

[0027] FIG. 18 is a flow chart of an embodiment of a method in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0028] FIG. 1 is a schematic block diagram of an embodiment of a communication system in accordance with the present invention. In particular, a communication system is shown that includes a communication device 10 that communicates real-time data 24 and/or non-real-time data 26 wirelessly with one or more other devices such as base station 18, non-real-time device 20, real-time device 22, and non-real-time and/or real-time device 24. In addition, communication device 10 can also communicate via short range wireless communications 28, such as a millimeter wave communications with non-real-time device 12, real-time device 14, non-real-time and/or real-time device 16.

[0029] The wireless connection can communicate in accordance with a wireless network protocol such as IEEE 802.11, Bluetooth, Ultra-Wideband (UWB), WIMAX, or other wireless network protocol, a wireless telephony data/voice protocol such as Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS), Enhanced Data Rates for Global Evolution (EDGE), Personal Communication Services (PCS), or other mobile wireless protocol or other wireless communication protocol, either standard or proprietary. Further, the wireless communication path can include separate transmit and receive paths that use separate carrier frequencies and/or separate frequency channels. Alternatively, a single frequency or frequency channel can be used to bi-directionally communicate data to and from the communication device 10.

[0030] Communication device 10 can be a mobile phone such as a cellular telephone, a personal digital assistant, communications device, personal computer, laptop computer, or other device that performs one or more functions that include communication of voice and/or data via short range wireless communications 28 and/or the wireless communication path. In an embodiment of the present invention, the real-time and non-real-time devices 18, 20, 22 and 24 can be personal computers, laptops, PDAs, mobile phones, such as cellular telephones, devices equipped with wireless local area network or Bluetooth transceivers, FM tuners, TV tuners, digital cameras, digital camcorders, or other devices that either produce, process or use audio, video signals or other data or communications. Real-time and non-real-time devices 12, 14 and 16 can be: user interface devices such as a mouse or other pointing device, a touch pad, keyboard, keypad, microphone, earphones, headsets; other peripheral devices such as a memory, RFID device; and/or other devices that can be coupled to communications device 10 via short range communications 28.

[0031] The communication device 10 can include one or more applications that operate based on user data, such as user data from a peripheral device, user interface device or memory in communication with the communication device 10. Examples of these application include voice communications such as standard telephony applications, voice-over-Internet Protocol (VOIP) applications, local gaming, Internet gaming, email, instant messaging, multimedia messaging, web browsing, audio/video recording, audio/video playback, audio/video downloading, playing of streaming audio/video, office applications such as databases, spreadsheets, word processing, presentation creation and processing and other voice and data applications. In conjunction with these applications,

the real-time data 26 includes voice, audio, video and multimedia applications including Internet gaming, etc. The non-real-time data 24 includes text messaging, email, web browsing, file uploading and downloading, etc.

[0032] In addition or in the alternative, real-time and non-real-time devices 12, 14 and 16 can include a RFID terminal and the communication device 10 can itself operate as a RFID tag. In operation, the communication device 10 can run an application that includes an RFID function such as secure access, user authentication, payment system, etc. In this fashion, the communication device 10 can operate as a identification card, key card, credit or debit card.

[0033] In an embodiment of the present invention, the communication device 10 includes an integrated circuit, such as a combined voice, data and RF integrated circuit that includes one or more features or functions of the present invention. Such circuits shall be described in greater detail in association with FIGS. 4-15 that follow.

[0034] FIG. 2 is a schematic block diagram of an embodiment of another communication system in accordance with the present invention. In particular, FIG. 2 presents a communication system that includes many common elements of FIG. 1 that are referred to by common reference numerals. Communication device 30 is similar to communication device 10 and is capable of any of the applications, functions and features attributed to communication device 10, as discussed in conjunction with FIG. 1. However, communication device 30 includes two separate wireless transceivers for communicating, contemporaneously, via two or more wireless communication protocols with data device 32 and/or data base station 34 via RF data 40 and voice base station 36 and/or voice device 38 via RF voice signals 42.

[0035] In an embodiment of the present invention, the communication device 30 includes a circuit, such as a combined voice, data and RF integrated circuit that includes one or more features or functions of the present invention. Such circuits shall be described in greater detail in association with FIGS. 4-15 that follow.

[0036] FIG. 3 is a pictorial diagram representation of a communication device and peripheral in accordance with an embodiment of the present invention. In particular, communications device 10 or 30 is shown that is coupled via short range communications, such as short range communications 28, to communicate with real-time or non-real-time devices such as keyboard 11, keypad 13, touchpad 15, pointing device 17, headset 19, flash memory device 21 and RFID card 23. In accordance with the present invention, communications device 10 or 30 transmits an RF signal that powers a remote RFID device, such as keyboard 11, keypad 13, touchpad 15, pointing device 17, headset 19, flash memory device 21 or RFID card 23. Backscattering of this RF signal by the peripheral device conveys user data back to the communications device 10 or 30. Further details regarding the interface between communications device 10 or 30 and such remote RFID devices will be described in conjunction with FIG. 4.

[0037] FIG. 4 is a block diagram representation of a communication device and peripherals in accordance with an embodiment of the present invention. In particular, a communication system is shown that includes communications device 10 or 30 and one or more remote RFID devices 109 and 111. In this mode of operation, the communication device 10 or 30 operates as an RFID terminal to communicate with, and to optionally power, one or more remote RFID devices. In this example, remote RFID device 109 is a user interface device,