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

RP-020049

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

Source: **TSG-RAN WG1**

Agenda item: **7.1.3**

No.	Spec	CR	Rev	R1 T-doc	Subject	Release	Cat	Workitem	V_old	V_new
1	25.221	070	2	R1-02-0337	Clarification of spreading for UL physical channels	R99	F	TEI	3.9.0	3.10.0
2	25.221	071	2	R1-02-0337	Clarification of spreading for UL physical channels	Rel-4	A	TEI	4.3.0	4.4.0
3	25.221	072	1	R1-02-0336	Common midamble allocation for beacon time slot	R99	F	TEI	3.9.0	3.10.0
4	25.221	073	1	R1-02-0336	Common midamble allocation for beacon time slot	Rel-4	A	TEI	4.3.0	4.4.0
5	25.221	074	3	R1-02-0442	Correction to a transmission of paging indicators bits	R99	F	TEI	3.9.0	3.10.0
6	25.221	075	3	R1-02-0442	Correction to a transmission of paging indicators bits	Rel-4	A	TEI	4.3.0	4.4.0

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

R1-02-0337

CR-Form-v5

CHANGE REQUEST

⌘ **25.221** **CR** **070** ⌘ **rev** **2** ⌘ 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 ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	Clarification of spreading for UL physical channels
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	11-01-02
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:	⌘	In TS25.221 there is ambiguity regarding the choice of channelisation code for UL physical channels.
Summary of change:	⌘	Clarification of channelisation code selection, when UE autonomously increases SF and for spreading of TFCI and TPC bits on UL.
Consequences if not approved:	⌘	Ambiguous selection of channelisation code. **Isolated Impact Analysis:** Correction to a function where the specification was: ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise. The CR intends to clarify behaviour that has very likely been assumed in most implementations.

Clauses affected:	⌘	5.2.1.2, 5.2.2.4,5.2.2.5		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

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 with the higher code numbering 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].

5.2.2.4 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 code word bits 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 with the highest code numbering of the allowed OVSF sub tree, as depicted in [8]. Hence the midamble structure and length is not changed. The TFCI code word is to be transmitted directly adjacent to the midamble, possibly after the TPC. Figure 7 shows the position of the TFCI code word in a traffic burst in downlink. Figure 8 shows the position of the TFCI code word in a traffic burst in uplink.

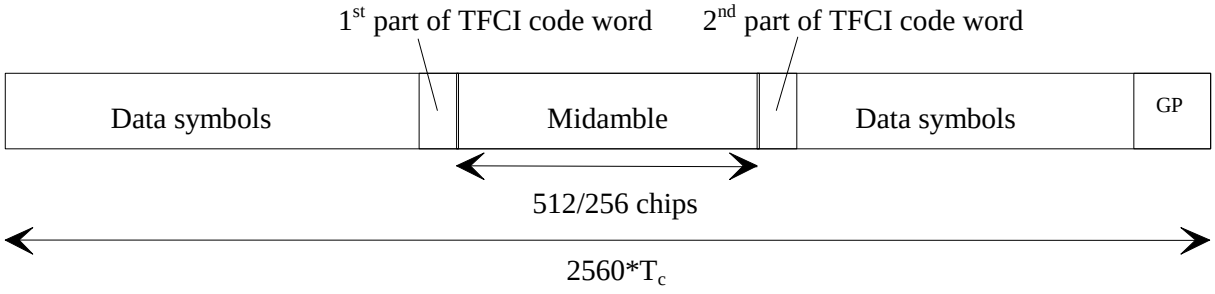


Figure 7: Position of the TFCI code word in the traffic burst in case of downlink

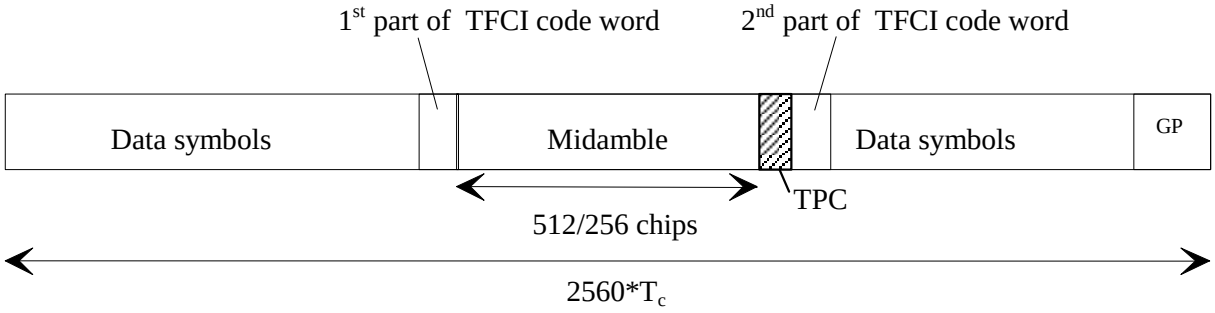


Figure 8: Position of the TFCI code word in the traffic burst in case of uplink

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

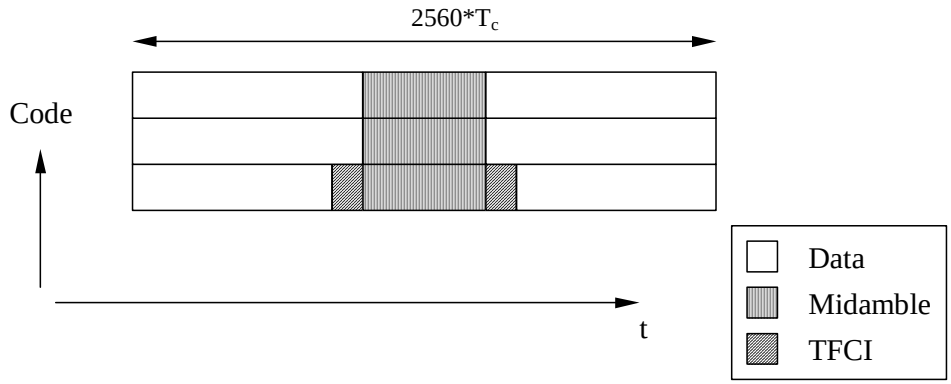


Figure 9: Example of TFCI transmission with physical channels multiplexed in code domain

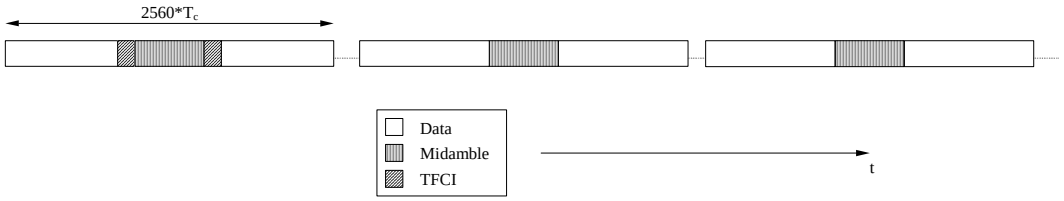


Figure 10: Example of TFCI transmission with physical channels multiplexed in time domain

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 with the highest code numbering 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 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 a TFCI is applied for a CCTrCH, TPC shall be transmitted with the same channelization codes and in the same timeslots as the 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.

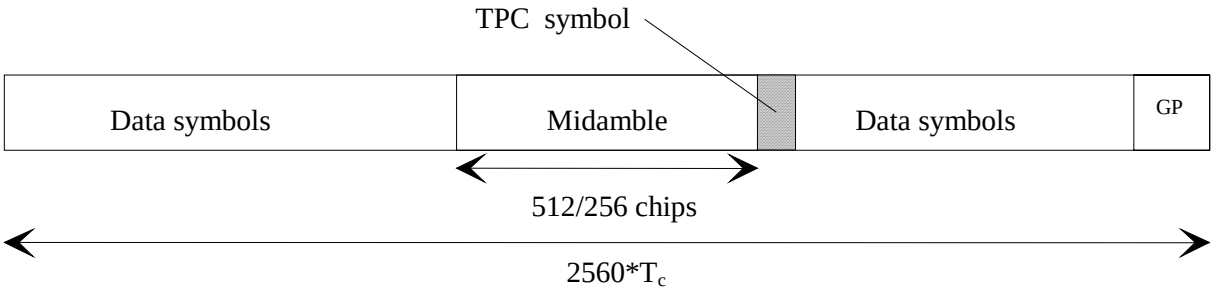


Figure 11: Position of TPC information in the traffic burst

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

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

R1-020-0337

CR-Form-v5

CHANGE REQUEST

⌘ **25.221** **CR** **071** ⌘ **rev** **2** ⌘ 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:	⌘	Clarification of spreading for UL physical channels
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	11-01-02
Category:	⌘	**F**
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 TS25.221 there is ambiguity regarding the choice of channelisation code for UL physical channels.
Summary of change:	⌘	Clarification of channelisation code selection, when UE autonomously increases SF and for spreading of TFCI and TPC bits on UL.
Consequences if not approved:	⌘	Ambiguous selection of channelisation code. **Isolated Impact Analysis:** Correction to a function where the specification was: ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise. The CR intends to clarify behaviour that has very likely been assumed in most implementations.

Clauses affected:	⌘	5.2.1.2, 5.2.2.4,5.2.2.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

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 with the higher code numbering 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].

5.2.2.4 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 code word bits 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 with the highest code numbering of the allowed OVSF sub tree, as depicted in [8]. Hence the midamble structure and length is not changed. The TFCI code word is to be transmitted directly adjacent to the midamble, possibly after the TPC. Figure 7 shows the position of the TFCI code word in a traffic burst in downlink. Figure 8 shows the position of the TFCI code word in a traffic burst in uplink.

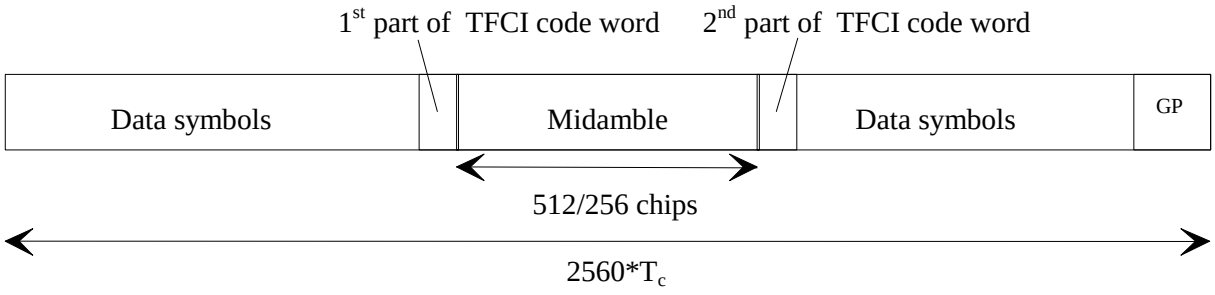


Figure 7: Position of the TFCI code word in the traffic burst in case of downlink

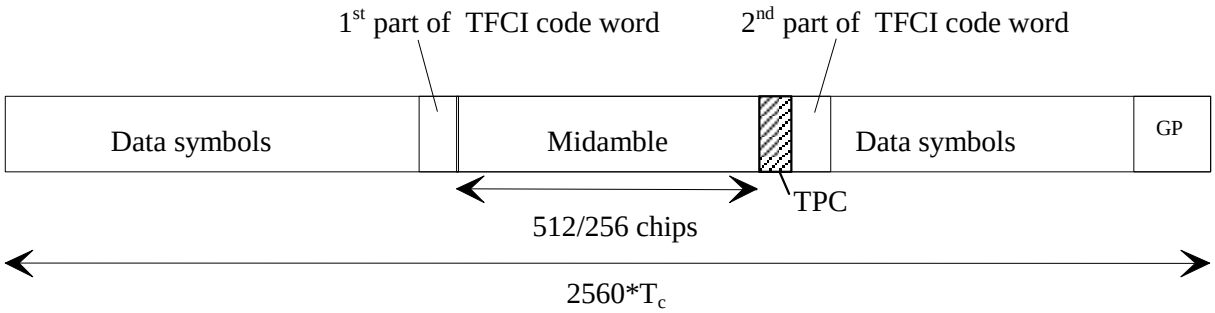


Figure 8: Position of the TFCI code word in the traffic burst in case of uplink

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

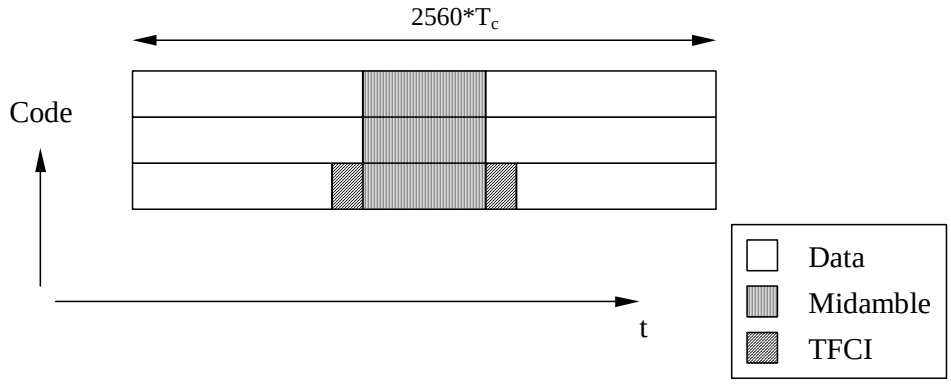


Figure 9: Example of TFCI transmission with physical channels multiplexed in code domain

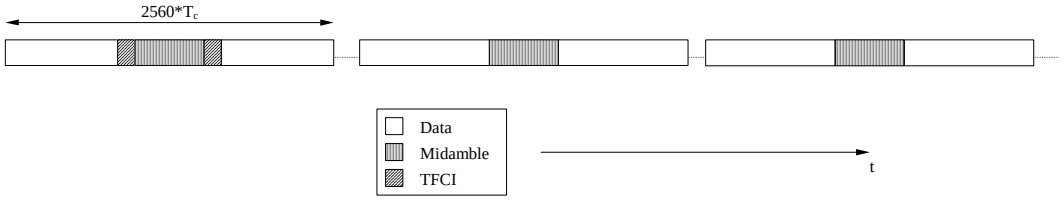


Figure 10: Example of TFCI transmission with physical channels multiplexed in time domain

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 with the highest code numbering 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 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 a TFCI is applied for a CCTrCH, TPC shall be transmitted with the same channelization codes and in the same timeslots as the 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.

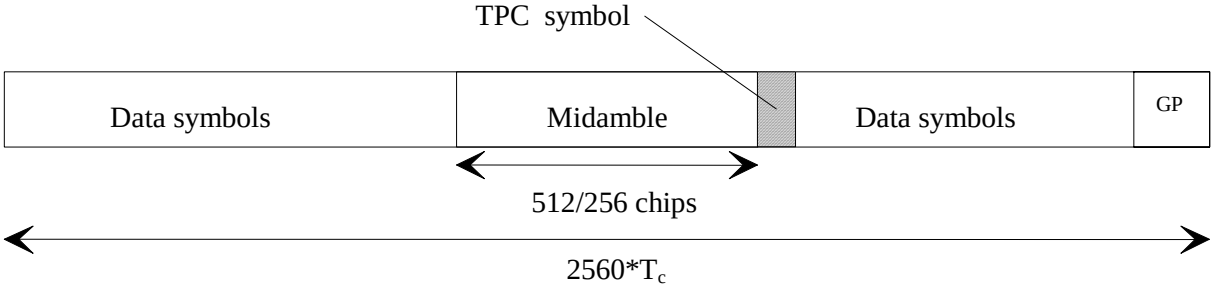


Figure 11: Position of TPC information in the traffic burst

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

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

R1-02-0336

CR-Form-v4

CHANGE REQUEST

⌘ **25.221** **CR** **072** ⌘ 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:	⌘	Common midamble Allocation for beacon time slot
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	12-02-02
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:	⌘	In TS25.221 Annex B there is an inconsistency in mapping midamble shifts to channelisation codes for beacon time slots when beacon is the only channel present.
Summary of change:	⌘	Correction of common midamble mapping scheme for beacon time slots.
Consequences if not approved:	⌘	Ambiguous mapping of common midamble scheme when beacon is the only channel present in the time slot. **Isolated Impact Analysis:** Correction to a function where the specification was : • ambiguous or not sufficiently explicit. • Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise. The CR intends to clarify behaviour that has very likely been assumed in most implementations.

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

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

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.43, B.5 and B.64 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.43, B.5 and B.64, 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_{Cell} =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_{Cell} =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_{Cell} =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.4 Mapping scheme for beacon timeslots and K_{Cell} =16 Midambles.

m1	m2	m3	M4	m5	m6	m7	M8	m9	m10	m11	M12	m13	m14	m15	m16	
1	x(*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 code (see note 1)
1	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2 codes (SCTD applied to PICH in this time slot, see note 2)
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 (SCTD not applied to PICH in this time slot) 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

(*) For the ~~In~~ case of SCTD~~Block-STTD encoding for the~~ applied to P-CCPCH and PICH, midamble shift 2 is used by the diversity antenna

Note 1: If only one code is present in a beacon time slot, this code is a beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midamble(s) shall be used.

Note 2: If SCTD is applied to the PICH and only two codes are present in a beacon time slot, the PICH is the beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midambles shall be used.

B.5 Mapping scheme for beacon timeslots and K_{Cell} =8 Midambles.

m1	m2	m3	m4	m5	m6	m7	M8	
1	x(*)	0	0	0	0	0	0	1 code (see note 1)
1	**1**	0	0	0	0	0	0	2 codes (SCTD applied to PICH in this time slot, see note 2)
1	x(*)	**1**	0	0	0	0	0	~~1 or~~ 7 or 13 codes
1	x(*)	0	**1**	0	0	0	0	2 (SCTD not applied to PICH in this time slot) 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

(*) For the ~~In~~ case of SCTD~~Block-STTD encoding for the~~ applied to P-CCPCH and PICH, midamble shift 2 is used by the diversity antenna

Note 1: If only one code is present in a beacon time slot, this code is a beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midamble(s) shall be used.

Note 2: If SCTD is applied to the PICH and only two codes are present in a beacon time slot, the PICH is the beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midambles shall be used.

B.6 Mapping scheme for beacon timeslots and K_{Cell} =4 Midambles.

m1	m3	m5	m7	
1	0	0	0	1 code (see note 1)
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

Note 1: If only one code is present in a beacon time slot, this code is a beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midamble shall be used.

B.7 Mapping scheme for Burst Type 2 and K_{Cell} =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.8 Mapping scheme for Burst Type 2 and K_{Cell} =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 #15
Jeju, Korea, 5 – 8, March, 2002

R1-02-0336

CR-Form-v4

CHANGE REQUEST

⌘ **25.221** **CR** **073** ⌘ rev **1** ⌘ 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:	⌘	Common midamble Allocation for beacon time slot
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	12-02-02
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 TS25.221 Annex C there is an inconsistency in mapping midamble shifts to channelisation codes for beacon time slots when beacon is the only channel present.
Summary of change:	⌘	Correction of common midamble mapping scheme for beacon time slots.
Consequences if not approved:	⌘	Ambiguous mapping of common midamble scheme when beacon is the only channel present in the time slot. **Isolated Impact Analysis:** Correction to a function where the specification was : • ambiguous or not sufficiently explicit. • Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise. The CR intends to clarify behaviour that has very likely been assumed in most implementations.

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

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

Annex C (normative): Signalling of the number of channelisation codes for the DL common midamble case for 3.84Mcps TDD

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~~ C.4, C.5 and ~~B.4~~ C.6 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~~ C.4, C.5 and ~~B.4~~ C.6, the fixed and pre-allocated channelisation code for the beacon channel is included into the number of indicated channelisation codes.

C.1 Mapping scheme for Burst Type 1 and K_{Cell} =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

C.2 Mapping scheme for Burst Type 1 and K_{Cell} =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

C.3 Mapping scheme for Burst Type 1 and K_{Cell} =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

C.4 Mapping scheme for beacon timeslots and K_{Cell} =16 Midambles.

m1	m2	m3	M4	m5	m6	m7	M8	m9	m10	m11	M12	m13	m14	m15	m16	
1	x(*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 code (see note 1)
1	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2 codes (SCTD applied to PICH in this time slot, see note 2)
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 (SCTD not applied to PICH in this time slot) 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

(*) For the ~~In~~ case of SCTD ~~Block-STTD encoding for the~~ applied to P-CCPCH and PICH, midamble shift 2 is used by the diversity antenna

Note 1: If only one code is present in a beacon time slot, this code is a beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midamble(s) shall be used.

Note 2: If SCTD is applied to the PICH and only two codes are present in a beacon time slot, the PICH is the beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midambles shall be used.

C.5 Mapping scheme for beacon timeslots and K_{Cell} =8 Midambles.

m1	m2	m3	m4	m5	m6	m7	M8	
1	x(*)	0	0	0	0	0	0	1 code (see note 1)
1	**1**	0	0	0	0	0	0	2 codes (SCTD applied to PICH in this time slot, see note 2)
1	x(*)	**1**	0	0	0	0	0	~~1 or~~ 7 or 13 codes
1	x(*)	0	**1**	0	0	0	0	2 (SCTD not applied to PICH in this time slot) 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

(*) For the ~~In~~ case of SCTD ~~Block-STTD encoding for the~~ applied to P-CCPCH and PICH, midamble shift 2 is used by the diversity antenna

Note 1: If only one code is present in a beacon time slot, this code is a beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midamble(s) shall be used.

Note 2: If SCTD is applied to the PICH and only two codes are present in a beacon time slot, the PICH is the beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midambles shall be used.

C.6 Mapping scheme for beacon timeslots and K_{Cell} =4 Midambles.

m1	m3	m5	m7	
1	0	0	0	1code (see note 1)
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

Note 1: If only one code is present in a beacon time slot, this code is a beacon channel and the beacon channel is the only channel in this slot, by default. Therefore, only the beacon midamble shall be used.

C.7 Mapping scheme for Burst Type 2 and K_{Cell} =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

C.8 Mapping scheme for Burst Type 2 and K_{Cell} =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 #15
Jeju, Korea, 5 – 8, March, 2002

R1-02-0442

CR-Form-v5

CHANGE REQUEST

⌘ **25.221** **CR** **074** ⌘ **rev** **3** ⌘ 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:	⌘	Correction to a transmission of paging indicators bits.
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	February 19, 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:	⌘	The information that paging indicator bits are transmitted in each radio frame is inconsistent with Appendix C and higher layer specification.
Summary of change:	⌘	The text referring to the transmission of paging indicator bit is reworded.
Consequences if not approved:	⌘	Misleading information in the specification, inconsistent with other section of the specification and RAN2 specification

Clauses affected:	⌘	5.3.7.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Isolated impact analysis: the wording is corrected to avoid the misleading interpretation of the information

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.

5.3.7 The Paging Indicator Channel (PICH)

The Paging Indicator Channel (PICH) is a physical channel used to carry the paging indicators.

5.3.7.1 Mapping of Paging Indicators to the PICH bits

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 s_{NPIB+1},..., s_{NPIB+4} adjacent to the midamble are reserved for possible future use.

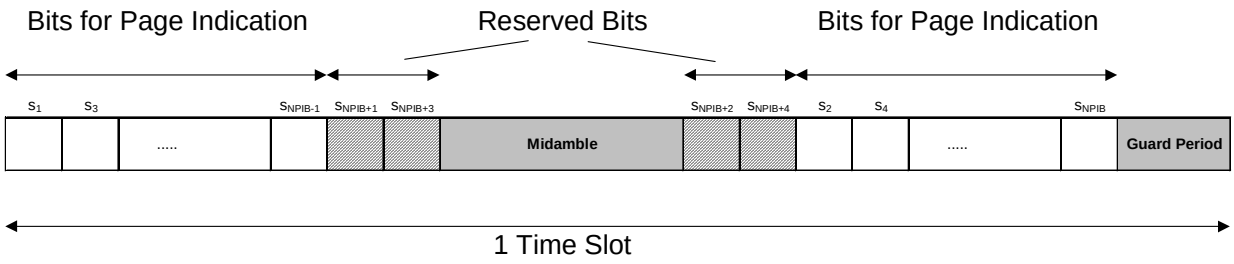


Figure 15: Transmission and numbering of paging indicator carrying bits in a PICH burst

Each paging indicator P_q in one time slot is mapped to the bits $\{s_{2Lpi*q+1},...,s_{2Lpi*(q+1)}\}$ within this time slot. Thus, due to the interleaved transmission of the bits half of the symbols used for each paging indicator are transmitted in the first data part, and the other half of the symbols are transmitted in the second data part, as exemplary shown in figure 16 for a paging indicator length L_{PI} of 4 symbols.

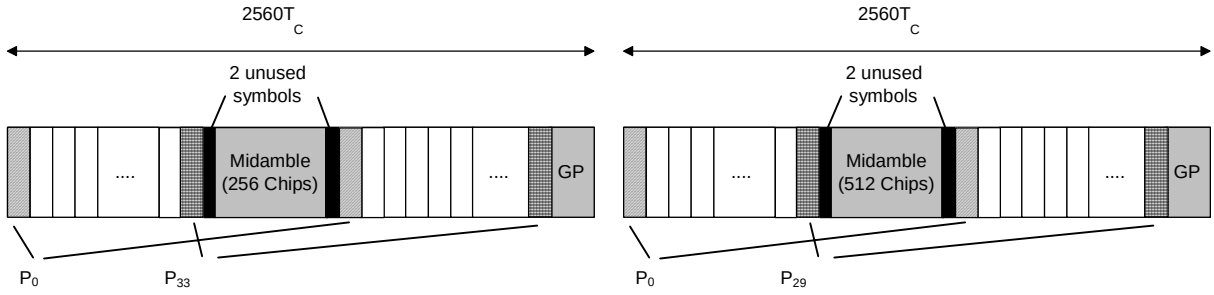


Figure 16: Example of mapping of paging indicators on PICH bits for L_{PI}=4

The setting of the paging indicators and the corresponding PICH bits (including the reserved ones) is described in [7].

~~In each radio frame~~ N_{PI} paging indicators of length L_{PI}=2, L_{PI}=4 or L_{PI}=8 symbols are transmitted in each radio frame that contains the PICH~~, using L_{PI}=2, L_{PI}=4 or L_{PI}=8 symbols~~. The number of paging indicators N_{PI} per radio frame is given by the paging indicator length and the burst type, which are both known by higher layer signalling. In table 7 this number is shown for the different possibilities of burst types and paging indicator lengths.

Table 7: 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

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

R1-01-0442

CR-Form-v5

CHANGE REQUEST

⌘ **25.221** **CR** **075** ⌘ **rev** **3** ⌘ 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:	⌘	Correction to a transmission of paging indicators bits
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	February, 19, 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:	⌘	The information that paging indicator bits are transmitted in each radio frame is inconsistent with Appendix C and higher layer specification.
Summary of change:	⌘	The text referring to the transmission of paging indicator bit is reworded. .
Consequences if not approved:	⌘	Misleading information in the specification, inconsistent with other section of the specification and RAN2 specification

Clauses affected:	⌘	5.3.7, 6.3.8.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Isolated impact analysis: the wording is corrected to avoid the misleading interpretation of the information.

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.

5.3.7 The Paging Indicator Channel (PICH)

The Paging Indicator Channel (PICH) is a physical channel used to carry the paging indicators.

5.3.7.1 Mapping of Paging Indicators to the PICH bits

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 s_{NPIB+1},..., s_{NPIB+4} adjacent to the midamble are reserved for possible future use.

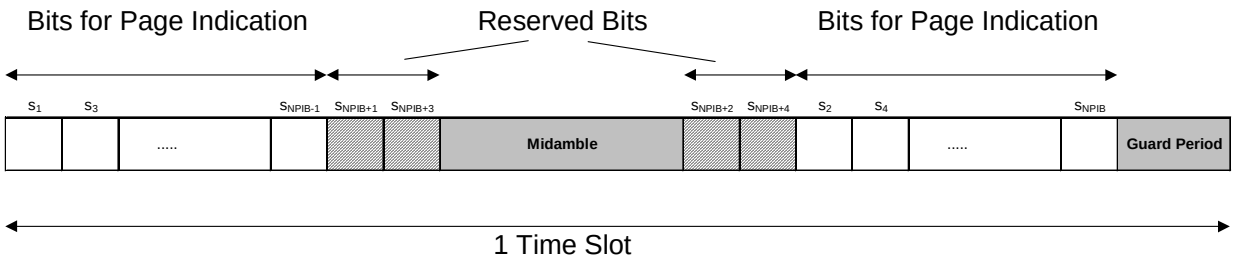


Figure 15: Transmission and numbering of paging indicator carrying bits in a PICH burst

Each paging indicator P_q in one time slot is mapped to the bits $\{s_{2Lpi*q+1},...,s_{2Lpi*(q+1)}\}$ within this time slot. Thus, due to the interleaved transmission of the bits half of the symbols used for each paging indicator are transmitted in the first data part, and the other half of the symbols are transmitted in the second data part, as exemplary shown in figure 16 for a paging indicator length L_{PI} of 4 symbols.

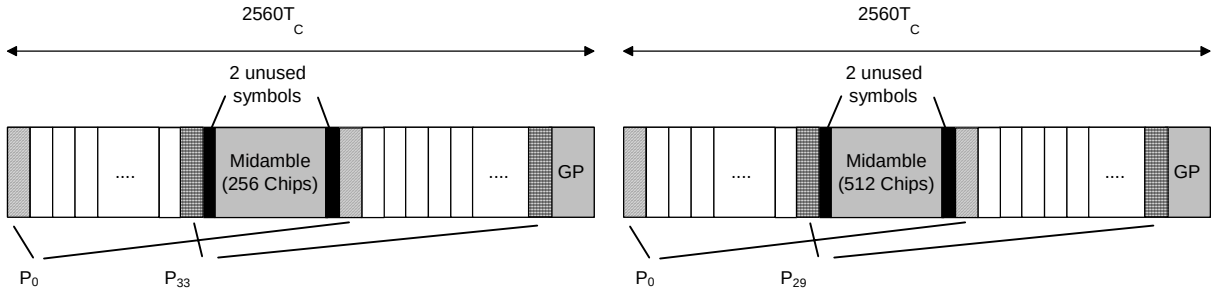


Figure 16: Example of mapping of paging indicators on PICH bits for L_{PI}=4

The setting of the paging indicators and the corresponding PICH bits (including the reserved ones) is described in [7].

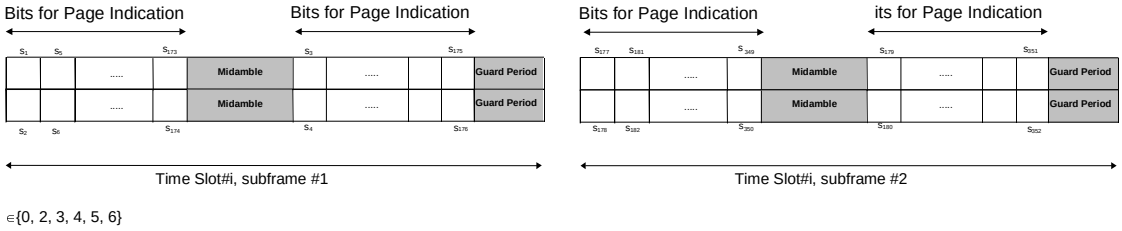
~~In each radio frame,~~ N_{PI} paging indicators of L_{PI}=2, L_{PI}=4 or L_{PI}=8 symbols are transmitted in each radio frame that contains the PICH~~, using L_{pi}=2, L_{pi}=4 or L_{pi}=8 symbols~~. The number of paging indicators N_{PI} per radio frame is given by the paging indicator length and the burst type, which are both known by higher layer signalling. In table 7 this number is shown for the different possibilities of burst types and paging indicator lengths.

Table 7: 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

6.3.8.1 Mapping of Paging Indicators to the PICH bits

Figure 29 depicts the structure of a PICH transmission and the numbering of the bits within the bursts. The burst type as described in [6.2.2 'Burst Format'] is used for the PICH. N_{PIB} bits are used to carry the paging indicators, where N_{PIB}=352.



∈{0, 2, 3, 4, 5, 6}

Figure 29: Transmission and numbering of paging indicator carrying bits in the PICH bursts

Each paging indicator P_q (where P_q, q = 0, ..., N_{PI}-1, $P_q \in \{0, 1\}$) in one radio frame is mapped to the bits $\{s_{2L_{PI}*q+1},...,s_{2L_{PI}*(q+1)}\}$ in subframe #1 or subframe #2.

The setting of the paging indicators and the corresponding PICH bits is described in [7].

~~In each radio frame,~~ N_{PI} paging indicators of length L_{PI}=2, L_{PI}=4 or L_{PI}=8 symbols are transmitted~~,~~ in each radio frame that contains the PICH ~~using L_{PI}=2, L_{PI}=4 or L_{PI}=8 symbols~~. The number of paging indicators N_{PI} per radio frame is given by the paging indicator length, which signalled by higher layers. In table 19 this number is shown for the different possibilities of paging indicator lengths.

Table 19: Number N_{PI} of paging indicators per radio frame for different paging indicator lengths L_{PI}

	L_{PI}=2	L_{PI}=4	L_{PI}=8
N_{PI} per radio frame	88	44	22