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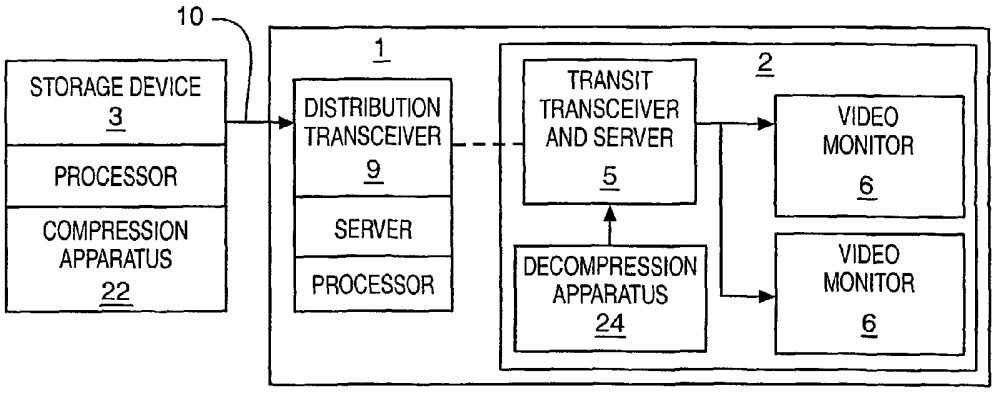
(54) Title: METHOD FOR BROADCASTING MULTIMEDIA TO PASSENGERS TRAVELLING ON A TRANSPORT VEHICLE



(57) Abstract: The broadcast method comprises a multimedia broadcast system for broadcasting stored audio, video, graphic and/or text messages to passengers on transit vehicles that travel a predetermined route in areas where traditional multimedia broadcast is not available. The system includes a multimedia program source (20) for generating the multimedia data for broadcast, one or more distribution transceivers (9) along the predetermined route that stores multimedia data and wirelessly transmits the data to at least one transit transceiver (5) located on the transit vehicles (110, 112 and 114) while the vehicle are stationary at a location corresponding to the distribution transceiver (5). The multimedia data is updated and encoded at the multimedia program source (20) and distributed to the distribution transceivers (9). When a transit vehicle (110, 112 and 114) is within range of the distribution transceiver (9), the updated multimedia data is wirelessly transmitted to the transit transceiver (5).

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METHOD FOR BROADCASTING MULTIMEDIA TO PASSENGERS TRAVELLING ON A TRANSPORT VEHICLE

Field of the Invention

This invention relates to broadcast systems, and more particularly to a method for broadcasting multimedia to passengers traveling on a transport vehicle within a confined area that lacks or does not receive traditional wireless broadcast reception.

Problem

Broadcast systems for passengers traveling in vehicles include closed circuit systems and wireless broadcast in the public domain. In a closed circuit system multimedia data is prerecorded for broadcast to passengers and is not updated regularly.

Wireless Broadcast

Wireless broadcast includes AM/FM audio and television signals received by individual radios or televisions and cellular broadcast for cellular telephones or other devices capable of receiving cellular frequencies. Wireless broadcast is aerial and is blocked by some solid masses or objects and the signals weaken with distance. Areas that are unable to receive the wireless broadcast are said to be out of the broadcast range. Wireless broadcast is not suitable for transit vehicles traveling in a closed environment, such as underground subways and commuter trains, vehicles traveling in remote areas, such as airplanes, trains and busses, or vehicles traveling at speeds that prevent hand-off of cellular signals or reception of continuous AM/FM or video broadcast.

Prerecorded Content

Closed circuit systems are limited to broadcast apparatus that read and distribute prerecorded content stored on cassettes, discs or other storage medium to audio/visual devices connected to the broadcast apparatus.

The audio/visual system disclosed by Scribner, (Pat. No. 5,555,466) includes a video graphic display, headset connection, and selector for individual passengers for use in vehicles where each passenger has an individual seat. The audio/visual unit is located in the seat back of the seat in front of the passenger and allows each passenger to select from a plurality of pre-recorded sources stored in a distribution box. Similarly, Jerome (Pat No. 6,177,887) discloses an aircraft video system that receives information from passengers, sends information to passengers, or can be

used by passengers for entertainment such as video games. The system disclosed by Jerome includes video graphic display units on the reverse side of the passenger food/convenience trays that store in the seatback and can be used by each passenger to make food and beverage selections and allows the flight crew to display flight or advertisement information. Both Scribner and Jones, disclose systems for broadcasting prerecorded content that is stored within the vehicle. Neither provides a means for updating the content.

Another known system for providing information to passengers aboard an aircraft is the audio system provided on most commercial aircraft that allow the passenger to listen to a selection of music or other audio via a headset adapter located at each passenger location. The same connection provides audio, on a different channel, when prerecorded content such as movies or advertisements is played. The audio portion of the movie or advertisement is distributed to the audio system on a different channel. The prerecorded content is stored on a removable diskette or cartridge that is not updated during predetermined stops along the vehicle's route. When safety information is distributed to passengers, one or more fixed video display screens display the video and the audio is broadcast over the aircraft's intercom system.

The systems just described are limited to use on transit vehicles where each passenger has an individual seat. The system fails to provide a means for broadcasting to passengers that are standing in a crowded vehicle or seated in seats that lack seatbacks in front of them. Both the audio and the video are distributed via a hard-wired broadcast system and the content is limited to pre-recorded audio and/or audio/video selections stored on the vehicle or on media compatible with the closed circuit system. The selection is not regularly updated at terminals and does not provide updated news, weather or other information.

Broadcast Content Management

A third type of broadcast system is a broadcast content management and scheduling system which is designed to move video content from a central location for television broadcast. This solution relies on a dedicated direct network connection between the content distribution center and the broadcast system content player at the end. This system assumes that the content player is always available to receive an update and can always be found at the same network address. Since the system utilizes a high-speed connection for distribution of

updated content, the system uses file transfer protocols that rely on an uninterrupted file transfer. While this system provides a solution for distribution of content to a content player via a dedicated direct high-speed connection, the solution fails to provide a method for distributing updated content to a content player located on a moving vehicle that does not include a dedicated direct high-speed connection.

The disclosed broadcast systems lack the capability to wirelessly receive a continuous stream of updated data while traveling a predetermined route or while the vehicle is temporarily stationary at predetermined stops along the vehicle's route and broadcast the updated data to passengers during transit. Neither do the systems provide a means for wirelessly transmitting the data within the vehicle or confined space where the vehicle is traveling for receipt via devices that are in the possession of passengers.

For these reasons there exists a need for a method of broadcasting updated multimedia data to passengers traveling in transit vehicles that travel in areas that lack traditional broadcast reception.

Solution

The present method for broadcasting multimedia to passengers traveling on a transit vehicle overcomes the problems outlined above and advances the art by providing a method for a transit vehicle to wirelessly receive updated multimedia data while the vehicle is traveling a predetermined route and to broadcast the received multimedia data to passengers.

The present broadcast method is intended for use in areas where traditional broadcast signals are unavailable to passengers. Distribution servers connected to distribution transceivers store multimedia data from multimedia program source 20. The multimedia data stored by the distribution servers may be wirelessly received from a multimedia program source or utilize a dedicated communication channel. The distribution transceivers simultaneously transmit the received multimedia data within a range corresponding to each distribution transceiver for receipt by transit vehicles traveling within the range of each successive distribution transceiver. The distribution transceivers wirelessly transmit the multimedia data to transit transceivers located on each transit vehicle where the multimedia data is stored on transit servers connected to the transit transceiver. The transit server then distributes the multimedia data to one or more video graphic displays connected to

the transit server. This provides a method for continuously broadcasting updated information such as news or weather to passengers.

The multimedia program source includes a server for selectively updating blocks of data, indexing the blocks of data and transmitting the updated multimedia data along with a directory to individually addressable distribution transceivers located at station along the route. The transit transceivers receive the updated multimedia data and the directory at intermediary points along the route and broadcast the received multimedia data in accordance with the directory. This provides a method for updating the stored multimedia data while the vehicle is traveling the predetermined route. The updated blocks of data may include data relating to the vehicles next stop, such as advertisements, news, weather or traffic information. The data can be translated to one or more languages and stored for distribution in multiple languages.

The distribution transceiver can include a radio transceiver for converting the stored data to a predetermined AM/FM or wireless frequency and a transmission antenna to broadcast in a confined area, such as an underground subway system. The transmitted signals can be received by AM/FM or wireless devices in the possession of passengers.

Thus, the present broadcast method wirelessly transmits updated multimedia data to transit vehicles that travel in areas that lack traditional broadcast reception and distributes the data to passengers while the vehicle is in transit replaces use of systems that distribute outdated prerecorded content to passengers. It also provides a means for wirelessly receiving blocks of data at intermediate stops along the route to maintain the updated data for broadcast while the vehicle travels the predetermined route.

Brief Description of the Drawings

Figure 1 is a block diagram of a transit vehicle multimedia broadcast system utilizing the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figure 2 is a flow diagram of the method of updating the multimedia content in accordance with the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figures 3a and 3b are block diagrams of a multimedia content;

Figure 4 is a block diagram of a transit vehicle multimedia broadcast system utilizing the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figure 5 is a flow diagram of downloading updated multimedia content to transit vehicles in accordance with the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figure 6a is a flow diagram of a method for broadcasting updated multimedia content in accordance with the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figure 6b is a flow diagram of a methods for transmitting multimedia content to the transit transceiver in accordance with the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figure 6c is a flow diagram of a methods for downloading multimedia content to a plurality of distribution transceivers in accordance with the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figure 7 is a block diagram of another transit vehicle multimedia broadcast system utilizing the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figure 8 is a block diagram of another transit vehicle multimedia broadcast system utilizing the present method for broadcasting multimedia to passengers traveling on a transport vehicle;

Figure 9 is a block diagram of another embodiment of the transit vehicle multimedia broadcast system utilizing the present method for broadcasting multimedia aboard transit vehicles; and

Figure 10 is yet another embodiment of the transit vehicle multimedia broadcast system utilizing the present method for broadcasting multimedia aboard transit vehicles.

Detailed Description

The transit vehicle multimedia broadcast method summarized above and defined by the enumerated claims may be better understood by referring to the following detailed description, which should be read in conjunction with the accompanying drawings. This detailed description of the preferred embodiment is not intended to limit the enumerated claims, but to serve as a particular example

thereof. In addition, the phraseology and terminology employed herein is for the purpose of description, and not of limitation.

The transit vehicle multimedia broadcast system provides a method to broadcast updated multimedia data to passengers on transit vehicles while the vehicle is traveling in areas that lack or do not receive traditional wireless broadcast signals. For example, a subway system that travels on the surface or underground where AM/FM, video broadcast, or wireless communication is lacking or absent or travels at speeds that prevent conventional hand-off of cellular signals or reception of continuous AM/FM or video broadcast. Passengers traveling in these areas are a captive audience with time to listen to or watch multimedia broadcast, but lacking the resources to do so.

The transit vehicle broadcast system provides a method for passengers to receive updated information on a closed circuit broadcast system or wirelessly on devices in the possession of passenger. The broadcast may be entertaining, making the travel time more enjoyable, or informational. It also provides a method for local merchants to bring their product or service to the attention of travelers that otherwise would not have access to the information. The system includes a method for updating the information at intermediate points throughout the transit system so that the broadcast can include information such as entertainment or restaurant advertisements targeted to passengers disembarking at the next station.

The new approach allows present information to be wirelessly downloaded for distribution to passengers on closed circuit audio and/or video graphic displays and/or AM/FM and/or wireless frequencies for receipt on passenger AM/FM radio, or other device capable of receiving wireless transmission of multimedia data. The storage device may receive the multimedia data wirelessly from a multimedia program source or from an intermediary distribution source. The multimedia data is stored on a storage device located at or near the terminus stations and is wirelessly downloaded to transceivers located on the vehicles. The multimedia program source may include a method for compressing the multimedia data, allowing a maximum amount of data to be downloaded in a minimal time. The received data is stored on transit servers for broadcast to passengers on a plurality of video graphic displays connected to the server.

The multimedia program source also transmits updated multimedia data to distribution transceivers located at stations along the predetermined route. While

vehicles are within range for receiving wireless transmission or temporarily stationary at the stations, distribution transceivers wirelessly transmit the updated data to the transceiver. For illustration, the transit vehicle multimedia broadcast system is described using a subway system although other transit systems, such as aircraft, busses, or trains, may be substituted.

Transit System Multimedia Broadcast System—Figure 1:

For simplicity, Figure 1 illustrates a transit vehicle multimedia broadcast system in a subway system having a plurality of stations and one train 2. Train 2 travels a predetermined route between two terminus stations and has scheduled stops at a plurality of stations between the two terminus stations. The multimedia program source 20 includes a storage device 3 for storing multimedia data. The multimedia data stored on the storage device 3 may include news, weather or sports broadcasts from sources such as national or local radio, television or cable stations. Multimedia program source 20 also includes a processor for executing an application program and editing or creating multimedia data for broadcast. Multimedia data can be graphics, audio, video, or any combination thereof and can be stored in multiple languages. Local business advertisements similar to traditional commercials may be stored on the server or can be created and broadcast as video graphics and/or text. The multimedia data may include audio for distribution to passengers on the previously described video system, a closed circuit audio system, or a combination thereof.

The multimedia data are transferred from multimedia program source 20 to distribution transceiver 9 located in subway station 1 via communication channel 10. In this example, communication channel 10 is a virtual private network (VPN) although different communication channels can be utilized. Distribution transceiver 9 includes a server integrally connected to distribution transceiver 9. The distribution server includes a processor for individually addressing a plurality of transit vehicles and for accessing stored data. The processor can select present multimedia data to be transmitted to individual transit vehicles based on the scheduled stops each transit vehicle makes at the plurality of stations.

Multimedia program source 20 can be co-located with distribution transceiver 9 or many miles away. The multimedia program source 20 can include apparatus 22 for compressing the multimedia data prior to transmission to allow a maximum amount of multimedia data to be transferred in a minimal time. Distribution

transceiver 9 may wirelessly transmit the compressed multimedia data to transit transceiver 5 when subway train 2 is within range of the distribution transceiver. After receiving the compressed multimedia data, transit transceiver 5 decompression apparatus 24 decompresses and stores the multimedia data for broadcast in a continuous loop. Compression and decompression apparatus 22 and 26 are known for compressing and decompressing digitized audio, data and video graphics for storage or for transmission via the telephone network or other communication medium. Such apparatus can be used to compress and decompress the multimedia data described for transmission from multimedia program source 20 to distribution transceiver 9 and transit transceiver 5.

The transit vehicle broadcast system includes capabilities to update the multimedia data at the multimedia program source and transmit the updated multimedia data to one or more distribution transceivers located at stations along the subway train's route. Each distribution transceiver is independently addressable by the multimedia program source so that multimedia data can be transmitted directly to individual distribution transceivers. Likewise, each transit transceiver is individually addressable and the distribution transceiver may download updated multimedia data directed to individual transit transceivers.

Multimedia Program Source

The multimedia program source is centrally located to transmit multimedia data to the distribution transceivers. The multimedia program source has a common database of network information and receives status messages from the distribution transceivers within the multimedia broadcast system. The common database of network information may include a list of user names and passwords for authenticating authorization for accessing/modifying the multimedia program source content. It may also include a list of all zones which the multimedia program source services, the distribution servers within each zone, routing tables identifying the address by which to communicate with the distribution server, and a list of the transit vehicles that travel within the zone. The database may also include information related to the content such as the content title, version, and a routing list of distribution servers scheduled to receive the updated content.

When new multimedia data is prepared at the multimedia program source, it is distributed to a zone. A zone is an area containing one or more distribution transceivers and one or more transit transceivers that receive multimedia data from

the distribution transceivers within the same zone. Each distribution transceiver covers an area wherein the distribution transceiver makes contact with the transit transceivers as the transit vehicle travels into range of the distribution server wireless Local Area Network. The multimedia program source may transit multimedia data to multiple distribution transceivers within the same zone or covering different zones. The configuration of the zones and the number of distribution transceivers and transit vehicles traveling within each zone are dependent on the configuration of the transit system for which the multimedia broadcast system is configured.

The multimedia program source is connected to each distribution transceiver via a high-speed dedicated network communication channel and each distribution transceiver is individually addressable by the multimedia program source. The communication channel 10 may be a virtual private network (VPN) although different communication channels can be utilized.

Referring to the process flow diagram of Figure 2 which disclosed a method of updating the multimedia content in accordance with the present method for broadcasting multimedia to passengers traveling on a transport vehicle, in step 200 multimedia content is generated at the multimedia program source for distribution and broadcast to passengers traveling on one or more transit vehicles. Multimedia content includes audio and/or audio/video content that are distributed for broadcast throughout the day. The multimedia content may be compressed in step 202 using a commonly know compression scheme such as MPEG-2 to reduce the storage requirements for the video content. The video may include an embedded native language audio track and may also include one or more alternate language audio tracks that are broadcast in synchronization with the video content. The audio and/or audio/video content is broadcast to passengers in a continuous loop until a new version of the multimedia content is downloaded to the transit vehicle.

Step 200 may also include generation of stereo audio tracks containing music, information and advertising content. Each stereo audio track may be a variable length and each may be broadcast in a continuous loop independent of the other stereo audio loops and the audio/video loop. After new multimedia content is generated in step 200 and compressed in step 202, the multimedia program source contacts one or more distribution transceivers in step 204. Staff at the multimedia program source may initiate distribution of the new multimedia content to the

distribution transceiver in step 204 or the multimedia program source may automatically initiate distribution when new multimedia content is available.

Once a distribution transceiver has been contacted in step 204, the distribution transceiver sends a reply in step 206. If a reply is not received in step 206, contact was not completed in step 204 and the multimedia program source continues to initiate contact with the distribution transceiver. When a reply is received in step 206, the reply includes identification information necessary for the multimedia program source to verify the identification of the distribution transceiver in step 208. If the identification of the distribution transceiver is verified in step 210, the multimedia program source checks the version of multimedia content saved on the distribution transceiver server in step 212. In step 214, if the multimedia content version at the multimedia program source is an updated version, the updated multimedia content is downloaded in step 216 to the distribution transceiver where the updated version is stored on the distribution server for distribution to the transit transceivers within range. If the distribution transceiver is not verified in step 210, the multimedia program source may initiate another attempt to contact the distribution transceiver in step 204.

As illustrated in Figure 3a, multimedia content 4 may be stored in blocks 11, shown as multimedia content A - D, so that only modified or new block 12, shown in Figure 3b as multimedia content E, need be transmitted during more frequent stops of shorter duration. The multimedia program source contains a directory of the blocks of multimedia content and transmits the directory along with the multimedia content to the distribution transceiver. The multimedia program source can also send a new directory with previously transmitted blocks deleted. The transit transceiver then uses the new directory to sequentially broadcast the multimedia content following the directory. Breaking the multimedia content into blocks provides a method for adding or deleting blocks of multimedia content or transmitting updated multimedia content without requiring downloading of the entire multimedia content to be displayed. It also allows updated multimedia content to be transmitted at stops of shorter duration such as those experienced on subway routes. This capability allows broadcast of advertisements or present information such as traffic or weather conditions relevant to the vehicles next stop.

Distribution to Transit Transceiver—Figures 4 and 5:

Each distribution transceiver may be connected to a high-speed wireless Local Area Network within a particular zone serviced by one or more distribution transceivers. In this example, the distribution transceivers may be located within rail yards or train stations within the zone of the distribution transceiver. A large transit facility may comprise a plurality of zones with each zone including one or more distribution transceivers as illustrated in Figure 4. Each distribution transceiver 9 includes a wireless Local Area Network (LAN) device that operates within a predetermined range. When a transit vehicle 5 is within the wireless range, the distribution transceiver corresponding to the range downloads an updated version of content to the transit transceiver 5 located within a transit vehicle. As illustrated in Figure 4, a transit vehicle traveling a predetermined route may travel through one zone 100 comprising three Local Area Network ranges 110, 112, and 114. While within one of the Local Area Network ranges, the distribution transceiver corresponding to that particular wireless Local Area Network range downloads updated multimedia content to the transit transceiver.

Referring to the flow diagram of Figure 5 which is a flow diagram that illustrates the method of distributing the multimedia content in accordance with the method for broadcasting multimedia to passengers traveling on a transport vehicle, in step 220, each distribution LAN device continuously monitors for a valid network connection to a transit transceiver traveling within range of the distribution Local Area Network. As the transport vehicle enters the Local Area Network range of the distribution transceiver, the LAN device and the transit vehicle wireless adapter establish a wireless connection in 224.

When the wireless connection is secured in step 226, the distribution transceiver may receive a block of uploaded data from the transit vehicle in step 228. The block of data may include transit vehicle identification, playback statistics and any error information that the transit transceiver may have encountered since the last download. The block of data uploaded to the distribution transceiver also includes the version of the content available at the transit server and completion status of any subsequent failed or incomplete download. The distribution transceiver may also download data to the transit transceiver identifying the distribution transceiver to which the transit transceiver is securely connected.

The distribution server processor identifies the transit transceiver to which it is connected and checks the content version presently available on the transit vehicle in step 230. If the content version at the distribution transceiver is not an updated version, the previous download may be incomplete. In step 236 the distribution server processor check the status of the previous transit transceiver download. If the download was incomplete in step 236, the pointer is obtained in step 238 from the transit server to indicate the point at which the previous download was terminated. Since the video files may be very large, the download may not be completed prior to the transport vehicle leaving the range of the previous distribution transceiver. In this example, the content version saved on the transit server is partially updated. Since the previous download was incomplete in step 236, the subsequent distribution transceiver then downloads the same updated version in step 232 from the point at which the previous download was terminated.

If the version of the content at the distribution transceiver is not an updated version in step 230, the updated content is downloaded to the transit transceiver in step 232. If the download is not completed in step 234 prior to the transit vehicle leaving the range of the distribution transceiver, the transit server records a pointer in step 235 to indicate the point at which the download was terminated.

Providing a method for each subsequent distribution transceiver to download the next portion of the updated version allows larger multimedia content files to be downloaded to the transit transceiver for broadcast to passengers traveling in the transit vehicle. The old version multimedia content saved on the transit vehicle server is broadcast to the passengers until the complete new version of multimedia content is downloaded to the transit transceiver and saved on the transit server.

In an alternative embodiment, the zone comprising the distribution transceivers may server more than one transit system. In this embodiment the zone which the particular distribution transceiver services may include a portion of the route traveled by long-haul transport vehicle such as an Amtrak train as well as a short-haul subway train. The multimedia program source may download different multimedia content for distribution to the long-haul and the short-haul transit vehicles. Once the transit vehicle is within range of the distribution transceiver's Local Area Network, the transit transceiver is connected to the distribution

transceiver, the distribution transceiver identifies the transit vehicle and downloads the corresponding multimedia content to the transit transceiver.

Transit Vehicle Broadcast—Figures 6a-6c:

Transit transceivers located within a transit vehicle include a server for saving and transmitting the multimedia content for broadcast, a processing device for executing an application program and a wireless adapter. While the transport vehicle is traveling, the transit transceiver may broadcast a video content with an embedded audio channel. The transit transceiver may also broadcast one or more alternative audio channels synchronized to the video content and multiple mono and/or stereo audio channels each in an individual loop. The video content is displayed on one or more video display means located throughout the transit vehicle. The audio channels may be modulated AM/FM signals that are broadcast on a low-power signal within each of the transit vehicles. Passengers may listen to the low-power AM/FM signal via passenger's radios or other device capable of receiving the AM/FM signals.

Referring to the flow diagram of Figure 6b, the transit transceiver receives updated multimedia content from the distribution transceiver in step 240. In step 242 the received multimedia content are saved in memory in the transit server. Referring to the flow diagram in Figure 6a, the transit transceiver broadcasts the multimedia content in one or more continuous loops in step 244. The transit server records interruptions in broadcast, system failures and other information relating to the broadcast of the audio and/or audio/video content in step 246. The transit server also records broadcast statistics in step 246 indicating when the transit transceiver broadcast each loop of the multimedia content.

Referring back to Figure 6b, while the transit transceiver is broadcasting the multimedia content, the wireless adapter within the transit server continuously monitors for a network signal in step 248 indicating that the transit vehicle is within range of a distribution transceiver. When a secure wireless connection is established in step 250 between the distribution transceiver wireless Local Area Network and the transit server wireless adapter, the transit transceiver uploads a transit transceiver identification to the distribution transceiver. As previously discussed, the distribution servers processes the identification received from the transit transceiver to verify the identification of the transit vehicle in step 254. If the transit vehicle identification is verified in step 256, the transit transceiver uploads

the recorded data to the distribution transceiver in step 252 and the distribution transceiver downloads the updated multimedia content which is received by the transit transceiver in step 240. If the transit vehicle is not verified, the transit transceiver continues to search for a network connection in step 248.

Simultaneous Distribution from a Plurality of Distribution Transceivers—Figures 7, 8 and 9:

As previously disclosed, a plurality of distribution transceivers may be located at various stations along the transit vehicle's route and there may be more than one vehicle traveling the route. Each transit vehicle can be equipped with a transit transceiver to receive multimedia content from the distribution transceivers. Figure 7 illustrates the broadcast system having two distribution transceivers 13a and 13b, one located at terminus station 14a and the other at intermediary station 14b and two subway trains 15a and 15b. Use of two stations and two trains is for illustration purpose and is not a limitation of the transit vehicle multimedia broadcast system.

Referring to the block diagram of Figure 7 in conjunction with the operational flow diagram in Figure 6c, the multimedia program source 20 may download the multimedia data in step 270 to a chain of serially connected distribution transceivers. A first distribution transceiver 13a may receive the multimedia content in step 272 from the multimedia program source and transmit the received multimedia content to a next distribution transceiver 13b. In this embodiment, the distribution transceivers may include an amplifier, or repeater, to amplify or regenerate the multimedia content in step 274 prior to distribution to the next distribution transceiver in step 276. Alternatively, the multimedia program source may download the multimedia content to the plurality of distribution transceivers via a dedicated line interconnecting the plurality of distribution transceivers. Repeaters located at intervals along the dedicated line amplify and/or regenerate the multimedia content signal as the multimedia content signal travels a distance from the multimedia program source to the plurality of distribution transceivers.

In this example, terminus station 14a is the starting point of the route and station 14b is an intermittent stop along the route. At terminus station 14a, transit transceiver 17a may receive enough multimedia content 16a from the distribution transceiver 13a for the transit transceiver 17a to broadcast during an entire route. After train 15a has left terminus station 14a, it makes a temporary stop at

intermediary station 14b to allow passengers to embark and disembark train 15a. Prior to this temporary stop, multimedia program source 20 may transmit blocks of new or updated multimedia content to distribution transceiver 13b. The new or updated multimedia content 16b is then wirelessly transmitted to transit transceiver 17a on train 15a during the temporary stop.

Similarly, train 15b traveling the same route will receive multimedia content 16a at the terminus station 14a and may receive updated or new multimedia content 16b at the temporary stop at station 14b. As the train makes additional intermittent stops along the route, distribution transceivers located at those stations may transmit updated or new blocks of multimedia content to the trains transit transceiver for broadcast. The time required to transmit the updated or new multimedia content should not exceed the time that the train will be temporarily stopped at the intermittent stations. While the transit vehicle is traveling, the transit transceiver 17a broadcast the multimedia content to passengers via connected video graphic display means. Although this embodiment has been illustrated with two video graphic displays on each train, the train could include a plurality of cars each having one or more video graphic displays.

Alternatively, the multimedia program source may transmit multimedia content simultaneously to the plurality of distribution transceivers in a continuous stream. Each distribution transceiver wirelessly transmits the received multimedia content within a predetermined range, wherein the ranges of the plurality of distribution transceivers encompass the area between the two terminus stations.

Each distribution transceiver 13a and 13b receives multimedia content and simultaneously wirelessly transmit the received multimedia content 16a and 16b in a continuous steam. Transit vehicles 15a and 15b traveling the predetermined route between the two terminus stations are within the range of one distribution transceiver at all times. Since distribution transceivers 13a and 13b are simultaneously transmitting the same multimedia data 16a and 16b received from multimedia program source 20, transit transceivers 17a and 17b located on transit vehicles 15a and 15b receive a continuous stream of update multimedia content 16a and 16b for broadcast to passengers. Simultaneously transmitting the multimedia content from a plurality of distribution transceiver's eliminates the need for each distribution transceiver to transfer or hand-off, transmission to a successive distribution transceiver for continuous reception by transit transceiver.

Referring to the block diagram of Figure 8, the transit vehicle broadcast system in another embodiment may include a sensing apparatus 26 located between the plurality of distribution transceivers and each transport vehicle. As transport vehicle 15a comes into range of distribution transceiver 13a, distribution transceiver 13a wirelessly transmits multimedia content for receipt by transit vehicle 15a's transit transceiver 17a. When transport vehicle 15a leaves the range of distribution transceiver 13a and enters the range of distribution transceiver 13b, distribution transceiver 13b wirelessly transmits the continuous stream of multimedia content 16b to transit transceiver 17a. Wirelessly transmitting the same continuous stream of multimedia content from successive distribution transceivers eliminates the need to identify which blocks of multimedia content have been received, rather a continuous stream of multimedia content is received by transit transceivers that distributes the multimedia content to video graphic displays without interruption.

As previously described, streams of compressed multimedia content may be received from a multimedia program source and wirelessly transmitted from the multimedia program source to distribution transceivers that wirelessly transit the streams of compressed multimedia content to the transit transceiver where the multimedia content is decompressed. Transit transceivers continuously distribute decompressed multimedia content to a video graphic display located on the transit vehicle. The multimedia content may include present television broadcast retransmitted within the confined space of the transport system or the immediate area of the predetermined route.

Wireless Broadcast—Figures 9 and 10:

While the previous examples described audio/video broadcast transmitted to video graphic displays located within the transit vehicle, the broadcast could be AM/FM radio signals. In this embodiment of the broadcast system, shown in Figure 9, a plurality of distribution transceivers 9 are located at predetermined locations within the confined area of subway system. Distribution transceivers 9 include a device for converting the received multimedia content to a predetermined AM/FM audio frequency. Each distribution transceiver 9 is each equipped with at least one transmission antenna 18 to broadcast low power audio messages that can be received via passenger's radios or other device capable of receiving the AM/FM signals. The broadcast area is limited to within a confined an area like an

underground subway system. Like the previous examples, distribution transceivers 5 receive data for broadcast from multimedia program source. Data received can include a directory and blocks of multimedia content in different languages. The distribution transceiver can then broadcast different languages on different frequencies. Since the transmission is in an area that is not accessible to traditional broadcast signals, this broadcast will not interfere with licensed AM/FM broadcast stations.

In another embodiment of the transit vehicle multimedia broadcast system shown in Figure 10, distribution transceiver 5 receives compressed multimedia content from multimedia program source and wirelessly transmits compressed multimedia content to one or more transit transceivers 5 each located on a transit vehicle. As in a previous example, transit transceiver 5 includes a device for decompressing compressed multimedia content. In this example, transit transceiver 5 includes a device for converting the decompressed multimedia data to one or more predetermined AM/FM or wireless transmission frequencies. Transit transceivers 6 include at least one antenna 18 to broadcast the multimedia content via low power AM/FM radio and/or wireless signals. The broadcast area is small, approximately the length of the transit vehicle, and the area is a confined space that does not conflict with traditional AM/FM or wireless broadcast signals. Passengers carrying devices capable of receiving AM/FM or wireless transmissions, such as laptop computers or cellular telephones, can receive the broadcast. The broadcast is low power and within the confined space of the transit vehicle, thus not requiring registration and licensing.

Alternative embodiments will occur to those skilled in the art. Although the multimedia broadcast system has been described for use within a subway system, alternative transit systems such as trains, busses, or aircraft could be substituted. Similarly, although embodiments were described downloading the compressed multimedia data via a virtual private network, alternative transmission methods could be used. Such variations and alternatives are contemplated, and can be made without departing from the spirit and scope of the invention claimed in the appended claims.

What is claimed is:

1. A method for broadcasting multimedia content to a plurality of passengers on a plurality of transit vehicles traveling a predetermined route in an area where traditional broadcast signals are not available, the predetermined route having a plurality of stations between two terminus stations, the method comprising:

generating the multimedia content at a multimedia program source (20) connected to a plurality of distribution transceivers (9) each located at one of the plurality of stations (110, 112 and 114);

transmitting the multimedia content from the multimedia program source (20) to the plurality of distribution transceivers (9);

storing the received multimedia content on a distribution transceiver storage medium connected to the each one of the plurality of distribution transceivers (9);

wirelessly downloading the stored multimedia content from one of the plurality of distribution transceivers (9) to one of the plurality of transit transceivers (5) when the transit transceiver (5) is within range of the one of the plurality of distribution transceivers (9), each one of the plurality of transit transceivers (5) located within one of the plurality of transit vehicles;

storing the wirelessly downloaded multimedia content on the corresponding one of a plurality transit transceiver storage mediums connected to each corresponding one of the plurality of transit transceivers (5); and

distributing the stored multimedia content from the corresponding one of the plurality of transit transceiver storage mediums to one or more of the plurality of video display (6) located on the corresponding one of the plurality of transit vehicles for viewing by the plurality of passengers.

2. The method of claim 1 wherein generating the multimedia content comprises:

generating an audio/video content at the multimedia program source (20), wherein the audio content is a native language audio content; and

compressing the audio/video content for transmission to one or more of the plurality of distribution transceivers (9).

3. The method of claim 2 wherein the audio/visual content comprises a plurality of audio/video blocks, the method further comprising:

updating one or more of the plurality of audio/video blocks (4), wherein each block (11)of the plurality of audio/video blocks (4) is individually addressable;

creating a directory of the plurality of audio/video blocks (4); and

compressing the updated one or more of the plurality of audio/video blocks (4) for transmission to one or more of the plurality of distribution transceivers (9).

4. The method of claim 2 further comprising:

generating one or more alternate language audio contents for distribution to one or more of the distribution transceivers (9), wherein the one or more alternate language blocks is synchronized with the audio/video content.

5. The method of claim 2 further comprising:

transmitting the compressed audio/video content from one of the plurality of distribution transceivers (9) to one or more of the plurality of transit transceivers (5) as a continuous stream while the one or more of the transit transceivers (5) is within range of the one of the plurality of distribution transceivers (9).

6. The method of claim 1 wherein generating the multimedia content comprises:

generating one or more audio contents for broadcast to the plurality of passengers.

7. The method of claim 1 wherein transmitting the multimedia content comprises:

contacting one or more of the plurality of distribution transceivers (9);

receiving a reply from the one of more of the plurality of distribution transceivers (9), the reply including the version of the multimedia content presently stored on the corresponding distribution transceiver storage medium;

comparing the version of the stored multimedia content with the version of the generated multimedia content at the multimedia program source (20); and

if the version of the stored multimedia content is different than the multimedia content at the multimedia program source (20), transmitting the multimedia content from the multimedia program source (20) to the one or more of the plurality of distribution transceivers (9).

8. The method of claim 1 wherein the plurality of distribution transceivers (9) comprises a means for sensing when one of the plurality of transit transceivers (5) is within range and downloading the multimedia content, the method comprising:

sensing when one of the plurality of transit vehicles is within range of one of the plurality of distribution transceivers (9); and

downloading the stored multimedia content from the one of the plurality of distribution transceivers (9) to the one of the plurality of transit transceiver (5) while the one of the plurality of transit transceivers (5) is within range of the one of the plurality of distribution transceivers (9).

9. The method of claim 8 wherein each next portion of the multimedia content is downloaded from each next one of the plurality of distribution transceivers (9) to the one or more of the plurality of transit transceivers (5) while the one or more of the plurality of transit transceivers (5) is within range of each next one of the plurality of distribution transceivers (9).

10. The method of claim 8 further comprising:

uploading a status data from the one of the plurality of transit transceivers (5) to the one of the plurality of distribution transceivers (9) when the one of the plurality of transit transceivers (5) is within range of the one of the plurality of distribution transceivers (9), wherein the status data includes the version of the one or more stored multimedia contents and a status of the previous download;

the one of the plurality of distribution transceivers (9), comparing the version of the multimedia content stored on the transit transceiver storage medium and the distribution transceiver storage medium;

if the version of the multimedia content stored on the transit storage means and the distribution storage means are the same, checking the status of the previous download;

if the status of the previous download is incomplete, downloading the multimedia content from the point at which the previous download was terminated; and

if the version of the multimedia content stored on the transit transceiver storage medium and the distribution transceiver storage medium are not the same, downloading the multimedia content from the one of the plurality of distribution transceivers (9) to the one of the plurality of transit transceivers (5).

11. The method of claim 9, further comprising:

the one of the plurality of transit transceivers (5), checking the status of the download; and

if the download is incomplete prior to the one of the transit transceivers (5) leaving the range of the one of the plurality of distribution transceivers (9), recording a pointer corresponding to the point at which the download was terminated.

12. A method of broadcasting multimedia data to a plurality of passengers on a plurality of transit vehicles traveling a predetermined route in an area where traditional broadcast signals are unavailable, wherein the predetermined route includes at least two terminus stations and a plurality of stations between the at least two terminus stations, the method comprising:

a multimedia program source (20), transmitting the multimedia data to a plurality of distribution transceivers (9) each located at one of the plurality of stations;

wirelessly transmitting the multimedia data from one of the plurality of distribution transceivers (9) to one of a plurality of transit transceivers (5) within range of the one of the plurality of distribution transceivers (9), each one of the plurality of transit transceivers (5) located on one of the plurality of transit vehicles;

storing the wirelessly received multimedia data on a transit transceiver storage device corresponding to the one of the plurality of transit transceivers (5);

distributing the stored multimedia data from the transit transceiver storage device to a plurality of video graphic displays (6) located on the one of the plurality of transit vehicles for viewing by the plurality of passengers, wherein the plurality of video graphic displays (6) are interconnected to the corresponding transit transceiver storage device.

13. The method of claim 12 wherein transmitting the multimedia data to a plurality of distribution transceivers (9), comprises:

creating the multimedia data;

compressing the multimedia data;

storing the compressed multimedia data on a storage device within the multimedia program source (20);

transmitting the stored compressed multimedia data from the multimedia program source (2) to the plurality of distribution transceivers (9) each one of the plurality of distribution transceivers (9) located at one of the plurality of stations.

14. The method of claim 12, wherein each one of the plurality of distribution transceivers (9) is integrally connected to a corresponding distribution transceiver storage device and wirelessly transmitting the multimedia data from one

of the plurality of distribution transceivers (9) to one of a plurality of transit transceivers (5) comprises:

storing the received multimedia data on the corresponding distribution transceiver storage device;

sensing when one of the plurality of transit transceivers (5) is within range of one of the one of the distribution transceivers (9); and

wirelessly transmitting the stored multimedia data from the corresponding one of the plurality of distribution transceivers (9) to the one of the plurality of transit transceivers (5) within range of the one of the plurality of distribution transceivers (9).

15. The method of claim 14 wherein wirelessly transmitting the stored multimedia content comprises:

uploading a status data from the one of the plurality of transit transceivers (5) to the one of the plurality of distribution transceivers (9) while the one of the plurality of transit transceivers (9) is within range of the one of the plurality of distribution transceivers (5)

wirelessly transmitting the stored multimedia content from the one of the plurality of distribution transceivers (9) to the one of the plurality of transit transceivers (5), the downloading comprising:

comparing the version of the multimedia content stored on the transit transceiver storage device to the version of the stored multimedia content on the distribution transceiver storage device; and

if the versions are different, downloading the stored multimedia content from the one of the plurality of distribution transceivers (9) to the one of the plurality of transit transceivers (5).

16 The method of claim 15 further comprising:

uploading a status data from the one of the plurality of transit transceivers (5) to the one of the plurality of distribution transceivers (9) while the one of the plurality of transit transceivers (5) is within range of the one of the plurality of distribution transceivers (9), wherein the status data includes the version of the one or more stored multimedia data and a status of the previous download;

comparing the version of the multimedia content stored on the transit transceiver storage device and the distribution transceiver storage device;

if the version of the multimedia content stored on the transit storage means and the distribution storage means are the same, checking the status of the previous download;

if the status of the previous download is incomplete, downloading the multimedia content from the point at which the previous download was terminated; and

if the version of the multimedia content stored on the transit transceiver storage device and the distribution transceiver storage device are not the same, downloading the multimedia content from the one of the plurality of distribution transceivers (9) to the one of the plurality of transit transceivers (5).

17. The method of claim 16 further comprising:

the one of the plurality of transit transceivers (5), checking the status of the download; and

if the download is incomplete prior to the one of the transit transceivers (5) leaving the range of the one of the plurality of distribution transceivers (9), recording a pointer corresponding to the point at which the download was terminated.

18. A method of broadcasting multimedia data to a plurality of passengers on a plurality of transit vehicles traveling a predetermined route in an area where traditional broadcast signals are unavailable, wherein the predetermined route includes at least two terminus stations and a plurality of stations between the at least two terminus stations, the method comprising:

downloading the multimedia data from a multimedia program source (20) to a first one of a plurality of distribution transceivers (9);

transmitting the received multimedia data from the first one of the plurality of distribution transceiver (9) to a next one of the plurality of distribution transceivers 99);

each next one of the plurality of distribution transceivers (9), transmitting the received multimedia data to a successive next one of the plurality of distribution transceivers (9);

wirelessly transmitting the multimedia data from each one of the plurality of distribution transceivers (9) to one of more of a plurality of transit transceivers (5) within range of each one of the plurality of distribution transceivers (9), each one of the plurality of transit transceivers (5) located on one of the plurality of transit vehicles; and

distributing the stored multimedia data from the transit transceiver storage device to a plurality of video graphic displays (6) located on the one of the plurality of transit vehicles for viewing by the plurality of passengers, wherein the plurality of video graphic displays (6) are interconnected to the corresponding transit transceiver storage device.

19. The method of claim 18 further comprising:

amplifying the received multimedia data at the plurality of distribution transceivers (9) prior to transmitting the multimedia data to the next one of the plurality of distribution transceivers (9).

20. The method of claim 18 further comprising:

regenerating the received multimedia data at the plurality of distribution transceivers (9) prior to transmitting the multimedia data to the next one of the plurality of distribution transceivers (9).

21. A method of broadcasting multimedia data to a plurality of passengers on a plurality of transit vehicles traveling a predetermined route in an area where traditional broadcast signals are unavailable, wherein the predetermined route includes at least two terminus stations and a plurality of stations between the at least two terminus stations, the method comprising:

downloading the multimedia data from a multimedia program source (20) via a dedicated communication channel (10) a plurality of distribution transceivers (9);

amplifying the downloaded multimedia content at period intervals by a plurality of repeaters connected to the dedicated communication channel (10);

wirelessly transmitting the multimedia data from each one of the plurality of distribution transceivers (9) to one of more of a plurality of transit transceivers (5) within range of each one of the plurality of distribution transceivers (9);

each one of the plurality of transit transceivers located on one of the plurality of transit vehicles; and

distributing the stored multimedia data from the transit transceiver storage device to a plurality of video graphic displays (6) located on the one of the plurality of transit vehicles for viewing by the plurality of passengers, wherein the plurality of video graphic displays (6) are interconnected to the corresponding transit transceiver storage device.

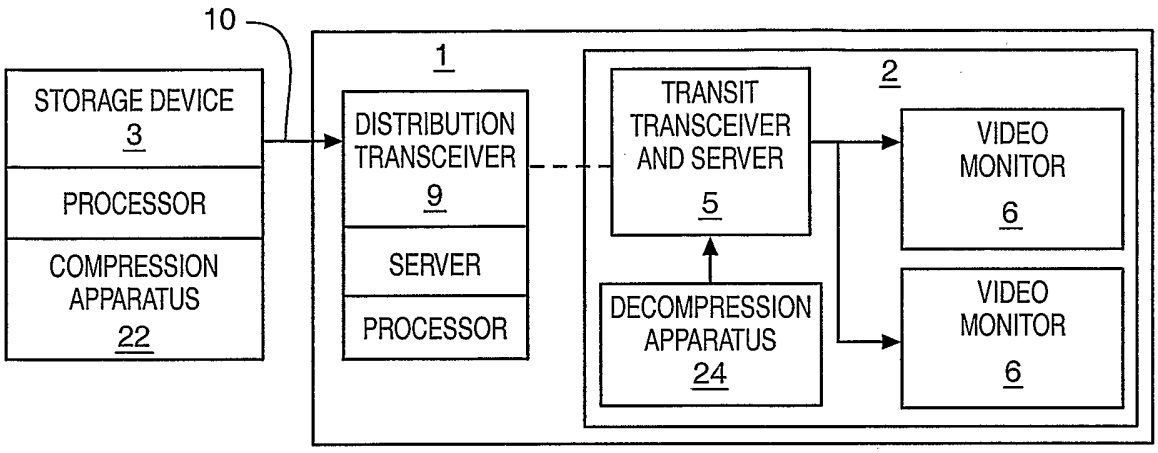


FIG. 1

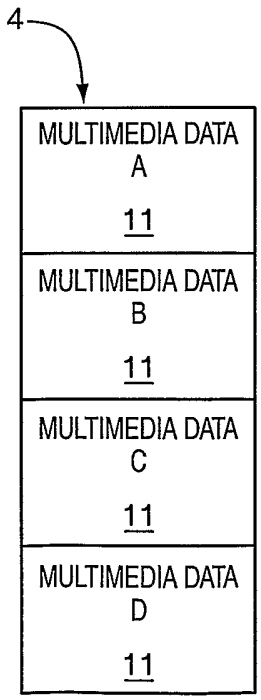


FIG. 3A

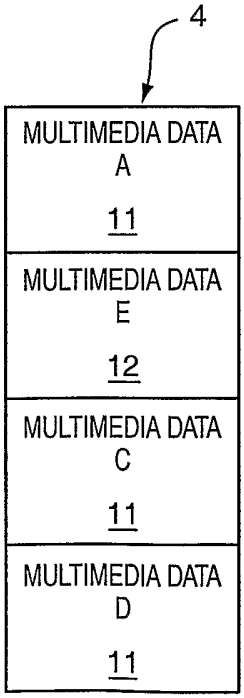


FIG. 3B

FIG. 2

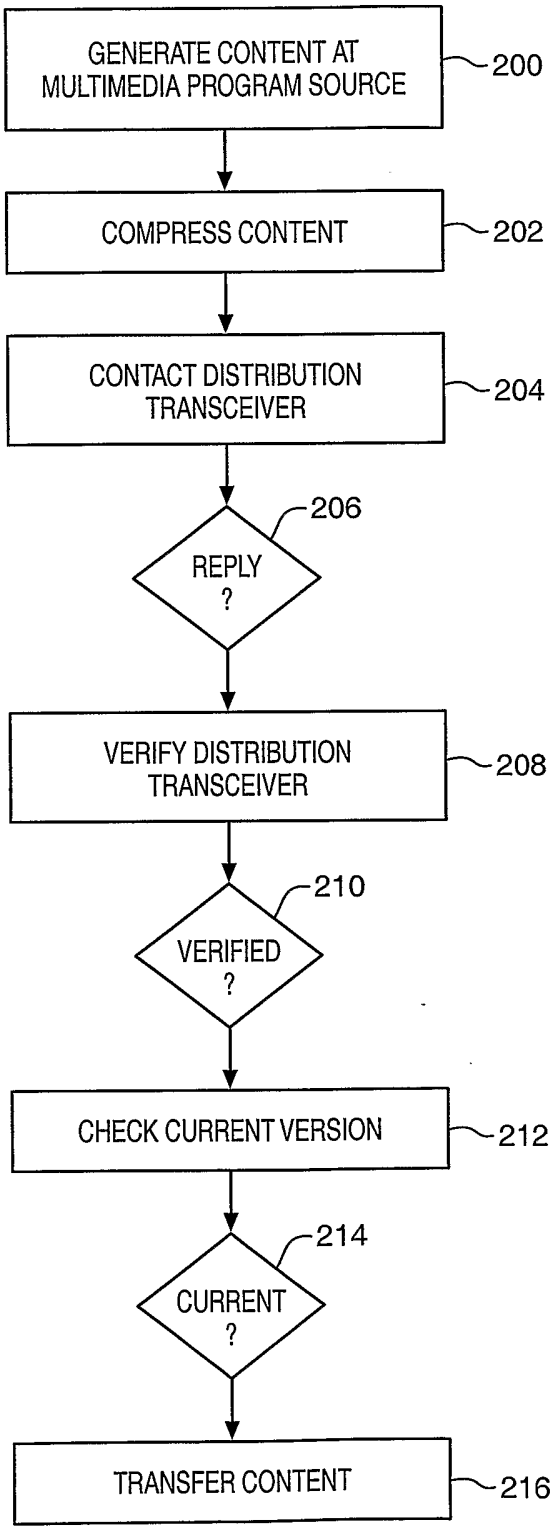

GENERATE CONTENT AT MULTIMEDIA PROGRAM SOURCE
200
COMPRESS CONTENT
202
CONTACT DISTRIBUTION TRANSCEIVER
204
206
REPLY ?
VERIFY DISTRIBUTION TRANSCEIVER
208
210
VERIFIED ?
CHECK CURRENT VERSION
212
214
CURRENT ?
TRANSFER CONTENT
216

FIG. 4

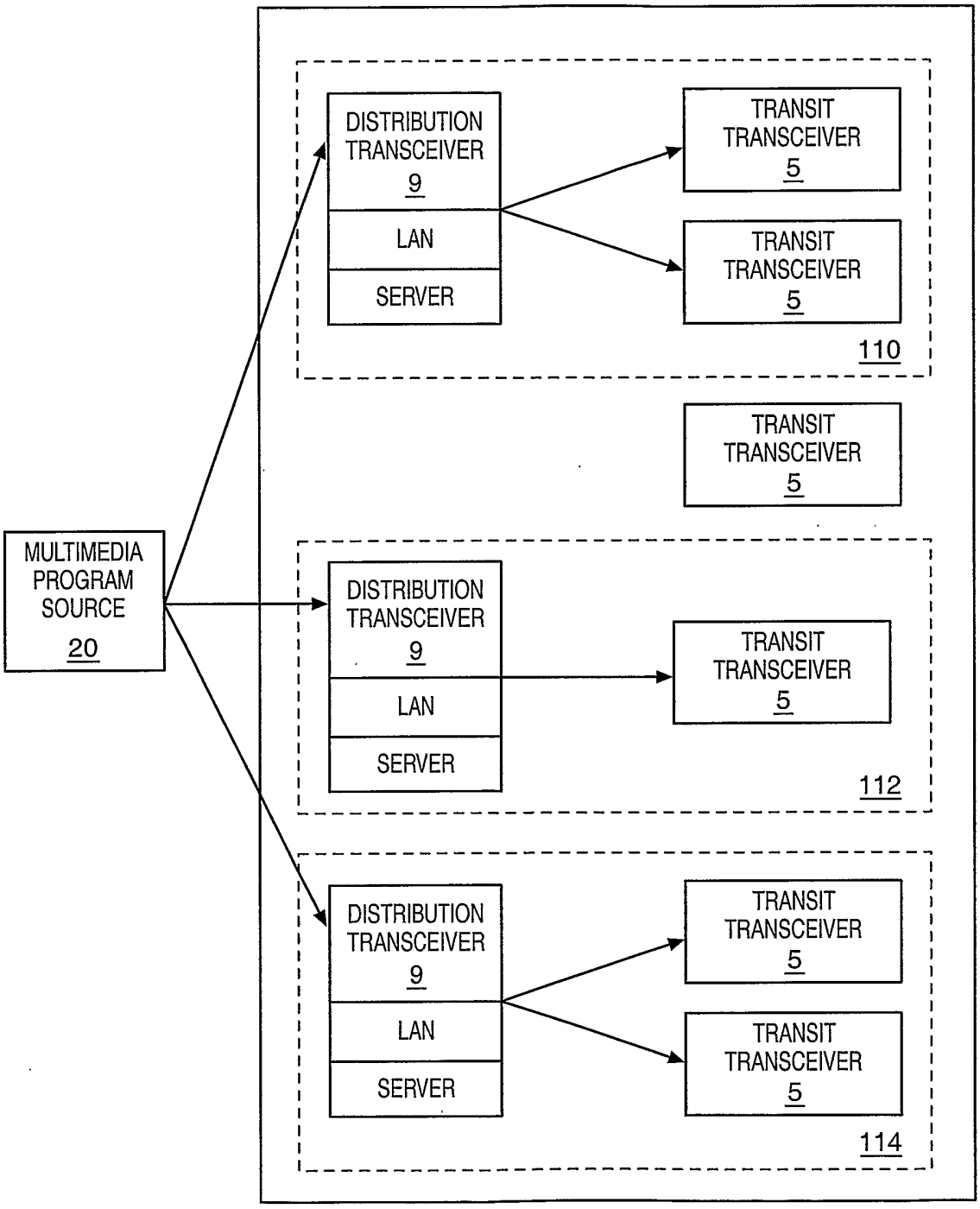

MULTIMEDIA PROGRAM SOURCE 20
DISTRIBUTION TRANSCEIVER 9
LAN
SERVER
TRANSIT TRANSCEIVER 5
TRANSIT TRANSCEIVER 5
110
TRANSIT TRANSCEIVER 5
DISTRIBUTION TRANSCEIVER 9
LAN
SERVER
TRANSIT TRANSCEIVER 5
112
DISTRIBUTION TRANSCEIVER 9
LAN
SERVER
TRANSIT TRANSCEIVER 5
TRANSIT TRANSCEIVER 5
114

FIG. 5

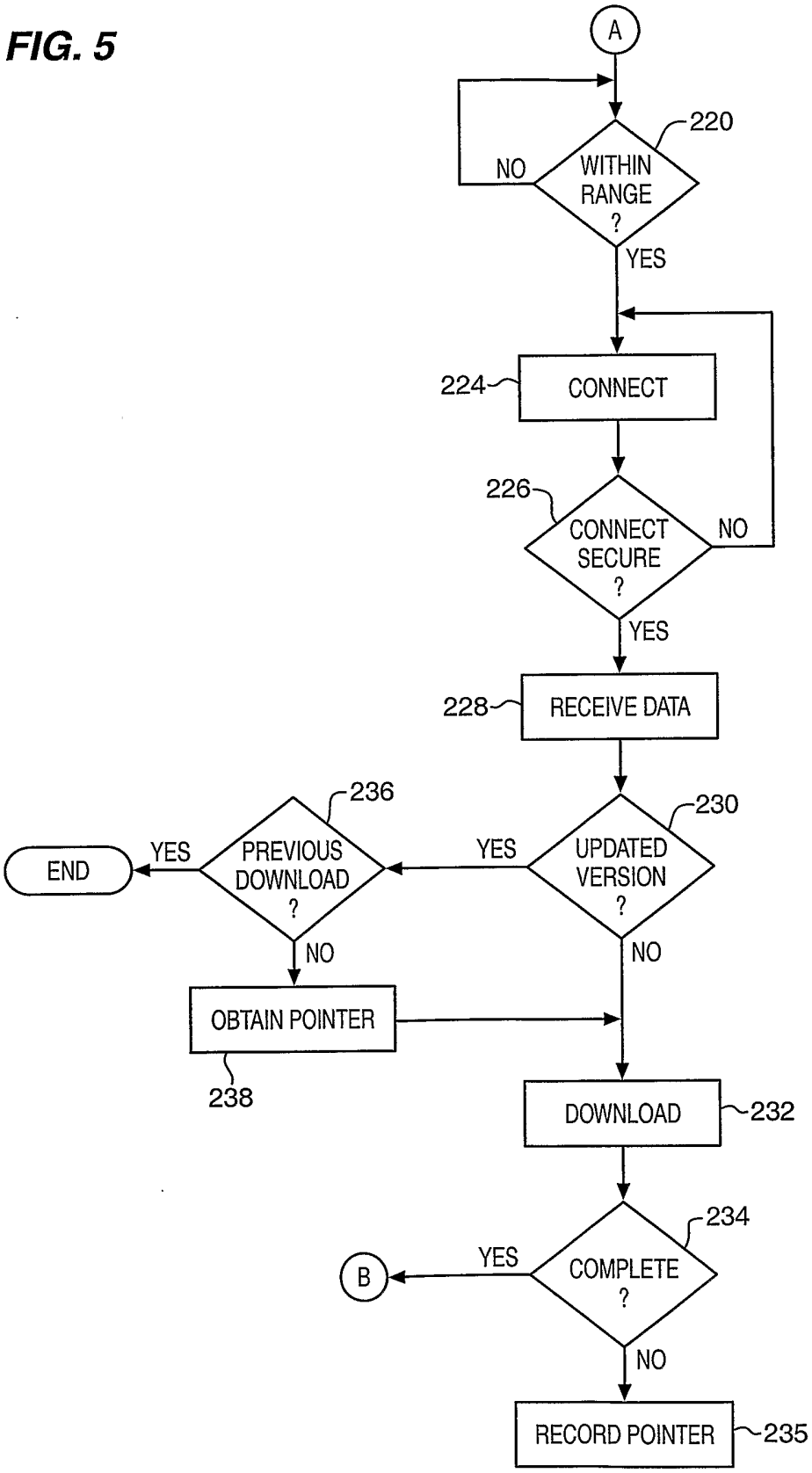

A
220
NO
WITHIN RANGE ?
YES
224
CONNECT
226
CONNECT SECURE ?
NO
YES
228
RECEIVE DATA
236
230
END
YES
PREVIOUS DOWNLOAD ?
YES
UPDATED VERSION ?
NO
NO
OBTAIN POINTER
238
DOWNLOAD
232
234
B
YES
COMPLETE ?
NO
RECORD POINTER
235

FIG. 6A

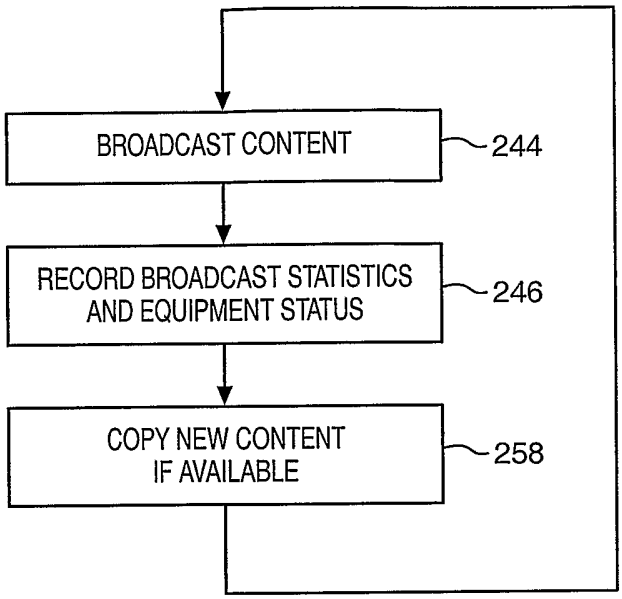

BROADCAST CONTENT
244
RECORD BROADCAST STATISTICS AND EQUIPMENT STATUS
246
COPY NEW CONTENT IF AVAILABLE
258

FIG. 6C

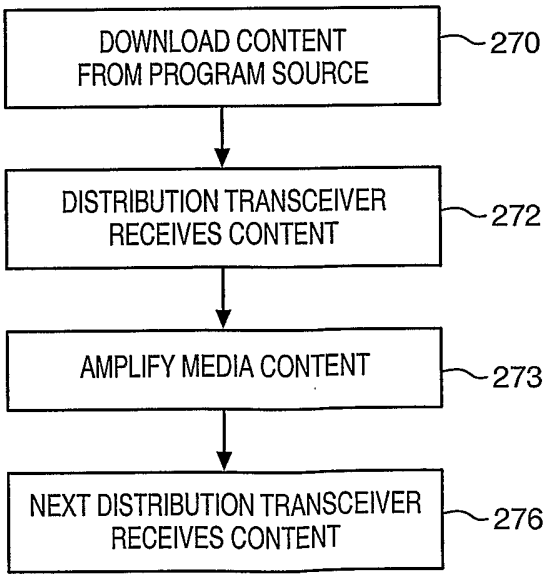
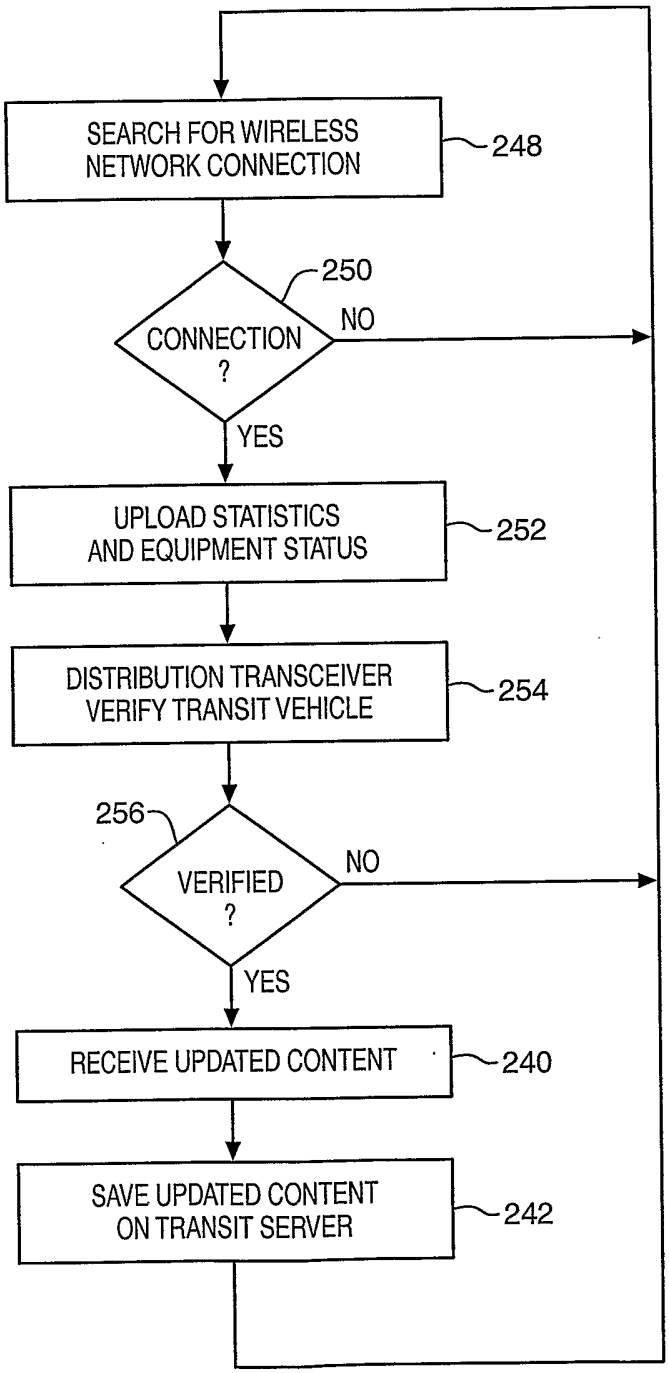

DOWNLOAD CONTENT FROM PROGRAM SOURCE
270
DISTRIBUTION TRANSCEIVER RECEIVES CONTENT
272
AMPLIFY MEDIA CONTENT
273
NEXT DISTRIBUTION TRANSCEIVER RECEIVES CONTENT
276

FIG. 6B


SEARCH FOR WIRELESS NETWORK CONNECTION
248
250
CONNECTION ?
NO
YES
UPLOAD STATISTICS AND EQUIPMENT STATUS
252
DISTRIBUTION TRANSCEIVER VERIFY TRANSIT VEHICLE
254
256
VERIFIED ?
NO
YES
RECEIVE UPDATED CONTENT
240
SAVE UPDATED CONTENT ON TRANSIT SERVER
242

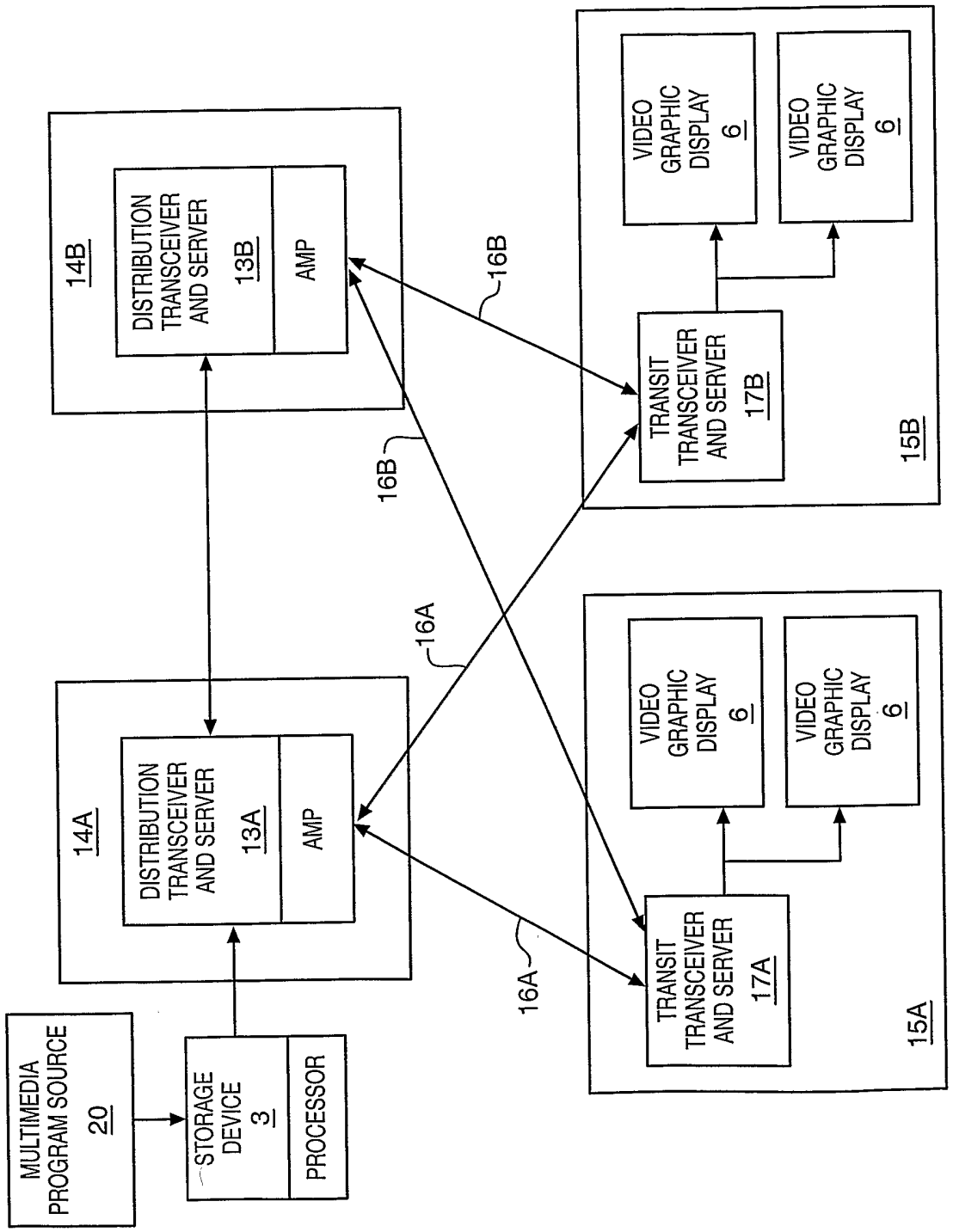

MULTIMEDIA PROGRAM SOURCE 20
STORAGE DEVICE 3
PROCESSOR
14A
DISTRIBUTION TRANSCEIVER AND SERVER 13A
AMP
14B
DISTRIBUTION TRANSCEIVER AND SERVER 13B
AMP
16A
16B
16A
16B
15A
TRANSIT TRANSCEIVER AND SERVER 17A
VIDEO GRAPHIC DISPLAY 6
VIDEO GRAPHIC DISPLAY 6
15B
TRANSIT TRANSCEIVER AND SERVER 17B
VIDEO GRAPHIC DISPLAY 6
VIDEO GRAPHIC DISPLAY 6

FIG. 7

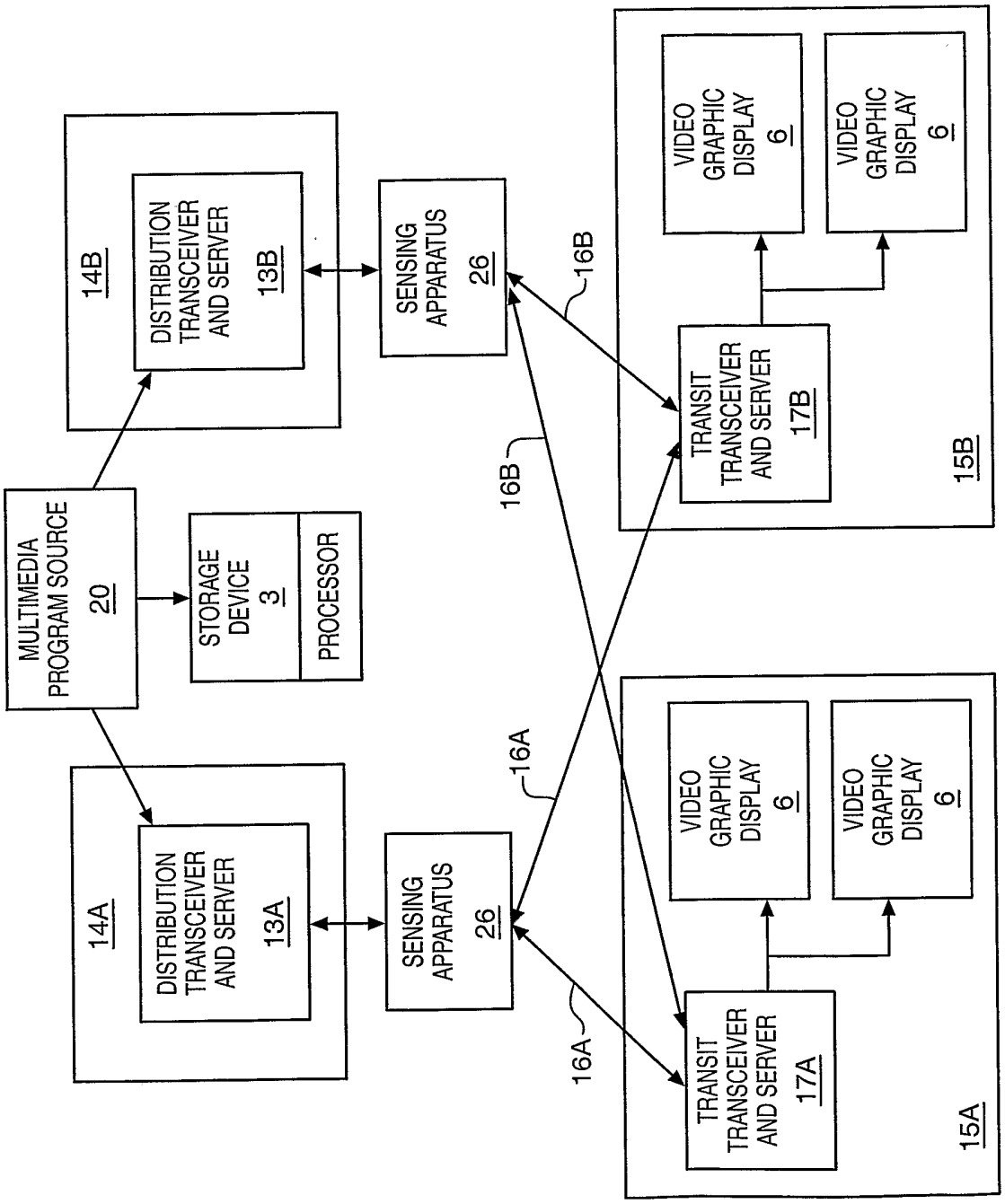

MULTIMEDIA PROGRAM SOURCE 20
STORAGE DEVICE 3
PROCESSOR
14A
DISTRIBUTION TRANSCEIVER AND SERVER 13A
14B
DISTRIBUTION TRANSCEIVER AND SERVER 13B
SENSING APPARATUS 26
SENSING APPARATUS 26
16A
16A
16B
16B
15A
TRANSIT TRANSCEIVER AND SERVER 17A
VIDEO GRAPHIC DISPLAY 6
VIDEO GRAPHIC DISPLAY 6
15B
TRANSIT TRANSCEIVER AND SERVER 17B
VIDEO GRAPHIC DISPLAY 6
VIDEO GRAPHIC DISPLAY 6

FIG. 8

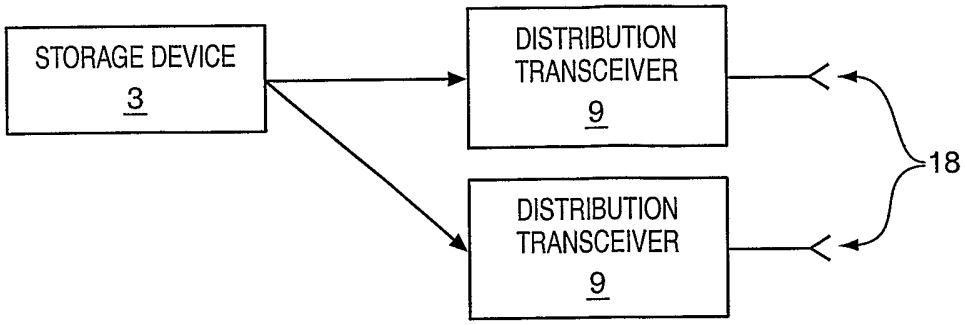

STORAGE DEVICE
3
DISTRIBUTION
TRANSCEIVER
9
DISTRIBUTION
TRANSCEIVER
9
18

FIG. 9

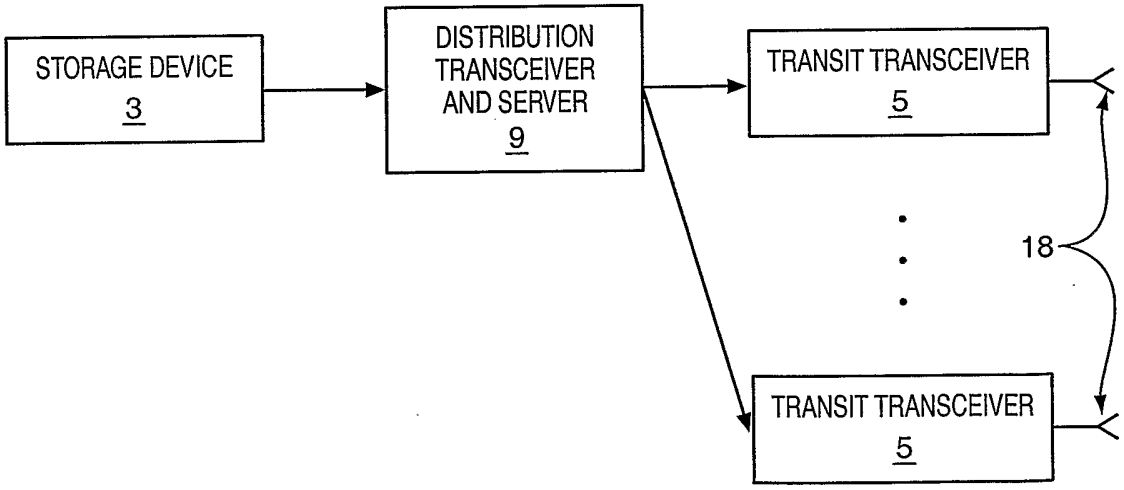

STORAGE DEVICE
3
DISTRIBUTION
TRANSCEIVER
AND SERVER
9
TRANSIT TRANSCEIVER
5
18
TRANSIT TRANSCEIVER
5

FIG. 10

INTERNATIONAL SEARCH REPORT

PCT/US 02/10841

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04H1/10 G08G1/133

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 7 H04H G08G G06F G07B H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	GB 2 306 857 A (INFOSCREEN GMBH) 7 May 1997 (1997-05-07) the whole document	1,8,9, 12,14, 18-21 2-7,10, 11,13, 15-17

Y A	US 5 732 216 A (LOGAN JAMES ET AL) 24 March 1998 (1998-03-24) column 4, line 39 -column 8, line 59	2-7,10, 11,13, 15-17 1,8,9, 12,14, 18-21

A	WO 01 27829 A (MOTOROLA INC) 19 April 2001 (2001-04-19) figure 3	1-21

	-/--	

[X] Further documents are listed in the continuation of box C. [X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"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
28 November 2002	12/12/2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Willems, B

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with Indication,where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01 03075 A (RITTER RUDOLF ;SWISSCOM AG (CH)) 11 January 2001 (2001-01-11) page 5, line 20 -page 6, line 18	1-21
A	WO 01 37517 A (WAYPORT INC) 25 May 2001 (2001-05-25) page 4, line 16 -page 9, line 19	1-21
A	US 6 173 399 B1 (GILBRECH SIDNEY A) 9 January 2001 (2001-01-09) column 3, line 66 -column 6, line 64	1-21

INTERNATIONAL SEARCH REPORT

PCT/US 02/10841

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
GB 2306857	A	07-05-1997	DE	29516556 U1	18-01-1996
			FR	2740254 A1	25-04-1997
US 5732216	A	24-03-1998	NONE		
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