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Bailey et al.

(54) **USAGE DATA FOR MARINE ELECTRONICS DEVICE**

(71) Applicant: **NAVICO HOLDING AS**, Egersund (NO)

(72) Inventors: **Paul Robert Bailey**, Auckland (NZ); **Phillip King Gaynor**, Chesapeake, VA (US)

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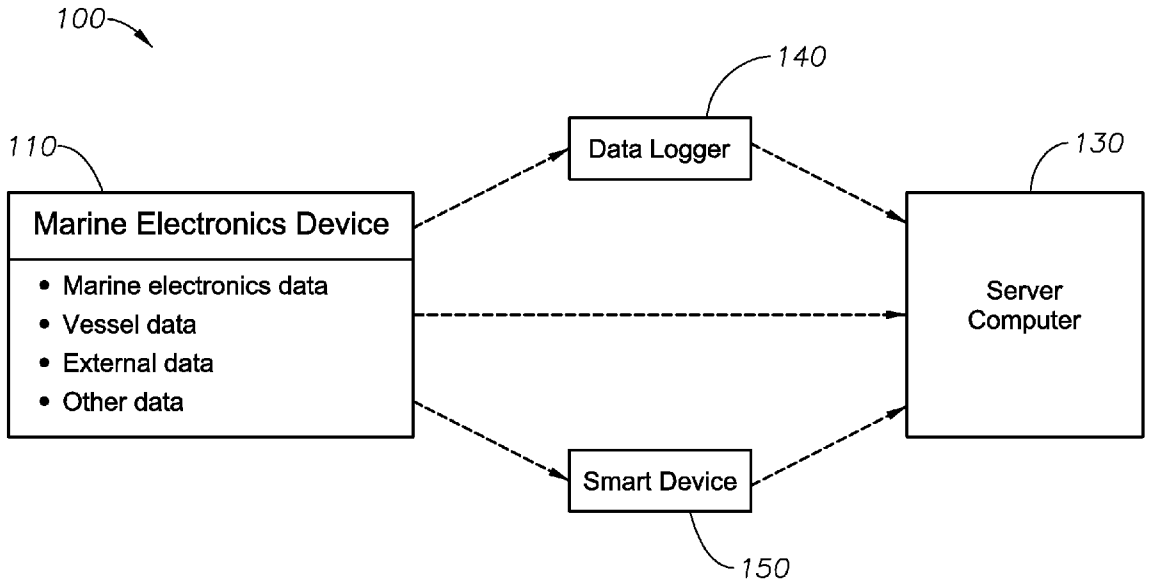
CPC ***G08C 17/02*** (2013.01)
USPC **340/870.01**

(57) **ABSTRACT**

Various implementations described herein are directed to usage data for a marine electronics device. In one implementation, a non-transitory computer-readable medium has stored thereon a plurality of computer-executable instructions which, when executed by a computer, cause the computer to record usage data at a marine electronics device. The usage data includes data relating to at least one user input to the marine electronics device. The computer-executable instructions are further configured to cause the computer to transmit the usage data to a server computer for analysis and evaluation.



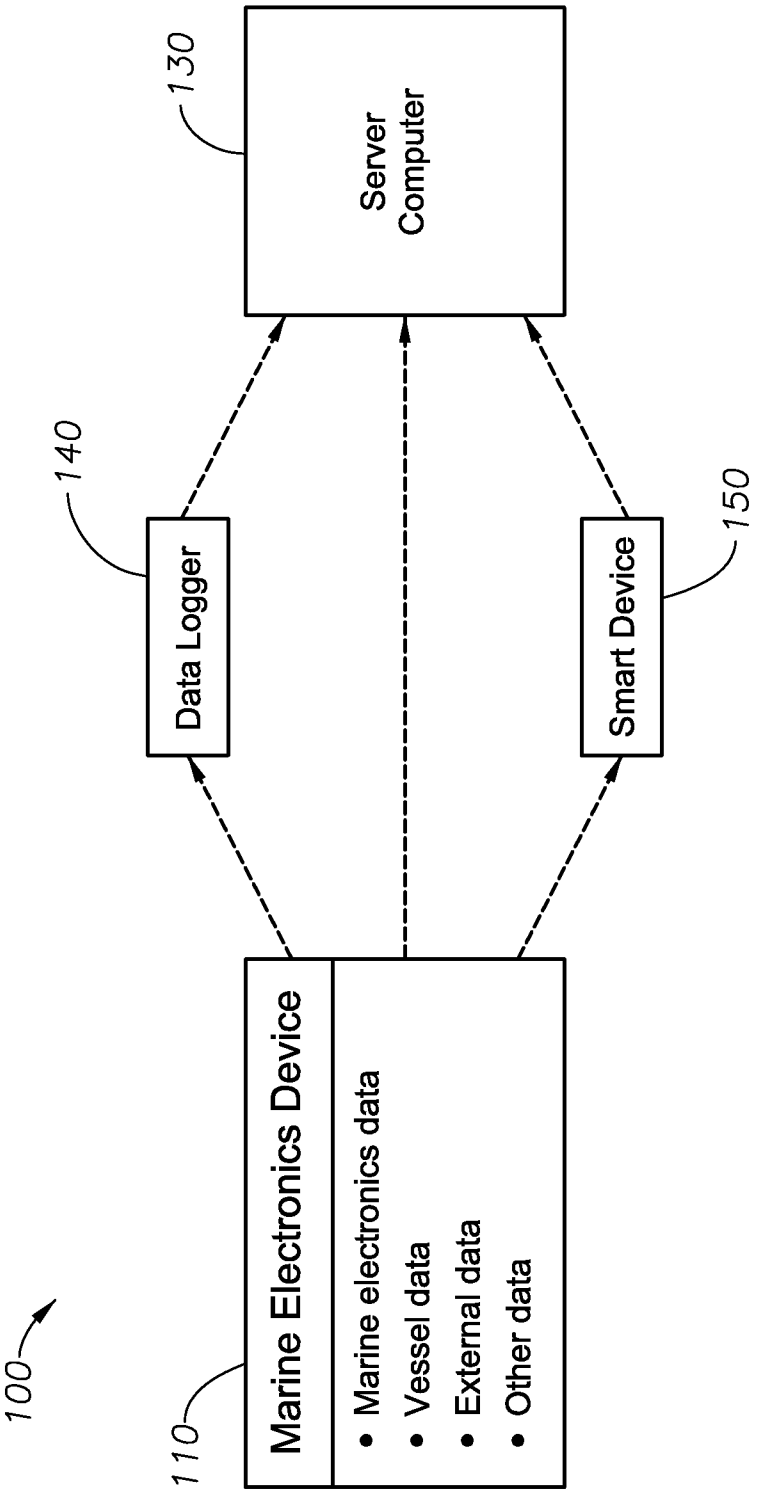

100
110
Marine Electronics Device
• Marine electronics data
• Vessel data
• External data
• Other data
130
Server Computer
140
Data Logger
150
Smart Device

FIG. 1

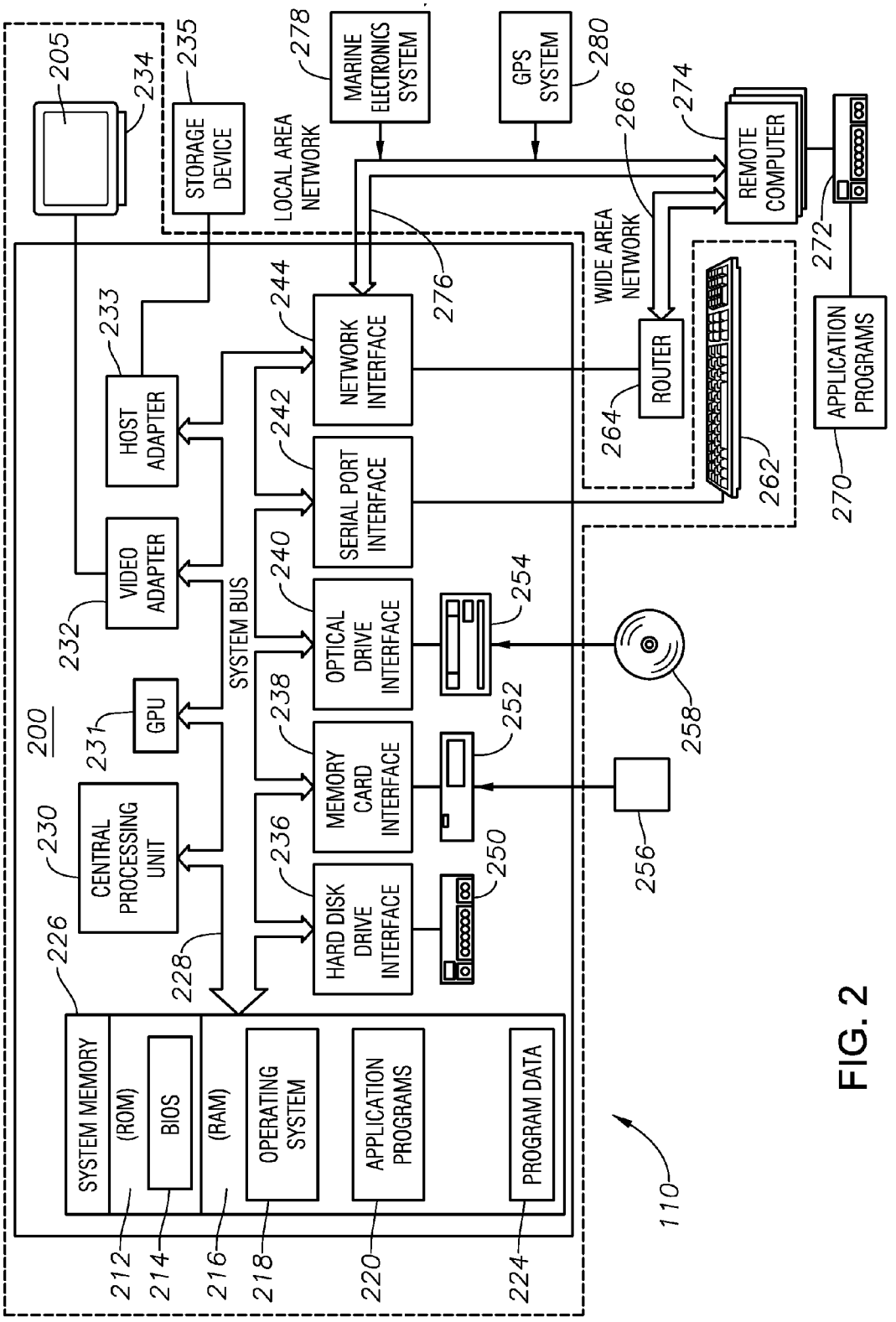

205
234
235
STORAGE DEVICE
LOCAL AREA NETWORK
278
MARINE ELECTRONICS SYSTEM
GPS SYSTEM
280
266
274
REMOTE COMPUTER
272
WIDE AREA NETWORK
276
244
NETWORK INTERFACE
233
HOST ADAPTER
242
SERIAL PORT INTERFACE
240
OPTICAL DRIVE INTERFACE
238
MEMORY CARD INTERFACE
236
HARD DISK DRIVE INTERFACE
ROUTER
264
262
270
APPLICATION PROGRAMS
254
252
250
258
256
232
VIDEO ADAPTER
231
GPU
SYSTEM BUS
200
230
CENTRAL PROCESSING UNIT
226
228
SYSTEM MEMORY
(ROM)
BIOS
(RAM)
OPERATING SYSTEM
APPLICATION PROGRAMS
PROGRAM DATA
212
214
216
218
220
224
110

FIG. 2

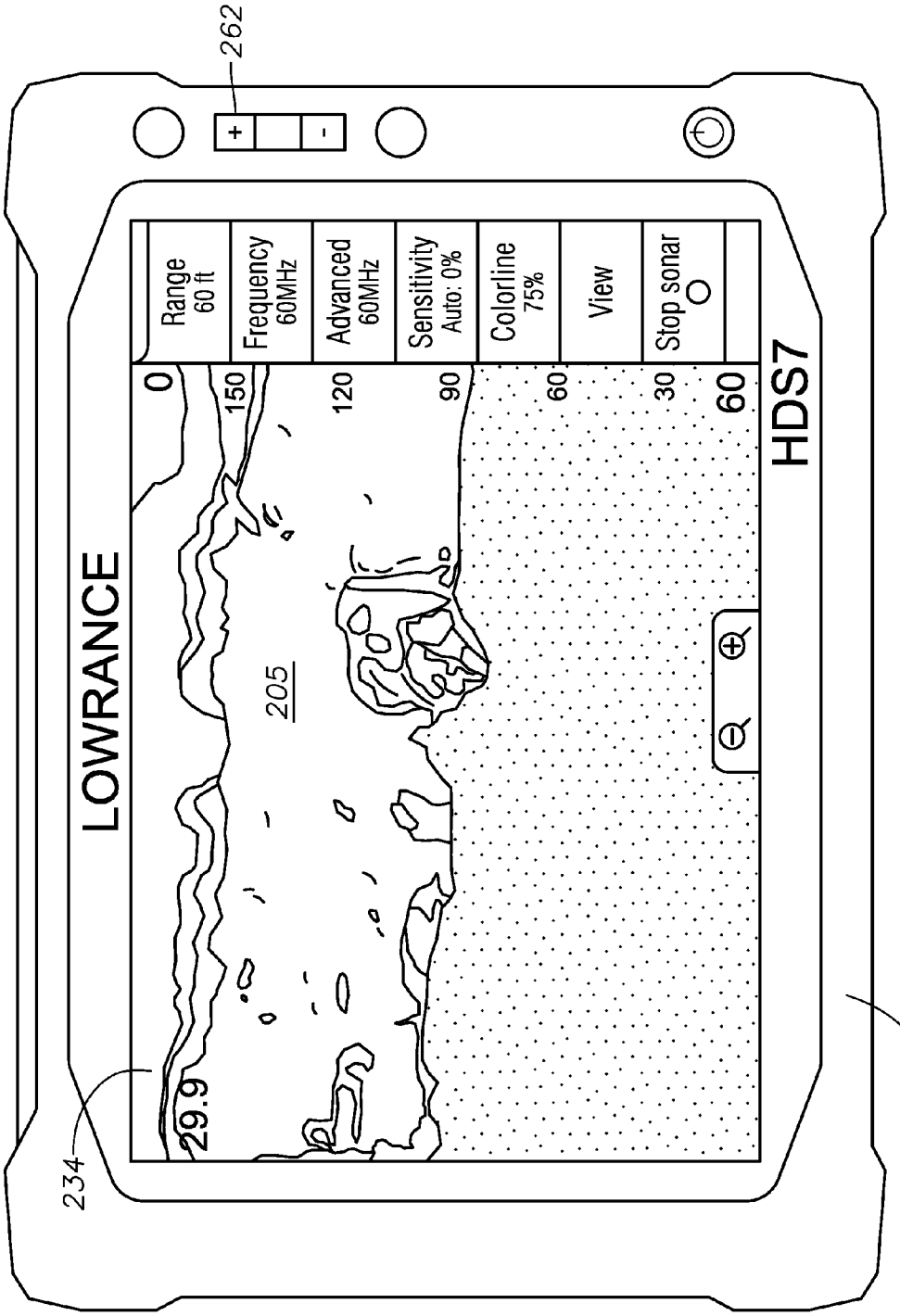

262
+
-
Range
60 ft
Frequency
60MHz
Advanced
60MHz
Sensitivity
Auto: 0%
Colorline
75%
View
Stop sonar
0
150
120
90
60
30
60
LOWRANCE
HDS7
205
29.9
234
300

FIG. 3

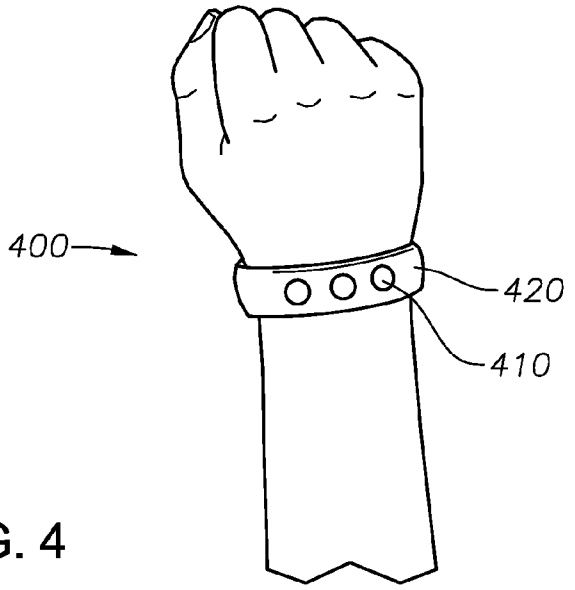

400
420
410

FIG. 4

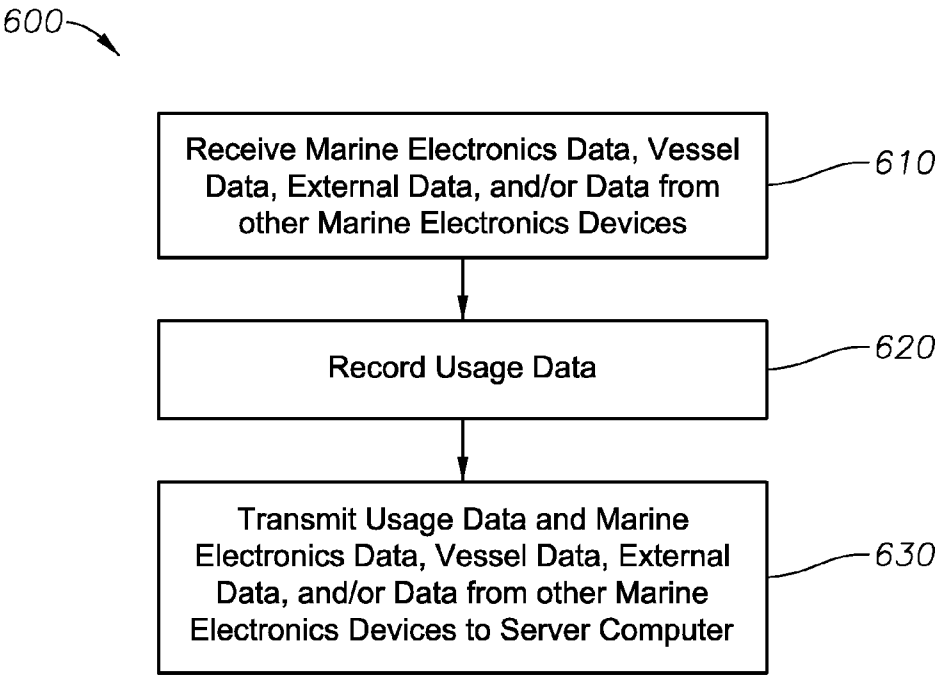

600
Receive Marine Electronics Data, Vessel Data, External Data, and/or Data from other Marine Electronics Devices
610
Record Usage Data
620
Transmit Usage Data and Marine Electronics Data, Vessel Data, External Data, and/or Data from other Marine Electronics Devices to Server Computer
630

FIG. 6

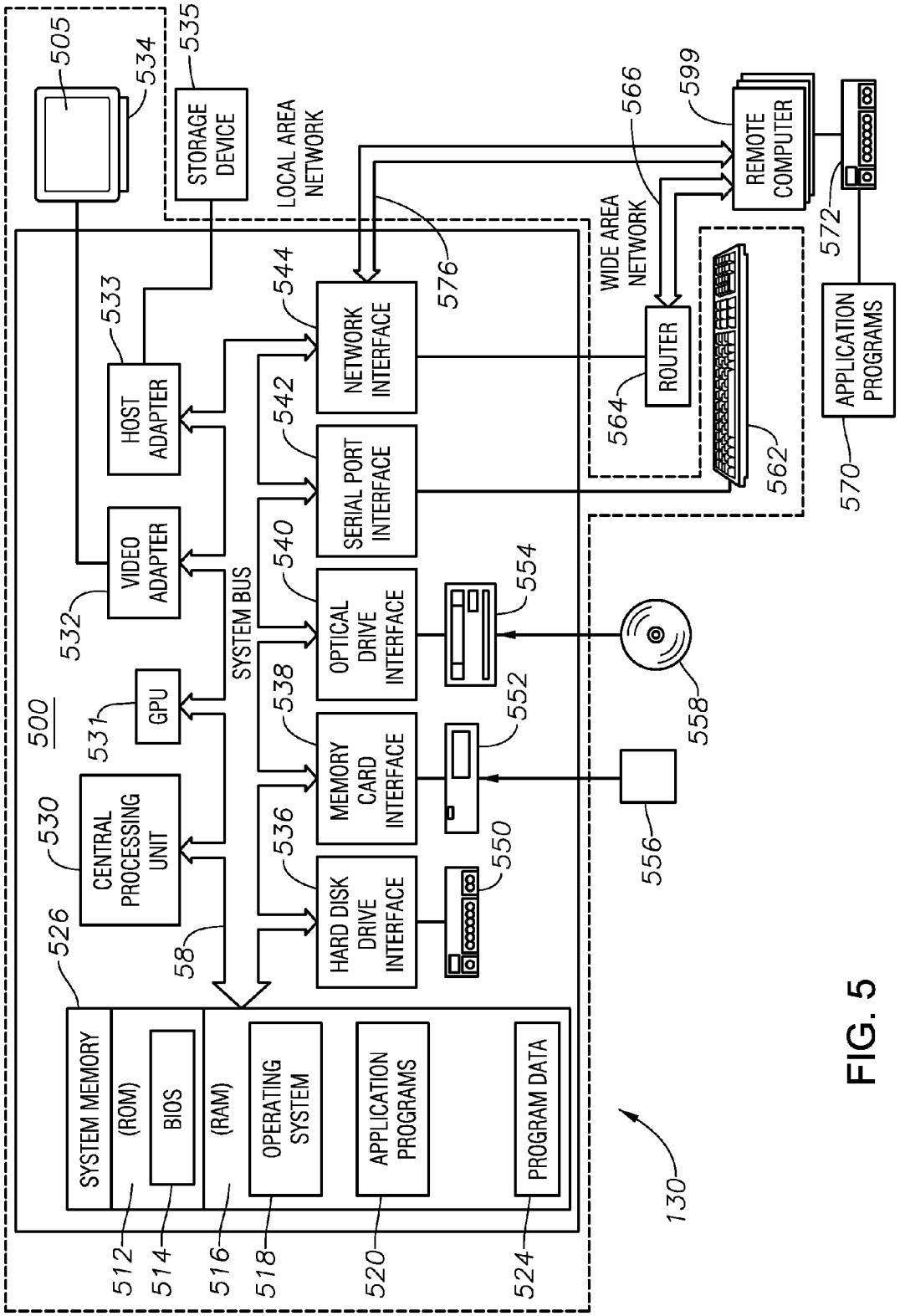

505
534
535
STORAGE DEVICE
LOCAL AREA NETWORK
566
599
REMOTE COMPUTER
572
WIDE AREA NETWORK
576
544
NETWORK INTERFACE
533
HOST ADAPTER
542
SERIAL PORT INTERFACE
564
ROUTER
562
APPLICATION PROGRAMS
570
532
VIDEO ADAPTER
540
OPTICAL DRIVE INTERFACE
554
SYSTEM BUS
500
531
GPU
538
MEMORY CARD INTERFACE
552
558
530
CENTRAL PROCESSING UNIT
536
HARD DISK DRIVE INTERFACE
550
556
526
58
SYSTEM MEMORY
(ROM)
BIOS
(RAM)
OPERATING SYSTEM
APPLICATION PROGRAMS
PROGRAM DATA
130
512
514
516
518
520
524

FIG. 5

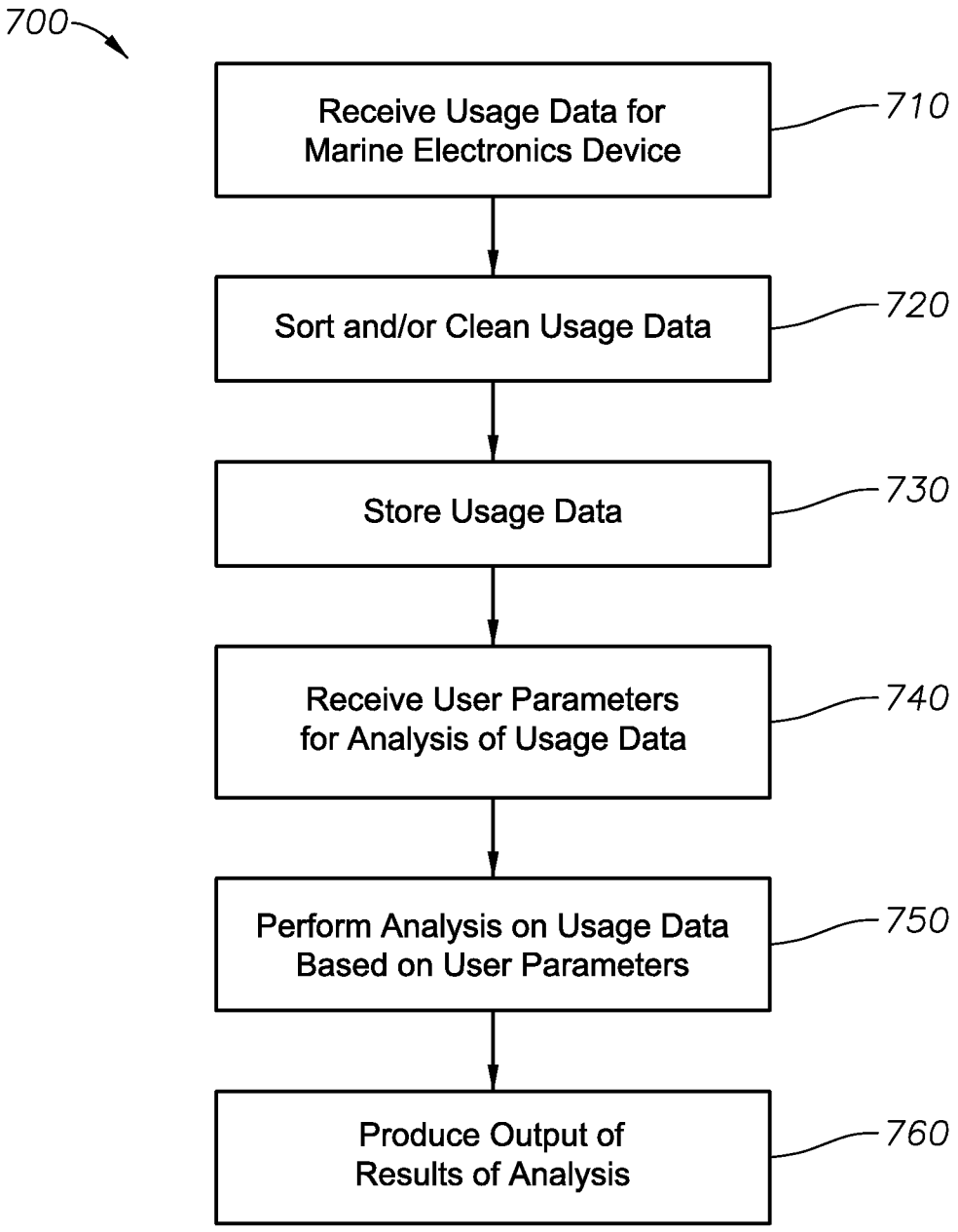

700
Receive Usage Data for Marine Electronics Device
710
Sort and/or Clean Usage Data
720
Store Usage Data
730
Receive User Parameters for Analysis of Usage Data
740
Perform Analysis on Usage Data Based on User Parameters
750
Produce Output of Results of Analysis
760

FIG. 7

USAGE DATA FOR MARINE ELECTRONICS DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application Ser. No. 61/868,444, filed Aug. 21, 2013, titled FISHING DATA COLLECTION AND USE, and the disclosure of which is incorporated herein by reference.

BACKGROUND

[0002] This section is intended to provide background information to facilitate a better understanding of various technologies described herein. As the section's title implies, this is a discussion of related art. That such art is related in no way implies that it is prior art. The related art may or may not be prior art. It should therefore be understood that the statements in this section are to be read in this light, and not as admissions of prior art.

[0003] Computing devices disposed on board and/or proximate to a vessel may be used to assist a user with various activities, such as fishing, vessel navigation, and the like. One such computing device may include a marine electronics device, which may be used to process and/or display various forms of marine electronics data. In one scenario, when analyzing the marine electronics device, information relating to how the user accesses hardware features and/or software features of the device may be useful.

SUMMARY

[0004] Described herein are implementations of various technologies relating to usage data for a marine electronics device. In one implementation, a non-transitory computer-readable medium has stored thereon a plurality of computer-executable instructions which, when executed by a computer, cause the computer to record usage data at a marine electronics device. The usage data may include data relating to at least one user input to the marine electronics device. The computer-executable instructions are further configured to cause the computer to transmit the usage data to a server computer for analysis and evaluation.

[0005] Another implementation is directed to a method that receives usage data from a marine electronics device. The usage data may include data relating to at least one user input to the marine electronics device. The method may also include receiving user parameters for analyzing the usage data. The method may further include analyzing the usage data based on the user parameters. The method may additionally include producing an output based on analyzing the usage data.

[0006] In yet another implementation, a non-transitory computer-readable medium has stored thereon a plurality of computer-executable instructions which, when executed by a computer, cause the computer to receive usage data from a marine electronics device. The usage data may include data relating to at least one user input to the marine electronics device. The computer-executable instructions are also configured to cause the computer to receive user parameters for analyzing the usage data. The computer-executable instructions are further configured to cause the computer to analyze the usage data based on the user parameters. The computer-executable instructions are additionally configured to cause the computer to produce an output based on analyzing the usage data.

[0007] The above referenced summary section is provided to introduce a selection of concepts in a simplified form that are further described below in the detailed description section. The summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter. Furthermore, the claimed subject matter is not limited to implementations that solve any or all disadvantages noted in any part of this disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Implementations of various techniques will hereafter be described with reference to the accompanying drawings. It should be understood, however, that the accompanying drawings illustrate only the various implementations described herein and are not meant to limit the scope of various techniques described herein.

[0009] FIG. **1** illustrates a diagram of a marine computing system in accordance with implementations of various techniques described herein.

[0010] FIG. **2** illustrates a schematic diagram of a marine electronics device having a computing system in accordance with implementations of various techniques described herein.

[0011] FIG. **3** illustrates a schematic diagram of a multi-function display (MFD) unit in accordance with implementations of various techniques described herein.

[0012] FIG. **4** illustrates a wearable electronic device in accordance with various implementations described herein.

[0013] FIG. **5** illustrates a schematic diagram of the server computer having a computing system in accordance with implementations of various techniques described herein.

[0014] FIG. **6** illustrates a flow diagram of a method for transmitting usage data in accordance with implementations of various techniques described herein.

[0015] FIG. **7** illustrates a flow diagram of a method for analyzing usage data in accordance with implementations of various techniques described herein.

DETAILED DESCRIPTION

[0016] The discussion below is directed to certain specific implementations. It is to be understood that the discussion below is only for the purpose of enabling a person with ordinary skill in the art to make and use any subject matter defined now or later by the patent "claims" found in any issued patent herein.

[0017] It is specifically intended that the claimed invention not be limited to the implementations and illustrations contained herein, but include modified forms of those implementations including portions of the implementations and combinations of elements of different implementations as come within the scope of the following claims. It should be appreciated that in the development of any such actual implementation, as in any engineering or design project, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with system-related and business related constraints, which may vary from one implementation to another. Moreover, it should be appreciated that such a development effort might be complex and time consuming, but would nevertheless be a routine undertaking of design, fabrication, and manufacture for those

of ordinary skill having the benefit of this disclosure. Nothing in this application is considered critical or essential to the claimed invention unless explicitly indicated as being "critical" or "essential."

[0018] Reference will now be made in detail to various implementations, examples of which are illustrated in the accompanying drawings and figures. In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the present disclosure. However, it will be apparent to one of ordinary skill in the art that the present disclosure may be practiced without these specific details. In other instances, well-known methods, procedures, components, circuits and networks have not been described in detail so as not to unnecessarily obscure aspects of the embodiments.

[0019] It will also be understood that, although the terms first, second, etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another. For example, a first object or step could be termed a second object or step, and, similarly, a second object or step could be termed a first object or step, without departing from the scope of the invention. The first object or step, and the second object or step, are both objects or steps, respectively, but they are not to be considered the same object or step.

[0020] The terminology used in the description of the present disclosure herein is for the purpose of describing particular implementations only and is not intended to be limiting of the present disclosure. As used in the description of the present disclosure and the appended claims, the singular forms "a," "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will also be understood that the term "and/or" as used herein refers to and encompasses any and all possible combinations of one or more of the associated listed items. It will be further understood that the terms "includes," "including," "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components and/or groups thereof.

[0021] As used herein, the term "if" may be construed to mean "when" or "upon" or "in response to determining" or "in response to detecting," depending on the context. Similarly, the phrase "if it is determined" or "if [a stated condition or event] is detected" may be construed to mean "upon determining" or "in response to determining" or "upon detecting [the stated condition or event]" or "in response to detecting [the stated condition or event]," depending on the context. As used herein, the terms "up" and "down"; "upper" and "lower"; "upwardly" and downwardly"; "below" and "above"; and other similar terms indicating relative positions above or below a given point or element may be used in connection with some implementations of various technologies described herein.

[0022] Various implementations relating to usage data for a marine electronics device described herein will now be described in more detail with reference to FIGS. **1-7**.

Marine Computing System

[0023] A vessel traversing through water may use equipment to assist an operator of the vessel with various activities, such as fishing, vessel navigation, and the like. The vessel may be a surface water vehicle, a submersible water vehicle, or any other implementation known to those skilled in the art.

[0024] The equipment may include one or more marine electronics devices disposed on board and/or proximate to the vessel. The marine electronics device may be any computing implementation known to those skilled in the art, and is further described below with respect to FIG. **2**. The marine electronics device may be used to process and/or display one or more types of marine electronics data, such as chart data, sonar data, structure data, radar data, navigation data, or any other type known to those skilled in the art. In a further implementation, and as further described below, the marine electronics device may process and/or display other types of data known to those skilled in the art.

[0025] In one implementation, the one or more marine electronics devices may be part of a marine computing system. FIG. **1** illustrates a diagram of a marine computing system **100** in accordance with implementations of various techniques described herein. The marine computing system **100** may include the marine electronics device **110** and a server computer **130**. In another implementation, the marine computing system **100** may include a data logger **140** and/or a smart device **150**.

[0026] As further described below, the marine electronics device **110** may transmit its data to the server computer **130**. In one implementation the marine electronics device **110** may transmit its data to the server computer **130** via the data logger **140** and/or the smart device **150**.

Marine Electronics Device

[0027] With respect to the marine electronics device **110**, implementations of various technologies described herein may be operational with numerous general purpose or special purpose computing system environments or configurations. Examples of well known computing systems, environments, and/or configurations that may be suitable for use with the various technologies described herein include, but are not limited to, personal computers, server computers, hand-held or laptop devices, multiprocessor systems, microprocessor-based systems, set top boxes, programmable consumer electronics, network PCs, minicomputers, mainframe computers, distributed computing environments that include any of the above systems or devices, and the like.

[0028] FIG. **2** illustrates a schematic diagram of a marine electronics device **110** having a computing system **200** in accordance with implementations of various techniques described herein. The marine electronics device **110** may be any type of electrical and/or electronics device capable of processing data via the computing system **200**. In one implementation, the marine electronics device **110** may be a marine instrument, such that the marine electronics device **110** may use the computing system **200** to display and/or process the one or more types of marine electronics data.

[0029] The marine electronics device **110** may be a conventional desktop, a handheld device, personal digital assistant, a server computer, electronic device/instrument, laptop, or tablet. It should be noted, however, that other computer system configurations may be used. The computing system **200** may include a central processing unit (CPU) **230**, a system memory **226**, a graphics processing unit (GPU) **231** and a system bus **228** that couples various system components including the system memory **226** to the CPU **230**. Although only one CPU **230** is illustrated in FIG. **2**, it should be under-

stood that in some implementations the computing system **200** may include more than one CPU **230**.

[0030] The CPU **230** may include a microprocessor, a microcontroller, a processor, a programmable integrated circuit, or a combination thereof. The CPU **230** can comprise an off-the-shelf processor such as a Reduced Instruction Set Computer (RISC), or a Microprocessor without Interlocked Pipeline Stages (MIPS) processor, or a combination thereof. The CPU **230** may also include a proprietary processor.

[0031] The GPU **231** may be a microprocessor specifically designed to manipulate and implement computer graphics. The CPU **230** may offload work to the GPU **231**. The GPU **231** may have its own graphics memory, and/or may have access to a portion of the system memory **226**. As with the CPU **230**, the GPU **231** may include one or more processing units, and each processing unit may include one or more cores.

[0032] The CPU **230** may provide output data to a GPU **231**. The GPU **231** may generate graphical user interfaces that present the output data. The GPU **231** may also provide objects, such as menus, in the graphical user interface. A user may provide inputs by interacting with the objects. The GPU **231** may receive the inputs from interaction with the objects and provide the inputs to the CPU **230**. A video adapter **232** may be provided to convert graphical data into signals for a monitor **234**. The monitor **234** includes a screen **205**. In certain implementations, the screen **805** may be sensitive to touching by a finger. In other implementations, the screen **805** may be sensitive to the body heat from the finger, a stylus, or responsive to a mouse.

[0033] The system bus **228** may be any of several types of bus structures, including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. By way of example, and not limitation, such architectures include Industry Standard Architecture (ISA) bus, Micro Channel Architecture (MCA) bus, Enhanced ISA (EISA) bus, Video Electronics Standards Association (VESA) local bus, and Peripheral Component Interconnect (PCI) bus also known as Mezzanine bus. The system memory **226** may include a read only memory (ROM) **212** and a random access memory (RAM) **216**. A basic input/output system (BIOS) **214**, containing the basic routines that help transfer information between elements within the computing system **200**, such as during start-up, may be stored in the ROM **212**.

[0034] The computing system **200** may further include a hard disk drive interface **236** for reading from and writing to a hard disk **250**, a memory card reader **252** for reading from and writing to a removable memory card **256**, and an optical disk drive **254** for reading from and writing to a removable optical disk **258**, such as a CD ROM or other optical media. The hard disk **250**, the memory card reader **252**, and the optical disk drive **254** may be connected to the system bus **228** by a hard disk drive interface **236**, a memory card reader interface **238**, and an optical drive interface **240**, respectively. The drives and their associated computer-readable media may provide nonvolatile storage of computer-readable instructions, data structures, program modules and other data for the computing system **200**.

[0035] Although the computing system **200** is described herein as having a hard disk, a removable memory card **256** and a removable optical disk **258**, it should be appreciated by those skilled in the art that the computing system **200** may also include other types of computer-readable media that may be accessed by a computer. For example, such computer-readable media may include computer storage media and communication media. Computer storage media may include volatile and non-volatile, and removable and non-removable media implemented in any method or technology for storage of information, such as computer-readable instructions, data structures, program modules or other data. Computer storage media may further include RAM, ROM, erasable programmable read-only memory (EPROM), electrically erasable programmable read-only memory (EEPROM), flash memory or other solid state memory technology, CD-ROM, digital versatile disks (DVD), or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by the computing system **200**. Communication media may embody computer readable instructions, data structures, program modules or other data in a modulated data signal, such as a carrier wave or other transport mechanism and may include any information delivery media. The term "modulated data signal" may mean a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, RF, infrared and other wireless media. The computing system **200** may also include a host adapter **233** that connects to a storage device **235** via a small computer system interface (SCSI) bus, a Fiber Channel bus, an eSATA bus, or using any other applicable computer bus interface.

[0036] The computing system **200** can also be connected to a router **264** to establish a wide area network (WAN) **266** with one or more remote computers **274**. The router **264** may be connected to the system bus **228** via a network interface **244**. The remote computers **274** can also include hard disks **272** that store application programs **270**.

[0037] In another implementation, the computing system **200** may also connect to the remote computers **274** via local area network (LAN) **276** or the WAN **266**. When using a LAN networking environment, the computing system **200** may be connected to the LAN **276** through the network interface or adapter **244**. The LAN **276** may be implemented via a wired connection or a wireless connection. The LAN **276** may be implemented using Wi-Fi™ technology, cellular technology, Bluetooth™ technology, satellite technology, or any other implementation known to those skilled in the art. The network interface **244** may also utilize remote access technologies (e.g., Remote Access Service (RAS), Virtual Private Networking (VPN), Secure Socket Layer (SSL), Layer 2 Tunneling (L2T), or any other suitable protocol). These remote access technologies may be implemented in connection with the remote computers **274**. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computer systems may be used.

[0038] A number of program modules may be stored on the hard disk **250**, memory card **256**, optical disk **258**, ROM **212** or RAM **216**, including an operating system **218**, one or more application programs **220**, and program data **224**. In certain implementations, the hard disk **250** may store a database system. The database system could include, for example, recorded points. The application programs **220** may include various mobile applications ("apps") and other applications

configured to perform various methods and techniques described herein. The operating system **218** may be any suitable operating system that may control the operation of a networked personal or server computer.

[0039] A user may enter commands and information into the computing system **200** through input devices such as buttons **262**, which may be physical buttons, virtual buttons, or combinations thereof. Other input devices may include a microphone, a mouse, or the like (not shown). These and other input devices may be connected to the CPU **230** through a serial port interface **242** coupled to system bus **228**, but may be connected by other interfaces, such as a parallel port, game port or a universal serial bus (USB).

[0040] Certain implementations may be configured to be connected to a GPS system **280**, and/or a marine electronics system **278**. The GPS system **280**, and/or marine electronics system **278** may be connected via the network interface **244**.

[0041] The marine electronics system **278** may include one or more components disposed at various locations on the vessel. For example, such components may include one or more data modules, sensors, instrumentation, and/or any other devices known to those skilled in the art which may transmit various types of data to the marine electronics device **110** for processing and/or display. Such sensors may be a paddlewheel sensor, a compass heading sensor, and the like. In such an example, the paddlewheel sensor may transmit speed data and the compass heading sensor may transmit heading data to the marine electronics device **110**.

[0042] The various types of data transmitted to the marine electronics device **110** may include marine electronics data, vessel data, and/or other data types known to those skilled in the art. The marine electronics data received from the marine electronics system **278** may include chart data, sonar data, structure data, radar data, navigation data, water level data, wind data, data from an internal and/or external GPS receiver, or any other type known to those skilled in the art. Vessel data received from the marine electronics system **278** may include data which relate to conditions on board the vessel, such as fuel data, engine data, temperature data, carbon monoxide data, data from sensors indicating a functioning alternating current (AC) voltage, data from sensors indicating an opened or closed door, and the like.

[0043] The marine electronics device **110** may receive external data via the LAN **276** or the WAN **266**. In one implementation, the external data may relate to information not available from the marine electronics system **278**. The external data may be retrieved from the Internet or any other source. The external data may include atmospheric temperature, tidal data, weather, moon phase, sunrise, sunset, water levels, historic fishing data, and other fishing data.

[0044] In one implementation, the marine electronics device **110** may be a multi-function display (MFD) unit, such that the marine electronics device **110** may be capable of displaying and/or processing multiple types of marine electronics data. FIG. **3** illustrates a schematic diagram of an MFD unit **300** in accordance with implementations of various techniques described herein. In particular, the MFD unit **300** may include the computing system **200**, the monitor **234**, the screen **205**, and the buttons **262** such that they may be integrated into a single console.

[0045] In another implementation, the marine electronics device **110** may be a wearable electronic device used to record data such as fishing statistics. FIG. **4** illustrates a wearable electronic device **400** in accordance with various implementations described herein. The wearable electronic device **400** may be worn around a fisherman's arm or wrist. The wearable electronic device **400** may also be attached to a fishing rod. The wearable electronic device **400** may include a housing **420**. The housing **420** may be in the shape of a band. The housing **420** may be made of a combination of plastics and rubbers, or of any other synthetic material.

[0046] The wearable electronics device **400** may include one or more buttons **410**. The one or more buttons **410** may be used for user input, such as to indicate the occurrence of a bite or catch, or to input the length and weight of a caught fish. The wearable electronics device **400** may contain motion sensors or other sensors. Using the sensors, wearable electronics device **400** may capture fishing statistics during a fishing trip. Wearable electronics device **400** may count casts, determine the type of cast used, determine the occurrence of a bite or catch, determine the weight and length of a caught fish, the number of caught fish, or other fishing statistics. The fishing statistics may be recorded in memory. The wearable electronics device **400** may contain wireless technology, such as Bluetooth™ or Wi-Fi™.

[0047] In one implementation, one or more other marine electronics devices may transmit data to the marine electronics device **110**. In such an implementation, the other marine electronics device may use wired or wireless technology to transmit its data, such as its marine electronics data, to the marine electronics device **110**. For example, the other marine electronics device may be a wearable electronic device **400**, where the wearable electronic device **400** may use wireless technology to transmit its recorded statistics to the marine electronics device **110**.

Server Computer

[0048] As shown in FIG. **1**, the marine electronics device **110** may transmit data to the server computer **130**. In particular, the marine electronics device **110** may transmit marine electronics data, vessel data, external data, data from other marine electronics devices, and/or the like to the server computer **130**. In one implementation, the marine electronics device **110** may transmit a timestamp with the data sent to the server computer **130**, where the timestamp indicates when the data was initially received by the marine electronics device **110**. In another implementation, the server computer **130** may receive data from multiple marine electronics devices **110**.

[0049] In one implementation, the marine electronics device **110** may transmit data directly to the server computer **130** via a memory card, Wi-Fi™ technology, cellular technology, Bluetooth™ technology, satellite technology, or any other implementation known to those skilled in the art. In such an implementation, the marine electronics device **110** may transmit the data at specified intervals, at the conclusion of a trip by a vessel, or combinations thereof. In another implementation, the marine electronics device **110** may transmit the data to the server computer **130** once a connection via Wi-Fi™ technology, cellular technology, Bluetooth™ technology, or satellite technology has been established.

[0050] FIG. **5** illustrates a schematic diagram of the server computer **130** having a computing system **500** in accordance with implementations of various techniques described herein. The server computer **130** may be a conventional desktop, a handheld device, personal digital assistant, a server computer, electronic device/instrument, laptop, tablet, or any other implementation known to those skilled in the art. In one implementation, the server computer **130** may be positioned

at a different geographic location than the marine electronics device **110**. In another implementation, the server computer **130** may be implemented using cloud computing.

[0051] Generally, the server computer **130** and the computing system **500** include at least some components which have generally similar functionality as those described with respect to the computing system **200**. In particular, the computing system **500** may include a central processing unit (CPU) **530**, a system memory **526**, a graphics processing unit (GPU) **531** and a system bus **528** that couples various system components including the system memory **526** to the CPU **530**, and which operate similar to their respective counterparts in the computing system **200**. In addition, for some implementations, a user may enter commands and information into the computing system **500** through input devices such as buttons **562**. These and other input devices may be connected to the CPU **530** through a serial port interface **542** coupled to system bus **528**, but may be connected by other interfaces, such as a parallel port, game port or a universal serial bus (USB).

[0052] In addition, the computing system **500** may also connect to remote computers **574** via LAN **576** or WAN **566**. When using a LAN networking environment, the computing system **500** may be connected to the LAN **576** through the network interface or adapter **544**. The LAN **576** may be implemented via a wired connection or a wireless connection. The LAN **576** may be implemented using Wi-Fi™ technology, cellular technology, Bluetooth™ technology, satellite technology, or any other implementation known to those skilled in the art. The network interface **544** may also utilize remote access technologies (e.g., Remote Access Service (RAS), Virtual Private Networking (VPN), Secure Socket Layer (SSL), Layer 2 Tunneling (L2T), or any other suitable protocol). These remote access technologies may be implemented in connection with the remote computers **574**. In one implementation, the LAN **576** may be the same as the LAN **276**, and the WAN **566** may be the same as the WAN **266**, such that the marine electronics device **110** and the server computer **130** may connect to one another via remote computing.

[0053] In one implementation, the server computer **130** may receive external data via the LAN **576** or the WAN **566**. The external data may be retrieved from the Internet or any other source. The external data may include atmospheric temperature, tidal data, weather, moon phase, sunrise, sunset, water levels, historic fishing data, and other fishing data.

Data Logger and Smart Device

[0054] In another implementation, the marine electronics device **110** may transmit data to the server computer **130** via the data logger **140**. In particular, the data logger **140** may receive data from the marine electronics device **110**, store the data, and then transmit the data to the server computer **130**. The data logger **140** may be a computing implementation with at least some components having generally similar functionality as those described with respect to the computing systems **200** and **500**. In particular, the data logger **140** may include at least a processor, system memory, and networking capability. The data logger **140** may be located on the vessel with the marine electronics device **110**. In one implementation, the data logger **140** may transmit a timestamp with the data sent to the server computer **130**, where the timestamp indicates when the data was initially received by the data logger **140**.

[0055] In one implementation, the marine electronics device **110** may transmit data directly to the data logger **140** via wired or wireless technology. The marine electronics device **110** may transmit the data at specified intervals, at the conclusion of a trip by a vessel, or combinations thereof. In a further implementation, the marine electronics device **110** may transmit the data to the data logger **140** once a connection via Wi-Fi™ technology, cellular technology, Bluetooth™ technology, or satellite technology has been established.

[0056] Similarly, in one implementation, the data logger **140** may transmit this data to the server computer **130** via wireless technology. In particular, the data logger **140** may transmit the data to the server computer **130** once a connection via Wi-Fi™ technology, cellular technology, Bluetooth™ technology, or satellite technology has been established.

[0057] In some implementations, the data logger **140** may filter this data prior to sending it to the server computer **130**. In such an implementation, the data logger **140** may remove marine electronics data or vessel data which may fall within a normal operating range for that data. For example, the data logger **140** may remove engine data from the data to be sent to the server computer **130** if the engine data indicates no abnormal conditions for an engine.

[0058] In yet another implementation, the marine electronics device **110** may transmit data to the server computer **130** via the smart device **150**. The smart device **150** may receive data from the marine electronics device **110**, store the data, and then transmit the data to the server computer **130** in a similar manner as the data logger **140**. The smart device **150** may be a handheld device, personal digital assistant, electronic device/instrument, laptop, tablet, or any other implementation known to those skilled in the art.

Usage Data

Transmitting Usage Data

[0059] In addition to the above-mentioned data, the marine electronics device **110** may record and transmit usage data to the server computer **130**. In particular, the marine electronics device **110** may record usage data such as key input data, screen selection data, features selection data, and other usage data known to those skilled in the art. In one implementation, the marine electronics device **110** may record timestamps for the usage data and transmit the timestamps to the server computer **130** together with the usage data. The timestamps may indicate when the usage data was initially received by the marine electronics device **110**.

[0060] Key input data may include data relating to keys or buttons pushed by the user on the marine electronics device **110**, such as the buttons **262** (shown in FIG. **2**). The key input data may indicate a frequency of buttons being pushed, which software features were assigned to the buttons, when the buttons were pushed, and the like. In one implementation, the marine electronics device **110** may use a key logger to obtain the key input data. Screen selection data may include data relating to options selected by the user on a touch screen of the marine electronics device **110**. The screen selection data may include data relating to which area of the touch screen was selected, which software features were assigned to touch screen options, when the touch screen selections were made, and the like. Features selection data may include which soft-

ware features were selected, when the software features were selected, a frequency of the selection of the software features, and the like.

[0061] The usage data may be transmitted to the server computer **130** similarly to how the above-described data is transmitted. In particular, the usage data may be sent from the marine electronics device **110** to the server computer **130** either directly, via the data logger **140**, via the smart device **150**, or combinations thereof. In another implementation, and as similarly described above, the data logger **140** may filter the usage data prior to sending it to the server computer **130**.

[0062] As similarly described above, in one implementation, the marine electronics device **110** may transmit the usage data at specified intervals, at the conclusion of a trip by a vessel, or combinations thereof. In another implementation, the marine electronics device **110** may transmit the usage data to the server computer **130** once a connection via Wi-Fi™ technology, cellular technology, Bluetooth™ technology, or satellite technology has been established. In yet another implementation, the marine electronics device **110** may send the usage data simultaneously with the marine electronics data, vessel data, external data, data from other marine electronics devices, and/or the like.

[0063] FIG. **6** illustrates a flow diagram of a method **600** for transmitting usage data in accordance with implementations of various techniques described herein. In one implementation, method **600** may be performed by a computer implementation, such as a marine electronics device **110** on board or proximate to a vessel. It should be understood that while method **600** indicates a particular order of execution of operations, in some implementations, certain portions of the operations might be executed in a different order. Further, in some implementations, additional operations or steps may be added to the method **600**. Likewise, some operations or steps may be omitted.

[0064] At step **610**, the marine electronics device **110** may receive marine electronics data, vessel data, external data, and/or data from other marine electronics devices. As mentioned above, the marine electronics device **110** may receive the marine electronics data, vessel data, and/or other data types from the marine electronics system **278** (shown in FIG. **2**). In another implementation, the marine electronics device **110** may receive external data via the LAN **276** or the WAN **266** (shown in FIG. **2**).

[0065] At step **620**, the marine electronics device **110** may record usage data. In particular, the marine electronics device **110** may record usage data such as key input data, screen selection data, features selection data, and other usage data known to those skilled in the art. In one implementation, the marine electronics device **110** may record timestamps for the usage data.

[0066] At step **630**, the marine electronics device **110** may transmit the usage data and the marine electronics data, vessel data, external data, and/or data from other marine electronics devices to the server computer **130**. In one implementation, the above data may be sent from the marine electronics device **110** to the server computer **130** either directly, via the data logger **140**, via the smart device **150**, or combinations thereof.

Analyzing Usage Data

[0067] Once the usage data is sent to the server computer **130**, the usage data may be analyzed in conjunction with the marine electronics data, the vessel data, external data, the data from other marine electronics devices, and/or the like. In one implementation, the usage data may be analyzed in terms of which buttons, screen selections, or features of the marine electronics device **110** were used, how they were used, when and where they were used, the frequency in which they were used, conditions of the vessel and the surrounding environment when they were used, the success or failure of the features selected, and the like. In such an implementation, the usage data may be analyzed using the timestamps sent with the usage data and the timestamps sent with the marine electronics data, the vessel data, external data, the data from other marine electronics devices, and/or the like.

[0068] Such analysis may be used to provide context for the usage data. Further, this analysis may be used to improve current implementations of the marine electronics device **110** and/or other devices, or may be used to develop newer implementations of the marine electronics device **110** and/or other devices.

[0069] FIG. **7** illustrates a flow diagram of a method **700** for analyzing usage data in accordance with implementations of various techniques described herein. In one implementation, method **700** may be performed by a computer, such as a server computer **130**. It should be understood that while method **700** indicates a particular order of execution of operations, in some implementations, certain portions of the operations might be executed in a different order. Further, in some implementations, additional operations or steps may be added to the method **700**. Likewise, some operations or steps may be omitted.

[0070] At step **710**, the server computer **130** may receive usage data for a marine electronics device **110**. In particular, the server computer **130** may receive the usage data directly from the marine electronics device **110**, from the data logger **140**, from the smart device **150**, or combinations thereof. In addition, the server computer **130** may receive marine electronics data, vessel data, external data, and/or data from other marine electronics devices from the marine electronics device **110**. In one implementation, the server computer **130** may receive external data via the LAN **576** or the WAN **566** (shown in FIG. **5**). The external data may be retrieved from the Internet or any other source.

[0071] At step **720**, the server computer **130** may sort and/or clean the usage data. In addition, the server computer **130** may sort and/or clean the marine electronics data, vessel data, external data, and/or data from other marine electronics devices. Sorting and/or cleaning data may be performed to expedite analysis of the data. In one implementation, the data received by the server computer **130**, including the usage data, may be sorted based on their timestamps. In another implementation, the server computer **130** may filter the data received by the server computer **130**, including the usage data, similar to how the data logger **140** may filter data.

[0072] At step **730**, the server computer **130** may store the usage data. In one implementation, the server computer **130** may store the usage data in the system memory **526** (shown in FIG. **5**). The server computer **130** may also store the marine electronics data, vessel data, external data, and/or data from other marine electronics devices received from the marine electronics device **110**.

[0073] At step **740**, the server computer **130** may receive user parameters for performing an analysis of the usage data. In one implementation, the user parameters may define conditions for performing a query on the stored usage data. In particular, the user parameters for the query could be based on which buttons, screen selections, or features of the marine

electronics device **110** were used, how they were used, when and where they were used, the frequency in which they were used, conditions of the vessel and the surrounding environment when they were used, the success or failure of the features selected, and the like. For example, the user parameters may be used to perform a query for identifying the time of day in which a feature was most frequently used.

[0074] At step **750**, the server computer **130** may perform the analysis on the usage data based on the user parameters. In one implementation, the server computer **130** may perform a query. In some implementations, the query may be either automated or manual, depending on the user parameters. In another implementation, based on the user parameters, the server computer **130** may also perform the analysis on the marine electronics data, vessel data, external data, and/or data from other marine electronics devices received from the marine electronics device **110**.

[0075] At step **760**, the server computer **130** may produce an output of the results of the analysis. The output may be in a variety of different formats, such as lists, charts, graphs, or the like. The output may provide information relating to the user parameters. For example, the output may be the time of day at which a particular feature was most frequently used.

[0076] In another implementation, the output may be used to provide recommendations for the user of the marine electronics device **110**. In such an implementation, an automated analysis of the output performed by the server computer **130**, such as via an algorithm, may provide the recommendations, which may include targeted services and/or products. For example, the automated analysis may provide a recommendation to target the user for sales of a fishing product line based on the user's frequent use of fishing features of the marine electronics device **110**.

[0077] In yet another implementation, the output may be used to provide recommendations and/or enhancements for implementations of the marine electronics device **110** or other devices. In such an implementation, the recommendations and/or enhancements may be transmitted to the marine electronics device **110** from the server computer **130**. For example, the recommendations and/or enhancements may be sent to the marine electronics device **110** to indicate that fishing or sailing software on the marine electronics device **110** should be updated, to provide updated fishing statistics to the user, to provide a notice of possible engine damage on the vessel, or other information known to those skilled in the art.

[0078] In another implementation, the output may be used to improve current implementations of the marine electronics device **110** or to develop future implementations of the marine electronics device. For example, an output of the usage data may indicate infrequent use of a particular button on the marine electronics device **110**. Based on the output, future implementations of the marine electronics device **110** may include a redesigned placement of the button or may remove the button entirely. In another example, based on the output, current implementations of the marine electronics device **110** may be provided a refined user interface to allow for more efficient use of the device.

[0079] In sum, implementations relating to usage data for a marine electronics device **110**, described above with respect to FIGS. **1-7**, may provide more accurate usage data to a server computer **130** than compared to usage data compiled using consumer surveys. The usage data acquired as discussed above with respect to FIGS. **1-7** may be analyzed to provide information as to the most-used hardware and software features of the marine electronics device **110**. For example, the usage data may be analyzed to determine whether a user prefers buttons or touch screens when accessing the marine electronics device **110**. Analysis of the usage data may provide an enhanced use of current and/or future implementations of the marine electronics device **110**. Such enhanced use may be provided through improved functionality and/or targeted services provided to the user based on the output of the analysis.

[0080] pow While the foregoing is directed to implementations of various techniques described herein, other and further implementations may be devised without departing from the basic scope thereof, which may be determined by the claims that follow. Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

[0081] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A non-transitory computer-readable medium having stored thereon a plurality of computer-executable instructions which, when executed by a computer, cause the computer to:

record usage data at a marine electronics device, the usage data comprising data relating to at least one user input to the marine electronics device; and

transmit the usage data to a server computer for analysis and evaluation.

2. The non-transitory computer-readable medium of claim **1**, wherein the plurality of computer-executable instructions which, when executed by the computer, further cause the computer to:

receive marine electronics data, vessel data, external data, data from a second marine electronics device, or combinations thereof at the marine electronics device; and

transmit the usage data with the marine electronics data, vessel data, external data, data from the second marine electronics device, or combinations thereof to the server computer.

3. The non-transitory computer-readable medium of claim **1**, wherein the usage data comprises key input data, screen selection data, features selection data, or combinations thereof.

4. The non-transitory computer-readable medium of claim **1**, wherein the plurality of computer-executable instructions which, when executed by the computer, further cause the computer to transmit the usage data directly to the server computer via a memory card, Wi-Fi technology, cellular technology, Bluetooth technology, or satellite technology.

5. The non-transitory computer-readable medium of claim **1**, wherein the plurality of computer-executable instructions which, when executed by the computer, further cause the computer to transmit the usage data to the server computer via a data logger, a smart device, or combinations thereof.

6. The non-transitory computer-readable medium of claim **1**, wherein the plurality of computer-executable instructions which, when executed by the computer, further cause the computer to receive recommendations, enhancements, or combinations thereof for the marine electronics device from the server computer based on an analysis of the usage data.

7. The non-transitory computer-readable medium of claim **1**, wherein the plurality of computer-executable instructions which, when executed by the computer, further cause the computer to transmit the usage data to the server computer either directly, via a data logger, or via a smart device once a connection via Wi-Fi technology, cellular technology, Bluetooth technology, or satellite technology is established.

8. The non-transitory computer-readable medium of claim **1**, wherein the plurality of computer-executable instructions which, when executed by the computer, further cause the computer to transmit a timestamp corresponding to the usage data sent to the server computer.

9. The non-transitory computer-readable medium of claim **1**, wherein the marine electronics device comprises a multi-function display unit or a wearable electronics device.

10. A method, comprising:

receiving usage data from a marine electronics device, the usage data comprising data relating to at least one user input to the marine electronics device;

receiving user parameters for analyzing the usage data;

analyzing the usage data based on the user parameters; and

producing an output based on analyzing the usage data.

11. The method of claim **10**, further comprising:

receiving marine electronics data, vessel data, external data, data from a second marine electronics device, or combinations thereof from the marine electronics device; and

analyzing the marine electronics data, vessel data, external data, data from the second marine electronics device, or combinations thereof based on the user parameters; and

producing an output based on analyzing the usage data and the marine electronics data, vessel data, external data, data from the second marine electronics device, or combinations thereof.

12. The method of claim **10**, further comprising receiving the usage data from the marine electronics device either directly, via a data logger, or via a smart device.

13. The method of claim **10**, further comprising sorting the usage data based on one or more timestamps of the usage data.

14. The method of claim **10**, wherein the user parameters comprise conditions for performing a query on the usage data.

15. The method of claim **10**, wherein the user parameters comprise conditions for performing a query on the usage data based on which buttons, screen selections, features, or combinations thereof of the marine electronics device were used.

16. The method of claim **10**, further comprising using the output to provide recommendations, enhancements, or combinations thereof for the marine electronics device.

17. The method of claim **16**, further comprising transmitting the recommendations, enhancements, or combinations thereof to the marine electronics device.

18. The method of claim **10**, further comprising performing an automated analysis of the output to provide recommendations for a user of the marine electronics device.

19. A non-transitory computer-readable medium having stored thereon a plurality of computer-executable instructions which, when executed by a computer, cause the computer to:

receive usage data from a marine electronics device, the usage data comprising data relating to at least one user input to the marine electronics device;

receive user parameters for analyzing the usage data;

analyze the usage data based on the user parameters; and

produce an output based on analyzing the usage data.

20. The non-transitory computer-readable medium of claim **19**, wherein the usage data comprises key input data, screen selection data, features selection data, or combinations thereof.

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