

[54] BROADCASTING SYSTEM WITH SUPPLEMENTAL DATA TRANSMISSION AND STORAGE

4,879,751 11/1989 Franks et al. .... 381/81
4,887,308 12/1989 Dutton ..... 455/158
4,908,713 3/1990 Levine ..... 455/181

[75] Inventor: David Alwadish, New York, N.Y.

FOREIGN PATENT DOCUMENTS

[73] Assignee: Ing Communications, Inc., New York, N.Y.

58-131865 8/1983 Japan ..... 455/181
60-170332 9/1985 Japan .

[21] Appl. No.: 663,298

OTHER PUBLICATIONS

[22] Filed: Feb. 28, 1991

E. B. U., Specifications of the radio data system RDS for VHF/FM sound broadcasting, Mar. 1984.

G. L. Dexter, a new age for radio, Popular Electronics, Oct. 1989.

Related U.S. Application Data

[63] Continuation of Ser. No. 413,536, Sep. 27, 1989, abandoned.

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Assistant Examiner—Lisa Charouel
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[51] Int. Cl.5 ..... H04B 7/00
[52] U.S. Cl. .... 455/45; 455/66; 455/158; 455/186

[57] ABSTRACT

[58] Field of Search ..... 455/3, 6, 42, 45, 66, 455/68, 70, 158, 185, 186; 381/1, 2, 3, 4, 5, 6, 77, 78, 81, 119

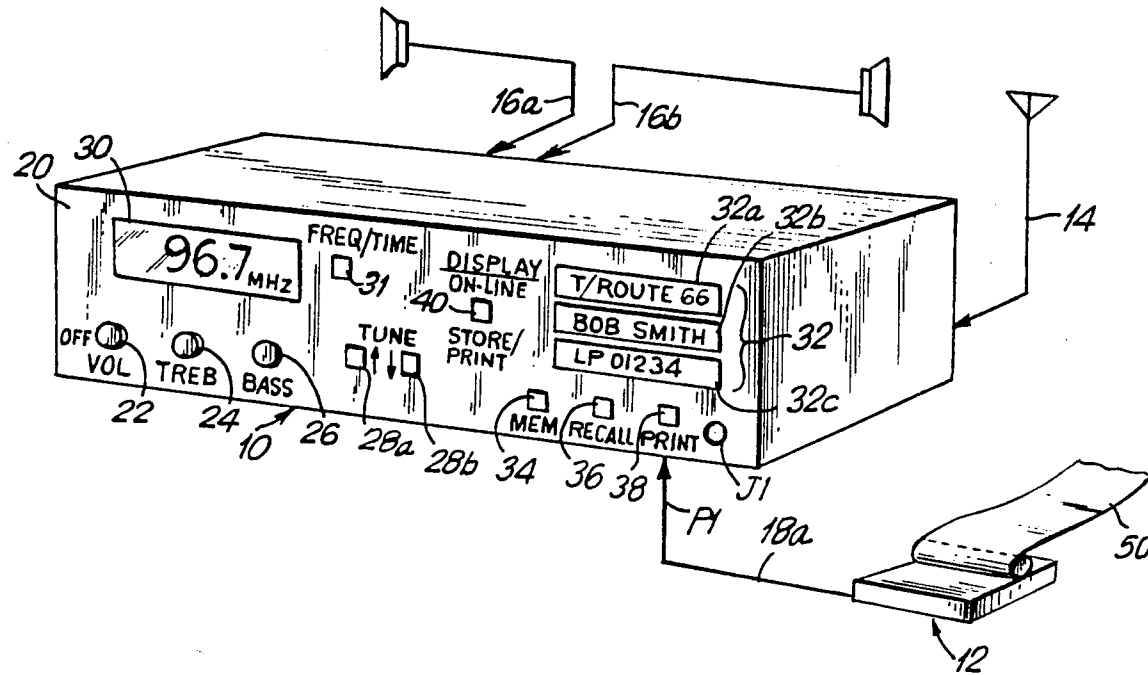
A technique for broadcasting program material together with encoded items of information pertaining to the program material such as the title of a broadcast musical piece, the artist name, catalog number, and the like. A number of sources of recorded program material are provided at a broadcast site, and encoded information data pertaining to the program material is processed for transmission from the site with the broadcast program material. A receiver reproduces the program material and, upon entry of a memory command, decodes and stores the transmitted items of information data in a memory. Sets of stored information data relating to selected broadcasts can later be retrieved from the memory and output by a display and/or a printer device.

[56] References Cited

U.S. PATENT DOCUMENTS

- 4,268,724 5/1981 Hubbard .
4,279,035 7/1981 Skerlos ..... 455/158
4,379,947 4/1983 Warner ..... 370/11
4,380,027 4/1983 Leventer et al. .
4,392,246 7/1983 Niioka et al. .
4,488,273 12/1984 Nokihara et al. .
4,534,654 8/1985 Maisel ..... 381/14
4,686,528 8/1987 Ferrer et al. .... 340/825.44
4,686,707 8/1987 Iwasaki et al. .
4,787,085 11/1988 Suto et al. .... 455/6
4,805,217 2/1989 Morihiro et al. .
4,829,500 5/1989 Saunders ..... 381/77
4,829,558 5/1989 Welsh .

30 Claims, 3 Drawing Sheets



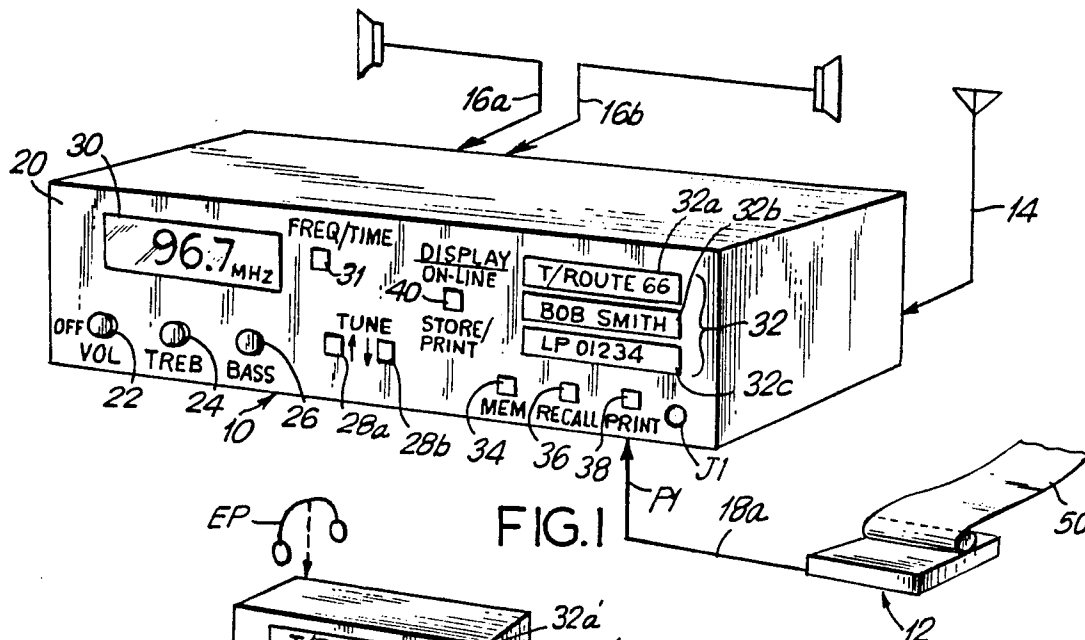


FIG. 1

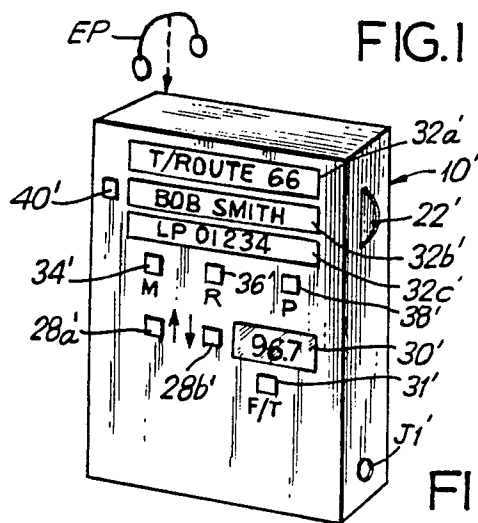


FIG. 2

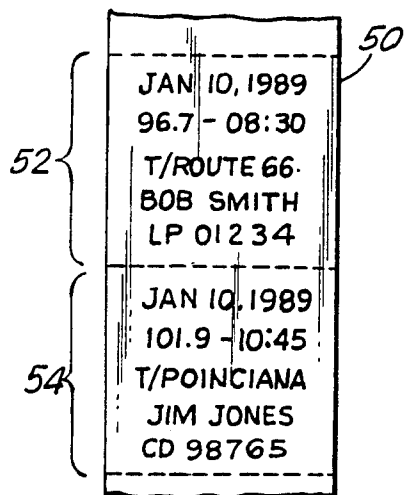


FIG. 3

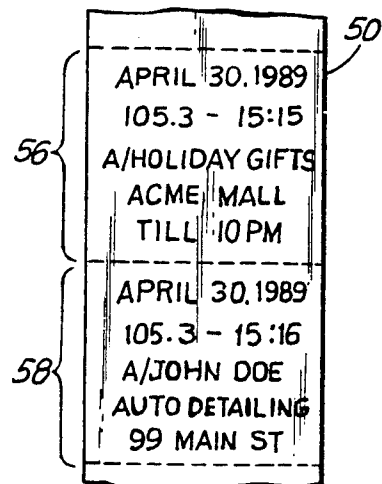
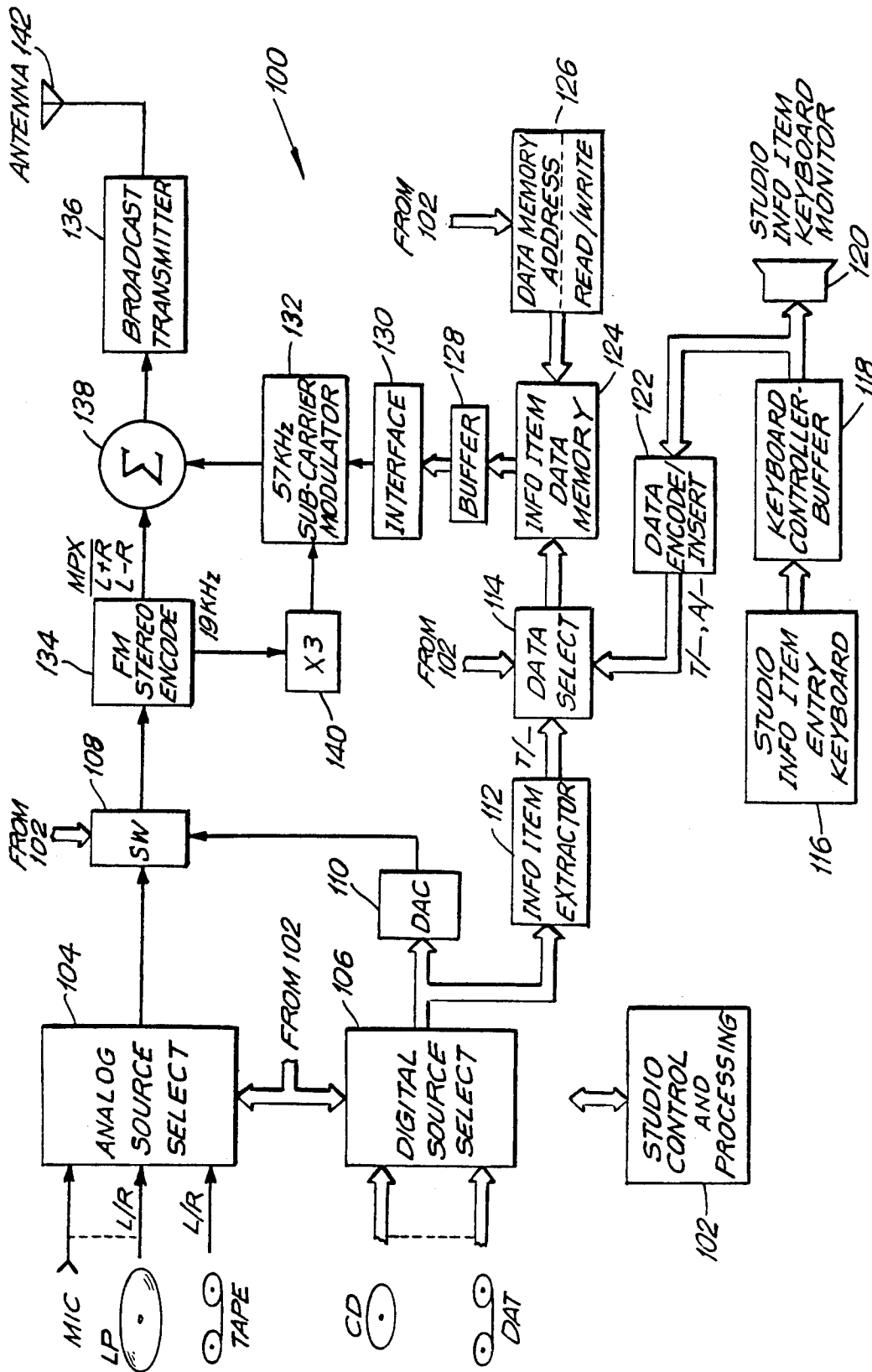


FIG. 4



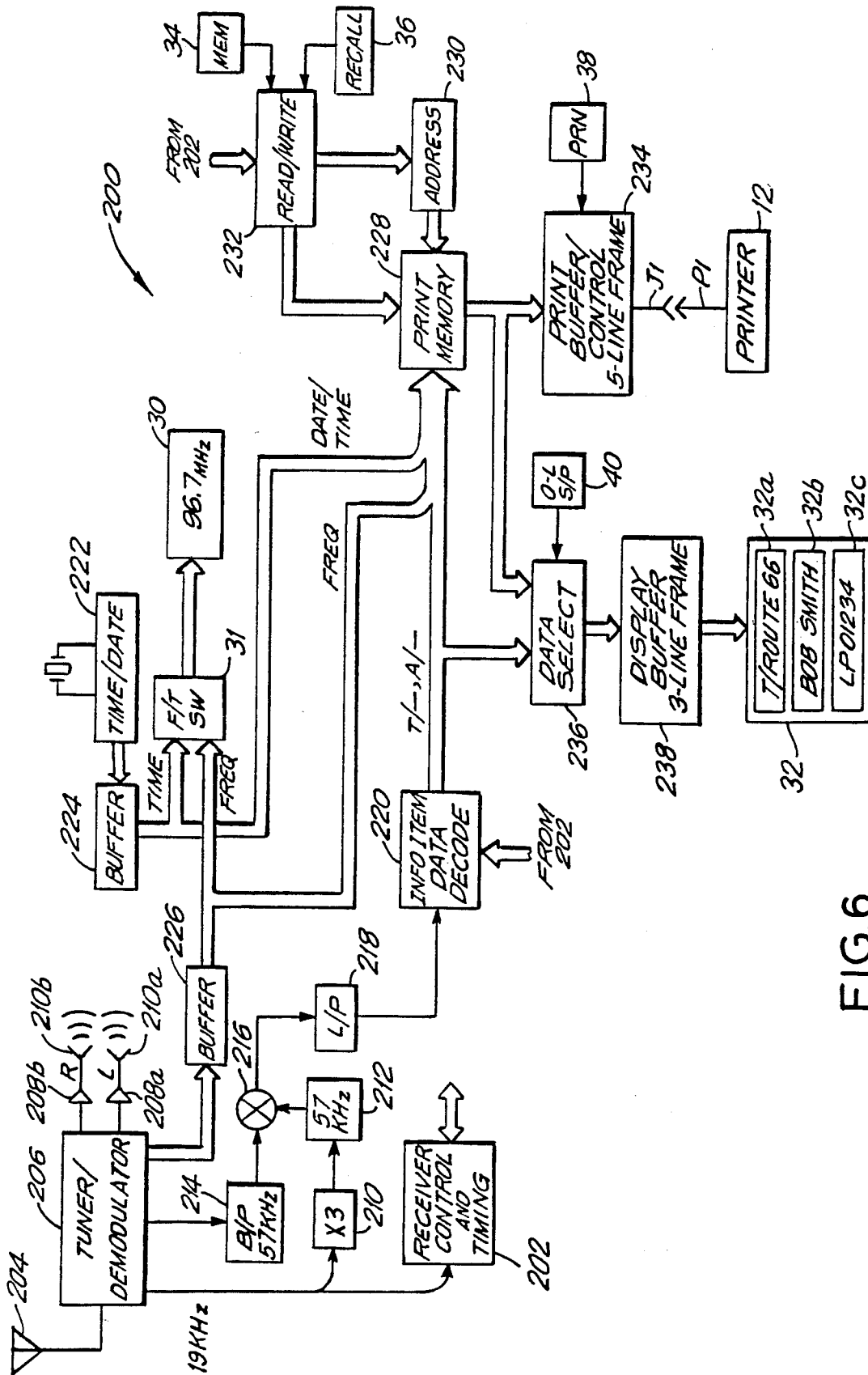


FIG. 6

**BROADCASTING SYSTEM WITH  
SUPPLEMENTAL DATA TRANSMISSION AND  
STORAGE**

**CROSS REFERENCE TO RELATED  
APPLICATION**

This application is a continuation of my co-pending application Ser. No. 413,536 filed Sept. 27, 1989, now abandoned.

**BACKGROUND OF THE INVENTION**

**I. Field of the Invention**

The present invention relates generally to broadcasting systems, and more particularly to a system in which supplemental data is inserted in a broadcast carrier for transmission to specially adapted receivers capable of decoding the data.

**II. Discussion of the Known Art**

Listeners of all kinds of music frequently wish they can remember the name, artist or other pertinent information relating to a musical piece or selection they heard during a recent broadcast. If the listener happens to hear an announcer identify the piece before or after it is played over the broadcast station, he or she may note the information down with pencil and paper if convenient. Usually, however, the selection is first heard by the listener while driving or under some other condition where it is not possible or practical to jot down identifying information so as to enable the selection to be later purchased at a record/tape store.

Broadcast stations often transmit a number of musical pieces, one right after the other, by various artists and selected from different records or tapes, without any narration or other means of identifying the title of each piece just before or after it is played. Thus, when the announcer identifies each of, e.g., five selections that were played successively over the past 15 minutes, the listener cannot be sure which title and name identifies a particular selection he or she may have especially liked.

As far as is known, no existing or proposed commercial broadcasting system affords the listener an opportunity to identify, by means of supplemental information encoded in the broadcast carrier signal, items such as the artist and title of a musical selection simultaneously with its broadcast. A frequency-modulation (FM) broadcasting system has been proposed in which auxiliary tuning and program information is inserted into a monophonic or stereophonic FM broadcast in the commercial FM band of 88 to 108 MHz. See Specifications of the Radio Data System RDS for VHF/FM Sound Broadcasting, European Broadcasting Union, Tech. 3244-E (March 1984), referred to hereafter as "the EBU system".

In the EBU system, blocks of character data are continuously inserted, in synchronized fashion, in a 57 KHz sub-carrier of a FM broadcast signal. The blocks of data may correspond to (1) the country from which the broadcast originates, (2) the area of coverage, viz., international, national or regional, and (3) the type of program such as traffic information, sports, pop music or the like. Circuitry within specially designed automobile receivers would, upon decoding the data blocks, cause the receiver either to stay tuned to the received station, or to scan for another station that is transmitting a certain kind of program information pre-selected by the driver. The EBU system does contemplate transmissions of text material (Radiotext) addressed primarily to

new home receivers. It is acknowledged that a changing message display on an automobile receiver could divert the driver's attention from the road and thus present a safety hazard.

U.S. Pat. No. 4,805,217 issued Feb. 14, 1989, discloses a receiving set with a playback function. A portion of an audio signal that is reproduced by a receiver can be stored in a digital memory, for later recall by the listener. Likewise, U.S. Pat. No. 4,268,724 issued May 19, 1981, and U.S. Pat. No. 4,488,273 issued Dec. 11, 1984, disclose systems in which a received radio broadcast program is first recorded on a continuous loop of magnetic tape prior to being audibly reproduced.

**SUMMARY OF THE INVENTION**

An object of the invention is to provide a broadcasting technique that allows listeners safely to record selected auxiliary information transmitted during a broadcast.

Another object of the invention is to provide a broadcasting technique wherein supplemental information pertaining to broadcast program material is inserted for transmission with the program material for decoding and storage in a broadcast receiver.

A further object of the invention is to provide a broadcasting technique in which items of identifying information are encoded for transmission with program material from a broadcasting station, and wherein the information items are decoded and stored in a receiver for later recall by a listener.

According to the invention, a method of broadcasting whereby supplemental information is encoded for transmission with program material, includes reproducing at a broadcast site a source of program material, processing the reproduced broadcast material for transmission over a broadcast carrier signal, inserting encoded items of information into the carrier signal, receiving with a specially adapted broadcast receiver the transmitted program material and the inserted information items, and enabling the received information items to be recalled and decoded by means in the specially adapted receiver after reception of the program material.

According to another aspect of the invention, a method of broadcasting program material together with items of information that identify the program material, includes providing at a broadcast site a number of sources of recorded program material, encoding in a given source items of identification data that identify the program material recorded in the source, reproducing the recorded program material and the items of identification data from the given source, transmitting the reproduced program material on a broadcast carrier signal, and processing the reproduced items of identification data for insertion into the carrier signal.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of the present disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawing and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

**BRIEF DESCRIPTION OF THE DRAWING**

In the drawing:

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