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United States Patent [19]

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Aijala et al.

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[54] **METHOD AND APPARATUS FOR ENCODING/DECODING BROADCAST OR RECORDED SEGMENTS AND MONITORING AUDIENCE EXPOSURE THERETO**

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(List continued on next page.)

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[75] Inventors: **Victor A. Aijala, Arnold; Gerald B. Cohen, Gaithersburg; James M. Jensen, Columbia; Wendell D. Lynch, Silver Spring; Juan C. Urbi, Laurel, all of Md.**

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[73] Assignee: **The Arbitron Company, Columbia, Md.**

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[21] Appl. No.: **396,342**

Primary Examiner—Thai Q. Tran
Assistant Examiner—Robert Chevalier
Attorney, Agent, or Firm—Curtis, Morris & Safford, P.C.; Eugene L. Flanagan, III

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Related U.S. Application Data

[63] Continuation of Ser. No. 976,558, Nov. 16, 1992, abandoned.

[51] Int. Cl.⁶ **H04N 5/76; H04N 5/00**

[52] U.S. Cl. **386/96; 381/2; 386/98**

[58] Field of Search 381/14, 2, 3, 4; 455/2, 49.1, 53, 67; 358/335, 341, 343; 348/1, 2, 3, 5

[57] ABSTRACT

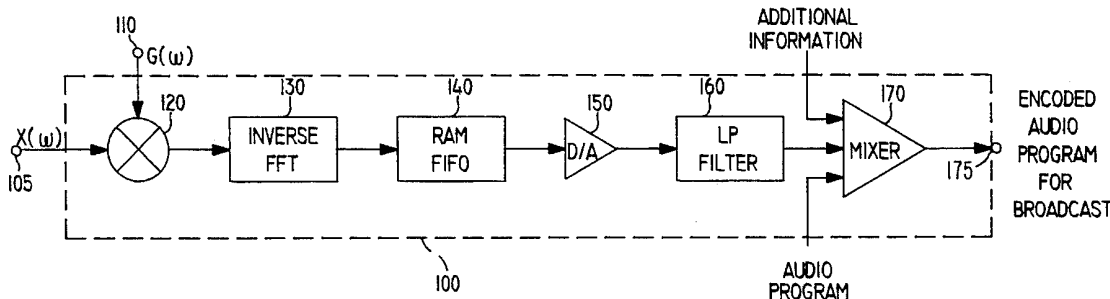
Methods and apparatus for encoding and decoding information in broadcast or recorded segment signals are described. In certain embodiments, an audience monitoring system encodes identification information in the audio signal portion of a broadcast or recorded segment using spread spectrum encoding. A personal monitoring device receives an acoustically reproduced version of the broadcast or recorded signal via a microphone, decodes the identification information from the audio signal portion despite significant ambient noise, and stores this information, automatically providing a diary for the audience member which is later uploaded to a centralized facility. A separate monitoring device decodes additional information from the broadcast signal, which is matched with the audience diary information at the central facility. This monitor may simultaneously send data to the centralized facility using a dial-up telephone line, and receive data from the centralized facility through a signal encoded using a spread spectrum technique and modulated with a broadcast signal from a third-party.

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110 Claims, 10 Drawing Sheets



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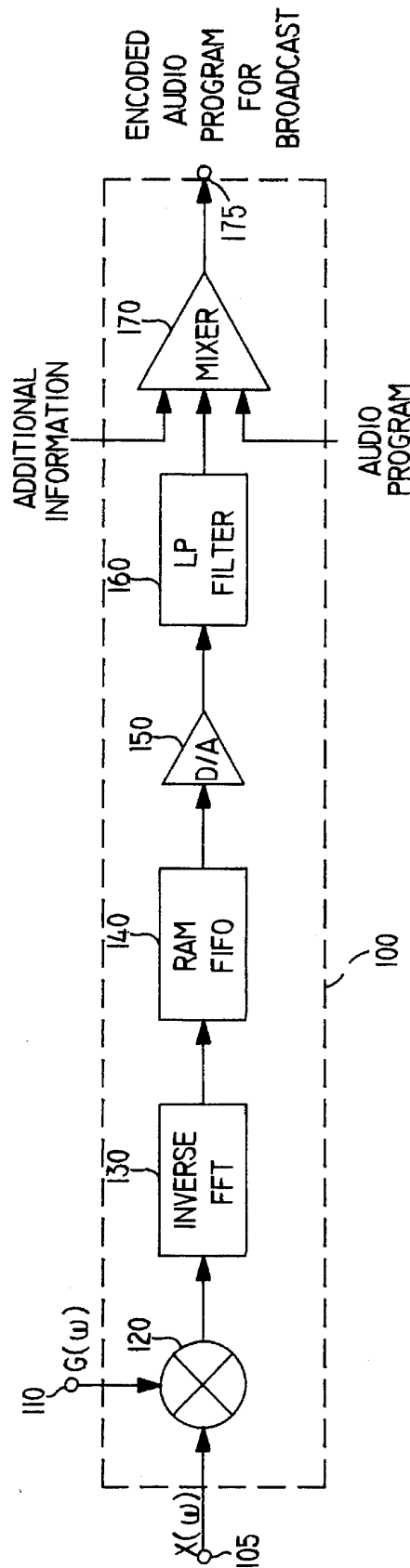


FIG. 1

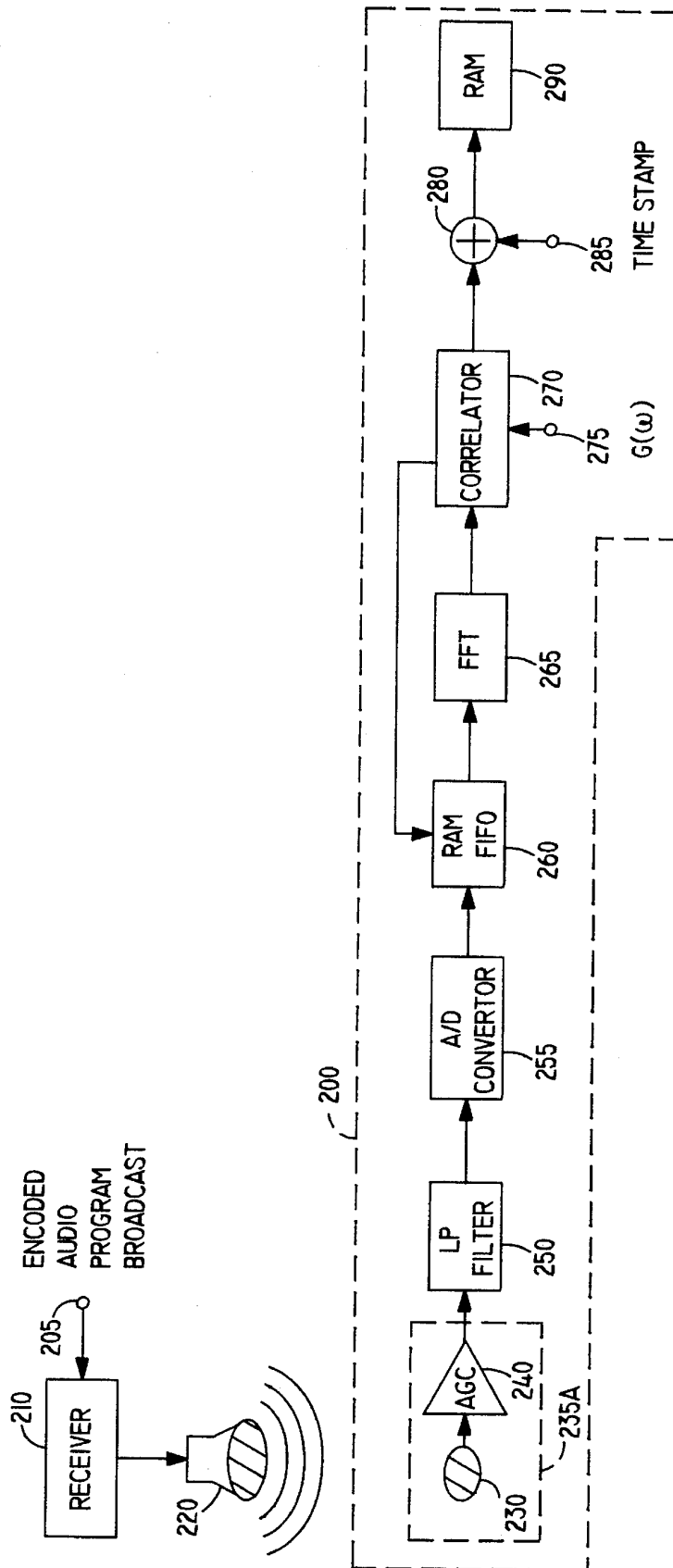


FIG. 2A

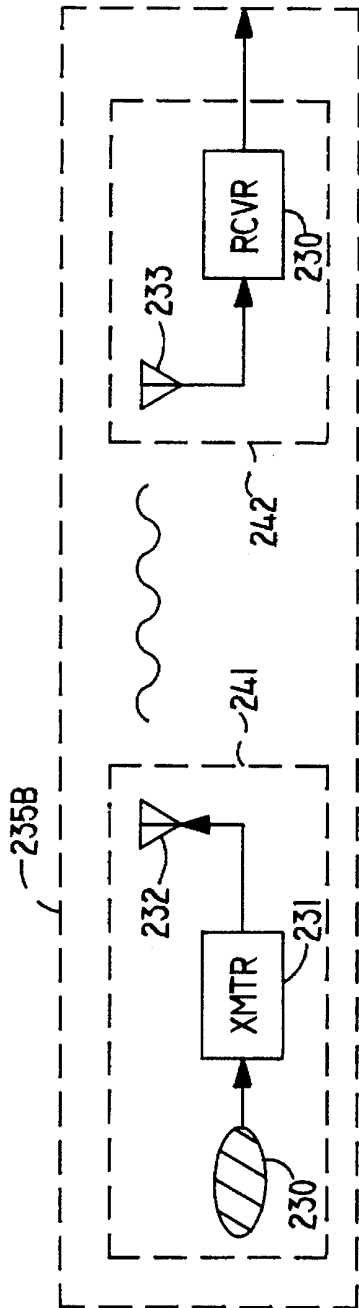


FIG. 2B

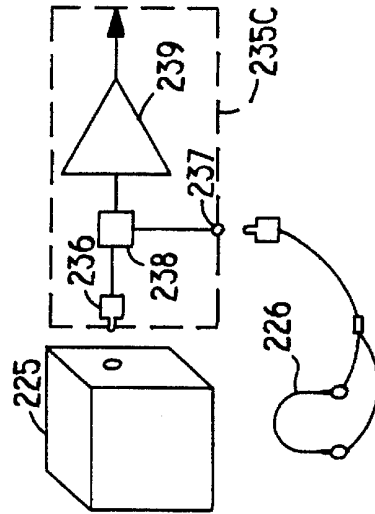


FIG. 2C

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