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Title	**A scheme for the absolute identification and numbering of Coexistence Control Channel Slots**
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Re:	IEEE 802.16h-06/015r1 – working group review.
Abstract	This document defines a scheme that will identify the intervals of time in which the Coexistence Control Channel (CX_CC) slots are available.
Purpose	This document is provided to define a scheme that will identify the intervals of Coexistence Control Channel in WirelessMAN-CX systems.
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A scheme for the absolute identification and numbering of Coexistence Control Channel Slots

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Introduction

A scheme is required that will identify the intervals of time in which the Coexistence Control Channel (CX_CC) slots are available. The position of these slots need to be universally known to all WirelessMAN-CX systems in order to coordinate noise and interference measurements, identify non-Wireless MAN_CX users, and to send specific signaling required for the resolution of inter-system co-channel interference. The scheme described below is proposed.

The Coexistence Control Channel (CX_CC) is composed of time slots of approximately 1.9 milliseconds duration (Tcc-s) that have a repetitive cycle of 12 seconds (T-cogn). There are 60 slots in every repetitive cycle. Each slot occurs every 200 ms (Tcc). The start of this period is 0030:000 in Absolute Time, thus there are 7200 T-cogn cycles per 24 hour day. The positions of the uplink and downlink slots inside the frame is detailed in Section 10.5.2.

The CX_CC time slots are designed to appear within the Common Frame. The numbering of this frame is defined in Section 6.4.1.3 and the location of a specific CX_CC slot is identified by its CX_MAC_NO. The frame number for the same CX_CC slot changes depending on the frame duration; however the position of a the specific slot in absolute time is independent of the frame numbering. Thus, the same CX_CC slot occurs at exactly the same time, regardless if a 5, 10, or 20 msec frame duration is chosen.

The first 4 CX_CC time slots are devoted to GPS synchronization signal distribution as detailed in section 15.2.1.1. Two slots are devoted each to uplink and downlink transmissions.

A total of 7 slots are available during the CX_CC cycle for measurement of noise floor and detection on non-WirelessMAN-CX systems. These slots (CX_CC_No1-7) are universally quiet for all WirelessMAN_CX terminals. Both BS and SS simply listen during these intervals.

There are 4 slots (AT1-4) reserved for ad-hoc registration of Wireless MAN-CX systems as detailed in Section 15.4.3.2. These are special slots which are 20 milliseconds in duration and specifically set for Radio Signature signaling using Frequency-keyed energy pulses.

For same-PHY systems using the Coexistence Message Interval signaling (using BSD and SSURF messaging); provision has been made to accommodate 6 co-channel systems.
Each system (n) has 3 downlink CMI (CX_CMI_Dn) slots and 3 uplink slots (CX_CMI_Un) per repetitive cycle in which to schedule and transmit BSD and SSURF messages. Initially only CMI intervals 1-3 will be used.

For systems using CSI signaling, 24 intervals are identified roughly spaced at 400 msec intervals. The CSI would be inserted at the end of the identified frame in accordance to Section 15.1.4.1.1

Numerous spare intervals are provided for future applications.

Insert the following new section as 10.5.3 (after Control Channel)

10.5.3 Coexistence Control Channel Function and Frame Numbering Scheme

Function Of Control Channel (Note 1)	**Control Channel Function Name&Chapter (Note 2)**	**CX_MAC_NO containing Control Channel for given Frame Duration (Note 3,4)**		
		5 ms	10 ms	20 ms
GPS timing recovery DL	CX_CC_GPS1 (15.2.1.1)	1	1	1
GPS timing recovery UL	CX_CC_GPS2	41	21	11
GPS timing recovery DL	CX_CC_GPS3	81	41	21
GPS timing recovery UL	CX_CC_GPS4	121	61	31
No & Interference (No+Io)	CX_CC_No1	161	81	41
Spare		201	101	51
CMI #1 down link (CSI)	CX_CMI_D1 (15.1.4.1.2)	241	121	61
CMI #2 down link	CX_CMI_D2	281	141	71
CMI #3 down link (CSI)	CX_CMI_D3 (15.1.4.1.1)	321	161	81
CMI #4 down link	CX_CMI_D4	361	181	91
CMI #5 down link (CSI)	CX_CMI_D5	401	201	101
CMI #6 down link	CX_CMI_D6	441	221	111
CMI #1 up link (CSI)	CX_CMI_U1	481	241	121
No & Interference (No+Io)	CX_CC_No2	521	261	131
AT1	CX_AT1 (15.4.3.2)	561	281	141
CMI #2 up link (CSI)	CX_CMI_U2	601	301	151
CMI #3 up link	CX_CMI_U3	641	321	161
CMI #4 up link (CSI)	CX_CMI_U4	681	341	171
CMI #5 up link	CX_CMI_U5	721	361	181
CMI #6 up link (CSI)	CX_CMI_U6	761	381	191
AT2	CX_AT2	801	401	201
No & Interference (No+Io)	CX_CC_No3	841	421	211
CMI #1 down link (CSI)	CX_CMI_D1	881	441	221
CMI #2 down link	CX_CMI_D2	921	461	231

CMI #3 down link (CSI)	CX_CMI_D3	961	481	241
Spare		1001	501	251
AT3	CX_AT3	1041	521	261
CMI #4 down link (CSI)	CX_CMI_D4	1081	541	271
CMI #5 down link	CX_CMI_D5	1121	561	281
CMI #6 down link (CSI)	CX_CMI_D6	1161	581	291
Spare		1201	601	301
No & Interference (No+Io)	CX_CC_No4	1241	621	311
AT4	CX_AT4	1281	641	321
Spare (CSI)		1321	661	331
CMI #1 up link	CX_CMI_U1	1361	681	341
CMI #2 up link (CSI)	CX_CMI_U2	1401	701	351
CMI #3 up link	CX_CMI_U3	1441	721	361
CMI #4 up link (CSI)	CX_CMI_U4	1481	741	371
CMI #5 up link	CX_CMI_U5	1521	761	381
CMI #6 up link (CSI)	CX_CMI_U6	1561	781	391
No & Interference (No+Io)	CX_CC_No5	1601	801	401
CMI #1 down link (CSI)	CX_CMI_D1	1641	821	411
CMI #2 down link	CX_CMI_D2	1681	841	421
CMI #3 down link (CSI)	CX_CMI_D3	1721	861	431
CMI #4 down link	CX_CMI_D4	1761	881	441
CMI #5 down link (CSI)	CX_CMI_D5	1801	901	451
CMI #6 down link	CX_CMI_D6	1841	921	461
No & Interference (No+Io)	CX_CC_No6	1881	941	471
CMI #1 up link (CSI)	CX_CMI_U1	1921	961	481
CMI #2 up link	CX_CMI_U2	1961	981	491
CMI #3 up link (CSI)	CX_CMI_U3	2001	1001	501
CMI #4 up link	CX_CMI_U4	2041	1021	511
CMI #5 up link (CSI)	CX_CMI_U5	2081	1041	521
CMI #6 up link	CX_CMI_U6	2121	1061	531
Spare (CSI)		2161	1081	541
No & Interference (No+Io)	CX_CC_No7	2201	1101	551
Spare (CSI)		2241	1121	561
Spare		2281	1141	571
Spare (CSI)		2321	1161	581
Spare		2361	1181	591

Note 1: Control Channel duration Tcc_s is ~1.9 msec
Note 2: CMI 4-6 are considered reserved for future applications.
Note 3: CX_MAC_NO =1 begins at absolute time 0030:000 sec and repeats every T_cogn.
Note 4: T_cogn =12 seconds, with MAX { CX_MAC_NO} equaling respectively 2400, 1200 and 600 for Frame durations of 5,10, and 20 msec.