A multifunction mobile device, cellular phone, or smart phone may have a touch screen, cellular radio, microphone, speakers, video and still camera, voicemail, and Internet website connectivity. The device may communicate using Bluetooth, Ethernet, USB, WiFi or 802.11x with an access point and cellular, GSM, CDMA, or LTE. The device records spoken audio, processes the audio, transcribes the audio into text, and displays the text on the screen. Spoken audio may be used for emails or documents composition. The device may accept voice commands for actions including calling, dialing, browsing websites, or Internet searching. The device may use local or server-based voice recognition software. Voice patterns may be stored for an individual in a database. Voice may control functions on the device, a server, Internet site, or an intelligent television.
FIG. 1
| DISPLAY        | TELEPHONY MAY INCLUDE BUILT-IN MICROPHONE AND SPEAKERS | INPUT BLOCK RECEIVER BLOCK DECODER BLOCK INPUT BUFFER BLOCK INPUT CONTROLLER BLOCK PROCESSOR BLOCK DATA COMPRESSION BLOCK OUTPUT BUFFER BLOCK OUTPUT CONTROLLER BLOCK ENCODER BLOCK TRANSMISSION BLOCK MEMORY BLOCK DATA STORAGE BLOCK PROGRAMMABLE LOGIC BLOCK | TRANSMIT/RECEIVE FUNCTION OR MODEM WHICH MAY OPERATE THROUGH EITHER WIRED OR WIRELESS MEANS |

FIG. 2
MULTIPLE INPUTS FROM INTELLIGENT APPLIANCES AND OR MOBILE DEVICE (CT, IK)

FROM COMMUNICATION LINE OR LINES

RECEIVER BLOCK

DECODER BLOCK

INPUT BUFFER BLOCK

INPUT CONTROLLER BLOCK

PROCESSOR BLOCK

DATA COMPRESSION BLOCK

OUTPUT BUFFER BLOCK

OUTPUT CONTROLLER BLOCK

ENCODER BLOCK

TRANSMISSION BLOCK

TO INTELLIGENT DEVICES AND/OR MOBILE DEVICE (CT, IK)

TO COMMUNICATION LINE OR LINES

SINGLE OR MULTIPLE OUTPUTS

FIG. 3
SENDING DATA:

| CODE | INFORMATION | CODE |

RECEIVING DATA:

| DECODE | INFORMATION | DECODE |

FIG. 4
FIG. 5
FIG. 6
FIG. 7
MOBILE DEVICE (CT, IK)

INSIDE LINE

MULTICHANNEL MULTIPLEXING TRANSMITTER/ RECEIVER

OUTSIDE LINE

NETWORK SERVER

INTELLIGENT PRINTER

FIG. 9
MOBILE DEVICE (CT, IK)

INSIDE LINE

MULTICHANNEL MULTIPLEXING TRANSMITTER/RECEIVER

OUTSIDE LINE

NETWORK SERVER

INTELLIGENT TV/MONITOR

FIG. 10
MOBILE DEVICE (CT, IK)

INSIDE LINE

MULTICHANNEL MULTIPLEXING TRANSMITTER/RECEIVER

 OUTSIDE LINE

NETWORK SERVER

FIG. 11
FIG. 12
MULTIFUNCTION MOBILE DEVICE AND CELLULAR PHONE WITH TOUCH SCREEN AND INTERNET CONNECTIVITY

CROSS REFERENCE TO RELATED PATENT APPLICATIONS


BACKGROUND

[0002] This application relates generally to Portable Electronic Devices including a Mobile Device, Mobile Phone, Cellular Telephone (CT), or Intellikyboard (IK), which can execute complex tasks previously resident on the personal computer, workstation, server, or a mainframe computer; more particularly, the Mobile Device/Cellular Phone leverages the tremendous power of both the Intranet and the Internet. Intelligent telephony, appliances, devices, and equipment will find increasing use in modern society. There is a need for one single universal, handheld, lightweight, transportable, intelligent device that can compute, command, and control all these intelligent devices.

[0003] The Mobile Device/Cellular Phone is lightweight and portable. The Mobile Device/Cellular Phone comprises a display, a microphone, speaker, digital still or video camera, high speed transmit/receive device, such as a modem, in addition to a full function keyboard. The display may be touch enabled, touch sensitive, or a touch screen. The device may be multi-touch enabled. The Mobile Device/Cellular Phone may have various icons, keys, on-screen keyboards, virtual keyboards, international keyboards, and other aspects which may be integrated into the operating system or downloaded and modified by a server. The Mobile Device/Cellular Phone may have additional input/output ports for plugging in auxiliary devices such as a printer, and other devices through either wired or wireless means. The Mobile Device/Cellular Phone has a transmitter, receiver, a digital signal processor(s), other processors, controller, display electronics and audio/video electronics. These functional blocks may be implemented using standard electronic, mechanical, or electromechanical components or custom electronic, mechanical, or electromechanical components by those knowledgeable in the art.

[0004] The Mobile Device/Cellular Phone is able to leverage the computing power of the network or local server to process data. The Mobile Device/Cellular Phone serves as a transmit and receive hub. Thus, the Mobile Device/Cellular Phone is able to access a network or local server or an intelligent peripheral device to perform any operation or function.

[0005] The Mobile Device/Cellular Phone is able to transmit data inputted by the user to the network or local server or other devices for further processing. A user may input data into the Mobile Device/Cellular Phone by typing on the keyboard, inputting voice or sound through the Mobile Device/Cellular Phone’s speaker, touching the screen of the display on the Mobile Device/Cellular Phone, using a mouse that interfaces with the Mobile Device/Cellular Phone, or through another method or device that interfaces with the Mobile Device/Cellular Phone. This data and commands generated by the Mobile Device/Cellular Phone may be sent to the local network server or other devices for further processing. The Mobile Device/Cellular Phone is able to retrieve data processed by the local or network server or other devices. The Mobile Device/Cellular Phone can then perform further processing or output this data through the optional display, the speaker, or another device that interfaces with the Mobile Device/Cellular Phone.

[0006] Multiple intelligent equipment, intelligent appliances, televisions, printers and other devices can be accessed by a single Mobile Device/Cellular Phone or multiple Mobile Device/Cellular Phones either through a local/network server or directly. Unique addressing identification of each intelligent device, sequencing of instructions, execution of commands will be performed via a common set of protocols and procedures that reside on a local or network server or on other intelligent devices.

[0007] Multiple Mobile Device/Cellular Phone’s may coexist in an environment to access a common set of intelligent equipment, intelligent appliances, televisions, printers, and other devices. Multiple Mobile Device/Cellular Phones will operate in this common environment without conflict by leveraging a common set of protocols that reside on the local or network server and the Mobile Device/Cellular Phone.

[0008] The Mobile Device/Cellular Phone with a built-in transmit/receive device, may access standard telephone lines or other communication lines to communicate with other intelligent devices that may be either resident locally or located across an Intranet or the Internet. This two way communication may be either wired or wireless. The Mobile Device/Cellular Phone has the ability to dial-up and connect with a communication line or another intelligent appliance. The Mobile Device/Cellular Phone may also work in tandem with other modems and transmit/receive devices that may exist in other appliances or work with a central host modem or transmit/receive unit. The Mobile Device/Cellular Phone may be configured with several wired and wireless transmit and receive components including 4G, Long term evolution (LTE), 3G, 2G, CDMA, WiMax, NFC, RFID, Global Positioning System (GPS), WiFi, IEEE 802.11a,b,c,n (or any variant), Bluetooth, Zigbee, spread-spectrum, direct sequence spread spectrum (DSSS), frequency division multiplexing (FDM), Orthogonal FDM (OFDM), Ethernet, cable, telephone, USB 1.0, USB 2.0, USB 3.0 or other wired or wireless means. The Mobile Device/Cellular Phone may operate on a plurality of frequencies, communication bands, and channels. The Mobile Device/Cellular Phone may access location based services. The Mobile Device/Cellular Phone may be configured with various software applications that may be run on a server as a software service or are downloaded from the server.

[0009] The Mobile Device/Cellular Phone combines transmitting and receiving information, performing standard computing functions through use of a network or local server, interacting and commanding many intelligent peripheral devices around the home or office through wired or wireless means, telephony, handwriting recognition, barcode creating, reading and printing, magnetic stripe creating, reading and printing; electronic mail, which may include audio, text/graphics, and video; mass storage device and display features, video input/output, imaging, audio input/output, voice mail
capability, voice synthesis, language translation with text to
voice and voice to text capability built into one multi-function
device.

The Mobile Device/Cellular Phone may also serve
as a base station or individual station for telephony able to
operate with a built-in or detachable handset. It can also
operate with multiple telephones and handsets. In this mode,
the Mobile Device/Cellular Phone can convert voice to text,
text to voice, or voice to voice in the same language or in
another language. With the large computing/processing
power of the local or network server the possibility to conduct
live conversation in same or two or more different languages
is feasible. Also text transcription of voice conversations and
the reverse is possible. The Mobile Device/Cellular Phone
may also include the option to have the keys in its keyboard be
inscribed in Braille for individuals that are visually impaired.
The Mobile Device/Cellular Phone may be limited to some or
all of the features described above or may include all the
features described above based on the options desired by the
user.

In this age of the Intranet and the Internet, there is a
trend for the computing power and software protocols to
move away from the user location, such as the personal com-
puter, to the local server/network server. The Mobile Device/
Cellular Phone may use the local server/network server to
perform complex operations, such as language translation. In
addition, the Mobile Device/Cellular Phone may have some
language translation capability resident in itself via language
translation modules that may be easily plugged in and out of
the Mobile Device/Cellular Phone.

The Mobile Device/Cellular Phone integrates
currently available functions such as transmitting keystrokes to
a computing device with transmitting and receiving informa-
tion, performing standard computing functions through use
of a network or local server, interacting and commanding
many intelligent peripheral devices around the home or office
through wired or wireless means, telephony, handwriting rec-
ognition, digital signatures, barcode creating, reading and
printing; magnetic stripe creating, reading and printing; elec-
tronic mail, which may include audio, text/graphics, and
video mass storage device and display features, video input/
output, imaging, audio input/output, voice mail capability,
voice synthesis, language translation, with text to voice and
voice to text capability, and other high speed communication
features that may be either wired or wireless. For example, the
Mobile Device/Cellular Phone can interact with various intel-
ligent peripherals and appliances, through either wired or
wireless means, to print, scan, fax, copy or perform other
functions.

SUMMARY

An aspect of the Mobile Device/Cellular Phone
System is to enable the basic Mobile Device/Cellular Phone,
which possesses the electronics and computing power to
transmit data to and receive data from either a network server
(the network server can be a PC) or intelligent peripheral
or intelligent appliance through either wired or wireless means,
to serve as a transmit and receive hub. Using the computing
power resident on the network server a user can perform all
standard computing functions from the Mobile Device/Cel-
lar Phone. The Mobile Device/Cellular Phone has a trans-
mitter, receiver, a digital signal processor, controller, display
electronics and audio electronics which are available as chips.
These chips may be standard integrated circuits or custom
built. There can be a modem or a transmit/receive device built
into the Mobile Device/Cellular Phone. This modem or trans-
mitt/receive device can operate through either wired or wire-
less means.

Another aspect of the Mobile Device/Cellular Phone
System is to enable the Mobile Device/Cellular Phone
to interact and command many intelligent peripheral devices
around the home or office through either wired or wireless
means and thus serve as a universal keyboard. By using the
processing power of the network server, the Mobile Device/
Cellular Phone can assign an identification number to each
peripheral or appliance. With this unique identification num-
ber and the processing capability of the network server, the
Mobile Device/Cellular Phone can then control the intelli-
gent appliance or peripheral. All the appliances and peripherals
will subscribe to the same protocols such that they will be able
to communicate with each other and be able to execute
instructions. The intelligent appliances and Mobile Device/
Cellular Phones may operate with a common Operating Sys-
tem that may be either proprietary or an industry standard.

Yet another aspect of the Mobile Device/Cellular Phone
System is to enable a communication and control
scheme of intelligent appliances and peripherals using the
Mobile Device/Cellular Phone. The Central multichannel
duplexing transmit/receive may include cellular towers,
home access points, home router, home switch, a smart televi-
sion box or other device and may receive inputs from the
local intelligent appliances and route these inputs to the net-
work server/outside world. Conversely, the Central multi-
channel multiplexing transmit/receive such as a Cellular
Local Area Network WLAN Access Point device may receive
inputs from the outside world/network server and route these
inputs to the local intelligent appliances. The Central multi-
channel multiplexing transmit/receive such as a Wireless
Local Area Network WLAN Access Point device is also able
to facilitate communication between the local intelligent
appliances. The Central multichannel multiplexing transmit/
receive such as a Cellular Local Area Network WLAN
Access Point device or functional block may have multiple
input and output channels, such that sequential/simultaneous
addressing and communication with numerous intelligent
appliances and communication paths is possible. The Mobile
Device/Cellular Phone is one element that would serve as
a universal keyboard/command, compute, and control unit
within this environment. It is anticipated that the Central
multichannel multiplexing transmit/receive such as a Wire-
less Local Area Network WLAN Access Point device would
exist in each home/office environment to facilitate the overall
scheme described in this Mobile Device/Cellular Phone
system. The Central multichannel multiplexing transmit/receive
such as a Wireless Local Area Network WLAN Access Point
device may be built in multiple configurations. The Central
multichannel multiplexing transmit/receive such as a Wire-
less Local Area Network WLAN Access Point device may be
configured with the desired number of input and output chan-
nels. The Central multichannel multiplexing modem can be
implemented by those knowledgeable in the art utilizing the
electronic functional blocks described in this Mobile Device/
Cellular Phone system. The Central multichannel multiplex-
ing transmit/receive such as a Wireless Local Area Network
WLAN Access Point device may work in tandem with an
embedded transmit/receive device that may exist in each
intelligent appliance. Thus, there may exist within the home/
office environment a hierarchy of transmit/receive devices:
1. An embedded transmit/receive device may exist in each intelligent appliance.

2. This embedded transmit/receive device may have multiple inputs/outputs facilitating communication between other intelligent appliances and the central transmit/receive device or directly with the outside world.

3. A central transmit/receive device that will exist in the home/office environment such that it may communicate with numerous intelligent appliances and the outside world.

4. The ability to convert passive electrical outlets and switches that could communicate within this environment and be controlled by an Mobile Device/Cellular Phone or other means.

5. A universal Mobile Device/Cellular Phone that will facilitate the command, compute and control of all intelligent appliances and systems within the home/office environment.

6. Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone, which has a speaker and microphone to facilitate interaction between voice recognition software resident on the network server and the Mobile Device/Cellular Phone. The voice recognition software may display text on the screen of the device. The voice recognition software may be resident on a local or network server. The Mobile Device/Cellular Phone is also capable of sounding out. It is also able to convert sound to data that can be transmitted to a network server. By using the voice recognition software resident on the network server, Mobile Device/Cellular Phone can convert text data into voice and broadcast voice through a speaker mechanism.

7. Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone's display to send data to and receive data from the network server. This display is capable of showing text, graphics or other data.

8. Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to transmit inputs from either the keypad, display or voice inputs (sound) picked up from the microphone to the network server or intelligent peripheral or intelligent appliance for processing (through either wired or wireless means). Thus, one may either send data to software resident on the network server or intelligent peripheral or intelligent appliance through the keypad, through voice commands, or through the display by touching the screen.

9. Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to receive and transmit information through a modem, a telephone line, an ethernet line or other form of data communication. These inputs and outputs are then processed by a network server or local server and are relayed back to the Mobile Device/Cellular Phone and/or the display. The Mobile Device/Cellular Phone can use its modem to transmit data to and receive data from a network server or "intelligent" peripheral or appliance through either wired or wireless means. In this scenario, the network server may perform any computation that is necessary. Intelligent peripherals and appliances will interact with the Mobile Device/Cellular Phone through either wired or wireless means.

10. For example, wireless communication may be achieved through either radio frequency, in which line of sight is not required, or through infrared, in which line of sight is required. For wireless operation, a radio frequency transmit/receive device or functional block can be built into the Mobile Device/Cellular Phone. The radio frequency transmit/receive device or functional block allows the Mobile Device/Cellular Phone, which uses the computing power of the network server, to interface and control other intelligent peripherals or intelligent appliances. The radio frequency modem can be either single or multi-channel. This means that the radio frequency transmit/receive device or functional block which is built into the Mobile Device/Cellular Phone can receive all of its input from the Mobile Device/Cellular Phone or it can receive many different inputs from various intelligent appliances and peripherals simultaneously. The radio frequency may be in any range that is FCC approved, including spread spectrum.

11. Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to be connected to a local area network or wide area network, including the Internet, through either wired or wireless means, to receive inputs of text and/or voice and to send outputs of text or voice depending on the user's choice. Voice sent to a network server could be stored as a data file.

12. Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to work in tandem with a network server to receive text or voice data and process these inputs for audio output. The primary computing power/protocols and software reside on the server.

13. Voice includes spoken, as well as, other audio and or audible tones inclusive of music/sound.

14. Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to have options and attachments added to it. For instance, the Mobile Device/Cellular Phone can have more processing power such that it can perform basic computations and will not have to directly communicate with the network server to perform certain functions. For example, Mobile Device/Cellular Phone can possess more processing power so that it can assign an identification number to various appliances and peripherals, recognize various appliances and peripherals and so that it can assign instructions for these appliances and peripherals to execute. Additionally, other features such as data storage can be added to the Mobile Device/Cellular Phone. A module or storage device can be built into the Mobile Device/Cellular Phone to record and store data and voice. For example, this can be accomplished by using a PCMCIA card, flash drive, SD, or micro-SD card. The Mobile Device/Cellular Phone can also be connected to a mouse, pen, CD-ROM, printer, CRT/TV by either wired or wireless means. As an option a scanner may interface with the Mobile Device/Cellular Phone so that documents can then be sent to the network server for further processing.

15. Another aspect of the Mobile Device/Cellular Phone System is to combine transmitting and receiving information, performing standard computing functions through use of a network or local server, interacting, and commanding many intelligent peripheral devices that perform functions through either wired or wireless means.

16. Another aspect of the Mobile Device/Cellular Phone System is to combine transmitting and receiving information, performing standard computing functions through use of a network or local server, interacting, and commanding many intelligent peripheral devices around the home or office through wired or wireless means, telephony, handwriting recognition, barcode creation, reading and printing, magnetic stripe creating, reading and printing; electronic mail, which may include audio, text, graphics, and video; mass storage device and display features, video input/output, imaging,
audio input/output, voice mail capability, voice synthesis, language translation with text to voice and voice to text capability, and other high speed communication features that may be either wired or wireless into one device.

[0032] Yet another aspect of the Mobile Device/Cellular Phone System is to enable a user to translate voice in one language to text or voice in another language. This can be accomplished either by using language translation modules which fit into the Mobile Device/Cellular Phone or by using the software capabilities of the local or network server. The output can be in audio, display/video format or the Mobile Device/Cellular Phone can command an intelligent peripheral such as a printer to convert this output into hard copy format.

[0033] Yet another aspect of the Mobile Device/Cellular Phone System is to enable a user to translate text in one language to text or voice in another language. This can be accomplished by either using language translation modules which fit into the Mobile Device/Cellular Phone or by using the software capabilities of the local or network server. The output can be in audio, display/video format, or the Mobile Device/Cellular Phone can command an intelligent peripheral such as a printer to convert this output into hard copy format.

[0034] Yet another aspect of the Mobile Device/Cellular Phone System is to enable users to communicate with and command the Mobile Device/Cellular Phone remotely, through either the Internet or through a data communication line such as a telephone line.

[0035] Still another aspect of the Mobile Device/Cellular Phone System is to enable a user to command the Mobile Device/Cellular Phone through voice commands. As an example, a user could dictate a message to the Mobile Device/Cellular Phone in any language.

[0036] Yet another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to be able to interact with other intelligent peripherals or intelligent appliances. This could involve, for instance, interacting with an intelligent television to output the keystrokes that are typed on the Mobile Device/Cellular Phone.

[0037] Yet another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to interact with other devices through either wired or wireless means.

[0038] Still another aspect of the Mobile Device/Cellular Phone is to enable the device to work in conjunction with a local or network server to receive text, voice, or other data and process these inputs for either editing, audio, video, and other data output.

[0039] A feature of the Mobile Device/Cellular Phone is to use the computing power of the local or network server to perform complex tasks. As an example, a local server may be a personal computer.

[0040] Another unique feature of the Mobile Device/Cellular Phone is that it has a built-in communication functional block such as a high speed transmit/receive device. This high speed transmit/receive function enables the Mobile Device/Cellular Phone to access the network at very high data rates that are necessary in order to transmit and receive data from other devices or from the network. The ability to transmit/receive may reside within the keyboard or be external to it. This access to the Internet, the Intranet, cable network, wireless network, or other networks may be via wired or wireless means. As an example, the Mobile Device/Cellular Phone may receive/transmit through a wireless satellite network. It is anticipated that many intelligent appliances will have a common transmit/receive function that would operate under common industry standards and protocols. These standards would apply both for the hardware and the software implementation. These transmit/receive functional blocks will be part of the hardware of many intelligent appliances/devices.

[0041] Another unique feature of the Mobile Device/Cellular Phone is that it could serve as the base station or as a handset for telephony with the ability to operate with multiple telephone handsets. This will enable the user to transmit and receive using voice and selectively display as needed. The telephony may be either wired or wireless.

[0042] In accordance with another feature of the Mobile Device/Cellular Phone System the Mobile Device/Cellular Phone may have options and other devices added on to it. For example, extra data/mass storage devices can interconnect with the Mobile Device/Cellular Phone. This will allow local archival of confidential and sensitive messages and data, while at the same time will enable the user to access certain types of data since it is resident locally rather than on the network.

[0043] Another unique feature of the Mobile Device/Cellular Phone is that it can take inputs of written word or spoken word and output a synthesized voice through its speakers. The database that contains the intonation and phonetic character of the voice can reside either in specialized modules which fit into the Mobile Device/Cellular Phone, or on the local or network server, or on the Mobile Device/Cellular Phone itself. Various synthesized voices can be selected ranging from your own to someone else’s. As an example, you could record some selected sounds and it would recognize your voice patterns and synthesize it. This allows text to be output as speech in your own voice or another voice.

[0044] Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to capture images from books, blackboards, white boards, paper easel boards, and other displays to either print, process, transmit, or store for future use. As an example, the Mobile Device/Cellular Phone may have an image capture capability through a digital camera. The image capture capability may either be built-in, or be in an optional attachment or be part of a peripheral device that works in tandem with the Mobile Device/Cellular Phone. In this scenario, the Mobile Device/Cellular Phone can digitize the text/drawings or other information displayed on a book, sheet of paper, blackboard, white board, paper easel, or other forms of display for archival, further processing, or transmission via a network to other locations/devices.

[0045] Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to use its digital camera, which can be an attachment or can be built into the Mobile Device/Cellular Phone, to digitize an image. This image can then be converted to either voice or text. As an example, if the digital camera took a digitized image of a page in a book which might be inconvenient to scan in through a page-feed scanner, as opposed to a flat-bed scanner, it could then convert this image into text and store this as a text document, process this information further, could convert the image into voice for further processing, or output the voice through the speakers.

[0046] Another aspect of the Mobile Device/Cellular Phone System is to automatically add subtitles/text to a video clip, which may be displayed continuously or frame by frame. The Mobile Device/Cellular Phone converts the voice from
the video clip into text and is able to display this text/subtitle on a CRT or display in any or multiple languages. As an example, this option would be of great benefit to individuals who are hearing impaired. Another example of the benefit of this textual display is the ability for those watching a movie in one language to hear the sound in that language but view the text/subtitles on the screen in a different language.

Another aspect of the Mobile Device/Cellular Phone System is to recognize alpha-numeric text to create barcodes. The Mobile Device/Cellular Phone can also read barcodes to create alpha-numeric text. With a barcode reader attachment which may be wired or wireless the Mobile Device/Cellular Phone serves as a vehicle either to print barcode labels or to store the digitized barcode information for further processing.

Another aspect of the Mobile Device/Cellular Phone System is to enable the Mobile Device/Cellular Phone to serve as a point of sale terminal that can read magnetically coated information from credit cards. In this configuration, the Mobile Device/Cellular Phone will have a built-in feature or an external attachment where a credit card can be swiped across a reader that would be able to read magnetically coated information from the credit card for transmission, verification, transaction, and confirmation. The Mobile Device/Cellular Phone, as an example, may be used in stores to conduct transactions. By interacting, and commanding an intelligent printer, the Mobile Device/Cellular Phone would be able to print. It is also anticipated that the Mobile Device/Cellular Phone would be able to facilitate home banking, home shopping via this feature with the ability to provide printed receipts or storage of relevant information on a local and/or network server.

Another aspect of the Mobile Device/Cellular Phone System is to enable a user to input handwritten text in any specific language and have the Mobile Device/Cellular Phone output text in the same or another language in a standardized format in any font for either display, transmission, or further processing. The Mobile Device/Cellular Phone can perform the reverse operation of converting standardized text in any specific language to handwritten text in the same or a different language. It is anticipated that independent third parties would develop handwriting pattern recognition algorithms based on sampling and digitizing various types of handwriting patterns in a specific language with the object of creating a lookup table that would provide a corresponding standardized textual equivalent. These types of handwriting recognition databases may be created for English and other languages with a textual equivalent in each language. Cross-linking of these different handwriting language databases allows for language translation of handwritten text into the same language or another language's textual equivalent. As a result, it is also possible to have the conversion of handwritten text in one language to handwritten text in another language. If the user desires to use his own handwriting for output, the user can input a sample document of his handwriting to the Mobile Device/Cellular Phone. The Mobile Device/Cellular Phone can then store the handwriting pattern and various handwritten letters of the alphabet in a look-up table or database. The Mobile Device/Cellular Phone can use this database and optical character recognition/handwriting pattern recognition algorithms to output a text document in the user's handwriting. It is also possible to convert handwritten text into voice and the reverse process of voice into handwritten text in the same or a different language. The software, protocols, handwriting recognition algorithms and databases to perform this function may reside in the Mobile Device/Cellular Phone or on a local or network server which the Mobile Device/Cellular Phone interacts with.

Another aspect of the Mobile Device/Cellular Phone System is to provide complete portability such that the Mobile Device/Cellular Phone can be used locally or globally. A Mobile Device/Cellular Phone may be personalized and used anywhere in the world by plugging into a communication line to access various intelligent appliances and devices.

Another aspect of the Mobile Device/Cellular Phone System is to enable handheld personal computers and other similar portable or desktop devices to incorporate some or all of the features claimed for the Mobile Device/Cellular Phone.

Another aspect of the Mobile Device/Cellular Phone System is that an embedded multichannel transmit/receive device or functional device may be incorporated into various intelligent appliances including a handheld PC. The embedded transmit/receive function allows the communication among various intelligent appliances and is configured to work in tandem with a Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device.

Another aspect of the Mobile Device/Cellular Phone System is that a Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device will be an integral part of a local or wide area network working as a central controller or communications server. In this capacity, it is able to control a number of intelligent client appliances within its local sphere of control or Radio Frequency (RF) range. In this capacity as a communications server this unit unlike a PC or other standard servers may not have full range of computing capabilities but a limited set that enables it to serve in sequencing and scheduling the transmit/receive functions.

Another aspect of the Mobile Device/Cellular Phone System is to define a transmit/receive functional block that can be single input or multiple input with either a single or multiple outputs that may be accessed sequentially or simultaneously. Conceptually the transmit/receive functional block may be executed in two forms: 1) as an embedded transmit/receive function that would reside in an intelligent appliance or device 2) as a central multichannel multiplexing unit that could work in association with a number of embedded transmit/receivers, to schedule and sequence communication traffic.

Another aspect of the Mobile Device/Cellular Phone System is that the embedded transmit/receive function and the Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point functional block concept can be executed at a printed circuit board level or as a multichip single package or as a single chip monolithic IC solution. This solution can be an integral part of every intelligent appliance, personal computer, servers, and other devices to enable intelligent appliances to communicate within a local or wide area network or across the Internet.

Another aspect of the Mobile Device/Cellular Phone System is to enable the ubiquitous wall electrical sockets, switches, sensors, and other similar devices to be turned into intelligent units capable of being controlled by the Mobile Device/Cellular Phone and functioning smartly within an intelligent local or wide area network. This is
accomplished by an embedded radio frequency controller. The functional block level concept for executing this radio frequency controller as a single chip monolithic IC solution is outlined.

[0057] The Mobile Device/Cellular Phone System, objects and features thereof will be more readily apparent from the following detailed descriptions and appended claims when used in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0058] FIG. 1 is a system level input/output configuration block diagram of the Mobile Device/Cellular Phone. In addition to its normal keyboard functions, display, and other features, the Mobile Device/Cellular Phone has the ability to interface with a telephone line, to other networks, to ethernet or to other data communication paths, either by wired or by wireless. Note that all arrows on FIG. 1 can signify either wired or wireless data communication paths. The Mobile Device/Cellular Phone may have built-in embedded transmit/receive device/function or may interface with an external transmit/receive device of either which may be wired or wireless, either radio frequency or infrared. The input/output functions of the Mobile Device/Cellular Phone described in this figure can be executed by those knowledgeable in the art and reduced to actual practice.

[0059] FIG. 2 is a detailed block diagram of the Mobile Device/Cellular Phone that highlights the display, telephony, transmit/receive function, and other specialized functions which can be implemented as hardware and/or software by those knowledgeable in the art and reduced to practice.

[0060] FIG. 3 is an embedded transmit/receive function diagram that describes one of the possible schemes and detailed functional blocks that would be part of an embedded transmit/receive function. It is anticipated that many intelligent appliances will have an embedded transmit/receive function that complies with established industry standard hardware and software protocols that are expected to emerge. The figure shows multiple inputs and multiple outputs that would allow each intelligent appliance to sequentially/simultaneously interface with more than one intelligent appliance or Mobile Device/Cellular Phone. The Mobile Device/Cellular Phone itself is an intelligent device that would have the same embedded transmit/receive function.

[0061] FIG. 4 is a simplified block diagram showing a method to transmit, receive and identify that would allow the coding of information, transmitted by an intelligent device such that this information received by another device can be decoded and identified to its unique source from which the data was transmitted.

[0062] FIG. 5 shows a global scheme of how multiple intelligent devices and the Mobile Device/Cellular Phone coexist in an office/home environment with each other, the PC/server, the network server, and the outside world. This drawing shows a Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device that is able to receive inputs from various intelligent appliances and channel the routing and transmission for efficient communication between various intelligent appliances. Note that all lines represent either radio frequency paths, infrared paths, another form of wired or wireless data communication.

[0063] FIG. 6 shows how the Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device/function could be implemented as a hardware system in a box or as an integrated system level silicon solution in the form of a single chip/multi-chip single packaged integrated circuit. Many combinations of inputs and outputs are possible as shown in FIG. 6. Note that the transmitter/receiver may be either wired or wireless.

[0064] All the figures are for illustrative purposes and the number of inputs and outputs is not to be construed as limited by the examples shown in the Figures. In addition, the feature of programmability provides for added flexibility. Furthermore, each of the input/output channels could be hardwired designed or software programmable to interface with various types of input/output data communication lines.

[0065] FIG. 7 shows how the ubiquitous electrical outlet and the electrical switch could be made to be intelligent by having an embedded radio frequency controller. The embedded radio frequency controller allows the Mobile Device/Cellular Phone and/or other intelligent appliances to efficiently and intelligently interact with the electrical outlet and the electrical switch. The electrical wiring may serve as an antenna. By extension this concept may be applied to other appliances that are either active or passive. In addition, the existing base of electrical outlets/switches could have an intelligent plug-in module to turn these hitherto passive outlets into active intelligent outlets switches. The embedded RF controller may have programmable features built-in to provide added options. Note that the antenna may be part of the intelligent electrical switch or intelligent electrical socket or intelligent sensor or it may use the internal wiring of the house as an antenna.

[0066] FIGS. 8-12 show additional block diagrams of an Mobile Device/Cellular Phone system.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0067] Referring now to FIG. 1, the Mobile Device/Cellular Phone may have multiple inputs and outputs which may be connected through either wired or wireless means. Additional inputs and outputs may be added as needed to make the Mobile Device/Cellular Phone a multifunction universal keyboard. The added features may be external or built-in.

[0068] Referring to FIG. 1, the Mobile Device/Cellular Phone may have an optional built-in scanner mechanism such that the Mobile Device/Cellular Phone can be used as a handheld scanner. This built-in scan mechanism may be arranged along any edge of the Mobile Device/Cellular Phone to allow for page scanning, or other document scanning by dragging or sweeping the Mobile Device/Cellular Phone edge wise, across the document. The scanned images may be displayed on a built-in screen of the Mobile Device/Cellular Phone or transmitted for further processing/display on other intelligent devices.

[0069] Referring, to FIG. 1, the Mobile Device/Cellular Phone may also have a built-in CD-ROM capability with insertion/removal of CD along any edge of the Mobile Device/Cellular Phone. The compact disc diameter may vary and may be customized to a smaller diameter to fit into the Mobile Device/Cellular Phone and meet any size constraints. Similarly, along another edge of the Mobile Device/Cellular Phone it is possible to have a slot for a floppy disk drive or other ports.

[0070] Referring to FIG. 1, the Mobile Device/Cellular Phone may have a built-in microphone and speaker to facilitate speaking directly into the Mobile Device/Cellular Phone
as we normally do into a telephone handset and also listening to its sound output. In addition, the Mobile Device/Cellular Phone may have optional attachments to provide other standard telephony features.

[0071] Referring now to FIG. 2, the Mobile Device/Cellular Phone comprises a keyboard, a display, a microphone, a speaker, telephone, transmit/receive device, with optional input/output ports. The telephony feature may work either with an intelligent telephone/base station or with a local or network server. Data may be inputted via the keyboard, a touch screen display, or through voice. Processing may be performed within the Mobile Device/Cellular Phone or by the local or network server or other intelligent devices.

[0072] Referring now to FIG. 3, illustrates the Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device, and the electronics/components of the Central multichannel multiplexing, transmit/receive device: an input block, receiver block, decoder block, input buffer block, input controller block, process controller block, data compression block, output buffer block, output controller block, encoder block, and transmission block. Shown in this Figure are multiple inputs from various intelligent appliances and/or the Mobile Device/Cellular Phone. The input block consists of multiple channels that will route the data to the receiver. The receiver electronics is capable of receiving data and identifying the source of each data packet. The receiver block is capable of receiving inputs simultaneously or sequentially from various sources. The data received from the receiver block may be in an encoded form in which case the decoder block decodes the data for further processing. Simultaneous and/or sequential data packets from multiple sources are stored and queued for further processing in the input buffer block. The input controller block decides which packet of information needs to be processed next and sends the appropriate packet of data for further processing by the processor block. After the data is processed by the processor, it is now ready for transmission. However, to achieve high speed transmission the data compression block compresses the data. The data is now stored in the output buffer block awaiting specific instructions by the output controller block. The encoder block encodes the packet of data such that it reaches the unique appliance or device for which it is intended. The transmission block transmits the data in sequence to the intended appliance or device or for further processing via a standard communication line or a RF data path. Those knowledgeable in the art can implement each of the specific functional blocks utilizing standard electronic components or custom components. These components may be configured to perform parallel processing for various data streams. For example, when four channel capabilities are desired, four separate processor components may be used or a four channel monolithic processor specifically designed for this purpose may be used.

[0073] Referring now to FIG. 4, this figure shows a simplified block diagram by which an identifying string could be attached to real data. This identifying string will precede actual data transmission and will also be sent after the actual data transmission. In other words, packets of real data are embedded in between two identifying strings. These identifying strings uniquely define the source of the data and the destination of the data.

[0074] Thus the intelligent appliance sending the data is uniquely identified and the intelligent appliance receiving the data is uniquely identified. The periodicity at which the identifying strings could be appended to actual data will depend on the level of accuracy, security, and the speed of transmission desired. The actual data may be encrypted. These protocols ensure that the correct intelligent appliance is being addressed at all times. In addition, the user may be able to set a unique identification number and addressing sequence of his choice for each intelligent appliance or device.

[0075] Referring now to FIG. 5, this figure shows a system level scheme that describes the various communication and data paths between various intelligent appliances, the Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device, the local or network server, and the Mobile Device/Cellular Phone. When sending data, intelligent appliances and devices are expected to subscribe to common, industry standard protocols that establish the identity of each intelligent appliance/device and the unique way to address each intelligent appliance/device. These protocols ensure that the correct intelligent appliance/device is being addressed at all times. In addition, the user may be able to set a unique identification number and addressing sequence of their choice for each intelligent appliance/device.

[0076] The Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device may receive inputs from the local intelligent appliances and route these inputs to the network server/outsider world. Conversely, the Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device may receive inputs from the outsider world/network server and route these inputs to the local intelligent appliances. The Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device is also able to facilitate communication between the local intelligent appliances. The Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device may have multiple input and output channels such that sequential and simultaneous addressing and communication with numerous intelligent appliances and communication paths is possible.

[0077] The Mobile Device/Cellular Phone is one element that would serve as a universal keyboard/command and control unit within this environment. It is anticipated that the Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device would exist in each home/office environment to facilitate the overall scheme described in this Mobile Device/Cellular Phone system. The Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device may be built in multiple configurations. The Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device may be configured with the desired number of input and output channels. The Central multichannel multiplexing transmitter/receiver can be implemented by those knowledgeable in the art utilizing the electronic functional blocks described in this Mobile Device/Cellular Phone system.

[0078] The Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device may work in tandem with an embedded transmit/receive device that may exist in each intelligent appliance. Thus, there exists within the home/office environment a hierarchy of transmit/receive devices:

[0079] 1. An embedded transmit/receive device may exist in each intelligent appliance. This embedded trans-
A transmit/receive device may have multiple inputs/outputs facilitating communication between other intelligent appliances and the central transmit/receive device or directly with the outside world.

2. A Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device that will exist in the home/office environment such that it may communicate with numerous intelligent appliances and the outside world.

3. The ability to convert passive electrical outlets and switches that could communicate within this environment and be controlled by a Mobile Device/Cellular Phone or other means.

4. A universal Mobile Device/Cellular Phone that will facilitate the command, compute and control of all intelligent appliances and systems within the home/office environment.

Referring now to FIG. 6, which describes a multichannel multiplexing transmit/receive device, the transmit/receive controller electronics block diagram can be implemented by those skilled in the art with either standard or custom electronics. The entire controller electronics may be a single chip integrated circuit. It is anticipated that all intelligent appliances would utilize this block diagram as a universal and requisite embedded feature. This embedded transmit/receive function may come in multiple configurations of inputs and outputs. In dual channel configuration, the multiplexing transmit/receive device has two inputs and two outputs. This will allow an intelligent appliance to sequentially or simultaneously be addressed by the Mobile Device/Cellular Phone for either sequential or simultaneous output. Similarly, the same block diagram concept is executable for a Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device.

Referring now to FIGS. 3, 4, 5, and 6, the following examples serve to demonstrate the workings of the Mobile Device/Cellular Phone, intelligent appliances, and the central multichannel multiplexing transmit/receiver:

Example 1

A telephone call may be initiated or received using the Mobile Device/Cellular Phone using a cellular or Voice IP. A user may activate the Mobile Device/Cellular Phone and put it into the telephony mode. Immediately, the Mobile Device/Cellular Phone is in RF communication with the central multichannel multiplexing transmitter/receiver located in the local area network. The central multichannel multiplexing transmitter/receiver will connect with the outside line and complete the connection. Let us say at some point in the conversation the capability of the local server or network server is desired. The Mobile Device/Cellular Phone can send a RF command to the central multichannel multiplexing transmitter/receiver to bring the server on-line and into the communication loop. The server may be used to record the conversation or to have the conversation translated into another language using the extensive language translation capabilities resident on the local/network server. Conversations could be conducted in two or more languages.

Example 2

If at any time during the conversation a printout is desired an intelligent printer can be activated by the Mobile Device/Cellular Phone to initiate and execute the job. This is accomplished by sending an RF signal from the Mobile Device/Cellular Phone to the intelligent printer via the central multichannel multiplexing transmitter/receiver. The intelligent printer is now in the loop and is executing the tasks immediately or queuing and scheduling the task.

Example 3

The text, graphics, and video may be activated by the Mobile Device/Cellular Phone and viewed on a built-in screen or viewed on an intelligent TV screen by patching the intelligent TV screen into the communication loop.

Example 4

Multichannel capability and the ability to multiplex the inputs/outputs sequentially or simultaneously for use by a number of intelligent appliances is possible. This multichannel multiplexing capability may exist in each intelligent appliance. The ability to incorporate this feature is driven by need and cost. The advantage is that this feature allows each intelligent appliance and the whole local area network to be used efficiently and effectively by allowing queuing and scheduling of various tasks. The queuing and scheduling tasks is real time and there may be different levels of queuing and scheduling capabilities resident in each intelligent appliance and the local area network.

Example 5

Certain levels of queuing and scheduling capabilities may exist in the intelligent appliance, another level of capabilities may exist in the central multichannel multiplexing transmitter/receiver and yet another level of capability may exist in the local or network server. The level of capability to queue, schedule, process, receive, and transmit data depends on the number of input and output channels, the size of the data buffer and whether the inputs and outputs can be multiplexed. It is also possible to define and dedicate certain channels for various pre-defined or programmable tasks only. The embedded transmitter/receiver function and the central multichannel multiplexing transmitter/receiver can be built to have a combination of various input and output channels with and without multiplexing capability. The basic concept of how these electronic functional blocks can be executed at either the board level or chip level is described. As an example, a quad-in and quad-out transmitter/receiver can have one channel dedicated for telephony, another channel dedicated for TV, another channel for printers, and a channel for security or it is possible to have certain channels multiplexed for use by a number of intelligent appliances.
allows multiple intelligent appliances to use the same RF frequency domain and co-exist within a local area network. The implementation of this concept requires the hardware described and a pre-defined set of software protocols that may be either industry standard or custom.

Example 6

[0091] The central multichannel multiplexing transmitter/receiver may either connect with the outside world through the wire or by wireless or satellite means. It is possible that this central multichannel multiplexing transmitter/receiver may communicate in one defined frequency domain within the local or wide area network with all intelligent appliances that are part of this network and at a same or different frequency domain with the outside world. By extension the reverse concept is also claimed. In this scenario, where there may be a need for two different frequencies of communication the transmitter/receiver electronics and chip level solutions can be designed to accommodate for this requirement.

Example 7

[0092] Referring now to FIG. 7, the figure consists of an intelligent electrical outlet with a built-in radio frequency controller. The radio frequency controller has the ability to receive inputs and transmit output such that the electrical outlet can be controlled by the Mobile Device/Cellular Phone or other means. The radio frequency controller consists of the transmit/receive function and the control function which includes the ability to turn the outlet on and off and perform other variable and programmable control functions. The radio frequency controller consists of a receiver, a processor, controller, programmable logic, and a transmitter. The radio frequency controller electronics may be implemented by those skilled in the art using, either standard or custom electronics. The entire controller electronics may be implemented as a monolithic single chip integrated circuit. A block diagram concept of how this embedded RF controller can be implemented at a chip level is shown in FIG. 7. The radio frequency controller can be incorporated on all new electrical outlets and switches to be made in the future such that they are all intelligent electronic outlets and intelligent electrical switches. Alternatively, a plug-in module may be configured to make existing electrical outlets and electronic switches intelligent. Additionally, this concept of an embedded RF controller may be extended to other sensors that would sense such things as light, temperature, and pressure, smoke, to name a few. The radio frequency controller consists of the transmit/receive function and the control function which includes the ability to turn the switch on and off. It is possible to assign a unique identification to each electrical outlet and each electrical switch to uniquely address and control these units using the Mobile Device/Cellular Phone.

[0093] More detailed examples of the aspects of the present Mobile Device/Cellular Phone System will now be described.

Example 8

[0094] FIG. 8 consists of three distinct blocks, Block 10 being the Mobile Device/Cellular Phone block, Block 20 being the Multichannel Multiplexing Transmitter/Receiver, and Block 30 being the Network Server, all connected by wired or wireless means.

[0095] This example describes the use of the Mobile Device/Cellular Phone in the telephony mode. Telephony for voice or data transmission may be initiated by selecting the telephony mode on the Mobile Device/Cellular Phone. This may be activated by voice or key command.

[0096] The telephony connection may be wired or wireless. The connection is completed between the Mobile Device/Cellular Phone and the central multichannel multiplexing transmitter/receiver located in the loop. The transmitter/receiver in turn establishes a connection to an outside line for either dialup or Internet access. In this mode, two-way voice or data transmission may be conducted. In addition, specific advance use of language translation capability may be brought online by connecting to a network server on which resides an extensive database capability to translate from one language to another by recognizing the speech patterns of either speaker. Using this database capability the network server is able to provide speech in any selected language at either end. As an example, a speaker conversing in English at one end may have his speech translated to Japanese at the other end. Similarly, the reverse translation can be performed. The server could record the conversations if desired by selecting a record feature.

Example 9

[0097] FIG. 9 consists of four distinct blocks, Block 10 being the Mobile Device/Cellular Phone block, Block 20 being the Multichannel Multiplexing Transmitter/Receiver, Block 30 being the Network Server, and Block 40 being an Intelligent Printer, all connected by wired or wireless means.

[0098] In this example, a textual transcript of any telephonic conversations could be generated in any selected language using the extensive mapping capabilities for language translation resident on the network server. These features would provide real-time voice translation and transcription capabilities. The text may be printed at either end in a desired language using an Intelligent Printer. Once the Intelligent Printer is part of the loop, it may execute tasks immediately or queue and/or schedule the tasks.

Example 10

[0099] FIG. 10 consists of four distinct blocks, Block 10 being the Mobile Device/Cellular Phone block, Block 20 being the Multichannel Multiplexing Transmitter/Receiver, Block 30 being the Network Server, and Block 50 being an Intelligent TV/Monitor, all connected by wired or wireless means.

[0100] The text, graphics, and video may be activated by the Mobile Device/Cellular Phone and viewed on a built-in screen or viewed on an intelligent TV/monitor screen by patching the intelligent TV/monitor screen into the communication loop.

Example 11

[0101] FIG. 11 consists of five distinct blocks, Block 10 being the Mobile Device/Cellular Phone block, Block 20 being the Multichannel Multiplexing Transmitter/Receiver, Block 30 being the Network Server, Block 42 being an Intelligent Appliance/Device, and Block 44 being another Intelligent Appliance/Device, all connected by wired or wireless means.

[0102] Multichannel capability and the ability to multiplex the inputs/outputs sequentially or simultaneously for use by a number of intelligent appliances is possible. This multichannel multiplexing capability may exist within each intelligent...
The ability to incorporate this feature is driven by need and cost. The advantage is that this feature allows each intelligent appliance and the whole local area network to be used efficiently and effectively by allowing queuing and scheduling of various tasks. The queuing and scheduling tasks is real time and there may be different levels of queuing and scheduling capabilities resident in each intelligent appliance and the local area network.

Certain levels of queuing and scheduling capabilities may exist in intelligent appliance, another level of capabilities may exist in the central multi-channel multiplexing transceiver and yet another level of capability may exist in the local or network server. The level of capability to queue, schedule, process, receive, and transmit data depends on the number of input and output channels, the size of the data buffer, and whether the inputs and outputs can be multiplexed.

It is also possible to define an embedded transmitter/receiver function with multiple channels with and without multiplexing capability. The basic concept of how these electronic functional blocks can be executed at each the board level or chip level is described. As an example, a quad-in and quad-out transmitter/receiver can have one channel dedicated for telephony, another channel dedicated for TV, another channel for printers, and a channel for security. As an option, specific channels may be multiplexed for use by a number of intelligent appliances.

In specific, referring to FIG. 11, the multi-channel multiplexing transmitter/receiver is described with four channels, one channel being dedicated for two-way communication with the Mobile Device/Cellular Phone, another channel dedicated for two-way communication with the network server, and two other channels each dedicated for two communication with two different intelligent appliances. In this quad configuration, the multi-channel multiplexing transmitter/receiver can interact with four different entities having the capability to schedule or process the data real time. Similarly, each of the Intelligent Appliances/Devices may have some built-in capabilities for communication directly with the Mobile Device/Cellular Phone or through the Multi-Channel Multiplexing Transmitter/Receiver.

Example 12

Once again referring to FIG. 11, it is possible for a unique identification to be assigned to each Intelligent Appliance/Device to maintain communication protocols. Intelligent Appliance/Device 1 would have a specific beginning and ending code that uniquely identifies it. Whenever data is received by the Mobile Device/Cellular Phone or any other device on the network it would be able to identify the source. If Intelligent Appliance/Device 1 has transmitted certain data the Mobile Device/Cellular Phone would identify the source or the multi-channel multiplexing transmitter/receiver could queue or transmit the data to the uniquely designated appliance.

The wireless transmission/reception is within the FCC prescribed frequency domain for intelligent appliances. The wireless transmitter/receiver electronics and ICs are designed to conform to the prescribed standards. However, within the local or wide area network significant RF traffic from numerous intelligent appliances may be present with the potential for crosstalk and other problems. To avoid this crosstalk, packets of RF data sent by each intelligent appliances are coded and transmitted in such a way that periodically there will be an identifying string of data that clearly defines the source of the data and the destination. The periodicity of this identifying string data, the length and complexity of this identifying string data, and the encryption of actual data is driven by the level of accuracy and the level of security desired. This ability to encode and decode identifying strings from each appliance allows multiple intelligent appliances to use the same RF frequency domain and co-exist within a local area network. The implementation of this concept requires the hardware described and a pre-defined set of software protocols that may be either industry standard or custom.

Example 13

Referring to FIG. 12 which shows a block diagram of intelligent devices communicating within the network at a specific frequency of $F_{\text{local}}$ and with the outside world via satellite transmitter/receiver or cellular base station, indicated as 12, at a different frequency of $F_{\text{outside}}$.

The central multi-channel multiplexing transmitter/receiver may either connect with the outside world through the wired such as cable, fiber, DSL or by wireless such as WiFi, any 802.11 variant, cellular, or satellite means. The central multi-channel multiplexing transmitter/receiver may function as a local 802.11 access point in a home environment or as a cellular base station in the home or public environment. It is possible that this central multi-channel multiplexing transmitter/receiver may communicate in one defined frequency domain within the local or wide area network with all Intelligent Appliances that are part of this network and at same or different frequency domain with the outside world. By extension the reverse concept is also claimed. In this scenario, where there may be a need for two different frequencies of communication the transmitter/receiver electronics and chip level solutions can be designed to accommodate for this multiple frequency requirement.

Example 14

Referring now to FIG. 7, the figure consists of an intelligent electrical outlet with a built-in radio frequency controller. The radio frequency controller has the ability to receive inputs and transmit output such that the electrical outlet can be controlled by the Mobile Device/Cellular Phone or other means. The radio frequency controller consists of the transmit/receive function and the control function including the ability to turn the outlet on and off and perform other variable and programmable control functions. The radio frequency controller consists of a receiver, a processor, controller, programmable logic, and a transmitter. The radio frequency controller electronics may be implemented by those skilled in the art using either standard or custom electronics. The entire controller electronics may be implemented as a monolithic single chip integrated circuit.

A block diagram concept of how this embedded RF controller can be implemented at a chip level is shown in FIG. 7. The radio frequency controller can be incorporated on all new electrical outlets and switches to be made in the future, such that they are all intelligent electronic outlets and intelligent electrical switches. Alternatively, a plug-in module may be configured to make existing electrical outlets and electrical switches intelligent. Additionally, this concept of an embedded RF controller may be extended to other sensors that would sense such things as light, temperature, and pressure, smoke, to name a few. The radio frequency controller...
consists of the transmit/receive function and the control function including at a minimum, the ability to turn the switch on and off. It is possible to assign a unique identification to each electrical outlet and each electrical switch to uniquely address and control these units using the Mobile Device/Cellular Phone.

[0112] Thus, while the Mobile Device/Cellular Phone System has been described with reference to specific embodiments and applications, the description is illustrative of the Mobile Device/Cellular Phone System and is not to be construed as limiting the Mobile Device/Cellular Phone System. Various modifications and applications may occur to those skilled in the art without departing from the true spirit and scope of the Mobile Device/Cellular Phone System as defined by the appended claims.

[0113] 1. The Mobile Device/Cellular Phone may have the ability to communicate with other intelligent devices and appliances through either wired or wireless means. The Mobile Device/Cellular Phone system configuration may combine the standard keyboard functions, display functions, transmit and receive functions, telephony functions, fax and scan functions, voice and speech recognition functions, in addition to serving as a universal command and control unit for appliances and devices that operate using electrical power.

[0114] 2. The system level configuration for the command and control of multiple intelligent appliances utilizing the Mobile Device/Cellular Phone, an embedded transmit/receive function that would exist within each intelligent appliance or device, and a Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device that would be part of a local or wide area network within the home or office. A board level, multichip single package and/or single chip monolithic integrated circuit implementation of the embedded transmit/receive function and the central multichannel multiplexing function is also claimed. The Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device is capable of multiplexing inputs/outputs from a number of intelligent appliances/devices and communicating via the built-in transmit/receive function across various communication paths and/or lines.

[0115] 3. The system level configuration where the Mobile Device/Cellular Phone and the Central multichannel multiplexing transmit/receive such as a Wireless Local Area Network WLAN Access Point device can work in tandem with a local or network server to perform various computing, data processing, and data transmission functions, inclusive of text, graphics, audio, and video.

[0116] 4. The basic Mobile Device/Cellular Phone has the electronics and computing power to transmit data to and receive data from either a network or local server, which may be a personal computer, or intelligent peripheral or intelligent appliance through either wired or wireless means. The Mobile Device/Cellular Phone may serve as a transmit and receive hub. Using the computing power resident on the local or network server or other intelligent devices, a user can perform all standard computing functions from the Mobile Device/Cellular Phone.

[0117] 5. The Mobile Device/Cellular Phone is a device with a speaker and is capable of facilitating interaction between voice recognition software resident on the network server, local server, or on the intelligent appliance and the Mobile Device/Cellular Phone. Mobile Device/Cellular Phone is capable of outputting sound. It is also able to convert sound to data that can be transmitted to a local or network server.

[0118] 6. Mobile Device/Cellular Phone may have a built-in display or operate with an external display. This Mobile Device/Cellular Phone is capable of displaying data being sent to or received from the local or network server or other intelligent appliances. This display is capable of showing text, graphics or other data.

[0119] 7. Mobile Device/Cellular Phone has a transmitter, receiver, a digital signal processor, controller, and display electronics and audio electronics which may be implemented with standard or custom components by those knowledgeable in the art. By using the voice recognition software resident on the local or network server, Mobile Device/Cellular Phone can convert text data into voice and broadcast voice through a speaker mechanism.

[0120] 8. There can be a transmit/receive functional block built into the Mobile Device/Cellular Phone. The Mobile Device/Cellular Phone can operate through either wired or wireless means.

[0121] 9. The Mobile Device/Cellular Phone need not have an operating system, but is capable of operating, with a built-in operating system or an operating system resident on a local or network server or other intelligent devices.

[0122] 10. The Mobile Device/Cellular Phone is capable of transmitting inputs from either the keypad, display or voice inputs picked up from the microphone to the local server or network server or intelligent peripheral or intelligent appliance for processing, through either wired or wireless means.

Voice includes spoken as well as other audio and/or audible tones inclusive of music/sound. Thus one may either send data to software resident on the local server or network server or intelligent peripheral or intelligent appliance through the keypad on the Mobile Device/Cellular Phone, through voice commands, through the display by touching the screen, through a pen which interacts with the display, or through another device which interfaces with the Mobile Device/Cellular Phone.

[0123] 11. Mobile Device/Cellular Phone is capable of taking input and output through a transmit/receive functional block, a telephone line, an ethernet line or other form of data communication. These inputs and outputs are then processed by a local or network server and relayed back to Mobile Device/Cellular Phone and/or the display.

[0124] 12. Mobile Device/Cellular Phone can be hooked to a local area network or wide area network, including, the Internet, through either wired or wireless means, to receive inputs of text and/or voice and to send outputs of text or voice depending on the user’s choice. Voice sent to a local or network server could be stored as a data file. Voice may be in any language since the Mobile Device/Cellular Phone leverages the language capabilities of the local or network server.

[0125] 13. Mobile Device/Cellular Phone may also work in tandem with a local or network server to receive text or voice data and process these inputs for audio output. The primary computing power/protocols and software reside on the server.

[0126] 14. The Mobile Device/Cellular Phone is capable of interacting and commanding many intelligent peripheral devices around the home or office through either wired or wireless means and is a universal keyboard. By using the processing power of the local or network server, the Mobile Device/Cellular Phone can assign/reassign an identification number to each peripheral or appliance. With this unique
identification number and the processing capability of the local or network server, the Mobile Device/Cellular Phone can then control that particular intelligent appliance or other peripheral devices. The intelligent appliances will have programmation capability to set or change identification and encryption. This programmation capability can be easily accessed and controlled by the Mobile Device/Cellular Phone. This will allow the Mobile Device/Cellular Phone to re-configure various intelligent appliances as needed by the user. All the appliances and peripherals will subscribe to the same protocols such that they will be able to communicate to each other and execute instructions. A user may also use the programmation capability of the Mobile Device/Cellular Phone to assign a password or other security measures, such as data encryption to a particular intelligent appliance. Thus, unauthorized control of intelligent devices will be prevented.

[0127] 15. The Mobile Device/Cellular Phone can use its transmit/receive device to transmit data to and receive data from a local or network server or intelligent peripheral or appliance through either wired or wireless means. In this scenario, the local or network server will perform any computation that is necessary. The transmit/receive can be either single or multichannel. This means that the transmit/receive device which is built into the Mobile Device/Cellular Phone can receive all of its input from the Mobile Device/Cellular Phone or it can receive many different inputs from various intelligent appliances and peripherals simultaneously or sequentially.

[0128] 16. Other features and options may be added to the Mobile Device/Cellular Phone. For example, the Mobile Device/Cellular Phone can possess more processing power such that it can perform basic computations and will not have to directly communicate with the local or network server to perform certain functions. For example, Mobile Device/Cellular Phone may possess more processing power so that it can assign an identification number to various appliances and peripherals, recognize various appliances and peripherals and so that it can assign instructions for these appliances and peripherals to execute. Other features such as data storage can be added to the Mobile Device/Cellular Phone. A module or storage device can be built in to the Mobile Device/Cellular Phone to record and store data and voice. For example, this can be accomplished by using a PCMCIA card. Mobile Device/Cellular Phone can be connected to a mouse, electronic pen, CD-ROM, printer, CRT/TV by either wired or wireless means. As an option a scanner may interface with the Mobile Device/Cellular Phone so that documents can then be sent to the local or network server for further processing. Another option is to enable a printer to interface with the Mobile Device/Cellular Phone to print data locally.

[0129] 17. The transmit/receive controller electronics block diagram, as shown in FIG. 6, can be implemented by those skilled in the art with either standard or custom electronics. The entire controller electronics may be a single chip integrated circuit. It is anticipated that all intelligent appliances would utilize this block diagram as a universal and requisite embedded feature. As described in FIG. 6, this embedded transmit/receive function may come in multiple configurations of inputs and outputs. In dual channel configuration, the multiplexing transmit/receive device has two inputs and two outputs. This will allow an intelligent appliance to sequentially or simultaneously be addressed by the Mobile Device/Cellular Phone for either sequential or simultaneous output. In addition, it is possible for the multichannel multiplexing transmit/receive function to be incorporated on a mother board or a daughter board of a personal computer, server, or other computing/processing device.

[0130] 18. The Mobile Device/Cellular Phone, the multiplexing transmit/receive device, and the system configuration and protocols described in this Mobile Device/Cellular Phone system allow the Mobile Device/Cellular Phone to fully serve as a universal command and control module. As an example, the Mobile Device/Cellular Phone can serve as a telephone. As another example, the Mobile Device/Cellular Phone can turn lights on and off in a particular location of a house. As another example, the Mobile Device/Cellular Phone can accept voice input and through the Mobile Device/Cellular Phone’s use of the processing power of the local server or network server or other intelligent device, the Mobile Device/Cellular Phone can convert this voice into text for printing by an intelligent printer. As another example, the Mobile Device/Cellular Phone may interact with a diversity of electronic equipment, such as garage doors, security systems, printers, televisions, washing machines, ovens, stove tops, personal computers, and other electronic devices. The Mobile Device/Cellular Phone can have its own antenna.

[0131] 19. The Mobile Device/Cellular Phone may have a keyboard configuration that provides either a partial or a full function keyboard which can be folded or collapsed to achieve a compact size and portability. Mobile Device/Cellular Phone, may also be folded or collapsed to achieve a compact size and portability. The Mobile Device/Cellular Phone, unlike a personal digital assistant or handheld PC, need not have large computing and processing power built into it since it leverages its basic communication capabilities with the processing and computing power resident on the local or network server or other intelligent devices.

[0132] 20. The Mobile Device/Cellular Phone can command and control each and every electrical outlet or switch through either wired or wireless means. Refer to FIG. 7. Each electrical outlet and/or switch may be configured to have a radio frequency transmit/receive controller and associated electronics built into it which would enable the Mobile Device/Cellular Phone to communicate and control each outlet and switch. The electrical outlet may have its own antenna or it may use the wiring of the house as its antenna for communication with the Mobile Device/Cellular Phone and/or other devices. This can be accomplished by having a unique identification number for each outlet and switch which can be programmed by the user. The Mobile Device/Cellular Phone not only addresses, commands, and controls intelligent appliances and devices, it can also interface with each electrical outlet, electrical switch, and sensors thereby controlling appliances and devices that may traditionally not have had these intelligent functions built-in.

What is claimed is:

1. A multifunction mobile phone system comprising:
   a mobile phone comprising a processor, a touch screen display, a microphone, a speaker, a camera, a wireless cellular voice or data transmit and receive component, a wireless local area network transmit and receive component; and wherein the device is configured for communication over an Internet Protocol based network;
   a software application stored in a non-transitory computer readable medium executed by the processor on the mobile phone, wherein the application is configured to control voice and video transmission, wherein the application presents an alphanumeric keyboard, and
a central multichannel multiplexing transmit and receive (CMMTR) device, wherein the CMMTR is connected to a plurality of networks, wherein the CMMTR transmits data communication between the mobile phone and a remote server.

2. The mobile phone system of claim 1, wherein the mobile phone is configured to place a call using spread spectrum radio and wherein the mobile phone is configured to access an Internet server using a wireless local area network.

3. The mobile phone system of claim 1, wherein the mobile phone is configured to access an inside line path, and wherein the inside line path is a wireless local area network (WLAN) and access an outside line path, wherein the outside line path is a wireless public network simultaneously.

4. The mobile phone system of claim 1, wherein the mobile phone is configured to accept a data connection from a second mobile phone.

5. The mobile phone system of claim 1, wherein the mobile phone is configured with voice recorder software.

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