TSG-RAN Working Group 1 meeting #7 **TSGR1#7(99)d45**
Hannover, Germany, Aug. 30 - Sep. 3, 1999

Agenda Item:

Source: **SK Telecom**

Title: **Uplink Synchronization Transmission Scheme**
Document for: **Discussion**

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1. Introduction

Uplink Synchronous Transmission Technique was adopted as an optional techniques for low mobility UE in ARIB Volume 3 and has been discussed in ETSI layer 1 expert meetings[1][2]. But it has not been accepted in text and as a pending item, which is described in section 9. In this document, we propose the refined text for further discussion.
Major changes from the previous description are;

- channelization code assignment method for reducing Peak to Average power Ratio [3].
- scrambling code generation method
- revision of ~~fine~~ the text and fix the undefined parameters.

2. Text Proposal

4.3.2 Scrambling codes

4.3.2.1 General

There are 2^{24} uplink scrambling codes. Either short or long scrambling codes should be used on the uplink. The short scrambling code is typically used in cells where the base station is equipped with an advanced receiver, such as a multi-user detector or interference canceller. With the short scrambling code the cross-correlation properties between different physical channels and users does not vary in time in the same way as when a long code is used. In cells where there is no gain in implementation complexity using the short scrambling code, the long code is used instead due to its better interference averaging properties. Both short and long scrambling codes are represented with complex-value.
The uplink scrambling generator (either short or long) shall be initialised by a 25 bit value. One bit shall indicate selection of short or long codes (short = 1, long = 0). Twenty four bits shall be loaded into the scrambling generators as shown in sections 4.3.2.2 and 4.3.2.3.

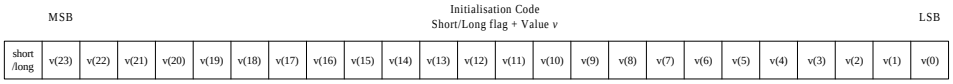

Figure 1~~1~~5 - Initialisation Code for Uplink Scrambling generator

~~[Alternatively, if the system chooses, RSTS for uplink transmission, the scrambling code is the same as the downlink scrambling code described in 5.2.2. In this case, the same scrambling code is allocated to all dedicated physical channels in the cell.]~~

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9 Reverse link synchronous transmission

~~*< Editor's note: This clause is only to be found in ARIB Volume 3. Some more discussion on this technique is probably needed, and for now the original text is kept. The physical layer procedures of RSTS needs to be identified and further refined and described in this clause. >*~~

Since the timing control is carried out at much lower rate than TPC, TAB replaces the TPC bit every timing control period of 20 msec. ~~(In the exemplary embodiment, t~~ The timing control period equals to the ~~frame~~ length of two frames~~or multiples of it,. In case of the example of timing control every frame,~~ and the first TPC bit of every two ~~ach~~ frames is replaced by TAB~~)~~

- At the UE, hard~~soft~~ decision on the TAB shall be performed, and when it is judged as "0", the transmission time shall be delayed by ~~1/4 (or~~ 1/8~~)~~ chip, whereas if it is judged as "1", the transmission time shall be advanced by ~~1/4 (or~~ 1/8~~)~~ chip.

9.4 Reference time

The reference time of cell is set up at even numbered frame starting timing plus half slot duration.~~the starting point of forward link frame plus the median value between minimum and maximum round trip delay within a cell. < *Editor's note: How can one take the median of two values?* >~~

Note) The required L2, L3 procedures for supporting USTS

- As the USTS is optional technique, the message indicating whether a base station is based on USTS or not is included in BCH.
- The message for the initial synchronization process in FACH.
- Channelization code allocation message in FACH

3. References

[1] TTA, “Reverse Link Synchronous Transmission Scheme,” Tdoc SMG2 UMTS-L156/98
[2] TTA, “Text Proposal for Uplink Synchronous Transmission Scheme,” Tdoc SMG2 UMTS-L1 410/98
[3] ETRI, “Channelization code assignment for RSTS” TSGR1#5(99)581