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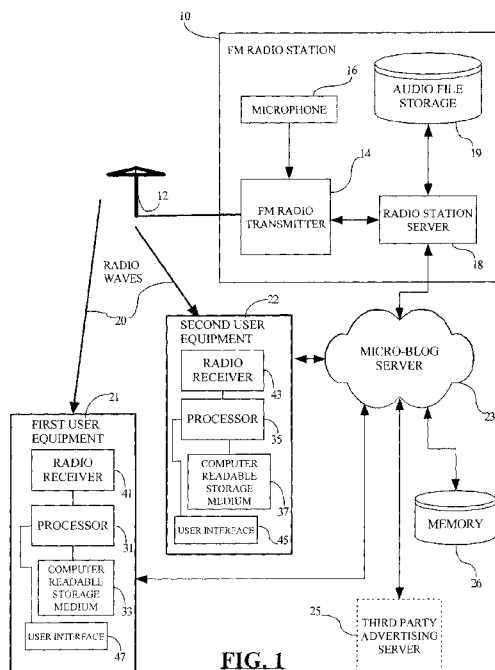


FIG. 1

(57) Abstract: An approach is provided for implementing socially interactive radio listening. An input is accepted to tune a first user equipment to a frequency corresponding to a selected radio station, wherein the first user equipment is configured to receive over-the-air analog radio frequency signals. A browsing request is sent to a server, wherein the browsing request is for browsing information received from a second user equipment that is tuned to the selected radio station. The first user equipment receives a response from the server that includes a browsing result comprising at least a portion of the information, and the first user equipment displays the browsing result.



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METHODS, APPARATUSES, AND COMPUTER-READABLE STORAGE MEDIA FOR  
PROVIDING SOCIALLY INTERACTIVE FM RADIO

TECHNICAL FIELD

5 [0001] This invention relates generally to wireless communication and, more specifically, to methods, apparatuses, and computer readable storage media for providing socially interactive FM radio.

BACKGROUND

10 [0002] This section is intended to provide a background or context to the invention disclosed below. The description herein may include concepts that could be pursued, but are not necessarily ones that have been previously conceived, implemented or described. Therefore, unless otherwise explicitly indicated herein, what is described in this section is not prior art to the description in this application and is not admitted to be prior art by inclusion in this section.

15 [0003] At present, many mobile phones offer applications for listening to radio stations. These applications are somewhat limited, enabling users to access music, news, entertainment, and sports programming, but no mechanism is provided for program listeners to interact with one another. In some cases, station listeners are able to communicate with a DJ or program host by sending text messages to the radio station. However, this technique does not support listener-to-listener interactions. Moreover, current FM radio applications require listeners to search for  
20 radio stations manually. For example, if a listener moves to another state or takes a trip to another city, they need to search for new radio stations by scanning the FM band and manually programming new stations of interest into the mobile phone.

SOME EXAMPLE EMBODIMENTS

25 [0004] Therefore, there is a need for a mobile phone FM radio application that is configured to provide listener-to-listener interactions. According to one embodiment, a method comprises accepting an input to tune a first user equipment to a frequency corresponding to a selected radio station, wherein the first user equipment is configured to receive over-the-air, analog radio-frequency signals; sending a browsing request to a server, wherein the browsing request is for

browsing information received from a second user equipment that is tuned to the selected radio station; receiving a response from the server that includes a browsing result comprising at least a portion of the information; and displaying at the first user equipment the browsing result. Illustratively, the information includes at least one comment, tweet, or message.

5 **[0005]** According to another embodiment, an apparatus comprises at least one processor, and at least one memory including computer program code for one or more computer programs, the at least one memory and the computer program code configured to, with the at least one processor, cause, at least in part, the apparatus to accept an input to tune a first user equipment to a frequency corresponding to a selected radio station, wherein the first user equipment is  
10 configured to receive over-the-air, analog radio-frequency signals; send a browsing request to a server, wherein the browsing request is for browsing information received from a second user equipment that is tuned to the selected radio station; receive a response from the server that includes a browsing result comprising at least a portion of the information; and display at the first user equipment the browsing result. Illustratively, the information includes at least one  
15 comment, tweet, or message.

**[0006]** According to another embodiment, a computer-readable storage medium carries one or more sequences of one or more instructions which, when executed by one or more processors, cause, at least in part, an apparatus to accept an input for tuning the apparatus to a frequency corresponding to a selected radio station, wherein the apparatus is configured to receive over-the-  
20 air analog radio frequency signals; send a browsing request to a server, wherein the browsing request is for browsing information received from a second user equipment that is tuned to the selected radio station; receive a response from the server that includes a browsing result comprising at least a portion of the information; and display at the first user equipment the browsing result. Illustratively, the information includes at least one comment, tweet, or  
25 message.

**[0007]** According to another embodiment, an apparatus comprises means for processing and/or facilitating a processing of accepting an input for tuning the apparatus to a frequency corresponding to a selected radio station, wherein the apparatus is configured to receive over-the-  
air analog radio frequency signals. The apparatus sends a browsing request to a server wherein  
30 the browsing request is for browsing information received from a user equipment that is tuned to

the selected radio station. The apparatus receives a response from the server that includes the information, and the apparatus displays the information.

**[0008]** In addition, for various example embodiments of the invention, the following is applicable: a method comprising facilitating a processing of and/or processing (1) data and/or (2) information and/or (3) at least one signal, the (1) data and/or (2) information and/or (3) at least one signal based, at least in part, on (or derived at least in part from) any one or any combination of methods (or processes) disclosed in this application as relevant to any embodiment of the invention.

**[0009]** For various example embodiments of the invention, the following is also applicable: a method comprising facilitating access to at least one interface configured to allow access to at least one service, the at least one service configured to perform any one or any combination of network or service provider methods (or processes) disclosed in this application.

**[0010]** For various exemplary embodiments of the invention, the following is also applicable: a method comprising facilitating creating and/or facilitating modifying (1) at least one device user interface element and/or (2) at least one device user interface functionality, the (1) at least one device user interface element and/or (2) at least one device user interface functionality based, at least in part, on data and/or information resulting from one or any combination of methods or processes disclosed in this application as relevant to any embodiment of the invention, and/or at least one signal resulting from one or any combination of methods (or processes) disclosed in this application as relevant to any embodiment of the invention.

**[0011]** For various example embodiments of the invention, the following is also applicable: a method comprising creating and/or modifying (1) at least one device user interface element and/or (2) at least one device user interface functionality, the (1) at least one device user interface element and/or (2) at least one device user interface functionality based at least in part on data and/or information resulting from one or any combination of methods (or processes) disclosed in this application as relevant to any embodiment of the invention, and/or at least one signal resulting from one or any combination of methods (or processes) disclosed in this application as relevant to any embodiment of the invention.

**[0012]** In various example embodiments, the methods (or processes) can be accomplished on the service provider side or on the mobile device side or in any shared way between service provider and mobile device with actions being performed on both sides.

**[0013]** For various example embodiments, the following is applicable: An apparatus  
5 comprising means for performing the method of any of originally filed claims 1-7, 18, and 19.

**[0014]** Still other aspects, features, and advantages of the invention are readily apparent from the following detailed description, simply by illustrating a number of particular embodiments and implementations, including the best mode contemplated for carrying out the invention. The invention is also capable of other and different embodiments, and its several details can be  
10 modified in various obvious respects, all without departing from the spirit and scope of the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not as restrictive.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0015]** In the attached Figures:

**[0016]** FIG. 1 is a hardware block diagram of an illustrative system suitable for use with the  
15 instant invention.

**[0017]** FIG. 2 is a flowchart setting forth an illustrative operational sequence for browsing one or more messages, comments, or tweets that are associated with a selected radio station according to the instant invention.

**[0018]** FIG. 3 is a flowchart setting forth an illustrative operational sequence for accepting  
20 one or more messages, tweets, or comments from a user equipment regarding a selected radio station according to the instant invention.

**[0019]** FIG. 4 is a flowchart setting forth an illustrative operational sequence for providing a notification to a user equipment identifying one or more other listeners for a selected radio  
25 station, or identifying one or more DJs associated with the selected radio station, according to the instant invention.

**[0020]** FIG. 5 is a flowchart setting forth an illustrative operational sequence for providing a program list to a user equipment identifying one or more programs offered by a selected radio station according to the instant invention.

**[0021]** FIG. 6 is a flowchart setting forth an illustrative operational sequence for setting a system-level reminder notification for a selected program according to the instant invention.

**[0022]** FIG. 7 is a flowchart setting forth an illustrative operational sequence for providing a list of social contacts to a user equipment wherein at least one social contact on the list is associated with a corresponding radio program identification indicative of a program to which the social contact is listening according to the instant invention.

**[0023]** FIG. 8 is a hardware block setting forth an illustrative system for providing a user equipment with a map of listeners who are currently listening to a selected radio station.

**[0024]** FIG. 9 is a data flow diagram showing information flow between a user equipment, a micro-blog server, and a radio station according to the instant invention.

**[0025]** FIG. 10 is an illustrative screen shot of an exemplary user interface from which a user may select an over-the-air, analog FM radio station according to the instant invention.

**[0026]** FIG. 11 is an illustrative screen shot of an exemplary user interface for viewing micro-blogs and comments associated with a selected radio station according to the instant invention.

**[0027]** FIG. 12 is an illustrative screen shot of an exemplary user interface for viewing program details for a selected radio station according to the instant invention.

**[0028]** FIG. 13 is an illustrative screen shot of an exemplary user interface for viewing details about one or more disc jockeys (DJs) associated with the selected radio station according to the instant invention.

**[0029]** FIG. 14 is an illustrative screen shot of an exemplary user interface for viewing map details about one or more other individuals who are listening to the selected radio station according to the instant invention.

[0030] FIG. 15 is an illustrative screen shot of an exemplary user interface for viewing map details about one or more listeners in a particular city who are listening to the selected radio station according to the instant invention.

5 [0031] FIG. 16 is an illustrative screen shot of an exemplary user interface in the form of a thermograph showing population density as a function of location for a plurality of individuals in a particular geographic area who are listening to the selected radio station according to the instant invention.

#### DESCRIPTION OF SOME EMBODIMENTS

10 [0032] Examples of a method, apparatus, and computer program product for providing socially interactive FM radio are disclosed. In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the embodiments of the invention. It is apparent, however, to one skilled in the art that the  
15 embodiments of the invention may be practiced without these specific details or with an equivalent arrangement. In other instances, well-known structures and devices are shown in block diagram form in order to avoid unnecessarily obscuring the embodiments of the invention.

[0033] FIG. 1 is a hardware block diagram of an illustrative system suitable for use with the instant invention. An FM radio station 10 includes an FM radio transmitter 14 coupled to an antenna 12. The FM radio transmitter 14 and antenna 12 are configured to broadcast an over-  
20 the-air signal which is substantially audible throughout a geographically defined area. This signal may be analog, digital, or a hybrid of analog and digital such as the In-Band On-Channel (IBOC) system currently utilized by hundreds of radio stations throughout North America. The FM radio transmitter 14 is shown for purposes of illustration, it being understood that an AM transmitter, an analog or digital television transmitter, a single-sideband transmitter, or any other  
25 type of transmitter capable of producing an over-the-air signal may be employed in lieu of, or in addition to, the FM transmitter 14.

[0034] The FM radio transmitter 14 is coupled to a microphone 16 for use by one or more program hosts or DJs. A radio station server 18 is configured to stream one or more audio files

from an audio file storage 19 device and to output the streamed file to the FM radio transmitter 14. These audio files may comprise songs, musical performances, feature programs, news items, talk shows, advertisements, public service announcements, station identifications, and various other types of programming. The radio station server 18 is also configured to  
5 communicate with a social networking services (SNS) server, which in the present example is a micro-blog server 23. However, pursuant to various alternate embodiments, the SNS server may be implemented using Facebook, Google+, or any other type of electronic social networking platform. Moreover, pursuant to various alternate embodiments, the radio station server 18 may  
10 be implemented by two separate servers, a first server that is dedicated to producing streamed audio for broadcast and a second server that is used to communicate with the micro-blog server 23.

**[0035]** The micro-blog server 23 is coupled to a memory 26. The memory 26 is configured to store one or more respective comments, tweets, or messages, and to associate each of the respective comments, tweets, or messages with a corresponding radio station identifier that  
15 uniquely identifies a specified radio station. The micro-blog server 23 may be coupled to an optional third party advertising server 25 configured to provide one or more advertising messages to the micro-blog server 23. Optionally, the micro-blog server 23 may be equipped to transmit demographic or user information to the third party advertising server 25, whereupon the third party advertising server 25 is programmed to send the micro-blog server 23 one or more  
20 advertisements that are appropriate to the demographic or user information.

**[0036]** A first user equipment 21 and a second user equipment 22 are equipped for communication with the micro-block server 23. Illustratively, this communication may take place over a cellular or wireless telecommunications network. The first user equipment 21 and the second user equipment 22 may represent, for example, mobile phones, tablet devices, or any  
25 of various other types of equipment capable of communicating over a wireless network. The first user equipment 21 includes a processor 31 coupled to a non-transitory computer readable storage medium 33, a user interface 47 and a radio receiver 41. Likewise, the second user equipment 22 includes a processor 35 coupled to a non-transitory computer readable storage medium 37, a user interface 45 and a radio receiver 43. The user interfaces 45 and 47 are  
30 configured to accept user inputs and to display information. Illustrative examples of user

interfaces 45 and 47 include keypads, touch screens, display screens, speech recognition software, and various combinations thereof. Examples of display screens and touch screens are described hereinafter with reference to FIGs. 10-13.

**[0037]** The radio receivers 41 and 43 are each configured for receiving over-the-air broadcast signals without the need for data connections such as 3G, 4G, GPRS, or WiFi. The radio receivers 41, 43 are responsive to radio waves 20 emanating from the FM radio station antenna 12 to receive an over-the-air radio-frequency (RF) broadcast signal, and to demodulate the received signal to generate a baseband audio signal. Illustratively, the radio receivers 41, 43 may each be configured to receive radio stations that transmit analog signals, digital signals, or hybrid analog-digital signals in the FM broadcast band. Illustratively, the radio receivers 41, 43 may each feature a digitally-tuned user interface display, an analog-tuned user interface display, or both

**[0038]** FIG. 2 is a flowchart setting forth an illustrative operational sequence for browsing one or more messages, comments, or tweets that are associated with a selected radio station according to the instant invention. The operational sequence commences at block 1301 where a user equipment 21 (FIG. 1) accepts an input from a user to tune a receiver to a frequency corresponding to a selected radio station. In the example of FIG. 2, the receiver is configured to receive over-the-air analog radio-frequency signals. Next, at block 1303, the user equipment plays the selected radio station by demodulating the received over-the-air signal to generate a baseband audio signal. In the illustrative embodiment of FIG. 2, the user equipment 201 (FIG. 1) then accepts a browsing request from the user to browse comments, tweets, or messages associated with the selected radio station (FIG. 2, block 1305). However, pursuant to various alternate embodiments, one or more comments, tweets, or messages associated with the selected radio station are automatically retrieved and displayed by the user equipment. In accordance with these alternate embodiments, performance of block 1305 is optional. For example, the one or more comments, tweets, or messages for a selected radio station may be automatically displayed by the user equipment in response to the user equipment being tuned to the selected radio station.

**[0039]** The operational sequence advances to block 1310 where the user equipment 21 (FIG. 1) sends the browsing request to the micro-blog server 23 (FIG. 1) along with an identifier that

uniquely identifies the selected radio station. Returning to FIG. 2, the identifier may include any of a station identifier 1317 (such as “103Jamz”), a station call letters 1319 (such as KJQY), or a station frequency 1321 (such as “103.3 MHz”). In addition to the identifier, the browsing request may but need not include any of a time period 1315 (such as 2:00 PM to 5:00 PM, or January 5<sup>th</sup> to January 10<sup>th</sup>), keywords 1323 (such as a name of an artist, a musical genre, etc.), a name of a city 1325 (such as “Schaumburg”), or a geographically defined region 1327 (such as the “Chicagoland Area”).

**[0040]** At block 1313, the microblog server 23 (FIG. 1) receives the browsing request and identifier from the user equipment 21, along with any additional information such as the time period 1315 (FIG. 2), keywords 1323, city 1325, or geographically defined region 1327. The micro-blog server 23 (FIG. 1) responds to the browsing request by retrieving information from memory 26 that is associated with the identifier for the selected radio station. The retrieved information may include any of a microblog with comments (comments, tweets, or messages associated with the selected radio station) 1331 (FIG. 2), a user ID associated with a microblog 1333, a nickname of a user 1335, a status of a user ID 1337, or a thumbnail picture corresponding to a user ID 1339. For example, the status of a user ID 1337 may specify whether or not a user has been authenticated, or whether or not the user is currently online.

**[0041]** FIG. 3 is a flowchart setting forth an illustrative operational sequence for accepting one or more messages, tweets, or comments from a user equipment regarding a selected radio station according to the instant invention. The operational sequence commences at block 901 where a first user equipment 21 (FIG. 1) accepts an input from a first user to tune a first receiver to a frequency corresponding to a selected radio station. Illustratively, the first receiver is configured to receive over-the-air analog radio-frequency signals. Next, at block 902 (FIG. 3), the first user equipment 21 (FIG. 1) plays the selected radio station by demodulating the received over-the-air signal to generate a baseband audio signal. The first user equipment 21 establishes a communication link with the micro-blog server 23 (FIG. 3, block 903).

**[0042]** The operational sequence of FIG. 3 continues to block 905 where the first user equipment 21 (FIG. 1) accepts information (such as a message, a comment, a tweet, or other content) that is related to the selected radio station. The first user equipment 21 associates the information with an identifier that uniquely identifies the selected radio station (FIG. 3, block

907). Next, the first user equipment 21 (FIG. 1) sends the information to the micro-blog server 23 along with the associated identifier (FIG. 3, block 909). Pursuant to various illustrative embodiments of the invention, an optional Application Identifier may also be sent to the micro-blog server 23 (FIG. 1). For example, some micro-blog service providers provide an open platform and interface for developers to develop applications on top of the micro-blog service. Illustratively, one or more of these applications may be configured to implement socially interactive FM radio. Thus, each micro-blog application may be associated with a corresponding Application Identifier that is used to identify the source of a tweet, comment, or message. The micro-blog server 23 (FIG. 1) receives the information and the identifier associated therewith (FIG. 3, block 911). The micro-blog server 23 (FIG. 1) stores the associated identifier in memory along with the received information (FIG. 3, block 913).

**[0043]** Next, at block 915, a second user equipment 22 (FIG. 1) accepts an input from a second user to tune a second receiver to a frequency corresponding to a chosen radio station, wherein the second receiver is configured to receive over-the-air analog radio-frequency signals, and wherein the chosen radio station is identical to the selected radio station that was selected at block 901 using the first user equipment 21 (FIG. 1). The second user equipment 22 retrieves an identifier for the selected radio station and sends a request to the micro-blog server 23 for retrieving any information (such as messages, comments, tweets, or another type of content) that is associated with the identifier for the selected radio station (FIG. 3, block 917). The micro-blog server 23 (FIG. 1) accepts the request from the second user equipment, retrieves information that illustratively includes at least one message, comment, tweet, or other content that is associated with the identifier for the selected radio station, and sends the at least one retrieved message, tweet, or comment to the second user equipment (FIG. 3, block 919). The second user equipment 22 (FIG. 1) receives and displays the retrieved information (FIG. 3, block 921).

**[0044]** FIG. 4 is a flowchart setting forth an illustrative operational sequence for providing a notification to a user equipment 21 (FIG. 1) identifying one or more other listeners for a selected radio station, or identifying one or more DJs associated with the selected radio station, according to the instant invention. The operational sequence commences at block 1410 (FIG. 4) where the user equipment 21 (FIG. 1) accepts a request from a user to view user information about at

least one other user who is listening to a selected radio station, or to view DJ information about one or more program hosts for the selected radio station. The user equipment 21 sends the request to the micro-blog server 23 along with an identifier that uniquely identifies the selected radio station. This request may include any of: a station identifier 1415 (FIG. 4), a station call  
5 letters 1417, a station frequency 1419, a city 1421, or a geographically defined region 1423.

**[0045]** The operational sequence of FIG. 4 continues to block 1413 where the micro-blog server 23 (FIG. 1) receives the request and identifier from the user equipment 21. The micro-blog server 23 responds to the request by retrieving information from memory 26 that is associated with the at least one other user who is listening to the selected radio station, or by  
10 retrieving information from memory 26 that is associated with one or more program hosts for the selected radio station. The information retrieved from memory 26 may include any of: a user ID of at least one respective user who is listening to the selected radio station on a corresponding user equipment 1401 (FIG. 4), a thumbnail image for at least one respective user who is listening to the selected radio station on a corresponding user equipment 1403, a nickname for at least one  
15 respective user who is listening to the selected radio station on a corresponding user equipment 1405, a status of a user ID for at least one respective user who is listening to the selected radio station on a corresponding user equipment 1407, or a user ID for at least one DJ or program host associated with the selected radio station, or a user ID for a current host or DJ of the selected radio station 1409.

**[0046]** FIG. 5 is a flowchart setting forth an illustrative operational sequence for providing a program list to a user equipment identifying one or more programs offered by a selected radio station according to the instant invention. The operational sequence commences at block 1510 where a user equipment 21 (FIG. 1) accepts a request from a user to view user information about one or more programs of a selected radio station. The user equipment 21 sends the request to  
25 the micro-blog server 23 along with an identifier that uniquely identifies the selected radio station. The request may include any of: a city 1515 (FIG. 5), a date and time 1517, a station frequency 1519. A station identifier or call letters 1521, or a geographically defined region 1523 such as a metropolitan area.

**[0047]** The operational sequence continues to block 1513 where the micro-blog server 23  
30 (FIG. 1) receives the request and identifier from the user equipment 21. The micro-blog server

23 responds to the request by retrieving information from memory 26 that is associated with one or more programs offered by the selected radio station, or by retrieving information from memory that is associated with one or more program hosts for the selected radio station. The retrieved information may include any of: (a) at least one program identifier that identifies a program carried by the selected radio station along with at least one of a starting time and an ending time for the program 1501 (FIG. 5), (b) a thumbnail image of at least one respective DJ or program host for the selected radio station 1503, (c) a nickname of at least one respective DJ or program host for the selected radio station 1505, (d) a status of a user ID for at least one DJ or program host of the selected radio station 1507, or (e) a user ID for at least one DJ or program host associated with the selected radio station, or a user ID of a current host or DJ of the selected radio station 1509.

**[0048]** FIG. 6 is a flowchart setting forth an illustrative operational sequence for setting a system-level reminder notification for a selected program according to the instant invention. The operational sequence commences at block 1610 where a user equipment 21 (FIG. 1) accepts a request from a user to set a program reminder for a program to be broadcast by a selected radio station. The user equipment 21 sends the request to the micro-blog server 23 along with an identifier that uniquely identifies the selected radio station. This request may include any of: a program reminder set by a user 1615 (FIG. 6), a date and time 1617, a name of a program 1619, a station frequency, identifier, or call letters 1621, or a city or geographically defined region 1623.

**[0049]** The operational sequence of FIG. 6 continues to block 1613 where the micro-blog server 23 (FIG. 1) receives the request and identifier from the user equipment 21. The micro-blog server 23 responds to the request by sending a reminder to the user prior to commencement of the program (FIG. 6, block 1605), and also by sending reminder statistics 1603 to the selected radio station 1601. Pursuant to various alternate embodiments, the reminder is saved and triggered locally on the user equipment.

**[0050]** FIG. 7 is a flowchart setting forth an illustrative operational sequence for providing a list of social contacts to a user equipment 21 (FIG. 1) wherein at least one social contact on the list is associated with a corresponding radio program identification indicative of a program to which the social contact is listening according to the instant invention. The operational

sequence of FIG. 7 commences at block 1710 where a user equipment 21 (FIG. 1) accepts a request from a user to acquire radio station listening status information for one or more respective other users each associated with a corresponding user ID. Each corresponding user ID is included in a friends list. The user equipment 21 sends the request to the micro-blog server 23. The request includes a user ID 1715 (FIG. 7) as well as a password 1717 associated with the user ID 1715.

**[0051]** The operational sequence of FIG. 7 continues to block 1713 where the micro-blog server 23 (FIG. 1) receives the request and identifier from the user equipment 21. The micro-blog server 23 responds to the request by retrieving listening status information from memory for each of the user IDs included in the friends list and sending the retrieved listening status information to the user equipment. The listening status information may include any of: (a) a user ID of at least one other user included in the friends list (FIG. 7, block 1701), (b) a status of at least one other user included in the friends list 1703 (e.g. which station they are currently listening to), (c) any recent messages, comments, or tweets entered by the at least one other user included in the friends list 1705, (d) for at least one other user included in the friends list, a radio station identifier for a radio station that is currently selected by the at least one other user 1709, and (e) a thumbnail picture corresponding to a user ID 1711.

**[0052]** FIG. 8 is a hardware block setting forth an illustrative system for providing a user equipment 1801 with a map of listeners who are currently listening to a selected radio station. The user equipment 1801 executes software for implementing a mobile client 1803. The mobile client 1803 is configured to send data to a map server 1805 and also to receive data from the map server 1805. For example, the data sent by the mobile client 1803 to the map server 1805 may include any of a latitude and a longitude 1809, a frequency of a selected radio station 1811, a city or geographically defined region 1813, or a user ID 1815. The data sent by the map server 1805 to the mobile client 1803 may include one or more user IDs or one or more thumb-nail images for friends, other listeners, or program hosts in close geographic proximity to the user equipment 1801.

**[0053]** The mobile client 1803 is configured to send data to a micro-blog server 1807, and also to receive data from the micro-blog server 1807. For example, the data sent by the mobile client 1803 to the micro-blog server 1807 may include any of a user ID and password 1819, a

frequency of a selected radio station 1821, or a city or geographically defined region 1823. The data sent by the micro-blog server 1807 to the mobile client 1803 may include at least one micro-blog that is relevant to a selected radio station.

**[0054]** An optional advertisement server 1830, coupled to the mobile client 1803, is configured to provide targeted advertisements for a user based upon at least one of: (a) a user profile corresponding to the user ID and password 1819, or (b) a current geographical location of the user. An optional question and answer server 1840, coupled to the mobile client 1803, is configured to send questions to the user equipment 1801, and to receive answers or responses from the user equipment 1801. The question and answer server 1840 may be employed to send questions to targeted user groups for answering. The responses to these questions may then be distributed by the question and answer server 1840 to all members of the targeted user group, or to a selected radio station, or to a research organization for statistical analysis.

**[0055]** FIG. 9 is a data flow diagram showing information flow between a user equipment 21 (FIG. 1), a micro-blog server 23, and an FM radio station 10 according to the instant invention. The information flow of FIG. 9 commences at block 601 where the user equipment 21 (FIG. 1) obtains position data specifying a current geographic location for a user equipment. The position data is sent to the micro-blog server 23. At block 603 (FIG. 9), the micro-blog server 23 (FIG. 1) processes the position data to retrieve a geographically defined region corresponding to the position data. The geographically defined region is sent to the user equipment 21. Next, at block 605 (FIG. 9), the user equipment 21 (FIG. 1) requests a list of terrestrial, over-the-air FM radio stations corresponding to the retrieved geographically defined region. The micro-blog server 23 (FIG. 1) returns a list of terrestrial over-the-air FM radio stations corresponding to the retrieved geographically defined region (FIG. 9, block 607).

**[0056]** The program flow of FIG. 9 continues to block 611 where the user equipment 21 (FIG. 1) requests a program list for an FM radio station to which the user equipment is tuned. The micro-blog server 23 receives the request for the program list at block 613 (FIG. 9), and passes the request to the radio station 10 (FIG. 1). The radio station 10 retrieves the requested program list and sends the program list to the micro-blog server 23 (FIG. 9, block 615). The micro-blog server 23 (FIG. 1) sends the program list to the user equipment (FIG. 9, block 617).

**[0057]** Next, the program flow of FIG. 9 continues to block 619 where the user equipment 21 (FIG. 1) requests a DJ list for the FM radio station to which the user equipment is tuned. The micro-blog server 23 receives the request for the DJ list at block 621 (FIG. 9), and passes the request to the radio station 10 (FIG. 1). The radio station 10 retrieves the requested DJ list and sends the DJ list to the micro-blog server 23 (FIG. 9, block 623). The micro-blog server 23 (FIG. 1) sends the DJ list to the user equipment (FIG. 9, block 625).

**[0058]** At block 627, the user equipment 21 (FIG. 1) accepts a new comment, message or tweet entered by a user and sends the new comment, message, or tweet to the micro-blog server 23. This new comment, message, or tweet is associated with the FM radio station to which the user equipment is tuned. Specifically, the micro-blog server 23 inserts the new comment, message or tweet into a micro-blog listing associated with the FM radio station to which the user equipment is tuned (FIG. 9, block 629). Next, at block 631, the user equipment 21 (FIG. 1) accepts a request from a user for a micro-blog listing for the FM radio station to which the user equipment is tuned. The request is sent to the micro-blog server 23. At block 633 (FIG. 9), the micro-blog server 23 (FIG. 1) performs a search to retrieve the micro-blog listing for the FM radio station to which the user equipment 21 is tuned and returns the list to the user equipment.

**[0059]** FIG. 10 is an illustrative screen shot of an exemplary user interface 100 from which a user may select an over-the-air, analog FM radio station according to the instant invention. The user interface 100 includes a digitally-tuned user interface display 101 indicating the frequency of an over-the-air FM broadcast station that transmits an analog signal, a digital signal, or a hybrid analog-digital signal such as IBOC. A message window 109 displays one or more user comments, tweets, or messages in a text field 103. Each respective displayed comment in the text field 103 is associated with a corresponding thumbnail image of a user who posted the displayed comment. For example, the text field 103 is associated with a first thumbnail 105 of a user who has posted the message “That new DJ plays some of the best dance mixes I’ve ever heard!” in the text field 103. The message window 109 may also include a frequency display window for displaying the frequency, name, call letters, or slogan of a currently selected radio station.

**[0060]** FIG. 11 is an illustrative screen shot of an exemplary user interface 300 for viewing micro-blogs and comments associated with a selected radio station according to the instant

invention. While a first user is listening to a selected radio station on a radio receiver, such as the radio receiver 41 (FIG. 1) of the first user equipment 21, the user interface 47 of the first user equipment may illustratively display some or all of the information shown in FIG. 11. For example, a radio station identity window 304 displays identifying information for the selected radio station to which the first user equipment 21 (FIG. 1) is tuned. As shown in FIG. 11, this identifying information may include a frequency (103.3). Alternatively or additionally, this information may include a slogan (103 Jamz), call letters (KJQY), or other identifying information.

[0061] A first illustrative comment 305 is associated with a first thumbnail 301 of a first user, wherein the first user has entered the first illustrative comment 305 into a user equipment such as the first user equipment 21 (FIG. 1). Similarly, a second illustrative comment 306 (FIG. 11) is associated with a second thumbnail 302 of a second user, wherein the second user has entered the second illustrative comment 307 into a user equipment such as the second user equipment 22 (FIG. 1). Likewise, a third user, identified by a third thumbnail 303 (FIG. 11), has posted a third illustrative comment 307. The first, second, and third illustrative comments 305, 306, 307 are all posted by users who are listening to the selected radio station on a corresponding user equipment. Thus, the posted comments enable a plurality of listeners to share their experiences and opinions in real time while all are listening to the same radio station.

[0062] From time to time, the micro-blog server 23 (FIG. 1) receives a respective radio station identifier that uniquely identifies a radio station to which a radio receiver of a corresponding user equipment is tuned. For example, the micro-blog server may receive a radio station identifier from the first user equipment 21 indicating that the radio receiver 41 is tuned to "103 Jamz". From time to time, the micro-blog server 23 may also receive one or more respective comments, tweets, or messages from one or more corresponding user equipments, such as second user equipment 22. Each respective comment, tweet, or message is associated with a corresponding radio station identifier that uniquely identifies a radio station to which a radio receiver in the user equipment was tuned at the time that the comment, message, or tweet was accepted by the user equipment. Each respective comment, tweet, or message is also associated with a corresponding user identifier that uniquely identifies a user who entered the comment, tweet, or message into the user equipment.

[0063] The micro-blog server 23 distributes all received comments, messages, and tweets that are associated with a specified radio station identifier to all user equipments that have radio receivers tuned to a radio station corresponding to the specified radio station identifier. Each respective distributed comment, tweet, or message is associated with a corresponding user  
5 identifier or thumbnail that identifies a user who posted the respective comment, tweet, or message. This distribution process may, but need not, take place substantially in real time, such that incoming messages are distributed by the micro-blog server 23 to the user equipments 21, 22 as soon as these messages are received at the micro-blog server 23.

[0064] FIG. 12 is an illustrative screen shot of an exemplary user interface 400 for viewing  
10 program details for a selected radio station according to the instant invention. A radio station identity window 404 displays identifying information for the selected radio station to which the first user equipment 21 (FIG. 1) is tuned. This identifying information may include a frequency, a slogan, call letters, or other identifying information. A first program identifier 401 is associated with a first starting time 405 and a first ending time 408. Similarly, a second  
15 program identifier 402 is associated with a second starting time 406 and a second ending time 409. Likewise, a third program identifier 403 is associated with a third starting time 407 and a third ending time 410. In the present example, the second program identifier 402, second starting time 406, and second ending time 409 are highlighted because this is the program that is currently being broadcast by the selected radio station identified in the radio station identity  
20 window 404.

[0065] FIG. 13 is an illustrative screen shot of an exemplary user interface 500 for viewing details about one or more disc jockeys (DJs) associated with the selected radio station according to the instant invention. A radio station identity window 504 displays identifying information for the selected radio station to which the first user equipment 21 (FIG. 1) is tuned. This  
25 identifying information may include a frequency, a slogan, call letters, or other identifying information. The third thumbnail 303 image (FIGS. 11 and 13) is associated with a first program host identifier 505 (FIG. 13) which, in the present example, is DJ Lemonhead. Similarly, a fourth thumbnail 502 image is associated with a second program host identifier 506 such as DJ Drake. Likewise, a fifth thumbnail 503 image is associated with a third program  
30 host identifier 507 such as Captain Whammo. The first, second, and third program host

identifiers 505, 506, and 507 all correspond to program hosts for the selected radio station identified in the radio station identity window 504

**[0066]** FIG. 14 is an illustrative screen shot of an exemplary user interface for viewing map details about one or more other individuals who are listening to the selected radio station according to the instant invention. This map view may be generated, for example, using the system previously described in conjunction with FIG. 8. The illustrative screen shot of FIG. 14 displays the geographic location of a listener named Linda as Linda moves about an urban area. Linda is listening to a radio station identified as Music Radio FM 103.6. Other listeners to Music Radio FM 103.6 can view Linda's location on a map of the urban area, and these other listeners can also read any comments that Linda has posted while listening to FM 103.6. In this example, Linda is agreeing with the opinion of a program host on FM 103.6.

**[0067]** FIG. 15 is an illustrative screen shot of an exemplary user interface for viewing map details about one or more listeners in a particular city or an area who are listening to the selected radio station according to the instant invention. Optionally, the screen shot may also display map details about one or more listeners who are listening to stations other than the selected radio station. This map view may be generated, for example, using the system previously described in conjunction with FIG. 8. The illustrative screen shot of FIG. 15 displays a map view showing geographic locations for listeners of all FM stations. For example, Linda is listening to FM 103.6 while she is located near the City Hospital. Eric, only a few blocks from Linda, is listening to FM 106.8. In the Jewelry Quarter, Leon is tuned to FM 96.5 and Lily is tuned to FM 92.1.

**[0068]** At another, perhaps later, point in time, Leon is located at the Southern edge of the map. He is still listening to FM 96.5. Likewise, Eric is now located at the Southeastern corner of the map. Linda has moved from the vicinity of City Hospital to the Southwestern quadrant of the map near Hagley Road. She is still listening to FM 103.6, and she posts a comment indicating that she wishes to know the name of the second song in a current set of songs played by FM 103.6.

**[0069]** FIG. 16 is an illustrative screen shot of an exemplary user interface in the form of a thermograph showing population density as a function of location for a plurality of individuals in a particular geographic area who are listening to the selected radio station according to the

instant invention. Unshaded white regions indicate areas where there are no listeners to the selected radio station. Regions that are shaded in light grey indicate areas where a low density of listeners to the selected radio station are situated relative to regions that are colored in darker shades of grey. Regions that are shaded in the darkest shades of grey have the highest densities of listeners to the selected radio station.

**[0070]** An exemplary user interface may optionally provide for swapping between an analog over-the-air radio broadcast and a digital audio stream provided by an Internet radio service. This feature enables interactions between friends, listeners and DJs. With this feature, users are able to switch between a local analog local radio station and an internet radio service wherein the local analog radio station and the internet radio service may, but need not, be offering the same program. With this function, users are able to listen to the same content that a friend in another place is listening to, even if the friend is listening to a radio station that is in another city or location. Moreover, remotely situated listeners can interact with the local listeners of a given radio station. Even for a local station, users may be provided with an option for selecting either listening to the local station's analog over-the-air FM broadcast or listening to the local station's internet stream.

**[0071]** While the invention has been described in connection with a number of embodiments and implementations, the invention is not so limited but covers various obvious modifications and equivalent arrangements, which fall within the purview of the appended claims. Although features of the invention are expressed in certain combinations among the claims, it is contemplated that these features can be arranged in any combination and order.

**WHAT IS CLAIMED IS:**

1. A method comprising:

accepting an input to tune a first user equipment to a frequency corresponding to a selected radio station, wherein the first user equipment is configured to receive over-the-air,  
5 analog radio-frequency signals;

sending a browsing request to a server, wherein the browsing request is for browsing information received from a second user equipment that is tuned to the selected radio station;

receiving a response from the server that includes a browsing result comprising at least a portion of the information; and

10 displaying at the first user equipment the browsing result.

2. The method of claim 1 further comprising accepting the browsing request at the first user equipment, wherein the second user equipment is configured to receive over-the-air, analog radio-frequency signals.

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3. The method of claim 1 wherein the browsing request is a request for browsing at least one comment, tweet, or message received from the second user equipment, and the response received from the server includes the at least one comment, tweet, or message.

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4. The method of claim 3 further comprising displaying at the first user equipment at least one of a graphical icon or a thumbnail image, wherein the graphical icon or thumbnail image is associated with the at least one comment, tweet, or message.

5. The method of claim 3 further comprising displaying at the first user equipment at least one graphical icon or thumbnail image associated with the second user equipment when the second user equipment is tuned to the selected radio station.

6. The method of claim 4 or claim 5 further comprising displaying the graphical icon or thumbnail image on a map.

7. The method according to any of claims 1-6 further comprising accepting at least one comment, tweet, or message at the first user equipment and sending the at least one comment, tweet, or message to the server for posting to the second user equipment.

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8. The method according to any of claims 1-7 further comprising displaying at least one graphical icon or thumbnail image corresponding to a program host on the selected radio station.

9. An apparatus comprising means for performing the method according to any of claims 1-8.

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10. The apparatus of claim 9, wherein the apparatus is a mobile phone further comprising:

user interface circuitry and user interface software configured to facilitate user control of at least some functions of the mobile phone through use of a display and configured to respond to user input; and

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a display and display circuitry configured to display at least a portion of a user interface of the mobile phone, the display and display circuitry configured to facilitate user control of at least some functions of the mobile phone.

11. An apparatus comprising at least one processor and at least one memory including computer program code for one or more programs, the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus to perform at least the following:

5            accepting an input to tune a first user equipment to a frequency corresponding to a selected radio station, wherein the first user equipment is configured to receive over-the-air, analog radio-frequency signals;

             sending a browsing request to a server, wherein the browsing request is for browsing information received from a second user equipment that is tuned to the selected radio station;

10           receiving a response from the server that includes a browsing result comprising at least a portion of the information; and

             displaying at the first user equipment the browsing result.

12. The apparatus of claim 11 wherein the browsing request is accepted at the first user equipment, and wherein the second user equipment is configured to receive over-the-air, analog radio-frequency signals.

13. The apparatus of claim 11 wherein the browsing request is a request for browsing at least one comment, tweet, or message received from the user equipment, and the response  
20 received from the server includes the at least one comment, tweet, or message.

14. The apparatus of claim 13 configured to display at least one of a graphical icon or a thumbnail image, wherein the graphical icon or thumbnail image is associated with the at least one comment, tweet, or message.

15. The apparatus of claim 13 configured to display at least one graphical icon or thumbnail image associated with the user equipment when the user equipment is tuned to the selected radio station.

5 16. The apparatus of claim 14 or claim 15 further configured to display the graphical icon or thumbnail image on a map.

17. The apparatus according to any of claims 13-16 further configured to accept at least one comment, tweet, or message, and to send the at least one comment, tweet, or message to the server for posting to the user equipment.

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18. The apparatus according to any of claims 13-17 further configured to display at least one graphical icon or thumbnail image corresponding to a program host on the selected radio station.

15

19. The apparatus according to any of claims 13-18, wherein the apparatus is a mobile phone further comprising:

user interface circuitry and user interface software configured to facilitate user control of at least some functions of the mobile phone through use of a display and configured to respond to user input; and

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a display and display circuitry configured to display at least a portion of a user interface of the mobile phone, the display and display circuitry configured to facilitate user control of at least some functions of the mobile phone.

20. A method comprising:

receiving a radio station identifier for a selected radio station from a first user equipment when the first user equipment is tuned to the selected radio station, wherein the first user equipment is configured to receive over-the-air, analog radio-frequency signals;

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receiving information from a second user equipment that is tuned to the selected radio station, wherein the second user equipment is configured to receive over-the-air, analog radio-frequency signals;

5 storing in memory the information received from the second user equipment and associating the information with a radio station identifier that uniquely identifies the selected radio station;

receiving a browsing request from the first user equipment for browsing at least a portion of the received information associated with the selected radio station;

10 retrieving from memory the at least a portion of the received information associated with the radio station identifier; and

sending the at least a portion of the received information to the first user equipment.

21. The method of claim 20 wherein the received information comprises at least one comment, tweet, or message.

15 22. The method of claim 21 further comprising associating the at least one comment, tweet, or message with a user identifier corresponding to the second user equipment.

23. A computer-readable storage medium carrying one or more sequences of one or more instructions which, when executed by one or more processors, cause an apparatus to perform at least the method according to any of claims 1-8.

20

24. A computer-readable storage medium carrying one or more sequences of one or more instructions which, when executed by one or more processors, cause an apparatus to perform at least the method according to any of claims 20-21.

25. A computer program product including one or more sequences of one or more instructions which, when executed by one or more processors, cause an apparatus to at least perform the steps of the method according to any of claims 1-8.

5 26. A computer program product including one or more sequences of one or more instructions which, when executed by one or more processors, cause an apparatus to at least perform the steps of the method according to any of claims 20-21.

27. A method comprising facilitating access to at least one interface configured to allow access to at least one service, the at least one service configured to perform the method according to any of claims 1-8.

10 28. A method comprising facilitating access to at least one interface configured to allow access to at least one service, the at least one service configured to perform the method according to any of claims 20-21.

15 29. A method comprising facilitating a processing of and/or processing (1) data and/or (2) information and/or (3) at least one signal, the (1) data and/or (2) information and/or (3) at least one signal based, at least in part, on the method according to any of claims 1-8.

30. A method comprising facilitating a processing of and/or processing (1) data and/or (2) information and/or (3) at least one signal, the (1) data and/or (2) information and/or (3) at least one signal based, at least in part, on the method according to any of claims 20-21.

20 31. A method comprising facilitating creating and/or facilitating modifying (1) at least one device user interface element and/or (2) at least one device user interface functionality, the (1) at least one device user interface element and/or (2) at least one device user interface functionality based, at least in part, on the method according to any of claims 1-8.

32. A method comprising facilitating creating and/or facilitating modifying (1) at least one device user interface element and/or (2) at least one device user interface functionality, the (1) at least one device user interface element and/or (2) at least one device user interface functionality based, at least in part, on the method according to any of claims 20-21.

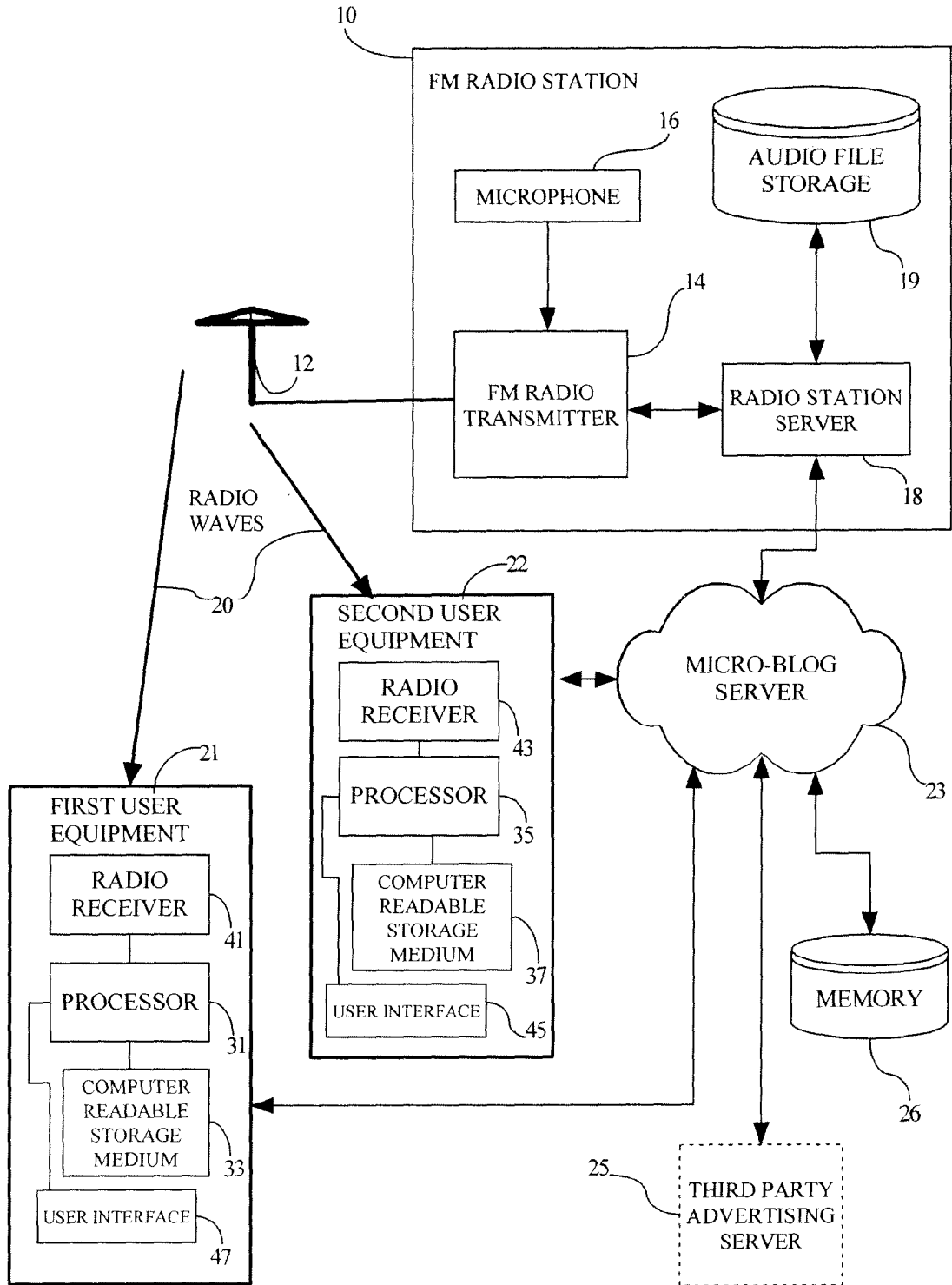


FIG. 1

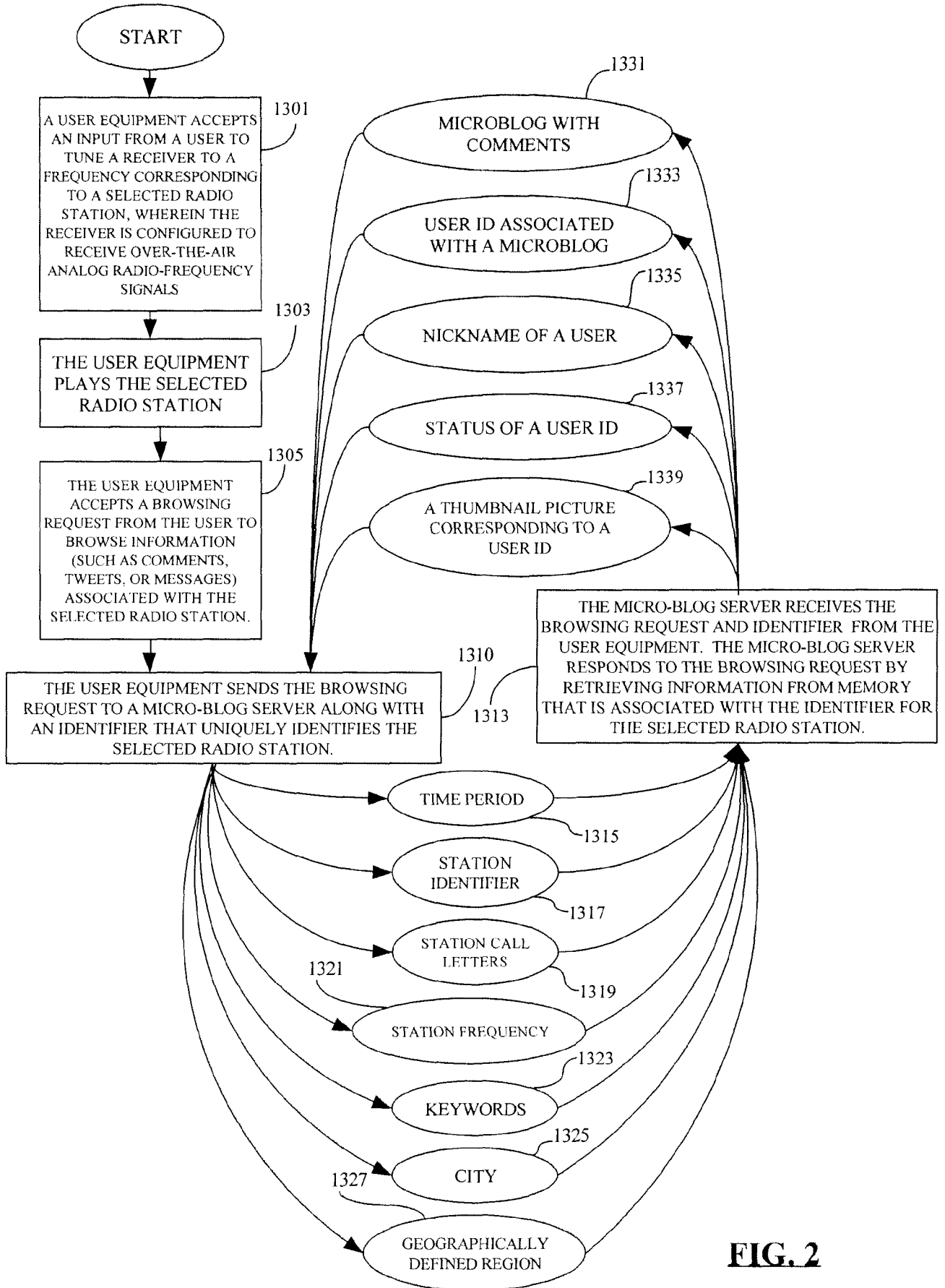
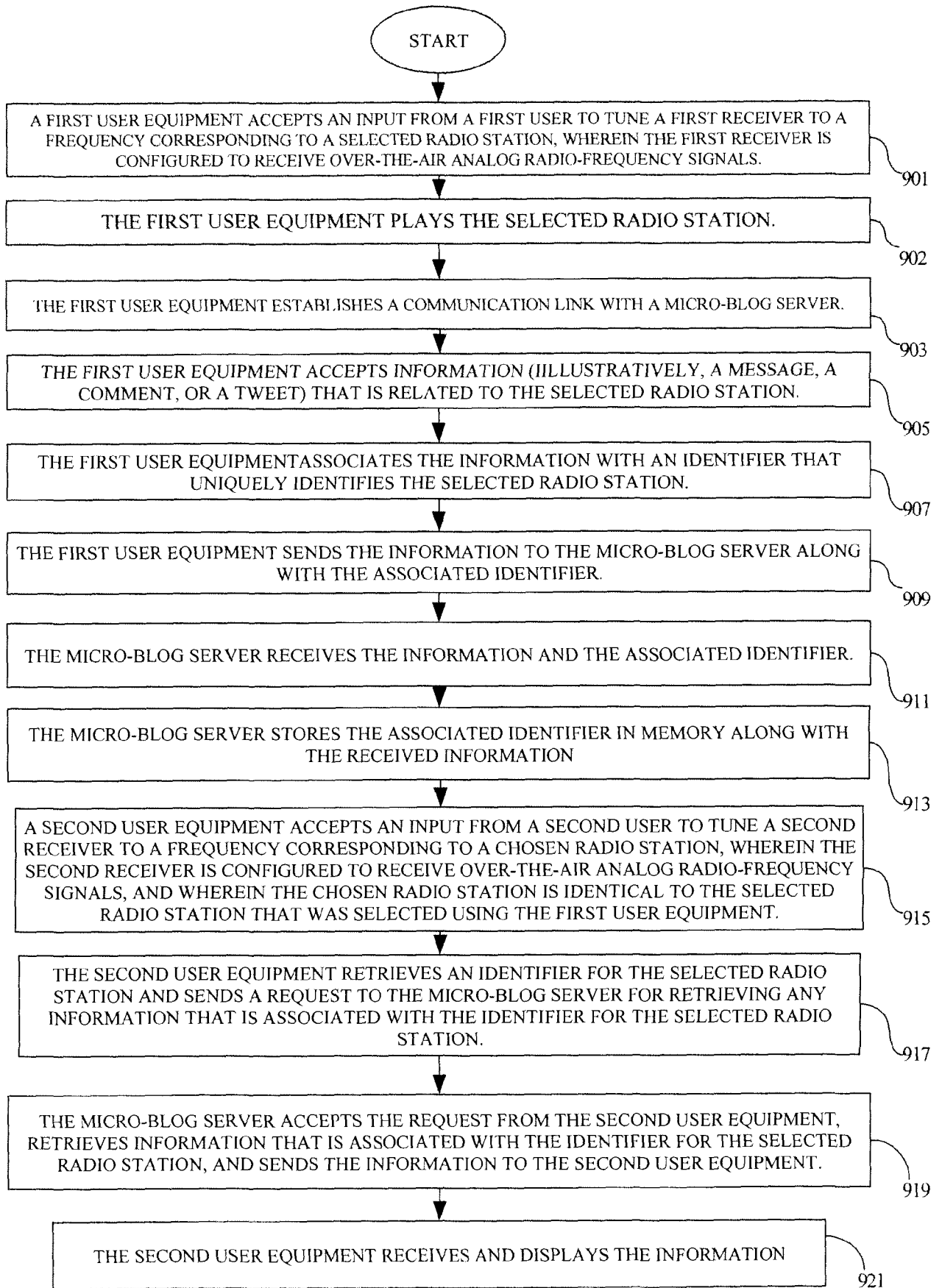
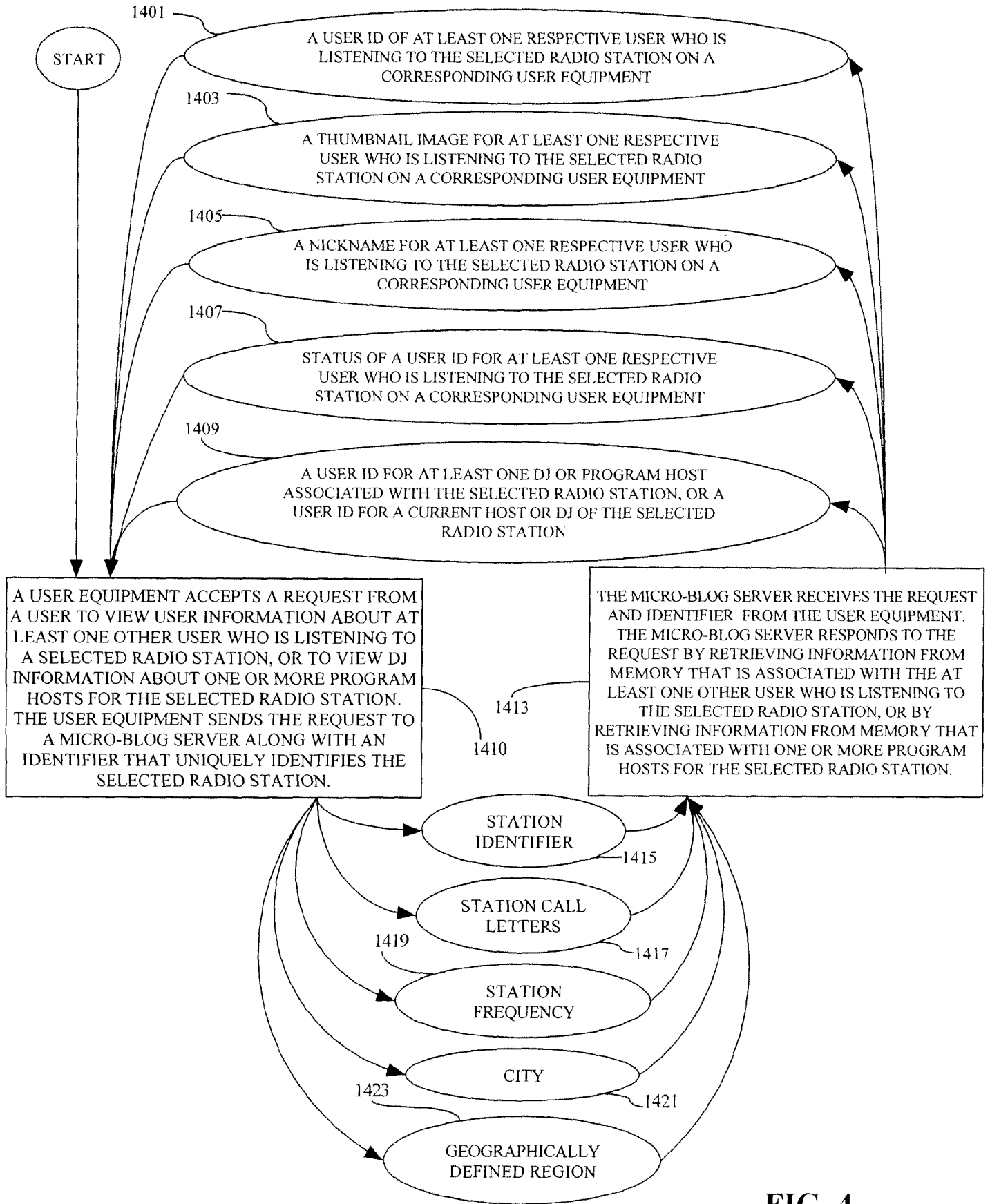


FIG. 2



**FIG. 3**



**FIG. 4**

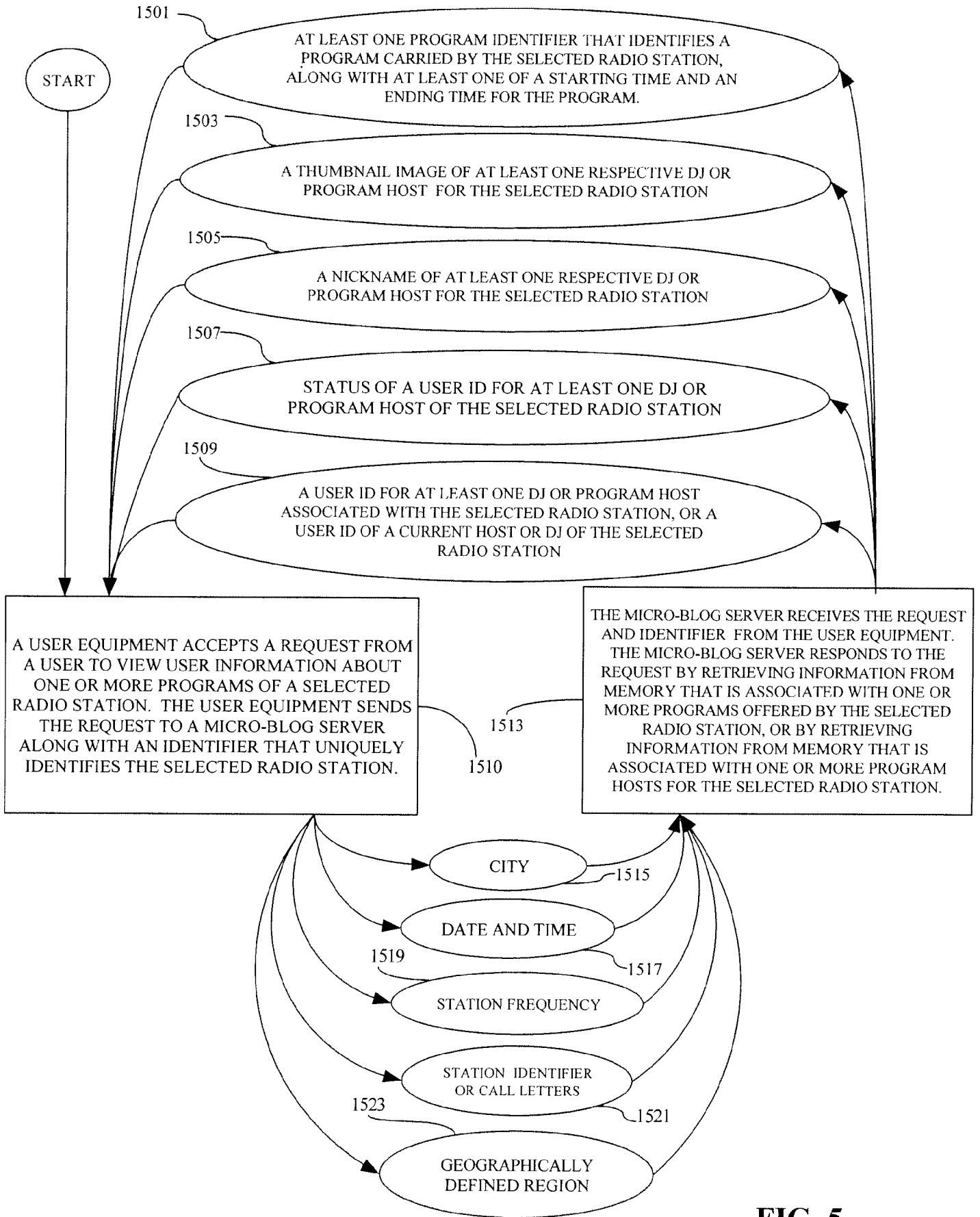
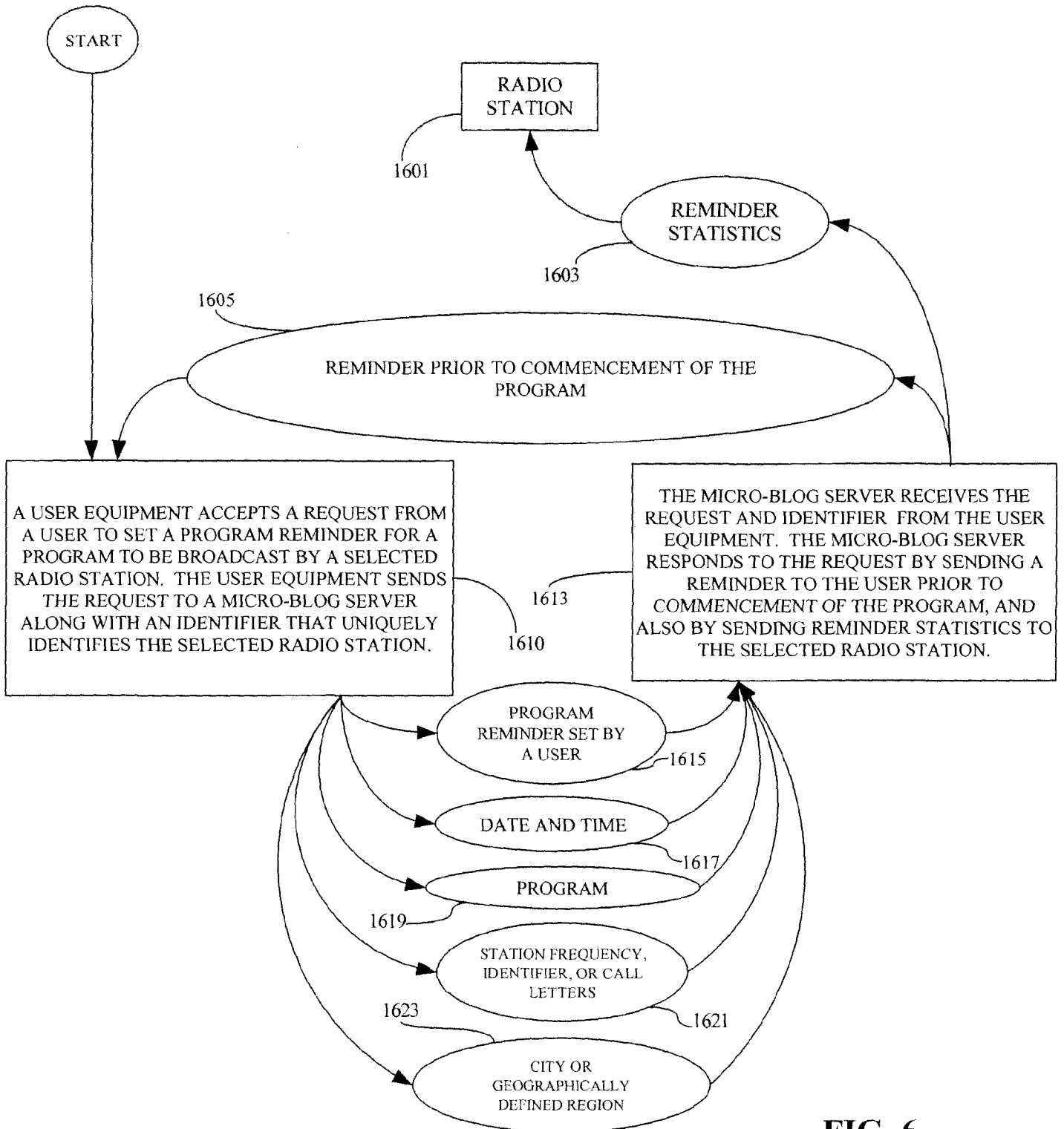
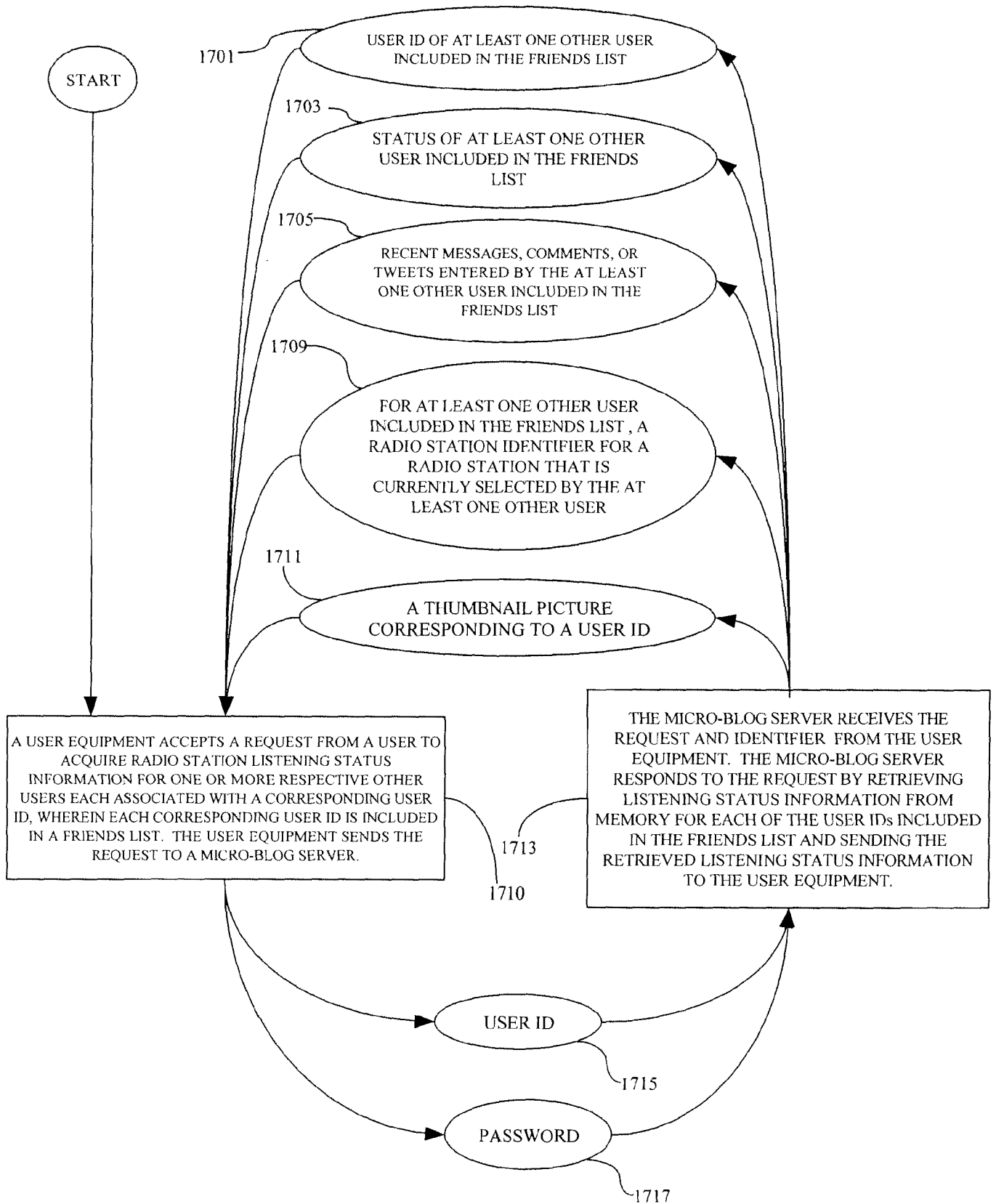


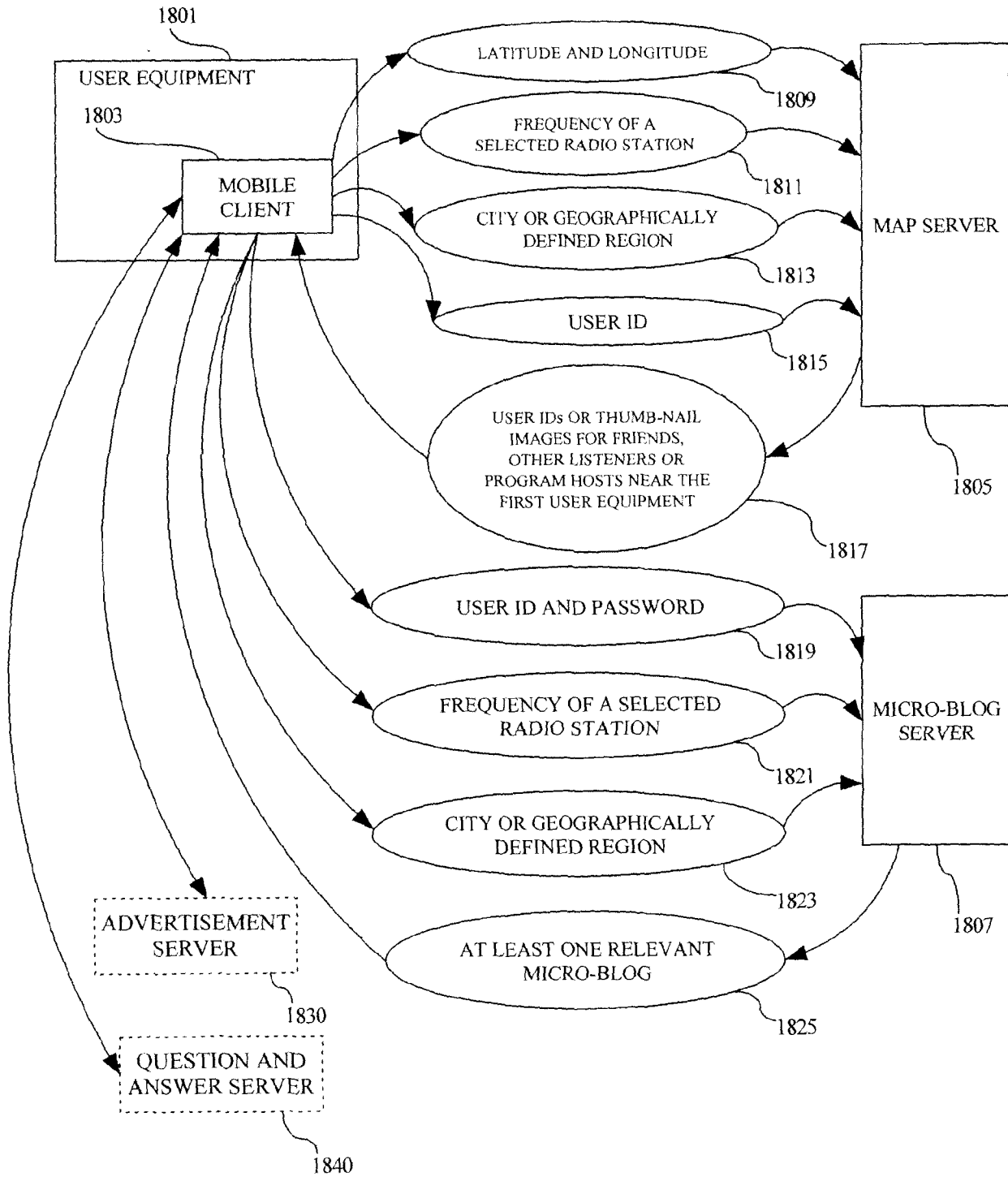
FIG. 5



**FIG. 6**



**FIG. 7**



**FIG. 8**

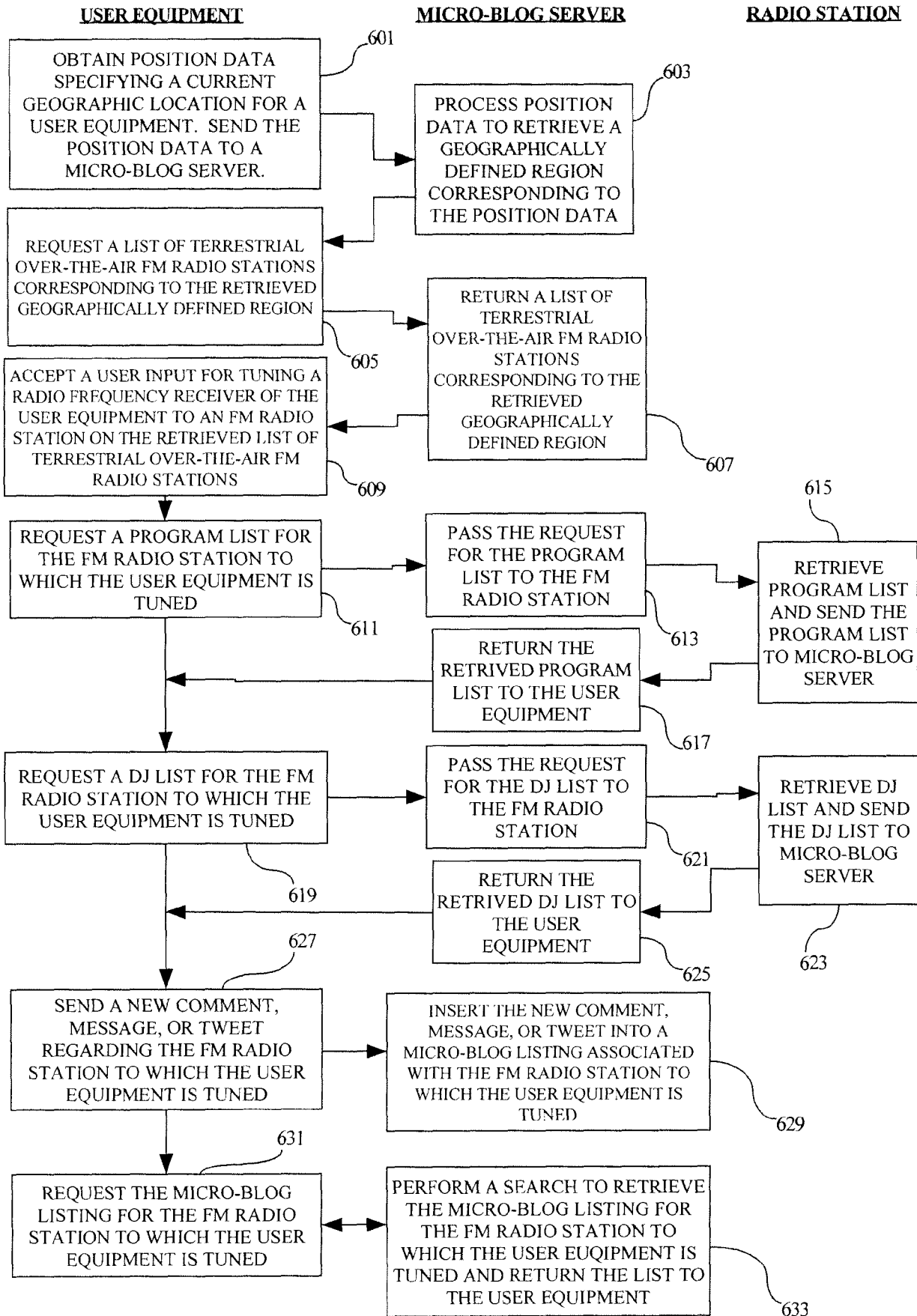
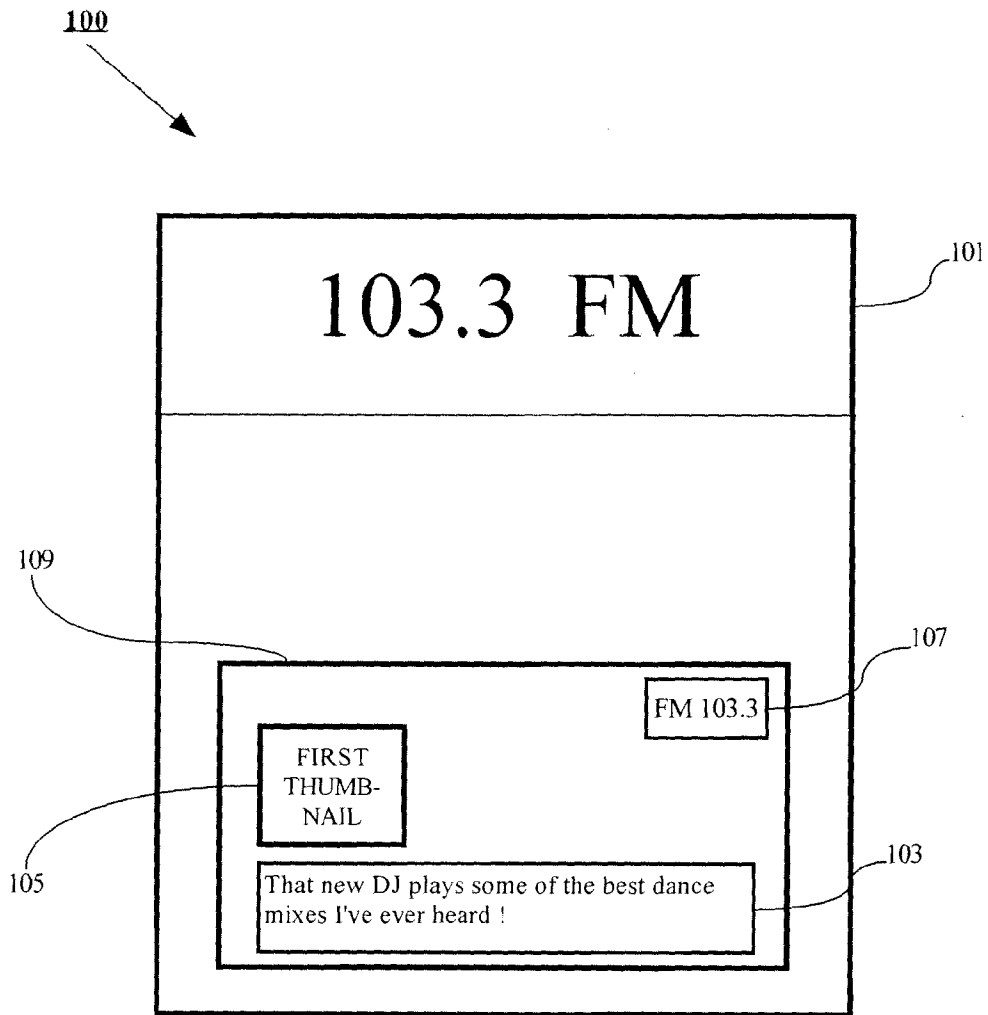
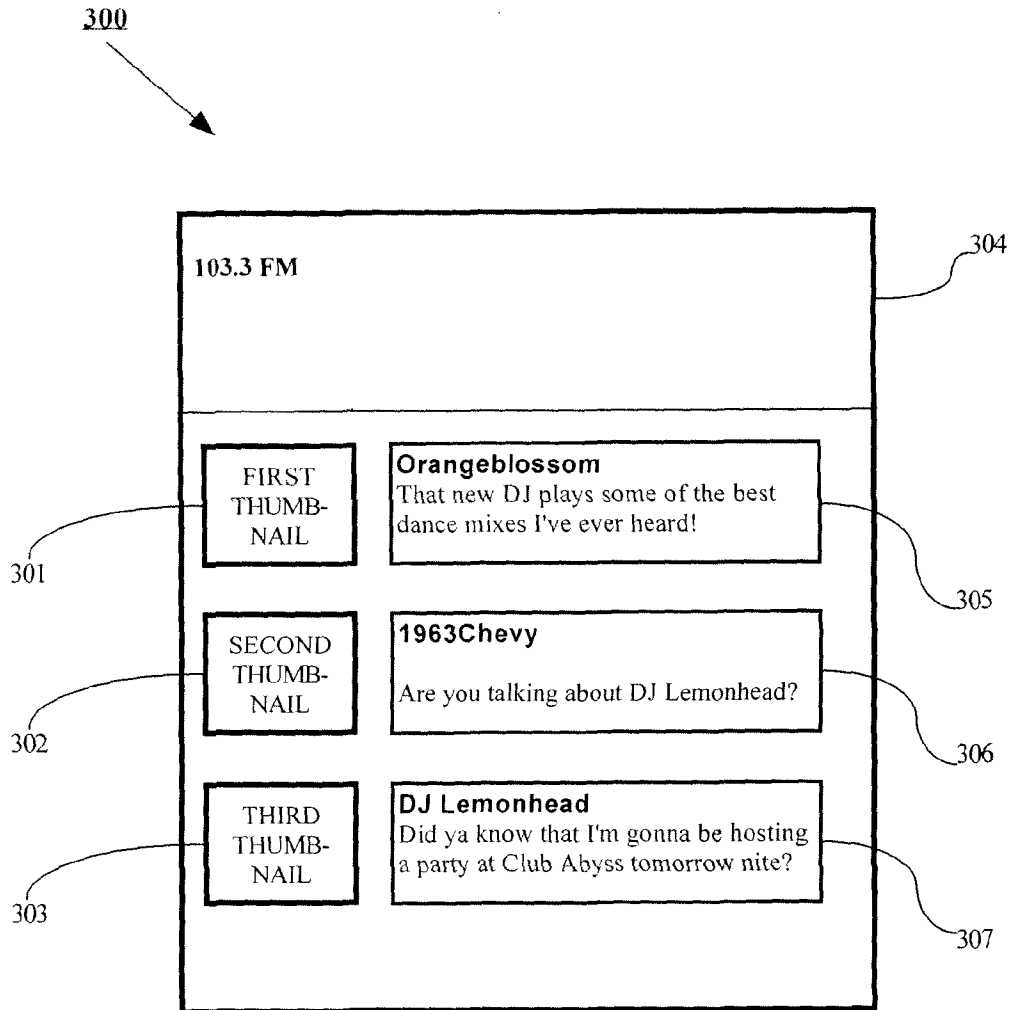


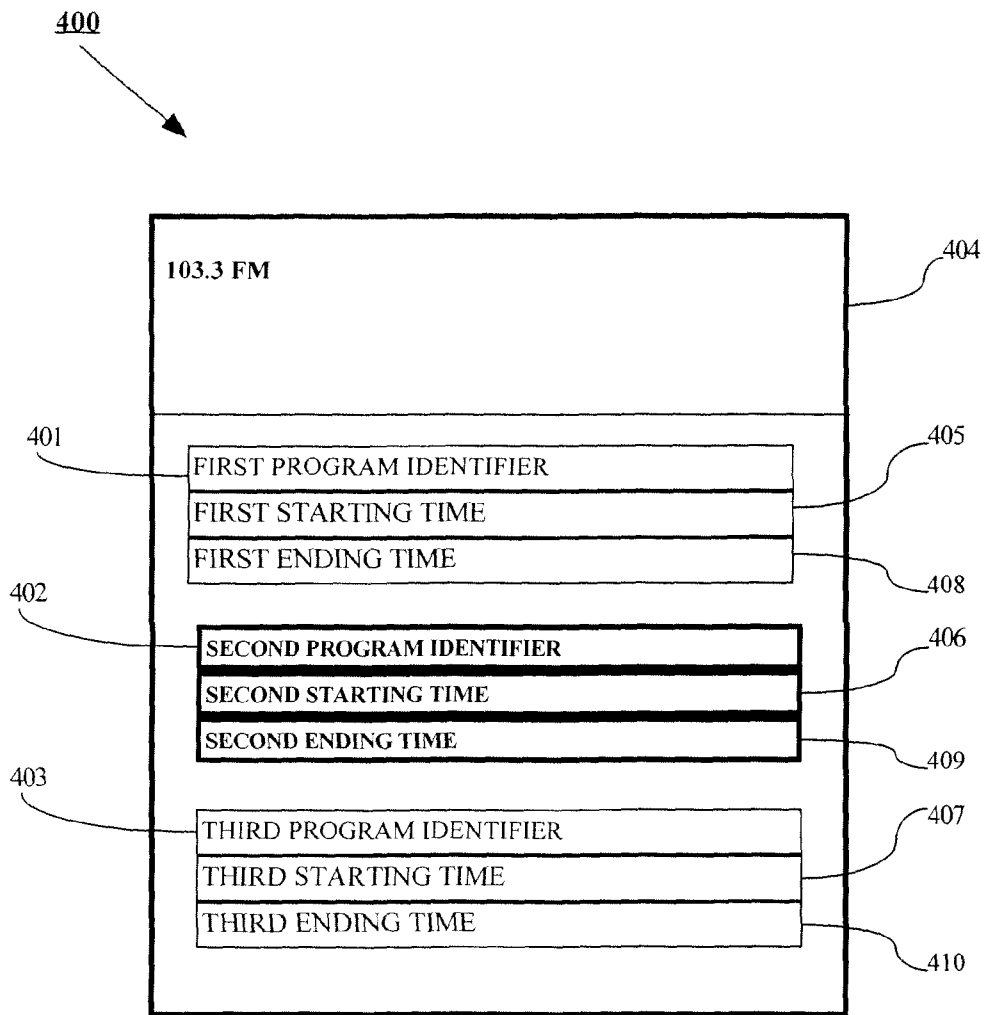
FIG. 9



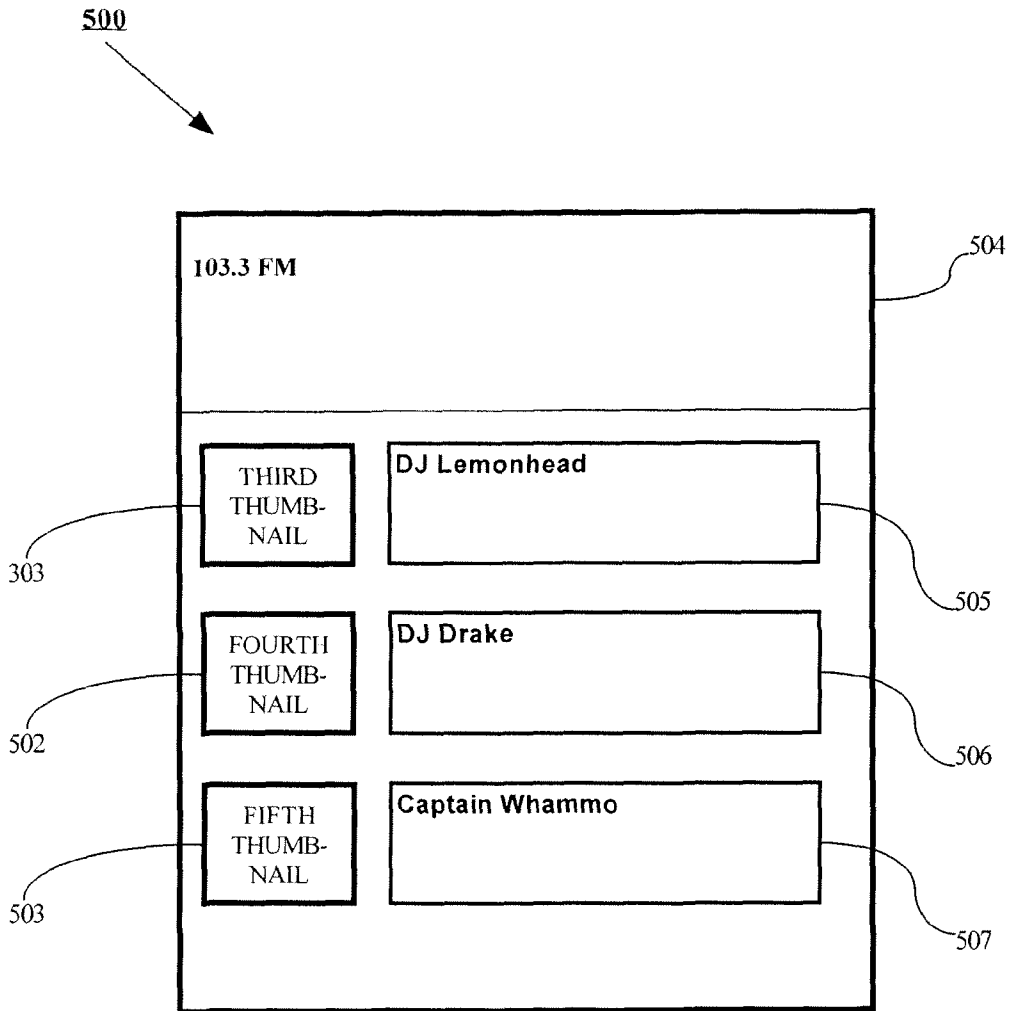
**FIG. 10**



**FIG. 11**



**FIG. 12**



**FIG. 13**



FIG. 14

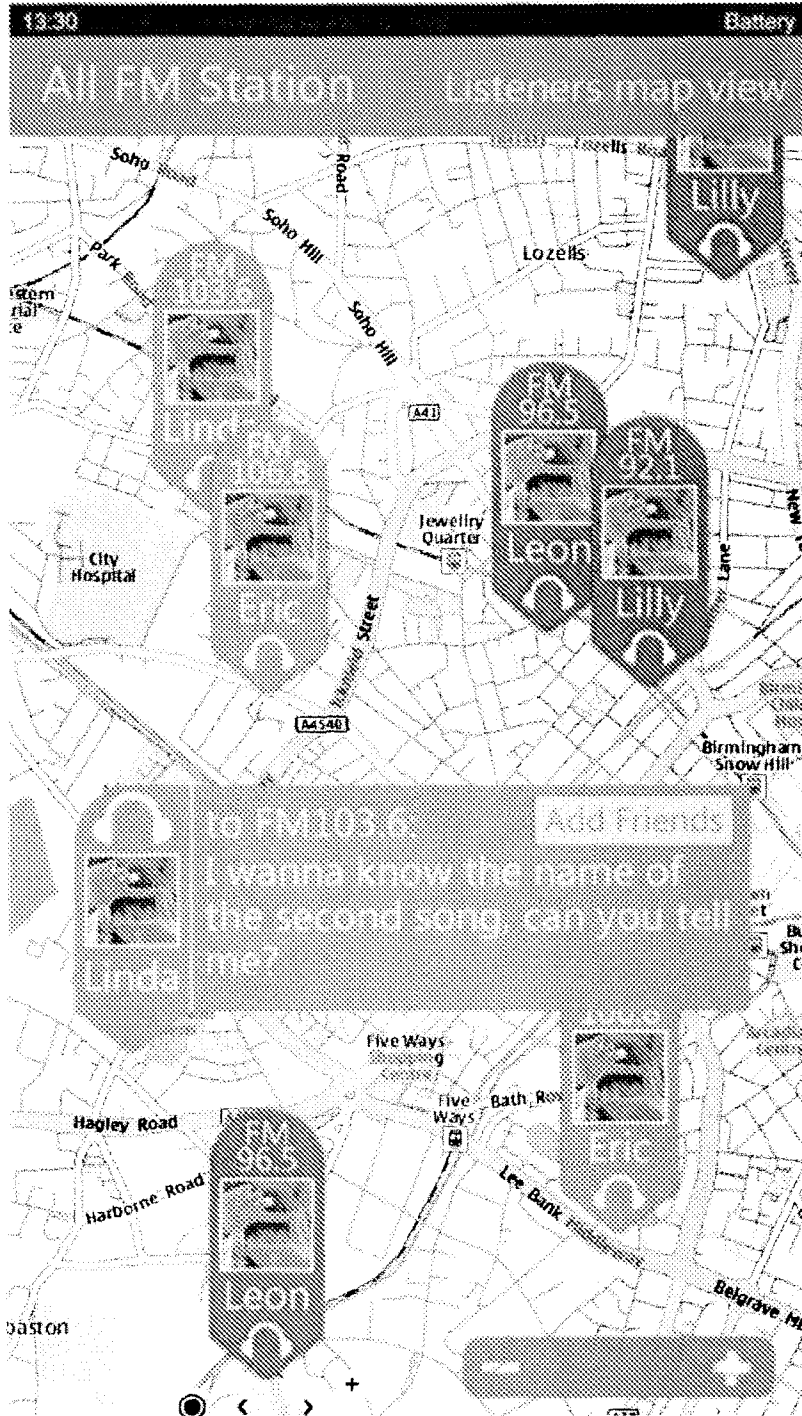


FIG. 15

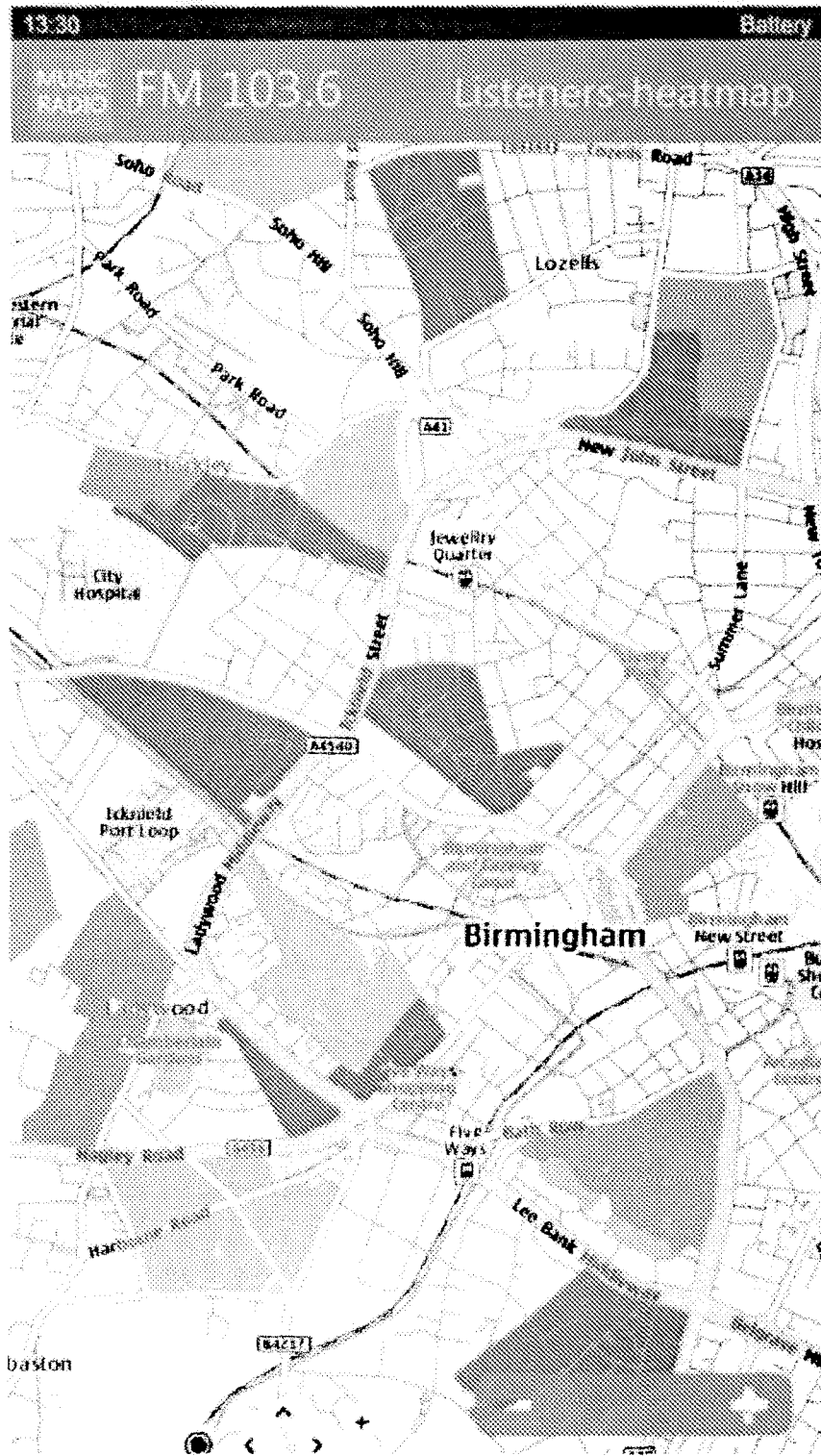


FIG. 16

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CN2012/071086

## A. CLASSIFICATION OF SUBJECT MATTER

H04H20/53 (2008.01) i

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: H04H; H04N

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 practicable, search terms used)

CNABS; CNTXT; CNKI; VEN: broadcast, radio station, program+, server, brows???, tune, request, test, comment, microblog, tweet, interact???, identifier, ID

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN101449496A (NOKIA CORP.) 03 June 2009(03.06.2009) the description page 10 paragraph 2 to page 17 paragraph 2, figures 4-6	1-19,23,25,27,29,31
A	CN102316371A (BAOLI MICRO ELECTRONIC SYSTEM HOLDING CO.) 11 Jan. 2012(11.01.2012) the whole document	1-32
A	CN102210163A (QUALCOMM INC.) 05 Oct. 2011(05.10.2011) the whole document	1-32

Further documents are listed in the continuation of Box C.

See patent family annex.

<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“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)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p>	<p>“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</p> <p>“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</p> <p>“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</p> <p>“&amp;” document member of the same patent family</p>
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Date of the actual completion of the international search  
12 Oct. 2012(12.10.2012)

Date of mailing of the international search report  
**15 Nov. 2012 (15.11.2012)**

Name and mailing address of the ISA/CN  
The State Intellectual Property Office, the P.R.China  
6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China  
100088  
Facsimile No. 86-10-62019451

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Telephone No. (86-10)62412033

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
PCT/CN2012/071086

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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		US2012036534A1	09.02.2012
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CN102316371A	11.01.2012	None	
CN102210163A	05.10.2011	US2010064307A1	11.03.2010
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