

TSGR1#7 (99)c73

TS 25.221 V1.3.0 (1999-08)

Technical Specification

**3rd Generation Partnership Project (3GPP);
Technical Specification Group (TSG)
Radio Access Network (RAN);
Working Group 1 (WG1);
Physical channels and mapping of transport channels
onto physical channels (TDD)**



Reference

xxxx

Keywords

3GPP

Postal address

Office address

Internet

<http://www.3gpp.org>

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© 3GPP 1999.
All rights reserved.

Content

CONTENT	3
INTELLECTUAL PROPERTY RIGHTS	4
FOREWORD	4
1 SCOPE	4
2 REFERENCES	4
3 DEFINITIONS AND ABBREVIATIONS	4
4 TRANSPORT CHANNELS	6
4.1 TRANSPORT CHANNELS	6
4.1.1 <i>Dedicated transport channels</i>	6
4.1.2 <i>Common transport channels</i>	6
5 PHYSICAL CHANNELS	8
5.1 FRAME STRUCTURE.....	9
5.2 DEDICATED PHYSICAL CHANNEL (DPCH).....	10
5.2.1 <i>Spreading codes</i>	10
5.2.2 <i>Burst Types</i>	11
5.2.3 <i>Training sequences for spread bursts</i>	13
5.3 COMMON CONTROL PHYSICAL CHANNELS (CCPCH)	15
5.3.1 <i>Downlink common control physical channel</i>	15
5.3.2 <i>The physical random access channel (PRACH)</i>	16
5.4 THE PHYSICAL SYNCHRONISATION CHANNEL (PSCH)	18
5.5 PHYSICAL UPLINK SHARED CHANNEL (PUSCH).....	20
5.6 PHYSICAL DOWNLINK SHARED CHANNEL (PDSCH)	20
5.7 THE PAGE INDICATOR CHANNEL (PICH)	20
6 MAPPING OF TRANSPORT CHANNELS TO PHYSICAL CHANNELS	21
6.1 DEDICATED TRANSPORT CHANNELS	21
6.2 COMMON TRANSPORT CHANNELS	22
6.2.1 <i>The Broadcast Channel (BCH)</i>	22
6.2.2 <i>The Paging Channel (PCH)</i>	22
6.2.3 <i>The Forward Channel (FACH)</i>	22
6.2.4 <i>The Random Access Channel (RACH)</i>	22
6.2.5 <i>The Synchronisation Channel (SCH)</i>	22
6.2.6 <i>Common Transport Channels for ODMA networks</i>	22
6.3 MULTIFRAME STRUCTURE.....	23
ANNEX A	24
A.1 BASIC MIDAMBLE CODES FOR BURST TYPE 1 AND PRACH BURST TYPE	24
A.2 BASIC MIDAMBLE CODES FOR BURST TYPE 2	28
ANNEX B (INFORMATIVE)	32
CCPCH MULTIFRAME STRUCTURE	32
HISTORY	34

Intellectual Property Rights

Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 Indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

2 References

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply;
- b) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] B. Steiner; P. Jung: Uplink channel estimation in synchronous CDMA mobile radio systems with joint detection. The fourth International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'93), Yokohama, Japan, September 8-11, 1993.

3 Definitions and abbreviations

BCH	Broadcast Channel
CCPCH	Common Control Physical Channel
CDMA	Code Division Multiple Access
DPCH	Dedicated Physical Channel
DSCH	Downlink Shared Channel
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
ODCH	ODMA Dedicated Transport Channel
ODMA	Opportunity Driven Multiple Access
ORACH	ODMA Random Access Channel
PCH	Paging Channel
PDSCH	Physical Downlink Shared Channel
PDU	Protocol Data Unit
PRACH	Physical Random Access Channel
PSCH	Physical Synchronisation Channel
PUSCH	Physical Uplink Shared Channel
RACH	Random Access Channel
RLC	Radio Link Control
RT	Real Time
RU	Resource Unit
SACCH	Slow Associated Control Channel
SCH	Synchronisation Channel
SDCCH	Stand-alone Dedicated Control Channel
TCH	Traffic Channel
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
USCH	Uplink Shared Channel

4 Transport channels

4.1 Transport channels

<Note: The following Transport Channel definitions should finally be included in WG2 specification documents. Thus as soon as the WG2 specification is updated accordingly the following definitions shall be removed and shall be replaced by a reference to WG2 specifications.>

The chapter describes transport channels that are required for data transfer. Transport channels are the services offered by layer 1 to the higher layers. A general classification of transport channels is into two groups:

- common channels (where there is a need for in-band identification of the UEs when particular UEs are addressed) and
- dedicated channels (where the UEs are identified by the physical channel, i.e. code , time slot and frequency)

4.1.1 Dedicated transport channels

The Dedicated Channel (DCH) is a up- or down-link transport channel that is used to carry user or control information between the network and a mobile station.

Two types of dedicated transport channels have been identified:

1. Dedicated Channel (DCH) characterized by:
 - Existing in uplink or downlink
 - possibility to use beam forming,
 - possibility to change rate fast (each 10ms),
 - possibility to use timing advance
 - enhanced power control and
 - inherent addressing of UEs.
2. ODMA Dedicated Transport Channel (ODCH) characterized by:
 - possibility to use beam forming,
 - possibility to change rate fast(each 10ms),
 - closed loop power control
 - closed loop timing advance control,
 - temporary addressing of UEs.

4.1.2 Common transport channels

Common transport channels are:

1. Broadcast Channel (BCH) characterized by:
 - existence in downlink only,
 - low fixed bit rate and
 - requirement to be broadcast in the entire coverage area of the cell.

The Broadcast Channel (BCH) is a downlink transport channel that is used to broadcast system- and cell-specific information.

2. Paging Channel (PCH) characterized by:
 - existence in downlink only,
 - possibility for sleep mode procedures and

- requirement to be broadcast in the entire coverage area of the cell.

The Paging Channel (PCH) is a downlink transport channel that is used to carry control information to a mobile station when the system does not know the location cell of the mobile station.

3. Forward Access Channel(s) (FACH) characterized by:

- existence in downlink only,
- possibility to use beam forming,
- possibility to use slow power control,
- possibility to change rate fast (each 10ms),
- lack of fast power control and
- requirement for in-band identification of UEs.

The Forward Access Channel (FACH) is a downlink transport channel that is used to carry control information to a mobile station when the system knows the location cell of the mobile station. The FACH may also carry short user packets.

4. Random Access Channel(s) (RACH) characterized by:

- existence in uplink only,
- limited data field.
- collision risk,
- open loop power control,
- requirement for in-band identification of the UEs.
- no timing advance control

The Random Access Channel (RACH) is an up link transport channel that is used to carry control information from mobile station. The RACH may also carry short user packets.

5. ODMA Random Access Channel (ORACH) characterized by:

- existence in relay links,
- collision risk,
- open loop power control,
- no timing advance control and
- requirement for in-band identification of the UEs.

6. Synchronisation Channel (SCH) characterized by:

- existence in downlink only,
- low fixed bit rate and
- requirement to be broadcast in the entire coverage area of the cell.

7. Uplink Shared Channel (USCH) characterised by:

- Existence in TDD only
- Existence in uplink only
- Possibility to use beam forming
- Possibility to use power control
- Possibility to use timing advance
- Always associated with another channel (DCH or FACH)

8. Downlink Shared Channel (DSCH) characterised by:

- Existence in downlink only
- Possibility to use beam forming
- Possibility to use slow power control
- Possibility to use fast power control, when associated with dedicated channel(s)
- Possibility to be broadcast in the entire cell
- Always associated with another channel (DCH or FACH)

5 Physical channels

All physical channels take three-layer structure of superframes, radio frames, and timeslots. Depending on the resource allocation, the configuration of radio frames or timeslots becomes different. All physical channels need guard symbols in every timeslot. The time slots are used in the sense of a TDMA component to separate different user signals in the time and the code domain. The physical channel signal format is presented in Figure 1.

The basic physical channel is defined as the association of one code, one time slot and one frequency.

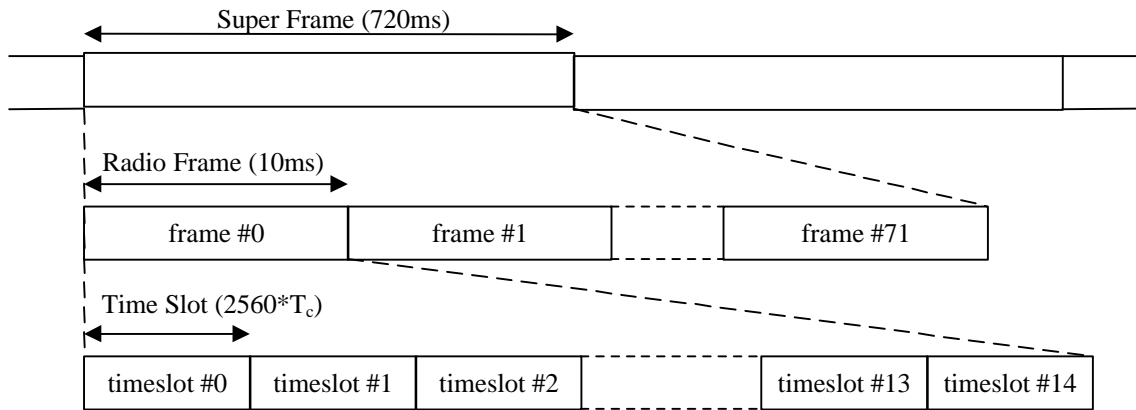


Figure 1 Physical channel signal format

5.1 Frame structure

The TDMA frame has a duration of 10 ms and is subdivided into 15 time slots (TS) of $2560 \cdot T_c$ duration each. A time slot corresponds to 2560 chips. The physical content of the time slots are the bursts of corresponding length as described in section 5.2.2.

Each 10 ms frame consists of 15 time slots, each allocated to either the uplink or the downlink (Figure 2). With such a flexibility, the TDD mode can be adapted to different environments and deployment scenarios. In any configuration at least one time slot has to be allocated for the downlink and at least one time slot has to be allocated for the uplink.

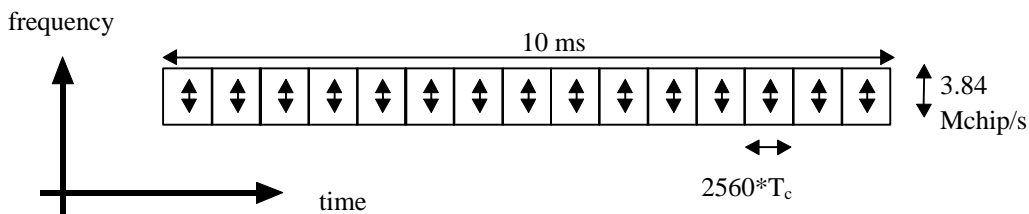
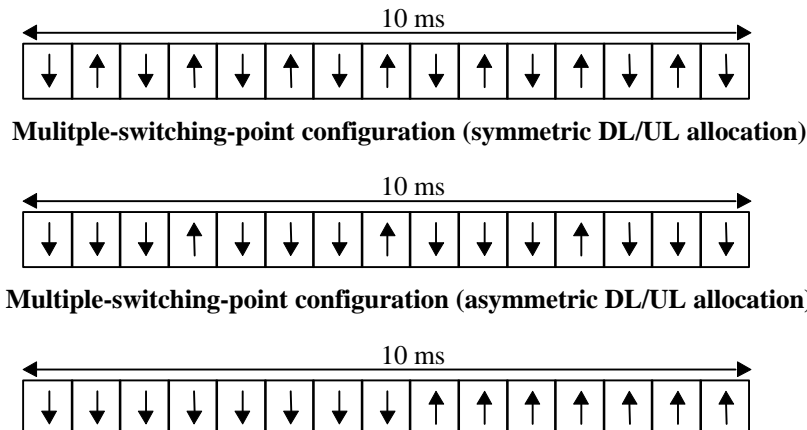


Figure 2 The TDD frame structure

Examples for multiple and single switching point configurations as well as for symmetric and asymmetric UL/DL allocations are given in Figure 3.



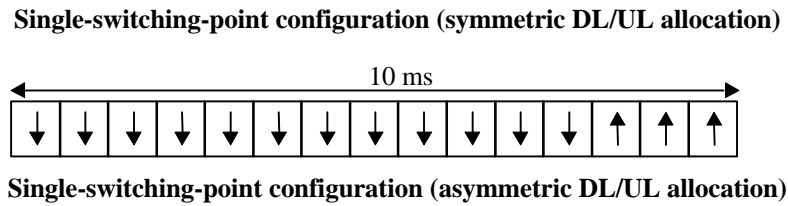


Figure 3 TDD frame structure examples

When operating ODMA at least one common timeslot has to be allocated for the ORACH. If large quantities of information have to be transferred between ODMA nodes then it is normal to use at least one timeslot for the ODCH (Figure 4). As Figure 4 shows, any timeslot in the TDD frame may potentially be used by the ODCH.

Note: a common timeslot indicates a carrier-timeslot combination which can be used for transmission and reception by a group of mobiles operating ODMA.

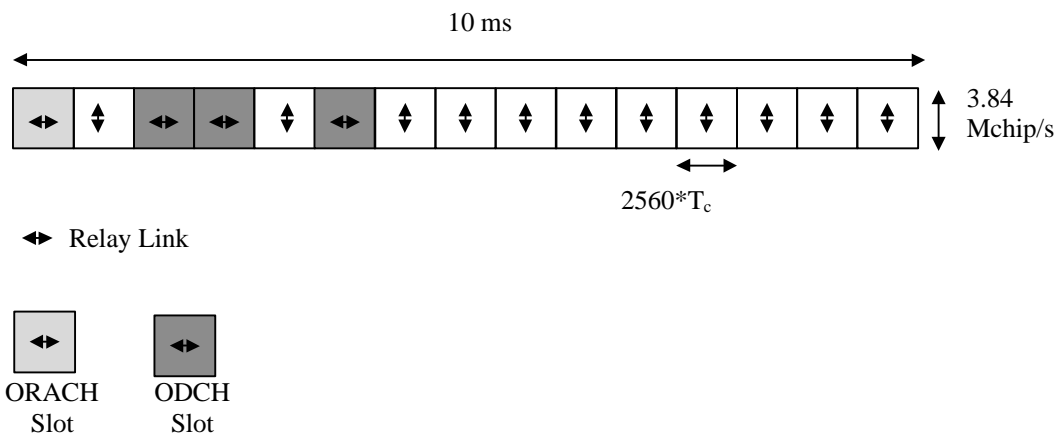


Figure 4 TDD frame structure example for ODMA operation.

5.2 Dedicated physical channel (DPCH)

The DCH or in case of ODMA networks the ODCH as described in section 4.1.1 are mapped onto the dedicated physical channel.

5.2.1 Spreading codes

Two options are being considered for the bursts that can be sent as described below. Both options allow a high degree of bit rate granularity and flexibility, thus allowing the implementation of the whole service range from low to high bit rates.

Spreading factor of and the number of codes for multicode transmission are assigned independently for uplink and downlink. The number of timeslots is also assigned independently for uplink and downlink.

5.2.1.1 Multicode transmission with fixed spreading

Within each time slot of length $2560 * T_c$, an additional separation of user signals by spreading codes is used. This means, that within one time slot of length $2560 * T_c$, more than one burst of corresponding length as described in section 5.2.2 can be transmitted. These multiple bursts within the same time slot can be allocated to different users as well as partly or all to a single user. For the multiple bursts within the same time slot, different spreading codes are used to allow the distinction of the multiple bursts.

5.2.1.2 Single code transmission with variable spreading

Within each time slot of $2560 \cdot T_c$ duration,

- a mobile always uses single code transmission by adapting the spreading factor as a function of the data rate. This limits the peak-to-average ratio of the modulated signal and consequently the stress imposed to the power amplifier resulting in an improved terminal autonomy. Several mobiles can be received in the same time slot by the base station, they are separated by their codes and the individual decoding can take profit of the joint detection.
- a base station should broadcast a single burst per mobile again by adapting the spreading as a function of the data rate. High rate data transmissions requiring more than one timeslot per mobile can be supported by terminals having the processing power for joint detection on a single slot : the required throughput occupies in a general way an integer number of slots plus a fraction of an extra slot. Single burst transmission should occur in the integer number of slots, while the extra slot can be occupied by a burst for the considered mobile plus extra bursts for other mobiles, joint detection is only needed for this last time slot in the considered mobile.

5.2.2 Burst Types

As explained in the section 5.2.1, two options are being considered for the spreading. The bursts described in this section can be used for both options.

Two types of bursts for dedicated physical channels are defined: The burst type 1 and the burst type 2. Both consist of two data symbol fields, a midamble and a guard period. The bursts type 1 has a longer midamble of 512 chips than the burst type 2 with a midamble of 256 chips. Sample sets of midambles are given in section 7.2.3.1 and 7.2.3.2.

Because of the longer midamble, the burst type 1 is suited for the uplink, where up to 16 different channel impulse responses can be estimated. The burst type 2 can be used for the downlink and, if the bursts within a time slot are allocated to less than four users, also for the uplink.

Thus the burst type 1 can be used for

- uplink, independent of the number of active users in one time slot
- downlink, independent of the number of active users in one time slot

The burst type 2 can be used for

- uplink, if the bursts within a time slot are allocated to less than four users
- downlink, independent of the number of active users in one time slot

The data fields of the burst type 1 are 976 chips long, whereas the data fields length of the burst type 2 are 1104 chips long. The corresponding number of symbols depends on the spreading factor, as indicated in Table 1 below. The guard period for the burst type 1 and type 2 is 96 chip periods long.

The bursts type 1 and type 2 are shown in Figure 5 and Figure 6. The contents of the burst fields are described in Table 2 and Table 3.

Table 1 number of symbols per data field in bursts 1 and 2

Spreading factor (Q)	Number of symbols (N) per data field in Burst 1	Number of symbols (N) per data field in Burst 2
1	976	1104
2	488	552
4	244	276
8	122	138
16	61	69

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

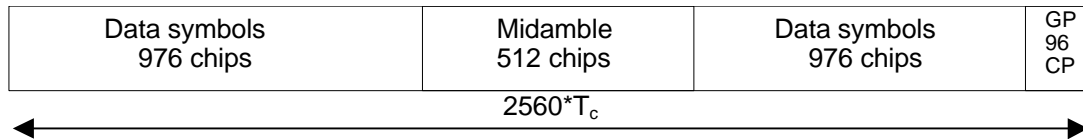


Figure 5 Burst structure of the burst type 1. GP denotes the guard period and CP the chip periods.

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

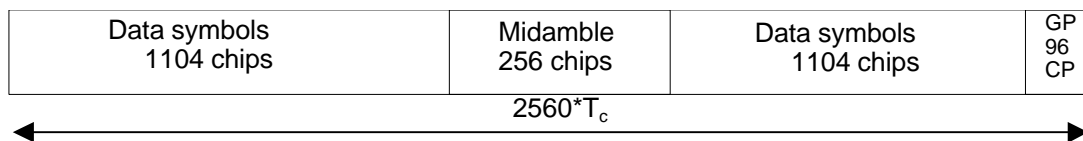


Figure 6 Burst structure of the burst type 2. GP denotes the guard period and CP the chip periods.

The two different bursts defined here are well-suited for the different applications mentioned above. It may be possible to further optimise the burst structure for specific applications, for instance for unlicensed operation.

5.2.2.1 Transmission of TFCI

Both burst types 1 and 2 for dedicated channels provide the possibility for transmission of TFCI both in up- and downlink.

The transmission of TFCI is negotiated at call setup and can be re-negotiated during the call. This means, it is indicated whether the TFCI is applied or not and how many bits are to be allocated for this purpose. If applied, transmission of TFCI is done in the data parts of the traffic burst. Hence the midamble structure and length is not changed. The TFCI information is to be transmitted directly adjacent to the midamble. Figure 7 shows the position of the TFCI in a traffic burst.

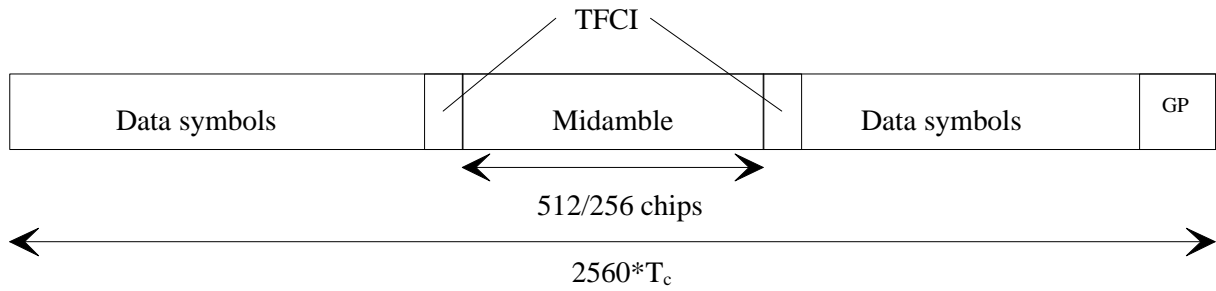


Figure 7 Position of TFCI information in the traffic burst

For every user the TFCI information is to be transmitted once per frame. Different numbers of symbols can be allocated for TFCI. The TFCI is spread with the same spreading factor (SF) as the data parts. The SF of the burst which contains the TFCI is applied to both data and signalling and shall be constant, except when a negotiation between transmitter and receiver initiates a change of the SF. Variable Data Rates shall be handled by DTX.

Two examples of TFCI transmission in the case of multiple resource units (RUs) 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 RUs not carrying TFCI information.

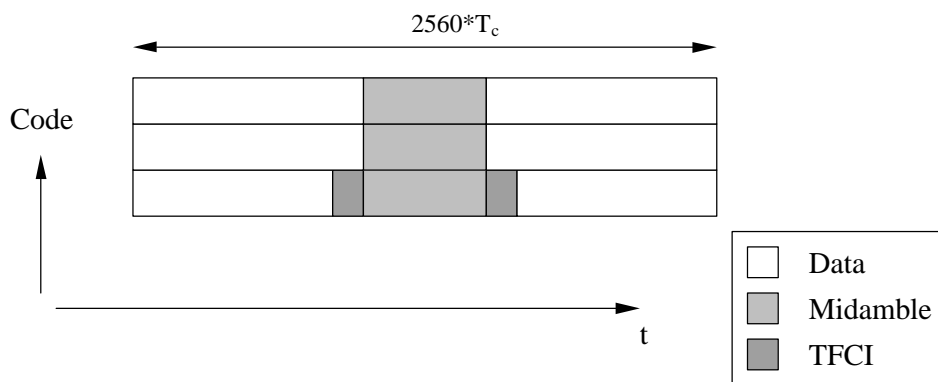


Figure 8 Example of TFCI transmission with RUs multiplexed in code domain

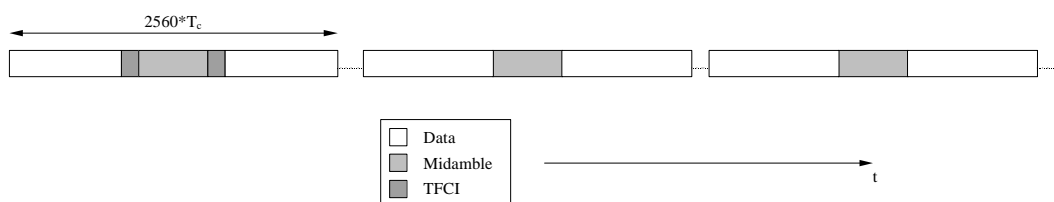


Figure 9 Example of TFCI transmission with RUs multiplexed in time domain

5.2.3 Training sequences for spread bursts

As explained in the section 5.2.1, two options are being considered for the spreading. The training sequences presented here are common to both options.

The training sequences, i.e. midambles, of different users active in the same time slot are time shifted

versions of one single periodic basic code. Different cells use different periodic basic codes, i.e. different midamble sets. In this way a joint channel estimation for the channel impulse responses of all active users within one time slot can be done by one single cyclic correlation. The different user specific channel impulse response estimates are obtained sequentially in time at the output of the correlator. Following this principle it is shown hereafter how to derive the midambles from the periodic basic code.

Section 5.2.2 contains a description of the spread speech/data bursts. These bursts contain L_m midamble chips, which are also termed midamble elements. The L_m elements $\underline{m}_i^{(k)}$; $i=1,\dots,L_m$; $k=1,\dots,K$; of the midamble codes $\underline{\mathbf{m}}^{(k)}$; $k=1,\dots,K$; are taken from the complex set

$$\underline{V}_m = \{1, j, -1, -j\}. \quad (1)$$

K is the maximum number of users, i.e. the available number of spreading codes per time slot.

The elements $\underline{m}_i^{(k)}$ of the complex midamble codes $\underline{\mathbf{m}}^{(k)}$ fulfil the relation

$$\underline{m}_i^{(k)} = (j)^i \cdot m_i^{(k)} \quad m_i^{(k)} \in \{1, -1\}; i=1,\dots,L_m; k=1,\dots,K. \quad (2)$$

Hence, the elements $\underline{m}_i^{(k)}$ of the complex midamble codes $\underline{\mathbf{m}}^{(k)}$ of the K users are alternating real and imaginary.

With W being the number of taps of the impulse response of the mobile radio channels, the L_m binary elements $m_i^{(k)}$; $i=1,\dots,L_m$; $k=1,\dots,K$; of (2) for the complex midambles $\underline{\mathbf{m}}^{(k)}$; $k=1,\dots,K$; of the K users are generated according to Steiner's method [1] from a single periodic basic code

$$\mathbf{m} = (m_1, m_2, \dots, m_{L_m + (K'-1)W + \lfloor P/K \rfloor})^T \quad m_i \in \{1, -1\}; i=1,\dots,(L_m + (K'-1)W + \lfloor P/K \rfloor). \quad (3)$$

$\lfloor x \rfloor$ denotes the largest integer smaller or equal to x , $K' = K/2$.

The elements m_i ; $i=1,\dots,(L_m + (K'-1)W + \lfloor P/K \rfloor)$, of (3) fulfil the relation

$$m_i = m_{i-P} \text{ for the subset } i = (P+1), \dots, (L_m + (K'-1)W + \lfloor P/K \rfloor). \quad (4)$$

The P elements m_i ; $i=1,\dots,P$, of one period of \mathbf{m} according to (3) are contained in the vector

$$\mathbf{m}_p = (m_1, m_2, \dots, m_p)^T. \quad (5)$$

With \mathbf{m} according to (3) the L_m binary elements $m_i^{(k)}$; $i=1,\dots,L_m$; $k=1,\dots,K$; of (2) for the midambles of the first K' users are generated based on Steiner's formula

$$m_i^{(k)} = m_{i+(K-k)W} \quad i=1,\dots,L_m; k=1,\dots,K. \quad (6)$$

The midambles for the second K' users are generated based on a slight modification of this formula introducing intermediate shifts

$$m_i^{(k)} = m_{i+(K-k)W + \lfloor P/K \rfloor} \quad i=1,\dots,L_m; k=K'+1,\dots,K. \quad (7)$$

Whether intermediate shifts are allowed in a cell is broadcast on the BCH.

In the following the term 'a midamble code set' or 'a midamble code family' denotes K specific midamble codes $\underline{\mathbf{m}}^{(k)}$; $k=1,\dots,K$. Different midamble code sets $\underline{\mathbf{m}}^{(k)}$; $k=1,\dots,K$; are specified based on different periods \mathbf{m}_p according to (5).

In adjacent cells of the cellular mobile radio system, different midamble codes sets $\underline{\mathbf{m}}^{(k)}$; $k=1,\dots,K$; should be used to guarantee a proper channel estimation.

As mentioned above a single midamble code set $\underline{\mathbf{m}}^{(k)}$; $k=1,\dots,K$; consisting of K midamble codes is based

on a single period \mathbf{m}_p according to (5).

In the Annex A the periods \mathbf{m}_p according to (5), i.e. the Basic Midamble Codes, which shall be used to generate different midamble code sets $\underline{\mathbf{m}}^{(k)}$; $k=1,\dots,K$; are listed in tables in a hexadecimal representation. As shown in Table 4 always 4 binary elements m_i are mapped on a single hexadecimal digit.

Table 4 Mapping of 4 binary elements m_i on a single hexadecimal digits

4 binary elements m_i	Mapped on hexadecimal digit
-1 -1 -1 -1	0
-1 -1 -1 1	1
-1 -1 1 -1	2
-1 -1 1 1	3
-1 1 -1 -1	4
-1 1 -1 1	5
-1 1 1 -1	6
-1 1 1 1	7
1 -1 -1 -1	8
1 -1 -1 1	9
1 -1 1 -1	A
1 -1 1 1	B
1 1 -1 -1	C
1 1 -1 1	D
1 1 1 -1	E
1 1 1 1	F

As different Basic Midamble Codes are required for different burst formats, the Annex A shows the codes m_{PL} for burst type 1 and m_{PS} for burst type 2. It should be noted that the different burst types must not be mixed in the same timeslot of one cell.

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.

5.2.4 Beamforming in Physical Channels

When DL beamforming or TX Diversity is used, at least that user to which beamforming is applied and which has a dedicated channel shall get one individual midamble shift, according to chapter 5.2.3, even in DL.

5.3 Common control physical channels (CCPCH)

5.3.1 Downlink common control physical channel

Either the BCH, the PCH or the FACH as described in section 4.1.2 are mapped onto one or more downlink common control physical channels (CCPCH). In such a way the capacity of BCH, PCH and FACH can be adopted depending on the operators need.

5.3.1.1 Spreading codes

The downlink CCPCH uses fixed spreading with a spreading factor $SF = 16$ as described in section 5.2.1.1.

5.3.1.2 Burst Types

The bursts as described in section 5.2.2 are used for the downlink CCPCH.

5.3.1.3 Training sequences for spread bursts

The training sequences, i.e. midambles, as described in section 5.2.3 are used for the downlink CCPCH.

5.3.2 The physical random access channel (PRACH)

The RACH or in case of ODMA networks the ORACH as described in section 4.1.2 are mapped onto one or more uplink physical random access channels (PRACH). In such a way the capacity of RACH and ORACH can be flexibly scaled depending on the operators need.

This description of the physical properties of the PRACH also applies to bursts carrying other signaling or user traffic if they are scheduled on a time slot which is (partly) allocated to the RACH or ORACH.

5.3.2.1 PRACH Spreading codes

The uplink PRACH uses either spreading factor SF=16 or SF=8 as described in section 5.2.1.1. The set of admissible spreading codes for use on the PRACH and the associated spreading factors are broadcast on the BCH (within the RACH configuration parameters on the BCH, see Ref.[3])

5.3.2.2 PRACH Burst Types

The mobile stations send the uplink access bursts randomly in the PRACH. The PRACH burst consists of two data symbol fields, a midamble and a guard period. The second data symbol field is shorter than the first symbol data field by 96 chips in order to provide additional guard time at the end of the PRACH time slot.

The precise number of collision groups depends on the spreading codes (i.e. the selected RACH configuration). The access burst is depicted in Figure 10, the contents of the access burst fields are listed in Table 7 and Table 8.

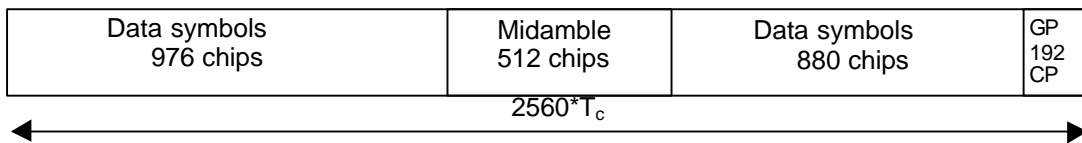


Figure 10 PRACH burst, GP denotes the guard period

Table 7 number of symbols per data field in PRACH burst

Spreading factor (Q)	Number of symbols in data field 1	Number of symbols in data field 2
8	122	110
16	61	55

Table 8 The contents of the PRACH burst field

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
1488-2367	880	cf Table 1	Data symbols
2368-2559	192	-	Guard period

5.3.2.3 PRACH Training sequences

The training sequences, i.e. midambles, of different users active in the same time slot are time shifted versions of a small set of periodic basic codes (in cells with small radius, a single periodic code can be used). The basic midamble codes used for PRACH bursts are the same as for burst type 1 and are shown in

Annex A. The necessary time shifts are obtained by choosing either *all* $k=1,2,3,\dots,K'$ (for cells with small radius) or *uneven* $k=1,3,5,\dots\leq K'$ (for cells with large radius). Different cells use different periodic basic codes, i.e. different midamble sets. In this way, a joint channel estimation for the channel impulse responses of all active users within one time slot can be performed by a small number of cyclic correlations (in cells with small radius, a single cyclic correlator suffices). The different user specific channel impulse response estimates are obtained sequentially in time at the output of the cyclic correlators.

5.3.2.4 Association between Training Sequences and Spreading Codes

For the PRACH there exists a fixed association between the training sequence and the spreading code. The generic rule to define this association is based on the order of the spreading codes $\mathbf{a}_Q^{(k)}$ given by k and the order of the midambles $\mathbf{m}_j^{(k)}$ given by k , firstly, and j , secondly, with the constraint that the midamble for a spreading factor Q is the same as in the upper branch for the spreading factor $2Q$. The index j indicates different basic periodic codes.

For the case that all k are allowed and there is only one periodic basic code available for the RACH, the association depicted in figure 23 is straightforward. For the case that only odd k are allowed the principle of the association is shown in figure 24. This association is applied for one and two basic periodic codes.

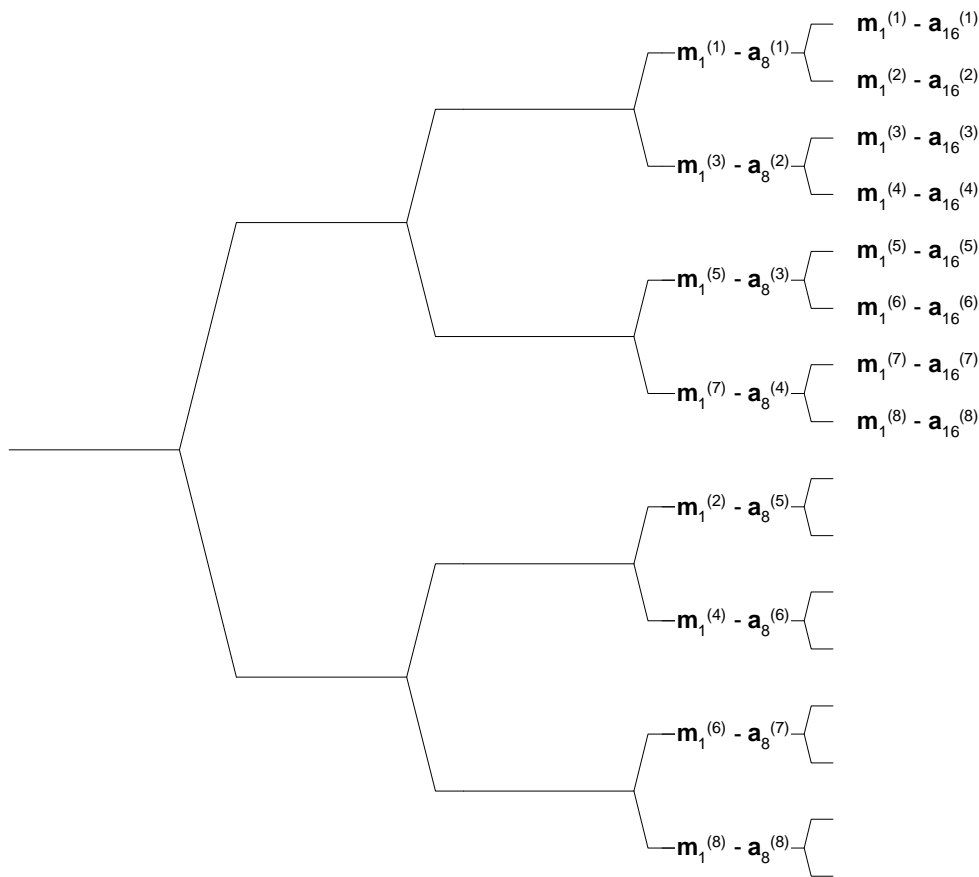


Figure 23 Association of Midambles to Spreading Codes in the OVSF tree for all k

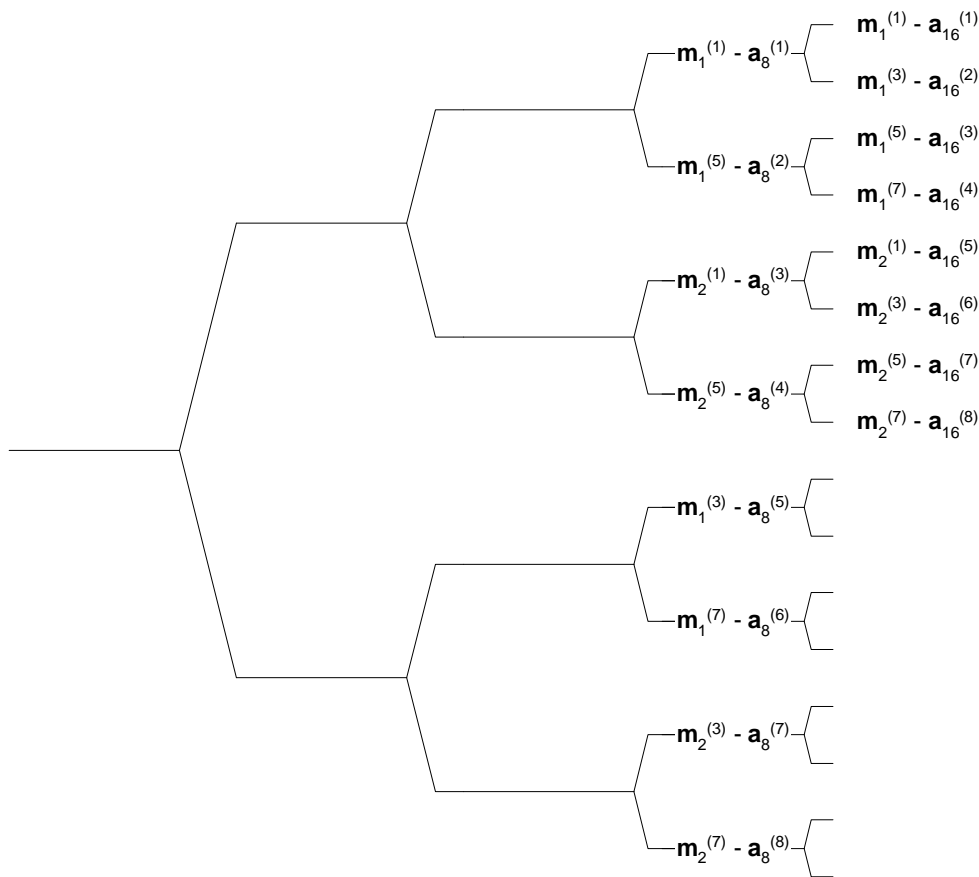


Figure 24 Association of Midambles to Spreading Codes in the OVSF tree for odd k

5.4 The physical synchronisation channel (PSCH)

The PSCH is similar to the FDD SCH, where the code group of a cell can be derived when decoding the FDD synchronisation channel. In TDD mode additional information, received from higher layers on SCH transport channel, is transmitted to the UE in PSCH in case 3 from below. In order not to limit the uplink/downlink asymmetry the PSCH is mapped on one or two downlink slots per frame only.

There are three cases of PSCH and CCPCH allocation as follows:

Case 1) PSCH and CCPCH allocated in TS# k , $k=0\dots14$

Case 2) PSCH in two TS and CCPCH in the same two TS: TS# k and TS# $k+8$, $k=0\dots6$

Case 3) PSCH in two TS, TS# k and TS# $k+8$, $k=0\dots6$, and the primary CCPCH TS# i , $i=0\dots14$, pointed by PSCH. Pointing is determined via the SCH from the higher layers.

These three cases are addressed by higher layers using the SCCH in TDD Mode. The position of PSCH (value of k) in frame can change on a long term basis in any case.

Figure 11 is an example for transmission of PSCH, $k=0$, of Case 2 or Case 3.

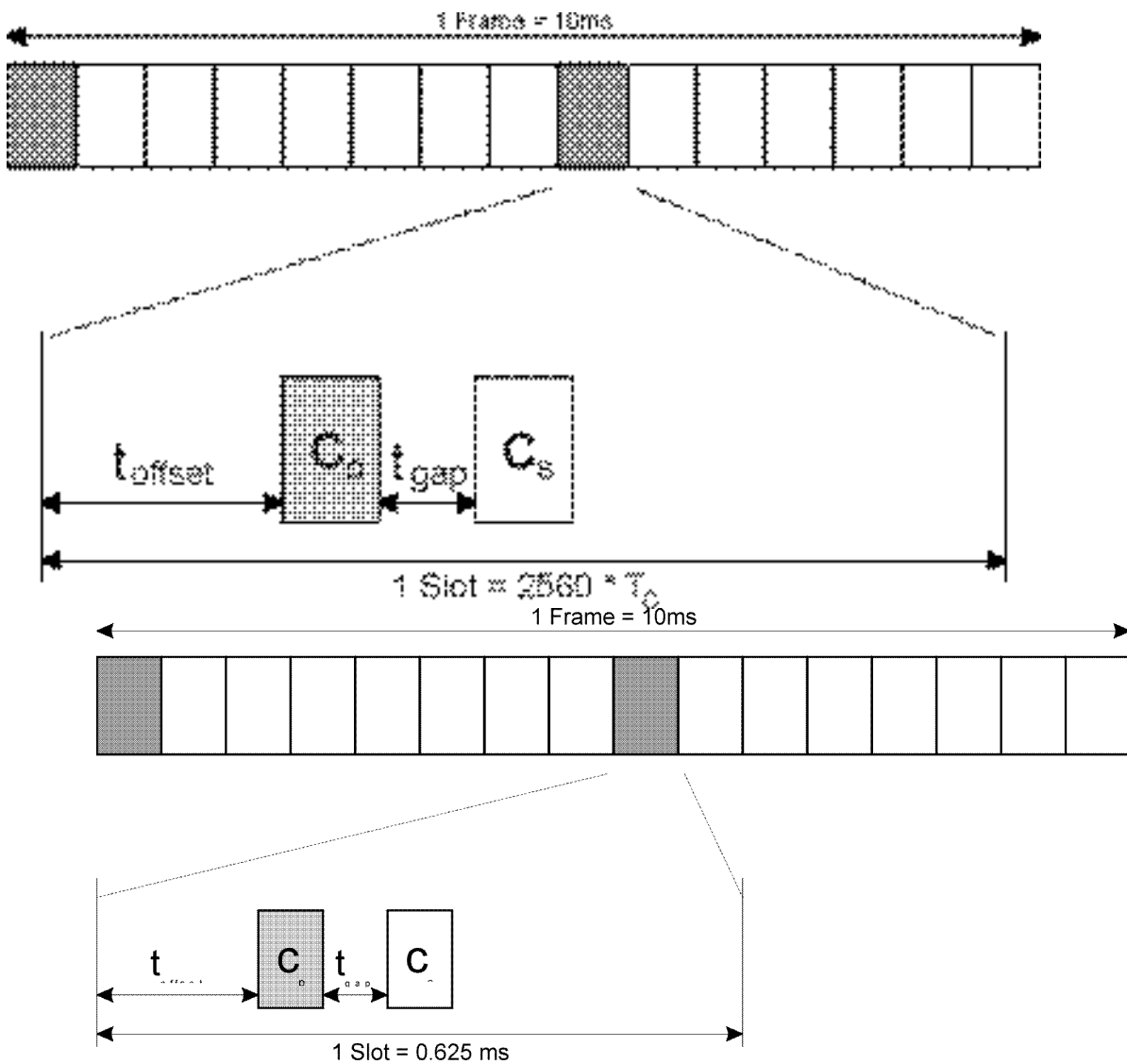


Figure 11 Scheme for Physical Synchronisation channel PSCH consisting of one primary sequence C_p and one secondary sequence C_s in slot k and $k+8$ (example for $k=0$ in Case 2 or Case 3)

As depicted in Figure 11, the PSCH consists of a primary and secondary code sequence with 256 chips length. The used sequences C_p and C_s are the same as in FDD-Mode, see TS25.223, chapter 7 'Synchronization codes'.

The time offset t_{gap} is the time between the primary synchronisation code and the secondary synchronisation code. It provides enough time for calculations and a better interference distribution, since the codes do not superimpose. <Editor's note: The value of t_{gap} is to be defined>

Due to mobile to mobile interference, it is mandatory for public TDD systems to keep synchronisation between base stations. As a consequence of this, a capture effect concerning PSCH can arise. The time offset t_{offset} enables the system to overcome the capture effect.

The time offset t_{offset} is one of 32 values, depending on the cell parameter, thus on the code group of the cell, cf. 'Table 9 Mapping scheme for Cell Parameters, Code Groups, Scrambling Codes, Midambles and t_{offset} ' in 'TS25.223 Spreading and modulation (TDD)'. The exact value for t_{offset} , regarding column 'Associated t_{offset} ' in Table 9 from TS25.221, is given by:

$$t_n = t_{offset,n} = n \cdot T_C \cdot \left\lfloor \frac{2560 - 96 - 512 - \frac{t_{gap}}{T_C}}{31} \right\rfloor ; n = 0 \dots 31$$

Please note that $\lfloor x \rfloor$ denotes the largest integer number less or equal to x and that T_C denotes the chip duration.

5.5 Physical Uplink Shared Channel (PUSCH)

For Physical Uplink Shared Channel (PUSCH) the burst structure of DPCH as described in section 5.2 shall be used. User specific physical layer parameters like power control, timing advance or directive antenna settings are derived from the associated channel (FACH or DCH).

5.6 Physical Downlink Shared Channel (PDSCH)

For Physical Downlink Shared Channel (PDSCH) the burst structure of DPCH as described in section 5.2 shall be used. User specific physical layer parameters like power control or directive antenna settings are derived from the associated channel (FACH or DCH).

5.7 The Page Indicator Channel (PICH)

The Page Indicator Channel (PICH) is a physical channel used to carry the Page Indicators (PI). The PICH substitutes one or more paging sub-channels that are mapped on a CCPCH, see 6.2.2. The page indicator indicates a paging message for one or more UEs that are associated with it.

The page indicators of length $L_{PI}=2$, $L_{PI}=4$ or $L_{PI}=8$ symbols are transmitted in a normal burst (type 1 or 2) as seen in figure 24. The PI may be repeated within one superframe. The number of repetitions within one superframe is given by the repetition factor RF_{PI} . The number of page indicators N_{PI} per superframe is given by the number of time slots per superframe N_{PICH} , used for the PICH, the number L_{PI} of symbols for the page indicators, the burst type BT and the repetition factor of the paging indicators, RF_{PI} . The same burst type is used for the PICH in every cell. In case of $L_{PI}=4$ or $L_{PI}=8$, one symbol in each data part adjacent to the midamble is left over. These symbols are filled by dummy bits that are transmitted with the same power as the PI. Figure 24 shows an example for $L_{PI}=4$, BT 1, $N_{PICH}=4$, $RF_{PI}=2$.

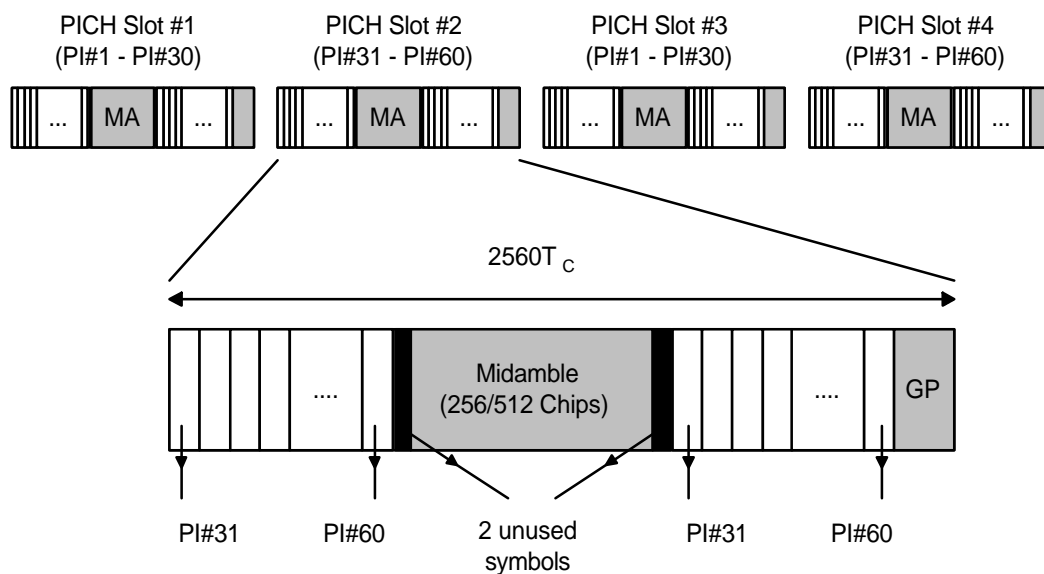


Figure 24: Example of PI Transmission in the PICH

6 Mapping of transport channels to physical channels

This section describes the way in which transport channels are mapped onto physical resources, see Figure 12. A description of the multiframe structure is given in section 8.3.

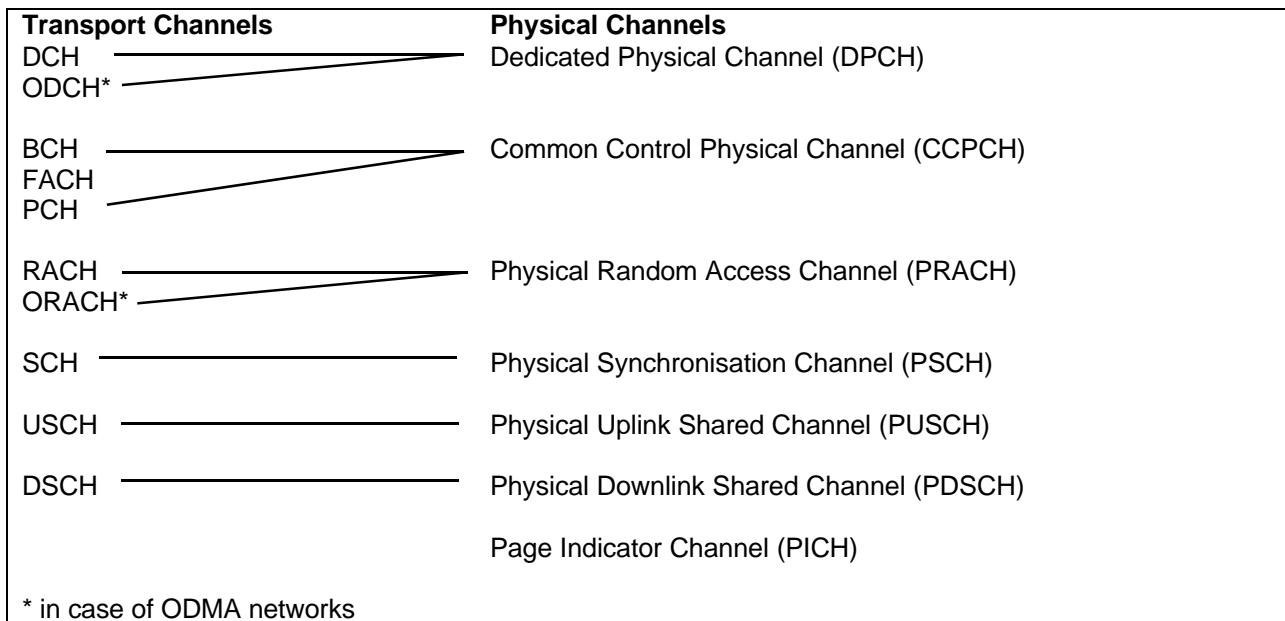


Figure 12 Transport channel to physical channel mapping

In the sequel, we use the terms physical channel and resource unit (RU); a physical channel is defined as the association of one code, one time slot and one frequency. A resource unit (RU) is that part of a physical channel allocated for one frame.

6.1 Dedicated Transport Channels

A dedicated transport channel is mapped onto one or more sets of slots and codes within a frame. An interleaving period is associated with each allocation. The frame is subdivided into slots that are available for uplink and downlink information transfer. Each set of slots and codes over an interleaving period maps to a data unit and a data unit can correspond to one or more FEC code blocks and one or more RLC protocol data units dependent from the service being supported. The mapping is illustrated by the following diagram (Figure 13):

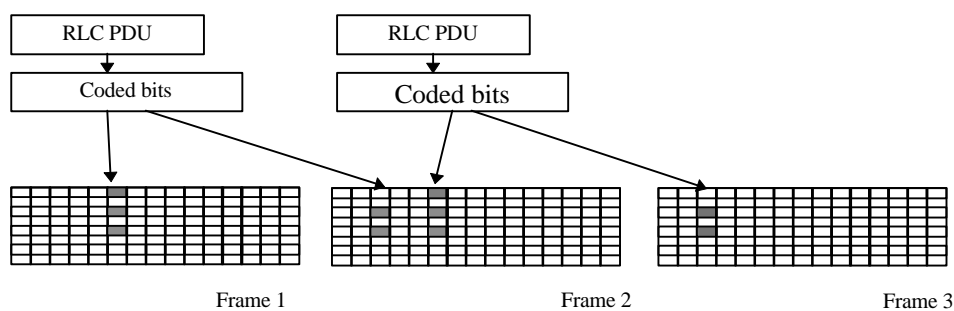


Figure 13 Mapping of PDU onto the physical bearer

For NRT packet data services an allocation is made only for a relatively short period of time. In general, for RT services an allocation is made for a certain time period and a release procedure is necessary to release

the resource. For the efficient use of resources the slot/ code set allocated to a radio bearer may be changed from time to time and the resources allocated to a VBR service may increase or decrease along with the changes in the data rate. Traffic channels are power controlled.

An ODCH is also mapped onto one or more sets of slots and codes within a TDD frame as shown in Figure 6. The actual transmission mode (i.e. combination of slots, codes, TX power, interleaving depth etc.) chosen for a relay link will be negotiated between nodes prior to transmission. Several of these transmission mode parameters can be adapted during transmission due to changes in propagation and data traffic.

6.2 Common Transport Channels

6.2.1 The Broadcast Channel (BCH)

The BCH is mapped on one or several RU per frame. The secondary SCH indicates in which timeslot and code group a mobile can find the BCH. If the BCH uses more than one RU, the secondary SCH comprises a pointer to the whole BCH mapping scheme or only to the primary BCH RU and this comprises a pointer to secondary BCH RU. The BCH has a reference power level. The RU allocated by BCH can be shared with other common control channels, e.g. PCH or FACH, according to a multi-frame structure.

6.2.2 The Paging Channel (PCH)

The PCH can be mapped onto any combination of time slots and codes so that capacity can be matched to requirements. The location of the PCH is indicated on the BCH. It is always transmitted at a reference power level.

To allow an efficient DRX, the PCH is divided into several paging sub-channels within the multiframe structure of one superframe. Examples of multiframe structures are given in the Annex B of this document. Each paging sub-channel is mapped on 2 consecutive frames that are allocated to the PCH on the same CCPCH, i.e. the same resource unit. Thus, the number of paging sub-channels per CCPCH is half of the number of frames used for the PCH in one superframe. Layer 3 information to a particular paging group is transmitted only in the associated paging sub-channel. The assignment of UEs to paging groups is independent of the assignment of UEs to page indicators.

6.2.3 The Forward Channel (FACH)

The FACH can be mapped onto any combination of downlink resource units. The location of the FACH is indicated on the BCH and both, capacity and location can be changed, if required. FACH may or may not be power controlled.

6.2.4 The Random Access Channel (RACH)

The RACH has intraslot interleaving only and is mapped onto PRACH. The same slot may be used for PRACH by more than one cell. Multiple transmissions using different spreading codes may be received in parallel. More than one slot per frame may be administered for the PRACH. The location of slots allocated to PRACH is broadcast on the BCH. The PRACH uses open loop power control. The details of the employed open loop power control algorithm may be different from the corresponding algorithm on other channels.

6.2.5 The Synchronisation Channel (SCH)

The SCH is mapped onto the PSCH as described in section 5.4.

6.2.6 Common Transport Channels for ODMA networks

The ORACH is used to transfer short probes or short protocol data units (PDU) between one or more nodes for routing and resource allocation control.

To limit the transmission time of short probe PDUs on the ORACH then this data should be transmitted as

one burst on one resource unit (RU). That is, one probe burst should be transmitted on one $2560 \cdot T_c$ timeslot (which as described in section 5.1 would be configured as an ORACH slot).

Since the ORACH is a common control channel used to transfer probes between one or more nodes a common fixed spreading factor should be adopted.

6.3 Multiframe structure

A strong requirement for the multiframe structure comes from the realisation of low cost dual mode FDD-TDD terminals and from the GSM compatibility of the UTRA proposal. In this respect the superframe and multiframe structure for FDD and TDD mode have to be compatible and harmonised with GSM.

Thus in the proposed structure a multiframe is composed by 72 frames each of length 10 ms. So the multiframe period is 720 ms.

All frames in the traffic channel multiframe are used to carry both user data and dedicated signalling. The TDD multiframe matches exactly a FDD multiframe ensuring the compatibility of both modes.

Annex A

A.1 Basic Midamble Codes for Burst Type 1 and PRACH Burst Type

In the case of burst type 1 (see section 5.2.2) or in the case of PRACH burst the midamble has a length of $L_m=512$, which is corresponding to:

$K'=8$; $W=57$; $P=456$.

- For application to burst type 1 and cells with small delay spread the midambles are generated from the basic periodic midamble code for all $k=1,2,\dots,K$.
- For PRACH or for cells with large delay spread only the first K' midambles $\underline{m}^{(k)}$, $k=1,\dots,K'$ are used.
- For PRACH in large cells the midambles are generated for uneven $k=1,3,5,\dots\leq K'$ only.

The mapping of these Basic Midamble Codes to Cell Parameters is shown in TS25.223.

Table A-1: Basic Midamble Codes m_p according to equation (5) from section 5.2.3 for case of burst type 1

Code ID	Basic Midamble Codes m_{pL} of length $P=456$
m_{pL0}	8DF65B01E4650910A4BF89992E48F43860B07FE55FA0028E454EDCD1F0A09A6F029668F55427253FB8A71E5EF2EF360E539C489584413C6DC4
m_{pL1}	4C63F9BC3FD7B655D5401653BE75E1018DC26D271AADA1CF13FD348386759506270F2F953E93A44468E0A76605EAE8526225903B1201077602
m_{pL2}	8522611FFCAEB55A5F07D966036C852E7B15B893B3ABA9672C327380283D168564B8E1200F0E2205AF1BB23A58679899785CFA2A6C131CFDC4
m_{pL3}	F58107E6B777C221999BDE9340E192DC6C31AB8AE85E70AA9BBEB39727435412A5A27C0EF73AB453ED0D28E5B032B94306EC1304736C91E922
m_{pL4}	89670985013DFD2223164B68A63BD58C7867E97316742D3ABD6CBDA4FC4E08C0B0CBE44451575C72F887507956BD1F27C466681800B4B016EE
m_{pL5}	FCDEF63500D6745CDB962594AF171740241E982E9210FC238C4DD85541F08C1A010F7B3161A7F4DF19BAD916FD308AB1CED2A32538C184E92C
m_{pL6}	DB04CE77A5BA7C0E09B6D3551072B11A7A43B6A355C1D6FDCF725D587874999895748DD09832ABC35CEC3008338249612E6FE5005E13B03103
m_{pL7}	D2F61A622D0BA9E448CD29587D398EF8CDC3B6582B6CDD50E9E20BF5FE2B3258041E14D60821DC6725132C22D787CD5D497780D4241E3B420D
m_{pL8}	7318524E62D806FA149ECC5435058A2B74111524B84727FE9A7923B4A1F0D8FCD89208F34BEE5CADEB90130F9954BB30605A98C11045FF173D
m_{pL9}	8E832B4FA1A11E0BF318E84F54725C8052E0D099EF0AF54BC342BEE44976C9F38DE701623C7BF6474DF90D2E222A4915C8080E7CD3EC84DAC
m_{pL10}	CFA5BAC90780876C417933C43103B55699A8AD51164E590AF9DA6AF0C18804E1F74862F00CE7ECC899C85B6ABB0CAD5E50836AD7A39878FE2F
m_{pL11}	AD539094A19858A75458F1B98E286A4F7DC3A117083D04724CBE83F34102817C5531329CDB437FFF712241B644BDF0C1FEC8598A63C2F21BD7
m_{pL12}	BEB8483139529BDE23E42DA6AB8170DD0BFBB30CE28A4502FAF3C8EDA219B9A6D5B849D9C9E4451F74E2408EA046061201E0C1D69CF48F3A94
m_{pL13}	C482462CA7846266060D21688BA00B72E1EC84A3D5B7194C8DA39E21A3CE12BF512C8AAB6A7079F73C0D3E4F40AC555A4BCC453F1DFE3F6C82
m_{pL14}	9663373935FD5C213AC58C0670206683D579D2526C05B0A81030DDF61A221D8A68EAD8D6F7AA0D662C07C6DCD0115A54D39F03F7122B0675AC
m_{pL15}	387397AE5CD3F2B3912C26B8F87CE82CEFEC55507DB08FB0C4CF2FD6858896201ACA7264281D0298440DD3481E5E9DDB24C16F30EB7A22948A
m_{pL16}	AFE9266843C892571B6230D808788C63B9065EA3BDF687B92B8734A8D7099559FEA22C9416576D0C087EB4503E87E356471B330182A24A3E6
m_{pL17}	6E6C550A4CB74010F6C3E0328651DF421C456D9A5E8AE9D3946C10189D72B579184552EE3E799970969C870FE8A37B6C4BA890992103486DC0
m_{pL18}	D803CA71B6F99CFB3105D40F4695D61EB0B62E803F79302EE3D2A6BF12EA70D304B

	181E8B38B3B74F5022B67EB8109808C62532688C563D4BE
m _{PL19}	E599ED48D01772055DBE9D343A4EA5EABE643DA38F06904FC7523B08C4101F021B199AF759A00D9AC298881D79413A77470992A75C771492D0
m _{PL20}	9F30AC4162CE5D185953705F3D45F026F38E9B5721AEFE07370214D526A2C4B344B508B57BFB2492320C05903C79CBEE08C6E7F218B57E14D6
m _{PL21}	B5971060DA84685B4D042ED0189FAF13C961B2EF61CC164E363B22AAB14AC8AF607906C1C6E04F2054C687AA6741A9E70639857DA02B6FFFA
m _{PL22}	97135FC2226C4B4A5CBA5FCA3732763B87455F73A1148006F3DF214BD4C936D061E04045160E2CE33B9CD09D08FDE2A37F4E998322B4401D27
m _{PL23}	4D256D57C861B9791151A78D5299C56D116B6178B2A2D04BB95FB76540AF28341DC6EC4E7ED3BF9E508478D9C8F44914805DA82429E1CF320E
m _{PL24}	858EF5C84CE32D18D9ABA110EEA7474CF0CD70254D2928C3F4DFF6BB3A518587CADA19029078AC90A8336C8178203BE3289E601F07D089CB64
m _{PL25}	920A8796A511650AEF32F93DD3C39C624E07AE03CE8C96139973F54DCB9803C5164ADB502D4FF561564D607037FCD172921F1982B102C3312C
m _{PL26}	485C5DAE76B360A9C56E20B8422EA3E6ACF07CB093B5587CB0E6A5498A4714081EA98DBCDB0482B26E0D097C03444473D233BEF3C8E440DEBF
m _{PL27}	565A9D54EA789892B024F97E728E8EE112411942C48BD0C5BC8AA457D8DC9941F0F7424B38643FFE6521CD306FBC56FE10F1428D4C245B5606
m _{PL28}	5AEF2C0C2C378179A1AC36242E6B3EDB72C42D3624437674F8D51260C0898C201837CBA14E9E23D1EF6451C4ACF27AB031F457A8A1BFD148AE
m _{PL29}	87D8FE685417822A23D925307E6C11081ADAC4702BCCD9BE448E78984D109B50DEF5B7C58BC71EA1F0A6826BA8AD1978843E7697F3E416AADA
m _{PL30}	84802B72AF27B5BE724D1FB629E0E627BDB0D9061292562F98350C1D0C9D4B9D8E2BF71123C82EBB161003AE9829E07244D78F19926F8847A2
m _{PL31}	8CCB5128238BCB088E30972D62792AEF02B9BBDDCAD68C9916C00BF91CBE788B0F03851FAAF88605534FD73436C259D270B1013CB14226F658
m _{PL32}	62F4E6FAC2BF1979CE6854AA2D33534BFB2F946519101A6589131C3640707D40E67ED804AF8736AD213CAF5935741900061967E8285C27E34C
m _{PL33}	4095E5B4EEAFDCF68A34B267EEA28D8444FA533900F41499E260D2E65C256A52E1DD5861F5227C98E00687D107233F51A1167BCF72FB184654
m _{PL34}	5630E9A79FCAD303404D9E5A802299162657AAC734761C6E90DA8BCE4F61A763E0BB48D3FEB3F78468C828ABA4828DAD06E0F904CFD40421DC
m _{PL35}	CD12B24C0BCA8AAC1FCBF0500A3BC684A180E863D888F2506B48C68ECF17F76CB285991FBA18EB6397211FAD002F482D57A258CD45DE3FF1A6
m _{PL36}	AFCF2A50877286CD3405442730C45514F082D9EC296B367C0F64F04C4E0007DCA9E50BEED5C102126E319ACBC64F1729272F2F72C9397029FE
m _{PL37}	18F89EE8589D20882A72A44DCCDF0050F0A3D88DBA6531614973D26905FDF41E3F779FF0648E8AF1540928511BCF4C25D9C64AF34AC31B8965
m _{PL38}	F890D550F33F032ECDA3A51FED427D634F64EB29AF1332A23CD961258E4BAED040E7B336918E250EC272A12816B9EBFFA1E0AE401185F08C10
m _{PL39}	ACE5DD61506047E80FB7D41BD3992DF4D7F18EB46CC145C0E9105428C2F8F299141F5D66691904A7DC2513A3B83994ACB1292246B32818FE9D
m _{PL40}	150680FF900C9B46E1E24D54BE2238CB950A934E5CCDE9BC3939EB51CB0AE202B7D339EEC2018B33A0AB9B63DA5D512D64FB58C0E51A1C82C2
m _{PL41}	51A579EED2663A002D32D10A0753173612F4D5BA167D1807C61F25C4D42C063682E8E9DD019F79D446A046EB3F75E50FEB228DC52F08E694B6
m _{PL42}	CDC644FE4C0C6897604F9D14D714123BF16FFF0E49F35F674908CA60653702FE27BCCA2A47098453AF8661055C8C549EB6A951A8396AD4B94D
m _{PL43}	750A10366C595373C5001CA3E4239764B1409D602CF6052B39BC6A3255A15FE06C782C4C5F847026A7E79838A2933A61C77BB6CBF5915B2DA5
m _{PL44}	B7490686D78E409082C4C48FE18D4C35429C20AADF96076B92FC4E85490664753DB0891A0B27FD849BB7FCA99E3B38F22F8C662852C0D35AA6
m _{PL45}	D86E1B575B47D23DA811806A54C231281F03317830E7BD305D3CAA7D6382A5233104CFD54D22DF9F34535E5B390D9040CF1375FEA44CEC29E2
m _{PL46}	828655960C026EC67B683480992AC2ED2C43ABC606F5220C2945F373470BE7ED5BCCF7C1AA0986BBCCC84F11F1658AA568FAA0A60C5F0B5BFA
m _{PL47}	D76230E02C8533653AAB99B288AA2ADE25A1C1BF28516C04239240EAF1EFC0B98974B51F886861D8A1E9F5D62CFFEC309F071A9716B325101B

m _{PL48}	EA207662865B8A07D69648964DED818EE474A90B94473408871880E63EF0596B9FCF EC3C06B86EA6AD2B06C91672EFB33C70241A5450B59B8A
m _{PL49}	9CB5459549909835FAB22F0D99298C120ACF479F814CCE749079D40688F2810103776 2F125C776DA9C5FA1FCE0E76E452F8185354FDCDE94E2
m _{PL50}	227506304AEC1D6F93569B51FDC3405A0F38194F65BE17163A3CB9827A35AECEA75 7D020FE249377ECD561428A38FEED004EC859C272563185
m _{PL51}	96B9AEC9938910F0E533422A3977519B05CD4AD3909BC15A7502D48D49C124FA192 A8E57027CFEB11DF542010603CE5C9FDF8E626D4FBF8CF4
m _{PL52}	A6AAD06E095A9BE0BD9F8A2ED40C3CBDBAE91C700CBB778C8696CC06F3A675C16 BDB2918E5F2111005A8727206DC6A9684E05655185C398EEB
m _{PL53}	CD168D384A78DA172991AD333EE2A9880905AFE59E2A2A4AC4414C40F82874F98A3 CBE7B44F4C7F4710B35FD88AFC0399FAEB070EB9CA4D30A
m _{PL54}	22016CA87AD1549174A8699DD65599697871091457E83E0912E7E77A06531C209394D 283D18A38662B73681DD9C5BF330FED978BDA7D487CA8
m _{PL55}	B9401B0843AA6F7827A13BD66C922287E8886C31EB5B90B82B472CCD6DA3D8D4FB F78B8F8496DFA8252B06429D5DD17142F1C908ACCD70EA0C
m _{PL56}	E42B9EFDC5D09AC27B3C7DA28D02493A70521223B9D7A76A9D13E9C171017964D16 A70C08EAD02C3DC948889C23E365AFCF01BF20B89B0BF5C
m _{PL57}	9DA0180168DB915E9F3597B59312198E1B5CC00D743C2ECB0DBAADA3E35A2465ED 1EAA9D74734D49A313CE4DFF020D0760E3153DC485603943
m _{PL58}	B6C966619ECB98191D719C187C07BD503425650CAA3A2D1F2DF5212B1441D7A0C1D 36A4C9C2550240AD17CA43BB3943DFFFBF1E283D81299CC
m _{PL59}	DB0E8C41F08A03D477C1AA548799274C4BF3EB68F2636166FDC8D4B1E7132539930 297E228BA232BB5C279FA5ECA3AC10E24361AF050A453B8
m _{PL60}	89BCE2DE2974EEBA833CF32F224C85A2891484478527DB48FA6ECEA84C5E288CC3 914CB54ADA0476278750187F68FBEA41017E1E58DF1A5A3D
m _{PL61}	70A457D1314A278625443EEB52520815EC92CEF17417B97440DCB531BC1CE83212F6 3270418D0FBDE71F6DB9E0EA88772E1E4535B6633E4425
m _{PL62}	C388460AD54B36C4452CF0433BD347100ACCC24C79C535AD3E1F23FE0425E93A044 C553BFA116E09AA4BB32F13CFA76FBA1BC17520F45EFD44
m _{PL63}	0BAFCADCDF9AA2846681782CD3B90CA036A863C78EE1507620BC394D0C6804B4C9 7A15BC9C0D7B79E6892EA1BFF1A0DD9573A9213AB140D0D2
m _{PL64}	833B0226789A62882FCD27A30885E67872B1A1C2FA484AD498011599DD57E8E2A07A 560B47167AA5F60EF47177DBB1632D5387A2896348640B
m _{PL65}	8F52820323ABA5E6C6B465821B621600B980E59F53A599DA5646BA103214336836CF1 7E3386CE4FB2BC5F25CCB30CF7F500546828EC8786B8E
m _{PL66}	E2E9A29C3C8207B9A4508FD2F667A159F068EEE8D00686F46EA904C3692C1D79DFF 1B32E5103720D47B4B58AC35384A26087027E141B3126A8
m _{PL67}	70E7C39FD2D3AE1DCE341699A544D801A8688A6EE47C5CB3630022147DDC06241F C5337A348A462B2472DEC5E104DD520ADA5114DB065D4B0D
m _{PL68}	9E3483CAB164BD053C4971D4D87494CC689033D589EF80E5453376E4A8DCC02183B 98C36B0FF7DDC0AD07FCE8B4D5164371BD03A2110AD1247
m _{PL69}	04DA1C649B0608938DAADD3FE920A4F681690C54505429DBDCDCF10067AB5714BC DDFE1F28692710F794765781C1D233344E119BEE8A8416DC
m _{PL70}	7A18D6D30BDF44410714C3DCA27D8F9EA8A542D87122205640B98313C91AD9A0B99 3A5A7BC3E035F93B88BBE6D4204BC82A9FA8D4C1A7618CF
m _{PL71}	EB9525E10265A48733C8E0E77E459310112A71DCA680F68AC044B64BC0A31D02EEA 0F7ACAAAB7F1E574E94FEA2D1301CB14B03263DA8122B76
m _{PL72}	E706C6ED2D6F89153835079BE0C6D45310845EF2F9F6C6AE91B7419810508BA501C0 148BF09955BAD90D6391BA8EBA5CEFBBD23221CC75143D7
m _{PL73}	DF071A10AC4120CD1431590BEDCFF9483CA7047B19590D035D309240BDB4264E9A3 A2761402EC97FD8BC51B4AF32E37FBC47162A2357D18751
m _{PL74}	F0F952B2238139F46D8254D1A2C1C22A16BA71EC0C0C900ED1442452D7F44C798BC 65FF40671B88074BA0B74C6510996EEAC495C5B49C37DEB
m _{PL75}	1C86BD82EDA81FD65418D3837B5552A853791456D93B06C62C650D86CFBEC269AFF D772763064062C03751B9428C6DA2E60383025F9E404B70
m _{PL76}	B390978DD2552C88AABA7838489A6F5A8E9C41E95FFA2215819BF8A5BFE39C8A706 CC658E549E966611B843A1468406C41C09D1560BEDA4F1B
m _{PL77}	1A69EC9D053C7E84BAE7A48CCC71857D0C6B06D1065E3EA4633B133AA022B8104F

	6EE7C69B6184B746C8822958B0A16686F27C8A0E3B4EFEAD
m _{PL78}	C95B2070816DC97C6D8DD2583263E73F9AAAFD13F0548D2EBD835824418F11E54111005FB713AB234BE412347358281C7DE331EDD21B8BEA52
m _{PL79}	56D6408399F23C2ED85EE0F68111D69A91A3AD9A732AC57CA08F86CC28B3CF4E4B02EBBA0BCE5CAE5BACC4D52004070797C04093A84BB18DBA
m _{PL80}	E662E7043867BE250764DA0596D34A582A619B408B505E6211DD6286E93A37F95B1EA680C0C5F3E777E3F71E8D75495D59043217FC0E222E16
m _{PL81}	27D5E681C222297AD478A079EF12F1A98F744B66335303322EF8880B931FEBF8322F4302944E80BED468A0A516D410B183D863795992DA7DDB
m _{PL82}	5100336C05F9E5BF35201906C1C588858E0DAF56130DF5554B9AB21CA15311A90290624CD63E03F5EDA49DB7A0C32AB5F1CA427A2D5635FDA5
m _{PL83}	C696DC993BF9A9A61B781B9C5C3F5CFAA4C8339D8B03A9B0387883D0482A41AC78D6522425959846E561D26A30FF79A205C801A85889736B2
m _{PL84}	D562297561AFF42D3168296C1153E4E39BE7B2EB0348BC704625AA08391235075EE0DE0A79AB03222FEDB27218C56F96EAC2F91CC8FCE64B12
m _{PL85}	DD0B6768FC01CC0A551F8ACC36907129623E975AB8B3FF58037F1859E2FA8C62C2D9D1E8506916029A2C3F8CAD9A26AE2CC652F48800859F5C
m _{PL86}	923920696EB3AB413786C41854822282BB83F6900D33A232D470BE198BBF086067B72613300C593B74251E2F079857ADBBCD86583A9DCAA6DC
m _{PL87}	B8EF30C797D8D2C4EF11244F137D806E556A436626D0115A621C92C34D166A68BCE DFA0040DA8FD6F987B1CD5C2AA1C1B045E64475F0F8DABD
m _{PL88}	E1887001D414405ED6419E9EE1D1D346D924ED57ADF04B31B7948099976B2D1501A60DFFB287AD44C8783DF0C1EA5AA5D273D1389C8EA22DCC
m _{PL89}	8C2E379A58AA96748141CA84C35987905F984A49D3AD9BFF7807AC244C16C1DF74343C2E1F25514F5A0954CFBB3C92E25EF783136844998AC5
m _{PL90}	78F8A99E0A54E27F51C0726FE7A11EB26B1E29FE65F55AC8AC58011465900B958488A90F6DF614A58431DC8B6C6B9A6F032EE0E0B1306EC4B4
m _{PL91}	88F7A31B7B20E0F05CA26E729B4F8A1933962D7BD7BE3E1EB130B28C794C0B4D01CADE09006FF97E80117509733F3A9DC225413A0AE08CA662
m _{PL92}	BE4DFCEAC18905AC8D5DA27A794F88A4D3058D2EFA3B075A819DEAE688EAF8940A653ED7104E7B403D490F0A9030264E1F12B8922C75775E61
m _{PL93}	5BA4B79FC4550234D8922963BF3537485E3C8745A5DB90D3E2E454B30FF61112F508155B7C2B3C4C628AF846240C2021ACDE547E5A41F666B8
m _{PL94}	00556D35649F7610AB24A43C4F16D6AC0571FD126F11880C5CD72100D730E4E4D6BB73C33F837FAF1072743B249ADA2E09598B1EB23F1180A7
m _{PL95}	7A0CC9F21BD69CF3023E944545C2176EF0D4F450B765C28359FB8A32137D043D0E5713E67B3F61320985D2C6106605081F87D2296321468A2F
m _{PL96}	DA669880995B0671201172BABFF141D5854A245E211879EF3038A7C84170DADBD368455F24653161E7886E15B253F93E3A3C568EFB17CDEB1A
m _{PL97}	4E294E53D1661C1F6F748302A7723DA951C00FDB8BEBBF67A68710BA0F1A255DFB1627059D41A23D3961726DE6FEB10E5D209CC4505B209812
m _{PL98}	73385DF701414E144768A67EF72924B1653479E962FB1554B7E54BC5284D9B3E41C0C133F878972230721918AA425501B920B204FECE0C7F8A
m _{PL99}	F4492160805F258CE592DF4D1200566F81D173458D78EA3ABED79A14AF88170DB1D4A9A5931D2B80C58C27FE17D806E3E6A66CDAAD09F118D4
m _{PL100}	44D562D9012D8B07B8F44596467C11A163982BB7EAEAC184078B6B8CE46B5D7E17C39CEF576A025491183017FA09931D070B307B86524B03FF
m _{PL101}	FCAEEFCC49A13B4FFA12C0CC6A2B90CF4F57D78B1E98294B04675C2F0991661FDC61A452A247F8C29E0284AA21026F368307375AA2C3F1E12C
m _{PL102}	C486DF0510DCAD5AB86E178A686D398E11A0ECFAC5A326C10129257E5456B22FB8E147E9190D9929A5DFFE44715FA47D62F04CFC9B1C201414
m _{PL103}	C10AF383DC708E257E15A8AB337BCE684A2F4AC7A22DC2C25C277F8E8D0858E79317CDDD9AA2EA6CBE604D24AC0945026103E7B4126FD361A4
m _{PL104}	A5C60A181148D9A931B2DDDB9D169648BA54F366B4EFAE88F6861909EE0F07C037EE349D0EC59A823286E366CA3943589EEA7F828C3728085F
m _{PL105}	96136AEBD5E28462B0421DF292BA899FFA660D80EA01620D2C7490E5347127884AA3C3D1FF44BCEEF6C29EC589CDEF200C5742C5964F8B2B52
m _{PL106}	40F63C04ACAD986255D1E16B769A6D4C11A1D075E804BDC0AC61923E9A67F5D7417756328072455F6E22B1C64E06F367D1B0808295C2D90E22

m _{PL107}	F4B82D413578C4888C5F002CF6D0E03778134A860436551FD57537E4CED334B3C9C EBACE615238271717AA762448B86FA53D2074BCE35658A7
m _{PL108}	BCCC92D72C920E685530591FC351743D1E23DE044BF81D32650406113E23ECC757F DE4E386B6E2E7195EE4969717A7BD0812AC312B33A54308
m _{PL109}	6ED59DE0D44370A861CE2B42CF5E578E764A682AB5777905EE027D7160490EDC6C2 8989B23805AA697FCD215CB401BC5E4D430624C01B16192
m _{PL110}	DE80C0E273B92CC3C5034F7A20DB3914643C430B425C8B9249EAF73ACE8C3BCF17 957242CF534D87A67D4DC0252275262E737F4095450CFA14
m _{PL111}	9505C4FEF2A397D5059F4729D013292A8321FFFA929ACB0A210D0A13E13061227C44 A68FBD8CE6B66CE3D783363CD039AB35EE52603E09B758
m _{PL112}	E8BE90D7F954B14D8002A4CAC20765ABEED80634498C836D79B0F9338DBC17B28F0 5CF4E79136779E1C55AA30B6215F890882887B3B53C23E2
m _{PL113}	9F4B622C1358AE5468DC31E4B2CA320E5E20458C1DE5405BF4F9AD7D45A5BCAA39 EC0626FFFC698C16A009CCCB7A18A64E85E70BA71731BA24
m _{PL114}	B91B2624843CF48299AFC2B1442570B41F28F578530D1E322E0B54282372131C71AC B924E70768A243EEC3200E7A5EBFA77111D9FB07FEA8AE
m _{PL115}	965F42DDA3A4650FE2F5103932B68F166FA424B9F0F7045311D962C2A9F66B9BC6C6 6FB480F9800354E0C54A72251071422CF1DFC44F94C00C
m _{PL116}	08ADCE48699FC30FA0788073BDAADB9177BBB4C1CED41F93085218364B8BAD8488 561EF0FE1B0DDAA403C602494CB35697D62AA0A2B93A64CF
m _{PL117}	9A313BED80B1220D77C8ADA4B2E0B3D284A5120A94B741380923C78D3AD32BC3E7 1EC6EEA520E9D447D8727697598BB987F17506F482003ABD
m _{PL118}	24C9AD4C14EFEC002A3473FCAB04E492F2E269161A2960BA8AF09FD710B444A40C4 E8B138418E62301E91FBA97AFDC58759A76D00F676736C7
m _{PL119}	6514C7733711CE4942CD2123AB37186EB7FECB7E78ABB28744864942FCF4C0F81005 4AF55B1042EB53064F0857C61D85B2CF0D2DC5826AF22F
m _{PL120}	B2C80CDC83E48C36BC6FDAB8661208EAD392F3A0571BE41DFAD765E744932ADEA5 0061E66C05498A5381B2A1F1B446587089DC4E4A2DF03D82
m _{PL121}	639368BA75CC709A3D9F28EDA237E32C2017A9BF1E382045B9426AEE0A4049DCB4E 1D7EBE4647B855212824557497CFA039885A3BA42F98F63
m _{PL122}	6A70DDC17D0C8024B1C853F0C1948561EF32510151BE0C63BCA9171F20217891D10 21EE72586CAFF557F8973336913A94A2A699B8740B054B8
m _{PL123}	2E32E3A35CCD001172CE310B63B4E406126045A0FA3795BE3E3D9B56F72405FC94F D89946818BAECD24A61BABBBE2D23052AB01EF73CA0CF4A
m _{PL124}	829395C35205A480AC1351C25E234BF52D384A3DE1C5138A650A6F82F739757D812D 9C38231AB9FD81AA0648B11F6F6113F9312C57624FC746
m _{PL125}	D98FFE19C0AAAAB0571A9075ECDFD3E7373F5255DC669116A8C6913F0123E598F93 0934C5F6A601C37C529C371A0C391B59AC5A9E286D04011
m _{PL126}	C1A108192BCE96C2430A63C189BB33856BE6B8B524703FCB205DAEF37EF544CD43 CA09B6181B417398083FF2F781BA4AE89A5CA291DB928D71
m _{PL127}	42568DF9F61849BF9E7DEE750604BE2E0BC16CC464B1CDE15015E01D6498E9F3E6 D6950E5824651F212BA0057CE9529B9CCAB88D8136B8545E

A.2 Basic Midamble Codes for Burst Type 2

In the case of burst type 2 (see section 5.2.2) the midamble has a length of $L_m=256$, which is corresponding to:

$$K'=3; W=64; P=192.$$

The mapping of these Basic Midamble Codes to Cell Parameters is shown in TS25.223.

Table A-2: Basic Midamble Codes m_p according to equation (5) from section 6.2.3 for case of burst type 2

Code ID	Basic Midamble Codes m_{PS} of length $P=192$
m _{PS0}	5D253744435A24EF0ECC21F43AA5B8144FBDB348C746080C
m _{PS1}	9D7174187201B5CE0136B7A6D85D39A9DD8D4B00E23835E4
m _{PS2}	AE90B477C294E55D28467476C6011029CDE29B7325DF0683

m _{PS3}	BC8A44125F823E51E568641EC12A6C68EAFDFA2350E3233C
m _{PS4}	898B7317B830D207C9BC7B521D5715680824DC08347B2943
m _{PS5}	466C7482C8827655BC13F479C7C1417290679A9841297C4A
m _{PS6}	AC0734C27C7DC1B818A8492744290DFE866B0EBA62B0B56E
m _{PS7}	0A92106325B15A8C15FC3764724CE67A5056D50A77F9360E
m _{PS8}	AE69F62E23035083E6094B89493D33E06FDB6532D473A280
m _{PS9}	B485D4E3614C9C373EA1365FA6FA890E9844084EBA90EB0C
m _{PS10}	66182885E2D28360D2FEAB842C65304FFC956CE8DC8A90C7
m _{PS11}	CC30A9B0A742FCC1E9A408415368391F1299AEA3CB6509FE
m _{PS12}	673928915886947F464FDDAAD29A07D182328EBC5839089A
m _{PS13}	4418861C14D62B46EE6D70D4BF05A3ED801A01BD6CDC5235
m _{PS14}	DAD62DC88F52F2D140062C2330BE6540E6F86192322AFB04
m _{PS15}	A2122BAF24529CEA9855FB43CE40923E7CA7B30D92E40702
m _{PS16}	6C44AB41E11F54B0929DF65673BD231F92A380132D9F1712
m _{PS17}	1DC2742E756CDA6421340D0087DD087A615E4B8688CB2F75
m _{PS18}	2E0105328B56E9E07D9B5A62F38B08AF8D8C2817B54F3302
m _{PS19}	88315EC30A94CA4EDB2C77079D9BD810A2E280B50DABB213
m _{PS20}	440E0093D28CB2B2B0A95D18CEB4AB934C33FA45C1CFC7B0
m _{PS21}	CC9BF85D41A96A6EC314F9611D5E1C0672556C8850801BB4
m _{PS22}	1ABEA04C99BC26972715F01957C0B6B959CC71CD88120817
m _{PS23}	EC5A33DA0BA4470442C5CB324A8E47B0A9F7968FC8108EE8
m _{PS24}	F82086290271DB446B5B1DC15D9BE96414B19B3D5E0F540C
m _{PS25}	11A1A790D6958FD3A9157DF1E05D1378248CA201EBCC7592
m _{PS26}	AA8564882231907BCE78092DC6C9DD4F5A0E4A34AFCFB809
m _{PS27}	912EE2238212F87BC7CDA7F30441ED184A6AA954EC4D20C8
m _{PS28}	2D200D8B8891B804673E380A1AF5AB875986E29D37D3FDC9
m _{PS29}	75E086B6C818423491BF9D6365C52FD1C5E42A576E268170
m _{PS30}	50ADBF27DA2A3701470186B699118E16DDB0D10F705607B1
m _{PS31}	656C0692B4E22023590A906D2A74DFD471C883A7B1E0B3A2
m _{PS32}	C21FDACD09A3CDCE74C4794010A3E45769B142505C56A0E6
m _{PS33}	CD9392A87C2D4D7CE5801CDDA8A76339B6F900F008B290E2
m _{PS34}	956426FEFD8B8D52073E87984E10C4D255064E1372C04A24
m _{PS35}	C4F4D6DF1B754AD6063FD10C331C1428ABB27B0700134B94
m _{PS36}	B65548082B34E9FAF43F33C4070F79099758CFD41B491A11
m _{PS37}	C8317EA111A82B04E78B88B864B1EF5D711BBEB4A0527036
m _{PS38}	8FB7AD1188E8D1A5219845013672560FD38904E70537403B
m _{PS39}	B41A324E0D80AA0598A8D391C1D7FFC82B4A075218E98EC3
m _{PS40}	49A6350A62E208B011E86528B9A481A0E76D723F6675FF82
m _{PS41}	C344C8C23C42A7B7442E6022E95AE4B08A4BFA786F35F911
m _{PS42}	28F430CF67D69C9DF60E25656413BC5F932A022DB1406C44
m _{PS43}	2FA5D70CF0FED4213F32116051450391C2A627D9B670C428
m _{PS44}	959537D988FDD4F1360B4E84701AE5409229C30EDF8BC404
m _{PS45}	CDD2E0450F9EC12F81391AD4633CB29F315B4A0A890A9A22
m _{PS46}	158776A20B4B82C563EC08F086830EA66DBD2DCCB4DF6026

m _{PS47}	431FCACBE48208975950342709D11F19AD5FB047F3B440C9
m _{PS48}	86B141AC571BA6B42653B12FF04D4F0E6C81F3EB608660A2
m _{PS49}	86D297ABD34E8510F6CDB0EA617F1F1051C8799117B02211
m _{PS50}	80B2D9530B34E781311D95CFA3857F277CC07014D324AF5A
m _{PS51}	2B607B93FD8B45601C1E574E14CFC6912C22AEC1045ADC49
m _{PS52}	D234C5C45E105A837E6DD74BC4E534523A20317BA0625A29
m _{PS53}	768CCDB3E2A7A2B863128382590946B25472BE2BFFC40641
m _{PS54}	3DA38212E0A987EE1F665D4E13C2AA4446E00A76C948A073
m _{PS55}	09173135E4A2CFC8F2678750AB5257110906F013587BDE82
m _{PS56}	522E070B266F35E99C1F3C42D2017F8E415550492B72F086
m _{PS57}	D63E4BD805262A3DEF05C7D86C422E5048921E5531784132
m _{PS58}	564AF806E28131611E5F884229265D446A50E1E488EAFBBA
m _{PS59}	A2603E009D3D30147727B750C35C62299AF754D3E4A54E1C
m _{PS60}	938504B02599D33E28246E4271C375AE81A3BBE8D3F8A920
m _{PS61}	461516B2CAC6FC42A4B707CC6073BBE573C014892C811776
m _{PS62}	29186DE4CCAAB2CD0100BB19EA595879D63F0F0CFA881AA5
m _{PS63}	A064B449CB784A91B803369CDC5EF61A670AAAC044BA3E68
m _{PS64}	8719C454D88FF5149DB943CB6CADA01D0B9664B357A18203
m _{PS65}	A27EC68720F00A714AA2C45A7EF232286984D7B193F5C916
m _{PS66}	AC8361676AB424E48F0789082B0CD2EFB8D2E627D041DD66
m _{PS67}	ABA1BEB0064733A0620906BF2B29C95883F069D7E4C35D39
m _{PS68}	9E22EDED47D92CA1D0B7530EC6062287BD83A04874AE00C
m _{PS69}	0BADEF288B20F5686C5DE3A71219AC2172054326BE831696
m _{PS70}	953801EB2AF58C2F80E49A6CC46085CB554243E3B3BBEC8C
m _{PS71}	333A504C51C8FAC5025994565C3F600F154F64FAEF4EA484
m _{PS72}	A6583E19647662005474153A6F8DD88A473853E94B720CE7
m _{PS73}	90ACAF707D18AF34F5848C58166830AF620ACDC1B2DFDDA8
m _{PS74}	39C5C598A374EA82F3F83378258248DAD3808812DD0E74BB
m _{PS75}	F79525DE694629346D73F6256CC0F140F82603197AAA1844
m _{PS76}	B8C2A8F139097699A693022E78588D4058DB0A65FF52F813
m _{PS77}	449B50C2A52996FA5A828A907F30F9F460EE3D99930DF890
m _{PS78}	62CEC9574D30184BCB4F94EECF0CC23D2D2A8D0003F0AA33
m _{PS79}	B56D258889703F76A0738EE3A7D355994159A4851833E198
m _{PS80}	65894AA54C0F6C9A206521C9FC379A8AAF6E621C03CF849C
m _{PS81}	2D47F3414E30CC02C6835D95C9BA204488F0FFCB4852677D
m _{PS82}	12BE4DD8B906B584010F8A330AB67B278E8642FA33D51B68
m _{PS83}	BC928A90A4B10906CAEE638BF768E08542F48F1676006DF0
m _{PS84}	30C544E437C8ADA143566CD1BC4E9E7BA84139A08505C2F4
m _{PS85}	84FD5B05506192B753FBA2C719B584E0EDA01814999867D2
m _{PS86}	191F14DD00034E03AB5BB4342F1138B2CD33784E60CFD75A
m _{PS87}	B8ACE7990B6A98A80A61162C4D2D5F88F24E8F7DE4207590
m _{PS88}	EC1DBE72E8EED0C61054FC2695422AC0AD2D888265B21AB0
m _{PS89}	9A1B4CA467AB7E082AF4278E44D177EA78424508C23E8B08
m _{PS90}	999EE541C608164AC975214F3A37A677FC2CA03E2C2A4B20

m _{PS91}	1BDCC20265031432917A2EB828FB356A22DF9CB609C0F8F3
m _{PS92}	EB4A81859C93338B8A1B87C02C815AE09D765F6F2249B958
m _{PS93}	E6A5D1629F4CF09A1F280DE0C480D4C73B26ADE321A50AEE
m _{PS94}	BAAB7286DD24C80B15A7958039B904F1CA83C310C8C7AFF2
m _{PS95}	12220F72619E983717C68FFE1C4148F2354B7B1955B65620
m _{PS96}	A198706E24FAA08BD09EE392414816038E667BB34307D6B2
m _{PS97}	30B3493B4C035881A7A722E4546527AAE787FA2C0893AC46
m _{PS98}	5A7318126522843DCB7F00A2D9F9BA8F88963E4152BC923C
m _{PS99}	844844B0CACAB702C332CE2692B4166F4B0C63E62BF151BF
m _{PS100}	B8297389526410313692F861DC60DA86A23607F7DDE24755
m _{PS101}	6C1144CF8BC01538D655D29ED62DE6E74A3180EC905BF1E0
m _{PS102}	E9DB3221FACFC5C88691A7013EF09672A130D52C3413AAE2
m _{PS103}	2FD0508615EC4CD4BF18ADD46D777078869130C8921A4F0E
m _{PS104}	40911B4E0525AC874228F6EF642E59154730CB187C7E417A
m _{PS105}	2034C6A027D4D850F5184AA64C3153231F4651B616BBFCF9
m _{PS106}	57833235451525A1DFA213FCE0B419B6494BC7B99F488410
m _{PS107}	6DC3D57F2E39158D036825F8804810D77CA1ECA610ECD894
m _{PS108}	F5C50DE43AA7B731CAB7683524021701F97650499A7070E4
m _{PS109}	F2184D2699785442E09FA22CC2D60A5A13FFF22AE660A470
m _{PS110}	EF0029DE0D79207205458CF4D7328E81A93518D93C9A74BD
m _{PS111}	9D6D8992482FB885AA5E878C3BA2045538B09886C23CDC2D
m _{PS112}	C0A5AB67D1CEA126F6476C75443F0A11CBE749412EF03104
m _{PS113}	1853A5C20CDF968C5A180D8EB5E72BF15517D06680D98412
m _{PS114}	8CEA1223227ADF37D0DAAB320906E1C79029F480D25181A7
m _{PS115}	5561038E96A658EF3EC665612FF92B064065D1ACC1F54812
m _{PS116}	C55A6263F08D664A1E53584560DFF5E611640D8281D9A843
m _{PS117}	4386A8EA59124D043F29056A4598735A4FC7BC11119B90C1
m _{PS118}	D6571B20668BED50BD7C80388C162632BCB069AA67C7FC22
m _{PS119}	4F9F09ABBC1391EC2CCA5359FB52250E533BF04324154106
m _{PS120}	662659F42188C9453F6E6DF00C579627045DA1461A3A0EA5
m _{PS121}	8DCC9274C0C2A9BA6096BF27FACA542CD01CA8653D60A80F
m _{PS122}	5C1210A1E50E505F6B73C90156C9D9F19AE2310BBD820DF0
m _{PS123}	B1E0A7CE26202E223D4FC06D5C9BBA4E5F6D98204D2D5286
m _{PS124}	DB506776958E34552F7E60E4B400D836153218F918E22FA6
m _{PS125}	ECAA60300439B2360B2AC3C43FB6241ACDE5055B295FA71C
m _{PS126}	BF1E6D9AA9CA4AC092BE60500C77D0DC7A6A236520F86722
m _{PS127}	051C5FA122845A30B4EC306B38016B45667C7754F92F13A0

Annex B (Informative)

CCPCH Multiframe Structure

In the following figures B.1 to B.3 some examples for Multiframe Structures on CCPCH are given. The figures show the placement of Common Transport Channels on the Common Control Physical Channel. Especially those CCPCH containing the BCH are depicted. Additional CCPCH capacity can be allocated on other codes and timeslots of course, e.g. FACH capacity is related to overall cell capacity and can be configured according to the actual needs. Channel capacities in the annex are derived using bursts with short midambles (Burst format 2). Every TrCH-box in the figures is assumed to be valid for two frames (see row 'Frame #'), i.e. the transport channels in CCPCH have an interleaving time of 20msec.

The figures B.1 to B.3 as given below are considered for case 2) of Physical Synchronisation Channel (PSCH), cf. section 7.4. In this case CCPCH is to be transmitted in timeslots k and $k+8$. The BCH is split on those timeslots k and $k+8$ in a redundant way, thus a UE can collect the BCH information even if one of both slots is interfered.

The actual CCPCH Multiframe Scheme used in the cell is described and broadcast on Primary BCH. Thus the system information structure has its roots in this particular transport channel and allocations of other Common Channels can be handled this way, i.e. by pointing from primary BCH.

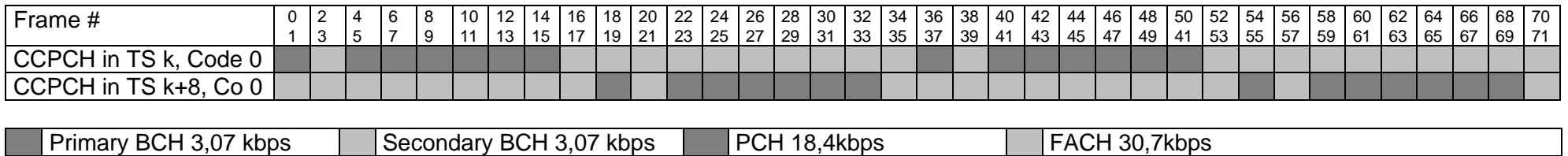


Figure B.1: Example for a multiframe structure for DL-CCPCH.

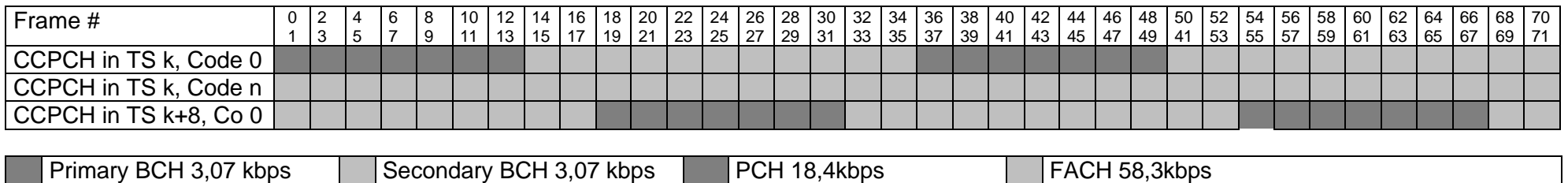


Figure B.2: Example for a multiframe structure for DL-CCPCH. n=1...7

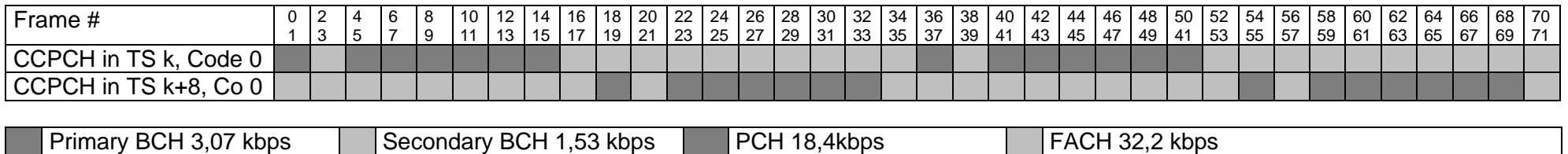


Figure B.3: Example for a multiframe structure for DL-CCPCH.

History

Document history		
v0.0.1	1999-01-29	Document created based on the documents UMTS (xx.09) V 1.2.0 and ARIB Volume 3 Ver.1.0
v0.0.2 (v0.1.0)	1999-02-23	Document updated based on the TRGR1 #2(99) 115 which was agreed in the TSG RAN WG1#2 meeting, Yokohama, Feb.23,1999. The usage of ODMA is still under study.
v0.1.1	1999-02-26	Small changes (Modification of the editorial errors)
v0.1.2	1999-03-11	Small changes (Modification of the editorial errors)
v1.1.0	1999-04-6	Small changes (Modification of the editorial errors)
v1.2.0	1999-04-19	Document updated based on the TRGR1 #4(99)357 which was agreed in the TSG RAN WG1#4 meeting, Yokohama, April 19,1999. Number of Chapters are changed ("Scope" starts from section 1.)
v2.0.0	1999-04-20	Document updated based on the TSG RAN WG1#4 meeting, Yokohama, April 19,1999.
TS 25.221 V1.0.0	1999-04-22	Noted by TSG-RAN as TS 25.221 V1.0.0
TS25.221 V1.0.1	1999-06-4	Document updated based on the TSG RAN WG1#3 meeting, Nynäshamn, March 22-26 1999. Small changes (Changed from 'S1.2x' to 'TS25.22x', 'MS' to 'UE', 'Reverse link' to 'Down link', 'Forward link' to 'Up link'.)
TS25.221 V1.1.0	1999-06-4	Document updated based on the TSG RAN WG1#5 meeting, Cheju, June 4,1999.
TS25.221 V1.1.1	1999-07-6	TS25.221 V1.0.1 was not updated completely based on TSG RAN WG1#3 meeting, Nynäshamn, March 22-26 1999. So update the document again.
TS25.221 V1.2.0	1999-07-13	Document updated based on the TSG RAN WG1#6 meeting, Espoo, July 13,1999.
TS25.221 V1.2.1	1999-07-15	Proposal for update according to decisions at WG1#6 meeting in Espoo
TS25.221 V1.3.0	1999-08-30	Proposal for update (V1.2.1) approved at WG1#7 meeting in Hanover
<p>Editor for TS 25.221 Physical Layer Procedures, TDD Parts, is:</p> <p>Katsuhiko Hiramatsu</p> <p>Matsushita Communication Ind. Co., Ltd. (Panasonic)</p> <p>Tel: +81-468-40-5161</p> <p>Fax: +81-468-40-5183</p> <p>Email: Katsuhiko.Hiramatsu@yrp.mci.mei.co.jp</p> <p>This document is written in Microsoft Word 97.</p>		