TSG-RAN Meeting #12 *RP-010336*
Stockholm, Sweden, 12-15, June, 2001

Title: **Agreed CRs (R99 and Rel-4 Category A) to TS 25.221**

Source: **TSG-RAN WG1**

Agenda item: **8.1.3**

No.	Spec	CR	Rev	R1 T-doc	Subject	Release	Cat	W / I	V_old	V_new
1	25.221	047	1	R1-01-0500	Clarification of Midamble Usage in TS25.221	R99	F	TEI	3.6.0	3.7.0
2	25.221	051	-	R1-01-0501	Clarification of Midamble Usage in TS25.221	REL-4	A	TEI4	4.0.0	4.1.0
3	25.221	050	2	R1-01-0628	Addition to the abbreviation list, correction of references to tables and figures	R99	F	TEI	3.6.0	3.7.0
4	25.221	053	-	R1-01-0628	Addition to the abbreviation list, correction of references to tables and figures	REL-4	A	TEI4	4.0.0	4.1.0

3GPP TSG RAN Meeting #12
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R1-01-0500

CR-Form-v3

CHANGE REQUEST

⌘ **25.221** **CR** **047** ⌘ rev **1** ⌘ Current version: **3.6.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

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

Title:	⌘	Clarification of Midamble Usage in TS25.221
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	20/02/01
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	In case of a default midamble allocation, according to the current specifications the UE shall use an individual midamble for each channelisation code. However, if less than 16 midambles are available in that slot, there is only one midamble available for a channelisation code group, containing one primary and one or more secondary codes. Also, it is clarified that each of the code group specific midambles of the default midamble allocation may result in different channel estimates. The default midamble allocation currently well supports open loop TxDiversity techniques that transmit different codes on different antennas to one user in multicode operation. These techniques are transparent to the UE. From the closed loop TxDiversity techniques, supported by the standard, one might conclude that all codes for one user are always transmitted with the same antenna weightings. The assumption of user specific antenna weightings only could lead to faulty UE receiver implementations.
Summary of change:	⌘	Clarifies that the UE shall use one midamble per channelisation code group and that the channel estimates may be different for each of the midamble. Moreover, it is clarified that the default midamble allocation does not apply for downlink timeslots which are assigned to one user.
Consequences if not approved:	⌘	Ambiguous specifications

Clauses affected:	⌘	5.6.1.2.1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	

Other comments: ⌘	

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

5.6.1.2.1 Default midamble

If a midamble is not explicitly assigned and the use of the common midamble allocation scheme is not signalled by higher layers, the UE shall derive the midambles from the allocated~~ssociated~~ channelisation codes and shall use an individual midamble for each channelisation code group containing one primary and a set of secondary channelisation codes. The ~~For each~~ association between midambles and channelisation code groups is given in annex A.3.~~, there is one primary channelisation code associated to each midamble. A set of secondary channelisation codes is associated to each primary channelisation code.~~ All the secondary channelisation codes within a set use the same midamble as the primary channelisation code to which they are associated.

Higher layers shall allocate the channelisation codes in a particular order. Primary channelisation codes shall be allocated prior to associated secondary channelisation codes. If midambles are reserved for the beacon channels, all primary and secondary channelisation codes that are associated with the reserved midambles shall not be used.

C~~Primary and its associated secondary c~~hannelisation codes of one channelisation code group shall not be allocated to different UE's.

In the case that secondary channelisation codes are used, secondary channelisation codes of one set shall be allocated in ascending order, with respect to their numbering.

The UE shall assume different channel estimates for each of the individual midambles.

The default midamble allocation shall not apply for those downlink channels that are intended for a UE which will be the only UE assigned to a given time slot or slots for the duration of the assigned channel's existence (as in the case of high rate services).

CR-Form-v3

CHANGE REQUEST

⌘ **25.221** **CR** **050** ⌘ rev **2** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘	Addition to the abbreviation list, correction of references to tables and figures
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	May 22, 2001
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
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A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
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REL-5	*(Release 5)*

Reason for change:	⌘	Incorrect references to figures and table. Acronyms are used but not defined
Summary of change:	⌘	The references to tables and figures are corrected. Additions to the abbreviation list.
Consequences if not approved:	⌘	Incorrect references and incomplete abbreviation list.

Clauses affected:	⌘	3., 5.2.2.4, 5.2.2.5, 5.2.2.6.1, 5.2.2.6.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

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3 Abbreviations

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

BCH	Broadcast Channel
CCPCH	Common Control Physical Channel
CCTrCH	Coded Composite Transport Channel
CDMA	Code Division Multiple Access
DCH	Dedicated Channel
DL	Downlink
DPCH	Dedicated Physical Channel
DRX	Discontinuous Reception
DSCH	Downlink Shared Channel
DTX	Discontinuous Transmission
FACH	Forward Access Channel
FDD	Frequency Division Duplex
FEC	Forward Error Correction
GP	Guard Period
GSM	Global System for Mobile Communication
NRT	Non-Real Time
OVSF	Orthogonal Variable Spreading Factor
P-CCPCH	Primary CCPCH
PCH	Paging Channel
PDSCH	Physical Downlink Shared Channel
PI	Paging Indicator (value calculated by higher layers)
PICH	Page Indicator Channel
P_q	Paging Indicator (indicator set by physical layer)
PRACH	Physical Random Access Channel
PUSCH	Physical Uplink Shared Channel
RACH	Random Access Channel
RF	Radio Frame
RT	Real Time
S-CCPCH	Secondary CCPCH
SCH	Synchronisation Channel
SF	Spreading Factor
SFN	Cell System Frame Number
STTD	Space Time Transmit Diversity
TCH	Traffic Channel
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
TFC	Transport Format Combination
TFCI	Transport Format Combination Indicator
TFI	Transport Format Indicator
TPC	Transmitter Power Control
TrCH	Transport Channel
TSTD	Time Switched Transmit Diversity
TTI	Transmission Time Interval
UE	User Equipment
UL	Uplink
UMTS	Universal Mobil Telecommunications System
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

5.2.2.4 Transmission of TFCI

All burst types 1, 2 and 3 provide the possibility for transmission of TFCI.
The transmission of TFCI is negotiated at call setup and can be re-negotiated during the call. For each CCTrCH it is indicated by higher layer signalling, which TFCI format is applied. Additionally for each allocated timeslot it is signalled individually whether that timeslot carries the TFCI or not. The TFCI is always present in the first timeslot in a radio frame for each CCTrCH. If a time slot contains the TFCI, then it is always transmitted using the first allocated channelisation code in the timeslot, according to the order in the higher layer allocation message.
The transmission of TFCI is done in the data parts of the respective physical channel. In DL the TFCI and data bits are subject to the same spreading procedure as depicted in [8]. In UL, independent of the SF that is applied to the data symbols in the burst, the data in the TFCI field are always spread with SF=16 using the channelisation code in the lowest branch of the allowed OVSF sub tree, as depicted in [8]. Hence the midamble structure and length is not changed. The TFCI information is to be transmitted directly adjacent to the midamble, possibly after the TPC. Figure ~~6~~7 shows the position of the TFCI in a traffic burst in downlink. Figure ~~7~~8 shows the position of the TFCI in a traffic burst in uplink.

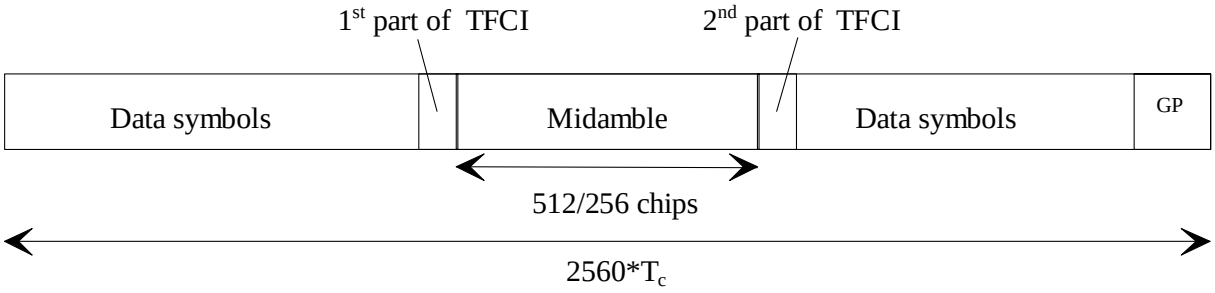

Figure 7: Position of TFCI information in the traffic burst in case of downlink

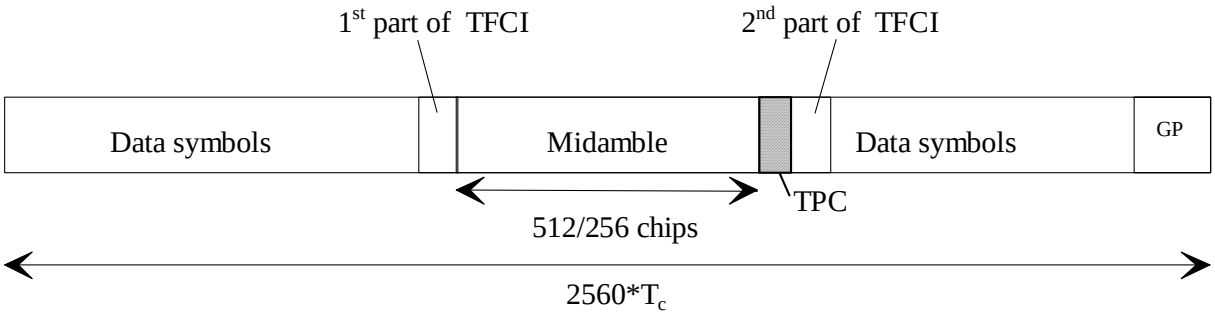

Figure 8: Position of TFCI information in the traffic burst in case of uplink

Two examples of TFCI transmission in the case of multiple DPCHs used for a connection are given in the Figure ~~8~~9 and Figure ~~9~~ 10below. Combinations of the two schemes shown are also applicable.

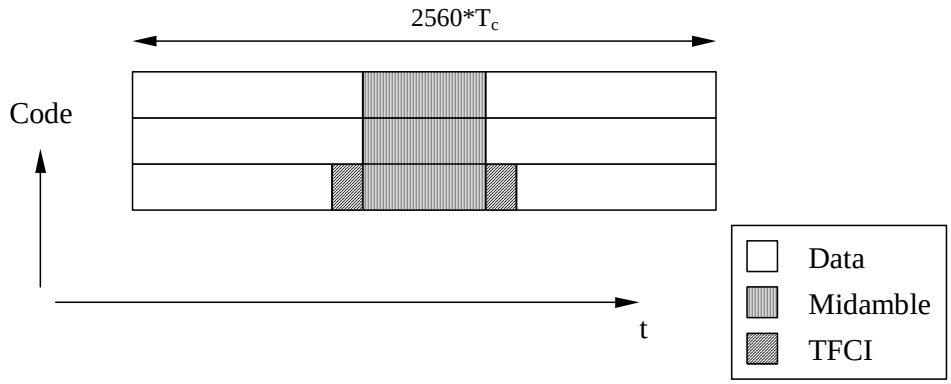

Figure 9: Example of TFCI transmission with physical channels multiplexed in code domain

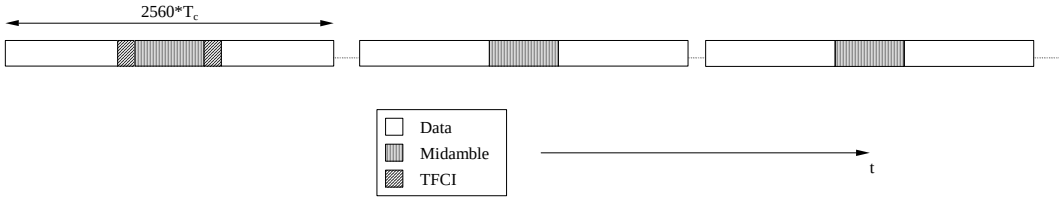

Figure 10: Example of TFCI transmission with physical channels multiplexed in time domain

In case the Node B receives an invalid TFI combination on the DCHs mapped to one CCTrCH the procedure described in [16] shall be applied. According to this procedure DTX shall be applied to all DPCHs to which the CCTrCH is mapped to.

5.2.2.5 Transmission of TPC

All burst types 1, 2 and 3 for dedicated channels provide the possibility for transmission of TPC in uplink.
The transmission of TPC is done in the data parts of the traffic burst. Independent of the SF that is applied to the data symbols in the burst, the data in the TPC field are always spread with SF=16 using the channelisation code in the lowest branch of the allowed OVSF sub tree, as depicted in [8]. Hence the midamble structure and length is not changed. The TPC information is to be transmitted directly after the midamble. Figure ~~10~~11 shows the position of the TPC in a traffic burst.
For every user the TPC information shall be transmitted at least once per transmitted frame. If TFCI is applied for a CCTrCH, TPC shall be transmitted with the same channelization codes and in the same timeslots as TFCI. If no TFCI is applied for a CCTrCH, TPC shall be transmitted using the first allocated channelisation code and the first allocated timeslot, according to the order in the higher layer allocation message.

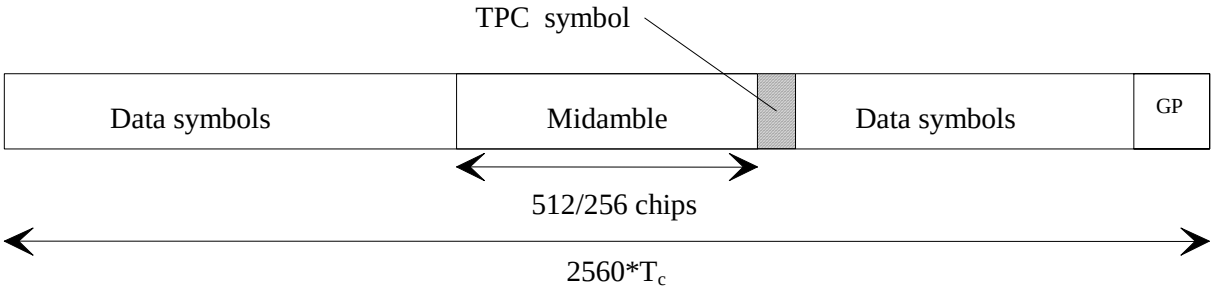

Figure 11: Position of TPC information in the traffic burst

The length of the TPC command is one symbol. The relationship between the TPC symbol and the TPC command is shown in table 4a.

Table 4a: TPC bit pattern

TPC Bits	TPC command	Meaning
00	'Down'	Decrease Tx Power
11	'Up'	Increase Tx Power

5.2.2.6 Timeslot formats

5.2.2.6.1 Downlink timeslot formats

The downlink timeslot format depends on the spreading factor, midamble length and on the number of the TFCI bits, as depicted in the table ~~4a~~5a.

Table 5a: Time slot formats for the Downlink

Slot Format #	Spreading Factor	Midamble length (chips)	N_{TFCI} (bits)	Bits/slot	$N_{Data/Slot}$ (bits)	$N_{data/data\ field}$ (bits)
0	16	512	0	244	244	122
1	16	512	4	244	240	120
2	16	512	8	244	236	118
3	16	512	16	244	228	114
4	16	512	32	244	212	106
5	16	256	0	276	276	138
6	16	256	4	276	272	136
7	16	256	8	276	268	134
8	16	256	16	276	260	130
9	16	256	32	276	244	122
10	1	512	0	3904	3904	1952
11	1	512	4	3904	3900	1950
12	1	512	8	3904	3896	1948
13	1	512	16	3904	3888	1944
14	1	512	32	3904	3872	1936
15	1	256	0	4416	4416	2208
16	1	256	4	4416	4412	2206
17	1	256	8	4416	4408	2204
18	1	256	16	4416	4400	2200
19	1	256	32	4416	4384	2192

5.2.2.6.2 Uplink timeslot formats

The uplink timeslot format depends on the spreading factor, midamble length, guard period length and on the number of the TFCI bits. Due to TPC, different amount of bits are mapped to the two data fields. The timeslot formats are depicted in the table ~~4b~~5b.

3GPP TSG RAN Meeting #12
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R1-01-0501

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CHANGE REQUEST

⌘ **25.221** **CR** **051** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

Title:	⌘	Clarification of Midamble Usage in TS25.221
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI4
Date:	⌘	20/02/01
Category:	⌘	**A**
Release:	⌘	REL-4

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Consequences if not approved:	⌘	Ambiguous specifications

Clauses affected:	⌘	5.6.1.2.1		
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5.6.1.2.1 Default midamble

If a midamble is not explicitly assigned and the use of the common midamble allocation scheme is not signalled by higher layers, the UE shall derive the midambles from the allocated~~ssociated~~ channelisation codes and shall use an individual midamble for each channelisation code group containing one primary and a set of secondary channelisation codes. The ~~For each~~ association between midambles and channelisation code groups is given in annex A.3.~~, there is one primary channelisation code associated to each midamble. A set of secondary channelisation codes is associated to each primary channelisation code.~~ All the secondary channelisation codes within a set use the same midamble as the primary channelisation code to which they are associated.

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CHANGE REQUEST

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Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI4
Date:	⌘	May 22, 2001
Category:	⌘	**A**
Release:	⌘	REL-4

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P_q	Paging Indicator (indicator set by physical layer)
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PUSCH	Physical Uplink Shared Channel
RACH	Random Access Channel
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RT	Real Time
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SCH	Synchronisation Channel
SF	Spreading Factor
SFN	Cell System Frame Number
STTD	Space Time Transmit Diversity
TCH	Traffic Channel
TDD	Time Division Duplex
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TFCI	Transport Format Combination Indicator
TFI	Transport Format Indicator
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TrCH	Transport Channel
TSTD	Time Switched Transmit Diversity
TTI	Transmission Time Interval
UE	User Equipment
UL	Uplink
UMTS	Universal Mobil Telecommunications System
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

5.2.2.4 Transmission of TFCI

All burst types 1, 2 and 3 provide the possibility for transmission of TFCI.
The transmission of TFCI is negotiated at call setup and can be re-negotiated during the call. For each CCTrCH it is indicated by higher layer signalling, which TFCI format is applied. Additionally for each allocated timeslot it is signalled individually whether that timeslot carries the TFCI or not. The TFCI is always present in the first timeslot in a radio frame for each CCTrCH. If a time slot contains the TFCI, then it is always transmitted using the first allocated channelisation code in the timeslot, according to the order in the higher layer allocation message.
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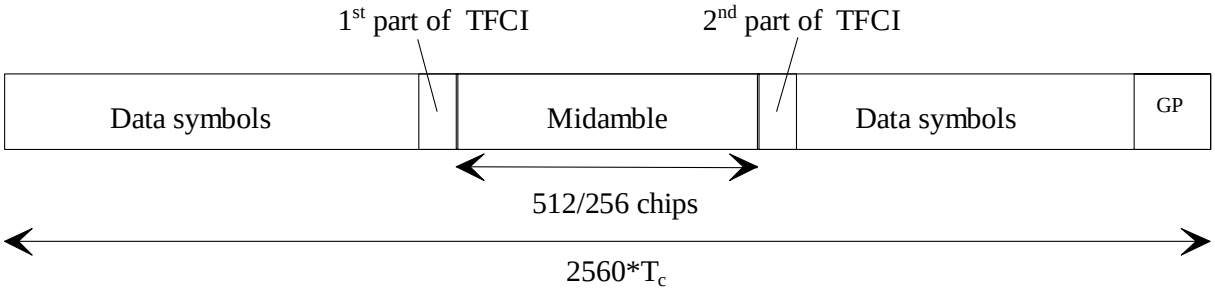

Figure 7: Position of TFCI information in the traffic burst in case of downlink

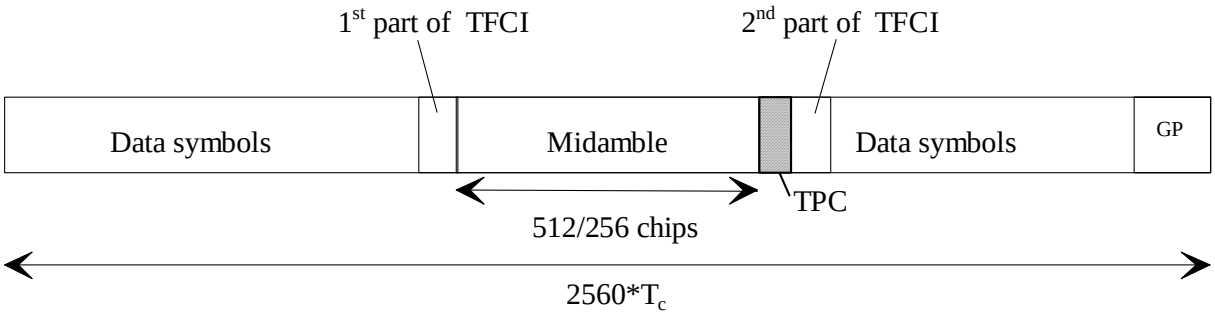

Figure 8: Position of TFCI information in the traffic burst in case of uplink

Two examples of TFCI transmission in the case of multiple DPCHs used for a connection are given in the Figure ~~8~~9 and Figure ~~9~~ 10below. Combinations of the two schemes shown are also applicable.

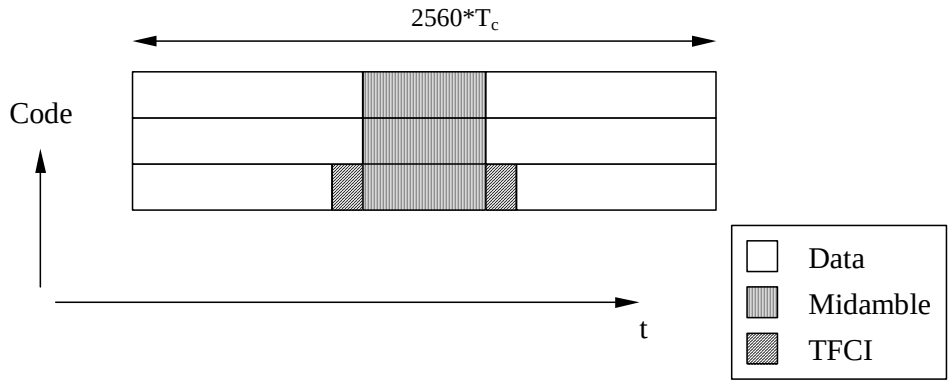

Figure 9: Example of TFCI transmission with physical channels multiplexed in code domain

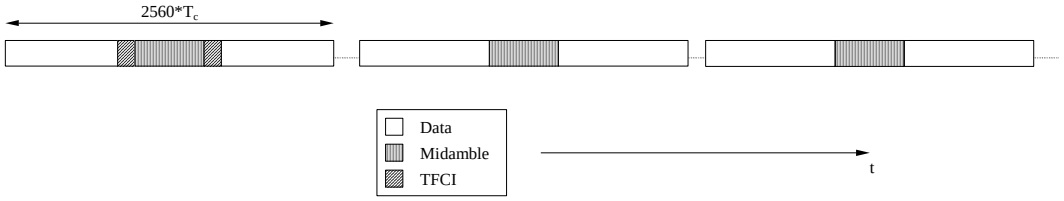

Figure 10: Example of TFCI transmission with physical channels multiplexed in time domain

In case the Node B receives an invalid TFI combination on the DCHs mapped to one CCTrCH the procedure described in [16] shall be applied. According to this procedure DTX shall be applied to all DPCHs to which the CCTrCH is mapped to.

5.2.2.5 Transmission of TPC

All burst types 1, 2 and 3 for dedicated channels provide the possibility for transmission of TPC in uplink.
The transmission of TPC is done in the data parts of the traffic burst. Independent of the SF that is applied to the data symbols in the burst, the data in the TPC field are always spread with SF=16 using the channelisation code in the lowest branch of the allowed OVSF sub tree, as depicted in [8]. Hence the midamble structure and length is not changed. The TPC information is to be transmitted directly after the midamble. Figure ~~10~~11 shows the position of the TPC in a traffic burst.
For every user the TPC information shall be transmitted at least once per transmitted frame. If TFCI is applied for a CCTrCH, TPC shall be transmitted with the same channelization codes and in the same timeslots as TFCI. If no TFCI is applied for a CCTrCH, TPC shall be transmitted using the first allocated channelisation code and the first allocated timeslot, according to the order in the higher layer allocation message.

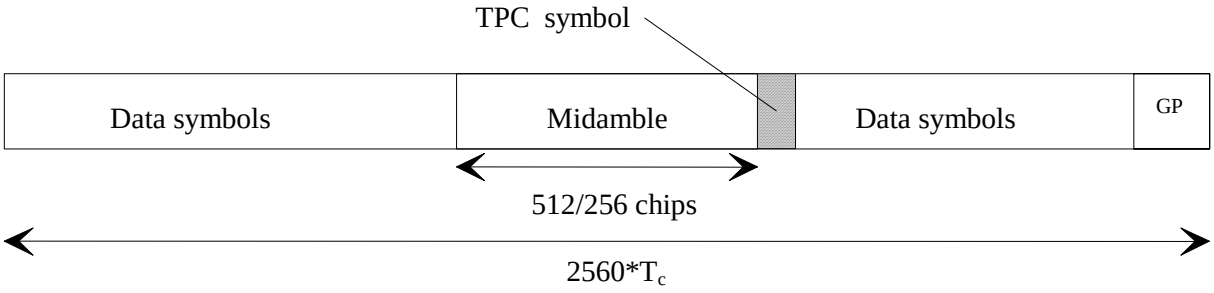

Figure 11: Position of TPC information in the traffic burst

The length of the TPC command is one symbol. The relationship between the TPC symbol and the TPC command is shown in table 4a.

Table 4a: TPC bit pattern

TPC Bits	TPC command	Meaning
00	'Down'	Decrease Tx Power
11	'Up'	Increase Tx Power

5.2.2.6 Timeslot formats

5.2.2.6.1 Downlink timeslot formats

The downlink timeslot format depends on the spreading factor, midamble length and on the number of the TFCI bits, as depicted in the table ~~4a~~5a.

Table 5a: Time slot formats for the Downlink

Slot Format #	Spreading Factor	Midamble length (chips)	N_{TFCI} (bits)	Bits/slot	$N_{Data/Slot}$ (bits)	$N_{data/data\ field}$ (bits)
0	16	512	0	244	244	122
1	16	512	4	244	240	120
2	16	512	8	244	236	118
3	16	512	16	244	228	114
4	16	512	32	244	212	106
5	16	256	0	276	276	138
6	16	256	4	276	272	136
7	16	256	8	276	268	134
8	16	256	16	276	260	130
9	16	256	32	276	244	122
10	1	512	0	3904	3904	1952
11	1	512	4	3904	3900	1950
12	1	512	8	3904	3896	1948
13	1	512	16	3904	3888	1944
14	1	512	32	3904	3872	1936
15	1	256	0	4416	4416	2208
16	1	256	4	4416	4412	2206
17	1	256	8	4416	4408	2204
18	1	256	16	4416	4400	2200
19	1	256	32	4416	4384	2192

5.2.2.6.2 Uplink timeslot formats

The uplink timeslot format depends on the spreading factor, midamble length, guard period length and on the number of the TFCI bits. Due to TPC, different amount of bits are mapped to the two data fields. The timeslot formats are depicted in the table ~~4b~~5b.