IEEE P802.11Wireless LANs

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| Proposed Resolutions to 2 CIDs of 11az SAB1  |
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Abstract

This submission proposes the resolutions to 11az SAB1 CID-7122 and 7126.

The page and line numbers refer to those in 11az Draft 4.1 [1].

**Introduction**

This submission proposes the resolutions to 11az SAB1 CID- 7122 and 7126.

The page and line numbers refer to those in 11az Draft 4.1 [1].

**Comments:**

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| CID | Page/Line | Clause | Comment | Proposed change | Resolution |
| 7122 | 238/17 | 27.3.18a.1 | What does a "segment" mean? | Define "segment". | Revised. Agree with the commenter that segment is not clearly defined. “segment” can also be confused with frequency segment used in 11ax. As a result, HE-LTF field, HE-LTF User Block, and HE-LTF Repetition Block are defined to describe the structure of HE-LTFs of an HE Ranging NDP and an HE TB Ranging NDP. TGaz editor: please incorporate the text changes in submission 22/489r0<https://mentor.ieee.org/802.11/dcn/21/11-22-0489-00-00az-proposed-resolutions-to-SAB1-2CIDs.docx> |
| 7126 | 240/37 | 27.3.18a.2 | What is a “structure for HE-LTF fields”?  | Define “structure for HE-LTF fields”.  | Revised. Agree with the commenter that “structure for the HE-LTF fields” is not clearly defined. As a result, HE-LTF field, HE-LTF User Block, and HE-LTF Repetition Block are defined to describe the structure of HE-LTFs of an HE Ranging NDP and an HE TB Ranging NDP. TGaz editor: please incorporate the text changes in submission 22/489r0<https://mentor.ieee.org/802.11/dcn/21/11-22-0489-00-00az-proposed-resolutions-to-SAB1-2CIDs.docx> |

**Proposed resolution**

**27.3.11 HE Preamble**

**27.3.11.1 Introduction**

***TGaz Editors: Please modify the text on page 236/line 29 as shown below:***

See 27.3.18a.1 and 27.3.18a.2 for HE preamble for HE Ranging NDP and HE TB Ranging NDP, respectively.

**27.3.18a HE Ranging NDP and HE TB Ranging NDP**

This subclause applies only to HE Ranging NDP and HE TB Ranging NDP. (#**5474**) A HE Ranging NDP or a HE TB Ranging NDP contains a HE-LTF field that consists of one or more HE-LTF User Blocks, where:

* An HE-LTF User block contains all HE-LTF symbols of a one user. The number of an HE-LTF User Block is greater than or equal to one when included in an HE Ranging NDP transmitted for TB Ranging with secure HE-LTF, and is one otherwise.
* An HE-LTF User Block contains one or more HE-LTF Repetition Blocks, and the number of HE-LTF Repetition Blocks is equal to LTF\_REP.
* An HE-LTF Repetition Block of an HE-LTF User Block compromises one or more HE-LTF symbols, NHE-LTF, calculated using the number of space-time streams N\_STS for this user.

(#7122, 7126)

**27.3.18a.1 HE Ranging NDP**

***TGaz Editors: Please modify the text on page 238/line 11-21 as shown below:***

When the TXVECTOR parameter SECURE\_LTF\_FLAG is set to 0, HE-LTFs (#**5217**) as defined in Subclause 27.3.11.10 (HE-LTF) are used in the HE Ranging NDP. The number of HE-LTF symbols is the product of the number of HE-LTF repetitions, given in LTF\_REP, and HE-LTF Repetition Block which is the conventional number of HE-LTF, NHE-LTF, based on the number of space-time streams N\_STS, as defined in Table 21-13 (Number of VHT-LTFs required for different numbers of space-time streams). The construction of the HE-LTFs in an HE Ranging NDP is done by repeating the steps in Subclause 27.3.6.9 (Construction of HE-LTF) LTF\_REP times, i.e., a value of LTF\_REP equal to 1 indicates no repetition of an HE-LTF Repetition Block within an HE-LTF User Block, and a value of LTF\_REP greater than 1 indicates the use of repetitions of an HE-LTF Repetition Block within an HE-LTF User Block. (#7122, #7126) If the TXVECTOR parameter SECURE\_LTF\_FLAG is set to 0, the TXVECTOR parameter NUM\_USERS is not present which is then assumed to be 1. (#**7347**)

***TGaz Editors: Please modify the text on page 239/line 3-14 as shown below:***

When the TXVECTOR parameter SECURE\_LTF\_FLAG is set to 1 and the NUM\_USERS parameter is larger than 1, the TXVECTOR parameters LTF\_KEY, NUM\_STS and LTF\_REP will be in array form with NUM\_USERS entries. The number of Secure HE-LTF will depend on the sum of: HE-LTF Repetition Block, NHE-LTF, times LTF\_REP, across all HE-LTF User Blocks. In this case, the repetitions of the HE-LTF symbols are repetition of the HE-LTF Repetition Block. (#, 7122, #7126)The randomized HE-LTF sequences are different for HE-LTF repetitions. (#**2357**) For Secure HE-LTF transmissions, the number of HE-LTF repetitions given in LTF\_REP shall be greater than 1. (#**7348**)

NOTE—The intended receiver can use the LTF repetitions to check for consistency of the channel estimates across the repetitions. One metric that can be used for the consistency check is to take the mean-squared error between consecutive channel estimates and compare against a threshold relative to the measured noise power. (#**5189**, #**5192**)

The Secure HE-LTF for each HE-LTF User Block (#7122, #7126) are concatenated one after another to a maximum of 64 Secure HE-LTF.

***TGaz Editors: Please modify the text on page 239/line 16-20 as shown below:***

In the HE modulated fields, the number of Tx antennas are the same as the N\_STS in each user’s HE-LTF User Block and may vary from one HE-LTF User Block to the other due to N\_STS change. (#7122, #7126) In the pre-HE modulated fields, the number of Tx antennas used shall be no less than the minimum number of Tx antennas used in the HE modulated fields. The sum of the Tx power across all Tx antennas shall remain constant throughout the entire HE Ranging NDP PPDU. (#**TC1007r1**)

**27.3.18a.2 HE TB Ranging NDP**

***TGaz Editors: Please modify the text on page 240/line 27-32 as shown below:***

The number of HE-LTF symbols in an HE TB Ranging NDP is the product of the usual number of HE-LTF symbols in an HE-LTF Repetition Block, NHE-LTF, and the number of HE-LTF repetitions, given in LTF\_REP. A value of LTF\_REP equal to 1 indicates no repetition of an HE-LTF Repetition Block within an HE-LTF User Block, and a value of LTF\_REP greater than 1 indicates the use of repetitions of an HE-LTF Repetition Block within an HE-LTF User Block. (#7122, #7126) The sum of Tx power shall remain constant throughout the entire HE TB Ranging NDP PPDU. (#**TC1007r1, #5435, #5452, #5376**, #**7352**)

When the TXVECTOR parameter SECURE\_LTF\_FLAG is set to 0, HE-LTFs as defined in Subclause 27.3.11.10 (HE-LTF) are used in the HE-LTF Repetition Block in the HE-LTF User Block. (#7122, 7126)

***TGaz Editors: Please modify the text on page 241/line 1-6 as shown below:***

When the TXVECTOR parameter SECURE\_LTF\_FLAG is set to 1, Secure HE-LTFs as defined in 27.3.18d (Construction of Secure HE-LTF) are used in the HE-LTF Repetition Block in the HE-LTF User Block, and the Packet Extension field will be partially replaced by a zero power GI in its first 1.6 μs; see Figure 27-46f (HE TB Ranging NDP format with Secure HE LTFs). The repetitions of the HE-LTF symbols are repetition of an HE-LTF Repetition Block. (#7122, #7126) The randomized HE-LTF sequences are different for HE-LTF repetitions. (#**2357**)

**References**

[1] IEEE P802.11az™/D4.1, Draft Standard for information technology – Telecommunications and information exchange between systems Local and metropolitan area networks – Specific requirements, Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications, Amendment 4: Enhancements for positioning