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

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(54) **DYNAMIC SUB-CARRIER ASSIGNMENT IN OFDM SYSTEMS**

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(75) Inventors: **Bassam M. Hashem**, Nepean (CA);
David G. Steer, Nepean (CA); **Shalini S. Periyalwar**, Ottawa (CA)

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(73) Assignee: **Nortel Networks Limited**, St. Laurent (CA)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 419 days.

* cited by examiner

(21) Appl. No.: **09/672,704**

Primary Examiner—Cong Van Tran

(22) Filed: **Sep. 29, 2000**

(51) **Int. Cl.**⁷ **H04Q 7/20**

(57) **ABSTRACT**

(52) **U.S. Cl.** **455/450**; 455/509; 455/414.1; 455/464; 370/203; 370/208

A method and apparatus are provided for selecting and signaling the identity of sub-carriers to be used for transmission of data in a radio communication system, and for using other sub-carriers. A remote unit determines which sub-carriers are acceptable for use in data transmission by comparing the signal to interference ratio of each sub-carrier with a threshold. A base station transmits data over the acceptable sub-carriers at the optimum Link Mode or Link Modes. The base station may use some of the unacceptable sub-carriers for transmission of low sensitivity data at the optimum Link Mode, and may use some of the unacceptable sub-carriers for transmission of data at a lower Link Mode. The transmission power any unused unacceptable sub-carriers can be diverted to other sub-carriers.

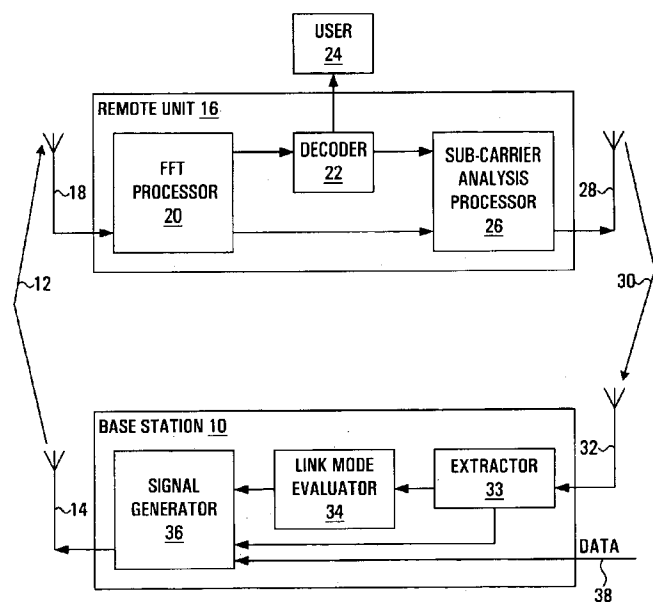
(58) **Field of Search** 455/450, 455, 455/464, 509, 511, 515, 154.1, 166.2, 185.1, 130, 135, 277.2, 403, 408, 407, 414.1; 370/343, 344, 330, 341, 342, 208, 203, 480; 375/260, 349

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23 Claims, 6 Drawing Sheets



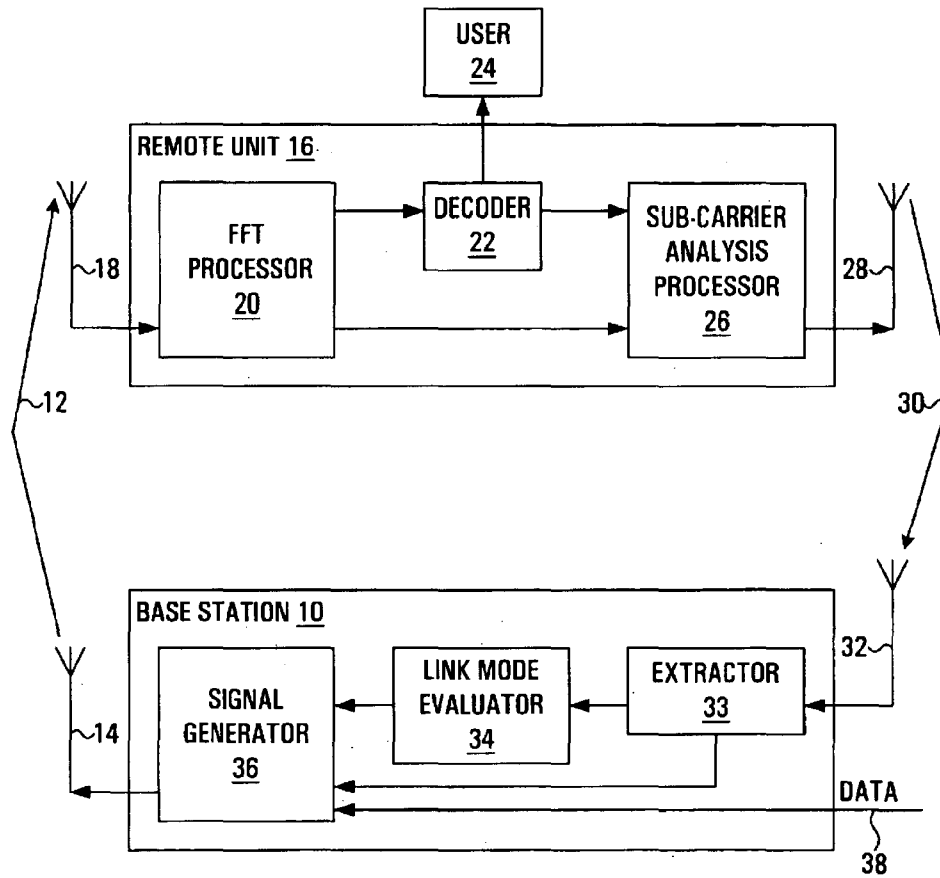


FIG. 1

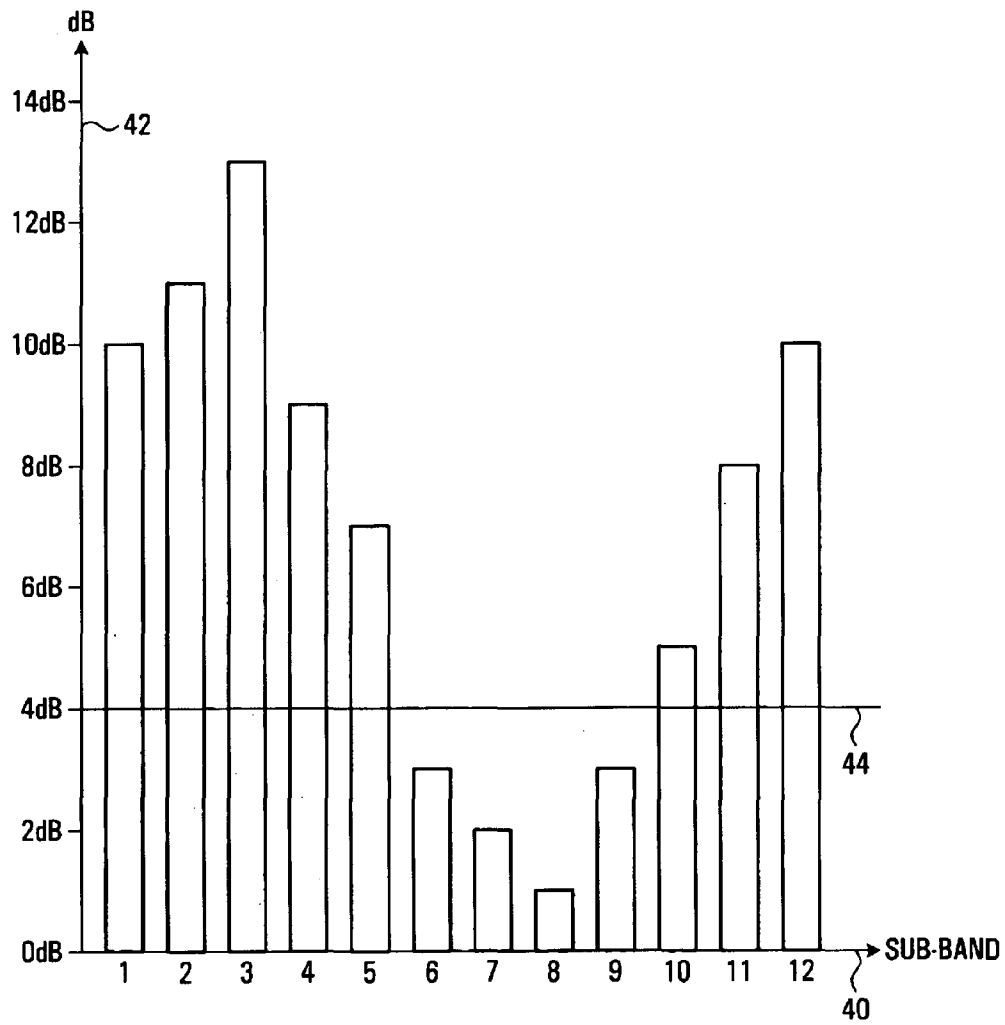


FIG. 2

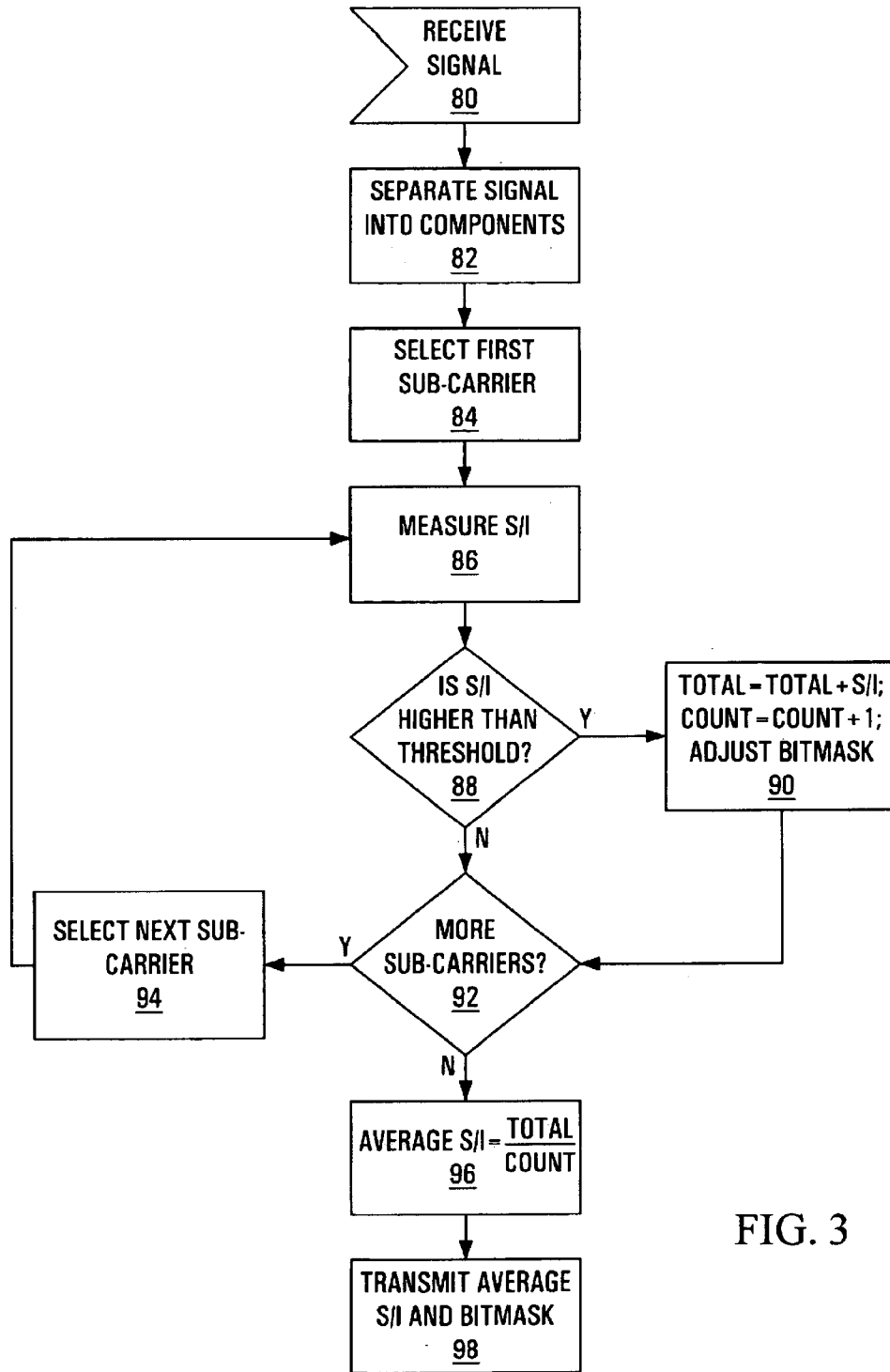


FIG. 3

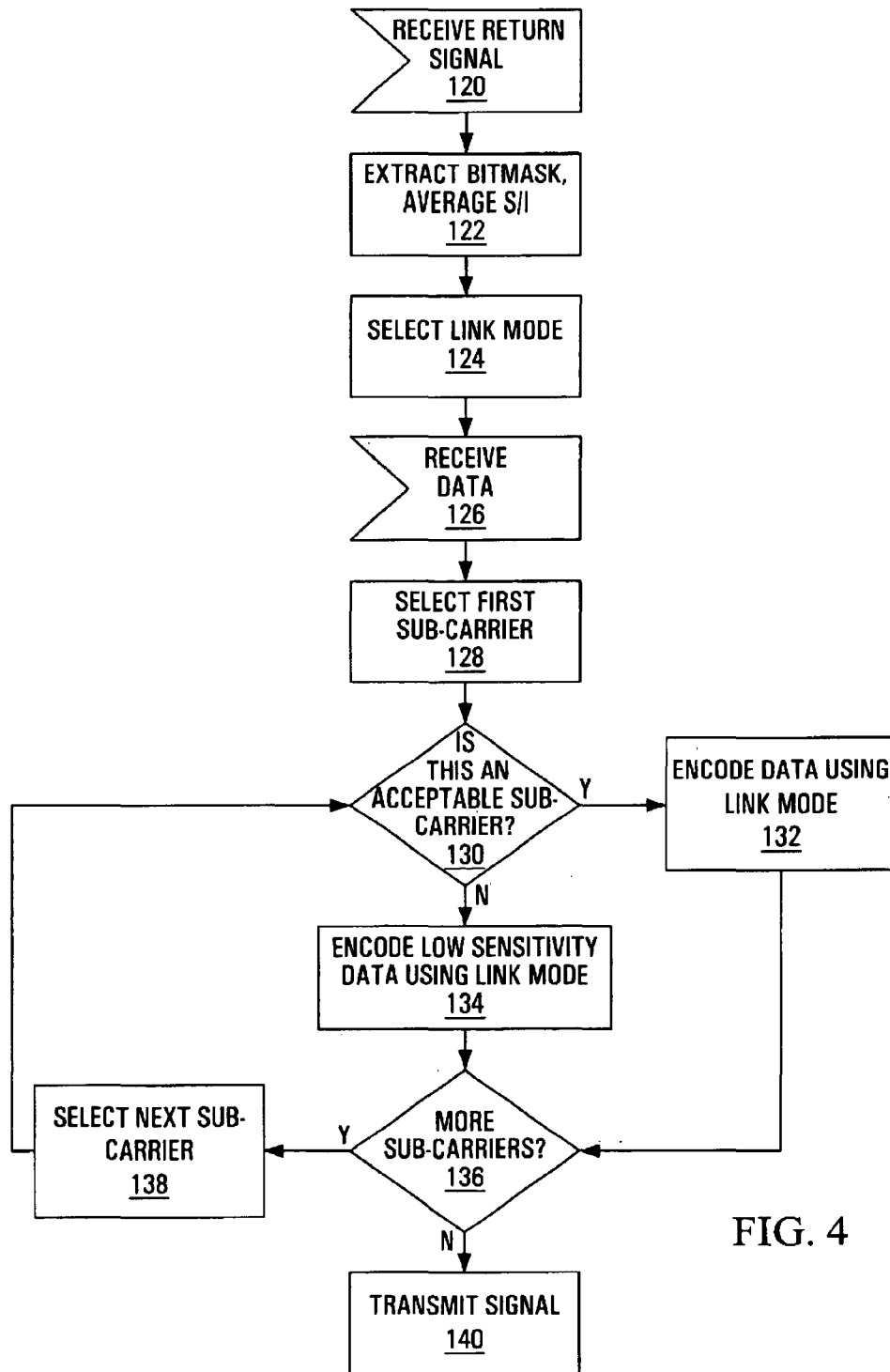


FIG. 4

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