IEEE P802.11
Wireless LANs

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| Resolution of PHY CIDs |
| Date: 2018-05-04 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Claudio da Silva | Intel |  |  | claudio.da.silva@intel.com |
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Abstract

This submission proposes resolutions to PHY-related CIDs. The text used as reference is D1.1.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1510 | 30.4.7 | 280.13 | "The performance requirements of the EDMG control mode shall be the same as the DMG control mode and defined in 20.4.4."The EVM and CCA requirements for 4.32, 6.48, 8.64, 2.16+2.16 and 4.32+4.32 GHz transmission are unclear. | Change the text (P280L13-14) as follows: "The transmit performance requirements of the EDMG control mode and the non-EDMG control mode are the same as the DMG control mode and defined in 20.4.4.1.2. For 4.32, 6.48, 8.64, 2.16+2.16 and 4.32+4.32 GHz transmission, the EVM is measured over each of the occupied 2.16 GHz channels. The recieve requirements of the EDMG control mode and the non-EDMG control mode are defined in 30.3.8." |

**Proposed resolution**: Revised

**Modifications:** *Replace lines 13 and 14 of page 328 with the following:*

The transmit EVM performance requirement of EDMG and non-EDMG control mode PPDUs shall be the same as that of DMG control mode PPDUs defined in 20.4.4.1.2.

In the transmit EVM accuracy test, each transmit chain of the transmitting STA shall be connected through a cable to one input port of the testing instrumentation. If the TXVECTOR parameter CH\_BANDWIDTH is set to CBW432, CBW648, CBW864, CBW216+216, or CBW432+432, the duplicate transmission in the two or more 2.16 GHz channels may be tested independently. In this case, the transmit EVM accuracy of each 2.16 GHz channel shall meet the required value defined in 20.4.4.1.2 using only the signal within the corresponding channel.

Receive requirement of EDMG and non-EDMG control mode PPDUs are defined in 30.3.8.

*Modify 30.3.8 (CCA sensitivity) as follows*

The start of a valid 2.16 GHz EDMG PPDU and of a valid 2.16 GHz non-EDMG PPDU at a receive power level greater than the minimum sensitivity for a 2.16 GHz SC PPDU using MCS 1 shall cause the receiver to issue a PHY-CCA.indication(BUSY) with a probability > 90% within aCCAtime. The PHY-CCA.indication(BUSY) shall be maintained for the duration of the PPDU. The receiver shall issue the PHY-CCA.indication(BUSY) for any signal 20 dB above the minimum sensitivity for a 2.16 GHz PPDU using SC MCS 1.

For a receiver open to any combination of 4.32 GHz, 6.48 GHz, 8.64 GHz, 2.16+2.16 GHz, or 4.32+4.32 GHz channels, the start of a valid EDMG PPDU and of a valid non-EDMG PPDU at a receive power level greater than the minimum sensitivity for a 2.16 GHz SC PPDU using MCS 1 at the primary channel shall cause the receiver to issue a PHY-CCA.indication(BUSY) with a probability > 90% within aCCAtime. The PHY-CCA.indication(BUSY) shall be maintained for the duration of the PPDU. The receiver shall issue the PHY-CCA.indication(BUSY,primary/secondary/secondary1/secondary2) for any signal 20 dB above the minimum sensitivity for a 2.16 GHz PPDU using SC MCS 1 at any of the channels (primary/secondary/secondary1/secondary2) the receiver is open to receive in.

A receiver that has more than one active RX chain shall issue PHY-CCA.indication(BUSY,RX-Antenna-ID) if the condition above applies to any DMG antenna connected to an active receive chain.

*Add a second condition/value to the NUM\_TX\_CHAINS parameter in Table 32 (TXVECTOR and RXVECTOR parameters)*

* Condition: FORMAT is NON\_EDMG and NON\_EDMG\_MODULATION is NON\_EDMG\_DUP\_C\_MODE
* Value: The value of this field indicates the number of transmit chains used in the transmission of a non-EDMG control mode PPDU.

Integer: range 1 to 8.

* TXVECTOR: Y
* RXVECTOR: N

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 2238 | 9.4.2.255 | 70.15 | In 11ay the unit for length is TRN-Unit. Should use the same unit for L-RX and L-TX-RX | change to 'number of TRN-R TRN-Units requested' |

**Proposed resolution**: Revised

**Modifications:** *Modify lines 17-19 of page 93 as follows*

The L-RX field indicates the number of ~~TRN-R subfields~~ TRN-Units requested by the transmitting STA as part of beam refinement. When the EDMG BRP Request element is present in a frame, the value of this field overrides the value of the subfield with the same name carried in the BRP Request field.

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| 1802 | 11.1.4.3.3 | 198.26 | "may append receive training (TRN-R) subfields to the probe request." It is not clear in which field the TRN-R subfield should present. I may have missed something, but I could not find any additional field or element that can carry TRN-R subfield in Proble Request frame. There is a similar language in 199.5, too. | Please clarify. |

**Proposed resolution**: Revised

**Modifications:** *Modify the underlined text in lines 25 and 26 of page 238 as follows:*

An EDMG STA may transmit the probe request using a quasi-omni antenna pattern and, in this case, may append ~~receive training (TRN-R) subfields to the probe request~~ a TRN field to the PPDU that carries the request.

*Modify the underlined text in lines 4 and 5 of page 239 as follows:*

An EDMG STA may transmit the probe request using a quasi-omni antenna pattern and, in this case, may append ~~receive training (TRN-R) subfields to the probe request~~ a TRN field to the PPDU that caries the request.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1250 | 9.2.4.1.3 | 30.07 | Where is the short SSW frame type, I think it shouldn't be mixed with SSW frame type. If using the same frame type, it would end up with decoding errors in some implementations. | Please add new subframe type for Short SSW frame |

**Proposed resolution**: Rejected

**Discussion:** As discussed in the resolution of CIDs 1401/1628/1748 in 18/0394r2, short SSW packets are PHY packets, and not a MAC frame type. The resolution of the CIDs indicated above include change texts that may clarify this point and clarify the commenter’s concern.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1001 | 30.9.2.2.6 | 387.12 | "The TRN field shall consist of NTX orthogonal waveforms, where NTX is the number of transmit chains used in the transmission of the EDMG PPDU."What is a time domain waveform of the TRN subfield using the EDMG SC and control mode?Similar to 30.9.2.2.7 (TRN subfield definition for EDMG OFDM PPDUs OFDM TRN subfield), a time domain waveform (r^{itx}\_{TRN}) for 30.9.2.2.6 should be defined as well.Because 30.4.6.3 (EDMG PPDU transmission), 30.5.10.4 (EDMG SU PPDU transmission) and 30.5.10.5 (EDMG MU PPDU transmission) are saying that r^{itx}\_{TRN} is defined in 30.9.2.2.5.But, r^{itx}\_{TRN} is defined in 30.9.2.2.7 only for the EDMG OFDM PPDU. | Please define a time domain waveform of the TRN subfield using the EDMG SC and control mode.And, correct the references in 30.4 and 30.5 for r^{itx}\_{TRN} to 30.9.2.2.6. |

**Proposed resolution**: Revised

**Discussion:** In 18/0330r3, 30.9.2.2.6 (TRN subfield definition for EDMG SC PPDUs and EDMG control mode PPDUs) was changed to include equations for:

* The basic EDMG control/SC TRN subfield waveform for the *iTXth* transmit chain $r\_{TRN\\_BASIC}^{i\_{TX}}$; and
* The TRN subfield waveform for the *iTXth* transmit chain $r\_{TRN\\_SUBFIELD}^{i\_{TX}}$ (for EDMG control/SC PPDUs), which is given by



To address CID 1001, we must

* Provide an equation for the TRN field (as a function of $r\_{TRN\\_SUBFIELD}^{i\_{TX}}$)
* Align OFDM and control/SC mode text.

**Modifications:**

*Add the following text at the end of 30.9.2.2.6 (after changes proposed in 18/0330r3 are introduced)*

The TRN field waveform for the *itx*-th transmit chain in an EDMG control PPDU or EDMG SC PPDU is defined as follows:



where:

*  is the TRN subfield waveform defined in 30.9.2.2.6
*  is the time duration of the TRN subfield
*  is the total number of TRN subfields transmitted in the TRN field
*  is a chip time index, 

*Delete lines 2, 3, 4, 5, and 15 in page 438.*

*Add the following before the paragraph in lines 17-19 in page 438.*

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



where

* $r\_{TRN\\_BASIC}^{i\_{TX}}\left(qT\_{S}\right)$ is the basic TRN subfield waveform for the *iTXth* transmit chain
* $T\_{BASIC}$ is the duration of the basic TRN subfield
*  shall be set to 2 if the value of the TXVECTOR parameter TRN\_SEQ\_LENGTH of the PPDU is equal to Normal; or to 1 if TRN\_SEQ\_LENGTH is equal to Short; or to 4 if TRN\_SEQ\_LENGTH is equal to Long
*  is a time sample index

The TRN field transmit waveform for *itx*-th transmit chain in an EDMG OFDM PPDU is defined as follows:



where:

*  is the TRN subfield waveform defined in 30.9.2.2.7
*  is the time duration of the TRN subfield
*  is the total number of TRN subfields transmitted in the TRN field
*  is a sample time index, 

*Modify lines 1-2 in page 319 as follows*

units included in the TRN field and each transmit chain transmits its own TRN field as defined in ~~30.9.2.2.5~~ 30.9.2.2.6.

*Modify line 12 in page 327 as follows*

transmit chain as defined in ~~30.9.2.2.5~~ 30.9.2.2.6. The TRN field is filtered and resampled with conversion rate ratio

*Modify line 15 in page 343 as follows*

A TRN field per transmit chain (see ~~30.9.2.2.5~~ 30.9.2.2.6) may be appended to an SU PPDU.

*Modify line 23 in page 344 as follows*

A TRN field per transmit chain (see ~~30.9.2.2.5~~ 30.9.2.2.6) may be appended to an SU PPDU.

*Modify line 30 in page 346 as follows*

A TRN field per transmit chain (see ~~30.9.2.2.5~~ 30.9.2.2.6) may be appended to an MU PPDU.

*Modify line 2 in page 367 as follows*

as defined in ~~30.9.2.2.5~~ 30.9.2.2.6.

*Modify line 3 in page 373 as follows*

transmit chain as defined in ~~30.9.2.2.5~~ 30.9.2.2.6.

*Modify line 17 in page 375 as follows*

transmit chain as defined in ~~30.9.2.2.5~~ 30.9.2.2.6.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1328 | 383.33 | 30.9.2.2.2 | "If beam refinement is performed on a 4.32 GHz, 6.48 GHz, 8.64 GHz, 2.16 + 2.16 GHz or 4.32 + 4.32 GHz channel, the TRN field in EDMG BRP packets sent as part of the beam refinement shall be transmitted over the entire signal bandwidth of the channel". This text is a bit foggy. Needs to be defined what does it mean using the entire bandwidth. | as in comment |

**Proposed resolution:** Revised

**Modifications:** *Replace lines 33-35 of page 431 with the following*

As defined in 30.9.2.2.6 for EDMG SC PPDUs and EDMG control mode PPDUs, and in 30.9.2.2.7 for EDMG OFDM PPDUs, if beam refinement is performed on a 4.32 GHz, 6.48 GHz, or 8.64 GHz channel, the TRN field in EDMG BRP packets sent as part of beam refinement shall occupy 2, 3, or 4 contiguous 2.16 GHz channels, respectively. Also, if beam refinement is performed on a 2.16 + 2.16 GHz or 4.32 + 4.32 GHz channel, the TRN field in EDMG BRP packets sent as part of beam refinement shall occupy one or two contiguous 2.16 GHz channels, respectively, for each of the two aggregated channels.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1912 | 30.3.3.3.2.3 | 249.01 | The use of the parameter "EDMG TRN-Unit N" is a bit confusing as in DMG BRP, the parameter "N" corresponds to the "EDMG\_TRN\_LEN" | switch to K or P ? |

**Proposed resolution**: Rejected

**Discussion:** Different resolutions proposed in response to D1.0 comments, such as those in 18/0146r1, 18/0394r2, and 18/0395r1, includes both text and figure changes that improve the readability of both 30.3.3.3.2.3 (Definition for EDMG SC mode and EDMG OFDM mode PPDUs) and 30.9.2.2.5 (TRN field definition). With such changes, the definition/meaning of the parameter “EDMG TRN-Unit N” has improved and, as result, we believe confusion with the parameter N defined in a different clause (Clause 20, in this case) will no longer happen. It should be noted that both K and P are already used in 30.9.2.2.5.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1544 | 9.5.7 | 91.04 | The names of EDMG TRN-Unit P field, EDMG TRN-Unit M field and EDMG TRN-Unit N field of the EDMG BRP field are the same as the corresponding fields in EDMG-Header-A. However, these fields in the EDMG BRP field and the EDMG-Header-A have different meaning. These fields in the EDMG BRP field define the requested TRN parameters of EDMG BRP packet to be transmitted; while these fields in EDMG-Header-A define the actual TRN parameters of an EDMG PPDU. | change the names of EDMG TRN-Unit P field, EDMG TRN-Unit M field and EDMG TRN-Unit N field of the EDMG BRP field to "Requested EDMG TRN-Unit P field, Requested EDMG TRN-Unit M field and Requested EDMG TRN-Unit N field" |
| 1545 | 9.4.2.255 | 70.08 | The names of EDMG TRN-Unit P field, EDMG TRN-Unit M field and EDMG TRN-Unit N field of the EDMG BRP Request element field are the same as the corresponding fields in EDMG-Header-A. However, these fields in the EDMG BRP field and the EDMG-Header-A have different meaning. These fields in the EDMG BRP Request element define the requested TRN parameters of EDMG BRP packet to be transmitted; while these fields in EDMG-Header-A defines the actual TRN parameters of an EDMG PPDU. | Change the names of EDMG TRN-Unit P field, EDMG TRN-Unit M field and EDMG TRN-Unit N field of the EDMG BRP Request element to "Requested EDMG TRN-Unit P field, Requested EDMG TRN-Unit M field and Requested EDMG TRN-Unit N field" |

**Proposed resolution:** Revised

**Modifications:** *The changes proposed by the reviewer, specifically*

* *EDMG TRN-Unit P 🡪 Requested EDMG TRN-Unit P,*
* *EDMG TRN-Unit M 🡪 Requested EDMG TRN-Unit M, and*
* *EDMG TRN-Unit N 🡪 Requested EDMG TRN-Unit N,*

*must be carried out at the following places:*

* *Figure 59,*
* *Lines 5-18, page 94,*
* *Figure 92, and*
* *Lines 7-10, page 118.*

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1460 | 30.3.3.3.2.3 | 246.03 | "TRN Aggregation" field: Name is confusing and same definition used for SC/OFDM modes could be used instead (and uniform the field names and descriptions used in all modes). | Replace "TRN Aggregation" with "Channel Aggregation" as done in Table 36 for SC/OFDM. Replace description given for "TRN Aggregation" with that of "Channel Aggregation" for SC/OFDM (Table 36). |

**Proposed resolution:** Rejected

**Background:** Difference in terminology is justified given that the data field in an EDMG control mode PPDU, different from that of an EDMG SC/OFDM PPDU, is always transmitted in duplicate mode (and thus the transmission of the TRN fields is the only case that must be differentiated).

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1602 | 30.2.2 | 231.01 | Not clear why RF\_CHAIN\_ID is a single parameter. 11ay supports multiple RF chains. If this is for SSSW, we should indicate | Please clarify/ revise |

**Proposed resolution**: Revised

**Modifications:** *Modify Table 94 (Short SSW field definition) as follows:*

* *Add the following statement to the description of the parameter Direction:* Corresponds to TXVECTOR parameter SSSW\_DIR.
* *Add the following statement to the description of the parameter Addressing Mode:* Corresponds to TXVECTOR parameter SSSW\_ADD\_MODE.
* *Add the following statement to the description of the parameter Source AID:* Corresponds to TXVECTOR parameter SSSW\_SOURCE\_AID.
* *Add the following statement to the description of the parameter Destination AID:* Corresponds to TXVECTOR parameter SSSW\_DESTINATION\_AID.
* *Add the following statement to the description of the parameter CDOWN:* Corresponds to TXVECTOR parameter SSSW\_CDOWN.
* *Add the following statement to the description of the parameter RF Chain ID:* Corresponds to TXVECTOR parameter RF\_CHAIN\_ID.
* *Add the following statement to the description of the parameter Short Scrambled BSSID:* Corresponds to TXVECTOR parameter BSSID.
* *Add the following statement to the description of the parameter Unassociated:* Corresponds to TXVECTOR parameter SSSW\_UNASSOCIATED.
* *Add the following statement to the description of the parameter Setup Duration:* Corresponds to TXVECTOR parameter SSSW\_SETUP\_DURATION.
* *Add the following statement to the description of the parameter Short SSW Feedback:* Corresponds to TXVECTOR parameter SSSW\_FEEDBACK.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 2051 | 30.2.2 | 222.01 | The text "The transmitter may change the AWV used in the transmission of each of the last M TRN subfields in each TRN-Unit present in the TRN field" and "The transmitter sends a number of consecutive TRN-Units in which the same AWV is used in the transmission of of the last M TRN subfields of each TRN-Unit" is confusing. Please specify exact when the AWVs may be changed. Added a reference to text or a figure would be extremely helpful | Please clarify when the AWVs may be changed. Either add a reference to text or a figure |

**Proposed resolution:** Revised

**Summary:** The following modifications are proposed:

* New description: “The transmitter may change the AWV at the beginning of each set of N TRN subfields present in the last M TRN subfields of each TRN-Unit in the TRN field.”
* “The transmitter sends a number of consecutive TRN-Units in which the same AWV is used for the last M TRN subfields of each TRN-Unit.”
* To reduce the number of “re-definitions” by making reference to 30.9.2.2.

**Modifications:** *Modify value for the parameter EDMG\_PACKET\_TYPE in page 268 as follows*

EDMG-TRN-T-PACKET indicates a packet whose data field is followed by ~~one or more TRN subfields. The transmitter may change the AWV used in the transmission of each of the last M TRN subfields in each TRN-Unit present in the TRN field.~~ a TRN field. As defined in 30.9.2.2, the transmitter may change the AWV at the beginning of each set of N TRN subfields present in the last M TRN subfields of each TRN-Unit in the TRN field.

*Modify description for the field EDMG TRN-Unit M in page 295 as follows*

Corresponds to TXVECTOR parameter EDMG\_TRN\_M. For EDMG BRP TX packets, as defined in 30.9.2.2, the transmitter may change the AWV at the beginning of each set of N TRN subfields present in the last M TRN subfields of each TRN-Unit in the TRN field, where M is the value of this field plus one and the value of N is indicated by the TXVECTOR parameter EDMG\_TRN\_N. ~~the value of this field plus one indicates the number of TRN subfields in a TRN-Unit in which the transmitter may change AWV at the beginning of each TRN subfield transmission, as defined in 30.9.2.2.5.~~ For EDMG BRP-RX/TX packets, the value of this field plus one indicates the number of TRN subfields in a TRN-Unit transmitted with the same AWV following a possible AWV change, as defined in 30.9.2.2.5.

For EDMG BRP-RX packets, this field is reserved. For EDMG BRP-TX packets transmitted with EDMG Beam Tracking Request Type field set to 1, this field is reserved.

*Modify lines 17-20 of page 431 as follows*

EDMG BRP-TX packets are used for transmit AWV training. ~~The transmitter may change the AWV used in the transmission of each of the last M TRN subfields in each TRN-Unit present in the TRN field.~~ The transmitter may change the AWV at the beginning of each set of N TRN subfields present in the last M TRN subfields of each TRN-Unit in the TRN field. The receiver performs measurements during the reception of the EDMG BRP-TX packet and sends feedback to the STA that transmitted the packet.

*Modify lines 16-23 of page 433 as follows*

For EDMG BRP-TX packets, ~~for each TRN-Unit, the transmitter may change AWV at the beginning of each consecutive N repetitions out of the M repetitions of TRN subfields,~~ the transmitter may change the AWV at the beginning of each set of N TRN subfields present in the last M TRN subfields of each TRN-Unit in the TRN field, where N is the value indicated by ~~of~~ the EDMG TRN-Unit N field ~~in~~ within the EDMG-Header-A ~~plus one~~. For EDMG BRP-RX/TX packets, the transmitter may change AWV once at the beginning of the last M TRN subfields of each TRN-Unit with the constraint that the same AWV configuration is used in the transmission of R TRN-Units, where R is the value of the RX TRN-Units per Each TX TRN-Unit field in the EDMG-Header-A plus one. Any transmit signal transients that occur due to TX AWV configuration changes at the beginning of a TRN subfield shall settle within 64×Tc from the beginning of the TRN subfield.

*Modify lines 11-13 of page 94 as follows*

The value of the EDMG TRN-Unit M field plus one indicates the requested number of TRN subfields within a TRN-Unit that ~~can change the AWV configuration~~ may be used for transmit training, as defined in 30.9.2.2. The value of this field plus one is an integer multiple of the value indicated in the EDMG TRN-Unit N field.

*Modify meaning for the field Requested EDMG TRN-Unit M in page 98 as follows*

The value of this field plus one indicates the requested number of TRN subfields in a TRN-Unit ~~transmitted with the same AWV following a possible AWV change~~ that may be used for transmit training, as defined in 30.9.2.2. This field is reserved when the SU/MU field is set to 0.

*Modify meaning for the field Requested EDMG TRN-Unit M in page 99 as follows*

The value of this field plus one indicates the requested number of TRN subfields in a TRN-Unit ~~transmitted with the same AWV following a possible AWV change~~ that may be used for transmit training, as defined in 30.9.2.2. This field is reserved when the Poll Type field is set to 0.

*Modify value for the parameter EDMG\_TRN\_M in page 269 as follows*

If EDMG\_PACKET\_TYPE is TRN-T-PACKET or TRN-R/T-PACKET, indicates the number of TRN subfields in a TRN-Unit that may be used for transmit training, as defined in 30.9.2.2. ~~in which the transmitter may change AWV at the beginning of each TRN subfield transmission. If EDMG\_PACKET\_TYPE is TRN-R/T-PACKET, indicates the number of TRN subfields in a TRN-Unit transmitted with the same AWV following a possible AWV change.~~ Values are in the range 0 to 15.

The parameter is reserved if TRN-LEN is 0. The parameter is reserved if EDMG\_PACKET\_TYPE is TRN-R-PACKET.

*Modify lines 20-21 of page 93 as follows*

The L-TX-RX field indicates the requested number of consecutive TRN-Units for which the transmit AWV remain with the same AWV configuration.

*Modify meaning for the field L-TX-RX* *in page 98 as follows*

Indicates the requested number of consecutive TRN-Units in which the same AWV is used in the transmission of the last M TRN subfields of each TRN-Unit. This field is reserved when the SU/MU field is set to 0.

*Modify meaning for the field L-TX-RX* *in page 99 as follows*

Indicates the requested number of consecutive TRN-Units in which the same AWV is used in the transmission of the last M TRN subfields of each TRN-Unit. This field is reserved when the Poll Type field is set to 0.

*Modify value for the parameter EDMG\_PACKET\_TYPE in page 268 as follows*

EDMG-TRN-R/T-PACKET indicates a packet whose data field is followed by one or more TRN subfields. The transmitter sends a number of consecutive TRN-Units in which the same AWV is used in the transmission of the last M TRN subfields of each TRN-Unit.

*Modify value for the parameter RX\_TRN\_PER\_TX\_TRN in page 268 as follows*

Indicates the number of consecutive TRN-Units in which the same AWV is used in the transmission of the last M TRN subfields of each TRN-Unit. Values are in the range 0–255.

The parameter is valid only when the EDMG\_PACKET\_TYPE is TRN-R/T-PACKET and EDMG\_TRN\_LEN is greater than 0.

*Modify description for the field RX TRN-Units per Each TX TRN-Unit in page 294 as follows*

Corresponds to TXVECTOR parameter RX\_TRN\_PER\_TX\_TRN. This field is reserved if the value of the EDMG TRN Length field is 0. Otherwise, the value of this field plus one indicates the number of consecutive TRN-Units in the TRN field for which the transmitter remains with the same transmit AWV (see 30.9.2.2.5).

*Modify lines 21-25 of page 431 as follows*

EDMG BRP-RX/TX packets are used for simultaneous training of the transmitter’s transmit AWV and the receiver’s receive AWV. To enable simultaneous receive and transmit training using the same EDMG BRP-RX/TX packet, different from an EDMG BRP-TX packet, the transmitter sends a number of consecutive TRN-Units in which the last M TRN subfields of each TRN-Unit are transmitted with the same AWV configuration.

*Modify lines 16-23 of page 433 as follows*

For EDMG BRP-TX packets, for each TRN-Unit, the transmitter may change AWV at the beginning of each consecutive N repetitions out of the M repetitions of TRN subfields, where N is the value of the EDMG TRN-Unit N field in the EDMG-Header-A plus one. For EDMG BRP-RX/TX packets, the transmitter may change AWV once at the beginning of the last M TRN subfields of each TRN-Unit with the constraint that the same AWV configuration is used in the transmission of R TRN-Units, where R is the value of the RX TRN-Units per Each TX TRN-Unit field in the EDMG-Header-A plus one. Any transmit signal transients that occur due to TX AWV configuration changes at the beginning of a TRN subfield shall settle within 64×Tc from the beginning of the TRN subfield.