

EXHIBIT 5

(12) United States Patent
Katagishi et al.

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(45) Date of Patent: Jun. 18, 2002

- (54) **CELLULAR TELEPHONE**
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- (73) Assignee: **Hitachi, Ltd.**, Tokyo (JP)
- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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Assistant Examiner—Keith Ferguson
 (74) *Attorney, Agent, or Firm*—Mattingly, Stanger & Malur, P.C.

- (21) Appl. No.: **09/436,502**
- (22) Filed: **Nov. 9, 1999**
- (30) **Foreign Application Priority Data**
 Nov. 10, 1998 (JP) 10-318689
- (51) **Int. Cl.⁷** **H04Q 7/32**
- (52) **U.S. Cl.** **455/571; 455/574; 455/126; 455/127; 455/115; 375/345; 370/311; 370/342**
- (58) **Field of Search** 455/571, 126, 455/127, 115, 116, 118, 121, 125, 73, 232.1, 132.4, 239.1, 240.1, 250.1, 251.1, 245.1, 574; 330/278, 285, 129, 2; 375/345; 370/311, 342

(57) ABSTRACT

A cellular telephone receives a first communication signal from a cell-site station and transmits a second communication signal to the cell-site station. The cellular telephone includes an antenna, a duplexer, a receiver, an encoder/decoder apparatus, an acoustic transducer, a transmitter and a controller. The receiver is connected to the antenna through the duplexer. The receiver converts the first communication signal into a voice signal code, and outputs a signal indicating an intensity of the first communication signal. The transmitter is connected to the encoder/decoder apparatus and to the antenna through the duplexer. The receiver converts the input voice code signal from the encoder/decoder apparatus into the second communication signal. The controller is connected to the receiver and the transmitter. The controller controls amplitude of the transmitter corresponding to said intensity of the first communication signal. The transmitter includes a variable amplitude amplifier and a power amplifier means, and the controller includes a central processing unit and a memory. The controller controls a gain of the variable amplitude amplifier and a bias condition of the power amplifier means according to a function stored in the memory.

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7 Claims, 8 Drawing Sheets

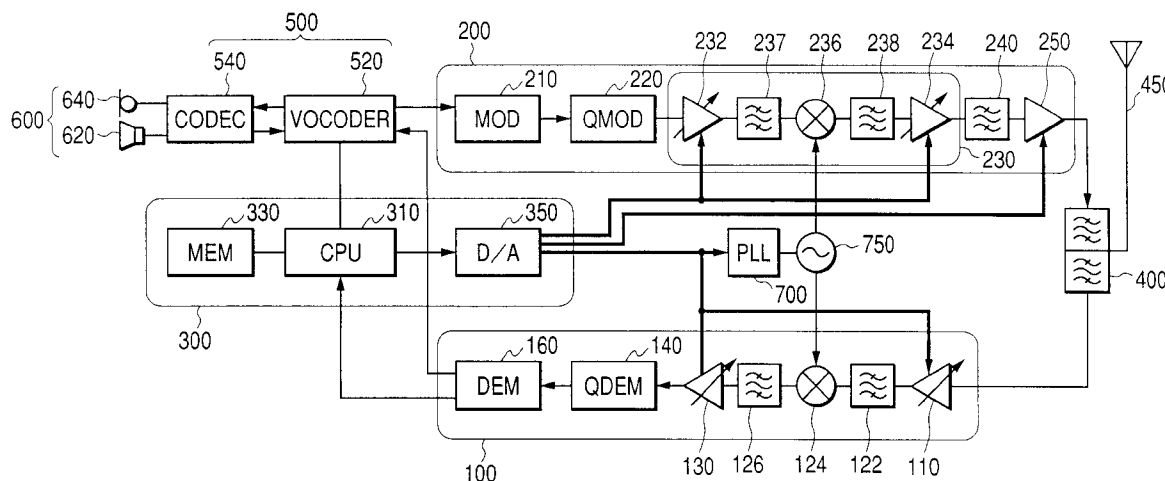


FIG. 1

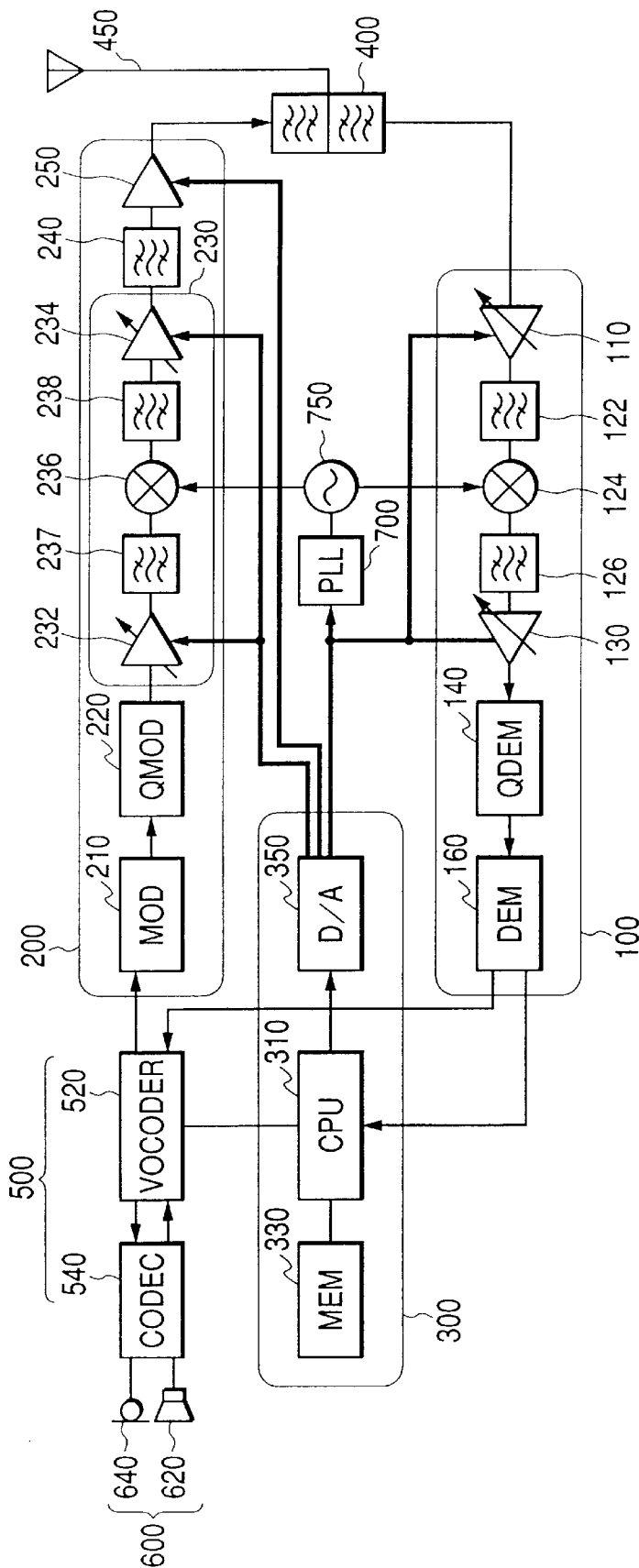


FIG. 2

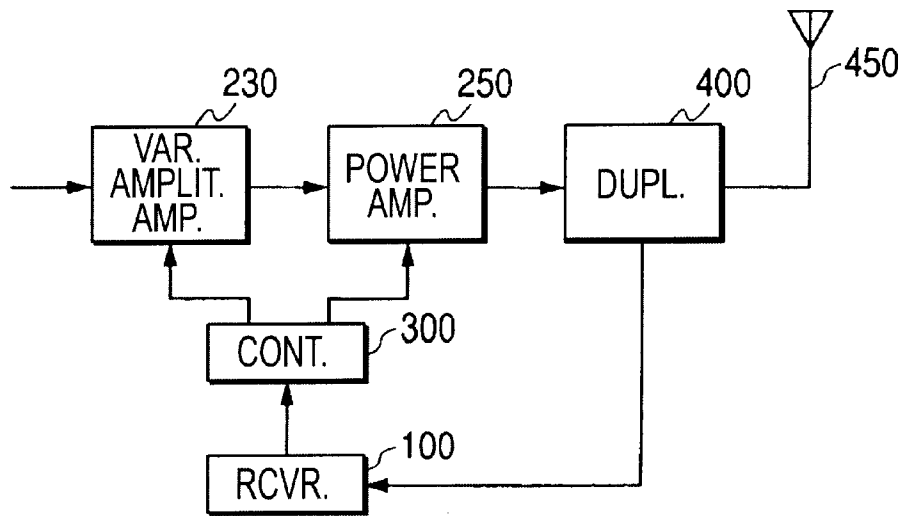


FIG. 3

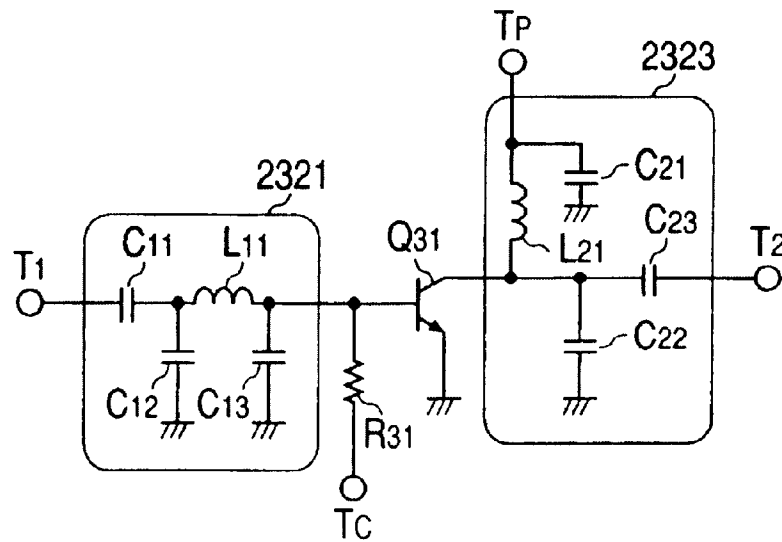


FIG. 4

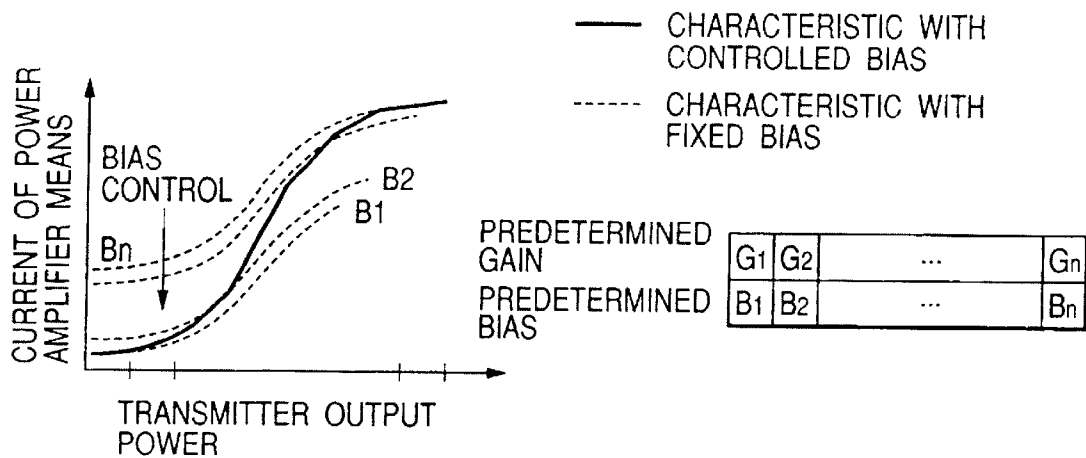
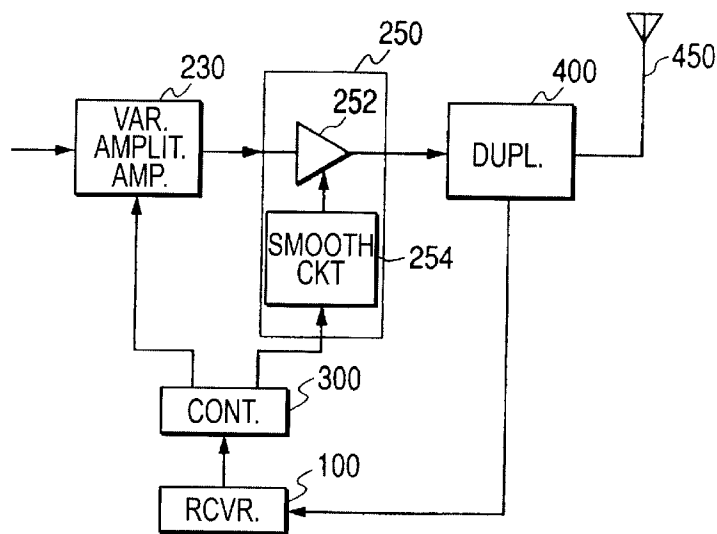


FIG. 5



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