RP-010518

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

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	Α	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	Α	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	Α	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	Α	TEI	4.1.0	4.2.0

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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.

7.5 DPCH/PDSCH timing

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

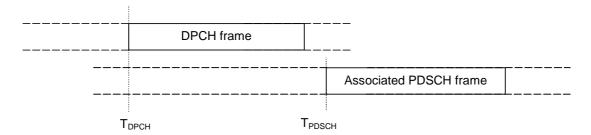


Figure 33: Timing relation between DPCH frame and associated PDSCH frame

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 $\leq T_{PDSCH} - T_{DPCH} < 84480$ 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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- 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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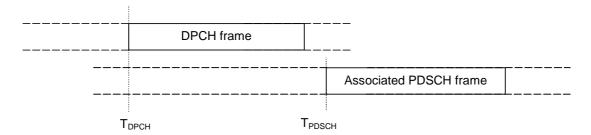


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7.6 DPCCH/DPDCH timing relations

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

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 loc	op mode	Closed loop		
	TSTD	STTD	Mode		
P-CCPCH	_	X	-		
SCH	Χ	-	-		
S-CCPCH	_	X	-		
DPCH	_	X	Х		
PICH	_	X	_		
PDSCH	_	X	Χ		
AICH	_	X	_		
CSICH	_	Х	_		

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

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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:

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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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Reason for change	e: # TSG-RAN WG1 #20 meeting the reference to FACH using beamforming was removed (CR25.211 099/100). However, in the introduction section of TS25.2 there is still a reference to FACH beamforming.	
Summary of chang	ge: * The reference to FACH beamforming is removed in section 4.1.2.2	
Consequences if not approved:	# Inconsistency in description of FACH in TS25.211	
Clauses affected:	# 4.1.2.2	
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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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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:

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

4.1.1 Dedicated transport channels

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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 or over only a part of the cell using e.g. beam-forming antennas</u>. 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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- 1) Fill out the above form. The symbols above marked # contain pop-up help information about the field that they are
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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 type	? S
"X" – can be applied, "–" – not applied	

Physical channel type	Open lo	Closed loop	
	TSTD	STTD	Mode
P-CCPCH	_	Х	_
SCH	X	_	_
S-CCPCH	_	Х	_
DPCH	_	Х	X
PICH	_	Х	_
PDSCH	_	Х	X
AICH	_	Х	_
CSICH	_	Χ	_

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.

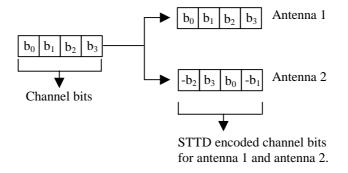


Figure 8: Generic block diagram of the STTD encoder

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.

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For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the % symbols.														
Proposed change a	ffect	s: #	(U)	SIM	ME	/UE	X	Rad	io Ac	cess N	letwork	X	Core No	etwork
Title: 第	Clar	ificati	on of S	STTD										
Source: #	TSG	RAN	I WG1											
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	Use <u>o</u> F A E C Detail	(corn (corn (add (fun (edia ed exp	rection) respone dition of ctional torial m blanatic	owing cate ds to a co f feature), modification ons of the TR 21.900	rrection on of fe n) above	n in ai eature	e)		elease	Use 2 P) R R R R R	96 97 98 99 EL-4	(GSN (Rele (Rele (Rele (Rele (Rele	L-4 Ilowing rel 1 Phase 2) ase 1997) ase 1998) ase 1999) ase 4) ase 5)	
Reason for change: RRC signaling is imposing an unnecessary restriction on the STTD usage (or allows STTD signaling for all RL of a UE), while NBAP allows signaling of ST 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 NBA).						of STTD pasis. ing CH as								
Summary of change	e:#	this l		TD shall									Signals ng CPIC	STTD for H as
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Other specs affected:	¥	Te	est spe	ore specification	าร	ns	ж							
Other comments:	¥													

- 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 specificatio the clause containing the first piece of changed text. Delete those parts of the specification which are the change reques	on just in front of on the not relevant to

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 type	? S
"X" – can be applied, "–" – not applied	

Physical channel type	Open lo	Closed loop		
	TSTD	STTD	Mode	
P-CCPCH	_	Х	_	
SCH	X	_	_	
S-CCPCH	_	Х	_	
DPCH	_	Х	X	
PICH	_	Х	_	
PDSCH	_	Х	X	
AICH	_	Х	_	
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.

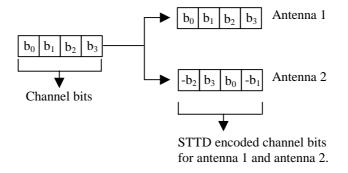


Figure 8: Generic block diagram of the STTD encoder

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.

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For <u>HELP</u> 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:	Clari	ficatio	n of the	e usage	of Tx	divers	sity	mod	es in	Soft Ho	VC			
Source: #	TSG	RAN	WG1											
Work item code: ₩	TEI									Da	te: ೫	30-	08-2001	
Category:	F A B C D Detaile	(corre	ection) esponds ition of fe tional m orial mod lanations	ving cate to a core eature), odification s of the a	rection on of fe) above (in an eature)			elease	2 R9 R9 R9 R9	<u>one</u> of 96 97 98	the for (GSN (Rele (Rele (Rele (Rele (Rele	L-4 Illowing real Phase 2, ease 1996, ease 1997, ease 1999, ease 4) ease 5))))
	- 00	TI '- /	2D 1 l		1- 26 2					DANIA -	'6'			
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 relinks within one active set. No Tx diversity on one or more radio links shall not prevent UTRAN to use diversity on other radio links within the same active set. However, the UE so operate this Tx diversity mode on all radio links.						use Tx								
Consequences if not approved:	*	all po	ssible s d on inc	cenario	s, unn	ecess	saril	y inc	creas	ing the	comp	lexity	take into . Further fail to wo	more,
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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)	3) With "track changes" disabled, paste the entire CR form (the clause containing the first piece of changed text. Delethe change request.	use CTRL-A to select it) into the specification just in front of ete those parts of the specification which are not relevant to

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 loc	Closed loop	
	TSTD	STTD	Mode
P-CCPCH	_	X	-
SCH	Χ	-	-
S-CCPCH	_	X	-
DPCH	-	X	Χ
PICH	_	X	_
PDSCH	_	X	Χ
AICH	_	X	_
CSICH	_	Х	_