

EXHIBIT F



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

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(54) **CODE DIVISION MULTIPLE ACCESS
 MOBILE COMMUNICATION 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 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/869,920**

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(65) **Prior Publication Data**
 US 2004/0228316 A1 Nov. 18, 2004

Related U.S. Application Data

(63) Continuation of application No. 09/518,690, filed on Mar. 3, 2000, now Pat. No. 6,879,571, which is a continuation of application No. 09/257,002, filed on Feb. 25, 1999, now Pat. No. 6,507,576.

(30) **Foreign Application Priority Data**
 May 13, 1998 (JP) 10-129995

(51) **Int. Cl.**
H04B 1/00 (2006.01)

(52) **U.S. Cl.** 375/150; 370/342; 370/335

(58) **Field of Classification Search** 375/130, 375/133, 134, 137, 142, 145, 149, 150, 326, 375/356, 362, 335; 370/342, 328, 335
 See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,969,159 A 11/1990 Belcher et al.

(Continued)

FOREIGN PATENT DOCUMENTS

EP 693834 A1 1/1996

(Continued)

OTHER PUBLICATIONS

IEEE, K. Higushi et al, "Fast Cell Research Algorithm in DS-CDMA Mobile Radio Using Long Spreading Codes," May 4, 1997, pp. 1430-1434.

(Continued)

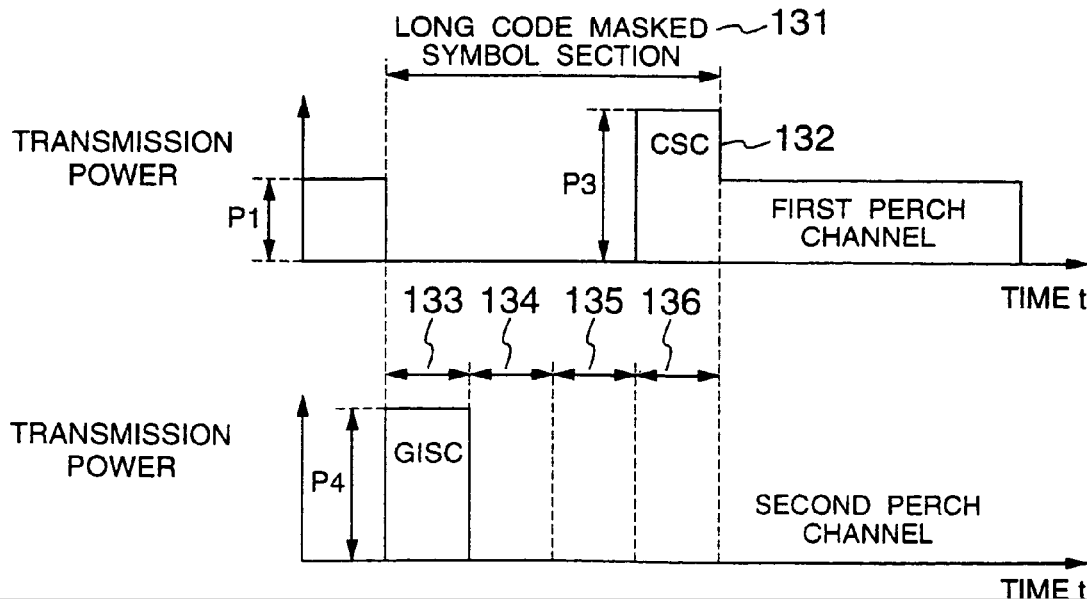
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(57) **ABSTRACT**

In a mobile communication system using a code division multiple access (CDMA) method, spreading code detection and frame/slot timing synchronization (cell search) is conducted by using a long code masked symbol. The spreading factor of the long code masked symbol is set to a value lower than spreading factors of other ordinary symbols. As a result, it becomes possible to reduce the circuit scale and power dissipation of the mobile terminal and raise the speed of cell search.

2 Claims, 11 Drawing Sheets



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U.S. PATENT DOCUMENTS

6,226,315	B1	5/2001	Sriram et al.	
6,370,134	B1*	4/2002	Aramaki	370/342
6,385,232	B1	5/2002	Terashima	
6,459,724	B1	10/2002	Yoneyama	
6,665,277	B1*	12/2003	Sriram	370/324
6,754,251	B1*	6/2004	Sriram et al.	375/145
6,891,817	B2*	5/2005	Miya et al.	370/335
2004/0057414	A1*	3/2004	Sriram	370/342
2005/0213643	A1*	9/2005	Iwamoto et al.	375/149
2005/0213644	A1*	9/2005	Iwamoto et al.	375/149

FOREIGN PATENT DOCUMENTS

EP	0825737	2/1998
EP	838 910	4/1998

EP	0388910	4/1998
EP	0852430	7/1998
JP	61-248698	5/1986
JP	8-79131	3/1996
JP	08-307316	11/1996
JP	09-261121	10/1997
WO	WO 99/12273	3/1999

OTHER PUBLICATIONS

Translation of the Institute of Electronics, Information and Communication Engineers, Technical Report of IEICE DSP98-116, SAT96-111, RCS96-122 (Jan. 1997).
 K. Higuchi et al, "Fast Cell Search Algorithm in DS-CDMA Mobile Radio Using Long Spreading Codes", IEEE, 47th, May 4-7, 1997, pp. 1430-1434.

* cited by examiner

FIG. 1

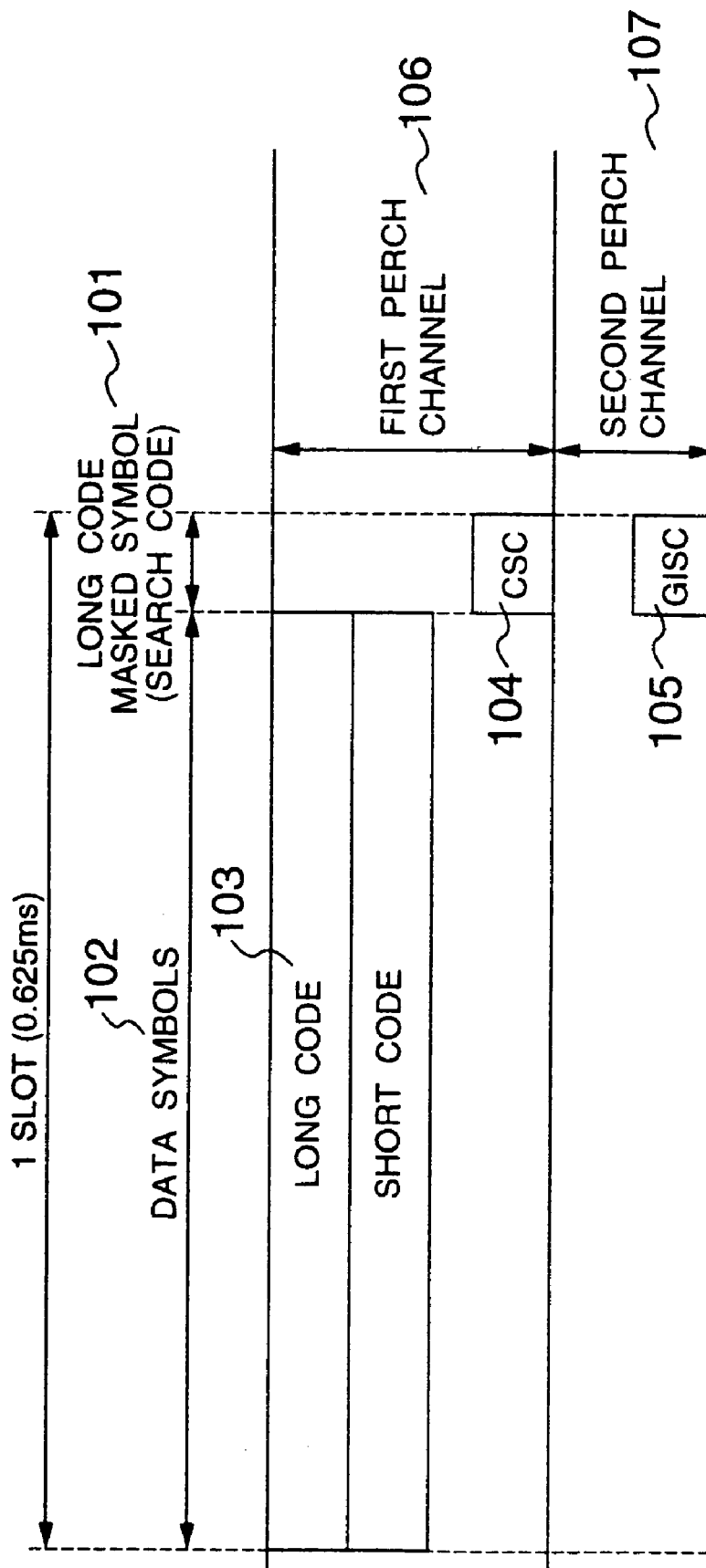


FIG. 2

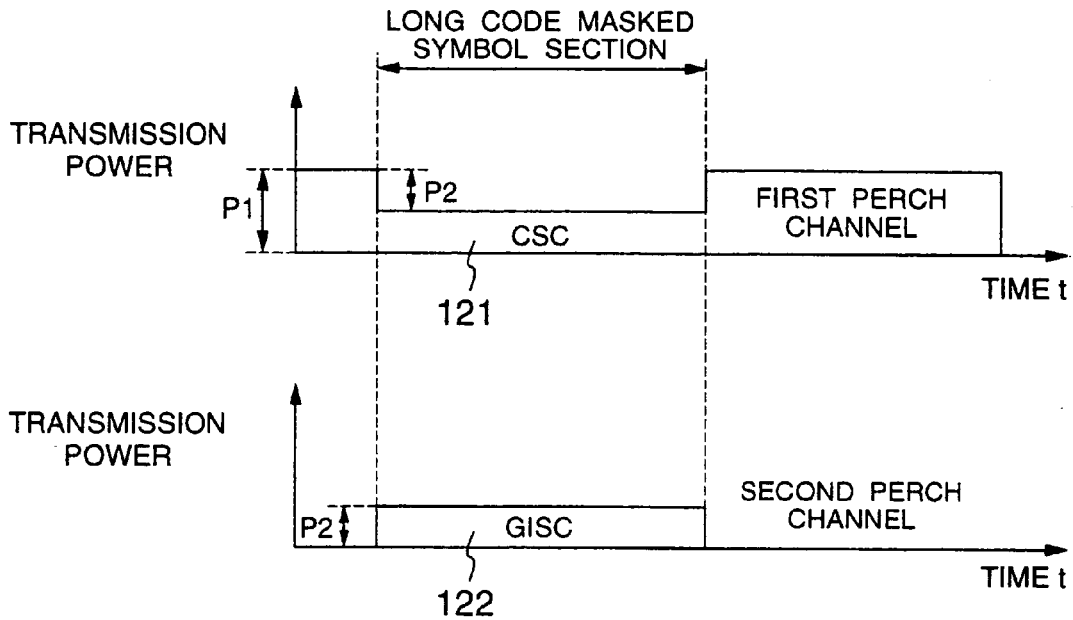
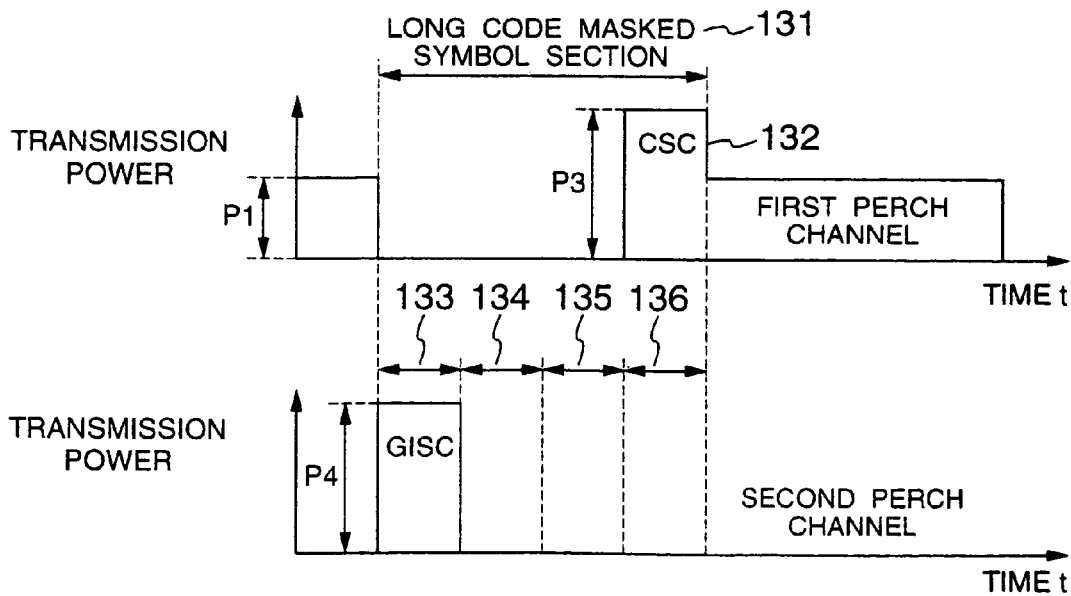


FIG. 3



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