IEEE P802.11
Wireless LANs

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| [The Comment regolution for clause 32.2.7.2 Non\_NGV portion of NGV format preamble] |
| Date: 2020-06-15 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Dongguk Lim | LG Electronics | 19, Yangjae-Daero 11 gil, Seoch-gu, Seoul, Korea |  | dongguk.lim@lge.com |
|  |  |  |  |  |

Abstract

This submission proposes resolutions for following CIDs

114, 115, 116, 117, 144, 145, 146, 147, 279, 280, 281, 282, 283, 284, 286, 287, 289, 290, 291(total 19 CID)

Revisions:

* Rev 0: Initial version of the document.

## CID 279

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 279 | 42.18 | 32.3.7.2.1 | fill TBD | as in comment | Revised TGbd editor to make the changes shown in 11-20/845r1 |

### Discussion:

We have agreed that 11bd can use the 2 antennae and support the up to 2 spatial streams. So, for efficient transmission, we need to add the description for the cyclic shift.

Propose:

***TGbd editor: please change the TBD in 32.3.7.2.1 Cyclic shift for pre-NGV modulated fields to follows***

The cyclic shift value $T\_{cs}^{i\_{TX}}$ for the L-STF, L-LTF, L-SIG, RL-SIG, NGV-SIG and RNGV-SIG fields of the PPDU for transmit chain iTX out of a total of NTX are defined in Table 32-xx (Cyclic shift values for L-STF, L-LTF, L-SIG, RL-SIG, NGV-SIG and RNGV-SIG fields of the PPDU).

Table 32-xx - Cyclic shift values for L-STF, L-LTF, L-SIG, RL-SIG, NGV-SIG and RNGV-SIG fields of the PPDU

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| $T\_{cs}^{i\_{TX}}$ values for the L-STF, L-LTF, L-SIG, RL-SIG, NGV-SIG and RNGV-SIG fields of the PPDU |
| Total number of transmit chains (NTX) per frequency segment | Cyclic shift for transmit chain iTX (in units of ns) |
| 1 | 2 |
| 1 | 0 | - |
| 2 | 0 | TBD |

## CID 144, 145, 280, 281, 282

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 144 | 42.30 | 32.3.7.2.2 | In equation (32-6), "\eta\_L-STF,k" is not tone index dependent, suggest to remove k and move the scaling factor outside of the per-tone summation. | As in the comment. | **Accepted**  |
| 145 | 42.40 | 32.3.7.2.2 | "when BPSK or BPSKand DCM is used on Data field", need some rephrasing for this sentence. | change "when BPSK or BPSKand DCM is used on Data field" to "when Data field is modulated using BPSK with and without DCM". | **Revised**NGV-MCS defined in table 32-5 includes both BPSK modulation and BPSK with DCM modulation for Data field. So to make more clear, it is better to use the MCS index. TGbd editor to make the changes shown in 11-20/845r0 |
| 280 | 42.30 | 32.3.7.2.2 | In Equation (19-8), k = -26 to 26 but Nsr in CBW10 in Table 32-6 is 28. constant is not matched. | as in comment | **Revised** In principle, the commenter is right.The number of suncarriers for L-STF is equal to NSD defined in table 17-7 of 802.11revmd D3.0TGbd editor to make the changes shown in 11-20/845r0 |
| 281 | 42.40 | 32.3.7.2.2 | the meaning of "BPSK or BPSKand DCM" is not clear. Better to use MCS indices when applied sqrt(2). | as in comment | **Revised** See the resolution for CID 145 |
| 282 | 42.43 | 32.3.7.2.2 | fill TBD | as in comment | **Revised** The CSD for Non-NGV portion is defiend in the subclause 32.3.7.2.1.  TGbd editor to make the changes shown in 11-20/0845r1 |

### Discussion : none.

Propose :

***TGbd editor: please change the 32.3.7.2.2 L-STF definition as follows***

### 33.8.2.2 L-STF definition

The L-STF field for a 10 MHz or 20 MHz transmission is defined by Equation (19-8) and Equation (19-9), respectively, in 19.3.9.3.3 (L-STF definition).

The time domain representation of the signal on transmit chain $i\_{TX}$ shall be as specified in Equation (33-6).

$r\_{L-STF}^{\left(i\_{TX}\right)}\left(t\right)=\frac{1}{\sqrt{N\_{TX}N\_{L-STF}^{Tone}}}w\_{T\_{L-STF}}(t)η\_{L-STF}\sum\_{k=-N\_{SR}26}^{N\_{SR}26}η\_{L-STF,k}\left(γ\_{k,BW}S\_{k}exp⁡(j2πk∆\_{F,NGV}\left(t-T\_{cs}^{i\_{TX}}\right))\right)$ (33-6)

where

 $η\_{L-STF,k}$ is a modulation dependent scaling factor for the L-STF field ~~on subcarrier index~~ $k $with the following value

$$η\_{L-STF,k}=\left\{\begin{matrix}\sqrt{2}, when BPSK or BPSK and DCM is used on Data field when MCS0 or MCS10 is used for data field \\1, otherwise \end{matrix}\right.$$

$T\_{cs}^{i\_{TX}}$ represents the cyclic shift for transmit chain $i\_{TX}$ with a value given in ~~TBD~~ 32.3.7.2.1 Cyclic shift for pre-NGV modulated fields

$γ\_{k,BW}$ is TBD

$N\_{L-STF}^{Tone}$ has the value given in Table 32-8 (Tone scaling factor and guard interval duration values for PHY fields)

## CID 146, 283, 284

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 146 | 42.63 | 32.3.7.2.2 | In equation (32-7), "\eta\_L-LTF" is not tone index dependent, suggest to move the scaling factor outside of the per-tone summation. | As in the comment. | **Accepted**  |
| 283 | 42.62 | 32.3.7.2.3 | In Equation (19-11), k = -26 to 26 but Nsr in CBW10 in Table 32-6 is 28. constant is not matched. | as in comment | **Revised** In principle, the commenter is right.The number of subcarriers for L-STF is equal to NSD defined in table 17-7 of 802.11revmd D3.0TGbd editor to make the changes shown in 11-20/845r1 |
| 284 | 43.06 | 32.3.7.2.3 | fill TBD | as in comment | **Revised** The CSD for Non-NGV portion is defiend in the subclause 32.3.7.2.1.  TGbd editor to make the changes shown in 11-20/845r1 |

### Discussion : none

Propose :

***TGbd editor: please change the 32.3.7.2.3 L-LTF definition as follows***

### 33.8.2.3 L-LTF definition

For a 10 MHz or 20 MHz transmission,  the L-LTF pattern in the NGV preamble is defined by Equation (19-11) and Equation (19-12) in 19.3.9.3.4 (L-LTF definition), respectively.

The time domain representation of the signal on transmit chain $i\_{TX}$ shall be as defined in Equation (32-7).

$r\_{L-LTF}^{\left(i\_{TX}\right)}\left(t\right)=\frac{1}{\sqrt{N\_{TX}N\_{L-LTF}^{Tone}}}w\_{T\_{L-LTF}}(t)η\_{L-LTF}\sum\_{k=-N\_{SR}26}^{N\_{SR}26}η\_{L-LTF}\left(γ\_{k,BW}S\_{k}exp⁡(j2πk∆\_{F,NGV}(t-T\_{cs}^{i\_{TX}})\right)$ (32-7)

Where

$η\_{L-LTF}$ is a modulation dependent scaling factor for the L-LTF field ~~on subcarrier index~~ $k$with the same value as $η\_{L-STF,k}$

$T\_{cs}^{i\_{TX}}$ represents the cyclic shift for transmitter chain $i\_{TX}$ with a value given in ~~<TBD>~~ 32.3.7.2.1 Cyclic shift for pre-NGV modulated fields

$γ\_{k,BW}$ is defined in Equation (32-4) and Equation (32-5)

$N\_{L-LTF}^{Tone}$ has the value given in Table32-8 (Tone scaling factor and guard interval duration values for PHY fields)

## CID 114, 115, 116, 286, 287,288, 289

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 114 | 43.21 | 32.3.7.2.4 | "non-HT duplicate" PPDU is not defined for 11bd | Remove "In a non-HT duplicate PPDU, the RATE field is defined in 17.3.4.2 (RATE field) using the L\_DATARATE parameter in the TXVECTOR" | **Revised**. TGbd editor to make the changes shown in 11-20/845r1 |
| 115 | 43.35 | 32.3.7.2.4 | "non-HT duplicate" PPDU is not defined for 11bd | Remove "In a non-HT duplicate PPDU,the LENGTH field is defined in 17.3.4.3 (PHY LENGTH field) using the L\_LENGTH parameter in the TXVECTOR." | **Revised**.Please refer the resolution for CID 114.  |
| 116 | 43.60 | 32.3.7.2.4 | In Equation 32-9, start value of iBW is not defined in the first summation. It should be 0. "p\_{k}" should be replace with "P\_{k}" (Uppercase P) | As in comment | **Revised**. In principle, the commenter is right.The initial value for iBW should be set to 0 in equation 32-9. And uppercase P should be used for alignment of 11REVmd spec. TGbd editor to make the changes shown in 11-20/845r1 |
| 286 | 43.28 | 32.3.7.2.4 | TXTIME in Equation (32-8) and TXTIME at L32 should keep the same type letter. One is italic and the other is not italic. | as in comment | **Revised.** In principle, the commenter is right.TGbd editor to make the changes shown in 11-20/845r1 |
| 287 | 43.55 | 32.3.7.2.4 | Equation (33-x4) refers wrong equation. It should be Equation (32-9) | as in comment | **Accepted** |
| 289 | 43.58 | 32.3.7.2.4 | In Equation (32-9) Nsr should be 26 as aligned in subcarriers [-26, 26] at L52. it has nothing to do with channel bandwidth. | as in comment | **Revised**In principle, the commenter is right.The equation (32-9) and equation (32-10) should be aligned. TGbd editor to make the changes shown in 11-20/845r1 |
| 147 | 44.28 | 32.3.7.2.5 | P\_0 should be lowercase p. | As in the comment. | **Accepted**  |

### Discussion:

CID 114, 115 : 11bd shall support the signal transmission by using the 11p PPDU defined in clause 17 in 802.11REVmd spec to support the backward compatibility with 11p. And in the 802.11REVmd spec, 11p PPDU is defined as a non-HT PPDU. But, since the only 10MHz PPDU is used for 11p transmssion, it 11p PPDU can’t be configured as the duplicated PPDU format. So, “non-HT duplicate” should be change to “non-HT”

Propose :

***TGbd editor: please change the sentence of L2,1 L28 and L35, P43 as follows***

L21: “In a non-HT ~~duplicate~~ PPDU, the RATE field is defined in 17.3.4.2 (RATE field) using the L\_DATARATE parameter in the TXVECTOR.”

L28: “$Pp\_{0}$ is the first pilot value in the sequence defined in 17.3.5.10 (OFDM modulation)”

L35: “In a non-HT ~~duplicate~~ PPDU, the LENGTH field is defined in 17.3.4.3 (PHY LENGTH field) using the L\_LENGTH parameter in the TXVECTOR.”

***TGbd editor: please replace the equation 32-8 with the below equation.***

$$Length= \frac{TXTIME-40}{8}×3-3$$

***TGbd editor: please change the L55, P43 as follows***

The time domain waveform of the L-SIG field shall be as given by Equation ~~(33-x4).~~(32-9).

***TGbd editor: please change the equation 32-9 as follows***

$$r\_{L-SIG}^{\left(i\_{TX}\right)}\left(t\right)=\frac{1}{\sqrt{N\_{TX}N\_{L-SIG}^{Tone}}}w\_{T\_{L-SIG}}(t)\sum\_{i\_{BW}=0}^{N\_{10MHz}-1}\sum\_{k=-N\_{SR}26}^{N\_{SR}26}\left(\begin{matrix}γ\_{k-K\_{shift}(i\_{BW}),BW}(D\_{k,20}+p\_{0}pP\_{k})\\ ∙exp⁡(j2π(k-K\_{shift}\left(i\_{BW}\right))∆\_{F,NGV}(t-T\_{GI}-T\_{cs}^{i\_{TX}})\end{matrix}\right)$$

## CID 117, 147, 290

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 117 | 44.53 | 32.3.7.2.5 | In Equation 32-11, start value of iBW is not defined in the first summation. It should be 0. "p\_{0}p\_{k}" should be replace with "p\_{1}P\_{k}" (Uppercase P) | As in comment | **Revised** The initial value for iBW should be set to 0 in equation 32-11. And *p*0 is the right. Please refer the definition of *p*0 in 11REVmd spec.TGbd editor to make the changes shown in 11-20/845r1 |
| 290 | 44.52 | 32.3.7.2.5 | In Equation (32-11) Nsr should be 26 as aligned in subcarriers [-26, 26] like L-SIG. it has nothing to do with channel bandwidth. | as in comment | **Revised** In principle, the commenter is right. TGbd editor to make the changes shown in 11-20/845r1 |

### Discussion : none

Propose :

***TGbd editor: please change the equation 32.11 as follows***

$$r\_{RL-SIG}^{\left(i\_{TX}\right)}\left(t\right)=\frac{1}{\sqrt{N\_{TX}N\_{RL-SIG}^{Tone}}}w\_{T\_{L-SIG}}(t)\sum\_{i\_{BW}=0}^{N\_{10MHz}-1}\sum\_{k=-N\_{SR}26}^{N\_{SR}26}\left(\begin{matrix}γ\_{k-K\_{shift}(i\_{BW}),BW}(D\_{k,20}+p\_{0}pP\_{k})\\ ∙exp⁡(j2π(k-K\_{shift}\left(i\_{BW}\right))∆\_{F,NGV}(t-T\_{GI}-T\_{cs}^{i\_{TX}})\end{matrix}\right)$$

**References:**

**[1] 802.11REVmd\_D3.0**