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(54) **Title**: BULK UDTA CONTROL GUI

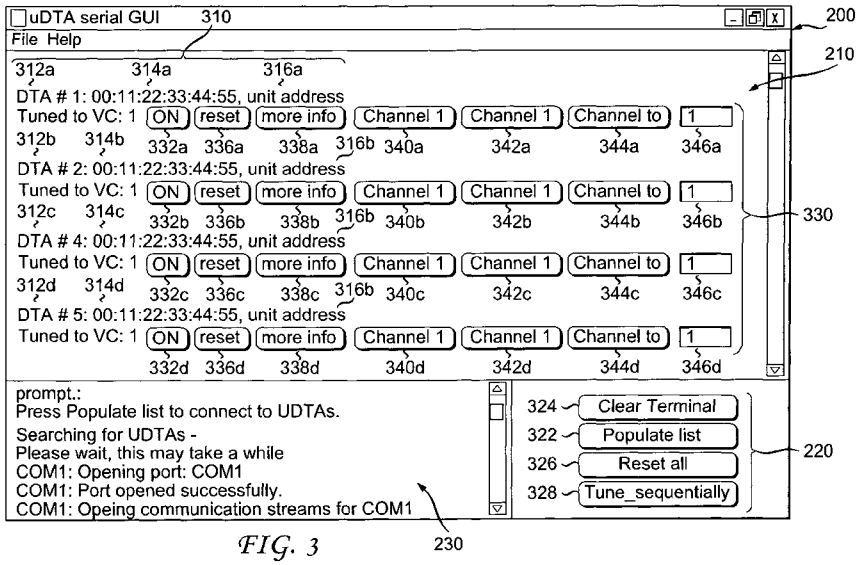


FIG. 3

(57) **Abstract**: A method, user interface, and system are provided for controlling multiple universal digital terminal adapters (UDTAs). This involves providing a listing of UDTAs available for control and providing controls for one or more of the UDTAs in the listing of UDTAs. Commands can then be provided via the controls and performed to control one or more of the UDTAs available for control.

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Bulk UDTA Control GUI

TECHNICAL FIELD

This disclosure relates to the field of Universal Digital Terminal Adapters (UDTAs). More particularly, this disclosure relates to Graphical User Interfaces (GUIs) for controlling groups of Universal Digital Terminal Adapters.

BACKGROUND OF THE INVENTION

A UDTA is used to tune, receive, or otherwise decode digital cable. With cable providers switching from analog transmission to digital transmission, UDTA are necessary to decode the digitally encoded content of the digital transmission. In certain multi-dwelling environments, such as apartment complexes, hotels, motels, etc.; where a common analog cable feed was distributed to multiple rooms or apartments, multiple UDTAs are now required to provide the same functionality (i.e. providing cable service to each room/apartment). As such it would be advantageous to be able to control the multiple UDTAs from a single common interface.

SUMMARY OF THE INVENTION

Embodiments of the invention include a method for controlling multiple universal digital terminal adapters (UDTAs). The method comprises providing a listing of UDTAs available for control and providing controls for one or more of the UDTAs in the listing of UDTAs. In certain embodiments the method further comprises receiving a command via the controls for one or more of the UDTAs and performing the command.

Other embodiments of the invention also include a user interface for controlling multiple universal digital terminal adapters (UDTAs). The user interface comprises a field for displaying a listing of UDTAs available for control; and controls for the UDTAs listed in the field.

Still other embodiments include a computer readable medium containing instructions for performing for controlling multiple UDTAs. The instructions include steps for providing a listing of UDTAs available for control; and providing controls for one or more of the UDTAs in the listing of UDTAs.

Still other embodiments include a system. The system comprises multiple Universal digital terminal adapters (UDTAs), a computer, and a user interface. The computer is connected to the multiple UDTAs. The user interface is for controlling the multiple universal digital terminal adapters (UDTAs) via the computer. The user interface comprises a field for displaying a listing of UDTAs available for control and controls for the UDTAs listed in the field.

BRIEF DESCRIPTION OF THE DRAWINGS

The subject matter that is regarded as the invention is particularly pointed out and distinctly claimed in the claims at the conclusion of the specification. The foregoing and other features and advantages of the invention will be apparent from the following detailed description taken in conjunction with the accompanying drawings.

Figure 1 is a block diagram of a system comprising multiple universal digital terminal adapters (UDTAs) in accordance with an embodiment of the invention.

Figure 2 is a diagram of a user interface for controlling multiple UDTAs before the listing of the available UDTAs is populated in accordance with an embodiment of the invention.

Figure 3 is a diagram of a user interface for controlling multiple UDTAs after the listing of the available UDTAs is populated in accordance with an embodiment of the invention.

Figure 4 is a diagram of a user interface for controlling multiple UDTAs wherein additional information about a UDTA is provided in a pop-up window in accordance with an embodiment of the invention.

Figure 5 is a flowchart depicting a method for controlling multiple UDTAs in accordance with an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

It is important to note that the embodiments disclosed by the invention are only examples of the many advantageous uses of the innovative teachings herein. In general, statements made in the specification of the present application do not necessarily limit any of the various claimed inventions. Moreover, some statements may apply to some inventive features but not to others. In general, unless otherwise indicated, singular elements may be in plural and vice versa with no loss of generality. In the drawings, like numerals refer to like parts through several views.

One example of a system having the multiple UDTAs grouped together for control and distribution of the cable signal can be seen in Figure 1. The system 100 includes multiple UDTAs 110a, 110b, 110c and at least one computer 120 running a user interface 200 for controlling the UDTAs 110a, 110b, 110c. The UDTAs 110a, 110b, 110c are connected to the computer 120 either directly or through port server 130. In this example, the UDTAs 110a, 110b, 110c are connected to the port server 120 via RS-232 connections 115a, 115b, 115c while the port server 130 is connected to the computer 120 via an Ethernet connection. Also seen in this example is a remote controlled power supply 140 connected to the port server for providing power to the UDTAs 110a, 110b, 110c.

This allows the UDTAs 110a, 110b, 110c to be controlled by a single access point through one or more connected computers 120. Thus a technician or other user can access and control the multiple UDTAs 110a, 110b, 110c either directly through the connected computer(s) 120 or optionally via a computer 150 at a remote location over the internet 155.

The UDTAs 110a, 110b, 110c receive a digital cable signal 160 through a splitter 165. The digital cable signal 160 is decoded by the UDTAs 110a, 110b, 110c into baseband audio video signals 170a, 170b, 170c. The baseband audio and video signals 170a, 170b, 170c can then be converted to a RF Modulated Channels 174a, 174b, 174c, (for example by Drake Modules 172a, 172b, 172c) and combined into an analog cable signal 180 by combiner 180 (for providing cable service to each room/apartment).

To provide the control of the multiple UDTAs, a user interface is provided. An example of such a user interface can be seen in Figure 2. In Figure 2 the user interface 200 is a graphical user interface. In this embodiment, the user interface includes a field 210 for displaying a listing of UDTAs available for control, controls 220 for controlling one or more of the UDTAs, and a text box 230.

In the example of Figure 2, the user interface 200 is depicted with field 210 unpopulated with a listing of the UDTAs available for control. That is, this is what the GUI 200 looks like before the user does anything. The text box 230 prompts the user to hit "Populate list". A "Populate list" button 222 is provided as part of the controls 220 for controlling one or more of the UDTAs.

Once the user hits "Populate list" button 222, several things happen. The application providing the GUI 200 finds all the UDTAs 110a, 110b, 110c attached to the computer 120 (either directly or through a Port Server 130). It does this by sending out a request for each of the UDTAs to go into "Really-Remote Control" mode (ASCII "42405"), and then after a short delay it asks them to respond (ASCII "PLEASE: :THANKYOU!"). If a UDTA responds ("ALRIGHT: :NOPROBLEM"), the GUI application will add it to its list of UDTAs available. An example of this can be seen in Figures 3 and 4.

In certain embodiments, the GUI application will also ask for some additional information (the UDTA's identifiers, MAC address and Unit address, channel tuned to). In some embodiments, The GUI application will populate the modifiable field 210 with this additional information 310 including the UDTAs' identifier 312a-d, MAC address 314a-d, Unit address 316a-d, and the current virtual channel the UDTA is tuned to 318a-d,. The GUI application can also change the second button in the bottom right from a "Populate list" button 222 to "Refresh list" button 322.

The GUI application's list of UDTAs available for control is dynamic – if a user were to hook up 20 UDTAs, the GUI application would account for that. If the user hooked up 1000 UDTAs, the GUI would account for that too. Every UDTA is given its own set of controls. In the example of Figures 3 and 4 these controls are provided as buttons 330.

Some examples of these controls 330 include an "ON" button 332a-d, a "OFF" button 334a, a "Reset" button 336a-d, a "More info" button 338a-d, a "Channel Up" button 340a-d, a "Channel Down" button 342a-d, a "Channel to" button 344a-d, and a modifiable field 346a-d for entering a desired channel. The functionality of these buttons is described below.

ON/OFF – The "ON" 332a-d and "Off" 334a buttons, when activated, turn the UDTA Off and On at the hardware level, by controlling its power (See remote controlled power supply 140 in Figure 1). The "ON" button 332a-d is green and pressed. The "OFF" button 334a is red and depressed (see Figure 4).

Reset – The "Reset" button 336a-d, when activated, turns the UDTA Off and immediately afterwards On at the software level, by doing a software reset.

More info – The "More info" button 338a-d, when activated, provides important diagnostic information about an Individual UDTA. This information can be provided in

a pop-up screen 500 such as seen in Figure 5. In this embodiment, the information provided is limited to the software on the UDTA such as the software version 510, MAC address 520, unit address 530, current virtual channel 540, current channel frequency 550, power level 560, and signal to noise ratio 570. In other embodiments, additional information could be provided.

Channel (up/down) – The "Channel Up" 340a-d and "Channel Down" 342a-d buttons, when activated, allow the user to tune to the next or previous channel.

Channel to – The "Channel to" button 344a-d, when activated, attempts to tune to the channel in the virtual channel map that is input into the modifiable field 346a-d.

At the bottom of the example GUI 200 of Figures 3 and 4 is the text box 230 which provides important diagnostic and debugging information. The text in here can be highlighted, copied or saved to a file. Other options include a fully workable terminal that allows a user to have complete control of any connected UDTA with keyboard interaction, similar to the command prompt (or a batch file). As the GUI application is communicating with the UDTAs, the text box is updating with the most recent information.

In addition to the controls 330 provided for controlling the individual UDTAs, The GUI 200 can also provide global commands 220 that control all UDTA's. Examples of such controls include a "Clear Terminal" button 324, the previously mentioned "Populate List" 222 and "Refresh List" 322 buttons, a "Reset All" button 326, and a "Tune Sequentially" button 328. The functionality of these buttons is described below.

Clear Terminal – The "Clear Terminal" button 324, when activated, removes all the text in the text box 230 to prevent clutter.

Populate List / Refresh List – The "Populate List" 222, and "Refresh List" 322 buttons, when activated, ping all the serial ports for UDTAs (If a user had 20 UDTAs with the program running, then hooked up 20 more, and pressed "Refresh List", they would populate the list of UDTAs available for control).

Reset all – The "Reset all" button 326, when activated, does a software reset on all of the UDTAs.

Tune sequentially – The "Tune sequentially" button 328, when activated, takes the current virtual channel of the first UDTA, and forces the second UDTA to tune to the next virtual channel after it. This is accomplished by first tuning the second UDTA to the channel of the first UDTA, and then logically tuning up. It then repeats that process for every UDTA in the list. Such that the third UDTA is tuned to the third available virtual channel, the forth UDTA is tuned to the forth available virtual channel and so forth. This results in each of the available UDTA outputting a different tuned channel which can then be combined (using combiner 180 after being converted from and baseband audio-video signals 170a-c into an radio frequency modulated signals 174a-c by Drake modules 172a-c) into and analog cable signal 185 (See Figure 1) that can then distributed to the various dwellings of a multi-dwelling environment.

An exemplary method 600 of controlling multiple UDTAs can be seen in Figure 6. In this embodiment, the method includes the optional steps of providing a prompt to the user to populate the listing of UDTAs available for control (step 610) and receiving a user command to populate the listing of UDTAs available for control (step 620). The UDTAs available for control can then be listed (step 630) and controls for the UDTAs are provided (step 640). The embodiment of Figure 6 also includes the steps of receiving commands provided via the controls (step 650) and performing or executing the commands (step 660).

An example of providing a prompt to a user to populate the listing of available UDTAs (step 610) can be seen in Figure 2 where in the text box 230 the user is instructed to press "Populate List." The receiving of the command to populate the list (620) and the execution of the command is also explained above in relation to Figures 2 and 3.

An example of providing a listing of UDTAs available for control (step 630) and providing controls for the UDTAs (Step 640) can be seen in Figures 3 and 4. The description of the controls 220 and 320 in relation to Figures 3, 4, and 5 provide examples of receiving a command (step 650) and performing the command (step 660). For example, when the more info button 338a is activated the pop-up screen 500 depicted in Figure 5 is provided.

While one embodiment has been focused on, it will be understood that various modifications may be made. For example, elements of different implementations may be combined, supplemented, modified, or removed to produce other implementations. Additionally, one of ordinary skill will understand that other structures and processes may be substituted for those disclosed and the resulting implementations will perform at least substantially the same function(s), in at least substantially the same way(s), to achieve at least substantially the same result(s) as the implementations disclosed. Accordingly, these and other implementations are contemplated by this disclosure and are within the scope of this disclosure.

Most preferably, the principles of the invention can be implemented in hardware, firmware, software, or any combination thereof. Moreover, the software is preferably implemented as an application program tangibly embodied on a program storage unit or computer readable medium. One of ordinary skill in the art would recognize that a "machine readable medium" is a medium capable of storing data and can be in a form of a digital circuit, an analogy circuit or combination thereof. The application program may be uploaded to, and executed by, a machine comprising any suitable architecture. Preferably, the machine is implemented on a computer platform having hardware such

as one or more central processing units ("CPUs"), a memory, and input/output interfaces. The computer platform may also include an operating system and microinstruction code. The various processes and functions described herein may be either part of the microinstruction code or part of the application program, or any combination thereof, which may be executed by a CPU, whether or not such computer or processor is explicitly shown. In addition, various other peripheral units may be connected to the computer platform such as an additional data storage unit and a printing unit.

CLAIMS

1. A method for controlling multiple universal digital terminal adapters (UDTAs), the method comprising:

providing a listing of UDTAs available for control; and

providing controls for one or more of the UDTAs in the listing of UDTAs.

2. The method of claim 1, further comprising the steps of:

receiving a command via the controls for one or more of the UDTAs in the listing of UDTAs; and

performing the command.

3. The method of claim 1, wherein the listing of UDTAs available for control is provided in response to a command from a user.

4. The method of claim 3, wherein the command from the user is received in response to a prompt provided to the user.

5. The method of claim 1, wherein the provided listing of UDTAs available for control further comprises additional information about each of the available UDTAs.

6. The method of claim 5, wherein the additional information for each of the UDTAS comprises one or more of: a unit identifier; a MAC address; a unit address; and the channel to which the UDTA is currently tuned.

7. The method of claim 1, further comprising:

providing a text box for providing additional information about UDTAs available for control.

8. The method of claim 7, wherein the additional information comprises one or more of: user prompts; diagnostic information; and debugging information.

9. The method of claim 7, wherein the provided text box is further configured to receive commands from a user.

10. The method of claim 1, wherein the provided controls for one or more of the UDTAs in the listing of UDTAs comprise one or more of the following: ON; OFF; reset; more information; channel up; channel down; and direct channel input.

11. The method of claim 1, wherein the provided controls for one or more of the UDTAs in the listing of UDTAs comprise global commands for controlling all of the available UDTAs.

12. The method of claim 11, wherein the global commands comprise one or more of the following: Clear terminal; populate list; refresh list, reset all; and tune sequentially.

13. A user interface for controlling multiple universal digital terminal adapters (UDTAs), the user interface comprising:

a field for displaying a listing of UDTAs available for control; and

controls for the UDTAs listed in the field.

14. The user interface of claim 13, wherein the controls for the UDTAs listed in the fields comprise buttons selectable by a user.

15. The user interface of claim 13, wherein the displayed listing of UDTAs available for control further comprises additional information about each of the available UDTAs.

16. The user interface of claim 15, wherein the additional information for each of the UDTAS comprises one or more of: a unit identifier; a MAC address; a unit address; and the channel to which the UDTA is currently tuned.

17. The user interface of claim 13, further comprising:

a text box for providing additional information about UDTAs available for control.

18. The user interface of claim 17, wherein the additional information comprises one or more of: user prompts; diagnostic information; and debugging information.

19. The user interface of claim 17, wherein the provided text box is further configured to receive commands from a user.

20. The user interface of claim 13, wherein the controls for one or more of the UDTAs in the listing of UDTAs comprise one or more of the following: ON; OFF; reset; more information; channel up; channel down; and direct channel input.

21. The user interface of claim 13, wherein the provided controls for one or more of the UDTAs in the listing of UDTAs comprise global commands for controlling all of the available UDTAs.

22. The user interface of claim 21, wherein the global commands comprise one or more of the following: Clear terminal; populate list; refresh list, reset all; and tune sequentially.

23. A computer readable medium containing instructions for performing the steps comprising:

providing a listing of UDTAs available for control; and

providing controls for one or more of the UDTAs in the listing of UDTAs.

24. A system comprising:

multiple Universal digital terminal adapters (UDTAs);

a computer connected to the multiple UDTAs; and

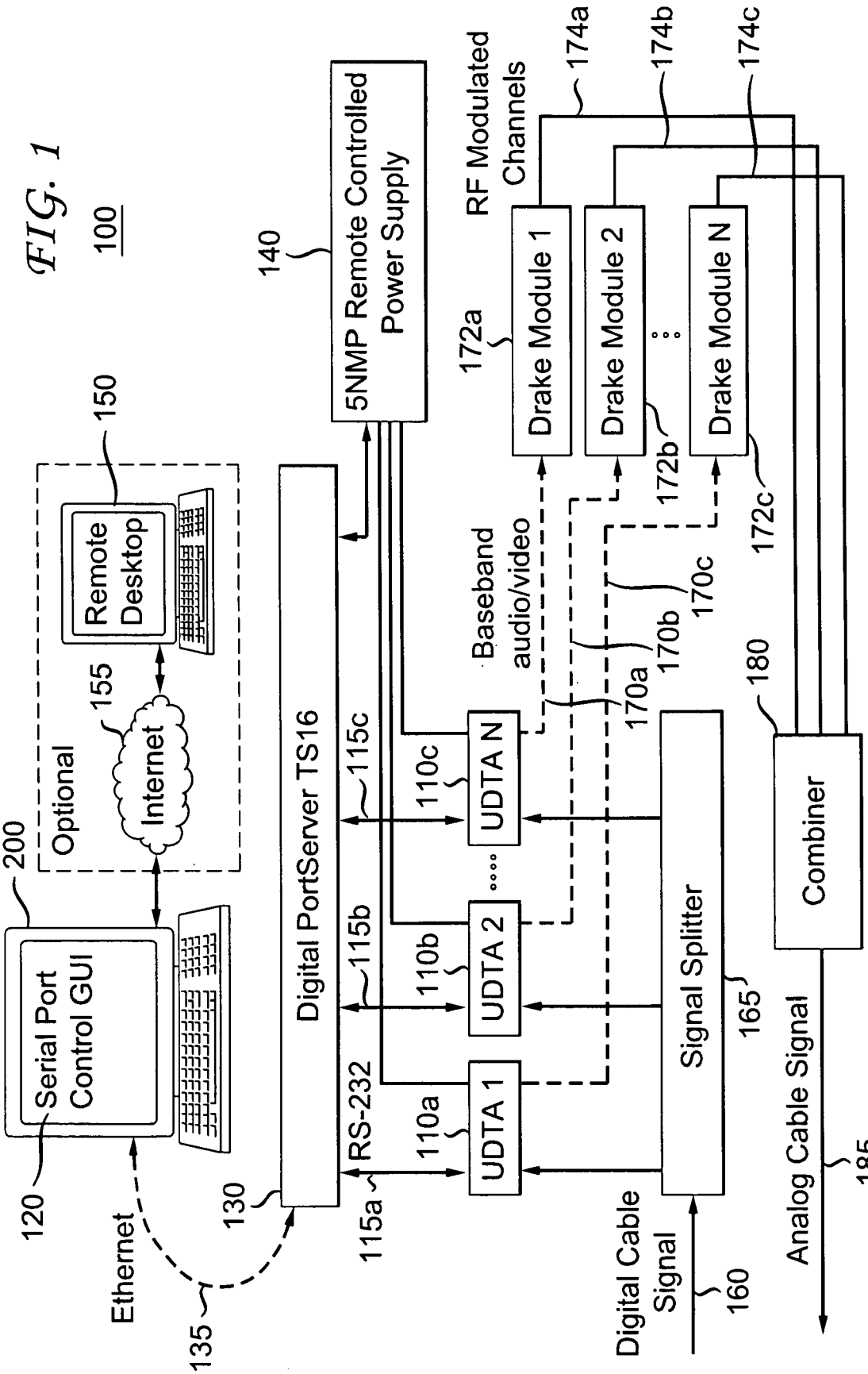
a user interface for controlling the multiple universal digital terminal adapters (UDTAs), the user interface comprising:

a field for displaying a listing of UDTAs available for control; and

controls for the UDTAs listed in the field.

25. The system of claim 24, further comprising a digital port server connecting the multiple UDTAs and the computer.

FIG. 1


100
140
5NMP Remote Controlled Power Supply
RF Modulated Channels
174a
174b
174c
172a
Drake Module 1
Drake Module 2
Drake Module N
172b
172c
150
Remote Desktop
155
Internet
Optional
200
Serial Port Control GUI
120
Ethernet
135
130
Digital PortServer TS16
115a
RS-232
115b
115c
110a
110b
110c
UDTA 1
UDTA 2
UDTA N
Baseband audio/video
170a
170b
170c
Signal Splitter
165
Digital Cable Signal
160
180
Combiner
Analog Cable Signal
185

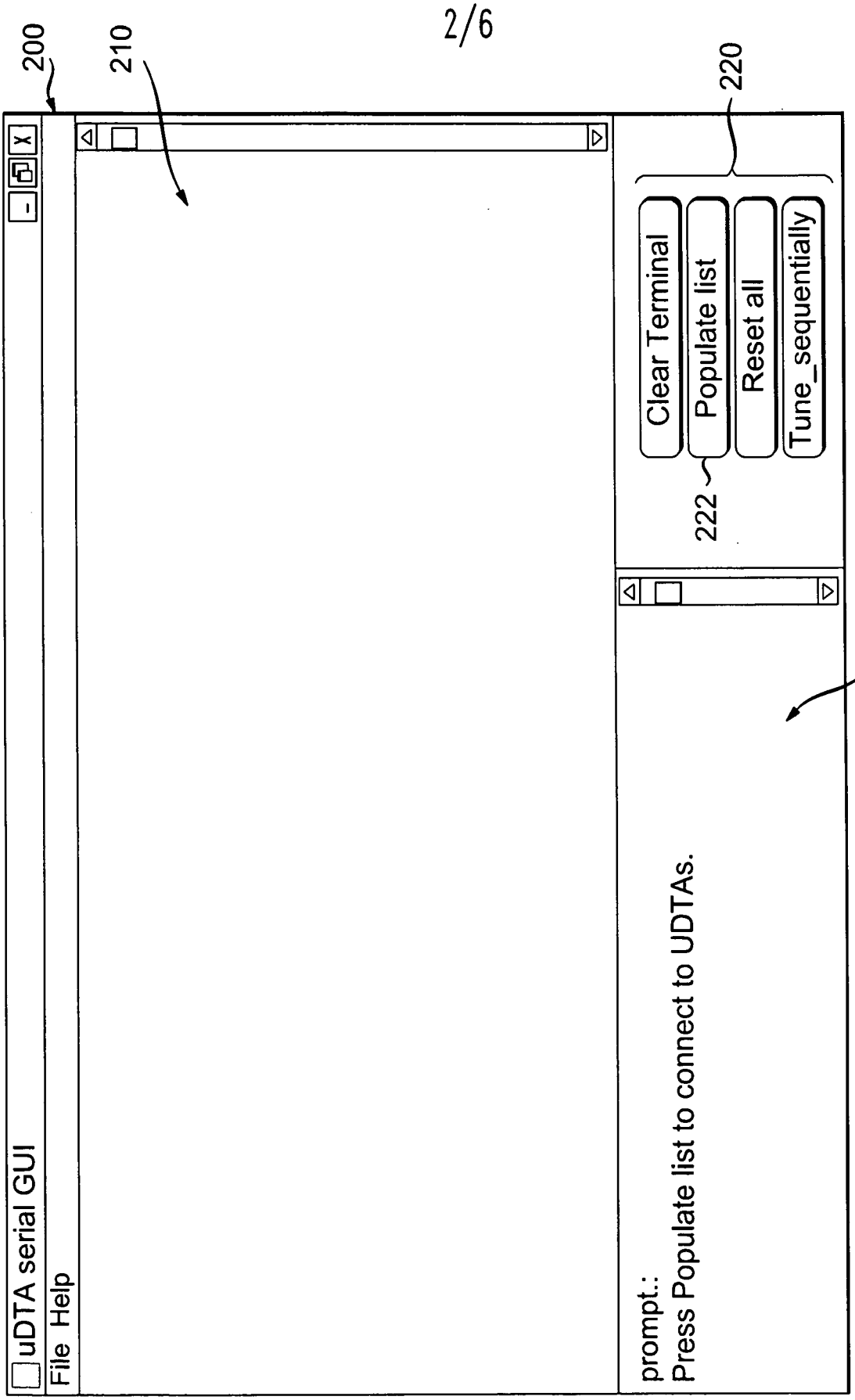

200
210
220
uDTA serial GUI
File Help
Clear Terminal
Populate list
Reset all
Tune_sequentially
222
230
prompt::
Press Populate list to connect to UDTAs.

FIG. 2

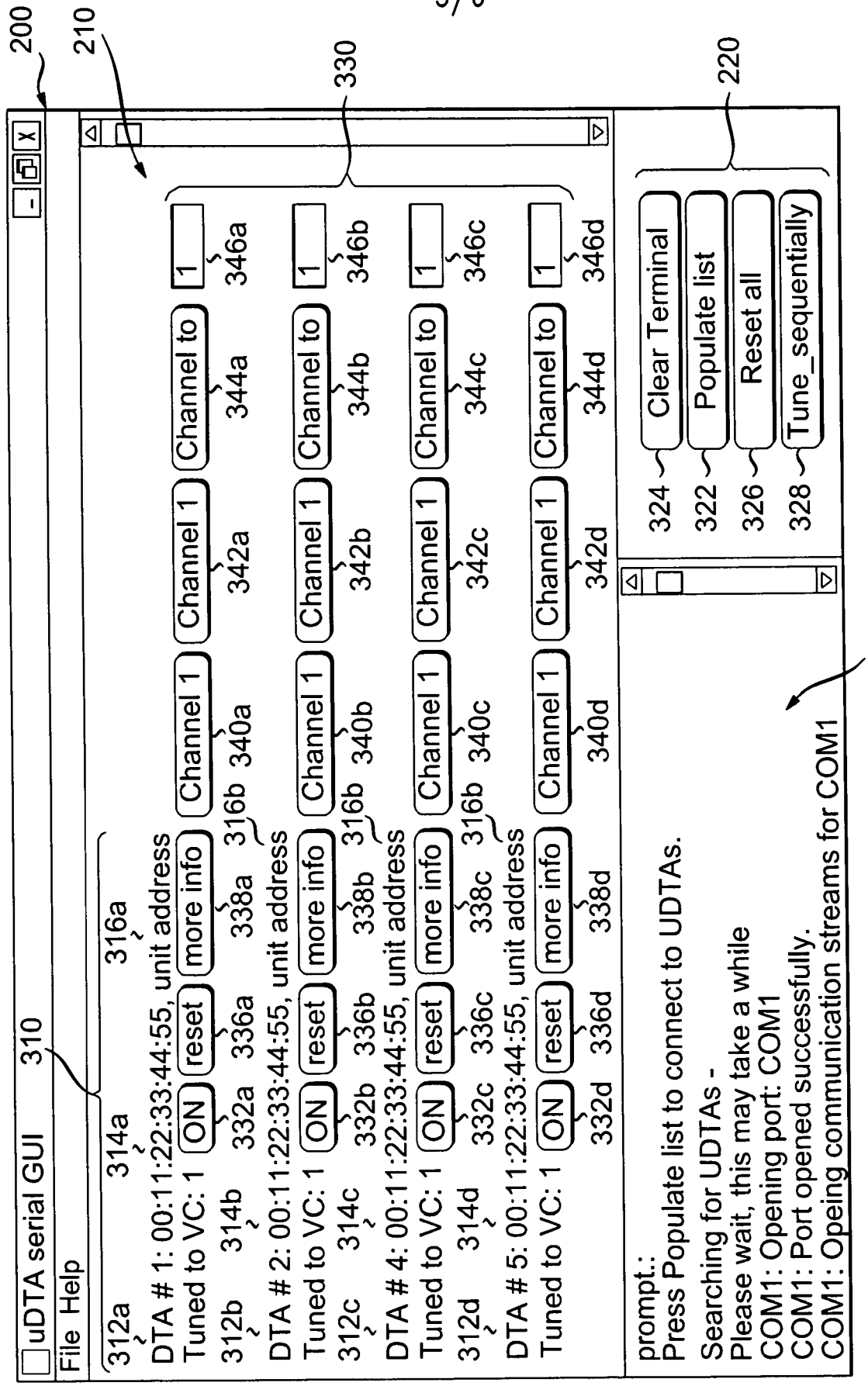

200
210
uDTA serial GUI
310
File Help
312a
314a
316a
DTA # 1: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel to
1
332a
336a
338a
316b
340a
342a
344a
346a
312b
314b
DTA # 2: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel to
1
332b
336b
338b
316b
340b
342b
344b
346b
312c
314c
DTA # 4: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel to
1
332c
336c
338c
316b
340c
342c
344c
346c
312d
314d
DTA # 5: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel to
1
332d
336d
338d
340d
342d
344d
346d
330
220
324
Clear Terminal
322
Populate list
326
Reset all
328
Tune_sequentially
prompt.:
Press Populate list to connect to UDTAs.
Searching for UDTAs -
Please wait, this may take a while
COM1: Opening port: COM1
COM1: Port opened successfully.
COM1: Opeing communication streams for COM1
230

FIG. 3

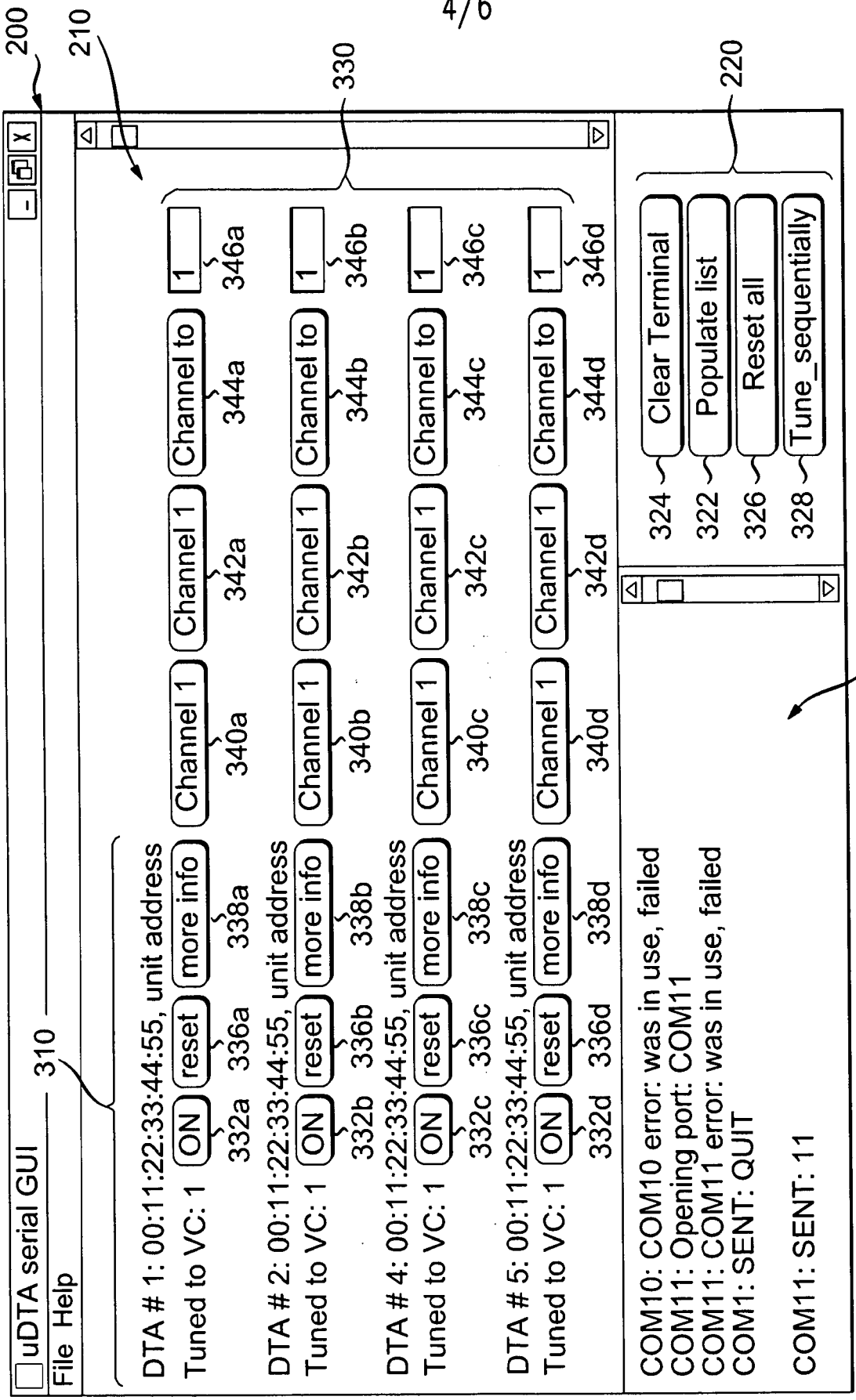

200
210
330
220
uDTA serial GUI
310
File Help
DTA # 1: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel to
1
332a 336a 338a 340a 342a 344a 346a
DTA # 2: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel to
1
332b 336b 338b 340b 342b 344b 346b
DTA # 4: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel to
1
332c 336c 338c 340c 342c 344c 346c
DTA # 5: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel to
1
332d 336d 338d 340d 342d 344d 346d
Clear Terminal
Populate list
Reset all
Tune_sequentially
324
322
326
328
COM10: COM10 error: was in use, failed
COM11: Opening port: COM11
COM11: COM11 error: was in use, failed
COM1: SENT: QUIT
COM11: SENT: 11
230

FIG. 4

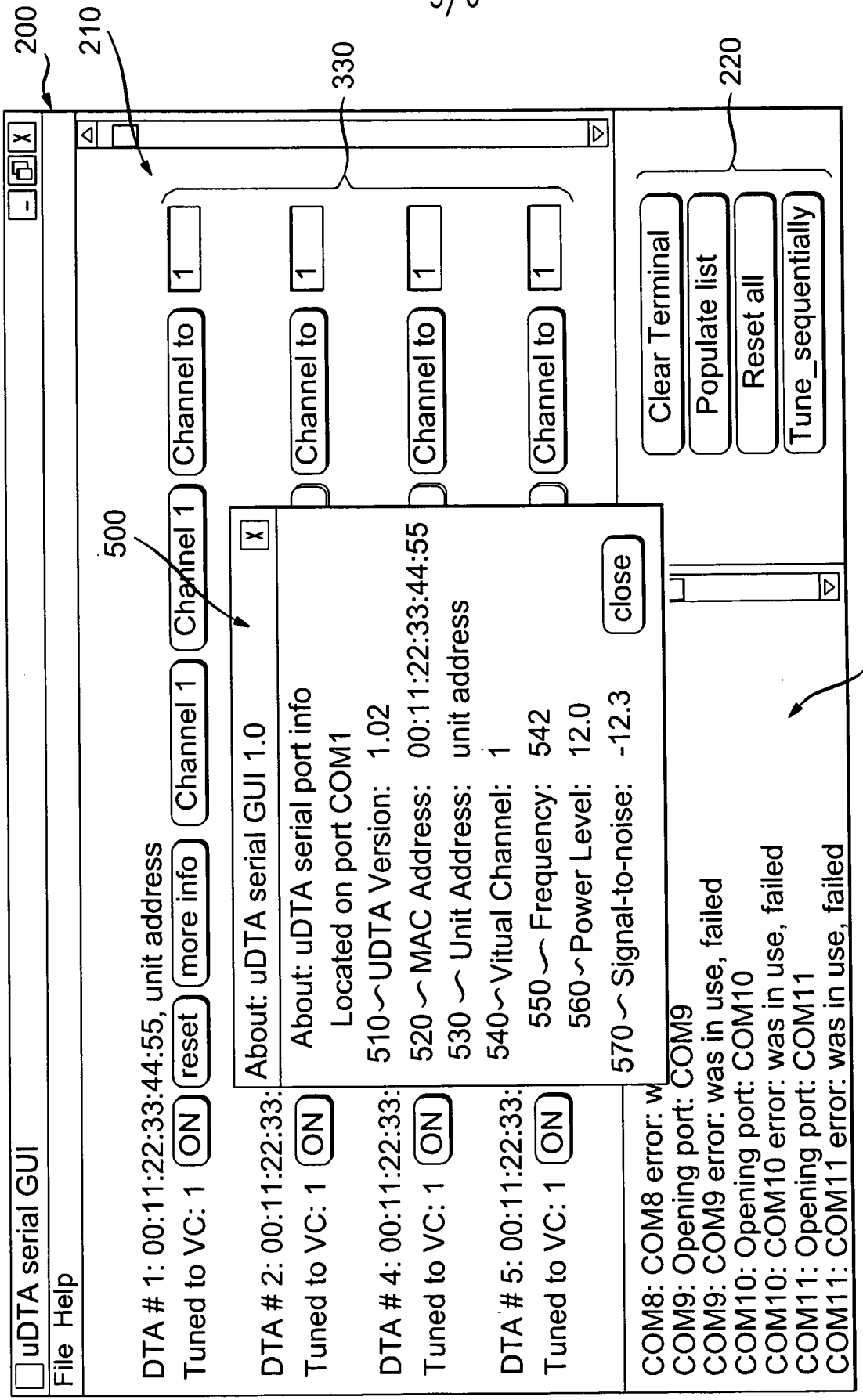

200
210
330
220
500
230
uDTA serial GUI
File Help
DTA # 1: 00:11:22:33:44:55, unit address
Tuned to VC: 1
ON
reset
more info
Channel 1
Channel 1
Channel to
1
DTA # 2: 00:11:22:33:
Tuned to VC: 1
ON
Channel to
1
DTA # 4: 00:11:22:33:
Tuned to VC: 1
ON
Channel to
1
DTA # 5: 00:11:22:33:
Tuned to VC: 1
ON
Channel to
1
About: uDTA serial GUI 1.0
About: uDTA serial port info
Located on port COM1
510 UDTA Version: 1.02
520 MAC Address: 00:11:22:33:44:55
530 Unit Address: unit address
540 Vitual Channel: 1
550 Frequency: 542
560 Power Level: 12.0
570 Signal-to-noise: -12.3
close
Clear Terminal
Populate list
Reset all
Tune_sequentially
COM8: COM8 error: w
COM9: Opening port: COM9
COM9: COM9 error: was in use, failed
COM10: Opening port: COM10
COM10: COM10 error: was in use, failed
COM11: Opening port: COM11
COM11: COM11 error: was in use, failed

FIG. 5

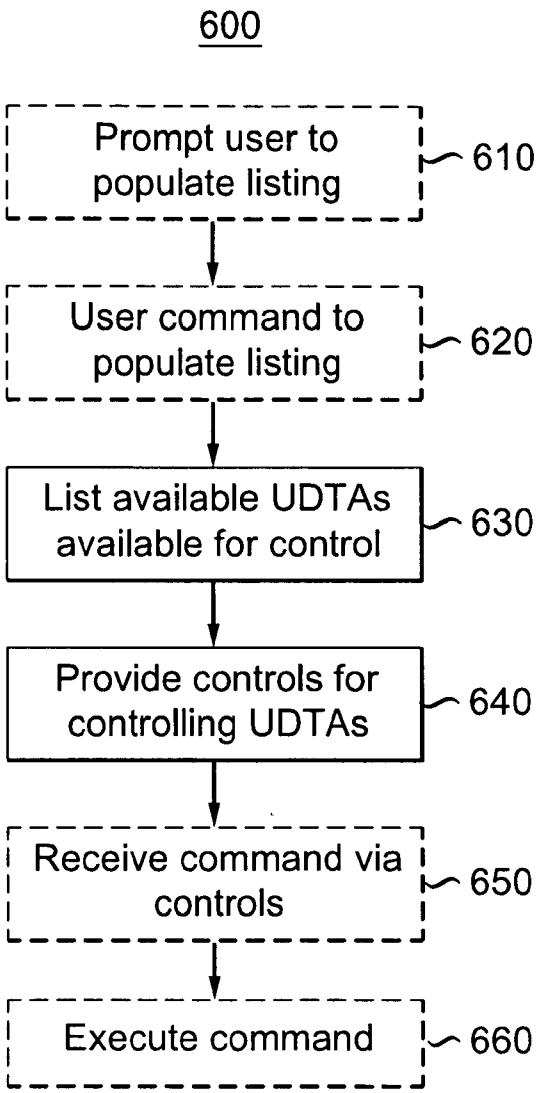

600
Prompt user to populate listing
610
User command to populate listing
620
List available UDTAs available for control
630
Provide controls for controlling UDTAs
640
Receive command via controls
650
Execute command
660

FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/00574

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/00 (2011.01)
USPC - 715/740
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC: G06F 3/00 (2011.01)
USPC: 715/740

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 715/700, 733-740, 764, 810; 345/418; 725/37, 151, 152, 116, 117, 78, 80, 82 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
pubWEST(USPT,PGPB,EPAB,JPAB,USOCR); Google(Web); Search terms used: control manage global forward broadcast global command instruction digital terminal adapters legacy conversion list terminal set-top boxes multi-dwelling apartments hotels console GUI status channel change tune

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/0172757 A1 (ALDREY et al.) 02 July 2009 (02.07.2009) entire document especially Abstract; Figs. 1, 5b, 6; para [0020], [0027], [0056], [0064], [0068], [0075]-[0078]	1-25
Y	US 2007/0203979 A1 (WALKER et al.) 30 August 2007 (30.08.2007) entire document especially Abstract; para [0020], [0022]	1-25
A	US 2004/0187156 A1 (PALM et al.) 23 September 2004 (23.09.2004) entire document	1-25
A	US 2010/0070997 A1 (FRIEDMAN et al.) 18 March 2010 (18.03.2010) entire document	1-25
A	US 2004/0261110 A1 (KOLBECK et al.) 23 December 2004 (23.12.2004) entire document	1-25

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
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"O" document referring to an oral disclosure, use, exhibition or other means
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 May 2011 (20.05.2011)	03 JUN 2011
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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