US 20070093943A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0093943 A1

Nelson et al. (43) Pub. Date: Apr. 26, 2007

(54) SYSTEM AND METHOD FOR REMOTE CONVENIENCE VEHICLE TELEMATICS

(76) Inventors: **Scott Nelson**, Redondo Beach, CA (US); **Masayuki Habaguchi**, Utsunomiya-shi (JP)

Correspondence Address:
HONDA/FENWICK
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041 (US)

(21) Appl. No.: 11/446,066

(22) Filed: Jun. 1, 2006

Related U.S. Application Data

(60) Provisional application No. 60/686,661, filed on Jun. 1, 2005.

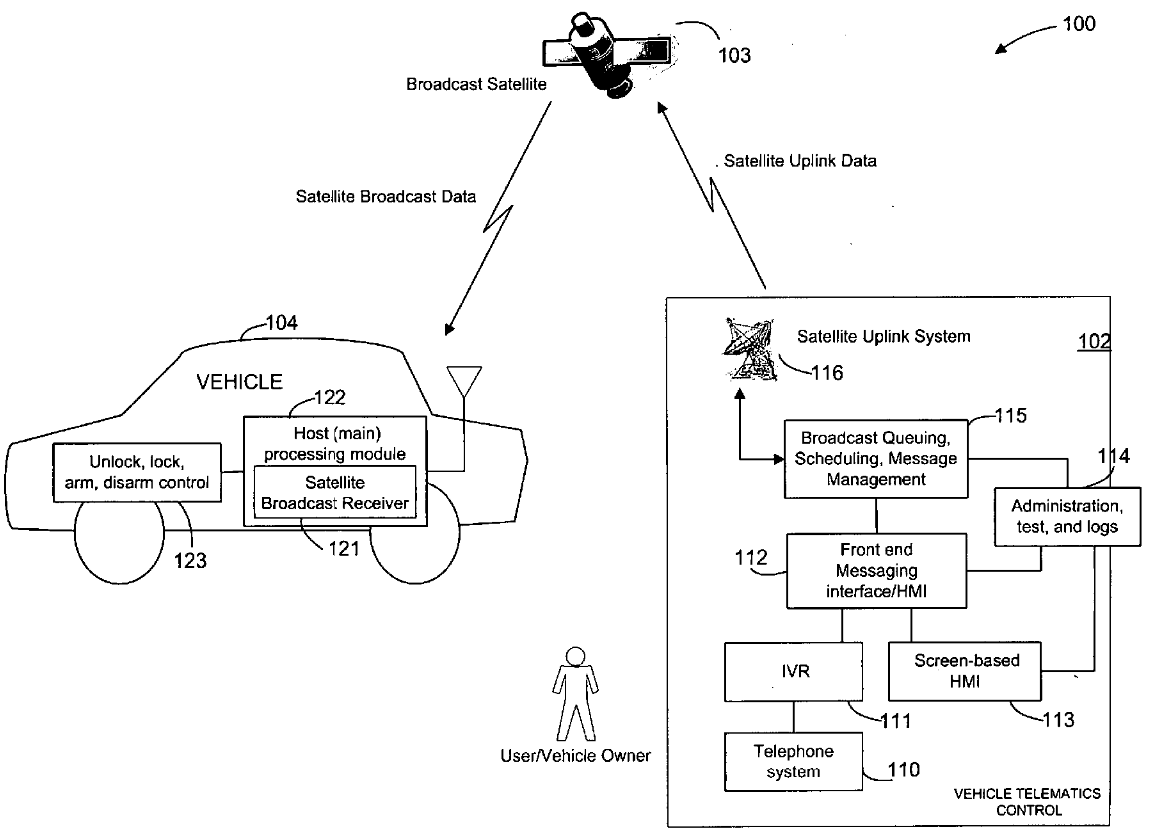
Publication Classification

(51) Int. Cl.
G06F 17/00 (2006.01)

(52) U.S. Cl. 701/2

(57) **ABSTRACT**

A system comprises a satellite broadcasting a signal including a remote convenience telematics command, a user interface system providing the remote convenience telematics command to the satellite in response to user input, and a vehicle system for performing a remote convenience task in response to a received broadcast signal. The vehicle system is in a sleep mode in response to a vehicle turn off signal and is in a monitoring mode during predetermined time intervals after the vehicle turn off signal or in response to a user input. The vehicle system monitors for receipt of the broadcast signal during the monitoring mode. The predetermined time intervals have a duration so that the vehicle system has a predetermined probability of detecting the broadcast signal.



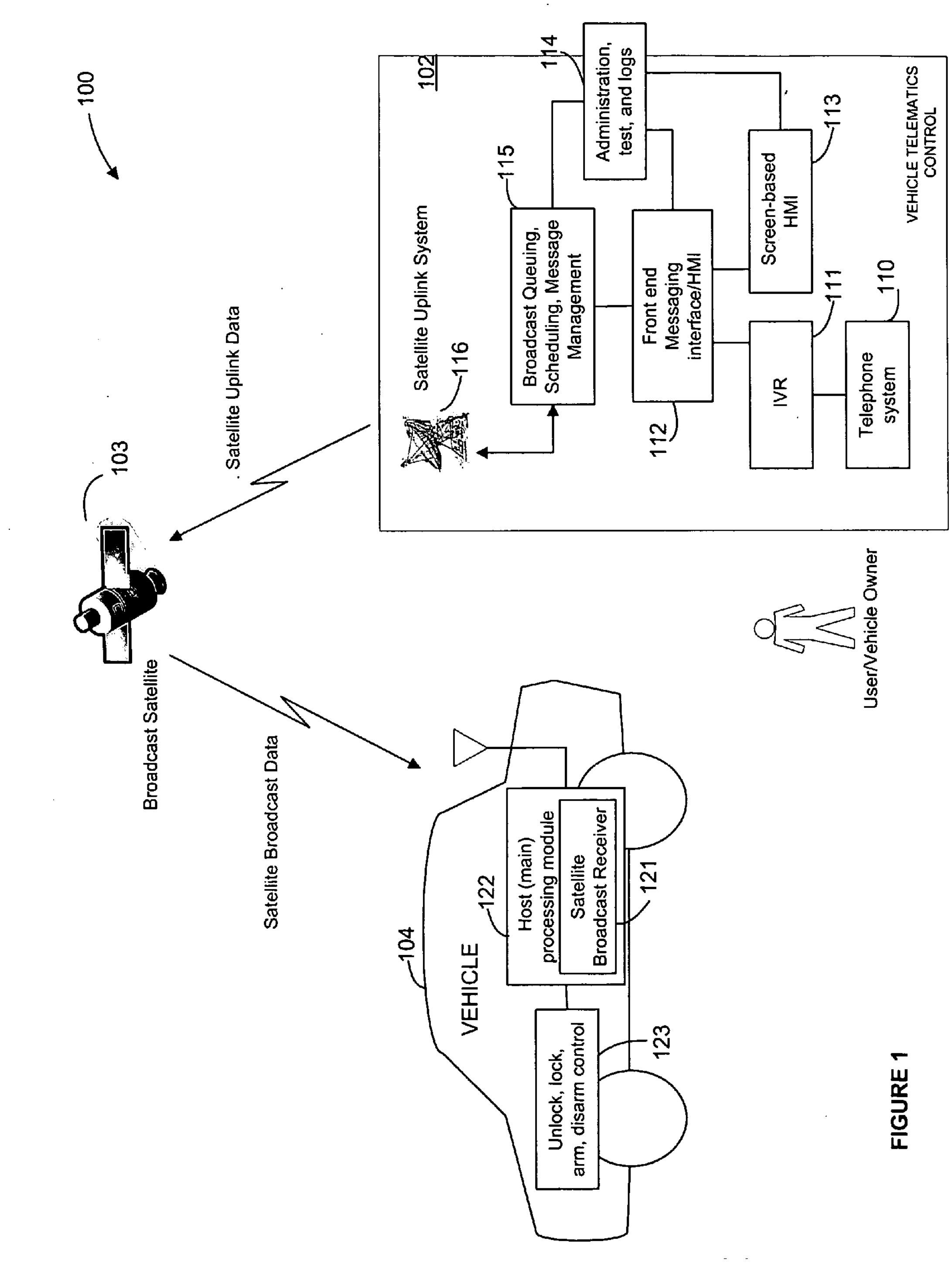

100
103
Broadcast Satellite
Satellite Uplink Data
Satellite Broadcast Data
102
Satellite Uplink System
116
Broadcast Queuing, Scheduling, Message Management
115
114
Administration, test, and logs
Front end Messaging interface/HMI
112
Screen-based HMI
113
IVR
111
Telephone system
110
VEHICLE TELEMATICS CONTROL
User/Vehicle Owner
VEHICLE
104
Host (main) processing module
122
Satellite Broadcast Receiver
121
Unlock, lock, arm, disarm control
123

FIGURE 1

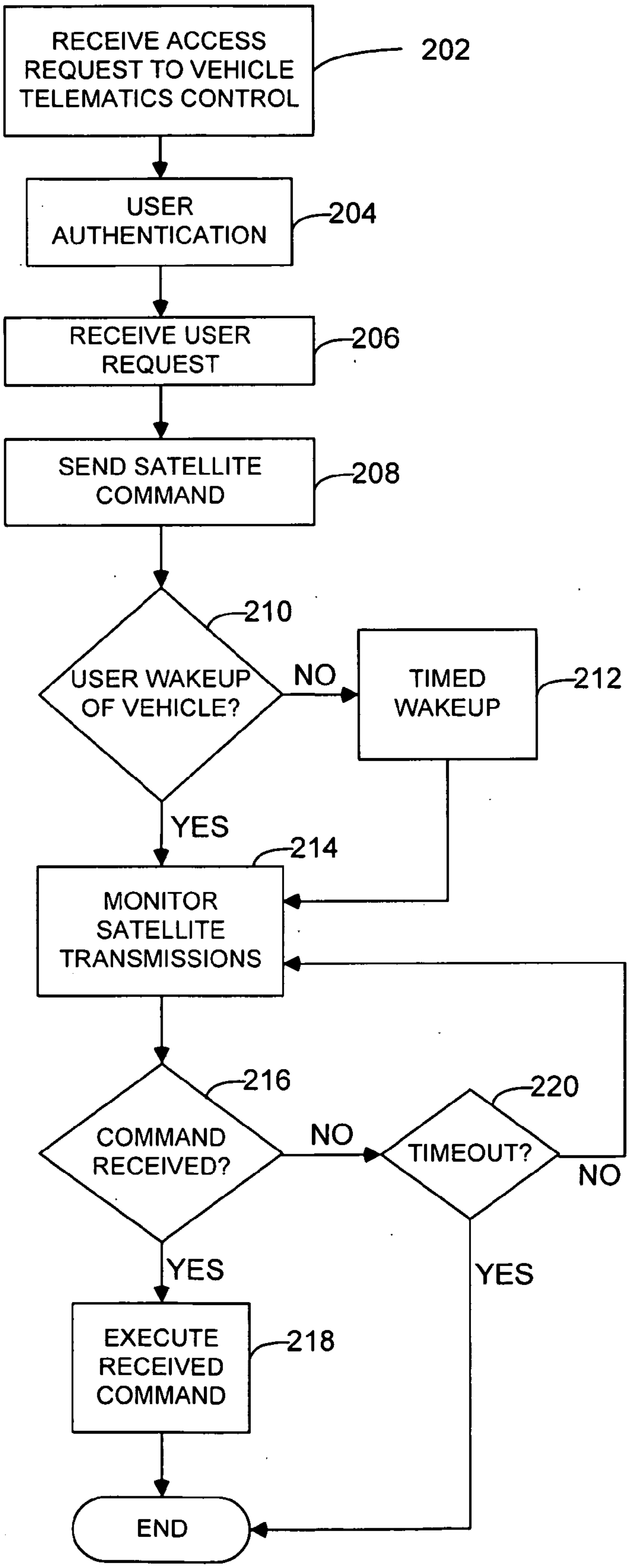
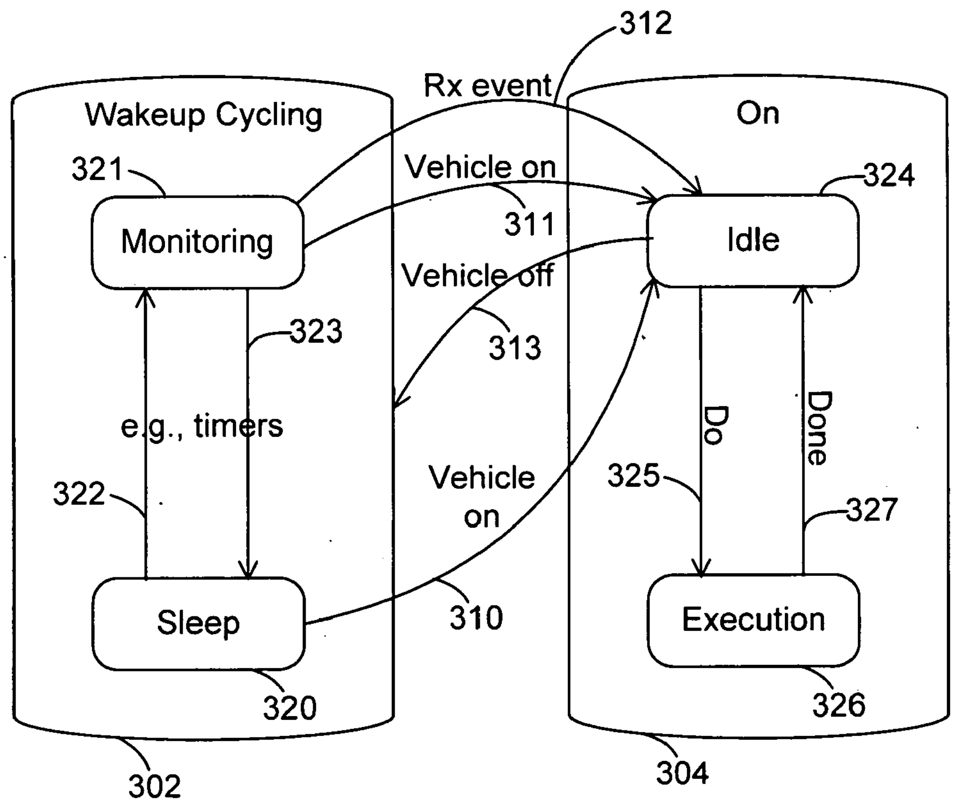

RECEIVE ACCESS REQUEST TO VEHICLE TELEMATICS CONTROL
202
USER AUTHENTICATION
204
RECEIVE USER REQUEST
206
SEND SATELLITE COMMAND
208
USER WAKEUP OF VEHICLE?
210
NO
TIMED WAKEUP
212
YES
214
MONITOR SATELLITE TRANSMISSIONS
COMMAND RECEIVED?
216
NO
TIMEOUT?
220
NO
YES
YES
EXECUTE RECEIVED COMMAND
218
END

FIGURE 2



312
Rx event
Wakeup Cycling
On
321
Monitoring
Vehicle on
311
324
Idle
Vehicle off
313
323
e.g., timers
Do
Done
322
Vehicle
on
325
327
Sleep
310
Execution
320
326
302
304

FIGURE 3

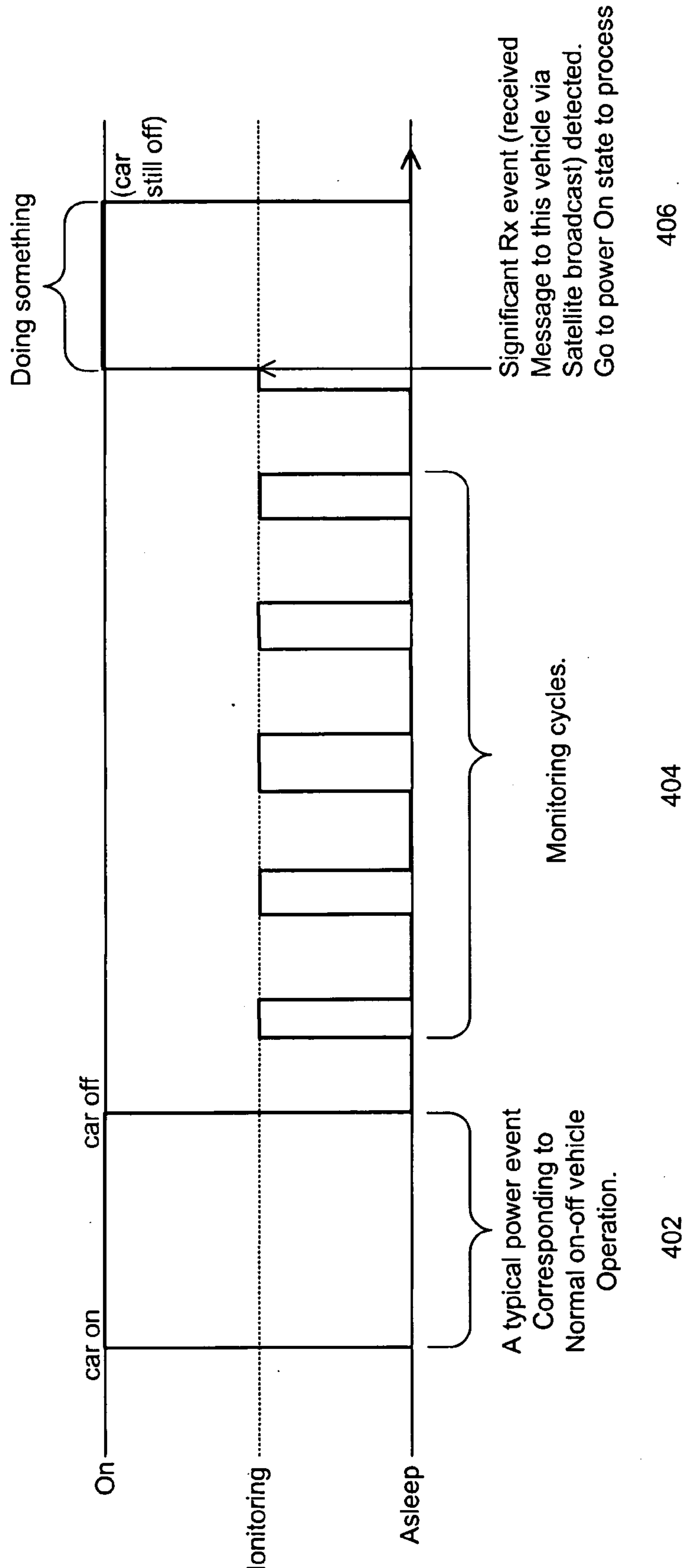

On
Monitoring
Asleep
car on
car off
A typical power event Corresponding to Normal on-off vehicle Operation.
402
Monitoring cycles.
404
Doing something
(car still off)
Significant Rx event (received Message to this vehicle via Satellite broadcast) detected. Go to power On state to process
406

FIGURE 4

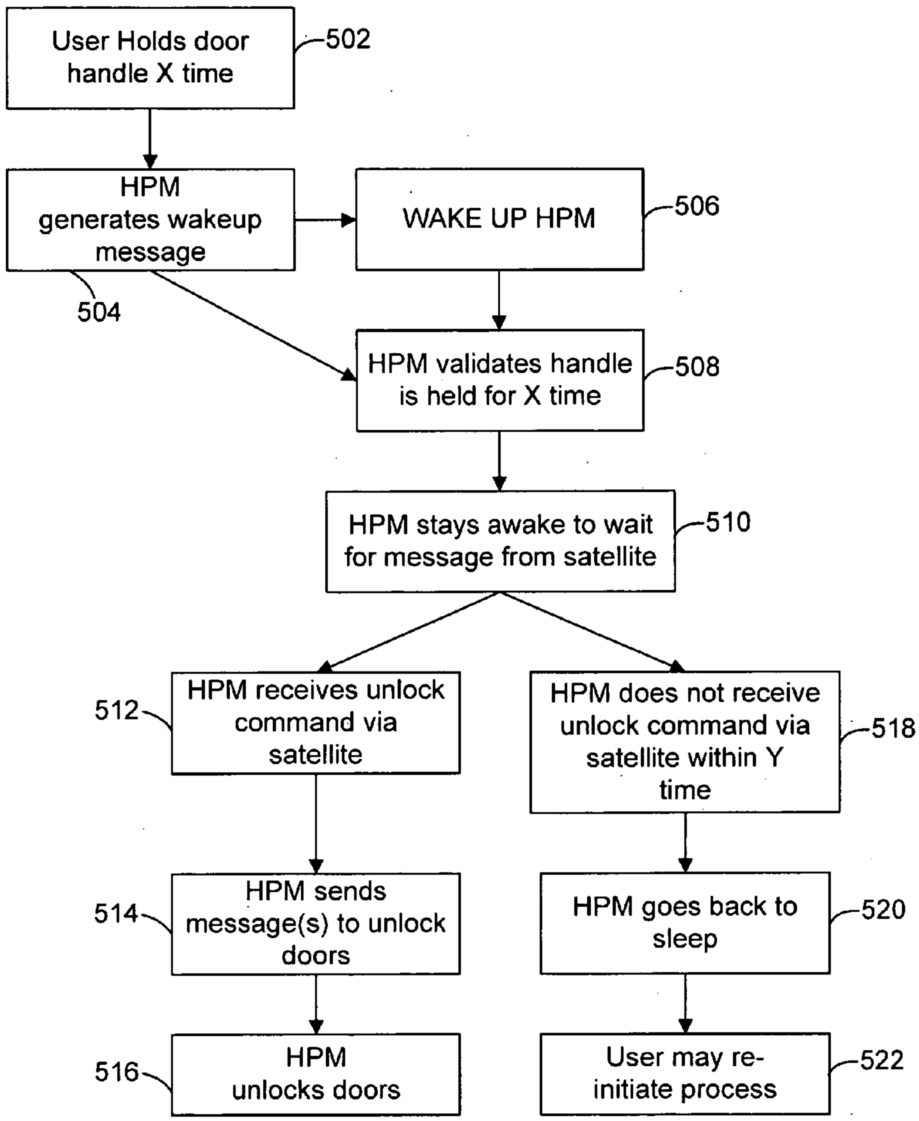

User Holds door handle X time
502
HPM generates wakeup message
504
WAKE UP HPM
506
HPM validates handle is held for X time
508
HPM stays awake to wait for message from satellite
510
HPM receives unlock command via satellite
512
HPM does not receive unlock command via satellite within Y time
518
HPM sends message(s) to unlock doors
514
HPM goes back to sleep
520
HPM unlocks doors
516
User may re-initiate process
522

FIGURE 5

SYSTEM AND METHOD FOR REMOTE CONVENIENCE VEHICLE TELEMATICS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 60/686,661, filed Jun. 1, 2005, which is incorporated by reference in its entirety.

BACKGROUND

[0002] 1. Field of Art

[0003] The present invention generally relates to satellite communications, and more specifically, to remote service systems using one way satellite communications.

[0004] 2. Description of the Related Art

[0005] Telematics, the blending of computers and wireless telecommunications technologies, seeks to convey information over vast networks to provide a host of business or public services. The term has evolved to refer to automobile systems that make use of wireless communications to provide driver assistance and remote diagnostics. Conventional vehicular telematics systems make use of two-way wireless communications, typically cellular or two-way radio communications or paging.

[0006] From the above, there is a need for a system and process to provide driver assistance that uses less complex communications.

SUMMARY

[0007] A system comprises a satellite broadcasting a signal including a remote convenience telematics command, a user interface system providing the remote convenience telematics command to the satellite in response to user input, and a vehicle system for performing a remote convenience task in response to a received broadcast signal.

[0008] In one embodiment, the vehicle system is in a sleep mode in response to a vehicle turn off signal and is in a monitoring mode during predetermined time intervals after the vehicle turn off signal or in response to a user input. The vehicle system monitors for receipt of the broadcast signal during the monitoring mode. The predetermined time intervals have a duration so that the vehicle system has a predetermined probability of detecting the broadcast signal.

[0009] In one embodiment, the vehicle system comprises a satellite broadcast receiver for receiving a broadcast signal including remote convenience telematics commands. A host processing module determines a remote convenience task corresponding to the received command. A controller performs the remote convenience task in a vehicle in response to the remote convenience telematics commands.

[0010] In one embodiment, the user interface system provides uplink data to the satellite. The user interface system comprises a user interface for receiving a user request for a remote convenience service. A broadcast manager determines timing of a remote convenience telematics command for inclusion in the uplink data to the satellite. An uplink system provides an uplink data signal including the remote convenience telematics command to the satellite vehicle system for broadcast to a vehicle for execution of the remote convenience service.

[0011] The features and advantages described in the specification are not all inclusive and, in particular, many additional features and advantages will be apparent to one of ordinary skill in the art in view of the drawings, specification, and claims. Moreover, it should be noted that the language used in the specification has been principally selected for readability and instructional purposes, and may not have been selected to delineate or circumscribe the inventive subject matter.

BRIEF DESCRIPTION OF DRAWINGS

[0012] The disclosed embodiments have other advantages and features which will be more readily apparent from the following detailed description and the appended claims, when taken in conjunction with the accompanying drawings, in which:

[0013] FIG. **1** is a block diagram illustrating one embodiment of a remote convenience telematics vehicle system according to the present invention.

[0014] FIG. **2** is a flowchart illustrating a methodology of the remote convenience telematics vehicle system of FIG. **1** according to the present invention.

[0015] FIG. **3** is a state diagram illustrating timed wake-up cycles of the remote convenience telematics vehicle system of FIG. **1** according to the present invention.

[0016] FIG. **4** is a timing diagram of the timed wake-up cycles of the state diagram of FIG. **3** according to the present invention.

[0017] FIG. **5** is a flowchart illustrating a methodology of processing a user initiated wake-up of the vehicle of the remote convenience telematics vehicle system of FIG. **1** according to the present invention.

DETAILED DESCRIPTION

[0018] The Figures and the following description relate to preferred embodiments of the present invention by way of illustration only. It should be noted that from the following discussion, alternative embodiments of the structures and methods disclosed herein will be readily recognized as viable alternatives that may be employed without departing from the principles of the claimed invention.

[0019] Reference will now be made in detail to several embodiments, examples of which are illustrated in the accompanying figures. It is noted that wherever practicable similar or like reference numbers may be used in the figures and may indicate similar or like functionality. The figures depict embodiments of the present invention for purposes of illustration only. One skilled in the art will readily recognize from the following description that alternative embodiments of the structures and methods illustrated herein may be employed without departing from the principles described herein.

[0020] Generally, the disclosed embodiments describe a vehicle system that receives remote convenience telematics commands from one-way satellite broadcast communications. A user communicates over a second communication system, such as telephone or Internet, to a vehicle telematics control system to set desired remote convenience services for the user's vehicle.

[0021] The "remote convenience" (RC) services are flexible, and accommodate a number of operational scenarios. For example, the user may have i) locked his keys in his car, ii) forgot to lock his car, iii) forgot where he parked his car (such as in a vast parking lot), or iv) want to disable the vehicle. The user can request remote convenience services while near the vehicle by way of cell phone or pager-type device or remote from the vehicle, e.g., at a kiosk or computer. Such services can include unlock, lock, turn on/off lights, honk horn, set a panic alert or car-finder service, or disable/immobilize the vehicle. Furthermore, a service can be sub-specified to do more specific tasks. For example, unlock may unlock one door, all doors, or open the trunk. Furthermore, the available remote convenience services, by design of the protocol, are only limited to those vehicle functions accessible by the HPM via the vehicle bus or wired interface. The protocol can pass through any commands available at such interface, thereby not limiting the service to those previously listed.

[0022] FIG. **1** is an illustration of the environment in which one embodiment of the present invention operates. In this system, the participants "user" and "owner" may be considered interchangeable, provided that a non-owner "user" is authorized by the owner of the vehicle. A remote convenience vehicle telematics system **100** comprises a vehicle telematics control system **102**, a broadcast satellite **103**, and a vehicle **104**. The vehicle telematics control system **102** includes the user interface to a satellite uplink system to receive user requested for remote convenience services. The vehicle **104** includes the electronics and mechanics associated with the remote convenience telematics. The broadcast satellite **103** provides one-way communications of commands for remote convenience telematics services from the vehicle telematics control system **102** to the vehicle **104**.

[0023] The vehicle telematics control system **102** comprises a telephone system **110**, an interactive voice response (IVR) subsystem **111**, a front end messaging interface **112**, a screen-based human message interface (HMI) **113**, an administrative subsystem **114**, a broadcast management subsystem **115**, and a satellite uplink system **116**.

[0024] The interactive voice response subsystem **111** is used to field calls from the telephone system **110** (e.g., a traditional analog phone, PBX, voice-over-Internet Protocol (VoIP) system, or direct interface with a wireless telephone system) for requesting remote convenience services. The interactive voice response subsystem **111** serves those calls with voice prompted instructions, and can interpret user speech commands and presses of DTMF digits on a telephone keypad. The interactive voice response subsystem **111** can also transfer calls to other telephone lines or systems.

[0025] The screen-based human machine interface subsystem **113** provides the user with a screen-based interface, such as a kiosk, web browser, or other terminal device such as a mobile client device, for requesting remote convenience services.

[0026] Through either the interactive voice response subsystem **111** or the screen-based human machine interface subsystem **113**, the user is first identified and authenticated. The user can then initiate the remote convenience services described above. The user can also check the status of the vehicle telematics control system **102**. For example, the user can view or change settings related to the user's account or services.

[0027] The front-end human messaging interface (HMI) **112** handles communications between either of the interactive voice response subsystem **111** or the screen-based HMI **112** and the administrative subsystem **114**, the broadcast management subsystem **115**, and the satellite uplink system **116**.

[0028] The broadcast management subsystem **115** prepares and sends messages for the remote convenience services to the broadcast satellite **103** through the satellite uplink system **116**. Messages are managed and scheduled for sending based on such factors as priority, device availability, user inputs, system load, other messages currently being broadcast, and the timing of message delivery to the vehicle. The messages can be targeted for delivery to a particular vehicle according to a unique identifier, such as vehicle identification number (VIN). The unique identifier can be directly provided by the user, assuming that authentication/validation criteria have been satisfied. Alternately, the unique identifier can be determined by the vehicle telematics control system **102**, based on the user's identity and the identity of a vehicle stored in the system and associated with the user.

[0029] In one embodiment, the front end messaging interface **112** and the broadcast management subsystem **115** can i) check for sufficient user account "credits" prior to fully executing the service, ii) elect to bill the user according to stored billing information, or iii) prompt the user for billing credentials in order to charge on a pay-per-use basis.

[0030] The administrative subsystem **114** provides for administration of the system **100**, e.g., for internal operations, logs, maintenance, test or diagnosis. The administrative subsystem **114** may also serve as a point of contact for privileged access by, e.g., customer service agents or vehicle dealerships.

[0031] The interactive voice response (IVR) subsystem **111**, the front end messaging interface **112**, the screen-based human message interface (HMI) **113**, the administrative subsystem **114**, and the broadcast management subsystem **115** may be implemented by equipment including individual desktop computers, clusters of computers, mainframes, distributed networks of computers or computing resources, or other types of hardware and software resources.

[0032] The satellite uplink system **116** sends messages intended for broadcast by the satellite **103**. Although one broadcast satellite **103** is shown, other numbers of broadcast satellites **103** may be used. Any satellite system may be used that is capable of broadcasting to the vehicle. According to one embodiment, the uplink system of a Satellite Digital Audio Radio Service (SDARS), such as the XM Satellite Radio service, is used. In one embodiment, the remote convenience telematics commands are time division multiplexed into satellite uplink data. The satellite uplink system **116** sends satellite uplink data to the broadcast satellite **103**.

[0033] The broadcast satellite **103** broadcasts the satellite uplink data to a plurality of vehicles **104**. Although one vehicle **104** is shown, other numbers of vehicles **104** may be used. The remote vehicle telematics command includes a unique identifier as described above for the vehicle **104** of the user requesting the remote convenience service.

[**0034**] The vehicle **104** receives the broadcast satellite data stream and processes the remote convenience telematics commands in the data stream that are addressed to the vehicle. The vehicle **104** comprises a host processing module **122** and a controller **123**.

[**0035**] The host processing module **122** detects an applicable data broadcast. The host processing module **122** can automatically "wake up" from a power-save mode (described in detail below in conjunction with FIG. **3**) to fully receive such a broadcast, or can be triggered to do so by the user (e.g., through an external input device accessible by the user). The host processing module **122** may filter, store, or discard messages that are not considered unique, relevant, timely, authenticated, or intended for the receiving vehicle.

[**0036**] The host processing module **122** includes a satellite data broadcast receiver **121** that receives the broadcast radio signal, decodes the data stream, and communicates the decoded data to the balance of the host processing module **122**. In one embodiment, the satellite data broadcast receiver is external to the host processing module **122**.

[**0037**] The host processing module **122** decodes a request for some action to determine whether the action is applicable, appropriate, necessary, and otherwise meets requirements. If these tests are met, the host processing module **122** signals the action to the following portion, either directly or via a vehicle bus (not shown).

[**0038**] The controller **123** may be a mechanical and/or electrical module, and performs a remote convenience service action, such as lock, unlock, signal a human message interface, make an alert, arm a system, and/or disarm a system, based upon the received remote convenience telematics command. The controller **123** may also communicate with the host processing module **122** to determine operations or signaling to the user such as vehicle lights, LEDs, displays, or audible devices to indicate status or progression of the service.

[**0039**] In one embodiment, the user may interact again with the vehicle telematics control system **102** to communicate success or failure, or to check the status of any remote convenience service request. The vehicle telematics control system **102** may interpret the user inaction to perform additional actions, such as rebroadcast, alter timing, or cancel broadcast.

[**0040**] The host processing module **122**, the satellite data broadcast receiver **121**, and the controller **123** may be implemented by any combination of instruction-set processors, dedicated hardware, software or firmware, and mechanical apparatus.

[**0041**] FIG. **2** is a flowchart illustrating one embodiment of a methodology of the remote convenience telematics vehicle system **100**. The vehicle telematics control system **102** receives **202** an access request from the user. When a remote convenience service is desired, the user calls a number specific to the services through the telephone system **110** to the interactive voice response subsystem **111** or logs into an appropriate website for a screen-based messaging interface **113**.

[**0042**] The front-end messaging interface **112** prompts the user to supply identification, for example, user name and personal identification number (PIN). The front-end messaging interface **112** authenticates **204** the user based on authentication criteria applied to the received information. If the user account includes multiple vehicles, the front-end messaging interface **112** accesses a stored list of possible vehicle identification numbers. The user can then choose a vehicle from the list by any appropriate interactive means.

[**0043**] The front-end messaging interface **112** prompts the user with a list of remote convenience options. The front-end messaging interface **112** receives **206** a user request from the interactive voice response subsystem **111** or the screen-based messaging interface **113**. For example, the user may choose to unlock a vehicle **104**. In one embodiment, the vehicle telematics control system **102** queries whether the user is currently at or near the vehicle **104**. If not, the vehicle telematics control system **102** queries the user for the estimated time for the user to return to the vehicle. The message management subsystem **115** then estimates the optimum time to broadcast the necessary messages via the satellite uplink system **116** and the broadcast satellite **103**. This timing estimation depends in part on the scheduling in the uplink and on the current mode of the vehicle **104**. The message management system **115** sends **208** the appropriate commands through the satellite uplink system **116** to the broadcast satellite **103** for transmission.

[**0044**] The vehicle **104** may enter a power saving mode (e.g., "sleep" or "hibernation" mode) after a specified period inactivity to avoid excessively draining the battery of the vehicle **104**. If the vehicle **104** is in a power saving mode, the vehicle **104** determines **210** whether the user has woken up the vehicle **104**; otherwise the vehicle **104** waits **212** for a timed wake-up. The user wake-up and time wake-up are described below in conjunction with FIG. **3**. When awake, the host processing module **122** monitors **214** satellite transmissions and determines whether a command is received **216** in a transmission. If a command is received, the host processing module **122** executes **218** the received command by sending the appropriate signals to the controller **123**. Otherwise if no command is received **216** the host processing module **122** waits **122** for a time-out to receive remote convenience service commands. If a timeout **122** occurs, the vehicle **104** enters the power saving mode as next described.

[**0045**] FIG. **3** is a state diagram illustrating wake-up cycles of the remote convenience telematics vehicle system **100**. In order to receive remote convenience messages from a satellite **103**, the satellite broadcast receiver **121** is in a hibernation mode that sufficiently powers the satellite broadcast receiver **123** to receive messages, and to signal the host processing module **122** to act on the received messages. The vehicle **104** operates in a wake-up cycle state **302** or in an on state **304**. The vehicle **104** changes from a wake-up cycle state **302** to the on state **304** in response to a vehicle turned on events **310** or **311** or from a transmit event **312** from the satellite broadcast data. The vehicle **104** changes from the on state **304** to the wake-up cycle state **302** in response to a vehicle off event **313** that is generated when the vehicle **104** is turned off.

[**0046**] In the wake-up cycle state **302**, the host processing module **122** is in a sleep-state **320** and may switch to a monitoring state **321**, which is a wake-up state in response to a wake-up event **322**, which may be a periodic wake-up from the sleep mode or user action, such as lifting up the door handle of the vehicle **104**. During the monitoring state **321**, the host processing module **122** checks for sufficient signal strength from the satellite **103** and issues a confirmation. For example, the vehicle lights may flash or the horn or some other device may beep. In response to a time-out event **323**, the host processing module **122** goes into the sleep-state **323**.

[0047] The wake-up event **322** and the sleep event **323** may be orchestrated by a clock/timing device (e.g., a "real-time clock"). For example, the electronics may be awake during one of every ten minutes. In one embodiment, to further limit battery drain, the remote unlock service may be disabled, e.g., 24 hours after the user leaves the vehicle, by discontinuing the periodic wakeup. The timing associated with periodic wakeup may be adjusted to balance availability of remote convenience services with power consumption. The availability of remote convenience services can be improved by supplementing or replacing periodic wakeup with a user-induced wakeup. This may be implemented in cases that the user can physically interact with the vehicle **104**, such as by actuating some electrical switch attached in some manner to the vehicle **104**. In such cases, rather than sending messages for a longer time at a lower rate (to save bandwidth), the system could send messages at a higher rate over a shorter time. Periodic and user-induced wakeup may be implemented exclusively or in combination. For example, a particular type of vehicle may not have a switch suitable for user interaction, in which case only periodic wakeup would be used. On the other hand, if only remote unlock service and a switch are provided, only user-induced wakeup may be used. Both periodic and user-induced wakeup may be provided if the offered remote conveniences support and benefit from both wakeup mechanisms. The vehicle telematics control system **102** provides instructions to the user regarding user initiated wake-up procedures, and any action that the use can take to wake-up the vehicle **104** and to confirm the wake-up to the system **102**.

[0048] During the monitoring state **321**, the host processing module **122** goes to an idle state **324** from the on state **304** in response to a vehicle on event **311** or a received event **312**. The host processing module **122** remains in the idle state **324** until the vehicle is turned off for a vehicle off event **313** or a remote convenience command **325** is detected. In response to the remote convenience command **325**, the host processing module **122** enters an execution state **326** to execute the requested function and after execution **327** enters the idle state **324**.

[0049] Referring again to FIG. **2**, the timing of the send **208** the satellite command, the monitor **216** of the satellite transmissions and executes **218** the received command are scheduled because the system **100** is a one-way, e.g., broadcast system. The message management subsystem **115** determines the appropriate time to insert messages into the broadcast data stream. In the present example, the appropriate time to insert and possibly reinsert messages is determined based upon the estimated times for i) the user to return to the vehicle (if the user is not at or near the vehicle), ii) the user to confirm the intent to wake up and iii) the host processing module **122** to wakeup.

[0050] For example, unlock commands may be sent every 3 seconds for up to 10 minutes. The host processing module **122** acts upon the first-received command message and ignores subsequent duplicate messages. Multiple messages are sent to provide immunity to dropouts in the satellite signal and to accommodate uncertainty in message timing. Such timing uncertainty may arise in part if the satellite uplink system "pulls" rather than "pushes" messages. In other words, the design is such that messages may be queued until an opportunity arises for them to be accepted by the satellite uplink system, to accommodate the possibility of uncertainty as to when such acceptance will occur.

[0051] Additional timing uncertainty is introduced by the broadcast process itself. For example, even if a message could be "pulled" within an acceptable or expected period of time, the vehicle telematics control system **102** may have difficulty determining an exact message schedule based upon uncertainty, for example, as to when the vehicle **104** will be awake. The vehicle telematics control system **102** therefore may not precisely determine an appropriate time of message delivery to the vehicle **104**. Message repetition may be used, and the repetition interval is selected to balance effectiveness and reliability of service with bandwidth limitations and other constraints, such as vehicle battery drain.

[0052] Each command message includes a time-of-creation stamp. In one embodiment, the host processing module **122** will not respond if the message is "stale," e.g., if is received more than 20 minutes after the time stamp. This protects against the possibility that the user's situation has changed since the user issued the unlock command. The time period for determining staleness may be set by the user or the system **102**.

[0053] After the vehicle is unlocked, the user may confirm, either immediately (if able to do so, e.g., if the user is still connected by phone), or subsequently (e.g., the user calls back). If the user confirms, broadcasting ceases, so that bandwidth is conserved. If the user is at the vehicle **104** and confirms, the associated messages can be scheduled for broadcast immediately, or nearly so (e.g., the delay only involves a period of sustained user-vehicle physical interaction and time to wake the host processing module **122**).

[0054] The system message timing may be designed to provide a specified minimum quality of service while satisfying bandwidth restrictions. For example, message timing may be designed so that the maximum time-to-unlock is 10 minutes in 99% of cases, and 20 minutes in 99.99% of cases, without exceeding bandwidth limitations.

[0055] FIG. **4** is a timing diagram of timed wake up cycles of the vehicle **104** corresponding to the timed events **322** and **323** of FIG. **3**. During a time period **402**, the host processing module **122** is in the on state **304**, because the vehicle **104** is turned on. After the vehicle is turned off (vehicle off event **313**), the host processing module **122** is in the wake up cycling state **302**, and more particularly goes to the sleep state **320**. During a monitoring period **404**, a series of wake up events **322** switches the host processing module **122** into the monitoring state **321**. If no command is received **216** (received event **312**), the host processing module **122** goes into the sleep state **320** until the next wake up event **322**. As described above, the monitoring **404** continues for a predetermined time-out or until a receive event **312** occurs which is shown in FIG. **4** as time **406**. The monitoring cycles need not be linear or fixed (e.g., could be algorithmically-based), and may use global positioning satellites (GPS) time to correct for clock drift. During time **406**, the host processing module **122** is in the on state **304** and processes the remote convenience command as described above in conjunction with FIG. **3**.

[**0056**] A user initiated wake-up of the vehicle **104** is next described.

[**0057**] FIG. **5** is a flowchart illustrating a methodology of processing a user initiated wake-up of the vehicle **104**. The user holding **502** the door handle for a predetermined time indicates a wake-up of the host processing module **122**. As noted above, switches other than a door handle switch can be used for user-initiated wake-up (the door handle being an easily understood illustration). The host processing module **122** generates **504** a wake-up message to switch from the sleep state **320** to the monitoring state **321**. The host processing module **122** completely wakes up **506**. The host processing module **122** validates **508** that the handle has been held for the predetermined time. The host processing module **122** is awake **510** to wait for a message from a satellite **103** in the monitoring state **321**. If the host processing module **122** receives **512** an unlock command from the satellite **103**, the host processing module **122** sends **514** messages to the controller **123** to unlock the doors, and the controller **123** unlocks **516** the doors. On the other hand, if the receive command **312** is not received **518** within another predetermined time, the host processing module **122** times out and returns **520** to the sleep mode **320**, until the user reinitiates **522** the process by holding the door handle.

[**0058**] In one embodiment, if an expected user-vehicle physical confirmation is not recognized following an unlock request, the host processing module **122** may assume that the user in fact does not wish to unlock the vehicle. Alternately, the host processing module **122** may interpret such a situation as arising from fraud or other foul play. Optionally, the host processing module **122** may then cancel the requested action or revert to another remote convenience service. For example, the host processing module **122** may assume that the user actually forgot where he parked his vehicle **104**, and accordingly may command the vehicle horn to honk, or to otherwise signal so that user can locate the vehicle **104**.

[**0059**] As used herein, the terms "comprises,""comprising,""includes,""including,""has,""having" or any other variation thereof, are intended to cover a non-exclusive inclusion. For example, a process, method, article, or apparatus that comprises a list of elements is not necessarily limited to only those elements but may include other elements not expressly listed or inherent to such process, method, article, or apparatus. Further, unless expressly stated to the contrary, "or" refers to an inclusive or and not to an exclusive or. For example, a condition A or B is satisfied by any one of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

[**0060**] In addition, use of the "a" or "an" are employed to describe elements and components of the invention. This is done merely for convenience and to give a general sense of the invention. This description should be read to include one or at least one and the singular also includes the plural unless it is obvious that it is meant otherwise.

[**0061**] Upon reading this disclosure, those of skill in the art will appreciate still additional alternative structural and functional designs for a system and a process for remote convenience vehicle telematics through the disclosed principles herein. Thus, while particular embodiments and applications have been illustrated and described, it is to be understood that the present invention is not limited to the precise construction and components disclosed herein and that various modifications, changes and variations which will be apparent to those skilled in the art may be made in the arrangement, operation and details of the method and apparatus of the present invention disclosed herein without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A system comprising:

a satellite broadcasting a signal including a remote convenience telematics command;

a user interface system providing the remote convenience telematics command to the satellite in response to user input;

a vehicle system for performing a remote convenience task in response to a received broadcast signal.

2. The system of claim 1 wherein the remote convenience telematics command includes unlocking door of a vehicle.

3. The system of claim 1, wherein the vehicle system is in a sleep mode in response to a vehicle turn off signal and is in a monitoring mode during predetermined time intervals after the vehicle turn off signal, the vehicle system monitoring for receipt of the broadcast signal during the monitoring mode.

4. The system of claim 3 wherein predetermined time intervals have duration so that the vehicle system has a predetermined probability of detecting the broadcast signal.

5. The system of claim 1, wherein the vehicle system is in a sleep mode in response to a vehicle turn off signal and is in a monitoring mode during predetermined time intervals after the vehicle turn off signal or in response to a user input to a device on a vehicle including the vehicle system, the vehicle system monitoring for receipt of the broadcast signal during the monitoring mode.

6. The system of claim 5 wherein predetermined time intervals have duration so that the vehicle system has a predetermined probability of detecting the broadcast signal.

7. The system of claim 5 wherein the vehicle system generates an acknowledgement signal in response to the user input.

8. The system of claim 1 wherein the remote convenience telematics command includes locking a door of a vehicle.

9. A vehicle system comprising:

a satellite broadcast receiver for receiving a broadcast signal including remote convenience telematics commands;

a host processing module for determining a remote convenience task corresponding to the received command;

a controller for performing the remote convenience task in a vehicle in response to the remote convenience telematics commands.

10. The system of claim 9 wherein the remote convenience telematics commands include unlocking door of a vehicle.

11. The system of claim 9, wherein the host processing module is in a sleep mode in response to a vehicle turn off signal and is in a monitoring mode during predetermined time intervals after the vehicle turn off signal, the host processing module monitoring for receipt of the broadcast signal during the monitoring mode.

12. The system of claim 11 wherein predetermined time intervals have duration so that the host processing module has a predetermined probability of detecting the broadcast signal.

13. The system of claim 9, wherein the host processing module is in a sleep mode in response to a vehicle turn off signal and is in a monitoring mode during predetermined time intervals after the vehicle turn off signal or in response to a user input to a device on a vehicle coupled to the vehicle system, the host processing module monitoring for receipt of the broadcast signal during the monitoring mode.

14. The system of claim 13 wherein predetermined time intervals have duration so that the host processing module has a predetermined probability of detecting the broadcast signal.

15. The system of claim 14 wherein the host processing module generates an acknowledgement signal in response to the user input and the controller generates a physical manifestation of an acknowledgement in response to the acknowledgement signal.

16. The system of claim 9 wherein the remote convenience telematics commands includes locking a door of a vehicle.

17. A system for providing uplink data to a satellite, the system comprising:

a user interface for receiving a user request for a remote convenience service;

a broadcast manager for determining timing of a remote convenience telematics command for inclusion in the uplink data to the satellite;

an uplink system for providing an uplink data signal including the remote convenience telematics command to the satellite vehicle system for broadcast to a vehicle for execution of the remote convenience service.

18. The system of claim 17 wherein the remote convenience telematics command includes unlocking door of a vehicle.

19. The system of claim 17, wherein the timing of the remote convenience telematics command accounts for a monitoring mode of the vehicle for monitoring for receipt of the broadcast signal.

20. The system of claim 18 wherein the timing of the remote convenience telematics command provides a predetermined probability of the vehicle detecting the broadcast signal.

21. The system of claim 17, wherein the timing of the remote convenience telematics command accounts for a monitoring mode of the vehicle for monitoring for receipt of the broadcast signal or in response to a user input to a device on the vehicle to cause the vehicle to be in the monitoring mode.

22. The system of claim 21 wherein the timing of the remote convenience telematics command provides a predetermined probability of the vehicle detecting the broadcast signal.

* * * * *