TSG-RAN Meeting #10 ***RP-000542***
Bangkok, Thailand, 6 - 8 December 2000

Title: **Agreed CRs to TS 25.221**

Source: **TSG-RAN WG1**

Agenda item: **5.1.3**

No.	R1 T-doc	Spec	CR	Rev	Subject	Cat	V_old	V_new
1	R1-001003	25.221	034	-	Correction on TFCI & TPC Transmission	F	3.4.0	3.5.0
2	R1-001009	25.221	035	1	Clarifications on Midamble Associations	F	3.4.0	3.5.0
3	R1-001342	25.221	036	-	Clarification on PICH power setting	F	3.4.0	3.5.0

3GPP TSG RAN Meeting #10
Bangkok, Thailand, 6-8, December 2000

Document R1-00-1003
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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25.221	**CR**	**034**	Current Version:	3.4.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#10	for approval	X	strategic		*(for SMG use only)*
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source:	TSG RAN WG1
Date:	2000-10-29
Subject:	Correction on TFCI & TPC Transmission
Work item:	

Category:				**Release:**		
	F	Correction	X		Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification			Release 99	X
					Release 00	

Reason for change:	Fixes the SF for the TFCI and TPC field to 16 in order to enable high repetition factors on the data field in case of low bit rates and low fixed SF.
Clauses affected:	5.2.1.2, 5.2.2.1, 5.2.2.2, 5.2.2.3

Other specs affected:				
	Other 3G core specifications		→ List of CRs:	CR222-050
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:	

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<--------- double-click here for help and instructions on how to create a CR.

5.2.1.2 Spreading for Uplink Physical Channels

The range of spreading factor that may be used for uplink physical channels shall range from 16 down to 1. For each physical channel an individual minimum spreading factor SF_{min} is transmitted by means of the higher layers. There are two options that are indicated by UTRAN:

1. The UE shall use the spreading factor SF_{min}, independent of the current TFC.

2. The UE shall autonomously increase the spreading factor depending on the current TFC.

If the UE autonomously changes the SF, it shall always vary the channelisation code along the lower branch of the allowed OVSF sub tree, as depicted in [8].

For multicode transmission a UE shall use a maximum of two physical channels per timeslot simultaneously. These two parallel physical channels shall be transmitted using different channelisation codes, see [8].

5.2.2.1 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. 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. 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, ~~this means TFCI and data bits are subject to the same spreading procedure~~ 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 shows the position of the TFCI in a traffic burst in downlink. Figure 7 shows the position of the TFCI in a traffic burst in uplink.

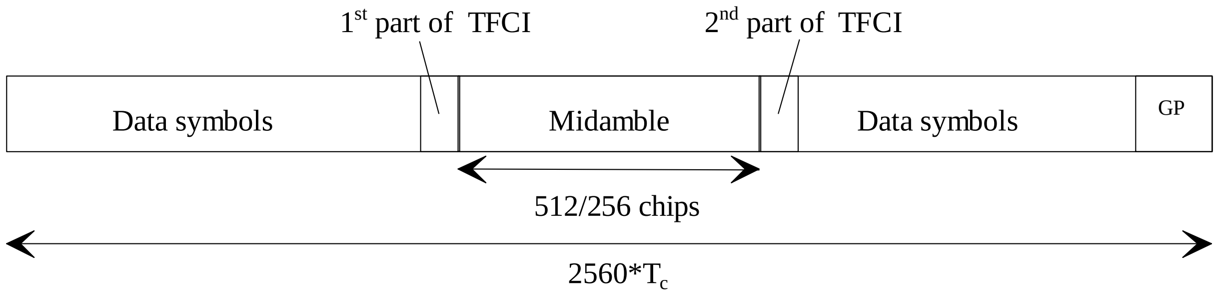

Figure 7: Position of TFCI information in the traffic burst in case of downlink

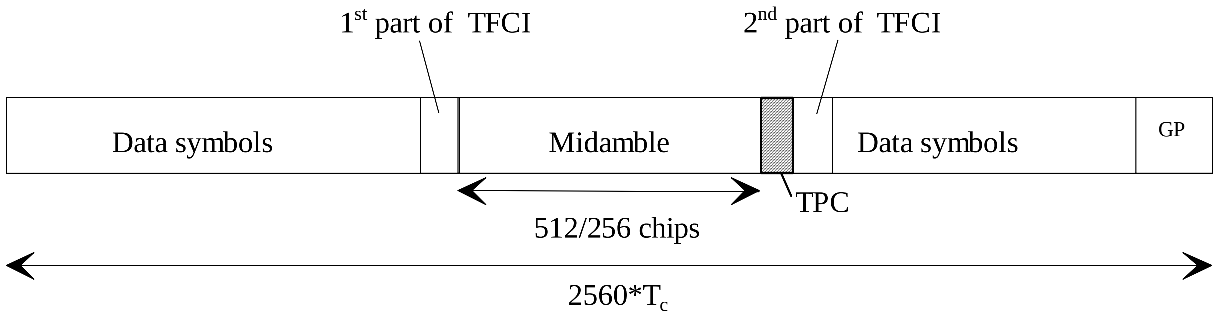

Figure 8: Position of TFCI information in the traffic burst in case of uplink

Two examples of TFCI transmission in the case of multiple DPCHs used for a connection are given in the Figure 8 and Figure 9 below. Combinations of the two schemes shown are also applicable. ~~It should be noted that the SF can vary for the DPCHs not carrying TFCI information.~~

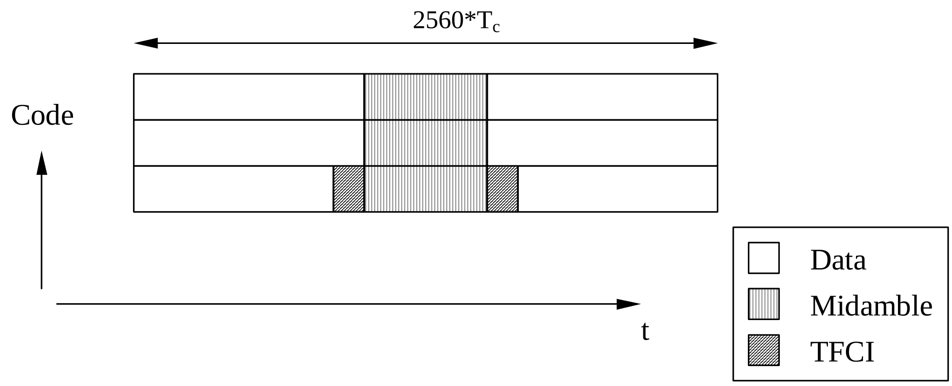

Figure 9: Example of TFCI transmission with physical channels multiplexed in code domain

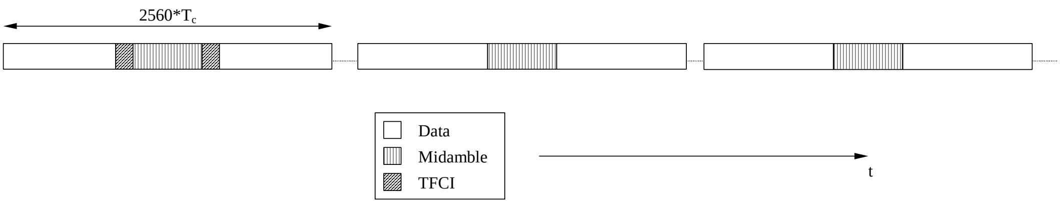

Figure 10: Example of TFCI transmission with physical channels multiplexed in time domain

5.2.2.2 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 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. ~~The TPC is spread with the same spreading factor (SF) and spreading code as the data parts of the respective physical channel.~~

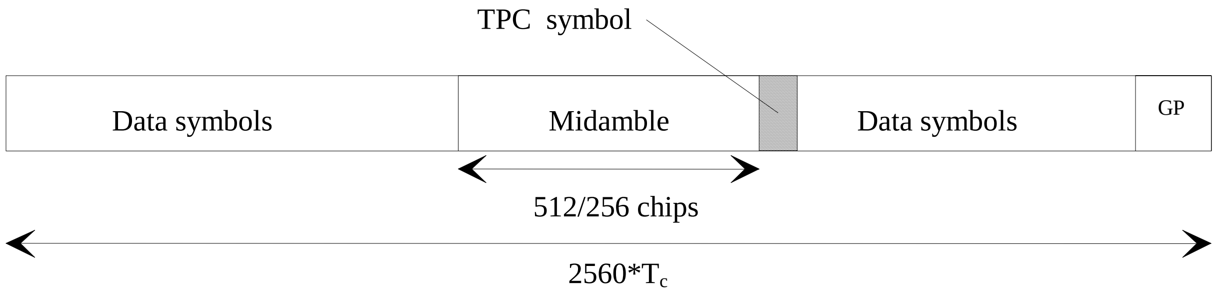

Figure 11: Position of TPC information in the traffic burst

5.2.2.3 Timeslot formats

5.2.2.3.1 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.

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

5.2.2.3.2 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.

Table 5b: Timeslot formats for the Uplink

Slot Format #	Spreading Factor	Midamble length (chips)	Guard Period (chips)	N_{TFCI} (bits)	N_{TPC} (bits)	Bits/slot	$N_{Data/Slot}$ (bits)	$N_{data/data field(1)}$ (bits)	$N_{data/data field(2)}$ (bits)
0	16	512	96	0	0	244	244	122	122
1	16	512	96	0	2	244	242	122	120
2	16	512	96	4	2	244	238	120	118
3	16	512	96	8	2	244	234	118	116
4	16	512	96	16	2	244	226	114	112
5	16	512	96	32	2	244	210	106	104
6	16	256	96	0	0	276	276	138	138
7	16	256	96	0	2	276	274	138	136
8	16	256	96	4	2	276	270	136	134
9	16	256	96	8	2	276	266	134	132
10	16	256	96	16	2	276	258	130	128
11	16	256	96	32	2	276	242	122	120
12	8	512	96	0	0	488~~488~~	488~~488~~	244~~244~~	244~~244~~
13	8	512	96	0	2	486~~488~~	484~~486~~	244~~244~~	240~~242~~
14	8	512	96	4	2	482~~488~~	476~~482~~	240~~242~~	236~~240~~
15	8	512	96	8	2	478~~488~~	468~~478~~	236~~240~~	232~~238~~
16	8	512	96	16	2	470~~488~~	452~~470~~	228~~236~~	224~~234~~
17	8	512	96	32	2	454~~488~~	420~~454~~	212~~228~~	208~~226~~
18	8	256	96	0	0	552~~552~~	552~~552~~	276~~276~~	276~~276~~
19	8	256	96	0	2	550~~552~~	548~~550~~	276~~276~~	272~~274~~
20	8	256	96	4	2	546~~552~~	540~~546~~	272~~274~~	268~~272~~
21	8	256	96	8	2	542~~552~~	532~~542~~	268~~272~~	264~~270~~
22	8	256	96	16	2	534~~552~~	516~~534~~	260~~268~~	256~~266~~
23	8	256	96	32	2	518~~552~~	484~~518~~	244~~260~~	240~~258~~
24	4	512	96	0	0	976~~976~~	976~~976~~	488~~488~~	488~~488~~
25	4	512	96	0	2	970~~976~~	968~~974~~	488~~488~~	480~~486~~
26	4	512	96	4	2	958~~976~~	952~~970~~	480~~486~~	472~~484~~
27	4	512	96	8	2	946~~976~~	936~~966~~	472~~484~~	464~~482~~
28	4	512	96	16	2	922~~976~~	904~~958~~	456~~480~~	448~~478~~
29	4	512	96	32	2	874~~976~~	840~~942~~	424~~472~~	416~~470~~
30	4	256	96	0	0	1104~~1104~~	1104~~1104~~	552~~552~~	552~~552~~
31	4	256	96	0	2	1098~~1104~~	1096~~1102~~	552~~552~~	544~~550~~
32	4	256	96	4	2	1086~~1104~~	1080~~1098~~	544~~550~~	536~~548~~
33	4	256	96	8	2	1074~~1104~~	1064~~1094~~	536~~548~~	528~~546~~
34	4	256	96	16	2	1050~~1104~~	1032~~1086~~	520~~544~~	512~~542~~
35	4	256	96	32	2	1002~~1104~~	968~~1070~~	488~~536~~	480~~534~~
36	2	512	96	0	0	1952~~1952~~	1952~~1952~~	976~~976~~	976~~976~~
37	2	512	96	0	2	1938~~1952~~	1936~~1950~~	976~~976~~	960~~974~~
38	2	512	96	4	2	1910~~1952~~	1904~~1946~~	960~~974~~	944~~972~~
39	2	512	96	8	2	1882~~1952~~	1872~~1942~~	944~~972~~	928~~970~~

Slot Format #	Spreading Factor	Midamble length (chips)	Guard Period (chips)	N_{TFCI} (bits)	N_{TPC} (bits)	Bits/slot	$N_{Data/Slot}$ (bits)	$N_{data/data\ field(1)}$ (bits)	$N_{data/data\ field(2)}$ (bits)
40	2	512	96	16	2	1826~~1952~~	1808~~1934~~	912~~968~~	896~~966~~
41	2	512	96	32	2	1714~~1952~~	1680~~1918~~	848~~960~~	832~~958~~
42	2	256	96	0	0	2208~~2208~~	2208~~2208~~	1104~~1104~~	1104~~1104~~
43	2	256	96	0	2	2194~~2208~~	2192~~2206~~	1104~~1104~~	1088~~1102~~
44	2	256	96	4	2	2166~~2208~~	2160~~2202~~	1088~~1102~~	1072~~1100~~
45	2	256	96	8	2	2138~~2208~~	2128~~2198~~	1072~~1100~~	1056~~1098~~
46	2	256	96	16	2	2082~~2208~~	2064~~2190~~	1040~~1096~~	1024~~1094~~
47	2	256	96	32	2	1970~~2208~~	1936~~2174~~	976~~1088~~	960~~1086~~
48	1	512	96	0	0	3904~~3904~~	3904~~3904~~	1952~~1952~~	1952~~1952~~
49	1	512	96	0	2	3874~~3904~~	3872~~3902~~	1952~~1952~~	1920~~1950~~
50	1	512	96	4	2	3814~~3904~~	3808~~3898~~	1920~~1950~~	1888~~1948~~
51	1	512	96	8	2	3754~~3904~~	3744~~3894~~	1888~~1948~~	1856~~1946~~
52	1	512	96	16	2	3634~~3904~~	3616~~3886~~	1824~~1944~~	1792~~1942~~
53	1	512	96	32	2	3394~~3904~~	3360~~3870~~	1696~~1936~~	1664~~1934~~
54	1	256	96	0	0	4416~~4416~~	4416~~4416~~	2208~~2208~~	2208~~2208~~
55	1	256	96	0	2	4386~~4416~~	4384~~4414~~	2208~~2208~~	2176~~2206~~
56	1	256	96	4	2	4326~~4416~~	4320~~4410~~	2176~~2206~~	2144~~2204~~
57	1	256	96	8	2	4266~~4416~~	4256~~4406~~	2144~~2204~~	2112~~2202~~
58	1	256	96	16	2	4146~~4416~~	4128~~4398~~	2080~~2200~~	2048~~2198~~
59	1	256	96	32	2	3906~~4416~~	3872~~4282~~	1952~~2192~~	1920~~2190~~
60	16	512	192	0	0	232	232	122	110
61	16	512	192	0	2	232	230	122	108
62	16	512	192	4	2	232	226	120	106
63	16	512	192	8	2	232	222	118	104
64	16	512	192	16	2	232	214	114	100
65	16	512	192	32	2	232	198	106	92
66	8	512	192	0	0	464~~464~~	464~~464~~	232~~244~~	232~~220~~
67	8	512	192	0	2	462~~464~~	460~~462~~	232~~244~~	228~~218~~
68	8	512	192	4	2	458~~464~~	452~~458~~	228~~242~~	224~~216~~
69	8	512	192	8	2	454~~464~~	444~~454~~	224~~240~~	220~~214~~
70	8	512	192	16	2	446~~464~~	428~~446~~	216~~236~~	212~~210~~
71	8	512	192	32	2	430~~464~~	396~~430~~	200~~228~~	196~~202~~
72	4	512	192	0	0	928~~928~~	928~~928~~	464~~488~~	464~~440~~
73	4	512	192	0	2	922~~928~~	920~~926~~	464~~488~~	456~~438~~

Slot Format #	Spreading Factor	Midamble length (chips)	Guard Period (chips)	N_{TFCI} (bits)	N_{TPC} (bits)	Bits/slot	$N_{Data/Slot}$ (bits)	$N_{data/data\ field(1)}$ (bits)	$N_{data/data\ field(2)}$ (bits)
74	4	512	192	4	2	910~~928~~	904~~922~~	456~~486~~	448~~436~~
75	4	512	192	8	2	898~~928~~	888~~918~~	448~~484~~	440~~434~~
76	4	512	192	16	2	874~~928~~	856~~910~~	432~~480~~	424~~430~~
77	4	512	192	32	2	826~~928~~	792~~894~~	400~~472~~	392~~422~~
78	2	512	192	0	0	1856~~1856~~	1856~~1856~~	928~~976~~	928~~880~~
79	2	512	192	0	2	1842~~1856~~	1840~~1854~~	928~~976~~	912~~878~~
80	2	512	192	4	2	1814~~1856~~	1808~~1850~~	912~~974~~	896~~876~~
81	2	512	192	8	2	1786~~1856~~	1776~~1846~~	896~~972~~	880~~874~~
82	2	512	192	16	2	1730~~1856~~	1712~~1838~~	864~~968~~	848~~870~~
83	2	512	192	32	2	1618~~1856~~	1584~~1822~~	800~~960~~	784~~862~~
84	1	512	192	0	0	3712~~3712~~	3712~~3712~~	1856~~1952~~	1856~~1760~~
85	1	512	192	0	2	3682~~3712~~	3680~~3710~~	1856~~1952~~	1824~~1758~~
86	1	512	192	4	2	3622~~3712~~	3616~~3706~~	1824~~1950~~	1792~~1756~~
87	1	512	192	8	2	3562~~3712~~	3552~~3702~~	1792~~1948~~	1760~~1754~~
88	1	512	192	16	2	3442~~3712~~	3424~~3694~~	1728~~1944~~	1696~~1750~~
89	1	512	192	32	2	3202~~3712~~	3168~~3678~~	1600~~1936~~	1568~~1742~~

5.6.2 Midamble Allocation for UL Physical Channels

If the midamble is explicitly assigned by higher layers, an individual midamble shall be assigned to all UE's in one UL time slot.

If no midamble is explicitly assigned by higher layers, the UE shall derive the midamble from the assigned channelisation code that is used for the data part (except for TFCI/TPC) of the burst. The associations between midamble and channelisation code are the same as for DL physical channels. If the UE changes the SF according to the data rate, it shall always vary the channelisation code along the lower branch of the OVSF tree.

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Bangkok, Thailand, 6-8, December 2000

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or for SMG, use the format P-99-xxx

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25.221 CR 035r1 Current Version: 3.4.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: RAN#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

Proposed change affects: (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG RAN WG1 **Date:** 05-October-2000

Subject: Clarifications on Midamble Associations

Work item:

Category:				**Release:**	
	F	Correction	X	Phase 2	
	A	Corresponds to a correction in an earlier release		Release 96	
(only one category	B	Addition of feature		Release 97	
shall be marked	C	Functional modification of feature		Release 98	
with an X)	D	Editorial modification		Release 99	X
				Release 00	

Reason for change:

The specification of the P-CCPCH in TS 25.221 is currently not consistent, when Block STTD is applied to the P-CCPCH and only four midambles are used in a cell. This is because in the four midamble case only the odd midambles m(1), m(3), m(5) and m(7) are available. However, when Block STTD is applied to the P-CCPCH midambles m(1) and m(2) shall be used. In order to make the spec consistent, we propose to forbid the use of Block-STTD and four midambles at the same time.

Revision of Section 5.2.2.2 for more clarity on where to use Burst Type 2

Clarifications on the midamble transmit power

Modification of the midamble to spreading codes associations so that the primary code appears on the lower part of the tree, in accordance with the rule about the use of variable spreading factors described in section 5.5.2.

Clauses affected: 5.2.2.2, 5.2.3.1, 5.3.1.3, Annex A.3, Annex B

Other specs affected:			
	Other 3G core specifications		→ List of CRs:
	Other GSM core specifications		→ List of CRs:
	MS test specifications		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments:

5.2.2 Burst Types

Three types of bursts for dedicated physical channels are defined. All of them consist of two data symbol fields, a midamble and a guard period, the lengths of which are different for the individual burst types. Thus, the number of data symbols in a burst depends on the SF and the burst type, as depicted in table 1.

Table 1: Number of data symbols (N) for burst type 1, 2, and 3

Spreading factor (SF)	Burst Type 1	Burst Type 2	Burst Type 3
1	1952	2208	1856
2	976	1104	928
4	488	552	464
8	244	276	232
16	122	138	116

The support of all three burst types is mandatory for the UE. The three different bursts defined here are well suited for different applications, as described in the following sections.

5.2.2.1 Burst Type 1

The burst type 1 can be used for uplink and downlink. Due to its longer midamble field this burst type supports the construction of a larger number of training sequences, see 5.2.3.~~, which shall be used to estimate the different channels for different UEs in UL and, in case of TxDiversity or Beamforming, also in DL.~~ The maximum number of training sequences depend on the cell configuration, see annex A. For the burst type 1 this number may be 4, 8, or 16.

The data fields of the burst type 1 are 976 chips long. The corresponding number of symbols depends on the spreading factor, as indicated in table 1 above. The midamble of burst type 1 has a length of 512 chips. The guard period for the burst type 1 is 96 chip periods long. The burst type 1 is shown in Figure 4. The contents of the burst fields are described in table 2.

Table 2: The contents of the burst type 1 fields

Chip number (CN)	Length of field in chips	Length of field in symbols		Contents of field
0-975	976	Cf table 1		Data symbols
976-1487	512	-		Midamble
1488-2463	976	Cf table 1		Data symbols
2464-2559	96	-		Guard period

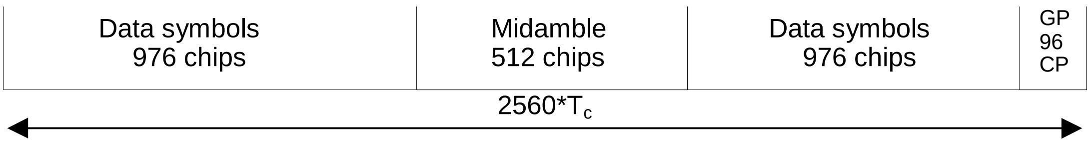

Figure 4: Burst structure of the burst type 1. GP denotes the guard period and CP the chip periods

5.2.2.2 Burst Type 2

The burst type 2 can be used for uplink and downlink. It~~The burst type 2~~ offers a longer data field than burst type 1 on the cost of a shorter midamble. Due to the shorter midamble field the burst type 2 supports a maximum number of training sequences of 3 or 6 only, depending on the cell configuration, see annex A.

The data fields of the burst type 2 are 1104 chips long. The corresponding number of symbols depends on the spreading factor, as indicated in table 1 above. The guard period for the burst type 2 is 96 chip periods long.The burst type 2 is shown in Figure 5. The contents of the burst fields are described in table 3.

Table 3: The contents of the burst type 2 fields

Chip number (CN)	Length of field in chips	Length of field in symbols		Contents of field
0-1103	1104	cf table 1		Data symbols
1104-1359	256	-		Midamble
1360-2463	1104	cf table 1		Data symbols
2464-2559	96	-		Guard period

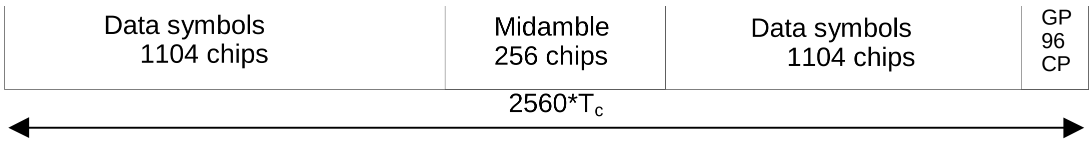

Figure 5: **Burst structure of the burst type 2. GP denotes the guard period and CP the chip periods**

5.2.3.1 Midamble Transmit Power

If in the downlink all users in one time slot have a common midamble, the transmit power of this common midamble is such that there is no power offset between the data part and the midamble part of the transmit signal within the time slot.

In the case of user specific midambles, the transmit power of the user specific midamble is such that there is no power offset between the data parts and the midamble part for this user within one slot.

5.3.1.3 P-CCPCH Training sequences

The training sequences, i.e. midambles, as described in subclause 5.2.3 are used for the P-CCPCH. For those timeslots in which the P-CCPCH is transmitted, the midambles $m^{(1)}$ and $m^{(2)}$ are reserved for P-CCPCH in order to support Block STTD antenna diversity and the beacon function, see 5.4 and 5.5. The use of midambles depends on whether Block STTD is applied to the P-CCPCH:

- If no antenna diversity is applied to P-CCPCH, $m^{(1)}$ is used and $m^{(2)}$ is left unused;. The maximum number K of midambles in a cell may be 4, 8 or 16.
- If Block STTD antenna diversity is applied to P-CCPCH, $m^{(1)}$ is used for the first antenna and $m^{(2)}$ is used for the diversity antenna. The maximum number K of midambles in a cell may be 8 or 16. The case of 4 midambles is not allowed for Block STTD.

5.7 Midamble Transmit Power

There shall be no offset between the sum of the powers allocated to all midambles in a timeslot and the sum of the powers allocated to the data symbol fields. The transmit power within a timeslot is hence constant.

The midamble transmit power of beacon channels is equal to the reference power. If Block STTD is used for the P-CCPCH, the reference power is equally divided between the midambles $m^{(1)}$ and $m^{(2)}$.

The midamble transmit power of all other physical channels depends on the midamble allocation scheme used. The following rules apply

- In case of Default Midamble Allocation, every midamble is transmitted with the same power as the associated codes.
- In case of Common Midamble Allocation in the downlink, the transmit power of this common midamble is such that there is no power offset between the data parts and the midamble part of the overall transmit signal within one time slot.
- In case of UE Specific Midamble Allocation, the transmit power of the UE specific midamble is such that there is no power offset between the data parts and the midamble part of every user within one time slot.

The following figure depicts the midamble powers for the different channel types and midamble allocation schemes. For the UE Specific Midamble Allocation, as an example, code 1 and code 2 are both assigned to UE 1, whereas to UE m is assigned only the code n.

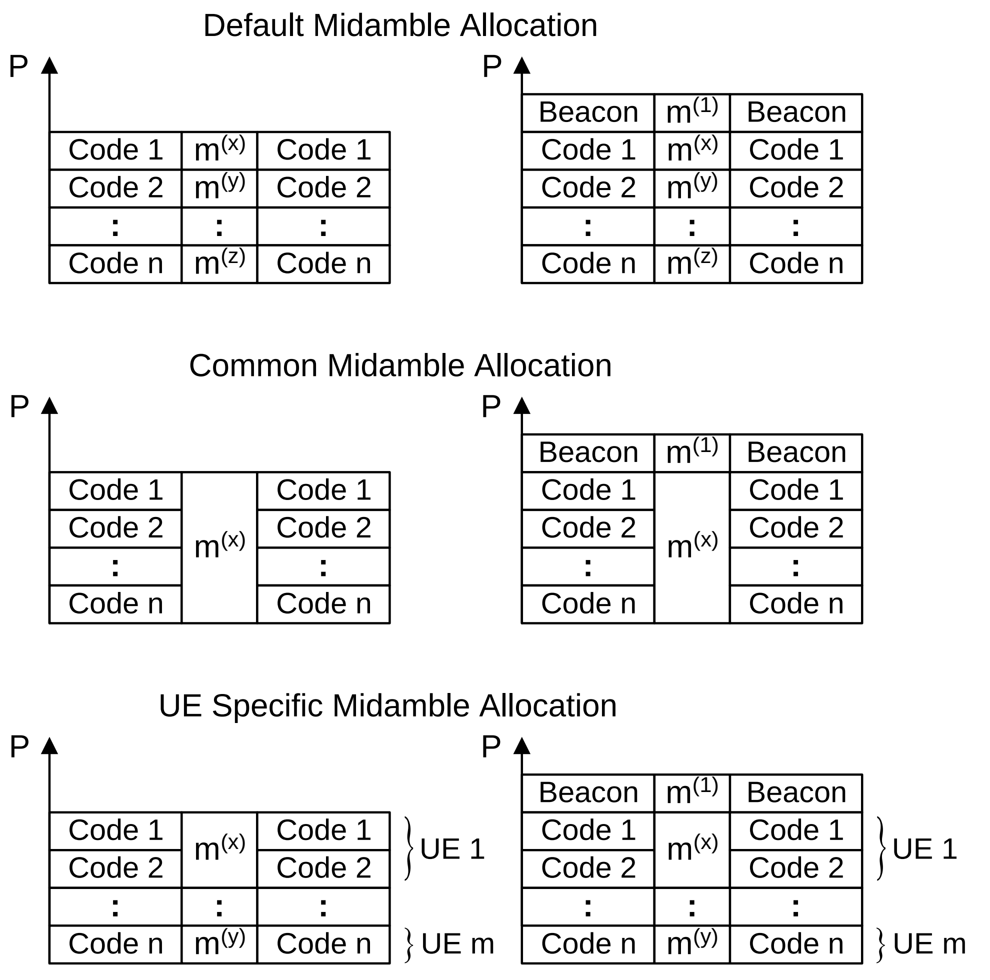

Figure 18: Midamble powers for the different midamble allocation schemes

A.3.2 Association for Burst Type 1/3 and K=8 Midambles

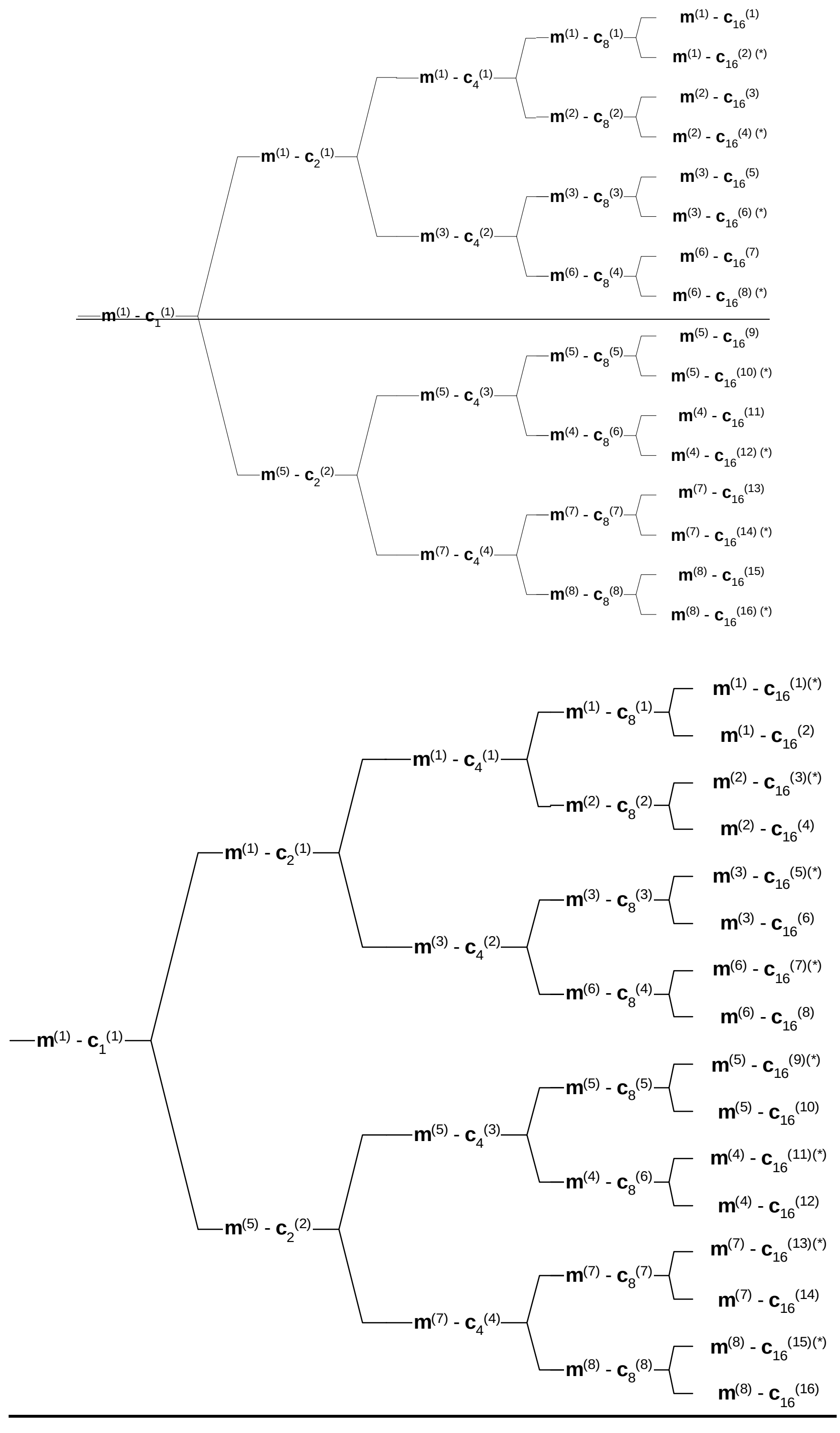

Figure A-2: Association of Midambles to Spreading Codes for Burst Type 1/3 and K=8

A.3.3 Association for Burst Type 1/3 and K=4 Midambles

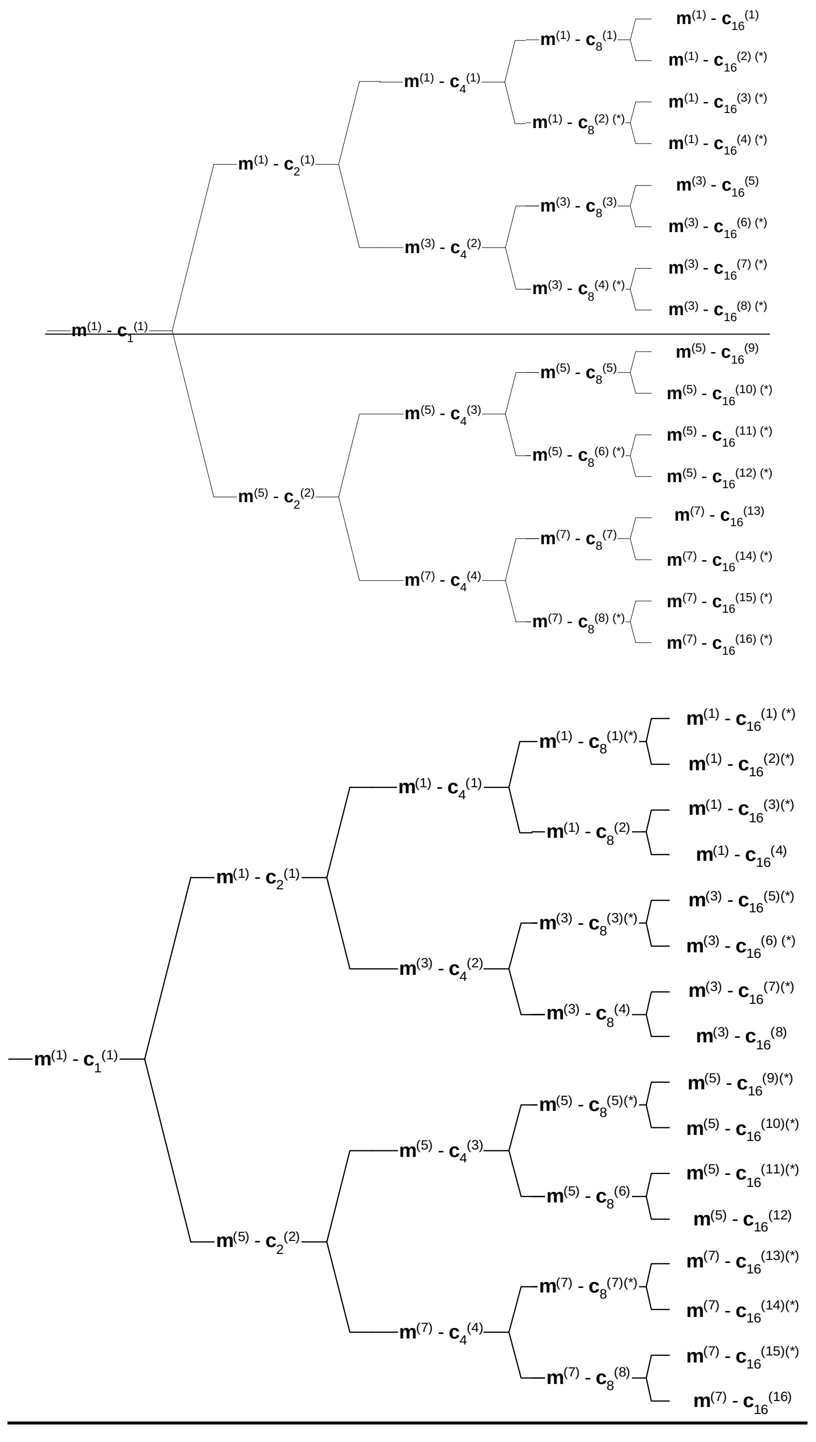

Figure A-3: Association of Midambles to Spreading Codes for Burst Type 1/3 and K=4

A.3.4 Association for Burst Type 2 and K=6 Midambles

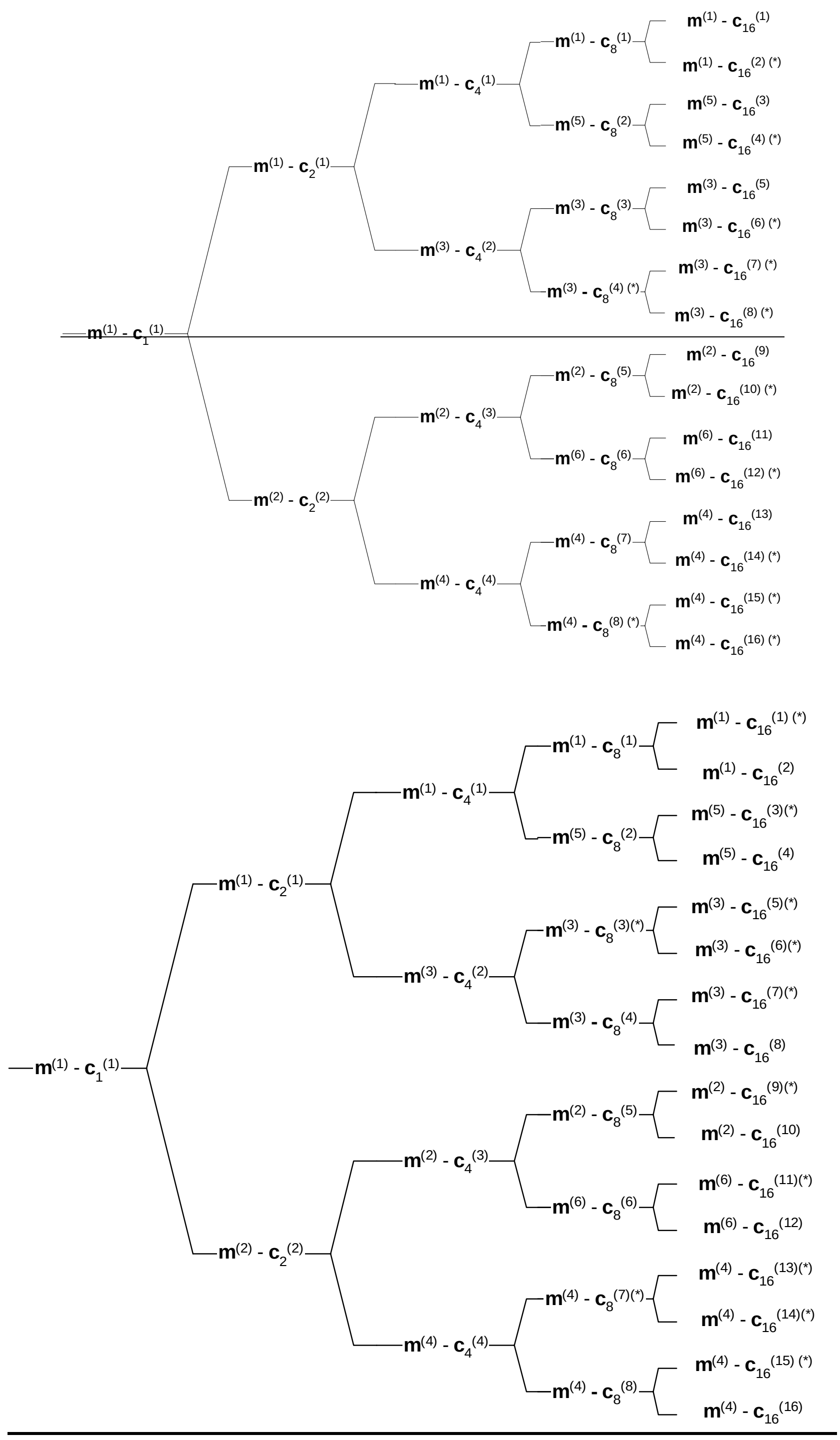

Figure A-4: Association of Midambles to Spreading Codes for Burst Type 2 and K=6

A.3.5 Association for Burst Type 2 and K=3 Midambles

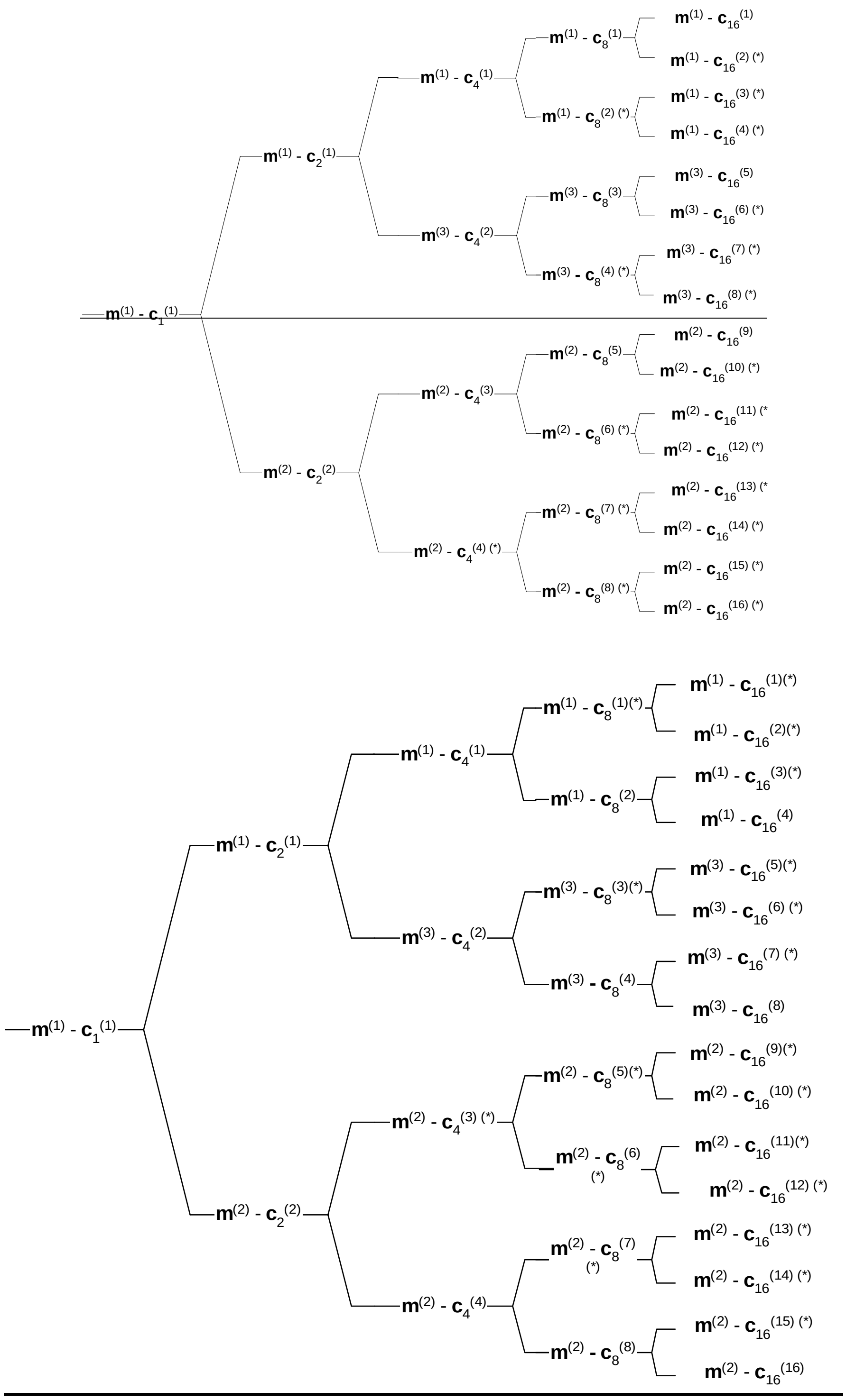

Figure A-5: Association of Midambles to Spreading Codes for Burst Type 2 and K=3

Annex B (normative) Signalling of the number of channelisation codes for the DL common midamble case

The following mapping schemes shall apply for the association between the number of channelisation codes employed in a timeslot and the use of a particular midamble shift in the DL common midamble case. In the following tables the presence of a particular midamble shift is indicated by '1'. Midamble shifts marked with '0' are left unused. Mapping schemes B.3 and B.4 are not applicable to beacon timeslots where a P-CCPCH is present, because the default midamble allocation scheme is applied to these timeslots. Note that in mapping schemes B.3 and B.4, the fixed and pre-allocated channelisation code for the beacon channel is included into the number of indicated channelisation codes.

B.1 Mapping scheme for Burst Type 1 and K=16 Midambles.

m1	m2	m3	m4	m5	m6	m7	M8	m9	m10	m11	m12	m13	m14	m15	m16	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 code
0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2 codes
0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	3 codes
0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	4 codes
0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	5 codes
0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	6 codes
0	0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	7 codes
0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	8 codes
0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	0	9 codes
0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	10 codes
0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	11 codes
0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	12 codes
0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	13 codes
0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	14 codes
0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	15 codes
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	16 codes

B.2 Mapping scheme for Burst Type 1 and K=8 Midambles.

M1	m2	m3	m4	m5	m6	m7	m8	
1	0	0	0	0	0	0	0	1 code or 9 codes
0	**1**	0	0	0	0	0	0	2 codes or 10 codes
0	0	**1**	0	0	0	0	0	3 codes or 11 codes
0	0	0	**1**	0	0	0	0	4 codes or 12 codes
0	0	0	0	**1**	0	0	0	5 codes or 13 codes
0	0	0	0	0	**1**	0	0	6 codes or 14 codes
0	0	0	0	0	0	**1**	0	7 codes or 15 codes
0	0	0	0	0	0	0	**1**	8 codes or 16 codes

B.3 Mapping scheme for Burst Type 1 and K=4 Midambles.

m1	m3	m5	m7	
1	0	0	0	1 or 5 or 9 or 13 codes
0	**1**	0	0	2 or 6 or 10 or 14 codes
0	0	**1**	0	3 or 7 or 11 or 15 codes
0	0	0	**1**	4 or 8 or 12 or 16 codes

B.43 Mapping scheme for beacon timeslots and K=16 Midambles.

m1	m2	m3	M4	m5	m6	m7	M8	m9	m10	m11	M12	m13	m14	m15	m16	
1	x(*)	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	1 codes or 13 codes
1	x(*)	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	2 codes or 14 codes
1	x(*)	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	3 codes or 15 codes
1	x(*)	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	4 codes or 16 codes
1	x(*)	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	5 codes
1	x(*)	0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	6 codes
1	x(*)	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	7 codes
1	x(*)	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	8 codes
1	x(*)	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	9 codes
1	x(*)	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	10 codes
1	x(*)	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	11 codes
1	x(*)	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	12 codes

(*) In case of Block-STTD encoding for the P-CCPCH, midamble shift 2 is used by the diversity antenna

B.54 Mapping scheme for beacon timeslots and K=8 Midambles.

m1	m2	m3	m4	m5	m6	m7	M8	
1	x(*)	**1**	0	0	0	0	0	1 or 7 or 13 codes
1	x(*)	0	**1**	0	0	0	0	2 or 8 or 14 codes
1	x(*)	0	0	**1**	0	0	0	3 or 9 or 15 codes
1	x(*)	0	0	0	**1**	0	0	4 or 10 or 16 codes
1	x(*)	0	0	0	0	**1**	0	5 codes or 11 codes
1	x(*)	0	0	0	0	0	**1**	6 codes or 12 codes

(*) In case of Block-STTD encoding for the P-CCPCH, midamble shift 2 is used by the diversity antenna

B.6 Mapping scheme for beacon timeslots and K=4 Midambles.

m1	m3	m5	m7	
1	**1**	0	0	1 or 4 or 7 or 10 or 13 or 16 codes
1	0	**1**	0	2 or 5 or 8 or 11 or 14 codes
1	0	0	**1**	3 or 6 or 9 or 12 or 15 codes

B.75 Mapping scheme for Burst Type 2 and K=6 Midambles.

m1	m2	m3	m4	m5	m6	
1	0	0	0	0	0	1 or 7 or 13 codes
0	**1**	0	0	0	0	2 or 8 or 14 codes
0	0	**1**	0	0	0	3 or 9 or 15 codes
0	0	0	**1**	0	0	4 or 10 or 16 codes
0	0	0	0	**1**	0	5 or 11 codes
0	0	0	0	0	**1**	6 or 12 codes

B.86 Mapping scheme for Burst Type 2 and K=3 Midambles.

m1	m2	m3	
1	0	0	1 or 4 or 7 or 10 or 13 or 16 codes
0	**1**	0	2 or 5 or 8 or 11 or 14 codes
0	0	**1**	3 or 6 or 9 or 12 or 15 codes

3GPP TSG RAN Meeting #10
Bangkok, Thailand, 6-8, December 2000

Document R1-00-1342
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.221	**CR**	**036**	Current Version:	3.4.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG RAN WG1 **Date:** 10-11-2000

Subject: Clarification on PICH power setting

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: In WG3 specification, PICH power is set by NBAP signalling. In WG1 specifications PICH power is fixed to the P-CCPCH reference power. In order to make specifications consistent this CR changes the definitions on L1, because this aligns FDD and TDD settings and allows reduced interference for the case of good PICH coding.

Clauses affected: 5.3.7

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	CR25.224-040
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

5.3.7 The Paging Indicator Channel (PICH)

The Paging Indicator Channel (PICH) is a physical channel used to carry the paging indicators. ~~The PICH is always transmitted at the same reference power level as the P-CCPCH.~~

Figure 15 depicts the structure of a PICH burst and the numbering of the bits within the burst. The same burst type is used for the PICH in every cell. N_{PIB} bits in a normal burst of type 1 or 2 are used to carry the paging indicators, where N_{PIB} depends on the burst type: N_{PIB}=240 for burst type 1 and N_{PIB}=272 for burst type 2. The bits b_{NPIB},..., b_{NPIB+3} adjacent to the midamble are reserved for possible future use. They shall be set to 0 and transmitted with the same power as the paging indicator carrying bits.

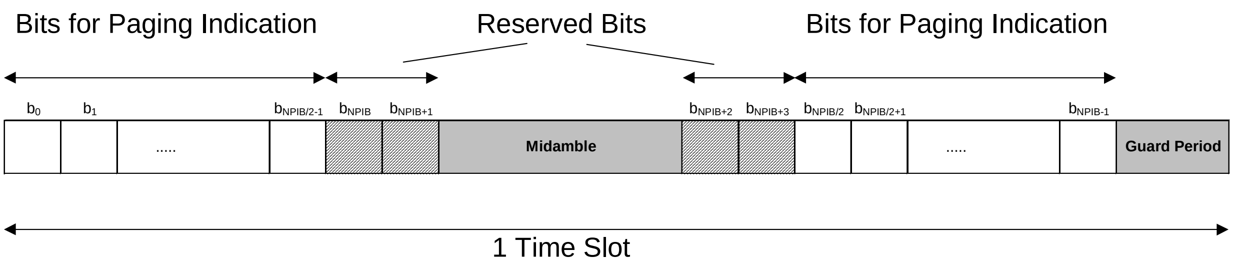

Figure 15: Transmission and numbering of paging indicator carrying bits in a PICH burst

In each time slot, N_{PI} paging indicators are transmitted, using L_{PI}=2, L_{PI}=4 or L_{PI}=8 symbols. L_{PI} is called the paging indicator length. The number of paging indicators N_{PI} per time slot is given by the paging indicator length and the burst type, which are both known by higher layer signalling. In table 8 this number is shown for the different possibilities of burst types and paging indicator lengths.

Table 8: Number N_{PI} of paging indicators per time slot for the different burst types and paging indicator lengths L_{PI}

	L_{PI}=2	L_{PI}=4	L_{PI}=8
Burst Type 1	N_{PI}=60	N_{PI}=30	N_{PI}=15
Burst Type 2	N_{PI}=68	N_{PI}=34	N_{PI}=17

As shown in figure 16, the paging indicators of N_{PICH} consecutive frames form a PICH block, N_{PICH} is configured by higher layers. Thus, N_P=N_{PICH}*N_{PI} paging indicators are transmitted in each PICH block.

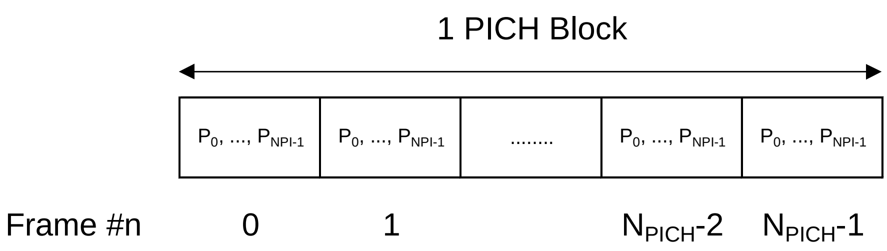

Figure 16: Structure of a PICH block

The value PI (PI = 0, ..., N_P-1) calculated by higher layers for use for a certain UE, see [15], is associated to the paging indicator P_q in the nth frame of one PICH block, where q is given by

$$q = PI \bmod N_{PI}$$

and n is given by

$$n = PI \operatorname{div} N_{PI}.$$

The PI bitmap in the PCH data frames over Iub contains indication values for all possible higher layer PI values, see [16]. Each bit in the bitmap indicates if the paging indicator P_q associated with that particular PI shall be set to 0 or 1. Hence, the calculation in the formulas above is to be performed in Node B to make the association between PI and P_q.

The paging indicator P_q in one time slot is mapped to the bits $\{b_{Lpi*q},\ldots,b_{Lpi*q+Lpi-1},b_{NPIB/2+Lpi*q},\ldots,b_{NPIB/2+Lpi*q+Lpi-1}\}$ within this time slot, as exemplary shown in figure 17. Thus, half of the L_{PI} symbols used for each paging indicator are transmitted in the first data part, and the other half of the L_{PI} symbols are transmitted in the second data part.

The coding of the paging indicator P_q is given in [7].

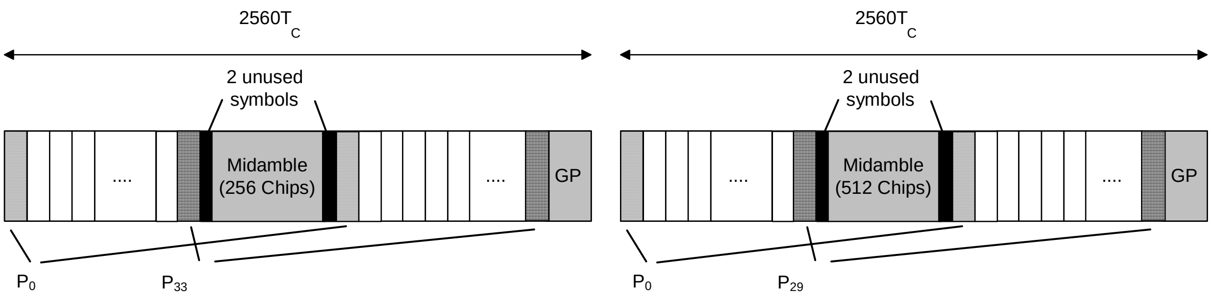

Figure 17: Example of mapping of paging indicators on PICH bits for L_{PI}=4