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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

Global Interactive Media, Inc.,

Plaintiff,

v.

Watchwith Inc.,

Defendant.

Case No.

Complaint for Patent Infringement

JURY TRIAL DEMANDED

Plaintiff Global Interactive Media, Inc. ("GIM") brings this patent-infringement action against Watchwith Inc. ("Watchwith").

1. Global Interactive is a Belizian company based in Belize.

2. Watchwith is a corporation organized under the laws of California, with its principal place of business located in San Francisco, California.

Jurisdiction and Venue

3. This action arises under the patent laws of the United States, 35 U.S.C. §§ 101 *et seq*.

4. This Court has subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

5. This Court may exercise personal jurisdiction over Watchwith. Watchwith maintains its principal place of business in this District; conducts continuous and systematic business in this District; and this patent-infringement claim arises directly from Watchwith's continuous and systematic activity in this District. In short, this Court's exercise of jurisdiction over Watchwith would be consistent with the California long-arm statute and traditional notions of fair play and substantial justice.

6. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391(b)(1)-(2) and 1400(b).

Count 1 – Infringement of U.S. Patent No. 8,032,907

7. Global Interactive owns United States Patent 8,032,907 (the "'907 patent") (attached as Exhibit A).

8. Watchwith is infringing at least one of the 90 methods and systems claimed in the '907 patent.

9. For example, and for illustration of one of the 90 claims of the '907 patent that Global Interactive alleges Watchwith infringes, Watchwith's "Watchwith Platform"— including its "Showrunner," "Everywhere," and "Televised" services—infringes claim 18 of the '907 patent as follows:

a. Claim 18 is "a method for providing recipients of a broadcast with automated information about program material . . . ." (Ex. A, 19:13-14.) Watchwith practices the method of claim 18: "The Watchwith Platform™ turns your broadcast schedule data and VOD playlists into perfectly timed interactive content, ads and commerce opportunities for consumers." http://www.watchwith.com/what-is-watchwith.

b. Claim 18 is a method of "receiving one or more user inquiries from one or more recipients of said at least one broadcast, said one or more inquiries including broadcast identifier information . . . ." (Ex. A, 19:17-19.) Watchwith receives an inquiry from a recipient of a broadcast including identification that the broadcast is an "enhanced program." http://www.watchwith.com/televised/ ("Upon recognition of an enhanced program, Televised is downloaded to the television . . . .").

c. The method of claim 18 involves "creating a program description file comprising program information related to program material to be broadcast in the future" and "communicating the program information into a programmed data processor . . . ." (Ex. A, 19:20-24.) Prior to a broadcast, program description files are created using Watchwith's Showrunner and communicated to a programmed data processor: "Your TV producers use Showrunner™ to

editorially create and curate interactive events that match your show's timelines and airings." http://www.watchwith.com/what-is-watchwith.

d. Claim 18 involves "synchronizing said communicated program information with said program material of said at least one broadcast. . . ." (Ex. A, 19:25-26.) Watchwith synchronizes the program information with broadcasts: "Scrub, mark and grab video frames for timing, image capture, preview." http://www.watchwith.com/showrunner. "Create multiple tracks from the same timeline to support Second Screen, First Screen or TV Everywhere experiences." *Id.*

e. Claim 18 involves "using said data programmed data processor to communicate, to the one or more recipients, program information that corresponds to the broadcast identifier information included in said one or more inquiries, wherein at least one of the program description file, the program information, and the synchronized program information is associated with the broadcast identifier information." (Ex. A, 19:28-35.) Watchwith communicates the program file to the recipient: "Televised displays the corresponding HTML and CSS for each In-Program event type, following precise 'in' and 'out' points and other event specific data authored in Showrunner." http://www.watchwith.com/showrunner.

Count 2 – Infringement of U.S. Patent No. 6,314,577

10. Global Interactive owns United States Patent 6,314,577 (the "'577 patent") (attached as Exhibit B).

11. Watchwith is infringing at least one of the 130 methods and systems claimed in the '577 patent.

12. For example, and for illustration of one of the 130 claims of the '577 patent that Global Interactive alleges that Watchwith infringes, Watchwith's "Watchwith Platform"—including its "Showrunner," "Everywhere," and "Televised" services—infringes claim 18 of the '907 patent as follows:the service infringes claim 94 of the '577 patent as follows:

a. Claim 94 is a "method for providing listeners or viewers of a radio or television broadcast with automated information about program material, comprising the steps of: broadcasting at least one radio or television broadcast . . . ." (Ex. B, 23:14-18.) Watchwith practices the method of claim 94: "The Watchwith Platform™ turns your broadcast schedule data and VOD playlists into perfectly timed interactive content, ads and commerce opportunities for consumers." http://www.watchwith.com/what-is-watchwith.

b. Claim 94 involves "receiving user inquiries from a listener or viewer of said radio or television broadcast . . . ." (Ex. B, 19-20.) Watchwith receives an inquiry when it recognizes that the broadcast is an "enhanced program." http://www.watchwith.com/televised/ ("Upon recognition of an enhanced program, Televised is downloaded to the television . . . .").

c. Claim 94 involves "creating a program description file . . . ." (Ex. B, 23:21.) Prior to a broadcast, program description files are created using Watchwith's Showrunner: "Your TV producers use Showrunner™ to editorially create and curate interactive events that match your show's timelines and airings." http://www.watchwith.com/what-is-watchwith.

d. The method of claim 94 involves "communicating program list information into a programmed data processor . . . ." (Ex. B, 23:23-24.) Watchwith then loads the created program description file into a programmed data processor.

e. Claim 94 involves "correlating said program descriptions of program material with said program list information and generating information in a database responsive to only a broadcast identifier . . . ." (Ex. B, 23:24-27.) Watchwith performs the correlation: "Once Televised establishes ProgramID and ProgramTime on the host platform, Televised calls the Watchwith API and fetches a timeline of corresponding interactive events that have been authorized your [sic] producers specifically for each consumer platform." http://www.watchwith.com/televised.

f. Claim 94 involves "using said programmed data processor to communicate said program description file responsive to said user inquiry." Watchwith uses the data processor to communicate the program description file: "Televised displays the corresponding HTML and CSS for each In-Program event type, following precise 'in' and 'out' points and other event specific data authored in Showrunner." http://www.watchwith.com/showrunner.

Prayer for Relief

WHEREFORE, Global Interactive prays for the following relief against Watchwith:

(a) Judgment that Watchwith has directly infringed claims of the '907 patent and the '577 patent;

(b) For a reasonable royalty;

(c) For pre-judgment interest and post-judgment interest at the maximum rate allowed by law; and

(d) For such other and further relief as the Court may deem just and proper.

/ / / /

Demand for Jury Trial

Global Interactive demands a trial by jury on all matters and issues triable by jury.

Date: June 5, 2015

Respectfully Submitted,

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Exhibit A

US008032907B2

(12) **United States Patent**
Pocock

(10) **Patent No.: US 8,032,907 B2**
(45) **Date of Patent: Oct. 4, 2011**

(54) **SYSTEM TO SYNCRONIZE AND ACCESS BROADCAST INFORMATION**

(76) Inventor: **Michael Pocock**, London (CA)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/238,772**

(22) Filed: **Sep. 29, 2005**

(65) **Prior Publication Data**

US 2006/0026640 A1 Feb. 2, 2006

Related U.S. Application Data

(63) Continuation of application No. 09/965,808, filed on Oct. 1, 2001, which is a continuation of application No. 08/916,099, filed on Aug. 21, 1997, now Pat. No. 6,314,577, which is a continuation of application No. 08/329,837, filed on Oct. 27, 1994, now Pat. No. 5,661,787.

(51) **Int. Cl.**
H04N 7/173 (2011.01)
H04N 5/445 (2011.01)

(52) **U.S. Cl.** **725/39**; 725/40; 725/52; 725/105

(58) **Field of Classification Search** 725/39, 725/82, 37, 40, 102, 103, 105, 127
See application file for complete search history.

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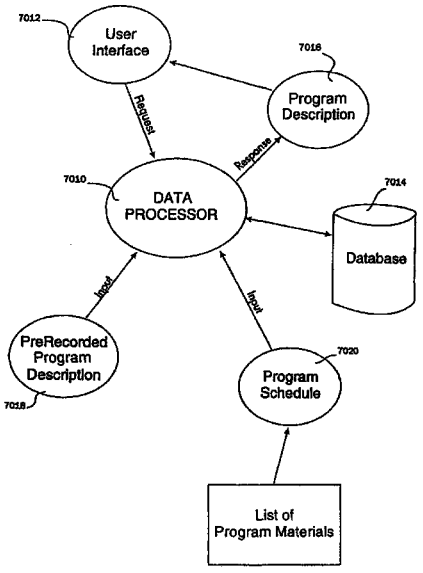
Primary Examiner — Pankaj Kumar
Assistant Examiner — Reuben Brown
(74) *Attorney, Agent, or Firm* — Jefferson IP Law, LLP; Raymond B. Persino

(57) **ABSTRACT**

The system enables listeners and viewers of a broadcast to access additional information associated with a broadcast. Listeners and viewers utilize a user device to connect to a database containing program descriptions (e.g. audio, text, video or combination thereof) further describing the programming and ancillary information. The database is indexed by the broadcast's program list or schedule thereby allowing a user of the system to search and select a particular program description of interest. Hearing or viewing program descriptions enables users to preview excerpts and review a broadcast before purchasing an item heard or viewed on a broadcast.

90 Claims, 7 Drawing Sheets



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5,953,046	A		9/1999	Pocock	

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FIG. 1

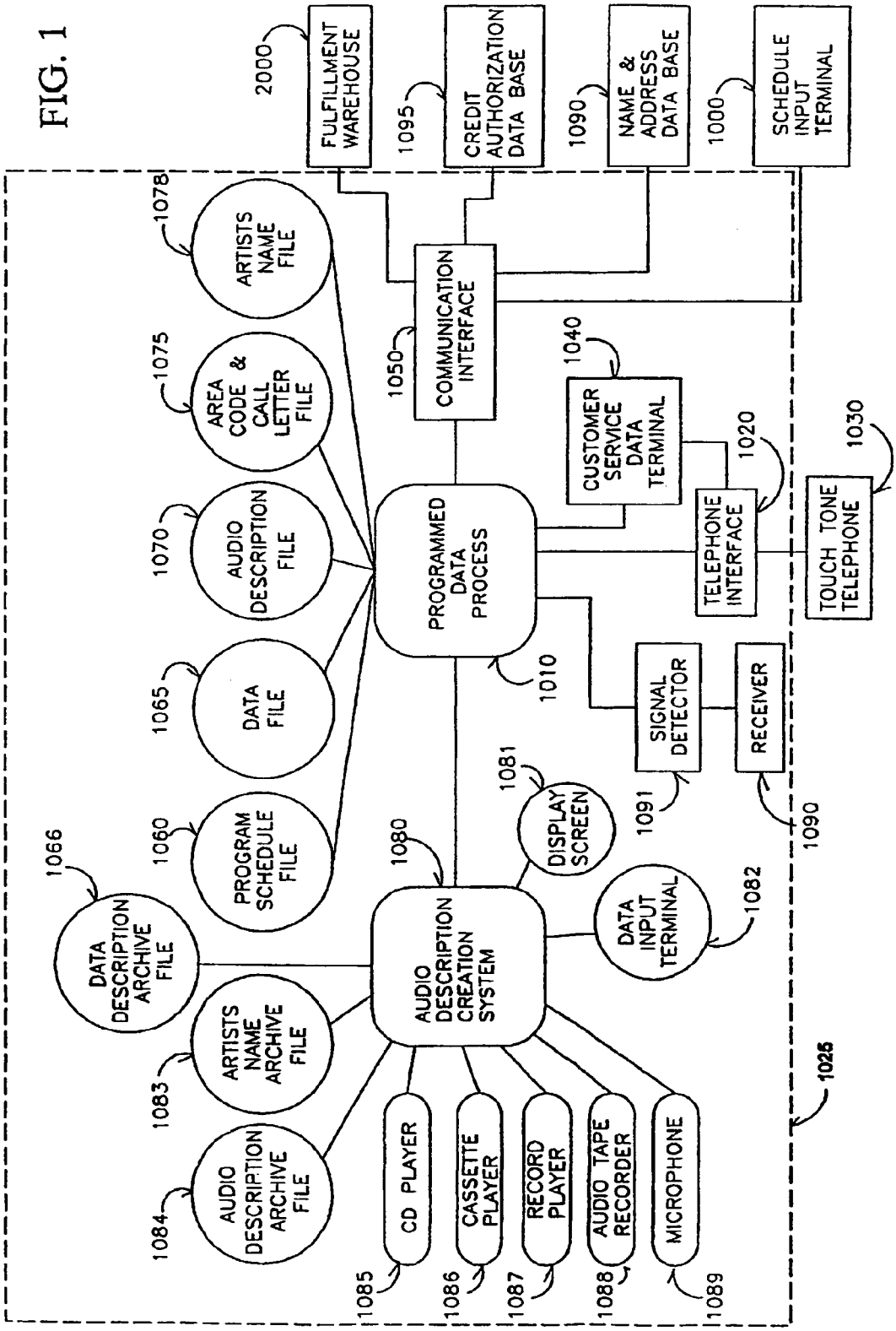

2000
FULFILLMENT WAREHOUSE
1095
CREDIT AUTHORIZATION DATA BASE
1090
NAME & ADDRESS DATA BASE
1000
SCHEDULE INPUT TERMINAL
1078
ARTISTS NAME FILE
1075
AREA CODE & CALL LETTER FILE
1070
AUDIO DESCRIPTION FILE
1065
DATA FILE
1060
PROGRAM SCHEDULE FILE
1066
DATA DESCRIPTION ARCHIVE FILE
1083
ARTISTS NAME ARCHIVE FILE
1084
AUDIO DESCRIPTION ARCHIVE FILE
1050
COMMUNICATION INTERFACE
1040
CUSTOMER SERVICE DATA TERMINAL
1020
TELEPHONE INTERFACE
1030
TOUCH TONE TELEPHONE
PROGRAMMED DATA PROCESS
1010
SIGNAL DETECTOR
1091
RECEIVER
1090
1081
DISPLAY SCREEN
1080
AUDIO DESCRIPTION CREATION SYSTEM
DATA INPUT TERMINAL
1082
1025
1085
CD PLAYER
1086
CASSETTE PLAYER
1087
RECORD PLAYER
1088
AUDIO TAPE RECORDER
1089
MICROPHONE

FIG. 2

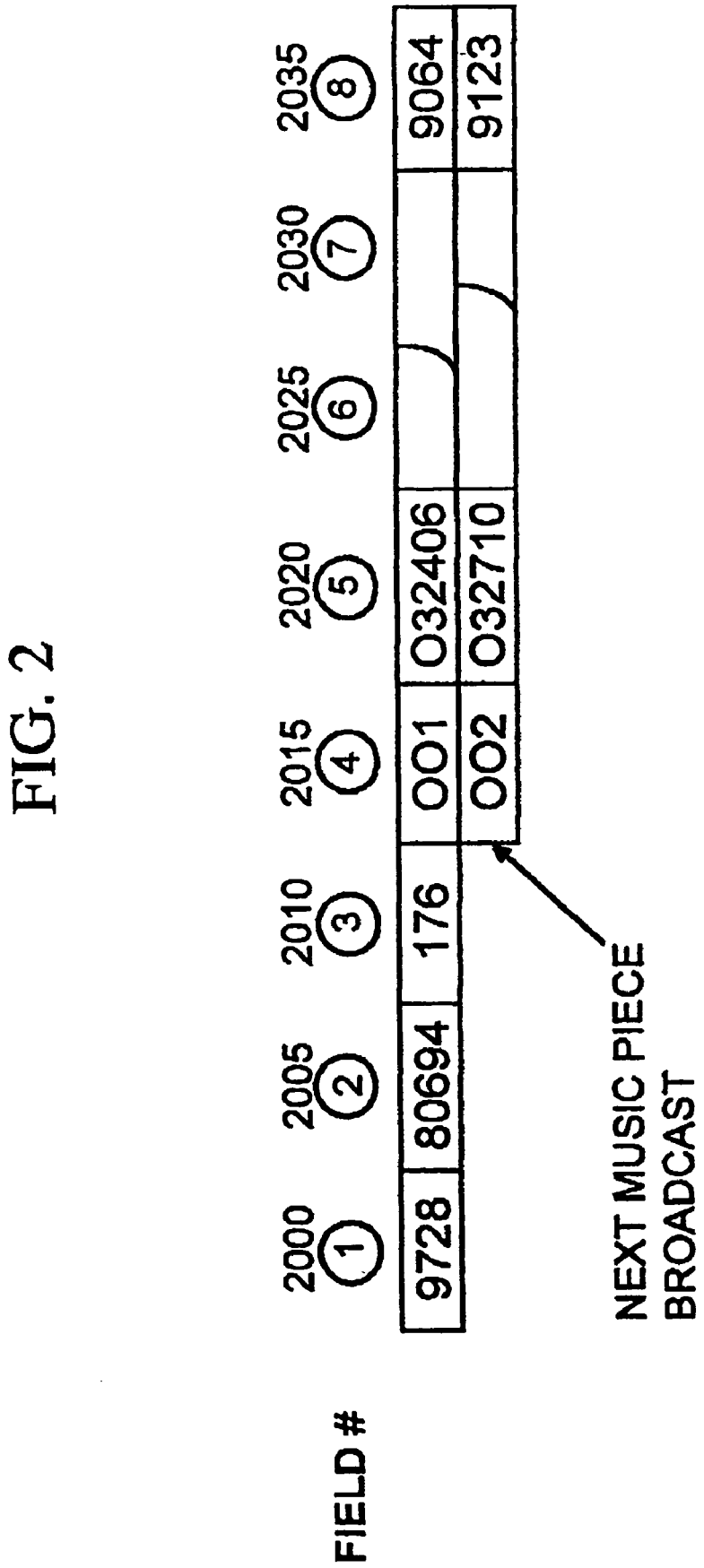

FIELD #
2000 1
2005 2
2010 3
2015 4
2020 5
2025 6
2030 7
2035 8
9728
80694
176
001
002
032406
032710
9064
9123
NEXT MUSIC PIECE BROADCAST

FIG. 3

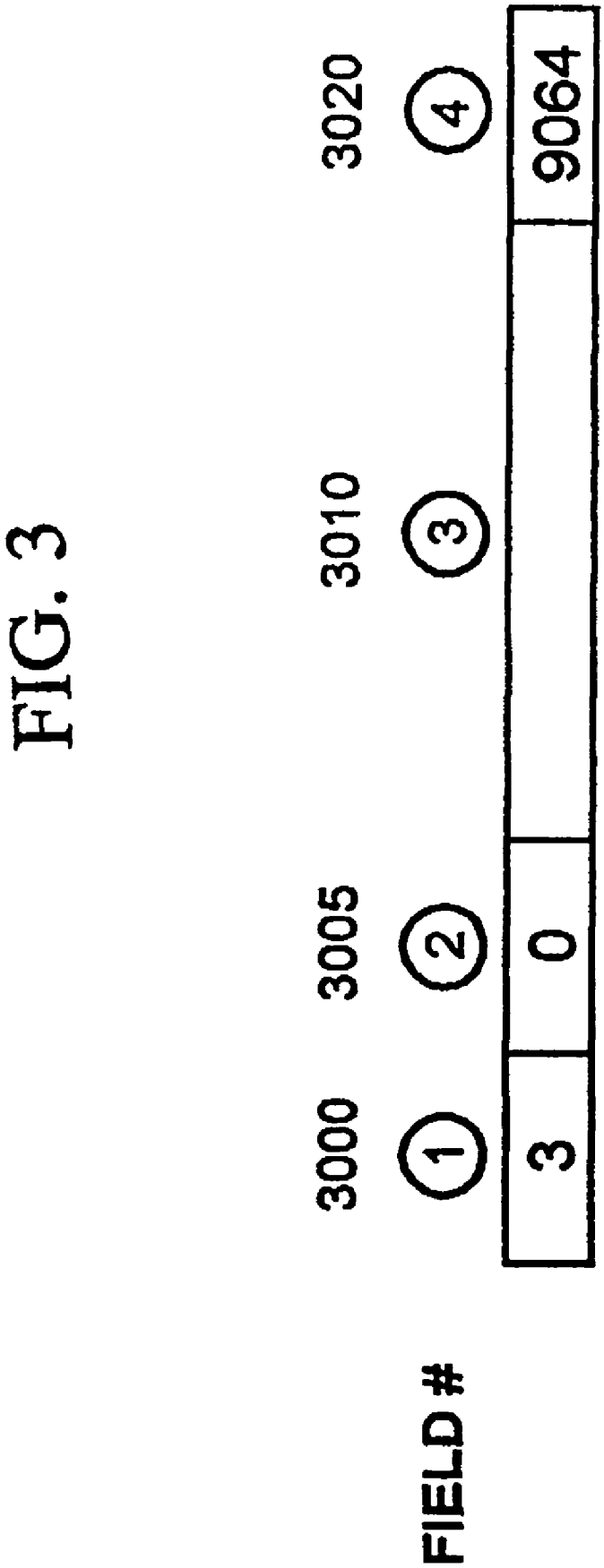


FIG. 4

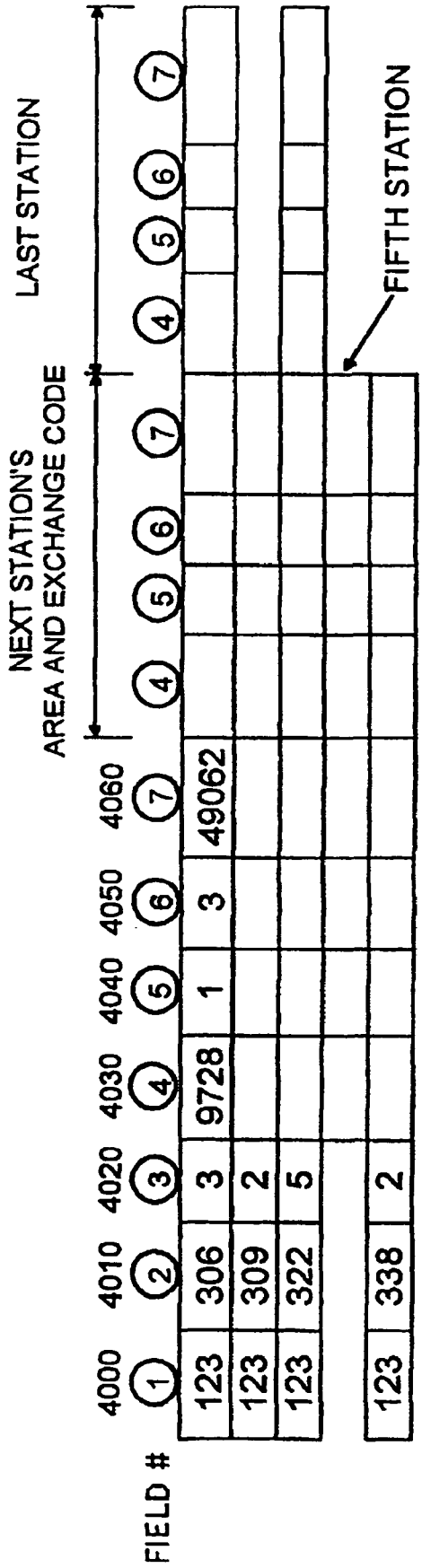
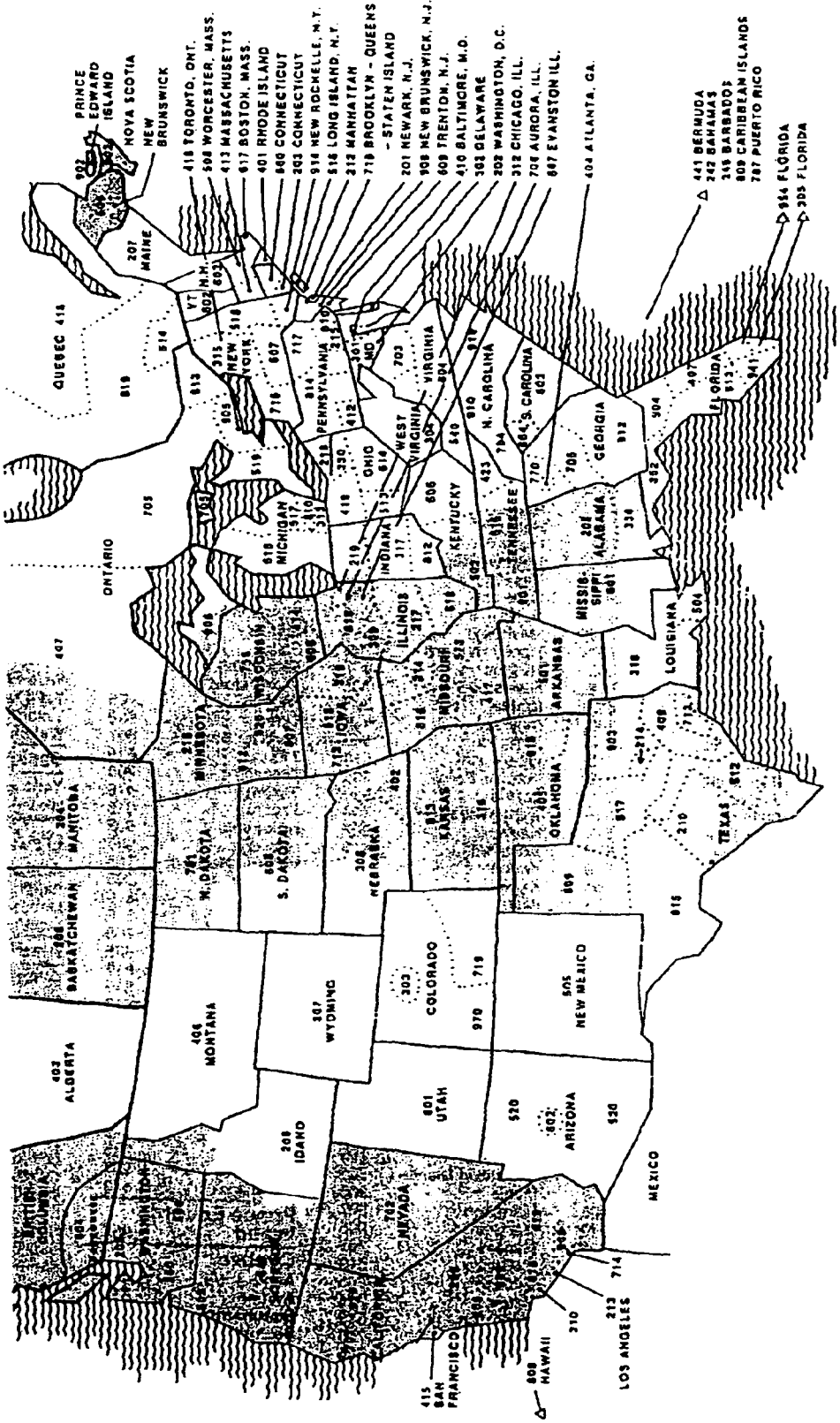

FIELD #
4000
4010
4020
4030
4040
4050
4060
1
2
3
4
5
6
7
123
306
3
9728
1
3
49062
123
309
2
123
322
5
123
338
2
NEXT STATION'S AREA AND EXCHANGE CODE
LAST STATION
FIFTH STATION

FIG. 5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MINNESOTA
MANITOBA
SASKATCHEWAN
ALBERTA
N. DAKOTA
S. DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MONTANA
WYOMING
COLORADO
NEW MEXICO
IDAHO
UTAH
NEVADA
ARIZONA
MEXICO
PENNSYLVANIA
OHIO
WEST VIRGINIA
VIRGINIA
KENTUCKY
INDIANA
ILLINOIS
MISSOURI
ARKANSAS
LOUISIANA
MISSISSIPPI
ALABAMA
GEORGIA
S. CAROLINA
N. CAROLINA
TENNESSEE
FLORIDA
HAWAII
LOS ANGELES
SAN FRANCISCO
416 TORONTO, ONT.
508 WORCESTER, MASS.
413 MASSACHUSETTS
617 BOSTON, MASS.
401 RHODE ISLAND
860 CONNECTICUT
203 CONNECTICUT
914 NEW ROCHELLE, N.Y.
516 LONG ISLAND, N.Y.
212 MANHATTAN
718 BROOKLYN - QUEENS - STATEN ISLAND
201 NEWARK, N.J.
908 NEW BRUNSWICK, N.J.
609 TRENTON, N.J.
410 BALTIMORE, M.D.
302 DELAWARE
202 WASHINGTON, D.C.
312 CHICAGO, ILL.
708 AURORA, ILL.
847 EVANSTON ILL.
404 ATLANTA, GA.
441 BERMUDA
242 BAHAMAS
246 BARBADOS
809 CARIBBEAN ISLANDS
787 PUERTO RICO
954 FLORIDA
305 FLORIDA

FIG. 6

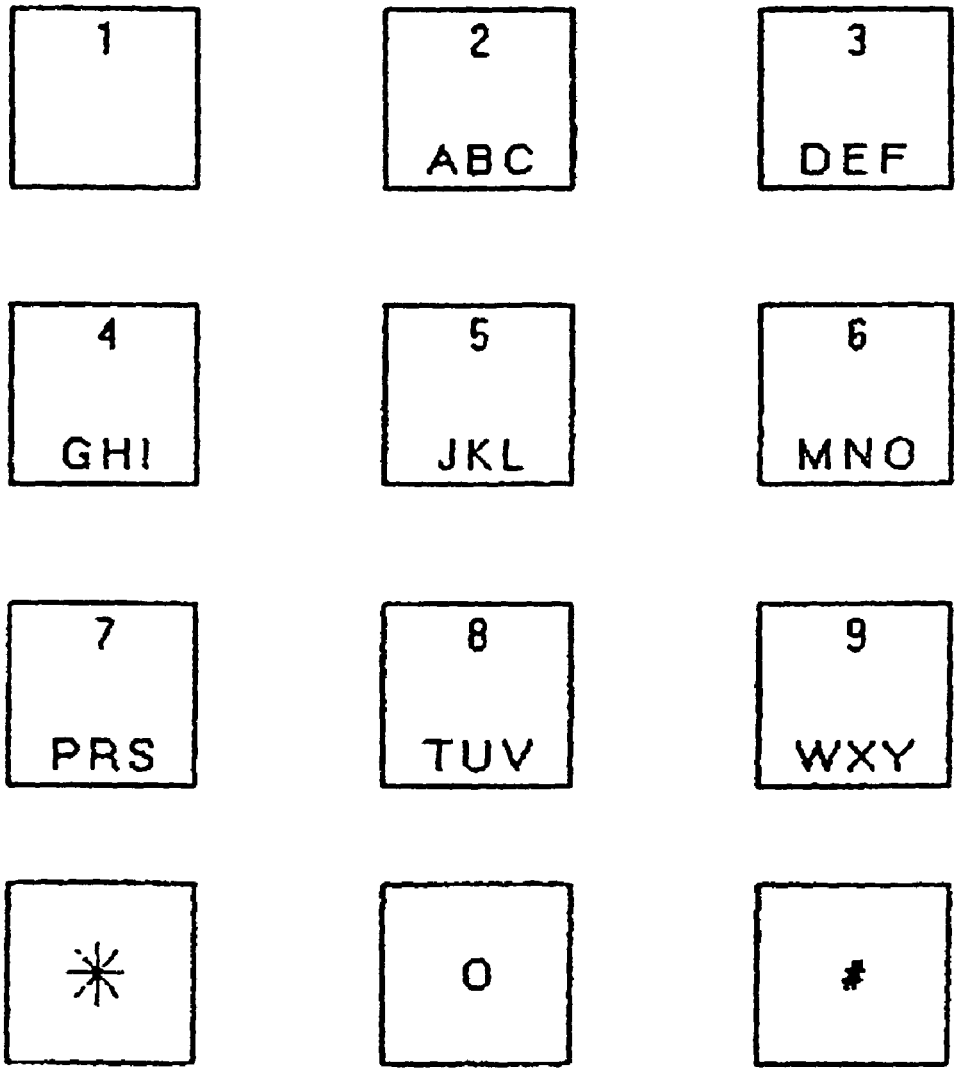
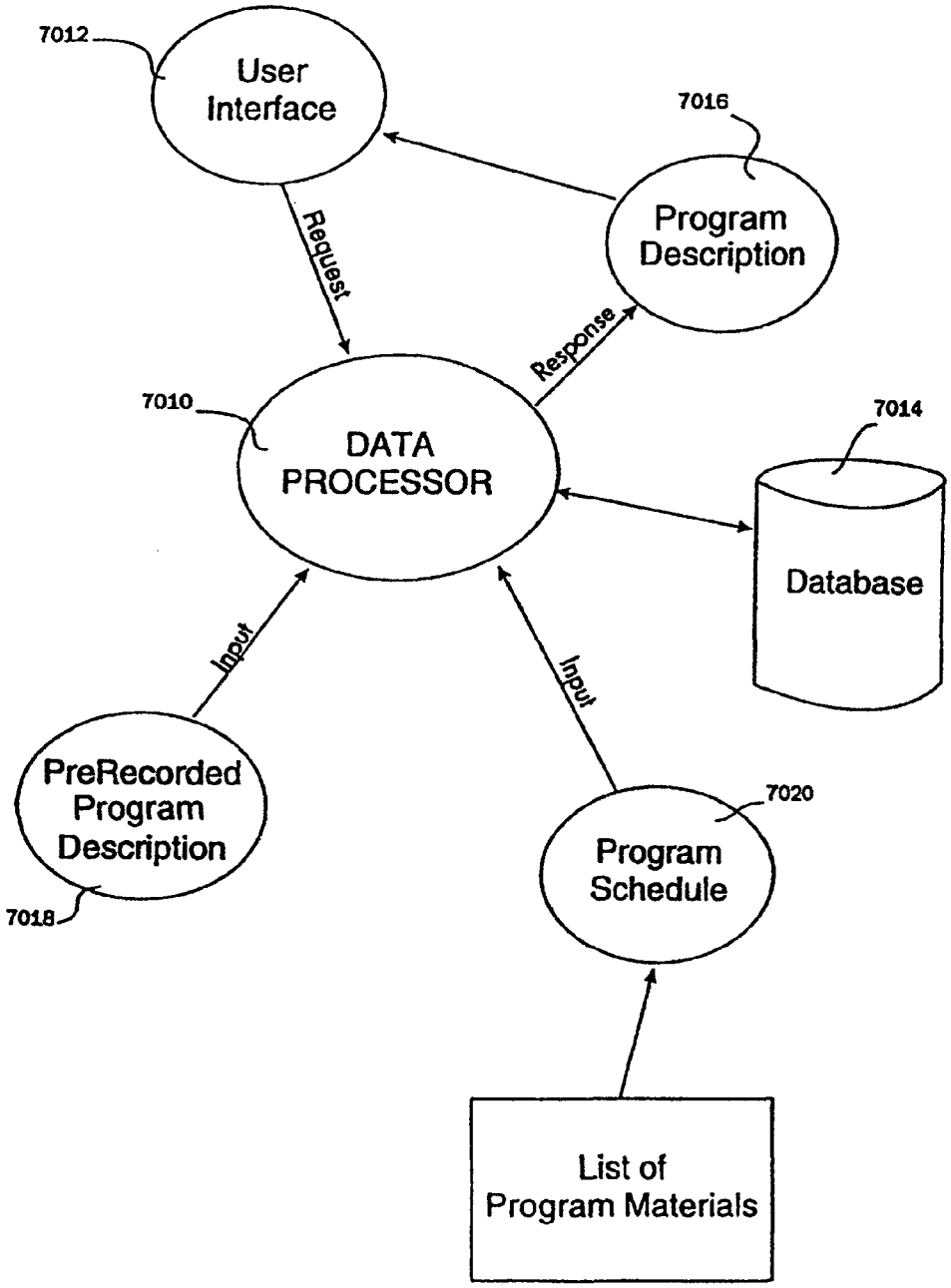


Figure 7


7012
User Interface
7016
Program Description
Request
Response
7010
DATA PROCESSOR
7014
Database
Input
Input
PreRecorded Program Description
7018
7020
Program Schedule
List of Program Materials

SYSTEM TO SYNCRONIZE AND ACCESS BROADCAST INFORMATION

RELATED APPLICATIONS

This is a continuation of application Ser. No. 09/965,808 filed Oct. 1, 2001, entitled APPARATUS AND METHOD TO GENERATE AND ACCESS BROADCAST INFORMATION, which is a continuation of Ser. No. 08/916,099, filed on Aug. 21, 1997, now U.S. Pat. No. 6,314,577. entitled APPARATUS AND METHOD TO GENERATE AND ACCESS BROADCAST INFORMATION which is a continuation of Ser. No. 08/329,837, filed on Oct. 27, 1994, now U.S. Pat. No. 5,661,787 entitled SYSTEM FOR ON-DEMAND REMOTE ACCESS TO A SELF-GENERATING AUDIO RECORDING, STORAGE, INDEXING AND TRANSACTION SYSTEM. This continuation and the two related applications are incorporated herein by reference as though set out in full.

TECHNICAL FIELD

The present invention relates generally to a method and apparatus to enable a broadcast listener to automatically purchase a music product such as a record album, cassette tape or compact disk without the intervention of an operator after hearing a music piece played on a radio station or music television station. More specifically, the preferred embodiment of the invention utilizes a programmed data processor, a digitally stored audio database containing the names of musical artists and groups, the names of pieces which have been recorded on the musical products, musical excerpts of these pieces, and a telephone system to replay this descriptive information through a telephone connection to a potential purchaser. This method utilizes the program schedule from a local radio station indicating when pieces will be played, a digital recording facility to automatically record excerpts of the music pieces played, a telephone system to decode DTMF tones from a touch tone telephone and an interface to a data communications network for communication with remote databases and computers.

BACKGROUND ART

Radio networks offer the most significant marketing medium for the music industry to create awareness for music titles and artists. But music products such as records, cassettes and compact disks (CDS) are inconvenient to purchase at the time when the consumer has the maximum impulse to buy, after hearing a musical piece on the radio.

Additionally, the inability to automate many of the key functions of a radio based, direct marketing sales operation make it cost prohibitive for a single radio station to establish a direct marketing service linked to the music they broadcast. Station operators offer different programming in each market area making it unsuitable to link their stations into a national music retail network. As well, regulatory limitations curtail the number of stations a radio operator can own in a major market thereby limiting the number of listeners below the critical mass necessary to operate a profitable direct marketing music business.

Radio broadcasters provide no means to fulfill the impulse purchase nature of the radio business. When a radio listener hears a music piece they wish to purchase they must listen for, and remember, the artists name and title of the song. In many instances it is inconvenient to write this information down for future reference. In order to purchase the music product containing the song heard on the radio the consumer must be further motivated to travel to a music store to proceed with the purchase process. At the music store the potential purchaser must determine if the selected music product is in stock and assess the pricing information.

The consumer is further constrained because they are unable to preview the songs on the music product they are considering because the music products are packaged and cannot be played at the store. The potential purchaser must remember and continue to be motivated by the music piece heard on the radio broadcast, possibly from days ago, and hope the other pieces recorded on the album are of sufficient interest to justify the purchase. The inconvenience and inability to sustain the impulse impetus severely impacts the purchase process.

Radio networks are unable to capitalize on the direct marketing opportunities they initiate through impulse music purchases because of the high cost of creating a direct marketing operation. Coordinating and tracking the music aired with the music products to be sold, recording of musical excerpts to be previewed, customer service operations and order fulfillment are all high overhead activities requiring a large dedicated staff with a separate skill set than radio station personnel. The cost for a radio station to establish a direct marketing operation far exceeds the returns from the music selling proceeds derived from a single radio station.

Cable television shopping networks have successfully developed large direct marketing networks based on national coverage by telecasting their programming over many cable companies reaching millions of potential purchasers. Radio station operators are unable to market music products in the same manner because station operators broadcast different music programming in each market preventing the linking of these stations into a common national market.

Radio is the most widely received broadcast medium throughout the world. The problems as previously described have prevented radio networks from being utilized for a mass media, direct marketing, music retail business.

DISCLOSURE OF INVENTION

In view of the foregoing, one objective of this invention is to resolve the problems which inhibit the successful development of a direct marketing music business for the radio industry. In this regard, it should be apparent that there exists a need in the art for a method of operating an automated system which tracks radio audio segments enabling radio broadcast listeners to select, preview and purchase a music product containing the music piece listened to for a radio broadcast.

It is therefore an object of this invention to provide an automated transaction system to record and track radio audio segments enabling a radio listener to use their telephone to recall and preview, on-demand, music pieces previously broadcast thereby assisting the listener in the purchase of a music product such as a record album, cassette or CD. The invention provides the consumer with a timely method to purchase a musical product by supplying all of the required information to conveniently make a music product purchase.

It is another object of the invention to provide a method for an automated transaction system to service multiple radio broadcasts simultaneously, thereby creating a mass radio audience for the direct marketing of music.

These and other objects are achieved by a method of and apparatus for tracking and recording a radio broadcast using a telephone interface connected to a programmed data processor such that when a potential purchaser calls a designated telephone number advertised by the radio station, for example

1-800-RECORDS, a telephone interface provides the listener with the name of the musical artist and the song titles in the reverse order played during the broadcast, starting with the current piece played. The selection, from the current artist played, to the music product the potential purchaser wants to order, is controlled by the potential purchaser using the touch tone telephone keys or voice input. When the potential purchaser reaches the song and artist of interest, further details can be related such as the other songs recorded on the album, pricing, availability and delivery information.

The invention can playback through the telephone, on instructions from the caller, excerpts or the entire song, as broadcast over the radio network, to assist the caller with the purchasing process.

When the potential purchaser indicates they are ready to order, the automated order system obtains the correct name and shipping address by accessing a name and address database responsive to the consumer's telephone number or credit card information. The system also records the consumer's credit card information and obtains credit authorization. The invention then transmits the complete order to the fulfillment warehouse for shipment of the musical product to the purchaser.

It is a further object of this invention to provide a method and apparatus whereby multiple radio stations can be supported simultaneously, offering services on a local, regional or national basis providing the economies of scale and mass audience to support the sales volume necessary to operate a profitable direct marketing service. When a potential purchaser dials the advertised number such as 1-800-RECORDS they are directed by audio prompts to indicate by touch tone entry or voice input the call letters for the radio station to which they are listening. The audio prompts are provided by a telephone interface that is connected to a programmed data processor which performs database functions. The potential purchaser's telephone number, input by the caller or supplied by the telephone company's (ANI) Automatic Number Identification service, is compared to all the radio station broadcast coverage zones offered by the participating radio stations. This comparison determines the radio stations within the broadcast range of the caller, providing a limited set of radio stations for the programmed data processor to sort and search based on the callers input of the station call letters. The input of the station call letters enables the programmed data processor to select the correct station program schedule and related information. Thus a large number of radio stations, dispersed locally, regionally, nationally and internationally can be supported by one automated system.

The inventive method also includes the step of efficiently selecting the correct radio station based on touch tone input. Although, each of the telephone keys 2 through 9 have three related alphabetical characters, callers need only to input four telephone key strokes for the four station call letters. The programmed data processor only recognizes the input for the participating radio stations broadcasting in the callers area as determined by the telephone number and broadcast coverage comparison previously described.

It is a further object of this invention to automate the manual and time-consuming functions. The inputting of the radio station play schedule in advance of the broadcast as well as the tracking of the program schedule during the broadcast day requires significant overhead if undertaken manually. As the service expands, and many radio stations are added to the service, the tracking of the various program schedules becomes unmanageable from a manual standpoint.

One component of the method and apparatus of the invention is a system for management of the radio station's program schedule. A radio station's program schedule is produced days and sometimes weeks in advance of broadcast. The program schedule is organized chronologically in the order musical pieces are broadcast and includes information such as the title of the song, the recording artist and group, as well as the day and time the piece is to be broadcast. A radio station broadcasts hundreds of musical pieces each day and the input of the program schedule by an operator is both time-consuming and prone to manual input error. The present invention enables the automation of the program schedule input by utilizing a data communications link and a communications interface such as a facsimile interface to receive the program schedule directly from the radio station into the programmed data processor. The communication interface such as a facsimile board is resident in the programmed data processor and in conjunction with a imaging software, such as a character recognition package, automatically interprets and directly stores the stations program schedule and associated information on a programmed data processor.

The radio station program schedule contains timetable information as well as information describing the music pieces played such as the title, artist and group name. The program schedule is accessed by a audio description creation system which is connected to the programmed data processor. The audio description creation system creates the audio description heard by the caller over the telephone when inquiring about a particular music piece. The audio description information describes the music piece outlined in the program schedule and the music product containing the music piece, along with other related information such as product pricing. The audio description creation system digitally records the audio and is connected to various input devices such as a compact disc player, cassette player, digital audio tape and a microphone. An announcer accesses the program schedule file on a display screen and reads the description information into the microphone creating the audio description file for each music piece. The announcer has access to previous recordings stored in an audio description archive which can be accessed via a data input terminal connected to the audio description creation system enabling previously recorded audio descriptions to be referenced.

It is another object of the invention to automate the recording and storing of the music excerpts for the music pieces outline in the program schedule. These audio segments can be accessed by the potential purchaser to assist in the purchase process and to verify to the caller they are purchasing the music product containing the music piece listened to during the radio broadcast. The automated record and store process is accomplished by inserting a signal such as a tone or pulse at the beginning of each music piece broadcast. A receiver is tuned to the broadcast containing the music pieces to be recorded and a signal detector triggers the digital recording of the piece by the programmed data processor. The music piece is recorded for a specified time such as ten seconds providing an audio segment of the music piece.

Coordination of the audio description file with the program schedule is accomplished through a synchronized time schedule whereby the program schedule file and the recording of the audio segments on the programmed data processor are initiated at the same time. Each station's program schedule is stored in chronological order enabling the coordination. Another method of implementing the signal insertion enables information to be encoded as part of the selection signal and decoded into data for use by a programmed data processor. Information such as the program schedule number or music piece number can be incorporated into the selection signal enabling the coordination of the audio description with the

program schedule. Information can be encoded into the selection signal through means such as multiple pulses or combination of tones and pulses.

The invention also provides the information for a potential purchaser to automatically order a music product without having heard one of the pieces through a radio broadcast. For instance when the potential purchaser dials the telephone number a telephone system audibly requests the potential purchaser to touch 1 on their touch tone telephone if they want to order a music piece they have just heard played on the radio, or touch 2 if they want to order a music product from the automated music catalogue. If the potential purchaser touches 2 the invention will then proceed to determine the musical product to be ordered by asking the potential purchaser to select the type of music and to input the artists name or group name using the touch tone telephone keys. Once the correct artist or group is determined the system can reference all the music products performed by that artist or group and provide the potential purchaser with the names of the music album and the recording media available such as CD, record or cassette along with pricing. Further information can also be made available such as the names of the pieces of each piece recorded on each music product along with excerpts to preview each song. The invention conveniently provides all the information required to make a purchase. Some of this information is not available even at the record store.

When the potential purchaser indicates they wish to buy a particular music product the system determines the shipping address and credit authorization and then places the order for the music product with the fulfillment warehouse.

In the case where more than one main artist or group performed on a music product or the purchase process was too complex, the potential purchaser can be bridged to an operator who can obtain and input any required data and assist the caller through the purchase process.

The invention can also be utilized with other broadcast services such as a music television telecast. Viewers of music television program or channel, access the invention in the same manner as previously described but enter the station designation such as call letters, channel number or advertised pseudo-name enabling the invention to recall the pertinent program schedule relating to the viewed television program or channel. The audio portion of the music broadcast, would be recorded and utilized to assist the viewer in the purchasing process. The invention can simultaneously support orders originating from both radio listeners and television viewers.

Other applications of the invention are also possible. The broadcast can consist of content other than music whereby products are advertised within a broadcast and the invention enables listeners to select, preview and purchase items advertised for sale over the network. The audio segments for these products would be recorded in the same manner as previously described for the music pieces and the products would match the program schedule as input prior to the broadcast.

The invention also extends to a digital as well as analog broadcast format whereby the selection signals are digital signals inserted into the digital broadcast.

The foregoing features of the invention, as well as the advantages provided thereby, are explained in greater detail hereinafter with reference to preferred embodiments illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of the self-generating audio recording, storage, indexing and transaction system according to the present invention;

FIG. **2** illustrates an example of a Program Schedule reference file;

FIG. **3** illustrates an Artist and Group Name reference file;

FIG. **4** illustrates the telephone area and exchange code, station call letter code and touch tone input database file;

FIG. **5** is a table and map of North American telephone area codes;

FIG. **6** is the touch tone telephone keypad lay out; and

FIG. **7** is an entity relationship diagram illustrating some of the principles of the invention.

BEST MODE FOR CARRYING OUT THE INVENTION

In order to explain the present invention in detail, reference will be made in particular to FIG. **1**.

In FIG. **1**, the reference number **1000** designates the radio station schedule input terminal device located at a remote radio station that can communicate with the programmed data processor **1010**, located at the central site **1025**, and input the program schedule of music to be broadcast on the remote radio station. In the preferred embodiment the radio station schedule input terminal **1000** is the computer system at the radio station that schedules the time of play for both commercials and musical program content. This terminal device **1000** is equipped with a modem and a communications program so that it can automatically dial the communications interface **1050** of the programmed data processor **1010** and input the program schedule including the artists name, name of the musical piece, and the date and time the music is to be played. This information can be coded to reduce the transmission time as there could be hundreds of music pieces broadcast each day.

Alternatively the radio station schedule can be automatically input by FAX (facsimile) using a computer or typewritten print out of the stations program schedule to transmit the stations schedule from the local FAX machine at the radio station to the central site **1025**. At the central site **1025**, the FAX receiver is a FAX board mounted within either a stand alone personal computer or the programmed data processor **1010** that would sequentially provide each incoming FAX message with its own identification number prior to storing the FAX digitally on the computer systems hard drive. In the process of setting up the FAX call a hand shake protocol is established between the sending and receiving FAX machines such that the receiving FAX machine can determine, by error free data transfer, the telephone number of the transmitting FAX machine. Alternatively, the station's FAX number can be established through, the telephone company supplied, (ANI) Automatic Number Identification service. The programmed data processor **1010** utilizes this telephone number as an index to select the optimal algorithm to convert the FAX images to data. For example, message number **101** assigned by the FAX receiving board is associated with radio station WHAM FM because of the stations digitized telephone number received in the hand shake protocol. The programmed data processor **1010** then accesses the interpretation protocol that matches the FAXed data for WTAM FM to convert the character images sent from the radio station FAX into ASCII characters to be stored on the programmed data processor **1010** in the program schedule file **1060**. For example, radio station WTAM FM could utilize a computer printer that produced text in the Roman font. Each line on their schedule begins with time of play, followed by duration, artist name, then the name of the music piece. A different radio station, identified through the handshake protocol by their telephone number as WPAT AM, utilizes a different scheduling com-

puter to print out their program schedule using the Tudor font highlighting the artist name first, followed by the musical piece, time of play and duration. Because the programmed data processor **1010** knows the identity of the sending FAX machine it can apply the optimum algorithm to interpret the text font and determine from the text placement the contents of the page. This approach enables the programmed data processor **1010** to automatically file the FAXed program schedule of the remote radio station in a fixed digital format in the program schedule file **1060** associated with a particular radio station. An example of the format to which the program schedule files are processed is illustrated in FIG. **2**.

Alternatively, the terminal device **1000** could be a nonprogrammable terminal connected via a network to the communications interface **1050**, interacting on line to input the program schedule. The program schedule data could also be input using a touch tone telephone with voice prompting when connected to the telephone interface **1020** or input by voice into a section of the telephone interface that recognized spoken numbers and words through voice recognition. A coded version of the radio station program schedule makes the input easier and quicker. The schedule data could also be read over the telephone to an operator who would input the data. As this program schedule data is received from all of the participating radio stations it is stored in the program schedule **1060** of the programmed data processor **1010**.

Music television channels and other telecasters can also utilize the above-mentioned methods to forward and store their program schedules for use by the system.

The digitized audio description file **1070** is created using the audio description creation system **1080** which is connected to the programmed data processor **1010**. The audio description creation system consists of a set of audio input devices, such as a CD player **1085**, cassette player **1086**, record player **1087**, audio tape player **1088** and microphone **1089** for an announcer to record audio descriptions.

The audio description file **1070** consists of the audio description information describing the music piece and an audio segment consisting of an excerpt of the music piece. The audio description information corresponds to the audio recording of the text description of each music piece listed in the program schedule stored in the program schedule file **1060**. The announcer uses the display screen **1081** to recall the program schedule from the programmed data processor **1010** for each radio station. As well, additional information concerning the music piece such as the name of the music product containing the music piece and pricing can be input into the creation system via the attached data input terminal **1082** or personal computer and stored on the audio description creation system available to the announcer for audio recording.

For example, the station program schedule, after receipt from a participating radio station, would be loaded onto the audio description creation system **1020**. The program schedule file **1060**, an example of which is referenced in FIG. **2**, contains the station code or identifier for the station **2000**, field **1**, date and period of the program schedule broadcast **2005** field **2**, number of music pieces in the time period **2010** field **3**, chronological schedule number **2015** field **4**, time of broadcast for a particular music piece **2020** field **5**, artist or group name **2025** field **6**, title of the music piece **2030** field **7** and the pointer to data file **2035** field **8**. Parts of this schedule information can be coded to reduce the transmission time from the radio station to the system. For example, a particular artist or group could be located in a reference table and related to an artist or group number followed by a music piece reference number. The coded entry would be made in the program schedule at the radio station and FAXed to the central site **1025**. A standardized reference system could be utilized by all reference table based stations or different tables implemented for each station whereby the station reference table conversion is conducted by the programmed data processor **1010** when the imaging and interpolation process occurs for incoming program schedules.

For the purposes of recording the music title portion of the audio description, the audio description creation system **1080** performs an initial sort of the music pieces listed in the program schedules to remove redundant entries for the same artist and music piece. The artist name **2025** field **6** and the name of the music piece **2030** field **7** contained in the program schedule **1060**, or the code representing it, is compared to the data description archive file **1066** containing all previous listings for which audio descriptions already exist. The announcer is then presented, on the display screen **1081**, with the listings that require an audio description. The announcer then reads the artist's name and title of the music piece into the microphone **1089** and stores them in the audio description file **1070** while at the same time updating the audio description archive file **1084**.

Information not contained in the program schedule such as pricing, album name or other background can be input by the data input terminal **1082**, prior to audio recording, and stored as part of the data description archive file **1066** to be included in the audio description by the announcer.

The music product containing the music piece outlined in the program schedule can then be loaded into its respective player such as a CD player **1085**, on the audio description creation system **1080** and the audio segment digitized, compressed and stored into its associated audio description file **1070** while also updating the audio description archive file **1084**. The audio segment can consist of an excerpt of the music piece or the entire music piece.

The announcer would then depress the space bar or other key of the display terminal **1082** to indicate completion of that audio input and the linking of the entry in the program schedule with the corresponding audio description. The link is made through a database which utilizes the pointer to data file, **2035** field **8**, which is added to each music piece in the program schedule and references the corresponding audio and data description.

The announcer can then proceed with the next descriptive item of that musical product which would be displayed on the display screen **1081** for the announcer to record onto the system. This process can be repeated for each piece recorded on the musical product and referenced in the database by product name. Both the audio description archive file **1084** and the data description archive file **1066** are automatically updated with the new entries.

Instead of using a staff announcer's voice to provide the audio description it is possible to have the recording artist provide their own music descriptions on a recording medium such as an audio tape and have it sent to the creation system site to be input and included as part of the audio description via the audio tape recorder **1088**.

When the audio descriptions for all of program schedule entries and potentially for all of the new music products have been processed by the audio description creation system **1080**, the digital audio description file **1070** on the programmed data processor **1010** is updated with the new audio descriptions contained in the audio description archive file **1084**. As well, the data file **1065** is also updated with the new files contained in the data description archive file **1066**. The program schedule **1060** is updated with the revised schedule

containing the pointer to data file **2035** field **8** linking to the corresponding audio and data description.

Acquiring the music products and manually recording the music pieces is both expensive and time-consuming. The system offers a method for automatically recording the audio segments of the music pieces broadcast. This is accomplished by digitally recording the music in real time directly from the broadcast and storing the recorded segments into the associated audio description file **1070** on the programmed data processor **1010**.

In the radio industry, recordable media, such as Digital Audio Tape (DAT) or digital hard drives are used to prerecord many hours of music for preparation and play by radio stations. The music on the digital media is prepared in accordance with a station's program schedule. Existing technology enables an audio signal such as a pulse or DTMF tone to be recorded on the DAT and included with the broadcast to trigger remote audio and video equipment. This capability is commonly used in the radio and television industries to remotely play advertisements.

According to the invention, the automated record and store process is accomplished by inserting a selection signal such as a tone or pulse at the beginning of each music piece to be recorded from the broadcast. In FIG. **1** the receiver **1090** is connected to the signal detector **1091** which is connected to the programmed data processor **1010**. The receiver **1090** receives the broadcast containing the music pieces to be recorded and a signal detector **1091**, when it detects the appropriate signal, triggers the digital recording of the piece by the programmed data processor **1010**. The recording of the music piece continues for a specified time, such as ten seconds, providing an excerpt of each music piece denoted by the selection signal. The digitizing facility can be part of the signal detector **1091** or contained within the programmed data processor **1010**.

An additional signal can be included to signal the programmed data processor **1010** to stop recording rather than a timer based approach. Having a signal start and stop the recording function enables the entire music piece to be recorded whereby the additional signal is appended to the end of the music piece.

The real-time recording of the music piece is linked to the program schedule **1060** enabling the recorded audio segment to be stored in the correct audio description file. The recording of the music pieces is initially time synchronized with the program schedule for each station. A receiver **1090** and signal detector **1091** is dedicated to each station requiring real-time recording. Knowing the station code or identifier that the receiver is dedicated to, the programmed data processor **1010** loads the correct program schedule **1060**, for the station it is recording, based on the station code **2000** field **1**, and the current time and period of broadcast **2005** field **2**. The system clock is used by the programmed data processor to locate the current music piece played as indicated in the program schedule, using the time of broadcast **2020** field **5**. The incoming audio segment, as detected by the signal detector **1091** is recorded into its corresponding audio description file **1070** as referenced by the pointer to data file **2035** field **8** in its program schedule **1070**. After the initial synchronization, the recording of the music pieces into the audio description file **1070** follows in chronological order with the program schedule for that particular station. For example, if synchronization between the incoming audio segments and the current program schedule occurred with the first music piece listed in the program schedule as indicated by the chronological schedule number **2015** field **4**, then the next audio segment detected would be recorded into the audio description file corresponding to the next program schedule listing containing the chronological schedule number of two.

When the programmed data processor **1010** reaches the last listing in a program schedule it loads the next schedule for that particular station and proceeds to synchronize and record when the next audio segment is detected. Establishing the last listing in a program schedule can be accomplished in various ways such as comparing the number of music pieces in the time period **2010** field **3** and the chronological schedule number **2015** field **4** for the current listing. If the two fields match the next program schedule is loaded for synchronization with the next incoming audio segment. Another method of detecting the end of a program schedule involves the addition of a delineator at the end of the program listing which when reached causes the loading of the new program schedule. As well, a delineator signal can be added to the broadcast signaling the programmed data processor to refer to the next program schedule.

Specific signals or multiple signals can be inserted for various purposes such as to synchronize the program schedule with the automatic recording of the music pieces. When creating the program schedule the station can indicate the time of the synchronizing signal and upon receiving the program schedule, the programmed data processor **1010** automatically interprets the signal placement along with the rest of the program schedule information. Many stations currently utilize a beginning of the hour signal for advertising purposes and this beginning of the hour signal can be detected by the programmed data processor and utilized to synchronize the program schedule.

Another method of implementing the selection signaling enables information to be encoded as part of the inserted signal and converted into data by the signal detector **1091**. Information such as a program schedule number or a music piece reference number can be incorporated into the selection signal enabling the coordination of the program schedule **1060** with the recording of the music pieces into the correct audio description file **1070**. The selection signal information can be encoded in the inserted signal through various means such as multiple tones or a combination of tones and pulses. For example, when DAT tapes are prepared containing the music for a days broadcast, a signal such as DTMF tones can be inserted prior to each music piece whereby the program schedule number precedes the music piece in the broadcast. For example, the 46th music piece in the program schedule can be preceded by the tones representing a 4 and 6. The signal detector **1091** would detect and decode the signal and pass the information to the programmed data processor **1010**. The programmed data processor **1010** would reference the chronological schedule number **2015** field **4**, within the current program schedule and record the audio segment into the correct audio description file **1070**.

The encoding and inserting of information in the broadcast can be utilized in several ways. A coded music piece reference number indicating the title and artist name can be inserted into the broadcast and received, detected and decoded for use by the programmed data processor **1010** to coordinate the recording of the audio description and synchronization of the program schedule.

In an alternate method of operating the system, the insertion of the music piece reference number enables the system to operate without a program schedule. The insertion of the music piece reference number enables the programmed data processor to go directly to an audio description without accessing a program schedule. If the music piece reference number referred to an audio description not available on the programmed data processor **1010** then the programmed data

processor can access the audio description archive file **1084** to retrieve the associated audio description. For operation without a program schedule utilizing the insertion of a music piece reference number, the audio description archive file **1084** can be located on the programmed data processor **1010** to provide more efficient operation.

The selection signal or other information, can be sent as data with the broadcast signal through methods such as the side band frequency of the broadcast signal or as digital data contained within a digital radio transmission or digital television signal.

As well, the selection signal can be utilized to pass messages in real-time to the programmed data processor **1010** such as in the case whereby the disc jockey at the radio station manually inserts a specific signal as part of the broadcast. The signal is decoded by the signal detector **1091** and passed to the programmed data processor **1010**, relaying messages such as, a music piece will be skipped and the next music piece in the program schedule will be played enabling the programmed data processor to skip the next listing in the current program schedule.

The real-time insertion of a music piece reference number enables radio stations that conduct live or request radio, to insert the music piece reference number preceding or during the music piece broadcast, enabling the programmed data processor **1010** to locate the corresponding audio description or trigger the recording facility.

The selection signal methodology also applies in the case of a music television channel, music video program or a music station associated with a television telecast such as provided through a cable television telecast, satellite broadcast or television signals distributed via the telephone network. The selection signal is inserted into the audio portion of the signal and detected and potentially decoded as previously described.

An alternate signaling method enables video information to be inserted and detected as the selection signal. In the case of video signaling, the receiver **1090** becomes a television receiver and the signal detector and decoder is a video decoder able to decode the embedded video signal contained within the broadcast.

The audio description archive file **1084** can be updated at the end of the day or recording period by up-loading the audio segments and audio descriptions recorded from the broadcast that do not already exist in the archive. Music pieces, whether prerecorded when the artist name and titles are recorded by the announcer, or real-time recorded from the broadcast, are recorded once and can be referenced in multiple program schedules or multiple times within a given program schedule. Each audio description is filed in the audio description archive file **1084** contained on the audio description creation system **1080**. The audio description archive file **1084** enables easy reference and repeated use of the audio descriptions. This is significant from an efficiency standpoint because in most cases a relatively limited number of music pieces receive the majority of the broadcast play.

The audio description creation system **1080** is also the means to create the area code and call letter file **1075**, which when located on the programmed data processor **1010**, is the basis for determining the call letters of the radio station being listened to by the potential purchaser.

For example each of the approximately 130 telephone company area codes, see FIG. **5**, have less than 999 unique local exchange codes. Each telephone exchange code defines a small portion of the geographic area of the telephone area code that it is located in, such that a specific exchange code can only exist in one city or town for that particular area code. Similarly, cellular and other wireless telephone services such as PCS (Personal Communications Services) have identification codes relating to cell and transmitter locations with defined geographic limits. Every radio station has an area of signal coverage that is publicly available on maps such that for every exchange code it can be determined which radio stations provide coverage within the boundaries of a particular exchange. For example, in area code **519**, exchanges **293**, **526**, **765**, **773**, **565**, **644**, **523**, **228**, **482**, **233**, **234**, **237**, **268**, **762**, **235**, **769**, **287**, **524**, **238**, **225**, **269**, **262**, **263**, **666**, **247**, **229**, **652**, **227**, **289**, **264**, **232**, **294**, **874**, **243**, **782**, **785**, **631**, **633**, **527**, **522**, **764**, **775**, **866**, **245**, **296**, **461**, **693**, **768**, **236** are located in an area surrounding London, Ontario, Canada and these following exchanges are within the London city limits **432**, **433**, **434**, **438**, **439**, **451**, **452**, **453**, **455**, **471**, **472**, **473**, **641**, **643**, **645**, **649**, **657**, **659**, **660**, **661**, **663**, **667**, **668**, **672**, **673**, **679**, **681**, **685**, **686** and from these exchanges the following radio stations can be heard CBBL FM, CBCL FM, CIXX FM, CJBC FM, CJBK AM, CJBX FM, CIQM FM, CKSL AM, CFPL AM in London and CHLO AM in St. Thomas and CBEG FM, CHOK AM, CKJD AM, CJFI FM in Samia. By organizing this information in a database it is possible to determine from touch tone input, the call letters of the radio station listened to even though the touch tone keys have three alphabetic characters on each key as illustrated in FIG. **6**.

The area code and call letter file and database structure are illustrated in FIG. **4** where the area code **4000** and the local exchange digits **4010** are the first two data fields followed by a third field **4020** which indicates the maximum number of radio stations that can be satisfactorily heard in that area and exchange code. A radio station is described in the next set of four fields which are repeated for each radio station. **4030**, field **4** contains the numeric values of the touch tone keys that match the letters of the radio stations call letters. For instance WPAT FM would appear as 9728 where the number 9 is contained on the touch tone key corresponding to the letters WXY. **4040** field **5** contains a 0 if the station is AM station or a 1 if FM. **4050** field **6** contains a number 0 to 9 indicating the type of radio station such as country, pop or rock. **4060** field **7** contains a pointer to an audio description of the station call letters so that the potential purchaser can be prompted with the station call letters combined with the type of station in the event the purchaser forgets the call letters. The radio station call letter fields would be arranged in sorted order to improve the speed of the retrieval.

The system would know in advance as part of the database that the first two stations listed in the above example, CBBL FM and CBCL FM have the same touch tone numeric values 22252 and would audibly ask the caller to select the correct station once it detected this conflict.

To determine the radio station call letters the potential purchasers telephone area and exchange code digits are used as a retrieval key against the area code and call letter file **1075** to retrieve the set of radio station call letters that could be heard from that telephone exchange. The potential purchaser is asked to use the telephone to input the station call letters. The call letter numbers from the area code and call letter file **1075** are then compared with the numeric values of the station call letters input by the potential purchaser. If a match is established the system can then proceed to determine which music has been played on the selected radio station. If a match is not found the potential purchaser can be verbally prompted with the types of radio stations in that area code and exchange, for example touch 1 for country, 2 for pop, which when selected, will allow the system to further prompt the potential purchaser with the radio station call letters that match the

selected type of station. If this process does not determine the radio station, the potential purchaser can be bridged to a customer service operator, located at a customer service data terminal, **1040** to determine and input the radio station call letters.

As well as station call letters, other identifiers can be utilized in place of or in conjunction with the station call letters, for example, a radio station frequency number, television channel call letters, cable or television station number or advertised station descriptor. This entails an expanded version of the area code and call letter file referenced in FIG. **4** whereby **4030**, field **4** includes the touch tone numbers for additional identifiers.

In some cases the station operator may request their own specific telephone number for their listeners to access the service, in which case the called number would identify the station and enable the programmed data processor to recall the appropriate program schedule.

The audio description creation system **1080** is also the means to create an artist name archive file **1083** which is updated every time a new artist adds a musical product. This artists name archive file **1083** updates the artists name file **1078** on the programmed data processor **1010** each time it is updated. The artists name file **1078** contains the touch tone key combinations and other related information for each artist or group name. This file is also partitioned into as many segments as a potential purchaser can identify as separate sets or styles of music. For example, 5 partitions can be created by dividing all artists or groups into the categories of soft rock, hard rock, pop, easy listening and country. Each of these categories can then be divided into single artists or groups. Then the artist and group names are converted into the numeric values of the touch tone keys that match the alphabetic characters of their names. For example, the letters A,B,C would all be represented by the number 2 which is the numeric value of the touch tone key containing them. A generalized version of this file is described in FIG. **3** where **3000** field **1** contains a number between 1 and 5 representing the type or category of music. **3005** field **2** contains a 0 for an artist or 1 indicating a group. **3010** field **3** contains the name of the artist in touch tone representation of the ASCII characters of their name. Since the characters Q and Z and Space do not appear on the touch tone telephone keypad the number 1 is used to indicate either Q or Z and the number 0 is used to denote a space. The potential purchaser would be informed of these keyboard characteristics when prompted to input the artist or group name. **3020** field **4** would contain a pointer to the artist or group name in the data file **1065** referencing the pointers to all the musical products for the artist or group as well as pointers to the audio description of the artist's name, the names of the artist's musical products, the various pieces included in the musical products and musical excerpts of these pieces contained in the audio description file **1070**.

When the updated program schedule **1060**, data file **1065**, area code and call letter file **1075**, artists name file **1078**, and audio description file **1070** have been loaded on to the programmed data processor **1010** along with the program to initialize and control the data processor, the system is ready to receive telephone calls ordering music products.

Referencing FIG. **1**, the potential purchaser uses a touch tone telephone **1030** to dial an advertised number such as 1-800-RECORDS (equivalent to 1-800-732-6737) to be connected to the telephone interface **1020**. The telephone interface **1020** uses audio prompts to ask the potential purchaser to use the touch tone keys to input their telephone number including the area code. Alternatively, this information can be supplied or verified by the telephone company ANI (Automatic Number Identification) service.

After receiving the telephone number the system asks the potential purchaser to touch 1 if they heard the music piece of interest on a radio station, or to touch 2 if they plan to order a music product not recently heard on the radio station.

If the potential purchaser touched 1 the telephone interface **1020** would ask the potential purchaser to input the call letters of the radio station to which they were listening, including AM and FM designations if necessary. Since the basic radio station call letters are four characters and each of the touch tone telephone keys with an alphabetical listing contain three possible characters, the potential for confusion as to which radio station identifier was input is very large. One of the concepts of the invention is to eliminate this confusion by using the caller's telephone area code and the mutually exclusive exchange code digits. This area and exchange code information enables the system to determine which city the call originated from and compare the caller input with a select group of radio station call letters consisting of only the stations participating in the service from that area. The request for the input of AM and FM designations would be requested when an equivalent set of base call letters, such as WPAT FM and WPAT AM, provide a potential conflict.

If the potential purchaser cannot remember the station call letters it is possible to use the area and exchange code digits to retrieve station descriptions from the area code and call letter file **1075** to verbally prompt the user with the call letters only available from their city. This audio prompting could also include general station descriptions such as Country and Western or Rock to help determine the exact station listened to.

Once the system has determined which radio station was listened to, the system can search the program schedule for the selected station to determine the current piece being played and provide the prospective purchaser with the first level of description such as the artists name. Then the telephone interface directs the potential purchaser to touch 1 if it is the music piece in which they are interested or touch the 2 key to hear an excerpt of the music piece broadcast to confirm the music piece of interest or touch the number key # on their telephone to jump to the previous piece of music played on the broadcast.

With each touch of the number key (#) the system would step back through each piece of music previously broadcast or telecast until the potential purchaser touched 1 to indicate reaching the music piece of interest. Listeners can also, through the telephone, enter the time they listened to a song to speed the retrieve process for those callers that were significantly delayed in calling the service.

Upon reaching the music piece of interest, the system audibly informs the potential purchaser of the formats available for the music product selected, such as CD, cassette tape or record album and provide the pricing, shipping and other details.

The system would then ask the potential purchaser to touch the asterisk key * on the touch tone telephone **1030** if they want to order the music product. Alternatively they can press the number key # if they want more details.

If the potential purchaser touches the number key # the other musical pieces on the product would be described and, if requested, excerpts could be played so that the potential purchaser had all the required information to make the purchase. Pressing the asterisk key * begins the order process.

When the asterisk key * is pressed to order the musical product, the system would use the caller's telephone number to determine the shipping address. The system accomplishes

this by requesting the communications interface **1050** to connect to an outside database **1090** to provide the address associated with the caller's telephone number. This address could also be obtained from a local CD ROM, attached to the programmed data processor **1010**, that contains the street addresses for the respective telephone numbers. If the caller requests a different shipping address, they can leave a voice message on the audio response system **1025** or be connected to a customer service operator.

As the address retrieval process is proceeding, the telephone interface **1020** audibly requests the purchaser to input their credit card number on the touch tone telephone **1030**. The programmed data processor **1010** then directs the communications interface **1050** to contact the credit card issuer **1095** and obtain a credit authorization number which would enable the system to subsequently invoice the customers credit card account upon shipment.

With the shipping address and credit authorization known, the programmed data processor **1010** directs the communications interface **1050** to connect to the fulfillment warehouse **2000** and place the order for the requested music product. If the product is not in stock the fulfillment warehouse computer informs the programmed data processor **1010** through the communications interface **1050** which then instructs the telephone interface **1020** to inform the customer of the out of stock condition.

Once it has been determined that the product is in stock an is placed with all the information to ship the product and create the appropriate records to invoice the purchaser and record the transaction for further accounting and statistical purposes.

In each of these steps, if the caller experiences problems not easily handled by inputting information via the touch tone telephone the caller can be connected through the telephone interface **1020** to a customer service operator, who would obtain the required information verbally for input into the system via the customer service data terminal **1040**. The customer service operator has complete control of the session with the caller once the bridge connection has been made. For example, the customer service operator, can over the telephone, play the recorded excerpts for the caller, obtain and enter shipping addresses or explain credit problems. In general the customer service operator is the last resort when the automatic system is unable to complete the order process.

The system will also support orders from callers not directed by a broadcast but interested in purchasing a music product. For example, the potential purchaser can initially, upon calling, be prompted to press the number 2 on their touch tone telephone indicating they were not a radio listener but wished to use the automated music catalogue service whereby the system would proceed to automatically determine the required musical product and provide all the information, including the playing of music excerpts, to enable the potential purchaser to order a selected music album. The system accomplishes this by narrowing the scope of possible music products by first asking the potential purchaser to touch 1 if the artist of group is soft rock, touch 2 if hard rock, touch 3 for blues and touch 4 for country, then to indicate whether the music product is recorded by a group or single artist. Then the telephone interface **1020** requests the artists name followed by a terminator key such as the number key #, to be input using the touch tone keys on the telephone **1030**. The type of music and the numeric representation of the artist or group name is combined together as a retrieval key. Matching the retrieval key with the artists name file **1078** provides access to the pointer for the selected artist's name in the data file **1065**. The data file **1065** contains a pointer to the artist's name in the audio description file **1070** for the telephone interface **1020** to audibly relate the artist or group name and ask the potential purchaser to confirm the selection of the correct artist or group, using the touch tone keys.

Once the correct artist has been identified the system retrieves the names of musical products for the selected artist stored in the data file **1065** and relates them in the reverse order of their release. These names have pointers to audio descriptions in the audio description file **1070**, which when played to the potential purchaser, can assist in determining which musical music product is of interest. By using the touch tone keys, the potential purchaser can hear excerpts from any musical product until satisfied they have all the required information to initiate the purchasing process by touching the asterisk key *. Once the asterisk key * is depressed the system will automatically proceed with the purchase process as previously described.

It is contemplated that a 1-900 telephone number can be used for the service where the potential purchaser would be charged by their telephone company for the telephone call on either a per call or duration basis.

It is further anticipated that record and music clubs can use this invention to assist in describing and selling their products. As well, record stores can use this invention to allow potential customers to hear excerpts from the musical products over telephone lines. These services could be offered from one central site or through smaller local distributed systems networked together.

In both of the above-mentioned examples the music product number or unit code can be used to access the album index of possible pieces to be previewed, thereby reducing the retrieval time to obtain the music information required to make a purchase.

It is further contemplated that specific components of the system can be located remotely and networked to provide a distributed approach to reduce communications costs. For example, the telephone interface **1020** can contain local file storage capabilities and be located remotely from the programmed data processor **1010** such that the telephone interface, and its audible response and preview functions, can be located in major cities.

It is further envisioned that the system may provide support for a variety of terminal devices through the system user interface **7012**. For example, a multi-media device such as a personal computer may access the program list information through a digital interface such as the communication interface **1050** thereby enabling access to both audio and text files comprising the program list information. The personal computer communicates utilizing digital data and users select program list information through keypad commands. The user may be guided through the selection process through one of, or a combination of, audio and visual prompts provided through the personal computer.

Further, the system includes support for the addition of video to the program list information whereby the system records, indexes and stores program list information that comprises audio and video content, such as a music video program information recorded from a cable, satellite or digital data network telecast. The video portion of the program list information may be recorded, indexed and stored in conjunction with the audio description in the same manner as previously described. A multi-media terminal device such as a personal computer or interactive television receiver may access the system through the user interface **7012** or such data communication functionality may be provided through the communication interface **1050** providing multi-media descriptions of the program schedule information.

Having now described the preferred embodiment of the invention, reference will be made to FIG. **7**, which gives an overview of some of the principles of the present invention. As illustrated, the present invention employs data processor **7010** which is provided with a suitable user interface **7012**. In the presently preferred embodiment, the user interface is integrated with the existing telephone infrastructure, so that persons may interact with the system using conventional DTMF telephone equipment, as described above. Connected to data processor **7010** is a subsystem **7018** for providing prerecorded program descriptions of the program material (e.g. recorded music) that the caller may wish to purchase. Subsystem **7018** may be implemented using hard disk storage, optical storage, digital audiotape (DAT) storage, or the like. The program material (e.g. recorded music) may be prerecorded from the media played over the air, or it may be prerecorded from the live broadcast using a suitable AM or FM receiver and suitable digitizing (analog to digital conversion) equipment. Also connected to data processor **7010** is a program schedule input system **7020**, which may be any suitable means for inputting the program schedule or play list identifying what program materials have been or will be broadcast, including optical character recognition equipment for inputting play lists provided in printed form and telefacsimile equipment for inputting play list information via FAX.

Data processor **7010** is further provided with a database system **7014** for storing the program schedule, suitable data or pointers from which the prerecorded program description may be obtained, reconstructed or generated. A program description subsystem **7016** is coupled to data processor **7010** to provide the selected program description to the user via the user interface **7012**. The program description subsystem may include digital to analog conversion equipment for converting digitally pre-recorded program description information into an analog form suitable for distributing serially over the telephone. Alternatively or additionally, the program description subsystem may include synthesis equipment for performing text to speech conversion on text data files representing prerecorded program description information.

While the invention has been described with regard to the presently preferred embodiment, it will be understood that the invention is capable of certain modification without departing from the spirit of the invention as set forth in the appended claims.

What is claimed is:

1. A computer implemented information system to present program description information for one or more broadcast programs, the system comprising:

a processing system for execution by a computer;

a user interface coupled to said processing system, said user interface providing means for receiving one or more user inquiries regarding one or more broadcast programs;

a database coupled to said processing system;

an input means coupled to said processing system, for inputting program description information of one or more broadcast programs to be broadcast in the future; and

a program description transmission means coupled to said processing system and to said user interface,

wherein said processing system comprises:

means for synchronizing said inputted program description information with one or more broadcast programs of a broadcast transmission;

means for responding to a user inquiry placed through said user interface; and

means for further responding to said user inquiry by causing said program description transmission means to transmit program description information responsive to said user inquiry.

2. The system of claim **1**, wherein said input means includes a broadcast receiver.

3. The system of claim **1**, wherein said program description information comprises one or more reference codes associated with a master listing.

4. The system of claim **1**, wherein the synchronizing means synchronizes said program description information to another program description information.

5. The system of claim **1**, wherein said program description information transmitted in response to said user inquiry is transmitted in an order associated with one of a program list and a broadcasted order of the broadcast programs.

6. The system of claim **1**, wherein said program description information is transmitted according to a program list.

7. The system of claim **1**, further comprising a signal insertion device, wherein said signal insertion device inserts a selection signal into at least one of said broadcast transmission and the one or more broadcast programs.

8. The system of claim **7**, wherein at least a portion of the one or more broadcast programs is recorded from said broadcast transmission, and further wherein the recording of the one or more broadcast programs is controlled based on said selection signal.

9. The method of claim **1**, wherein the synchronizing comprises at least one of generating a playlist, synchronizing a playlist, synchronizing a playlist to another playlist, generating a program list, synchronizing a program list, synchronizing a program list to another program list, synchronizing said program description information to other program description information, synchronizing based on date and time of day, synchronizing at preset times, and synchronizing based on a selection signal included at least one of said broadcast transmission and the one or more broadcast programs.

10. The system of claim **1**, wherein the synchronizing is based on one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

11. The system of claim **1**, wherein the program description information transmitted in response to said user inquiry is transmitted in one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

12. The system of claim **1**, wherein any number of the one or more broadcast programs comprises a radio broadcast program, a television broadcast program, a cable broadcast program, a satellite broadcast program, a telecast broadcast program, and a telephone broadcast program.

13. The system of claim **1**, wherein said program description information comprises at least one of audio, video, data, text, and a reference code.

14. The system of claim **1**, wherein said user inquiry placed through said user interface includes additional information, the additional information comprising one or more of location information, a network address, a content identifier, station call letters, a station tuning frequency, a television channel allocation, a cable provider identification, a music genre, a telephone number, an identification number and a predetermined identifier, and

wherein the means for further responding to said user inquiry causes said program description means to transmit program description information responsive to said user inquiry based on the additional information.

15. The system of claim **1**, wherein at least a portion of the one or more broadcast programs is recorded from said broadcast transmission.

16. The system of claim **15**, wherein at least a portion of the recorded one or more broadcast programs is included in corresponding program description information.

17. The system of claim **15**, wherein the recording of the at least a portion of the one or more broadcast programs is controlled based on a synchronization between the one or more broadcast programs of said broadcast transmission and one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

18. A method for providing recipients of a broadcast with automated information about program material, the method comprising:

broadcasting program material in at least one broadcast;

receiving one or more user inquiries from one or more recipients of said at least one broadcast, said one or more inquiries including broadcast identifier information;

creating a program description file comprising program information related to program material to be broadcast in the future;

communicating the program information into a programmed data processor;

synchronizing said communicated program information with said program material of said at least one broadcast; and

using said programmed data processor to communicate, to the one or more recipients, program information that corresponds to the broadcast identifier information included in said one or more inquiries,

wherein at least one of the program description file, the program information, and the synchronized program information is associated with the broadcast identifier information.

19. The method of claim **18**, further comprising inserting at least one selection signal into said broadcast or said program material.

20. The method of claim **19**, wherein said selection signal comprises at least one reference code.

21. The method of claim **19**, further comprising:

receiving a plurality of broadcasted program material; and

at least one of detecting and extracting said selection signal from each of said broadcasted program material.

22. The method of claim **19**, wherein at least a portion of said program material is recorded from said at least one broadcast, and further wherein the recording of the at least a portion of said program material is controlled based on said selection signal.

23. The method of claim **18**, wherein information from two or more program lists are synchronized to each other.

24. The method of claim **18**, wherein at least one of said one or more user inquiries and said broadcast identifier information comprises one or more of location information, a network address, a content identifier, station call letters, a station tuning frequency, a television channel allocation, a cable provider identification, a music genre, a telephone number, an identification number and a predetermined identifier, and

wherein at least one of said one or more user inquiries and said broadcast identifier information being used to identify said broadcast, or being used to create a subset of broadcasts.

25. The method of claim **18**, wherein the synchronizing comprises at least one of generating a playlist, synchronizing a playlist, synchronizing a playlist to another playlist, generating a program list, synchronizing a program list, synchronizing a program list to another program list, synchronizing said program information to other program information, synchronizing based on date and time of day, synchronizing at preset times, and synchronizing based on a selection signal included at least one of said program material and said at least one broadcast.

26. The system of claim **18**, wherein the synchronizing is based on one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

27. The system of claim **18**, wherein the program information communicated in response to said user inquiry is communicated in one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

28. The system of claim **18**, wherein any number of the at least one broadcast comprises a radio broadcast, a television broadcast, a cable broadcast, a satellite broadcast, a telecast broadcast, and a telephone broadcast.

29. The system of claim **18**, wherein said program information comprises at least one of audio, video, data, text, and a reference code.

30. The method of claim **18**, wherein the program information communicated in response to said user inquiry is communicated in an order associated with one of a program list and an order of the broadcasted program material.

31. The system of claim **18**, wherein at least a portion of the program material is recorded from said at least one broadcast.

32. The system of claim **31**, wherein at least a portion of the recorded program material is included in corresponding program information.

33. The system of claim **31**, wherein the recording of the at least a portion of said program material is controlled based on a synchronization between the program material broadcast in said at least one broadcast and one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

34. A method for providing program description information which is related to content of a broadcast, the method comprising:

receiving, by a receiver, a broadcast signal comprising a selection signal, wherein said selection signal is associated with the content of the broadcast;

determining from said selection signal, by a signal detector, information related to one or more databases, the one or more databases storing one or more program descriptions, wherein the one or more program descriptions, when initially stored in the one or more databases, relate to content to be broadcast in the future, and wherein at least one of the one or more databases and the one or more program descriptions are associated with broadcast content identifier information;

sending, by a communications interface, at least one request to the one or more databases for the one or more program descriptions, the at least one request including broadcast content identifier information;

receiving, by the communications interface, from said one or more databases, said one or more program descriptions that correspond to the broadcast content identifier information included in the at least one request; and

providing, by an interface, said one or more received program descriptions, wherein the provided one or more program descriptions are synchronized to said content of said broadcast signal.

35. The method of claim **34**, wherein the at least one broadcast signal comprises at least one of a radio broadcast signal, a television broadcast signal, a cable broadcast signal, a satellite broadcast signal, a telecast broadcast signal, and a telephone broadcast signal.

36. The method of claim 34, wherein the one or more program descriptions each comprise at least one of audio, video, data, text, and a reference code.

37. The method of claim 34, wherein the one or more program descriptions each comprise at least a portion of the content broadcast in said broadcast signal corresponding thereto.

38. The method of claim 34, wherein the one or more program descriptions are one of received and provided in an order associated with one of a program list and an order of the content broadcast in the broadcast signal.

39. The method of claim 34, wherein at least one of the at least one request and the broadcast content identifier information includes one or more of location information, a network address, a broadcast identifier, a content identifier, station call letters, a station tuning frequency, a television channel allocation, a cable provider identification, a music genre, a telephone number, an identification number and a predetermined identifier.

40. The system of claim 34, wherein the synchronizing comprises at least one of generating a playlist, synchronizing a playlist, synchronizing a playlist to another playlist, generating a program list, synchronizing a program list, synchronizing a program list to another program list, synchronizing said program descriptions to other program descriptions, synchronizing based on date and time of day, synchronizing at preset times, and synchronizing based on said selection signal.

41. The system of claim 34, wherein at least a portion of the content is recorded from said broadcast signal.

42. The system of claim 41, wherein at least a portion of the recorded content is included in corresponding program descriptions.

43. The system of claim 41, wherein the recording of the at least a portion of the content is controlled based on a synchronization between the one or more broadcast programs of said broadcast transmission and one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

44. The system of claim 41, wherein the recording of the at least a portion of the content is controlled based on said selection signal.

45. An apparatus for providing program description information which is related to content of a broadcast, the apparatus comprising:

a receiver for receiving at least one broadcast signal, said broadcast signal comprising a selection signal, wherein said selection signal is associated with the content of the broadcast;

a signal detector for detecting the selection signal from the at least one broadcast signal, wherein the detected selection signal comprises information related to one or more databases, the one or more databases storing one or more program descriptions, wherein the one or more program descriptions, when initially stored in the one or more databases, relate to the content to be broadcast in the future, and wherein at least one of the one or more databases and the one or more program descriptions are associated with broadcast content identifier information;

a communications interface for sending at least one request to the one or more databases for the one or more program descriptions, the at least one request including broadcast content identifier information, and for receiving, from said one or more databases, said one or more program descriptions that correspond to the broadcast content identifier information included in the at least one request; and

an interface for providing said received one or more program descriptions, wherein the provided one or more program descriptions are synchronized to said content of said broadcast signal.

46. The method of claim 45, wherein the at least one broadcast signal comprises at least one of a radio broadcast signal, a television broadcast signal, a cable broadcast signal, a satellite broadcast signal, a telecast broadcast signal, and a telephone broadcast signal.

47. The method of claim 45, wherein the one or more program descriptions each comprise at least one of audio, video, data, text, and a reference code.

48. The method of claim 45, wherein the one or more program descriptions each comprise at least a portion of the content broadcast in said broadcast signal corresponding thereto.

49. The method of claim 45, wherein the one or more program descriptions are one of received and provided in an order associated with one of a program list and an order of the content broadcast in the broadcast signal.

50. The method of claim 45, wherein at least one of the at least one request and the broadcast content identifier information includes one or more of location information, a network address, a broadcast identifier, a content identifier, station call letters, a station tuning frequency, a television channel allocation, a cable provider identification, a music genre, a telephone number, an identification number and a predetermined identifier.

51. The system of claim 45, wherein the synchronizing comprises at least one of generating a playlist, synchronizing a playlist, synchronizing a playlist to another playlist, generating a program list, synchronizing a program list, synchronizing a program list to another program list, synchronizing said program descriptions to other program descriptions, synchronizing based on date and time of day, synchronizing at preset times, and synchronizing based on said selection signal.

52. The system of claim 45, wherein at least a portion of the content is recorded from said broadcast signal.

53. The system of claim 52, wherein at least a portion of the recorded content is included in corresponding program descriptions.

54. The system of claim 52, wherein the recording of the at least a portion of the content is controlled based on a synchronization between the one or more broadcast programs of said broadcast transmission and one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

55. The system of claim 52, wherein the recording of the at least a portion of the content is controlled based on said selection signal.

56. An information system for use with a broadcast signal for providing access to program description information which is related to content of the broadcast signal, said system comprising:

at least one broadcast signal from a broadcast signal source;

a program description source associated with program description information, wherein, when the program description source is initially associated with the program description information, the program description information relates to content to be broadcast in the future;

a plurality of terminals, each of said terminals including:

a first receiver for receiving program description information from said program description source;

means for generating a request for program description information to be received from said program description source, said request including broadcast identifier information relating to a broadcast signal being broadcast; and

a first transmitting device for transmitting said request for program description information; and

a network for receiving program description information from said program description source, and distributing said program description information to a receiver of at least one of said terminals transmitting a request for program description information, said network including:

a second receiver for receiving one or more requests for program description information from one or more of said plurality of terminals;

means responsive to the receipt of said one or more requests for program description information for employing said broadcast identifier information to access program description information from said program description source; and

a second transmission device for transmitting said program description information to said one or more of said plurality of terminals,

wherein said program description information is presented and further wherein the presented program description information is synchronized to content broadcast in said broadcast signal.

57. The system of claim **56**, wherein the program description information is, one of transmitted to said one or more of said plurality of terminals and provided, in an order associated with one of a program list and an order of said content broadcast in said broadcast signal.

58. The system of claim **56**, wherein the synchronizing comprises at least one of generating a playlist, synchronizing a playlist, synchronizing a playlist to another playlist, generating a program list, synchronizing a program list, synchronizing a program list to another program list, synchronizing said program description information to other program description information, synchronizing based on date and time of day, and synchronizing at preset times.

59. The system of claim **56**, wherein program description information is stored at one or a plurality of remote program description sources.

60. The system of claim **56**, wherein said program description source comprises a storage device for storing said program description information.

61. The system of claim **56**, wherein said program description source comprises a database for receiving and storing program description information related to content for a plurality of broadcast signals.

62. The system of claim **56**, wherein said second receiver for receiving one or more requests for program description information captures a network address associated with said one or more requests, said network address used to access said program description information from said program description source.

63. The system of claim **56**, wherein each of the plurality of terminals comprises a decoder coupled to a receiver of the broadcast signal to decode said selection signal for presenting said program description information.

64. The system of claim **56**, wherein said broadcast identifier information includes at least one of station call letters, a station tuning frequency, a television channel allocation, a cable subscriber or provider identification, a music genre, a telephone number, a network address, an identification number and a predetermined identifier.

65. The system of claim **56**, wherein said network comprises a synchronizing means for synchronizing said program description information to the content broadcast in said broadcast signal.

66. The system of claim **65**, wherein said synchronizing means synchronizes one of a playlist, a program list, a program schedule, an audio description file, and a video description file, that comprises the program description information.

67. The system of claim **56**, wherein the second transmission device transmits said program description information to said one or more of said plurality of terminals in one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

68. The system of claim **56**, wherein the plurality of terminals comprises one or more of a telephonic device, cable converter device, and a personal computer.

69. The system of claim **56**, wherein the at least one broadcast signal comprises at least one of a radio broadcast signal, a television broadcast signal, a cable broadcast signal, a satellite broadcast signal, a telecast broadcast signal, and a telephone broadcast signal.

70. The system of claim **56**, wherein said network comprises a broadcast signal receiver for receiving the at least one broadcast signal.

71. The system of claim **56**, wherein said program description information comprises at least one of audio, video, data, text, and a reference code.

72. The system of claim **56**, wherein said program description information comprises at least a portion of the content broadcast in said broadcast signal corresponding thereto.

73. The system of claim **56**, wherein at least a portion of the content is recorded from said broadcast signal.

74. The system of claim **73**, wherein at least a portion of the recorded content is included in corresponding program description information.

75. The system of claim **73**, wherein the recording of the at least a portion of the content is controlled based on a synchronization between the content broadcast in said broadcast signal and one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

76. The system of claim **56**, wherein the synchronizing is based on one of a playlist, a program list, a program schedule, an audio description file, and a video description file.

77. The system of claim **56**, wherein said one or more requests for program description information include additional information, the additional information comprising one or more of location information, a network address, a content identifier, station call letters, a station tuning frequency, a television channel allocation, a cable provider identification, a music genre, a telephone number, an identification number and a predetermined identifier, and

wherein the means responsive to the receipt of said one or more requests for program description information accesses program description information from said program description source based on the additional information.

78. The system of claim **56**, wherein said broadcast signal includes a selection signal, said selection signal associated with program description information related to content broadcast in said broadcast signal.

79. The system of claim **78**, wherein the content is recorded from said broadcast signal and further wherein the recording of the content is controlled based on said selection signal.

80. The system of claim **78**, wherein said synchronization is bases on said selection signal.

81. The system of claim **78**, wherein said selection signal identifies the content being broadcast in said broadcast signal.

82. The system of claim **78**, wherein said selection signal is the program description source and denotes or comprises program description information related to content of said broadcast signal.

83. The system of claim **78**, wherein said network further includes:

means for receiving the at least one broadcast signal; and

means for detecting said selection signal from said at least one broadcast signal.

84. The system of claim **83**, wherein the means for transmitting said selection signal transmits the selection signal to at least one of said second receiver in said network and said first receiver of one or more of said plurality of terminals.

85. The system of claim **78**, wherein said selection signal provides an identification of program description information associated with said program description source.

86. The system of claim **85**, wherein, said program description information comprises one or more reference codes.

87. The system of claim **78**, wherein said selection signal identifies program description information on a remotely located program description source.

88. The system of claim **78**, wherein said selection signal is comprised by one of said broadcast signal and said content broadcast in said broadcast signal.

89. The system of claim **78**, wherein said selection signal is periodically transmitted with said broadcast signal.

90. The system of claim **78**, wherein said network further comprises a decoder coupled to a receiver of the at least one broadcast signal to decode said selection signal.

* * * * *

Exhibit B

US006314577B1

(12) **United States Patent**
Pocock

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(45) **Date of Patent: *Nov. 6, 2001**

(54) **APPARATUS AND METHOD TO GENERATE AND ACCESS BROADCAST INFORMATION**

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5,359,419	*	10/1994	Kawasaki	348/6
5,457,739	*	10/1995	Le Cheviller	455/6.3
5,485,197	*	1/1996	Hoarty	348/7
5,539,635	*	7/1996	Larson	379/101.01
5,592,551	*	1/1997	Lett et al.	348/906
5,635,978	*	6/1997	Alten et al.	348/906
5,661,787	*	8/1997	Pocock	379/101.01
5,703,795	*	12/1997	Mankovitz	345/327
5,734,961	*	3/1998	Castille	379/101.01
5,809,246	*	9/1998	Goldman	379/101.01

* cited by examiner

Primary Examiner—Andrew Faile
Assistant Examiner—Reuben M. Brown

(57) **ABSTRACT**

The system enables listeners and viewers of a broadcast to access additional information associated with a broadcast. Listeners and viewers utilize a user device to connect to a database containing program descriptions (e.g. audio, text, video, or combination thereof) further describing the programming and ancillary information. The database is indexed by the broadcast's program list or schedule thereby allowing a user of the system to search and select a particular program description of interest. Hearing or viewing program descriptions enables users to preview excerpts and review a broadcast before purchasing an item heard or viewed on a broadcast.

130 Claims, 7 Drawing Sheets

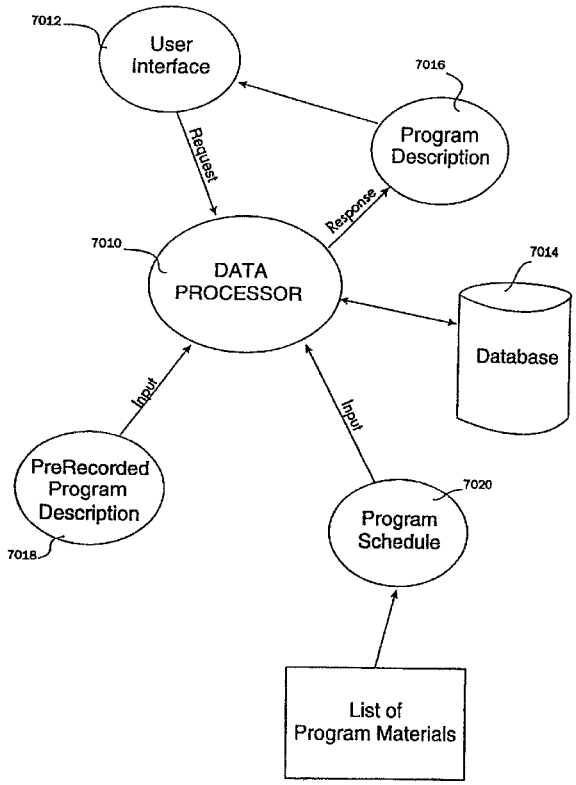


FIG. 1

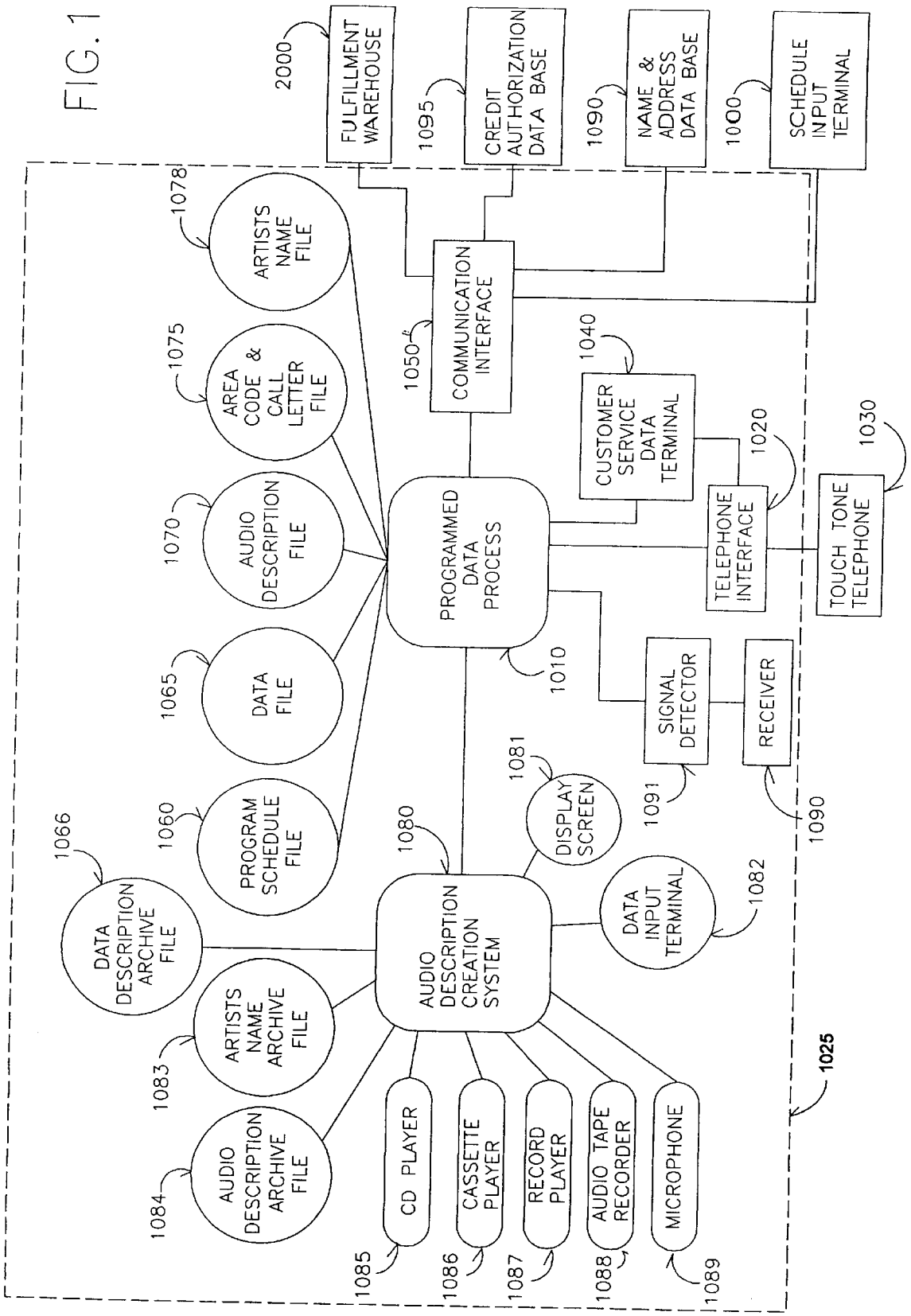

2000
FULFILLMENT WAREHOUSE
1095
CREDIT AUTHORIZATION DATA BASE
1090
NAME & ADDRESS DATA BASE
1000
SCHEDULE INPUT TERMINAL
1078
ARTISTS NAME FILE
1075
AREA CODE & CALL LETTER FILE
1070
AUDIO DESCRIPTION FILE
1065
DATA FILE
1060
PROGRAM SCHEDULE FILE
1066
DATA DESCRIPTION ARCHIVE FILE
1083
ARTISTS NAME ARCHIVE FILE
1084
AUDIO DESCRIPTION ARCHIVE FILE
1050
COMMUNICATION INTERFACE
1040
CUSTOMER SERVICE DATA TERMINAL
1020
TELEPHONE INTERFACE
1030
TOUCH TONE TELEPHONE
PROGRAMMED DATA PROCESS
1010
SIGNAL DETECTOR
1091
RECEIVER
1090
1081
DISPLAY SCREEN
1080
AUDIO DESCRIPTION CREATION SYSTEM
DATA INPUT TERMINAL
1082
1025
1085
CD PLAYER
1086
CASSETTE PLAYER
1087
RECORD PLAYER
1088
AUDIO TAPE RECORDER
1089
MICROPHONE

FIG. 2

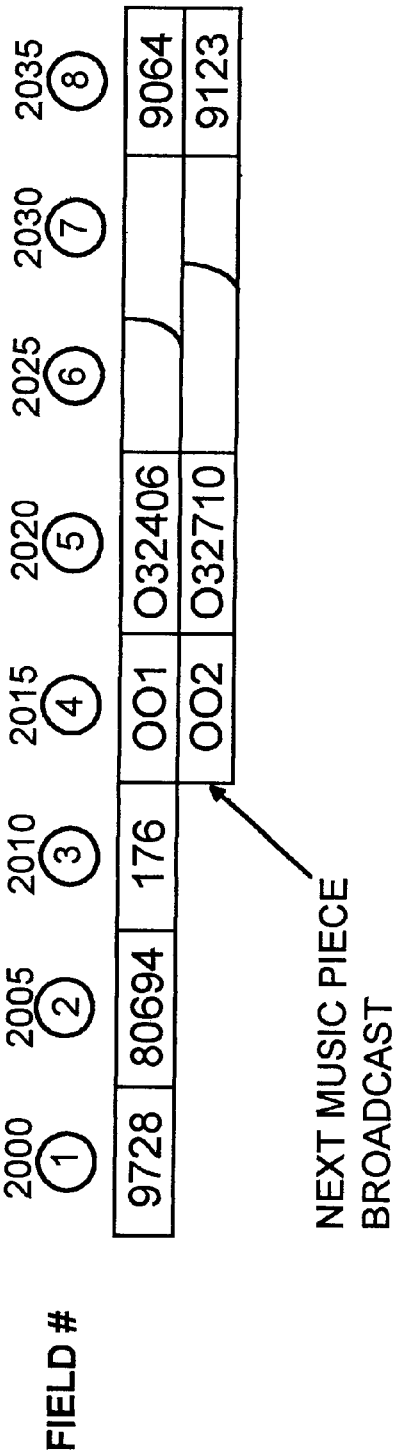

FIELD #
2000 ① 9728
2005 ② 80694
2010 ③ 176
2015 ④ OO1 OO2
2020 ⑤ O32406 O32710
2025 ⑥
2030 ⑦
2035 ⑧ 9064 9123
NEXT MUSIC PIECE BROADCAST

FIG. 3

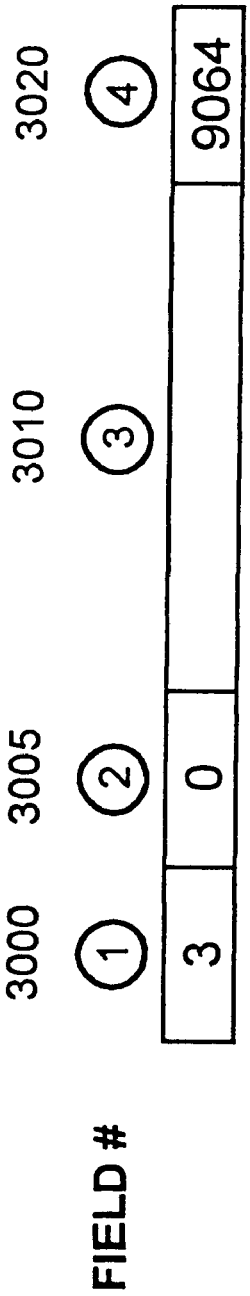


FIG. 4

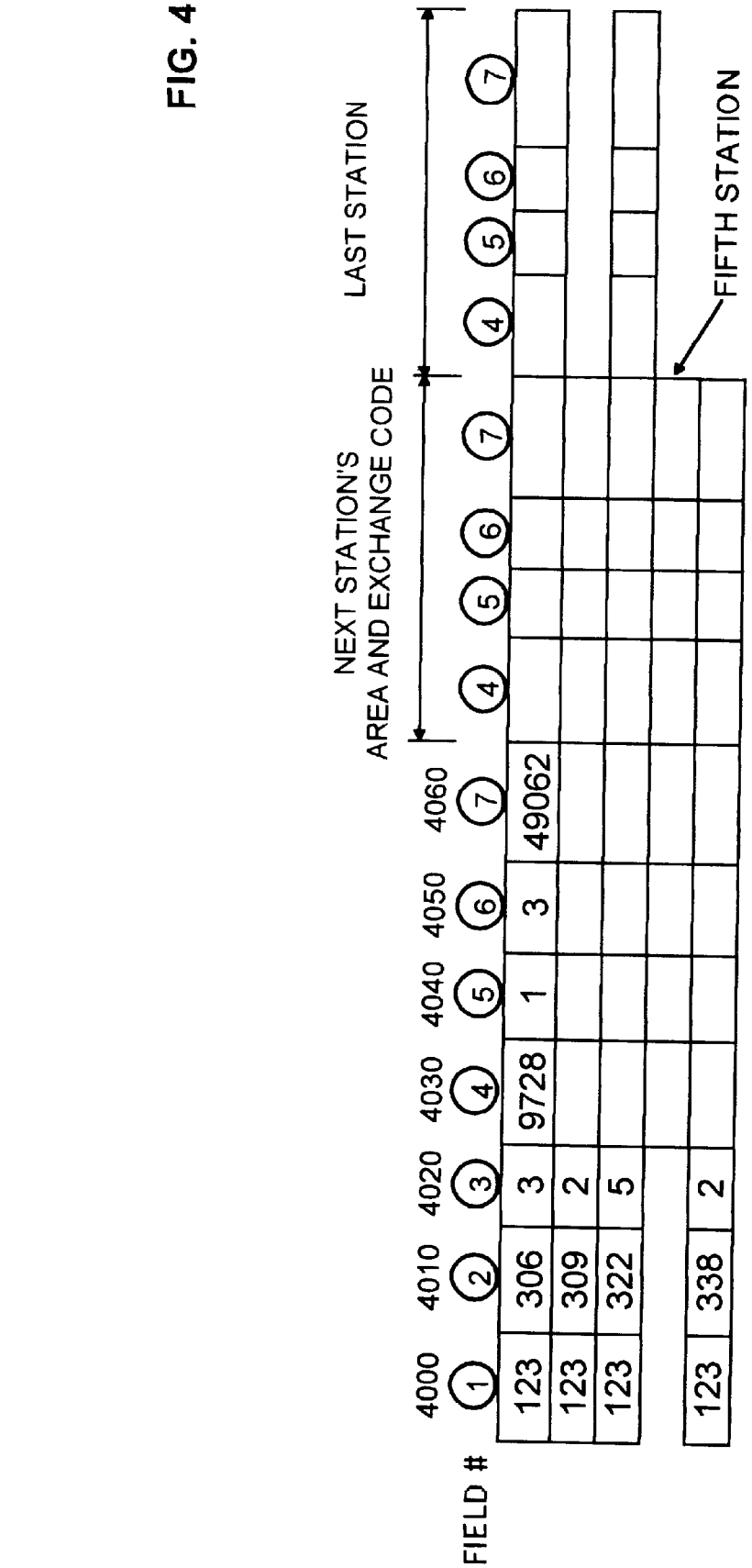

FIELD #
4000
4010
4020
4030
4040
4050
4060
LAST STATION
NEXT STATION'S AREA AND EXCHANGE CODE
FIFTH STATION
123
306
309
322
3
2
5
9728
1
3
49062
123
338
2

FIG. 5

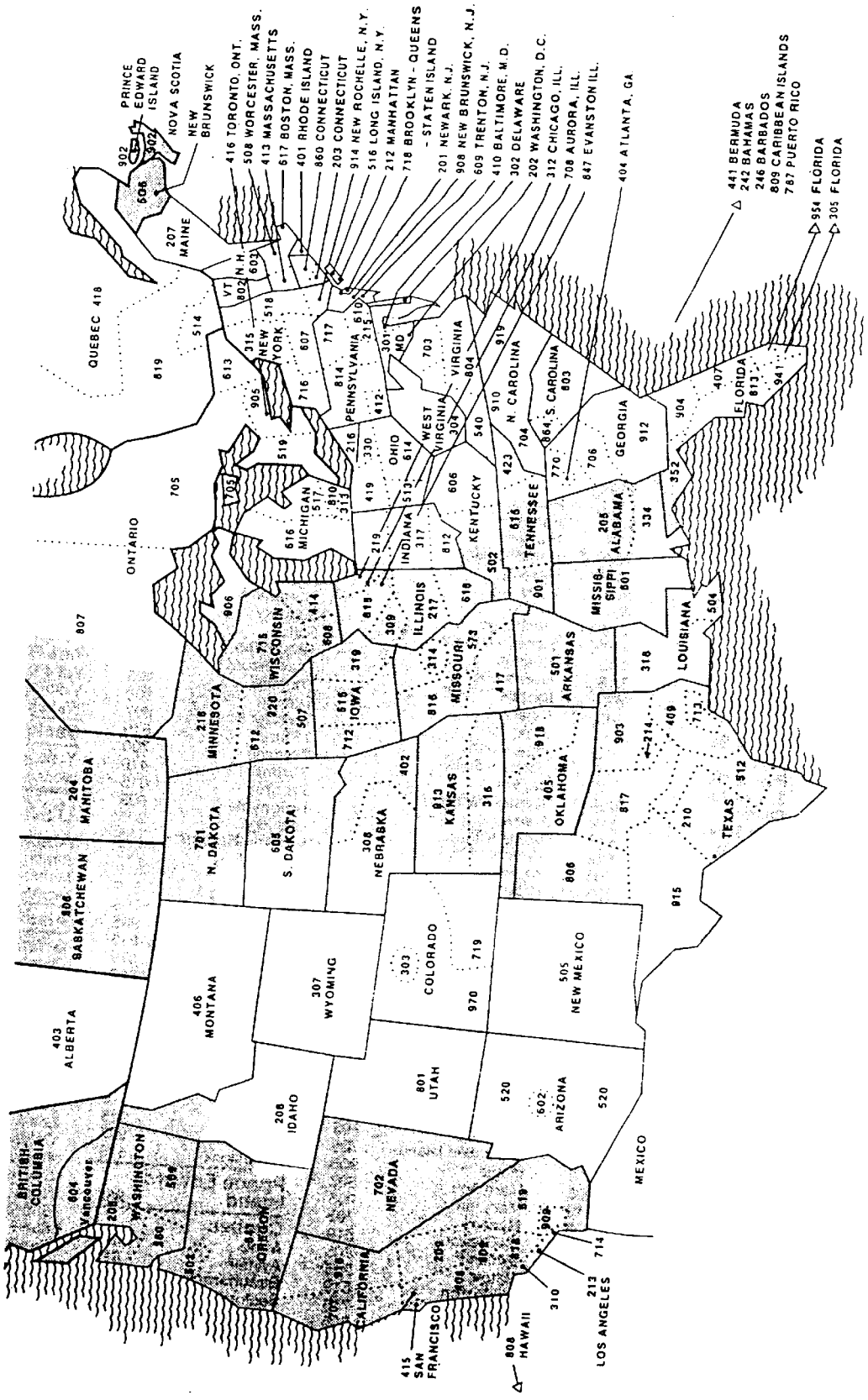

PRINCE EDWARD ISLAND
NOVA SCOTIA
NEW BRUNSWICK
MAINE
QUEBEC
ONTARIO
VT
N.H.
NEW YORK
PENNSYLVANIA
OHIO
WEST VIRGINIA
VIRGINIA
N. CAROLINA
S. CAROLINA
GEORGIA
FLORIDA
MICHIGAN
INDIANA
KENTUCKY
TENNESSEE
ALABAMA
MISSISSIPPI
LOUISIANA
ILLINOIS
WISCONSIN
MINNESOTA
IOWA
MISSOURI
ARKANSAS
KANSAS
OKLAHOMA
TEXAS
NEBRASKA
S. DAKOTA
N. DAKOTA
MANITOBA
SASKATCHEWAN
ALBERTA
MONTANA
WYOMING
COLORADO
NEW MEXICO
IDAHO
UTAH
ARIZONA
NEVADA
CALIFORNIA
OREGON
WASHINGTON
BRITISH COLUMBIA
Vancouver
MEXICO
HAWAII
SAN FRANCISCO
LOS ANGELES
416 TORONTO, ONT.
508 WORCESTER, MASS.
413 MASSACHUSETTS
617 BOSTON, MASS.
401 RHODE ISLAND
860 CONNECTICUT
203 CONNECTICUT
914 NEW ROCHELLE, N.Y.
516 LONG ISLAND, N.Y.
212 MANHATTAN
718 BROOKLYN - QUEENS - STATEN ISLAND
201 NEWARK, N.J.
908 NEW BRUNSWICK, N.J.
609 TRENTON, N.J.
410 BALTIMORE, M.D.
302 DELAWARE
202 WASHINGTON, D.C.
312 CHICAGO, ILL.
708 AURORA, ILL.
847 EVANSTON ILL.
404 ATLANTA, GA
441 BERMUDA
242 BAHAMAS
246 BARBADOS
809 CARIBBEAN ISLANDS
787 PUERTO RICO
954 FLORIDA
305 FLORIDA

FIG. 6

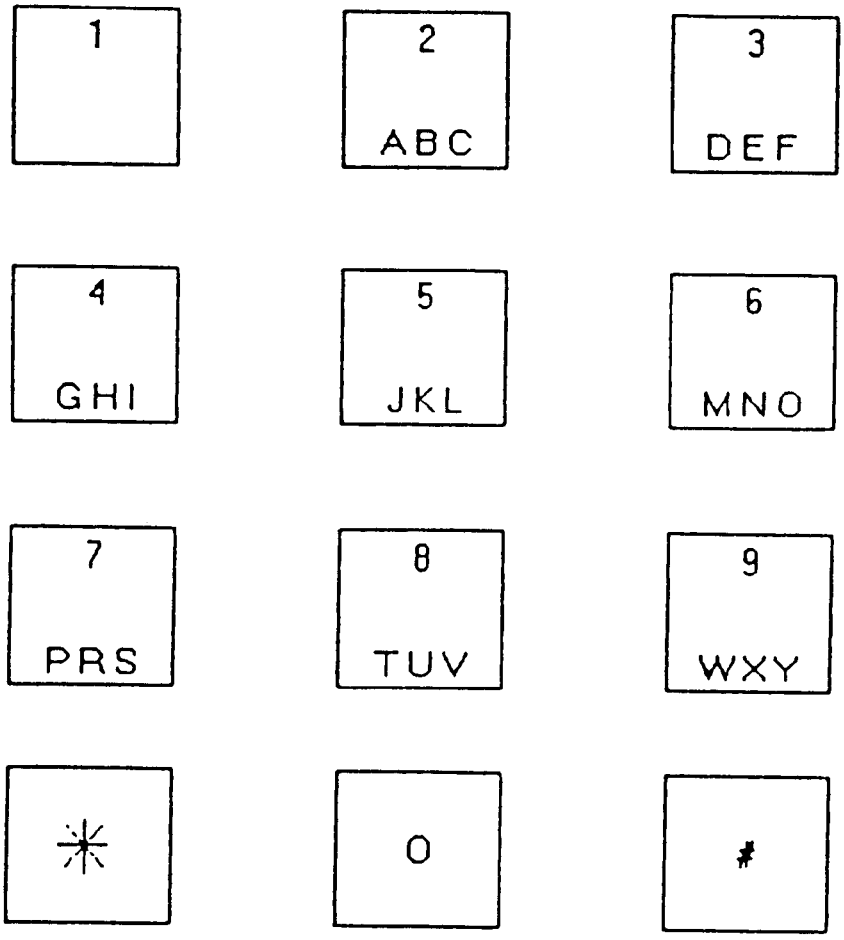
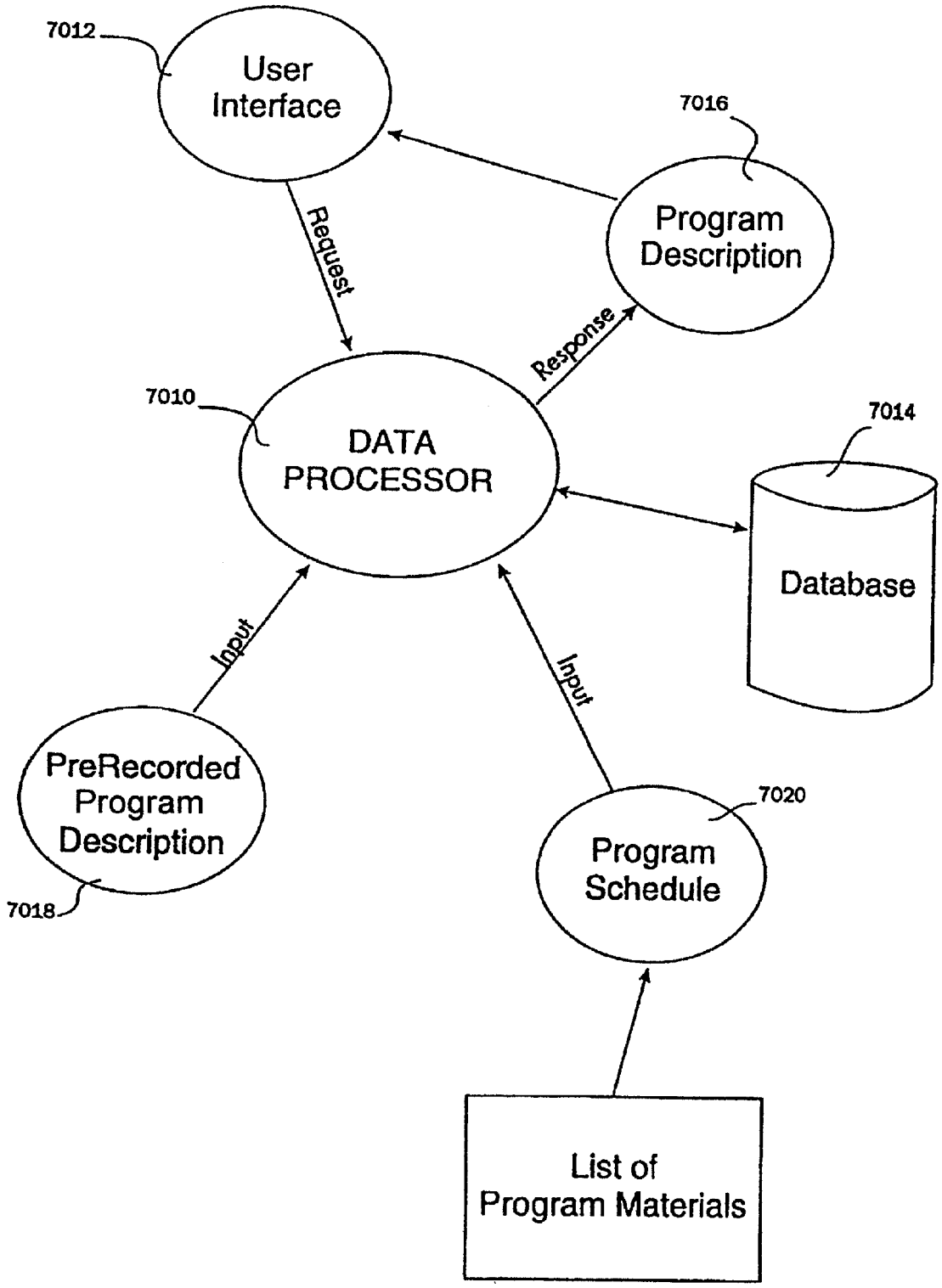


Figure 7


7012
User Interface
7016
Program Description
Request
Response
7010
DATA PROCESSOR
7014
Database
Input
Input
PreRecorded Program Description
7018
7020
Program Schedule
List of Program Materials

APPARATUS AND METHOD TO GENERATE AND ACCESS BROADCAST INFORMATION

This application is a continuation of application Ser. No. 08/329,837, filed Oct. 27, 1994, now U.S. Pat. No. 5,661,787.

FIELD OF THE INVENTION

The present invention relates generally to a method and apparatus to enable a broadcast listener to automatically purchase a music product such as a record album, cassette tape or compact disk without the intervention of an operator after hearing a music piece played on a radio station or music television station. More specifically, the preferred embodiment of the invention utilizes a programmed data processor, a digitally stored audio database containing the names of musical artists and groups, the names of pieces which have been recorded on the musical products, musical excerpts of these pieces, and a telephone system to replay this descriptive information through a telephone connection to a potential purchaser. This method utilizes the program schedule from a local radio station indicating when pieces will be played, a digital recording facility to automatically record excerpts of the music pieces played, a telephone system to decode DTMF tones from a touch tone telephone and an interface to a data communications network for communication with remote databases and computers.

BACKGROUND OF THE INVENTION

Radio networks offer the most significant marketing medium for the music industry to create awareness for music titles and artists. But music products such as records, cassettes and compact disks (CDs) are inconvenient to purchase at the time when the consumer has the maximum impulse to buy, after hearing a musical piece on the radio.

Additionally, the inability to automate many of the key functions of a radio based, direct marketing sales operation make it cost prohibitive for a single radio station to establish a direct marketing service linked to the music they broadcast Station operators offer different programming in each market area making it unsuitable to link their stations into a national music retail network. As well, regulatory limitations curtail the number of stations a radio operator can own in a major market thereby limiting the number of listeners below the critical mass necessary to operate a profitable direct marketing music business.

Radio broadcasters provide no means to fulfill the impulse purchase nature of the radio business. When a radio listener hears a music piece they wish to purchase they must listen for, and remember, the artists name and title of the song. In many instances it is inconvenient to write this information down for future reference. In order to purchase the music product containing the song heard on the radio the consumer must be further motivated to travel to a music store to proceed with the purchase process. At the music store the potential purchaser must determine if the selected music product is in stock and assess the pricing information.

The consumer is further constrained because they are unable to preview the songs on the music product they are considering because the music products are packaged and cannot be played at the store. The potential purchaser must remember and continue to be motivated by the music piece heard on the radio broadcast, possibly from days ago, and hope the other pieces recorded on the album are of sufficient interest to justify the purchase. The inconvenience and inability to sustain the impulse impetus severely impacts the purchase process.

Radio networks are unable to capitalize on the direct marketing opportunities they initiate through impulse music purchases because of the high cost of creating a direct marketing operation. Coordinating and tracking the music aired with the music products to be sold, recording of musical excerpts to be previewed, customer service operations and order fulfillment are all high overhead activities requiring a large dedicated staff with a separate skill set than radio station personnel. The cost for a radio station to establish a direct marketing operation far exceeds the returns from the music selling proceeds derived from a single radio station.

Cable television shopping networks have successfully developed large direct marketing networks based on national coverage by telecasting their programming over many cable companies reaching millions of potential purchasers. Radio station operators are unable to market music products in the same manner because station operators broadcast different music programming in each market preventing the linking of these stations into a common national market.

Radio is the most widely received broadcast medium throughout the world. The problems as previously described have prevented radio networks from being utilized for a mass media, direct marketing, music retail business.

SUMMARY OF THE INVENTION

In view of the foregoing, one objective of this invention is to resolve the problems which inhibit the successful development of a direct marketing music business for the radio industry. In this regard, it should be apparent that there exists a need in the art for a method of operating an automated system which tracks radio audio segments enabling radio broadcast listeners to select, preview and purchase a music product containing the music piece listened to for a radio broadcast.

It is therefore an object of this invention to provide an automated transaction system to record and track radio audio segments enabling a radio listener to use their telephone to recall and preview, on-demand, music pieces previously broadcast thereby assisting the listener in the purchase of a music product such as a record album, cassette or CD. The invention provides the consumer with a timely method to purchase a musical product by supplying all of the required information to conveniently make a music product purchase.

It is another object of the invention to provide a method for an automated transaction system to service multiple radio broadcasts simultaneously, thereby creating a mass radio audience for the direct marketing of music.

These and other objects are achieved by a method of and apparatus for tracking and recording a radio broadcast using a telephone interface connected to a programmed data processor such that when a potential purchaser calls a designated telephone number advertised by the radio station, for example 1-800-RECORDS, a telephone interface provides the listener with the name of the musical artist and the song titles in the reverse order played during the broadcast, starting with the current piece played. The selection, from the current artist played, to the music product the potential purchaser wants to order, is controlled by the potential purchaser using the touch tone telephone keys or voice input. When the potential purchaser reaches the song and artist of interest, further details can be related such as the other songs recorded on the album, pricing, availability and delivery information.

The invention can playback through the telephone, on instructions from the caller, excerpts or the entire song, as

broadcast over the radio network, to assist the caller with the purchasing process.

When the potential purchaser indicates they are ready to order, the automated order system obtains the correct name and shipping address by accessing a name and address database responsive to the consumers telephone number or credit card information. The system also records the consumer's credit card information and obtains credit authorization. The invention then transmits the complete order to the fulfillment warehouse for shipment of the musical product to the purchaser.

It is a further object of this invention to provide a method and apparatus whereby multiple radio stations can be supported simultaneously, offering services on a local, regional or national basis providing the economies of scale and mass audience to support the sales volume necessary to operate a profitable direct marketing service. When a potential purchaser dials the advertised number such as 1-800-RECORDS they are directed by audio prompts to indicate by touch tone entry or voice input the call letters for the radio station to which they are listening. The audio prompts are provided by a telephone interface that is connected to a programmed data processor which performs database functions. The potential purchaser's telephone number, input by the caller or supplied by the telephone company's (ANI) Automatic Number Identification service, is compared to all the radio station broadcast coverage zones offered by the participating radio stations. This comparison determines the radio stations within the broadcast range of the caller, providing a limited set of radio stations for the programmed data processor to sort and search based on the callers input of the station call letters. The input of the station call letters enables the programmed data processor to select the correct station program schedule and related information. Thus a large number of radio stations, dispersed locally, regionally, nationally and internationally can be supported by one automated system.

The inventive method also includes the step of efficiently selecting the correct radio station based on touch tone input. Although, each of the telephone keys **2** through **9** have three related alphabetical characters, callers need only to input four telephone key strokes for the four station call letters. The programmed data processor only recognizes the input for the participating radio stations broadcasting in the callers area as determined by the telephone number and broadcast coverage comparison previously described.

It is a further object of this invention to automate the manual and time-consuming functions. The inputting of the radio station play schedule in advance of the broadcast as well as the tracking of the program schedule during the broadcast day requires significant overhead if undertaken manually. As the service expands, and many radio stations are added to the service, the tracking of the various program schedules becomes unmanageable from a manual standpoint.

One component of the method and apparatus of the invention is a system for management of the radio station's program schedule. A radio station's program schedule is produced days and sometimes weeks in advance of broadcast. The program schedule is organized chronologically in the order musical pieces are broadcast and includes information such as the title of the song, the recording artist and group, as well as the day and time the piece is to be broadcast. A radio station broadcasts hundreds of musical pieces each day and the input of the program schedule by an operator is both time-consuming and prone to manual input error. The present invention enables the automation of the program schedule input by utilizing a data communications link and a communications interface such as a facsimile interface to receive the program schedule directly from the radio station into the programmed data processor. The communication interface such as a facsimile board is resident in the programmed data processor and in conjunction with a imaging software, such as a character recognition package, automatically interprets and directly stores the stations program schedule and associated information on a programmed data processor.

The radio station program schedule contains timetable information as well as information describing the music pieces played such as the title, artist and group name. The program schedule is accessed by a audio description creation system which is connected to the programmed data processor. The audio description creation system creates the audio description heard by the caller over the telephone when inquiring about a particular music piece. The audio description information describes the music piece outlined in the program schedule and the music product containing the music piece, along with other related information such as product pricing. The audio description creation system digitally records the audio and is connected to various input devices such as a compact disc player, cassette player, digital audio tape and a microphone. An announcer accesses the program schedule file on a display screen and reads the description information into the microphone creating the audio description file for each music piece. The announcer has access to previous recordings stored in an audio description archive which can be accessed via a data input terminal connected to the audio description creation system enabling previously recorded audio descriptions to be referenced.

It is another object of the invention to automate the recording and storing of the music excerpts for the music pieces outline in the program schedule. These audio segments can be accessed by the potential purchaser to assist in the purchase process and to verify to the caller they are purchasing the music product containing the music piece listened to during the radio broadcast. The automated record and store process is accomplished by inserting a signal such as a tone or pulse at the beginning of each music piece broadcast. A receiver is tuned to the broadcast containing the music pieces to be recorded and a signal detector triggers the digital recording of the piece by the programmed data processor. The music piece is recorded for a specified time such as ten seconds providing an audio segment of the music piece.

Coordination of the audio description file with the program schedule is accomplished through a synchronized time schedule whereby the program schedule file and the recording of the audio segments on the programmed data processor are initiated at the same time. Each station's program schedule is stored in chronological order enabling the coordination. Another method of implementing the signal insertion enables information to be encoded as part of the selection signal and decoded into data for use by a programmed data processor. Information such as the program schedule number or music piece number can be incorporated into the selection signal enabling the coordination of the audio description with the program schedule. Information can be encoded into the selection signal through means such as multiple pulses or combination of tones and pulses.

The invention also provides the information for a potential purchaser to automatically order a music product without having heard one of the pieces through a radio broadcast. For instance when the potential purchaser dials the 1-800-

RECORDS telephone number a telephone system audibly requests the potential purchaser to touch **1** on their touch tone telephone if they want to order a music piece they have just heard played on the radio, or touch **2** if they want to order a music product from the automated music catalogue. If the potential purchaser touches **2** the invention will then proceed to determine the musical product to be ordered by asking the potential purchaser to select the type of music and to input the artists name or group name using the touch tone telephone keys. Once the correct artist or group is determined the system can reference all the music products performed by that artist or group and provide the potential purchaser with the names of the music album and the recording media available such as CD, record or cassette along with pricing. Further information can also be made available such as the names of the pieces of each piece recorded on each music product along with excerpts to preview each song. The invention conveniently provides all the information required to make a purchase. Some of this information is not available even at the record store.

When the potential purchaser indicates they wish to buy a particular music product the system determines the shipping address and credit authorization and then places the order for the music product with the fulfillment warehouse.

In the case where more than one main artist or group performed on a music product or the purchase process was too complex, the potential purchaser can be bridged to an operator who can obtain and input any required data and assist the caller through the purchase process.

The invention can also be utilized with other broadcast services such as a music television, telecast. Viewers of music television program or channel, access the invention in the same manner as previously described-but enter the station designation such as call letters, channel number or advertised pseudo-name enabling the invention to recall the pertinent program schedule relating to the viewed television program or channel. The audio portion of the music broadcast, would be recorded and utilized to assist the viewer in the purchasing process. The invention can simultaneously support orders originating from both radio listeners and television viewers.

Other applications of the invention are also possible. The broadcast can consist of content other than music whereby products are advertised within a broadcast and the invention enables listeners to select, preview and purchase items advertised for sale over the network. The audio segments for these products would be recorded in the same manner as previously described for the music pieces and the products would match the program schedule as input prior to the broadcast.

The invention also extends to a digital as well as analog broadcast format whereby the selection signals are digital signals inserted into the digital broadcast.

The foregoing features of the invention, as well as the advantages provided thereby, are explained in greater detail hereinafter with reference to preferred embodiments illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of the self-generating audio recording, storage, indexing and transaction system according to the present invention;

FIG. **2** illustrates an example of a Program Schedule reference file;

FIG. **3** illustrates an Artist and Group Name reference file;

FIG. **4** illustrates the telephone area and exchange code, station call letter code and touch tone input database file;

FIG. **5** is a table and map of North American telephone area codes;

FIG. **6** is the touch tone telephone keypad lay out; and

FIG. **7** is an entity relationship diagram illustrating some of the principles of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In order to explain the present invention in detail, reference will be made in particular to FIG. **1**.

In FIG. **1**, the reference number **1000** designates the radio station schedule input terminal device located at a remote radio station that can communicate with the programmed data processor **1010**, located at the central site **1025**, and input the program schedule of music to be broadcast on the remote radio station. In the preferred embodiment the radio station schedule input terminal **1000** is the computer system at the radio station that schedules the time of play for both commercials and musical program content. This terminal device **1000** is equipped with a modem and a communications program so that it can automatically dial the communications interface **1050** of the programmed data processor **1010** and input the program schedule including the artists name, name of the musical piece, and the date and time the music is to be played. This information can be coded to reduce the transmission time as there could be hundreds of music pieces broadcast each day.

Alternatively, the radio station schedule can be automatically input by FAX (facsimile) using a computer or typewritten print out of the stations program schedule to transmit the stations schedule from the local FAX machine at the radio station to the central site **1025**. At the central site **1025**, the FAX receiver is a FAX board mounted within either a stand alone personal computer or the programmed data processor **1010** that would sequentially provide each incoming FAX message with its own identification number prior to storing the FAX digitally on the computer systems hard drive. In the process of setting up the FAX call a hand shake protocol is established between the sending and receiving FAX machines such that the receiving FAX machine can determine, by error free data transfer, the telephone number of the transmitting FAX machine. Alternatively, the station's FAX number can be established through, the telephone company supplied, (ANI) Automatic Number Identification service. The programmed data processor **1010** utilizes this telephone number as an index to select the optimal algorithm to convert the FAX images to data. For example, message number **101** assigned by the FAX receiving board is associated with radio station WTAM FM because of the stations digitized telephone number received in the hand shake protocol. The programmed data processor **1010** then accesses the interpretation protocol that matches the FAXed data for WTAM FM to convert the character images sent from the radio station FAX into ASCII characters to be stored on the programmed data processor **1010** in the program schedule file **1060**. For example, radio station WTAM FM could utilize a computer printer that produced text in the Roman font. Each line on their schedule begins with time of play, followed by duration, artist name, then the name of the music piece. A different radio station, identified through the handshake protocol by their telephone number as WPAT AM, utilizes a different scheduling computer to print out their program schedule using the Tudor font highlighting the artist name first, followed by the musical

piece, time of play and duration. Because the programmed data processor **1010** knows the identity of the sending FAX machine it can apply the optimum algorithm to interpret the text font and determine from the text placement the contents of the page. This approach enables the programmed data processor **1010** to automatically file the FAXed program schedule of the remote radio station in a fixed digital format in the program schedule file **1060** associated with a particular radio station. An example of the format to which the program schedule files are processed is illustrated in FIG. **2**.

Alternatively, the terminal device **1000** could be a non-programmable terminal connected via a network to the communications interface **1050**, interacting on line to input the program schedule. The program schedule data could also be input using a touch tone telephone with voice prompting when connected to the telephone interface **1020** or input by voice into a section of the telephone interface that recognized spoken numbers and words through voice recognition. A coded version of the radio station program schedule makes the input easier and quicker. The schedule data could also be read over the telephone to an operator who would input the data. As this program schedule data is received from all of the participating radio stations it is stored in the program schedule **1060** of the programmed data processor **1010**.

Music television channels and other telecasters can also utilize the above-mentioned methods to forward and store their program schedules for use by the system.

The digitized audio description file **1070** is created using the audio description creation system **1080** which is connected to the programmed data processor **1010**. The audio description creation system consists of a set of audio input devices, such as a CD player **1085**, cassette player **1086**, record player **1087**, audio tape player **1088** and microphone **1089** for an announcer to record audio descriptions.

The audio description file **1070** consists of the audio description information describing the music piece and an audio segment consisting of an excerpt of the music piece. The audio description information corresponds to the audio recording of the text description of each music piece listed in the program schedule stored in the program schedule file **1060**. The announcer uses the display screen **1081** to recall the program schedule from the programmed data processor **1010** for each radio station. As well, additional information concerning the music piece such as the name of the music product containing the music piece and pricing can be input into the creation system via the attached data input terminal **1082** or personal computer and stored on the audio description creation system available to the announcer for audio recording.

For example, the station program schedule, after receipt from a participating radio station, would be loaded onto the audio description creation system **1020**. The program schedule file **1060**, an example of which is referenced in FIG. **2**, contains the station code or identifier for the station **2000**, field **1**, date and period of the program schedule broadcast **2005** field **2**. number of music pieces in the time period **2010** field **3**, chronological schedule number **2015** field **4**, time of broadcast for a particular music piece **2020** field **5**, artist or group name **2025** field **6**, title of the music piece **2030** field **7** and the pointer to data file **2035** field **8**. Parts of this schedule information can be coded to reduce the transmission time from the radio station to the system. For example, a particular artist or group could be located in a reference table and related to an artist or group number followed by a music piece reference number. The coded entry would be made in the program schedule at the radio station and FAXed to the central site **1025**. A standardized reference system could be utilized by all reference table based stations or different tables implemented for each station whereby the station reference table conversion is conducted by the programmed data processor **1010** when the imaging and interpolation process occurs for incoming program schedules.

For the purposes of recording the music title portion of the audio description, the audio description creation system **1080** performs an initial sort of the music pieces listed in the program schedules to remove redundant entries for the same artist and music piece. The artist name **2025** field **6** and the name of the music piece **2030** field **7** contained in the program schedule **1060**, or the code representing it, is compared to the data description archive file **1066** containing all previous listings for which audio descriptions already exist. The announcer is then presented, on the display screen **1081**, with the listings that require an audio description. The announcer then reads the artist's name and title of the music piece into the microphone **1089** and stores them in the audio description file **1070** while at the same time updating the audio description archive file **1084**.

Information not contained in the program schedule such as pricing, album name or other background can be input by the data input terminal **1082**, prior to audio recording, and stored as part of the data description archive file **1066** to be included in the audio description by the announcer.

The music product containing the music piece outlined in the program schedule can then be loaded into its respective player such as a CD player **1085**, on the audio description creation system **1080** and the audio segment digitized, compressed and stored into its associated audio description file **1070** while also updating the audio description archive file **1084**. The audio segment can consist of an excerpt of the music piece or the entire music piece.

The announcer would then depress the space bar or other key of the display terminal **1082** to indicate completion of that audio input and the linking of the entry in the program schedule with the corresponding audio description. The link is made through a database which utilizes the pointer to data file, **2035** field **8**, which is added to each music piece in the program schedule and references the corresponding audio and data description.

The announcer can then proceed with the next descriptive item of that musical product which would be displayed on the display screen **1081** for the announcer to record onto the system. This process can be repeated for each piece recorded on the musical product and referenced in the database by product name. Both the audio description archive file **1084** and the data description archive file **1066** are automatically updated with the new entries.

Instead of using a staff announcer's voice to provide the audio description it is possible to have the recording artist provide their own music descriptions on a recording medium such as an audio tape and have it sent to the creation system site to be input and included as part of the audio description via the audio tape recorder **1088**.

When the audio descriptions for all of program schedule entries and potentially for all of the new music products have been processed by the audio description creation system **1080**, the digital audio description file **1070** on the programmed data processor **1010** is updated with the new audio descriptions contained in the audio description archive file **1084**. As well, the data file **1065** is also updated with the new files contained in the data description archive file **1066**. The program schedule **1060** is updated with the revised schedule

containing the pointer to data file **2035** field **8** linking to the corresponding audio and data description.

Acquiring the music products and manually recording the music pieces is both expensive and time-consuming. The system offers a method for automatically recording the audio segments of the music pieces broadcast. This is accomplished by digitally recording the music in real time directly from the broadcast and storing the recorded segments into the associated audio description file **1070** on the programmed data processor **1010**.

In the radio industry, recordable media, such as Digital Audio Tape (DAT) or digital hard drives are used to prerecord many hours of music for preparation and play by radio stations. The music on the digital media is prepared in accordance with a station's program schedule. Existing technology enables an audio signal such as a pulse or DTMF tone to be recorded on the DAT and included with the broadcast to trigger remote audio and video equipment. This capability is commonly used in the radio and television industries to remotely play advertisements.

According to the invention, the automated record and store process is accomplished by inserting a selection signal such as a tone or pulse at the beginning of each music piece to be recorded from the broadcast. In FIG. **1** the receiver **1090** is connected to the signal detector **1091** which is connected to the programmed data processor **1010**. The receiver **1090** receives the broadcast containing the music pieces to be recorded and a signal detector **1091**, when it detects the appropriate signal, triggers the digital recording of the piece by the programmed data processor **1010**. The recording of the music piece continues for a specified time, such as ten seconds, providing an excerpt; of each music piece denoted by the selection signal. The digitizing facility can be part of the signal detector **1091** or contained within the programmed data processor **1010**.

An additional signal can be included to signal the programmed data processor **1010** to stop recording rather than a timer based approach. Having a signal start and stop the recording function enables the entire music piece to be recorded whereby the additional signal is appended to the end of the music piece.

The real-time recording of the music piece is linked to the program schedule **1060** enabling the recorded audio segment to be stored in the correct audio description file. The recording of the music pieces is initially time synchronized with the program schedule for each station. A receiver **1090** and signal detector **1091** is dedicated to each station requiring real-time recording. Knowing the station code or identifier that the receiver is dedicated to, the programmed data processor **1010** loads the correct program schedule **1060**, for the station it is recording, based on the station code **2000** field **1**, and the current time and period of broadcast **2005** field **2**. The system clock is used by the programmed data processor to locate the current music piece played as indicated in the program schedule, using the time of broadcast **2020** field **5**. The incoming audio segment, as detected by the signal detector **1091** is recorded into its corresponding audio description file **1070** as referenced by the pointer to data file **2035** field **8** in its program schedule **1070**. After the initial synchronization, the recording of the music pieces into the audio description file **1070** follows in chronological order with the program schedule for that particular station. For example, if synchronization between the incoming audio segments and the current program schedule occurred with the first music piece listed in the program schedule as indicated by the chronological schedule number **2015** field **4**, then the next audio segment detected would be recorded into the audio description file corresponding to the next program schedule listing containing the chronological schedule number of two.

When the programmed data processor **1010** reaches the last listing in a program schedule it loads the next schedule for that particular station and proceeds to synchronize and record when the next audio segment is detected. Establishing the last listing in a program schedule can be accomplished in various ways such as comparing the number of music pieces in the time period **2010** field **3** and the chronological schedule number **2015** field **4** for the current listing. If the two fields match the next program schedule is loaded for synchronization with the next incoming audio segment. Another method of detecting the end of a program schedule involves the addition of a delineator at the end of the program listing which when reached causes the loading of the new program schedule. As well, a delineator signal can be added to the broadcast signalling the programmed data processor to refer to the next program schedule.

Specific signals or multiple signals can be inserted for various purposes such as to synchronize the program schedule with the automatic recording of the music pieces. When creating the program schedule the station can indicate the time of the synchronizing signal and upon receiving the program schedule, the programmed data processor **1010** automatically interprets the signal placement along with the rest of the program schedule information. Many stations currently utilize a beginning of the hour signal for advertising purposes and this beginning of the hour signal can be detected by the programmed data processor and utilized to synchronize the program schedule.

Another method of implementing the selection signalling enables information to be encoded as part of the inserted signal and converted into data by the signal detector **1091**. Information such as a program schedule number or a music piece reference number can be incorporated into the selection signal enabling the coordination of the program schedule **1060** with the recording of the music pieces into the correct audio description file **1070**. The selection signal information can be encoded in the inserted signal through various means such as multiple tones or a combination of tones and pulses. For example, when DAT tapes are prepared containing the music for a days broadcast, a signal such as DTMF tones can be inserted prior to each music piece whereby the program schedule number precedes the music piece in the broadcast. For example, the 46th music piece in the program schedule can be preceded by the tones representing a 4 and 6. The signal detector **1091** would detect and decode the signal and pass the information to the programmed data processor **1010**. The programmed data processor **1010** would reference the chronological schedule number **2015** field **4**, within the current program schedule and record the audio segment into the correct audio description file **1070**.

The encoding and inserting of information in the broadcast can be utilized in several ways. A coded music piece reference number indicating the title and artist name can be inserted into the broadcast and received, detected and decoded for use by the programmed data processor **1010** to coordinate the recording of the audio description and synchronization of the program schedule.

In an alternate method of operating the system, the insertion of the music piece reference number enables the system to operate without a program schedule. The insertion of the music piece reference number enables the pro-

grammed data processor to go directly to an audio description without accessing a program schedule. If the music piece reference number referred to an audio description not available on the programmed data processor **1010** then the programmed data processor can access the audio description archive file **1084** to retrieve the associated audio description. For operation without a program schedule utilizing the insertion of a music piece reference number, the audio description archive file **1084** can be located on the programmed data processor **1010** to provide more efficient operation.

The selection signal or other information, can be sent as data with the broadcast signal through methods such as the side band frequency of the broadcast signal or as digital data contained within a digital radio transmission or digital television signal.

As well, the selection signal can be utilized to pass messages in real-time to the programmed data processor **1010** such as in the case whereby the disc jockey at the radio station manually inserts a specific signal as part of the broadcast. The signal is decoded by the signal detector **1091** and passed to the programmed data processor **1010**, relaying messages such as, a music piece will be skipped and the next music piece in the program schedule will be played enabling the programmed data processor to skip the next listing in the current program schedule.

The real-time insertion of a music piece reference number enables radio stations that conduct live or request radio, to insert the music piece reference number preceding or during the music piece broadcast, enabling the programmed data processor **1010** to locate the corresponding audio description or trigger the recording facility.

The selection signal methodology also applies in the case of a music television channel, music video program or a music station associated with a television telecast such as provided through a cable television telecast, satellite broadcast or television signals distributed via the telephone network. The selection signal is inserted into the audio portion of the signal and detected and potentially decoded as previously described.

An alternate signaling method enables video information to be inserted and detected as the selection signal. In the case of video signaling, the receiver **1090** becomes a television receiver and the signal detector and decoder is a video decoder able to decode the embedded video signal contained within the broadcast.

The audio description archive file **1084** can be updated at the end of the day or recording period by up-loading the audio segments and audio descriptions recorded from the broadcast that do not already exist in the archive. Music pieces, whether prerecorded when the artist name and titles are recorded by the announcer, or real-time recorded from the broadcast, are recorded once and can be referenced in multiple program schedules or multiple times within a given program schedule. Each audio description is filed in the audio description archive file **1084** contained on the audio description creation system **1080**. The audio description archive file **1084** enables easy reference and repeated use of the audio descriptions. This is significant from an efficiency standpoint because in most cases a relatively limited number of music pieces receive the majority of the broadcast play.

The audio description creation system **1080** is also the means to create the area code and call letter file **1075**, which when located on the programmed data processor **1010**, is the basis for determining the call letters of the radio station being listened to by the potential purchaser.

For example each of the approximately 130 telephone company area codes, see FIG. **5**, have less than 999 unique local exchange codes. Each telephone exchange code defines a small portion of the geographic area of the telephone area code that it is located in, such that a specific exchange code can only exist in one city or town for that particular area code. Similarly, cellular and other wireless telephone services such as PCS (Personal Communications Services) have identification codes relating to cell and transmitter locations with defined geographic limits. Every radio station has an area of signal coverage that is publicly available on maps such that for every exchange code it can be determined which radio stations provide coverage within the boundaries of a particular exchange. For example, in area code 519, exchanges 293, 526, 765, 773, 565, 644, 523, 228, 482, 233, 234, 237, 268, 762, 235, 769, 287, 524, 238, 225, 269, 262, 263, 666, 247, 229, 652, 227, 289, 264, 232, 294, 874, 243, 782, 785, 631, 633, 527, 522, 764, 775, 866, 245, 296, 461, 693, 768, 236 are located in an area surrounding London, Ontario, Canada and these following exchanges are within the London city limits 432, 433, 434, 438, 439, 451, 452, 453, 455, 471, 472, 473, 641, 643, 645, 649, 657, 659, 660, 661, 663, 667, 668, 672, 673, 679, 681, 685, 686 and from these exchanges the following radio stations can be heard CBBL FM, CBCL FM, CIXX FM, CJBC FM, CJBK AM, CJBX FM, CIQM FM CKSL AM CFPL AM in London and CHLO AM in St. Thomas and CBEG FM, CHOK AM, CKJD AM, CJFI FM in Sarnia. By organizing this information in a database it is possible to determine from touch tone input, the call letters of the radio station listened to even though the touch tone keys have three alphabetic characters on each key as illustrated in FIG. **6**.

The area code and call letter file and database structure are illustrated in FIG. **4** where the area code **4000** and the local exchange digits **4010** are the first two data fields followed by a third field **4020** which indicates the maximum number of radio stations that can be satisfactorily heard in that area and exchange code. A radio station is described in the next set of four fields which are repeated for each radio station. **4030**, field **4** contains the numeric values of the touch tone keys that match the letters of the radio stations call letters. For instance WPAT FM would appear as **9728** where the number **9** is contained on the touch tone key corresponding to the letters WXY. **4040** field **5** contains a 0 if the station is AM station or a 1 if FM. **4050** field **6** contains a number 0 to 9 indicating the type of radio station such as country, pop or rock. **4060** field **7** contains a pointer to an audio description of the station call letters so that the potential purchaser can be prompted with the station call letters combined with the type of station in the event the purchaser forgets the call letters. The radio station call letter fields would be arranged in sorted order to improve the speed of the retrieval.

The system would know in advance as part of the database that the first two stations listed in the above example, CBBL FM and CBCL FM have the same touch tone numeric values 22252 and would audibly ask the caller to select the correct station once it detected this conflict.

To determine the radio station call letters the potential purchaser's telephone area and exchange code digits are used as a retrieval key against the area code and call letter file **1075** to retrieve the set of radio station call letters that could be heard from that telephone exchange. The potential purchaser is asked to use the telephone to input the station call letters. The call letter numbers from the area code and call letter file **1075** are then compared with the numeric values of the station call letters input by the potential

purchaser. If a match is established the system can then proceed to determine which music has been played on the selected radio station. If a match is not found the potential purchaser can be verbally prompted with the types of radio stations in that area code and exchange, for example touch 1 for country, 2 for pop, which when selected, will allow the system to further prompt the potential purchaser with the radio station call letters that match the selected type of station. If this process does not determine the radio station, the potential purchaser can be bridged to a customer service operator, located at a customer service data terminal, **1040** to determine and input the radio station call letters.

As well as station call letters, other identifiers can be utilized in place of or in conjunction with the station call letters, for example, a radio station frequency number, television channel call letters, cable or television station number or advertised station descriptor. This entails an expanded version of the area code and call letter file referenced in FIG. **4** whereby **4030**, field **4** includes the touch tone numbers for additional identifiers.

In some cases the station operator may request their own specific telephone number for their listeners to access the service, in which case the called number would identify the station and enable the programmed data processor to recall the appropriate program schedule.

The audio description creation system **1080** is also the means to create an artist name archive file **1083** which is updated every time a new artist adds a musical product. This artists name archive file **1083** updates the artists name file **1078** on the programmed data processor **1010** each time it is updated. The artists name file **1078** contains the touch tone key combinations and other related information for each artist or group name. This file is also partitioned into as many segments as a potential purchaser can identify as separate sets or styles of music. For example, 5 partitions can be created by dividing all artists or groups into the categories of soft rock, hard rock, pop, easy listening and country. Each of these categories can then be divided into single artists or groups. Then the artist and group names are converted into the numeric values of the touch tone keys that match the alphabetic characters of their names. For example, the letters A,B,C would all be represented by the number **2** which is the numeric value of the touch tone key containing them. A generalized version of this file is described in FIG. **3** where **3000** field **1** contains a number between 1 and 5 representing the type or category of music. **3005** field **2** contains a 0 for an artist or 1 indicating a group. **3010** field **3** contains the name of the artist in touch tone representation of the ASCII characters of their name. Since the characters Q and Z and Space do not appear on the touch tone telephone keypad the number 1 is used to indicate either Q or Z and the number 0 is used to denote a space. The potential purchaser would be informed of these keyboard characteristics when prompted to input the artist or group name. **3020** field **4** would contain a pointer to the artist or group name in the data file **1065** referencing the pointers to all the musical products for the artist or group as well as pointers to the audio description of the artist's name, the names of the artist's musical products, the various pieces included in the musical products and musical excerpts of these pieces contained in the audio description file **1070**.

When the updated program schedule **1060**, data file **1065**, area code and call letter file **1075**, artists name file **1078**, and audio description file **1070** have been loaded on to the programmed data processor **1010** along with the program to initialize and control the data processor, the system is ready to receive telephone calls ordering music products.

Referencing FIG. **1**, the potential purchaser uses a touch tone telephone **1030** to dial an advertised number such a 1-800-RECORDS (equivalent to 1-800-732-6737) to be connected to the telephone interface **1020**. The telephone interface **1020** uses audio prompts to ask the potential purchaser to use the touch tone keys to input their telephone number including the area code. Alternatively, this information can be supplied or verified by the telephone company ANI (Automatic Number Identification) service.

After receiving the telephone number the system asks the potential purchaser to touch 1 if they heard the music piece of interest on a radio station, or to touch 2 if they plan to order a music product not recently heard on the radio station.

If the potential purchaser touched 1 the telephone interface **1020** would ask the potential purchaser to input the call letters of the radio station to which they were listening, including AM and FM designations if necessary. Since the basic radio station call letters are four characters and each of the touch tone telephone keys with an alphabetical listing contain three possible characters, the potential for confusion as to which radio station identifier was input is very large. One of the concepts of the invention is to eliminate this confusion by using the caller's telephone area code and the mutually exclusive exchange code digits. This area and exchange code information enables the system to determine which city the call originated from and compare the caller input with a select group of radio station call letters consisting of only the stations participating in the service from that area. The request for the input of AM and FM designations would be requested when an equivalent set of base call letters, such as WPAT FM and WPAT AM, provide a potential conflict.

If the potential purchaser cannot remember the station call letters it is possible to use the area and exchange code digits to retrieve station descriptions from the area code and call letter file **1075** to verbally prompt the user with the call letters only available from their city. This audio prompting could also include general station descriptions such as Country and Western or Rock to help determine the exact station listened to.

Once the system has determined which radio station was listened to, the system can search the program schedule for the selected station to determine the current piece being played and provide the prospective purchaser with the first level of description such as the artists name. Then the telephone interface directs the potential purchaser to touch 1 if it is the music piece in which they are interested or touch the 2 key to hear an excerpt of the music piece broadcast to confirm the music piece of interest or touch the number key # on their telephone to jump to the previous piece of music played on the broadcast.

With each touch of the number key (#) the system would step back through each piece of music previously broadcast or telecast until the potential purchaser touched 1 to indicate reaching the music piece of interest. Listeners can also, through the telephone, enter the time they listened to a song to speed the retrieve process for those callers that were significantly delayed in calling the service.

Upon reaching the music piece of interest, the system audibly informs the potential purchaser of the formats available for the music product selected, such as CD, cassette tape or record album and provide the pricing, shipping and other details.

The system would then ask the potential purchaser to touch the asterisk key * on the touch tone telephone **1030** if they want to order the music product. Alternatively they can press the number key # if they want more details.

If the potential purchaser touches the number key # the other musical pieces on the product would be described and, if requested, excerpts could be played so that the potential purchaser had all the required information to make the purchase. Pressing the asterisk key * begins the order process.

When the asterisk key * is pressed to order the musical product, the system would use the caller's telephone number to determine the shipping address. The system accomplishes this by requesting the communications interface **1050** to connect to an outside database **1090** to provide the address associated with the caller's telephone number. This address could also be obtained from a local CD ROM, attached to the programmed data processor **1010**, that contains the street addresses for the respective telephone numbers. If the caller requests a different shipping address, they can leave a voice message on the audio response system **1025** or be connected to a customer service operator.

As the address retrieval process is proceeding, the telephone interface **1020** audibly requests the purchaser to input their credit card number on the touch tone telephone **1030**. The programmed data processor **1010** then directs the communications interface **1050** to contact the credit card issuer **1095** and obtain a credit authorization number which would enable the system to subsequently invoice the customers credit card account upon shipment.

With the shipping address and credit authorization known, the programmed data processor **1010** directs the communications interface **1050** to connect to the fulfillment warehouse **2000** and place the order for the requested music product. If the product is not in stock the fulfillment warehouse computer informs the programmed data processor **1010** through the communications interface **1050** which then instructs the telephone interface **1020** to inform the customer of the out of stock condition.

Once it has been determined that the product is in stock an is placed with all the information to ship the product and create the appropriate records to invoice the purchaser and record the transaction for further accounting and statistical purposes.

In each of these steps, if the caller experiences problems not easily handled by inputting information via the touch tone telephone the caller can be connected through the telephone interface **1020** to a customer service operator, who would obtain the required information verbally for input into the system via the customer service data terminal **1040**. The customer service operator has complete control of the session with the caller once the bridge connection has been made. For example, the customer service operator, can over the telephone, play the recorded excerpts for the caller, obtain and enter shipping addresses or explain credit problems. In general the customer service operator is the last resort when the automatic system is unable to complete the order process.

The system will also support orders from callers not directed by a broadcast but interested in purchasing a music product. For example, the potential purchaser can initially, upon calling, be prompted to press the number 2 on their touch tone telephone indicating they were not a radio listener but wished to use the automated music catalogue service whereby the system would proceed to automatically determine the required musical product and provide all the information, including the playing of music excerpts, to enable the potential purchaser to order a selected music album. The system accomplishes this by narrowing the scope of possible music products by first asking the potential purchaser to touch 1 if the artist of group is soft rock, touch 2 if hard rock, touch 3 for blues and touch 4 for country, then to indicate whether the music product is recorded by a group or single artist. Then the telephone interface **1020** requests the artists name followed by a terminator key such as the number key #, to be input using the touch tone keys on the telephone **1030**. The type of music and the numeric representation of the artist or group name is combined together as a retrieval key. Matching the retrieval key with the artists name file **10713** provides access to the pointer for the selected artist's name in the data file **1065**. The data file **1065** contains a pointer to the artist's name in the audio description file **1070** for the telephone interface **1020** to audibly relate the artist or group name and ask the potential purchaser to confirm the selection of the correct artist or group, using the touch tone keys.

Once the correct artist has been identified the system retrieves the names of musical products for the selected artist stored in the data file **1065** and relates them in the reverse order of their release. These names have pointers to audio descriptions in the audio description file **1070**, which when played to the potential purchaser, can assist in determining which musical music product is of interest. By using the touch tone keys, the potential purchaser can hear excerpts from any musical product until satisfied they have all the required information to initiate the purchasing process by touching the asterisk key *. Once the asterisk key * is depressed the system will automatically proceed with the purchase process as previously described.

It is contemplated that a 1-900 telephone number can be used for the service where the potential purchaser would be charged by their telephone company for the telephone call on either a per call or duration basis.

It is further anticipated that record and music clubs can use this invention to assist in describing and selling their products. As well, record stores can use this invention to allow potential customers to hear excerpts from the musical products over telephone lines. These services could be offered from one central site or through smaller local distributed systems networked together.

In both of the above-mentioned examples the music product number or unit code can be used to access the album index of possible pieces to be previewed, thereby reducing the retrieval time to obtain the music information required to make a purchase.

It is further contemplated that specific components of the system can be located remotely and networked to provide **13** distributed approach to reduce communications costs. For example, the telephone interface **1020** can contain local file storage capabilities and be located remotely from the programmed data processor **1010** such that the telephone interface, and its audible response and preview functions, can be located in major, cities.

It is further envisioned that the system may provide support for a variety of terminal devices through the system user interface **7012**. For example, a multi-media device such as a personal computer may access the program list information through a digital interface such as the communication interface **1050** thereby enabling access to both audio and text files comprising the program list information. The personal computer communicates utilizing digital data and users select program list information through keypad commands. The user may be guided through the selection process through one of, or a combination of, audio and visual prompts provided through the personal computer.

Further, the system may include support for the addition of video to the program list information whereby the system

records, indexes and stores program list information that comprises audio and video content, such as a music video program information recorded from a cable, satellite or a digital data network broadcast or telecast. The video portion of the program list information may be recorded, indexed and stored in conjunction with the audio description in the same manner as previously described. A multi-media terminal device such as a personal computer or interactive television receiver may access the system through the user interface **7012** of which such communication functionality may be provided through the communication interface **1050** providing multi-media descriptions of the program schedule information.

Having now described the preferred embodiment of the invention, reference will be made to FIG. **7**, which gives an overview of some of the principles of the present invention. As illustrated, the present invention employs data processor **7010** which is provided with a suitable user interface **7012**. In the presently preferred embodiment, the user interface is integrated with the existing telephone infrastructure, so that persons may interact with the system using conventional DTMF telephone equipment, as described above. Connected to data processor **7010** is a subsystem **7018** for providing prerecorded program descriptions of the program material (e.g. recorded music) that the caller may wish to purchase. Subsystem **7018** may be implemented using hard disk storage, optical storage, digital audio tape (DAT) storage, or the like. The program material (e.g. recorded music) may be prerecorded from the media played over the air, or it may be prerecorded from the live broadcast using a suitable AM or FM receiver and suitable digitizing (analog to digital conversion) equipment. Also connected to data processor **7010** is a program schedule input system **7020**, which may be any suitable means for inputting the program schedule or play list identifying what program materials have been or will be broadcast, including optical character recognition equipment for inputting play lists provided in printed form and telefacsimile equipment for inputting play list information via FAX.

Data processor **7010** is further provided with a database system **7014** for storing the program schedule, suitable data or pointers from which the prerecorded program description may be obtained, reconstructed or generated. An program description subsystem **7016** is coupled to data processor **7010** to provide the selected program description to the user via the user interface **7012**. The program description subsystem may include digital to analog conversion equipment for converting digitally prerecorded program description information into an analog form suitable for distributing serially over the telephone. Alternatively or additionally, the program description subsystem may include synthesis equipment for performing text to speech conversion on text data files representing prerecorded program description information.

While the invention has been described with regard to the presently preferred embodiment, it will be understood that the invention is capable of certain modification without departing from the spirit of the invention as set forth in the appended claims.

What is claimed is:

1. A computer-implemented information system to provide users with information concerning program materials disseminated according to a program list, comprising:

a processing system for execution by a computer;

a user interface coupled to said processing system, said user interface providing means for placing user inquiries regarding the program material;

a database coupled to said processing system;

first input means coupled to said processing system, for inputting information reflecting program descriptions of said program materials;

second input means coupled to said processing system, for inputting program list information regarding a plurality of program material items;

a program description output means coupled to said processing system and to said user interface; and

identifier means responsive to only a broadcast identifier for generating and storing information in said database;

said processing system having:

means for correlating said program descriptions of program material with said program list information and for storing said correlated program descriptions and program list information in said database responsive to receipt of said broadcast identifier;

means for responding to a user inquiry, placed through said user interface, about an item in said program list, by retrieving a selected program description from said database associated with said broadcast identifier, and

means for further responding to said user inquiry by causing said program description output means to produce a message based on said selected program description.

2. The information system of claim **1** wherein said processing system is a computer program running on said computer.

3. The information system of claim **1** wherein said user interface includes means for coupling to a computer.

4. The information system of claim **1** wherein said user interface comprises a communication interface and wherein said user inquiries are placed using digital data entered through a keypad.

5. The information system of claim **1** wherein said first input means includes a television receiver.

6. The information system of claim **1** wherein said first input means includes a video signal digitizer.

7. The information system of claim **1** wherein said first input means includes means for extracting said program description from prerecorded material.

8. The information system of claim **1** wherein said second input means includes a video receiver.

9. The information system of claim **1** wherein said first input means couples to a digital data network.

10. The information system of claim **1** wherein said program description output means includes a text to speech conversion system.

11. The information system of claim **1** wherein said program description output means includes digital to analog conversion means.

12. The information system of claim **1** wherein said program description comprises a telecast schedule.

13. The information system of claim **1** wherein said program description comprises information specific to a broadcaster.

14. The information system of claim **1** wherein said user interface includes means for coupling to a digital data network.

15. The information system of claim **1** wherein said user interface includes means for coupling to a personal computer which receives said program list.

16. The information system of claim **1** wherein said user interface includes means for coupling to a computer which receives and displays said program description information comprising a multi-media presentation.

17. The information system of claim 1 wherein said user interface includes means for coupling to an interactive television device.

18. The information system of claim 1 wherein multiple program descriptions are selected from said program list.

19. The information system of claim 1 wherein said message produced by said program description relates to a subset of said program list.

20. The information system of claim 1 wherein said first input means includes a reception device for a digital signal.

21. The information system of claim 1 wherein said broadcast identifier includes one of the following, station call letters, a station tuning frequency, a television channel allocation, a cable subscriber identification, a music genre, a telephone number, a network address, an identification number or a predetermined identifier.

22. The information system of claim 1 wherein said system further comprises means to store a master listing of program descriptions and wherein said first input means updates said master listing with information reflecting program descriptions.

23. The information system in claim 1 wherein said second input means receives said program list information in the chronological order of a broadcast or telecast.

24. The information system in claim 1 wherein said program description output means produces said messages consecutively in the chronological order in which the program list information is received.

25. The information system in claim 1 wherein said message produced by said program description output means is contained within a digit data transmission.

26. The information system in claim 1 wherein said broadcast identifier comprises an address for a remote user device.

27. The information system in claim 1 wherein said broadcast identifier comprises a program material item.

28. The information system of claim 1 wherein said program list is associated with a broadcast signal transmitted through a digital data network.

29. The information system of claim 1 wherein said message produced by said program description output means comprises text.

30. The information system of claim 1 wherein said message produced by said program description output means comprises video.

31. The information system of claim 1 wherein said message produced by said program description output means comprises audio.

32. The information system of claim 1 wherein said first input means comprises a communications interface connected to a network.

33. The information system of claim 1 wherein said first input means records and stores at least one program description from said broadcast.

34. The information system of claim 1 wherein said message produced by said program description output means contains more than one program description.

35. The information system of claim 1 wherein said program description output means is located geographically remote from said information system.

36. The information system of claim 1 wherein said program list comprises a listing of advertisements and wherein said program description contains information relating to said advertisements.

37. The information system of claim 1 wherein said broadcast identifier is associated with a conversion format to apply to said program list.

38. The information system of claim 1 wherein said user inquiry comprises a broadcast identifier.

39. The information system of claim 1 wherein said program list is synchronized with said broadcast.

40. The information system of claim 1 wherein said user inquiry comprises a program item from said program list.

41. The information system of claim 1 wherein said user inquiry comprises a reference number or code.

42. The information system of claim 1 wherein information within said program list is associated with number representations or codes referenced from a master listing.

43. The information system of claim 42 wherein said number representations or codes are associated with said program descriptions.

44. The information system of claim 42 wherein said number representations or codes are interpreted responsive to said broadcast identifier.

45. The information system of claim 42 wherein said number representations or codes are encoded and inserted with broadcast.

46. The information system of claim 1 wherein said program list is input through a touch tone telephone or using voice recognition.

47. The information system of claim 1 wherein said user inquiry comprises a city or geographic region.

48. The information system of claim 1 wherein said database further comprises digital data representing the alpha-numeric touch tone telephone key pad input of artist names, song titles and music album titles referenced within said database.

49. The information system of claim 1 wherein said program list information is provided interactively in real-time.

50. The information system of claim 1 wherein said user interface comprises means to connect to a wireless network.

51. The information system of claim 1 wherein said correlation of said program description with said program list is responsive to receipt of program list information.

52. The information system of claim 1 wherein said correlation of said program description with said program list is responsive to receipt of a program description.

53. The information system of claim 1 wherein said user interface comprises a telephone interface and wherein said user inquiries are placed using telephone DTMF codes entered through a touch tone telephone.

54. The information system of claim 1 wherein said program list is synchronized with said program descriptions.

55. An information system for on-demand remote access to a self-generating program recording, storage and indexing system comprising:

at least one broadcast unit for providing a broadcast to remote locations;

signal generator means coupled to said at least one broadcast unit for providing a signal within said broadcast;

a programmed data processor that includes a data input system and a first database for receiving program list information;

a user interface coupled to said programmed data processor, said user interface providing means to communicate with remote users;

at least one reception device to receive said broadcast;

a detection device associated with said at least one reception device for detecting said signal from said broadcast;

a storage device to digitally record and store detected program descriptions;

identifier means responsive to only a broadcast identifier for generating information in said first database; and

wherein said programmed data processor is coupled to said user interface, to said storage device and to said detection device, said programmed data processor causing said user interface to communicate said program description information to said remote user, responsive to a user inquiry.

56. The information system in claim **55** wherein said user inquiry comprises a broadcast identifier.

57. The information system in claim **55** further comprising means for correlating said program descriptions with said program list and for storing said correlated program descriptions and program list information in said first database.

58. The information system in claim **55** wherein said broadcast identifier comprises an identification of a listing from said program list.

59. The information system in claim **55** wherein said broadcast comprises a digital data broadcast.

60. The information system in claim **55** wherein said broadcast comprises a cable telecast.

61. The information system in claim **55** further comprising a system for extracting program descriptions from prerecorded materials.

62. The information system in claim **55** wherein said broadcast identifier includes information from said program list.

63. The information system in claim **55** wherein said program list is received from said broadcast.

64. The information system in claim **55** wherein said program descriptive information is recorded from said broadcast.

65. The information system in claim **55** wherein said program description information includes video.

66. The information system in claim **55** wherein said program description information includes text.

67. The information system of claim **55** wherein said broadcast identifier comprises one of the following, station call letters, a station tuning frequency, a television channel allocation, a cable subscriber identification, a music genre, a telephone number, a network address, an identification number or a predetermined identifier.

68. The information system in claim **55** wherein said database further comprises digital data representing the alpha-numeric touch tone telephone key pad input of artist names, song titles and music album titles referenced within said database.

69. The information system claim **55** wherein said program list comprises a listing of advertisements and wherein said program description contains information relating to said advertisements.

70. The information system of claim **55** wherein said signal is received within a digital radio, digital television or the sideband of a broadcast signal.

71. The information system of claim **55** wherein said program list is synchronized with said program descriptions.

72. The information system of claim **55** wherein said program list is synchronized with said broadcast.

73. The information system of claim **55** wherein said program descriptions are located geographically remote from said information system.

74. An information system for on-demand remote access to a self-generating program recording, storage and indexing system comprising:

at least one broadcast unit for providing a broadcast;

a signal generator coupled to said at least one broadcast unit for providing a signal within said broadcast;

a programmed data processor that includes a data input system and a first database for receiving a program list;

a user interface for providing user inquiries to said programmed data processor;

at least one reception device to receive said broadcast;

a detection device associated with said at least one reception device for detecting said signal from said broadcast;

a storage device for digitally recording and storing detected information on said programmed data processor, responsive to only a broadcast identifier;

a program description creation device for creating a program description file, said creation device being selected from the group consisting essentially of a compact disc player, a tape cassette player, a digital audio tape device, a videotape player, a multi-track audio tape recorder, a microphone and a data input device;

a responsive device responding to the receipt of at least one item from said program list to access said first database to read program descriptive information; and

wherein said programmed data processor is coupled to said user interface, and to said detection device, said programmed data processor causing said user interface to communicate said program descriptive information to said remote locations.

75. The information system in claim **74** wherein said broadcast comprises a digital data broadcast.

76. The information system in claim **74** wherein said broadcast comprises a cable telecast.

77. The information system in claim **74** wherein said user inquiry includes a broadcast identifier.

78. The information system in claim **74** wherein said user interface comprises a telephone interface and wherein said user inquiries are placed using telephone DTMF codes entered through a touch tone telephone.

79. The information system in claim **74** wherein said broadcast identifier includes information from said program list.

80. The information system in claim **74** wherein said program list is received from said broadcast.

81. The information system in claim **74** wherein said program descriptive information is recorded from said broadcast.

82. The information system in claim **74** wherein said program description creation device is located remotely from said system.

83. The information system in claim **74** wherein said program description information is stored remotely from said information system.

84. The information system of claim **74** wherein said broadcast identifier comprises one of the following, station call letters, a station tuning frequency, a television channel allocation, a cable subscriber identification, a music genre, a telephone number, a network address, an identification number or a predetermined identifier.

85. The information system in claim **74** wherein said program description information includes video.

86. The information system in claim **74** wherein said program description information includes text.

87. The information system of claim **74** wherein said database further comprises digital data representing the alpha-numeric touch tone telephone key pad input of artist names, song titles and music album titles referenced within said database.

88. The information system of claim **74** wherein said user inquiry comprises a product name, product code or reference number.

89. The information system claim **74** wherein said program list comprises a listing of advertisements and wherein said program description contain information relating to said advertisements.

90. The information system of claim **74** wherein said signal is received within a digital radio, digital television or the sideband of a broadcast signal.

91. The information system of claim **74** wherein said program list is synchronized with said program

92. The information system of claim **74** wherein said program list is synchronized with said broadcast.

93. The information system of claim **74** wherein said program descriptions are located geographically remote from said information system.

94. A method for providing listeners or viewers of a radio or television broadcast with automated information about program material, comprising the steps of:

broadcasting at least one radio or television broadcast;

receiving user inquiries from a listener or viewer of said radio or television broadcast;

creating a program description file;

communicating program list information into a programmed data processor;

correlating said program descriptions of program material with said program list information and generating information in a database responsive to only a broadcast identifier; and

using said programmed data processor to communicate said program description file responsive to said user inquiry.

95. The method of claim **94** further comprising the step of recording data from said broadcast.

96. The method of claim **94** wherein said user inquiry comprises a broadcast identifier.

97. The method of claim **94** wherein said broadcast is a digital data broadcast.

98. The method of claim **94** wherein said program list is synchronized with said broadcast.

99. The method of claim **94** wherein said user inquiry comprises city or geographic region information.

100. The method of claim **94** wherein a conversion format is applied to said program list based upon said broadcast identifier.

101. The method of claim **94** wherein said user inquiry is provided through a computer device.

102. The method of claim **94** wherein said user inquiry is provided through a wireless network.

103. The method of claim **94** wherein said user inquiry is provided through a touchtone telephone.

104. The method of claim **94** wherein said user inquiry is transmitted through a digital data network.

105. The method of claim **94** wherein said program list is input by touch-tone telephone or using voice recognition.

106. The method of claim **94** wherein said correlation of said program descriptions with said program list information is responsive to receipt of said program list information.

107. The method of claim **94** wherein said correlation of said program description information with said program list is responsive to receipt of said program description.

108. The method of claim **94** further comprising the step of storing said program description files in a master listing of program description files, said master listing associated with said program list information.

109. The method of claim **108** further comprising the step of associating said program list with said program descriptions, said program descriptions being stored geographically remote from said database.

110. The method of claim **94** including the step of assigning number representations or codes to information within said program list, said number representations or codes assigned from a master listing.

111. The method of claim **110** wherein said number representations or codes are associated with said program descriptions.

112. The method of claim **110** wherein said number representations or codes are interpreted responsive to said broadcast identifier.

113. The method of claim **110** including the step of encoding and broadcasting said number representations or codes with said broadcast.

114. The method of claim **94** wherein said database further comprises digital data representing the alpha-numeric touch tone telephone key pad input of an artist name, song title or album, and wherein said user inquiries are entered through a touch tone telephone and compared to said digital data representing said alpha-numeric touch tone telephone key pad input of an artist name, song title or album, thereby identifying a listing in said database.

115. The method of claim **94** wherein said database includes partitions for categorizing said program descriptions by music genre.

116. The method of claim **94** wherein the step of receiving a user inquiry includes providing a user with a menu of broadcasters from which to select a broadcast.

117. The method of claim **94** wherein said program list comprises a listing of advertisements and wherein said program description contains information relating to said advertisements.

118. The method of claim **94** further including the step of communicating said program description file from a remotely located storage device.

119. The method of claim **94** further including the step of linking a user to a remote located storage unit wherein said program description file is stored.

120. The method of claim **94** further comprising the step of including a signal within said broadcast.

121. The method of claim **120** further comprising the step of encoding data into said signal.

122. The method of claim **120** further comprising the step of encoding said program list information in said signal.

123. The method of claim **120** further comprising the step of encoding said program description information in said signal.

124. The method of claim **120** wherein said signal is received within a digital radio, digital television or sideband of a broadcast signal.

125. The method of claim **94** further comprising the step of receiving said broadcast.

126. The method of claim **125** further comprising the step of recording said program description file from said broadcast.

127. The method of claim **125** further comprising the step of recording said program list information from said broadcast.

128. The method of claim **94** further including the step of receiving a network address comprising said user inquiry.

129. The method of claim **94** wherein said broadcast identifier includes one of the following, station call letters, a station tuning frequency, a television channel allocation, a cable subscriber identification, a music genre, a telephone number, a network address, an identification number or a predetermined identifier.

130. The method of claim **94** wherein said program list is synchronized with said program descriptions.

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