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Re:	Supporting document for Letter Ballot #17 comment
Abstract	The definition of achieving MAC synchronization is based on the concept of valid DL-MAP/DCD messages without properly specifying what that actually means.
Purpose	Correction to be included into P802.16-2004/Cor1-D1
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Definition of valid DL-MAP/DCD messages in MAC synchronization

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Introduction

The changes proposed in this document are to clarify the meaning of "valid" DL-MAP and usage of such to achieve MAC synchronization during the Network Entry and Initialization.

Description of Problem

The text indicates that the SS achieves MAC synchronization once it has received at least one DL-MAP message. It also states that an SS MAC remains synchronized as long as it continues to successfully receive "valid" DL-MAP and DCD messages for its Channel. However, it is possible to receive a DL-MAP before a DCD message in which case there is no means to decode the DL-Burst Profiles contained in the DL-MAP. Therefore, is the DL-MAP received successfully and considered valid? If MAC synchronization and maintaining it is based on solely receiving a DL-MAP with correct CRC, then the SS might exit the MAC synchronization stage without proper understanding of the burst profiles and lacks the parameters to start initial ranging. If "valid" DL-MAP includes being able to understand all included parameters then a DCD message has to be received before the timeout condition for Lost DL-MAP occurs, otherwise the SS is forced to scan for another channel even though the current one was perfectly suitable (see Figure 57). However, this timeout condition might easily occur before the first DCD message is received (T1 >> Timeout Lost DL-MAP).
To avoid this, the Timeout Lost DL-MAP has to be started after a DCD has been received.

In order to clarify that to receive a DL-MAP successfully, all fields contained with the DL-MAP must be understood. To do this implies that the DCD and a DL-MAP must both be received before you can consider the MAC "synchronized".

Proposed Text Changes

Text changes apply to P802.16-2004/Cor1.
On page 26, line 48 insert:

6.3.9.2 Obtain downlink parameters

Change the first paragraph as indicated:

The MAC shall search for a DCD MAC management message followed by ~~the~~ DL-MAP MAC management messages. The SS achieves MAC synchronization once it has received at least one DCD message followed by a DL-MAP message and is able to decode the DL-Burst Profiles contained therein. An SS MAC remains in synchronization as long as it continues to successfully receive the DL-MAP and DCD messages for its Channel. If the Lost DL-MAP Interval (Table 342) has elapsed without a valid DL-MAP message or the T1 interval (Table 342) has elapsed without a valid DCD message, an SS shall try to reestablish synchronization. The process of acquiring synchronization is illustrated in Figure 56. The process of maintaining synchronization is illustrated in Figure 57.

Replace Figure 56 on page 170 in IEEE Std 802.16-2004 with the following:

```
                    ( Start )
                        |
                        |<--------------------------+
                        v                           |
                ┌───────────────┐                   |
                │   Start T20   │                   |
                └───────────────┘                   |
                        |                           |
                        v                           |
                ┌───────────────┐                   |
                │  Search for PHY│                   |
                │ frame on channel i│                |
                └───────────────┘                   |
                   |          |                     |
                   v          |                     |
            ┌────────────┐    |                     |
            │ PHY Frame  │    |                     |
            │  Detected  │    |                     |
            └────────────┘    |                     |
                   |          |                     |
                   v          |                     |
            ┌────────────┐    |                     |
            │  Start T21 │    |                     |
            └────────────┘    |                     |
               |       |      |                     |
               v       v      |                     |
          ┌──────┐  ┌──────────┐                    |
          │ DCD  │  │Timeout T21│                   |
          └──────┘  └──────────┘                    |
            |    |       |                          |
            v    v       |                          |
     ┌────────┐ ┌──────────┐                        |
     │ DL-MAP │ │Timeout T21│                       |
     └────────┘ └──────────┘                        |
         |          |                               |
         v          |                               |
  ┌──────────────┐  |       ┌──────────┐            |
  │Start Lost    │  |       │Timeout T20│<----------+
  │DL-MAP        │  |       └──────────┘
  └──────────────┘  |           |
         |          |           v
         v          |     ┌──────────────┐
  ┌──────────────┐  |---->│ Move to next │
  │   Start T1   │        │ channel, i=i+1│
  └──────────────┘        └──────────────┘
         |                       |
         v                       |
  ┌──────────────┐               |
  │   Start T12  │               |
  └──────────────┘               |
         |                       |
         v                       |
  ┌──────────────┐               |
  │  Downlink    │               |
  │  Synch.      │               |
  │  Established │               |
  └──────────────┘
         |
         v
  ( Synchronized )
```
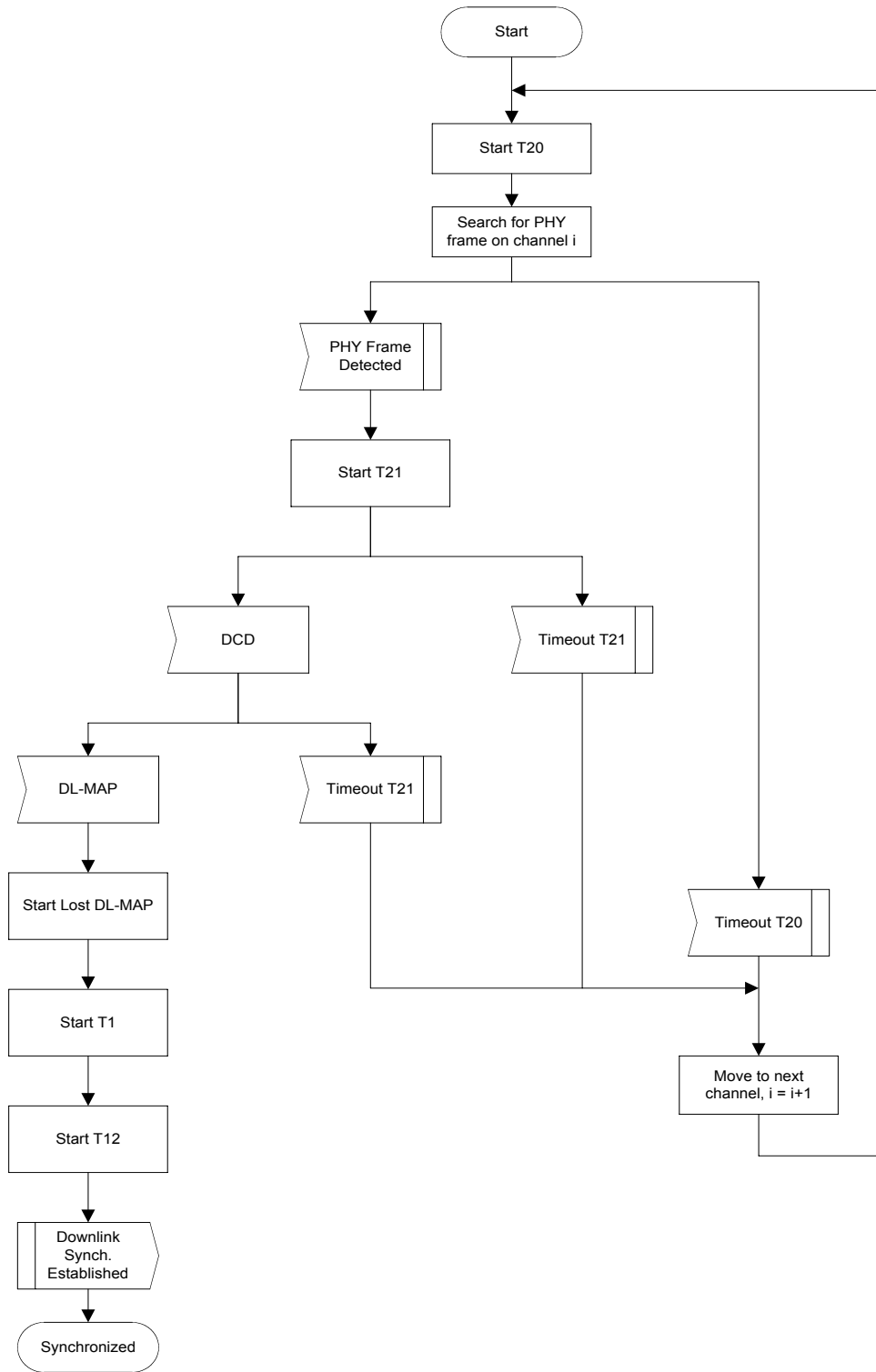
Change Table 114 as indicated:

BS   SS

2

clock time to send DL-MAP   ----------------- DL-MAP ---------------->
                                                                                   power on sequence
complete

clock time to send DL-MAP   ----------------- DL-MAP ---------------->

                                                                                   establish PHY

synchronization

clock time to send DL-MAP   ----------------- DL-MAP ---------------->

clock time to send DCD   -------------------- DCD ------------------->

clock time to send DL-MAP   ----------------- DL-MAP ---------------->
                                                                                   establish MAC PHY
synchronization
                                                                                    & wait for UCD

clock time to send DL-MAP   ----------------- DL-MAP ---------------->