



(19) **United States**

(12) **Patent Application Publication**
Billock et al.

(10) **Pub. No.: US 2002/0059581 A1**

(43) **Pub. Date: May 16, 2002**

(54) **VIDEO-ON-DEMAND SERVICE WITH AN INTERACTIVE INTERFACE FOR FACILITATING VIEWER SELECTION OF VIDEO PROGRAMS**

(73) Assignee: **Time Warner Entertainment Company, L.P.**

(21) Appl. No.: **10/039,855**

(22) Filed: **Oct. 19, 2001**

(75) Inventors: **John K. Billock**, Greenwich, CT (US);
Craig D. Cuttner, Norwalk, CT (US);
Kevin C. Dowdell, New York, NY (US); **Elizabeth B. Flanagan**,
Westfield, NJ (US); **James E. Granger**,
Corte Madera, CA (US); **Henry C. Hsu**, Port Washington, NY (US);
Robert I. Martin, New York, NY (US);
Robert May, San Francisco, CA (US);
Nicholas Peck, Millvalley, CA (US);
Michael S. Pontecorvo, San Francisco, CA (US); **Bruce E. Probst**, Croton On Hudson, NY (US); **Marc D. Rosenberg**, New York, NY (US);
Debra R. Smul, New York, NY (US);
Dennis P. Wilkinson, Old Greenwich, CT (US); **Robert M. Zitter**, Stamford, CT (US)

Related U.S. Application Data

(63) Continuation of application No. 08/811,418, filed on Mar. 4, 1997, now patented, which is a continuation of application No. 08/305,847, filed on Sep. 14, 1994, now patented.

Publication Classification

(51) **Int. Cl.⁷** **H04N 7/16; H04N 7/173**
(52) **U.S. Cl.** **725/25; 725/87; 725/93**

(57) **ABSTRACT**

A telecasting service is provided that offers video programs upon viewer demand, and which includes an interactive interface for facilitating viewer selection of video programs. The interactive interface allows the viewer to scan through a list of video programs available on the demand telecasting service. The interactive interface also provides the viewer with still images, full-motion previews, and textual descriptions of the available programs. The demand telecasting service distinguishes subscribers from non-subscribers, and provides an interactive facility for allowing non-subscribers to subscribe to the system.

Correspondence Address:

FISH & NEAVE
1251 AVENUE OF THE AMERICAS
50TH FLOOR
NEW YORK, NY 10020-1105 (US)

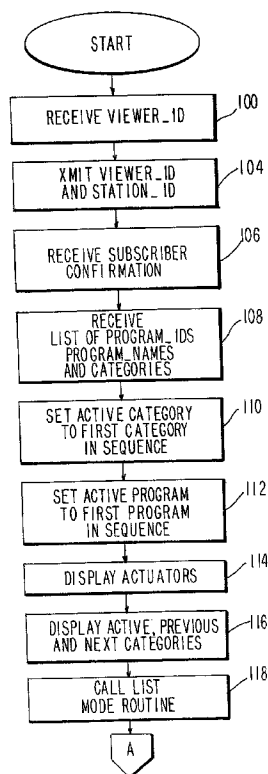
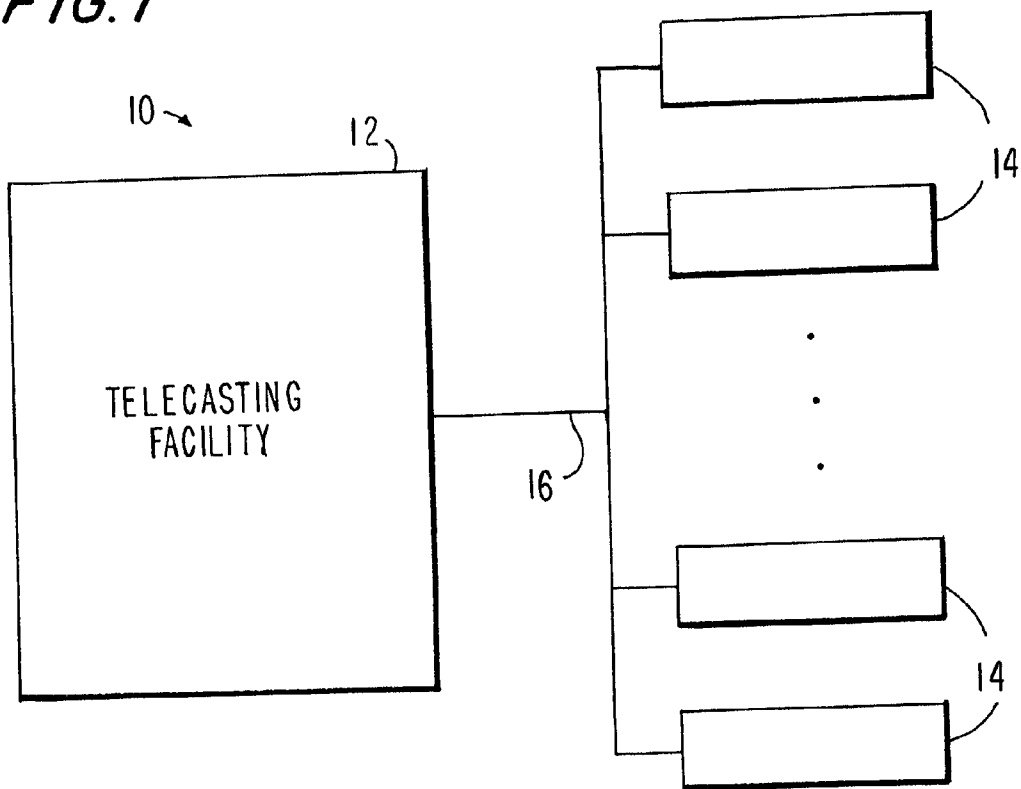


FIG. 1



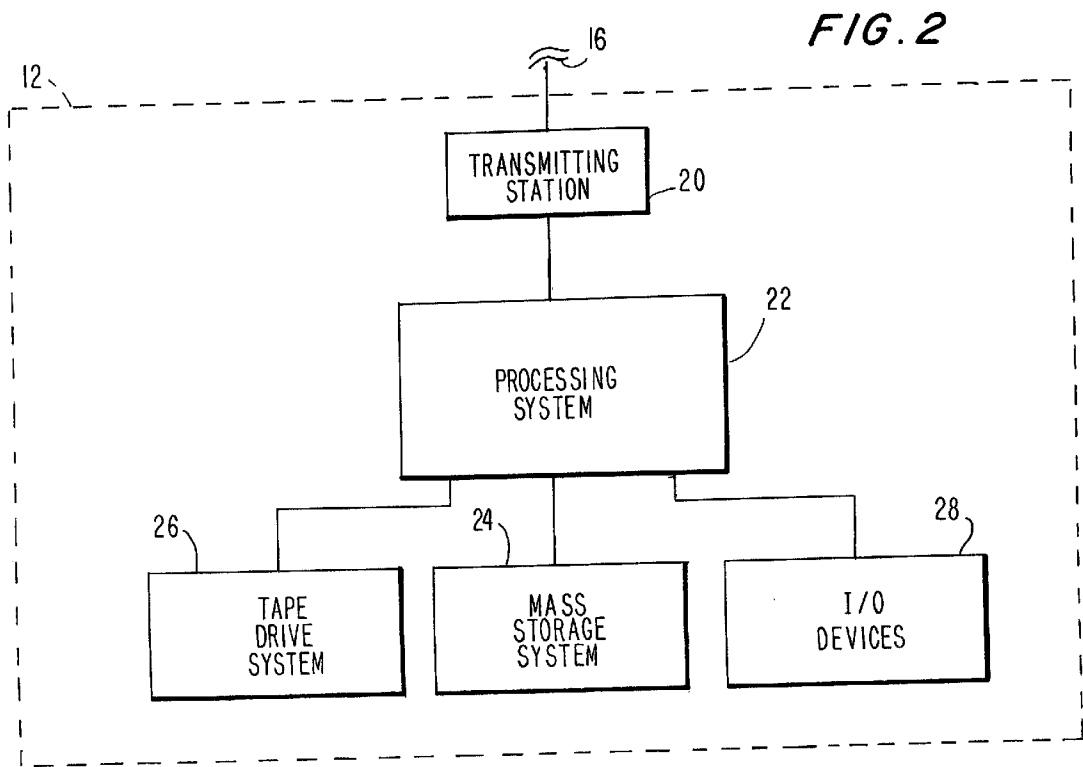
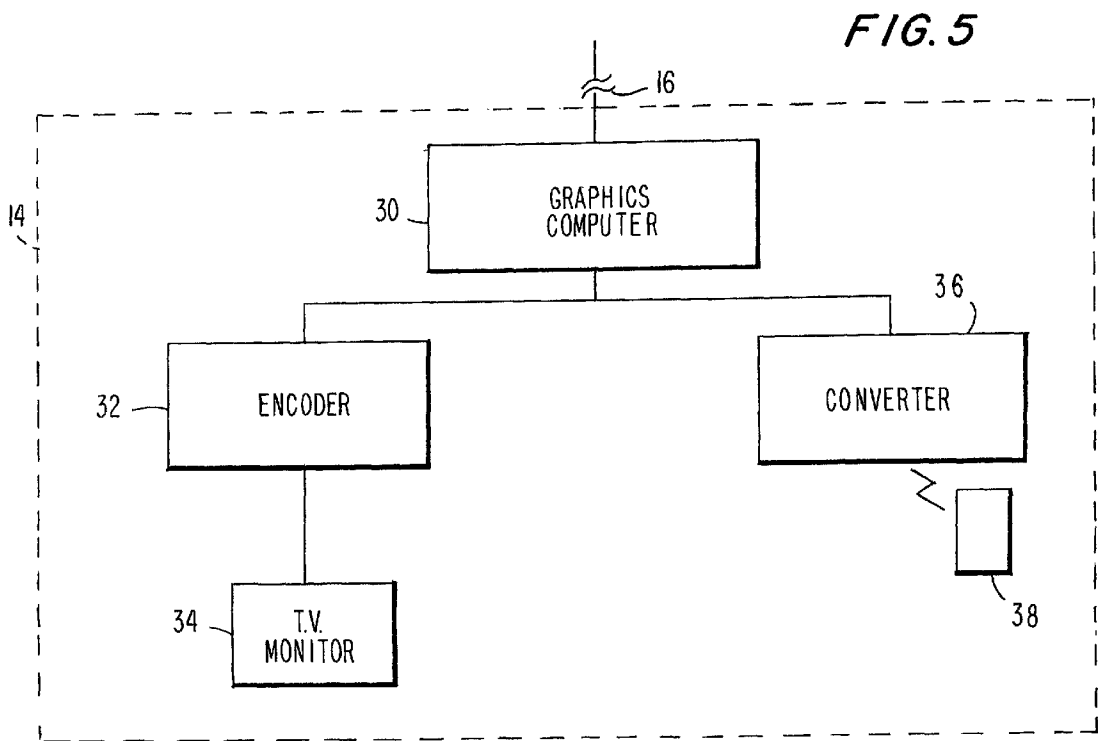


FIG. 3

PROGRAM_ID
PROGRAM_NAME
CATEGORY
CLASSIFICATION
DESCRIPTION
STILL_IMAGE
PREVIEW_VIDEO
PREVIEW_AUDIO
FULL_VIDEO
FULL_AUDIO

FIG. 4

STATION_ID
VIEWER_ID
CLASSIFICATION



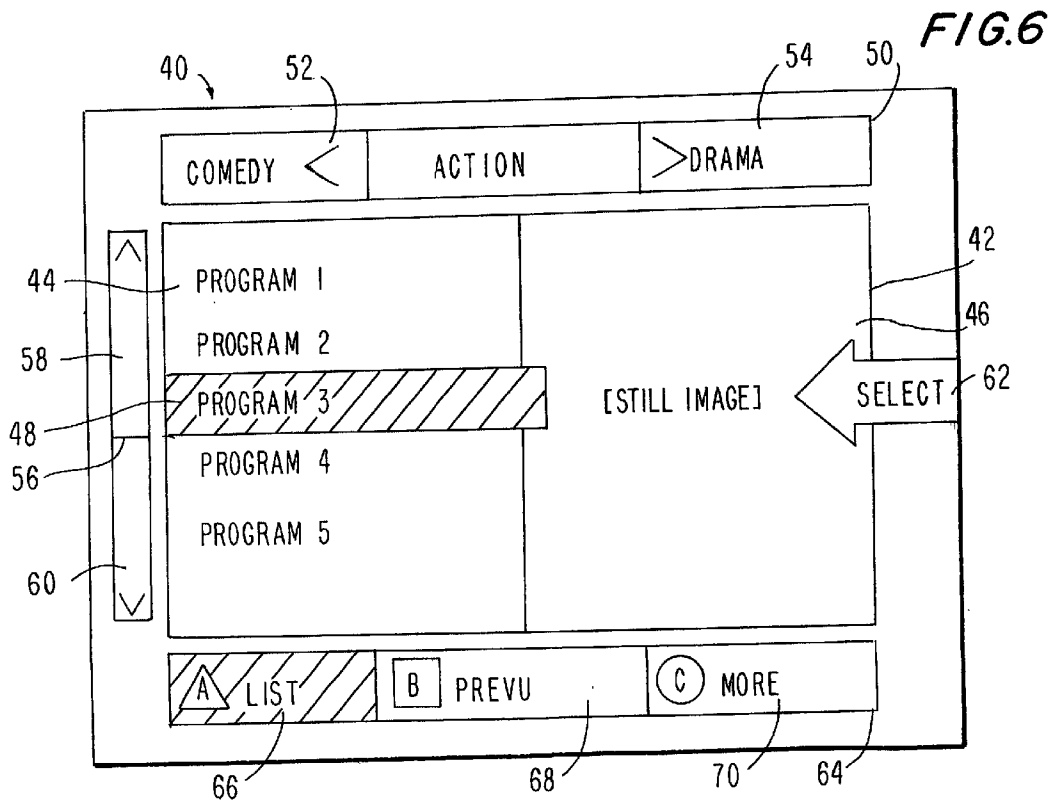


FIG. 7

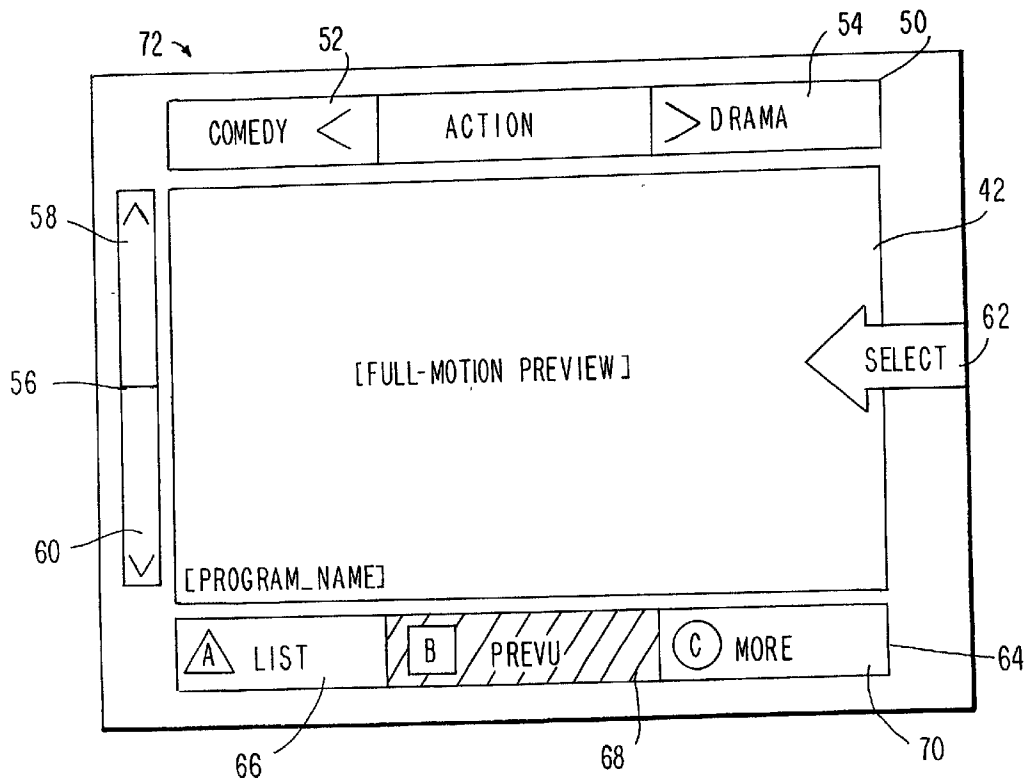
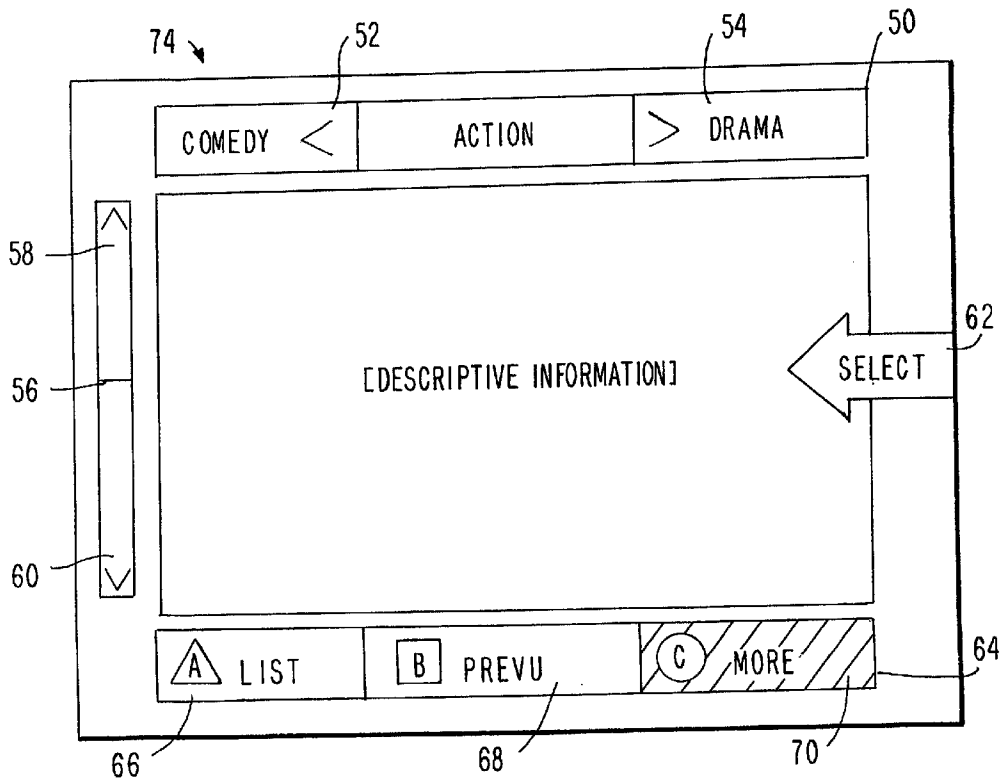


FIG. 8



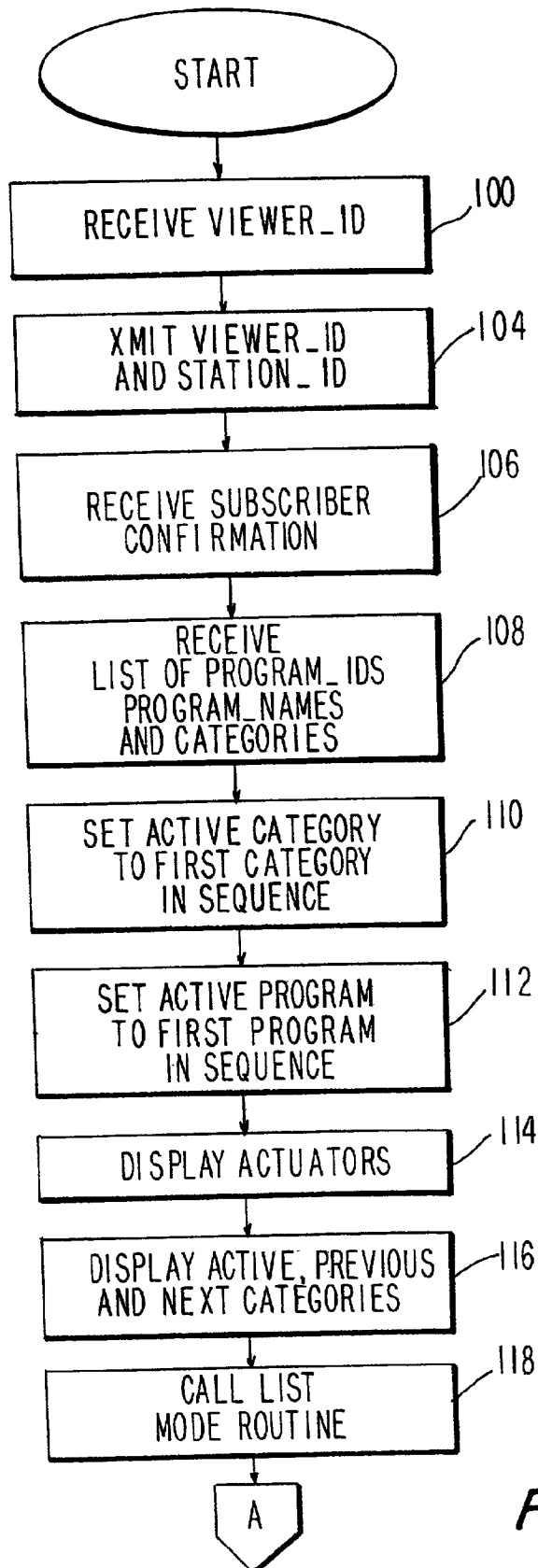


FIG. 9A

FIG. 9B

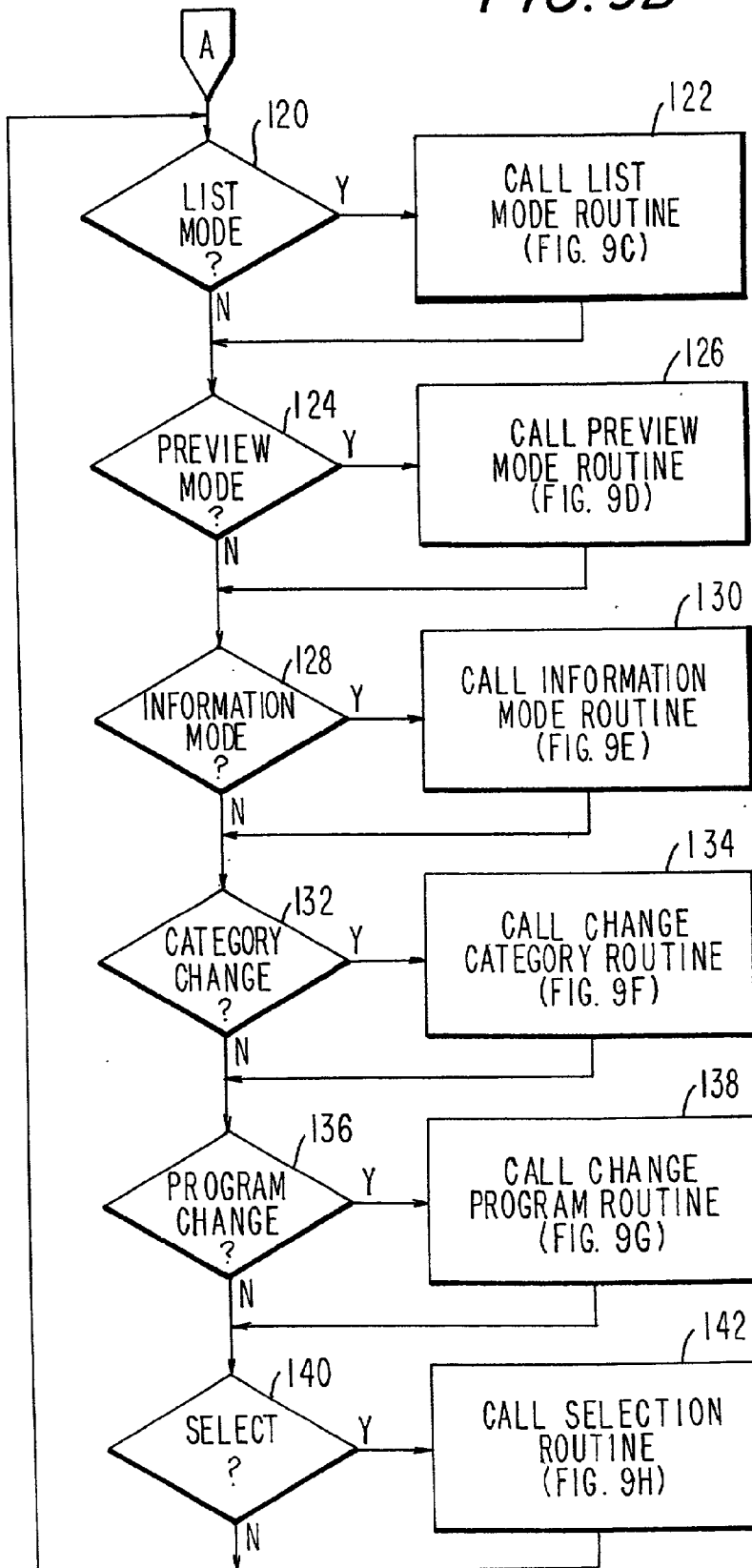
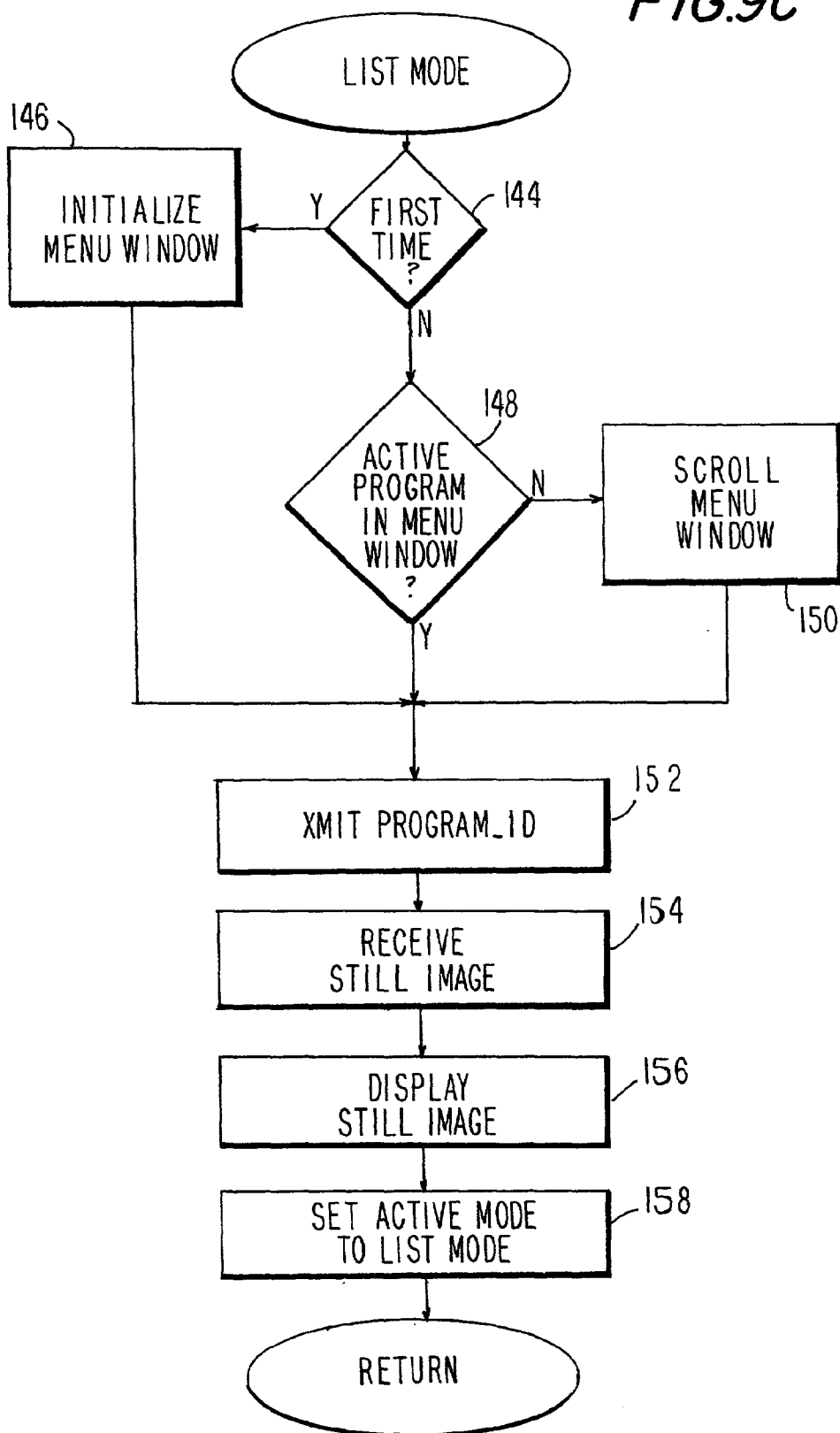
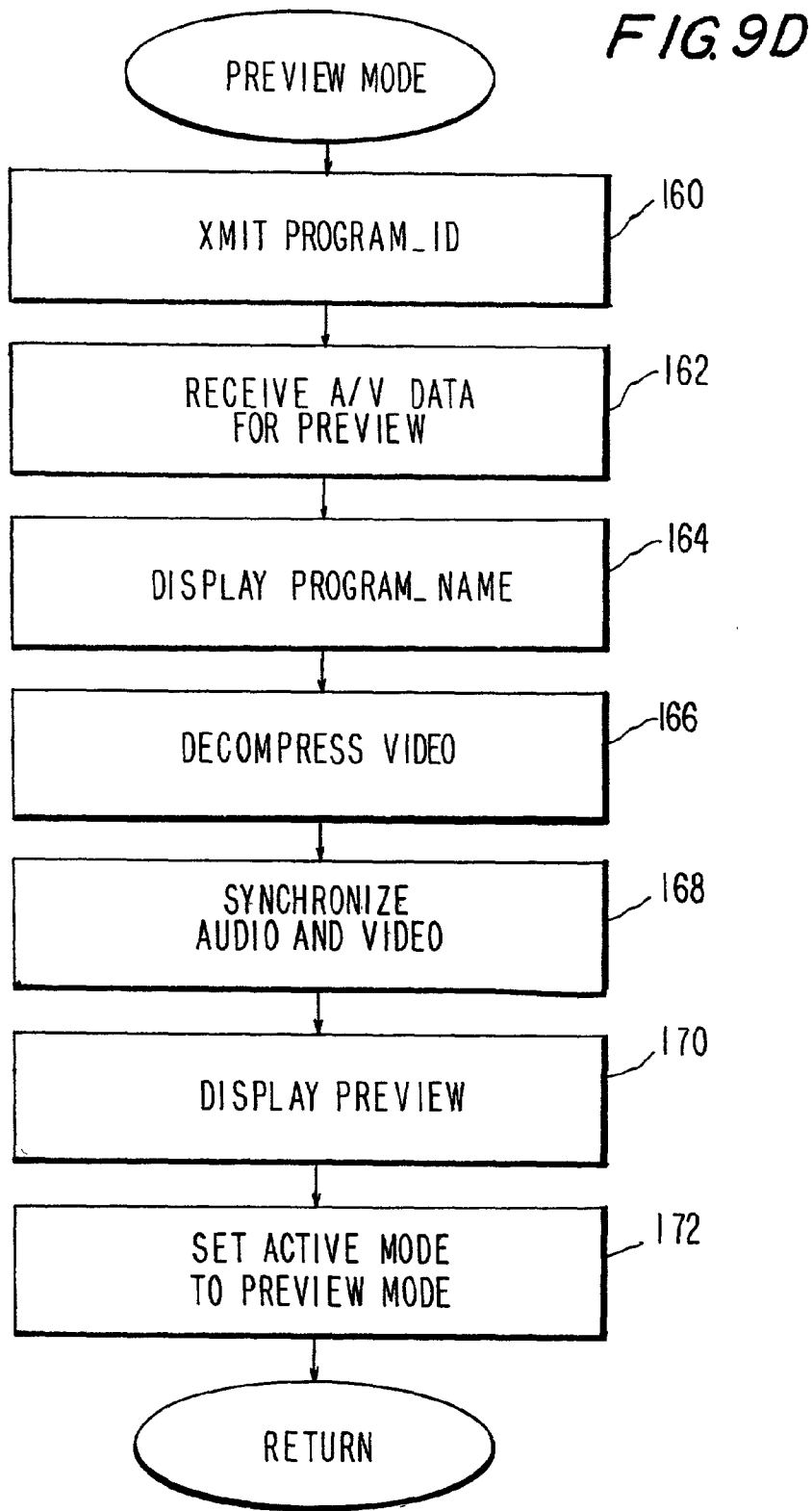


FIG.9C





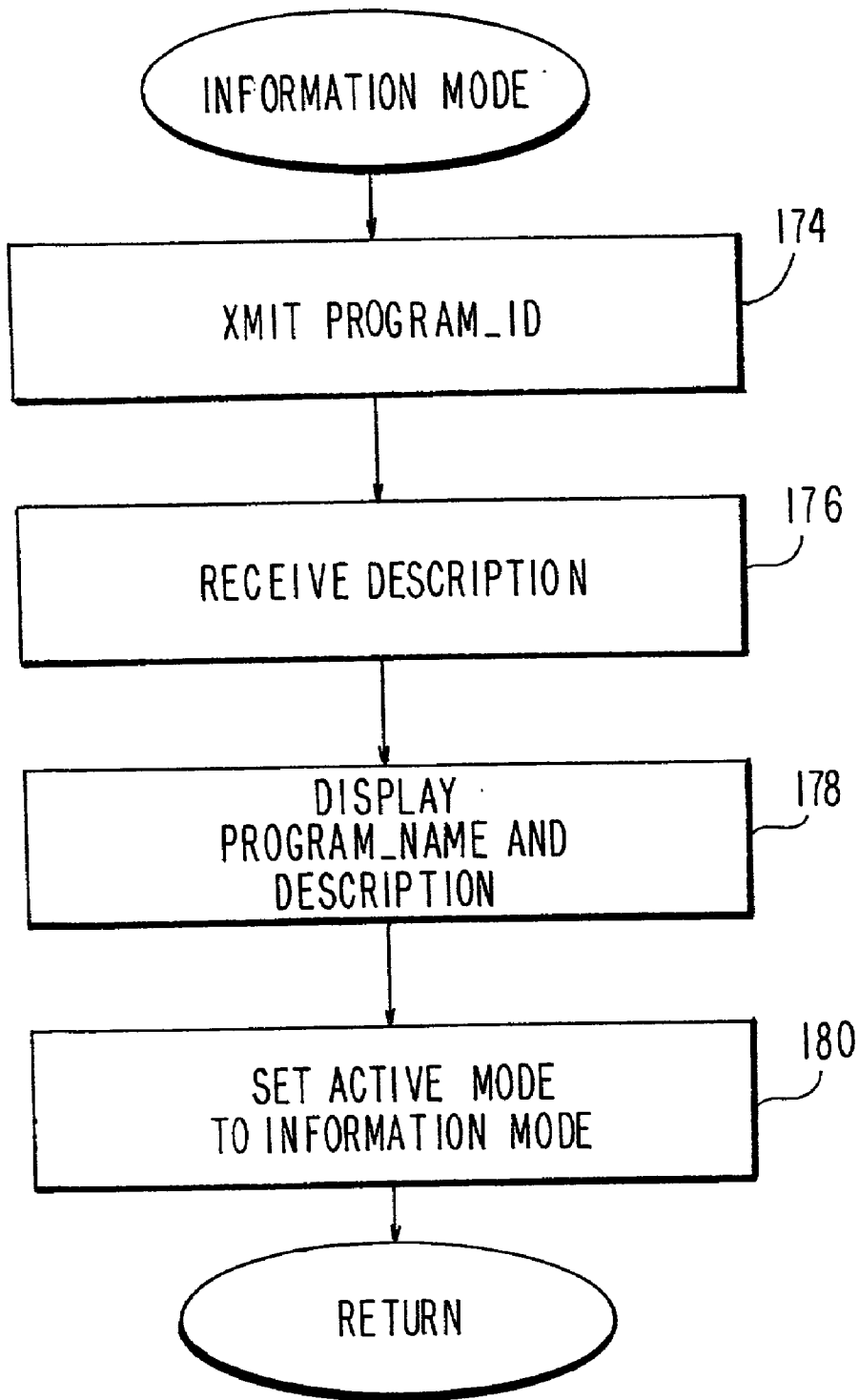


FIG. 9E

FIG. 9F

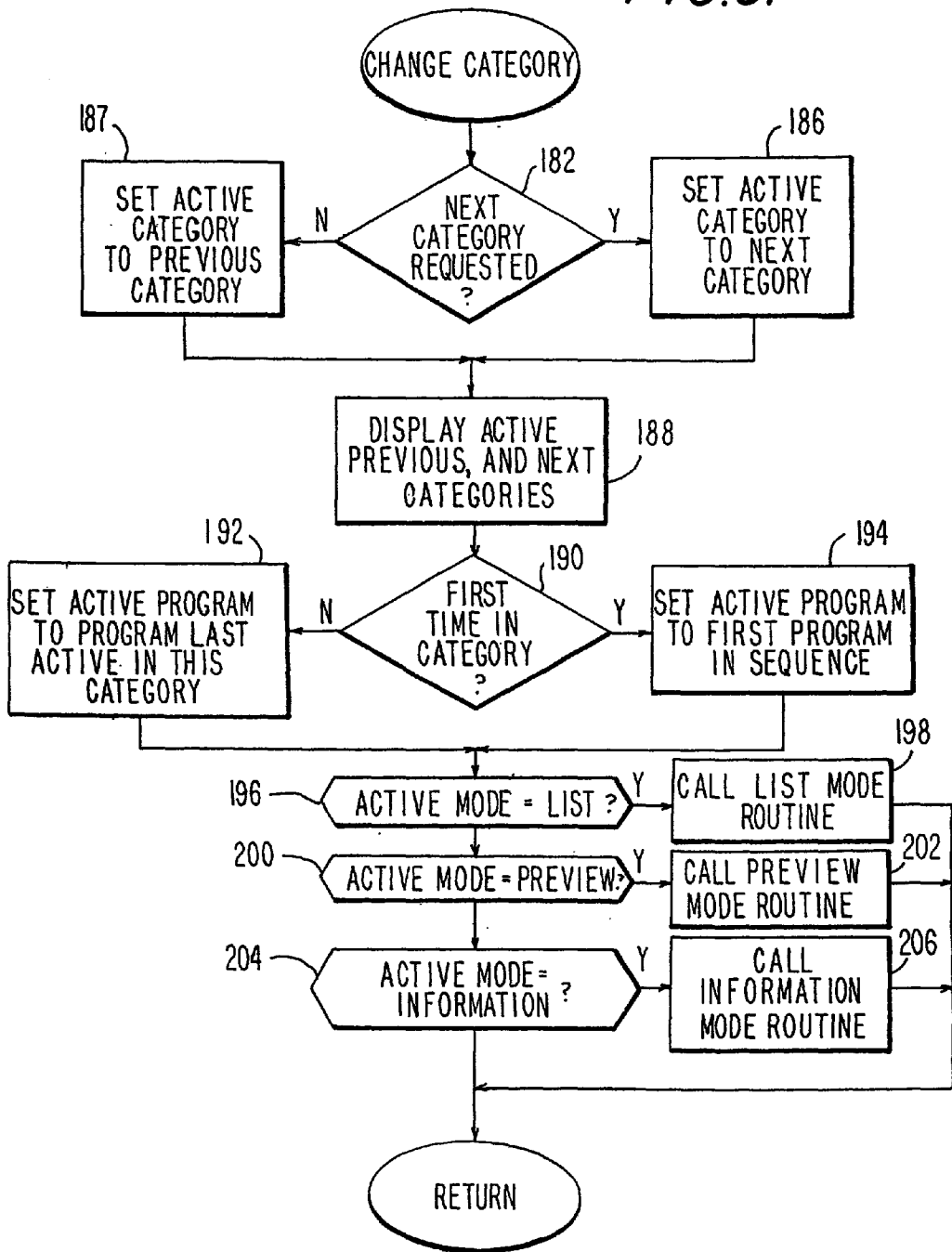


FIG. 9G

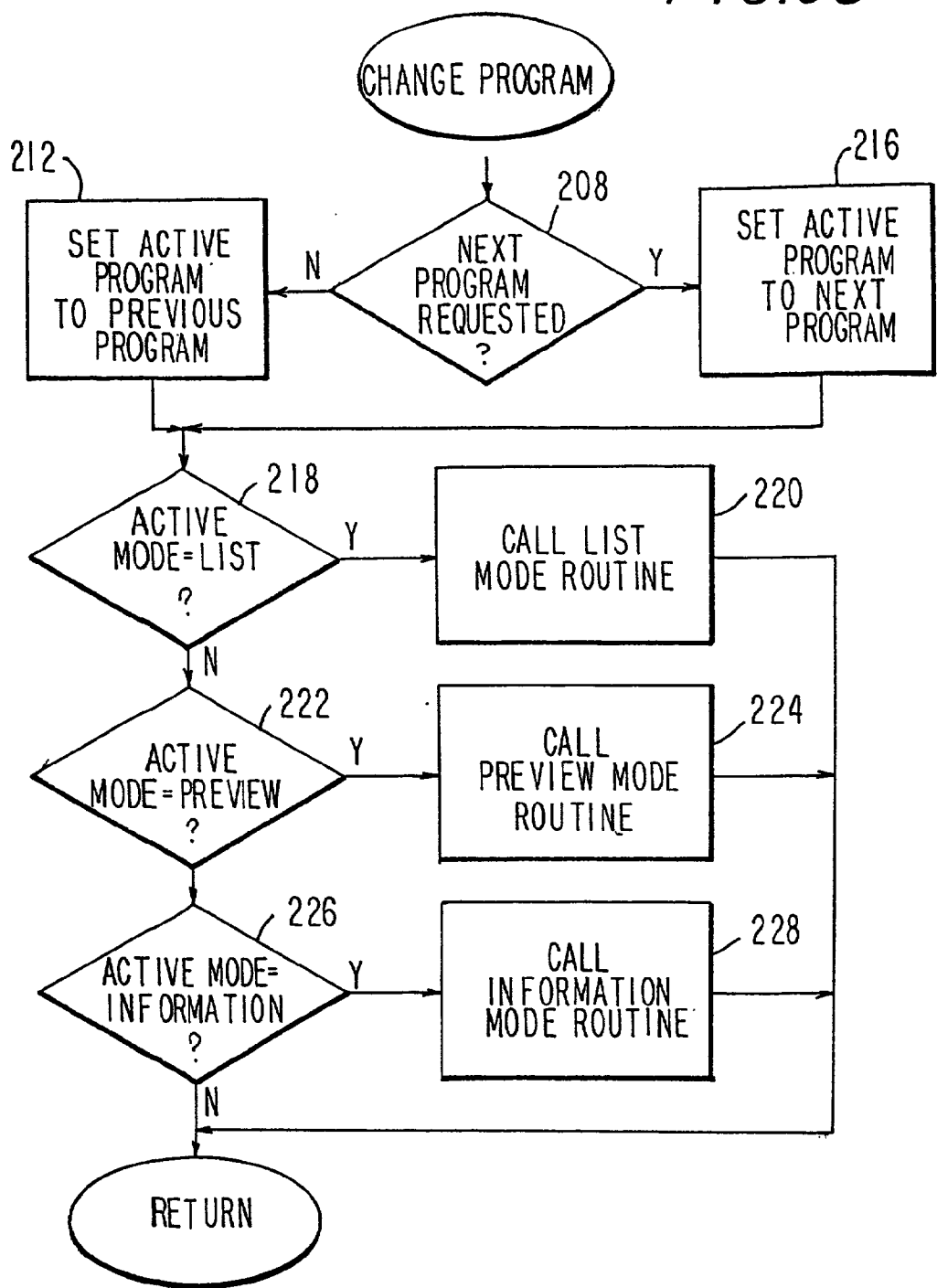
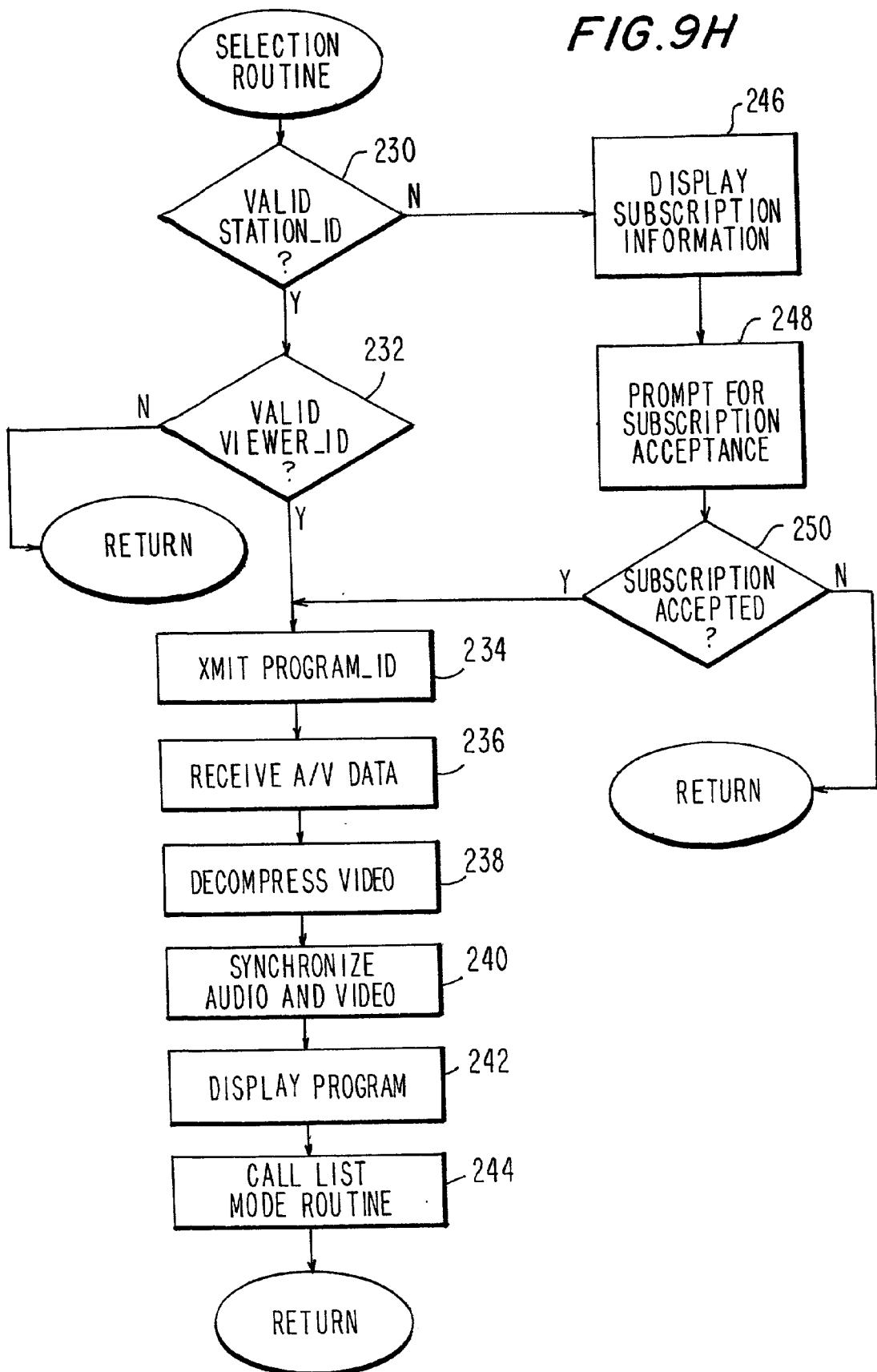


FIG. 9H



VIDEO-ON-DEMAND SERVICE WITH AN INTERACTIVE INTERFACE FOR FACILITATING VIEWER SELECTION OF VIDEO PROGRAMS

Cross Reference to Related Applications

[0001] This is a continuation of copending, commonly assigned U.S. patent application Ser. No. 08/811,418, filed Mar. 4, 1997, now U.S. Pat. No. _____, which is a continuation of commonly assigned U.S. patent application Ser. No. 08/305,847, filed Sep. 14, 1994, now U.S. Patent Ser. No. 5,619,249.

BACKGROUND OF THE INVENTION

[0002] This invention relates to telecasting systems and particularly to telecasting systems that provide video programs which may be viewed on conventional televisions or other suitable video monitors. More particularly, this invention is directed toward a telecasting service that provides video programs upon viewer demand, and which includes an interactive interface for facilitating viewer selection of video programs.

[0003] Television viewing has become an increasingly popular pastime over the past several decades. Commercial and public broadcasting stations and cable networks provide viewers with entertainment programming, educational programming, as well as programming dedicated to news, weather, and commercial advertising. But programming variety is not the only reason for the popularity of television—the convenience of television also contributes substantially to its popularity. Indeed, nearly every household in the United States is equipped with at least one (and commonly several) television sets. It is not surprising that many people take advantage of the convenience of television instead of seeking out other forms of entertainment.

[0004] Early telecasting systems relied almost exclusively on aerial transmissions to deliver video programs to the viewers' television sets. Many difficulties led to the demise of aerial broadcasting as the dominant video delivery system. For example, the quality of aerial broadcasts varies considerably depending on atmospheric conditions and the viewer's geographic location. But more importantly, aerial broadcasting systems could not keep up with viewer demands for increased variety, because of the limited bandwidth available for aerial transmissions.

[0005] In response to the difficulties associated with aerial broadcasting systems, cable telecasting systems have been developed, and they have become the telecasting systems of choice in areas where they are available. Cable telecasting systems provide consistent, high quality transmissions of video programming. They also offer greater variety than aerial systems because more bandwidth is available on cable networks. For example, whereas most viewers receive only a few aerial programming channels, typical cable telecasting systems currently provide 30-75 different programming channels, and systems with even greater channel capacity have been launched in certain areas.

[0006] In most cable telecasting systems, a central telecasting facility is coupled to the subscribing viewers', television sets through a communication network. Most current networks use coaxial cable as the communication medium. However, an increasing number of cable telecasting systems

are migrating to fiber optic networks. Fiber optic networks offer substantially greater bandwidth than coaxial networks, which has created the opportunity for even more programming variety than is currently available. Indeed, a cable telecasting system based on a fiber optic network can support hundreds of programming channels, as compared to the typical few dozen channels offered by coaxial cable-based systems.

[0007] The increased program variety offered by modern cable telecasting systems is advantageous because it gives the viewer a wider selection of video programs to choose from at any given time. However, no matter how many different programs are available, the viewer's selection has to date been limited to the programs that are being exhibited at any particular time. The viewer thus has been constrained by a predetermined program schedule, which may be undesirable in some situations. For example, television viewers are frequently forced to choose between watching a program of particular interest or engaging in an activity that temporally conflicts with the program of interest. Of course, the viewer may choose to record the program, but this is often a cumbersome task, especially if a video recorder is not immediately available.

[0008] Many viewers overcome scheduling conflicts by renting video programs. Although video rental establishments typically offer a wide variety of programs to choose from, the process of renting video programs is rather inconvenient. As a result, a large number of viewers may forego viewing a particular program of interest until it is scheduled on one of the program channels—which may not occur until sometime in the distant future, if at all.

[0009] In view of the foregoing, it would be desirable to provide a demand telecasting service which allows a viewer to select a video program from a plurality of available programs, and which telecasts the selected program substantially at the time the viewer makes the program selection.

[0010] It would also be desirable to provide a telecasting service that includes an interactive interface which allows a viewer to review a list of available video programs and which facilitates the viewer's selection of a desired program.

[0011] It would further be desirable to provide a telecasting service that allows a viewer to preview a segment of a video program before viewing the entire video program.

[0012] It would even further be desirable to provide a telecasting service that distinguishes subscribers from non-subscribers, which allows even non-subscribers to preview a segment of a video program, but allows only subscribers to view the entire video program.

SUMMARY OF THE INVENTION

[0013] It is an object of this invention to provide a demand telecasting service which allows a viewer to select a video program from a plurality of available programs, and which telecasts the selected program substantially at the time the viewer makes the program selection.

[0014] It is also an object of this invention to provide a telecasting service that includes an interactive interface which allows a viewer to review a list of available video programs and which facilitates the viewer's selection of a desired program.

[0015] It is a further object of this invention to provide a telecasting service that allows a viewer to preview a segment of a video program before viewing the entire video program.

[0016] It is even a further object of this invention to provide a telecasting service that distinguishes subscribers from non-subscribers, which allows even non-subscribers to preview a segment of a video program, but allows only subscribers to view the entire video program.

[0017] In accordance with this invention, there is provided a demand telecasting service for telecasting video programs for display on a television or other suitable video display. The demand telecasting service allows a viewer to select from among a plurality of programs that are available substantially at the time of viewer selection. The demand telecasting service provides an interactive interface for facilitating viewer selection of a program. The interactive interface includes a memory for storing a list of available programs and a segment of each program on the list, a display generator for displaying the list on the display, and a viewer control unit that is used by the viewer to select one of the programs on the list, to initiate display of the selected program, and to initiate display of one of the segments corresponding to the selected program. After selecting one of the programs from the list and before initiating display of the selected program, the viewer can preview the selected program by initiating display of the segment corresponding to the selected program.

[0018] In order to distinguish subscribers from non-subscribers, the memory of the interactive interface can further store a list of identifiers corresponding to subscribing viewers. The viewer control unit transmits an identifier corresponding to a viewer using the viewer control unit. The interactive interface further comprises a validator for comparing the transmitted identifier to the list of identifiers corresponding to subscribing viewers. When the transmitted identifier does not match any identifier on the list of identifiers, the validator prevents display of the selected program, but allows the viewer to preview the segment corresponding to the selected program.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The above and other objects and advantages of the present invention will be apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which like reference characters refer to like parts throughout, and in which:

[0020] FIG. 1 is a block diagram of a cable telecasting network within which the demand telecasting service of the present invention may be implemented;

[0021] FIG. 2 is a more detailed block diagram of the telecasting facility shown in FIG. 1;

[0022] FIGS. 3 and 4 are tables containing lists of data items stored in the mass storage system shown in FIG. 2;

[0023] FIG. 5 is a more detailed block diagram of one of the viewing stations shown in FIG. 1;

[0024] FIGS. 6-8 are sample screen displays which illustrate the operation of the interactive interface of the present invention; and

[0025] FIGS. 9A-9H are logic flow diagrams representing a control program used to implement the interactive interface of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0026] FIG. 1 shows a cable telecasting network 10 within which the demand telecasting service of the present invention may be implemented. Network 10 includes a telecasting facility 12 and a plurality of viewing stations 14. A communication medium 16 couples telecasting facility 12 to viewing stations 14. Communication medium 16 may be any medium that is suitable for delivering signals over long distances between telecasting facility 12 and viewing stations 14. Preferably, communication medium 16 is fiber optic cable, although other media (such as coaxial cable) may be used instead.

[0027] In many respects, network 10 operates in a conventional manner to make video programs available for viewing on viewing stations 14. Telecasting facility 12 preferably includes a central transmitting station that transmits video programs to viewing stations 14 via communication medium 16. Viewing stations 14 are typically located in viewers' homes or other locations that are convenient for viewing video programs. Each viewing station 14 preferably includes a conventional television monitor or other suitable video display.

[0028] Telecasting facility 12 preferably telecasts a plurality of video programs simultaneously over a plurality of programming channels on communication medium 16. All viewing stations 14 on network 10 have access to the plurality of programs that are telecast by telecasting facility 12. A viewer can view a particular video program by tuning one of the viewing stations 14 to the programming channel that is carrying the program of interest.

[0029] However, unlike conventional telecasting networks, network 10 permits bi-directional communication between telecasting facility 12 and each viewing station 14 over communication medium 16. Preferably, at least one of the plurality of programming channels is used for interactive applications, like the demand telecasting service of the present invention. However, it should be understood that a plurality of programming channels may be used for the demand telecasting service without departing from the spirit of the invention.

[0030] When the viewer tunes one of the viewing stations 14 to the interactive channel, commands may be sent from that viewing station 14 to telecasting facility 12. As described in detail below, such commands may include a program selection command that causes telecasting facility 12 to telecast a program of interest on the interactive channel substantially at the time that the command is transmitted. Although all viewing stations 14 receive all of the signals telecast on the interactive channel, only the viewing station 14 that is used to select a particular program displays the selected program. The use of the interactive channel by one of the viewing stations 14 does not interfere with the use of the interactive channel by another one of the viewing stations 14. Thus, many different viewing stations 14 on network 10 may be used to view different interactively selected programs at the same time.

[0031] Referring now to FIG. 2, a preferred embodiment of a telecasting facility is described that is suitable for use as telecasting facility 12 shown in FIG. 1. As mentioned above, telecasting facility 12 includes a transmitting station 20 that

transmits video programs to viewing stations **14** (**FIG. 1**) over a plurality of programming channels on communication medium **16** in a conventional manner. However, in order to implement the demand telecasting service of the present invention, telecasting facility **12** also includes a processing system **22** coupled to the transmitting station **20**, a mass storage system **24**, a tape drive system **26**, and conventional I/O devices **28** (such as a keyboard, display monitor, and mouse). Mass I/O storage system **24**, tape drive system **26**, and I/O devices **28** are considered peripheral components of processing system **22**.

[0032] Processing system **22** is preferably a multiple processor computer system that is capable of handling many programming requests that may be received from viewing stations **14** (**FIG. 1**) over communication medium **16** on the interactive channel. Such requests are initially received by transmitting station **20** and are subsequently passed on to processing system **22**. In a preferred embodiment, processing system **22** is a network of at least eight Challenge computer systems available from Silicon Graphics, Inc., located in Mountain View, Calif. Each Challenge computer is preferably equipped with at least eight processors operating in parallel, thus providing processing system **22** with at least **64** processors for handling programming requests.

[0033] Mass storage system **24** is preferably an array of high performance disk drives. Alternatively, other types of data storage systems can be used, such as CD-ROM systems.

[0034] Tape drive system **26** is preferably a multi-component system that includes a tape storage unit (not shown), a plurality of tape players (not shown), and an automatic tape retrieval unit (not shown). When a request for a video program is received, processing system **22** instructs the automatic tape retrieval unit to retrieve the tape containing the selected video program from the appropriate location in the tape storage unit. The automatic tape retrieval unit then inserts the tape into an available tape drive, which in turn plays the tape to be telecast. As the tape is played, the video program data (video and audio) is transferred to mass storage system **24** for temporary storage, after which the program is telecast to the viewing station **14** (**FIG. 1**) from which the viewer made the selection. When the tape has finished playing, the automatic tape retrieval unit returns the tape to the appropriate location.

[0035] Tape drive system **26** preferably accommodates professional recording tapes, such digital linear tapes (DLTs), although systems which accommodate other types of media (such as conventional video tapes, digital audio tapes (DATs), video disks, etc.) may be used instead. A suitable automated tape drive system that uses DLTs is available from Digital Equipment Corporation, located in Maynard, Mass. It should be noted, however, that a manual tape storage and retrieval system may be used without departing from the spirit of the invention.

[0036] Preferably, telecasting facility **12** receives tapes containing the video and audio portions of new video programs on a periodic basis (e.g., monthly). The video portion of each video program is preferably stored in a compressed format in accordance with the MPEG-1 video compression standard established by the Motion Picture Experts Group. The tapes are loaded into the storage unit of tape drive system **26**, into locations that may be predeter-

mined by the supplier of the tapes. If a particular predetermined location is occupied, another location may be used, as long as processing system **22** has information reflecting the actual tape location.

[0037] Mass storage system **24** stores many data files used in connection with the demand telecasting service of the present invention. These data files include data files for storing the video and audio portions of frequently selected video programs, data files for storing the video and audio portions of full-motion previews from the available video programs, and data files for storing still images from the available video programs. Mass storage system **24** also stores additional data (described below in connection with **FIGS. 3 and 4**) associated with each available video program and each subscribing viewing station **14** (**FIG. 1**). Further, as mentioned above, mass storage system **24** temporarily stores data files containing the audio and video portions of programs that have been transferred from tape in response to viewer selections.

[0038] The still image data and the video portions of the full-length video programs and full-motion previews are preferably stored in a compressed format in accordance with the MPEG-1 standard.

[0039] The full-motion preview data and the still image data are preferably received on tape along with the tapes containing the corresponding full-length video programs. The full-motion preview data and the still image data for each available program are preferably transferred to mass storage system **24** at the time the corresponding video program tapes are loaded into the tape storage unit of tape drive system **26**.

[0040] When a video program needs to be retrieved from the tape storage unit, the viewer may experience a noticeable delay between the time of selection and the time the program is exhibited. By storing the data for frequently selected programs in mass storage system **24** on a long-term basis, telecasting facility **12** is able to service requests for such programs more rapidly than would otherwise be the case. Indeed, if there is sufficient storage space, it may be preferable to store the entire program library in mass storage system **24**, to eliminate the delays associated with the use of tape drive system **26**.

[0041] Processing system **22** receives requests for available video programs from viewing stations **14** (**FIG. 1**). In a large telecasting network, it should be expected that processing system **22** will be called upon to service a large number of requests within relatively short periods of time. In order to promptly service a large number of requests, processing system **22** preferably uses the asynchronous transfer mode (ATM) protocol to manage data flow on communication medium **16**. In accordance with the ATM protocol, telecasting facility **12** and each viewing station **14** (**FIG. 1**) are assigned time slots during which they are permitted to transmit data on communication medium **16**. Data to be transmitted by a particular device are buffered by that device in a conventional manner until its time slot is reached. When its time slot is reached, the transmitting device transmits the data, along with an address that identifies the device that is to receive the data.

[0042] When large amounts of data need to be transmitted, such as when telecasting facility **12** needs to transmit an

entire video program to one of viewing stations 14 (FIG. 1), the data are divided into smaller packets which are transmitted during different time slots. Each packet is transmitted with a destination address. The destination device receives and reassembles the packets as required. Telecasting facility 12 transmits packets at a rate that allows the receiving viewing station 14 (FIG. 1) to present an uninterrupted video program to the viewer.

[0043] FIGS. 3 and 4 are tables that list data items that are representative of data that are stored in mass storage system 24 (FIG. 2) (in addition to the files containing the full-length video data, the full-motion preview data, and the still image data). The data represented by the tables shown in FIGS. 3 and 4 are preferably stored in conventional database tables.

[0044] The data items listed in FIG. 3 represent data that are stored in connection with each stored video program. This data is preferably transferred to mass storage system 24 (FIG. 2) each time new video program tapes are received by telecasting facility 12 (FIG. 2). This may be accomplished through a tape transfer (similar to the full-motion preview data and the still image data), or through a direct transfer from the video program supplier (e.g., through a modem connection).

[0045] The data item "PROGRAM_ID" represents a unique identifier that is associated with each available video program. As explained below, viewer requests for video programs are accomplished by the transmission of the PROGRAM_ID associated with the desired program from one of viewing stations 14 (FIG. 1) to processing system 22 (FIG. 2). A numerical identifier is preferred as the PROGRAM_ID to facilitate rapid processing of viewer requests.

[0046] The data item "PROGRAM_NAME" preferably represents a text field that contains the commonly known name of an available video program.

[0047] The data item "CATEGORY" preferably represents a text field that contains the name of one of several categories to which a video program may be assigned. Typical categories for video programs may include "action," "drama," "sports," etc. Preferably, the CATEGORY field can support multiple category assignments for each video program. Thus, some video programs may appear in the program listings for two or more categories. For example, a recently released comedy program may be assigned to a "comedy" category, as well as a special category designated "new releases."

[0048] The data item "CLASSIFICATION" is used to further categorize each video program. One particularly useful classification scheme distinguishes video programs that are suitable for children from those that are not. As explained below, this data item may be used to limit certain viewers' program choices.

[0049] The data item "DESCRIPTION" represents a text field that contains information that may be helpful to a viewer when searching for a particular video program of interest. Some examples of this type of information include the names of the performers, the name of the director, the length of the video program, and a brief description of the content of the video program. Other useful information may be added, as appropriate.

[0050] The data item "STILL_IMAGE" represents a text field that contains the name of a data file stored in mass

storage system 24 (FIG. 2) that contains image data that is used to provide the viewer with a still image from a video program. The still image is provided to the viewer (in a manner described below) as an aid to selecting a program of interest.

[0051] The data items "PREVIEW_VIDEO" and "PREVIEW_AUDIO" are text fields that represent the names of data files stored in mass storage system 24 (FIG. 2) that contain the video and audio portions of a short segment of a video program. The short segment of the video program is provided to the viewer (in a manner described below) as an aid to selecting a program of interest.

[0052] The data items "FULL_VIDEO" and "FULL_AUDIO" are text fields that represent data that are used by processing system 22 (FIG. 2) to determine the location of a selected video program. If the video program is one that is stored on a long-term basis in mass storage system 24 (FIG. 2), the FULL_VIDEO and FULL_AUDIO data items represent the names of the data files containing the full video and audio portions of the video program. Otherwise, the FULL_VIDEO data item represents a location in the tape storage unit of tape drive system 26 (FIG. 2) where the tape containing the video program is stored. The FULL_AUDIO data item is not used in this situation.

[0053] The data items listed in FIG. 4 represent data that pertain to viewing stations 14 (FIG. 1) that are connected to network 10 (FIG. 1). This information may be entered by an operator using I/O devices 28 (FIG. 2).

[0054] The data item "STATION ID" preferably represents a numeric field that contains a unique identifier for each viewing station 14 (FIG. 1) that has subscribed to the demand telecasting service of the present invention. The station identifiers are used by processing system 22 (FIG. 2) as the destination addresses for data packets transmitted on communication medium 16 (FIG. 2).

[0055] The data item "VIEWER_ID" represents a text field that contains a unique identifier for each person that is permitted to use a particular viewing station 14 (FIG. 1).

[0056] The data item "CLASSIFICATION" is similar to the data item of the same name described in connection with FIG. 3. However, the purpose here is to define the classes of video programs that a particular viewer (as identified by the VIEWER_ID) is permitted to watch.

[0057] Referring now to FIG. 5, a preferred embodiment of a viewing station is described that is suitable for use as one of the viewing stations 14 shown in FIG. 1. Viewing station 14 includes a graphics computer 30, a video encoder 32, a television monitor 34, a signal converter 36, and a remote viewer control unit 38. It should be understood that some or all of these components, especially graphics computer 30, video encoder 32, and signal converter 36, may be combined into a single device without departing from the spirit of the invention.

[0058] Graphics computer 30 performs the graphics functions required to implement the interactive interface of the present invention. Graphics computer 30 also performs the communications functions for viewing station 14, including transmitting data packets to, and receiving data packets from, telecasting facility 12 (FIG. 2). In a preferred embodiment, graphics computer 30 is an R4000PC Indy computer

available from Silicon Graphics, Inc. The Indy computer is preferably equipped with 8 megabytes of memory, a Newport graphics card, and an A/V card which provides an audio and video interface between graphics computer 30 and signal converter 36.

[0059] Graphics computer 30 receives several different types of information in packets from telecasting facility 12 (FIG. 2) over the interactive channel on communication medium 16. This information includes the video and audio portions of video programs selected by the viewer, the video and audio portions of short segments of the video programs, still images from the video programs, textual descriptions of the available video programs, and listings of the available video programs. As explained below, this information is presented to the viewer through the use of a convenient interactive interface.

[0060] Information received by viewing station 14 is initially processed by graphics computer 30. Such processing steps may include reassembling of data packets, decompression of the compressed video portions of the video programs and short segments of the video programs, and synchronization of the video and audio portions of the video programs and the short segments of the video programs. These processing steps may be performed in a conventional manner.

[0061] The information processed by graphics computer 30 that is to be made available to the viewer (e.g., video programs, short segments, still images, program lists, etc.) is sent to video encoder 32. Video encoder 32 is preferably a 2826 Video Encoder II available from RasterOps, Inc., located in Santa Clara, Calif. Video encoder 32 converts the information from the native format of graphics computer 30 to a television standard format such as NTSC, PAL, or SECAM, as appropriate. Converting the information to the appropriate format renders the information suitable for viewing on conventional television monitor 34.

[0062] The viewer can communicate with graphics computer 30 through the use of the combination of signal converter 36 and remote viewer control unit 38. In many respects, control unit 38 is similar to conventional remote control units that are commonly used with audio-visual equipment. However, control unit 38 includes buttons that are used in connection with the interactive interface of the present invention, as described below.

[0063] Preferably, control unit 38 transmits infrared signals to signal converter 36 in response to commands entered by the viewer. Signal converter 36 receives the infrared signals and converts them to electrical signals suitable for transmission to graphics computer 30. In a preferred embodiment, signal converter 36 is an 8600 Converter available from Scientific-Atlanta, Inc., located in Atlanta, Ga.

[0064] Graphics computer 30 is programmed to provide an interactive interface that is intended to facilitate the viewer's selection of a video program. The interactive interface facilitates the viewer's program selection by organizing the programs available for selection into a convenient menu, and by providing the viewer with helpful selection aids, including still images, short segment previews, and textual descriptions of the available programs. The interactive interface may be understood by reference to the screen examples shown in FIGS. 6-8.

[0065] The interactive interface preferably operates in three modes—a list mode, a preview mode, and an information mode. FIG. 6 depicts a list mode screen 40 that appears on television monitor 34 when the interactive interface is operating in the list mode. List mode screen 40 is preferably the first screen displayed after the viewer logs into the interactive interface.

[0066] In the center of list mode screen 40 is a display window 42. In the list mode, display window 42 is preferably divided into a menu window 44 (on the left side) and a still image window 46 (on the right side). Menu window 44 displays a list of video programs that are available for viewer selection. The list of video programs is transmitted from telecasting facility 12 (FIG. 1) to the viewing station 14 (FIG. 1) that the viewer is using.

[0067] At any given time, one of the video programs in menu window 44 is highlighted by an active program bar 48. When list mode screen 40 first appears after start-up, active program bar 48 highlights the first program in the list. The video program highlighted by active program bar 48 is deemed the "active program."

[0068] The interactive interface provides several program selection tools that may be used by the viewer to learn more about the active program. One such tool requires no viewer interaction—a still image of the active program automatically appears in still image window 46. The still image may aid the viewer in identifying or remembering the subject matter of the active program. Data files used to display the still images corresponding to each available video program are transmitted to the viewing station 14 (FIG. 1) being used along with the list of video programs.

[0069] In order to simplify the program selection process, the available video programs are organized into categories, as described above in connection with FIG. 3. Only the programs in an "active category" appear in menu window 44 at any given time. The name of the active category appears in the center of a category selection bar 50 which is displayed above display window 42. When list mode screen 40 is first displayed after start-up, the first category in a sequence of available categories is the active category. The list of categories is transmitted to the viewing station 14 (FIG. 1) being used along with the list of available video programs.

[0070] Category selection bar 50 also includes two actuators that are used to change the active category a previous-category actuator 52 and a next-category actuator 54. In general, the various actuators described below in connection with the screens shown in FIGS. 6-8 preferably correspond to buttons on control unit 38 (FIG. 5). In order to activate a particular actuator, the viewer simply presses the corresponding button on control unit 38 (FIG. 5). Alternatively, control unit 38 (FIG. 5) may include a highlighting device for activating some or all of the various actuators. It should be understood that the labels which appear in FIGS. 6-8 to denote the various actuators may be modified without departing from the spirit of the invention.

[0071] Previous-category actuator 52 is used by the viewer to change the active category to the preceding category in the sequence of categories. Next-category actuator 54 is used to advance the active category to the next category in the sequence. When either previous-category actuator 52 or

next-category actuator **54** is used, the category name displayed in the center of category selection bar **50**, and the list of programs displayed in menu window **44**, change accordingly. Both previous-category actuator **52** and next-category actuator **54** conveniently display the name of the category that will be the active category if the corresponding actuator is activated. Preferably, the category actuators operate in an endless loop fashion.

[0072] Along the left side of display window **42** is a program selection bar **56**. Program selection bar **56** includes two actuators for changing the active program—a previous-program actuator **58** and a next-program actuator **60**. Previous-program actuator **58** and next-program actuator **60** operate in a manner similar to that of previous-category actuator **52** and next-category actuator **54**. Specifically, the viewer can move backward and forward in the list of programs displayed in menu window **44** through the use of previous-program actuator **58** and next-program actuator **60**.

[0073] Typically, only a subset of the programs in the active category can be displayed in menu window **44** at any given time. To view other program titles, the viewer may use previous-program actuator **58** and next-program actuator **60** to cause the displayed list of programs to scroll backward and forward, respectively, through the complete list of programs within the active category. Previous-program actuator **58** and next-program actuator **60** preferably operate in an endless loop fashion.

[0074] Preferably, the interactive interface stores a pointer to the most recently active program in each category. Thus, if the viewer leaves a first category to scan programs in a second category, and then returns to the first category, the active program will be the program that was active when the viewer left the first category. The viewer therefore does not need to re-scan the programs in the first category to locate the most recently considered program in that category.

[0075] A selection actuator **62** (labeled “SELECT”) may be used by the viewer to select the active program (as indicated by active program bar **48**) for viewing. When selection actuator **62** is activated, list mode screen **40** disappears and the full-length video program that was selected by the viewer begins. After the program has completed, list mode screen **40** returns to allow the viewer to make another selection.

[0076] In some situations, the still image from the active program that appears in still image window **46** may not provide enough information for the viewer to make a program selection. The interactive interface thus offers the preview mode and the information mode to provide the viewer with even more information to facilitate program selection.

[0077] The different operational modes of the interactive interface are selected by the viewer through the use of three actuators in a mode selection bar **64**. On the left side of mode selection bar **64** is a list mode actuator **66** (labeled “A LIST”). When list mode screen **40** is displayed, list mode actuator **66** is preferably highlighted to show that the list mode is the current mode of operation. List mode actuator **66** is active only when the interactive interface is operating in either the preview mode or the information mode. Any depressions of the button on control unit **38** (FIG. 5) corresponding to list mode actuator **66** have no effect on the operational mode when list mode actuator **66** is highlighted.

[0078] A preview mode actuator **68** (labeled “B PREVU”) is positioned in the center of mode selection bar **64**. Preview mode actuator **68** may be used by the viewer to cause the interactive interface to switch to the preview mode. As described below in connection with FIG. 7, the preview mode is used to provide the viewer with a full-motion preview of the active program.

[0079] An information mode actuator **70** (labeled “C MORE”) appears on the right side of mode selection bar **64**. Information mode actuator **70** may be used by the viewer to cause the interactive interface to switch to the information mode. As described below in connection with FIG. 8, the information mode is used to provide the viewer with a textual description of the active program. Preferably, graphics computer **30** (FIG. 5) causes monitor **34** (FIG. 5) to play background music while the information mode is active. Background music may also be provided during the list mode.

[0080] When the viewer activates preview mode actuator **68**, a preview mode screen **72** is displayed, as shown in FIG. 7. In the preview mode, display window **42** serves as a single large window for displaying a full-motion preview of the active program (i.e., the program that was highlighted by active program bar **48** in the list mode shown in FIG. 6). Preferably, the full-motion preview lasts for about 30 seconds, and includes video and audio components. The title of the active program appears in the lower portion of display window **42**.

[0081] Preview mode screen **72** also includes category selection bar **50**, program selection bar **56**, and mode selection bar **64**. It should be noted that preview mode actuator **68** becomes inactive while the interactive interface is operating in the preview mode, and accordingly, the preview mode actuator is highlighted on preview mode screen **72**. However, the other actuators described above in connection with the various selection bars, as well as selection actuator **62**, remain active during the full-motion preview.

[0082] Through the use of the above-described actuators, the viewer can perform the functions described above in connection with list mode screen **40** (FIG. 6). For example, the viewer can use previous-category actuator **52** and next-category actuator **54** to change the active category. Also, the viewer can use previous-program actuator **58** and next-program actuator **60** to change the active program within the active category. When the viewer makes such changes, the full-motion preview being displayed in display window **42** changes accordingly. This allows the viewer to rapidly scan through several full-motion previews without having to return to list mode screen **40** (FIG. 6).

[0083] List mode actuator **66** may be used to return to list mode if the viewer desires to review the list of available programs in a menu-based format. If the viewer changed the active program or active category while in the preview mode, the changes are “remembered” by the interactive interface, and active program bar **48** (FIG. 6) in the list mode appears on the program title that corresponds to the program most recently made active during the preview mode.

[0084] Selection actuator **62** may also be used from preview mode screen **72** to begin a full-length presentation of the active program.

[0085] The interactive interface is preferably programmed to take one of four courses of action if the viewer does not use one of the available actuators on preview mode screen 72 before the end of the full-motion preview. In one embodiment, the interactive interface enters a waiting state where it simply waits until the viewer activates one of the various actuators. In another embodiment, the interactive interface returns to the list mode to allow the viewer to consider other programs. In still another embodiment, the interactive interface returns to the mode it was in when the viewer initiated a preview. In yet another embodiment, the interactive interface begins a full-motion preview of the next program in the active category. If the active program is the last in the sequence of programs within the active category, the interactive interface preferably cycles to the first program in the active category. If the fourth embodiment is adopted, the automatic cycling of programs during the preview mode preferably results in a corresponding change in the active program, such that the last program previewed at the time one of the actuators is activated becomes the active program.

[0086] From either list mode screen 40 (FIG. 6) or preview mode screen 72, the viewer may use information mode actuator 70 (labeled "C MORE") to switch to an information mode screen 74, which is shown in FIG. 8. While in the information mode, display window 42 displays textual information pertaining to the actual program. Such information may include, for example, the title of the program, the length of the program, the program's cast, and the director of the program. Of course, this information can be varied in accordance with the type of program being considered.

[0087] All of the actuators described above are available for use from information mode screen 74, with the exception of information mode actuator 70, which is highlighted. Thus, the viewer can freely change the active program or the active category from information mode screen 74. Also, the viewer can switch to either the list mode or the preview mode using the appropriate actuator from mode selection bar 64. Selection actuator 62 may also be used from information mode screen 74 to begin a full-length presentation of the active program.

[0088] As can be seen from the screen examples of FIGS. 6-8, the interactive interface allows the viewer to efficiently acquire information about many available video programs. For example, after designating a particular program as the active program in list mode screen 40, the viewer can quickly evaluate a still image of the program in still image window 46. If more information is needed, the viewer can rapidly switch to either the preview mode or the information mode using the appropriate actuators. Further, the active program or active category can be changed in any of the three operational modes, thereby allowing the viewer to consider the same type of information for several different programs in succession. And once the viewer has made a program selection, selection actuator 62 can be activated from within any of the three modes of operation to begin a full-length presentation of the active program.

[0089] Turning now to FIGS. 9A-9H, a series of logic flow diagrams are described which represent a control program that is executed by graphics computer 30 (FIG. 5). The control program allows graphics computer 30 (FIG. 5) to provide the interactive interface of the present invention. It also manages communication between viewing station 14 (FIG. 5) and telecasting facility 12 (FIG. 2).

[0090] Referring first to FIG. 9A, the control program starts when the viewer selects the demand telecasting service of the present invention from a list of interactive applications available on the interactive channel of telecasting network 10 (FIG. 1). After start-up, graphics computer 30 (FIG. 5) receives a VIEWER_ID provided by the viewer at step 100. However, the viewer can choose not to provide a VIEWER_ID at step 100. As explained below, this prevents the viewer from viewing the full-length video programs, but allows the viewer to use the other features of the interactive interface.

[0091] It should be understood that the present invention can be practiced without the use of VIEWER_IDS. Indeed, if it is determined that a viewing population would find the task of entering a VIEWER_ID to be cumbersome, it may be preferable to eliminate VIEWER_IDS and any features which require them. For the purposes of the following discussion, it is assumed that the system accommodates VIEWER_IDS. Any modifications required to eliminate VIEWER_IDS would be apparent to one of ordinary skill in the art.

[0092] At step 104, graphics computer 30 (FIG. 5) transmits the VIEWER_ID and a STATION_ID to telecasting facility 12 (FIG. 2). The STATION_ID is a unique identifier stored in graphics computer 30 (FIG. 5).

[0093] After telecasting facility 12 (FIG. 2) receives the VIEWER_ID and the STATION_ID, processing system 22 (FIG. 2) determines if the received information matches an entry in the station table described in connection with FIG. 4. If there is a matching entry, telecasting facility 12 (FIG. 2) transmits a subscriber confirmation signal, which is received by graphics computer 30 (FIG. 5) at step 106. Otherwise, telecasting facility 12 (FIG. 2) transmits a non-subscriber confirmation signal, which is also received at step 106.

[0094] At step 108, graphics computer 30 (FIG. 5) receives a list of PROGRAM_IDS, PROGRAM_NAMES, and CATEGORIES from telecasting facility 12 (FIG. 2). If a VIEWER_ID was received at step 100, the list is limited to information pertaining to the programs that the viewer is authorized to view. Processing system 22 (FIG. 2) determines which data are to be transmitted by comparing the CLASSIFICATION data item from the station table (FIG. 4) corresponding to the viewer's VIEWER_ID to the CLASSIFICATION data items in the program table (FIG. 3). This step is useful, for example, for limiting the list of available programs to those that are appropriate for children. If a VIEWER_ID was not received at step 100, the complete list of available video programs is preferably received by graphics computer 30 (FIG. 5) at step 108.

[0095] At step 110, graphics computer 30 (FIG. 5) sets the active category to the first category in the sequence of categories received at step 108. Then, at step 112, the active program is set to the first program in the sequence of programs within the active category.

[0096] At step 114, the actuators described in connection with FIGS. 6-8 are displayed on monitor 34 (FIG. 5). At step 116, graphics computer 30 (FIG. 5) then displays the active category in the center of category selection bar 50 (FIGS. 6-8), the previous category in the sequence (which at this time is actually the last category in the sequence) in previ-

ous-category actuator **52** (FIGS. 6-8), and the next category in the sequence in next-category actuator **54** (FIGS. 6-8).

[0097] At step **118**, graphics computer **30** (FIG. 5) calls a list mode routine to establish the initial mode of operation for the interactive interface. The list mode routine is described below in connection with FIG. 9C. However, before turning to the list mode routine, the main program loop of the control program, which responds to the viewer's use of the various actuators, will be described.

[0098] The main program loop is shown in FIG. 9B. It includes a series of six tests that are re-executed until the viewer leaves the interactive interface (typically by changing the channel or turning off viewing station **14** (FIG. 5) using control unit **38** (FIG. 5)). The six tests are performed to detect when the viewer activates one of the actuators by pressing one of the corresponding buttons on control unit **38** (FIG. 5).

[0099] At test **120**, graphics computer **30** (FIG. 5) determines if list mode actuator **66** (FIGS. 6-8) was activated. If so, the list mode routine (FIG. 9C) is called at step **122**.

[0100] At test **124**, graphics computer **30** (FIG. 5) determines if preview mode actuator **68** (FIGS. 6-8) was activated. A preview mode routine (FIG. 9D) is called if appropriate at step **126**.

[0101] At test **128**, graphics computer **30** (FIG. 5) determines if information mode actuator **70** (FIGS. 6-8) was activated. An information mode routine (FIG. 9E) is called at step **130** when such an activation is detected.

[0102] At test **132**, graphics computer **30** (FIG. 5) determines if either previous-category actuator **52** (FIGS. 6-8) or next-category actuator **54** (FIGS. 6-8) was activated. Category changes are handled by a change category routine (FIG. 9F) which is called at step **134**.

[0103] Similarly, at test **136**, graphics computer **30** (FIG. 5) determines if either previous-program actuator **58** (FIGS. 6-8) or next-program actuator **60** (FIGS. 6-8) was activated. Program changes are handled by a change program routine (FIG. 9G) which is called at step **138**.

[0104] Finally, test **140** is performed by graphics computer **30** (FIG. 5) to determine if selection actuator **62** (FIGS. 6-8) was activated. Program selections are managed by a selection routine (FIG. 9H) which is called at step **142**.

[0105] Turning now to FIG. 9C, the list mode routine is described. The list mode routine starts with test **144**, where graphics computer **30** (FIG. 5) determines if the list mode routine is being executed for the first time during the current session of the interactive interface. If so, step **146** is performed to initialize menu window **44** (FIG. 6). Preferably, the PROGRAM_NAMES of at least the first five programs in the sequence of available programs within the active category are displayed. Since the active program is the first program in the sequence, active program bar **48** (FIG. 6) appears on the first displayed PROGRAM_NAME.

[0106] If the list mode routine was previously executed during the current session, test **148** is performed to determine if the active program is within the list of PROGRAM_NAMES that was previously displayed in menu window **44** (FIG. 6). If not, at step **148**, graphics computer **30** (FIG. 5) scrolls the list of PROGRAM_NAMES, either upwardly or

downwardly, to an extent that allows active program bar **48** (FIG. 6) to appear on the PROGRAM_NAME corresponding to the active program.

[0107] At step **152**, graphics computer **30** (FIG. 5) transmits the PROGRAM_ID corresponding to the active program to telecasting facility **12** (FIG. 2). Processing system **22** (FIG. 2) applies the PROGRAM_ID to the program table (FIG. 4) to determine the name of the data file (STILL_IMAGE) stored in mass storage system **24** (FIG. 2) that contains the still image data for the active program. Telecasting facility **12** (FIG. 2) then transmits the data file to graphics computer **30** (FIG. 5), which receives the data at step **154**. Graphics computer **30** (FIG. 5) displays the still image in still image window **46** (FIG. 6) at step **156**.

[0108] At step **158**, graphics computer **30** (FIG. 5) sets the active mode to the list mode. Control then returns to the main program loop of FIG. 9B.

[0109] The logic flow diagram for the preview mode routine is shown in FIG. 9D. The preview mode routine starts at step **160**, where graphics computer **30** (FIG. 5) transmits the PROGRAM_ID corresponding to the active program to telecasting facility **12** (FIG. 2). Processing system **22** (FIG. 2) receives the PROGRAM_ID and applies it to the program table (FIG. 4) to determine the names of the video file (PREVIEW_VIDEO) and the audio file (PREVIEW_AUDIO) stored in mass storage system **24** (FIG. 2) that contain the data for the full-motion preview for the active program. Processing system **22** (FIG. 2) then transmits the data files to graphics computer **30** (FIG. 5), which receives the data at step **162**.

[0110] At step **164**, the PROGRAM_NAME of the active program is displayed at the bottom of display window **42** (FIG. 7). At step **166**, graphics computer **30** (FIG. 5) decompresses the video portion of the data. Then at step **168**, graphics computer **30** (FIG. 5) synchronizes the video and the audio portions of the full-motion preview. The synchronized data is provided to monitor **34** (FIG. 5) for viewing at step **170**. At step **172**, the active mode is set to the preview mode.

[0111] Preferably, each full-motion preview lasts about 30 seconds. It should be noted that the interactive interface does not linger in the preview mode routine while the preview is running. Rather, graphics computer **30** (FIG. 5) exits the preview mode routine to return to the main program loop (FIG. 9B) to allow the viewer to use the various actuators while the preview is running. Thus, the viewer can stop a preview by activating either list mode actuator **66** (FIG. 7), information mode actuator **70** (FIG. 7) or selection actuator **62** (FIG. 7).

[0112] It should also be noted that several possible courses of action may be taken by graphics computer **30** (FIG. 5) when a full-motion preview ends. In one embodiment, graphics computer **30** (FIG. 5) enters a waiting state within the main program loop (FIG. 9B) until the viewer activates one of the various actuators. In another embodiment (not shown), graphics computer **30** (FIG. 5) resets the interactive interface to the list mode, so that viewer can consider other programs. In still another embodiment (not shown), graphics computer **30** (FIG. 5) resets the interactive interface to the mode it was in (either the list mode or the information mode) when the user initiated a preview. In yet another embodi-

ment (not shown), graphics computer 30 (FIG. 5) cycles through full-motion previews of the programs within the active category until the viewer activates one of the various actuators. The particular programming steps required for the second, third, and fourth embodiments can be easily implemented by one of ordinary skill in the art.

[0113] Turning now to FIG. 9E, the information mode routine is described. The information mode routine begins at step 174, where graphics computer 30 (FIG. 5) transmits the PROGRAM_ID corresponding to the active program to telecasting facility 12 (FIG. 2). Processing system 22 (FIG. 2) receives the PROGRAM_ID and applies it to the program table (FIG. 4) to extract the DESCRIPTION data item corresponding to the active program. Processing system 22 (FIG. 2) then transmits the DESCRIPTION to graphics computer 30 (FIG. 5), which receives the data at step 176.

[0114] At step 178, graphics computer 30 (FIG. 5) displays the PROGRAM_NAME and the DESCRIPTION corresponding to the active program in display window 42 (FIG. 8). The active mode is set to the information mode at step 180, and control then returns to the main program loop (FIG. 9B).

[0115] The change category routine is shown in FIG. 9F. The change category routine is executed whenever the viewer actuates either previous-category actuator 52 (FIGS. 6-8) or next-category actuator 54 (FIGS. 6-8).

[0116] At test 182, graphics computer 30 (FIG. 5) determines which of the two category actuators was activated. If previous-category actuator 52 (FIGS. 6-8) was activated, the active category is set to the previous category in the sequence at step 184. The active category may be set to the last category in the sequence if actuator 52 (FIGS. 6-8) is activated while the first category in the sequence is active. If next-category actuator 54 (FIGS. 6-8) was activated, the active category is set to the next category in the sequence at step 186. The active category may be set to the first category in the sequence if actuator 54 (FIGS. 6-8) is activated while the last category in the sequence is active. At step 188, graphics computer 30 (FIG. 5) displays the active, previous, and next categories in category selection bar 50, as described above in connection with FIGS. 6-8.

[0117] At test 190, graphics computer 30 (FIG. 5) determines whether the category made active at either step 184 or step 186 was ever previously active during the current session. If so, the active program is set to the program that was last active within the active category at step 192. Otherwise, the active program is set to the first program in the sequence of programs within the active category. Test 190 advantageously allows the viewer to quickly return to the most recently considered program within a particular category—without having to re-scan the program list.

[0118] Tests 196, 200, and 204 are used by graphics computer 30 (FIG. 5) to determine the mode that the interactive interface was operating in at the time one of the category actuators was activated. If it is determined at test 196 that the list mode is the active mode, the list mode routine is called at step 198. If it is determined at test 200 that the preview mode is the active mode, the preview mode routine is called at step 202. Or if it is determined at test 204 that the information mode is the active mode, the information mode routine is called at step 206. This sequence of tests

and steps causes the interactive interface to return to the active mode and provide the viewer with information corresponding to the new active program.

[0119] The change program routine is shown in FIG. 9G. The change program routine is executed whenever the viewer actuates either previous-program actuator 58 (FIGS. 6-8) or next-program actuator 60 (FIGS. 6-8).

[0120] At test 208, graphics computer 30 (FIG. 5) determines which of the two program actuators was activated. If previous-program actuator 58 (FIGS. 6-8) was activated, the active program is set to the previous program in the sequence at step 212. The active program may be set to the last program in the sequence if actuator 58 (FIGS. 6-8) is activated while the first program in the sequence is active. If next-program actuator 60 (FIGS. 6-8) was activated, the active program is set to the next program in the sequence at step 216. The active program may be set to the first program in the sequence if actuator 60 (FIGS. 6-8) is activated while the last program in the sequence is active.

[0121] Tests 218, 222, and 226, and steps 220, 224, and 228 are executed by graphics computer 30 (FIG. 5) to cause the interactive interface to return to the active mode and provide the viewer with information corresponding to the new active program, as described above in connection with FIG. 9F. Control then returns to the main program loop.

[0122] The selection routine, shown in FIG. 9H, is called when the viewer activates selection actuator 62 (FIGS. 6-8) to view the active program. At test 230, graphics computer 30 validates the subscriber confirmation data previously transmitted by telecasting facility 12 (FIG. 2) to determine if viewing station 14 (FIG. 5) is a subscribing viewing station. If it is, test 232 is performed to determine if the viewer provided a valid VIEWER_ID during the login procedure. If the VIEWER_ID is invalid, control returns to the main program loop. The viewer is thus prevented from viewing the full-length video program unless a valid VIEWER_ID is provided.

[0123] If a valid VIEWER_ID was provided, graphics computer 30 (FIG. 5) transmits the PROGRAM_ID corresponding to the active program to telecasting facility 12 (FIG. 2) at step 234. Processing system 22 (FIG. 2) receives the PROGRAM_ID and applies it to the program table (FIG. 4) to determine the location of the active program. If the FULL_VIDEO data item indicates that the video program needs to be retrieved from the tape storage unit of tape drive system 26 (FIG. 2), processing system 22 (FIG. 2) causes tape drive system 26 (FIG. 2) to retrieve the appropriate tape and transfer the data to mass storage system 24 (FIG. 2). Otherwise, processing system 22 (FIG. 2) uses the FULL_VIDEO and FULL_AUDIO data items to locate the appropriate data files in mass storage system 24 (FIG. 2). Processing system 22 (FIG. 2) then begins to transmit the data to graphics computer 30 (FIG. 5) (preferably in packets, as described above), which in turn receives the data at step 236.

[0124] At step 238, graphics computer 30 (FIG. 5) decompresses the video portion of the data. Then at step 240, graphics computer 30 (FIG. 5) synchronizes the audio and video portions of the data. The synchronized data is provided to monitor 34 (FIG. 5) for viewing at step 242. It

should be noted that the full-length program may last several hours. Accordingly, steps **236**, **238**, **240**, and **242** are repeated as often as necessary to process the large number of data packets that are transmitted from telecasting facility **12** (**FIG. 2**) in connection with the presentation of the full-length program.

[**0125**] When the full-length program has completed, the list mode routine is called at step **244**. Control then returns to the main program loop (**FIG. 9B**), so that the viewer can use the interactive interface to consider additional video programs for viewing.

[**0126**] If it is determined at test **230** that the viewing station is not a subscribing viewing station, graphics computer **30** (**FIG. 5**) displays a message informing the viewer that only subscribing viewing stations can receive full-length video programs. Graphics computer **30** (**FIG. 5**) may provide the viewer with subscription information (such as a program schedule, listing of features, etc.) at step **246**. Then at step **248**, the viewer may be provided with an opportunity to interactively subscribe to the demand telecasting service. Preferably, if interactive subscribing is provided, the viewer is prompted to confirm a new subscription by pressing the button on control unit **38** (**FIG. 5**) that corresponds to selection actuator **62** (**FIGS. 6-8**). If the viewer presses any other button on control unit **38** (**FIG. 5**), it is interpreted as a refusal.

[**0127**] At test **250**, graphics computer **30** (**FIG. 5**) determines whether the viewer accepted or refused a subscription. If the subscription was refused, control returns to the main program loop (**FIG. 9B**). Otherwise, graphics computer **30** (**FIG. 5**) preferably assigns a temporary VIEWER_ID to the viewer so that the viewer can view full-length programs (as described above in connection with steps **234**, **236**, **238**, **240**, and **242**) until the subscription is confirmed. It is contemplated that new subscriptions will be confirmed by mail, telephone, or other suitable means.

[**0128**] Thus a telecasting service is provided that offers video programs upon viewer demand, and which includes an interactive interface for facilitating viewer selection of video programs. One skilled in the art will appreciate that the present invention can be practiced by other than the described embodiments, which are presented for purposes of illustration and not of limitation, and the present invention is limited only by the claims which follow.

We claim:

1. A method of operating a video-on-demand service comprising at least one interactive channel coupled to a viewing station, said service accessible to subscribers and non-subscribers of said service, said service providing video programs, segments of said video programs, and a list of at least some of said video programs, said method comprising:

transmitting a first signal to said viewing station acknowledging access of said service;

transmitting said list to said viewing station;

receiving a second signal from said viewing station indicating a selection of one of said segments or said video programs;

transmitting one of said segments to said viewing station when said second signal indicates a selection of said one segment;

preventing transmission of one of said video programs to said viewing station when said second signal indicates a selection of said one video program by one of said non-subscribers; and

transmitting one of said video programs to said viewing station when said second signal indicates a selection of said one video program by one of said subscribers.

2. The method of claim 1 wherein said first signal acknowledges access of said service at said viewing station by one of said subscribers.

3. The method of claim 1 wherein said first signal acknowledges access of said service at said viewing station by one of said non-subscribers.

4. The method of claim 1 wherein at least some of said video programs and said segments comprise video and audio portions.

5. The method of claim 1 wherein said video programs comprise at least one movie.

6. The method of claim 1 wherein said video programs comprise at least one television program.

7. A video-on-demand service comprising:

a telecasting facility operative to provide video programs, previews of said video programs, and at least one list of at least some of said video programs and operative to receive selections of said previews and of said video programs, said facility comprising:

a multiple processor computer that allows said list and said previews to be transmitted to subscribers and non-subscribers of said service and that allows said video programs to be transmitted to only said subscribers,

a mass storage system coupled to said computer, said mass storage system storing said list and said previews, and

a transmitting station coupled to said computer, said transmitting station operative to transmit said video programs, said previews, and said list and operative to receive said selections; and

a communication medium coupled to said transmitting station over which said video programs, said previews, and said list are transmitted from said telecasting facility and over which said selections are transmitted to said telecasting facility.

8. The video-on-demand service of claim 7 wherein said communication medium comprises a plurality of channels.

9. The video-on-demand service of claim 7 wherein said communication medium is selected from the group consisting of coaxial cable and fiber optic cable.

10. A method of operating a video-on-demand service, said service interactively coupled to a viewing station comprising a video display, said service accessible to non-subscribers of said service, said service providing video programs, segments of said video programs, and a list of at least some of said video programs, said method comprising:

displaying on said display said list to one of said non-subscribers;

displaying on said display one of said segments selected by one of said non-subscribers;

preventing display on said display of one of said video programs selected by one of said non-subscribers;

displaying on said display an offer for one of said non-subscribers to become a subscriber substantially immediately after said non-subscriber selects one of said video programs for display;

receiving interactively from said non-subscriber via said viewing station an acceptance of said offer to become a subscriber;

establishing said non-subscriber as a subscriber substantially immediately after said receiving; and

allowing said video programs selected by said non-subscriber to be displayed on said display substantially immediately after said establishing.

11. The video-on-demand service of claim 10 wherein said display comprises a television monitor.

12. The video-on-demand service of claim 10 wherein said display provides audio.

13. The video-on-demand service of claim 10 wherein said display is part of a personal computer.

14. A video-on-demand service comprising:

a telecasting facility operative to transmit video programs, previews of said video programs, and lists of said video programs, said facility comprising a first computer programmed to allow said lists and said previews to be transmitted to subscribers and non-subscribers of said service and to allow said video programs to be transmitted to only said subscribers;

a viewing station comprising a video display and a second computer, said viewing station operative to receive said video programs, said previews, and said lists and operative to transmit selections of said video programs and said previews, said second computer programmed to display on said video display said programs, said previews, and said lists; and

a communication medium coupled to said facility and to said viewing station over which said programs, said previews, and said lists are transmitted from said facility to said viewing station and over which said selections are transmitted from said viewing station to said facility.

15. The video-on-demand service of claim 14 wherein:

said viewing station is operated by one of said non-subscribers;

said telecasting facility is further operative to transmit subscription offers over said communication medium to said viewing station; and

said viewing station is further operative to receive said subscription offers and to transmit a subscription offer acceptance over said communication medium to said telecasting facility.

16. A method of operating a video-on-demand service, said service interactively coupled to a viewing station comprising a video display, said service accessible to subscribers and non-subscribers of said service, said service providing video programs, segments of said video programs, and lists of said video programs, and said method comprising:

receiving video program classification information associated with a viewer identifier;

storing said classification information;

displaying on said display any of said segments selected from said lists by one of said non-subscribers;

preventing display on said display of any of said video programs selected from said lists by one of said non-subscribers;

receiving said viewer identifier from said viewing station;

generating one of said lists in accordance with said stored classification information; and

displaying on said display said generated list, only those segments and video programs on said generated list being selectable for display on said display.

17. The method of claim 16 wherein said classification information causes those said video programs that contain violence to be excluded from said generated list.

18. The method of claim 16 wherein said classification information causes only those said video programs that are suitable for children to be included on said generated list.

19. A method of operating a video-on-demand service, said service interactively coupled to a viewing station, said service accessible to subscribers and non-subscribers of said service, said service operative to provide video programs, segments of said video programs, and a list of at least some of said video programs and operative to receive selections of said segments and said video programs, said method comprising:

receiving an identifier from said viewing station;

comparing said identifier with a list of identifiers corresponding to said subscribers;

receiving one of said selections;

transmitting one of said video programs to said viewing station when said comparing indicates that said identifier is on said list of identifiers and said selection corresponds to said one video program;

preventing transmission of one of said video programs to said viewing station when said comparing indicates that said identifier is not on said list of identifiers and said selection corresponds to said one video program; and

transmitting one of said segments to said viewing station when said comparing indicates that said identifier is not on said list of identifiers and said selection corresponds to said one segment.

20. The method of claim 19 wherein said identifier is a viewer identifier, said method further comprising:

receiving a station identifier from said viewing station; and

addressing transmissions to said viewing station using said station identifier to determine an address of said viewing station.

21. A video-on-demand service comprising:

a telecasting facility operative to transmit video programs, previews of said video programs, and lists of said video programs, said facility also operative to receive selections of said previews and said video programs, said facility comprising:

a first computer programmed to allow said lists and said previews to be transmitted to subscribers and non-

subscribers of said service and programmed to allow video programs to be transmitted to only said subscribers, and

a transmitting station coupled to said first computer and operative to transmit said video programs, said previews, and said lists and operative to receive said selections; and

a viewing station for use by said subscribers and non-subscribers, said viewing station operative to receive said programs, said previews, and said lists and operative to transmit said selections, said viewing station comprising:

a video display; and

a second computer coupled to said display and programmed to provide said display with an interactive interface to facilitate selection of said video programs.

22. The video-on-demand service of claim 21 wherein said preview comprises a portion of a corresponding video program.

23. The video-on-demand service of claim 21 wherein said preview comprises a summary of the content of a corresponding video program.

24. The video-on-demand service of claim 23 wherein said summary comprises audio.

25. The video-on-demand service of claim 23 wherein said summary comprises full-motion video.

26. The video-on-demand service of claim 21 wherein:

said telecasting facility is further operative to transmit textual descriptions of said video programs;

said viewing station is further operative to receive said textual descriptions; and

said interactive interface comprises:

a first screen that displays one of said lists;

a second screen that displays one of said previews; and

a third screen that displays one of said textual descriptions.

27. The video-on-demand service of claim 26 wherein any one of said screens is displayable immediately after display of any other one of said screens.

28. The video-on-demand service of claim 26 wherein one of said video programs is selectable from any one of said screens.

29. The video-on-demand service of claim 26 wherein another one of said lists, said segments, and said textual descriptions is displayable on said respective screens immediately after a respective one of said lists, said segments, and said textual descriptions is displayed on said respective screens.

30. The video-on-demand service of claim 21 wherein:

said telecasting facility is further operative to transmit textual descriptions of said video programs;

said viewing station is further operative to receive said textual descriptions; and

said interactive interface comprises:

a list mode actuator that when actuated causes one of said lists to be displayed on said display;

a preview mode actuator that when actuated causes one of said previews to be displayed on said display; and

an information mode actuator that when actuated causes one of said textual descriptions to be displayed on said display.

31. The video-on-demand service of claim 30 wherein said viewing station further comprises a remote control unit, said remote control unit operative to actuate any one of said actuators.

32. The video-on-demand service of claim 21 wherein:

said video programs are organized into categories; and

said interactive interface comprises:

a previous-category actuator that when actuated displays on said display a preceding category of video programs in a sequence of categories;

a next-category actuator that when actuated displays on said display the next category of video programs in said sequence;

a previous-program actuator that when actuated causes a displayed one of said lists to scroll in a first direction on said display;

a next-program actuator that when actuated causes a displayed one of said lists to scroll in a second direction on said display; and

a selection actuator that when actuated selects one of said video programs for display on said display.

33. The video-on-demand service of claim 32 wherein one of said categories is comedy.

34. The video-on-demand service of claim 32 wherein said previous-category actuator and said next-category actuator operate in an endless loop.

35. The video-on-demand service of claim 32 wherein said viewing station further comprises a remote control unit, said remote control unit operative to actuate any one of said actuators.

36. A method of operating a video-on-demand service, said service interactively coupled to a viewing station comprising a video display, said service accessible to subscribers and non-subscribers of said service, said service operative to transmit video programs, segments of said video programs, and a list of at least some of said video programs, said method comprising:

displaying said list on said display, said list available to said subscribers and said non-subscribers;

displaying one of said segments on said display, said segment available to said subscribers and said non-subscribers; and

displaying one of said video programs on said display, said video program available only to subscribers.

37. The method of claim 36 wherein said displaying one of said segments comprises displaying a preview of one of said video programs on said display.

38. The method of claim 36 wherein said displaying one of said segments comprises displaying a portion of one of said video programs on said display.

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