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Agenda Item: AH21
Source: Siemens AG
To: TSG RAN WG1
Title: Coding of SS commands in 1.28Mcps TDD
Document for: Decision

1. Summary

The SS command, one kind of L1 control signals, is an identifier sent in downlink, to instruct a timing adjustment. In 3.84 Mcps TDD, the SS information is not transmitted. Because of uplink synchronisation in 1.28 Mcps TDD, SS information is transmitted, as one of L1 signals, once per 5ms sub-frame. The length of the SS command is 1 symbol.

2. Introduction

The SS command is an identifier sent in downlink, to instruct a timing adjustment each M frames. The length of the SS command is 1 symbol, which gives maximum distance between the 'Up' and 'Down' command.

The SS bits "11" mean "Up" command which increasing synchronisation shift $k/8 T_c$, "00" mean "Down" command which decreasing the timing advance by $k/8 T_c$ while "01" means "do-nothing" – no change - when using QPSK.

If the modulation of 8PSK is applied, e.g. in case of 2Mbps service, the number of the SS bits is 3. The specific coding of SS for the case of 8PSK service is similar as that of the modulation of QPSK. The "Up" command, SS bits "110" means increasing timing advance $k/8 T_c$. The "Down" command "000" means decreasing the timing advance by $k/8 T_c$ while "011" means "do nothing" – no change. It gives maximum distance between the "Up" and "Down" commands from the modulation constellation point view.

M (1-8) and k (1-8) can be adjusted during call setup or readjusted during the call.

3. Proposal

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

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

4.4.5 Coding of Synchronization Shift Control(SS)

4.4.5.1 Coding of SS for QPSK

The SS command is an identifier sent in downlink transmission only, to instruct the UE whether the synchronisation shift has to be increased or decreased by $k/8 T_c$ or has to remain unchanged. The length of the SS command is one symbol. The coding of the SS command is shown in table XX.

Table XX: Coding of the SS for QPSK

<u>SS</u>	<u>SS Bits</u>	<u>Meaning</u>
<u>'Down'</u>	<u>00</u>	<u>Decrease synchronisation shift by $k/8 T_c$</u>
<u>'Up'</u>	<u>11</u>	<u>Increase synchronisation shift by $k/8 T_c$</u>
<u>'Do nothing'</u>	<u>01</u>	<u>No change</u>

4.4.5.2 Coding of SS for 8PSK

The SS command is an identifier sent in downlink transmission only, to instruct the UE whether the synchronisation shift has to be increased or decreased by $k/8 T_c$ or has to stay unchanged. The length of the SS command is one symbol. The coding of the SS command is shown in table XXX.

Table XXX: Coding of the SS for 8PSK

<u>SS</u>	<u>SS Bits</u>	<u>Meaning</u>
<u>'Down'</u>	<u>000</u>	<u>Decrease synchronisation shift by $k/8 T_c$</u>
<u>'Up'</u>	<u>110</u>	<u>Increase synchronisation shift by $k/8 T_c$</u>
<u>'Do nothing'</u>	<u>011</u>	<u>No change</u>

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