TSG-RAN Working Group 1 meeting#15 ***TSGR1(00)1020***
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Agenda Item: AH21
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To: TSG RAN WG1
Title: Cell Search for 1.28Mcps TDD
Document for: Discussion and Approval

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1 Summary

In the1.28Mcps TDD, the DwPTS is used to establish synchronisation and to identify the cell. When powered on, the UE starts the initial cell search procedure, it searches for a cell. First, the UE determines the DwPTS of the cell thus acquire downlink synchronisation, next it finds the scrambling and basic midamble code identification, then control multi-frame synchronisation and at last reads the contents in BCH. This initial cell search is carried out in 4 steps.

This four-step procedure is a little different from that of 3.84Mcps option.

2 Proposal

It's proposed to discuss and include the following text proposal into the clause 5.3.1 Cell Search of working CR of TS25.224.

---------- Changes to working CR of 25.224 begin ----------

5.3.1Cell search

During the initial cell search, the UE searches for a cell. It then determines the DwPTS synchronization, scrambling and basic midamble code identification, control multi-frame synchronisation and then reads the contents in BCH. This initial cell search is carried out in 4 steps:

Step 1: Search for DwPTS

During the first step of the initial cell search procedure, the UE uses the SYNC (in DwPTS) to acquire DwPTS synchronization to a cell. This is typically done with one or more matched filters (or any similar device) matched to the received SYNC which is chosen from PN sequences set. A single or more matched filter (or any similar device) is used for this purpose. During this procedure, the UE needs to identify which of the 32 possible SYNC sequences is used.

Step 2: Scrambling and basic midamble code identification

During the second step of the initial cell search procedure, the UE receives the midamble of the P-CCPCH.The P-CCPCH is followed by the DwPTS. In the 1.28Mcps TDD each DwPTS code corresponds to a group of 4 different basic midamble code. Therefore there are total 128 midamble codes and these codes are not overlapping with each other. Basic midamble code number divided by 4 gives the SYNC code number. Since the SYNC and the group of basic midamble codes of the P-CCPCH are related one by one (i.e, once the SYNC is detected, the 4 midamble codes can be determined), the UE knows which 4 basic midamble codes are used. Then the UE can determine the used basic midamble code using a try and error technique. The same basic midamble code will be used throughout the frame. As each basic midamble code is associated with a scrambling code, the scrambling code is also known by that time. According to the result of the search for the right midamble code, UE may go to next step or go back to step 1.

Step 3: Control multi-frame synchronisation

During the third step of the initial cell search procedure, the UE searches for the MIB(Master Indication Block) of multi-frame of the BCH in the P-CCPCH indicated by QPSK phase modulation of the DwPTS with respect to the P-CCPCH midamble. The control multi-frame is positioned by a sequence of QPSK symbols modulated on the DwPTS. [n] consecutive DwPTS are sufficient for detecting the current position in the control multi-frame. According to the result of the control multi-frame synchronisation for the right midamble code, UE may go to next step or go back to step 2.

Step 4: Read the BCH

The (complete) broadcast information of the found cell in one or several BCHs is read. According to the result the UE may move back to previous steps or the initial cell search is finished.

---------- Changes to working CR of 25.224 end ----------