Agenda item:	**WG1 Plenary**
Source:	**Philips, Nokia**
Title:	**Revised Text Proposal and Change Request for CPCH power control preamble length**
Document for:	**Decision**

Introduction

In the Adhoc 14 meeting at WG1#8, it was agreed that the length of the CPCH power control preamble should be a higher layer parameter which can take one of 2 values, 0 slots or 8 slots.

This paper is a re-submission of the corresponding text proposal and change requests contained in R1-99h02 and agreed in adhoc 14 at WG1#8.

The previously agreed CRs 25211-003 and 25214-006 have now been updated to use the new version of the CR form.

In addition, CR25211-003 has been modified to update another reference to the power control preamble length which had been missed in the first version of the CR.

CHANGE REQUEST

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

3G25.211 CR	**003rev2**	Current Version:	3.0.0

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

For submission to:	TSG-RAN #6	for approval	**X**		strategic		*(for SMG*
list expected approval meeting # here ↑		for information			non-strategic		*use only)*

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

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

Source:	Philips, Nokia	**Date:**	1999-11-18

Subject:	CPCH power control preamble length

Work item:	

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

Reason for change:	Resolution of "ffs" item.

Clauses affected:	5.2.2.2.1 "CPCH transmission", 5.2.2.2.4 "CPCH power control preamble part", 7.4 "PCPCH/AICH timing relation"

Other specs affected: Other 3G core specifications   **X**   → List of CRs: 25214-006rev2
                                         Other GSM core
                                            specifications   ☐   → List of CRs:
                                         MS test specifications   ☐   → List of CRs:
                                         BSS test specifications   ☐   → List of CRs:
                                         O&M specifications   ☐   → List of CRs:

Other comments:	

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5.2.2.2.1   CPCH transmission

The CPCH transmission is based on DSMA-CD approach with fast acquisition indication. The UE can start transmission at a number of well-defined time-offsets, relative to the frame boundary of the received BCH of the current cell. The access slot timing and structure is identical to RACH in section 5.2.2.1.1. The structure of the CPCH random access transmission is shown in figure 6. The CPCH random access transmission consists of one or several Access Preambles [A-P] of length 4096 chips, one Collision Detection Preamble (CD-P) of length 4096 chips, a [10] ms DPCCH Power Control Preamble (PC-P) which is either 0 slots or 8 slots in length, and a message of variable length Nx10 ms.
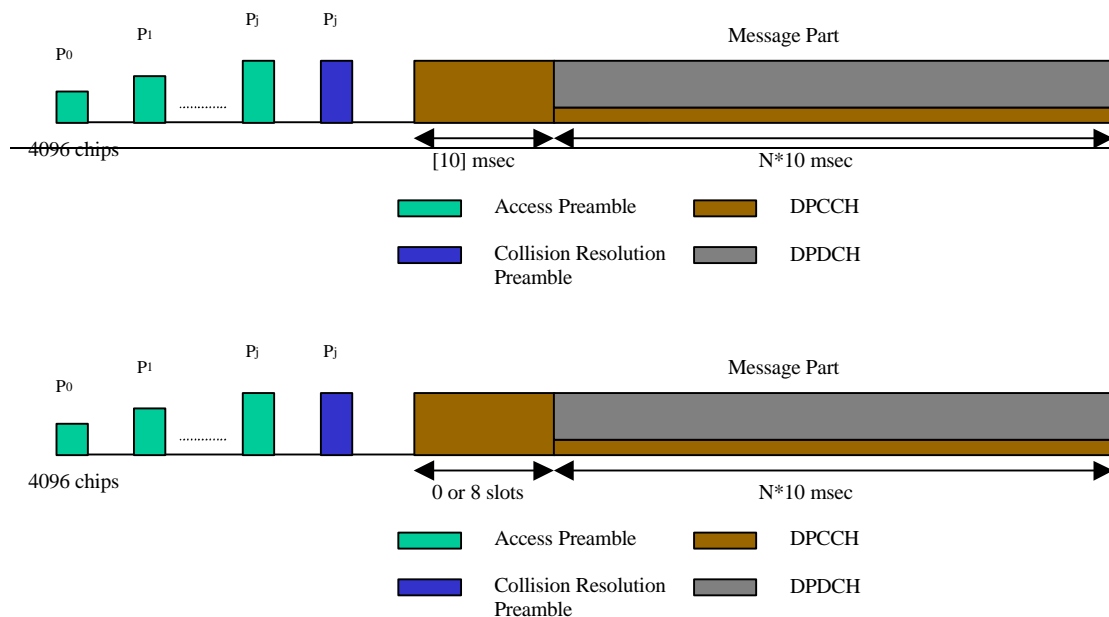

Figure 6: Structure of the CPCH random access transmission

5.2.2.2.2   CPCH access preamble part

Similar to 5.2.2.1.2 (RACH preamble part). The RACH preamble signature sequences are used. The number of sequences used could be less than the ones used in the RACH preamble. The scrambling code could either be chosen to be a different code segment of the Gold code used to form the scrambling code of the RACH preambles (see [4] for more details) or could be the same scrambling code in case the signature set is shared.

5.2.2.2.3   CPCH collision detection preamble part

Similar to 5.2.2.1.2 (RACH preamble part). The RACH preamble signature sequences are used. The scrambling code is chosen to be a different code segment of the Gold code used to form the scrambling code for the RACH and CPCH preambles (see [4] for more details).

5.2.2.2.4   CPCH power control preamble part

The power control preamble segment is a [10] ms DPCCH Power Control Preamble (PC-P). The following table 9 is identical to Rows 2 and 4 of table 2 in section 5.2.1. Table 9 defines the DPCCH fields which only include Pilot, FBI and TPC bits. The Power Control Preamble length is a parameter which shall take the values 0 or 8 slots, as set by the higher layersffs.

Table 9: DPCCH fields for CPCH power control preamble segment.

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Frame	Bits/ Slot	N_{pilot}	N_{TFCI}	N_{FBI}	N_{TPC}
0	15	15	256	150	10	8	0	0	2
1	15	15	256	150	10	7	0	1	2

7.4   PCPCH/AICH timing relation

Transmission of random access bursts on the PCPCH is aligned with access slot times. The timing of the access slots is derived from the received Primary CCPCH timing The transmit timing of access slot n starts n×20/15 ms after the frame boundary of the received Primary CCPCH, where n = 0, 1, …,14. In addition, transmission of access preambles in PCPCH is limited to the allocated access slot subchannel group which is assigned by higher layer signalling to each CPCH set. Twelve access slot subchannels are defined and PCPCH may be allocated all subchannel slots or any subset of the twelve subchannel slots. The access slot subchannel identification is identical to that for the RACH and is described in table 6 of section 6.1 of [5].

Everything in the previous section [PRACH/AICH] applies to this section as well. The timing relationship between preambles, AICH, and the message is the same as PRACH/AICH. Note that the collision resolution preambles follow the access preambles in PCPCH/AICH. However, the timing relationships between CD-Preamble and CD-AICH is identical to RACH Preamble and AICH. The timing relationship between CD-AICH and the Power Control Preamble in CPCH is identical to AICH to message in RACH. The T_{cpch} timing parameter is identical to the PRACH/AICH transmission timing parameter. When T_{cpch} is set to zero or one, the following PCPCH/AICH timing values apply:

Note that a1 corresponds to AP-AICH and a2 corresponds to CD-AICH.

τ_{p-p} =   Time to next available access slot, between Access Preambles.

   Minimum time = 15360 chips + 5120 chips X Tcpch

   Maximum time = 5120 chips X 12 = 61440 chips

   Actual time is time to next slot (which meets minimum time criterion) in allocated access slot subchannel group.

τ_{p-a1} =   Time between Access Preamble and AP-AICH has two alternative values: 7680 chips or 12800 chips, depending on T_{cpch}

τ_{a1-cdp} =   Time between receipt of AP-AICH and transmission of the CD Preamble has one value: 7680 chips.

τ_{p-cdp} =   Time between the last AP and CD Preamble. is either 3 or 4 access slots, depending on T_{cpch}

τ_{cdp-a2} =   Time between the CD Preamble and the CD-AICH has two alternative values: 7680 chips or 12800 chips, depending on T_{cpch}

$\tau_{cdp-pcp}$ =   Time between CD Preamble and the start of the Power Control Preamble is either 3 or 4 access slots, depending on T_{cpch}.

Figure 27 illustrates the PCPCH/AICH timing relationship whenT$_{cpch}$ is set to 0 and all access slot subchannels are available for PCPCH.
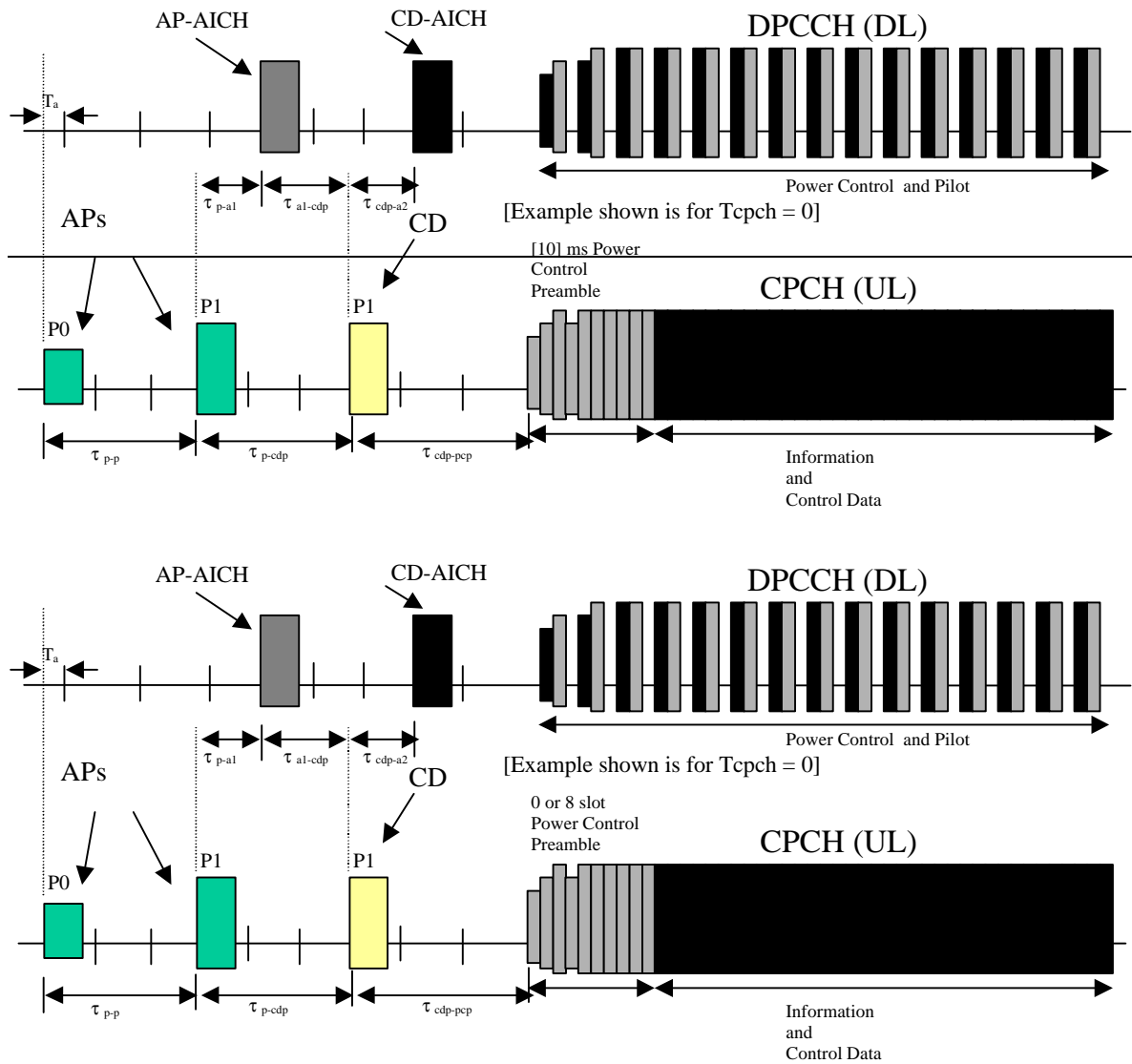
Figure 27: Timing of PCPCH and AICH transmission as seen by the UE, with T_{cpch}= 0

7.5 DPCH/PDSCH timing

The relative timing between a DPCH frame and the associated PDSCH frame is shown in figure 28.
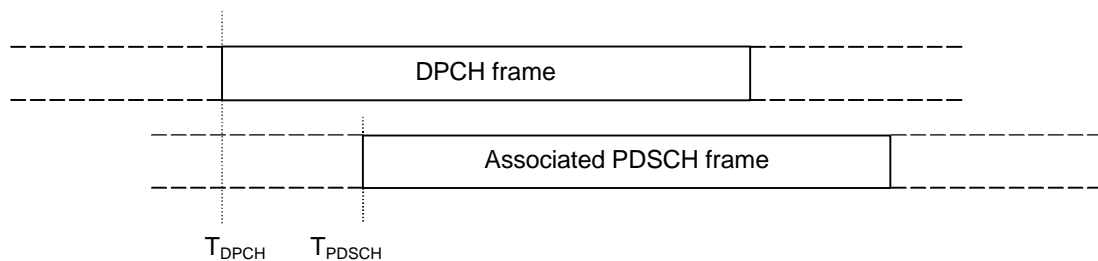

Figure 28: Timing relation between DPCH frame and associated PDSCH frame

The start of a DPCH frame is denoted T_{DPCH} and the start of the associated PDSCH frame is denoted T_{PDSCH}. Any DPCH frame is associated to one PDSCH frame through the relation -35840 chips $< T_{DPCH}$ - $T_{PDSCH} \le 2560$ chips, i.e. the associated PDSCH frame starts anywhere between 1 slot before or up to 14 slots behind the DPCH.

CHANGE REQUEST

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3G25.214	CR	**006rev2**	Current Version:	3.0.0

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

For submission to: **TSG-RAN #6**
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for approval **X**
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strategic ☐
non-strategic ☐

(for SMG use only)

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Proposed change affects:
(at least one should be marked with an X)

(U)SIM ☐   ME **X**   UTRAN / Radio **X**   Core Network ☐

Source: Philips, Nokia   **Date:** 1999-11-18

Subject: CPCH power control preamble length

Work item:

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

F	Correction	☐	
A	Corresponds to a correction in an earlier release	☐	
B	Addition of feature	☐	
C	Functional modification of feature	**X**	
D	Editorial modification	☐	

Release:

Phase 2	☐
Release 96	☐
Release 97	☐
Release 98	☐
Release 99	**X**
Release 00	

Reason for change: Resolution of "ffs" item from TS25.211.

Clauses affected: 6.2 "CPCH Access Procedures"

Other specs affected:

Other 3G core specifications	**X**	→ List of CRs:	25211-003rev2
Other GSM core specifications	☐	→ List of CRs:	
MS test specifications	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments:

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6.2   CPCH Access Procedures

For each CPCH physical channel in a CPCH set allocated to a cell the following physical layer parameters are included in the System Information message:

-     UL Access Preamble (AP) scrambling code.

-     UL Access Preamble signature set

-     The Access preamble slot sub-channels group

-     AP- AICH preamble channelization code.

-     UL Collision Detection(CD) preamble scrambling code.

-     CD Preamble signature set

-     CD preamble slot sub-channels group

-     CD-AICH preamble channelization code.

-     CPCH UL scrambling code.

-     CPCH UL channelization code. (variable, data rate dependant)

-     DPCCH DL channelization code.([512] chip)

NOTE: There may be some overlap between the AP signature set and CD signature set if they correspond to the same scrambling code.

The following are access, collision detection/resolution and CPCH data transmission parameters:

Power ramp-up, Access and Timing parameters (Physical layer parameters)

1) N_AP_retrans_max = Maximum Number of allowed consecutive access attempts (retransmitted preambles) if there is no AICH response. This is a CPCH parameter and is equivalent to Preamble_Retrans_Max in RACH.

2) $P_{RACH} = P_{CPCH}$ = Initial open loop power level for the first CPCH access preamble sent by the UE.

[RACH/CPCH parameter]

3) ΔP_0 = Power step size for each successive CPCH access preamble.

[RACH/CPCH parameter]

4) ΔP_1 = Power step size for each successive RACH/CPCH access preamble in case of negative AICH. A timer is set upon receipt of a negative AICH. This timer is used to determine the period after receipt of a negative AICH when ΔP_1 is used in place of ΔP_0.

[RACH/CPCH parameter]

5) T_{cpch} = CPCH transmission timing parameter: This parameter is identical to PRACH/AICH transmission timing parameter.

[RACH/CPCH parameter]

6. $L_{pc-preamble}$ = Length of power control preamble (0 or 8 slots)

[CPCH parameter]

NOTE: It is FFS if ΔP_0 for the CPCH access may be different from ΔP_0 for the RACH access as defined in section 6.1.