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(12) **United States Patent**
Jalali

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(54) **TRANSMISSION OF SIGNALING IN AN OFDM-BASED SYSTEM**

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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 1466 days.

(21) Appl. No.: **10/944,146**

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(65) **Prior Publication Data**

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Related U.S. Application Data

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(51) **Int. Cl.**
H04J 11/00 (2006.01)

(52) **U.S. Cl.** **370/208**; 370/329; 455/102

(58) **Field of Classification Search** 370/208–210, 370/329, 341, 348; 455/101, 102, 105
See application file for complete search history.

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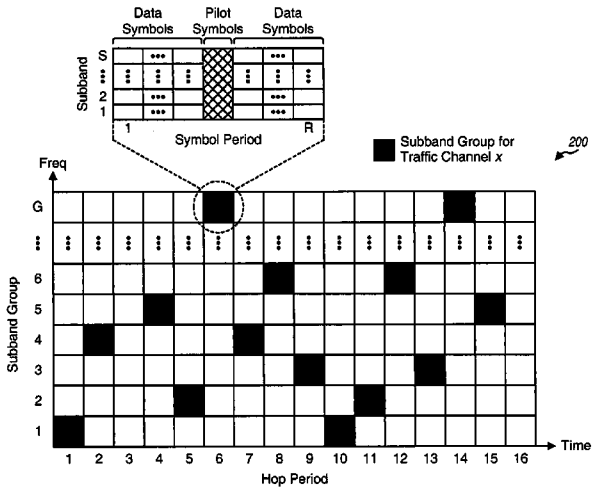
(57) **ABSTRACT**

Techniques for efficiently transmitting various types of signaling on the forward and reverse links in an OFDM-based system are described. Instead of specifically allocating subbands to individual signaling channels, signaling data for a signaling channel on a given link is sent as "underlay" to other transmissions that may be sent on the same link. Each wireless terminal is assigned a different PN code. The signaling data for each terminal is spectrally spread over all or a portion of the system bandwidth using the assigned PN code. For the reverse link, a wireless terminal may transmit signaling on all N usable subbands and may transmit traffic data on L subbands assigned for data transmission, which may be a subset of the N usable subbands. For the forward link, a base station may transmit signaling and traffic data for all terminals on the N usable subbands.

52 Claims, 10 Drawing Sheets



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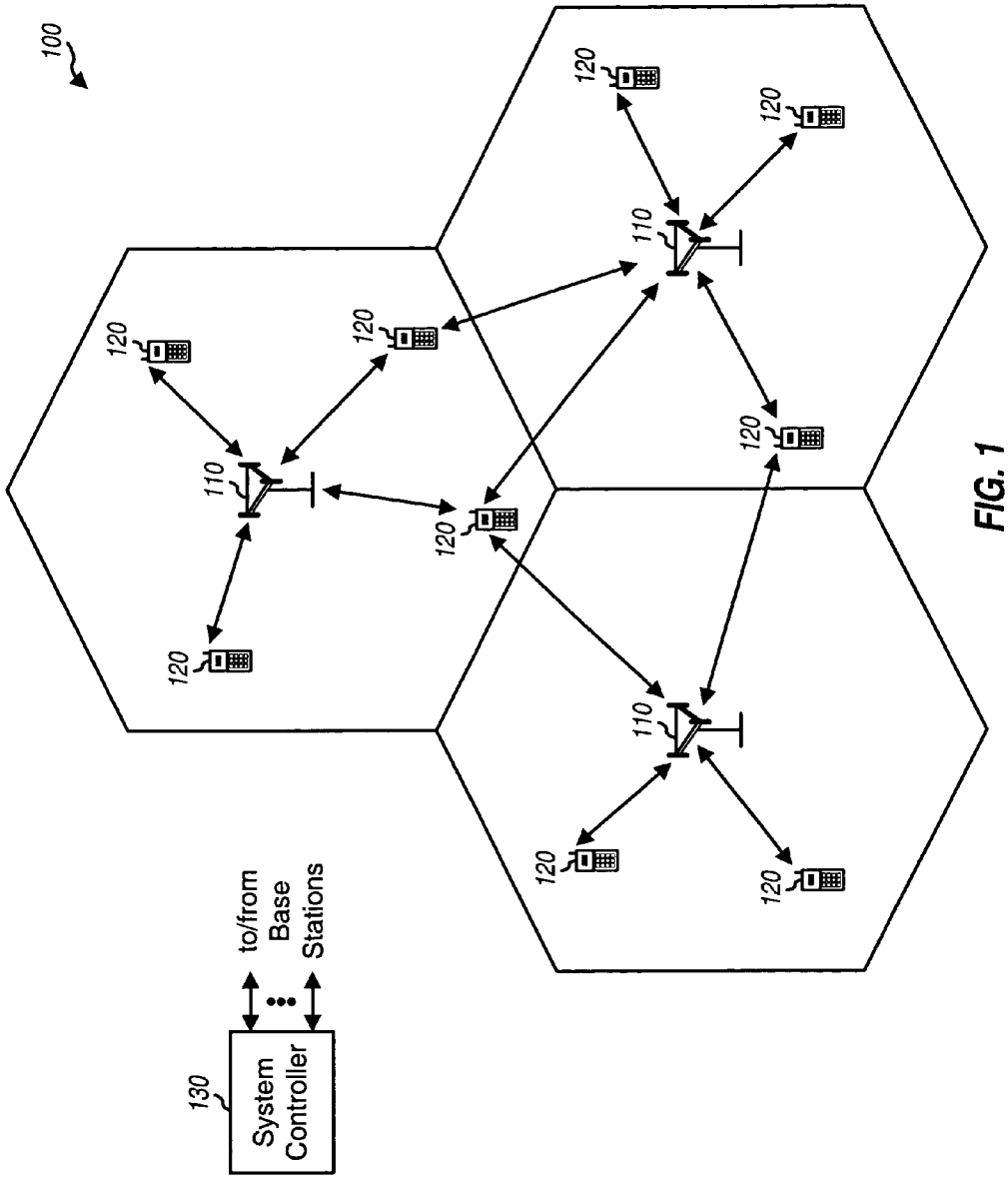

FIG. 1

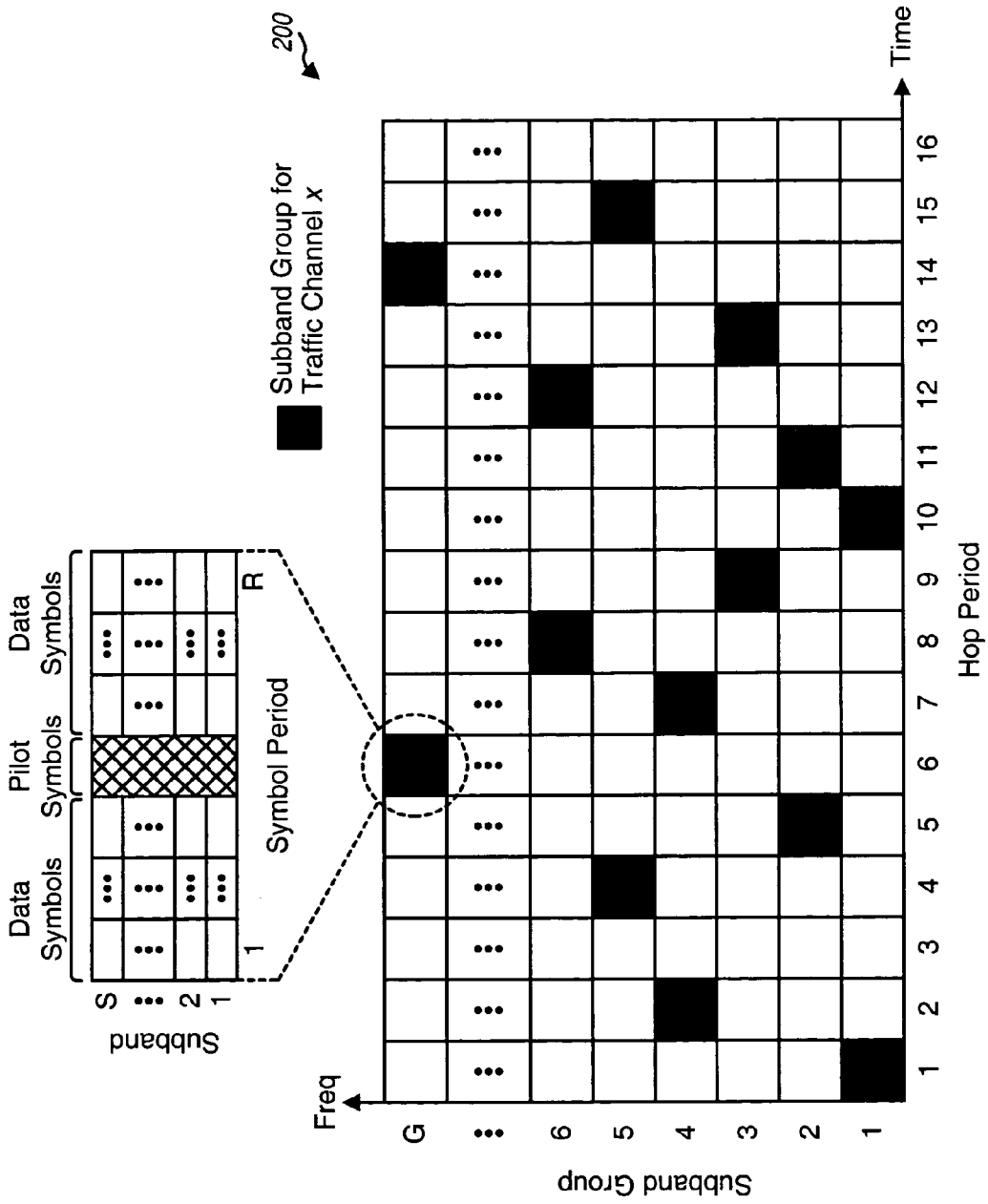

FIG. 2

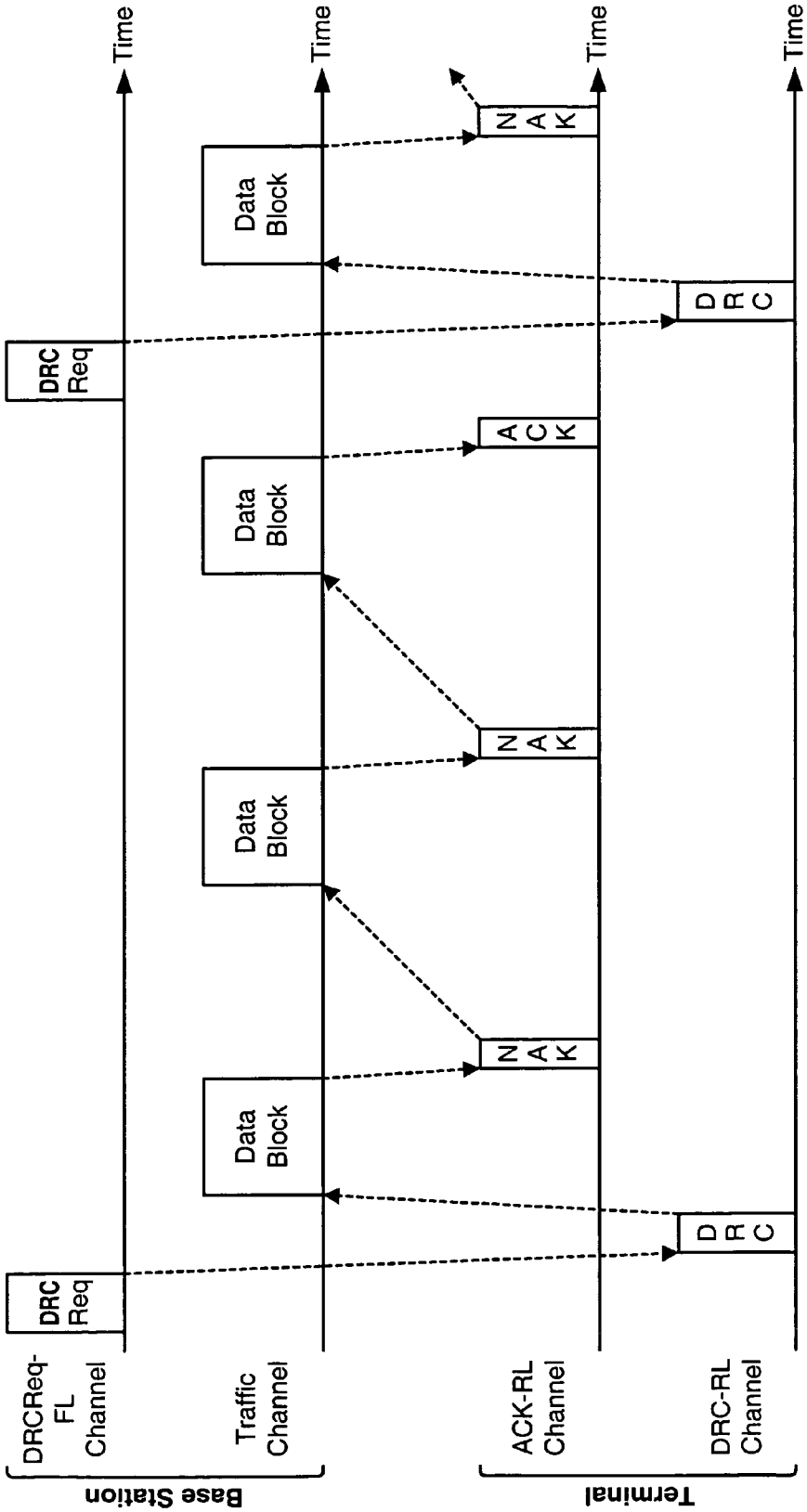

FIG. 3

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