

United States Patent [19]

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Ehlers

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- [54] PROGRAMMABLE FUNCTIONS FOR RECONFIGURABLE REMOTE CONTROL
- [75] Inventor: Raymond G. Ehlers, Chesapeake, Va.
- [73] Assignee: General Electric Company, Portsmouth, Va.
- [21] Appl. No.: 610,549
- [22] Filed: May 15, 1984
- [51] Int. Cl.⁴ G08C 19/00; H04B 9/00
- [52] U.S. Cl. 340/825.69; 340/825.57; 340/825.72; 455/603; 455/608; 358/194.1
- [58] Field of Search 340/825.57, 825.69, 340/825.72, 825.34, 825.31; 358/194.1; 375/69; 455/601, 603, 608

- [56] **References Cited**
- U.S. PATENT DOCUMENTS**
- 4,535,333 8/1985 Twardowski 340/825.69

Primary Examiner—Ulysses Weldon
 Assistant Examiner—Ralph Smith

- [57] **ABSTRACT**
- A reconfigurable remote control transmitter is disclosed

that has the ability to learn, store and repeat the remote control codes from any other infrared transmitter. The reconfigurable remote control transmitter includes an infrared receiver, a microprocessor, nonvolatile and scratch pad random access memories, and an infrared transmitter. The microprocessor application is divided into four main categories: learning, storing, retransmitting, and user interface. In the learning process, the reconfigurable remote control transmitter receives and decodes the transmissions from another remote control transmitter. The process is repeated at least twice for each key to make sure that it has been properly received and decoded. Once the data has been received and decoded, it is stored for later use. In order to do this, the received and decoded data is compressed so that it can fit into the nonvolatile memory. This process is repeated for each of the several remote control transmitters that are to be replaced by the reconfigurable remote control transmitter. When the learning and storing operations have been completed, the reconfigurable remote control transmitter is ready to use.

6 Claims, 23 Drawing Figures

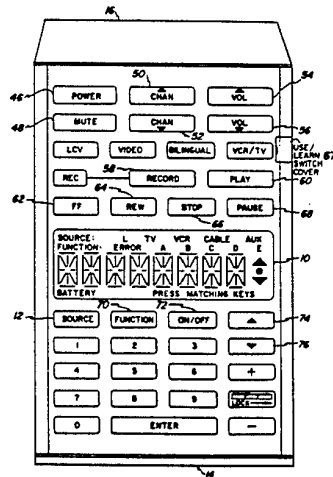


FIG. 1

MODULATION SCHEMES

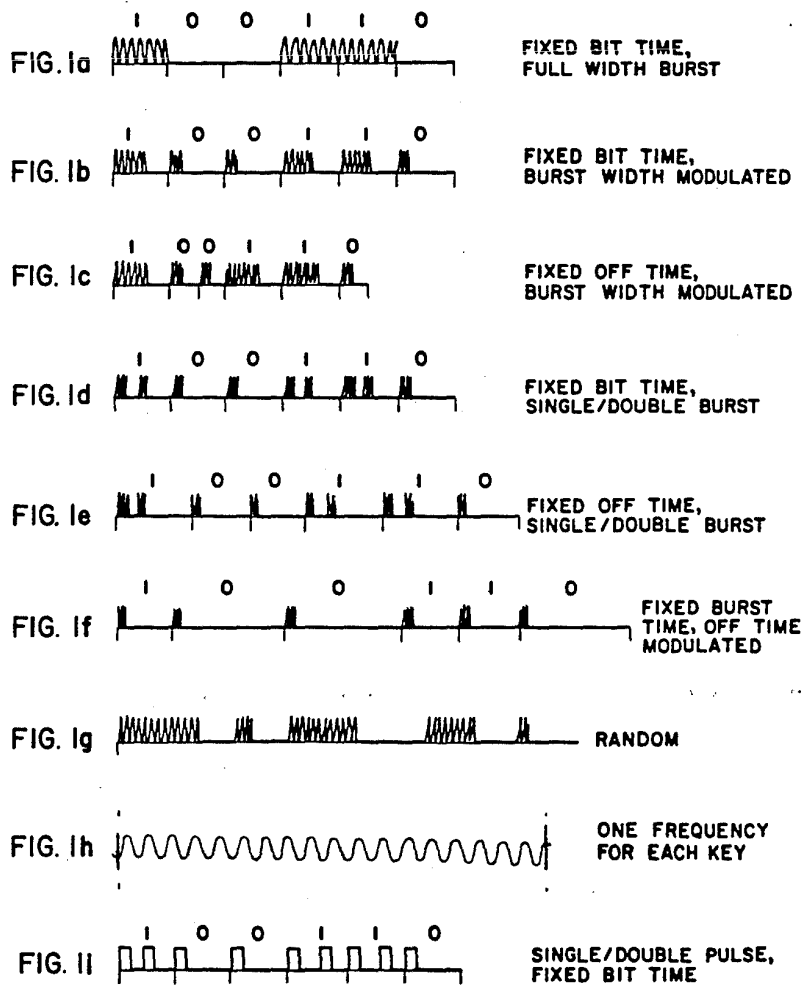
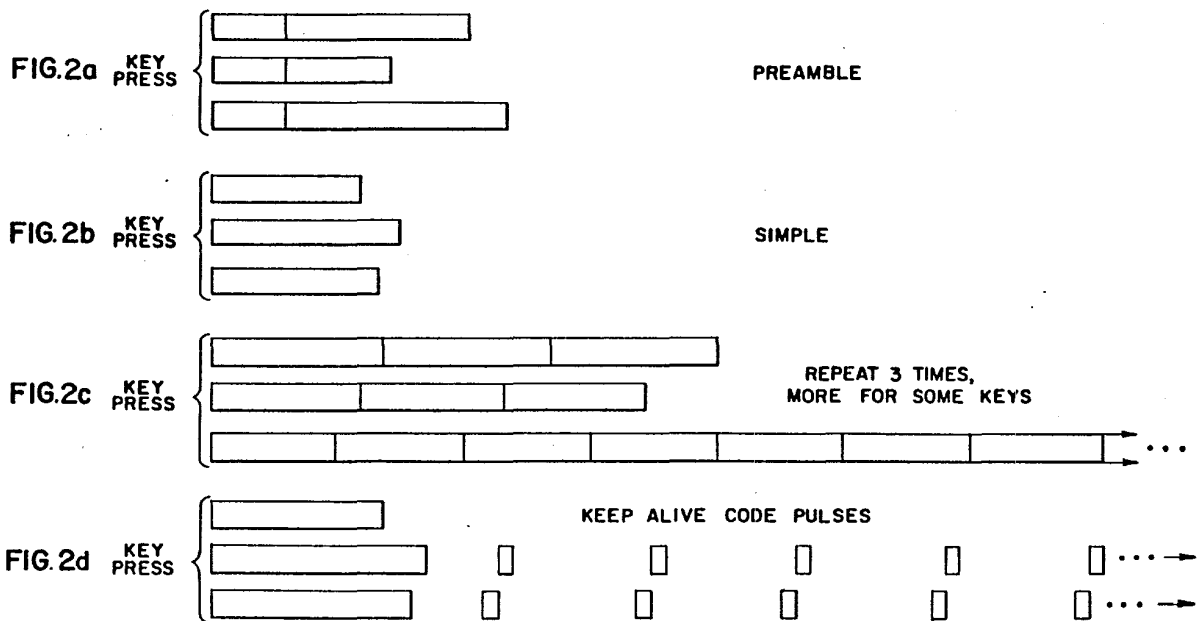
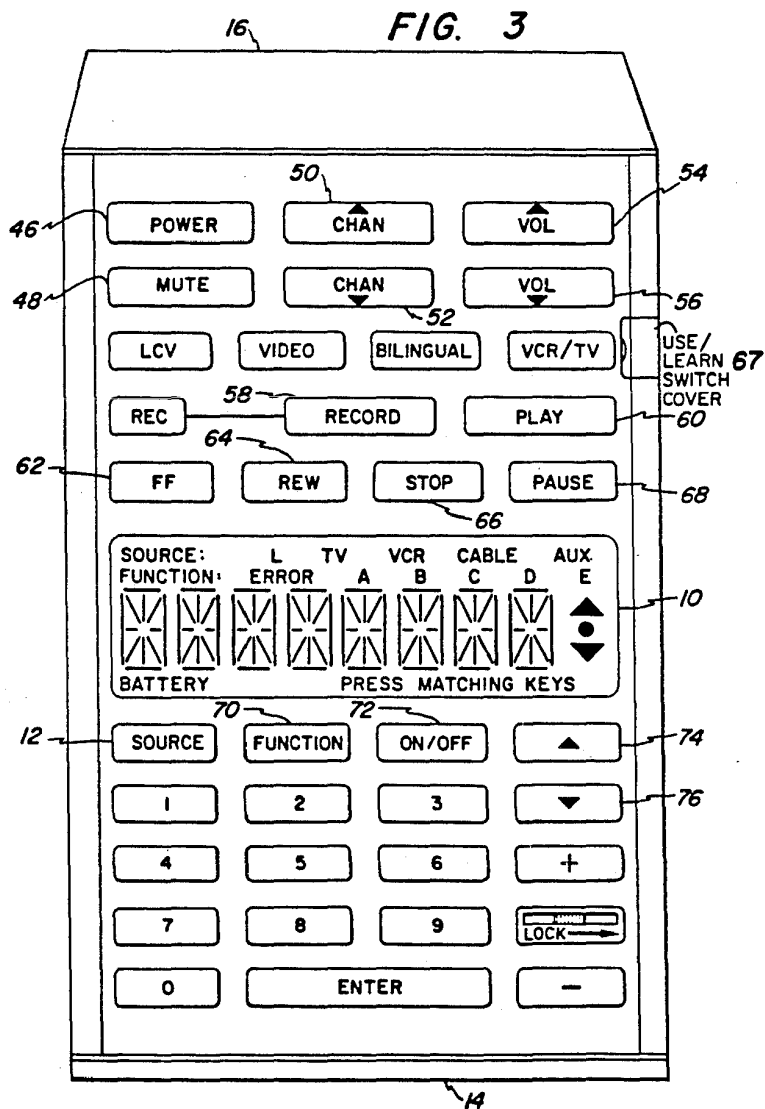


FIG. 2

KEYBOARD ENCODING SCHEMES





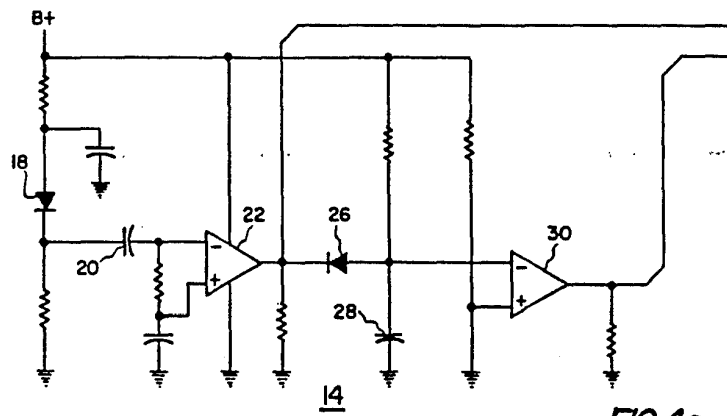
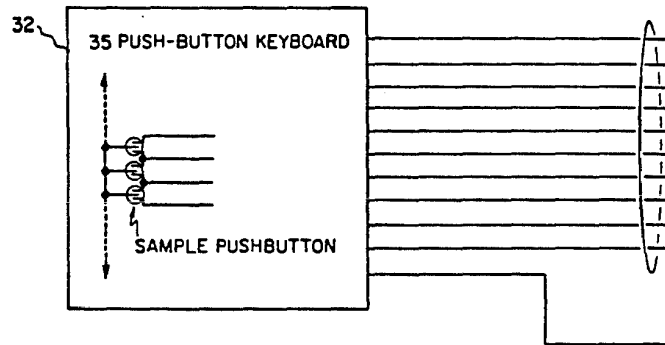


FIG. 4a

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