IEEE P802.11
Wireless LANs

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| 802.11[TGaz SA1 Group CR Part 5](relative to P802.11az/D4.1) |
| Date: 2022-03-09 |
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**Abstract**

This submission contains resolutions for CIDs 7123, 7131, 7134, 7138, 7139, 7162, 7172, 7177, 7181, 7182, 7185, 7186, 7187, 7195, 7196, 7191, 7219, 7223 (18 CIDs total).

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| **CID** | **Page/****Line** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 7123 | 237.1 | 27.3.18a.1 | Does LTF\_OFFSET[1] have to be 0? Or is it sufficient for one LTF\_OFFSET[u] (u = 1 ~ NUM\_USERS) to be 0? Or is it allowed to have none of LTF\_OFFSET[u] to be 0? Note that this question came to my mind when reading "first user" at P238L24. I.e., is "first user" defined? | Clarify the requirement for LTF\_OFFSET (which 'user' need to have offset 0, if any). Also, may want to define what a "first user" is (e.g. at P238L24). | **Reject**.The intend of the LTF\_OFFSET is to provide symbol offset reference to individual receivers (seperated from strasnit stream offset), in each of those fields the user is expected to receive streams from the first and on, in the secure case its expected to receive all streams, there are no zero power gaps spaning over one or more symbols. |
| 7131 | 240.24 | 27.3.18a.3.1 | It is very hard to read Equation (27-126a). | At P20 between L9 and L10, add "1.5 Terminology for mathematical, logical, and bit operations [Begin italics] Insert the following paragraph at the end of this subclause [End italics] [Begin italics] a:b:c [end italics] is a regularly spaced numeric vector with values from a to c, in increments of b. NOTE - For example, 5:2:9 is equal to [5, 7, 9]." At P240L24, replace Equation (27-126a) with "NZ\_20MHz = { -122:2:-2, 2:2:122 } (27-126a)" At P241L18, replace Equation (27-126b) with "NZ\_40MHz = { -244:2:-4, 4:4:244 } (27-126b)" At P242L22, replace Equation (27-126c) with "NZ\_80MHz = { -500:2:-4, 4:4:500 } (27-126c)" | **Reject**.The format of eq. 27-126a is no different and likely much simpler than that of 11ax 27-50, 27-49, 27-48, 27-47, 27-46, 27-45, 27-44 and many many other 11ax , 11ac and prior revisions. A new methodology for identifying indices and their respective values is possible but maybe more of a confusion as it will not be consistent with the rest of the the 11ax PHY style. |
| 7134 | 241.4 | 27.3.18a.3.1 | "All entries ... other than the nonzero entries shall be set to 0". An entry other than the nonzero entry is by definition zero. Hence, setting them again to 0 seems to be a circular definition. | At P241L4, change "other than the nonzero entries shall be set to 0." to "other than the entries with indices defined in Equation (27-126a) shall be set to 0." At P242L7, change "other than the nonzero entries shall be set to 0." to "other than the entries with indices defined in Equation (27-126b) shall be set to 0." At P243L12, change "other than the nonzero entries shall be set to 0." to "other than the entries with indices defined in Equation (27-126c) shall be set to 0." | **Revise**.Looking for some good wordsmithing. |

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| **CID** | **Page/****Line** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 7138 | 246.29 | 27.3.18a.4 | "11az secure LTF" is not a proper name. | Change "11az secure LTF" to "secure HE-LTF". | **Accept**.Discussion: there are 283 occurrences of secure LTF and a single occurrence of 11az secure LTF. |
| 7139 | 247.6 | 27.3.18a.4 | 27.3.11 does not address HE (TB) Ranging NDP. | Delete "and 27.3.11" | **Revised**.This is a duplicate of 7085 from same commenter.Changes were made to fix reference 27.3.10 (mathematical description of signals), and delete reference to 27.3.11 . TGaz editor no further action needed beyond incorporation of resolution for CID 7085. |
| 7146 | 249.9 | 27.3.18f | Does HE (TB) NDP ranging support 80+80 MHz? I assume not as 27.3.18a.4 does not describe secure HE-LTF sequence for 80+80 MHz. | Delete "or CBW80+80" | No resolutionAsk for volunteer original text came from Bin and Steve Shellhammer.  |
| 7162 | 68.11 | 9.4.2.167 | "RSTA to ISTA angle" should be "ISTA to RSTA" as otherwise it is the same as the paragraph above. The intention is that it is a transmission from the ISTA to the RSTA | replace "RSTA to ISTA" with "ISTA to RSTA" | **Accept**Discussion: the I2R AOA Request should result in ISTA to RSTA AOA measurement. |
| 7172 | 147.27 | 11.21.6.4.2.1.6 | "due to rules b and c" - it is actually rules c and d that deal with FTM frame after retransmission. | replace "due to rules b and c" with "due to rules c and d" | **Accept.** |
| **CID** | **Page/****Line** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 7177 | 256.11 | 28.9.3.6 | "-π/2" - I believe that this should be "π/2" | delete the "-" before the "π" | **Revise**.D4.0 P.256L.11 does not have -Pi/2, so the original comment intent may not be captured correctly.However P256L.14 does refer to pi/2 BPSK modulation but this is not an equation but a mapping 384 \* Ncb where Pi/2-BPSK is the reference to the modulation type (Pi/2-BPSK vs. Pi/2-QPSK).TGaz Editor remove '-' prior to 'Pi/2-BPSK' in P.261L.14 |
| 7181 | 260.1 | B.4.4.1 | In the Status Column entry "FT 67" in the MAC frames table reads: "CFRSTA:M (CFTB OR CFNTB OR CF):M" Either the last "OR CF" should be removed or completed to denote a valid element of B4.3 IUT configuration. | Hence, please remove "OR CF" from the Status Column. | **Revise**.Agree with observation by the commenter. This is a duplicate of 7195.TGaz editor change D4.1 P.265 FT67 Support coloum to read:"CFRSTA:M(CFTB ORCFNTB ORCFPTB):M |
| 7182 | 262.1 | B.4.4.1 | The Status Column of "FR 72" and "FR 73" reads: "(CFISTA AND CFPTB):M CFPSTA:M" In the IUT configuration Table "CFPLISTA", "CFPLRSTA", and "CFPLPSTA" are defined, but no "CFPSTA". | Hence, please replace "CFPSTA" with "CFPLPSTA". | **Revise**.FR73 also includes a reference to the CFPSTA.This is a duplication of 7196TGaz editor in the Status column of FR 72 and FR 73 replace CFPSTA with CFPLSTA. |
| 7185 | 55.10 | 9.4.1.9 | The status codes for invalid pub key seems to require assignment. | Assign an ANA value to invalid public key | **Revise**.Agree with commenter.TGaz editor replace D4.1 P.55 L.16 "ANA-invalid-pub-key" with "136". |
| 7186 | 55.10 | 9.4.1.9 | PASN Base AKM failure seems to be missing an ANA number assignment | Assign an ANA value to PASN BASE AKM Failed status code | **Revise**.Agree with commenter.TGaz editor replace D4.1 P.55 L.16 "ANA-pasn-base-akmp-failure" with "137". |
| **CID** | **Page/****Line** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 7187 | 51.15 | 9.4.1.9 | Missing OCI status code is missing an ANA number assignment. | Assign an ANA value to missing OCI status code | **Revise**.Agree with commenter.TGaz editor replace D4.1 P.55 L.21 "ANA-missing-oci" with "138". |
| 7195 | 260.1 | B.4.4.1 | In the Status Column entry "FT 67" in the MAC frames table reads: "CFRSTA:M (CFTB OR CFNTB OR CF):M" Either the last "OR CF" should be removed or completed to denote a valid element of B4.3 IUT configuration. Hence, remove "OR CF" from the Status Column. | as in comment | **Revise**.Agree with observation by the commenter. This is a duplicate of 7181.TGaz editor change D4.1 P.265 FT67 Support coloum to read:"CFRSTA:M(CFTB ORCFNTB ORCFPTB):M |
| 7196 | 262.1 | B.4.4.1 | The Status Column of "FR 72" and "FR 73" reads: "(CFISTA AND CFPTB):M CFPSTA:M" In the IUT configuration Table "CFPLISTA", "CFPLRSTA", and "CFPLPSTA" are defined, but no "CFPSTA". Hence, replace "CFPSTA" with "CFPLPSTA". | as in comment | **Revise**.FR73 also includes a reference to the CFPSTA.This is a duplication of 7182.Resolution:TGaz editor in the Status column of FR 72 and FR 73 replace CFPSTA with CFPLSTA. |
| 7191 | 51.22 | 9.3.1.22.10.3 | "The I2R Rep subfield signals the number of repetitions N\_REP of the HE LTF symbols in the corresponding HE TB Ranging NDP". First N\_REP should be replaced by N\_LTF\_REP, e.g. see paragraph before this subclause. Second, the number of repetitions is "N\_LTF\_REP-1" see paragraph on P132L14. | as in comment. Note response to 6033 from LB255 | Revise. |

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| **CID** | **Page/****Line** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 7191 | P.51 L.22 | 9.3.1.22.10.3 | "The I2R Rep subfield signals the number of repetitions N\_REP of the HE LTF symbols in the corresponding HE TB Ranging NDP". First N\_REP should be replaced by N\_LTF\_REP, e.g. see paragraph before this subclause. Second, the number of repetitions is "N\_LTF\_REP-1" see paragraph on P132L14. | as in comment. Note response to 6033 from LB255 | Revise.The incorrect use of N\_REP was deleted, the variable N\_LTF\_REP cannot be used in the context of the MAC as it is undefined there, instead a reference was made to the essence of the field value which is number of HE LTF Repetitions. Refer to submission <https://mentor.ieee.org/802.11/dcn/21/11-21-1841-05-00az-comment-resolution-sa1-he-ltf-repetitions.docx>Already incorporated to D4.1TGaz editor in D4.1 P52 L.19 indicate resolution 7191.No further action needed. |
| 7219 | N/A | 6.3.56.1 | Why not have the same resolution with Figure 6-17 for Figures 6-17a to 6-17c? It would be more reader friendly. | Add the antenna lines and show when t1 to r4 are in Figures 6-17a to 6-17c. | Reject.Figure 6-17a refers to NTB measurement exchange which, like the TB measurement exchange, makes use of NDP frames. NDP frames are PHY entity and as such are not visible to the MAC and hence cannot draw them, nor it will provide value because the receive and transmission timing are within those and not the necessarily the beginning of the PPDU. instead the group decided to specify the frames carrying the results which are the ones important for the MAC layer as it can respond to the SME service request. As a side note, the group discussed the deletion of t1, t2, t3, t4 from the EDCA measurement exchange and due to backward compatibility and similarity to TM decided not make further changes to legacy figures.  |

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| **CID** | **Page/****Line** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 7223 | N/A | 9.3.1.19 | "If the AID11 subfield is less than 2008 …" Why not use the familiar number, 2007, which is the maximum number that can be assigned as an AID here? | Change it to read "If the AID11 subfield is equal to or less than 2007 …". Make similar change to the figure title for Figure 9-61da, i.e., change its title to "… when the AID11 subfield is equal to or less than 2007". | Revise.Agree with commenter, there are 6 occurrences of “less than 2008”.The base standard 802.11ax make use of 2007, e.g. ‘0 or greater than 2007’, ‘value greater than 2007’, ‘in the range 1 to 2007’. There is no reference in the context of AIDs (AID12) to 2008 or less than 2008.TGaz Editor, make changes identified below in https://mentor.ieee.org/802.11/dcn/22/11-22-0471-01.docx |

**Resolution:**

**TGaz editor make changes to P802.11az D4.1 as shown below:**

**P.43 L.17-29**

**Correct annotation of changes made by P802.11az to baseline standard in clause 9.3.1.19 – P802.11az changes should be marked with underline for additions and strikethrough for deletion, P.43 L17-29 require such proper annotations. Note the strikethrough in P.43 L.22 to 28 is incorrect as it includes “Ranging NDP”, and should revert to the baseline text for strikethrough, L.17 to 22 should be underlined.**

**TGaz editor change D4.1 L.17-29 as shown below:**

The VHT/HE/Ranging NDP Announcement frame contains at least one STA Info field. If the VHT/HE/Ranging NDP Announcement frame contains only one STA Info field with AID/RSID equal or less than 2007, then in the case of VHT or HE NDP Announcement frames the RA field is set to the address of the STA that can provide feedback (see 10.37.5.2 (Rules for VHT sounding protocol sequences)), while in the case of Ranging NDP Announcement frames, the RA address is set to the address of the RSTA or ISTA that is the intended recipient of the frame.(#**7156, #7223**)

**TGaz editor change D4.1 P.45 L.18 – 20 as shown below:**

The format of the STA Info field in a Ranging NDP Announcement frame when the AID11 is equal or less than 2007 is defined in Figure [9-61da](#F09o61da) (STA Info field format in a Ranging NDP Announcement frame when the AID11 subfield is equal or less than 2007), (#**3222, #7223**).

**TGaz editor change P.46 L.2 – L.20 as shown below:**

**Figure 9-61da—STA Info field format in a Ranging NDP Announcement frame when the AID11 subfield is equal or less than 2007 (#3222, #3010, #3882, #7223)**

A Ranging NDP Announcement frame contains one STA Info field with AID11 subfield equal or less than 2007 per STA that is intended to receive this frame. (#**3222**, #**3011**, #**5102, #5158, #7223**)

In the case of the non-TB ranging measurement exchange, see [11.22.6.4.4](#H11o22o6o4o4) (Non-TB ranging measurement exchange) there is always only one intended receiver and the RA field is set to the address of that STA.

In the case of the TB ranging measurement exchange, see [11.22.6.4.3](#H11o22o6o4o3) (TB ranging measurement exchange), the RA field is set to the broadcast address if more than one STA is intended to receive this frame; otherwise the RA field is set to the address of the STA that is intended to receive this frame. (#7223)

If the AID11 subfield is equal or less than 2007 (#**3222, #7223**), it identifies a STA that is intended to receive this frame and assigns the parameters within this STA Info field to this STA. In case of the TB ranging measurement exchange, see [11.22.6.4.3](#H11o22o6o4o3) (TB ranging measurement exchange), the AID11 subfield contains the 11 least significant Bits of the AID or RSID of an associated STA or an unassociated STA respectively (#**1194**, #**1608**, #**1771**, #**1785**) expected to process the following NDP. In case of the non-TB ranging measurement exchange, see [11.22.6.4.4](#H11o22o6o4o4) (Non-TB ranging measurement exchange), the intended receiver is identified by the RA field and the AID11 subfield is set to 0.

**TGaz editor change P.181 L.9 – L.38 and P.182 as shown below:**

* The NUM\_STS parameter is set as follows:
	+ In the TB ranging measurement exchange ([11.21.6.4.3](#H11o21o6o4o3)), set to the same value as the R2I N\_STS subfield in the STA Info field in the preceding Ranging NDP Announcement frame plus 1 (#**7355**).
	+ In the TB ranging measurement exchange with secure LTF ([11.21.6.4.5.2](#H11o21o6o4o5o2)). (#**3895**)
		- The NUM\_STS[*p*] is set to the same value as the R2I N\_STS subfield in the STA Info field addressed to the corresponding STA *p* in the preceding Ranging NDP Announcement frame plus 1 when the HE Ranging NDP is transmitted to more than one ISTA.
		- The NUM\_STS is set to the same value as the R2I N\_STS subfield in the STA Info field with AID11 subfield is equal or less than 2007 in the preceding Ranging NDP Announcement frame plus 1, when the HE Ranging NDP is transmitted to one ISTA. (#**7355, #7223**)
	+ In the Non-TB ranging measurement exchange ([11.21.6.4.4](#H11o21o6o4o4)) and the non-TB ranging measurement exchange with secure LTF ([11.21.6.4.5.3](#H11o21o6o4o5o3)), set to the same value as the R2I N\_STS subfield in the STA Info field with AID11 subfield equal or less than 2007 in the preceding Ranging NDP Announcement frame plus 1. (#**7355**)
* The LTF\_REP parameter is set as follows:
	+ In the TB ranging measurement exchange ([11.21.6.4.3](#H11o21o6o4o3)), set to the same value as the R2I Rep subfield in the STA Info field in the preceding Ranging NDP Announcement frame plus 1.
	+ In the TB ranging measurement exchange with secure LTF ([11.21.6.4.5.2](#H11o21o6o4o5o2)): (#**3895**)
		- The LTF\_REP[*p*] is set to the same value as the R2I Rep subfield in the STA Info field addressed to the corresponding STA *p* in the preceding Ranging NDP Announcement frame plus 1 when the HE Ranging NDP is transmitted to more than one ISTA. (#**5435**, #**5452**, #**5376**)
		- The LTF\_REP is set to the same value as the R2I Rep subfield in theSTA Info field with AID11 subfield equal or less than 2007 in the preceding Ranging NDP Announcement frame plus 1 when the HE Ranging NDP is transmitted to one ISTA. (#**7355, #7223)**)
	+ In the non-TB ranging measurement exchange ([11.21.6.4.4](#H11o21o6o4o4)) and the non-TB ranging measurement exchange with secure LTF ([11.21.6.4.5.3](#H11o21o6o4o5o3)), set to the same value as the R2I Rep subfield in the STA Info field with AID11 subfield equal or less than 2007 in the preceding Ranging NDP Announcement frame plus 1. (#**7355, #7223**)

**TGaz editor change P.183 L.7 – L.11as shown below:**

* The TX\_WINDOW\_FLAG is set to 1 if the SECURE\_LTF\_FLAG is set to 1 and the RSTA and ISTA have negotiated to use the optional frequency domain Tx window for I2R NPDs; it is set to 0 otherwise. (#**5204**)
* The NUM\_STS parameter is set to the same value as the I2R N\_STS subfield in the STA Info field with AID11 subfield equal or less than 2007 in the preceding Ranging NDP Announcement frame plus 1. (#**7356, #7223**)
* The LTF\_REP parameter is set to the same value as the I2R Rep subfield with AID11 subfield equal or less than 2007 in the STA Info field in the preceding Ranging NDP Announcement frame plus 1. (#**5435**, #**5452**, #**5376**, #**7356, #7223**)
* The TXPWR\_LEVEL\_INDEX parameter is set to a value that matches the Tx Power value indicated in the I2R NDP Tx Power subfield in the STA Info field with the AID11 subfield set to 2045 in the preceding Ranging NPD Announcement frame, except if the value in the I2R NDP Tx Power subfield was set to a reserved value. (#**3883**)