

**Agenda Item:**  
**Source:** CWTS  
**To:** TSG RAN WG1  
**Title:** Cell search procedures for low chip rate TDD option  
**Document for:** Approval

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## Introduction

In 3GPP, there are two options for TDD mode. They are high chip rate option (3.84Mcps) and low chip rate option (1.28Mcps). Although the initial cell search procedure of them are both carried out in three steps.,they are different for low chip rate option has its own features and properties,

## Cell Search Procedures

During the initial cell search, the UE searches for a cell. It then determines the DwPTS, sub-frame and multi-frame synchronisation of that cell and then decodes the contents in BCH. This initial cell search is carried out in three 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 filter (or any similar device) matched to the received SYNC which is chosen from Gold sequences set. This can be obtained by detecting peaks in the matched filter(s) output(s). The corresponding SYNC of the maximum peak is the SYNC of the strongest cell.

In order to get more reliable output on low signal-noise-ratio, the output(s) of the matched filter(s) may accumulate a few sub-frames before decision.

### Step 2: Sub-frame synchronisation

During the second step of the initial cell search procedure, the UE receives the BCH, which is followed by the DwPTS Since the SYNC and the scrambling code of the BCH is relevant one by one (that is, once the SYNC is detected, the BCH scramble code can be determined), the UE can verify the correction of the BCH. According to the result of verification, UE may go to next step or go back to step 1.

### Step 3: Multi-frame synchronisation

During the third step of the initial cell search procedure, the UE search for the head of multi-frame and get the frame number first. And then read the complete broadcast information of the found cell in one or several BCHs.

## Conclusion

This document describes the cell search procedure of low chip rate option,it's proposed to include this new feature for low chip rate TDD option in new clause 8.3.2 of TR 25.928

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## **8.3 Synchronisation and Cell Search Procedures**

### **8.3.1 Uplink synchronisation**

### **8.3.2 Cell Search Procedures**

During the initial cell search, the UE searches for a cell. It then determines the DwPTS, sub-frame and multi-frame synchronisation of that cell and then decodes the contents in BCH. The initial cell search uses the DwPTS and BCH are described in [1].

This initial cell search is carried out in three steps:

#### **Step 1: Search for DwPTS**

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#### **Step 2: Sub-frame synchronisation**

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#### **Step 3: Multi-frame synchronisation**

During the third step of the initial cell search procedure, the UE search for the head of multi-frame and get the frame number first. And then read the complete broadcast information of the found cell in one or several BCHs.

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