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Analog Signal Input/Output System Using Network Lines

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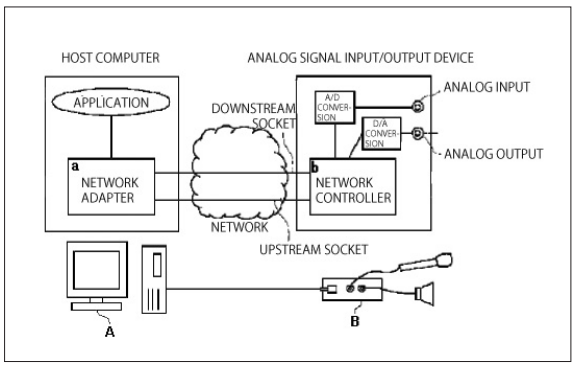
External view of the Internet speaker

Summary of Technology

The present invention is an instrument (specifically, an Internet speaker) that is equipped with an analog signal input terminal that converts analog input signals into digital signals and transmits the converted signals to the host computer over a network. The instrument also features an analog output terminal that receives the digital signals generated by the host computer and transmitted over a network and converts the received digital signals into analog signals for output. This architecture allows audio signals from the computer to be output to the present instrument and also permits audio signals input to the present instrument to be transferred to the host computer over the network. For the former function, output may be selectively switched between multiple Internet speakers. Furthermore, since the Internet speaker requires no dedicated circuitry, it may be installed anywhere with access to a network socket. However, there is one problem with this otherwise apparently very convenient Internet speaker. Generally, network delays are not constant, and are dependent on the volume of the information passing through the network, and so the delays may not be negligible in cases where stereo audio data are reproduced over such network lines subject to fluctuating delays. However, the present invention is equipped with a synchronous control mechanism for delay-free transmission, enabling faithful reproduction of the phase of the sound output from both speakers of the stereo system. Furthermore, this invention is capable of adapting immediately to any changes in the coding or reproduction method. Through such innovations, the architecture of the present instrument has been made suitable for applications that demand functions such as high-quality stereo reproduction requiring precise phase reproduction of the left and right phases, easy switchover between collective/selective transmission, and a local-area broadcasting system that allows two-way communication.



Architecture

Examples of Application

In the future, we expect society to enter the "ubiquitous" age, in which Internet information sockets will be installed in every room in the house and all household electronic appliances will be connected to the network. Nearly all electronic appliances will be included in the network, from air conditioners to the microwave oven, to TV sets. Internet speakers, installed as the default audio system in every room, may be used as the audio output unit for various AV devices and will allow a person to move from one room to another without interruption in the audio information, which will be carried over from one set of Internet speakers to the set in the next room. The device may also be used as an intercom for conversation between rooms. Furthermore, as long as the Internet socket is available, systems for all-round emergency broadcasting, individual paging, and the reception of responses to such signals in business establishments, schools, and hospitals may be easily set up with the addition or removal of Internet speakers—simply by switching the software, even if the building is not equipped with conventional broadcasting wiring. As in these examples, the Internet speaker can realize a whole range of applications, and it may not be long before they become common equipment in all homes.

Forwarded to a nearby speaker from a notebook PC

Multiple speakers may be used simultaneously

Speakers may be switched over as the person moves around

Commercialization of the Internet speaker

The present technology has been transferred to, and is marketed by, Musashino Electronics Co., Ltd. Two types of boards are available: one with a built-in speaker and another without. Either type may be selected depending on the intended application. The boards also come with PC software to allow instant installation.

(Article written by SAWADA Fumitake, Expert, Intellectual Property Management Group, Research Promotion Department)

Internet speaker (speaker-less board)

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