



US007436758B2

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

(10) **Patent No.:** **US 7,436,758 B2**
(45) **Date of Patent:** **Oct. 14, 2008**

(54) **APPARATUS AND METHOD FOR TRANSMITTING/RECEIVING PILOT PATTERN SET TO DISTINGUISH BASE STATION IN ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING (OFDM) COMMUNICATION SYSTEM**

(75) Inventors: **Chang-Ho Suh**, Seoul (KR); **Jung-Min Ro**, Seoul (KR); **Seok-Hyun Yoon**, Seoul (KR); **Young-Kwon Cho**, Suwon-si (KR)

(73) Assignee: **Samsung Electronics Co., Ltd** (KR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 629 days.

(21) Appl. No.: **10/974,413**

(22) Filed: **Oct. 27, 2004**

(65) **Prior Publication Data**
US 2005/0088960 A1 Apr. 28, 2005

(30) **Foreign Application Priority Data**
Oct. 27, 2003 (KR) 10-2003-0075194

(51) **Int. Cl.**
H04J 11/00 (2006.01)
H04Q 7/20 (2006.01)

(52) **U.S. Cl.** **370/203; 370/208; 370/491**

(58) **Field of Classification Search** **370/203, 370/208, 335, 342, 491**
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,567,374 B1* 5/2003 Bohnke et al. 370/203

7,002,901 B2*	2/2006	Yun et al.	370/209
7,218,617 B1*	5/2007	Usuda et al.	370/320
2004/0114504 A1*	6/2004	Jung et al.	370/203
2004/0218523 A1*	11/2004	Varshney et al.	370/208
2004/0228267 A1*	11/2004	Agrawal et al.	370/203
2004/0258134 A1*	12/2004	Cho et al.	375/131
2005/0002369 A1*	1/2005	Ro et al.	370/342
2005/0058097 A1*	3/2005	Kang et al.	370/329
2005/0111429 A1*	5/2005	Kim et al.	370/344
2006/0146867 A1*	7/2006	Lee et al.	370/465
2006/0279435 A1*	12/2006	Krishnan et al.	341/29

* cited by examiner

Primary Examiner—Min Jung
(74) *Attorney, Agent, or Firm*—The Farrell Law Firm, PC

(57) **ABSTRACT**

An apparatus and method for transmitting/receiving a pilot pattern set to distinguish a base station in an FDM communication system. The method divides a total frequency bandwidth into at least two sub-bandwidths including a plurality of sub-carriers in an OFDMA (Orthogonal Frequency Division Multiple Access) mobile communication system, configures a single frame cell (FC) using one sub-bandwidth from among the sub-bandwidths and a plurality of OFDM (Orthogonal Frequency Division Multiplexing) symbol intervals, and assigns a pilot signal to a time-frequency cell comprised of at least one OFDM symbol and at least one sub-carrier within the FC. The method includes the steps of spreading a pilot signal and a data signal using different orthogonal codes, synthesizing the spread pilot and data signals, and performing a CDM (Code Division Multiplexing) process; and mapping the CDM-processed pilot and data signals to a predetermined time-frequency cell in the FC.

22 Claims, 11 Drawing Sheets

