

A VERSATILE WIRELESS TELEPHONY SYSTEM USING A PC

FIELD OF THE INVENTION

5 The present invention relates generally to the field of wireless communication, and in particular, to the field of wireless communication using a personal computer.

BACKGROUND OF THE INVENTION

10

Wireless audio input devices such as cordless telephones are common everyday devices. Although many of them generally perform their intended functions well, they lack versatility. Today's PCs ("PC" means personal computers, but generically, it can mean any computing apparatus) are an extremely versatile device which are ever increasingly used for different functions. Currently, some PCs are provided with the infrared (IR) and radio frequency (RF) receivers. Virtually all of them can interface with a modem. As of now, these components have not been used to facilitate cordless telephone function and some of the other audio input type of functions taking advantage of the RF and IR receivers, though doing so can allow a great expansion of the their capability such as facilitating easy encryption. This implementation also lowers overall power consumption as well as the cost of implementation. Hence, there is a desirability for having a cordless telephony system which is implemented using a PC which can serve as other audio input devices.

15
20
25

OBJECT OF THE INVENTION

Hence, it is an object of the present invention to provide a wireless
5 telephony system which is versatile and which can function as other
wireless audio input devices.

It is another object of the present invention to provide a wireless
telephony system which saves on power consumption and cost of
implementation.

10

SUMMARY OF THE INVENTION

The present invention for wireless telephony results in much lower
overall power consumption than the traditional wireless telephone
15 systems. As compared to the existing systems which allow for 2 to 3 hours
of talk time, the present system can reach near 50 hours of continuous
audio transmission. Moreover, the cost of implementation is lower in that
many of the generic peripheral devices can be used. In addition, using an
encryption software, the telephony communication can be easily encrypted
20 to achieve communication privacy.

Moreover, the present telephony system is versatile in that it can
facilitate other functions beside telephony. For instance, the audio input
can be used to facilitate karaoke function and the keypad can be used to
make various karaoke choices. In addition, the remote controller can used
25 to serve many other functions such as for navigation and media control.

Generally, the present system includes a personal computer (PC) having a radio frequency (RF) and infrared (IR) receiver unit, a display monitor, a set of speakers, a wireless microphone, and IR remote controller with an RF transmitter. The IR remote controller includes an RF transmitter
5 and an IR transmitter, which are coupled to each other and to an audio circuit whose main function is to amplify the sound signal received from the microphone. The audio circuit is coupled to a micro-controller. A keypad is provided to input commands to the micro-controller.

The RF and IR receiver unit includes an RF receiver which is
10 coupled to an IR receiver. Both the RF receiver and IR receiver are coupled to a micro-controller. The RF receiver is further coupled to a sound system which is coupled to a modem. Both the sound system and the modem are located in the PC. A set of speakers is coupled to the sound system which is basically any device or circuitry such as a sound
15 card designed to produce analog sound signals in a PC.

To facilitate the wireless telephony function, the modem needs to be connected to a telephone line and some software should be provided in the PC for handling a call. When a call comes in, the call can be answered using the keypad of the remote controller unit where various functions are
20 assigned to the various keys on the pad. The incoming signal is sent to the speakers where the voice of the incoming caller can be heard. To speak to the incoming caller, a person speaks into the wireless microphone. The voice audio is then transmitted by the RF transmitter of the remote controller unit to the RF receiver of the RF/IR receiver unit. The inputs to the

keypad are sent to the RF/IR receiver unit as an IR signal while the audio is sent as an RF signal

BRIEF DESCRIPTION OF THE DRAWINGS

5

FIG. 1 illustrates a block diagram of the general system configuration.

FIG. 2 illustrates a general schematic diagram of the present system.

10

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 illustrates a block diagram of the general system configuration which includes a personal computer (PC) 10 having a radio frequency (RF) and infrared (IR) receiver unit 12, a display monitor 14, a set of speakers 16, a wireless microphone 18, and IR remote controller 20 with an RF transmitter. Although here the microphone 18 and the remote controller 20 are shown separately, the two devices can be physically attached for convenience in usage for the user.

FIG. 2 illustrates a general schematic diagram of the present system. The IR remote controller 20 includes an RF transmitter 21 and an IR transmitter 22, which are coupled to each other and to an audio circuit 23 whose main function is to amplify the sound signal received from the microphone. The audio circuit 23 is coupled to a micro-controller 24. A keypad 25 is provided to input commands to the micro-controller 24.

Still referring to FIG. 2, the RF and IR receiver unit 12 includes an RF receiver 26 which is coupled to an IR receiver 27. Both the RF receiver 26 and IR receiver 27 are coupled to a micro-controller 28. The RF receiver 26 is further coupled to a sound system 30 which is coupled to a modem.

5 Both the sound system 30 and the modem are located in the PC 10. A set of speakers 16 is coupled to the sound system 30 which is basically any device or circuitry such as a sound card designed to produce analog sound signals in a PC.

The wireless transmission of audio is based on FM modulation
10 using the frequency range of 88 to 108 MHz. Hence, a 88-108 MHz receiver is used. The function keys of the keypad 25 are implemented using 38-40 KHz modulation scheme. To optimally implement the present invention, the FM transmitter should be relatively stable such that the FM carrier does not drift within a tolerance, and the receiver must be able to
15 lock to the carrier frequency within a pre-defined range. The audio quality should be within the audio specification of the FM modulated audio.

To facilitate the wireless telephony function, the modem needs to be connected to a telephone line and some software should be provided in the PC for handling a call. When a call comes in, the call can be answered
20 using the keypad 25 of the remote controller unit 20 where various functions are assigned to the various keys on the pad. The incoming signal is sent to the speakers 16 where the voice of the incoming caller can be heard. To speak to the incoming caller, a person speaks into the wireless microphone 18. The voice audio is then transmitted by the RF transmitter
25 21 of the remote controller unit 20 to the RF receiver 26 of the RF/IR

receiver unit 12. The inputs to the keypad 25 are sent to the RF/IR receiver unit 12 as an IR signal while the audio is sent as an RF signal

The present configuration for wireless telephony results in much lower overall power consumption than the traditional wireless telephone systems. As compared to the existing systems which allow for 2 to 3 hours of talk time, the present system can reach near 50 hours of continuous audio transmission. Moreover, the cost of implementation is lower in that many of the generic peripheral devices can be used. In addition, using an encryption software, the telephony communication can be easily encrypted to achieve communication privacy.

The configuration shown here is versatile in that it can facilitate other functions beside telephony. For instance, the audio input can be used to facilitate karaoke function and the keypad can be used to make various karaoke choices. In addition, the remote controller can be used to serve many other functions such as for navigation and media control.

The present invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The presently disclosed embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims and all changes which come within the meaning and range of equivalency of the claims are, therefore, to be embraced therein.

CLAIMS

I Claim:

- 1 1. A versatile wireless telephony system comprising:
 - 2 a computing apparatus capable of producing sound signals;
 - 3 an RF receiving apparatus and IR receiving apparatus coupled to
 - 4 said computing apparatus
 - 5 a modem coupled to said computing apparatus and connected to a
 - 6 telephone line, said modem receiving and transmitting voice signals;
 - 7 and a speaker coupled to said computing apparatus, said speaker
 - 8 outputting a voice of a remote caller;
 - 9 a remote controller, said remote controller having an RF transmitting
 - 10 device and an IR transmitting device coupled to an audio circuit, micro-
 - 11 controller, user input device and a microphone, said IR transmitting device
 - 12 sending IR signals to said IR receiving apparatus per input from said user
 - 13 input device, said RF transmitting device transmitting RF signals to said RF
 - 14 receiving apparatus, said RF signals being voice signals of a caller
 - 15 speaking into said microphone.

