TSG-RAN Meeting #15 ***RP-020159***
Jeju-do, Korea, 5 - 8 March 2002

(R1-020519 and R2-020593, to TSG-RAN) LS on Special submission of CRs for feature deferral or removal

Title:	**LS on Special submission of CRs for feature deferral or removal**
Source:	**RAN1 and RAN2**
To:	**RAN**
Cc:	**-**
Response to:	**-**
Release:	**R99**

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Attachments: 12 CRs (see deferral tables for RAN1 and RAN2, also attached)

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1. Overall Description:

RAN WG1 and RAN WG2 have had a joint meeting on Release 99 clean-up and on the concept of optionality to ease commercial availability of terminals that was discussed in RAN Plenary in December.

There was general consensus in the meeting that moving certain features from mandatoriness to optionality in Release 99 should not be done, and that instead removal from Release 99 and deferral to Release 4, or complete removal from the specifications, was a better way.

However, no consensus was reached on the fact that some working features should be deferred or removed. It was decided that therefore a decision in RAN Plenary should be made.

A candidate list of features has been identified, namely the following:

- No coding option, to be removed (except for 1.28 Mcps TDD)
- SSDT, to be deferred to Rel4
- Power control DPC Mode 1, to be deferred to Rel4
- Tx Diversity Closed loop mode 2, to be deferred to Rel4
- Power control algorithm 2, initially to be deferred to Rel4, although T1 clarified that they would like to keep the feature, and therefore this is no more a candidate proposed to RAN Plenary.

A list of technically correct Change Requests is presented to RAN Plenary for decision. As highlighted above, some companies objected on the CRs and therefore the CRs were not agreed in WGs but only checked technically. Consensus was only that they could be presented to RAN Plenary for decision.

It should be noted that the CRs have been written so as not to impact existing UE implementations and rely on the fact that the network should not use these features with Release 99 terminals.

2. Actions:

To RAN group.

ACTION: RAN should decide on the way forward on these Change Requests.

3. Date of Next RAN1 and RAN2 Meetings:

RAN2_28	8 – 12 April 2002	Kobe, Japan.
RAN1_25	9 – 12 April 2002	Paris, France.
RAN2_29/RAN1_26	13/14 – 17 May 2002	Gyeongju, Korea.

CR-Form-v5

CHANGE REQUEST

⌘ **25.211**	**CR 142**	⌘ **rev**	**-**	⌘ Current version:	**3.9.0** ⌘

*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: ⌘	Deferring of mandatory UE support of SSDT to Rel-4		
Source: ⌘	Nortel Networks		
Work item code: ⌘	TEI	***Date:*** ⌘	Feb 18th
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: ⌘	At the Joint RAN1-RAN2 meeting dedicated to R99 clean-up (5-6 Feb 2001 Sophia Antipolis) several R99 mandatory features in the UE have been identified as candidates for deferral to Release 4 in order to ease the UE implementation and therefore speed-up market readiness of UE terminals. SSDT was included in this list. However the discussions regarding the deferral to REL4 of the SSDT feature didn't reach consensus. The agreed way forward was to submit the CR to RAN1 for checking and then leave the final decision to RAN plenary. The proposed changes are isolated impact.
Summary of change: ⌘	It is specified that SSDT is removed from R99. However it is proposed to be kept in further releases.
Consequences if not approved: ⌘	

Clauses affected: ⌘		
Other specs affected: ⌘	[ ] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘ 25.101, 25.214, 25.331
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.

5.2.1 Dedicated uplink physical channels

There are two types of uplink dedicated physical channels, the uplink Dedicated Physical Data Channel (uplink DPDCH) and the uplink Dedicated Physical Control Channel (uplink DPCCH).

The DPDCH and the DPCCH are I/Q code multiplexed within each radio frame (see [4]).

The uplink DPDCH is used to carry the DCH transport channel. There may be zero, one, or several uplink DPDCHs on each radio link.

The uplink DPCCH is used to carry control information generated at Layer 1. The Layer 1 control information consists of known pilot bits to support channel estimation for coherent detection, transmit power-control (TPC) commands, feedback information (FBI), and an optional transport-format combination indicator (TFCI). The transport-format combination indicator informs the receiver about the instantaneous transport format combination of the transport channels mapped to the simultaneously transmitted uplink DPDCH radio frame. There is one and only one uplink DPCCH on each radio link.

Figure 1 shows the frame structure of the uplink dedicated physical channels. Each radio frame of length 10 ms is split into 15 slots, each of length T_{slot} = 2560 chips, corresponding to one power-control period.

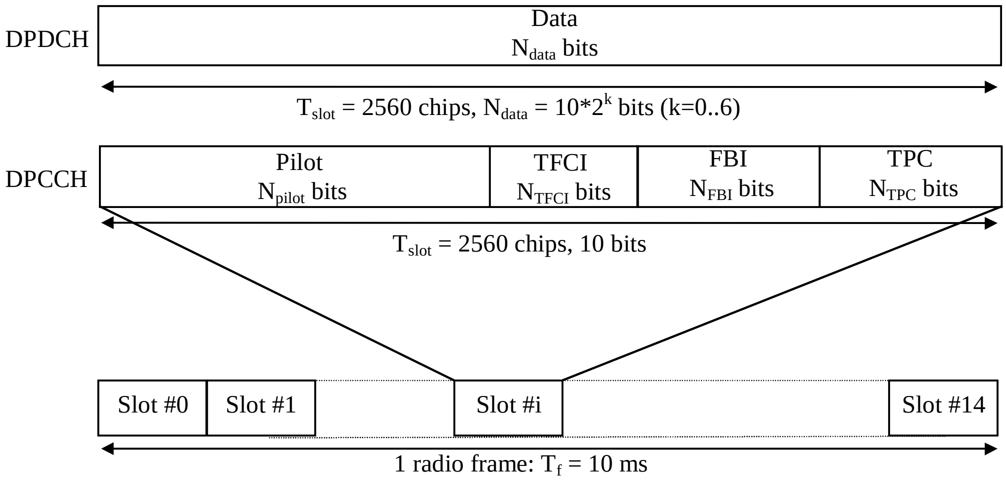

Figure 1: Frame structure for uplink DPDCH/DPCCH

The parameter k in figure 1 determines the number of bits per uplink DPDCH slot. It is related to the spreading factor SF of the DPDCH as $SF = 256/2^k$. The DPDCH spreading factor may range from 256 down to 4. The spreading factor of the uplink DPCCH is always equal to 256, i.e. there are 10 bits per uplink DPCCH slot.

The exact number of bits of the uplink DPDCH and the different uplink DPCCH fields (N_{pilot}, N_{TFCI}, N_{FBI}, and N_{TPC}) is given by table 1 and table 2. What slot format to use is configured by higher layers and can also be reconfigured by higher layers.

The channel bit and symbol rates given in table 1 and table 2 are the rates immediately before spreading. The pilot patterns are given in table 3 and table 4, the TPC bit pattern is given in table 5.

The FBI bits are used to support techniques requiring feedback from the UE to the UTRAN Access Point, including closed loop mode transmit diversity and site selection diversity transmission (SSDT). The structure of the FBI field is shown in figure 2 and described below.

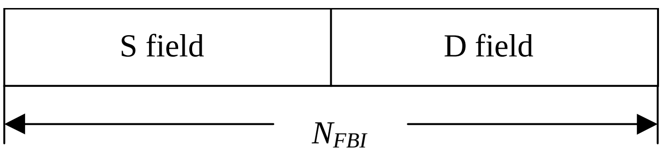

Figure 2: Details of FBI field

The S field is used for SSDT signalling, while the D field is used for closed loop mode transmit diversity signalling. The S field consists of 0, 1 or 2 bits. The D field consists of 0 or 1 bit. The total FBI field size N_{FBI} is given by table 2. If total FBI field is not filled with S field or D field, FBI field shall be filled with "1". When N_{FBI} is 2bits, S field is 0bit and D field is 1bit, left side field shall be filled with "1" and right side field shall be D field. The use of the FBI fields is described in detail in [5].

SSDT is not supported in this version of the specification.

Table 1: DPDCH fields

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Frame	Bits/ Slot	N_{data}
0	15	15	256	150	10	10
1	30	30	128	300	20	20
2	60	60	64	600	40	40
3	120	120	32	1200	80	80
4	240	240	16	2400	160	160
5	480	480	8	4800	320	320
6	960	960	4	9600	640	640

There are two types of uplink dedicated physical channels; those that include TFCI (e.g. for several simultaneous services) and those that do not include TFCI (e.g. for fixed-rate services). These types are reflected by the duplicated rows of table 2. It is the UTRAN that determines if a TFCI should be transmitted and it is mandatory for all UEs to support the use of TFCI in the uplink. The mapping of TFCI bits onto slots is described in [3].

In compressed mode, DPCCH slot formats with TFCI fields are changed. There are two possible compressed slot formats for each normal slot format. They are labelled A and B and the selection between them is dependent on the number of slots that are transmitted in each frame in compressed mode.

Table 2: DPCCH fields

Slot Form at #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Frame	Bits/ Slot	N_{pilot}	N_{TPC}	N_{TFCI}	N_{FBI}	Transmitted slots per radio frame
0	15	15	256	150	10	6	2	2	0	15
0A	15	15	256	150	10	5	2	3	0	10-14
0B	15	15	256	150	10	4	2	4	0	8-9
1	15	15	256	150	10	8	2	0	0	8-15
2	15	15	256	150	10	5	2	2	1	15
2A	15	15	256	150	10	4	2	3	1	10-14
2B	15	15	256	150	10	3	2	4	1	8-9
3	15	15	256	150	10	7	2	0	1	8-15
4	15	15	256	150	10	6	2	0	2	8-15
5	15	15	256	150	10	5	1	2	2	15
5A	15	15	256	150	10	4	1	3	2	10-14
5B	15	15	256	150	10	3	1	4	2	8-9

The pilot bit patterns are described in table 3 and table 4. The shadowed column part of pilot bit pattern is defined as FSW and FSWs can be used to confirm frame synchronization. (The value of the pilot bit pattern other than FSWs shall be "1".)

Table 3: Pilot bit patterns for uplink DPCCH with N_{pilot} = 3, 4, 5 and 6

	N_{pilot} = 3			N_{pilot} = 4				N_{pilot} = 5					N_{pilot} = 6					
Bit #	0	1	2	0	1	2	3	0	1	2	3	4	0	1	2	3	4	5
Slot #0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0
1	0	0	1	1	0	0	1	0	0	1	1	0	1	0	0	1	1	0
2	0	1	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1
3	0	0	1	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0
4	1	0	1	1	1	0	1	1	0	1	0	1	1	1	0	1	0	1
5	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0
6	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	0
7	1	0	1	1	1	0	1	1	0	1	0	0	1	1	0	1	0	0
8	0	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	1	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	0	1	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1
11	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1
12	1	0	1	1	1	0	1	1	0	1	0	0	1	1	0	1	0	0
13	0	0	1	1	0	0	1	0	0	1	1	1	1	0	0	1	1	1
14	0	0	1	1	0	0	1	0	0	1	1	1	1	0	0	1	1	1

Table 4: Pilot bit patterns for uplink DPCCH with N_{pilot} = 7 and 8

	N_{pilot} = 7							N_{pilot} = 8							
Bit #	0	1	2	3	4	5	6	0	1	2	3	4	5	6	7
Slot #0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
1	1	0	0	1	1	0	1	1	0	1	0	1	1	1	0
2	1	0	1	1	0	1	1	1	0	1	1	1	0	1	1
3	1	0	0	1	0	0	1	1	0	1	0	1	0	1	0
4	1	1	0	1	0	1	1	1	1	1	0	1	0	1	1
5	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
6	1	1	1	1	0	0	1	1	1	1	1	1	0	1	0
7	1	1	0	1	0	0	1	1	1	1	0	1	0	1	0
8	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	0	1	1	0	1	1	1	0	1	1	1	0	1	1
11	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1
12	1	1	0	1	0	0	1	1	1	1	0	1	0	1	0
13	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1
14	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1

The relationship between the TPC bit pattern and transmitter power control command is presented in table 5.

Table 5: TPC Bit Pattern

TPC Bit Pattern		Transmitter power control command
N_{TPC} = 1	N_{TPC} = 2	
1	11	1
0	00	0

Multi-code operation is possible for the uplink dedicated physical channels. When multi-code transmission is used, several parallel DPDCH are transmitted using different channelization codes, see [4]. However, there is only one DPCCH per radio link.

A period of uplink DPCCH transmission prior to the start of the uplink DPDCH transmission (uplink DPCCH power control preamble) shall be used for initialisation of a DCH. The length of the power control preamble is a higher layer parameter, N_{pcp} , signalled by the network [5]. The UL DPCCH shall take the same slot format in the power control preamble as afterwards, as given in table 2. When $N_{pcp} > 0$ the pilot patterns of table 3 and table 4 shall be used. The timing of the power control preamble is described in [5], subclause 4.3.2.3. The TFCI field is filled with "0" bits.

TSG-RAN Meeting #15 ***(R2-020593)***
Jeju-do, Korea, 5 - 8 March 2002

Title: **CRs (Release '99 and Rel-4 category A) for feature deferrals. Not agreed by TSG-RAN WG2 but technically endorsed**

Source: **Various companies**

Agenda item: **6.3**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-020408	tech.end.	25.302	120	1	R99	Removal of channel coding option “no coding” for FDD and 3.84 Mcps TDD	C	3.11.0	
R2-020409	tech.end.	25.302	121		Rel-4	Removal of channel coding option “no coding” for FDD and 3.84 Mcps TDD	A	4.3.0	
R2-020459	tech.end.	25.331	1235	1	R99	Deferral of SSDT from R99 to REL-4	C	3.9.0	
R2-020490	tech.end.	25.331	1295	1	R99	Removal of channel coding option “no coding” for FDD and 3.84 Mcps TDD	C	3.9.0	
R2-020491	tech.end.	25.331	1296		Rel-4	Removal of channel coding option “no coding” for FDD and 3.84 Mcps TDD	A	4.3.0	
R2-020504	tech.end.	25.331	1328	1	R99	Removal of Tx Diversity Closed loop mode 2 from R'99 only	C	3.9.0	
R2-020567	tech.end.	25.331	1334	2	R99	Removal of Power control DPC Mode 1 from R99 only	C	3.9.0	

3GPP TSG-RAN Meeting #15 ***(R1-020519)***
Jeju, Korea, 5 – 8, March, 2002

Title: **CRs (Release '99) for feature deferrals. Not agreed by TSG-RAN WG1 though technical contents were checked.**

Source: **Various companies**

Agenda item: **6.3**

No.	Spec	CR	Rev	R1 T-doc	Subject	Release	Cat	Workitem	V_old	V_new
1	25.211	142	-	R1-02-0304	Deferring of mandatory UE support of SSDT to Rel-4	R99	F	TEI	3.9.0	3.10.0
2	25.211	145	1	R1-02-0496	Deferring of closed loop mode 2 transmit diversity from R99	R99	F	TEI	3.9.0	3.10.0
3	25.214	238	-	R1-02-0303	Deferring of mandatory UE support of SSDT to Rel-4	R99	F	TEI	3.9.0	3.10.0
4	25.214	243	1	R1-02-0497	Deferring of closed loop mode 2 transmit diversity from R99	R99	F	TEI	3.9.0	3.10.0
5	25.214	249	1	R1-02-0498	Deferral of DPC_MODE=1 of downlink power control	R99	F	TEI	3.9.0	3.10.0

3GPP TSG-RAN2 Meeting #27 **Tdoc R2-020567**
Orlando, U.S.A, 18-22 February, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.331 CR 1334** ⌘ **rev** **-** ⌘ Current version: **3.9.0** ⌘

*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:	⌘	Removal of Power control DPC Mode 1 from R99 only
Source:	⌘	Panasonic
Work item code:	⌘	TEI — ***Date:*** ⌘ 18 Feb 2002
Category:	⌘	**C** — ***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:	⌘	At Joint RAN1-2 meeting held on 5-8th Feb 2002, it was agreed that several features that are mandatory in R'99 should be deferred to later release. Power control DPC Mode 1 was one of candidates for deferral. This CR needs to be checked for technical correctness (not for consensus) by WG2 as decision is left to RAN plenary. The proposed changes are isolated impact. Affected functionality is Power Control. If UTRAN does not implent this CR but the UE implements it then the UE behavior is unspecified. If UTRAN implements this CR then there is no impact on the UE.
Summary of change:	⌘	Power control DPC mode 1 is ~~removed~~ deferred from R'99 to later releases, it shall not be send by the UTRAN. No modification in RRC procedure description(8.6.6.28) is necessary. ~~The IE "DPC mode" with 'TPC triplet in soft' is modified to 'dummy'and should be processed according to subclause 11.0.~~
Consequences if not approved:	⌘	Unnecessary complexity in early stage terminals.

Clauses affected:	⌘	10.3.6.23, 11.3
Other specs affected:	⌘	[X] Other core specifications ⌘ 25.214 No change to 25.331 v4.3.0! [ ] 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.

10.3.6.23 Downlink DPCH power control information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>DPC Mode	MP		Enumerated (Single TPC, TPC triplet in soft)	"Single TPC" is DPC_Mode=0 and "TPC triplet in soft" is DPC_mode=1 in [29].
>TDD				
>>TPC Step Size	OP		Integer (1, 2, 3)	In dB

NOTE: DPC Mode 1 is not supported in Release 99 and UTRAN should not send the IE with “DPC Mode” set to “TPC triplet in soft”. If a Release 99 UE receives the IE “DPC Mode” set to “TPC triplet in soft”, its behavior is unspecified. This superseedes other descriptions of UE behaviour that could be found in Release 99 specifications.

11.3 Information element definitions

```
/******** omitted *********/

DL-DPCH-PowerControlInfo ::=            SEQUENCE {
    modeSpecificInfo                        CHOICE {
        fdd                                     SEQUENCE {
            dpc-Mode                                DPC-Mode
        },
        tdd                                     SEQUENCE {
            tpc-StepSizeTDD                         TPC-StepSizeTDD         OPTIONAL
        }
    }
}

/******** omitted *********/
-- DPC Mode 1 is not supported in Release 99 and UTRAN should not send the IE with DPC-Mode set to
-- tpcTripletInSoft. If a Release 99 UE receives the IE DPC-Mode set to tpcTripletInSoft, its
-- behavior is unspecified.  This superseedes other descriptions of UE behaviour that could  be
-- found in Release 99 specifications.
DPC-Mode ::=                            ENUMERATED {
                                            singleTPC,
                                            tpcTripletInSoft }
```

3GPP TSG-RAN WG2 Meeting #27 ***R2-020504***
Orlando, Florida, USA, 18-22 February 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.331**	**CR 1328**	⌘ **rev r1** ⌘	Current version:	**3.9.0**	⌘

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:	⌘	Removal of Tx Diversity Closed loop mode 2 from R'99 only
Source:	⌘	Nokia
Work item code:	⌘	TEI
Date:	⌘	13 Feb 2002
Category:	⌘	C
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: ⌘ At the Joint R1-R2 meeting on R99 clean-up (5-6 Feb 2001 Sophia Antipolis) several R99 mandatory features in the UE have been identified as candidates for deferral to Release 4 in order to ease the UE implementation and therefore speed-up market readiness of UE terminals. Tx Diversity Closed loop mode 2 was included in this list. The agreed way forward was to submit the CR to RAN2 for checking and then leave the final decision to RAN plenary.

Isolated impact analysis:

Affected functionality is Tx diversity closed loop mode 2.

If UTRAN does not implement this CR but UE implements it then the UE behavior is unspecified.

If UTRAN implements this CR then there is no impact on the UE.

Summary of change: ⌘ It is specified that Tx Diversity Closed loop mode 2 is removed from R99 but kept in further releases.

Consequences if not approved: ⌘

Clauses affected: ⌘ 8.6.6.24, 10.3.6.21, 10.3.6.86

Other specs affected: ⌘ [ ] Other core specifications ⌘ No change to 25.331 v4.3.0!
[ ] 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.

8.6.6.24 Tx Diversity Mode

Tx Diversity Mode "closed loop mode2" is not supported in Release 99 and UTRAN should not use this value. If a Release 99 UE receives this value, its behaviour is unspecified. This superseeds other descriptions of UE behaviour that could be found in Release 99 specifications.

If the IE "Tx Diversity Mode" is included the UE shall:

- configure the Layer 1 to use the Tx diversity mode indicated in the IE only for the radio links for which the IE "Closed loop timing adjustment mode" is included;
- if the value of the IE "Tx Diversity Mode" is STTD:
  - ignore the value of the IE "Closed loop timing adjustment mode", for all the radio links for which the IE "Closed loop timing adjustment mode" is included;.
- if the value of the IE "Tx Diversity Mode" is closed loop mode1 or closed loop mode2:
  - apply the value of the IE "Closed loop timing adjustment mode", for all the radio links for which the IE "Closed loop timing adjustment mode" is included.

10.3.6.21 Downlink DPCH info for each RL

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.62	
>>DPCH frame offset	MP		Integer(0..38144 by step of 256)	Offset (in number of chips) between the beginning of the P-CCPCH frame and the beginning of the DPCH frame This is called $\tau_{DPCH,n}$ in [26]
>>Secondary CPICH info	OP		Secondary CPICH info 10.3.6.73	
>>DL channelisation code	MP	1 to <maxDPCH-DLchan>		For the purpose of physical channel mapping [27] the DPCHs are numbered, starting from DPCH number 1, according to the order that they are contained in this IE.
>>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.74	Default is the same scrambling code as for the Primary CPICH
>>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	Defined in CHOICE SF512-AndCodenumber with "code number" in ASN.1
>>>Code number	MP		Integer(0..Spreading factor - 1)	
>>>Scrambling code change	CH-*SF/2*		Enumerated (code change, no code change)	Indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'.
>>TPC combination index	MP		TPC combination index 10.3.6.85	
>>SSDT Cell Identity	OP		SSDT Cell Identity 10.3.6.76	
>>Closed loop timing adjustment mode	CH-*TxDiversity Mode*		Integer(1, 2)	It is present if current TX Diversity Mode in UE is "closed loop mode 1"~~ or "closed loop mode 2"~~. Value in slots
>TDD				
>>DL CCTrCh List	MP	1..<maxCCTrCH>		
>>>TFCS ID	MD		Integer(1..8)	Identity of this CCTrCh. Default value is 1
>>>Time info	MP		Time Info 10.3.6.83	
>>>Common timeslot info	MD		Common Timeslot Info 10.3.6.10	Default is the current Common timeslot info
>>>Downlink DPCH timeslots and codes	MD		Downlink Timeslots and Codes 10.3.6.32	Default is to use the old timeslots and codes.
>>>UL CCTrCH TPC List	MD	0..<maxCCTrCH>		UL CCTrCH identities for TPC commands associated

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				with this DL CCTrCH. Default is previous list or all defined UL CCTrCHs
>>>>UL TPC TFCS Identity	MP		Transport Format Combination Set Identity 10.3.5.21	

Condition	Explanation
SF/2	The information element is mandatory present if the UE has an active compressed mode pattern sequence, which is using compressed mode method "SF/2". Otherwise the IE is not needed.
TxDiversity Mode	This IE is mandatory present if current TX Diversity Mode in UE is "closed loop mode 1"~~ or "closed loop mode 2"~~. Otherwise the IE is not needed.

10.3.6.86 TX Diversity Mode

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Tx diversity Mode	MP		Enumerated (none, STTD, closed loop mode1, closed loop mode2)	"Closed loop mode 2" is not used in this version of the protocol.

3GPP TSG-RAN WG2 Meeting #27
Orlando, USA, 18th – 22th February 2002

Tdoc R2-020491

CR-Form-v5

CHANGE REQUEST

⌘	**25.331**	**CR**	**1296**	⌘ **rev**	**-**	⌘ Current version: **4.3.0** ⌘

*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:	⌘	Removal of channel coding option "no coding" for FDD and 3.84 Mcps TDD
Source:	⌘	Siemens
Work item code:	⌘	TEI
Date:	⌘	18th February 2002
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:	⌘	In the last joint RAN1/RAN2 meeting it has been agreed to remove the channel coding option "no coding" for FDD and 3.84 Mcps TDD. For 1.28 Mcps TDD this option is still valid.
Summary of change:	⌘	The channel coding option "no coding" has been removed in the IE "Type of channel coding". **Isolated Impact Analysis** This change affects the channel coding type. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.
Consequences if not approved:	⌘	"no coding" option is possible

Clauses affected:	⌘	10.3.5.11, 11
Other specs affected:	⌘	[ ] Other core specifications ⌘ 25.331 v3.9.0, CR 1295r1 [ ] 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 request.

10.3.5.11 Semi-static Transport Format Information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission time interval	MP		Integer(10, 20, 40, 80, dynamic)	In ms. The value dynamic is only used in TDD mode
Type of channel coding	MP		Enumerated(No coding, Convolutional, Turbo)	The option "No coding" is only valid for 1.28 Mcps TDD.
Coding Rate	CV-*Coding*		Enumerated(1/2, 1/3)	
Rate matching attribute	MP		Integer(1..hiRM)	
CRC size	MP		Integer(0, 8, 12, 16, 24)	in bits

```
ChannelCodingType ::=               CHOICE {
    -- the option 'noCoding' is only used for 1.28 Mcps TDD in this version of the specification,
otherwise it should be ignored
    noCoding                            NULL,
    convolutional                       CodingRate,
    turbo                               NULL
}
```

3GPP TSG-RAN WG2 Meeting #27 *Tdoc R2-020490*
Orlando, USA, 18th – 22th February 2002

CR-Form-v5

CHANGE REQUEST

⌘	**25.331**	**CR 1295**	⌘ **rev**	**r1**	⌘ Current version:	**3.9.0** ⌘

*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:	⌘	Removal of channel coding option “no coding” for FDD and 3.84 Mcps TDD	
Source:	⌘	Siemens	
Work item code:	⌘	TEI	***Date:*** ⌘ 18th February 2002
Category:	⌘	**C**	***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:	⌘	In the last joint RAN1/RAN2 meeting it has been agreed to remove the channel coding option “no coding” for FDD and 3.84 Mcps TDD.
Summary of change:	⌘	The channel coding option “no coding” has been removed in the IE “Type of channel coding”. **Isolated Impact Analysis** This change affects the channel coding type. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.
Consequences if not approved:	⌘	“no coding” option is possible

Clauses affected:	⌘	10.3.5.11, 11		
Other specs affected:	⌘	[ ] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘	25.331 v4.3.0, CR 1296
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.

10.3.5.11 Semi-static Transport Format Information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission time interval	MP		Integer(10, 20, 40, 80, dynamic)	In ms. The value dynamic is only used in TDD mode
Type of channel coding	MP		Enumerated(~~No coding,~~ Convolutional, Turbo)	
Coding Rate	CV-*Coding*		Enumerated(1/2, 1/3)	
Rate matching attribute	MP		Integer(1..hiRM)	
CRC size	MP		Integer(0, 8, 12, 16, 24)	in bits

```
ChannelCodingType ::=               CHOICE {
    -- dummy is not used in this version of the specification and should be ignored
    dummynoCoding                           NULL,
    convolutional                       CodingRate,
    turbo                               NULL
}
```

3GPP TSG-RAN2 Meeting #27 **R2-020459**
Orlando, FL, USA, 18-23 Feb 2002

CR-Form-v6.1

CHANGE REQUEST

⌘ **25.331**	**CR 1235**	⌘ **rev**	**r1** ⌘	Current version:	**3.9.0**	⌘

*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: ⌘	Deferral of SSDT from R99 to REL-4		
Source: ⌘	Nortel Networks		
Work item code: ⌘	TEI	***Date:*** ⌘	18 Feb 2002
Category: ⌘	**C** *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.	***Release:*** ⌘	R99 *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: ⌘	At the Joint RAN1-RAN2 meeting dedicated to R99 clean-up (5-6 Feb 2001 Sophia Antipolis) several R99 mandatory features in the UE have been identified as candidates for deferral to Release 4 in order to ease the UE implementation and therefore speed-up market readiness of UE terminals. SSDT was included in this list. However the discussions regarding the deferral to REL4 of the SSDT feature didn't reach consensus. The agreed way forward was to submit the CR to RAN2 for checking and then leave the final decision to RAN plenary. The proposed changes are isolated impact. Affected functionality is SSDT. If UTRAN does not implent this CR but the UE implements it then the UE behavior is unspecified. If UTRAN implements this CR then there is no impact on the UE.
Summary of change: ⌘	It is specified that in R99 UTRAN should not use SSDT configuration~~is removed from R99~~. However it is proposed to be kept in further releases.
Consequences if not approved: ⌘	

Clauses affected: ⌘	8.3.6.2, 8.6.6.25, 10.2.1, 10.3.6.21, 10.3.6.24	
Other specs affected: ⌘	[ ] Other core specifications ⌘ [ ] Test specifications	25.101, 25.213, 25.214 No change to 25.331 v4.3.0!

	☐ 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 request.

8.3.6.2 Initiation

The procedure is initiated when a radio access technology other than UTRAN, e.g. GSM, using radio access technology-specific procedures, orders the UE to make a handover to UTRAN.

A HANDOVER TO UTRAN COMMAND message is sent to the UE via the radio access technology from which inter-RAT handover is performed.

In case UTRAN decides to uses a predefined or default radio configuration that is stored in the UE, it should include the following information in the HANDOVER TO UTRAN COMMAND message.

- the IE "New U-RNTI" to be assigned;
- the IE "Predefined configuration identity", to indicate which pre-defined configuration of RB, transport channel and physical channel parameters shall be used; or
- the IE "Default configuration mode" and IE "Default configuration identity", to indicate which default configuration of RB, transport channel and physical channel parameters shall be used;
- PhyCH information elements.

NOTE 1: When using a predefined or default configuration during handover to UTRAN, UTRAN can only assign values of IEs "New U-RNTI" and "scrambling code" that are within the special subranges defined exclusively for this procedure. UTRAN may re- assign other values after completion of the handover procedure.

NOTE 2: When using a predefined or default configuration during handover to UTRAN, fewer IEs are signalled; when using this signalling option some parameters e.g. concerning compressed mode, DSCH~~, SSDT~~ can not be configured. In this case, the corresponding functionality can not be activated immediately.

In case UTRAN does not use a predefined radio configuration that is stored in the UE, it should include the following information in the HANDOVER TO UTRAN COMMAND message.

- the IE "New U-RNTI" to be assigned;
- the complete set of RB, TrCH and PhyCH information elements to be used.

8.6.6.25 SSDT Information

SSDT is not supported in Release 99 and UTRAN should not send this IE. If a Release 99 UE receives SSDT information, its behavior is unspecified. This superseedes other descriptions of UE behaviour that could be found in Release 99 specifications.

~~If the IE "SSDT Information" is included the UE shall:~~

- ~~configure the size of the S-field in the FBI field on the uplink DPCCH to the value indicated in the IE "S-field";~~
- ~~if the IE "Code Word Set" has the value "long", "medium" or "short":~~
  - ~~use the length of the temporary cell ID code for SSDT indicated in the IE "Code Word Set".~~
- ~~if the IE "Code Word Set" has the value "SSDT off":~~
  - ~~terminate SSDT.~~

10.2.1 ACTIVE SET UPDATE

NOTE: Only for FDD.

This message is used by UTRAN to add, replace or delete radio links in the active set of the UE.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.19	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now".
New U-RNTI	OP		U-RNTI 10.3.3.47	
CN information elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB information elements				
Downlink counter synchronisation info	OP			
>RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22	
Phy CH information elements				
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.39	Default value is the existing "maximum UL TX power.
Downlink radio resources				
Radio link addition information	OP	1 to <maxRL-1>		Radio link addition information required for each RL to add
>Radio link addition information	MP		Radio link addition information 10.3.6.68	
Radio link removal information	OP	1 to <maxRL>		Radio link removal information required for each RL to remove
>Radio link removal information	MP		Radio link	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
			removal information 10.3.6.69	
TX Diversity Mode	MD		TX Diversity Mode 10.3.6.86	Default value is the existing TX diversity mode.
SSDT information	OP		SSDT information 10.3.6.77	In this version of the protocol UTRAN should not send this IE

10.3.6.21 Downlink DPCH info for each RL

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.62	
>>DPCH frame offset	MP		Integer(0..38144 by step of 256)	Offset (in number of chips) between the beginning of the P-CCPCH frame and the beginning of the DPCH frame This is called $\tau_{DPCH,n}$ in [26]
>>Secondary CPICH info	OP		Secondary CPICH info 10.3.6.73	
>>DL channelisation code	MP	1 to <maxDPCH-DLchan>		For the purpose of physical channel mapping [27] the DPCHs are numbered, starting from DPCH number 1, according to the order that they are contained in this IE.
>>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.74	Default is the same scrambling code as for the Primary CPICH
>>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	Defined in CHOICE SF512-AndCodenumber with "code number" in ASN.1
>>>Code number	MP		Integer(0..Spreading factor - 1)	
>>>Scrambling code change	CH-*SF/2*		Enumerated (code change, no code change)	Indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'.
>>TPC combination index	MP		TPC combination index 10.3.6.85	
>>SSDT Cell Identity	OP		SSDT Cell Identity 10.3.6.76	In this version of the protocol UTRAN should not send this IE
>>Closed loop timing adjustment mode	CH-*TxDiversity Mode*		Integer(1, 2)	It is present if current TX Diversity Mode in UE is "closed loop mode 1" or "closed loop mode 2". Value in slots
>TDD				
>>DL CCTrCh List	MP	1..<maxCCTrCH>		
>>>TFCS ID	MD		Integer(1..8)	Identity of this CCTrCh. Default value is 1
>>>Time info	MP		Time Info 10.3.6.83	
>>>Common timeslot info	MD		Common Timeslot Info 10.3.6.10	Default is the current Common timeslot info
>>>Downlink DPCH timeslots and codes	MD		Downlink Timeslots and Codes 10.3.6.32	Default is to use the old timeslots and codes.
>>>UL CCTrCH TPC List	MD	0..<maxCCTrCH>		UL CCTrCH identities for TPC commands associated

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				with this DL CCTrCH. Default is previous list or all defined UL CCTrCHs
>>>>UL TPC TFCS Identity	MP		Transport Format Combination Set Identity 10.3.5.21	

Condition	Explanation
SF/2	The information element is mandatory present if the UE has an active compressed mode pattern sequence, which is using compressed mode method "SF/2". Otherwise the IE is not needed.
TxDiversity Mode	This IE is mandatory present if current TX Diversity Mode in UE is "closed loop mode 1" or "closed loop mode 2". Otherwise the IE is not needed.

10.3.6.24 Downlink information common for all radio links

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink DPCH info common for all RL	OP		Downlink DPCH info common for all RL 10.3.6.18	
CHOICE *mode*	MP			
>FDD				
>>DPCH compressed mode info	MD		DPCH compressed mode info 10.3.6.33	Default value is the existing value of DPCH compressed mode information
>>TX Diversity Mode	MD		TX Diversity Mode 10.3.6.86	Default value is the existing value of TX Diversity mode
>>SSDT information	OP		SSDT information 10.3.6.77	In this version of the protocol UTRAN should not send this IE
>TDD				(no data)
Default DPCH Offset Value	OP		Default DPCH Offset Value, 10.3.6.16	

3GPP TSG-RAN WG2 Meeting #27
Orlando, USA, 18th – 22th February 2002

Tdoc R2-020409

CR-Form-v5

CHANGE REQUEST

⌘ **25.302**	**CR 121**	⌘ **rev -** ⌘	Current version:	**4.3.0** ⌘

*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: ⌘	Removal of channel coding option "no coding" for FDD and 3.84 Mcps TDD		
Source: ⌘	Siemens		
Work item code: ⌘	TEI	***Date:*** ⌘	18th February 2002
Category: ⌘	**C** *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.	***Release:*** ⌘	REL-4 *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: ⌘	In the last joint RAN1/RAN2 meeting it has been agreed to remove the channel coding option "no coding" for FDD and 3.84 Mcps TDD. . For 1.28 Mcps TDD this option is still valid.
Summary of change: ⌘	The channel coding option "no coding" has been removed in the IE "Type of channel coding". **Isolated Impact Analysis** This change affects the channel coding type. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.
Consequences if not approved: ⌘	"no coding" option is possible

Clauses affected: ⌘	7.1.6, Annex A, Annex B	
Other specs affected: ⌘	[ ] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications	25.302 v3.11.0, CR 120r1
Other comments: ⌘		

How to create CRs using this form:

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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.

7.1.6 Transport Format

This is defined as a format offered by L1 to MAC (and vice versa) for the delivery of a Transport Block Set during a Transmission Time Interval on a Transport Channel. The Transport Format constitutes of two parts – one *dynamic* part and one *semi-static* part.

Attributes of the dynamic part are:

- Transport Block Size;
- Transport Block Set Size;
- Transmission Time Interval (optional dynamic attribute for TDD only);

Attributes of the semi-static part are:

- Transmission Time Interval (mandatory for FDD, optional for the dynamic part of TDD NRT bearers);
- error protection scheme to apply:
  - type of error protection, turbo code, convolutional code or no channel coding (1.28 Mcps TDD only);
  - coding rate;
  - static rate matching parameter;
- size of CRC.

Table A.1: Characterisation of Transport Format

		Attribute values	BCH	PCH	FACH	RACH
Dynamic part	Transport Block Size	0 to 5 000 1 bit granularity	246	1 to 5000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity
	Transport Block Set Size	0 to 200 000 1 bit granularity	246	1 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms				
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	20 ms	10ms for FDD, 20ms for TDD	10, 20 ms, 40 and 80 ms	10 ms and 20 ms for FDD, 10 ms for TDD
	Type of channel coding	No Coding (1.28 Mcps TDD only) Turbo coding Convolutional coding	Convolutional coding	Convolutional coding	No coding (1.28 Mcps TDD only) Turbo coding Convolutional coding	Convolutional coding
	code rates	1/2, 1/3	1/2	1/2	1/2, 1/3	1/2
	CRC size	0, 8, 12, 16, 24	16	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0,5 to 4				

		Attribute values	CPCH	DCH	DSCH	USCH
Dynamic part	Transport Block Size	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity
	Transport Block Set Size	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
	Type of channel coding	No coding (1.28 Mcps TDD only) Turbo coding Convolutional coding	No coding (1.28 Mcps TDD only) Turbo coding Convolutional coding	No coding (1.28 Mcps TDD only) Turbo coding Convolutional coding	No coding (1.28 Mcps TDD only) Turbo coding Convolutional coding	No coding (1.28 Mcps TDD only) Turbo coding Convolutional coding
	code rates (in case of convolutional coding)	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3
	CRC size	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0,5 to 4				

Table B.1

	Attribute	Value		
		Class A	Class B	Class C
Dynamic part	Transport Block Size	81 65 75 61 58 55 49 42 39	103 99 84 87 76 63 54 53 0	60 40 0 0 0 0 0 0 0
	Transport Block Set Size	Same as the transport block sizes		
Semi-static part	Transmission Time Interval	20 ms		
	Type of channel coding	Convolutional coding		
	code rates	1/2, 1/3 + class-specific rate matching	None (1.28 Mcps TDD only), 1/2, 1/3 + class-specific rate matching	None (1.28 Mcps TDD only), 1/2 , 1/3 + class-specific rate matching
	CRC size	8	0	0
	Resulting ratio after static rate matching	0.5 to 4(with no coding the rate matching ratio needs to be >1)		

3GPP TSG-RAN WG2 Meeting #27 *Tdoc R2-020408*
Orlando, USA, 18th – 22th February 2002

CR-Form-v5

CHANGE REQUEST

⌘	**25.302**	**CR** **120**	⌘ **rev**	**r1** ⌘	Current version:	**3.b.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: ⌘	Removal of channel coding option “no coding” for FDD and 3.84 Mcps TDD		
Source: ⌘	Siemens		
Work item code: ⌘	TEI	***Date:*** ⌘	18th February 2002
Category: ⌘	**C**	***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: ⌘	In the last joint RAN1/RAN2 meeting it has been agreed to remove the channel coding option “no coding” for FDD and 3.84 Mcps TDD.
Summary of change: ⌘	The channel coding option “no coding” has been removed in the IE “Type of channel coding”. **Isolated Impact Analysis** This change affects the channel coding type. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.
Consequences if not approved: ⌘	“no coding” option is possible

Clauses affected: ⌘	7.1.6, Annex A, Annex B	
Other specs affected: ⌘	[ ] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications	25.302 v4.3.0, CR 121
Other comments: ⌘		

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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.

7.1.6 Transport Format

This is defined as a format offered by L1 to MAC (and vice versa) for the delivery of a Transport Block Set during a Transmission Time Interval on a Transport Channel. The Transport Format constitutes of two parts – one *dynamic* part and one *semi-static* part.

Attributes of the dynamic part are:

- Transport Block Size;
- Transport Block Set Size;
- Transmission Time Interval (optional dynamic attribute for TDD only);

Attributes of the semi-static part are:

- Transmission Time Interval (mandatory for FDD, optional for the dynamic part of TDD NRT bearers);
- error protection scheme to apply:
  - type of error protection, turbo code~~,~~or convolutional code~~ or no channel coding~~;
  - coding rate;
  - static rate matching parameter;
- size of CRC.

Table A.1: Characterisation of Transport Format

		Attribute values	BCH	PCH	FACH	RACH
Dynamic part	Transport Block Size	0 to 5 000 1 bit granularity	246	1 to 5000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity
	Transport Block Set Size	0 to 200 000 1 bit granularity	246	1 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms				
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	20 ms	10ms for FDD, 20ms for TDD	10, 20 ms, 40 and 80 ms	10 ms and 20 ms for FDD, 10 ms for TDD
	Type of channel coding	~~No Coding~~ Turbo coding Convolutional coding	Convolutional coding	Convolutional coding	~~No coding~~ Turbo coding Convolutional coding	Convolutional coding
	code rates	1/2, 1/3	1/2	1/2	1/2, 1/3	1/2
	CRC size	0, 8, 12, 16, 24	16	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0,5 to 4				

		Attribute values	CPCH	DCH	DSCH	USCH
Dynamic part	Transport Block Size	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity
	Transport Block Set Size	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
	Type of channel coding	~~No coding~~ Turbo coding Convolutional coding	~~No coding~~ Turbo coding Convolutional coding	~~No coding~~ Turbo coding Convolutional coding	~~No coding~~ Turbo coding Convolutional coding	~~No coding~~ Turbo coding Convolutional coding
	code rates (in case of convolutional coding)	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3
	CRC size	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0,5 to 4				

Table B.1

	Attribute	Value		
		Class A	**Class B**	**Class C**
Dynamic part	Transport Block Size	81 65 75 61 58 55 49 42 39	103 99 84 87 76 63 54 53 0	60 40 0 0 0 0 0 0 0
	Transport Block Set Size	Same as the transport block sizes		
Semi-static part	Transmission Time Interval	20 ms		
	Type of channel coding	Convolutional coding		
	code rates	1/2, 1/3 + class-specific rate matching	~~None,~~ 1/2, 1/3 + class-specific rate matching	~~None,~~ 1/2 , 1/3 + class-specific rate matching
	CRC size	8	0	0
	Resulting ratio after static rate matching	0.5 to 4~~(with no coding the rate matching ratio needs to be >1)~~		

3GPP TSG RAN Meeting #15
Jeju, Korea, 5 – 8, March, 2002

R1-02-0498

CR-Form-v4

CHANGE REQUEST

⌘ **25.214 CR 249** ⌘	rev	**1** ⌘	Current version:	**3.9.0** ⌘	

*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: ⌘	Deferral of DPC_MODE=1 of downlink power control			
Source: ⌘	Panasonic			
Work item code: ⌘	TEI		***Date:*** ⌘	22 Feb 2002
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: ⌘	At the Joint RAN1-RAN2 meeting dedicated to R99 clean-up (5-6 Feb 2001 Sophia Antipolis) several R99 mandatory features in the UE have been identified as candidates for deferral to Release 4 in order to ease the UE implementation and therefore speed-up market readiness of UE terminals. DPC_MODE=1 was included in this list. However the discussions regarding the deferral to REL4 of the DPC_MODE=1 feature didn't reach consensus. The agreed way forward was to submit the CR to RAN1 for checking and then leave the final decision to RAN plenary. The proposed changes are isolated impact.
Summary of change: ⌘	It is specified that DPC_MODE=1 is removed from R99. However it is proposed to be kept in further releases.
Consequences if not approved: ⌘	

Clauses affected: ⌘	5.2.1.2	
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.

5.2.1.2 Ordinary transmit power control

5.2.1.2.1 UE behaviour

The UE shall generate TPC commands to control the network transmit power and send them in the TPC field of the uplink DPCCH. An example on how to derive the TPC commands in given in Annex B.2.

The UE shall check the downlink power control mode (DPC_MODE) before generating the TPC command:

- if DPC_MODE = 0 : the UE sends a unique TPC command in each slot and the TPC command generated is transmitted in the first available TPC field in the uplink DPCCH;
- if DPC_MODE = 1 : the UE repeats the same TPC command over 3 slots and the new TPC command is transmitted such that there is a new command at the beginning of the frame.

The DPC_MODE parameter is a UE specific parameter controlled by the UTRAN.

DPC_MODE = 1 is not supported in this version of the specification.

The UE shall not make any assumptions on how the downlink power is set by UTRAN, in order to not prohibit usage of other UTRAN power control algorithms than what is defined in subclause 5.2.1.2.2.

5.2.1.2.2 UTRAN behaviour

Upon receiving the TPC commands UTRAN shall adjust its downlink DPCCH/DPDCH power accordingly. For DPC_MODE = 0, UTRAN shall estimate the transmitted TPC command TPC_{est} to be 0 or 1, and shall update the power every slot. If DPC_MODE = 1, UTRAN shall estimate the transmitted TPC command TPC_{est} over three slots to be 0 or 1, and shall update the power every three slots. DPC_MODE = 1 is not supported in this version of the specification.

After estimating the k:th TPC command, UTRAN shall adjust the current downlink power $P(k-1)$ [dB] to a new power $P(k)$ [dB] according to the following formula:

$P(k) = P(k - 1) + P_{TPC}(k) + P_{bal}(k)$,

where $P_{TPC}(k)$ is the k:th power adjustment due to the inner loop power control, and $P_{bal}(k)$ [dB] is a correction according to the downlink power control procedure for balancing radio link powers towards a common reference power. The power balancing procedure and control of the procedure is described in [6].

$P_{TPC}(k)$ is calculated according to the following.

If the value of *Limited Power Increase Used* parameter is 'Not used', then

$$\mathrm{P_{TPC}}(k) = \begin{cases} +\Delta_{\mathrm{TPC}} & \text{if } \mathrm{TPC_{est}}(k) = 1 \\ -\Delta_{\mathrm{TPC}} & \text{if } \mathrm{TPC_{est}}(k) = 0 \end{cases}, \text{ [dB]}. \quad (1)$$

If the value of *Limited Power Increase Used* parameter is 'Used', then the k:th inner loop power adjustment shall be calculated as:

$$P_{TPC}(k) = \begin{cases} +\Delta_{TPC} & \text{if } \mathrm{TPC_{est}}(k) = 1 \text{ and } \Delta_{sum}(k) + \Delta_{TPC} < \text{Power\_Raise\_Limit} \\ 0 & \text{if } \mathrm{TPC_{est}}(k) = 1 \text{ and } \Delta_{sum}(k) + \Delta_{TPC} \geq \text{Power\_Raise\_Limit} \\ -\Delta_{TPC} & \text{if } \mathrm{TPC_{est}}(k) = 0 \end{cases}, \text{ [dB]} \quad (2)$$

where

$$\Delta_{sum}(k) = \sum_{i=k-\text{DL\_Power\_Averaging\_Window\_Size}}^{k-1} P_{TPC}(i)$$

is the temporary sum of the last *DL_Power_Averaging_Window_Size* inner loop power adjustments (in dB).

For the first (*DL_Power_Averaging_Window_Size* – 1) adjustments after the activation of the limited power increase method, formula (1) shall be used instead of formula (2). *Power_Raise_Limit* and *DL_Power_Averaging_Window_Size* are parameters configured in the UTRAN.

The power control step size Δ_{TPC} can take four values: 0.5, 1, 1.5 or 2 dB. It is mandatory for UTRAN to support Δ_{TPC} of 1 dB, while support of other step sizes is optional.

In addition to the above described formulas on how the downlink power is updated, the restrictions below apply.

In case of congestion (commanded power not available), UTRAN may disregard the TPC commands from the UE.

The average power of transmitted DPDCH symbols over one timeslot shall not exceed Maximum_DL_Power (dB), nor shall it be below Minimum_DL_Power (dB). Transmitted DPDCH symbol means here a complex QPSK symbol before spreading which does not contain DTX. Maximum_DL_Power (dB) and Minimum_DL_Power (dB) are power limits for one channelisation code, relative to the primary CPICH power [6].

3GPP TSG RAN Meeting #15
Jeju, Korea, 5 – 8, March, 2002

R1-02-0497

CR-Form-v5

CHANGE REQUEST

⌘ **25.214 CR 243** ⌘ **rev 1** ⌘ Current version: **3.9.0** ⌘

*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: ⌘	Deferring of closed loop mode 2 transmit diversity from R99		
Source: ⌘	Nokia		
Work item code: ⌘	TEI	***Date:*** ⌘	21.02.2002
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: ⌘	At the joint RAN1-RAN2 meeting deferral of closed loop mode 2 transmit diversity to REL4 was proposed. The agreed way forward was to submit the CR to RAN1 for checking and then leave the final decision to RAN plenary.
Summary of change: ⌘	It is specified that closed loop mode 2 transmit diversity is removed from R99. However it is proposed to be kept in further releases.
Consequences if not approved: ⌘	

Clauses affected: ⌘	7, 7.3	
Other specs affected: ⌘	[ ] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications	25.101, 25.211, 25.331
Other comments: ⌘	This CR is considered to have isolated impact: Would not affect any other features besides closed loop mode 2 transmit diversity	

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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

a) The next available slot when the PRACH and PCPCH scrambling code are not shared. Furthermore, the PCPCH AP preamble scrambling code and CD Preamble scrambling codes are different.

b) When the PRACH and PCPCH AP preamble scrambling code and CD preamble scrambling code are shared, the UE randomly selects one of the available access slots in the next 12 access slots. Number of CD sub-channels will be greater than 2.

10) If the UE does not receive a CD/CA-ICH in the designated slot, the UE aborts the access attempt and sends a failure message to the MAC layer.

11) If the UE receives a CD/CA-ICH in the designated slot with a signature that does not match the signature used in the CD Preamble, the UE aborts the access attempt and sends a failure message to the MAC layer.

12a) (In case CA is not Active) If the UE receives a CDI from the CD/CA-ICH with a matching signature, the UE transmits the power control preamble $\tau_{cd\text{-}p\text{-}pc\text{-}p}$ ms later as measured from initiation of the CD Preamble. The initial transmission power of the power control preamble shall be $\Delta P_{p\text{-}m}$ [dB] higher than the power of the CD preamble. The inner loop power control in the power control preamble is described in sub clause 5.1.3.3. The transmission of the message portion of the burst starts immediately after the power control preamble. Power control in the message part is described in sub clause 5.1.3.2.

12b) (In case CA is active) If the UE receives a CDI from the CD/CA-ICH with a matching signature and CA message that points out to one of the PCPCH's (mapping rule is in [5]) that were indicated to be free by the last received CSICH broadcast, the UE transmits the power control preamble $\tau_{cd\text{-}p\text{-}pc\text{-}p}$ ms later as measured from initiation of the CD Preamble. The initial transmission power of the power control preamble shall be $\Delta P_{p\text{-}m}$ [dB] higher than the power of the CD preamble. The inner loop power control in the power control preamble is described in sub clause 5.1.3.3. The transmission of the message portion of the burst starts immediately after the power control preamble. Power control in the message part is described in sub clause 5.1.3.2. If the CA message received points out the channel that was indicated to be busy on the last status information transmission received on the CSICH, the UE shall abort the access attempt and send a failure message to the MAC layer.

NOTE: If the $L_{pc\text{-}preamble}$ parameter indicates a zero length preamble, then there is no power control preamble and the message portion of the burst starts $\tau_{cd\text{-}p\text{-}pc\text{-}p}$ ms after the initiation of the CD Preamble. In this case the initial transmission power of the control part of the message part shall be $\Delta P_{p\text{-}m}$ [dB] higher than the power of the CD preamble. Power control in the message part is described in sub clause 5.1.3.2

13) The UE shall test the value of Start of Message Indicator received from DL-DPCCH for CPCH during the first $N_{Start\_Message}$ frames after Power Control preamble. Start of Message Indicator is a known sequence repeated on a frame by frame basis. The value of $N_{Start\_Message}$ shall be provided by the higher layers.

14) If the UE does not detect Start of Message Indicator in the first $N_{Start\_Message}$ frames of DL-DPCCH for CPCH after Power Control preamble, the UE aborts the access attempt and sends a failure message to the MAC layer. Otherwise, UE continuously transmits the packet data.

15) During CPCH Packet Data transmission, the UE and UTRAN perform inner-loop power control on both the CPCH UL and the DPCCH DL, as described in sub clause 5.1.3.

16) After the first $N_{Start\_Message}$ frames after Power Control preamble, upon the detection of an Emergency Stop command sent by UTRAN, the UE halts CPCH UL transmission, aborts the access attempt and sends a failure message to the MAC layer.

17) If the UE detects loss of DPCCH DL during transmission of the power control preamble or the packet data, the UE halts CPCH UL transmission, aborts the access attempt and sends a failure message to the MAC layer.

18) The UE may send empty frames after the end of the packet to indicate the end of transmission. The number of the empty frames is set by higher layers.

7 Closed loop mode transmit diversity

Closed loop mode 2 transmit diversity is not supported in this release.

The general transmitter structure to support closed loop mode transmit diversity for DPCH transmission is shown in figure 3. Channel coding, interleaving and spreading are done as in non-diversity mode. The spread complex valued signal is fed to both TX antenna branches, and weighted with antenna specific weight factors w_1 and w_2. The weight factors are complex valued signals (i.e., $w_i = a_i + jb_i$), in general.

The weight factors (actually the corresponding phase adjustments in closed loop mode 1 and phase/amplitude adjustments in closed loop mode 2) are determined by the UE, and signalled to the UTRAN access point (=cell transceiver) using the D sub-field of the FBI field of uplink DPCCH.

For the closed loop mode 1 different (orthogonal) dedicated pilot symbols in the DPCCH are sent on the 2 different antennas. For closed loop mode 2 the same dedicated pilot symbols in the DPCCH are sent on both antennas.

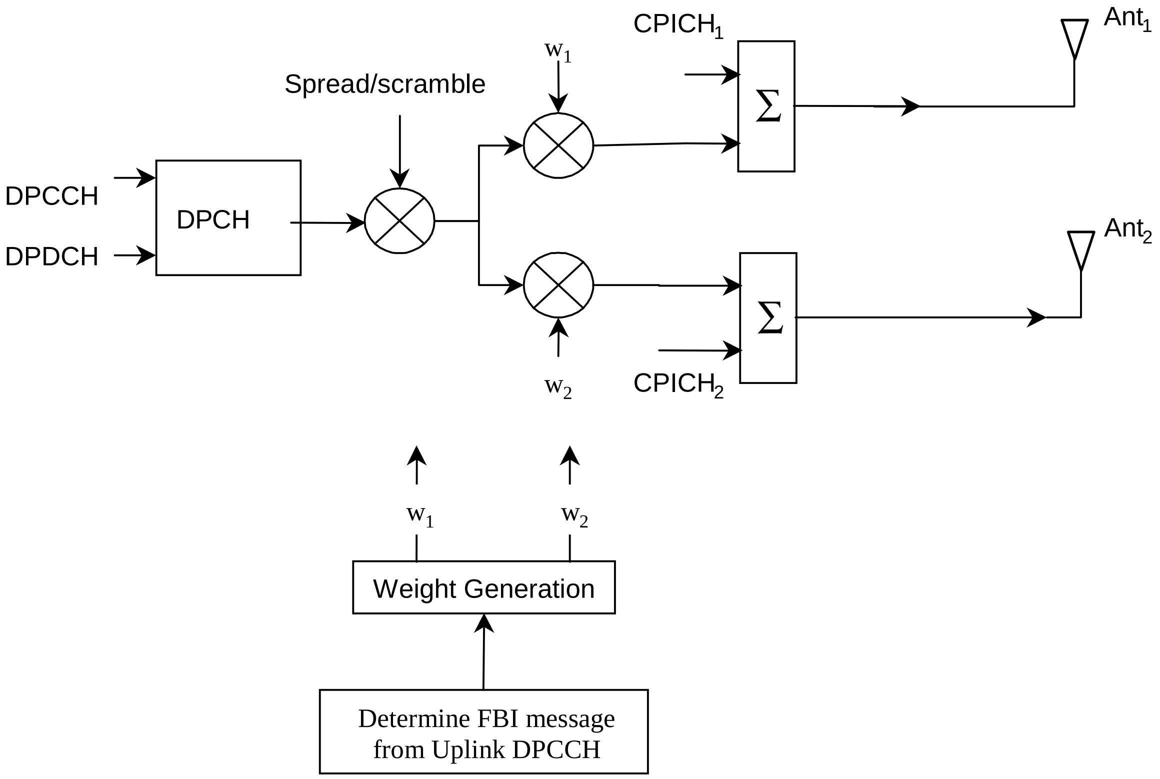

Figure 3: The generic downlink transmitter structure to support closed loop mode transmit diversity for DPCH transmission

There are two closed loop modes whose characteristics are summarised in the table 8. The use of the modes is controlled via higher layer signalling.

Table 8: Summary of number of feedback information bits per slot, N_{FBD}, feedback command length in slots, N_W, feedback command rate, feedback bit rate, number of phase bits, N_{ph}, per signalling word, number of amplitude bits, N_{po}, per signalling word and amount of constellation rotation at UE for the two closed loop modes

Closed loop mode	N_{FBD}	N_W	Update rate	Feedback bit rate	N_{po}	N_{ph}	Constellation rotation
1	1	1	1500 Hz	1500 bps	0	1	$\pi/2$
2	1	4	1500 Hz	1500 bps	1	3	N/A

7.1 Determination of feedback information

The UE uses the CPICH to separately estimate the channels seen from each antenna.

Once every slot, the UE computes the phase adjustment, ϕ, and for mode 2 the amplitude adjustment that should be applied at the UTRAN access point to maximise the UE received power. An example of how the computations can be accomplished is given in Annex A.2.

The UE feeds back to the UTRAN access point the information on which phase/power settings to use. Feedback Signalling Message (FSM) bits are transmitted in the portion of FBI field of uplink DPCCH slot(s) assigned to closed loop mode transmit diversity, the FBI D field (see [1]). Each message is of length $N_W = N_{po}+N_{ph}$ bits and its format is shown in the figure 4. The transmission order of bits is from MSB to LSB, i.e. MSB is transmitted first. FSM_{po} and FSM_{ph} subfields are used to transmit the power and phase settings, respectively.

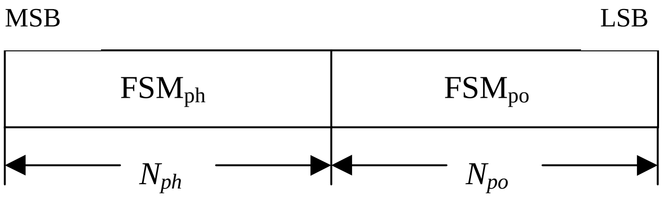

Figure 4: Format of feedback signalling message. FSM_{po} transmits the power setting and FSM_{ph} the phase setting

The adjustments are made by the UTRAN Access Point at the beginning of the downlink DPCCH pilot field. The downlink slot in which the adjustment is done is signalled to L1 of UE by higher layers. Two possibilities exist:

1) When feedback command is transmitted in uplink slot *i*, which is transmitted approximately 1024 chips in offset from the received downlink slot *j*, the adjustment is done at the beginning of the pilot field of the downlink slot (*j*+1) mod 15.

2) When feedback command is transmitted in uplink slot *i*, which is transmitted approximately 1024 chips in offset from the received downlink slot *j*, the adjustment is done at the beginning of the pilot field of the downlink slot (*j*+2) mod 15.

Thus, adjustment timing at UTRAN Access Point is either according to 1) or 2) as controlled by the higher layers.

In case a PDSCH is associated with a DPCH for which closed-loop transmit diversity is applied, the antenna weights applied to the PDSCH are the same as the antenna weights applied to the associated DPCH. The timing of the weight adjustment of the PDSCH is such that the PDSCH weight adjustment is done at the PDSCH slot border, N chips after the adjustment of the associated DPCH, where $0 \le N < 2560$.

7.2 Closed loop mode 1

The UE uses the CPICH transmitted both from antenna 1 and antenna 2 to calculate the phase adjustment to be applied at UTRAN access point to maximise the UE received power. In each slot, UE calculates the optimum phase adjustment, ϕ, for antenna 2, which is then quantized into ϕ_Q having two possible values as follows:

$$\phi_Q = \begin{cases} \pi, & \text{if } \pi/2 < \phi - \phi_r(i) \le 3\pi/2 \\ 0, & \text{otherwise} \end{cases} \qquad (1)$$

where:

$$\phi_r(i) = \begin{cases} 0, & i = 0,2,4,6,8,10,12,14 \\ \pi/2, & i = 1,3,5,7,9,11,13 \end{cases} \qquad (2)$$

If $\phi_Q = 0$, a command '0' is send to UTRAN using the FSM_{ph} field. Correspondingly, if $\phi_Q = \pi$, command '1' is send to UTRAN using the FSM_{ph} field.

Due to rotation of the constellation at UE the UTRAN interprets the received commands according to table 9 which shows the mapping between phase adjustment, ϕ_i, and received feedback command for each uplink slot.

Table 9: Phase adjustments, ϕ_i, corresponding to feedback commands for the slots *i* of the UL radio frame

Slot #		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FSM	0	0	π/2	0	π/2	0	π/2	0	π/2	0	π/2	0	π/2	0	π/2	0
	1	π	-π/2	π	-π/2	π	-π/2	π	-π/2	π	-π/2	π	-π/2	π	-π/2	π

The weight w_2 is then calculated by averaging the received phases over 2 consecutive slots. Algorithmically, w_2 is calculated as follows:

$$w_2 = \frac{\sum_{i=n-1}^{n} \cos(\phi_i)}{2} + j\frac{\sum_{i=n-1}^{n} \sin(\phi_i)}{2} \qquad (3)$$

where:

$$\phi_i \in \{0, \pi, \pi/2, -\pi/2\} \qquad (4)$$

For antenna 1, w_1 is constant:

$$w_1 = 1/\sqrt{2} \qquad (5)$$

7.2.1 Mode 1 end of frame adjustment

In closed loop mode 1 at frame borders the averaging operation is slightly modified. Upon reception of the FB command for slot 0 of a frame, the average is calculated based on the command for slot 13 of the previous frame and the command for slot 0 of the current frame, i.e. ϕ_i from slot 14 is not used:

$$w_2 = \frac{\cos(\phi_{13}^{j-1}) + \cos(\phi_0^j)}{2} + j\frac{\sin(\phi_{13}^{j-1}) + \sin(\phi_0^j)}{2} \qquad (6)$$

where:

- ϕ_{13}^{j-1} = phase adjustment from frame j-1, slot 13.
- ϕ_0^j = phase adjustment from frame j, slot 0.

7.2.2 Mode 1 normal initialisation

For the first frame of transmission UE determines the feedback commands in a normal way and sends them to UTRAN.

Before the first FB command is received, the UTRAN shall use the initial weight $w_2 = \frac{1}{2}(1+j)$.

Having received the first FB command the UTRAN calculates w_2 as follows:

$$w_2 = \frac{\cos(\pi/2) + \cos(\phi_0)}{2} + j\frac{\sin(\pi/2) + \sin(\phi_0)}{2} \qquad (7)$$

where:

ϕ_0 = phase adjustment from slot 0 of the first frame.

7.2.3 Mode 1 operation during compressed mode

7.2.3.1 Downlink in compressed mode and uplink in normal mode

When downlink is in compressed mode but uplink is operating normally (i.e. not compressed) the UTRAN continues it's Tx diversity related functions in the same way as in non-compressed downlink mode.

In downlink transmission gaps there are uplink slots for which no new estimate of the phase adjustment is calculated. During these slots the following rules are applied in UE when determining the feedback command:

1) If no new estimate of phase adjustment ϕ_i exists corresponding to the feedback command to be sent in uplink slot *i*:

- If $1 < i < 15$:
    - the feedback command sent in uplink slot *i*-2 is used;
- else if $i = 0$:
    - the feedback command sent in uplink slot 14 of previous frame is used;
- else if $i = 1$:
    - the feedback command sent in uplink slot 13 of previous frame is used;
- end if.

2) When transmission in downlink is started again in downlink slot $N_{last}+1$ (if $N_{last}+1 = 15$, then slot 0 in the next frame) the UE must resume calculating new estimates of the phase adjustment. The feedback command corresponding to the first new estimate of ϕ_i must be sent in the uplink slot which is transmitted approximately 1024 chips in offset from the downlink slot $N_{last}+1$.

7.2.3.2 Both downlink and uplink in compressed mode

During the uplink transmission gaps no FB commands are sent from UE to UTRAN. When transmission in downlink is started again in downlink slot $N_{last}+1$ (if $N_{last}+1 = 15$, then slot 0 in the next frame) the UE must resume calculating new estimates of the phase adjustment. The feedback command corresponding to the first new estimate of ϕ_i must be sent in the uplink slot which is transmitted approximately 1024 chips in offset from the downlink slot $N_{last}+1$.

The UTRAN continues to update the weight w_2 until the uplink transmission gap starts and no more FB commands are received. When the transmission in downlink resumes in slot $N_{last}+1$, the value of w_2, calculated after receiving the last FB command before the start of the uplink transmission gap, is applied to antenna 2 signal.

After the UE resumes transmission in uplink and sends the first FB command, the new value of w_2 is calculated as follows:

- S_1 = {0, 2, 4, 6, 8, 10, 12 14}.
- S_2 = {1, 3, 5, 7, 9, 11, 13}.
- i = number of uplink slot at which the transmission resumes.
- j = number of uplink slot at which the last FB command was sent before the start of the uplink transmission gap.
- Do while ($i \in S_1 \; and \; j \in S_1$) or ($i \in S_2 \; and \; j \in S_2$):
    - j = j-1;
    - if j < 0;
    - j = 14;
- end if;
- end do;

- calculate w_2 based on FB commands received in uplink slots i and j.

Note that for N_{last} = 13 the end of frame adjustment procedure shall be based on the FB commands for the last odd slot prior to the uplink transmission gap and slot 0.

7.2.3.3 Uplink in compressed mode and downlink in normal mode

The UTRAN continues to update the value of w_2 until the uplink transmission gap starts and no more FB commands are received. Then, the value of w_2 calculated after receiving the last FB command before the uplink transmission gap is applied to the antenna 2 signal. When the UE resumes transmission in uplink, it shall send FB commands according to section 7.2 equations 2 and 3 (normal operation) and the UTRAN Access Point shall interpret the FB commands according to Table 9.

The calculation of w_2 by the UTRAN following the uplink transmission gap, and before the first two FB commands following the gap are received is not specified.

7.2.4 Mode 1 initialisation during compressed mode

7.2.4.1 Downlink in compressed mode

When closed loop mode 1 is initialised during the downlink transmission gap of compressed mode there are slots for which no estimate of the phase adjustment is calculated and no previous feedback command is available.

In this case, if the UE is required to send feedback in the uplink, the FB command to the UTRAN shall be '0'.

When transmission in downlink is started again in slot N_{last}+1 (if N_{last}+1 = 15, then slot 0 in the next frame), the UTRAN shall use the initial weight $w_2 = \frac{1}{2}(1+j)$. The UE must start calculating estimates of the phase adjustment.

The feedback command corresponding to the first estimate of ϕ_i must be sent in the uplink slot which is transmitted approximately 1024 chips in offset from the downlink slot N_{last}+1. Having received this feedback command the UTRAN calculates w_2 as follows:

$$w_2 = \frac{\cos(\phi_i) + \cos(\phi_j)}{2} + j\frac{\sin(\phi_i) + \sin(\phi_j)}{2} \qquad (8)$$

where:

ϕ_i = phase adjustment in uplink slot i , which is transmitted approximately 1024 chips in offset from the downlink slot N_{last}+1.

$\phi_j = \frac{\pi}{2}$, if slot i is even ($i \in \{0, 2, 4, 6, 8, 10, 12, 14\}$) and

$\phi_j = 0$, if slot i is odd ($i \in \{1, 3, 5, 7, 9, 11, 13\}$)

7.2.4.2 Uplink in compressed mode

Initialisation of closed loop mode 1 operation during uplink compressed mode only is not specified.

7.3 Closed loop mode 2

Closed loop mode 2 transmit diversity is not supported in this release.

In closed loop mode 2 there are 16 possible combinations of phase and power adjustment from which the UE selects and transmits the FSM according to table 10 and table 11. As opposed to closed loop Mode 1, no constellation rotation is done at UE and no filtering of the received weights is performed at the UTRAN.

Table 10: FSM_{po} subfield of closed loop mode 2 signalling message

FSM_{po}	Power_ant1	Power_ant2
0	0.2	0.8
1	0.8	0.2

Table 11: FSM_{ph} subfield of closed loop mode 2 signalling message

FSM_{ph}	Phase difference between antennas (radians)
000	π
001	-3π/4
011	-π/2
010	-π/4
110	0
111	π/4
101	π/2
100	3π/4

To obtain the best performance, progressive updating is performed at both the UE and the UTRAN Access point. The UE procedure shown below is an example of how to determine FSM at UE. Different implementation is allowed. Every slot time, the UE may refine its choice of FSM, from the set of weights allowed given the previously transmitted bits of the FSM. This is shown in figure 5, where, in this figure b_i ($0 \le i \le 3$) are the bits of the FSM (from table 10 and table 11) from the MSB to the LSB and m=0, 1, 2, 3 (the end of frame adjustment given in subclause 7.3.1 is not shown here).

At the beginning of a FSM to be transmitted, the UE chooses the best FSM out of the 16 possibilities. Then the UE starts sending the FSM bits from the MSB to the LSB in the portion of FBI field of the uplink DPCCH during 4 (FSM message length) slots. Within the transmission of the FSM the UE refines its choice of FSM. This is defined in the following:

- define the 4 bits of FSM, which are transmitted from slot number k to k+3, as $\{b_3(k)\ b_2(k+1)\ b_1(k+2)\ b_0(k+3)\}$, where k=0, 4, 8, 12. Define also the estimated received power criteria defined in Equation 1 for a given FSM as $P(\{x_{3,}\ x_2\ x_1\ x_0\})$, where $\{ x_3\ x_2\ x_1\ x_0 \}$ is one of the 16 possible FSMs which defines an applied phase and power offset according to table 10 and table 11. The $b_i()$ and x_i are 0 or 1.

The bits transmitted during the m'th FSM of the frame, where m=0,1,2,3, are then given by:

$b_3(4m)=X_3$ from the $\{X_3\ X_2\ X_1\ X_0\}$ which maximises $P(\{x_3\ x_2\ x_1\ x_0\})$ over all x_3,x_2,x_1,x_0 (16 possible combinations);

$b_2(4m+1)=X_2$ from the $\{b_3(4m)\ X_2\ X_1\ X_0\}$ which maximises $P(\{b_3(4m)\ x_2\ x_1\ x_0\})$ over all x_2,x_1,x_0 (8 possible combinations);

$b_1(4m+2)=X_1$ from the $\{b_3(4m)\ b_2(4m+1)\ X_1\ X_0\}$ which maximises $P(\{b_3(4m)\ b_2(4m+1)\ x_1\ x_0\})$ over all x_1,x_0 (4 possible combinations);

$b_0(4m+3)=X_0$ from the $\{b_3(4m)\ b_2(4m+1)\ b_1(4m+2)\ X_0\}$ which maximises $P(\{b_3(4m)\ b_2(4m+1)\ b_1(4m+2)\ x_0\})$ over x_0 (2 possible combinations).

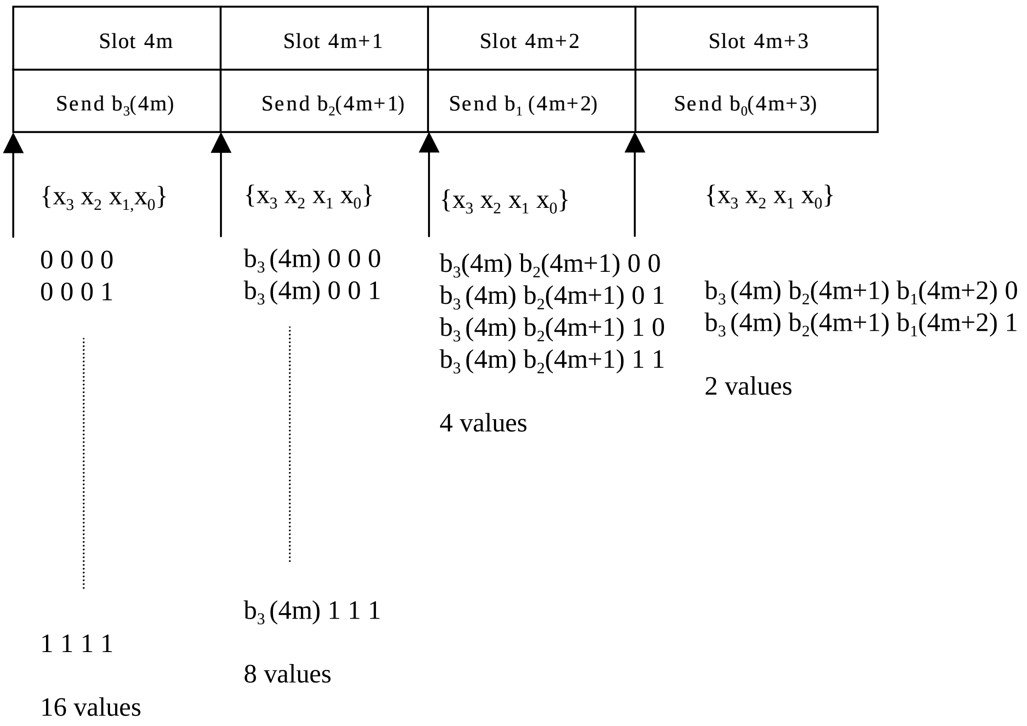

Figure 5: Progressive Refinement at the UE for closed loop mode 2

Every slot time the UTRAN constructs the FSM from the most recently received bits for each position in the word and applies the phase and amplitude (derived from power) as defined by table 10 and table 11. More precisely, the UTRAN operation can be explained as follows. The UTRAN maintains a register **z**={z_3 z_2 z_1 z_0}, which is updated every slot time according to z_i=b_i(ns) (i=0:3, ns=0:14). Every slot time the contents of register **z** are used to determine the phase and power adjustments as defined by table 10 and table 11, with FSM_{ph} ={z_3 z_2 z_1} and FSM_{po}=z_0.

Special procedures for initialisation and end of frame processing are described below.

The weight vector, $\underline{w}$, is then calculated as:

$$\underline{w} = \begin{bmatrix} \sqrt{power\_ant1} \\ \sqrt{power\_ant2}\, \exp(j\ phase\_diff) \end{bmatrix} \quad (9)$$

7.3.1 Mode 2 end of frame adjustment

The FSM must be wholly contained within a frame. To achieve this an adjustment is made to the last FSM in the frame where the UE only sends the FSM_{ph} subfield, and the UTRAN takes the power bit FSM_{po} of the previous FSM.

7.3.2 Mode 2 normal initialisation

For the first frame of transmission using closed loop mode 2, the operation is as follows.

The UE starts sending the FSM message from slot 0 in the normal way. The UE may refine its choice of FSM in slots 1 to 3 from the set of weights allowed given the previously transmitted bits of the FSM.

The UTRAN Access Point operation is as follows. Until the first FSM_{po} bit is received and acted upon (depending on the timing control specified via the higher layer parameter described in section 7.1) the power in both antennas shall be set to 0.5. Until the first FSM_{ph} bit is received and acted upon the phase difference between antennas shall be π radians.

The phase offset applied between the antennas is updated according to the number and value of FSM_{ph} bits received as given in table 12.

Table 12: FSM_{ph} normal initialisation for closed loop mode 2

FSM_{ph}	Phase difference between antennas (radians)
- - -	π (normal initialisation) or held from previous setting (compressed mode recovery)
0 - -	π
1 - -	0
0 0 -	π
0 1 -	$-\pi/2$
1 1 -	0
1 0 -	$\pi/2$
0 0 0	π
0 0 1	$-3\pi/4$
0 1 1	$-\pi/2$
0 1 0	$-\pi/4$
1 1 0	0
1 1 1	$\pi/4$
1 0 1	$\pi/2$
1 0 0	$3\pi/4$

This operation applies in both the soft handover and non soft handover cases.

7.3.3 Mode 2 operation during compressed mode

7.3.3.1 Downlink in compressed mode and uplink in normal mode

When the downlink is in compressed mode and the uplink is in normal mode, the closed loop mode 2 functions are described below.

When the UE is not listening to the CPICH from antennas 1 and 2 during the downlink transmission gap, the UE sends the last FSM bits calculated before the start of the downlink transmission gap.

Recovery from compressed mode is described in the following. Downlink transmissions commence at the pilot field of slot Nlast as described in [2].

After a transmission gap, UTRAN Access Point sets the power in both antennas to 0.5 until a FSM_{po} bit is received and acted upon. Until the first FSM_{ph} bit is received and acted upon, UTRAN uses the phase offset, which was applied before the transmission interruption (table 12).

If the uplink slot Nlast+1 (modulo 15) occurs at the beginning of a FSM period (that is at slot 0,4,8,or 12), the UE sends the FSM message in the normal way, with 3 FSM_{ph} bits and with the FSM_{po} bit on slot 3, 7 or 11, and the UTRAN Access Point acts on the FSM_{ph} bits according to table 12.

If the uplink slot Nlast+1 (modulo 15) does not occur at the beginning of a FSM period, the following operation is performed. In each of the remaining slots of the partial FSM period, that is from slot Nlast+1 (modulo 15) until the final slot (slot 3, 7, 11or 14), and for the first slot of the next full FSM period, the UE sends the first (i.e. MSB) bit of the FSM_{ph} message, and at the UTRAN access point the phase offset applied between the antennas is updated according to the number and value of FSM_{ph} bits received as given in table 13. During the following full FSM period, which starts on slot 0, 4, 8, or 12, the UE sends the FSM message in the normal way, with 3 FSM_{ph} bits and with the FSM_{po} bit on slot 3, 7 or 11, and the UTRAN Access Point acts on the FSM_{ph} bits according to table 12.

Table 13: FSM_{ph} subfield of closed loop mode 2 in compressed mode recovery period

FSM_{ph}	Phase difference between antennas (radians)
-	held from previous setting
0	π
1	0

7.3.3.2 Both downlink and uplink in compressed mode

During both downlink and uplink compressed mode, the UTRAN and the UE performs the functions of recovery after transmission gaps as described in the previous subclause 7.3.3.1.

7.3.3.3 Uplink in compressed mode and downlink in normal mode

The UTRAN continues to update the weight vector $\underline{w}$ until the uplink transmission gap starts and no more FSM bits are received. Then, UTRAN Access Point continues to apply the weight vector $\underline{w}$, which was used before the transmission gap. When the UE resumes transmission in uplink, it chooses FSM according to normal operation as described in section 7.3 and 7.3.1. If the uplink signalling does not resume at the beginning of a FSM period, the UE shall calculate the remaining FSM bits according to section 7.3, using the last FSM(s) sent before the uplink gap as the "previously transmitted bits of the FSM".

The calculation of the phase adjustment by UTRAN remains unspecified until all 3 FSM_{ph} bits have been received following the uplink transmission gap. The calculation of the power adjustment by UTRAN remains unspecified until an FSM_{po} bit has been received following the uplink transmission gap.

7.3.4 Mode 2 initialisation during compressed mode

7.3.4.1 Downlink in compressed mode

When closed loop mode 2 is initialised during the downlink transmission gap of compressed mode there are slots for which no FSM bit is calculated and no previous sent FSM bit is available.

In this case, if the UE is required to send feedback in the uplink, the FB command to the UTRAN shall be '0'.

The UTRAN and the UE perform the functions of recovery after the downlink transmission gap as described in the previous subclause 7.3.3.1. If no previous phase setting is available, UTRAN shall use the phase offset π, until the first FSM_{ph} bit is received and acted upon.

7.3.4.2 Uplink in compressed mode

Initialisation of closed loop mode 2 operation during uplink compressed mode only is not specified.

8 Idle periods for IPDL location method

8.1 General

To support time difference measurements for location services, idle periods can be created in the downlink (hence the name IPDL) during which time transmission of all channels from a Node B is temporarily seized. During these idle periods the visibility of neighbour cells from the UE is improved.

The idle periods are arranged in a predetermined pseudo random fashion according to higher layer parameters. Idle periods differ from compressed mode in that they are shorter in duration, all channels are silent simultaneously, and no attempt is made to prevent data loss.

In general there are two modes for these idle periods:

- Continuous mode, and
- Burst mode.

In continuous mode the idle periods are active all the time. In burst mode the idle periods are arranged in bursts where each burst contains enough idle periods to allow a UE to make sufficient measurements for its location to be calculated. The bursts are separated by a period where no idle periods occur.

3GPP TSG RAN Meeting #15
Jeju, Korea, 5 – 8, March, 2002

R1-02-0303

CR-Form-v5

CHANGE REQUEST

⌘	**25.214**	**CR**	**238**	⌘ **rev**	**-**	⌘ Current version:	**3.9.0** ⌘

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: ⌘	Deferring of mandatory UE support of SSDT to Rel-4			
Source: ⌘	Nortel Networks			
Work item code: ⌘	TEI		***Date:*** ⌘	Feb 18th
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: ⌘	At the Joint RAN1-RAN2 meeting dedicated to R99 clean-up (5-6 Feb 2001 Sophia Antipolis) several R99 mandatory features in the UE have been identified as candidates for deferral to Release 4 in order to ease the UE implementation and therefore speed-up market readiness of UE terminals. SSDT was included in this list. However the discussions regarding the deferral to REL4 of the SSDT feature didn't reach consensus. The agreed way forward was to submit the CR to RAN1 for checking and then leave the final decision to RAN plenary. The proposed changes are isolated impact.
Summary of change: ⌘	It is specified that SSDT is removed from R99. However it is proposed to be kept in further releases.
Consequences if not approved: ⌘	

Clauses affected: ⌘			
Other specs affected: ⌘	[ ] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘	25.101, 25.211, 25.331
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.

5.2.1.4 Site selection diversity transmit power control

5.2.1.4.1 General

Site selection diversity transmit (SSDT) is not supported in this version of the specification.

Site selection diversity transmit power control (SSDT) is another macro diversity method in soft handover mode. This method is optional in UTRAN.

Operation is summarised as follows. The UE selects one of the cells from its active set to be 'primary', all other cells are classed as 'non primary'. The main objective is to transmit on the downlink from the primary cell, thus reducing the interference caused by multiple transmissions in a soft handover mode. A second objective is to achieve fast site selection without network intervention, thus maintaining the advantage of the soft handover. In order to select a primary cell, each cell is assigned a temporary identification (ID) and UE periodically informs a primary cell ID to the connecting cells. The non-primary cells selected by UE switch off the transmission power. The primary cell ID is delivered by UE to the active cells via uplink FBI field. SSDT activation, SSDT termination and ID assignment are all carried out by higher layer signalling.

SSDT is only supported when the P-CPICH is used as the downlink phase reference and closed loop mode transmit diversity is not used simultaneously.

5.2.1.4.1.1 Definition of temporary cell identification

Each cell is given a temporary ID during SSDT and the ID is utilised as site selection signal. The ID is given a binary bit sequence. There are three different lengths of coded ID available denoted as "long", "medium" and "short". The network decides which length of coded ID is used. Settings of ID codes for 1-bit and 2-bit FBI are exhibited in table 3 and table 4, respectively.

Table 3: Settings of ID codes for 1 bit FBI

ID label	ID code		
	"long"	"medium"	"short"
a	000000000000000	(0)0000000	00000
b	101010101010101	(0)1010101	01001
c	011001100110011	(0)0110011	11011
d	110011001100110	(0)1100110	10010
e	000111100001111	(0)0001111	00111
f	101101001011010	(0)1011010	01110
g	011110000111100	(0)0111100	11100
h	110100101101001	(0)1101001	10101

Table 4: Settings of ID codes for 2 bit FBI

ID label	ID code (Column and Row denote slot position and FBI-bit position.) "long"	"medium"	"short"
a	(0)0000000 (0)0000000	(0)000 (0)000	000 000
b	(0)0000000 (1)1111111	(0)000 (1)111	000 111
c	(0)1010101 (0)1010101	(0)101 (0)101	101 101
d	(0)1010101 (1)0101010	(0)101 (1)010	101 010
e	(0)0110011 (0)0110011	(0)011 (0)011	011 011
f	(0)0110011 (1)1001100	(0)011 (1)100	011 100
g	(0)1100110 (0)1100110	(0)110 (0)110	110 110
h	(0)1100110 (1)0011001	(0)110 (1)001	110 001

The ID code bits shown in table 3 and table 4 are transmitted from left to right. In table 4, the first row gives the first FBI bit in each slot, the second row gives the 2nd FBI bit in each slot. The ID code(s) are transmitted aligned to the radio frame structure (i.e. ID codes shall be terminated within a frame). If FBI space for sending the last ID code within a frame cannot be obtained, the first bit(s) from that ID code are punctured. The bit(s) to be punctured are shown in brackets in table 3 and table 4.

The alignment of the ID codes to the radio frame structure is not affected by transmission gaps resulting from uplink compressed mode.

5.2.1.4.2 TPC procedure in UE

The UE shall generate TPC commands to control the network transmit power and send them in the TPC field of the uplink DPCCH based on the downlink signals from the primary cell only. An example on how to derive the TPC commands is given in Annex B.2.

5.2.1.4.3 Selection of primary cell

The UE selects a primary cell periodically by measuring the RSCP of P-CPICHs transmitted by the active cells. The cell with the highest P-CPICH RSCP is detected as a primary cell.

5.2.1.4.4 Delivery of primary cell ID

The UE periodically sends the ID code of the primary cell via portion of the uplink FBI field assigned for SSDT use (FBI S field). A cell recognises its state as non-primary if the following conditions are fulfilled simultaneously:

- The received ID code does not match with the own ID code.
- The received uplink signal quality satisfies a quality threshold, Qth, a parameter defined by the network.
- If uplink compressed mode is used, and less than $\lfloor N_{ID}/3 \rfloor$ bits are lost from the ID code (as a result of uplink compressed mode), where N_{ID} is the number of bits in the ID code (after puncturing according to clause 5.2.1.4.1.1, if puncturing has been done).

Otherwise the cell recognises its state as primary.

The state of the cells (primary or non-primary) in the active set is updated synchronously. If a cell receives the last portion of the coded ID in uplink slot j, the state of cell is updated in downlink slot $(j+1+T_{os})$ mod 15, where T_{os} is defined as a constant of 2 time slots. The updating of the cell state is not influenced by the operation of downlink compressed mode.

At the UE, the primary ID code to be sent to the cells is segmented into a number of portions. These portions are distributed in the uplink FBI S-field. The cell in SSDT collects the distributed portions of the primary ID code and then detects the transmitted ID. The period of the primary cell update depends on the settings of the code length and the number of FBI bits assigned for SSDT use as shown in table 5.

Table 5: Period of primary cell update

code length	The number of FBI bits per slot assigned for SSDT	
	1	2
"long"	1 update per frame	2 updates per frame
"medium"	2 updates per frame	4 updates per frame
"short"	3 updates per frame	5 updates per frame

5.2.1.4.5 TPC procedure in the network

In SSDT, a non-primary cell can switch off its DPDCH output (i.e. no transmissions).

The cell manages two downlink transmission power levels, P1, and P2. Power level P1 is used for downlink DPCCH transmission power level and this level is updated in the same way with the downlink DPCCH power adjustment specified in 5.2.1.2.2 (for normal mode) and 5.2.1.3 (for compressed mode) regardless of the selected state (primary or non-primary). The actual transmission power of TFCI, TPC and pilot fields of DPCCH is set by adding P1 and the offsets PO1, PO2 and PO3, respectively, as specified in 5.2.1.1. P2 is used for downlink DPDCH transmission power level and this level is set to P1 if the cell is selected as primary, otherwise P2 is switched off. The cell updates P1 first and P2 next, and then the two power settings P1 and P2 are maintained within the power control dynamic range. Table 6 summarizes the updating method of P1 and P2.

Table 6: Updating of P1 and P2

State of cell	P1 (DPCCH)	P2 (DPDCH)
non primary	Updated in the same way with the downlink DPCCH power adjustment specified in 5.2.1.2.2 and 5.2.1.3	Switched off
primary		= P1

B.2 Example of implementation in the UE

The downlink inner-loop power control adjusts the network transmit power in order to keep the received downlink SIR at a given SIR target, SIR_{target}. A higher layer outer loop adjusts SIR_{target} independently for each connection.

The UE should estimate the received downlink DPCCH/DPDCH power of the connection to be power controlled. Simultaneously, the UE should estimate the received interference and calculate the signal-to-interference ratio, SIR_{est}. SIR_{est} can be calculated as RSCP/ISCP, where RSCP refers to the received signal code power on one code and ISCP refers to the non-orthogonal interference signal code power of the received signal on one code. Note that due to the specific SIR target offsets described in [5] that can be applied during compressed frames, the spreading factor shall not be considered in the calculation of SIR_{est}.

The obtained SIR estimate SIR_{est} is then used by the UE to generate TPC commands according to the following rule: if $SIR_{est} > SIR_{target}$ then the TPC command to transmit is "0", requesting a transmit power decrease, while if $SIR_{est} < SIR_{target}$ then the TPC command to transmit is "1", requesting a transmit power increase.

When the UE is in soft handover and SSDT is not activated, the UE should estimate SIR_{est} from the downlink signals of all cells in the active set.

When SSDT is activated, the UE should estimate SIR_{est} from the downlink signals of the primary cell. If the state of the cells (primary or non-primary) in the active set is changed and the UE sends the last portion of the coded ID in uplink slot j, the UE should change the basis for the estimation of SIR_{est} at the beginning of downlink slot (j+1+T_{os}) mod 15, where T_{os} is defined as a constant of 2 time slots. SSDT is not supported in this version of the specification.

3GPP TSG RAN Meeting #15
Jeju, Korea, 5 – 8, March, 2002

R1-02-0496

CR-Form-v5

CHANGE REQUEST

⌘	25.211	CR	145	⌘ rev	1	⌘	Current version:	3.9.0	⌘

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:	⌘	Deferring of closed loop mode 2 transmit diversity from R99
Source:	⌘	Nokia
Work item code:	⌘	TEI
Date:	⌘	21.02.2002
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:	⌘	At the joint RAN1-RAN2 meeting deferral of closed loop mode 2 transmit diversity to REL4 was proposed. The agreed way forward was to submit the CR to RAN1 for checking and then leave the final decision to RAN plenary.
Summary of change:	⌘	It is specified that closed loop mode 2 transmit diversity is removed from R99. However it is proposed to be kept in further releases.
Consequences if not approved:	⌘	

Clauses affected:	⌘	5.3.1, 5.3.1.2, 5.3.2.2		
Other specs affected:	⌘	[ ] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘	25.101, 25.211, 25.331
Other comments:	⌘	This CR is considered to have isolated impact: Would not affect any other features besides closed loop mode 2 transmit diversity		

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

Table 9: Slot format of the control part of CPCH message part

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Frame	Bits/ Slot	N_{pilot}	N_{TPC}	N_{TFCI}	N_{FBI}
0	15	15	256	150	10	6	2	2	0
1	15	15	256	150	10	5	2	2	1

Figure 7 shows the frame structure of the uplink common packet physical channel. Each frame of length 10 ms is split into 15 slots, each of length T_{slot} = 2560 chips, corresponding to one power-control period.

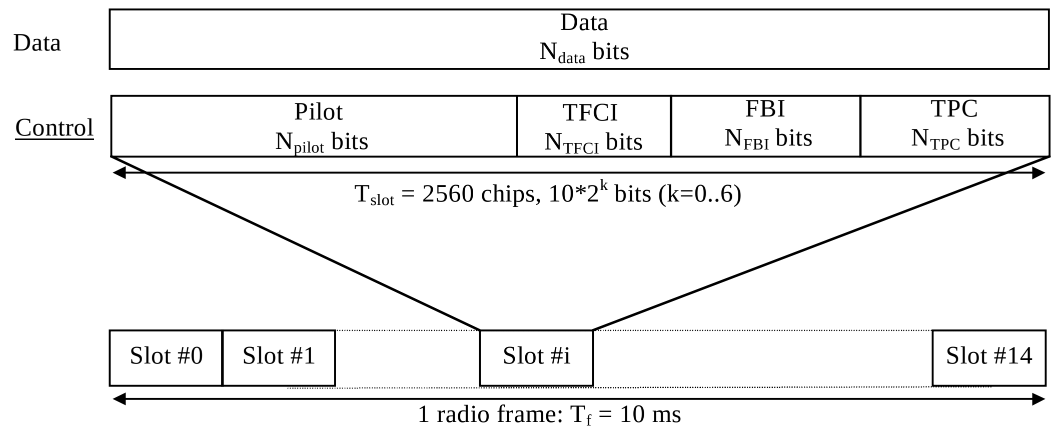

Figure 7: Frame structure for uplink Data and Control Parts Associated with PCPCH

The data part consists of $10*2^k$ bits, where k = 0, 1, 2, 3, 4, 5, 6, corresponding to spreading factors of 256, 128, 64, 32, 16, 8, 4 respectively.

5.3 Downlink physical channels

5.3.1 Downlink transmit diversity

Closed loop mode 2 transmit diversity is not supported in this release.

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. The transmit diversity mode on the associated DPCH may not change during a PDSCH frame and within the slot prior to the PDSCH frame. This includes any change between no Tx diversity, open loop, closed loop mode 1 or closed loop mode 2.

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	–
AP-AICH	-	X	-
CD/CA-ICH	-	X	-
DL-DPCCH for CPCH	-	X	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 (and the associated PDSCH if applicable) 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.

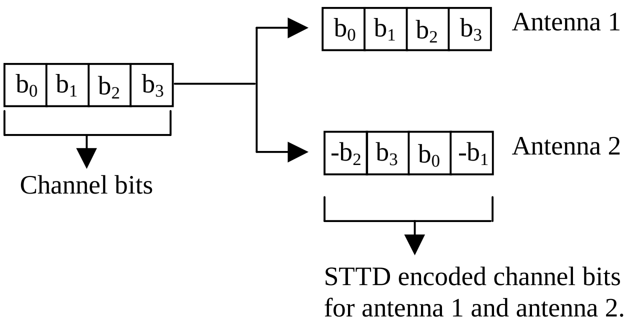

Figure 8: Generic block diagram of the STTD encoder

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 5.3.3.5.1.

5.3.1.2 Closed loop transmit diversity

Closed loop mode 2 transmit diversity is not supported in this release.

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.

5.3.2 Dedicated downlink physical channels

There is only one type of downlink dedicated physical channel, the Downlink Dedicated Physical Channel (downlink DPCH).

Within one downlink DPCH, dedicated data generated at Layer 2 and above, i.e. the dedicated transport channel (DCH), is transmitted in time-multiplex with control information generated at Layer 1 (known pilot bits, TPC commands, and an optional TFCI). The downlink DPCH can thus be seen as a time multiplex of a downlink DPDCH and a downlink DPCCH, compare subclause 5.2.1.

Figure 9 shows the frame structure of the downlink DPCH. Each frame of length 10 ms is split into 15 slots, each of length T_{slot} = 2560 chips, corresponding to one power-control period.

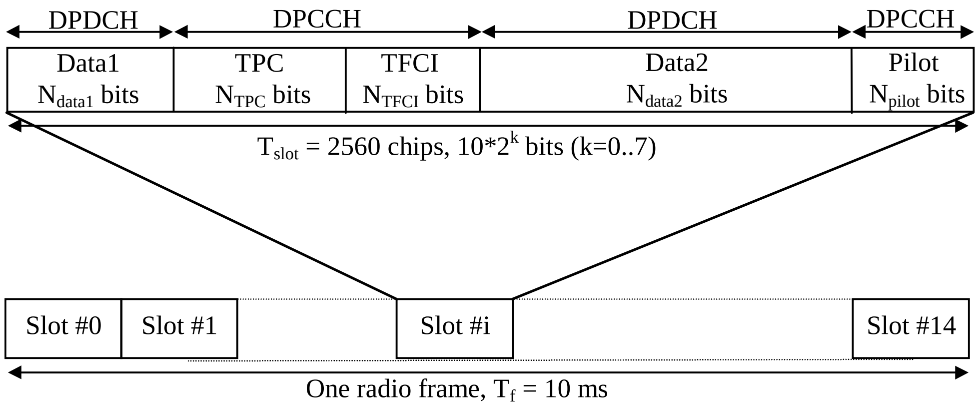

Figure 9: Frame structure for downlink DPCH

The parameter k in figure 9 determines the total number of bits per downlink DPCH slot. It is related to the spreading factor SF of the physical channel as SF = $512/2^k$. The spreading factor may thus range from 512 down to 4.

The exact number of bits of the different downlink DPCH fields (N_{pilot}, N_{TPC}, N_{TFCI}, N_{data1} and N_{data2}) is given in table 11. What slot format to use is configured by higher layers and can also be reconfigured by higher layers.

There are basically two types of downlink Dedicated Physical Channels; those that include TFCI (e.g. for several simultaneous services) and those that do not include TFCI (e.g. for fixed-rate services). These types are reflected by the duplicated rows of table 11. It is the UTRAN that determines if a TFCI should be transmitted and it is mandatory for all UEs to support the use of TFCI in the downlink. The mapping of TFCI bits onto slots is described in [3].

In compressed frames, a different slot format is used compared to normal mode. There are two possible compressed slot formats that are labelled A and B. Slot format B shall be used in frames compressed by spreading factor reduction and slot format A shall be used in frames compressed by puncturing or higher layer scheduling. The channel bit and symbol rates given in table 11 are the rates immediately before spreading.

Table 11: DPDCH and DPCCH fields

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot			Transmitted slots per radio frame N_{Tr}
					N_{Data1}	N_{Data2}	N_{TPC}	N_{TFCI}	N_{Pilot}	
0	15	7.5	512	10	0	4	2	0	4	15
0A	15	7.5	512	10	0	4	2	0	4	8-14
0B	30	15	256	20	0	8	4	0	8	8-14
1	15	7.5	512	10	0	2	2	2	4	15
1B	30	15	256	20	0	4	4	4	8	8-14
2	30	15	256	20	2	14	2	0	2	15
2A	30	15	256	20	2	14	2	0	2	8-14
2B	60	30	128	40	4	28	4	0	4	8-14
3	30	15	256	20	2	12	2	2	2	15
3A	30	15	256	20	2	10	2	4	2	8-14
3B	60	30	128	40	4	24	4	4	4	8-14
4	30	15	256	20	2	12	2	0	4	15
4A	30	15	256	20	2	12	2	0	4	8-14
4B	60	30	128	40	4	24	4	0	8	8-14
5	30	15	256	20	2	10	2	2	4	15
5A	30	15	256	20	2	8	2	4	4	8-14
5B	60	30	128	40	4	20	4	4	8	8-14
6	30	15	256	20	2	8	2	0	8	15
6A	30	15	256	20	2	8	2	0	8	8-14
6B	60	30	128	40	4	16	4	0	16	8-14
7	30	15	256	20	2	6	2	2	8	15
7A	30	15	256	20	2	4	2	4	8	8-14
7B	60	30	128	40	4	12	4	4	16	8-14
8	60	30	128	40	6	28	2	0	4	15
8A	60	30	128	40	6	28	2	0	4	8-14
8B	120	60	64	80	12	56	4	0	8	8-14
9	60	30	128	40	6	26	2	2	4	15
9A	60	30	128	40	6	24	2	4	4	8-14
9B	120	60	64	80	12	52	4	4	8	8-14
10	60	30	128	40	6	24	2	0	8	15
10A	60	30	128	40	6	24	2	0	8	8-14
10B	120	60	64	80	12	48	4	0	16	8-14
11	60	30	128	40	6	22	2	2	8	15
11A	60	30	128	40	6	20	2	4	8	8-14
11B	120	60	64	80	12	44	4	4	16	8-14
12	120	60	64	80	12	48	4	8*	8	15
12A	120	60	64	80	12	40	4	16*	8	8-14
12B	240	120	32	160	24	96	8	16*	16	8-14
13	240	120	32	160	28	112	4	8*	8	15
13A	240	120	32	160	28	104	4	16*	8	8-14
13B	480	240	16	320	56	224	8	16*	16	8-14
14	480	240	16	320	56	232	8	8*	16	15
14A	480	240	16	320	56	224	8	16*	16	8-14
14B	960	480	8	640	112	464	16	16*	32	8-14
15	960	480	8	640	120	488	8	8*	16	15
15A	960	480	8	640	120	480	8	16*	16	8-14
15B	1920	960	4	1280	240	976	16	16*	32	8-14
16	1920	960	4	1280	248	1000	8	8*	16	15
16A	1920	960	4	1280	248	992	8	16*	16	8-14

* If TFCI bits are not used, then DTX shall be used in TFCI field.

NOTE 1: Compressed mode is only supported through spreading factor reduction for SF=512 with TFCI.
NOTE 2: Compressed mode by spreading factor reduction is not supported for SF=4.
NOTE 3: If the Node B receives an invalid combination of data frames for downlink transmission, the procedure specified in [15], sub-clause 5.1.2,may require the use of DTX in both the DPDCH and theTFCI field of the DPCCH.

The pilot bit patterns are described in table 12. The shadowed column part of pilot bit pattern is defined as FSW and FSWs can be used to confirm frame synchronization. (The value of the pilot bit pattern other than FSWs shall be "11".) In table 12, the transmission order is from left to right.

In downlink compressed mode through spreading factor reduction, the number of bits in the TPC and Pilot fields are doubled. Symbol repetition is used to fill up the fields. Denote the bits in one of these fields in normal mode by x_1, x_2, x_3, …, x_X. In compressed mode the following bit sequence is sent in corresponding field: x_1, x_2, x_1, x_2, x_3, x_4, x_3, x_4,…, x_X,.

Table 12: Pilot bit patterns for downlink DPCCH with N_{pilot} = 2, 4, 8 and 16

	N_{pilot} = 2	N_{pilot} = 4 (*1)		N_{pilot} = 8 (*2)				N_{pilot} = 16 (*3)							
Symbol #	0	0	1	0	1	2	3	0	1	2	3	4	5	6	7
Slot #0	11	11	11	11	11	11	10	11	11	11	10	11	11	11	10
1	00	11	00	11	00	11	10	11	00	11	10	11	11	11	00
2	01	11	01	11	01	11	01	11	01	11	01	11	10	11	00
3	00	11	00	11	00	11	00	11	00	11	00	11	01	11	10
4	10	11	10	11	10	11	01	11	10	11	01	11	11	11	11
5	11	11	11	11	11	11	10	11	11	11	10	11	01	11	01
6	11	11	11	11	11	11	00	11	11	11	00	11	10	11	11
7	10	11	10	11	10	11	00	11	10	11	00	11	10	11	00
8	01	11	01	11	01	11	10	11	01	11	10	11	00	11	11
9	11	11	11	11	11	11	11	11	11	11	11	11	00	11	11
10	01	11	01	11	01	11	01	11	01	11	01	11	11	11	10
11	10	11	10	11	10	11	11	11	10	11	11	11	00	11	10
12	10	11	10	11	10	11	00	11	10	11	00	11	01	11	01
13	00	11	00	11	00	11	11	11	00	11	11	11	00	11	00
14	00	11	00	11	00	11	11	11	00	11	11	11	10	11	01

NOTE *1: This pattern is used except slot formats 2B and 3B.
NOTE *2: This pattern is used except slot formats 0B, 1B, 4B, 5B, 8B, and 9B.
NOTE *3: This pattern is used except slot formats 6B, 7B, 10B, 11B, 12B, and 13B.
NOTE: For slot format *n*B where *n* = 0, …, 15, the pilot bit pattern corresponding to N_{pilot}/2 is to be used and symbol repetition shall be applied.

The relationship between the TPC symbol and the transmitter power control command is presented in table 13.

Table 13: TPC Bit Pattern

TPC Bit Pattern			Transmitter power control command
N_{TPC} = 2	N_{TPC} = 4	N_{TPC} = 8	
11	1111	11111111	1
00	0000	00000000	0

Multicode transmission may be employed in the downlink, i.e. the CCTrCH (see [3]) is mapped onto several parallel downlink DPCHs using the same spreading factor. In this case, the Layer 1 control information is transmitted only on the first downlink DPCH. DTX bits are transmitted during the corresponding time period for the additional downlink DPCHs, see figure 10.

In case there are several CCTrCHs mapped to different DPCHs transmitted to the same UE different spreading factors can be used on DPCHs to which different CCTrCHs are mapped. Also in this case, Layer 1 control information is only transmitted on the first DPCH while DTX bits are transmitted during the corresponding time period for the additional DPCHs.

Note: support of multiple CCTrChs of dedicated type is not part of the current release.

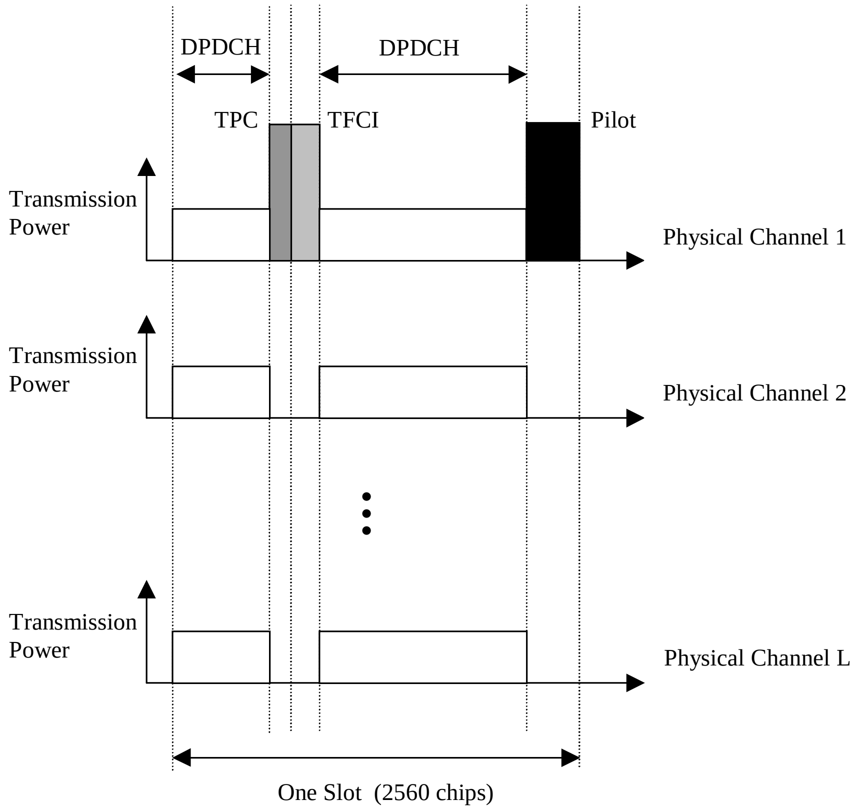

Figure 10: Downlink slot format in case of multi-code transmission

5.3.2.1 STTD for DPCH

The pilot bit pattern for the DPCH channel transmitted on antenna 2 is given in table 14.

- For N_{pilot} = 8, 16 the shadowed part indicates pilot bits that are obtained by STTD encoding the corresponding (shadowed) bits in Table 12. The non-shadowed pilot bit pattern is orthogonal to the corresponding (non-shadowed) pilot bit pattern in table 12.
- For N_{pilot} = 4, the diversity antenna pilot bit pattern is obtained by STTD encoding both the shadowed and non-shadowed pilot bits in table 12.
- For N_{pilot} = 2, the diversity antenna pilot pattern is obtained by STTD encoding the two pilot bits in table 12 with the last two bits (data or DTX) of the second data field (data2) of the slot. Thus for N_{pilot} = 2 case, the last two bits of the second data field (data 2) after STTD encoding, follow the diversity antenna pilot bits in Table 14.

STTD encoding for the DPDCH, TPC, and TFCI fields is done as described in subclause 5.3.1.1.1. For the SF=512 DPCH, the first two bits in each slot, i.e. TPC bits, are not STTD encoded and the same bits are transmitted with equal power from the two antennas. The remaining four bits are STTD encoded.

For compressed mode through spreading factor reduction and for N_{pilot} > 4, symbol repetition shall be applied to the pilot bit patterns of table 14, in the same manner as described in 5.3.2. For slot formats 2B and 3B, i.e. compressed mode through spreading factor reduction and N_{pilot} = 4, the pilot bits transmitted on antenna 2 are STTD encoded, and thus the pilot bit pattern is as shown in the most right set of table 14.

Table 14: Pilot bit patterns of downlink DPCCH for antenna 2 using STTD

	N_{pilot} = 2 (*1)	N_{pilot} = 4 (*2)		N_{pilot} = 8 (*3)				N_{pilot} = 16 (*4)								N_{pilot} = 4 (*5)	
Symbol #	0	0	1	0	1	2	3	0	1	2	3	4	5	6	7	0	1
Slot #0	01	01	10	11	00	00	10	11	00	00	10	11	00	00	10	01	10
1	10	10	10	11	00	00	01	11	00	00	01	11	10	00	10	10	01
2	11	11	10	11	11	00	00	11	11	00	00	11	10	00	11	11	00
3	10	10	10	11	10	00	01	11	10	00	01	11	00	00	00	10	01
4	00	00	10	11	11	00	11	11	11	00	11	11	01	00	10	00	11
5	01	01	10	11	00	00	10	11	00	00	10	11	11	00	00	01	10
6	01	01	10	11	10	00	10	11	10	00	10	11	01	00	11	01	10
7	00	00	10	11	10	00	11	11	10	00	11	11	10	00	11	00	11
8	11	11	10	11	00	00	00	11	00	00	00	11	01	00	01	11	00
9	01	01	10	11	01	00	10	11	01	00	10	11	01	00	01	01	10
10	11	11	10	11	11	00	00	11	11	00	00	11	00	00	10	11	00
11	00	00	10	11	01	00	11	11	01	00	11	11	00	00	01	00	11
12	00	00	10	11	10	00	11	11	10	00	11	11	11	00	00	00	11
13	10	10	10	11	01	00	01	11	01	00	01	11	10	00	01	10	01
14	10	10	10	11	01	00	01	11	01	00	01	11	11	00	11	10	01

NOTE *1: The pilot bits precede the last two bits of the data2 field.
NOTE *2: This pattern is used except slot formats 2B and 3B.
NOTE *3: This pattern is used except slot formats 0B, 1B, 4B, 5B, 8B, and 9B.
NOTE *4: This pattern is used except slot formats 6B, 7B, 10B, 11B, 12B, and 13B.
NOTE *5: This pattern is used for slot formats 2B and 3B.
NOTE: For slot format *n*B where *n* = 0, 1, 4, 5, 6, …, 15, the pilot bit pattern corresponding to $N_{pilot}/2$ is to be used and symbol repetition shall be applied.

5.3.2.2 Dedicated channel pilots with closed loop mode transmit diversity

Closed loop mode 2 transmit diversity is not supported in this release.

In closed loop mode 1 different pilot patterns (orthogonal when $N_{pilot} > 2$) are used between the transmit antennas. Pilot patterns defined in the table 12 will be used on antenna 1 and pilot patterns defined in the table 15 on antenna 2. This is illustrated in the figure 11 a which indicates the difference in the pilot patterns with different shading.

Table 15: Pilot bit patterns of downlink DPCCH for antenna 2 using closed loop mode 1

	N_{pilot} = 2	N_{pilot} = 4 (*1)		N_{pilot} = 8 (*2)				N_{pilot} = 16 (*3)								N_{pilot} = 4 (*4)	
Symbol #	0	0	1	0	1	2	3	0	1	2	3	4	5	6	7	0	1
Slot #0	01	01	10	11	00	00	10	11	00	00	10	11	00	00	10	01	10
1	10	10	10	11	00	00	01	11	00	00	01	11	10	00	10	10	01
2	11	11	10	11	11	00	00	11	11	00	00	11	10	00	11	11	00
3	10	10	10	11	10	00	01	11	10	00	01	11	00	00	00	10	01
4	00	00	10	11	11	00	11	11	11	00	11	11	01	00	10	00	11
5	01	01	10	11	00	00	10	11	00	00	10	11	11	00	00	01	10
6	01	01	10	11	10	00	10	11	10	00	10	11	01	00	11	01	10
7	00	00	10	11	10	00	11	11	10	00	11	11	10	00	11	00	11
8	11	11	10	11	00	00	00	11	00	00	00	11	01	00	01	11	00
9	01	01	10	11	01	00	10	11	01	00	10	11	01	00	01	01	10
10	11	11	10	11	11	00	00	11	11	00	00	11	00	00	10	11	00
11	00	00	10	11	01	00	11	11	01	00	11	11	00	00	01	00	11
12	00	00	10	11	10	00	11	11	10	00	11	11	11	00	00	00	11
13	10	10	10	11	01	00	01	11	01	00	01	11	10	00	01	10	01
14	10	10	10	11	01	00	01	11	01	00	01	11	11	00	11	10	01

NOTE *1: This pattern is used except slot formats 2B and 3B.
NOTE *2: This pattern is used except slot formats 0B, 1B, 4B, 5B, 8B, and 9B.
NOTE *3: This pattern is used except slot formats 6B, 7B, 10B, 11B, 12B, and 13B.
NOTE *4: This pattern is used for slot formats 2B and 3B.
NOTE: For slot format *n*B where *n* = 0, 1, 4, 5, 6, …, 15, the pilot bit pattern corresponding to $N_{pilot}/2$ is to be used and symbol repetition shall be applied.

In closed loop mode 2 same pilot pattern is used on both of the antennas (see figure 11 b). The pattern to be used is according to the table 12.

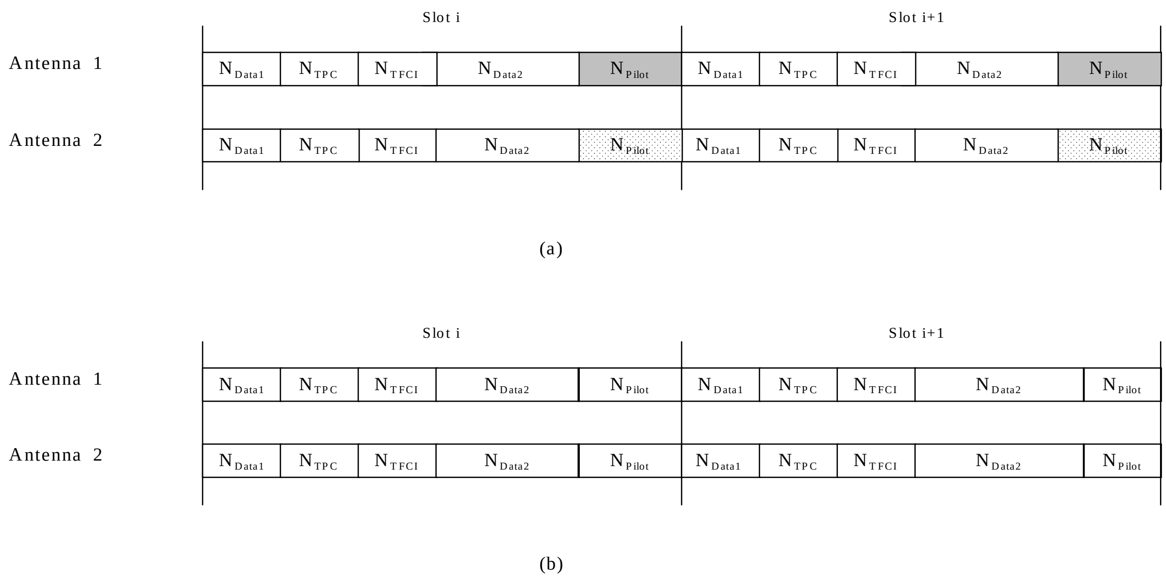

Figure 11: Slot structures for downlink dedicated physical channel diversity transmission. Structure (a) is used in closed loop mode 1. Structure (b) is used in closed loop mode 2. Different shading of the pilots indicate orthogonality of the patterns

5.3.2.3 DL-DPCCH for CPCH

The downlink DPCCH for CPCH is a special case of downlink dedicated physical channel of the slot format #0 in table 11. The spreading factor for the DL-DPCCH is 512. Figure 12 shows the frame structure of DL-DPCCH for CPCH.