

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GEOTAB USA, INC. AND GEOTAB, INC.,
Petitioners,

v.

OMEGA PATENTS, LLC,
Patent Owner.

Case No. IPR2023-00504
Patent No. 8,032,278

**DECLARATION OF JEFFREY MILLER, Ph.D.
IN SUPPORT OF PETITIONERS' REPLY TO POR**

Geotab Exhibit 1115 Geotab v. Omega IPR2023-00504

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I, Jeffrey Miller, declare:

I. INTRODUCTION

1. I have been retained on behalf of Geotab USA, Inc. and Geotab, Inc. (“Geotab” or “Petitioners”) as an independent technical expert in the above-captioned IPR proceeding (“the IPR”).

2. I make this Declaration based on my personal knowledge, including my education, training, research, and professional experience.

3. I have considered the materials identified in Appendix A. To the extent this Declaration cites any material not identified in Appendix A, I have considered the documents cited and referenced herein.

4. My opinions in this Declaration are based on my review of these documents, as well as upon my education, training, research, knowledge, and experience. When developing the opinions set forth in this Declaration, I assumed the perspective of a person having ordinary skill in the art (“POSA”) as explained below.

5. The opinions and comments formulated during this assessment are based on observations and information available at the time of this investigation.

II. POSA

6. In the context of the ’278 patent and the prior art, it is my opinion that the POSA to whom the patent is addressed would have had a Bachelor’s degree in

electrical engineering, computer engineering, computer science, automotive engineering, or a related discipline, and at least two years of experience in networking or automotive engineering. POSAs would have understood networking electronics, e.g., how to connect electronic devices so data can be accessed from and communicated to those devices over a wired or wireless link. A POSA would also have been familiar with vehicle data buses, regulations and industry standards involving OBD-II, and at least one underlying network protocol used by OBD-II.

7. In reaching this opinion as to the hypothetical person of ordinary skill in the art, I have considered the types of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level and professional capabilities of workers in the field.

8. The basis for my familiarity with the level of ordinary skill is my own technical experience, as well as my interaction with students and professionals in the field of Electrical and Computer Engineering, as well as the prior solutions to tracking units with multi-vehicle compatible controllers.

9. My POSA definition is further supported by the disclosure in the '278 patent, as well as in the prior art references U.S. Patent No. 6,957,133 (EX1023, "Hunt") and U.S. Patent 6,756,885 (EX1024, "Flick-885"), other prior art, and applicable standards and regulations. These concern networking and connecting

networked electronics in vehicles, and clearly involve networking standards used in OBD-II like SAE J1850 or Controller Area Networks (“CAN”). They involve reading data or “diagnostics” from devices using the OBD-II bus, and wirelessly transmitting data over cellular or other networks.

10. In my opinion a Bachelor’s degree in electrical engineering, computer engineering, computer science, automotive engineering, or a related discipline, and at least two years of experience in networking or automotive engineering, would have provided the ordinary skill in this subject matter to work with, design and implement tracking units and work with networked electronics in vehicles as discussed in these references. With this experience POSAs would have understood networking electronics, e.g., how to connect electronic devices so data can be accessed from and communicated to those devices over a wired or wireless link.

11. The ’278 patent tracking unit is discussed in the context of reading data from host vehicle electronics over vehicle data buses. The prior art, including Flick-885 and Flick-460, which the ’278 patent incorporated, cite industry standards on networking protocols as background.

12. POSAs would have been familiar with vehicle data buses, regulations and industry standards involving OBD-II, and at least one underlying network protocol used by OBD-II because anyone designing OBD-II scan tools, controllers, appliances, and tracking units as described in these references—and the ’278

patent—would have had to meet the requirements of the regulations or industry standards defining the networking protocols and used in the vehicles that would host these tracking units. POSAs would have understood that the standards and regulations would have explained the networking protocols needed to communicate with host vehicles. Any POSA designing commercial products would have understood that any devices they designed and built would also have to comply with applicable regulations and standards before they could sell them.

13. POSAs familiar with at least one underlying networking protocol, such as used by a given manufacturer as described in EX1023, would have had the skill to digest, understand, and apply other standards as needed, or as cross-referenced among the industry standards and regulations.

III. RELATIONSHIP OF HUNT AND FLICK-885.

14. I understand that Omega argues that POSAs would not have combined Hunt's GPS with Flick-885's controller because Hunt allegedly "does not address ongoing compatibility with different vehicles since *Hunt* discloses protocol modules being embodied in an ASIC." (POR, 57) (emphasis original). I disagree.

15. Hunt describes a controller that is compatible with different vehicles using multiple communication protocols. E.g., Hunt, Fig. 1B (circuit 25 and modules 25a-25e). How Hunt accomplishes this compatibility with different

vehicles is not relevant to the fact that Hunt's appliance is compatible and remains compatible with the different vehicles that use the communication protocol.

16. Furthermore, Hunt and Flick-885 are in the same field of endeavor as the '278 patent. All three references—Hunt, Flick-885, and the '278 patent—involve vehicle controllers comprising OBD-II readers. All three disclose multi-vehicle compatible controllers. Hunt and the '278 patent also disclose adding GPS to multi-vehicle compatible controllers. Moreover, Hunt and Flick-885 are also reasonably pertinent to the problems that the '278 patent purports to address, namely, adding GPS to a multi-vehicle compatible controller. Flick-885 discloses the same controller as the '278 patent but lacks a GPS for determining vehicle position. EX1001, 1:47-53, 2:17-41. Hunt discloses adding GPS to a multi-vehicle compatible controller. Hunt, Abstract, 1:8-11, 1:39-47, 2:42-48, 3:26-28, 5:7, 5:43-54, 7:30-33, Fig. 1A (GPS Module 2), Fig. 1B ("GPS Module"), Fig. 2, claim 1.

17. Hunt explains there are "many advantages" to adding GPS and location services to such systems. Hunt, 2:35-41 ("The wireless appliance monitors location and diagnostic data to provide services such as roadside assistance to a disabled vehicle or recovery of a stolen vehicle.... [T]he appliance provides a GPS-based system for alerting a vehicle's owner that someone other than the owner has moved the vehicle (e.g., the vehicle is stolen or towed)."), 4:12-22 ("The

invention has many advantages. ... [W]ireless, real-time transmission and analysis of GPS and diagnostic data... makes it possible to... determine [a vehicle's] location in real-time... [and] improve conventional services such as roadside assistance, vehicle theft notification and recovery, and remote diagnostics.”).

18. Omega does not provide any evidence disputing that adding GPS to Flick-885's controller would have provided the same advantages that GPS provided to Hunt, including “roadside assistance,” “alerting” the owner when the vehicle is moved, vehicle “recovery” and “remote diagnostics.” Hunt, 2:35-41, 4:12-22.

IV. “PLUG-IN” SOLUTIONS WERE KNOWN.

19. I understand that Omega argues that a challenged '278 patent claim, presumably including at least independent claim 1, was “non-obvious” because it responded to “customer need” for a “plug-in solution.” I understand that Omega makes this argument:

- by citing as evidence of “customer need” (POR, 61-62)
- testimony from its expert Mr. McAlexander (EX2010, ¶200)
- citing—without explanation—deposition testimony (EX2006, 64:15-24) from third-party defendant employees in a separate litigation involving Omega and CalAmp

- stating that “a simple plug-in solution is extremely attractive” because it reduced installation cost (EX2006, 64:15-24).

POR, 61-62, citing EX2010, ¶200, citing EX2006, 64:15-24 (but incorrectly citing EX2006 as EX2005).

20. I am not aware of any claim limitation in any challenged claim that recites providing a “plug-in solution.” The ’278 patent never uses the words “plug-in.” The ’278 patent never uses the words “data port” or describes an OBD-II data port. Claim 1 at limitation [1.d] recites “said multi-vehicle compatible controller [e.g., MVCC] to be coupled to the vehicle data bus for communication thereover,” but does not provide any requirement on how the MVCC is “to be coupled.”

21. A POSA would have understood that an OBD-II connector coupling a controller to a vehicle data bus through an OBD-II port was literally a “plug-in” connection and that this was well-known on July 3, 2007. Hunt describes connecting to an OBD-II bus by “electro/mechanical interface” to an OBD-II diagnostic port (Hunt, 5:55-61, Fig. 1B, claims 28, 30). There is nothing new in using an OBD-II port diagnostic connector to connect to an OBD-II bus.

22. Omega did not invent an OBD-II port, an OBD-II connector, or using an OBD-II diagnostic port connector to connect to an OBD-II bus. The OBD-II port and connector were standardized in industry standards documents that were

adopted by EPA regulations (as well as other state regulations) before July 3, 2007. By “adopted” I mean that the EPA regulations compelled industry compliance with the cited standards for motor vehicles, and those OBD-II requirements required “standardized access” to the OBD-II bus including specifying a “Diagnostic Connector.” EX1070, §§86.1806-04(h) (“OBD system shall provide standardized access”), 86.1806-04(h)(1)(iv) (connection interface requirements for “Diagnostic Connector”). The CAN standard—EX1072—shows the OBD connector at Fig. 8. EX1072, 18 Fig. 8 (OBD connector to vehicle bus).

23. In other words, before July 2007 every OBD-II compliant controller had a “plug-in” connector. Hunt’s multi-vehicle compatible controller was an OBD-II compliant controller that used a “plug in” connector and connected to vehicles through an OBD-II diagnostic port. And Hunt did this in 2003, long before Omega filed the application for the ’278 patent on July 3, 2007.

V. HUNT’S POST-MANUFACTURE FIRMWARE DOWNLOAD.

24. I understand that Omega argues there is “no need to download instructions” to Hunt’s controller. POR, 18-19. I disagree because Hunt expressly describes installing firmware and/or software on its appliance by wireless download after manufacture (Hunt, 11:5-32), and there were several reasons even after initial installation to update that firmware and/or software. Firmware and/or software are “instructions” for microprocessor 27.

25. First, Hunt expressly discloses installing firmware by wireless download on microprocessor 27 after Hunt's appliance is manufactured. Hunt, 11:5-18. Hunt explains that download can be accomplished by modulated carrier wave (Hunt, 11:5-19, 11:30-32), meaning wireless download. POSAs would have understood that Hunt's description of post-manufacture installation included wireless downloading firmware and/or software to Hunt's MVCC and installing it for use with microprocessor 27.

26. Second, even after the initial installation, POSAs understood that there were several reasons to update installed firmware/software on Hunt's MVCC through subsequent wireless download. For example, in July 2007 it was known and conventional to regularly update firmware/software to provide fixes to software errors (e.g., bugs).

27. I am told to assume that U.S. Patent No. 8,495,615 to a "Method, System and Computer Program For Distributing Software Patches" (EX1118, "Alberti") is prior art. Alberti describes bug fixes as patches (Alberti, 3:58-67):

[T]he patch consists of a small piece of code (in executable form) that is intended to remedy a problem (or bug) of the corresponding software product temporarily; for example, the patch can be used to prevent a security vulnerability or to correct a wrong behavior. The patches are designed to be inserted into the executable code of the software products directly, so as to provide an immediate solution to their problems; the patches may then be eventually incorporated

permanently into new versions of the software products at their next release.

28. Alberti explains that in an “endless” process “software patches” are “continually published” for bugs that “are invariably found in every software product” (1:15-25):

[A] very important issue is the management of software patches (or fixes) that are **continually published by the vendors of the software products to remedy corresponding problems** temporarily. Indeed, **problems are invariably found in every software product after it has been formally released** (notwithstanding any previous beta-test or tryout distribution); this **process is endless since even when the problems have been fixed by the corresponding patches new problems are discovered** (if not even introduced by the same patches).

29. POSAs would have known that applying bug patches was a reason for Hunt to wirelessly update firmware/software on microprocessor 27 even after the initial installation.

30. Third, Omega appears to admit that it would have been obvious to update Hunt’s vehicle communication circuit, comprising modules in an ASIC supporting various vehicle communication protocols, by swapping in new circuit modules or boards to support different communication protocols. POR, 40 (“Even if a POSA would recognize that it may be beneficial to add new protocols in *Hunt*, at the time of the invention the POSA would likely replace the ASIC with a

different ASIC similar to *Hunt*'s disclosure of replacing one modem for another. Ex-2010, ¶155."); EX2010, ¶¶154-155. I agree that a POSA would have considered it to have been obvious to replace Hunt's ASIC with a new ASIC to support different communication protocols.

31. POSAs would have understood that changing the ASIC modules to change the supported communication protocols in Hunt's vehicle communication circuit would have required updating the firmware/software in Hunt's microprocessor 27, and that this could have been done through wireless download just like the initial post-manufacture installation. Furthermore, in this scenario that Omega posits the POSA would have had direct physical access to the microprocessor in Hunt's appliance and could have updated its firmware/software using a wired connection. Thus, it would have been obvious to update the microprocessor's firmware to accommodate newly supported communication protocol hardware.

VI. HUNT'S CELLPHONE EMBODIMENT.

32. I understand that Omega argues that Hunt's "wireless appliance is hardwire installed in a vehicle; it is illogical to hardwire a cellphone to the OBD-II diagnostic port." POR, 30. I disagree with Omega's argument.

33. First, Hunt's appliance is not "hardwire[d]" to a vehicle. Hunt's appliance connects to an OBD-II port by interfacing a diagnostic port. Hunt, Fig.

1B (interface 23). Hunt, 3:34-38 (“wireless appliance features a mechanical adapter based on a connector”), 8:48-51 (“the vehicle communication circuit 25 [] connects to the host vehicle through a mechanical/electrical interface to the vehicle’s OBD-II diagnostic port”), Fig. 1B (interface to OBD-II port), claim 30 (diagnostic connector is OBD-II connector). The OBD-II port is a “plug-in” connection exactly like Omega argues that the ’278 patent claims. POR, 61-62.

34. Second, Hunt’s vehicle-communication circuit 25 can physically interface to the OBD-II diagnostic port because, as I explain below, the communication modules implement the physical layer for communication using supported vehicle communication protocols and thus would communicate modulated signals through physical connection to the OBD-II bus. However, nothing in Hunt requires connecting microprocessor 27 to the vehicle-communication circuit 25, or the vehicle, by “hardwire.”

35. Omega’s contention that Hunt’s processor must be “installed in a vehicle” *disregards* that while Hunt’s vehicle communication circuit 25 (comprising a physical layer) is connected to a vehicle OBD-II bus through connecting to the OBD-II diagnostic port, Hunt’s “*asynchronous serial connection*” *data link 179* (Hunt, 2:62-65, 8:55-58, Fig. 5, claim 11) connects the vehicle-communication circuit to microprocessor 27 (Hunt, 8:55-58, 9:18-20, Fig. 5) and also connects the vehicle-communication circuit to a wireless transmitter

(Hunt, 3:34-38, Fig. 1B, claim 56). The cellphone provides both the microprocessor and the wireless transmitter that connects by data link 179 to the vehicle-communication circuit.

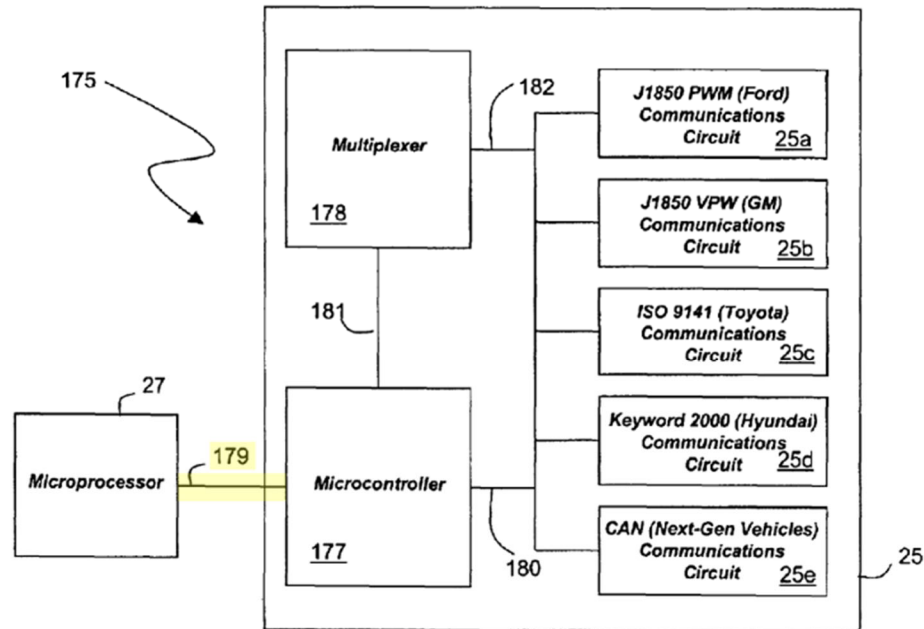


Fig. 5

36. Hunt does not require data link 179 to be a physical wired connection (e.g., “hardwire[d],” POR, 30). POSAs would have understood that the ordinary meaning of “data link” in Hunt’s specification *included wireless data links* like Bluetooth.

37. When Hunt was filed on May 8, 2003—and four years later when Omega filed the application for the ’278 patent on July 3, 2007—POSAs knew that Bluetooth provided a wireless asynchronous serial connection. POSAs also knew that a conventional use of Bluetooth was to provide a wireless asynchronous serial

connection between a cellphone and a vehicular network. E.g., EX1060, 6:25-41 (Bluetooth connecting cellphone to vehicle network).

A. Bluetooth is wireless.

38. POSAs knew that Bluetooth is a *wireless* data link. For example, J. Bray and C.F. Sturman, Bluetooth 1.1: Connect Without Cables (2d ed. Prentice Hall PTR 2002 (EX1116, “Bray”) provides a practical overview of Bluetooth technology in 2002. Bray explains that Bluetooth is a wireless communication technology.

Bluetooth is a low cost, low power, short range radio technology, originally developed as a cable replacement to connect devices such as mobile phone handsets, headsets, and portable computers. This in itself sounds relatively innocuous; however, by enabling standardised wireless communications between any electrical devices, Bluetooth has created the notion of a Personal Area Network (PAN), a kind of close range wireless network that looks set to revolutionise the way people interact with the information technology landscape around them.

Bray, 1. Bray further explains, “A key feature of the Bluetooth specification is that it aims to allow devices from lots of different manufacturers to work with one another. To this end, Bluetooth does not just define a radio system, it also defines a software stack to enable applications to find other Bluetooth devices in the area, discover what services they can offer, and use those services.” Bray, 5.

39. Exhibit B to EX1117 is an Atmel white paper entitled “The Bluetooth Wireless Technology White Paper.” Exhibit A to EX1117 explains that the Internet Archive captured Exhibit B from the Atmel website on April 15, 2003.

40. Atmel (which has since been acquired by Microchip Technology) made microchips and solid state components including Bluetooth transceivers. POSAs would have understood that it was common practice for component manufacturers to provide white papers on technologies that their products support. This was true in 2003, in 2007, and remains true today. I will refer to this white paper at EX1117, Exhibit B, as “Atmel” and cite to it by its internal page numbering.

41. At p. 2, Atmel explains,

The Bluetooth wireless technology provides the means for the replacement of cables and infrared links that connect one device to another with a universal short-range radio link.

42. Bluetooth operates in the 2.4 GHz Industrial, Scientific, and Medical (“ISM”) band (Bray, 8; Atmel, 4), with a range up to 10 meters. Atmel, 4.

B. Bluetooth provides an asynchronous data link.

43. POSAs would have known that Bluetooth provides “ACL (Asynchronous Connectionless) links for data communication.” Bray, 11; *accord* Atmel, 3. Bluetooth’s Asynchronous Connectionless data link is *asynchronous*,

meeting Hunt’s description of data link 179 as an “*asynchronous . . . connection*” (Hunt, 2:62-65, 8:55-58, Fig. 5, claim 11).

C. Bluetooth provides a serial data link.

44. POSAs would have known that Bluetooth provides a *serial* data link. “The RFCOMM protocol is a serial port emulation protocol that covers applications that make use of the serial ports of the unit. RFCOMM emulates RS-232 control and data signals[.]” Atmel, 3; *see also* Bray, 6, Fig. 1-2 (RFCOMM layer in the Bluetooth protocol stack “provides an RS-232 like serial interface.”), 177 (RFCOMM provides a wireless emulation of “an RS-232 serial port,” and the Bluetooth specification “specifies how a serial data stream can be emulated.”). Bluetooth supports devices with an “[i]nternal emulated serial port” or an “[i]ntermediate device with physical serial port.” Bray, 177.

45. In short, POSAs would have known that Bluetooth provides a wireless implementation of well-known serial data communication protocols like RS-232, which specified voltage and signal levels for communication over physical wires.

D. Bluetooth data rates exceeded those needed by Hunt’s vehicle communication protocols.

46. When Hunt was filed in 2003, Bluetooth provided data rates up to 723 kbps transmit, and 57.6 kbps return, on a wireless asynchronous serial data link. Bray, 11 (“[T]he maximum baseband data rate in one direction [using ACL] is 723.2 kb/s. . . . [P]ackets sent in the other direction will only carry 57.6 kb/s[.]”);

Atmel, 4 (“Estimates have indicated data transfer rates up to 720 kbps.”). The abbreviations “kb/s” and “kbps” refers to kilobits per second, in this context a unit meaning 1024 bits of data per second.

47. These Bluetooth serial asynchronous data rates were more than needed to support the data rates associated with the vehicle communication protocols identified in Hunt. For example, Hunt explains that the J1850 PWM protocol used by Ford required a data rate (“Baud Rate”) of 41.6 “kbits/s,” while the J1850 VPWM protocol used by GM and Chrysler and the ISO 9141-2 protocol used by Toyota and Chrysler required a data rate of 10.4 “kbits/s.” Hunt, Table 1, 8:14-28, Fig. 1B (module 25a (J1850 PWM), 25b (J1850 VPWM), 25c (ISO 9141)). Hunt’s “kbit/s” is another abbreviation for kilobit per second, like “kb/s” and “kbps”.

E. POSAs would have known that Hunt’s cellphone embodiment could have been easily and conventionally implemented with Bluetooth.

48. POSAs would have known that Bluetooth could be used to provide a wireless asynchronous serial connection that satisfied Hunt’s description of link 179 connecting microprocessor 27 to the microcontroller 177 in the vehicle communication circuit 25. In this way, POSAs would have known that Hunt’s cellphone embodiment could have been implemented with Bluetooth providing data link 179 by wirelessly connecting a cellphone with microprocessor 27 to a

vehicle communication circuit 25 that was physically connected to a vehicle bus at an OBD-II port. This would have used technology and techniques that were known and conventional in 2003, long before Omega filed the '278 patent.

49. Omega's assertion that Hunt's microprocessor 27 must be "installed in a vehicle" is simply wrong, ignores the facts, ignores the knowledge of the POSA at least as far back as 2003 when Hunt was filed, and provides no basis to disregard Hunt's cellphone embodiment.

VII. OMEGA MISCHARACTERIZES HOW HUNT WORKS.

50. I understand that Omega argues that device codes are "fixed" or "programmed... at manufacture" in Hunt's ASIC, or that Hunt's ASIC "generate[s]... vehicle device codes." POR, 18-19. I disagree with this characterization of Hunt.

A. Hunt does not require an ASIC.

51. Omega misrepresents Hunt as limited to "a hardware-based system in the form of a single ASIC." POR, 17. Hunt does not require an ASIC.

52. Hunt discloses vehicle-communication modules that can "implement" communication protocols using an ASIC "*or using transistors or conventional circuit elements.*" Hunt, 9:41-44; *id.*, claim 35 (no ASIC).

53. I understand that Omega's expert Mr. McAlexander admits that Hunt Figures 6 and 7 show "logic diagrams" that "implement" communication protocol

physical layers using *off-the-shelf* transceiver components *in place of* an ASIC.

Hunt, 9:28-35, Figs. 6-7; EX1123, 112:2-4, 125:21-127:2. I agree with this conclusion.

54. Hunt's Figures 6 and 7 show "logic diagrams" that "implement" communication protocol *physical layers using off-the-shelf components*. Hunt, 9:28-35, Figs. 6-7. For example, Figure 6 identifies two off-the-shelf components (SN75LBC176DR or LTC1487C58) for a J1850 PWM network. The SN75LBC176DR is a differential bus transceiver in the form of a surface mount component. EX1119 (representative SN75LBC176DR data sheet). The LTC1487 is also a differential line transceiver in the form of a surface mount component. EX1120 (representative LTC1487 data sheet).

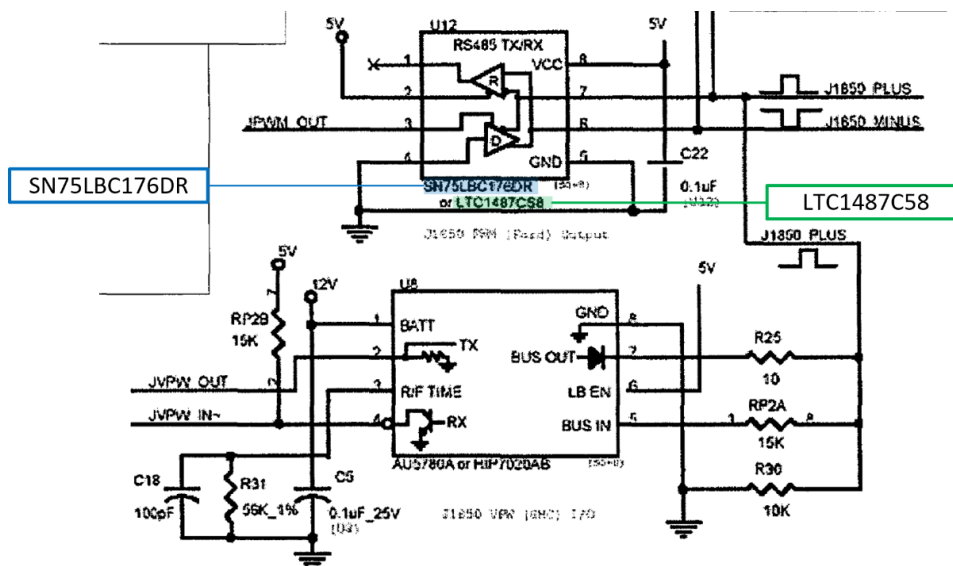
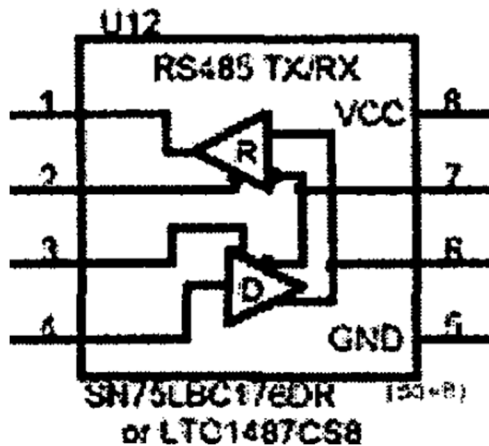


Fig. 6
Hunt, Fig. 6.



PACKAGE/ORDER INFORMATION

N8 PACKAGE 8-LEAD PDIP S8 PACKAGE 8-LEAD PLASTIC SO $T_{JMAX} = 125^{\circ}\text{C}$, $\theta_{JA} = 130^{\circ}\text{C/W}$ (N8) $T_{JMAX} = 125^{\circ}\text{C}$, $\theta_{JA} = 150^{\circ}\text{C/W}$ (S8)	ORDER PART NUMBER
	LTC1487CN8 LTC1487CS8
	S8 PART MARKING
	1487

Hunt, Fig. 6, J1850 PWM transceiver

EX1120, LTC1487, 2

55. Figure 7 identifies Si9243AEY or the L9637 as a transceiver for the ISO 9141-2 protocol. The Si9243AEY is “a monolithic bus transceiver designed to provide bidirectional serial communication in automotive diagnostic applications” in the form of an off-the-shelf surface mount component. EX1121, 1 (representative Si9243AEY data sheet). The L1937 is a bus driver in a “monolithic integrated circuit containing standard ISO 9141 compatible interface functions” provided a surface mount component. EX1122, 1 (representative L1937 data sheet).

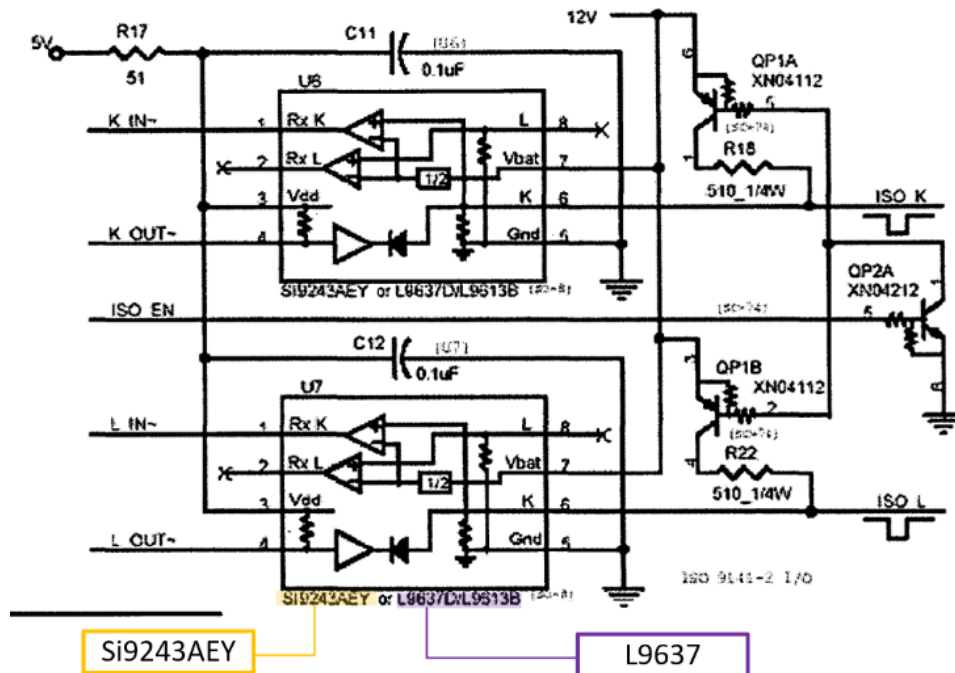


Fig. 7
Hunt, Fig. 7

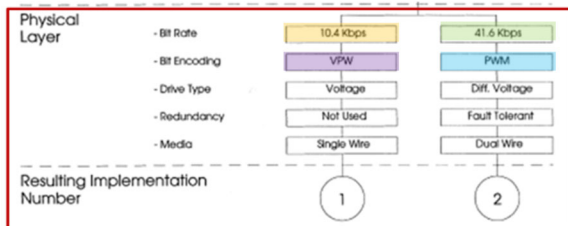
56. Hunt at 10:46-54 confirms that Omega misrepresents Hunt's invention as limited to "the form of a single ASIC" (POR, 17). At 10:46-54, Hunt explains:

Further, some embodiments of the present invention *may be implemented in part or in whole as a hard-wired circuit*, as a circuit configuration fabricated into an application specific integrated circuit [e.g., an ASIC], *or as a firmware program* loaded into non-volatile storage, *or a software program* loaded from or into a data storage medium as machine-readable code. *Such machine-readable code may include instructions executable by an array of logic elements, such as a microprocessor* or other digital signal processing unit.

B. Hunt's ASICs or circuit components implement the physical layer of a communication protocol.

57. POSAs understood that Hunt's ASIC modules implement the *physical layer* for a communication protocol because (1) Hunt's "logic diagrams" show providing *physical layer* interfaces for communication protocols, and (2) Hunt describes protocols in terms of the physical layer parameters. Hunt, 2:6-8, Fig. 6 (J1850 VPWM and PWM); *id.*, 2:9-11, Fig. 7 (ISO 9141-2); *id.*, 8:14-29, Table 1 (describing "managing communication protocols" in terms of *physical layer* parameters baud rate and pulse width), 9:28-35 (Figs. 6, 7 "logic diagrams represent circuits that function as individual modules"), claim 1 (vehicle-communication circuit ("VCC") ASIC modules "configured to be interfaced [e.g., *physically* connected] with a diagnostic connector"). While an ASIC can implement more than a physical layer, Hunt never describes implementing anything in an ASIC beyond the physical layer circuits corresponding to the off the shelf components shown in logic diagrams 200 and 210 in Figures 6 and 7.

58. To the extent Hunt's ASIC incorporates the circuits embodied in the commercial components shown in Figures 6 or 7, that means Hunt's ASIC is implementing the physical layer of a communication protocol. The different Hunt ASIC "modules" 25a-25e then implement the physical layer of the communication protocol associated with that module.



EX1071, 8, Fig. 1.

TABLE 1
Communication Protocols for Vehicles

Protocol	Vehicle	Baud Rate (kbits/s)	Pulse Width
J1850 PWM	Ford	41.6	constant
J1850 VPWM	GM, Chrysler	10.4	variable
ISO 9141-2	Toyota, Chrysler	10.4	constant

Hunt, 8:14-29.

C. The physical layer of a communication protocol does not generate device codes.

59. Different communication protocol implementations may require different *physical layers* in *hardware*. For example, Hunt describes using its appliance with the J1850 protocol. E.g., Hunt, Fig. 1B, 5 (modules 25a, 25b), 2:48-57. The J1850 protocol is described in EX1071. EX1071 explains that an “Application Layer” includes “control algorithms.” EX1071, 8, §5.3.1 (Application Layer includes “control algorithms”). EX1071 explains that “Typical *Physical Layer* protocol elements include voltage/current levels, media impedance, and bit/symbol definition and timing.” EX1071, 9, §5.3.3 (“Typical *Physical Layer* protocol elements include voltage/current levels, media impedance, and bit/symbol definition and timing.”). Other standards documents provide the same. EX1047, 3, §5 (Application Layer “contains management functions and... mechanisms to support applications.”).

60. The *physical layer* implements *physical* communication protocols (e.g., bit rate, modulation, drive type like single-ended or differential voltage signaling) that pass messages to/from the application layer. EX1071, 8, Fig. 1

(VPW and PWM) (annotated below showing Open System Interconnect (“OSI”) network layers for J1850). The OSI model can be seen as a universal language for computer networking. It is based on the concept of splitting up a communication system into seven abstract layers, each one stacked upon the last. The top layer is the application layer, and the bottom layer is the *physical layer*.

61. POSAs understood that implementing the *physical layer* in ASIC logic is not generating a device code because the physical layer modulates a signal (the code) provided to it, and because Hunt explains embodiments can be implemented in software executing on a processor. Hunt, 10:46-54 (invention can be implemented as “firmware... or... software” by “instructions executable by... a microprocessor.”); EX1071, 8, Fig. 1 (diagnostic code / parameter and message are part of application layer, not physical layer). Implementing the *physical layer* in circuit logic has nothing to do with generating device code content because the physical layer modulates a signal (the code) provided to it from a higher layer.

62. I understand that Omega’s expert agrees that the *physical layer* of a protocol *does not generate device codes*. EX1123, 78:7-21; *id.*, 54:22-57:1 (message generated in application, formatted in application layer), 79:22-81:8 (same), 112:2-19. Vehicle device codes are part of a message payload that is transmitted over a network conforming to a communication protocol. EX1123, 68:5-69:14, 75:2-9, 107:17-24. The *physical layer* modulates messages sent over a

network according to *physical* communication protocols (e.g., bit rate, modulation, drive type). EX1071, 8, Fig. 1 (VPW and PWM); EX1123, 58:5-59:19.

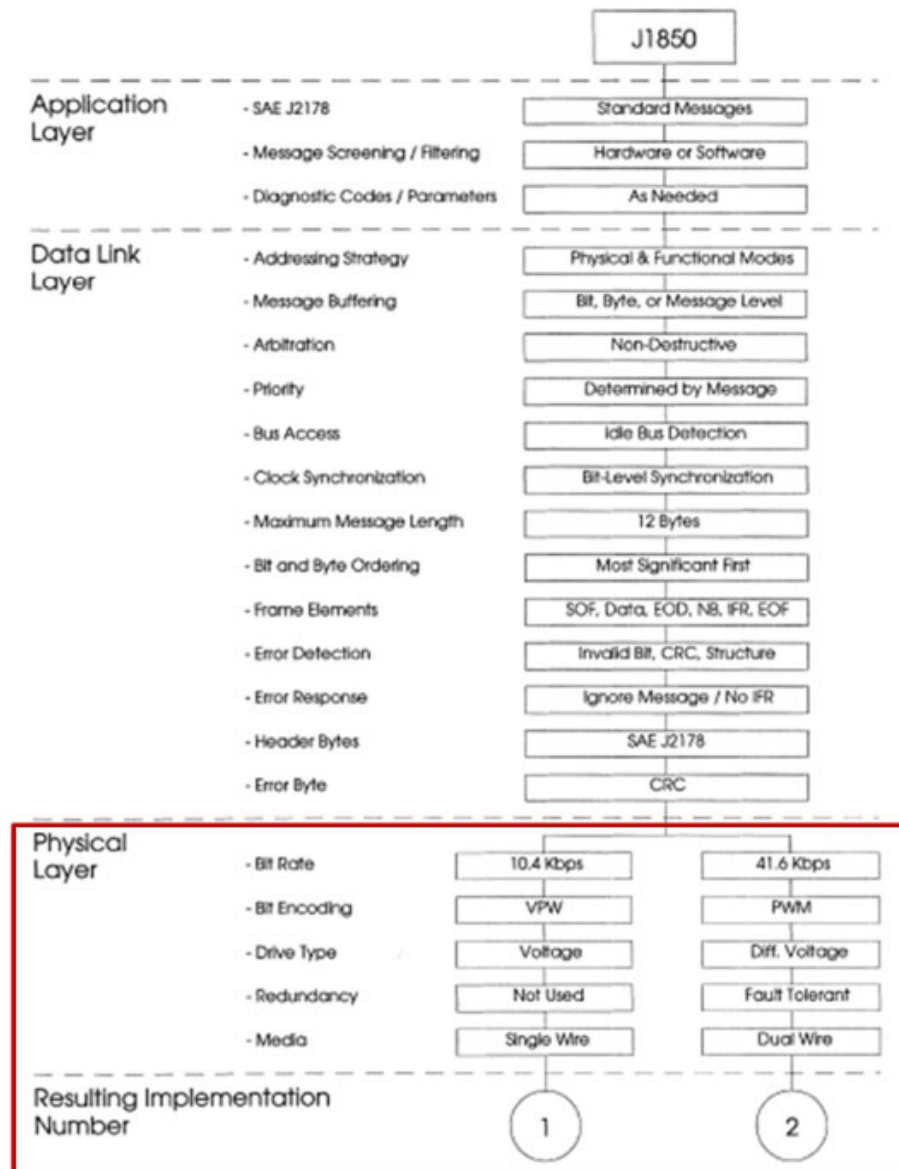


FIGURE 1—MAP OF SAE J1850 TO THE ISO OSI MODEL

EX1071, 8, Fig. 1.

D. Communication protocol layers above the physical layer can be implemented entirely in software including firmware.

63. In a communication protocol, such as J1850, every layer of the network stack *above* the *physical layer* can be implemented *in software*. Omega's expert agrees. EX1123, 57:11-58:1 (data link layer), 86:4-7 (application layer), 102:19-25, 103:9-104:5. More often than not the application layer is implemented in software. And moreover, even parts of the physical layer like modulation can be implemented in software. Omega's expert agreed. EX1123, 83:11-19. When I refer to implementing portions of the network layer for a vehicle communication protocol in software, I am including firmware in this description. Firmware is a type of software. As I discuss below, Hunt discloses implementing its appliance in both firmware and software. Using a driver as an example, Omega's expert referred to "software loaded into a system's firmware" (EX1123, 56:10-57:10) and did not identify any meaningful distinction between software and the particular type of software provided by firmware. For example, when agreeing that Hunt's ASIC that includes a microprocessor has to be programmed, Omega's expert made no distinction between that microprocessor executing software or firmware. E.g., EX1123, 93:22-96:12, 95:19-23 ("[T]he generation of an ASIC occurs based upon a design. And whether then relying *on software or firmware* to execute the necessary logic to perform functions, it's built in hardware.").

64. Omega's expert explained that POSAs would implement communication protocols in software to trade ASIC speed for software flexibility. EX1123, 137:20-138:19. I agree with this statement. Implementing communication protocol layers in software provides significant flexibility for designers and engineers. It also makes manufacture simpler because it eliminates any need for custom ASICs such as Omega mistakenly believes Hunt requires. Thus, communication protocols can be implemented in software using the commercial components such as shown in Hunt's Figures 6 and 7 to provide the physical interface to a vehicle data bus.

65. Hunt expressly contemplates this implementation of his invention because he specifically says that its invention "may be implemented in part or in whole" as "a firmware program... or a software program... executable by... a microprocessor." Hunt, 10:46-54; *supra* §VI (cellphone embodiment); *cf.* EX1123, 85:4-9 (query message formulated in software).

66. Hunt explains that programming a microprocessor to implement Hunt's invention was well-within the POSA's ordinary skill. Hunt, 10:55-11:3. I agree.

67. Hunt thus describes implementing communication protocols in a microprocessor, using off-the-shelf components providing a protocol *physical layer*, without using an ASIC at all.

68. Hunt describes implementing its invention in firmware or software running on a microprocessor. As a result, downloading new firmware or software can of course impact “the operation of the device” (POR, 19). This contradicts Omega’s contrary arguments.

E. Hunt’s ASIC is programmable because it includes a microprocessor.

69. I understand that Omega’s expert testified that Hunt’s “ASIC” is “programmed” in the form of circuit elements patterned at manufacture (EX2010, ¶¶74, 81; EX1123, 95:17-97:6), and that *an ASIC does not include a microprocessor* (EX1123, 90:24-91:5, 91:14-18).

70. I understand that Omega’s arguments that Hunt’s ASIC cannot be “updated” depend on this ASIC definition. POR, 17-19.

71. I disagree with Omega’s characterization of Hunt’s ASIC. Omega’s characterization ignores that *Hunt specifically says its ASIC includes a microprocessor*. Hunt, 3:50-51, 16:32-34 (claim 63).

72. Hunt’s microprocessors require programming. Omega’s expert agrees. EX1123, 94:11-17.

73. This contradicts Omega’s argument that Hunt’s ASIC cannot be “programmed” or is limited to “fixed programming.”

F. There is no support for Omega’s contention that Hunt’s ASIC is “programmed” with or “generates” vehicle device codes.

74. I understand that Omega argues that Hunt’s ASIC is “programmed” with device codes or “generates device codes” (POR, 18-19; EX2010, ¶¶77-78) based on Omega’s argument that Hunt only refers to “communication protocols” in connection with discussing an ASIC. EX1123, 116:8-120:14, 122:22-125:13.

75. Hunt does not provide any description of programming, storing, or generating device codes in a hardwired ASIC.

76. Regardless, Omega’s reasoning that Hunt only refers to “communication protocols” in connection with discussing an ASIC is demonstrably false and inconsistent with Hunt’s actual disclosure.

77. First, Hunt does not limit discussion of implementing protocols to the context of using an ASIC.

78. As I explained above, *supra* §VII.A, Hunt describes off-the-shelf components as “implementing” protocols. “[L]ogic diagrams and corresponding circuits other than those described above *can be used to implement protocols* such as J1850 PWM/VPWM, ISO 9141-2, CAN, Keyword 2000, and 11708. These protocols can be implemented using integrated silicon-based solutions (e.g., a custom ASIC), or using transistors or conventional circuit elements.” Hunt, 9:37-44.

79. Second, there is no passage in Hunt that describes “generating” a device code in an ASIC. I understand that Omega’s expert agrees. EX1123, 146:11-15.

80. Third, a “device code” and a “communication protocol” are completely different things. A device code is part of a message payload that is communicated over a network that supports a communication protocol. I understand that Omega’s expert agrees that device codes and communication protocols are “*totally different matters*” (EX1123, 66:1-20).

81. Consequently, Hunt’s reference to an ASIC “implementing,” “managing,” or “supporting” a *communication protocol* does not support Omega’s speculation that the ASIC is “programmed” with or “generates” *device codes* because: (1) Omega’s expert admits that device codes and communication protocols are “*totally different matters*” (EX1123, 66:1-20); and (2) Hunt does not describe “generating” device codes in an ASIC (EX1123, 146:11-15).

82. In other words, it does not follow that a reference to a device implementing a communication protocol means generating a device code. Hunt’s logic diagrams are a perfect example. Hunt describes the commercial circuits identified in Figure 6 and 7 logic diagrams as implementing a communication protocol, but those circuits have nothing to do with generating the vehicle device codes in message that are communicated over the network. The circuits implement

the physical layer – they modulate the messages (containing vehicle device codes) that are generated elsewhere.

83. Thus, Omega’s arguments that suggest that device codes are “fixed” because they are generated by Hunt’s ASIC hardware rather than Hunt’s programmed processor are baseless.

VIII. DATA THAT CAN BE DOWNLOADED DOES NOT IMPOSE STRUCTURE ON THE “DOWNLOADING INTERFACE.”

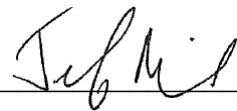
84. Limitation [1.e] recites a “downloading interface for permitting downloading of enabling data....” I am told to assume this means that the downloading interface must be “capable” of downloading “enabling data.” Claim 8 requires that the “downloading interface is also for permitting downloading of at least one programming instruction....” I am told to assume that “for permitting downloading” means capable of downloading. So together this means that the “downloading interface” must be capable of downloading “enabling data” and “at least one programming instruction.” A POSA would have understood a “programming instruction” is provided in firmware and/or software.

85. The ’278 patent states that the “downloading interface” can be “a socket to accept a memory card” (EX1001, 24:44-46). The content of data stored on an “accept[ed]” memory card does not limit the structure of the socket. This is no different from the idea that the content of data on a flash drive does not limit the structure of a USB port that receives the flash drive.

I declare that all statements made herein of my own knowledge are true, that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: 1/23/2024

A handwritten signature in black ink, appearing to read "Jeff Miller", is written over a horizontal line.

Jeffrey Miller, Ph.D.

APPENDIX A: MATERIALS CONSIDERED

A. Papers

Paper	Description
11	Institution Decision
15	Patent Owner Response

B. Exhibits

Exhibit	Description
1001	U.S. Patent No. 8,032,278
1002	Prosecution History of U.S. Patent No. 8,032,278
1003	<i>RESERVED</i>
1004	Curriculum Vitae of Jeffrey Miller, Ph.D.
1005	Prosecution History of Ser. No. 90/013,587 (RX1)
1006	Prosecution History of Ser. No. 90/013,851 (RX2)
1007	Prosecution History of Ser. No. 90/014,309 (RX3)
1008	Prosecution History of Ser. No. 90/014,419 (RX4)
1009	Prosecution History of Ser. No. 90/014,675 (RX5)
1010	Claim Rejection, mailed May 6, 2016 in No. 90/013,587 (RX1)
1011	Decision granting <i>ex parte</i> reexamination request, mailed December 15, 2016 in No. 90/013,851 (RX2)
1012	<i>Ex parte Omega Patents, LLC</i> , No. 2018-008119 (Nov. 3, 2018)
1013	Decision granting <i>ex parte</i> reexamination request, mailed March 25, 2021 in No. 90/014,675 (RX5)
1014	Non-Final Rejection, mailed October 5, 2021 in No. 90/014,675 (RX5)
1015	Patent Owner's Appeal Brief, No. 90/014,675 (April 1, 2022)
1016	Transcript of oral argument in <i>Ex parte Omega Patents, LLC</i> , No. 2022-003758, Reexamination No. 90/014,675 (Oct. 28, 2022)
1017	<i>Ex parte Omega Patents, L.L.C.</i> , No. 2022-003758 (Nov. 30, 2022)
1018	D.I. 50, Claim Construction Order, <i>Omega Patents, LLC v. CalAmp Corp.</i> , No. 6:13-cv-1950-Orl-40DAB (M.D. Fla. Feb. 20, 2015) (" <i>CalAmp-CC</i> ").
1019	D.I. 34, Claim Construction Order, <i>Omega Patents, LLC v. Firstech, LLC</i> , No. 2:20-cv-01344-TSZ (W.D. Wash. Nov. 22, 2021) (" <i>Firstech-CC</i> ").
1020	<i>Omega Patents, LLC v. CalAmp Corp.</i> , 920 F.3d 1337 (Fed. Cir. 2019) (" <i>CalAmp-F</i> ")

Exhibit	Description
1021	<i>Omega Patents, LLC v. CalAmp Corp.</i> , 13 F.4th 1361 (Fed. Cir. 2021) (“ <i>CalAmp-IP</i> ”)
1022	D.I. 14, Omega Patents Answering Brief In Opposition to Geotab USA, Inc.’s Motion to Dismiss, <i>Omega Patents, LLC v. Geotab USA, Inc. and Geotab, Inc.</i> , No. 1:22-cv-01044-CFC (D. Del. Nov. 16, 2022)
1023	U.S. Patent No. 6,957,133 (“Hunt”)
1024	U.S. Patent No. 6,756,885 (“Flick-885”)
1025	U.S. Patent No. 6,011,460 (“Flick-460”)
1026	D.I. 040, Omega Patents Opposition to CalAmp Motion For Claim Construction, <i>Omega Patents, LLC v. CalAmp Corp.</i> , No. 6:13-cv-1950-Orl-40DAB (M.D. Fla. Oct. 3, 2014)
1027	<i>RESERVED</i>
1028	<i>RESERVED</i>
1029	D.I. 143, Jury Instructions, <i>Omega Patents, LLC v. CalAmp Corp.</i> , No. 6:13-cv-1950-Orl-40DAB (M.D. Fla. Nov. 24, 2016)
1030	D.I. 309, Jury Instructions, <i>Omega Patents, LLC v. CalAmp Corp.</i> , No. 6:13-cv-1950-Orl-40DAB (M.D. Fla. Sep. 30, 2019)
1031	Y. Park and A. Fumiyuki, eds. <i>Enhanced Radio Access Technologies For Next Generation Mobile Communication</i> . Dordrecht: Springer, 2007.
1032	F. Delli Priscoli and M. Neri, “Integration of the ORBCOMM satellite network with the GSM Short Message Service.” <i>Space Communications</i> , Vol. 19, no. 1, pp. 47-57, 2003.
1033	D.I. 180, Transcript, Civil Jury Trial–Day 3, <i>Omega Patents, LLC v. CalAmp Corp.</i> , No. 6:13-cv-1950 (M.D. Fla. Feb. 18, 2016)
1034	<i>RESERVED</i>
1035	<i>RESERVED</i>
1036	<i>RESERVED</i>
1037	<i>RESERVED</i>
1038	<i>RESERVED</i>
1039	<i>RESERVED</i>
1040	Pages from D.I. 339, Transcript, Civil Jury Trial–Day 3, <i>Omega Patents, LLC v. CalAmp Corp.</i> , No. 6:13-cv-1950 (M.D. Fla. Sep. 25, 2019)
1041	<i>RESERVED</i>
1042	<i>RESERVED</i>
1043	<i>RESERVED</i>

Exhibit	Description
1044	Comparison of limitations in '278 patent claims 13-22 with limitations in '278 patent claims 1-12
1045	<i>RESERVED</i>
1046	Title 40 Code of Federal Regulations, Part 86, Subpart S—General Compliance Provisions for Control of Air Pollution From New and In-Use Light Duty Vehicles, Light-Duty Trucks, and Complete Otto-Cycle Heavy-Duty Vehicles (July 1, 2007)
1047	SAE J1939-71 Vehicle Application Layer (rev. DEC2004)
1048	<i>RESERVED</i>
1049	<i>RESERVED</i>
1050	International Standard ISO 15031-4 Road Vehicles—Communication between vehicle and external equipment for emissions related diagnostics—Part 4: External test equipment (1st ed. June 15, 2005) (“ISO 15031-4:2005”)
1051	Pages from Microsoft Internet & Networking Dictionary (2003)
1052	SAE J1978 OBD-II Scan Tool – Equivalent to ISO/DIS 15031-4: December 14, 2001 (revised 2002-04)
1053	Pages from IEEE 100 The Authoritative Dictionary of IEEE Standard Terms (7th Ed. 2000)
1054	<i>RESERVED</i>
1055	<i>RESERVED</i>
1056	U.S. Patent No. 8,856,266
1057	U.S. Patent Application Publication No. US 2005/0032511 A1
1058	U.S. Patent Application Publication No. US 2004/0138790 A1
1059	<i>RESERVED</i>
1060	U.S. Patent No. 7,209,813
1061	<i>RESERVED</i>
1062	<i>RESERVED</i>
1063	<i>RESERVED</i>
1064	U.S. Patent No. 7,617,727
1065	D.I. 145-85, PL104, 4/15/2015 Expert Report of Joseph C. McAlexander, <i>Omega Patents, LLC v. CalAmp Corp.</i> , No. 6:13-cv-1950 (M.D. Fla. Feb 25, 2016)
1066	13 Cal. Code Reg. §1968.2 Malfunction and Diagnostic System Requirements—2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines (2004)
1067	February 19, 2007 Internet Archive capture of startech.com webpage on computer cables at

Exhibit	Description
	https://web.archive.org/web/20070219050320/http://www.startech.com/Product/Category.aspx?WCID=7&WCLID=2&MLID=2&menu=1&from=more&c=US
1068	<i>RESERVED</i>
1069	<i>RESERVED</i>
1070	Control of Air Pollution From New Motor Vehicles and New Motor Vehicle Engines; Modification of Federal On-Board Diagnostic Regulations for: Light-Duty Vehicles, Light-Duty Trucks, Medium Duty Passenger Vehicles, Complete Heavy Duty Vehicles and Engines Intended for Use in Heavy Duty Vehicles Weighing 14,000 Pounds GVWR or Less; Extension of Acceptance of California OBD II Requirements, 68 Fed. Reg. 35792 (June 17, 2003)
1071	SAE J1850 Class B Data Communications Network Interface, (revised May 2001)
1072	ISO 15765-4:2005(E) Road vehicles – Diagnostics on Controller Area Networks (CAN) – Part 4: Requirements for emissions-related systems (1st ed. ISO January 15, 2005)
1073	ISO 15031-5:2006(E) Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 5: Emissions-related diagnostic services (ISO 1st ed. January 15, 2006)
1074	ISO 14230-4 Road vehicles — Diagnostic systems — Keyword Protocol 2000 —Part 4: Requirements for emission-related systems (ISO 1st ed. June 1, 2000)
1075	SAE J1979 (R) E/E Diagnostic Test Modes – Equivalent to ISO/DIS 15031-5:April 30, 2002 (revised April 2002)
1076	SAE J2178-1 Class B Data Communication Network Messages— Detailed Header Formats and Physical Address Assignments (reaffirmed July 2004).
1077	<i>RESERVED</i>
1078	SAE J2178-4 Class B Data Communication Network Messages— Message Definitions for Three Byte Headers (reaffirmed July 2004).
1079	Pages from Title 40 Code of Federal Regulations, Part 86, Subpart S— General Compliance Provisions for Control of Air Pollution From New and In-Use Light Duty Vehicles, Light-Duty Trucks, and Complete Otto-Cycle Heavy-Duty Vehicles (July 1, 2014)
1080	Pages from Collins English Dictionary (5th ed. 2000)
1081	Pages from Newton’s Telecom Dictionary (2005)

Exhibit	Description
1082	ISO 14230-2 Road vehicles—Diagnostic systems—Keyword Protocol 2000 – Part 2: data link layer (1st ed. Mar. 15, 1999)
1116	J. Bray and C.F. Sturman, Bluetooth 1.1: Connect Without Cables (2d ed. Prentice Hall PTR 2002) (“Bray”)
1117	Affidavit of Nathaniel E. Frank-White, Internet Archive Records Request Processor, with Exhibit B, “The Bluetooth Wireless Technology White Paper, Rev. 1991A-11/00” (Atmel 2000) (“Atmel”)
1118	U.S. Patent No. 8,495,615 (“Alberti”)
1119	Data Sheet SN55LBC176, SN65LBC176, SN65LBC176Q Differential Bus Transceiver (Texas Instruments)
1120	Data Sheet, LTC1487 Ultra-Low Power RS485 with Low EMI, Shutdown and High Input Impedance (Linear Technology)
1121	Data Sheet, Si9243AEY Single-Ended Bus Transceiver (Vishay Siliconix)
1122	Data Sheet, L9637 ISO 9141 Interface (STMicroelectronics)
1123	Transcript, Deposition of Joseph C. McAlexander III (January 5, 2023)
1126	Errata to Transcript, Deposition of Joseph C. McAlexander III (January 5, 2023)
2010	Second Declaration of Joseph C. McAlexander, III (EX2010) and materials cited therein

APPENDIX B: U.S. PATENT NO. 8,032,278 CLAIM LIST

Ref	Claim
1.pre	A multi-vehicle compatible tracking unit for a vehicle comprising a vehicle data bus extending throughout the vehicle, the multi-vehicle compatible tracking unit comprising:
1.a	a vehicle position determining device;
1.b	a wireless communications device;
1.c	a multi-vehicle compatible controller for cooperating with said vehicle position determining device and said wireless communications device to send vehicle position information;
1.d	said multi-vehicle compatible controller to be coupled to the vehicle data bus for communication thereover with at least one vehicle device using at least one corresponding vehicle device code from among a plurality thereof for different vehicles; and
1.e	a downloading interface for permitting downloading of enabling data related to the at least one corresponding vehicle device code for use by said multi-vehicle compatible controller.
2	The multi-vehicle compatible tracking unit according to claim 1 wherein said downloading interface comprises a wired signal downloading interface.
3	The multi-vehicle compatible tracking unit according to claim 2 wherein said wired signal downloading interface comprises a connector for temporary connection to a downloading device.
4	The multi-vehicle compatible tracking unit according to claim 1 wherein said downloading interface comprises a wireless signal downloading interface.
5	The multi-vehicle compatible tracking unit according to claim 4 wherein said wireless signal downloading interface comprises a wireless receiver for temporary connection to a downloading device.
6	The multi-vehicle compatible tracking unit according to claim 1 wherein the corresponding at least one vehicle code is for reading from the at least one vehicle device.
7	The multi-vehicle compatible tracking unit according to claim 1 wherein the corresponding at least one vehicle code is for writing to the at least one vehicle device.
8	The multi-vehicle compatible tracking unit according to claim 1 wherein said downloading interface is also for permitting downloading of at least one programming instruction for said multi-vehicle compatible controller.

Ref	Claim
9	The multi-vehicle compatible tracking unit according to claim 1 further comprising a remote transmitter; and wherein said multi-vehicle compatible controller also performs at least one vehicle remote control function responsive to said remote transmitter.
10	The multi-vehicle compatible tracking unit according to claim 9 wherein the at least one vehicle remote control function comprises at least one of a vehicle security function, a remote keyless entry function, and a remote engine starting function.
11	The multi-vehicle compatible tracking unit according to claim 1 wherein said wireless position determining device comprises a Global Positioning System (GPS) receiver.
12	The multi-vehicle compatible tracking unit according to claim 1 further comprising a housing containing said vehicle position determining device, said wireless communications device, said multi-vehicle compatible controller, and said downloading interface.
13.pre	A multi-vehicle compatible tracking unit for a vehicle comprising a vehicle data bus extending throughout the vehicle, the multi-vehicle compatible vehicle tracking unit comprising:
13.a	a vehicle position determining device;
13.b	a wireless communications device;
13.c	a multi-vehicle compatible controller for cooperating with said vehicle position determining device and said wireless communications device to send vehicle position information;
13.d	said multi-vehicle compatible controller to be coupled to the vehicle data bus for communication thereover with at least one vehicle device using at least one corresponding vehicle device code from among a plurality thereof for different vehicles; and
13.e	a downloading interface for permitting downloading of enabling data related to the at least one corresponding vehicle device code for use by said multi-vehicle compatible controller;
13.f	said downloading interface comprising a connector for temporary connection to a downloading device.
14	The multi-vehicle compatible tracking unit according to claim 13 wherein the corresponding at least one vehicle code is for reading from the at least one vehicle device.
15	The multi-vehicle compatible tracking unit according to claim 13 wherein the corresponding at least one vehicle code is for writing to the at least one vehicle device.

Ref	Claim
16	The multi-vehicle compatible tracking unit according to claim 13 wherein said downloading interface is also for permitting downloading of at least one programming instruction for said multi-vehicle compatible controller.
17	The multi-vehicle compatible tracking unit according to claim 13 further comprising a remote transmitter; and wherein said multi-vehicle compatible controller also performs at least one vehicle remote control function responsive to said remote transmitter.
18.pre	A multi-vehicle compatible tracking unit for a vehicle comprising a vehicle data bus extending throughout the vehicle, the multi-vehicle compatible vehicle tracking unit comprising:
18.a	a vehicle position determining device;
18.b	a wireless communications device;
18.c	a multi-vehicle compatible controller for cooperating with said vehicle position determining device and said wireless communications device to send vehicle position information;
18.d	said multi-vehicle compatible controller to be coupled to the vehicle data bus for communication thereover with at least one vehicle device using at least one corresponding vehicle device code from among a plurality thereof for different vehicles; and
18.e	a downloading interface for permitting downloading of enabling data related to the at least one corresponding vehicle device code for use by said multi-vehicle compatible controller;
18.f	said downloading interface comprising a wireless receiver for temporary connection to a downloading device.
19	The multi-vehicle compatible tracking unit according to claim 18 wherein the corresponding at least one vehicle code is for reading from the at least one vehicle device.
20	The multi-vehicle compatible tracking unit according to claim 18 wherein the corresponding at least one vehicle code is for writing to the at least one vehicle device.
21	The multi-vehicle compatible tracking unit according to claim 18 wherein said downloading interface is also for permitting downloading of at least one programming instruction for said multi-vehicle compatible controller.
22	The multi-vehicle compatible tracking unit according to claim 18 further comprising a remote transmitter; and wherein said multi-vehicle compatible controller also performs at least one vehicle remote control function responsive to said remote transmitter.