IEEE P802.11
Wireless LANs

|  |
| --- |
| 11ax Comment Resolutions for Clauses 26.3.2-26.3.9.3-26.3.9.4-26.3.9.5-26.3.9.8.5-26.3.10.2-26.3.10.13 |
| Date: 2016-06-28 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Yan Zhang | Marvell  | 5488 Marvell Ln, Santa Clara, CA 95054 | 408-222-0975 | yzhang@marvell.com |
| Rui Cao | Marvell |  |  | ruicao@marvell.com |
| Hongyuan Zhang | Marvell |  |  | hongyuan@marvell.com |

Abstract: This document contains proposed resolutions for comments in *Clause 26.3.2, 26.3.9.3, 26.3.9.4, 26.3.9.5, 26.3.9.8.5, 26.3.10.2 and 26.3.10.13* from 11ax D0.1 with the CIDs below.

All proposed resolution is based on 11ax D0.1, and all references to legacy WiFi standards are based on Draft P802.11REVmc\_D6.0.

|  |  |  |
| --- | --- | --- |
| ***Clauses 26.3.2, 26.3.9.3, 26.3.9.4, 26.3.9.5, 26.3.9.8.5, 26.9.10.2 and 26.9.10.13*** |  |  |
| * 836 883 884 1930 2247
* 292 525 904 906 908 1984 1990 1995 2748 2749
 |  |  |
| * 1988 1994
* 1058
* 1992
* 1991
* 1985 1989
* 1684
* 523
* 1857
* 271
* 1412 1195
* 1996 2532 2120
* 2098
* 293 1987 1993
 |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

***CIDs for Clause 26.3.2***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 271 | Bin Tian | 26.3.9.2 | 74.02 | Inconsistency in HE MU PPDU descrption between "HE MU PPDU format (HE\_MU) carries one or more PSDUs to one or more users" in 26.1.4 and "This format is used for MU transmission." The HE MU PPDU can be used for SU transmission | Change to: the format is used for SU or MU tranmission that is not a response of .. ." | **Revised.**Change to as in the resolution of CID836 in doc IEEE802.11-16/0937r6. |

Resolution to CID 271 as below.

Instruction to ax editor: please make the following text changes on P74L01 in *Clause 26.3.2*:

The format of the HE MU PPDU is defined as in Figure 26-2 (HE MU PPDU format). This format is used for transmission to one or more users that is not a response of a Trigger frame. An HE-SIG-B field is present in this format.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 836 | Jinsoo Choi | 26.3.2 | 75.25 | There are some fields with variable size in the Figure 26-5 NDP PPDU format such as HE-SIG-A (2 symbols or 4 symbols) or HE-STF (1x or 2x), but there is no note or explanation on those fields. It would be better to add some explanation or include the duration of each field in the figure explicitly. | Specify the duration of each field in Figure 26-5. | **Revised.**Change to as in the resolution of CID836 in doc IEEE802.11-16/0937r6. |
| 883 | JUNG HOON SUH  | 26.3.2 | 75.33 | Need to confirm the description for HE NDP PPDU, NOTE 2 | Change to: “There is only one HE-LTF mode for NDP packet” | **Revised.**Change to as in the resolution of CID883 in doc IEEE802.11-16/0937r6. |
| 884 | JUNG HOON SUH  | 26.3.2 | 75.35 | Need to confirm the description for HE NDP PPDU, NOTE 3 | Change to: " T\_HE-LTF-2X is the only symbol length for NDP PPDU” | **Revised.**Change to as in the resolution of CID884 in doc IEEE802.11-16/0937r6. |
| 1930 | Sigurd Schelstraete | 26.3.2 | 75.37 | "The presence and duration of PE are TBD" | The reason for PE does not appear to apply for sounding packet. Remove PE. | **Rejected.**PE gives the beamformees sufficient time to prepare extensive feedbacks after receiving sounding NDP PPDU. Refer to PHY motion #147 in IEEE802.11-16/0235r7. |
| 2247 | Vincent Knowles IV Jones | 26.3.2 | 75.15 | The GI for an NDP should be the maximum length GI. The maximum length GI will provide the best fidelity of channel measurement, and since there are very few GI in an entire NDP PPDU, there isn't too much overhead for selecting the max GI | Define a GI for the HE NDP. Define it to be the maximum GI length. | **Rejected.**11ax spec framework specifies that mandatory GI value for NDP is either 1.6uS or 0.8uS. This decision is made after many discussions. Maximum GI value is applied only when HELTF-4x sequence is used in NDP PPDU in spec framework, which is an optional mode. |

**Discussion:**

The commenters are right that HE-LTF mode and PE duration for HE NDP PPDU should be explicitly specified as in ax spec framework. The commenters are right that duration of each field in Figure 26-5 need to be specified.

Resolution to CID #836 as below.

Instruction to ax editor: please replace Figure 26-5 on P75L25 in *Clause 26.3.2* with the following one:

L

-

STF

L

-

LTF

L

-

SIG

RL

-

SIG

HE

-

SIG

-

A

HE

-

STF

HE

-

LTF

HE

-

LTF

...

8

µ

s

8

µ

s

4

µ

s

4

µ

s

8

µ

s

4

µ

s

-

6.4/12.8μs+GI per HE-LTF symbol

PE

4µs

**Figure 26-5—HE NDP PPDU format**

Resolution to CID #883/#884 as below.

Instruction to ax editor: please make the following text changes on P75L33 in *Clause 26.3.2*:

The HE NDP PPDU has the following properties:

—It uses the HE SU PPDU format but without the Data field

—2X HE-LTF is the only mandatory mode for NDP. 4X HE-LTF is optional mode for NDP. The combination of HE-LTF modes and GI duration is indicated in HE-SIG-A field.

—PE is always present in a NDP PPDU, with a duration of 4uS.

—NDP PPDU uses either of the GI values (1.6uS or 0.8uS) when use 2X HE-LTF. GI shall be set to 3.2uS if 4X HE-LTF sequence is used for NDP PPDU.

* On P75L35 (CID #884): Refer to resolution of CID #883.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 292 | Bin Tian | 26.3.9.3 | 101.13 | Why use signficant different math equations to describe L-STF, L-LTFwaveform from thoise I previous amendments? For example, Eq 26-12 is different from 22-20 in VHT section. In Eq 26-12, the T\_GI\_legacypreamble term shall be removed. | Use the same equations and texts to describe the L-STFand L-LTFwaveforms as in previous amendents. Only make necessary changes to the reflect the delta introudced in 11ax like boosting and beam\_change=0 case. | **Rejected.**The reason that the equation becomes much different is to handle the HE\_TRIG PPDU preamble, in which preambles are only transmitted on the same 20MHz channels where data are transmitted. |
| 525 | Dong Guk Lim | 26.3.9.5 | 103.35 | we agreed that the same power per tone as L-LTF is applied in L-SIG, RL-SIG, HE-SIG-A and HE-SIG-B fields. But, in D0.1, it does not applied yet. So, It should be applied in description/ equation of L-SIG, RL-SIG, HE-SIG-A and HE-SIG-B fields | add the text and field based on the PHY Motion #144 in IEEE 802.11-16/0235r7 | **Revised.**Change to as in the resolution of CID525 in doc IEEE802.11-16/0937r6. |
| 904 | Junghoon Suh | 26.3.9.3 | 101.49 | The first column of Q matrix is always used in Eqn (26-14) | in [Q\_4(~)^(i\_seq)]\_i\_TX,m -->m should be 0? Because the 1st column of Q matrix is always used here, and N\_STS,total is always 1 | **Revised.** Change to as in the resolution of CID904 in doc IEEE802.11-16/0937r6. |
| 906 | Junghoon Suh | 26.3.9.4 | 102.33 | The first column of Q matrix is always used in Eqn (26-16) | in [Q\_4(~)^(i\_seq)]\_i\_TX,m -->m should be 0? Because the 1st column of Q matrix is always used here, and N\_STS,total is always 1 | **Revised.** Change to as in the resolution of CID906 in doc IEEE802.11-16/0937r6. |
| 908 | Junghoon Suh | 26.3.9.4 | 104.19 | The first column of Q matrix is always used in Eqn (26-19) | in [Q\_4(~)^(i\_seq)]\_i\_TX,m -->m should be 0? Because the 1st column of Q matrix is always used here, and N\_STS,total is always 1 | **Revised.** Change to as in the resolution of CID908 in doc IEEE802.11-16/0937r6. |
| 1984 | Siguard Schelstraete | 26.3.9.3 | 101.14 | L-STF should only sum over "active" 20 MHz subbands | The sum runs over all 20 MHz bandwidths. Following agreement on PHY motion 154, this should be changed. The same aplies to Equations 26-14, 26-15 and 26-16 | **Revised.**Change to as in the resolution of CID1984 in doc IEEE802.11-16/0937r6. |
| 1990 | Siguard Schelstraete | 26.3.9.4 | 101.49 | T\_Cs,HE(n) is not used in Equation (26-14) | See comment | **Revised.**Change to as in the resolution of CID1990 in doc IEEE802.11-16/0937r6. |
| 1995 | Siguard Schelstraete | 26.3.9.4 | 102.44 | T\_Cs,HE(n) is not used in Equation (26-16) | See comment | **Revised.**Change to as in the resolution of CID1995 in doc IEEE802.11-16/0937r6. |
| 2748 | yujin noh | 26.3.9.8.5 | 117.31 | Per user field content potentially contains too many zeros during transmission. This may cause PAPR of SIG-B to be too large and effect transmission power of the PPDU. |  | **Revised** Change to as in the resolution of CID1995 in doc IEEE802.11-16/0937r6, according to passed motion. |
| 2749 | yujin noh | 26.3.9.8.5 | 117.40 | There may be SIG PAPR issues because one SIGB OFDM symbol could be full of zeros when the STAID for Broadcast will be 0 for single BSS AP. Reconsider using 0 for STAID or specify a method to reduce SIG-B PAPR with 0 STAID. | Specify field definition or a method to reduce PAPR of HE SIG-B. | **Revised** Change to as in the resolution of CID1995 in doc IEEE802.11-16/0937r6, according to passed motion. |

**Discussion:**

Since BEAM\_CHANGE = 0 only applies for HE\_SU PPDU, there is no change of sum over all 20MHz channels in Equations (26-14) and (26-16). Equations (26-12), (26-15), (26-18) and (26-21) should be updated.

The commenter is right that LSIG, RL-SIG, HE-SIGA and HE-SIGB fields’ power scaling factors in D0.1 texts are not consistent with PHY motion 144 and motion in 11-16/0652r2. We need to apply a power scaling facotr in equations (26-12), (26-14)-(26-16) to reflect PHY motion 144. We need to apply a power scaling factor 

for L-LSIG in equation (26-18) to differentiate extra 4 edge data tones and other data tones to reflect PHY motion 156.

The commenter is right that index *m* should start from 1 in Eqn(26-14), Eqn(26-16) and Eqn(26-19). The time domain CSD per antenna is used in these equations, which is inaccurate and should be replaced by frequency domain CSD per spatial stream.

In addition, L-STF sequence does not include GI. *TGI,LegacyPreamble* should be removed from the equations (26-12) and (26-14). And there should be no applied in equations (26-14) and (26-16) when BEAM\_CHANGE = 0.

In addition, sum over all 20MHz channels in equation (26-25) for HE-SIG-B needs to be changed to sum over only active 20MHz channels when preamble puncturing is applied. Phase rotation for HESIGB PAPR reduction shall be applied over each 20MHz channel.

Resolution to CID #525/#904/#906/#908/#1984/#1990/#1995/#2748/#2749 as follows.

Instruction to ax editor: please replace equation (26-12) on p101/l4 in *Clause 26.3.9.3* with the following one:

 (26-12)

Instruction to ax editor: please make the following changes on p101/23 in *Clause 26.3.9.3*:

|  |  |
| --- | --- |
|  |  |

 ε is a power scaling factor, with the following value



and  is PPDU format dependent scaling factor for L-STF on the *k*th tone index, with the following value

(26-13)

*N20MHz* is defined in 22.3.8.3.4 (L-SIG definition)



 represents the cyclic shift for transmitter chain  with a value given in 26.3.9.2 (Cyclic shift for Pre-HE modulated fields).

 is defined by Equation (22-14), Equation (22-15), Equation (22-16) and Equation (22-17).

has the value given in Table 22-8 (Tone scaling factor and guard interval duration values for PHY fields(11ac)).

 *Ω20MHz* is a set of 20MHz channels, which containsthe channels where pre-HE modulated fields are located and the channel indeces are within 0 to *N20MHz-1* in an HE\_TRIG PPDU or HE\_MU PPDU with preamble puncturing, or equals to *{0, 1, …, N20MHz-1}* otherwise.

Instruction to ax editor: please replace equations (26-14) in *Clause 26.3.9.3* and (26-15) in *Clause 26.3.9.4* with the following ones:

|  |  |
| --- | --- |
|  | (26-14) |

(26‑15)

Instruction to ax editor: please make the following changes on p101/23 in *Clause 26.3.9.4*:

 is PPDU format dependent scaling factor for L-LTF on the *k*th tone index, with the same value as.

Instruction to ax editor: please replace equations (26-16) in *Clause 26.3.9.4*, (26-18) and (26-19) in *Clause 26.3.9.5* with the following ones:

|  |  |
| --- | --- |
|  | (26-16) |

  (26-18)

|  |  |
| --- | --- |
|  | (26-19) |
| Instruction to ax editor: please make the following changes on p104/28 in *Clause 26.3.9.5*:Where  is PPDU format dependent scaling factor for L-SIG on the *k*th tone index, with the following value:  is given in 26.3.9.2 (Cyclic shift for Pre-HE modulated fields) |  |

Instruction to ax editor: please replace equation (26-21) in *Clause 26.3.9.7.4* with the following one:

|  |  |
| --- | --- |
|  (26-21)Instruction to ax editor: please replace  on P109L45 in *Clause 26.3.9.7.4* with the following one:  |  |
| Instruction to ax editor: please replace equation (26-22) in *Clause 26.3.9.7.4* with the following one:  | (26-22) |
| Instruction to ax editor: please make the following changes on P113L55 in *Clause 26.3.9.8.3*:The cyclic prefix used for HE-SIG-B shall be 0.8 μs. The number of symbols in HE-SIG-B, denoted by  *NSYM,HE-SIG-B*, shall be signaled in HE-SIG-A in the default mode (see Section 25.3.9.2.4). For the *cth* content channel (*c* = 1 or 2),denote the sample on the *kth* data subcarrier of the *n*th symbol by *dk,n,c*. The time domain waveform for the HE-SIG-B follows Equation (26‑25). |  |
| Instruction to ax editor: please replace equation (26-25) in *Clause 26.3.9.8.3* with the following one: | (26‑25) |
| Instruction to ax editor: please make the following changes on P114/L8 in *Clause 26.3.9.8.3*:where is the phase rotation value for HESIGB PAPR reduction. When HESIGB is modulated with MCS=0 and DCM=1, . For all other modulation schemes of HESIGB,   |   |
|  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 293 | Bin Tian | 26.3.9.3 | 101.38 | Gamma\_k,BW is defined in Table 26-14 and following Equations (26-8)-(26-11) with mostly TBDs. But in the application of this varible, it points to section 22 (11ac spec) as its reference. The same problem appears in the descriptions os many pre-HE modulated fields, like L-STF, L-LTF, ... | Redefining Gamma\_k,BW seems not necessary unless we have different values from legacy. Suggest to remove the definition of Gamma\_k,BW for 11ax and replace it by simple statement of using legacy definition and value for this varible | **Revised.**Change to as in the resolution of CID293 in doc IEEE802.11-16/0937r6. |
| 1987 | Siguard Schelstraete | 26.3.9.3 | 101.38 | Defintion of Gamma\_k,BW contradicts statement on page 100. | Page 100 states that the values are determined by 26-9, 26-10 and 26-11 | **Revised.**Change to as in the resolution of CID1987 in doc IEEE802.11-16/0937r6. |
| 1993 | Siguard Schelstraete | 26.3.9.4 | 102.22 | Defintion of Gamma\_k,BW contradicts statement on page 100. | Page 100 states that the values are determined by 26-9, 26-10 and 26-11 | **Revised.**Change to as in the resolution of CID1993 in doc IEEE802.11-16/0937r6.  |

Resolution to CID #293/#1987/#1993 as follows.

Instruction to ax editor: please make the following changes on P100/L1 in *Clause 26.3.9.3:*

 is used to represent tone rotation. . In HE modulated fields,  in all the subcarriers. In pre-HE modulated fields, is defined as in 21.3.7.5 (Definition of tone rotation) when TXVECTOR parameter BEAM\_CHANGE is set to 1, and for all the tones when TXVECTOR parameter BEAM\_CHANGE is set to 0. When TXVECTOR parameter BEAM\_CHANGE is not present (such as in HE MU PPDU and HE Trigger-based PPDU), BEAM\_CHANGE is assumed to be set to 1.

Instruction to ax editor: please remove the definition of on P100/L28 in *Clause 26.3.9.3:*

|  |  |
| --- | --- |
|  |  |

|  |  |
| --- | --- |
|  |  |

|  |  |
| --- | --- |
|  |  |

|  |  |
| --- | --- |
|  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 1991 | Siguard Schelstraete | 26.3.9.3 | 101.62 | Defintion of Qk | Clarify that the index of Qk refers to the tone spacing used for the data symbols | **Revised.**Change to as in the resolution of CID1991 in doc IEEE802.11-16/0937r6. |

**Discussions:**

Resolution to CID /#1991 as follows.

Instruction to ax editor: please make the following changes on P101/L58 in *Clause 26.3.9.3:*

is given in 26.3.9.2 (Cyclic shift for Pre-HE modulated fields).

 is the spatial mapping/steering matrix for subcarrier *k,* in frequency segment *iSeg* on the data symbols over tone spacing  as defined in Table 26-3. Refer to the descriptions in 22.3.10.11.1 (Transmission in VHT format) for examples of .

 is defined in Equation (26‑57)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 1988 | Siguard Schelstraete | 26.3.9.3 | 101.40 | wrong reference | Reference to Table 22-8 should be Table 26-13 | **Revised.**Change to as in the resolution of CID1988 in doc IEEE802.11-16/0937r6. |
| 1994 | Siguard Schelstraete | 26.3.9.4 | 102.24 | wrong reference | Reference to Table 22-8 should be Table 26-13 | **Revised.**Change to as in the resolution of CID1994 in doc IEEE802.11-16/0937r6. |

**Discussions:**

The commentor is right that reference table indices are not correct.

Resolution to CID #1988/#1994 as follows.

Instruction to ax editor: please make the following changes on P101/L40 in *Clause 26.3.9.3:*

 has the value given in Table26-13 (Tone scaling factor and guard interval duration values for HE PPDU fields.

Instruction to ax editor: please make the following changes on P102/L24 in *Clause 26.3.9.4:*

 has the value given in Table 26-13 (Tone scaling factor and guard interval duration values for PHY HE PPDU fields).

Instruction to ax editor: please make additional changes to Table 26-13 in *Clause 26.3.9.4*, changes are highlighted in “Yellow”:

|  |  |  |
| --- | --- | --- |
| **Field** |  **as a function of bandwidth, and RU size per frequency segment** | **Guard interval duration** |
| **20 MHz** | **40 MHz** | **80 MHz** | **160 MHz** |
| L-STF | 12 | 24 | 48 | 96 | - |
| L-LTF | 52 | 104 | 208 | 416 | *TGI2,Data* |
| L-SIG (in HE PPDU) | 56 | 112 | 224 | 448 | *TGI,LegacyPreamble* |
| L-SIG (in NON\_HT\_DUP) | - | 104 | 208 | 416 |
| RL-SIG | 56 | 112 | 224 | 448 | *TGI,LegacyPreamble* |
| HE-SIG-A | 56 | 112 | 224 | 448 | *TGI,LegacyPreamble* |
| HE-SIG-B | 56 | 112 | 224 | 448 | *TGI,LegacyPreamble* |
| HE-STF not in HE\_TRIG | 14 | 30 | 62 | 126 | - |
| HE-STF in HE\_TRIG | 30 | 60 | 124 | 248 | - |
| HE-LTF 1x Duration | 60 | 122 | 250 | 500 | *TGI,HE-LTF1* |
| HE-LTF 2x Duration | 122 | 242 | 498 | 996 | *TGI,HE-LTF2* |
| HE-LTF 4x Duration | 242 | 484 | 996 | 1992 | *TGI,HE-LTF4* |
| HE-Data | 242 | 484 | 996 | 1992 | *TGI,Data* or *TGI2,Data* or *TGI4,Data* |
| NON\_HT\_DUP\_OFDM-Data | ~~56~~~~-~~ | ~~112~~104 | ~~224~~208 | ~~448~~416 | *TGI,LegacyPreamble* |
| NOTE--in the case of an HE OFDMA PPDU, the value of HE-STF, HE-LTF and HE-Data fields is variable, and is determined by which RUs of the current full bandwidth are transmitted in the PPDU. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 1985 | Siguard Schelstraete | 26.3.9.3 | 101.18 | S\_k,20 is not defined in (26-12) | see comment | **Revised.**Change to as in the resolution of CID1985 in doc IEEE802.11-16/0937r6. |
| 1989 | Siguard Schelstraete | 26.3.9.3 | 101.54 | S\_k,20 is not defined in (26-14) | see comment | **Revised.**Change to as in the resolution of CID1989 in doc IEEE802.11-16/0937r6. |
| 1058 | Ke Yao | 26.3.9.4 | 103.26 | those extra tones are regarded as an extension of L-LTF used to improve channel estimations for a lager band SIG. we don't need to specify them as BPSK modulated tones. | suggest to change "Extra 4 BPSK modulated tones " to be "Extra 4 tones " | **Rejected.**The extra 4 tones are defined as BPSK and the values are specified in the following sentence. It is better to make it clear. |
| 1992 | Siguard Schelstraete | 26.3.9.4 | 102.09 | L\_k,20 is not defined in (26-15) | see comment | **Revised.**Change to as in the resolution of CID1992 in doc IEEE802.11-16/0937r6. |

**Discussions:**

 is defined as in 11a STF, and is missing here.

 is defined as in 11a, and is missing here.

Resolution to CID #1985/#1989 as follows.

Instruction to ax editor: please add the following line after P101/L40 in *Clause 26.3.9.3:*

*Sk,20* is defined as *S-26,26* in Equation (18-6).

Resolution to CID #1992 as follows.

Instruction to ax editor: please add the following line after P102/L24 in *Clause 26.3.9.4:*

*Lk,20* is defined as *L-26,26* in Equation (18-8).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 1684 | Oghenekome Oteri | 26.3.9.5 | 102.50 | +/-1 TBD Should have values. | It was decided in 114, Should be updated. | **Revised.**Change to as in the resolution of CID1984 in doc IEEE802.11-16/0937r6. |

Resolution to CID #1684 as follows.

Instruction to ax editor: please make the following change for the equation on P103/L50 in *Clause 26.3.9.5:*



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 523 | Dong Guk Lim | 26.3.9.5 | 104.05 | we define the NTonefields in table 26-13. | change the reference to table 26-13 | **Revised.**Change to as in the resolution of CID523 in doc IEEE802.11-16/0937r6. |

Resolution to CID #523 as follows.

Instruction to ax editor: please make the following change for the equation on P104/L5 in *Clause 26.3.9.5:*

has the value given in Table 26-13**.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 1412 | Mark RISON | 26.3.9.5 | 103.07 | Using m=1 or m=2 may cause existing devices to consider L-SIG corrupt and ignore it (just like some existing devices do for a Length greater than 2304), losing the CCA protection for the duration of the PPDU | Do not try to signal new stuff in the L-SIG Length. Instead signal the format in HT-SIG-A | **Rejected.**Using m= 1 or m= 2 will not cause existing devices to consider L-SIG corrupt and ignore it. 11n or 11ac device will interpret the packet as an 11a PPDU once it determines the length is not divisible by 3, and back off based on the duration indicated by this length. 11a device will decode the packet as an 11a PPDU and back off once it cannot correctly decode the packet.  |
| 1195 | Lei Huang | 26.3.9.5 | 103.07 | Regarding the length subfield in L-SIG field, m = 1 should be for an HE SU PPDU or HE trigger based PPDU and m =2 should be for an HE MU PPDU or HE extended range SU PPDU. | change "m is 1 for an HE MU PPDU and HE extended range SU PPDU, and 2 otherwise" to "m is 1 for an HE SU PPDU and HE trigger based PPDU, and 2 otherwise" | **Rejected.**As described in PHY motion 69, “If the length subfield in L-SIG field mod 3 equals 1, it indicates HE SU PPDU or HE trigger based PPDU. If the length subfield in L-SIG field mod 3 equals 2, it indicates HE MU PPDU or HE extended range SU PPDU.” Length mod 3 is 2 when m=1, which indicates HE MU PPDU and HE extended range SU PPDU. Length mod 3 is 1 when m= 2, which indicates HE SU PPDU and HE trigger-based PPDU. |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 1996 | Sigurd Schelstraete | 26.3.9.5 | 103.02 | The current defintion of TXTIME is not guaranteed to be a multiple of 4. How is this handled in the defintion of the Length field? | See comment | **Revised.**Change to as in the resolution of CID1996 in doc IEEE802.11-16/0937r6. |
| 2532 | Youhan Kim | 26.3.9.5 | 103.01 | Unlike VHT, TXTIME is not always a multiple of 4 usec in HE. | Add a ceil() function to Equation (26-17). Specifically, Length = ceil( ( TXTIME - 20 ) / 4 ) \* 3 - 3 - m. | **Revised.**Change to as in the resolution of CID2532 in doc IEEE802.11-16/0937r6. |
| 2120 | Sriram Venkateswaran | 26.3.9.5 | 103.02 | Length Field calculation: CEIL function expected | CEIL( (TXTIME-20)/4 ) | **Revised.**Change to as in the resolution of CID2120 in doc IEEE802.11-16/0937r6. |

Resolution to CID #1996/#2523/#2120: please refer to resolution of CID #1683.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 1857 | Sameer Vermani | 26.3.10.2 | 134.44 | Please update Table 26-22 | as comment | **Revised.**Change to as in the resolution of CID1857 in doc IEEE802.11-16/0937r6. |

Resolution to CID #1857 as follows.

Instruction to ax editor: please update the Table 1 on P134/L44 in *Clause 26.3.10.2* with the following one*:*

Table 1 - values

|  |  |
| --- | --- |
| **RU Size** | NSD.SHORT |
|  | DCM = 0 | DCM = 1 |
| 26 | 6 | 2  |
| 52 | 12 | 6  |
| 106 | 24 | 12  |
| 242 | 60 | 30  |
| 484 | 120 | 60  |
| 996 | 240 | 120  |
| 996x2 | 492 | 246  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Section | Page | Comment | Proposed Change | Resolution |
| 2098 | Sigurd Schelstraete | 26.3.10.13 | 150.48 | Wrong reference | Two errored references to be corrected (line 48 and 50) | **Revised.**Change to as in the resolution of CID2098 in doc IEEE802.11-16/0937r6. |

Resolution to CID #2098 as follows.

Instruction to ax editor: please make the following changes on P150/L44 in *Clause 26.3.10.13:*

 is defined in 22.3.10.10 (Pilot subcarriers)**.**

 is the transmitted constellation for user *u* in the *r-*th RU at subcarrier *k*, space-time stream *m*, and Data field OFDM symbol *n* and is defined in Equation (26-109)**.**

 has the value given in Table 26-13**.**