

Agenda Item: AH21
Source: Siemens AG
To: TSG RAN WG1
Title: Coding of FPACH
Document for: Decision

1. Summary

This paper gives the coding of FPACH for 1.28 Mcps TDD option.

2. Introduction

The FPACH burst contains 32 information bits. And FPACH makes use of one resource unit only at spreading factor 16, so that its burst is composed by 44 symbols, i.e. 88 bits.

The table below gives the content description of the FPACH information bits and their priority order.

Table: FPACH information bits description

Information field	Length (in bits)
Signature Reference Number	3 (MSB)
Relative Sub-Frame Number	2
Received starting position of the UpPCH ($UpPCH_{POS}$)	11
Transmit Power Level Command for RACH message	7
Reserved bits (default value: 0)	9 (LSB)

3. Proposal

We propose to add following paragraphs in the working CR for TS25.222 as the coding of FPACH in the 1.28Mcps TDD option.

----- Beginning of text proposal for working CR for 25.222 -----

4.3.4 Coding of the Forward Physical Access Channel (FPACH)

burst

The FPACH burst is composed by 32 information bits which are block coded and convolutional coded, and then delivered in one sub-frame.

4.3.4.1 Block coding

The 32 information bits are protected by 8 parity bits for error detection as described in sub-clause 4.2.1.1.

4.3.4.2 Convolutional Coding

Convolutional code with constraint length 9 and coding rate $\frac{1}{2}$ is applied as described in sub-clause 4.2.3.1.

The size of data block $c(k)$ after convolutional encoder is 96 bits.

4.3.4.3 Rate matching

To adjust the size of the data block $c(k)$ to the size of the FPACH burst, 8 bits are punctured as described in sub-clause 4.2.7.

The 88 bits after rate matching are then delivered to the intra-frame interleaving.

4.3.4.4 Interleaving

The bits in input to the interleaving unit are denoted as $\{x(0), \dots, x(87)\}$. The coded bits are block rectangular interleaved according to the following rule: the input is written row by row, the output is read column by column.

?	$x(0)$	$x(1)$	$x(2)$	□	$x(7)$?
?	$x(8)$	$x(9)$	$x(10)$	□	$x(15)$?
?	□	□	□	□	□	?
?	$x(80)$	$x(81)$	$x(82)$	□	$x(87)$?

Hence, the interleaved sequence is denoted by $y(i)$ and are given by:

$y(0), y(1), \dots, y(87)=x(0), x(8), \dots, x(80), x(1), \dots, x(87).$

Textproposal for working CR for 25.222

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