TSG-RAN Meeting #13
Beijing, China, 18 - 21, September, 2001

RP-010530

Title: **Agreed CR (Rel-4) to TS 25.223**

Source: **TSG-RAN WG1**

Agenda item: **8.1.4**

No.	Spec	CR	Rev	R1 T-doc	Subject	Release	Cat	W/I Code	V_old	V_new
1	25.223	022	1	R1-01-0966	Clarification of notations in TS25.221 and TS25.223	REL-4	F	LCRTDD-Phys	4.1.0	4.2.0

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R1-01-0966

CR-Form-v4

CHANGE REQUEST

⌘ **25.223** **CR** **022** ⌘ rev **1** ⌘ Current version: **4.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification of notations in TS25.221 and TS25.223
Source:	⌘	TSG RAN WG1
Work item code:	⌘	LCRTDD-Phys
Date:	⌘	21-08-2001
Category:	⌘	**F**
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The letter K is used in the specifications for three different purposes. It currently indicates the number of codes per time slot, the number of supported midambles in a cell, and the max. number of possible midambles for the different basic midamble codes. New abbreviations are introduced to distinguish between those purposes.
Summary of change:	⌘	K is used to indicate the max. Number of possible midambles for the different basic midambles. K_{CELL} is used to indicate the number of supported midambles in a cell. K_{CODE} is used to indicate the number of codes. In addition a missing formula is added and two equation numbers are corrected.
Consequences if not approved:	⌘	Ambiguous specifications

Clauses affected:	⌘	6		
Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	TS25.221
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6 Data modulation for the 1.28 Mcps option

6.1 Symbol rate

The symbol duration T_S depends on the spreading factor Q and the chip duration T_C: $T_s = Q \times T_c$, where $T_c = \frac{1}{chiprate}$.

6.2 Mapping of bits onto signal point constellation

6.2.1 QPSK modulation

The mapping of bits onto the signal point constellation for QPSK modulation is the same as in the 3.84Mcps TDD cf. [5.2.1 Mapping for burst type 1 and 2].

6.2.2 8PSK modulation

The data modulation is performed to the bits from the output of the physical channel mapping procedure. In case of 8PSK modulation 3 consecutive binary bits are represented by one complex valued data symbol. Each user burst has two data carrying parts, termed data blocks:

$$\underline{\mathbf{d}}^{(k,i)} = \left(\underline{d}_1^{(k,i)}, \underline{d}_2^{(k,i)}, ..., \underline{d}_{N_k}^{(k,i)}\right)^T, \quad i = 1,2; k = 1,..., K_{Code} \qquad \text{~~} \underline{\mathbf{d}}^{(k,i)} = (\underline{d}_1^{(k,i)}, \underline{d}_2^{(k,i)}, ..., \underline{d}_{N_k}^{(k,i)})^T \quad i = 1, 2; k = 1,..., K. \text{~~} \quad (1a)$$

N_k is the number of symbols per data field for the ~~user~~ code k. This number is linked to the spreading factor Q_k.

Data block $\underline{\mathbf{d}}^{(k,1)}$ is transmitted before the midamble and data block $\underline{\mathbf{d}}^{(k,2)}$ after the midamble. Each of the N_k data symbols $\underline{d}_n^{(k,i)}$; i=1, 2; k=1,...,K_{Code}; n=1,...,N_k; of equation 1 has the symbol duration $T_s^{(k)} = Q_k . T_c$ as already given.

The data modulation is 8PSK, thus the data symbols $\underline{d}_n^{(k,i)}$ are generated from 3 consecutive data bits from the output of the physical channel mapping procedure in [8]:

$$b_{l,n}^{(k,i)} \in \{0,1\} \quad l = 1,2,3; k = 1,..., K_{Code}; n = 1,..., N_k; i = 1,2 \qquad (2a)$$

using the following mapping to complex symbols:

Consecutive binary bit pattern $b_{1,n}^{(k,i)}$ $b_{2n}^{(k,i)}$ $b_{3n}^{(k,i)}$	complex symbol $\underline{d}_n^{(k,i)}$
000	cos(11pi/8)+ jsin(11pi/8)
001	cos(9pi/8)+ jsin(9pi/8)
010	cos(5pi/8)+ jsin(5pi/8)
011	cos(7pi/8)+ jsin(7pi/8)
100	cos(13pi/8)+ jsin(13pi/8)
101	cos(15pi/8)+ jsin(15pi/8)
110	cos(3pi/8)+ jsin(3pi/8)
111	cos(pi/8)+ jsin(pi/8)

The mapping corresponds to a 8PSK modulation of the interleaved and encoded data bits $b_{l,n}^{(k,i)}$ of the table above and $\underline{d}_n^{(k,i)}$ of equation 1a.