TSG-RAN Working Group1 meeting #5 *TSGR1#5(99)713*

***Cheju (Korea),* June 1st – 4th 1999**

Agenda Item :

Source : Drafting group[1]

Title : Proposal for change of 25.211 to include conclusions from ad-hoc 4 on the CCTrChs

Document for : Discussion

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6. Mapping of transport channels to physical channels

Figure 1 summarises the mapping of transport channels to physical channels.

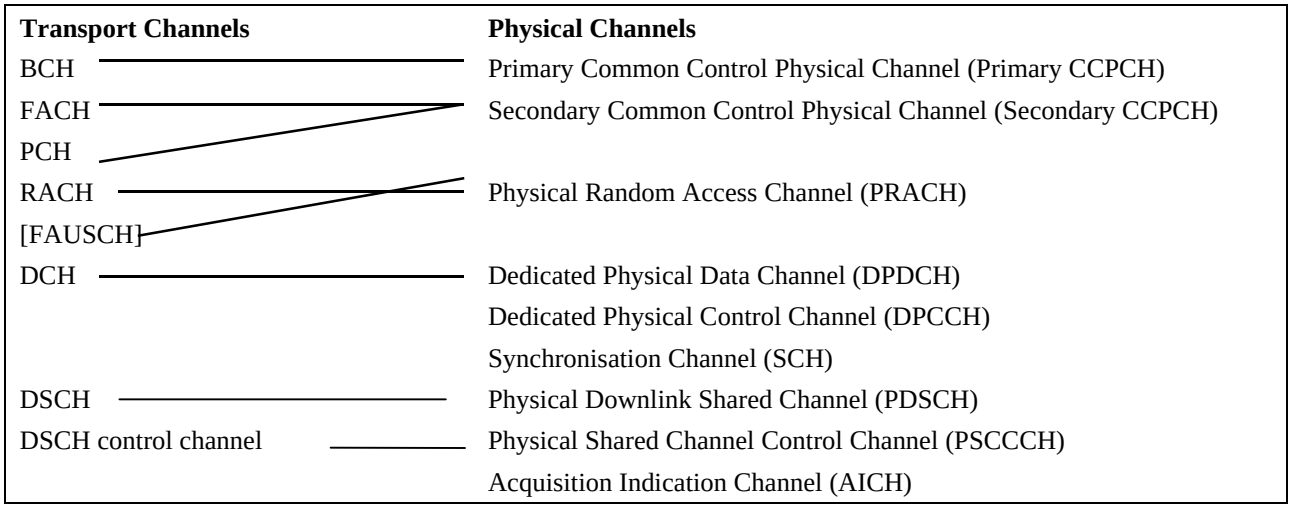

Figure 1: Transport-channel to physical-channel mapping.

The DCHs are coded and multiplexed as described in S1.12, and the resulting data stream is mapped sequentially (first-in-first-mapped) directly to the physical channel(s). The mapping of BCH and FACH is equally straightforward, where the data stream after coding and interleaving is mapped sequentially to the Primary and Secondary CCPCH respectively. Also for the RACH, the coded and interleaved bits are sequentially mapped to the physical channel, in this case the message part of the random access burst on the PRACH. The mapping of the PCH to the Secondary CCPCH is slightly more complicated to allow for an efficient sleep mode, and is described in the next section. The mapping of the DSCH to the PDSCH is done by mapping the data stream sequentially (first-in-first-mapped) directly to the physical channel.

6.1 Method for mapping of PCH to Secondary CCPCH

<Editors note: There is a basic fixed mapping of paging groups to paging blocks and a sliding paging mapping in order to improve the sleep mode.>

The method used to map the paging blocks to the Secondary CCPCH is shown in Figure 2.

The PCH is divided into several blocks in one superframe. Paging groups are mapped to the paging blocks where layer 3 information to each group is transmitted.

The mapping between a paging group "i" and the paging block f(i), which is numbered between 1 and 288, is according

f(i)=i (fixed mapping)

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[1] Ericsson, Nokia, Nortel Networks

$f(i)=((i+SUFN) \bmod N_{PB})) +1$ (sliding paging mapping to improve sleep mode)

where SUFN is the superframe number and N_{PB}=288 paging blocks per superframe. Thereby a paging group is mapped to the paging blocks

(i, i, ...) (fixed)
(i, i+1, i+2….,288,1,2,…) (sliding)

when the superframe number increases.

Each block on the PCH carries information amount worth of 4 slots, and consists of a total of 6 information parts: 2 Paging Indication (PI) parts - for indicating whether there are paging messages or not, and 4 Mobile User Identifier (MUI) parts - for indicating the identity of the UE and carrying the actual paging message.

In each block, PI parts are transmitted ahead of MUI parts.

In all groups, 6 information parts are allocated with a certain pattern in the range of 24 slots. By shifting each pattern by 4 slots, multiple 288 blocks of PCH can be allocated on one Secondary Common Control Physical Channel.

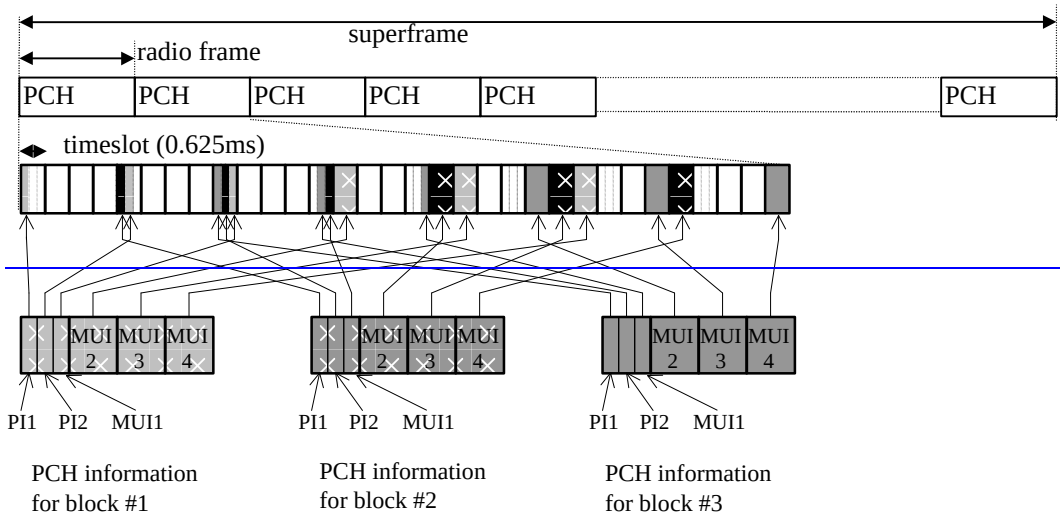
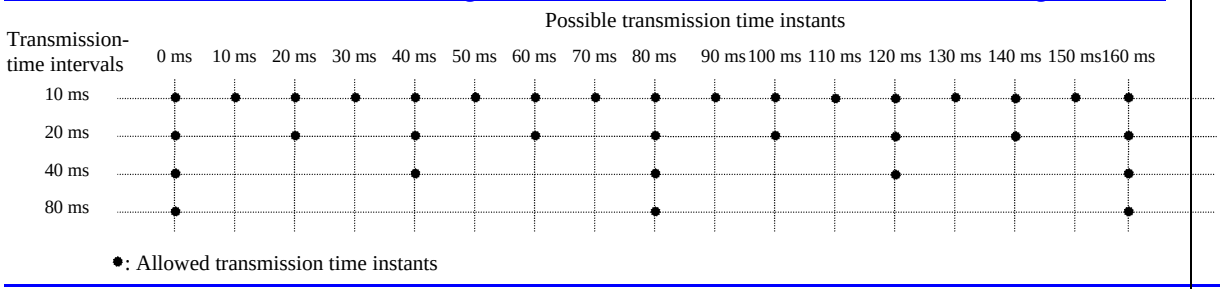


Figure 2: PCH mapping method.

6.2 Multiplexing of different transport channels onto one CCtrCH, and mapping of one CCTrCH onto physical channels

Different transport channels can be encoded and multiplexed together into one Coded Composite Transport Channel (CCTrCH) as described in [4]. The following rules shall apply to the different transport channels which are part of the same CCTrCH:

1) Transport channels multiplexed into one CCTrCh should have co-ordinated timings in the sense that transport blocks arriving from higher layers on different transport channels of potentially different transmission time intervals shall have aligned transmission time instants as shown in the figure below.



2) Only transport channels with the same active set can be mapped onto the same CCTrCH.

3) Different CCTrCHs cannot be mapped onto the same DPDCH.

4) One CCTrCH shall be mapped onto one or several DPDCHs. These physical channel shall have the same SF on the uplink. It is FFS whether one CCTrCH may be mapped –onto DPDCHs with different SF on the downlink. (see note 1)

5) Dedicated Transport channels and common transport channels cannot be multiplexed into the same CCTrCH

6) For the common transport channels, only the FACH and PCH may belong to the same CCTrCH

Note 1 : The decision on the possibility to map one CCtrCH onto DPDCHs of different SFs should consider issues like code usage and physical channel segmentation rule definition and performance.

Note 2 : It is also for further study if one transport channel can be split to several CCTrCHs. However de-multiplexing -might be better located in the MAC layer.

There are hence two types of CCTrCH

1) CCTrCH of dedicated type, corresponding to the result of coding and multiplexing of one or several DCH

2) CCTrCH of common type, corresponding to the result of the coding and multiplexing of a common channel, RACH in the uplink, DSCH , FACH or PCH for the downlink.

7. Allowed CCTrCH combinations for one UE

7.1 Allowed CCtrCH combinations on the downlink

The following CCTrCH combinations for one UE are allowed :

1) x CCTrCH of dedicated type + y CCTrCH of common type

The allowed combination of CCTrCHs of dedicated and common type are FFS.

Note 1: It is for further study if only one or several CCTrCHs of dedicated type are allowed in downlink, i.e if x is allowed to be greater than 1. The decision should consider performance of balancing using rate matching and how to code and transmit the TFCI. The decision should also consider code usage if conclusion from Note 2 in previous section was that one CCTrCH was to be mapped onto DPDCHs with the same SF.

Note 2 : There is only one DPCCH in the uplink, hence one TPC bits flow on the uplink to control possibly the different DPDCHs on the downlink, -part of the same or several CCTrCHs.

Note 3 : It is for further study if several DPCCHs can be transmitted in downlink, in conjunction with one CCTrCH with multiple DPDCHs or multiple CCTrCHs. Even if several DPCCH on the downlink are considered, one TPC command flow in downlink is used , with possibly the same TPC information on the different DPCCH, if applicable.

7.2 Allowed CCTrCH combinations on the uplink

The following CCTrCH combinations for one UE are allowed, where those are mutually exclusive :

1) one CCTrCH of dedicated type

2) one CCTrCH of “common” type

~~7.~~8. Timing relationship between physical channels