphin et al.
US 6,154,658	11/28/2000	Caci
US 6,236,933 B1	05/22/2001	Lang
US 6,330,499 B1	12/11/2001	Chou et al.
US 6,370,449 B1	04/09/2002	Razavi et al.
US 2002/095249 A1	07/18/2002	Lang
US 2002/152115 A1	10/17/2002	Morita et al.
US 2003/009347 A1	01/09/2003	Iwai et al.
US 2004/0083041 A1	04/29/2004	Skeen et al.
US 2004/0153362 A1	08/05/2004	Bauer et al.
US 6,810,362 B2	10/26/2004	Adachi et al.
US 2004/0217852 A1	11/04/2004	Kolls
US 6,819,986 B2	11/16/2004	Hong et al.
US 6,850,823 B2	02/01/2005	Eun et al.
US 2005/0182538 A1	08/18/2005	Phelan et al.
US 2006/0106515 A1	05/18/2006	Phelan et al.
US 2006/0111817 A1	05/25/2006	Phelan et al.
US 2006/0122749 A1	06/08/2006	Phelan et al.
US 7,774,217 B1	08/10/2010	Yager et al.
US 7,853,499 B2	12/14/2010	Czupek et al.
US 6,438,472	08/20/2002	Tano et al.

FOREIGN PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**COUNTRY**
WO 2004/040405 A2	05/13/2004	WIPO
WO 2004/040405 A3	05/13/2004	WIPO

OTHER ART – NON PATENT LITERATURE DOCUMENTS
AutoWatch – It's There When You're Not, "Are you a business or fleet owner who is interested in knowing when and how your vehicle's are being driven?," EASE Diagnostics, 2 pages.
AutoWatch – It's There When You're Not, Features, EASE Simulation, Inc., Revised January 2, 2006, copyright 1997-2006, 2 pages.
Di Genova, F. et al., "Incorporation of Wireless Communications into Vehicle On-Board Diagnostic (OBD) Systems," Sierra Research Inc., January 18, 2000, 132 pages.
Di Genova, F., " Incorporation of Radio Transponders into Vehicle On-Board Diagnostic Systems, Vol. 2 – Technical Proposal," Sierra Research, Inc., February 26, 1997, 154 pages.
Di Genova, F., " Incorporation of Radio Transponders into Vehicle On-Board Diagnostic Systems, Vol. 2 – Technical Proposal," Sierra Research, Inc., February 27, 1996, 215 pages.
Hayes, D., "Insurers, Tech Firm Team to Track Teen Drivers," NU Online News Service, April 9, printed from the internet at <http://www.propertyandcasualtyinsurancenews.com/cms/nupc/Templates/website/PrinterFriendly.aspx?{...> on April 10, 2007, 1 page.

Roberts, G., "Drive less during rush hour, get a lower insurance rate," Seattle Post-Intelligencer, March 28, 2007, printed from the internet at <http://seattlepi.nwsource.com/printer2/index.asp?ploc=t&refer=http://seatllepi.nwsource.com/transporati…> on March 30, 2007, 1 page.
SERF – System for Electronic Rate and Form Filing, printed from the internet at <http://statelogin.serff.com/serff/updateFilingView.do> on February 15, 2007, 4 pages.
Sierra Research Proposal, "Incorporation of Radio Transponders into Vehicular On-Board Diagnostic Systems, Vol. 1 – Administrative Documents," Sierra Research, Inc., February 27, 1996, 28 pages.
Sierra Research Proposal, "Incorporation of Radio Transponders into Vehicular On-Board Diagnostic Systems, Vol. 3 – Cost Proposal," Sierra Research, Inc., February 27, 1996, 18 pages.
Vehicle Monitoring Products – AutoWatch, EASE Diagnostics – The Leader in PC Automotive Diagnostic Software, EASE Simulation, Inc., Revised April 30, 2004, copyright 1997-2004, 2 pages.
U.S. Provisional Patent Application No. 60/077,650, which is the unpublished provisional parent application of U.S. Pat. No. 5,835,008 that issued, and thus became publically available, on November 10, 1998.

Applicants are enclosing Form PTO-1449 (two sheets), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). As each of the listed references is in English, no further commentary is believed to be necessary, 37 C.F.R §1.98(a)(3). Applicants respectfully request the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

Applicants also respectfully request the Examiner to review the claims and the prosecution history, including any Office Actions issued by the U.S. Patent and Trademark Office and any responses filed by Applicants, for Serial No. 08/592,958 (now U.S. Pat. No. 5,797,134), Serial No. 09/135,034 (now U.S. Pat. No. 6,064,970), Serial No. 09/571,650 (now U.S. Pat. No. 6,868,386), Serial No. 10/764,076, Serial No. 11/868,827, and reexamination of U.S. Pat. No. 6,064,970 (Serial No. 90/011,252).

U.S. Patent No. 6,064,970 is the subject of litigation in two cases pending in the U.S. District Court for the Northern District of Ohio: (1) *Progressive Casualty Insurance Company v. Safeco Insurance Company of Illinois, et al.,* Case No. 1:10-cv-01370; and (2) *Progressive Casualty Insurance Company v. Allstate Insurance Company et al.*, Case No. 1:11-cv-00082.

By submitting this Statement, Applicants are attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Applicants have calculated a processing fee in the amount of $180.00 to be due under 37 CFR §1.17(p) in connection with the filing of this Information Disclosure Statement. Applicants have enclosed a check covering this fee, or authorized charging the fee to a deposit account or credit card, as indicated in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

November 29, 2011
Date

/Joseph S. Hanasz/
Joseph S. Hanasz (Reg. No. 54,720)

FORM PTO-1449		SERIAL NO. 12/132,487	CASE NO. 12654-42
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE June 3, 2008	GROUP ART UNIT 3695
(use several sheets if necessary)	APPLICANT(S): Raymond Scott Ling et al.		CONFIRMATION NO. 7812

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	F1	US 4,710,694	12/01/1987	Sutphin et al.		
	F2	US 4,742,290	05/03/1988	Sutphin et al.		
	F3	US 6,154,658	11/28/2000	Caci		
	F4	US 6,236,933 B1	05/22/2001	Lang		
	F5	US 6,330,499 B1	12/11/2001	Chou et al.		
	F6	US 6,370,449 B1	04/09/2002	Razavi et al.		
	F7	US 2002/095249 A1	07/18/2002	Lang		
	F8	US 2002/152115 A1	10/17/2002	Morita et al.		
	F9	US 2003/009347 A1	01/09/2003	Iwai et al.		
	F10	US 2004/0083041 A1	04/29/2004	Skeen et al.		
	F11	US 2004/0153362 A1	08/05/2004	Bauer et al.		
	F12	US 6,810,362 B2	10/26/2004	Adachi et al.		
	F13	US 2004/0217852 A1	11/04/2004	Kolls		
	F14	US 6,819,986 B2	11/16/2004	Hong et al.		
	F15	US 6,850,823 B2	02/01/2005	Eun et al.		
	F16	US 2005/0182538 A1	08/18/2005	Phelan et al.		
	F17	US 2006/0106515 A1	05/18/2006	Phelan et al.		
	F18	US 2006/0111817 A1	05/25/2006	Phelan et al.		
	F19	US 2006/0122749 A1	06/08/2006	Phelan et al.		
	F20	US 7,774,217 B1	08/10/2010	Yager et al.		
	F21	US 7,853,499 B2	12/14/2010	Czupek et al.		
	F22	US 6,438,472	08/20/2002	Tano et al.		

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	F23	WO 2004/040405 A2	05/13/2004	WIPO		
	F24	WO 2004/040405 A3	05/13/2004	WIPO		

EXAMINER INITIAL		OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, 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.)
	F25	AutoWatch - It's There When You're Not, "Are you a business or fleet owner who is interested in knowing when and how your vehicle's are being driven?," EASE Diagnostics, 2 pages.
	F26	AutoWatch - It's There When You're Not, Features, EASE Simulation, Inc., Revised January 2, 2006, copyright 1997-2006, 2 pages.
	F27	Di Genova, F. et al., "Incorporation of Wireless Communications into Vehicle On-Board Diagnostic (OBD) Systems," Sierra Research Inc., January 18, 2000, 132 pages.

EXAMINER	DATE CONSIDERED

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.

FORM PTO-1449	SERIAL NO. 12/132,487	CASE NO. 12654-42
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT	FILING DATE June 3, 2008	GROUP ART UNIT 3695
(use several sheets if necessary)	APPLICANT(S): Raymond Scott Ling et al.	

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, 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.	
	F28	Di Genova, F., " Incorporation of Radio Transponders into Vehicle On-Board Diagnostic Systems, Vol. 2 - Technical Proposal," Sierra Research, Inc., February 26, 1997, 154 pages.
	F29	Di Genova, F., " Incorporation of Radio Transponders into Vehicle On-Board Diagnostic Systems, Vol. 2 - Technical Proposal," Sierra Research, Inc., February 27, 1996, 215 pages.
	F30	Hayes, D., "Insurers, Tech Firm Team to Track Teen Drivers," NU Online News Service, April 9, printed from the internet at <http://www.propertyandcasualtyinsurancenews.com/cms/nupc/Templates/website/PrinterFriendly.aspx?{…> on April 10, 2007, 1 page.
	F31	Roberts, G., "Drive less during rush hour, get a lower insurance rate," Seattle Post-Intelligencer, March 28, 2007, printed from the internet at <http://seattlepi.nwsource.com/printer2/index.asp?ploc=t&refer=http://seatllepi.nwsource.com/transporati…> on March 30, 2007, 1 page.
	F32	SERF - System for Electronic Rate and Form Filing, printed from the internet at <http://statelogin.serff.com/serff/updateFilingView.do> on February 15, 2007, 4 pages.
	F33	Sierra Research Proposal, "Incorporation of Radio Transponders into Vehicular On-Board Diagnostic Systems, Vol. 1 – Administrative Documents," Sierra Research, Inc., February 27, 1996, 28 pages.
	F34	Sierra Research Proposal, "Incorporation of Radio Transponders into Vehicular On-Board Diagnostic Systems, Vol. 3 – Cost Proposal," Sierra Research, Inc., February 27, 1996, 18 pages.
	F35	Vehicle Monitoring Products - AutoWatch, EASE Diagnostics - The Leader in PC Automotive Diagnostic Software, EASE Simulation, Inc., Revised April 30, 2004, copyright 1997-2004, 2 pages.
	F36	U.S. Provisional Patent Application No. 60/077,650, which is the unpublished provisional parent application of U.S. Pat. No. 5,835,008 that issued, and thus became publically available, on November 10, 1998.

EXAMINER	DATE CONSIDERED

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.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: November 29, 2011 Name: Joseph S. Hanasz, Reg. No. 54,720 Signature: /Joseph S. Hanasz/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Ling, et al.			
Appln. No.:	12/132,487	Examiner:	Robert R. Niquette
Filed:	June 3, 2008	Art Unit:	3695
For:	VEHICLE MONITORING SYSTEM	Conf. No.:	7812
Attorney Docket No.: 12654-42			

PETITION AND FEE FOR EXTENSION OF TIME (37 CFR § 1.136(a))

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is a petition for an extension of the time to respond to the Office Action dated June 29, 2011 for a period of 2 months.

Applicant is: ☐ small entity (per 37 CFR 1.27) ☒ other than small entity

	Extension Months	Other Than Small Entity	Small Entity
☐	One Month	$150.00	$75.00
☒	Two Months	$560.00	$280.00
☐	Three Months	$1,270.00	$635.00
☐	Four Months	$1,980.00	$990.00
☐	Five Months	$2,690.00	$1,345.00

Payment Method:

☐ Payment by credit card in the amount of $_____ to cover the fees listed above. Form PTO-2038 is enclosed for this purpose.

☒ The Commissioner is hereby authorized to charge $560.00 to cover the fees listed above to Deposit Account No. 23-1925.

☒ The Commissioner is hereby authorized to charge any deficiencies in fees or credit overpayment to Deposit Account No. 23-1925.

Respectfully submitted,

Dated: November 29, 2011

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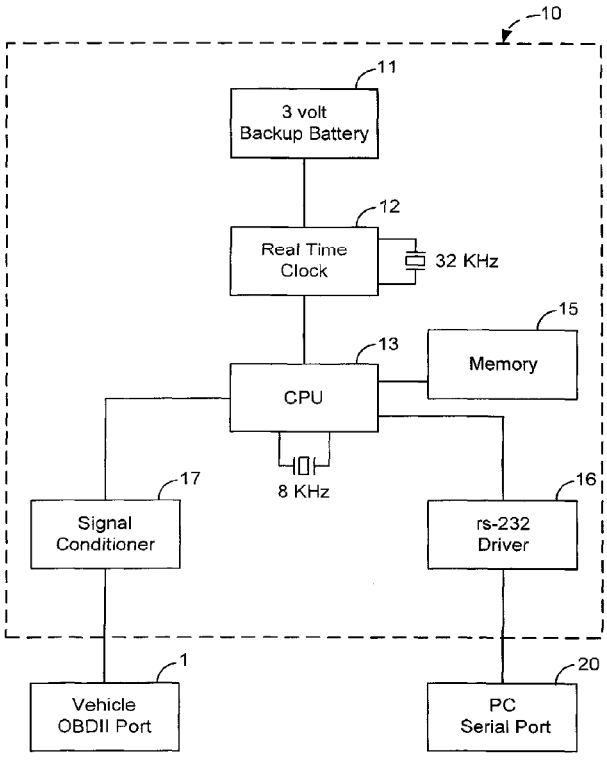
[Continued on next page]

(54) Title: MONITORING VEHICLE OPERATION THROUGH ONBOARD DIAGNOSTIC PORT



(57) Abstract: An onboard diagnostic memory module (10) is configured to plug into the OBD II port (1) and has a real-time clock (12) and power supply (11), a microprocessor (13) powered from a standard OBD II (1), microprocessor operating firmware, and an attached memory (7 MB) (15). In operation, the onboard diagnostic memory module (10) is preprogrammed with data collection parameters through microprocessor firmware by connection (20) to a computer, such as a PC, having programming software for the module firmware. Thereafter, the onboard diagnostic memory module (10) is moved into pin connection with the OBD II port (1) of a vehicle. Data is recorded on a "trip" basis, preferably using starting of the engine to define the beginning of the trip and stopping of the engine to define the end of the trip. Intelligent interrogation occurs by interpretive software from an interrogating computer to retrieve a trip-based and organized data set.

WO 2004/040405 A2

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

MODULE FOR MONITORING VEHICLE OPERATION THROUGH ONBOARD DIAGNOSTIC PORT

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application claims priority from US Patent Application Serial No. 10/281,330 filed October 25, 2002 by the named inventors herein and entitled Module for Monitoring Vehicle Operation through Onboard Diagnostic Port.

STATEMENT AS TO RIGHTS TO INVENTIONS MADE UNDER FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] NOT APPLICABLE

REFERENCE TO A "SEQUENCE LISTING," A TABLE, OR A COMPUTER PROGRAM LISTING APPENDIX SUBMITTED ON A COMPACT DISK.

[0003] NOT APPLICABLE

[0004] This invention relates to be on board recordation of operating data from a motor vehicle into a dedicated onboard diagnostic port memory module. More specifically, a "trip oriented" data recordation protocol is actuated during vehicle operation when the dedicated onboard diagnostic port memory module is connected to the onboard diagnostic port of the vehicle. The dedicated onboard diagnostic port memory module can be preprogrammed before placement to the vehicle as to certain critical data parameters to be monitored, placed in vehicle for monitoring over an extended period of time, and finally intelligently interrogated to discharge the recorded data. A detailed record of vehicle and driver operation of a vehicle can be generated from the recorded data. .

BACKGROUND OF THE INVENTION

[0005] Davis Instruments of Hayward, CA has pioneered the onboard recordation of data through a module known as "Drive Right." This device requires custom installation on a vehicle by a skilled mechanic, including a device for monitoring driveshaft rotation and the like. Recordation of data includes counters indicating vehicle operation within certain speed bands and acceleration and deceleration parameters. Purchase and operation of the device requires a motivated buyer willing to pay the cost of the unit as well as to accept the

inconvenience and additional expense of vehicle installation. This device finds its highest applicability with owners of "fleets" of automobiles.

[0006] So-called Onboard Diagnostic Ports are known and indeed required by The Environmental Protection Agency (EPA). The current device is known as Onboard Diagnostic Port II (hereinafter OBD II). The device is required to enable certain data to be sensed when the OBD II is monitored, and that data is specified by The Society of Automotive Engineers Vehicle Electrical Engineering Systems Diagnostic Standards Committee. The physical configuration of the OBD II output plug is specified (SAE J1962), containing a pin array which is to be electronically monitored. What is not mandated is the language of data transmission, and which pins are to emit the data. The OBD II mandated data to be sensed is contained in a voluminous catalog.

[0007] Surprisingly, there are four discrete "languages" (and corresponding pin arrays) now extant in which these OBD II ports now emit data. Those languages are SAE J1850 (GM, Ford), ISO, ISO 9141 (Chrysler and most foreign cars) and KWP 2000 (many 2001 and later foreign cars). For each of the so-called languages, the standard OBD II port has different pins emitting different information in different formats. As this international application is filed, a new language known as CAN (controller area network) protocol is specified in ISO 15765-4. Apparently, this will be the only protocol allowed after 2007.

[0008] The OBD II ports are designed to be connected with standard diagnostic equipment in modern automobile repair shops. It is known to have diagnostic equipment which upon being plugged into the OBD II port, determines the "language" of a particular port, properly addresses the pin array, and finally receives and interprets for the mechanic the specified data required of the OBD II port. It is known that manufacturers have proprietary codes for correspondingly proprietary operating parameters and parts of specific vehicles. Further, it is common to load into standard diagnostic equipment the labels specified by the Diagnostic Standards Committee. When the standard diagnostic equipment detects the data required of the OBD II port, the standard diagnostic equipment gives that particular data a display label which corresponds to the data mandated by the Diagnostic Standards Committee.

[0009] OBD II ports are, in some circumstances, monitored by having a computer (for example a laptop or notebook computer) attached to the ports while the vehicle is operating. Typically, a mechanic makes the computer connection, and thereafter drives or runs the vehicle to collect the desired data. Either during operation or once the data is collected, the computer displays the collected data in a programmed format.

[0010] As any driver of a modern vehicle can attest, such vehicles have warning systems including malfunction indicator lamps. In the usual case the malfunction indicator lamps are generally uninformative. For example, a typical display of such a malfunction indicator lamps is "Check Engine." Unfortunately, many of these lights are programmed so that they can be turned off only by a dealer. Often the lights are triggered by events that cannot be subsequently determined by the dealer when the light is reset. In short, these lights can be and often are a source of irritation. Even more important, sometimes the lights are activated by very routine automotive conditions, such as a dirty air filter. When such conditions occur, the driver must go to the dealer and pay a "diagnostic fee," have the dealer correct the conditions (for example replace the dirty air filter), and finally retrieve the vehicle from the dealer. A simplification in the operation of such malfunction indicator lamps would be ideal.

[0011] The above enumeration of the background and the related problems to the background is specific to the invention disclosed. The reader will recognize that frequently invention can include recognition of the problem(s) to be solved. The background set forth above was selected after the preferred embodiment of this invention was developed.

BRIEF SUMMARY OF THE INVENTION

[0012] An onboard diagnostic memory module is configured to plug into the OBD II port and has a real-time clock and power supply, a microprocessor powered from the OBD II port, microprocessor operating firmware, and an attached memory (currently 4 MB). In operation, the onboard diagnostic memory module is preprogrammed with data collection parameters through microprocessor firmware by connection to a computer, such as a PC, having programming software for the module firmware. Thereafter, the onboard diagnostic memory module is moved into pin connection with the OBD II port of a vehicle. Data is recorded on a "trip" basis, preferably using starting of the engine to define the beginning of the trip and stopping of the engine to define the end of the trip. EPA-mandated operating parameters are monitored, including vehicle speed. From the monitored vehicle speed, hard and extreme acceleration and deceleration parameters, as well as distance traveled, is determined and logged on a trip basis. When loaded with a typical data set from connection to a vehicle, which can be up to 300 hours of trip operation (about one month of average vehicle operation), the onboard diagnostic memory module is unplugged from the vehicle and plugged into the RS 232 port of a PC or other computer. Alternatively, the vehicle installed onboard diagnostic memory module can be intelligently interrogated in a permanent position of installation in a vehicle. The intelligent interrogation occurs by interpretive software from

an interrogating PC or palm sized personal digital assistant (PDA) to retrieve a trip-based and organized data set including hard and extreme acceleration and deceleration, velocity (in discrete bands), distance traveled, as well as the required EPA-mandated operating parameters. Telltale printouts can be generated highlighting operator habits (such as hard and extreme deceleration indicating that the driver is following too close), as well as the critical vehicle operating parameters. An extraordinary event log is maintained of densely recorded data based on (probable) accident parameters. Programming of the module can include resetting the malfunction indicator lamps of the vehicle. Installation of the module plugged to the OBD II port does not require vehicle modification.

[0013] The device is ideal for monitoring driver habits. The generated plots of vehicle speed bands with respect to time with overlying hard and extreme acceleration and deceleration parameters generates a unique telltale of driver habit including the "following too close." Further, the module is capable of operating on a driver-assigned basis. For example, the driver can be required to connect the module to any vehicle he operates with the module faithfully recording the cumulative operating parameters of the particular vehicle(s), despite language changes at the OBD II ports.

[0014] Further, the device can be used to greatly facilitate repair. For example, where a vehicle owner complains of intermittent vehicle behavior, such as a vehicle stalling due to a sticking valve, the module can be plugged into the vehicle for a specific period of time while the vehicle undergoes normal operation by the operator. At the end of a preselected period of time, the module can be returned to a diagnosing computer, such as a PC, the problem determined, and the repair made. In determining the problem, the memory of the operator can be used to pinpoint the particular trip and the probable time of the intermittent malfunction. The mechanic can be directed to the particular data set containing the vehicle operating parameters to diagnose and repair the intermittent vehicle behavior.

[0015] The repair simplifications are manifold. For example, trip data sets can be correlated with the memory of the driver. The driver can then supplement the recorded information with his memory to fully reproduce the exact conditions under which a malfunction occurred. Further, where simple malfunction conditions exist, such as dirty air filters, they may be immediately identified and repaired by facilities having less than full vehicle repair capability. A dirty air filter may be replaced at the local gas station. Where a malfunction indicator light such as "Check Engine" is triggered by the dirty air filter, the vehicle operator can reset the malfunction indicator light using the programmed module.

[0016] Even more complicated repair scenarios are simplified. For example, when the operating data is downloaded to a computer, such as a PC, , data coincident with a complicated malfunction can be isolated, and thereafter transmitted over the Internet to a diagnostic program specific to the vehicle involved. Thereafter, what is ordinarily a complicated diagnosis of vehicle malfunction can be rapidly reported to the mechanic or even to the vehicle operator. For example, for vehicles having custom parts with the OBD II port emitting custom codes, the codes can be sent over the Internet for diagnosis of the particular custom malfunction occurring.

[0017] Both the vehicle operator and the vehicle owner can benefit from the device. For example, where a company-owned vehicle is used by an operating employee required to submit expense reports, the combination of the trip-oriented data recordation (including time and trip mileage) with owner- and employee-generated information provides an uncontrovertable record of employee and vehicle operation. Further, where an accident occurs, the module can provide important corroboration to vehicle operating parameters which might otherwise be contested questions of fact related to the accident.

[0018] The computer, such as a PC, can be interactive with the onboard diagnostic memory module. For example, if the operating firmware in the onboard diagnostic memory module contains a bug, correction can occur. Upon connection to the Internet, the computer, such as a PC, can download a discrete program operable on a computer connected to the onboard diagnostic memory module. When the program is downloaded to the computer, it then runs to replace the firmware data set in the onboard diagnostic memory module to either remedy the malfunction or install and upgrade. Further, where enhanced operation of the onboard diagnostic port memory module is required for new vehicles, Internet firmware replacement can rapidly provide the required enhanced operation.

[0019] The organization of the collected data into "trip"-oriented data sets is particularly useful. In utilizing the system clock to time and date stamp the collected data with respect to a trip, the particularly useful organization of vehicle speed, acceleration and deceleration, and operating parameters can be collected. This organization, is extraordinarily useful, whether or not the module is removable from the vehicle. For example, provision may be made to download a permanently installed module using the infrared communication feature built into most hand held personal digital assistants (PDAs).

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Fig. 1 is a picture of the driver console of an automobile showing an expanded view of the OBD II port, which port is typically under the dashboard near the steering column;

[0021] Fig. 2 is an illustration of the onboard diagnostic port being connected to a standard PC;

[0022] Fig. 3A and 3B illustrate respectively the onboard diagnostic port memory module being connected to the onboard diagnostic port of an automobile and the connected onboard diagnostic port memory module with an illustrated firmware operated indicator lamp displayed from the module;

[0023] Fig. 4 is a schematic of the onboard diagnostic port memory module indicating the backup battery, clock, the memory, signal conditioner for reading the vehicle onboard diagnostic port, and finally the RS 232 driver for connection to a PC serial port;

[0024] Figs. 5A - 5E are wiring schematics of the onboard diagnostic port memory module used with this invention with:

[0025] Fig. 5A illustrating the microcontroller section;

[0026] Fig. 5B illustrating the physical interface to the vehicle for the PWM andVPW protocols;

[0027] Fig. 5C illustrating the physical interface to the vehicle for the ISO mode;

[0028] Fig.5D illustrating the optional IrDA interface allowing the module to communicate with a personal digital assistant (PDA); and,

[0029] Fig.5E illustrating the actual connection to the vehicle;

[0030] Fig. 6 is a firmware logic diagram of the firmware within the onboard diagnostic port memory module for recordation of data during vehicle operation;

[0031] Fig. 7 is a software logic diagram between the onboard diagnostic port memory module and a connected PC for both furnishing the module with settings and downloading data for analysis; and,

[0032] Figs. 8A through 8H are representative plots and tables of the recorded data where:

[0033] Fig. 8A is a plot of speed against elapsed time indicating normal or conservative driving;

[0034] Fig. 8B is a plot of speed against elapsed time indicating abnormal, risk incurring driving with hard and extreme braking and accelerating;

[0035] Fig. 8C is a tabular presentation all of time, speed, engine speed, coolant temperature, engine load, and battery voltage useful in diagnosing engine operation;

[0036] Fig. 8D is a tabular presentation of elapsed time vs. speed from which acceleration and deceleration as well as distance traveled can be determined;

[0037] Fig. 8E is a graphical plot of coolant temperature vs. elapsed time for diagnosing engine temperature and thermostat operation;

[0038] Fig. 8F is a tabular plot of elapsed time, speed, engine speed, engine load, and coolant temperature;

[0039] Fig. 8G is a graphical plot of data triggering operation of an accident log wherein operating parameters are stored in a first in, last out stack for preserving data indicating a possible accident and,

[0040] Fig. 8H is a tabular presentation of the data triggering operation of the accident log.

DETAILED DESCRIPTION OF THE INVENTION

[0041] Referring to Fig. 1, a driver console C is shown. An onboard diagnostic port 1 is typically configured under the dashboard adjacent to the steering column.

[0042] Referring to Fig. 2, of an onboard diagnostic port memory module 10 has a 8 pin connector port 11 with a 9 pin connector 12 and power supply 13 for connection to the serial port of a PC 14. At PC 14 data can be conventionally printed, transmitted to the Internet, or otherwise processed. As will be understood, this invention also contemplates reading of data using IrDA ports.

[0043] Referring to Fig. 3A and 3B, the onboard diagnostic port memory module 10 of this invention is illustrated as being plugged into OBD II port 1. In the plugged-in disposition, a firmware operated indicator light 2 can be used for indicating any number of selected functions including the presence of communication between the module 10 and the OBD II port.

[0044] Referring to Fig. 4, a schematic of onboard diagnostic port memory module 10 is illustrated. Three-volt battery 11 operates real-time clock 12 for the purpose of time stamping data. The time signal is given to CPU 13. When the module is connected to the OBD II port, signal conditioner 17 recognizes the particular language emitted by the vehicle and configures module 10 to receive data in the SAE J1850 (GM, Ford), ISO, ISO 9141 (Chrysler and most foreign cars) ,KWP 2000 and CAN (many 2001 and later foreign cars) formats. Data is then channeled directly to memory 15. As of the filing of this international application, ISO 15765-4 known as CAN is an addition to the list of languages.

[0045] Continuing with Fig. 4, programming and downloading of onboard diagnostic port memory module 10 occurs through PC serial port 20 connection and RS 232 driver 16.

During programming, firmware within CPU 13 has parameters set for data recordation. During downloading, inquiry is made through the RS 232 driver for CPU 13 to download memory 15.

[0046] Having set forth in the general configuration of onboard diagnostic memory module 10, circuitry for use with this device can be understood with respect to Figs 5A through 5E.

[0047] There are five major sections to the design of the onboard diagnostic memory module 10 hardware. These are the Microcontroller Section shown in Fig.5A, the PWM/VPW Physical Layer shown in Fig.5B, the ISO Physical Layer shown in Fig.5C, the Optional IrDA Interface shown in Fig.5D, and the J1962 Interface shown in Fig.5E.

[0048] As of this writing, the onboard diagnostic memory module design contains two printed circuit boards (PCBs), which are stacked on top of each other and connected via a single connector. The "top" board contains sections in Figs 5A, B, C, and D above, and the "bottom" board contains section in Fig.5E.

[0049] At present, there are two variations of the onboard diagnostic memory module design: the "basic" version and the "advanced" version. The basic version runs on 5.0V and has a smaller serial flash memory while the advanced version runs on 3.3V and has a larger serial flash memory. Please refer to the schematics for each of the versions.

[0050] Bother versions (basic and advanced) support all four types of vehicle protocols using the same hardware: PWM, VPW, and the two variants of ISO. Each section will be described in the sections below.

[0051] The microcontroller section forms the heart of the design.

[0052] U8 is an ATMEL ATmega 16L microcontroller, with on board flash memory, SPI communications bus, and a UART. The microcontroller is supplied with an 8 MHz clock by crystal X2. The microcontroller is powered from 5.0V in the "basic" version of the product, and 3.3V in the "advanced" version.

[0053] U2 is an ATMEL serial flash memory chip where the trip log data is stored. The basic version of the onboard diagnostic memory module uses an AT45D011 1 mega-bit memory, while the advanced version uses an AT45DB041B 4 mega-bit part. The serial flash memory is powered from 5.0V in the basic version and 3.3V in the advanced version.

[0054] U5 is a Real Time Clock (RTC), which provides a non-volatile time source for the product. When no power is applied to the onboard diagnostic memory module, the RTC is powered from 3V battery BT1 (see J1962 Interface Section). When the onboard diagnostic memory module is powered, power to the RTC is supplied from either 5.0V (basic) or 3.3V

(advanced). The clock communicates to the microcontroller (U8) via a two-wire communications bus.

[0055] U4 is a RS232 level shifter to provide communications with a PC. U4 has an integral charge pump to generate the proper voltage levels and operates from either 5.0V (basic) or 3.3V (advanced). The reader will also understand that USB modules can be utilized for communication with computers, such as PCs.

[0056] JP1 is a connector that provides the link to the PC when the onboard diagnostic memory module 10 is not plugged into the vehicle. There are three types of signals provided on this connector: a) external power, b) RS232 to PC, and c) SPI bus for development use. Note that diode D2 isolates the external power source from the vehicle power source if they are connected at the same time. The pin assignments are as follows:

[0057]	PIN	SIGNAL
[0058]	1	External Power (7 to 15V)
[0059]	2	RS232 Output (TXD)
[0060]	3	RS232 Input (RXD)
[0061]	4	SPI (MOSI)
[0062]	5	SPI (MISO)
[0063]	6	SPI (SCK)
[0064]	7	Microcontroller Reset
[0065]	8	Ground

[0066] The PWM/VPW Physical Layer (see Fig.5B) provides the physical interface to the vehicle for the PWM and VPW protocols. Common parts are shared between the implementation of the two protocols in order to minimize cost and complexity.

[0067] U6A is an Operational Amplifier (Op Amp), which drives the J1850 Plus line for both the PWM and VPW modes. It is configured as a non-inverting amplifier with a gain of four (4) and the input on pin 3. Q1 is a NPN transistor and is used to provide a high current drive source.

[0068] The components R6, R8, C16, and R16 create a wave shaping network that drive the input of U6A (for the values of these components see the BOM for the basic and advanced models). The input of this network is the output of microcontroller U8 pin 14, PWM/VPW TXD. In the basic mode, this voltage is 5.0V when high and in the advanced model it is 3.3V when high. The output of the network (i.e. the input to U6 pin 3) is 2.0V in VPW mode and 1.25V in PWM mode, resulting in a signal on the J1850 Plus line of 8.0V in VPW mode and 5.0V in PWM mode.

[0069] Q2 is a NPN transistor that forms the drive for the J1850 Minus line. In PWM mode, Q2 is actively driven on and off in complement to Q1 thus creating a differential signal between the J1850 Plus and J1850 Minus lines. In VPW mode, Q2 is forced off, leaving the J1850 Minus line disconnected.

[0070] R7 and R14 form a bias network for PWM mode. If undriven or disconnected from the vehicle, the J1850 Plus line will be pulled low and the J1850 Minus line will be pulled high (5.0V).

[0071] R15, C17, and Q3 create a termination circuit for VPW mode. In VPW mode, Q3 is turned on thus enabling the termination. In PWM mode, Q3 is left off.

[0072] U6B and associated circuitry form a differential receiver for PWM mode. R18 provides approximately 10% hysteresis for noise immunity. Q4 provides a level shifter and inverter for the output signal that goes to the microcontroller U8 pin 16 (PWM/VPW RXD).

[0073] U6C and associated circuitry form a receiver for VPW mode. The reference value of 3.75V is used to compare against the VPW signal (which is nominally between 8V and 0V). R23 provides about 10% hysteresis for noise immunity, and Q5 creates a level shifter and inverter for the output signal, which is logically "OR'ed" with the signal from Q4 via an open collector configuration.

[0074] In PWM mode, Q5 is disabled (MODE3 forced low) and the signal to the microcontroller is derived from Q4. In VPW mode, Q4 is disabled (MODE2 forced low) and the signal to the microcontroller is derived from Q5.

[0075] The ISO Physical Layer (see Fig.5C) provides the physical interface to the vehicle for the ISO mode.

[0076] Transistor Q6 (NPN) forms the drive for the ISO L line and Q7 forms the drive for the ISO K line.

[0077] U6D and associated circuitry form a receiver for ISO mode. The reference value of approximately 6.0V is used to compare against the ISO K signal (which is nominally between 12V and 0V). R36 provides about 10% hysteresis for noise immunity, and Q8 creates a level shifter and inverter for the output signal, which is connected to the microcontroller U8 pin 24.

[0078] JP2 is a socket (row of plated through holes), which provides the connection to the bottom board. The pin assignments are as follows:

	PIN	SIGNAL
[0079]		
[0080]	1	5.0V Logic Supply
[0081]	2	12V (vehicle battery voltage)
[0082]	3	ISO K

[0083]	4	ISO L
[0084]	5	J1850 Plus
[0085]	6	J1850 Minus
[0086]	7	RTC backup battery BT1
[0087]	8	Ground
[0088]	9	Battery voltage analog input
[0089]	10	3.3V Logic Supply

[0090] The Optional IrDA Interface (see Fig.5D) allows the onboard diagnostic memory module to communicate with a Personal Digital Assistant (PDA) using the wireless IrDA industry standard.

[0091] U10 is an "ENDEC" (Encoder/Decoder) chip that converts the serial data from the microcontroller U8 into a pulse train suitable for IrDA communication. U10 is supplied with a clock source equal to 16 times the serial baud rate from U8 pin 16, XCLK.

[0092] U11 is an IrDA transceiver that interfaces directly to the IR transmitter (LED D5) and the IR receiver (PIN diode D6).

[0093] If populated, both U10 and U11 are supplied from 3.3V in the advanced model, and 5.0V in the basic model.

[0094] The J1962 Interface (see Fig.5E) is the actual connection to the vehicle and is located entirely on the bottom board.

[0095] P1 is the OBDII connector that interfaces with the vehicle:

	PIN	SIGNAL
[0096]		
[0097]	1	NC
[0098]	2	J1850 Plus
[0099]	3	NC
[0100]	4	NC
[0101]	5	Ground
[0102]	6	CAN high
[0103]	7	ISO K
[0104]	8	NC
[0105]	9	NC
[0106]	10	J1850 Minus
[0107]	11	NC
[0108]	12	NC
[0109]	13	NC

[0110]	14	CAN low
[0111]	15	ISO L
[0112]	16	Vehicle Power

[0113] Resistors R2 and R4 form a voltage divider network (18.0 Vin = 2.56 Vout) that is used to sense the vehicle battery voltage by the microcontroller U8.

[0114] Diode D3 is used to isolate the vehicle power source from the external power source (if connected).

[0115] D4 is a Transient Voltage Suppressor (TVS) that is used to prevent voltage surges on the vehicle battery bus from damaging the onboard diagnostic memory module.

[0116] BT1 is a primary (non rechargeable) 3V battery cell that is used as the backup power for the RTC U5.

[0117] U1 is a 5V regulator used to power the onboard diagnostic memory module circuitry.

[0118] C38 is a 0.1F "supercap" that is used to provide adequate hold up time when the onboard diagnostic memory module is unplugged from the vehicle. This is required so that the microcontroller has enough time to program the flash memory and perform an orderly shutdown before power is lost.

[0119] U13 is a 3.3V regulator that is only used in the advanced model. If the unit is a basic mode, R45 is installed instead of U13.

[0120] JP3 is the connector the top board that provides the following signals: (Note that this JP3 controller may also include pins for CAN high and low.)

	PIN	SIGNAL
[0121]		
[0122]	1	5.0V Logic Supply
[0123]	2	12V (vehicle battery voltage)
[0124]	3	ISO K
[0125]	4	ISO L
[0126]	5	J1850 Plus
[0127]	6	J1850 Minus
[0128]	7	RTC backup battery BT1
[0129]	8	Ground
[0130]	9	Battery voltage analog input
[0131]	10	3.3V Logic Supply

[0132] Referring to Fig. 6, a representative firmware logic diagram is illustrated. The reader will understand that the firmware can be upgraded from time to time by the expedient

of having PC 14 Internet connected, downloading a program having a new firmware configuration from a web site, running the program in the PC to replacing the firmware in the unit. This type of protocol is preferred as inconsistencies in direct transfer of such a program from the web could interfere with the operation of the onboard diagnostic memory module. As of the writing of this application, the outlined firmware is preferred.

[0133] First, the onboard diagnostic port memory module is connected to the OBD II port of the host vehicle and detection of the connection made at 311. Sequentially, each protocol GM [VPW], Ford [PWM], ISO, and Advanced ISO [KWP] is tried at 312 from the onboard diagnostic port memory module to the automobile through the OBD II port 1. When the language of the vehicle is identified, both the pin array and the parameters necessary for reading data passing through the pin array are selected. Data is capable of being read and retained.

[0134] Second, onboard diagnostic port memory module 10 must determine the starting of the vehicle. In the protocol used here, where the engine has RPMs above 400, it is presumed that the vehicle is operating. Unfortunately, with at least some vehicles where constant interrogation is made for determining engine revolutions, battery failure can occur. Such battery failure results from the automobile computer being awakened, interrogating the engine for revolutions, and thereafter returning to the standby state. To avoid this effect, vehicle voltage is monitored. Where a starter motor is utilized, vehicle voltage change occurs. Only when vehicle voltage has changed by a predetermined amount, for example down two volts, is interrogation made of engine RPMs. The RPMs are chosen to be greater than those imposed by the starter motor but less than idling speed. Thus, vehicle voltage is detected at 314 and where voltage detection occurs, RPMs are measured at 315. This causes the storage of trip start data at 316.

[0135] Third, there is always the possibility of onboard diagnostic module 10 being disconnected from OBD II port 1, say where a driver chooses to have an unmonitored trip. In this case, tampered time 317 is recorded responsive to the drop in voltage caused by the disconnection. However, since engine revolutions will not be monitored in this instance, the data recorded will indicate onboard diagnostic module 10 disconnection from OBD II port 1.

[0136] Referring to Fig. 6, monitoring of vehicle speed occurs on a once-a-second basis at speed monitors 320. Thereafter, using previously recorded speeds, acceleration and deceleration is computed at 322. This data is temporarily stored at 324. Normal speed is recorded at 5-second intervals. Therefore, counter 325 asks each fifth speed count to be

stored. Further, speed counts one through four are discarded during normal module operation at 326.

[0137] Returning to the calculation of acceleration and deceleration at 322, a probable accident log can be maintained. Specifically, and where deceleration has a threshold greater than certain preset limits, and the vehicle speed goes to zero, a log of these unusual events can be maintained. All vehicle events occurring within the previous 20 seconds are remembered in a stack. Data stored in this stack can be subsequently accessed.

[0138] It remains for the end of trip to be detected. Specifically, and at the end of each 5-second interval, engine speed is monitored at 327 to determine whether RPMs are above a certain preset limit, here shown as 400 RPMs. This speed is faster than that speed generated by the starter motor but less than the normal speed of the engine when it is idling. If engine speed in the preset amount (over 400 RPMs) is detected, the recordation cycle continues. If the speed is not detected, it is presumed that the trip is ended and the end-of-trip data is stored at 328.

[0139] Referring to Fig. 7, the software logic diagram is illustrated. The onboard diagnostic port memory module is schematically illustrated having data 410 and settings 411. A communication port 420 is shown communicating between onboard diagnostic module 10 and personal computer 14. Upon the initial connection to the PC, serial port identification 422 is determined. Thereafter, three discrete functions can be actuated with in onboard diagnostic module 10.

[0140] First, the onboard diagnostic module memory can be cleared at 425.

[0141] Second, the onboard diagnostic module memory can be downloaded at 426. This can include data viewing 427 of the trip log 428, activity log 429, the accident log 430, and the vehicle trouble log 431. Provision is made to store the accumulated data at 432 and to recover previously stored data at 433. Additionally, provision is made to label the onboard diagnostic module unit number, unit name, and particular vehicle utilized. For example, onboard diagnostic memory module 10 could be assigned to a particular driver, and that driver could have a choice of vehicles to operate. Each time the driver plugged onboard diagnostic memory module 10 into a vehicle to be operated, vehicle identity would be recorded at 440 along with the driver's identification.

[0142] Third, the onboard diagnostic port memory module can be configured at 450. Such configuration can include speed bands 451, deceleration or brake bands 452, acceleration bands 453, operational parameters 454, and finally the required time stamping clock setting at 455.

[0143] Referring to Fig. 8A, a plot of a car trip is presented. Elapsed time of the trip is plotted against vehicle speed. By way of example, deceleration or brake bands 452 and acceleration bands 453 can be chosen to be 0.28 gravity fields for hard braking and 0.48 gravity fields for extreme braking. Speed bands can likewise be selected. A typical selection could include 75 miles per hour and above [band I], 60 to 75 miles per hour [band II], 45 to 60 miles per hour [band III], and 0 to 45 miles per hour [band IV]. As can be seen in Figs. 8A and 8B, such information can be graphically presented.

[0144] The particular utility of superimposing hard and extreme braking on the display data is apparent with respect to Figs. 8B. Specifically, the data represented is commonly associated with the driving habit known as "following too close." As can be seen in the plot, numerous braking incidents are recorded in the hard and extreme categories. Additionally, the drive is indicating abuse of the vehicle with rapid accelerations.

[0145] Referring to Fig 8C, a data plot is shown listing elapsed time relative to speed, engine speed, cooling temperature, engine load, and battery voltage.

[0146] Referring to Fig 8D, a plot of elapsed time vs. speed in miles per hour is illustrated. The reader will understand that from such data, both acceleration and deceleration as well as the distance traveled can be determined. In actual practice, speed traveled is frequently recorded. From the frequent recordings, accelerations and decelerations as well as distance traveled are computed, the former by differentiation and the latter by integration. Once this data is accumulated, intermediate velocity points can be discarded with the remaining velocity points being maintained in a table such as fat shown in Fig 8D.

[0147] Referring to Fig 8E, a plot of cooling temperature vs. time for a trip is illustrated. In this plot, possible malfunction of an automobile thermostat is illustrated.

[0148] Referring to Fig 8F, a tabular plot of elapsed time, speed, engine speed, engine load, and cooling temperature is shown. It should be understood that through conventional manipulation of PC software, arrays of data can be presented in any desired format.

[0149] Referring to Figs 8G and 8H, and then triggering an "accident log" is respectively graphically and tabularly illustrated. It can be immediately seen that the event here is triggered by rapid deceleration. When such a profile is detected by the disclosed onboard diagnostic port memory module, all operating data is preserved in a dense format. Further, the operating data in its dense format is transferred to a first in, last out data stack having capacity in the usual case for between 30 and 32 such events. In this manner, the onboard diagnostic memory module can maintain for a substantial period of time operating vehicle profiles for accident situations. Thus, with the onboard diagnostic memory module of this

invention, vehicle operating parameters that would be questions of controverted fact in the normal accident situations become unquestioned recorded data.

[0150] It is to be understood that the parameters for triggering an accident log recordation can be altered. Further, in this specification we have used a PC as the preferred embodiment. It will be understood that virtually any computer, personal digital assistant (PDA) or other computing device can be programmed for the intelligent interrogation of the module here used. Various new "languages" utilized by the OBDII ports may arise. For example, as of the filing of this PCT application, a new language known as CAN is being introduced. We intend to cover such languages within the scope and content of this patent application. Further, in the preferred embodiment herein, we have illustrated a clock and clock power supply being furnished with the module. The reader will realize that it is sufficient if data recorded by the module is time stamped. For example, the module could use a clock integral to the vehicle for such time stamping. Additionally, we illustrate wireless connection of the module to a computer utilizing a preferred IR connection. It will be understood that other forms of wireless connection such a Blue Tooth can also be utilized.

WHAT IS CLAIMED IS:

1. An onboard diagnostic memory module for an onboard diagnostic port of a vehicle comprising:

a connection to an onboard diagnostic port output of a vehicle;

a memory for receiving and emitting recorded data from the connection to the onboard diagnostic port output of the vehicle;

apparatus for time stamping the recorded data in the memory for receiving and emitting recorded data;

a microprocessor responsive to operational firmware for manipulating data to and from the memory through the connection to the onboard diagnostic port output of the vehicle;

memory operationally connected to the microprocessor for receiving the operational firmware;

the operational firmware including;

data receiving and recording parameters for the memory during the connection to the onboard diagnostic port output of the vehicle; and,

discharge parameters for discharging the recorded data responsive to intelligent interrogation of a computer having a connection to the onboard diagnostic memory module.

2. The onboard diagnostic memory module of claim 1 in wherein the connection to the onboard diagnostic port output of the vehicle includes:

a plugged connection to the onboard diagnostic port of the vehicle.

3. The onboard diagnostic memory module of claim 1 in wherein the connection to the onboard diagnostic port output of the vehicle includes:

a wired connection to the onboard diagnostic port of the vehicle.

4. The onboard diagnostic memory module of claim 1 and wherein:

the operational firmware further includes;

resetting parameters for a malfunction indicator light.

5. The onboard diagnostic memory module of claim 1 and wherein:

the operational firmware further includes;

interrogating language software for determining the language of the onboard diagnostic port.

6. The onboard diagnostic memory module of claim 5 and wherein:
the operational firmware further includes;
interrogating language software for determining the language of the onboard diagnostic port selected from the group consisting of GM, Ford, ISO, and KWP 2000

7.. The process of recording and analyzing data from the combination of an onboard diagnostic memory module, a vehicle having an onboard diagnostic port, and a computer having intelligent programming for the onboard diagnostic memory module comprising:
providing a vehicle having an onboard diagnostic port for emitting data;
providing an onboard diagnostic memory module including:
a connection to an onboard diagnostic port output of a vehicle;
a memory for receiving and emitting recorded data from the connection to the onboard diagnostic port output of the vehicle;
apparatus for time correlation to the recorded data in the memory for receiving and emitting recorded data;
a microprocessor responsive to operational firmware for manipulating data to and from the memory through the connection to the onboard diagnostic port output of the vehicle;
memory operationally connected to the microprocessor for receiving the operational firmware;
the operational firmware including;
data receiving and recording parameters for the memory during the connection to the onboard diagnostic port output of the vehicle; and,
discharge parameters for discharging the recorded data responsive to intelligent interrogation of a computer having a connection to the onboard diagnostic memory module;
providing a computer having;
interrogation parameters for the onboard diagnostic memory module; and,

emitting data receiving and recording parameters to the onboard diagnostic port memory module;

connecting the onboard diagnostic memory module to the computer to receive the data receiving and recording parameters;

sending from the computer to the onboard diagnostic memory module the data receiving and recording parameters;

connecting the onboard diagnostic memory module to the vehicle at the onboard diagnostic port;

recording data during operation of the vehicle at the onboard diagnostic port;

connecting the onboard diagnostic memory module to the computer; and,

interrogating the onboard diagnostic memory module recover the recorded data.

8. The process of recording data from the onboard diagnostic port of an operating vehicle according to claim 7 and wherein:

the connecting the onboard diagnostic memory module to the computer includes using a wireless connection.

9. An onboard diagnostic memory module for an onboard diagnostic port of a vehicle comprising:

a connection to an onboard diagnostic port output of a vehicle;

a memory for receiving and emitting recorded data from the connection to the onboard diagnostic port output of the vehicle;

apparatus for time stamping the recorded data in the memory for receiving and emitting recorded data;

a microprocessor responsive to operational firmware for manipulating data to and from the memory through the connection to the onboard diagnostic port output of the vehicle;

memory operationally connected to the microprocessor for receiving the operational firmware;

the operational firmware including;

data receiving and recording parameters for the memory during the connection to the onboard diagnostic port output of the vehicle; and,

discharge parameters for discharging the recorded data responsive to intelligent interrogation of a computer having a connection to the onboard diagnostic memory module

apparatus for activating the data receiving and recording parameters upon sensing the electric voltage of the automobile electrical system at a depressed voltage.

10. The onboard diagnostic memory module for an onboard diagnostic port of a vehicle according to claim 9 and wherein the depressed voltage of the car electrical system is at least two volts.

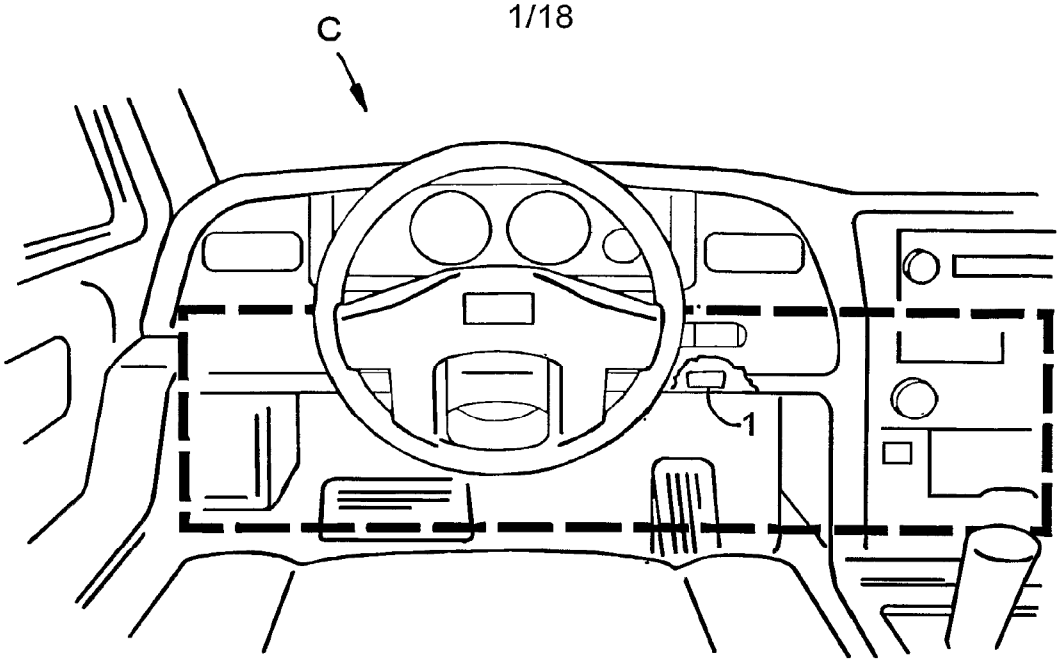


FIG. 1.

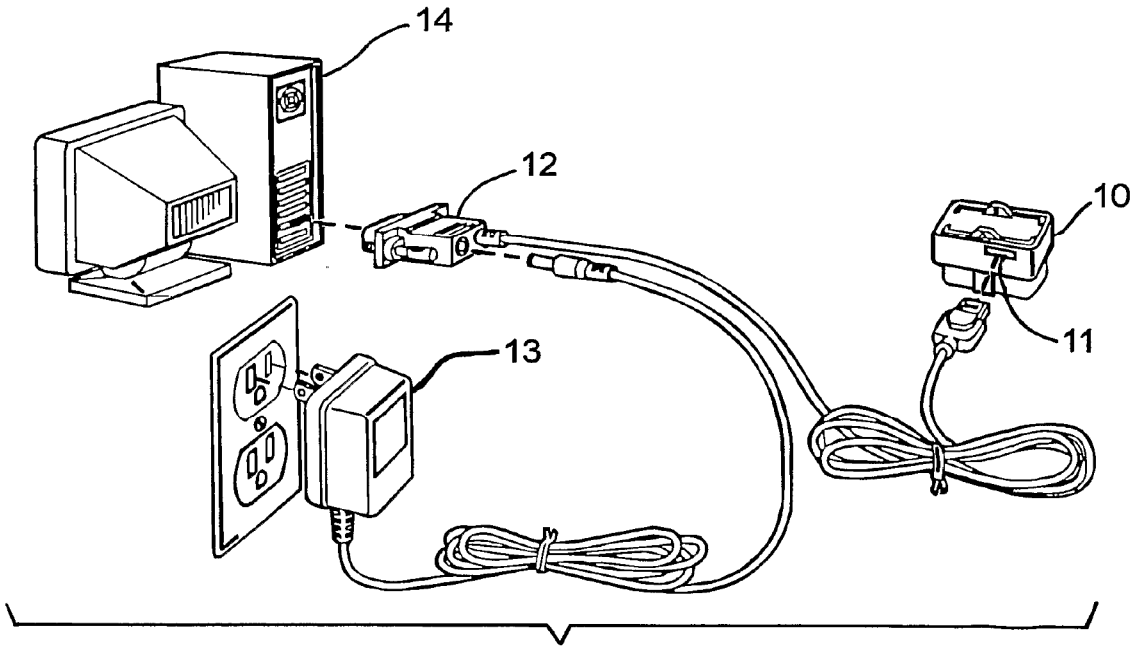


FIG. 2.

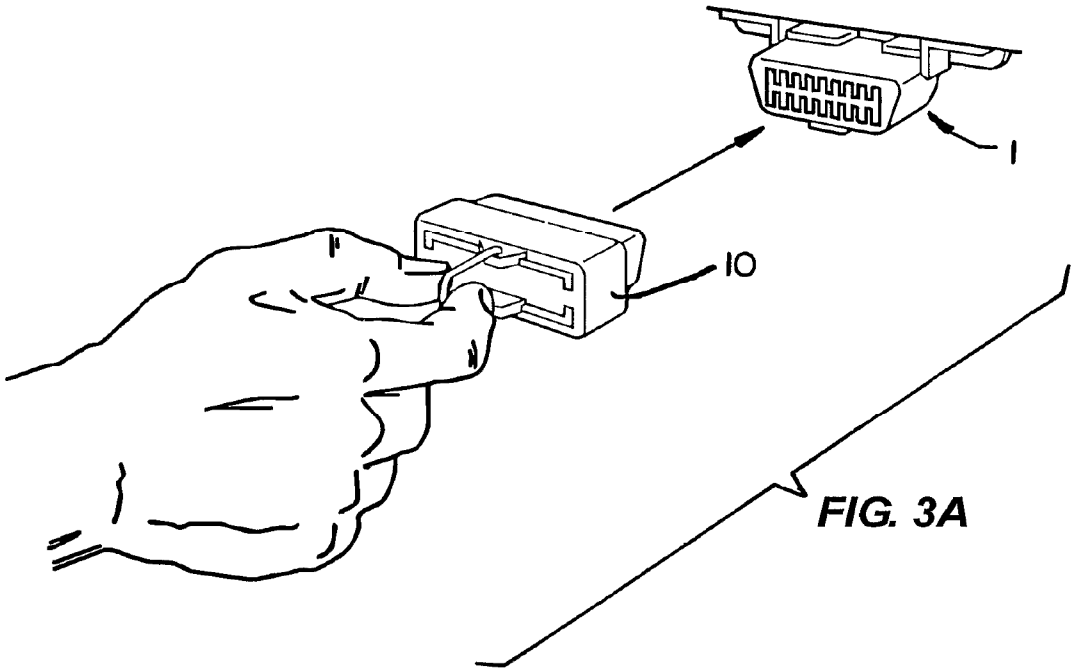


FIG. 3A

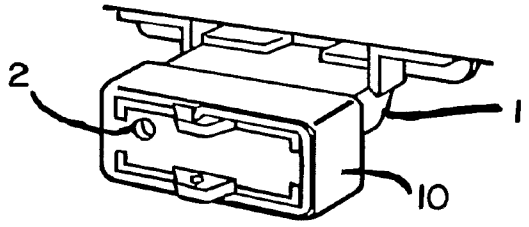


FIG. 3B

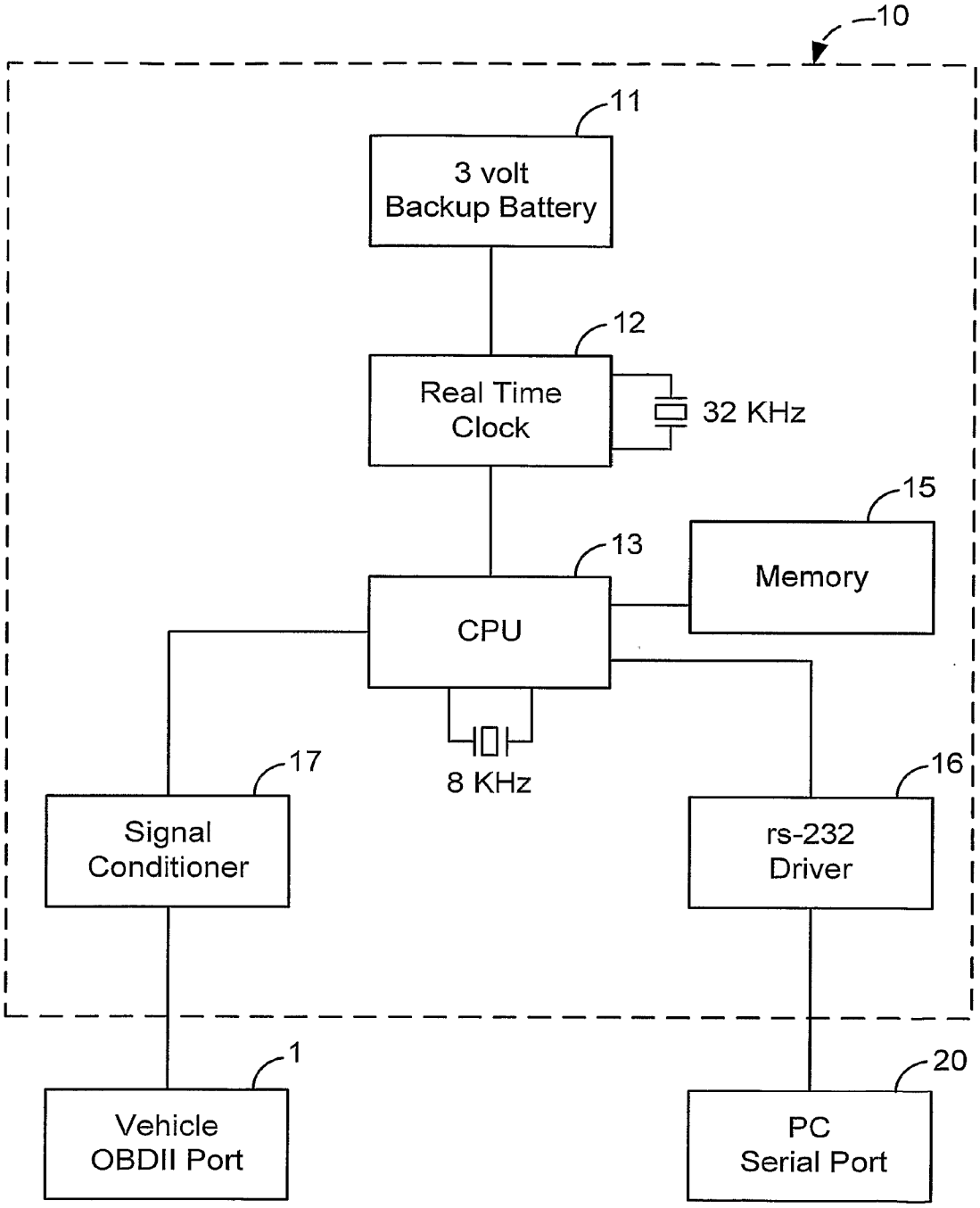

10
11
3 volt
Backup Battery
12
Real Time
Clock
32 KHz
15
Memory
13
CPU
8 KHz
17
Signal
Conditioner
16
rs-232
Driver
1
Vehicle
OBDII Port
20
PC
Serial Port

FIG. 4

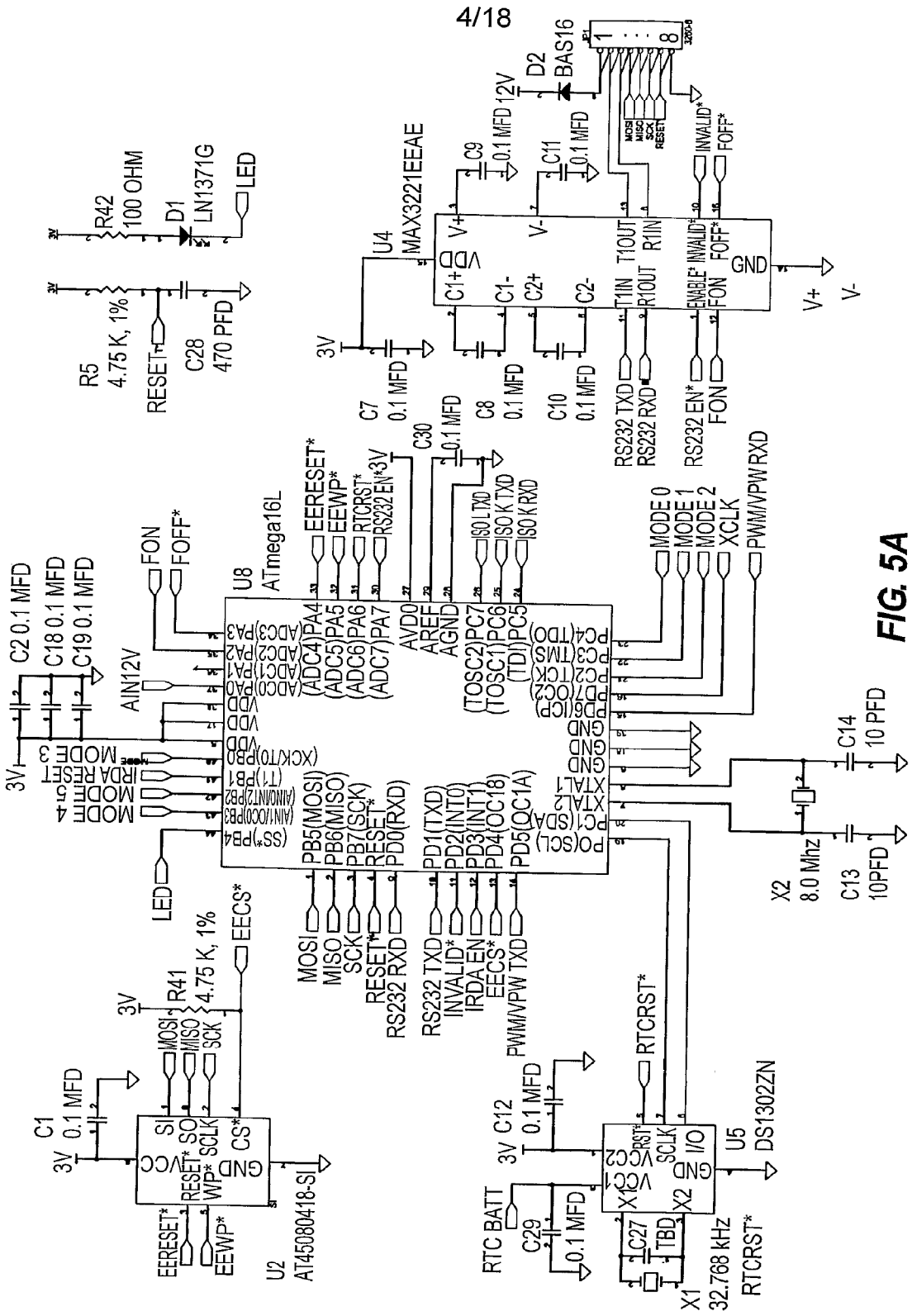

U8
ATmega16L
U4
MAX3221EEAE
U2
AT45080418-SI
U5
DS1302ZN
X1
32.768 kHz
X2
8.0 Mhz
D1
LN1371G
D2
BAS16
R5
4.75 K, 1%
R41
4.75 K, 1%
R42
100 OHM
RESET
LED
RS232 TXD
RS232 RXD
RS232 EN*
FON
FOFF*
INVALID*
EEWP*
EERESET*
RTCRST*
RTC BATT
MOSI
MISO
SCK
EECS*
IRDA EN
PWM/VPW TXD
MODE 0
MODE 1
MODE 2
XCLK
PWM/VPW RXD
AIN12V
3V
12V

FIG. 5A

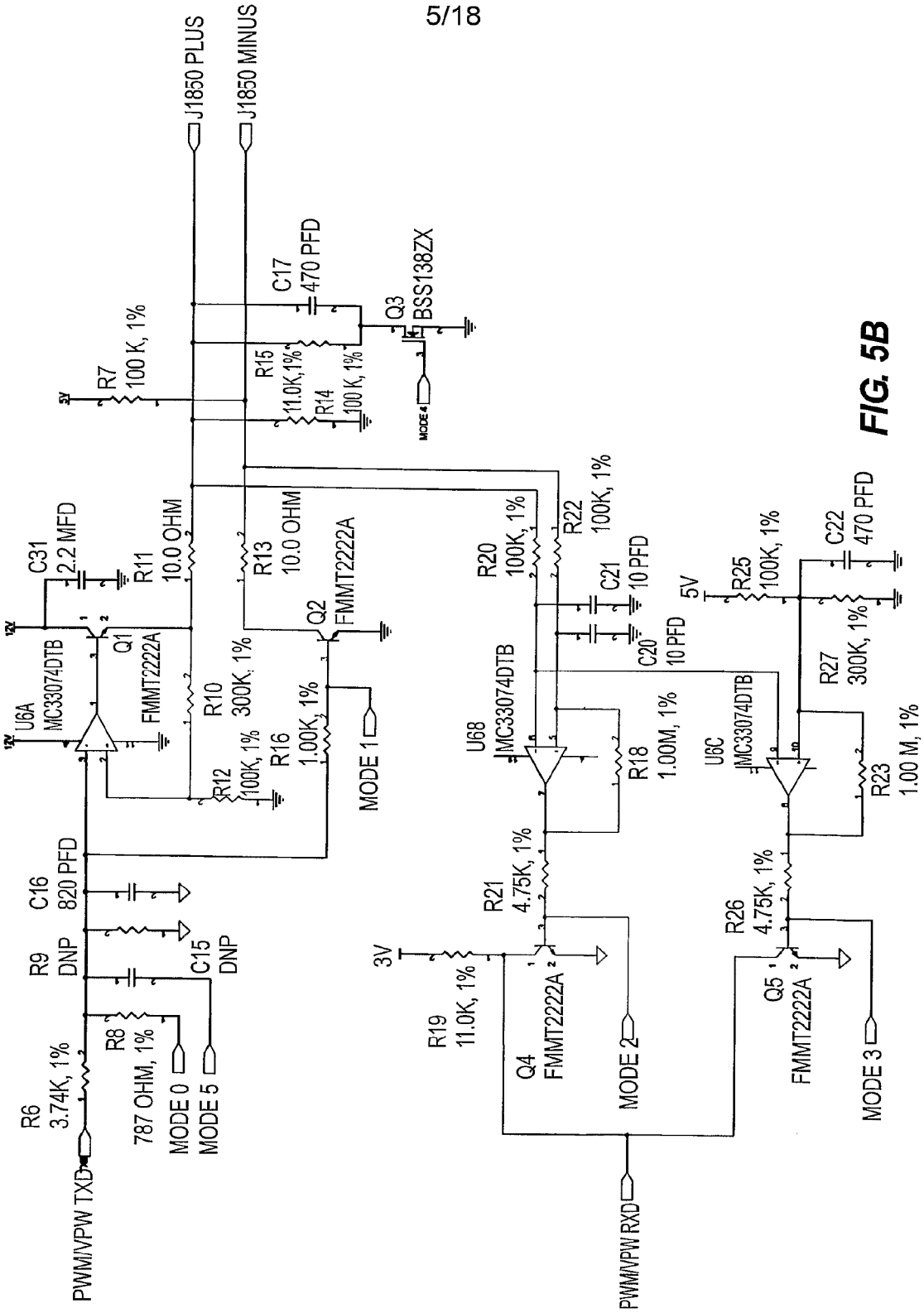

J1850 PLUS
J1850 MINUS
C17
470 PFD
Q3
BSS138ZX
R7
100 K, 1%
R15
11.0K,1%
R14
100 K, 1%
C31
2.2 MFD
R11
10.0 OHM
R13
10.0 OHM
Q2
FMMT2222A
U6A
MC33074DTB
Q1
FMMT2222A
R10
300K, 1%
R12
100K, 1%
R16
1.00K, 1%
MODE 1
R20
100K, 1%
R22
100K, 1%
C21
10 PFD
C20
10 PFD
U6B
MC33074DTB
R18
1.00M, 1%
R25
100K, 1%
C22
470 PFD
U6C
MC33074DTB
R27
300K, 1%
R23
1.00 M, 1%
C16
820 PFD
R9
DNP
C15
DNP
R8
787 OHM, 1%
R6
3.74K, 1%
MODE 0
MODE 5
PWM/VPW TXD
3V
R21
4.75K, 1%
R19
11.0K, 1%
Q4
FMMT2222A
MODE 2
R26
4.75K, 1%
Q5
FMMT2222A
MODE 3
PWM/VPW RXD

FIG. 5B

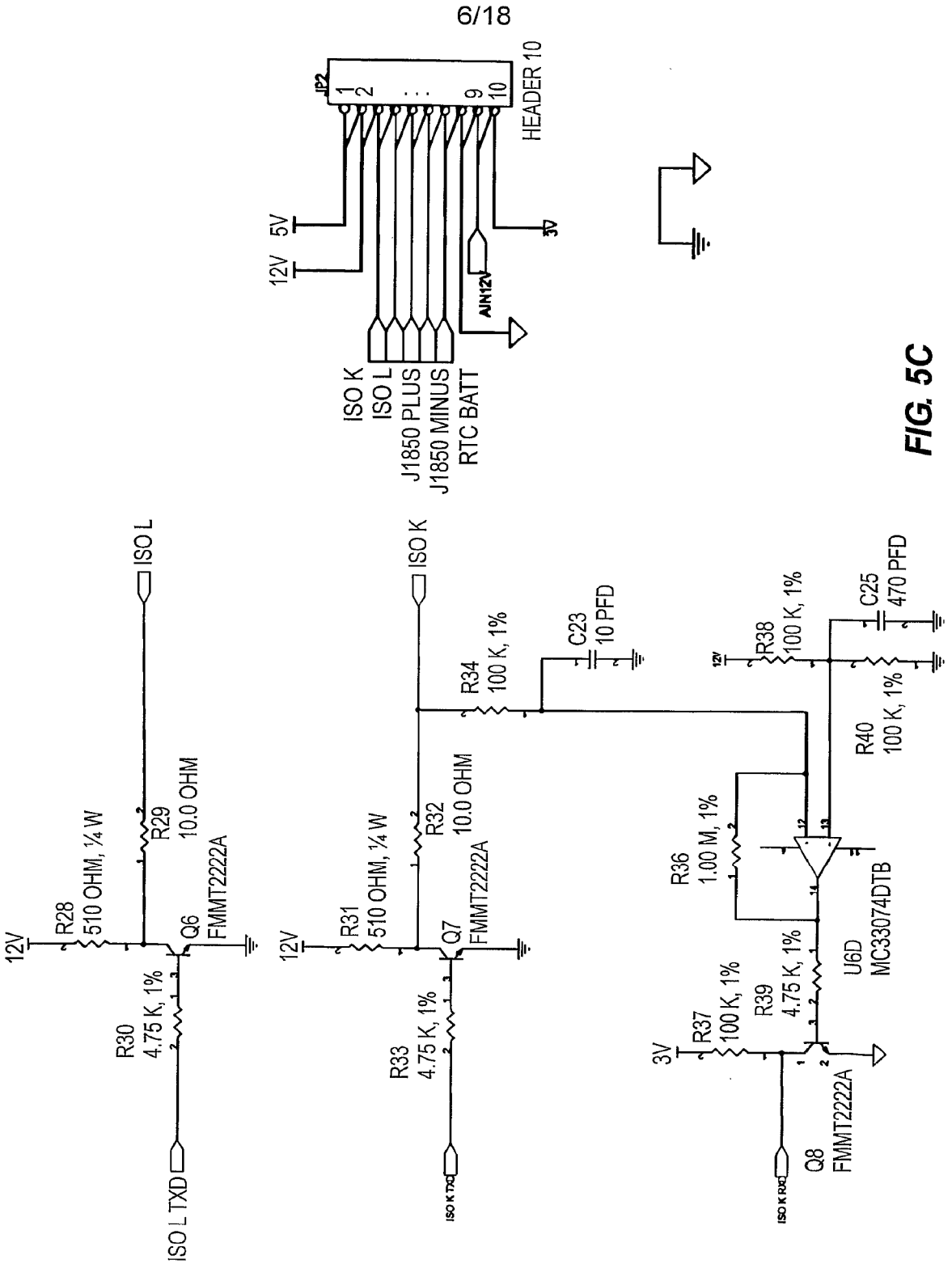

HEADER 10
JP2
1
2
9
10
5V
12V
3V
AIN12V
ISO K
ISO L
J1850 PLUS
J1850 MINUS
RTC BATT
ISO L
ISO K
12V
R28
510 OHM, ¼ W
R29
10.0 OHM
Q6
FMMT2222A
R30
4.75 K, 1%
ISO L TXD
R31
510 OHM, ¼ W
R32
10.0 OHM
Q7
FMMT2222A
R33
4.75 K, 1%
R34
100 K, 1%
C23
10 PFD
R36
1.00 M, 1%
R37
100 K, 1%
R38
100 K, 1%
C25
470 PFD
R40
100 K, 1%
R39
4.75 K, 1%
U6D
MC33074DTB
Q8
FMMT2222A
3V

FIG. 5C

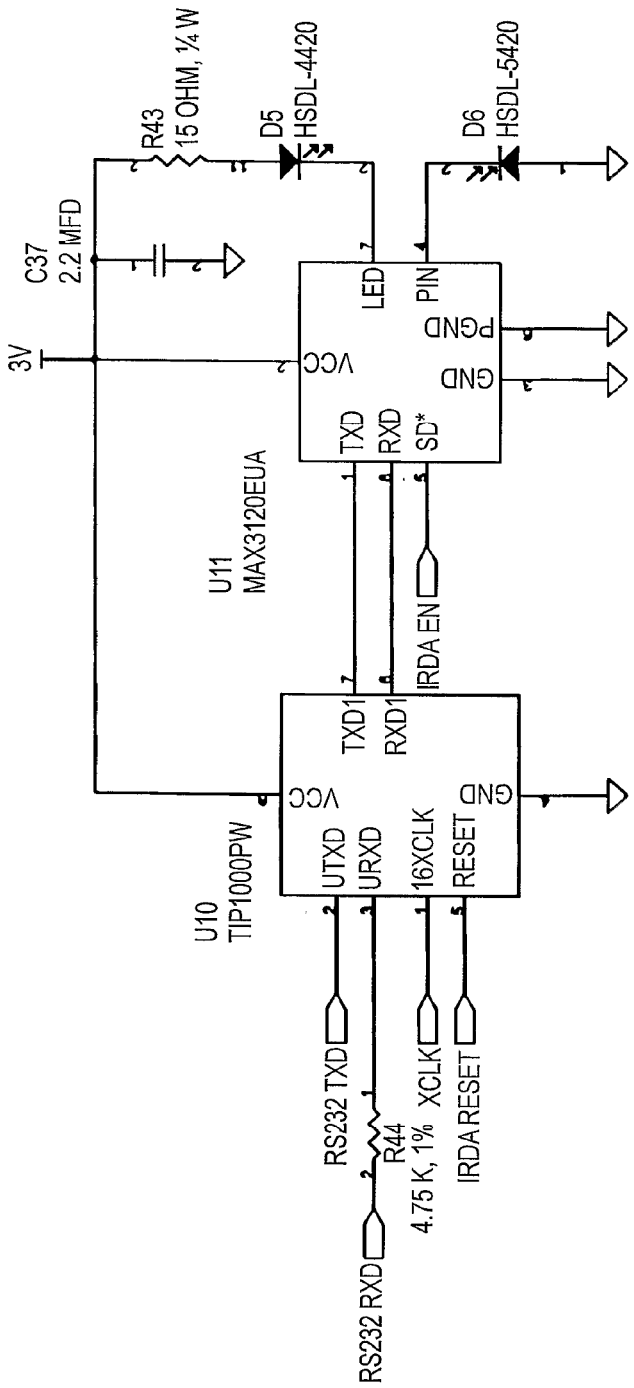

R43
15 OHM, ¼ W
D5
HSDL-4420
D6
HSDL-5420
C37
2.2 MFD
3V
U11
MAX3120EUA
VCC
LED
PIN
PGND
GND
TXD
RXD
SD*
IRDA EN
TXD1
RXD1
U10
TIP1000PW
VCC
UTXD
URXD
16XCLK
RESET
GND
RS232 TXD
R44
4.75 K, 1%
XCLK
IRDA RESET
RS232 RXD

FIG. 5D

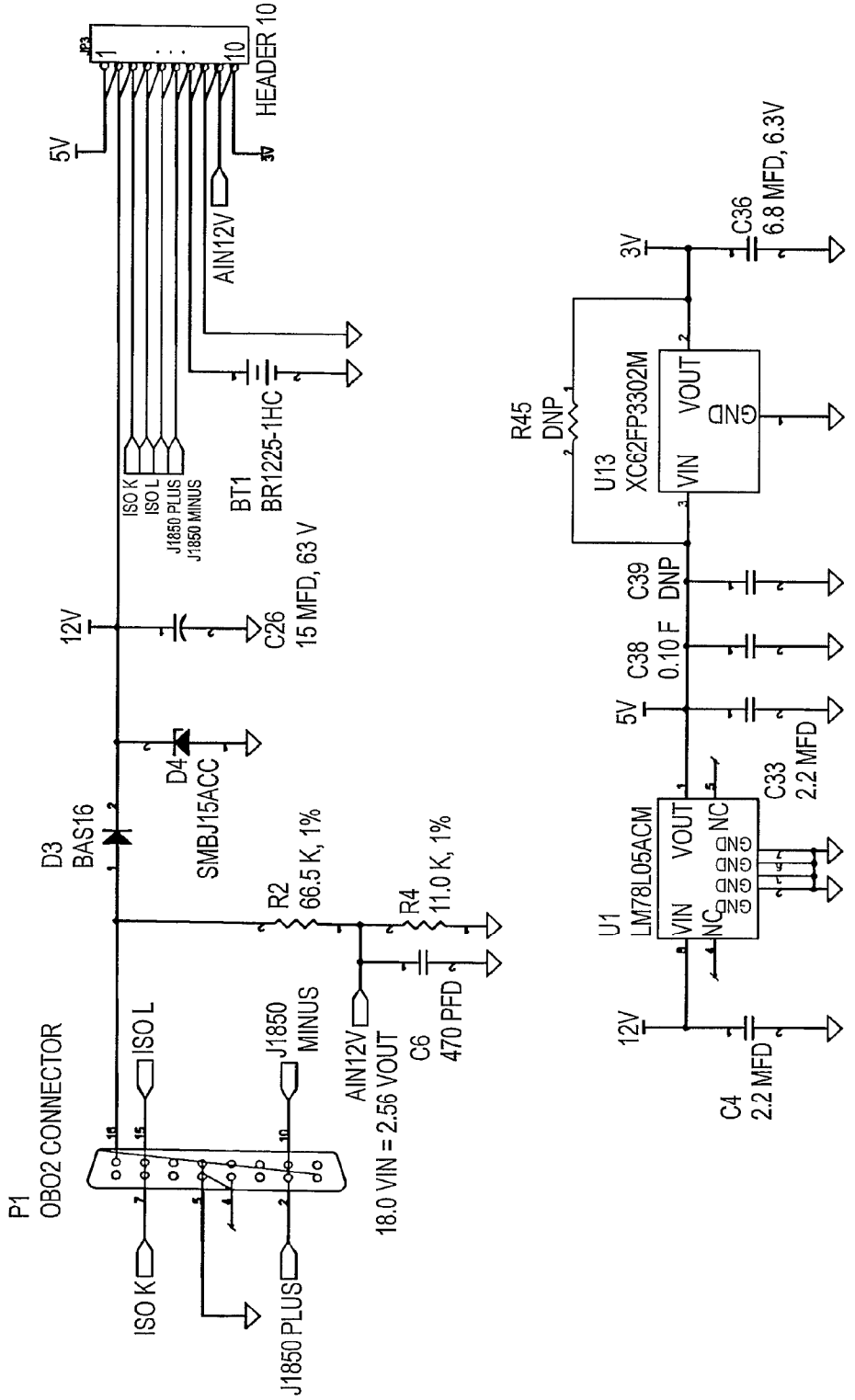

P1
OBO2 CONNECTOR
ISO K
ISO L
J1850 PLUS
J1850 MINUS
D3
BAS16
D4
SMBJ15ACC
R2
66.5 K, 1%
R4
11.0 K, 1%
AIN12V
18.0 VIN = 2.56 VOUT
C6
470 PFD
12V
C26
15 MFD, 63 V
BT1
BR1225-1HC
5V
HEADER 10
AIN12V
R45
DNP
U13
XC62FP3302M
VIN
VOUT
GND
3V
C36
6.8 MFD, 6.3V
C39
DNP
C38
0.10 F
C33
2.2 MFD
U1
LM78L05ACM
VIN
VOUT
NC
C4
2.2 MFD

FIG. 5E

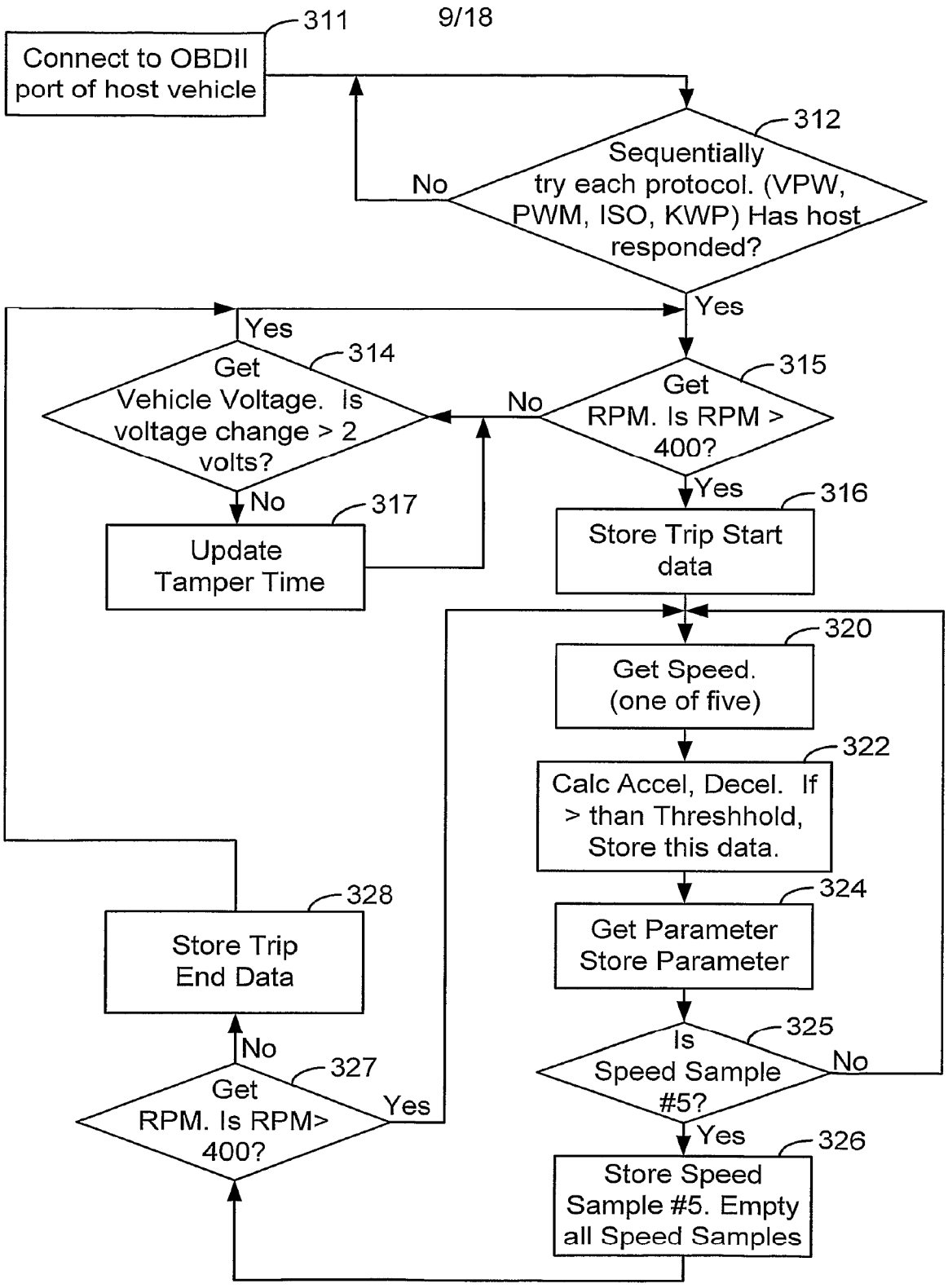

311
Connect to OBDII port of host vehicle
312
Sequentially try each protocol. (VPW, PWM, ISO, KWP) Has host responded?
No
Yes
314
Get Vehicle Voltage. Is voltage change > 2 volts?
Yes
No
315
Get RPM. Is RPM > 400?
No
Yes
316
Store Trip Start data
317
Update Tamper Time
320
Get Speed. (one of five)
322
Calc Accel, Decel. If > than Threshhold, Store this data.
324
Get Parameter Store Parameter
325
Is Speed Sample #5?
No
Yes
326
Store Speed Sample #5. Empty all Speed Samples
327
Get RPM. Is RPM> 400?
No
Yes
328
Store Trip End Data

FIG. 6

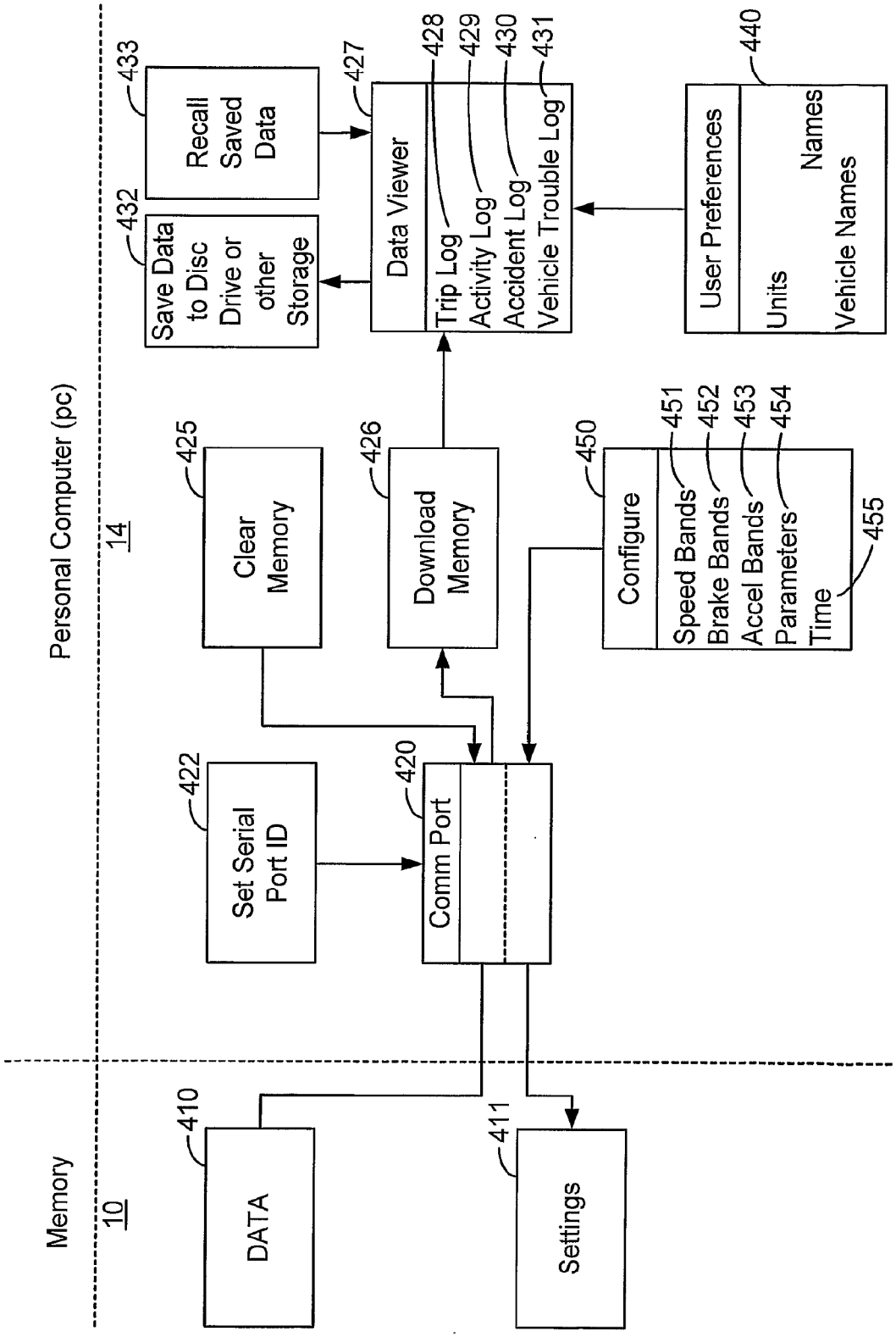

Personal Computer (pc)
14
Memory
10
DATA
410
Settings
411
Comm Port
420
Set Serial Port ID
422
Clear Memory
425
Download Memory
426
Configure
450
Speed Bands
451
Brake Bands
452
Accel Bands
453
Parameters
454
Time
455
Data Viewer
427
Trip Log
428
Activity Log
429
Accident Log
430
Vehicle Trouble Log
431
Recall Saved Data
433
Save Data to Disc Drive or other Storage
432
User Preferences
440
Units
Names
Vehicle Names

FIG. 7

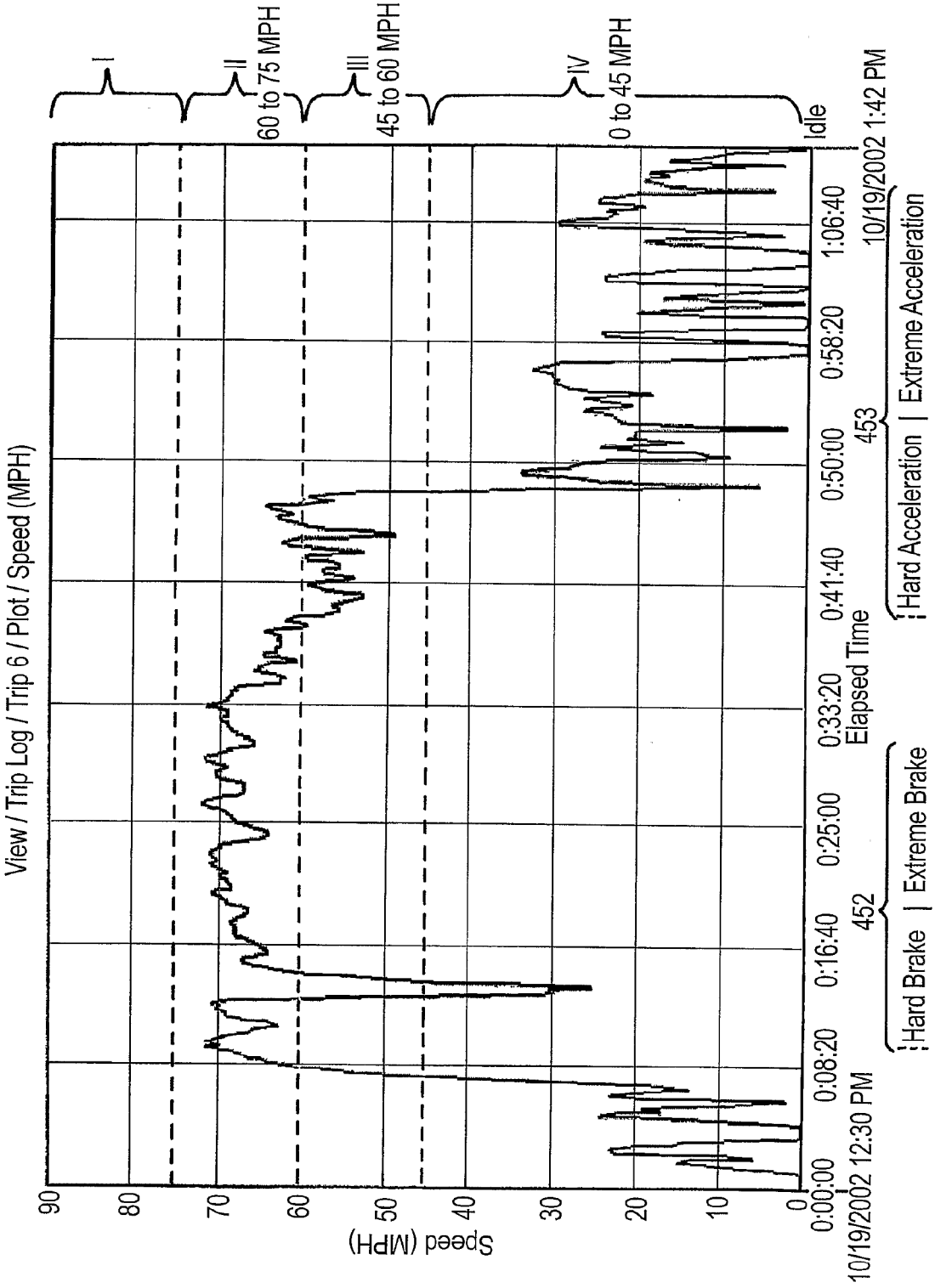

View / Trip Log / Trip 6 / Plot / Speed (MPH)
Speed (MPH)
90
80
70
60
50
40
30
20
10
0
I
II
60 to 75 MPH
III
45 to 60 MPH
IV
0 to 45 MPH
Idle
0:00:00
10/19/2002 12:30 PM
0:08:20
0:16:40
0:25:00
0:33:20
0:41:40
0:50:00
0:58:20
1:06:40
10/19/2002 1:42 PM
Elapsed Time
452
453
Hard Brake | Extreme Brake
Hard Acceleration | Extreme Acceleration

FIG. 8A

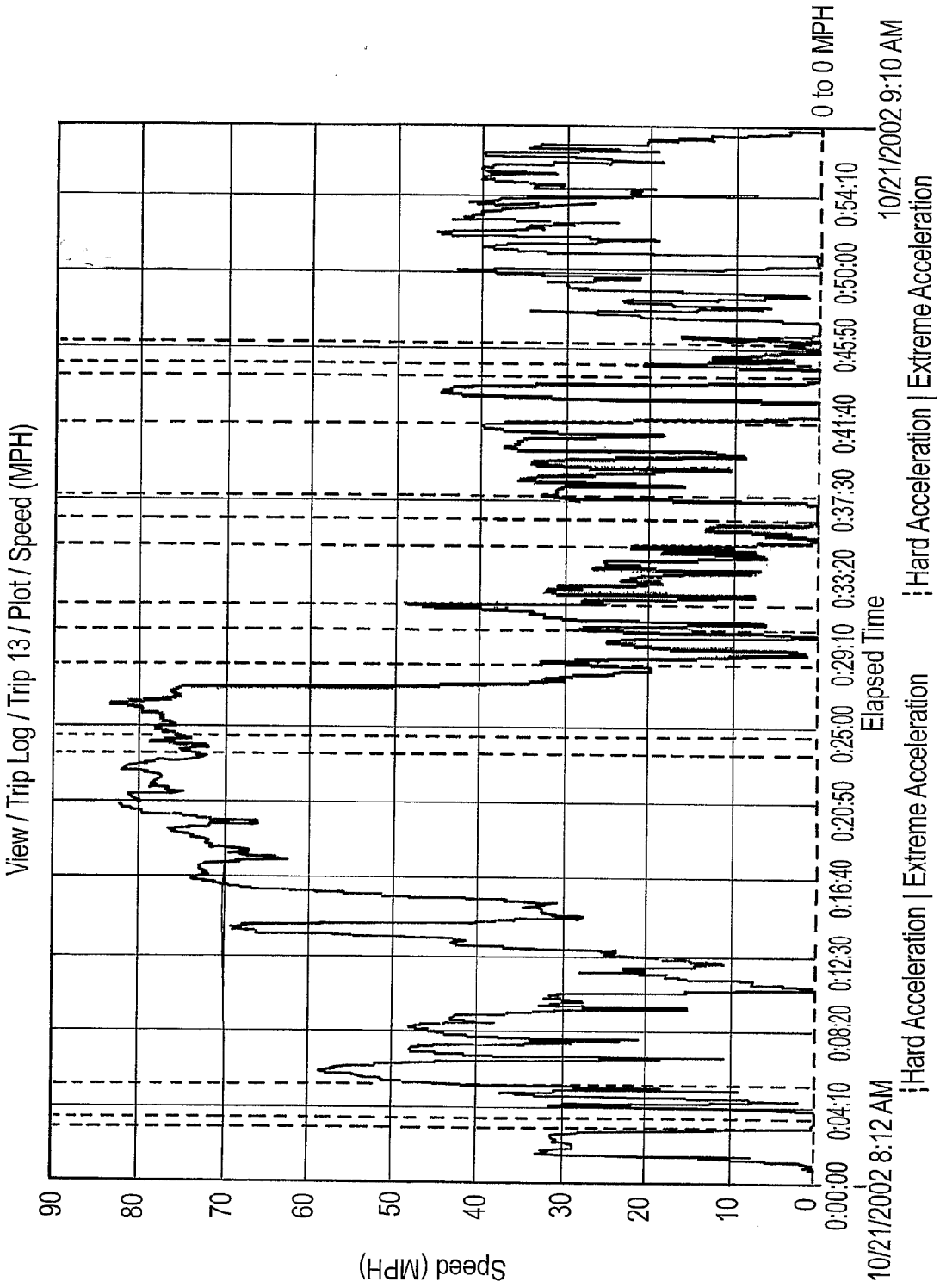

View / Trip Log / Trip 13 / Plot / Speed (MPH)
Speed (MPH)
90
80
70
60
50
40
30
20
10
0
0:00:00
0:04:10
0:08:20
0:12:30
0:16:40
0:20:50
0:25:00
0:29:10
0:33:20
0:37:30
0:41:40
0:45:50
0:50:00
0:54:10
10/21/2002 8:12 AM
10/21/2002 9:10 AM
Elapsed Time
Hard Acceleration | Extreme Acceleration
Hard Acceleration | Extreme Acceleration
0 to 0 MPH

FIG. 8B