TSG-RAN Working Group 1 meeting #7bis **TSGR1#7bis(99)f83**

October 4 - 5, Kyongju, Korea

Agenda Item : Ad hoc 14

Source : LG Information & Communications, Ltd.

Title : Text proposal for transmission of CPCH status information on DL-DPCCH

Document for : Approval

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1. Text proposal for 25.211

section 3.3 Abbreviations

AP	Access Preamble
CD	Collision Detection
CPCH	Common Packet Channel
CSI	CPCH Status Information
PCPCH	Physical Common Packet Channel

Section 4.2.5 CPCH – Common Packet Channel

The CPCH is an uplink transport channel that is used to carry small and medium sized packets. CPCH is a contention based random access channel used for transmission of bursty data traffic. CPCH is associated with a dedicated channel on the downlink which provides CSI and power control for the uplink CPCH.

Section 5.2.2.2.5

CPCH message part

Figure 1 in 5.2.1 shows the structure of the CPCH message part. Each message consists of up to N_Max_frames 10 ms frames. N_Max_frames is a MAC layer parameter. Each 10 ms frame is split into 15 slots, each of length T_{slot} = 2560 chips. Each slot consists of two parts, a data part that carries Layer 2 information and a control part that carries Layer 1 control information. The data and control parts are transmitted in parallel.

The data part consists of $10*2^k$ bits, where k = 0,1,2, 3, 4, 5, 6, corresponding to spreading factors of 256,128, 64, 32, 16, 8, 4 respectively. Note that various rates might be mapped to different signature sequences.

.The spreading factor for the UL-DPCCH (message control part) will be 256. ~~The SF for the UL-DPCCH (message control part) shall be 512. The DL-DPCCH fields (message control part) shall be identical to the first two rows of Table 10 in section 5.3.2.~~ The entries in Table 1 corresponding to spreading factors of 256 and below and Table 2 [both in section 5.2.1] apply to the UL-DPDCH and UL-DPCCH fields respectively for the CPCH message part.

The SF for the DL-DPCCH (message control part) shall be 512. The DL-DPCCH fields (message control part) shall be identical to the second row of Table 10 in section 5.3.2. A CSI is TFCI encoded and is transmitted in TFCI fields on DL-DPCCH during 2 frames. A CSI consists of two 9-bit CSI units.

The first CSI unit of 9 bits is constructed as:

$a_0 = u_1, a_1 = c_1, a_2 = c_2, \ldots, a_8 = c_8$

The second CSI unit of 9 bits is constructed as:

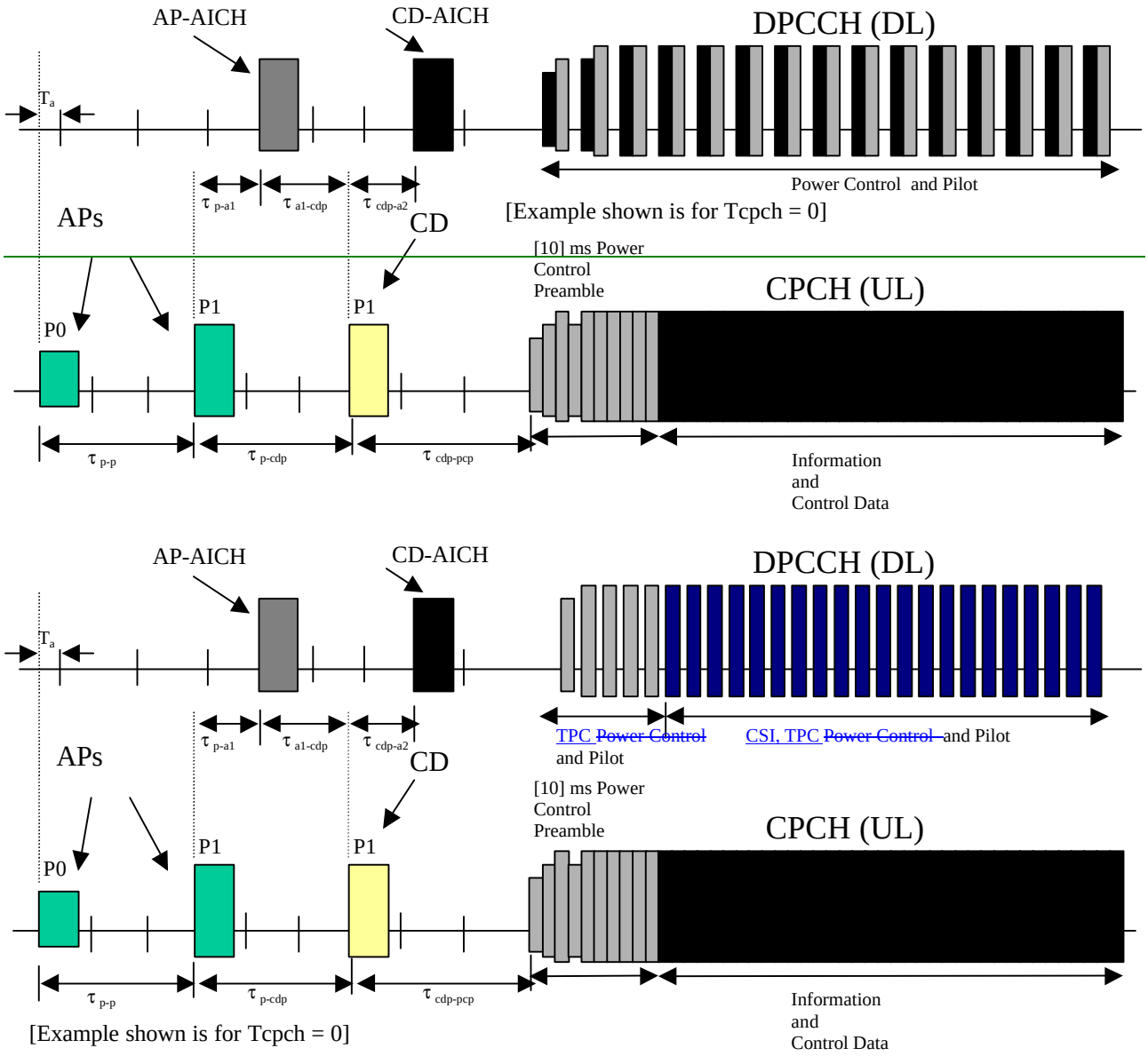
$a_0 = u_2, a_1 = c_9, a_2 = c_{10}, \ldots, a_8 = c_{16}$

a_i where i = 0,…8 is found in [3] section 4.3.1

u_i where i = 1,2 denotes i th CSI unit

c_i where i = 1,…16 denotes availability of the CPCH corresponding to AP signature i

Section 7.4



2. Text proposal for 25.214

Section 3.3 Abbreviations:

AP	Access Preamble

CD	Collision Detection
CPCH	Common Packet Channel
CSI	CPCH Status Information
PCPCH	Physical Common Packet Channel

Section 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.
- AP- AICH preamble channelization code.
- UL CD preamble scrambling code.
- CD-AICH preamble channelization code.
- CPCH UL scrambling code.
- CPCH UL channelization code. (variable, data rate dependant)
- DPCCH DL channelization code.(512 chip)
- Access slot sub-channel group. (Access slot sub-channel group is a set of access slot sub-channels as defined for the RACH using the SFN and Table 6 in section 6.1.)

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

[RACH/CPCH parameter]

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

[RACH/CPCH parameter]

6. N_period_CSI = The period of CSI transmission. This is a CPCH parameter.

The CPCH access procedure in the physical layer is:

1. The UE MAC function selects a CPCH transport channel from the channels available in the assigned CPCH set The CPCH channel selection includes a dynamic persistence algorithm (similar to RACH) for the selected CPCH channel.
2. The UE sets the preamble transmit power to the value $P_{CPCH\_}$ for initial power level for this CPCH access attempt.

3. The UE sets the AP Retransmission Counter to N_AP_Retrans_Max (value TBD).

4. The UE selects an AP signature from the signature set for this CPCH channel and also an uplink access slot from the access slot subchannel group for this CPCH channel. The selection scheme for the signature is random while the selection scheme for the access slot is the same as described for RACH, in section 6.1

5. The UE transmits the AP using the uplink access slot, signature, initial preamble transmission power.

6. If the UE does not detect the positive or negative acquisition indicator corresponding to the selected signature in the downlink access slot associated with the selected uplink access slot, the UE:

a Selects the next access slot from the access slot sub-channel group. There must be also a distance of three or four access slots from the uplink access slot in which the last preamble was transmitted depending on the CPCH/AICH transmission timing parameter. The selection scheme of this new access slot is the same as described for RACH, in section 6.1.

b Increases the preamble transmission power with the specified offset ΔP .

c Decrease the Preamble Retransmission Counter by one.

d If the Preamble Retransmission Counter < 0, the UE aborts the access attempt and sends a failure message to the MAC layer.

7. If the UE detects the AP-AICH_nak (negative acquisition indicator) with the selected signature in the downlink access slot associated with the selected uplink access slot, the UE aborts the access attempt and sends a failure message to the MAC layer.

8. Upon reception of AP-AICH_ack in the associated downlink slot with the selected signature, the access segment ends and the contention resolution segment begins. In this segment, the UE PHY randomly selects one of 16 signatures and transmits a CD Preamble, then waits for a CD-AICH from the base Node.

9. If the UE does not receive a CD-AICH in the designated slot, the UE aborts the access attempt and sends a failure message to the MAC layer.

10. If the UE receives a CD-AICH in the designated slot with a signature that does not match the signature used in the CD Preamble, the UE aborts the access attempt and sends a failure message to the MAC layer.

11. If the UE receives a CD-AICH with a matching signature, the UE transmits the power control preamble $\tau_{cd\text{-}p\text{-}pc\text{-}p}$ ms later as measured from initiation of the CD Preamble. . The transmission of the message portion of the burst starts immediately after the power control preamble.

12. UTRAN immediately transmits CSI the length of the power control preamble later from the start of DL-DPCCH. UTRAN transmits CSI every N_period_CSI. UE receives CSI every N_period_CSI.

~~12.~~13. During CPCH Packet Data transmission, the UE and UTRAN perform closed loop power control on both the CPCH UL and the DPCCH DL.

~~13.~~14. If the UE detects loss of DPCCH DL during transmission of the power control preamble or the packet data, the UE halts CPCH UL transmission, aborts the access attempt and sends a failure message to the MAC layer.

~~14.~~15. If the UE completes the transmission of the packet data, the UE sends a success message to the MAC layer.