

VEHICLE COMPUTER SYSTEM AND ITS METHOD OF RECEIVING MESSAGE FROM CONTROL CENTER

BACKGROUND OF THE INVENTION



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1. Field of the Invention

5 The present invention relates to a vehicle computer system and, also relates to a method of receiving message from a control center through the vehicle computer system.

2. Description of Related Art

10 When the control center sends a message to the motor vehicle's computer system, the computer system uses a pager to receive the message from the control center. However, conventional vehicle computer systems are not practical for receiving large amounts or a variety of messages from the control center via broadcasting in order to save transmission fees.

15 Therefore, it is desirable to provide a vehicle computer system that eliminates the aforesaid drawback.

SUMMARY OF THE INVENTION

20 The main object of the present invention is to provide a vehicle computer system, which receives messages from the control center efficiently. The control center transmits the message via broadcasting in two steps, i.e., the message is divided into a "pre-message" and a "post-message", the control center transmits the "pre-message" and then the "post message". The "pre-message" includes information describing the characteristics of the "post-message". Therefore, the "pre-message"
25 data amount is small. The "post-message" is the major part of the



message, containing a larger data amount than the "pre-message". According to the present invention, the vehicle computer system comprises a pager and a mobile telephone. In order to improve the efficiency and save the communication fee between the vehicle computer system and the control center, the mobile telephone starts to receive the "post-message" only when the "post-message" contains a large amount of data. A "pre-message" evaluation determines whether the mobile telephone will receive the "post message". The "pre-message" evaluation directs the vehicle computer system to implement the mobile telephone to receive the "post-message".

Another object of the present invention is to allow the vehicle computer system to receive different kinds of messages from the control center, for example, system updates, advertising messages, traffic condition, map data and burglar-alarm control information messages. Note that the vehicle system can still efficiently receive broadcasted messages.

Other objects, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic drawing explaining the use of the present invention.

FIG. 2 is a system block diagram showing the control center's hardware architecture according to the present invention.

FIG. 3 is a system block diagram showing the vehicle computer

system's hardware architecture according to the present invention.

FIG. 4 is a flowchart showing the interaction between the vehicle computer system and the control center.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

5 Referring to FIG. 1, the control center **10** transmits messages by broadcasting, and the vehicle computer system **20** (installed in a motor vehicle), receives messages from the control center **10**. The messages include for example, system information updates **51**, advertising messages **52**, traffic condition information **53**, map information **54**, and
10 burglar-alarm control information **55**. The vehicle computer system **20** can also send an answerback message **56** to the control center **10** when necessary.

FIG. 2 is a system block diagram showing the control center's **10** hardware architecture. As illustrated, the control center **10** comprises a
15 communication system **11** for receiving or transmitting messages to external targets (for example, PSTN) by a wired communication method or a wireless communication method. The communication system **11** and the computer system **12** are connected with the computer system **12** running the necessary software to transmit messages or control signals to
20 external targets through the communication system **11**.

FIG. 3 is a system block diagram showing the vehicle computer system's **20** hardware architecture. As illustrated, the vehicle computer system **20** comprises a host computer **21**, a pager **25**, a burglar-alarm system **26**, a mobile telephone **27**, a road traffic condition generator **28**,
25 and a GPS (global positioning system) **29**. The host computer **21**

comprises a microprocessor 22, a memory 23, and a display 24. The burglar-alarm system 26 has multiple sensors including burglar-alarm sensor means, vibration sensor means, etc. The sensors 261~264 are connected thereto. The aforesaid individual devices are hardware devices
5 known to those skilled in the art. Therefore a detailed description of the devices is unnecessary.

The interaction between the vehicle computer system 20 and the control center 10 is outlined hereinafter with reference to FIG. 4. The control center's 10 message transmitting operation characteristics are
10 necessarily explained before describing the flowchart of FIG 4. The control center 10 transmits messages by two steps, i.e., the message is divided into a pre-message and a post-message, with the exception of transmitting messages via broadcasting means. The pre-message contains a small amount of information including information describing
15 the post-message. The post-message contains the message in its entirety making the post-message larger than the pre-message.

Step 401:

Direct the pager 25 to receive the pre-message from the control center 10. If the message is a system information update 51, the
20 pre-message includes updated vehicle system model information, or updated system edition information, etc. If the message is an advertising message 52, the pre-message includes target vehicle information to which the advertising message will be delivered. If the message is traffic condition information 53, the pre-message includes the geographic
25 location or road name. If the message is map information 54, the

pre-message includes map area information. If the message is burglar-alarm control information **55**, the pre-message includes the motor vehicle's serial number (for example, the mobile telephone **27** number) enabling a particular motor vehicle to receive the burglar-alarm control information **55**.

Step 402:

Evaluate the message, i.e., evaluate the pre-message in order to classify the post-message.

Step 403:

10 Judge if to continuously receive the post-message. Proceed to **Step 404** if yes. The host computer's **21** memory **23** has motor vehicle specifications stored therein, said data including "vehicle model" information, for example, vehicle computer system **20** equipment information, vehicle computer system **20** system edition, mobile
15 telephone **27** telephone number , etc. If the message is a system information update **51**, direct the host computer **21** to check the vehicle computer system **20** system edition to determine continuous post-message reception. If the message is an advertising message **52**, direct the host computer **21** to verify that the motor vehicle model in
20 which the vehicle computer system **20** is installed is in accordance with the applicable pre-message model to determine if to continuously receive the post-message. If the message is traffic condition information **53**, direct the host computer **21** to verify that the road traffic condition generator **28** is included, otherwise a message will not be received. If the
25 message is map information **54**, direct the host computer **21** to verify that

the GPS 29 is included, otherwise a message will not be received. If the message is burglar-alarm control information 55, direct the host computer 21 to verify that the pre-message includes the mobile telephone 27 telephone number, so as to determine continuous post-message
5 reception.

Step 404:

Judge if to use the mobile telephone 27 to receive the post-message subject to pre-message information and then start mobile telephone 27 post-message reception if yes. Conditions for mobile
10 telephone usage to receive post-messages include having a large data amount in the post-message. Another simple way is allowing the pre-message to inform the vehicle computer system 20 to optionally use the mobile telephone 27 to receive the post-message.

Step 405:

15 Direct the mobile telephone 27 to receive the post-message.

Step 406:

Direct the pager 25 to receive the post-message.

Step 407:

Store the received message (includes at least the post-message)
20 in the memory 23.

Step 408:

Direct the host computer 21 to call the related device to process information subject to the received message. For example, direct the host computer 21 to fetch the received message from the memory 23 and to
25 execute the instructions contained in the received message through the

burglar-alarm main unit 26, the road traffic condition generator 28, or the GPS.

Step 409:

5 Check to ensure successful message processing, i.e., check for processing errors, for example, failed message reception during the aforesaid procedure.

Step 410:

10 Inform the control center 10 with a failure/error message , enabling the control center 10 to control the message transmitting situations.

Although the present invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.

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WHAT IS CLAIMED IS:

1. A method of using a vehicle computer system in a motor vehicle to receive a message from a control center, said vehicle computer system comprising a host computer having a microprocessor and a memory, a pager, and a mobile telephone, said control center being adapted to transmit a pre-message and then a post-message, the method comprising the steps of:
- a) directing said pager to receive said pre-message from said control center, said pre-message including information describing said post-message;
 - b) evaluating said pre-message to characterize said post-message;
 - c) judging if to continuously receive said post-message subject to the evaluation of said pre-message, and then proceeding to step d) if yes;
 - d) judging if to use said mobile telephone to receive said post-message subject to said pre-message information, and initiating said mobile telephone to receive said post-message if yes and under the condition of having a large data amount in said post-message, or directing said pager to receive said post-message if no; and
 - e) storing said post-message in said memory of said host computer of said vehicle computer system.

2. The method as claimed in claim 1, wherein said post-message regards a system information update event, and said pre-message includes the vehicle system model information to be updated, so as to check if said vehicle computer system has the updated system edition or not and then to continuously receive said post-message if no during step

c).

3. The method as claimed in claim 1, wherein said post-message regards an advertising message event, and said pre-message includes target vehicle information to which the advertising message is to be sent, so as to verify that the motor vehicle model in which said vehicle computer system is installed is in accordance with the target vehicles and then to continuously receive said post-message if yes during step c).

4. The method as claimed in claim 1, wherein said post-message regards a traffic condition information event, so as to check if said vehicle computer system includes a road traffic condition generator or not and then not to receive said post-message if no during step c).

5. The method as claimed in claim 1, wherein said post-message regards a map information event, so as to check if said vehicle computer system includes a GPS (global positioning system) or not and then not receive said post-message if no during step c).

6. The method as claimed in claim 1, further comprising step f) sending a failure/error message to said control center through said mobile telephone when a problem is encountered during said post-message reception.

7. A vehicle computer system installed in a motor vehicle and adapted for receiving a message from a control center, which transmits the message by broadcasting by means of transmitting a pre-message and then a post-message, said vehicle computer system comprising:

a host computer, said host computer comprising a

microprocessor, a memory, and a display;

a pager adapted for receiving said pre-message and said post-message from said control center; and

a mobile telephone adapted for receiving said pre-message and
5 said post-message from said control center; and

said host computer being adapted to achieve the steps of:

a) directing said pager to receive said pre-message from said control center, said pre-message including information describing said post-message;

10 b) evaluating said pre-message to characterize said post-message;

c) judging if to continuously receive said post-message subject to said pre-message evaluation, and then proceeding to step d) if yes;

d) judging if to use said mobile telephone to receive said post-message subject to said pre-message information, and then initiating said

15 mobile telephone to receive said post-message if yes and when under the condition of having a large data amount in said post-message, or directing said pager to receive said post-message if no; and

e) storing said post-message in said memory of said host computer of said vehicle computer system.

20 8. The vehicle computer system as claimed in claim 7, wherein said post-message regards a system information update event, and said pre-message includes the vehicle system model information to be updated, so as to check if said vehicle computer system has the updated system edition or not and then to continuously receive said post-message
25 subject if no during step c).

9. The vehicle computer system as claimed in claim 1, wherein
said post-message regards an advertising message event, and said
pre-message includes the target vehicle information to which the
advertising message is to be sent, so as to verify that the motor vehicle
5 model in which said vehicle computer system is installed is in accordance
with the target vehicles and then to continuously receive said
post-message if yes during step c).

10. The vehicle computer system as claimed in claim 7, further
comprising a road traffic condition generator, and said post-message
10 regards a road traffic condition information event, so that said road traffic
condition generator is capable of fetching the traffic condition
information post-message after step e).

11. The vehicle computer system as claimed in claim 7, further
comprising a GPS (global positioning system), and said post-message
15 regards a map information event, so that said GPS is capable of fetching
the map information post-message after step e).

12. The vehicle computer system as claimed in claim 7, wherein
said host computer is adapted to further achieve, after step e) the step f)
sending a failure/error message to said control center through said mobile
20 telephone when a problem is encountered during the action of receiving
said post-message.