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Source:	**Ad-hoc 14**
Title:	**Proposed CPCH-related insertions into 25.213 (revised Resubmission of R199a72)**
Agenda item:	**Plenary**
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New section: 4.2.3   PCPCH

The spreading and modulation of the message part of the CPCH Access Burst is basically the same as for the uplink dedicated physical channels. Only the control part is transmitted during the first [N] msec of the PCPCH message part. The scrambling code for the PCPCH message part is chosen based on the preamble code.

Add the following sections:

4.3.4   Common packet channel codes

4.3.4.1   Access preamble scrambling code

The access preamble scrambling code generation is done in the same way as for the PRACH with a difference of the initialisation of the x m-sequence. The long code c_{257} for the in-phase component is used directly on both in phase and quadrature branches without offset between branches. For the access preamble scrambling code this is done as follows:

$x_n(0)=n_0$, $x_n(1)= n_1$, ... ,$x_n(7)= n_7$, $x_n(8)= 1$, $x_n(9)=0$,... , $x_n(22)= 0$,$x_n(23)=1$, $x_n(24)=0$

4.3.4.2   CD preamble spreading code

The scrambling code for the access preamble is also used as the CD preamble spreading code. The 4096 chips from 4096 to 8191 of the code are used for the CD preamble spreading with the chip rate of 3.84

Mchip/s. The long code c_{257} for the in-phase component is used directly on both in phase and quadrature branches without offset between branches.

4.3.4.3 CPCH preamble signatures

4.3.4.3.1 Access preamble signature

The access preamble part of the CPCH-access burst carries one of the sixteen different orthogonal complex signatures identical to the ones used by the preamble part of the random-access burst.

4.3.4.3.2 CD preamble signature

The CD-preamble part of the CPCH-access burst carries one of sixteen different orthogonal complex signatures identical to the ones used by the preamble part of the random-access burst.

4.3.4.4 Channelization codes for the CPCH message part

The signature in the preamble specifies one of the 16 nodes in the code-tree that corresponds to channelization codes of length 16. The sub-tree below the specified node is used for spreading of the message part. The control (Q-branch) is always spread with a channelization code of spreading factor 256. The code is chosen from the lowest branch of the sub-tree. The data (I-branch) may use channelization codes from spreading factor 4 to 64. The node A UE is allowed to increase its spreading factor during the message transmission by choosing any channelization code from the uppermost branch of the sub-tree code. For channelization codes with spreading factors less that 16, the node is located on the same sub-tree as the channelization code of the access preamble.

4.3.4.5 Scrambling code for the CPCH message part

In addition to spreading, the message part is also subject to scrambling. The scrambling code is cell-specific and has a one-to-one correspondence to the spreading code used for the preamble part.

 The scrambling codes used are from the same set of codes as is used for the other dedicated uplink channels when the long scrambling codes are used for these channels. The long scrambling codes for 256 to 511 (c_{257} to c_{512}) of the long scrambling codes are used for the CPCH. The phases 8192 and above of the codes are used for the message part (phases 0 to 4095 of c_{257} are used in the access preamble spreading and phases 4096 to 8191 for the CD preamble) with the chip rate of 3.84 Mchips/s.

The generation of these codes is explained in Section 4.3.2.2. The mapping of these codes to provide a complex scrambling code is also the same as for the other dedicated uplink channels and is described in Section 4.3.2.

Add the bold sentences to section 5.1 as follows:

5.1 Spreading

Figure 11 illustrates the spreading and modulation for the downlink DPCH. Data modulation is QPSK where each pair of two bits are serial-to-parallel converted and mapped to the I and Q branch respectively. The I and Q branch are then spread to the chip rate with the same channelization code c_{ch} (real spreading) and subsequently scrambled by the scrambling code C_{scramb} (complex scrambling).
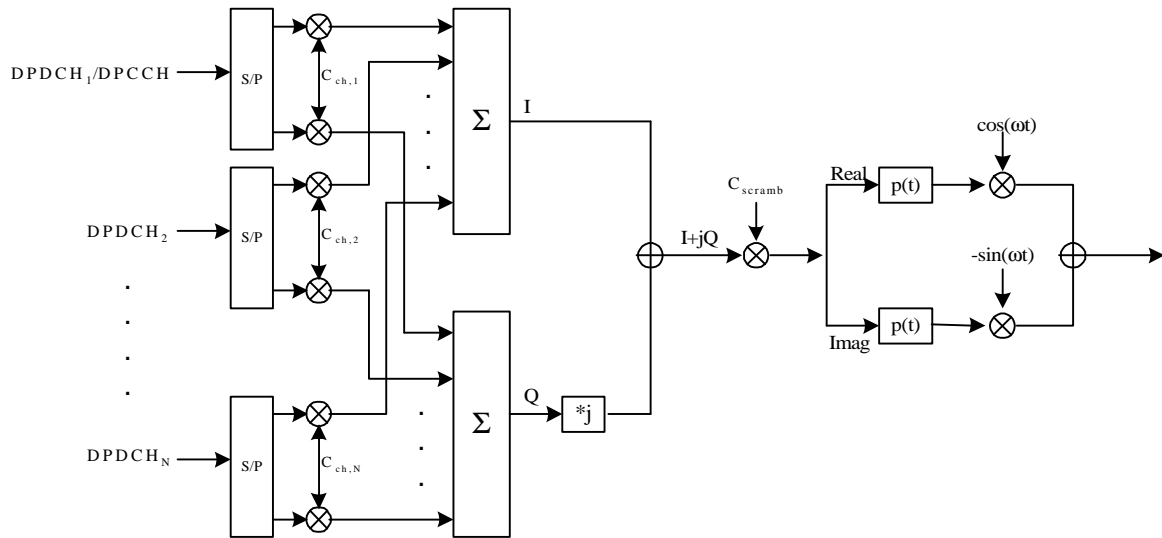
Figure 11.   Spreading/modulation for downlink DPCH.

Spreading/modulation of the Secondary CCPCH, PSCCCH, PDSCH, AICH, AP-AICH and CD-AICH is done in an identical way as for the downlink DPCH.

Spreading/modulation of the Primary CCPCH is done in an identical way as for the downlink DPCH, except that the Primary CCPCH is time multiplexed after spreading as illustrated in Figure 12. Primary SCH and Secondary SCH are code multiplexed and transmitted simultaneously during the 1st 256 chips of each slot. The transmission power of SCH can be adjusted by a gain factor $G_{P\text{-}SCH}$ and $G_{S\text{-}SCH}$, respectively, independent of transmission power of P-CCPCH. The SCH is *non-orthogonal* to the other downlink physical channels.

Add the bold sentences to the section 5.2.1

5.2   Code generation and allocation

5.2.1   Channelization codes

The channelization codes of Figure 11 and Figure 12 are the same codes as used in the uplink, namely Orthogonal Variable Spreading Factor (OVSF) codes that preserve the orthogonality between downlink channels of different rates and spreading factors. The OVSF codes are defined in Figure 3 in Section 4.3.1. The same restriction on code allocation applies as for the uplink, but for a cell and not a UE as in the uplink. Hence, in the downlink, a specific combination of channelization code and scrambling code can be used in a cell if and only if no other channelization code on the path from the specific code to the root of the tree or in the sub-tree below the specific code is used in the same cell with the same scrambling code. The channelization code for the BCH is a predefined code which is the same for all cells within the system**. The channelization codes used for the CPCH are a predefined set of codes, which is the same for all cells within the system.**
The channelization code(s) used for the Secondary Common Control Physical Channel is broadcast on the BCH.