

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

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(54) **METHOD OF TRANSMITTING DATA IN A MOBILE COMMUNICATION SYSTEM**

(52) **U.S. Cl.** 370/328; 370/329; 370/330
(58) **Field of Classification Search** 370/328
See application file for complete search history.

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(56) **References Cited**

U.S. PATENT DOCUMENTS

2005/0286409 A1 12/2005 Yoon et al.
2006/0153282 A1* 7/2006 Jung et al. 375/146

FOREIGN PATENT DOCUMENTS

JP 04-035332 2/1992
JP 11-154929 6/1999

(Continued)

OTHER PUBLICATIONS

Chang et al: "Synchronization Method Based on a New Constant Envelop Preamble for OFDM Systems," IEEE Transactions on Broadcasting, vol. 51, No. 1, Mar. 2005, pp. 139-143, XP-011127926.

(Continued)

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(57) **ABSTRACT**

Disclosed is a data transmission method in a mobile communication system. The data transmission method through a code sequence in a mobile communication system includes grouping input data streams into a plurality of blocks consisting of at least one bit so as to map each block to a corresponding signature sequence, multiplying a signature sequence stream, to which the plurality of blocks are mapped, by a specific code sequence, and transmitting the signature sequence stream multiplied by the specific code sequence to a receiver.

16 Claims, 22 Drawing Sheets

(73) Assignee: **LG Electronics Inc.**, Seoul (KR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 135 days.

(21) Appl. No.: **12/303,947**

(22) PCT Filed: **Jun. 8, 2007**

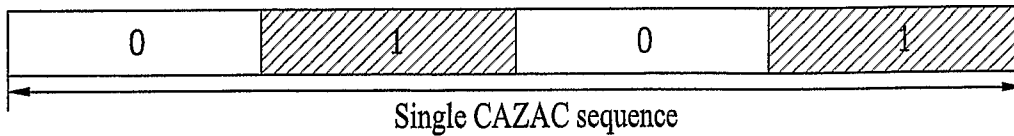
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§ 371 (c)(1),
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PCT Pub. Date: **Dec. 13, 2007**

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Jun. 26, 2006 (KR) 10-2006-0057488

(51) **Int. Cl.**
H04L 12/50 (2006.01)



 General CAZAC sequence of 0

 Conjugate CAZAC sequence of 1

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FOREIGN PATENT DOCUMENTS

JP	2000102067	4/2000
JP	2001268051	9/2001
JP	2003179576	6/2003
JP	2004512728	4/2004
JP	2004274794	9/2004
JP	2005260337	9/2005
WO	9637079 A1	11/1996
WO	01/11909 A1	2/2001

WO	2005/011128	2/2005
WO	2005/055527	6/2005
WO	2006/015108	2/2006

OTHER PUBLICATIONS

Texas Instruments: "On Allocation of Uplink Pilot Sub-Channels in EUTRA SC-FDMA," R1-050822, 3GPP TSG-RANWG1 AdHoc on LTE, Aug. 2005, XP-002448008.

* cited by examiner

FIG. 1

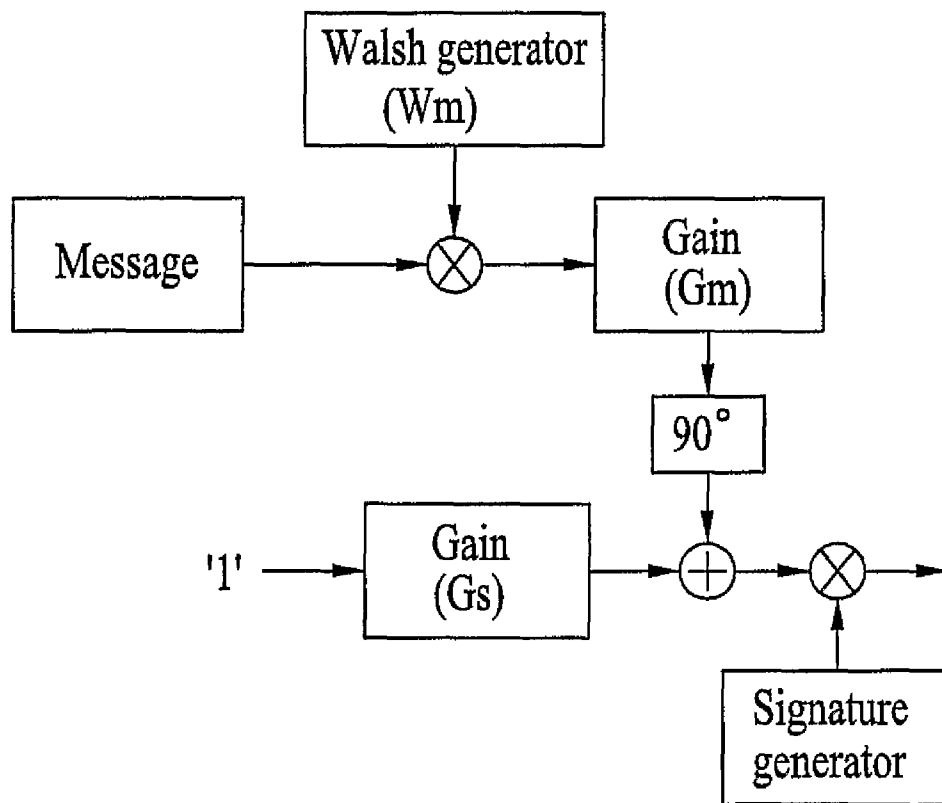


FIG. 2

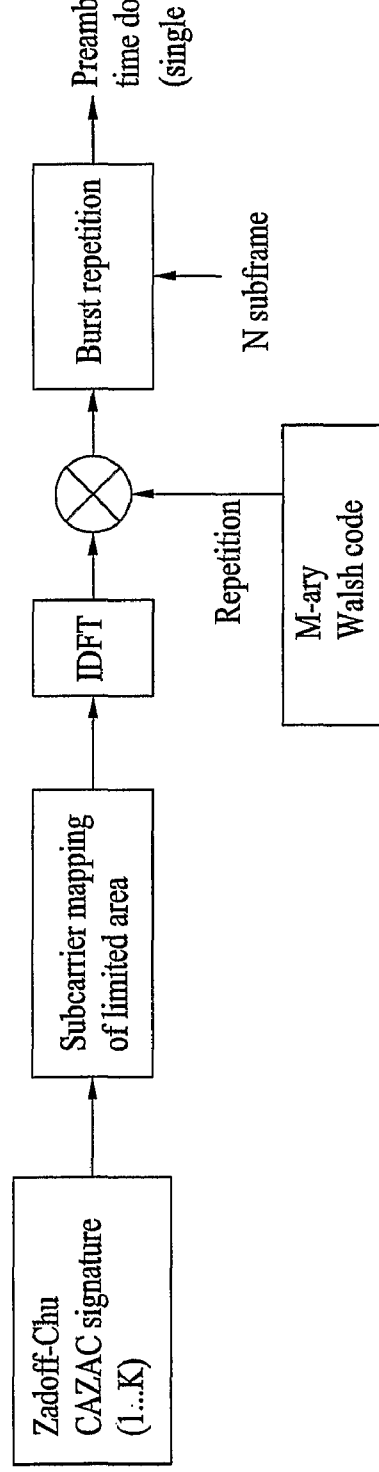


FIG. 3A

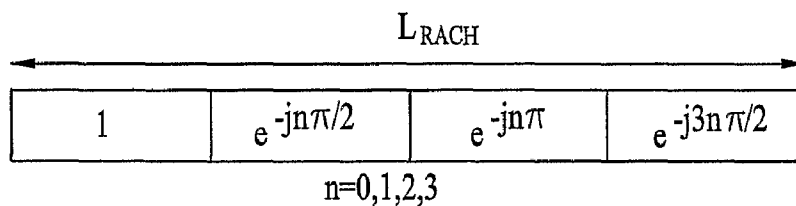


FIG. 3B

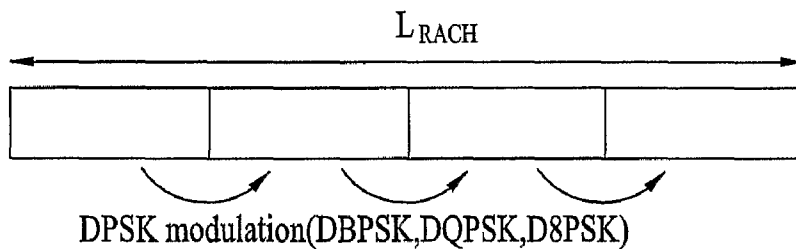


FIG. 4A

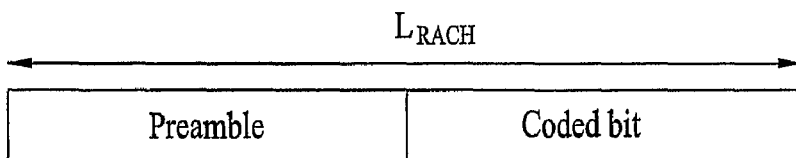
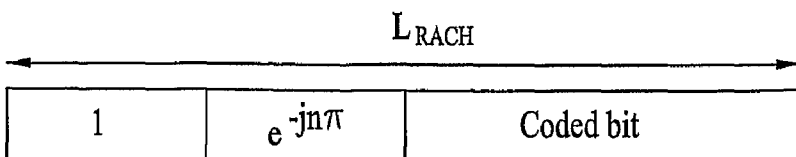


FIG. 4B



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