TSG-RAN Meeting #12
Stockholm, Sweden, 12-15, June, 2001

RP-010333

Title: **Agreed CRs (R99 and Rel-4 Category A) to TS 25.213**

Source: **TSG-RAN WG1**

Agenda item: **8.1.3**

No.	Spec	CR	Rev	R1 T-doc	Subject	Release	Cat	W / I Code	V_old	V_new
1	25.213	040	1	R1-01-0566	Clarification of DL channelization code alignment	R99	F	TEI	3.5.0	3.6.0
2	25.213	041	1	R1-01-0566	Clarification of DL channelization code alignment	REL-4	A	TEI4	4.0.0	4.1.0
3	25.213	042	1	R1-01-0662	Clarification of PDSCH root channelisation code definition	R99	F	TEI	3.5.0	3.6.0
4	25.213	043	1	R1-01-0662	Clarification of PDSCH root channelisation code definition	REL-4	A	TEI4	4.0.0	4.1.0

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R1-01-0566

CR-Form-v4

CHANGE REQUEST

⌘ **25.213** **CR** **040** ⌘ rev **1** ⌘ 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 **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification of DL channelization code alignment
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	18, May, 2001
Category:	⌘	**F**
Release:	⌘	R99

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)*
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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 channelization code sequence is aligned to symbol boundary is not well described.
Summary of change:	⌘	To add following text: The channelization code sequence should be aligned in time with the symbol boundary.
Consequences if not approved:	⌘	Misunderstanding may happen to the channelization code phase.

Clauses affected:	⌘	5.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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5.1 Spreading

Figure 8 illustrates the spreading operation for all downlink physical channels except SCH, i.e. for P-CCPCH, S-CCPCH, CPICH, AICH, PICH, PDSCH,and downlink DPCH. The non-spread physical channel consists of a sequence of real-valued symbols. For all channels except AICH, the symbols can take the three values +1, -1, and 0, where 0 indicates DTX. For AICH, the symbol values depend on the exact combination of acquisition indicators to be transmitted, compare [2] Section 5.3.3.6.

Each pair of two consecutive symbols is first serial-to-parallel converted and mapped to an I and Q branch. The mapping is such that even and odd numbered symbols are mapped to the I and Q branch respectively. For all channels except AICH, symbol number zero is defined as the first symbol in each frame. For AICH, symbol number zero is defined as the first symbol in each access slot. The I and Q branches are then spread to the chip rate by the same real-valued channelization code $C_{ch,SF,m}$. The channelization code sequence shall be aligned in time with the symbol boundary. The sequences of real-valued chips on the I and Q branch are then treated as a single complex-valued sequence of chips. This sequence of chips is scrambled (complex chip-wise multiplication) by a complex-valued scrambling code $S_{dl,n}$. In case of P-CCPCH, the scrambling code is applied aligned with the P-CCPCH frame boundary, i.e. the first complex chip of the spread P-CCPCH frame is multiplied with chip number zero of the scrambling code. In case of other downlink channels, the scrambling code is applied aligned with the scrambling code applied to the P-CCPCH. In this case, the scrambling code is thus not necessarily applied aligned with the frame boundary of the physical channel to be scrambled.

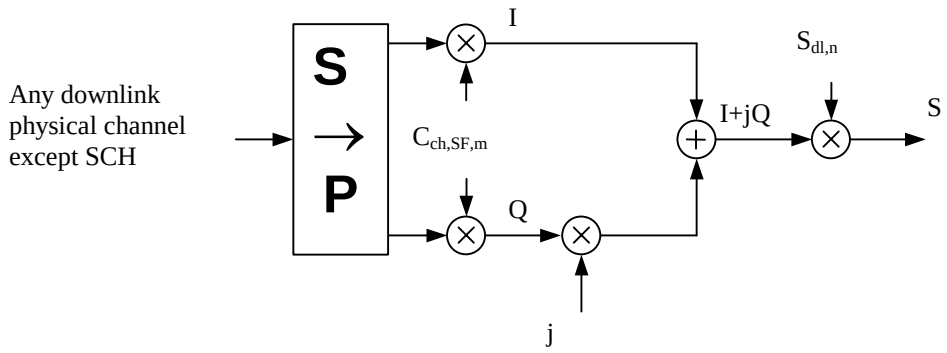

Figure 8: Spreading for all downlink physical channels except SCH

Figure 9 illustrates how different downlink channels are combined. Each complex-valued spread channel, corresponding to point S in Figure 8, is separately weighted by a weight factor G_i. The complex-valued P-SCH and S-SCH, as described in [2], section 5.3.3.4, are separately weighted by weight factors G_p and G_s. All downlink physical channels are then combined using complex addition.

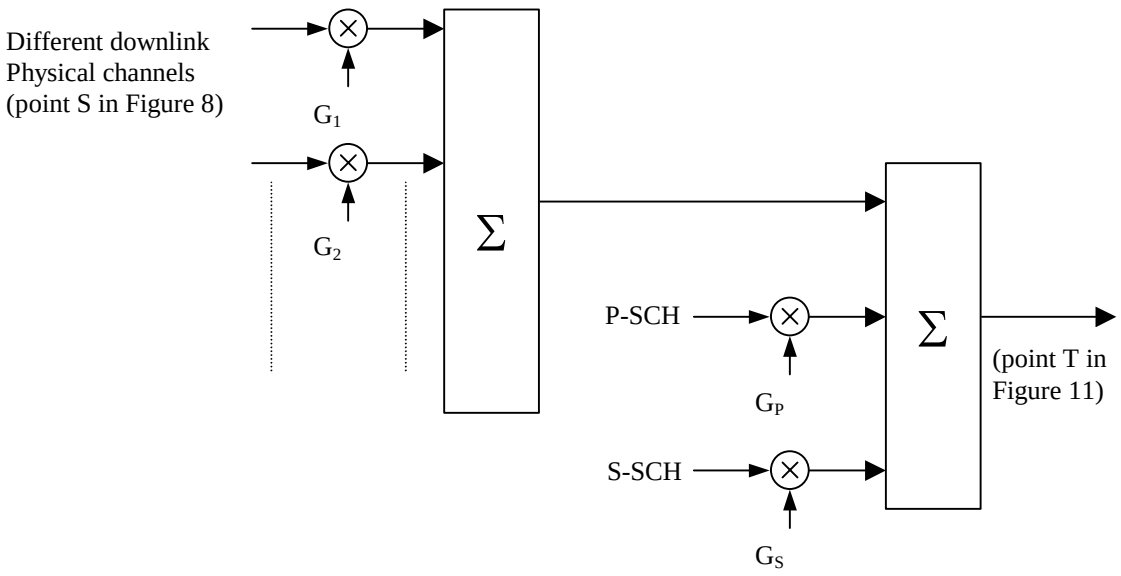

Figure 9: Spreading and modulation for SCH and P-CCPCH

3GPP TSG RAN Meeting #12
Stockholm, Sweden, 12-15, June, 2001

R1-01-0566

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CHANGE REQUEST

⌘ **25.213** **CR** **041** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

*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 DL channelization code alignment
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI4
Date:	⌘	18, May, 2001
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
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B *(addition of feature),*
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D *(editorial modification)*
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R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
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REL-5 *(Release 5)*

Reason for change:	⌘	The channelization code sequence is aligned to symbol boundary is not well described.
Summary of change:	⌘	To add following text: The channelization code sequence should be aligned in time with the symbol boundary.
Consequences if not approved:	⌘	Misunderstanding may happen to the channelization code phase.

Clauses affected:	⌘	5.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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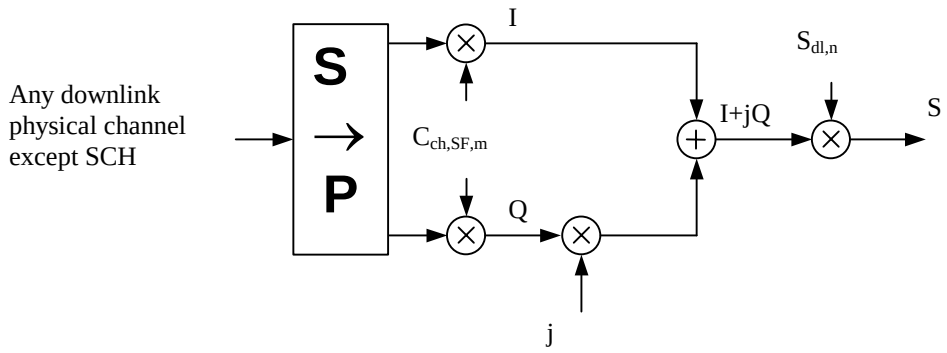

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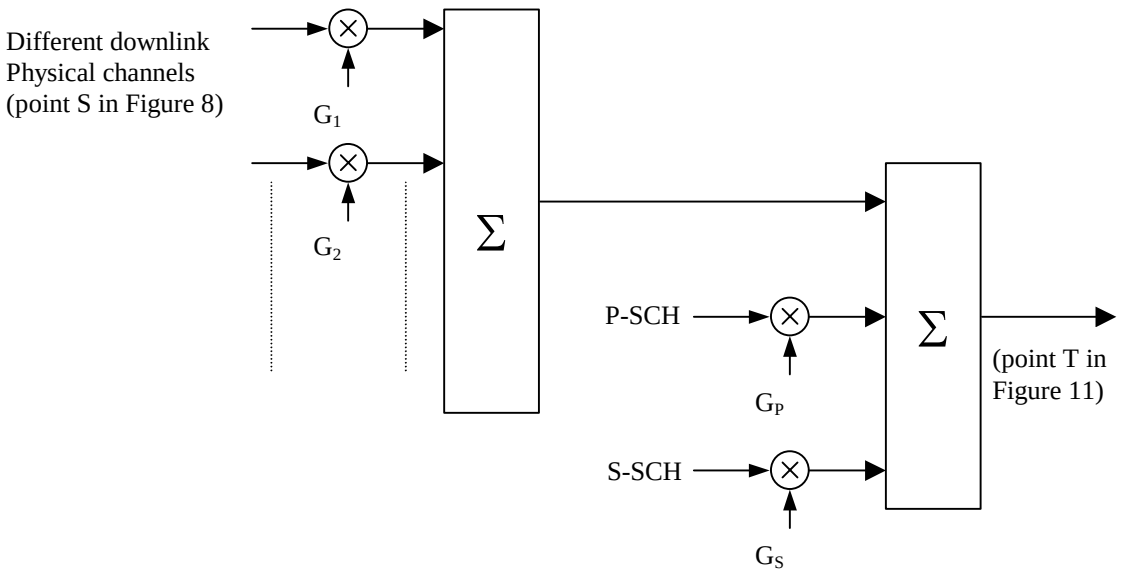

Figure 9: Spreading and modulation for SCH and P-CCPCH

3GPP TSG RAN Meeting #12
Stockholm, Sweden, 12-15, June, 2001

R1-01-0662

CR-Form-v4

CHANGE REQUEST

⌘ **25.213 CR 042** ⌘ rev **1** ⌘ Current version: **3.6.0** ⌘

*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 PDSCH root channelisation code definition
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	05-02-2001
Category:	⌘	**F**
Release:	⌘	R99

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 current definition of PDSCH in 25.211 is misleading, it uses the notion of PDSCH root channelisation code which is not defined in 25.211. It is defined in 25.213 without being explicitly named so. For consistency of the specifications, it needs to be clarified in 25.213
Summary of change:	⌘	The notion of PDSCH root channelisation code is defined.
Consequences if not approved:	⌘	PDSCH is ambiguous leading to potential different implementations from different vendors.

Clauses affected:	⌘	5.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Corresponding CR25.211-105r1.

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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.

5.2.1 Channelization codes

The channelization codes of figure 8 are the same codes as used in the uplink, namely Orthogonal Variable Spreading Factor (OVSF) codes that preserve the orthogonality between downlink channels of different rates and spreading factors. The OVSF codes are defined in figure 4 in section 4.3.1.

The channelization code for the Primary CPICH is fixed to $C_{ch,256,0}$ and the channelization code for the Primary CCPCH is fixed to $C_{ch,256,1}$.The channelization codes for all other physical channels are assigned by UTRAN.

With the spreading factor 512 a specific restriction is applied. When the code word $C_{ch,512,n}$, with n=0,2,4….510, is used in soft handover, then the code word $C_{ch,512,n+1}$ is not allocated in the cells where timing adjustment is to be used. Respectively if $C_{ch,512,n}$, with n=1,3,5….511 is used, then the code word $C_{ch,512,n-1}$ is not allocated in the cells where timing adjustment is to be used. This restriction shall not apply in cases where timing adjustments in soft handover are not used with spreading factor 512.

When compressed mode is implemented by reducing the spreading factor by 2, the OVSF code used for compressed frames is:

- $C_{ch,SF/2,\lfloor n/2 \rfloor}$ if ordinary scrambling code is used.
- $C_{ch,SF/2,n \bmod SF/2}$ if alternative scrambling code is used (see section 5.2.2);

where $C_{ch,SF,n}$ is the channelization code used for non-compressed frames.

In case the OVSF code on the PDSCH varies from frame to frame, the OVSF codes shall be allocated in such a way that the OVSF code(s) below the smallest spreading factor will be from the branch of the code tree pointed by the code with smallest spreading factor used for the connection which is called PDSCH root channelisation code. This means that all the codes for this UE for the PDSCH connection can be generated according to the OVSF code generation principle from the PDSCH root channelisation code i.e. the code with smallest spreading factor ~~code~~ used by the UE on PDSCH.

In case of mapping the DSCH to multiple parallel PDSCHs, the same rule applies, but all of the branches identified by the multiple codes, corresponding to the smallest spreading factor, may be used for higher spreading factor allocation i.e. the multiple codes with smallest spreading factor can be considered as PDSCH root channelisation codes..

3GPP TSG RAN Meeting #12
Stockholm, Sweden, 12-15, June, 2001

R1-01-0662

CR-Form-v4

CHANGE REQUEST

⌘ **25.213** **CR** **043** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

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

Title:	⌘	Clarification of PDSCH root channelisation code definition
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI4
Date:	⌘	05-02-2001
Category:	⌘	**A**
Release:	⌘	REL-4

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Consequences if not approved:	⌘	PDSCH is ambiguous leading to potential different implementations from different vendors.

Clauses affected:	⌘	5.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Corresponding CR25.211-106r1.

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