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(54) **PILOT DESIGN FOR OFDM SYSTEMS WITH FOUR TRANSMIT ANTENNAS**

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H04J 11/00 (2006.01)

(52) **U.S. Cl.**
USPC **370/208; 370/328; 370/334; 370/437; 375/260; 375/267; 455/562.1; 455/101**

(58) **Field of Classification Search**

USPC 370/328, 334, 208, 437; 375/260, 375/267; 455/101, 562.1
See application file for complete search history.

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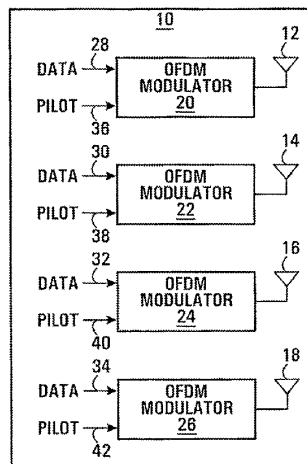
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(57) **ABSTRACT**

Pilot, preamble and midamble patterns are provided that are particularly suited for four transmit antenna OFDM systems. Pilots are inserted in a scattered manner for each of the four antennas, either uncoded, space-time coded in pairs, space-time frequency coded in pairs, or space-time-frequency coded.

30 Claims, 28 Drawing Sheets



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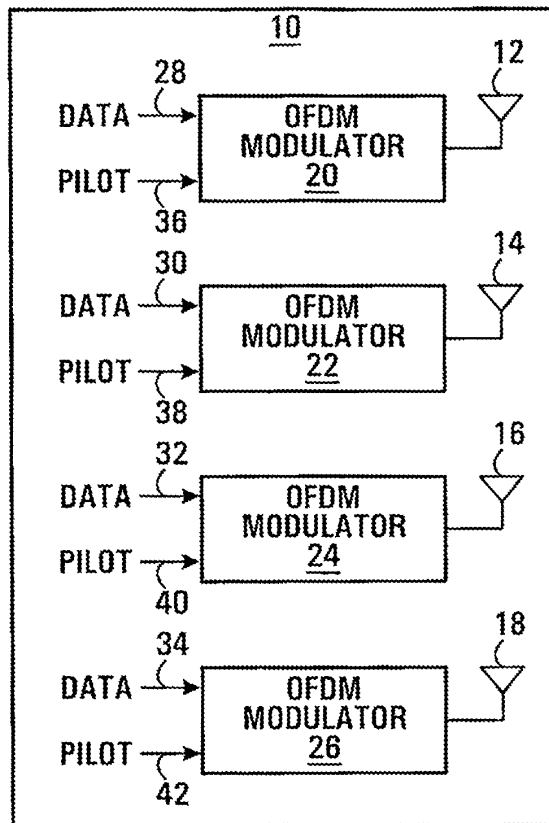


FIG. 1

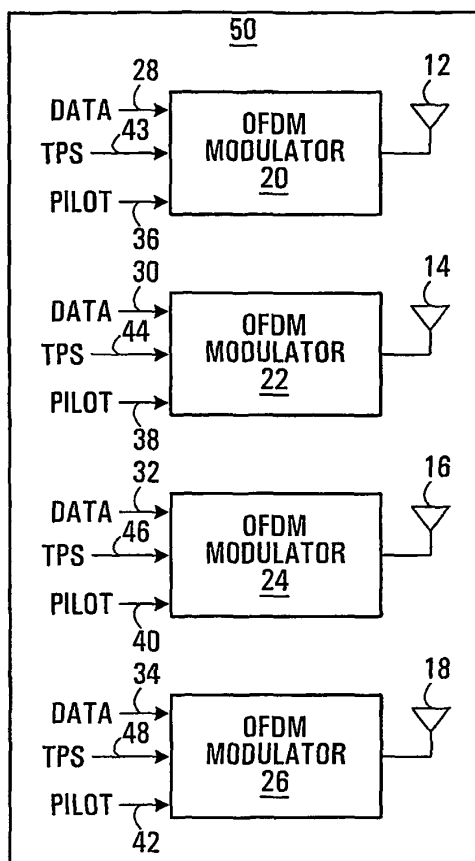


FIG. 2

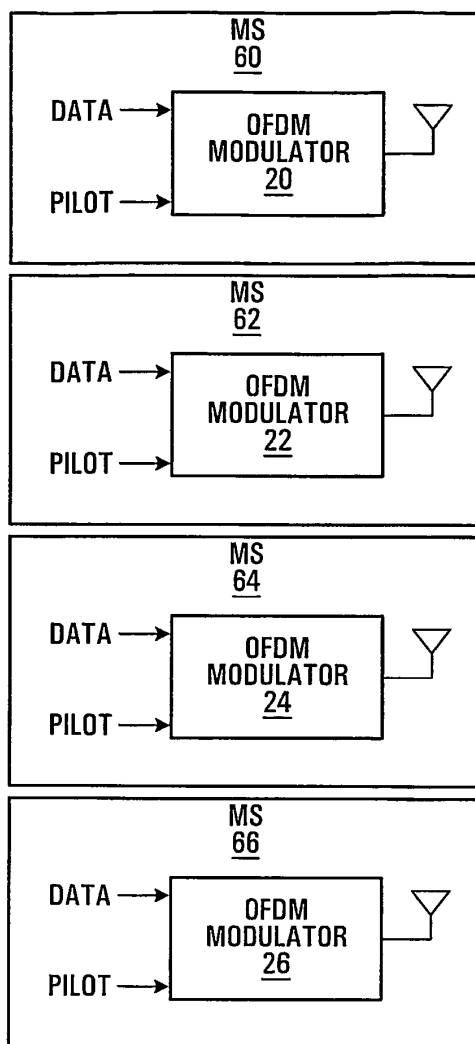


FIG. 3

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