3GPP/SMG Meeting #12
Seoul, Korea, April 10-April 18 2000

Document R1-00586
e.g. for 3GPP use the format TP-99xxx
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CHANGE REQUEST

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25.213	CR	034r1	Current Version:	3.2.0

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

For submission to:	WG1 # 12	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: Nortel Networks **Date:**

Subject: Numbering of the PCPCH access preamble and collision detection preamble scrambling codes

Work item: TS 25.213

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			Release 98	
D	Editorial modification	X		Release 99	X
				Release 00	

Reason for change:

Clauses affected:

Other specs affected:

Other 3G core specifications		→ List of CRs:
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.

4.3.4 PCPCH preamble codes

4.3.4.1 Access preamble

4.3.4.1.1 Access preamble code construction

Similar to PRACH access preamble codes, the PCPCH access preamble codes $C_{c\text{-}acc,n,s}$, are complex valued sequences. The PCPCH access preamble codes are built from the preamble scrambling codes $S_{c\text{-}acc,n}$ and a preamble signature $C_{sig,s}$ as follows:

- $C_{c\text{-}acc,n,s}(k) = S_{c\text{-}acc,n}(k) \times C_{sig,s}(k) \times e^{j(\frac{\pi}{4}+\frac{\pi}{2}k)}$, k = 0, 1, 2, 3, …, 4095;
  - where $S_{c\text{-}acc,n}$ and $C_{sig,s}$ are defined in section 4.3.4.1.2 and 4.3.4.1.3 below respectively.

4.3.4.1.2 Access preamble scrambling code

~~The access preamble scrambling code generation is done in a way similar to that of PRACH. There are 32768 PCPCH scrambling codes in total.~~

The scrambling code for the PCPCH preamble part is constructed from the long scrambling sequences. There are 40960 PCPCH access preamble scrambling codes in total.

The *n*:th PCPCH access preamble scrambling code, where *n* =*0, ..., ~~8192,8193,~~ …,40959* is defined as:

- $S_{c\text{-}acc,n}(i) = c_{long,1,n}(i)$, i = 0, 1, …, 4095;

where the sequence $c_{long,1,n}$ is defined in section 4.3.2.2.

~~In the case when the access resources are shared between the PRACH and PCPCH, the scrambling codes used in the PRACH preamble are used for the PCPCH preamble as well.~~

The 40960~~32768~~ PCPCH access preamble scrambling codes are divided into 512 groups with 80~~64~~ codes in each group. There is a one-to-one correspondence between the group of PCPCH access preamble scrambling codes in a cell and the primary scrambling code used in the downlink of the cell. The *k*:th PCPCH scrambling code within the cell with downlink primary scrambling code *m*, for *k* = 0,...~~16,17,…~~, 79 and *m* = 0, 1, 2, …, 511, is $S_{c\text{-}acc,\ n}$ as defined above with n=64×m+k for k=0,...,15 and *n* = 64×*m* + *(k-16)*+*8192~~76~~* for k=16,..., 79 .

The index k=0,...,15 may only be used as a PCPCH access preamble part scrambling code if the same code is also used for a PRACH.

The index k=16,..., 79 correspond to PCPCH access preamble scrambling codes which are not shared together with a PRACH. This leads to 32768 PCPCH specific preamble scrambling codes divided into 512 groups with 64 elements. ~~In case scrambling code resource is shared between PCPCH and PRACH, the index k is less than 16 and the corresponding PRACH formulae shall be used. Otherwise, if the index k is greater than or equal to 16, the formula in this section shall be used.~~

4.3.4.1.3 Access preamble signature

The access preamble part of the CPCH-access burst carries one of the sixteen different orthogonal complex signatures identical to the ones used by the preamble part of the random-access burst.

4.3.4.2 CD preamble

4.3.4.2.1 CD preamble code construction

Similar to PRACH access preamble codes, the PCPCH CD preamble codes $C_{c\text{-}cd,n,s}$ are complex valued sequences. The PCPCH CD preamble codes are built from the preamble scrambling codes Sc-cd,n and a preamble signature $C_{sig,s}$ as follows:

- $C_{c\text{-}cd,n,s}(k) = S_{c\text{-}cd,n}(k) \times C_{sig,s}(k) \times e^{j(\frac{\pi}{4}+\frac{\pi}{2}k)}$, k = 0, 1, 2, 3, …, 4095;

where $S_{c\text{-}cd,n}$ and $C_{sig,s}$ are defined in sections 4.3.4.2.2 and 4.3.4.2.3 below respectively.

4.3.4.2.2 CD preamble scrambling code

The PCPCH CD preamble scrambling code is derived from the same scrambling code used in the CPCH access preamble. There are .40960 PCPCH-CD preamble scrambling codes in total.

There are 32768 PCPCH scrambling codes in total.

The *n*:th PCPCH CD access preamble scrambling code, where *n* = *0,...,8192,8193, …,40959,* is defined as:

- $S_{c\text{-}cd,n}(i) = c_{long,1,n}(i)$, i = 0, 1, …, 4095;

where the sequence $c_{long,1,n}$ is defined in section 4.3.2.2.

In the case when the access resources are shared between the RACH and CPCH, the scrambling codes used in the RACH preamble will be used for the CPCH CD preamble as well.

The 3276840960 PCPCH scrambling codes are divided into 512 groups with 8064 codes in each group. There is a one-to-one correspondence between the group of PCPCH CD preamble scrambling codes in a cell and the primary scrambling code used in the downlink of the cell. The *k*:th PCPCH scrambling code within the cell with downlink primary scrambling code *m*, *k* = 0,1,16,17, …, 79 and *m* = 0, 1, 2, …, 511, is $S_{c\text{-}cd,\,n}$ as defined above with n=64×m+k for k=0,...,15 and $n = 64 \times m + (k-16) + 8192$ *for k=16,...,79*.

In case scrambling code resource is shared between PCPCH and PRACH, the index k is less than 16 and the corresponding PRACH formulae shall be used. Otherwise, if the index k is greater than or equal to 16, the formula in this section shall be used.

The index k=0,...,15 may only be used as a PCPCH CD preamble part scrambling code if the same code is also used for a PRACH.

The index k=16,..., 79 correspond to PCPCH CD preamble scrambling codes which are not shared together with a PRACH. This leads to 32768 PCPCH specific preamble scrambling codes divided into 512 groups with 64 elements.

4.3.4.2.3 CD preamble signature

The CD-preamble part of the CPCH-access burst carries one of sixteen different orthogonal complex signatures identical to the ones used by the preamble part of the random-access burst.

4.4 Modulation

4.4.1 Modulating chip rate

The modulating chip rate is 3.84 Mcps.

4.4.2 Modulation

In the uplink, the complex-valued chip sequence generated by the spreading process is QPSK modulated as shown in Figure 7 below: