

**Agenda Item:**  
**Source:** CWTS  
**To:** TSG RAN WG1  
**Title:** Mapping of BCH, PCH and FACH onto physical channels  
**Document for:** Discussion and Approval

**introduction:**

This paper introduce the mapping of BCH, PCH and FACH onto the physical channels.

**conclusion:**

It is proposed to discuss and to include the following text proposal in TR25.928.

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**7.3.2 Common Transport Channels**

**[Description:]**

The following figure shows the mapping of BCH, FACH and PCH transport channels onto the P-CCPCH :

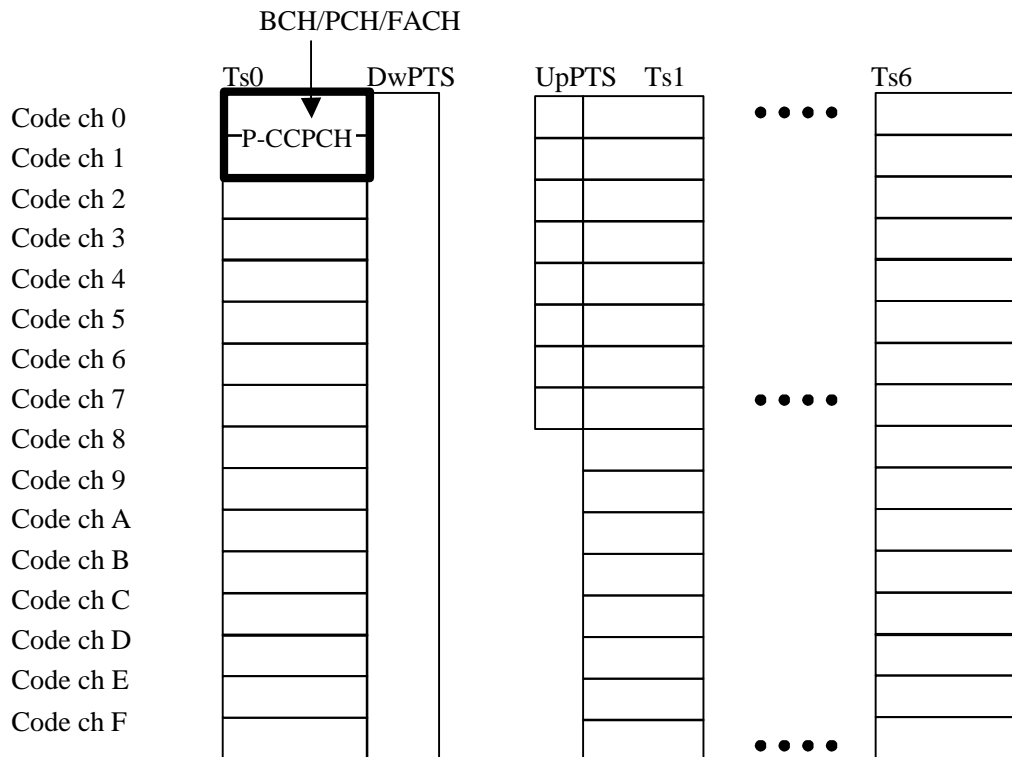


Figure 1 Transport channels mapping onto the physical channels

In low chip rate option, The P-CCPCH is built by the code 0 and 1 (spreading factor 16) not only by code number 0. Once more the first two codes form a single physical channel. The S-CCPCH is formed by another two codes of spreading factor 16 or by a single code of spreading factor 8 on any DL time slot. (as show in the figure 1). More details are giving as following:

The BCH is mapped on a pre-defined number of RUs/physical channels, so that the UE can unambiguously decode it. As it is for the TDD high chip rate option and for FDD mode, the low chip rate option as well foresees for one P-CCPCH only. On the same P-CCPCH, different logical channels can be mapped according to the multi-frame structure.

### **[Rationale:]**

#### **7.3.2.1 The broadcast channel (BCH)**

The BCH is always mapped on the P-CCPCH Due to the adoption of smart antenna, in order to provide the coverage of the whole cell, the P-CCPCH has to have in general higher transmission power level with omni-directional or sectorial pattern (without adaptive beamforming) compared with the other physical channels which can be adaptively beamformed. The BCH is time multiplexed with other channels in the multi-frame.

The UE can find the beginning of each block which is delivered on the P-CCPCH; that is the beginning of the interleaving period, through the DwPTS sequence and its relative phase with respect to the P-CCPCH midamble sequence. Each DwPTS can have 4 different phases and can be independently assigned by the Node B. Several continues different phase DwPTSs's combination can indicate the BCH's position in the multi-frame and the start position of the interleaving period. Also the beginning of the control multiframe can be detected from phase relations. To ensure correct decisions, an additional bit coded together with a BCH block, allows the UE to know the BCH interleaving block in P-CCPCH.

#### **7.3.2.2 The Paging Channel (PCH)**

The PCH is a special broadcast channel used to page UEs from RNC. As mentioned above, it can also be mapped onto the P-CCPCH time multiplexed with the BCH, FACH( see figure 1) , and, therefore, transmitted with the same power level and antenna pattern as those of the BCH. PCH, FACH and BCH will occupy their own blocks in the multi-frame structure. And this is the preferred way, in some condition, the PCH can be mapped onto a different physical channel (S-CCPCH, on any DL time slot but not on the codes used for the P-CCPCH.) , the location of PCH is indicated on the BCH.( This gives more flexibility to the system.)

#### **7.3.2.3 The Forward Access Channel (FACH)**

The FACH 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. The FACH can be mapped onto the P-CCPCH time multiplexed with the BCH and PCH( see figure 1) , and, therefore, transmitted with the same power level and antenna pattern as those of the BCH. PCH, FACH and BCH will occupy their own blocks in the multi-frame structure. And this is the preferred way, in some condition, the FACH can be mapped onto a different physical channel (S-CCPCH, on any DL time slot but not on the codes used for the P-CCPCH.) , the location of FACH is indicated on the BCH.( This gives more flexibility to the system.)

### **[Explanation difference:]**

In high chip rate option, the BCH is always mapped onto P-CCPCH and the PCH/FACH onto the S-CCPCH. The P-CCPCH always contains only the BCH . The secondary SCH indicates in which timeslot a mobile can find the PCCPCH containing BCH. And the location of PCH is indicated on the BCH.

In low chip rate option, the BCH is mapped only onto the P-CCPCH (Primary Common Control

Physical Channel). The P-CCPCH can also contain the PCH and FACH as well as the BCH. The P-CCPCH is mapped onto the DL time slot preceding the DwPTS using two codes of that time slot (as shown in the figure 1) as described above. According the frame structure, P-CCPCH carrying the BCH is followed by DwPTS, so when the UE detects the SYNC word, it can immediately find the BCH.

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