IEEE P802.11  
Wireless LANs

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| D2.0 Comment Resolution –Clause 22.3.4 | | | | |
| Date: March 9th 2011 | | | | |
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Abstract

This document provides resolutions for CID 5138, 4644, 4645, 5141, 5142, 5383, 5295, 5296 and 4202.

Rev.1 revised the resolution to CID 4644. In addition, currently straw poll on resolution to CID 5138, 5141 is deferred.

Rev. 2 revised the resolution to CID 5138 and 5141.

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 5138 | 183.27 | 22.3.4.2 | L-STF does no have GI inserted | There is no GI insertion for L-STF. See for instance page 198, line 35 ("For L-STF and VHT-STF, T\_GI,field is 0 usec") | REVISE.  See 12/0333r2 |
| 5141 | 185.18 | 22.3.4.2 | VHT-STF does no have GI inserted | There is no GI insertion for VHT-STF. See for instance page 198, line 35 ("For L-STF and VHT-STF, T\_GI,field is 0 usec") | REVISE.  12/0333r2 |
| <Discussion>  Even though *T\_GI* is not introduced in the corresponding equation of L-STF and VHT-STF, prepending of guard interval is actually done for L-STF and VHT-STF as well to get totally 8us L-STF and 4us VHTSTF. . The only reason not to include *T\_GI* in those equations is that the equation will be the same thing regardless of whether *T\_GI* is inserted or not in it due to the STF periodic characteristics. Slightly different from the equation things, this clause 22.3.4 talks about encoding process description. So, guard interval is needed to be included in this clause not to give any ambiguity. FYI, STF is created from frequency domain, i.e. IDFT is applied (it is 64 point IDFT), therefore it actually needs inserting GI to get totally 8us L-STF and 4us VHTSTF.  Refer to resolutions to CID2215 and CID 2217 in the document 11/1282-02-00ac-D1.0-comment-resolution-clause-22.3.4.  I revised some text in page 198 to keep consistency in writings.    **TGac editor: modify the D2.0 text from P198L35, as follows**  For L-STF and VHT-STF, T\_GI,Field = T\_GI, but it can be omitted in Eq. 24 due to the periodic property of L-STF and VHT-STF over every 0.8 us. | | | | | |
| 4644 | 183.38 | 22.3.4.3 | The L-LTF is not defined in section 18 but in section 20.3.9.3.4 L-LTF definition. Secondly there should be reference also to 22.3.8.1.3 | Correct the reference. | AGREE IN PRINCIPLE.  See 12/0333 |
| <Discussion>  Even though the short training field, the long training field and the SIG field (for legacy) are originally defined for legacy transmission, which is described in clause 18 of TGmb 12.0 (latest version of TGmb), the exact name “L-LTF”, “L-STF” and “L-SIG” are used in clause 20. In addition, the corresponding texts in clause 22 (clause 22.3.8.1.2 for L-STF, clause 22.3.8.1.3 for L-LTF, clause 22.3.8.1.4 for L-SIG) also use clause 20 (not clause 18) as their references. For your more information, the corresponding texts in clause 20 which was written by TGn standard (clause 20.3.9.3.3 for L-STF, clause 20.3.9.3.4 for L-LTF, clause 20.3.9.3.5 for L-SIG) did not refer to the related clause 18 texts for their constructions. So, it seems better to change the reference number here.  But, some sub-processing for L-SIG in clause 20 such as FEC encoding, interleaving, constellation mapping and pilot insertion just refer to clause 18 in their texts. So, it is also OK for those sub-processings for L-SIG to refer to clause 18, exceptionally.  Any way, for notational simplicity, I determined to introduce clause 22 to all these related texts (clause 22.3.4.2 ~ clause 22.3.4.4) as references. In addition, introduction of clause 22 as references also have a effect to introduce clause 18 and clause 20 as well.    **TGac editor: modify the D2.0 text from P183L09, as follows**  **22.3.4.2 Construction of L-STF**  Construct the L-STF field as defined in 22.3.8.1.2 with the following highlights:  a) Determine the CH\_BANDWIDTH from the TXVECTOR.  b) Sequence generation: Generate the L-STF sequence as described in 22.3.8.1.2 (L-STF definition).  c) Duplication and phase rotation: Duplicate the L-STF over each 20 MHz of the CH\_BANDWIDTH.  Apply appropriate phase rotation for each 20 MHz subchannel as described in 22.3.7 (Mathematical description of signals).  d) IDFT: Compute the inverse discrete Fourier transform.  e) CSD: Apply CSD for each transmit chain and frequency segment as described in 22.3.8.1.1 (Cyclic shift definition).  f) Insert GI and apply windowing: Prepend a GI (LONG\_GI) and apply windowing as described in 22.3.7 (Mathematical description of signals).  g) Analog and RF: Up-convert 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 22.3.7 (Mathematical description of signals) and 22.3.8 (VHT preamble) for details.  **22.3.4.3 Construction of the L-LTF**  Construct the L-LTF field as defined in 22.3.8.1.3 with the following highlights:  a) Determine the CH\_BANDWIDTH from the TXVECTOR.  b) Sequence generation: Generate the L-LTF sequence as described in 22.3.8.1.3 (L-LTF definition).  c) Duplication and phase rotation: Duplicate the L-LTF over each 20 MHz of the CH\_BANDWIDTH.  Apply appropriate phase rotation for each 20 MHz subchannel as described in 22.3.7 (Mathematical description of signals).  d) IDFT: Compute the inverse discrete Fourier transform.  e) CSD: Apply CSD for each transmit chain and frequency segment as described in 22.3.8.1.1 (Cyclic shift definition).  f) Insert GI and apply windowing: Prepend a GI (2 x LONG\_GI) and apply windowing as described in 22.3.7 (Mathematical description of signals).  g) Analog and RF: Up-convert 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 22.3.7 (Mathematical description of signals) and 22.3.8 (VHT preamble) for details.  **22.3.4.4 Construction of L-SIG**  Construct the L-SIG field as the SIGNAL field defined in 22.3.8.1.4 with the following highlights:  a) For a VHT PPDU, set the RATE subfield in the SIGNAL field to 6 Mbps. Set the Length, Parity and Tail bits in the SIGNAL field as described in 22.3.8.1.4 (L-SIG definition). Add calculated one bit parity and tail bits into the L-SIG symbol.  b) FEC Encoder: Encode the L-SIG symbol of the PLCP header by a convolutional encoder at the rate of R=1/2 as described in 22.3.10.5.3 (Binary convolution coding and puncturing).  c) BCC Interleaver: Interleave as described in 22.3.10.8 (BCC interleaver).  d) Constellation Mapper: BPSK modulate as described in 22.3.10.9 (Constellation mapping).  e) Pilot insertion: Insert pilots as described in 22.3.10.11 (OFDM modulation).  f) Duplication and Pphase rotation: Duplicate the L-SIG field over each 20 MHz of the CH\_BANDWIDTH. Apply appropriate phase rotation for each 20 MHz subchannel as described in 22.3.7 (Mathematical description of signals).  g) IDFT: Compute the inverse discrete Fourier transform.  h) CSD: Apply CSD for each transmit chain and frequency segment as described in 22.3.8.1.1 (Cyclic  shift definition).  i) Insert GI and apply windowing: Prepend a GI (LONG\_GI) and apply windowing as described in 22.3.7 (Mathematical description of signals).  j) Analog and RF: Up-convert 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 22.3.7 (Mathematical description of signals) and 22.3.8 (VHT preamble) for details. | | | | | |
| 4645 | 184.33 | 22.3.4.5 | The fact that VHT-SIG-A consist of two symbols is not defined in 22.3.2. That section only defines that it is 8 micro seconds. | The correct reference would be to section 22.3.8.2.3. Which contains the definition of symbols. | AGREE.  See 12/0333 |
| <Discussion>  As pointed out, it seems better to refer to 22.3.8.2.3 (VHT-SIG-A definition).    **TGac editor: modify the D2.0 text from P184L32, as follows**  The VHT-SIG-A field consists of two symbols, VHT-SIG-A1 and VHT-SIG-A2, as defined in 22.3.8.2.3 (VHT-SIG-A definition). | | | | | |
| 5142 | 185.29 | 22.3.4.7 | Change introductory text for VHT-LTF | The introductory text in section 22.3.4.7 explains the purpose of VHT-LTF. Other section simply say how to contruct the signal. Replace the introductory sentences with "Construct the VHT-LTF field as follows" | AGREE IN PRINCIPLE.  See 12/0333 |
| <Discussion>  As pointed out, it seems better to change the text considering fairness with other parts.    **TGac editor: modify the D2.0 text from P185L28, as follows**  Construct the VHT-LTF field as described in 22.3.8.2.5 (VHT-LTF definition). | | | | | |
| 5383 | 186.16 | 22.3.4.8 | VHT-SIG-B CSD is defined in 22.3.8.2.2. | Change "... described in 22.3.8.1.1" to "... described in 22.3.8.2.2" | AGREE.  See 12/0333 |
| 4202 | 186.16 | 22.3.4.8 | Reference to the wrong subsection | VHT-SIG-B should use the VHT CSDs, thus, change the reference to Section 22.3.8.2.2 Cyclic shift definition | AGREE.  See 12/0333 |
| <Discussion>  Corrected the error. CID4204 mentions the same thing, but its page number needs to be corrected.    **TGac editor: modify the D2.0 text from P186L16, as follows**  i) CSD: Apply CSD for each space-time stream and frequency segment as described in 22.3.8.2.2 (Cyclic shift definition). | | | | | |
| 5295 | 187.01 | 22.3.4.9.1 | This is a receiver functionality, should not be here: "Segment Deparser: For a contiguous 160 MHz transmission, merge the two frequency subblocks into one frequency segment as described in 22.3.11.9.3 (Segment deparser)." | Please delete | REVISED  See 12/0333 |
| 5296 | 187.55 | 22.3.4.9.2 | This is a receiver functionality, should not be here: "Segment Deparser: For a contiguous 160 MHz transmission, merge the two frequency subblocks into one frequency segment as described in 22.3.11.9.3 (Segment deparser)." | Please delete | REVISED  See 12/0333 |
| <Discussion>  Segment deparser is not a receiver function but a transmitter function, which is described in 22.3.10.9.3 (Segment deparser) and is depicted in Figure 22.8. For a contiguous 160 MHz VHT PPDU transmission (not for a non-contiguous 80+80MHz VHT PPDU transmission), segment deparsert has a role to make the two frequency subblocks at the output of the LDPC tone mapper for LDPC or constellation mapper for BCC are combined into one frequency segment to transmit as an one radio signal. For an 80+80 MHz VHT PPDU transmission, segment deparser is not needed because each 80MHz frequency segment is transmitted as an individual radio signal. As shown in Figure 22.8, between segment parser and segment deparser for a 160MHz VHT PPDU transmission, there are several blocks such as interleaver, constellation mapper and LDPC tone mapper, all of which operate in each 80MHz frequency segment.  For your information, segment parser is needed both in a contiguous 160MHz transmission and a non-contiguous 80+80MHz transmission. But, segment deparser is only needed in a contiguous 160MHz transmission.  Any way, some note such as “if needed” also needs to be added here as similar note is already added for segment parser. In addition, the reference number corrected.    **TGac editor: modify the D2.0 text from P187L01, as follows**  j) Segment Deparser (if needed): For a contiguous 160 MHz transmission, merge the two frequency subblocks into one frequency segment as described in 22.3.10.9.3 (Segment deparser).  **TGac editor: modify the D2.0 text from P187L52, as follows**  i) Segment Deparser (if needed): For a contiguous 160 MHz transmission, merge the two frequency subblocks  into one frequency segment as described in 22.3.10.9.3 (Segment deparser). | | | | | |