IEEE P802.11
Wireless LANs

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| CID Resolution – Part VII, Clause 30.7, 30.8, 30.9 |
| Date: 2018-03-25 |
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Abstract

This document proposes resolution for CIDs 1665, 2100, 2101, 2102, 2329, 1325, 1326, 1327, 1825, 1173, 1415, (11) [1].

**CID 1665**

*Comment:*

Grammar correction.

*Proposed change:*

Correct "In an 27 SU transmission," to "In a 27 SU transmission,"

*Resolution:*

Accepted.

*Editor: change the text as below, page 371, line 27, [2]*

Transmission can be prematurely terminated by the MAC through the PHY-TXEND.request primitive. The PSDU transmission is terminated by receiving a PHY-TXEND.request primitive. Each PHY-TXEND.request primitive is acknowledged with a PHY-TXEND.confirm primitive from the PHY. In a SU transmission, normal termination occurs after the transmission and confirmation of the last PSDU octet.

**CID 2100, 2101, 2102**

*Comment:*

Incorrect notation

*Proposed change:*

Replace x32 with 32x

Replace x4 with 4x

Replace x2 with 2x

*Resolution:*

Accepted.

*Editor: change the text as below, page 370, line 13, [2]*

If the EDMG\_MODULATION parameter is set to EDMG\_C\_MODE, all fields are transmitted using SC modulation. The L-STF and L-CEF fields are transmitted using π/2-BPSK modulated Golay complementary sequences defined in time domain as specified in 20.4.3.1.2 and 20.4.3.1.3, respectively. The L-Header, EDMG-Header-A composed of two parts EDMG-HeaderA1 and EDMG-Header-A2, and data (PSDU) are transmitted applying scrambling, LDPC code with effective rate less or equal to 1/2, DBPSK modulation, 32× spreading applying Golay sequences, and π/2-rotation as defined in 30.4.5.2. The TRN field is transmitted using π/2-BPSK modulated Golay complementary sequences in time domain as defined in 30.9.2.2.5.

*Editor: change the text as below, page 370, line 22, [2]*

The L-STF and L-CEF fields are transmitted using π/2-BPSK modulated Golay complementary sequences defined in time domain as specified in 30.3.3.2.2 and 30.3.3.2.3, respectively. The L-Header is transmitted applying LDPC code with effective rate 2/7, π/2-BPSK modulation, and codeword repetition 4× times. The transmission of L-Header occupies two SC symbol blocks. The EDMG-Header-A is transmitted applying the LDPC code with effective rate 2/7, π/2-BPSK modulation, and codeword repetition 2× times. It is composed of two parts – EDMG-Header-A1 and EDMG-Header-A2. The transmission of EDMG-Header-A occupies two SC symbol blocks.

**CID 2329**

*Comment:*

It is not clear why AMPDU must be used in Figure 150. MU-PPDU defines symbol/block level padding so it is possible to send 1 MPDU to each user w/o using AMPDU. The legacy header field 'aggregation' can be used to signal whether the EDMG PPDU carries MPDU or AMPDU for all users

*Proposed change:*

change to MPDU / A-MPDU in MAC part of figure

*Resolution:*

Accepted.

*Editor: change the text as below, page 369, line 5, Figure 150 [2]*



Figure 150— PHY transmit procedure for the SU SC and OFDM modes

**CID 1325**

*Comment:*

"measures a receive signal strength. The PHY indicates this activity to the MAC by issuing a PHY CCA.indication primitive. A PHY-CCA.indication(BUSY, channel-list) primitive is also issued as an initial indication of reception of a signal as defined in 8.3.5.12. The channel-list parameter of the CCA" - missing reference to indication of RX-Antenna-ID

*Proposed change:*

Add RX-Antenna-ID to PHY-CCA-Indication(BUSY.channe-list)

*Resolution:*

Revised.

*Editor: change the text as below, page 374, line 10, [2]*



Figure 152— PHY receive procedure for the EDMG control mode



Figure 153— PHY receive procedure for the SU EDMG SC and SU EDMG OFDM modes

NOTE— This procedure does not describe the operation of optional features, such as A-PPDU, SU multiple space-time streams, STBC, DCM SQPSK, and MU reception.

Upon receiving the transmitted PHY preamble overlapping the primary 2.16 GHz channel, the PHY measures a receive signal strength. The PHY indicates this activity to the MAC by issuing a PHY-CCA.indication primitive. A PHY-CCA.indication(BUSY, RX-Antenna-ID, channel-list) primitive is also issued as an initial indication of reception of a signal as defined in 8.3.5.12. The channel-list parameter of the CCA-PHY.indication primitive is absent when the operating channel width is 2.16 GHz. The channel-list parameter is present and includes the element primary when operating channel width is 4.32 GHz, 6.48 GHz, 8.64 GHz, 2.16+2.16 GHz, or 4.32+4.32 GHz. The RX-Antenna-ID parameter is present if PHY entity has more than one active RX chain and the CCA sensitivity condition defined in 30.3.8 applies to any DMG antenna connected to an active receive chain.

**CID 1326**

*Comment:*

"If the decoding of the L-Header is unsuccessful, then the RXTIME parameter cannot be determined. In this case, the PHY shall switch to the IDLE state immediately without waiting for the intended end of the PPDU." This is incorrect. PHY-CCA(BUSY) shall be maintained as long as the detected power is CCA-TH (MCS1 sensitivity+20dB) is and above. Also, I am not sure that this clause is normative, hence the use of "shall" may not be warranted

*Proposed change:*

Add a disclaimer that the PHY shall switch to idle after the energy falls below the CCA Energy TH.

*Resolution:*

Revised.

*Editor: change the text as below, page 376, line 6, [2]*

If signal loss occurs during reception prior to completion of the PPDU reception, the error condition shall be reported to the MAC using a PHY-RXEND.indication(CarrierLost) primitive. After waiting for the intended end of the PPDU as determined by the RXTIME parameter, including possibly a TRN field, the PHY shall generate a PHY-CCA.indication(IDLE) primitive and return to the IDLE state. If the decoding of the L-Header is unsuccessful, then the RXTIME parameter cannot be determined. In this case, the PHY-CCA(BUSY)shall be maintained as long as the detected energy is 20 dB above the minimum sensitivity for a 2.16 GHz PPDU using SC MCS 1. The PHY entity shall switch to the IDLE state immediately after the energy falls down below the specified threshold.

**CID 1327**

*Comment:*

"The minimum value for the Length field is equal to 14 octets and the Training Length (TRN-LEN) can be equal to zero. In the latter case, the TRN field is not appended to the PPDU." - This is incorrect. The minimum length is actually 6 in a short sector sweep packet.

*Proposed change:*

Replace "14" by "6"

*Resolution:*

Rejected.

*Discussion:*

In other parts of the D1.0, the minimum length of the PSDU is defined as 14.

**CID 1825**

*Comment:*

There is TBD placeholder for clause references.

*Proposed change:*

Remove TBD or add clause "section" numbers

*Resolution:*

Revised.

Resolved as a part of CID 1427, 1562, 1607, 1669, 1913, 2087, 2225, 2333 in (11-18-0210-03-00ay CID Resolution - Part III)

*Editor: change the text as below, page 253, line 29, [2]*

The EDMG-Header-A encoding and modulation for SC and OFDM EDMG A-PPDU is defined in 30.5.7 and 30.6.6, respectively.

**CID 1173**

*Comment:*

"Desired" occurs multiple times. This is anthropomorphic, and also hides how the values are communicated (i.e., I desire this channel width rather than, the channel width set up using the PHY CONFIG request primitive).

*Proposed change:*

Reword to avoid "desired".

*Resolution:*

Revised.

*Editor: change the text as below, page 242, Table 30, [2]*

Table 30 —Definition of Scrambler Initialization field when transmitted using the control mode if the Turnaround field bit is 1

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| **Scrambler Initialization field** | **Requested channel bandwidth** | **2.16 GHz channel(s) making up the requested channel** |
| **B0** | **B1** | **B2** | **B3** |
| 0 | 0 | 0 | 0 | 2.16 GHz | Anyone of 1, 2, 3, 4, 5, 6 |
| 1 | 0 | 0 | 0 | 4.32 GHz or2.16+2.16 GHz | 1 and 2, 3 and 4, 5 and 6 |
| 0 | 1 | 0 | 0 | 4.32 GHz or2.16+2.16 GHz | 2 and 3, 4 and 5, 1 and 6 |
| 1 | 1 | 0 | 0 | 6.48 GHz | 1 through 3, 5 through 6 |
| 0 | 0 | 1 | 0 | 6.48 GHz | 2 through 4 |
| 1 | 0 | 1 | 0 | 6.48 GHz | 3 through 5 |
| 0 | 1 | 1 | 0 | 8.64 GHz or4.32+4.32 GHz | 1 through 4 |
| 1 | 1 | 1 | 0 | 8.64 GHz or4.32+4.32 GHz | 2 through 5 |
| 0 | 0 | 0 | 1 | 8.64 GHz or4.32+4.32 GHz | 3 through 6 |
| 1 | 0 | 0 | 1 | 2.16+2.16 GHz | 1 and 3, 4 and 6 |
| 0 | 1 | 0 | 1 | 2.16+2.16 GHz | 2 and 4, 3 and 5 |
| 1 | 1 | 0 | 1 | 2.16+2.16 GHz | 1 and 4, 2 and 5, 3 and 6 |
| 0 | 0 | 1 | 1 | 2.16+2.16 GHz | 1 and 5, 2 and 6 |
| 1 | 0 | 1 | 1 | 4.32+4.32GHz | 1 – 2 and 4 – 5 |
| 0 | 1 | 1 | 1 | 4.32+4.32GHz | 2 – 3 and 5 – 6 |
| 1 | 1 | 1 | 1 | 4.32+4.32GHz | 1 – 2 and 4 – 6 |

**CID 1415**

*Comment:*

Need a formula for r\_TRN as in case for OFDM (see 30.9.2.2.7)

*Proposed change:*

Add formula defining the r\_TRN.

*Resolution:*

Accepted.

*Editor: page 388, add the text below the Table 87, [2]*

30.9.2.2.6 TRN subfield definition for EDMG SC PPDUs and EDMG control mode PPDUs

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The TRN subfield shall consist of *NTX* orthogonal waveforms, where *NTX* is the total number of transmit chains used in the transmission of the EDMG PPDU. The total number of transmit chains is indicated by the value of the TXVECTOR or RXVECTOR parameter NUM\_TX\_CHAINS.

The basic SC TRN subfield waveform for the *iTXth* transmit chain in time domain shall be defined at the SC chip rate *NCB*×*Fc* and chip time duration *Tc*/*NCB* as follows:



Note that sequences  and , *iTX* = 1, 2, …, 8, are defined for 0 ≤ *n* ≤ TRN\_BL × *NCB* – 1. For other values of *n*,  and  are set to zero.

If the TRN\_BL × *NCB* length is equal to 64 (TRN\_BL = 64 and *NCB* = 1), then the basic TRN subfield waveform for the *iTXth* transmit chain in time domain shall be defined at the SC chip rate *Fc* and chip time duration *Tc* as follows:



Note that sequences  and , *iTX* = 1, 2, …, 8, are defined for 0 ≤ *n* ≤ 63. For other values of *n*,  and  are set to zero.

The TRN\_BL represents the length of the Golay sequence used in the TRN subfield and depends on the value of the TRN Subfield Sequence Length field in EDMG-Header-A of the PPDU. If TRN Subfield Sequence Length field is 0, TRN\_BL is equal to 128. If TRN Subfield Sequence Length field is 1, TRN\_BL is equal to 256. If TRN Subfield Sequence Length field is 2, TRN\_BL is equal to 64.

The *NCB* = 1 for 2.16 GHz and 2.16+2.16 GHz channels, *NCB* = 2 for 4.32 GHz and 4.32+4.32 GHz channels, *NCB* = 3 for 6.48 GHz channel, and *NCB* = 4 for 8.64 GHz channel.

An EDMG STA shall support Golay sequences of length 128 and 256 (i.e., TRN\_BL equal to 128 and *NCB* = 1 and 2). Other lengths are optional and support is indicated in the STA’s EDMG Capabilities element.

The pairs of Golay complementary sequences (Gci64, Gdi64), (Gai128, Gbi128), (Gai192, Gbi192), (Gai256, Gbi256), (Gai384, Gbi384), (Gai512, Gbi512), (Gai768, Gbi768), and (Gai1024, Gbi1024) are defined in subclause 30.10. These sequences shall be transmitted using π/2-BPSK modulation.

The TRN subfield waveform for the *iTXth* transmit chain is defined as follows:



where:

 is the TRN mapping matrix (see below)

 is the number of SC TRN basic subfields in a TRN subfield for the given total number of transmit chains *NTX* (see below)

 is a matrix element from *m*th row and *n*th column

is the duration of the basic TRN subfield

 is a chip time index, 

The TRN mapping matrix for the TRN subfield definition for a 2.16 GHz, 4.32 GHz, 6.48 GHz, and 8.64 GHz PPDU transmission is defined as specified below.

The TRN mapping matrix for *NTX* = 1, 2 is defined as .

The TRN mapping matrix for *NTX* = 3, 4 is defined as .

The TRN mapping matrix for *NTX* = 5, 6, 7, and 8 is defined as

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The TRN mapping matrix for the TRN subfield definition for a 2.16+2.16 GHz and 4.32+4.32 GHz PPDU transmission is defined as specified below.

The TRN mapping matrix for *NTX* = 2, 4 is defined as .

The TRN mapping matrix for *NTX* = 6, 8 is defined as .

**SP:**

Do you agree to accept the proposed resolutions for CIDs 1665, 2100, 2101, 2102, 2329, 1325, 1326, 1327, 1825, 1173, 1415 in (11-18-0330-03-00ay CID Resolution - Part VII)?

**References:**

1. 11-18-0067-01-00ay-11ay-d1-0-comment-database
2. Draft P802.11ay\_D1.0