TSG-RAN Working Group 1 meeting #20
Pusan, Korea
May 21 – 25, 2001

TSGR1#20(01)0451

Agenda item: R99
Source: InterDigital Comm. Corp.
Title: CR 25.223-018 - Addition to the abbreviation list, add definition of the constant
Document for: Decision

This CR adds definitions of acronyms to the abbreviation list and defines a constant.

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Tdoc R1-01-0451

CR-Form-v3

CHANGE REQUEST

⌘ **25.223** **CR** **018** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

*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 ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Addition to the abbreviation list and definition of a constant.
Source:	⌘	InterDigital Comm. Corp.
Work item code:	⌘	***Date:*** ⌘ May 9, 2001
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(essential 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:	⌘	Acronyms and constants are used but not defined
Summary of change:	⌘	Additions to the Abbreviation list.
Consequences if not approved:	⌘	Incomplete abbreviation list.

Clauses affected:	⌘	3.2, 5.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CCTrCH	Coded Composite Transport Channel
DPCH	Dedicated Physical Channel
CDMA	Code Division Multiple Access
FDD	Frequency Division Duplex
OVSF	Orthogonal Variable Spreading Factor
P-CCPCH	Primary Common Control Physical Channel
PN	Pseudo Noise
PRACH	Physical Random Access Channel
PSC	Primary Synchronisation Code
QPSK	Quadrature Phase Shift Keying
RACH	Random Access Channel
SCH	Synchronisation Channel
SF	Spreading Factor
SFN	System Frame Number
TDD	Time Division Duplex
TFC	Transport Format Combination
UL	Uplink
UE	User Equipment

4 General

In the following, a separation between the data modulation and the spreading modulation has been made. The data modulation is defined in clause 5 and the spreading modulation in clause 6.

Table 1: Basic modulation parameters

Chip rate	same as FDD basic chiprate: 3.84 Mchip/s	Low chiprate: 1.28 Mchip/s
Data modulation	QPSK	QPSK
Spreading characteristics	Orthogonal Q chips/symbol, where $Q = 2^p$, $0 <= p <= 4$	Orthogonal Q chips/symbol, where $Q = 2^p$, $0 <= p <= 4$

5 Data modulation

5.1 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 $T_c = \frac{1}{chiprate}$.

5.2 Mapping of bits onto signal point constellation

5.2.1 Mapping for burst type 1 and 2

The data modulation is performed to the bits from the output of the physical channel mapping procedure in [8] and combines always 2 consecutive binary bits to a complex valued data symbol. Each user burst has two data carrying parts, termed data blocks:

$$\underline{\mathbf{d}}^{(k,i)} = (\underline{d}_1^{(k,i)}, \underline{d}_2^{(k,i)}, ..., \underline{d}_{N_k}^{(k,i)})^T \quad i = 1, 2; k = 1, ..., K. \tag{1}$$

K is the number of users, max K =16. N_k is the number of symbols per data field for the user k. This number is linked to the spreading factor Q_k as described in table 1 of [7].

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

$$b_{l,n}^{(k,i)} \in \{0,1\} \qquad l=1,2;\ k=1,\ldots K;\ n=1,\ldots,N_k;\ i=1,2 \qquad (2)$$

using the following mapping to complex symbols:

consecutive binary bit pattern	**complex symbol**
$b_{1,n}^{(k,i)}\ b_{2,n}^{(k,i)}$	$\underline{d}_n^{(k,i)}$
00	+j
01	+1
10	-1
11	-j

The mapping corresponds to a QPSK modulation of the interleaved and encoded data bits $b_{l,n}^{(k,i)}$ of equation 2.