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(12) **United States Patent**  
**Yu et al.**

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(54) **APPARATUS FOR TRANSMITTING AND RECEIVING DATA TO PROVIDE HIGH-SPEED DATA COMMUNICATION AND METHOD THEREOF**

(58) **Field of Classification Search**  
USPC ..... 375/340, 267, 299, 260; 455/101; 370/240  
See application file for complete search history.

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(21) Appl. No.: **13/292,715**

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**Prior Publication Data**

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**Related U.S. Application Data**

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**Foreign Application Priority Data**

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Feb. 11, 2005 (WO) ..... PCT/KR2005/000393

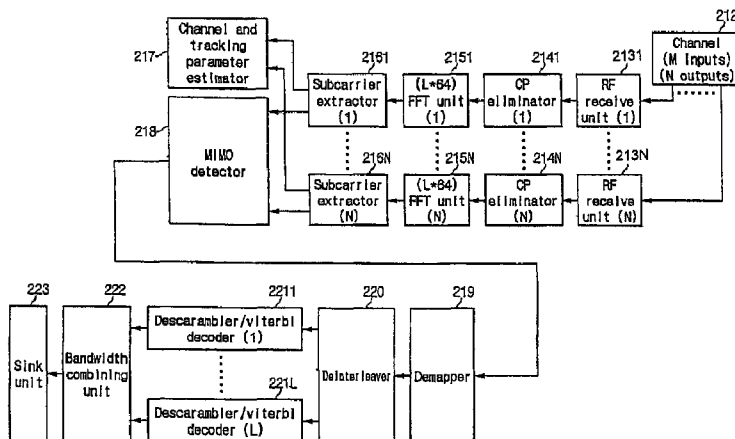
(51) **Int. Cl.**  
**H04L 27/06** (2006.01)

(52) **U.S. Cl.**  
USPC ..... **375/340; 375/267; 375/299; 375/260; 455/101; 370/240**

(57) **ABSTRACT**

In the present invention, data generated from a source unit are distributed to at least one bandwidth; the data distributed to the respective bandwidths are encoded in order to perform an error correction; the encoded data are distributed to at least one antenna; a subcarrier is allocated to the data distributed to the respective antennas, and an inverse Fourier transform is performed; a short preamble and a first long preamble corresponding to the subcarrier are generated; a signal symbol is generated according to a data transmit mode; and a frame is generated by adding a second long preamble between the signal symbol and a data field for the purpose of estimating a channel of a subcarrier which is not used.

**59 Claims, 9 Drawing Sheets**



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Fig. 1  
(PRIOR ART)

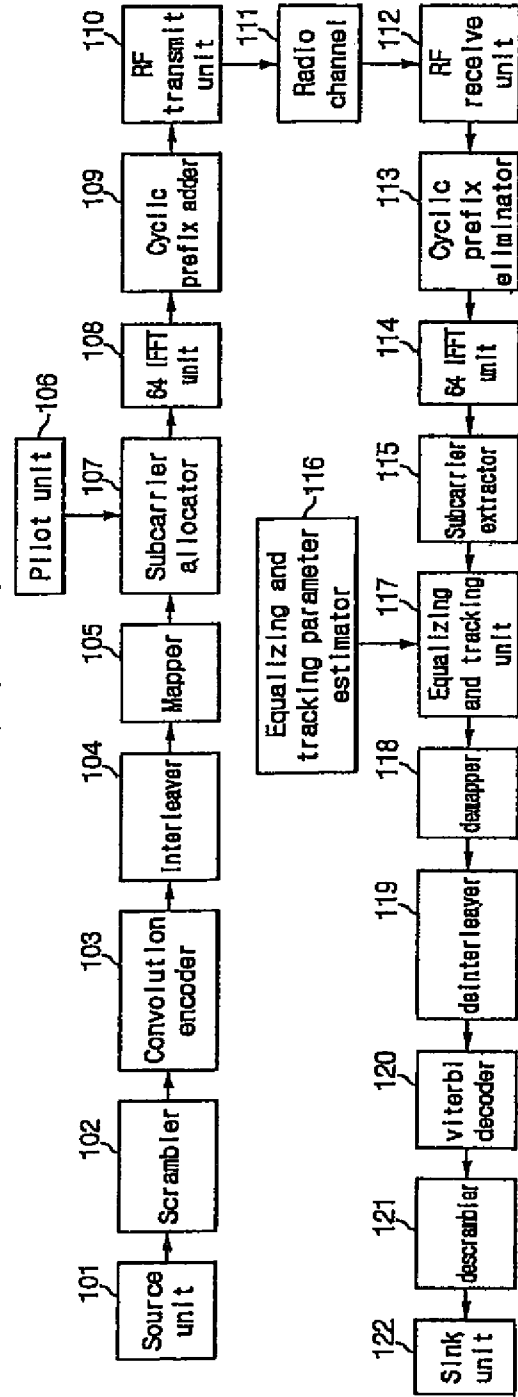


Fig. 2

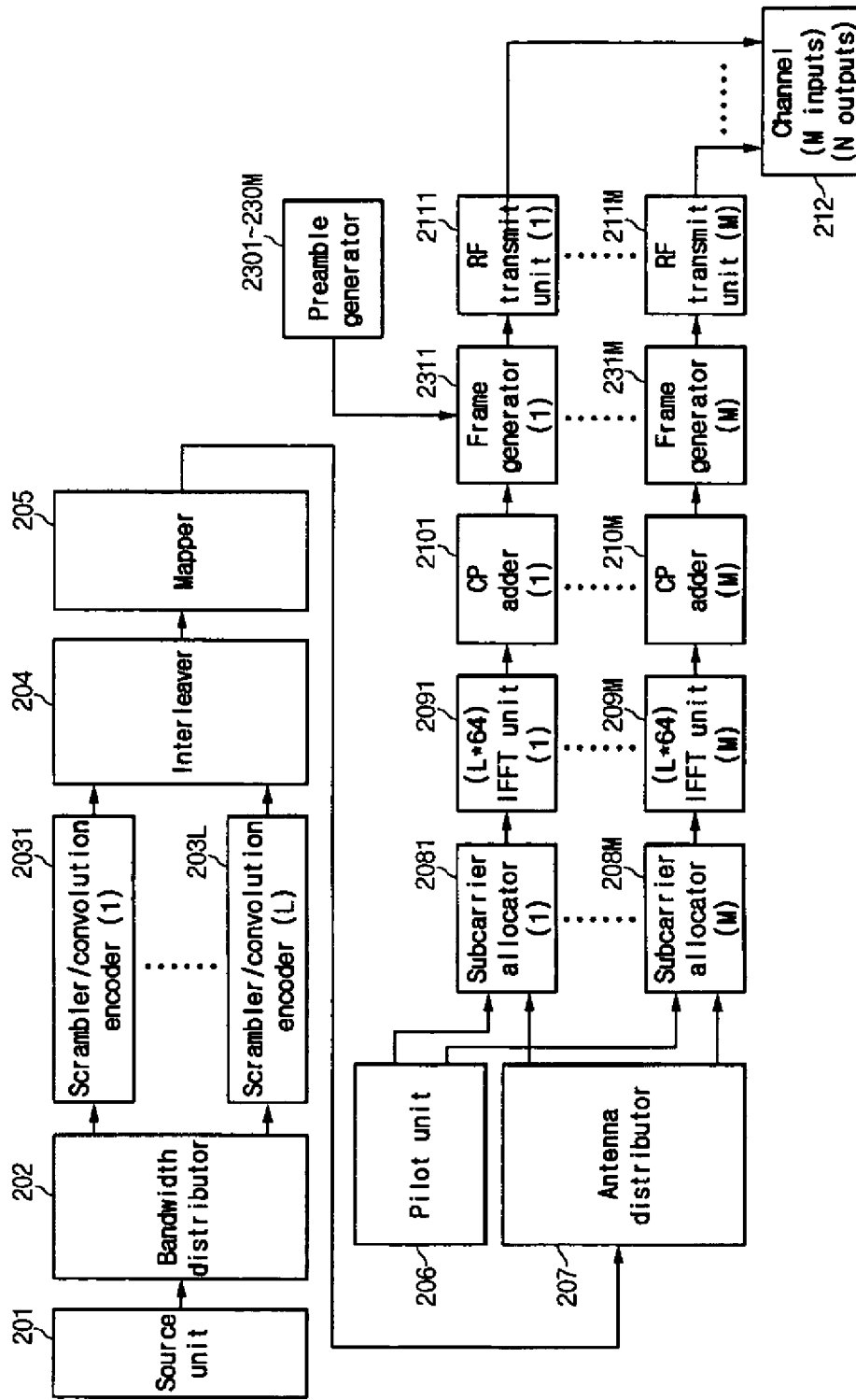
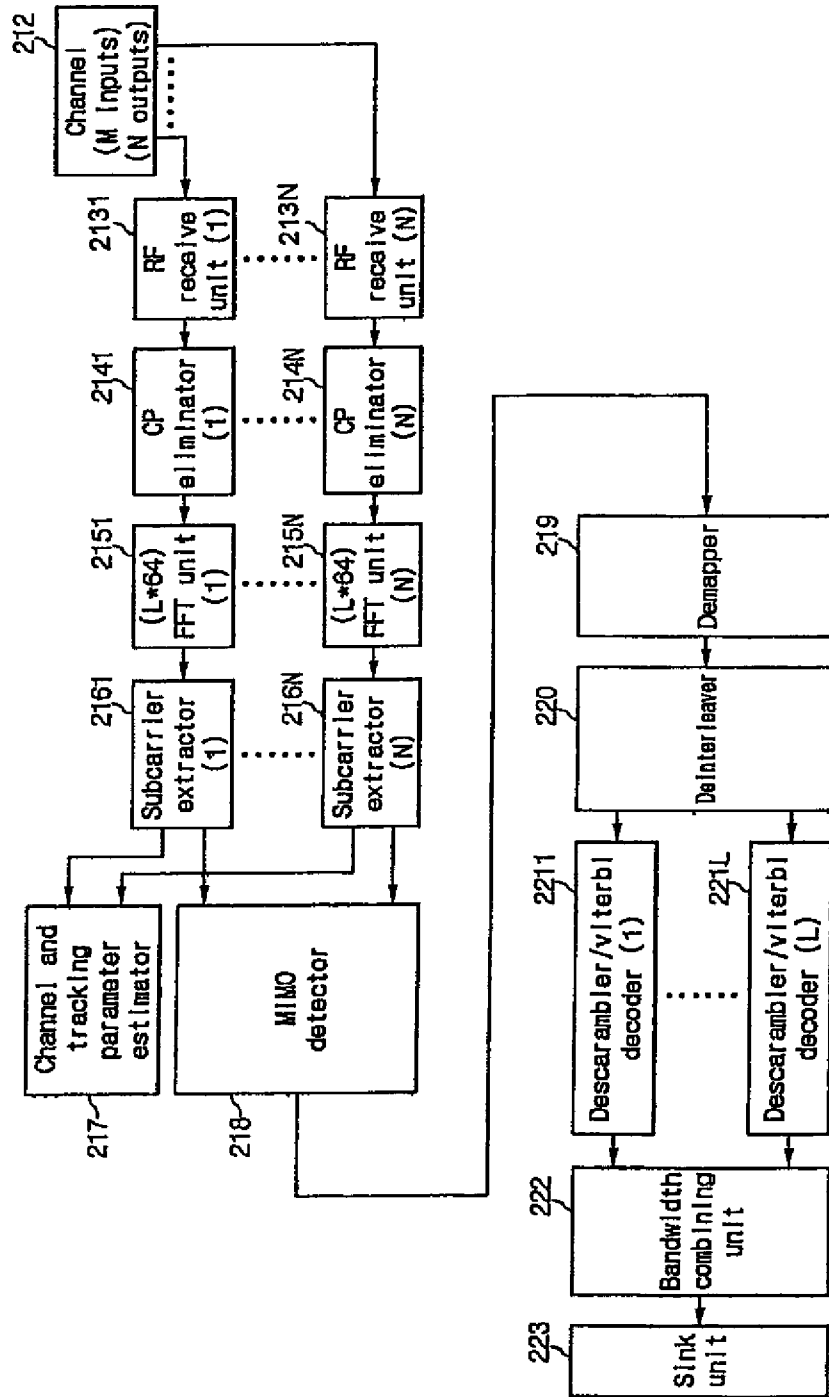


Fig. 3



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