3GPP TSG RAN WG1 (Radio) Meeting #9
Dresden, Germany. 30 NOV 1999 - 3 DEC 1999

Document R1-99h87
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.223	CR	002	Current Version:	V3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: Texas Instruments **Date:** 2 Nov 1999

Subject: Cycling of cell parameters

Work item: TS25.223

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature	X		Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Improvement in performance by reduction of false paths.

Clauses affected: 7.2,7.3

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	25.221-CR003, 25.224-CR003
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

7.2 Code Allocation

Three SCH codes are QPSK modulated and transmitted in parallel with the primary synchronization code. The QPSK modulation carries the following information.

- The code group that the base station belongs to (5 bits; Cases 1,2,3)
- The position of the frame within an interleaving period of 20 msec (1 bit, Cases 1,2,3)
- The position of the slot within the frame (1 bit, Cases 2,3)
- SCH transport channel information, e.g. the location of the Primary CCPCH (3 bits, Case 3)

The modulated codes are also constructed such that their cyclic-shifts are unique, i.e. a non-zero cyclic shift less than 2 (Case 1) and 4 (Cases 2 and 3) of any of the sequences is not equivalent to some cyclic shift of any other of the sequences. Also, a non-zero cyclic shift less than 2 (Case 1) and 4 (Cases 2 and 3) of any of the sequences is not equivalent to itself with any other cyclic shift less than 8. The secondary synchronization codes are partitioned into two code sets for Case 1, four code sets for Case 2 and thirty two code sets (possibly overlapping) for Case 3. The PSCH is modulated with a +1 or –1 to aid in cell identification, which is useful for GSM to TDD handover. The PSCH is modulated with a +1 if the initial cell parameter is one of the first two parameters in its code group. The PSCH is modulated with a –1 if the initial cell parameter is one of the last two parameters in its code group. The initial cell parameter is defined in Table 8 in Section 7.3. The code set of the PSCH is used to provide the following information:

7.3 Evaluation of synchronisation codes

The evaluation of information transmitted in SCH on code group and frame timing is shown in table 7, where the 32 code groups are listed. Each code group is containing 4 specific scrambling codes (cf. section 6.3), each scrambling code associated with a specific short and long basic midamble code.

Each code group is additionally linked to a specific t_{Offset}, thus to a specific frame timing. By using this scheme, the UE can derive the position of the frame border due to the position of the SCH sequence and the knowledge of t_{Offset}. The complete mapping of Code Group to Scrambling Code, Midamble Codes and t_{Offset} is depicted in table 7.

Table 7: Mapping scheme for Cell Parameters, Code Groups, Scrambling Codes, Midambles and t_{Offset}

CELL PARA-METER	Code Group	Associated Codes			Associated t_{Offset}
		Scrambling Code	Long Basic Midamble Code	Short Basic Midamble Code	
0	Group 1	Code 0	m_{PL0}	m_{SL0}	t_0
1		Code 1	m_{PL1}	m_{SL1}	
2		Code 2	m_{PL2}	m_{SL2}	
3		Code 3	m_{PL3}	m_{SL3}	
4	Group 2	Code 4	m_{PL4}	m_{SL4}	t_1
5		Code 5	m_{PL5}	m_{SL5}	
6		Code 6	m_{PL6}	m_{SL6}	
7		Code 7	m_{PL7}	m_{SL7}	
. . . .					
124	Group 32	Code 124	m_{PL124}	m_{SL124}	t_{31}
125		Code 125	m_{PL125}	m_{SL125}	
126		Code 126	m_{PL126}	m_{SL126}	
127		Code 127	m_{PL127}	m_{SL127}	

For basic midamble codes m_p cf.TS 25.221, annex A 'Basic Midamble Codes'.

Each cell will cycle through the four sets of cell parameters in a code group with the cell parameters changing each frame. The cycling patterns in different cells are synchronized through use of the 12-bit system frame number (SFN). Table 8 shows how the cell parameters are cycled according to the SFN. The cell parameters are changed from frame to frame so that the crosscorrelations between midambles of different cells will change from frame to frame. Both the BS and UE receivers may use these changing crosscorrelations to aid path estimation.

Table 8 Alignment of cell parameter cycling and system frame number

Initial Cell Parameter Assignment	Code Group	Cell Parameter used when SFN mod 4 = 0	Cell Parameter used when SFN mod 4 = 1	Cell Parameter used when SFN mod 4 = 2	Cell Parameter used when SFN mod 4 = 3
0	Group 1	0	1	2	3
1		1	2	3	0
2		2	3	0	1
3		3	0	1	2
4	Group 2	4	5	6	7
5		5	6	7	4
6		6	7	4	5
7		7	4	5	6
. . . .					
124	Group 32	124	125	126	127
125		125	126	127	124
126		126	127	124	125
127		127	124	125	126