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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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5 TITLE: AUDIO DEVICE INTEGRATION SYSTEM

SPECIFICATION

10 BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to an audio device integration system. More specifically,  
15 the present invention relates to an audio device integration system for integrating after-market  
components such as satellite receivers, CD players, CD changers, MP3 players, Digital Audio  
Broadcast (DAB) receivers, auxiliary audio sources, and the like with factory-installed (OEM) or  
after-market car stereo systems.

20 RELATED ART

Automobile audio systems have continued to advance in complexity and the number of  
options available to automobile purchasers. Early audio systems offered a simple AM and/or  
FM tuner, and perhaps an analog tape deck for allowing cassettes, 8-tracks, and other types of  
tapes to be played while driving. Such early systems were closed, in that external devices could  
25 not be easily integrated therewith.

With advances in digital technology, CD players have been included with automobile  
audio systems. Original Equipment Manufacturers (OEMs) often produce car stereos having CD  
players and/or changers for allowing CDs to be played while driving. However, such systems





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### SUMMARY OF THE INVENTION

The present invention relates to an audio device integration system. One or more after-market audio devices, such as a CD player, CD changer, MP3 player, satellite receiver (e.g., XM tuner), digital audio broadcast (DAB) receiver, or auxiliary input source, can be connected to and operate with an existing stereo system in an automobile, such as an OEM car stereo system or an after-market car stereo system installed in the automobile. The integration system connects to and interacts with the car stereo at any available port of the car stereo, such as a CD input port, a satellite input, or other known type of connection. If the car stereo system is an after-market car stereo system, the present invention generates a signal that is sent to the car stereo to keep same in an operational state and responsive to external data and signals. Commands generated at the control panel are received by the present invention and converted into a format recognizable by the after-market audio device. The formatted commands are executed by the audio device, and audio therefrom is channeled to the car stereo. Information from the audio device is received by the present invention, converted into a format recognizable by the car stereo, and forwarded to the car stereo for display thereby. The formatted information could include information relating to a CD or MP3 track being played, channel, song, and artist information from a satellite receiver or DAB receiver, or video information from one or more external devices connected to the present invention. The information can be presented as one or more menus, textual, or graphical prompts for display on an LCD display of the radio, allowing interaction with the user at the radio. A docking port is provided for allowing portable external audio devices to be connected to the interface of the present invention.

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In an embodiment of the present invention, a dual-input device is provided for integrating both an external audio device and an auxiliary input with an OEM or after-market car stereo. The user can select between the external audio device and the auxiliary input using the controls of the car stereo. The invention can automatically detect the type of device connected to the  
5 auxiliary input, and integrate same with the car stereo.

In another embodiment of the present invention, an interface is provided for integrating a plurality of auxiliary input sources with an existing car stereo system. A user can select between the auxiliary sources using the control panel of the car stereo. One or more after-market audio  
10 devices can be integrated with the auxiliary input sources, and a user can switch between the audio device and the auxiliary input sources using the car stereo. Devices connected to the auxiliary input sources are inter-operable with the car stereo, and are capable of exchanging commands and data via the interface.

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