IEEE P802.11
Wireless LANs

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| Comment Resolution SA1 – 8000s part1 |
| Date: 2022-07-08 |
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Abstract

This submission proposes the comment resolution of CIDs 8054, 8055, 8056, 8049, 8052; as part of SA1, changes are relative to Draft 5.0.

Revisions:

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGaz Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGaz Editor: Editing instructions preceded by “TGaz Editor” are instructions to the TGaz editor to modify existing material in the TGaz draft. As a result of adopting the changes, the TGaz editor will execute the instructions rather than copy them to the TGaz Draft.***

**The text preceded by “Discussion” is not part of the adopted changes.**

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| **8054** | 249.7 | 27.3.18a.4 | Add a figure for generation of secure HE-LTF symbol similar to generation of non-secure HE-LTF defined in 11ax standard | as in comment | **Revised**TGaz editor make changes depicted in[https://mentor.ieee.org/802.11/dcn/22/](https://mentor.ieee.org/802.11/dcn/22/11-22-0643-02-00az-comment-resolution-sa1-cid-7296-and-7336.docx)11-22-1022-00-00az-comment-resolution-sa1-8000s-part1.docx |
| **8055** | 250.14 | 27.3.18a.4 | This paragraph talks about construction of secure HE-LTF symbols and by saying "There is no CSD per space-time stream" makes no sense | Remove this bullet point ( e ) | **Revised**For secure LTF, CSD is replaced with pseudo random phase rotation so it makes sense to merge bullet point ( e ) with pseudo random phase rotation bullet point ( b ) TGaz editor make changes depicted in[https://mentor.ieee.org/802.11/dcn/22/](https://mentor.ieee.org/802.11/dcn/22/11-22-0643-02-00az-comment-resolution-sa1-cid-7296-and-7336.docx)11-22-1022-00-00az-comment-resolution-sa1-8000s-part1.docx |
| **8056** | 249.11 | 27.3.18a.4 | the order of construction of secure HE-LTF sequence seems arbitrary. 11ax style of HE-LTF sequence generation can be followed | Reorder the bullet points ( a ) followed by ( d ) followed by ( c ) followed by ( b ) similar to 11ax | **Accept**TGaz editor make changes depicted in[https://mentor.ieee.org/802.11/dcn/22/](https://mentor.ieee.org/802.11/dcn/22/11-22-0643-02-00az-comment-resolution-sa1-cid-7296-and-7336.docx)11-22-1022-00-00az-comment-resolution-sa1-8000s-part1.docx |
| **8049** | 240.00 | 27.3.18a.1 | In Figure 27-46b for a non-secure case A1=B1 and A2=B2 | replace B1, B2 with A1, A2 | **Revised**TGaz editor make changes depicted in[https://mentor.ieee.org/802.11/dcn/22/](https://mentor.ieee.org/802.11/dcn/22/11-22-0643-02-00az-comment-resolution-sa1-cid-7296-and-7336.docx)11-22-1022-00-00az-comment-resolution-sa1-8000s-part1.docx |
| **8052** | 242.08 | 27.3.18a.1 | what does this mean "a frequency domain flat top window, instead of the frequency domain rectangular window" ? Sentence is not clear please clarify | as in comment | **Revised**TGaz editor make changes depicted in[https://mentor.ieee.org/802.11/dcn/22/](https://mentor.ieee.org/802.11/dcn/22/11-22-0643-02-00az-comment-resolution-sa1-cid-7296-and-7336.docx)11-22-1022-00-00az-comment-resolution-sa1-8000s-part1.docx |

**Resolution:**

27.3.18a.4 Construction of secure HE-LTF

TGaz Editor: Change the following paragraphs on page 249 as follows

The construction of the Secure HE-LTF field is as follows:

1. Sequence generation: Generate the randomized LTF sequence in frequency domain over the bandwidth indicated by CH\_BANDWIDTH as described in [[27.3.18a.3](#H27o3o18ao3)](#H27o3o18c) (Generation of Randomized LTF Sequence).
2. A frequency domain window function is applied to all the tones of the secure HE-LTF sequence. When the TXVECTOR parameter TX\_WINDOW\_FLAG is set to 0, the Rectangular window is used, where for all the tones in all channel bandwidths. When the TXVECTOR parameter TX\_WINDOW\_FLAG is set to 1, the flat top window is used; it is defined as: (#**5216**)

 (27-126d)

where
and the impulse response p(n) is given by:

 (27-126e)
where

a0 = 0.21557895,
a1 = -0.41663158,
a2 = 0.277263158,
a3 = -0.083578947,
a4 = 0.006947368 and
NWinFT = 20.

Note that the shall be normalized to have unit RMS power.
In Equations ([27-126d](#E27o126d)) and ([27-126e](#E27o126e)), the LTF subcarrier values , where is secure HE-LTF sequence constructed after step c). (#**7138**)

1. 𝐴𝐻𝐸−𝐿𝑇𝐹matrix mapping: Apply the 𝑃𝐻𝐸−𝐿𝑇𝐹 matrix to all tones of the secure HE-LTF sequence. (#**1342**)
2. There is no CSD per space time stream instead, apply per spatial stream phase rotation: Generate the pseudorandom phase rotation for 11 each spatial stream. Apply the pseudorandom phase rotation along with the deterministic 12 phase rotation to the spatial streams as described in 27.3.18a.5 (Pseudorandom and 13 deterministic per spatial stream phase rotations). (#8055, 8056)

(#8055)

1. There is no spatial mapping, the Q matrix is a block identity matrix.
2. IDFT: Compute the inverse discrete Fourier transform.
3. Insert zero power GI: Prepend values of zero of length indicated by the TXVECTOR parameter GI\_TYPE.
4. Analog and RF: Upconvert the resulting complex baseband waveform associated with each transmit chain to an RF signal according to the center frequency of the desired channel and transmit. Refer to 27.3.10 (Mathematical description of signals). (#**7085** #**7139**)

TGaz Editor: Insert the following paragraph and figure on page 251 as follows

The generation of the time domain secure HELTF symbol per repetition for symbol k and tone index l is shown in Figure 27-46h (Generation of secure HE-LTF symbols per repetition in a HE Ranging NDP PPDU)



Figure 27-46h – Generation of secure HE-LTF symbols per repetition in a HE Ranging NDP PPDU (#8054)

27.3.18a.1 HE Ranging NDP

TGaz Editor: Change the following figure on page 240 as follows

See examples in Figure 27-46b (An example of HE-LTF field in an HE Ranging NDP with NUM\_USERS=1, NUM\_STS=2 and LTF\_REP =2) and Figure 27-46d (Example of Secure HE-LTF field with NUM\_USERS=2, NUM\_STS=[2,1] and LTF\_REP =[2,2]). (#7122, #7126)



**Figure 27-46b—An example of HE-LTFs in an HE Ranging NDP with NUM\_USERS=1,** **NUM\_STS=2 and N\_LTF\_REP =2 (#4014, #5452, #7122, #7126) (#8049)**

27.3.18a.2 HE TB Ranging NDP

TGaz Editor: Change the following paragraphs on page 242 as follows

* Uses HE-LTFs or secure HE-LTFs when the TXVECTOR parameter SECURE\_LTF\_FLAG is set to 0 or 1 respectively.
* Secure HE-LTFs use randomized HE-LTF sequences, pseudorandom and deterministic per stream phase rotation and a configurable frequency domain window; see 27.3.18a.4 (Construction of secure HE-LTF). (#3215, #3354, #3911, #3920, 9 #4018, #5216, #7114, #7122, #7126)(#8052)