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

RP-010518

Title: **Agreed CRs (R99 and Rel-4 Category A) to TS 25.211**

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	25.211	110	2	R1-01-0979	Correction to DPCH/PDSCH timing	R99	F	TEI	3.7.0	3.8.0
2	25.211	111	2	R1-01-0979	Correction to DPCH/PDSCH timing	REL-4	A	TEI	4.1.0	4.2.0
3	25.211	112	2	R1-01-0975	Clarification of the usage of Tx diversity modes in Soft HOV	R99	F	TEI	3.7.0	3.8.0
4	25.211	121	1	R1-01-0975	Clarification of the usage of Tx diversity modes in Soft HOV	REL-4	A	TEI	4.1.0	4.2.0
5	25.211	113	1	R1-01-0923	Removal of another reference to FACH beamforming	R99	F	TEI	3.7.0	3.8.0
6	25.211	114	1	R1-01-0923	Removal of another reference to FACH beamforming	REL-4	A	TEI	4.1.0	4.2.0
7	25.211	117	1	R1-01-0751	Clarification of STTD	R99	F	TEI	3.7.0	3.8.0
8	25.211	118	1	R1-01-0751	Clarification of STTD	REL-4	A	TEI	4.1.0	4.2.0

3GPP TSG RAN Meeting #13
Beijing, China, 18th – 21st , September, 2001

R1-01-0979

CR-Form-v4

CHANGE REQUEST

⌘ **25.211** **CR** **110** ⌘ rev **2** ⌘ Current version: **3.7.0** ⌘

*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 **X** Core Network ☐

Title:	⌘	Correction to DPCH/PDSCH timing
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	31 August 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:	⌘	Inconsistency exists between section 7.5 and section 7.1.
Summary of change:	⌘	Cross-reference inserted for clarification and grammar corrected.
Consequences if not approved:	⌘	Misunderstanding resulting in potential incompatibility of different vendors' products.
Clauses affected:	⌘	7.5
Other specs Affected:	⌘	☐ ☐ ☐
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.
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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.

7.5 DPCH/PDSCH timing

The relative timing between a DPCH frame and the associated PDSCH frame is shown in figure 33.

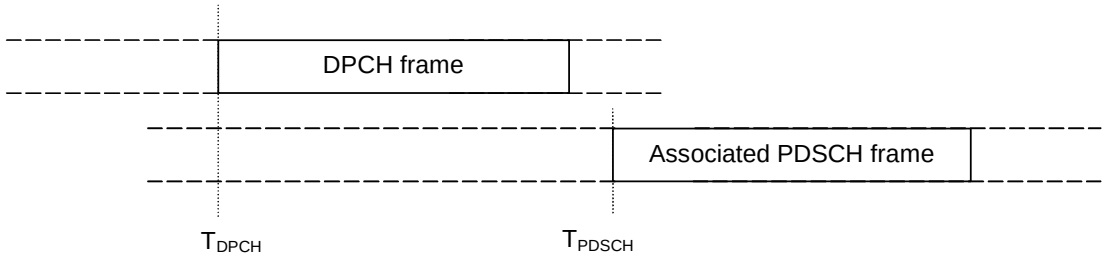

Figure 33: Timing relation between DPCH frame and associated PDSCH frame

The start of a DPCH frame is denoted T_{DPCH} and the start of the associated PDSCH frame is denoted T_{PDSCH}. Any DPCH frame is associated to one PDSCH frame through the relation 46080 chips ≤ T_{PDSCH} - T_{DPCH} < 84480 chips, i.e., the associated PDSCH frame starts ~~anywhere~~ between three slots after the end of the DPCH frame ~~up to~~and 18 slots ~~behind~~ after the end of the DPCH frame, as described in subclause 7.1.

7.6 DPCCH/DPDCH timing relations

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R1-01-0979

CR-Form-v4

CHANGE REQUEST

⌘ **25.211** **CR** **111** ⌘ rev **2** ⌘ 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 ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Correction to DPCH/PDSCH timing
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	31 August 2001
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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D *(editorial modification)*
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R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Inconsistency exists between section 7.5 and section 7.1.
Summary of change:	⌘	Cross-reference inserted for clarification and grammar corrected.
Consequences if not approved:	⌘	Misunderstanding resulting in potential incompatibility of different vendors' products.

Clauses affected:	⌘	7.5
Other specs Affected:	⌘	☐ ☐ ☐
Other comments:	⌘	

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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.

7.5 DPCH/PDSCH timing

The relative timing between a DPCH frame and the associated PDSCH frame is shown in figure 33.

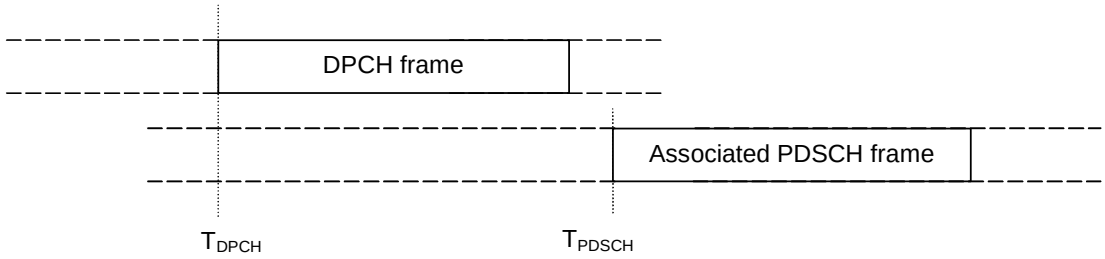

Figure 33: Timing relation between DPCH frame and associated PDSCH frame

The start of a DPCH frame is denoted T_{DPCH} and the start of the associated PDSCH frame is denoted T_{PDSCH}. Any DPCH frame is associated to one PDSCH frame through the relation 46080 chips ≤ T_{PDSCH} - T_{DPCH} < 84480 chips, i.e.,<u>,</u> the associated PDSCH frame starts ~~anywhere~~ between three slot<u>s</u> after the end of the DPCH frame ~~up to~~<u>and</u> 18 slots ~~behind~~ <u>after</u> the end of the DPCH frame<u>, as described in subclause 7.1</u>.

7.6 DPCCH/DPDCH timing relations

3GPP TSG RAN Meeting #13
Beijing, China, 18th – 21st , September, 2001

R1-01-0975

CR-Form-v4

CHANGE REQUEST

⌘ **25.211** **CR** **112** ⌘ rev **2** ⌘ Current version: **3.7.0** ⌘

*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 the usage of Tx diversity modes in Soft HOV
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	30-08-2001
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:	⌘	This CR includes a clarifying remark for the RAN1 specification.
Summary of change:	⌘	- Different Tx diversity modes (STTD, CL I, CL II) shall not be used on the radio links within one active set. - No Tx diversity on one or more radio links shall not prevent UTRAN to use Tx diversity on other radio links within the same active set. However, the UE shall operate this Tx diversity mode on all radio links.
Consequences if not approved:	⌘	Without clear specifications regarding this issue, UE's have to take into account all possible scenarios, unnecessarily increasing the complexity. Furthermore, based on incorrect interpretation of the specification UE's may fail to work correctly.

Clauses affected:	⌘	5.3.1
Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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.

5.3.1 Downlink transmit diversity

Table 10 summarizes the possible application of open and closed loop transmit diversity modes on different downlink physical channel types. Simultaneous use of STTD and closed loop modes on the same physical channel is not allowed. In addition, if Tx diversity is applied on any of the downlink physical channels it shall also be applied on P-CCPCH and SCH. Regarding CPICH transmission in case of transmit diversity, see subclause 5.3.3.1.

With respect to the usage of Tx diversity on different radio links within an active set, the following rules apply:

- Different Tx diversity modes (STTD and closed loop) shall not be used on the radio links within one active set.
- No Tx diversity on one or more radio links shall not prevent UTRAN to use Tx diversity on other radio links within the same active set. However, the UE shall operate this Tx diversity mode on all radio links.

Furthermore, the transmit diversity mode used for a PDSCH frame shall be the same as the transmit diversity mode used for the DPCH associated with this PDSCH frame. During the duration of the PDSCH frame, and within the slot prior to the PDSCH frame, the transmit diversity mode (open loop or closed loop) on the associated DPCH may not change. However, changing from closed loop mode 1 to mode 2 or vice versa, is allowed.

Table 10: Application of Tx diversity modes on downlink physical channel types "X" – can be applied, "–" – not applied

Physical channel type	Open loop mode		Closed loop Mode
	TSTD	STTD	
P-CCPCH	–	X	–
SCH	X	–	–
S-CCPCH	–	X	–
DPCH	–	X	X
PICH	–	X	–
PDSCH	–	X	X
AICH	–	X	–
CSICH	–	X	–

3GPP TSG RAN Meeting #13
Beijing, China, 18th – 21st , September, 2001

R1-01-0923

CR-Form-v4

CHANGE REQUEST

⌘ **25.211** **CR** **113** ⌘ rev **1** ⌘ Current version: **3.7.0** ⌘

*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 **X** Core Network ☐

Title:	⌘	Removal of another reference to FACH beamforming
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	22-08-2001
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:	⌘	TSG-RAN WG1 #20 meeting the reference to FACH using beamforming was removed (CR25.211 099/100). However, in the introduction section of TS25.211 there is still a reference to FACH beamforming.
Summary of change:	⌘	The reference to FACH beamforming is removed in section 4.1.2.2
Consequences if not approved:	⌘	Inconsistency in descpription of FACH in TS25.211

Clauses affected:	⌘	4.1.2.2
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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

4 Services offered to higher layers

4.1 Transport channels

Transport channels are services offered by Layer 1 to the higher layers. General concepts about transport channels are described in [12].

A transport channel is defined by how and with what characteristics data is transferred over the air interface. A general classification of transport channels is into two groups:

- Dedicated channels, using inherent addressing of UE;
- Common channels, using explicit addressing of UE if addressing is needed.

4.1.1 Dedicated transport channels

There exists only one type of dedicated transport channel, the Dedicated Channel (DCH).

4.1.1.1 DCH - Dedicated Channel

The Dedicated Channel (DCH) is a downlink or uplink transport channel. The DCH is transmitted over the entire cell or over only a part of the cell using e.g. beam-forming antennas.

4.1.2 Common transport channels

There are six types of common transport channels: BCH, FACH, PCH, RACH, CPCH and DSCH.

4.1.2.1 BCH - Broadcast Channel

The Broadcast Channel (BCH) is a downlink transport channel that is used to broadcast system- and cell-specific information. The BCH is always transmitted over the entire cell and has a single transport format.

4.1.2.2 FACH - Forward Access Channel

The Forward Access Channel (FACH) is a downlink transport channel. The FACH is <u>always</u> transmitted over the entire cell <u>in this release.</u> ~~or over only a part of the cell using e.g. beam-forming antennas~~. The FACH can be transmitted using slow power control.

4.1.2.3 PCH - Paging Channel

The Paging Channel (PCH) is a downlink transport channel. The PCH is always transmitted over the entire cell. The transmission of the PCH is associated with the transmission of physical-layer generated Paging Indicators, to support efficient sleep-mode procedures.

4.1.2.4 RACH - Random Access Channel

The Random Access Channel (RACH) is an uplink transport channel. The RACH is always received from the entire cell. The RACH is characterized by a collision risk and by being transmitted using open loop power control.

4.1.2.5 CPCH - Common Packet Channel

The Common Packet Channel (CPCH) is an uplink transport channel. CPCH is associated with a dedicated channel on the downlink which provides power control and CPCH Control Commands (e.g. Emergency Stop) for the uplink CPCH. The CPCH is characterised by initial collision risk and by being transmitted using inner loop power control.

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Beijing, China, 18th – 21st , September, 2001

R1-01-0923

CR-Form-v4

CHANGE REQUEST

⌘ **25.211** **CR** **114** ⌘ 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 ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Removal of another reference to FACH beamforming
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	22-08-2001
Category:	⌘	**A**
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)*
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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:	⌘	TSG-RAN WG1 #20 meeting the reference to FACH using beamforming was removed (CR25.211 099/100). However, in the introduction section of TS25.211 there is still a reference to FACH beamforming.
Summary of change:	⌘	The reference to FACH beamforming is removed in section 4.1.2.2
Consequences if not approved:	⌘	Inconsistency in descpription of FACH in TS25.211

Clauses affected:	⌘	4.1.2.2
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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4 Services offered to higher layers

4.1 Transport channels

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4.1.1 Dedicated transport channels

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4.1.1.1 DCH - Dedicated Channel

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4.1.2 Common transport channels

There are six types of common transport channels: BCH, FACH, PCH, RACH, CPCH and DSCH.

4.1.2.1 BCH - Broadcast Channel

The Broadcast Channel (BCH) is a downlink transport channel that is used to broadcast system- and cell-specific information. The BCH is always transmitted over the entire cell and has a single transport format.

4.1.2.2 FACH - Forward Access Channel

The Forward Access Channel (FACH) is a downlink transport channel. The FACH is <u>always</u> transmitted over the entire cell <u>in this release</u> ~~or over only a part of the cell using e.g. beam-forming antennas~~. The FACH can be transmitted using slow power control.

4.1.2.3 PCH - Paging Channel

The Paging Channel (PCH) is a downlink transport channel. The PCH is always transmitted over the entire cell. The transmission of the PCH is associated with the transmission of physical-layer generated Paging Indicators, to support efficient sleep-mode procedures.

4.1.2.4 RACH - Random Access Channel

The Random Access Channel (RACH) is an uplink transport channel. The RACH is always received from the entire cell. The RACH is characterized by a collision risk and by being transmitted using open loop power control.

4.1.2.5 CPCH - Common Packet Channel

The Common Packet Channel (CPCH) is an uplink transport channel. CPCH is associated with a dedicated channel on the downlink which provides power control and CPCH Control Commands (e.g. Emergency Stop) for the uplink CPCH. The CPCH is characterised by initial collision risk and by being transmitted using inner loop power control.

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R1-01-0751

CR-Form-v4

CHANGE REQUEST

⌘ **25.211** **CR** **117** ⌘ rev **1** ⌘ Current version: **3.7.0** ⌘

*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 STTD
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	2001-08-24
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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R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	RRC signaling is imposing an unnecessary restriction on the STTD usage (only allows STTD signaling for all RL of a UE), while NBAP allows signaling of STTD on a per RL basis. Usage of P-CPICH is signaled by RRC on a per RL basis. This would unnecessarily restrict soft handover between a STTD cell using CPICH as phase reference to a UE and a non-STTD cell not using CPICH as phase reference to a UE, without having STTD activated (as signaled by NBAP).
Summary of change:	⌘	If CPICH can not be used as phase reference in a cell but RRC signals STTD for this UE, STTD shall not be assumed for the RL in a cell not using CPICH as phase reference.
Consequences if not approved:	⌘	Unnecessary restriction on soft handover between a STTD cell using CPICH as phase reference to a UE and a non-STTD cell not using CPICH as phase reference to a UE, without having STTD activated (as signaled by NBAP).

Clauses affected:	⌘	5.3.1.1.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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 reques

5.3 Downlink physical channels

5.3.1 Downlink transmit diversity

Table 10 summarizes the possible application of open and closed loop transmit diversity modes on different downlink physical channel types. Simultaneous use of STTD and closed loop modes on the same physical channel is not allowed. In addition, if Tx diversity is applied on any of the downlink physical channels it shall also be applied on P-CCPCH and SCH. Regarding CPICH transmission in case of transmit diversity, see subclause 5.3.3.1.

Furthermore, the transmit diversity mode used for a PDSCH frame shall be the same as the transmit diversity mode used for the DPCH associated with this PDSCH frame. During the duration of the PDSCH frame, and within the slot prior to the PDSCH frame, the transmit diversity mode (open loop or closed loop) on the associated DPCH may not change. However, changing from closed loop mode 1 to mode 2 or vice versa, is allowed.

Table 10: Application of Tx diversity modes on downlink physical channel types
"X" – can be applied, "–" – not applied

Physical channel type	Open loop mode		Closed loop Mode
	TSTD	STTD	
P-CCPCH	–	X	–
SCH	X	–	–
S-CCPCH	–	X	–
DPCH	–	X	X
PICH	–	X	–
PDSCH	–	X	X
AICH	–	X	–
CSICH	–	X	–

5.3.1.1 Open loop transmit diversity

5.3.1.1.1 Space time block coding based transmit antenna diversity (STTD)

The open loop downlink transmit diversity employs a space time block coding based transmit diversity (STTD). The STTD encoding is optional in UTRAN. STTD support is mandatory at the UE. If higher layers signal that neither P-CPICH nor S-CPICH can be used as phase reference for the downlink DPCH for a radio link in a cell, the UE shall assume that STTD is not used for the downlink DPCH in that cell. STTD encoding is applied on blocks of 4 consecutive channel bits. A block diagram of a generic STTD encoder for channel bits b_0, b_1, b_2, b_3 is shown in the figure 8 below. Channel coding, rate matching and interleaving is done as in the non-diversity mode. The bit b_i is real valued {0} for DTX bits and {1, -1} for all other channel bits.

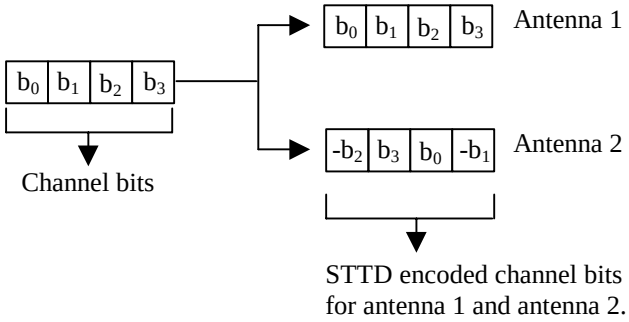

Figure 8: Generic block diagram of the STTD encoder

5.3.1.1.2 Time Switched Transmit Diversity for SCH (TSTD)

Transmit diversity, in the form of Time Switched Transmit Diversity (TSTD), can be applied to the SCH. TSTD for the SCH is optional in UTRAN, while TSTD support is mandatory in the UE. TSTD for the SCH is described in subclause 5.3.3.4.1.

5.3.1.2 Closed loop transmit diversity

Closed loop transmit diversity is described in [5]. Both closed loop transmit diversity modes shall be supported at the UE and may be supported in the UTRAN.

3GPP TSG RAN Meeting #13
Beijing, China, 18th – 21st , September, 2001

R1-01-0751

CR-Form-v4

CHANGE REQUEST

⌘ **25.211** **CR** **118** ⌘ 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 STTD
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	2001-08-24
Category:	⌘	**A**
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:	⌘	RRC signaling is imposing an unnecessary restriction on the STTD usage (only allows STTD signaling for all RL of a UE), while NBAP allows signaling of STTD on a per RL basis. Usage of P-CPICH is signaled by RRC on a per RL basis. This would unnecessarily restrict soft handover between a STTD cell using CPICH as phase reference to a UE and a non-STTD cell not using CPICH as phase reference to a UE, without having STTD activated (as signaled by NBAP).
Summary of change:	⌘	If CPICH can not be used as phase reference in a cell but RRC signals STTD for this UE, STTD shall not be assumed for the RL in a cell not using CPICH as phase reference.
Consequences if not approved:	⌘	Unnecessary restriction on soft handover between a STTD cell using CPICH as phase reference to a UE and a non-STTD cell not using CPICH as phase reference to a UE, without having STTD activated (as signaled by NBAP).

Clauses affected:	⌘	5.3.1.1.1
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://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 reques

5.3 Downlink physical channels

5.3.1 Downlink transmit diversity

Table 10 summarizes the possible application of open and closed loop transmit diversity modes on different downlink physical channel types. Simultaneous use of STTD and closed loop modes on the same physical channel is not allowed. In addition, if Tx diversity is applied on any of the downlink physical channels it shall also be applied on P-CCPCH and SCH. Regarding CPICH transmission in case of transmit diversity, see subclause 5.3.3.1.

Furthermore, the transmit diversity mode used for a PDSCH frame shall be the same as the transmit diversity mode used for the DPCH associated with this PDSCH frame. During the duration of the PDSCH frame, and within the slot prior to the PDSCH frame, the transmit diversity mode (open loop or closed loop) on the associated DPCH may not change. However, changing from closed loop mode 1 to mode 2 or vice versa, is allowed.

Table 10: Application of Tx diversity modes on downlink physical channel types
"X" – can be applied, "–" – not applied

Physical channel type	Open loop mode		Closed loop Mode
	TSTD	STTD	
P-CCPCH	–	X	–
SCH	X	–	–
S-CCPCH	–	X	–
DPCH	–	X	X
PICH	–	X	–
PDSCH	–	X	X
AICH	–	X	–
CSICH	–	X	–

5.3.1.1 Open loop transmit diversity

5.3.1.1.1 Space time block coding based transmit antenna diversity (STTD)

The open loop downlink transmit diversity employs a space time block coding based transmit diversity (STTD). The STTD encoding is optional in UTRAN. STTD support is mandatory at the UE. If higher layers signal that neither P-CPICH nor S-CPICH can be used as phase reference for the downlink DPCH for a radio link in a cell, the UE shall assume that STTD is not used for the downlink DPCH in that cell. STTD encoding is applied on blocks of 4 consecutive channel bits. A block diagram of a generic STTD encoder for channel bits b_0, b_1, b_2, b_3 is shown in the figure 8 below. Channel coding, rate matching and interleaving is done as in the non-diversity mode. The bit b_i is real valued {0} for DTX bits and {1, -1} for all other channel bits.

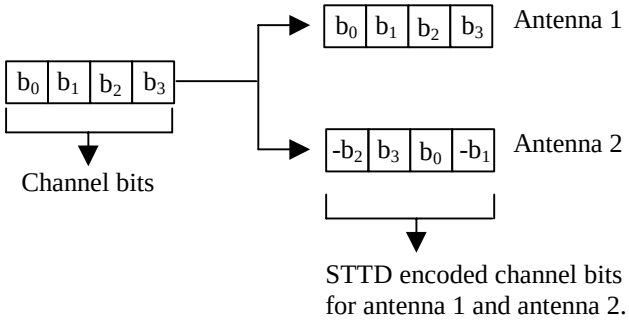

Figure 8: Generic block diagram of the STTD encoder

5.3.1.1.2 Time Switched Transmit Diversity for SCH (TSTD)

Transmit diversity, in the form of Time Switched Transmit Diversity (TSTD), can be applied to the SCH. TSTD for the SCH is optional in UTRAN, while TSTD support is mandatory in the UE. TSTD for the SCH is described in subclause 5.3.3.4.1.

5.3.1.2 Closed loop transmit diversity

Closed loop transmit diversity is described in [5]. Both closed loop transmit diversity modes shall be supported at the UE and may be supported in the UTRAN.

3GPP TSG RAN Meeting #13
Beijing, China, 18th – 21st , September, 2001

R1-01-0975

CR-Form-v4

CHANGE REQUEST

⌘ **25.211** **CR** **121** ⌘ rev **1** ⌘ Current version: **4.1.0** ⌘

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

Title:	⌘	Clarification of the usage of Tx diversity modes in Soft HOV
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	30-08-2001
Category:	⌘	**A**
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:	⌘	This CR includes a clarifying remark for the RAN1 specification.
Summary of change:	⌘	- Different Tx diversity modes (STTD, CL I, CL II) shall not be used on the radio links within one active set. - No Tx diversity on one or more radio links shall not prevent UTRAN to use Tx diversity on other radio links within the same active set. However, the UE shall operate this Tx diversity mode on all radio links.
Consequences if not approved:	⌘	Without clear specifications regarding this issue, UE's have to take into account all possible scenarios, unnecessarily increasing the complexity. Furthermore, based on incorrect interpretation of the specification UE's may fail to work correctly.

Clauses affected:	⌘	5.3.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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.

5.3.1 Downlink transmit diversity

Table 10 summarizes the possible application of open and closed loop transmit diversity modes on different downlink physical channel types. Simultaneous use of STTD and closed loop modes on the same physical channel is not allowed. In addition, if Tx diversity is applied on any of the downlink physical channels it shall also be applied on P-CCPCH and SCH. Regarding CPICH transmission in case of transmit diversity, see subclause 5.3.3.1.

With respect to the usage of Tx diversity on different radio links within an active set, the following rules apply:

- Different Tx diversity modes (STTD and closed loop) shall not be used on the radio links within one active set.
- No Tx diversity on one or more radio links shall not prevent UTRAN to use Tx diversity on other radio links within the same active set. However, the UE shall operate this Tx diversity mode on all radio links.

Furthermore, the transmit diversity mode used for a PDSCH frame shall be the same as the transmit diversity mode used for the DPCH associated with this PDSCH frame. During the duration of the PDSCH frame, and within the slot prior to the PDSCH frame, the transmit diversity mode (open loop or closed loop) on the associated DPCH may not change. However, changing from closed loop mode 1 to mode 2 or vice versa, is allowed.

Table 10: Application of Tx diversity modes on downlink physical channel types "X" – can be applied, "–" – not applied

Physical channel type	Open loop mode		Closed loop Mode
	TSTD	STTD	
P-CCPCH	–	X	–
SCH	X	–	–
S-CCPCH	–	X	–
DPCH	–	X	X
PICH	–	X	–
PDSCH	–	X	X
AICH	–	X	–
CSICH	–	X	–