US 20100079681A1

(19) **United States**

(12) **Patent Application Publication**

COBURN et al.

(10) **Pub. No.: US 2010/0079681 A1**

(43) **Pub. Date: Apr. 1, 2010**

(54) **SYSTEMS AND METHODS FOR GRAPHICAL CONTROL OF SYMBOL-BASED FEATURES IN A TELEVISION RECEIVER**

(75) Inventors: **Matthew COBURN**, Denver, CO (US); **Karen Michelle TAXIER**, Highlands Ranch, CO (US); **James Matthew WHITE**, Denver, CO (US); **Luke VANDUYN**, Highlands Ranch, CO (US); **Daniel L. RUDOLPH**, Castle Rock, CO (US)

Correspondence Address:
INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253 (US)

(73) Assignee: **ECHOSTAR TECHNOLOGIES LLC**, Englewood, CO (US)

(21) Appl. No.: **12/241,604**

(22) Filed: **Sep. 30, 2008**

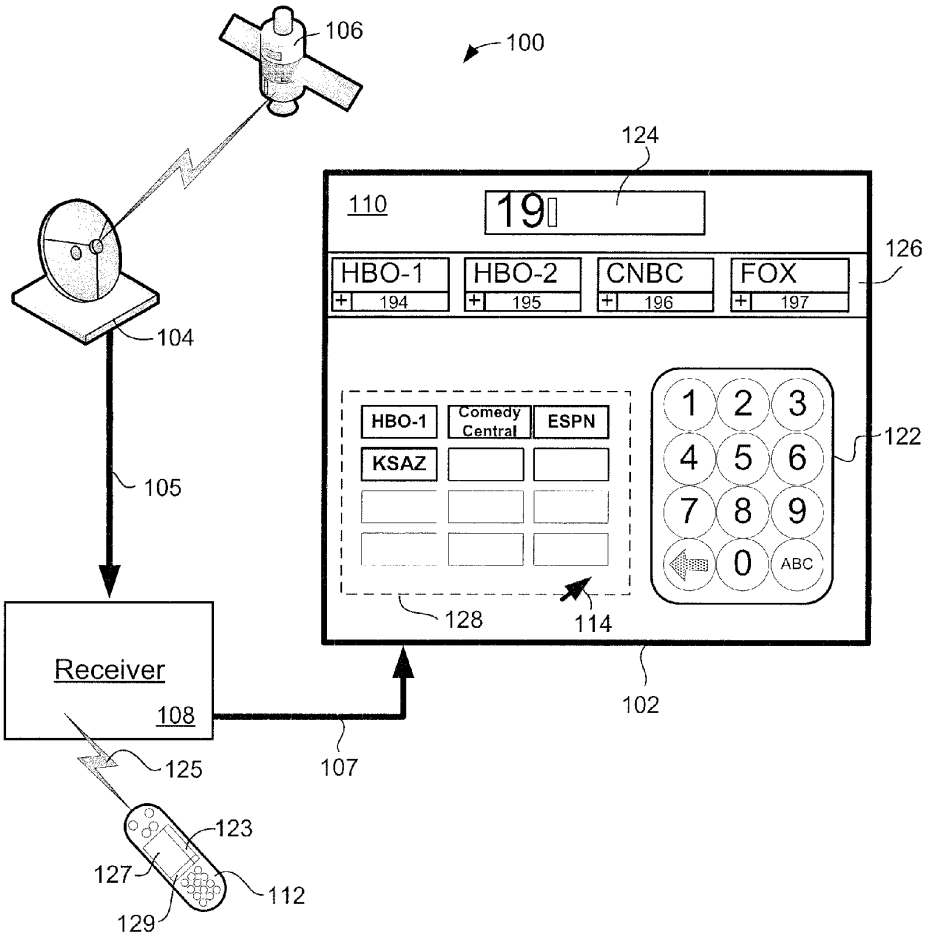
Publication Classification

(51) **Int. Cl.**
H04N 5/44 (2006.01)
G06F 3/02 (2006.01)
G06F 3/033 (2006.01)

(52) **U.S. Cl.** ... **348/734**; 345/168; 345/158; 348/E05.096

(57) **ABSTRACT**

Systems and methods provide for graphically controlling numeric, alphanumeric or other symbol-based features on a set top box (STB) or other television receiver. A keypad image is presented on the display that includes key images corresponding to the symbol-based features. A two-dimensional input is received from the remote control that indicates one of the key images, and imagery on the display is updated in response to the received two-dimensional input.



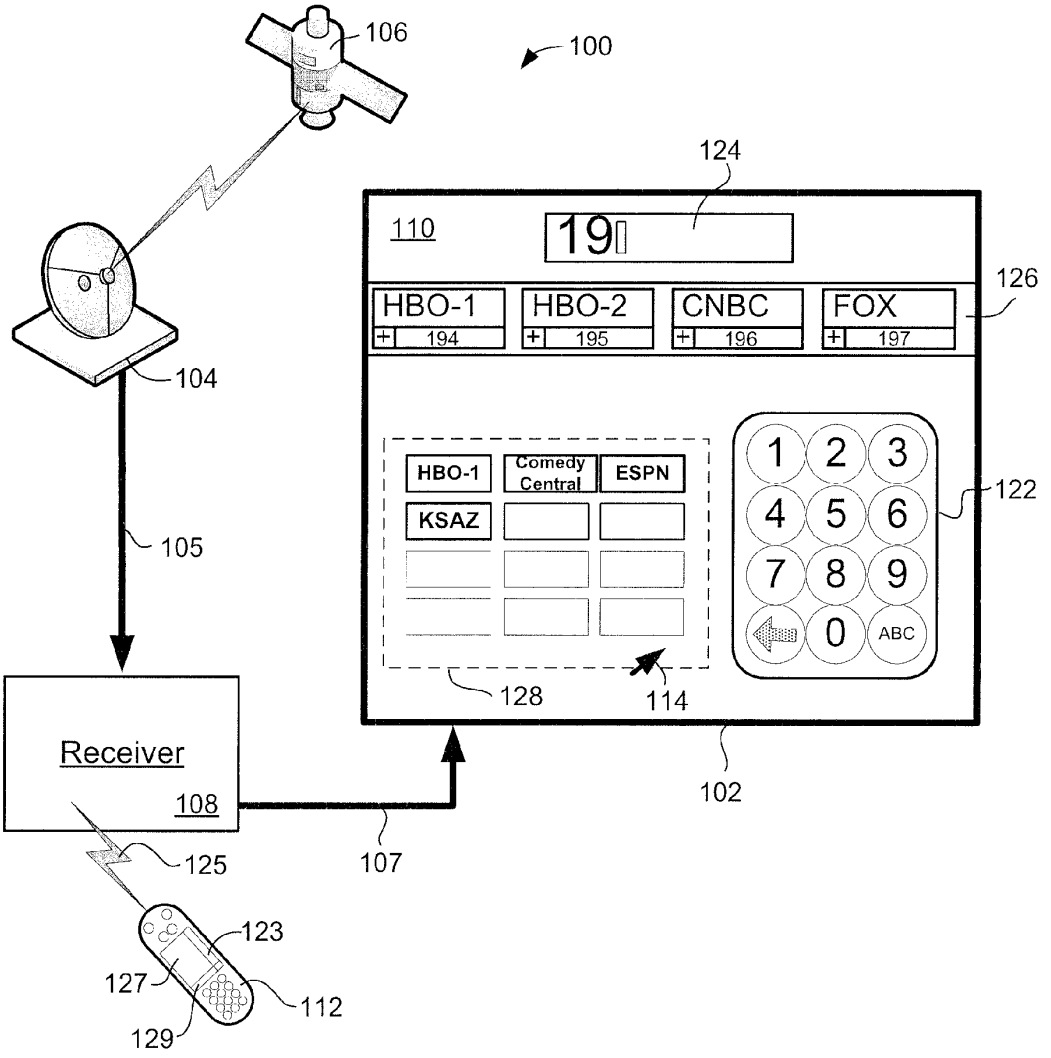

106
100
124
110
19
126
HBO-1
194
HBO-2
195
CNBC
196
FOX
197
104
HBO-1
Comedy Central
ESPN
KSAZ
1 2 3
4 5 6
7 8 9
0
ABC
122
105
128
114
Receiver
108
102
125
107
123
127
112
129

FIG. 1

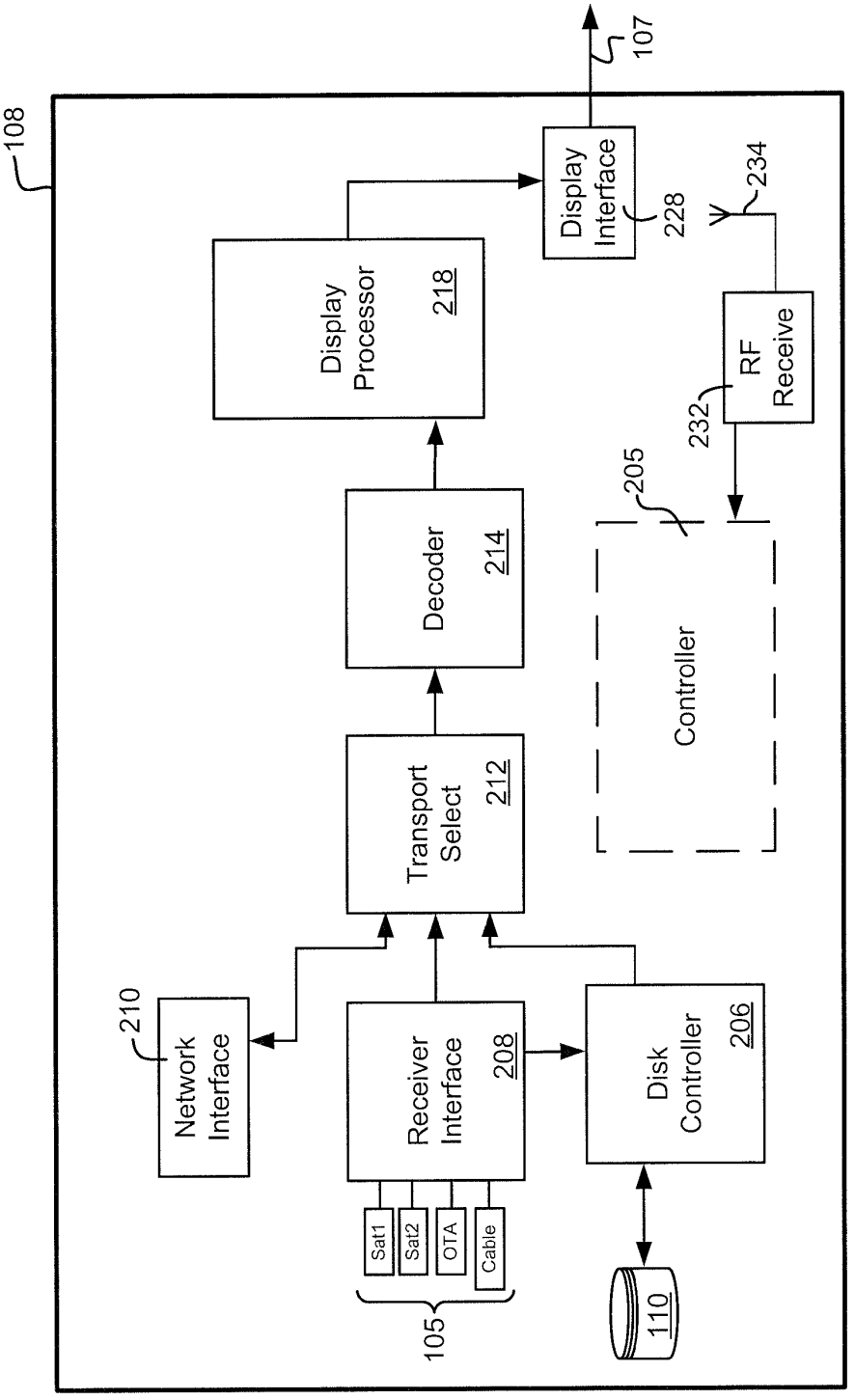

108
107
Display Interface
228
234
Display Processor
218
RF Receive
232
205
Decoder
214
Controller
Transport Select
212
210
Network Interface
Receiver Interface
208
Disk Controller
206
Sat1
Sat2
OTA
Cable
105
110

FIG. 2

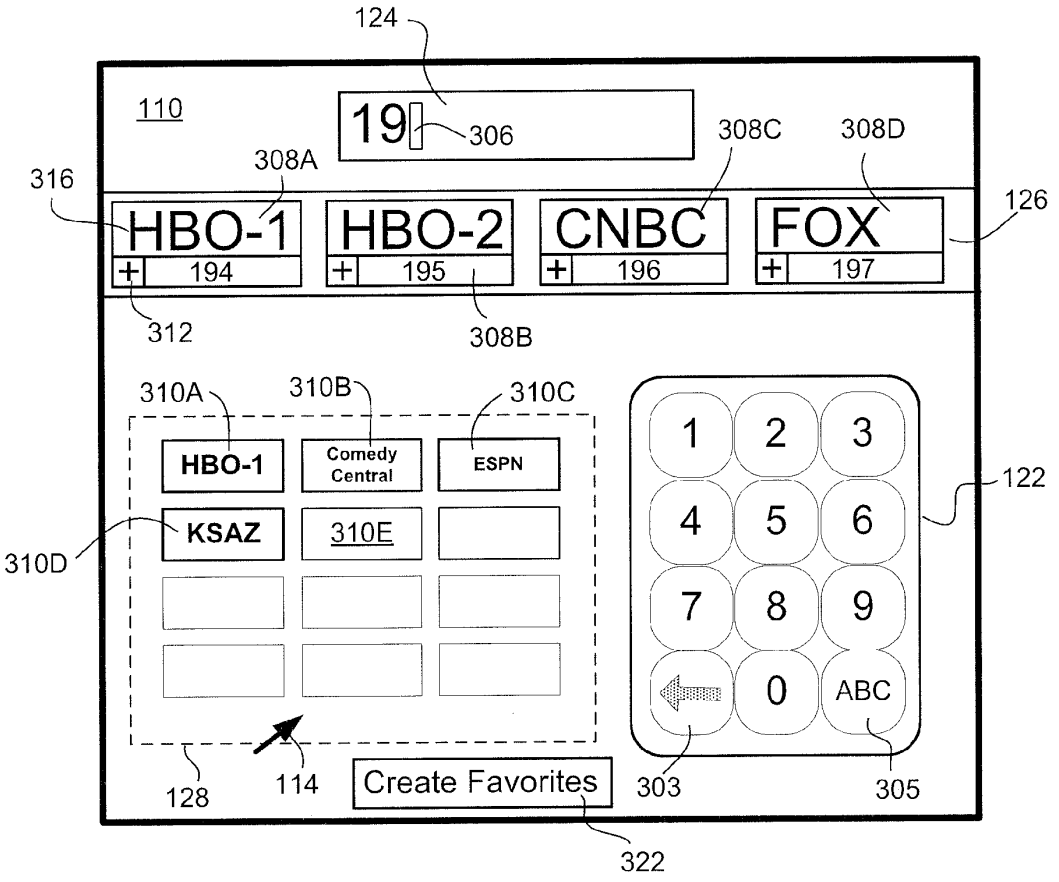

124
110
19
306
308C
308D
308A
316
HBO-1
HBO-2
CNBC
FOX
126
194
195
196
197
312
308B
310A
310B
310C
HBO-1
Comedy Central
ESPN
KSAZ
310E
310D
1
2
3
4
5
6
7
8
9
0
ABC
122
128
114
Create Favorites
303
305
322

FIG. 3

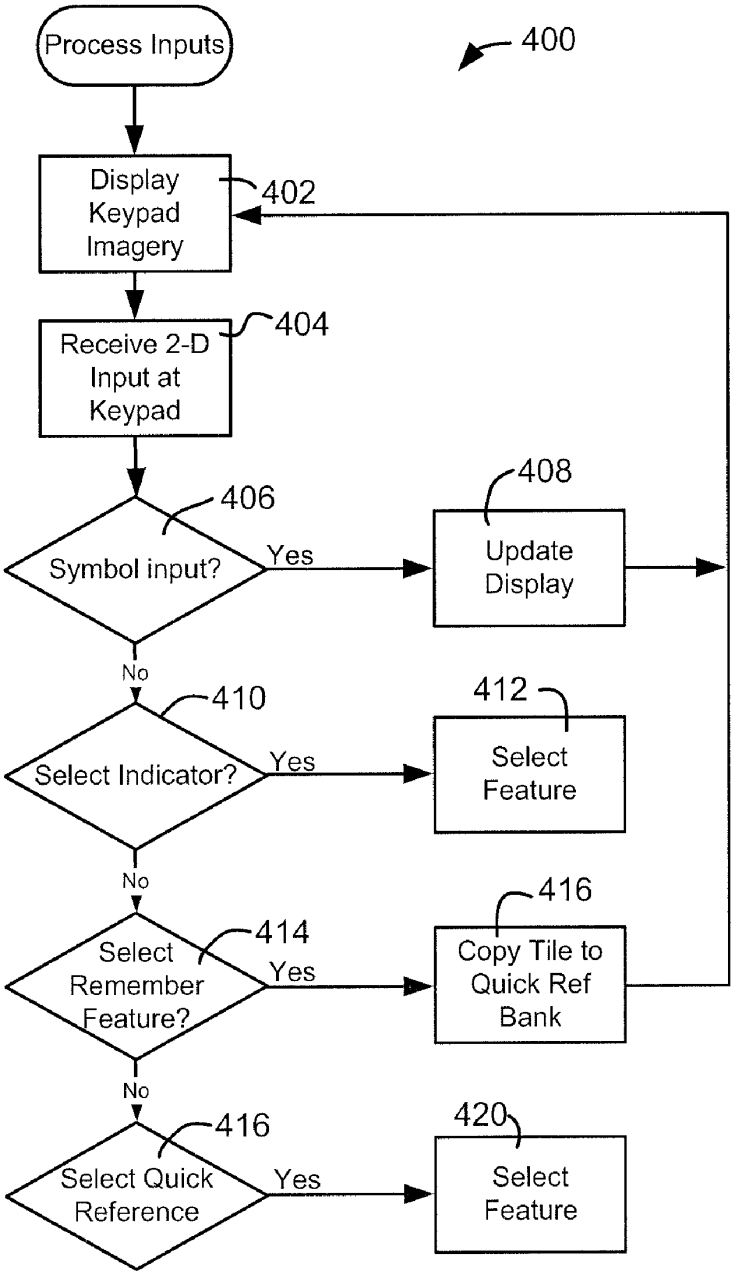

Process Inputs
400
Display Keypad Imagery
402
Receive 2-D Input at Keypad
404
406
Symbol input?
Yes
408
Update Display
No
410
Select Indicator?
Yes
412
Select Feature
No
414
Select Remember Feature?
Yes
416
Copy Tile to Quick Ref Bank
No
416
Select Quick Reference
Yes
420
Select Feature

FIG. 4

SYSTEMS AND METHODS FOR GRAPHICAL CONTROL OF SYMBOL-BASED FEATURES IN A TELEVISION RECEIVER

TECHNICAL FIELD

[0001] The present invention generally relates to user interfaces in television receiver devices, and more particularly relates to systems and methods for providing graphical adjustment and control of numeric, alphanumeric and/or other symbol-based features provided by a television receiver device.

BACKGROUND

[0002] Most television viewers now receive their television signals through a content aggregator such as a cable or satellite television provider. For subscribers to a direct broadcast satellite (DBS) service, for example, television programming is received via a broadcast that is sent via a satellite to an antenna that is generally located on the exterior of a home or other structure. Other customers receive television programming through conventional television broadcasts, or through cable, wireless or other media. Programming is typically received at a receiver such as a "set top box" (STB) or other receiver that demodulates the received signals and converts the demodulated content into a format that can be presented to the viewer on a television or other display. In addition to receiving and demodulating television programming, many television receivers are able to provide additional features. Examples of features available in many modern television receivers include electronic program guides (EPGs), digital or other personal video recorders, "place-shifting" features for streaming received content over a network or other medium, providing customer service information and/or the like.

[0003] Generally speaking, viewers interact with the STB or other receiver using some sort of user interface that receives inputs from a remote control or other input device. To change a channel, for example, the viewer typically depresses a "channel up/down" button, manually enters a number of a desired channel on a numeric keypad, and/or selects the new channel using a program guide feature of the receiver. Alternatively, viewers can often seek out programs using an EPG feature provided by the receiver. The EPG generally provides comprehensive lists of programs and associated information, and allows viewers to readily tune to programs currently being shown. Many EPGs also allow viewers to set a recording for a future event, or to take other actions as appropriate.

[0004] While conventional interfaces are useful for many purposes, there remains a continual desire for more efficient and intuitive user interfaces to the various features provided by the receiver. In particular, there is a desire to provide convenient access to numeric features (e.g., channel numbers) without using a numeric keypad. It is therefore desirable to create systems and methods for improving the viewer interface to the television receiver. These and other desirable features and characteristics will become apparent from the subsequent detailed description and the appended claims, taken in conjunction with the accompanying drawings and this background section.

BRIEF SUMMARY

[0005] According to various exemplary embodiments, systems and methods are provided for graphically providing numeric inputs or other controls a set-top box (STB) or other video receiver.

[0006] In various embodiments, a method is provided for graphically controlling symbol-based features in a television receiver configured to present imagery on a display in response to viewer instructions transmitted from a remote control. A keypad image is presented on the display that includes key images corresponding to the symbol-based features. A two-dimensional input is received from the remote control that indicates one of the key images, and imagery on the display is updated in response to the received two-dimensional input.

[0007] In further embodiments, a method is provided for selecting a channel in a television receiver configured to present imagery on a display in response to viewer instructions transmitted from a remote control. The method comprises presenting a keypad image on the display, wherein the keypad image comprises a plurality of key images each corresponding to a numeral, receiving a first two-dimensional input from the remote control that indicates at least one of the key images, and presenting an indicator of a television channel having a channel number that at least partially corresponds to the indicated key images in response to the first two-dimensional input, wherein the indicator comprises a remember feature. In response to a second two-dimensional input corresponding to the indicator, the receiver may be tuned to the indicated television channel. Further, in response to the second two-dimensional input corresponding to the remember feature, the television channel indicated by the indicator can be associated with a quick reference feature visible on the imagery presented on the display.

[0008] Still other embodiments provide a video receiver for presenting imagery on a display in response to viewer input signals provided from a remote control. The receiver comprises a receiver interface configured to receive an incoming modulated signal, a decoder configured to decode the incoming modulated signal to extract a video signal, a wireless receiver configured to receive the viewer input signals from the remote control, wherein the viewer input is a two-dimensional input, and a processor. The processor is configured to receive the viewer input signals from the wireless receiver and to generate the imagery presented on the display, wherein the imagery comprises a keypad image comprising a plurality of key images each corresponding to a symbol, and wherein the processor is further configured to present an indicator of a television channel having a channel number that at least partially corresponds to the indicated key images in response to the viewer input signals. In response to further two-dimensional input corresponding to the indicator, the processor is further configured to direct the decoder to decode at least a portion of the incoming modulated signal corresponding to the indicated television channel for presentation on the display.

[0009] Various other embodiments, aspects and other features are described in more detail below.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

[0010] Exemplary embodiments will hereinafter be described in conjunction with the following drawing figures, wherein like numerals denote like elements, and

[0011] FIG. **1** is a block diagram of an exemplary television receiver system;

[0012] FIG. **2** is a block diagram of an exemplary television receiver device;

[0013] FIG. **3** is a diagram of an exemplary screen display for receiving and processing numeric inputs from the viewer; and

[0014] FIG. **4** is a flowchart showing an exemplary process for manipulating numeric values in a television receiver or other device.

DETAILED DESCRIPTION

[0015] The following detailed description of the invention is merely exemplary in nature and is not intended to limit the invention or the application and uses of the invention. Furthermore, there is no intention to be bound by any theory presented in the preceding background or the following detailed description.

[0016] Generally speaking, the viewer is able to provide numeric, alpha-numeric or other symbol based inputs to a television receiver using two-dimensional or other user interface features. A keypad representing the various symbols is graphically presented on the display, and the viewer is able to interact with the keypad imagery using a cursor or other interface feature that can be moved in response to two-dimensional inputs applied at a touchpad, motion sensor or other sensor device associated with the remote control. In embodiments wherein the remote control includes a touchpad or similar control device but does not include a numeric keypad, for example, a viewer may nevertheless be able to provide numeric (or alphanumeric) inputs to the receiver by directing a cursor presented as part of the on-screen imagery. The cursor may be able to select numbers, letters and/or other features in order to tune channels or perform other tasks as desired. Other conveniences such as quick reference features may be provided as well.

[0017] Although the various techniques and systems described herein may be used with any sort of remote control or command equipment, various embodiments may be particularly well suited for use with a remote control that includes a touchpad, directional pad, joystick, trackball, set of directional buttons, motion sensor and/or other feature capable of providing two-dimensional inputs to the receiver. While the discussion herein focuses primarily on entering channel numbers, equivalent concepts could be readily applied to other numeric or alphanumeric features provided by the television receiver. Onscreen keypads may be fashioned to show any number of letters, numbers and/or other symbols (including foreign language symbols), thereby allowing the various principles and concepts presented herein to be applied in a wide variety of settings, applications and embodiments.

[0018] Turning now to the drawing figures and with initial reference to FIG. **1**, an exemplary system **100** for presenting television signals to a viewer suitably includes a receiver **108** that receives signals **105** in any format and generates appropriate outputs **107** to generate imagery **110** on display **102**. Typically, receiver **108** interacts with signals **125** received from a wireless remote control **112** to present television imagery **110** on display **102** as desired by the viewer.

[0019] In the exemplary view shown in FIG. **1**, imagery **110** includes a numeric, alphanumeric or other keypad **122** that allows for symbol-based data entry using cursor **114**. Imagery **110** also includes a symbol display window **124**, a channel indicator window **126**, and a quick reference area **128** as desired. The various features presented in imagery **110** may vary widely from embodiment to embodiment. The relative spacing, proportions and locations of the various windows and other features described herein, for example, are entirely exemplary, and may vary widely in other embodiments. Other embodiments may similarly add or omit certain features, or use the various features for purposes other than those described herein.

[0020] Television imagery is presented on display **102** as desired by the viewer. Further, two-dimensional navigation features may be presented to allow the viewer to enter symbol-type or other data through control of a cursor **114** or other interface feature via remote control **112**. In various embodiments, cursor **114** is able to move in response to two-dimensional input signals **125**, which are, in turn, generated in response to inputs applied to two-dimensional input device **124**. By moving cursor **114** to interact with the two-dimensional navigation features presented on display **102**, numeric, alphanumeric and/or other data may be entered, recalled and/or otherwise manipulated as desired.

[0021] Receiver **108** is any component, device or logic capable of receiving and decoding video signals **105**. In various embodiments, receiver **108** is a set-top box (STB) or the like capable of receiving satellite, cable, broadcast and/or other signals encoding audio/visual content. Receiver **108** may further demodulate or otherwise decode the received signals **105** to extract programming that can be locally viewed on display **102** as desired. Receiver **108** may also include a content database stored on a hard disk drive, memory, or other storage medium to support a digital or other personal video recorder (DVR/PVR) feature in some embodiments. Receiver **108** may also provide place shifting, electronic program guide, multi-stream viewing and/or other features as appropriate.

[0022] In the exemplary embodiment illustrated in FIG. **1**, receiver **108** is shown receiving digital broadcast satellite (DBS) signals **105** from a satellite **106** at an antenna **104**. Equivalent embodiments, however, could receive programming **105** from one or more programming sources, including any sort of satellite, cable or broadcast source, as well as any Internet or other network source or the like. In embodiments that include DVR functionality, programming may be stored in any sort of database as desired (e.g., in response to user/viewer programming instructions) for subsequent viewing. Content may also be received from digital versatile disks (DVDs) or other removable media in some embodiments.

[0023] Display **102** is any device capable of presenting imagery **110** to a viewer. In various embodiments, display **102** is a conventional television set, such as any sort of television operating in accordance with any digital or analog protocols, standards or other formats. Display **102** may be a conventional NTSC or PAL television receiver, for example. In other embodiments, display **102** is a monitor or other device that may not include built-in receiver functionality, but that is nevertheless capable of presenting imagery in response to signal **107** received from receiver **108**. In various embodiments, receiver **108** and display **102** may be physically combined or interconnected in any manner. A receiver card, for example, could be inserted into a slot or other interface in a conventional television, or the functionality of receiver **108** may be provided within a conventional television display **102**. In other embodiments, signals **107** are transferred between receiver **108** and display **102** using any sort of cable or other interface (including a wireless interface). Examples of common interfaces include, without limitation, component

video, S-video, High-Definition Multimedia Interface (HDMI), Digital Visual Interface (DVI), IEEE 1394, and/or any other formats as desired.

[0024] Remote control **112** is any sort of control device capable providing signals **125** to receiver **108** that represent inputs received from one or more viewers. Typically, remote control **112** is an infrared, radio frequency (RF) or other wireless remote that includes any number of buttons or other features for receiving viewer inputs. In an exemplary embodiment, remote control **112** communicates with receiver **108** using the IEEE 802.15.4 ("ZIGBEE") protocol for wireless personal area networks (WPANs), although other embodiments may instead communicate using IEEE 802.15.1 ("BLUETOOTH"), IEEE 802.11 ("WI-FI"), conventional infrared, and/or any other wireless techniques. In some embodiments, remote control **112** may be able to support multiple types of wireless communication, such as ZIGBEE communications and also infrared communications. This feature may be useful when remote control **112** is a so-called universal remote that is able to provide input signals **125** to multiple devices.

[0025] Remote control **112** generally includes any sort of buttons, sliders, rocker switches and/or other features for receiving physical inputs from the viewer. As the user depresses or otherwise interacts with the features, remote control **112** suitably produces wireless signals **125** in response. In further embodiments, remote control **112** includes a two-dimensional input device **124** that is able to receive inputs from the user in any multi-dimensional format (e.g, "X,Y", "r,Θ)", and/or the like). Examples of two-dimensional input devices **124** that could be used in various embodiments include, without limitation, touchpads, directional pads, joysticks, trackballs, sets of arrows or other buttons, and/or the like. In a typical implementation, two-dimensional input device **124** provides coordinates or other signals **125** that indicate absolute (e.g, "X,Y") and/or relative (e.g., "ΔX, ΔY") movement in two or more dimensions. Such signals **125** may be decoded at controller **108** or elsewhere to coordinate the viewer's actions with respect to input device **124** to movement of cursor **114** or other features presented on display **102**.

[0026] In the exemplary embodiment shown in FIG. **1**, remote control **112** is illustrated with a touchpad-type device **124** that accepts viewer inputs applied with a finger, stylus or other object. FIG. **1** also shows touchpad device **124** as having dedicated scroll regions **123** and **128** for vertical and horizontal scrolling, respectively. Viewer movements within region **123** that are more-or-less parallel to the right edge of device **124**, for example, could result in vertical scrolling, whereas movements within region **128** that are more-or-less parallel to the bottom edge of device **124** could result in horizontal scrolling. Dedicated scrolling regions **123**, **128** are optional features, however, that may not be present in all embodiments. Further, scrolling could be implemented in any other manner.

[0027] In operation, then, receiver **108** suitably receives television signals **105** from a satellite, cable, broadcast or other source. In a satellite based embodiment, for example, one or more channels can be extracted from a conventional satellite feed; the video content on the selected channel can be demodulated, extracted and otherwise processed as appropriate to display the desired content to the viewer. One or more cable or broadcast channels may be similarly obtained in any manner. In some embodiments, receiver **108** may obtain multiple channel signals from different sources (e.g., one channel from a cable or satellite source and another channel from a terrestrial broadcast, DVD or other source).

[0028] Receiver **108** suitably obtains the desired content from the channel(s) indicated by the viewer, and presents the content on display **102**. In various embodiments, viewers are able to further view imagery (e.g., the imagery **110** shown in FIG. **1**) that allows for numeric, alphanumeric or other symbol-based inputs to be generated using remote control **112**, even though remote control **112** may not have keys or buttons corresponding to some or all of the symbols entered. By moving cursor **114** with respect to imagery **110**, for example, a "virtual keypad" can be created that allows symbol-type inputs to be generated. A viewer may enter numerals, for example, by directing cursor **114** toward the desired numeral in keypad **122**, and then depressing a select or enter key on the remote **112** to select the indicated symbol. Entered symbols may be displayed or otherwise processed as desired. In the exemplary embodiment shown in FIG. **1**, numeric inputs are used to select a television channel to be decoded and presented on display **102**. In this embodiment, channel numbers generated with keypad **122** are presented in display window **124**, and are also used to select tiles or other indicators in channel indicator window **126**. These indicators can be selected (e.g., with cursor **114**) to directly tune the indicated channel, or one or more indicated channels may be saved in quick retrieval window **128** for later tuning. Other channel tuning implementations may provide widely varying layouts and features; still other embodiments may use symbol-based inputs for completely different functions, such as searching for programs in an EPG, DVR, network server or other program source, or any other function as desired.

[0029] FIG. **2** provides additional detail about an exemplary receiver **108** that includes a receiver interface **208**, a decoder **214** and a display processor **218**, as appropriate. FIG. **2** also shows a disk controller interface **206** to a disk or other storage device **110**, an interface **210** to a local or wide area network, a transport select module **212**, a display interface **228**, an RF receiver module and control logic **205**. Other embodiments may incorporate additional or alternate processing modules from those shown in FIG. **2**, may omit one or more modules shown in FIG. **2**, and/or may differently organize the various modules in any other manner different from the exemplary arrangement shown in FIG. **2**.

[0030] Receiver **108** may be physically and logically implemented in any manner. FIG. **2** shows various logical and functional features that may be present in an exemplary device; each module shown in the figure may be implemented with any sort of hardware, software, firmware and/or the like. Any of the various modules may be implemented with any sort of general or special purpose integrated circuitry, for example, such as any sort of microprocessor, microcontroller, digital signal processor, programmed array and/or the like. Any number of the modules shown in FIG. **2**, for example, may be implemented as a "system on a chip" (SoC) using any suitable processing circuitry under control of any appropriate control logic **205**. In various embodiments, control logic **205** executes within an integrated SoC or other processor that implements receiver interface **208**, transport selector **212**, decoder **214**, display processor **218**, disk controller **206** and/or other features, as appropriate. The Broadcom Corporation of Irvine, Calif., for example, produces several models of processors (e.g., the model BCM 7400 family of processors) that are capable of supporting SoC implementations of satellite and/or cable receiver systems, although products from

any number of other suppliers could be equivalently used. In still other embodiments, various distinct chips, circuits or components may be inter-connected and inter-relate with each other to implement the receiving and decoding functions represented in FIG. **2**.

[0031] Various embodiments of receiver **108** therefore include any number of appropriate modules for obtaining and processing media content as desired for the particular embodiment. Each of these modules may be implemented in any combination of hardware and/or software using logic executed within any number of semiconductor chips or other processing logic.

[0032] Various embodiments of control logic **205** can include any circuitry, components, hardware, software and/or firmware logic capable of controlling the various components of receiver **108**. Various routines, methods and processes executed within receiver **108** are typically carried out under control of control logic **205**, as described more fully below. Generally speaking, control logic **205** receives user input signals **125** (FIG. **1**) via an RF receiver interface **232** that is able to communicate with the remote control **112** using a suitable antenna **234**. Control logic receives user inputs from remote control **112** and/or any other source, and directs the other components of receiver **108** in response to the received inputs to present the desired imagery on display **102**.

[0033] As noted above, receiver **108** suitably includes a receiver interface **208**, which is any hardware, software, firmware and/or other logic capable of receiving media content via one or more content sources **105**. In various embodiments, content sources **105** may include cable television, direct broadcast satellite (DBS), broadcast and/or other programming sources as appropriate. Receiver interface **208** appropriately selects a desired input source and provides the received content to an appropriate destination for further processing. In various embodiments, received programming may be provided in real-time (or near real-time) to a transport stream select module **212** or other component for immediate decoding and presentation to the user. Alternatively, receiver interface **208** may provide content received from any source to a disk or other storage medium in embodiments that provide DVR functionality. In such embodiments, receiver **108** may also include a disk controller module **206** that interacts with an internal or external hard disk, memory and/or other device that stores content in a database **110**, as described above.

[0034] In the embodiment shown in FIG. **2**, receiver **108** also includes an appropriate network interface **210**, which operates using any implementation of protocols or other features to support communication by receiver **108** on any sort of local area, wide area, telephone and/or other network. In various embodiments, network interface **210** supports conventional LAN, WAN or other protocols (e.g., the TCP/IP or UDP/IP suite of protocols widely used on the Internet) to allow receiver **108** to communicate on the Internet or any other network as desired. Network interface **210** typically interfaces with the network using any sort of LAN adapter hardware, such as a conventional network interface card (NIC) or the like provided within receiver **108**. Other embodiments may provide interfaces **210** to conventional telephone lines or other communications channels, or may omit network connectivity altogether.

[0035] Transport stream select module **212** is any hardware and/or software logic capable of selecting a desired media stream from the available sources. In the embodiment shown in FIG. **2**, stream select module **212** is able to generate video signals for presentation on one or more output interfaces **228**. Typically, transport select module **212** responds to viewer inputs (e.g., via control logic **205**) to simply switch encoded content received from a broadcast, satellite, cable or other source **105** or from storage **110** to one or more decoder modules **214**.

[0036] Receiver **108** may include any number of decoder modules **214** for decoding, decompressing and/or otherwise processing received/stored content as desired. Generally speaking, decoder module **214** decompresses, decodes and/or otherwise processes received content from stream select module **212** to extract an MPEG or other media stream encoded within the stream. The decoded content can then be processed by one or more display processor modules **218** to create a presentation on display **102** (FIG. **1**) for the viewer in any appropriate format. FIG. **2** shows a single decoder module **214** operating on one television signal received from transport select module **212**. In practice, any number of decoder modules **214** may be used, particularly in "picture in picture" (PIP) situations when multiple signals are simultaneously decoded and displayed. The term "decoder", then, may collectively apply to one or more decoder modules that are able to decode one or more signals for presentation on display **104**.

[0037] Display processor module **218** includes any appropriate hardware, software and/or other logic to create desired screen displays via display interface **228** as desired. Such displays may include combining signals received from one or more decoder modules **214** to facilitate viewing of one or more channels. In various embodiments, display processing module **218** is also able to produce on screen displays (OSDs) for electronic program guide, setup and control, input/output facilitation and/or other features that may vary from embodiment to embodiment. Such displays are not typically contained within the received or stored broadcast stream, but are nevertheless useful to users in interacting with receiver **108** or the like. The generated displays, including received/stored content and any other displays may then be presented to one or more output interfaces **228** in any desired format. The various interface features described herein, for example, may be generated by display processor module **218** operating alone or in conjunction with control logic **205**.

[0038] Display processor **218** may also generate imagery **110** in response to viewer inputs received (and/or in response to instructions from command logic **205**) to thereby make up a user interface that allows the viewer select channels or programs, or to perform other tasks as desired. When the viewer provides inputs at keypad **122**, indicator window **126** and/or quick reference area **128**, for example, display processor **218** may be operable to draw (or redraw) imagery **110** in response, and/or to present television content identified by the viewer, as appropriate. As receiver **108** receives user inputs **125** from remote control **112**, control logic **205** may direct display processor **218** to adjust any feature(s) of imagery **110** as directed by the viewer. Display processor **218** therefore directs the presentation of imagery **110** in conjunction with one or more navigation features, and adjusts the imagery **110** in response to inputs received from the viewer.

[0039] Display processor **218** produces an output signal encoded in any standard format (e.g., ITU656 format for standard definition television signals or any format for high definition television signals) that can be readily converted to standard and/or high definition television signals at interface

228. In other embodiments, the functionality of display processor **218** and interface **228** may be combined in any manner.

[0040] FIG. **3** shows an exemplary display **300** that would allow a viewer to provide numeric or other symbol-based inputs using a remote control **112** with two-dimensional input capability. Other embodiments may incorporate imagery **110** of different sizes and configurations, and/or may allow for additional or other features in any manner. Practical views of imagery **110** presented on display **102** may vary widely from that shown in FIG. **3** without departing from the concepts discussed herein.

[0041] FIG. **3** shows an exemplary presentation of imagery **110** that includes a keypad **122**, a symbol display window **124**, a channel indicator window **126**, and a quick reference area **128** as appropriate. In the embodiment shown, a viewer is able to move cursor **114** with respect to the various interface features to enter symbolic information using keypad **122**, to choose an identifier **308**A-B to select a channel, program or other object, and/or to select a "quick reference" feature **301**A-E for rapid retrieval of favorite or frequently-used identifiers. The various features shown in FIG. **3** may be implemented using any sort of symbology, programming and/or the like; in an exemplary embodiment, imagery **110** is generated by display processing module **218** (FIG. **2**) in response to instructions from the viewer that are relayed by control logic **205**.

[0042] Keypad **122** is any sort of interface feature capable of support viewer inputs of symbol-based data. In various embodiments, keypad **122** is virtual representation of a numeric, alphanumeric, alphabetical or other keyboard, although other embodiments may support different types of symbols, including foreign language symbols, shapes or other universal access symbols, and/or the like.

[0043] Keypad **122** includes any number of key images that each correspond to one or more symbols. In the exemplary embodiment shown in FIG. **3**, keypad **122** includes twelve key images corresponding to ten numeric digits (0-9), with two additional key images **303**, **305** provided for additional features as desired. Key **305**, for example, could be selected to switch to an alphabetical keyboard of any sort. A conventional "QWERTY" or Dvorak-type keyboard could be displayed, for example, or a keypad with fewer key images could be presented, with multiple symbols assigned to each key image. Multiple letters could be assigned to a common key image, for example, and the viewer may be able to enter textual data using multiple "clicks" or other interactions for each key image, in a manner similar to that used for text entry in many conventional mobile phones. Other embodiments may omit alphabetic or alphanumeric entry entirely, or may provide other schemes for receiving alphanumeric data. Key **303** similarly provides any other desired feature. In various embodiments, key **303** may be used to provide a backspace, delete or other feature; other embodiments may use key **303** in a completely different manner, or may omit key **303** entirely.

[0044] The viewer provides symbol-based inputs in any manner. In various embodiments, the viewer guides cursor **114** over one or more key images associated with keypad **122** using the touchpad, motion sensor or other two-dimensional feature **124** associated with remote control **112**. When the cursor **114** is positioned as desired, the viewer may be able to select the symbol associated with the key image by depressing a "select" or "enter" key, as appropriate. The "select" key may be a button or trigger on remote **112**, for example, or may be any other interface feature as desired.

[0045] In various embodiments, symbols are presented in display window **124** as the viewer selects symbols in keypad **122**. In the exemplary embodiment illustrated in FIG. **3**, for example, the viewer has selected digits "1" and "9", and these are shown in window **124**. Some embodiments may provide a text cursor **306** that indicates a position in window **124** where symbol data will be entered. Text cursor **306** is shown as a simple horizontal line in FIG. **3**, although other embodiments may implement this feature as a static or blinking line, block, rectangle or any other image. Still other embodiments may omit text cursor **306** altogether.

[0046] Information entered on keypad **122** and/or displayed in window **124** may be processed in any manner. In various embodiments, the information may be used to select a channel or program for decoding and presentation, for searching a disk, network or the like for content, and/or for any other purpose. In various embodiments, data entered into window **124** can be processed in a predictive manner. In the embodiment shown in FIG. **3**, for example, numeric inputs from keypad **122** are used to select a channel to be tuned and presented by receiver **104**. As the viewer enters the first few digits of the channel number, imagery **110** may be updated as appropriate to present channels (or other objects) that correspond to the initially-entered data. As the user enters an initial "1", for example, the content of identifier window **126** may be updated to show identifiers **308**A-D that begin with 1 (e.g., "1", "10", "100" or the like). In an implementation that uses three-digit channel numbers (100-999), for example, an initial "1" could be result in window **126** showing identifiers **308**A-D including channel **100** (corresponding to the beginning of the number range), channel **150** (corresponding to the approximate middle of the channel range), or any other channel as desired. As the viewer enters additional symbols from keypad **122**, the additional data may be used to further refine the identifiers **308**A-D presented in window **126**. After the viewer entered both numerals "1" and "9", for example, window **126** may be updated to show channel identifiers **308**A-D associated with channels in the 190-199 range (e.g., channels 194-197, as shown in the example of FIG. **3**). Predictive behaviors may be modified in any manner, or omitted in some embodiments.

[0047] Identifier window **126** shows any number of identifiers **308**A-D for objects that are referenced based upon symbol-based data entered by the viewer. As the viewer selects numeric or other symbolic data from keypad **122**, for example, the identifiers **308**A-D may be presented and/or updated as desired. Each identifier **308**A-D represents any sort of object sought by the viewer; examples of such objects include programs, channels, networks, contents of programs, and/or the like. In the embodiment illustrated in FIG. **3**, identifiers **308**A-D represent particular channels that can be tuned by receiver **104** for presentation on display **102**.

[0048] To that end, in various embodiments viewers may be able to immediately select an action associated with any identifier **308**A-D by simply selecting that identifier. The viewer may select any identifier **308**A-D in any manner. In various embodiments, selection may occur by placing cursor **114** over the identifier **308**A-D on imagery **110**, and then selecting the identifier **308**A-D as appropriate. In the exemplary embodiment shown in FIG. **3**, selection of an identifier **308**A-D may result in receiver **104** tuning the channel associated with the selected identifier for presentation on display

102. Other actions could include setting a PVR to record a selected program, selecting a program for placeshifting, and/or taking any other action as desired.

[0049] In further embodiments, each identifier **308**A-D includes a remember feature **312** that allows the receiver **104** to remember the channel or other object identified by the identifier **308**A-D for subsequent retrieval. In the exemplary embodiment shown in FIG. **3**, remember feature **312** is shown as a plus sign ("+") on a portion of the identifier **308**A-D, although other embodiments may use any sort of symbology or imagery for the remember feature **312**, and may present the feature **312** at any location on imagery **110**.

[0050] Subsequent retrieval of remembered objects may be provided in any manner. FIG. **3** shows a quick reference area **128** that includes space for any number of quick reference features **310**A-E associated with remembered channel objects **308**A-E. As a user clicks on a remember feature **312** on any channel identifier **308** in window **126**, for example, a quick reference feature **310**A-E is associated with the relevant television channel and placed in area **128**. The viewer is then able to quickly tune to the remembered channel by simply clicking on the featured **310**A-E associated with the channel in area **128**. Again, the features are not limited to quick access to television channels; other remembered features may include programs, networks, files and/or any other objects as desired.

[0051] Further, various embodiments may allow the viewer to create a "favorites list" from some or all of the objects **310**A-E in quick reference area **128**. This list may be available, for example, from an electronic program guide view, or in response to a button or other feature activated on remote control **112**. This favorites list may be created automatically or default in some embodiments; in other embodiments, the viewer may activate a button, tile or other feature **322** to create the favorites list. Further, the viewer may be able to create multiple favorites lists in some embodiments by selecting feature **322** with different sets of objects **310**A-E in area **128**. That is, the viewer could create a first list by placing a first set of objects **310** in area **128** and then selecting feature **322**; that viewer (or another viewer of the same receiver **108**) could create another favorites list by placing a different set of objects **310** in area **128** and then selecting feature **322** again. The lists could be named or otherwise identified as appropriate, and used in conjunction with any features (including the EPG) provided by receiver **108**.

[0052] FIG. **4** shows an exemplary process **400** for graphically processing symbol-type inputs in a television receiver or the like. In various embodiments, the steps shown in FIG. **4** may be executed using source or object code in any format that may be stored in mass storage, firmware, memory or any other digital storage medium within receiver **104**. Such code may be executed by any module or combination of modules operating within receiver **104**. In an exemplary embodiment, some or all of the steps shown in process **600** are executed by control logic **205** (FIG. **2**) operating alone or in conjunction with a display processing module **218** and/or the various other features shown in FIG. **2** and described above. While FIG. **4** specifically shows a technique for tuning channels on a television receiver, the concepts set forth in the figure and accompanying text could be used to perform other tasks, such as recording programs, selecting programs, searching and/or taking other actions as appropriate. The various steps and actions set forth in FIG. **4** may therefore be supplemented or otherwise modified in any manner.

[0053] With reference now to FIG. **4**, an exemplary method **400** for processing numeric or other symbol-type data suitably includes the broad steps of displaying a keypad **122** (step **402**), receiving inputs from a two-dimensional input device **124** (step **404**), and then identifying (steps **406**, **410**, **414**, **418**) and processing (steps **408**, **412**, **416**, **420**) the received inputs as appropriate to execute the various tasks directed by the viewer. The steps of method **400** may take place in any other temporal order other than that shown in FIG. **4**, and/or additional or alternate steps may be provided in alternate embodiments. The actual steps shown in FIG. **4** may be combined or omitted in still other embodiments.

[0054] Keypad **122** may be displayed in any manner (step **402**). In various embodiments, keypad **122** is any sort of numeric, alphanumeric or other keypad that generated and displayed by display processor **218** (FIG. **2**), although other embodiments may generate the keypad in any other manner. As noted above, keypad **122** suitably includes any number of key images each corresponding to one or more letters, numbers and/or other symbols as desired.

[0055] Inputs may be received with respect to keypad **122** in any manner (step **404**). In various embodiments, receiver **104** receives two-dimensional inputs from remote control **112** relating to a position of a cursor **114**, as described above. The viewer is therefore able to position the cursor **114** over one or more key images and then indicate a selection of the key image in any manner.

[0056] Symbol input can be identified and processed in any manner (steps **406**, **408**). In various embodiments, symbol input is recognized from a selected cursor image corresponding to one or more key images in keypad **122**. These inputs can be processed in any manner; symbols entered may be displayed (e.g., in window **124** or the like), for example, and/or the symbols may be used to update other portions of imagery **110**. Entered numerals, for example, could be used to update the channel indicators **308**A-D displayed in window **126**, or other features could be provided as appropriate to the particular embodiment.

[0057] In various further embodiments, other user interface features may also be provided. In embodiments such as the one shown in FIG. **3**, for example, viewer selections of an indicator **308**A-D can be identified (step **410**) from two-dimensional inputs **125** received from remote **112**, as described above. These selections can be processed (step **412**) to tune a particular channel or program, or to take some other action as desired.

[0058] Some embodiments may provide remember features **312** associated with indicators **308**A-D, as described above. In such embodiments, viewer selections of the remember features **312** can be identified (step **414**) and processed as desired (step **416**). In various embodiments, selection of the remember feature **312** can result in a tile or other indicator **310** being placed in area **128** to allow the feature to be accessed at a later time via a "quick click" on the indicator **310** as appropriate. Upon selection of a quick reference indicator **310** (step **418**), any action associated with the referenced feature may be executed (step **420**) as desired. A channel may be quickly tuned, for example, or any other action may be taken as desired. As noted above, the objects **310** present in area **128** may be further used to create a quick reference or favorites list that can be accessed from other views (e.g., EPG views) provided by receiver **108**, as desired.

[0059] Accordingly, new systems and techniques are presented for graphically processing numeric, alphanumeric

and/or other symbol-type information. Although the systems and features are generally described herein as applying to processing numeric features, equivalent embodiments could apply the same concepts to alphabetical, alphanumeric and/or any other types of symbol-based information, including selection of programs referenced in an EPG or stored on a DVR, selection of programs from a network host or other source, selection of programs for placeshifting, and/or any other features as desired.

[0060] As used herein, the word "exemplary" means "serving as an example, instance, or illustration." Any implementation described herein as exemplary is not necessarily to be construed as preferred or advantageous over other implementations.

[0061] While the foregoing detailed description will provide those skilled in the art with a convenient road map for implementing various embodiments of the invention, it should be appreciated that the particular embodiments described above are only examples, and are not intended to limit the scope, applicability, or configuration of the invention in any way. To the contrary, various changes may be made in the function and arrangement of elements described without departing from the scope of the invention.

What is claimed is:

1. A method for graphically controlling symbol-based features in a television receiver configured to present imagery on a display in response to viewer instructions transmitted from a remote control, the method comprising:

presenting a keypad image on the display, wherein the keypad image comprises a plurality of key images each corresponding to one of the symbol-based features;

receiving a two-dimensional input from the remote control that indicates one of the key images; and

updating the imagery on the display in response to the received two-dimensional input.

2. The method of claim **1** wherein the plurality of key images corresponding to numeric values.

3. The method of claim **1** wherein the plurality of key images correspond to alphanumeric values.

4. The method of claim **1** wherein the updating comprises presenting an indicator of a television channel having a channel number that at least partially corresponds to the indicated key image.

5. The method of claim **4** further comprising receiving a second two-dimensional input corresponding to the indicator.

6. The method of claim **5** further comprising tuning the television channel indicated by the indicator in response to the second two-dimensional input.

7. The method of claim **5** further comprising associating the television channel indicated by the indicator with a quick reference feature visible on the imagery presented on the display.

8. The method of claim **7** further comprising receiving a third two-dimensional input corresponding to the quick reference feature, and tuning the television channel indicated by the quick reference feature in response to the third two-dimensional input.

9. The method of claim **7** further comprising providing a list of channels for subsequent reference based upon the television channels associated with the quick reference feature.

10. The method of claim **9** wherein the list of channels is accessible from an electronic program guide feature provided by the receiver.

11. The method of claim **1** wherein the two-dimensional input corresponds to a position of a cursor image presented on the display.

12. The method of claim **1** wherein the two-dimensional input corresponds to a report from a two-dimensional input device.

13. The method of claim **12** wherein the two-dimensional input device is one of the group consisting of: a touchpad, a trackball, a joystick, a directional pad and a motion sensor.

14. A method for selecting a channel in a television receiver configured to present imagery on a display in response to viewer instructions transmitted from a remote control, the method comprising:

presenting a keypad image on the display, wherein the keypad image comprises a plurality of key images each corresponding to a numeral;

receiving a first two-dimensional input from the remote control that indicates at least one of the key images;

presenting an indicator of a television channel having a channel number that at least partially corresponds to the indicated key images in response to the first two-dimensional input, wherein the indicator comprises a remember feature;

in response to a second two-dimensional input corresponding to the indicator, tuning the receiver to the indicated television channel; and

in response to the second two-dimensional input corresponding to the remember feature, associating the television channel indicated by the indicator with a quick reference feature visible on the imagery presented on the display.

15. The method of claim **14** further comprising receiving a third two-dimensional input corresponding to the quick reference feature, and tuning the television channel indicated by the quick reference feature in response to the third two-dimensional input.

16. A video receiver for presenting imagery on a display in response to viewer input signals provided from a remote control, the receiver comprising:

a receiver interface configured to receive an incoming modulated signal;

a decoder configured to decode the incoming modulated signal to extract a video signal;

a wireless receiver configured to receive the viewer input signals from the remote control, wherein the viewer input is a two-dimensional input; and

a processor configured to receive the viewer input signals from the wireless receiver and to generate the imagery presented on the display, wherein the imagery comprises a keypad image comprising a plurality of key images each corresponding to a symbol, and wherein the processor is further configured to present an indicator of a television channel having a channel number that at least partially corresponds to the indicated key images in response to the viewer input signals, and, in response to further two-dimensional input corresponding to the indicator, to direct the decoder to decode at least a portion of the incoming modulated signal corresponding to the indicated television channel for presentation on the display.

17. The video receiver of claim **16** wherein the receiver interface comprises a satellite interface.

18. The video receiver of claim **16** wherein the receiver interface comprises a cable interface.

19. The video receiver of claim **16** wherein the wireless receiver is configured to receive the two-dimensional input signals from a wireless remote control comprising a two-dimensional input device.

20. The video receiver of claim **16** wherein the two-dimensional input device is one of the group consisting of: a touchpad, a trackball, a joystick, a directional pad, and a motion sensor.

21. The video receiver of claim **16** wherein the indicator comprises a remember feature and wherein the processor is further configured, in response to the further viewer input signals corresponding to the remember feature, to associate the television channel indicated by the indicator with a quick reference feature visible on the imagery presented on the display.

22. The video receiver of claim **21** wherein the processor is further configured to direct the decoder to decode at least the portion of the television channel indicated by the quick reference feature in response to a third viewer input signal.

23. The video receiver of claim **21** wherein the quick reference feature is visible within an electronic program guide feature provided by the video receiver.

* * * * *