TSG-RAN Working Group 1 , AdHoc 21 **TSGR1(00)0828**

Espoo, Finland, June 14 ~ 15, 2000

Agenda Item: AH21
Source: CWTS
To: TSG RAN WG1
Title: Subframe Segmentation
Document for: Discussion and Approval

Introduction

This document describes subframe segmentation in low chip rate TDD option.

Conclusion

It's proposed to discuss and include the following text proposal into the clause 8.1.11 subframe segmentation of TR25.928.

---------- changes to TR25.928 begin ----------

8.1.11 Subframe segmentation

[Description:]

In the low chip rate option the radio frame which has a duration of 10 ms is subdivided into 2 subframes of 5ms each. The basic operated unit is a subframe. The bit streams in CCTrCH are mapped onto code channels of time slots in subframes. So, in low chip rate TDD option, it is needed to add the subframe segmentation unit between 2nd interleaving unit and physical channel mapping unit.

[Rational:]

In low chip rate option the radio frame which has a duration of 10 ms is subdivided into 2 subframes of 5ms each. The basic operated unit is a subframe. The bit streams in CCTrCH are mapped onto code channels of time slots in subframes. So, in low chip rate TDD option, it is needed to add subframe segmentation unit between 2nd interleaving unit and physical channel mapping unit. The operation of rate-matching guarantees that the bit streams is a even number and can be subdivided into 2 subframes. The transport channel multiplexing structure for uplink and downlink is shown in figure 1.

The input bit sequence is denoted by $x_{i1}, x_{i2}, x_{i3}, \ldots, x_{iX_i}$ where i is the TrCH number and X_i is the number bits. The two output bit sequences per radio frame are denoted by $y_{i,n_i1}, y_{i,n_i2}, y_{i,n_i3}, \ldots, y_{i,n_iY_i}$ where n_i is the subframe number in current radio frame and Y_i is the number of bits per radio frame for TrCH i. The output sequences are defined as follows:

$y_{i,n_ik} = x_{i,((n_i-1)Y_i)+k}$, n_i = 1 or 2, $k = 1 \ldots Y_i$

where

$Y_i = (X_i / 2)$ is the number of bits per subframe,

x_{ik} is the k[th] bit of the input bit sequence and

$y_{i,n_i k}$ is the k[th] bit of the output bit sequence corresponding to the n[th] subframe

The input bit sequence to the radio frame segmentation is denoted by $v_{(t)1}, v_{(t)2}, ..., v_{(t)U_{(t)}}$, $x_{ik} = v_{(t)k}$ and $X_i = U_{(t)}$.

The output bit sequence corresponding subframe n_i is denoted by $g_{p1}, g_{p2}, \ldots, g_{pU_p}$, where p is the PhCH number and U_p is the number of bits in one subframe for the respective PhCH. Hence, $g_{pk} = y_{i,n_i k}$ and $U_p = Y_i$.

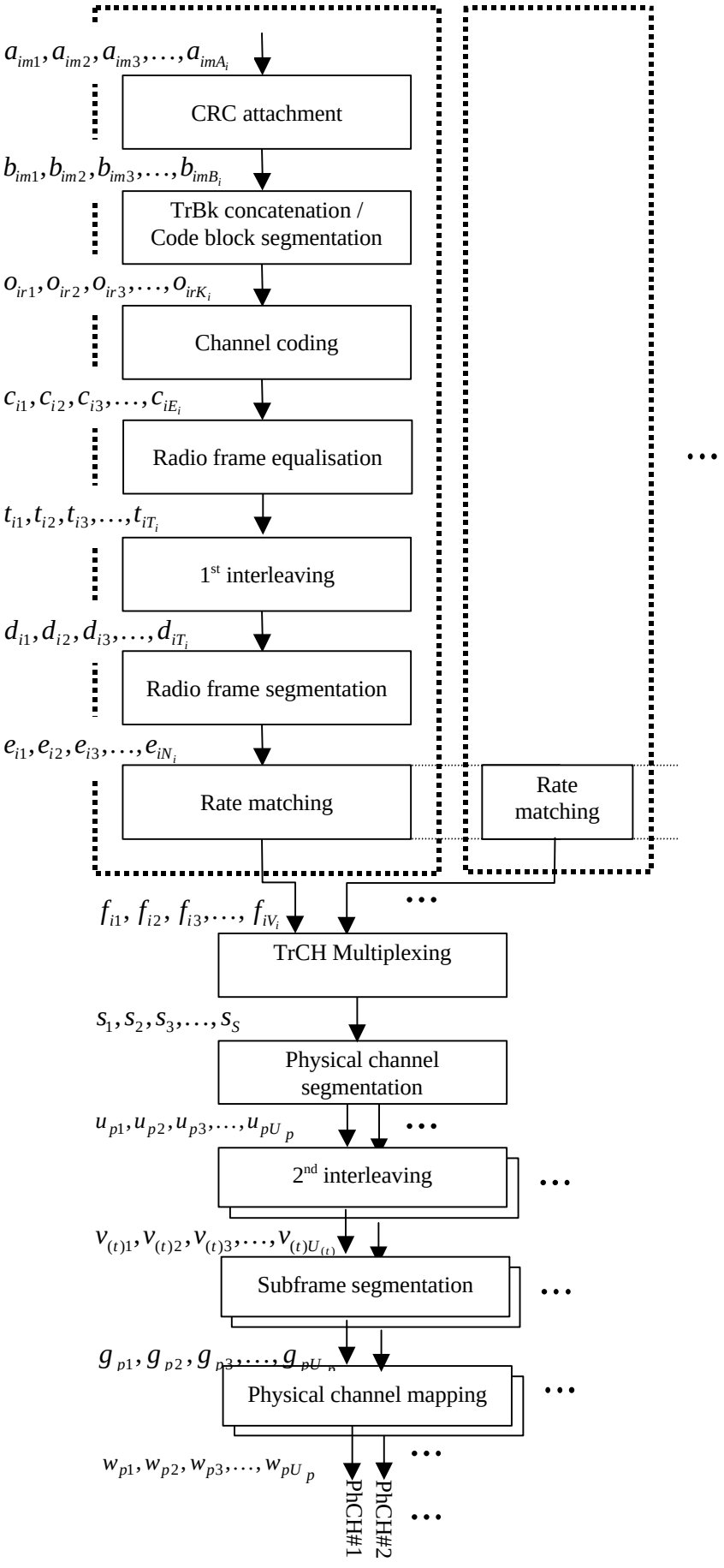
$a_{im1}, a_{im2}, a_{im3}, \ldots, a_{imA_i}$
CRC attachment
$b_{im1}, b_{im2}, b_{im3}, \ldots, b_{imB_i}$
TrBk concatenation / Code block segmentation
$o_{ir1}, o_{ir2}, o_{ir3}, \ldots, o_{irK_i}$
Channel coding
$c_{i1}, c_{i2}, c_{i3}, \ldots, c_{iE_i}$
Radio frame equalisation
$t_{i1}, t_{i2}, t_{i3}, \ldots, t_{iT_i}$
1st interleaving
$d_{i1}, d_{i2}, d_{i3}, \ldots, d_{iT_i}$
Radio frame segmentation
$e_{i1}, e_{i2}, e_{i3}, \ldots, e_{iN_i}$
Rate matching
Rate matching
$f_{i1}, f_{i2}, f_{i3}, \ldots, f_{iV_i}$
TrCH Multiplexing
$s_1, s_2, s_3, \ldots, s_S$
Physical channel segmentation
$u_{p1}, u_{p2}, u_{p3}, \ldots, u_{pU_p}$
2nd interleaving
$v_{(t)1}, v_{(t)2}, v_{(t)3}, \ldots, v_{(t)U_{(t)}}$
Subframe segmentation
$g_{p1}, g_{p2}, g_{p3}, \ldots, g_{pU_p}$
Physical channel mapping
$w_{p1}, w_{p2}, w_{p3}, \ldots, w_{pU_p}$
PhCH#1
PhCH#2

Figure 1: Transport channel multiplexing structure for uplink and downlink

[Explanation difference:]

In low chip rate option the radio frame which has a duration of 10 ms is subdivided into 2 subframes of 5ms each. The bit streams in CCTrCH are mapped onto code channels of time slots in subframes. So, in low chip rate TDD option, it is needed to add subframe segmentation unit between 2nd interleaving unit and physical channel mapping unit. While in high chip rate TDD option it is not included.

---------- changes to TR25.928 end ----------