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Title	Changes to the Section 15.1.5.3 re: Coexistence Control Channel Description and Function
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Re:	Changes to Draft Standard
Abstract	Editorial changes to provide clarity and change; changes as suggested by comments in LB#24
Purpose	Add consistency and clarity to draft document.
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Changes to Section 15.1.5.3 re: Coexistence Control Channel Description and Function

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Introduction

The current draft document [1] has an outdated description of the Coexistence Control Channel in Sections 15.1.5.3 and 15.1.5.3.1. The following editorial changes give an updated description of the CXCC and provide greater detail on its use and function. In Section 15.1.5.3.1 detail is given regarding the use of all the slots in the CXCC.

This document provided to deal with specific comments made during [2];

Comment 180: More details are provided in this document, as requested.
Comment 186: Details of how the CXCC is tied to the MAC (specifically by use of the CX_MAC_NO scheme is provided now.
Comment 238: Better definition of CXCC provided

Specific Editorial Changes

This section provides a list of changes to Ref[1].

Blue Underlined text represents specific editorial additions
~~Red strikethrough text~~ is to be deleted.
Black text is already in the draft.
Bold Italic text is editorial instructions to the editor.

Make the following changes to Section 15.1.5.3 by adding the following editorial changes to the text currently found on page53 and between lines20 and 36 of Ref [1].

15.1.5.3 CXCC-Coexistence Control Channel

The CXCC is the Coexistence Control Channel. It is created by having the Base Station synchronized to a universal timing standard (15.2.1) and observe fixed, but periodic timing requirements. It is a virtual channel in that all Base Stations (and their subscriber stations) have precisely known slots of time in which interference-free communications and monitoring can be undertaken.

The CXCC the provides for the following functionality:
— Time-synchronization for systems failing to use a direct GPS absolute time source;
— Measurement of cumulative Wireless MAN-CX interference by means of Radio Signature measurements.
— Identification of Wireless MAN-CX and other system interference sources.

— Measurement of (No+Io) noise floors when all Wireless MAN-CX systems are silent
— Coordination of the operation of Ad-Hoc systems and facilitates the reservation of interference-free slots for mutual coexistence;
— Broadcast of the IP Address of the Coexistence Proxy Server to enable IP level inter-system communication.

Make the following changes to Section 15.1.5.3.1 by adding the following editorial changes to the text currently found on page53 and between lines 39 and 65 of Ref [1].

15.1.5.3.1 Composition and implementation of the CXCC ~~CX Control Channel~~

The CXCC ~~Coexistence Control Channel~~ is composed ~~from~~ of time-slots Tcc_s having ~~of [2~~ 1.9~~]~~ ms duration, alternately appearing in ~~each for~~ UL and DL sub-frames ~~every~~ spaced apart by a ~~[~~200~~]~~ ms duration (Tcc)~~;~~ . A total of 50 slots constitute~~ing~~ a multi-frame Tcxcc having a duration of ~~[15~~ 10~~]~~ sec. The location of the frames in which the Coexistence Control Channel time-slots exist is given by the CX_MAC_NO (Section 10.5.3.1). The location of the time slot Tcc_s within either the DL or UL sub-frame is specified in Table 345c. Base Stations synchronized to the CXCC can indicate origin and intensity of mutual interference in a controlled manner by the transport of coexistence interference messages. They can also undertake synchronized noise and interference sensing operations during the channel slots .

Every system ~~will use~~ having selected its operating frequency channel, will synchronize to the universal time standard (15.2.1) and implement the timing requirements constituting the CXCC, as defined by the parameters of Section 10.5.3.1, and Tables 345c and 345d. All systems must do this prior to transmiting or receiveing on the CXCC ~~Control Channel~~.

The CX Control Channel ~~is using slots as follows~~ has the following control slots:

— [7] Timing Recovery Slots at the beginning of the CXCC cycle used for distributing universal time synchronization information. These slots are used by BS having the ability to derive such information from terrestrial or satellite timing distribution systems and in turn re-distribute the synchronzation information to BS not capable of deriving synchronization universal synchronization from terrestrial or satellite time systems. [The manner in which this is done is TBD]

—[4] AT1-4 Slots used by Ad-Hoc systems for TBD registration.

—[4] Frequency Keying slots for TBD Frequency Keying functions

— [~~6~~ 12] CX_CMI_Dn slots ~~/ sub-frames shall be~~ used by the Base Stations (DL) ~~operating during the sub-frame as Master~~. Those Base Stations shall transmit their radio signatures (such as BSD or Frequency Keyed Intervals) ~~with~~ at the maximum EIRP Spectral density used during ~~the~~ operation. In this way the BSs will provide the other systems sharing the ~~CX~~ Control Channel with the maximum interference levels. Systems operating on adjacent frequencies and using the same sub-frame may also induce interference, such that the signal levels to be measured in a slot will provide the possibility to evaluate the cumulated interference. ~~The radio signatures will be transmitted according to CMI or CSI procedures~~. Of the 12 DL slots, the last 6 (CX_CMI_D4-6) are reserved for future use. A CX_CMI_Dn slot is specifically claimed by a system, and only that system of the Coexistence Community is allowed to transmit its downlink Radio Signature. A CX_CMI_Dn slot is paired with a CX_CMI_Un slot. Each CX_CMI_Dn slot appears twice during Tcxcc.

— [~~6~~12] CX_CMI_Un slots ~~/ sub-frames shall be~~ used by the SSs (UL) ~~operating during the sub-frame as Master~~. Those Subscriber Stations shall transmit their radio signatures (such as SSURFs or Frequency Keyed Intervals) with the maximum EIRP~~.~~ Spectral density used during the operation. In this way the ~~BSs~~ SSs will provide the other systems sharing the ~~CX~~ Control Channel with the maximum interference levels. Of the 12 slots, the last 3 (CX_CMI_U4-6) are reserved for future use. A CX_CMI_Un Slot is specifically claimed by a system, and only that system of the Coexistence

Community is allowed to Uplink transmit its Radio Signature. A CX_CMI_Dn slot is paired with a CX_CMI_Un slot. Each CX_CMI_Un slot appears twice during Tcxcc.

— [~~3~~ 4] (No+Io) slots ~~DL and [3] slots UL~~ are provided for sensing the interference from systems not using the WirelessMAN-CX approach. During these intervals all Wireless MAN-CX systems cease transmission and monitor interference. These intervals are also used for measurement of the Thermal Noise Floor [N] of a receiver when there is no activity on the channel.

References

[1] IEEE P802.16h/D1: *Air Interface for Fixed Broadband Wireless Access Systems Improved Coexistence Mechanisms for License-Exempt Operation*, Draft Standard.

[2] IEEE 80216h-06_068r2: *Letter Ballot #24 Commentary file with resolutions from Session #46.*