IEEE P802.11  
Wireless LANs

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| Misc. Clause 24 CIDs Previously Unassigned | | | | |
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Abstract

This submission proposes resolutions for comments in Clause 24 of TGah Draft 5.1 with the following CIDs:

Clause 24 CIDs: 8163, 8164, 8510, 8543, 8544, 8533, 8328, 8327, 8277

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 TGah Draft. This introduction is not part of the adopted material.

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

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

## Comment Resolutions for Clause 24 CIDs

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 8163 | 477 | 25 | 24.3.13 | This equation is pretty far away from IEEE-SA equation style. | Conform to IEEE-SA equation style. Specifically create short terms to replace the "sermon in a variable name" variables. Add a where statement, with a separate para defining each short term. The [MHz] units indication is not used in IEEE-SA style. Instead, you could define a name for the 0.5 MHz term, (e.g. F\_S), and define it in the where list "F\_S has the value 0.5 MHz and is the frequency separation between adjacent channels" | Revise,  Agree to reformat equations and modify text to follow IEEE-SA equation style guidelines.  Instruction to Editor: Please refer to “Changes for CID 8163” in Doc. 11-16/0126r1 for text modifications. |
| 8164 | 486 | 43 | 24.3.16.5 | The indentation, and therefore the logical structure, of this list is unclear. | Create a table for the multichannel sample rate item and reference it from the list. | Revise.  Will reformat the indentation to match Clause 21.3.17.5 Time of Departure Accuracy  Instruction to Editor: Please take existing text in Clause 24.3.16.5 and reformat equation style/adjust indentation to match Clause 21.3.17.5. |
| 8510 | 387 | 21 | 25.1.4 | bandwidth is not stated for S1G\_DUP\_1M case. | Add bandwidth statement such as 'CH\_BANDWIDTH=CBW2 or CBW4 or CBW8 or CBW16' after the phrase 'Format=S1G\_DUP\_1M ' | Revise will rewrite section to better outline different PPDU formats  Instruction to Editor: Please refer to “Changes for CID 8510” in Doc. 11-16/0126r1 for text modifications. |
| 8543 | 463 | 21 | 24.3.9.4.4.2 | N\_{SYM,init} is used in the equation without defination | Add definition for N\_{SYM,init} | Revise,  Current text does not clearly separate SU/MU descriptions, will add clarifying text.  Instruction to Editor: Please refer to “Changes for CID 8543, 8544” in Doc. 11-16/0126r1 for text modifications. |
| 8544 | 463 | 26 | 24.3.9.4.4.2 | N\_{SYM} is not used in the equation and should not be defined. | Remove definition of N\_SYM | Revise,  Current text does not clearly separate SU/MU descriptions, will add clarifying text.  Instruction to Editor: Please refer to “Changes for CID 8543, 8544” in Doc. 11-16/0126r0 for text modifications. |
| 8533 | 457 | 26 | 24.3.8.3.3 | T\_LTF1 is used in the equation without definition | Add definition for T\_LTF1 | Revise  Will define T\_LTF1 alongside T\_LTF.  Instruction to Editor: Please refer to “Changes for CID 8533” in Doc. 11-16/0126r1 for text modifications. |
| 8327 | 409 | 22 | 24.3.3 | "when there is only one BCC encoder (NES=1)," does not track with Figure 22-12 in 802.11-REVmc\_D4.0. There is no "Nes" in the figure 22-12 | Delete (NES=1) | Revise,  Agree that text wording does not make clear how Clause 22 figure should be interpreted. Text should state that 11ah is fixed to Nes=1, hence figure is to be interpreted with single BCC encoder instantiation  Instruction to Editor: Please refer to “Changes for CID 8327, 8328” in Doc. 11-16/0126r1 for text modifications. |
| 8328 | 409 | 22 | 24.3.3 | "when there is only one BCC encoder (NES=1)," does not track with Figure 22-13in 802.11-REVmc\_D4.0. There is no "Nes" in the figure 22-13 | Delete "(NES=1)" | Revise,  Agree that text wording does not make clear how Clause 22 figure should be interpreted. Text should state that 11ah is fixed to Nes=1, hence figure is to be interpreted with single BCC encoder instantiation  Instruction to Editor: Please refer to “Changes for CID 8327, 8328” in Doc. 11-16/0126r1 for text modifications. |
| 8277 | 409 | 45 | 24.3.3 | Figure 24-4 includes a process labeled "BPSK Constelation Mapper". s/b "Constellation Mapper" (ref fig 22-5) | Delete "BPSK" from the Constellation Mapper process | Accept. |

## Changes for CID 8163

Instruction to Editor: Modify text on Page 477 in TGah\_D5.0

STAs compliant with the physical layer defined in Clause 24 (Sub 1 GHz (S1G) PHY specification) operate in the channels (700 MHz ~ 1 GHz) defined in Annex E.

The channel center frequency, , is defined as:

where

is the frequency separation between channels, and has the value of 0.5 MHz

and are region and operating class specific and given in Annex E.

The Channel spacing field in Annex E denotes the corresponding bandwidth for S1G operation.

The center frequency of the primary 1 MHz or primary 2 MHz channel, , is defined as:

where

is the frequency separation between channels, and has the value of 0.5 MHz

is the subchannel index of the primary 1 or 2MHz channel within the overall bandwidth for S1G operation

## Changes for CID 8510

Instruction to Editor: Modify text on Page 387 starting at Line 8 in TGah\_D5.0

The structure of the PPDU transmitted by an S1G STA is determined by the TXVECTOR parameters as defined in Table 24-1 (TXVECTOR and RXVECTOR parameters).

The FORMAT parameter determines the overall structure of the PPDU, and the allowed values are:

— S1G, for S1G non-duplicate PPDUs

— S1G\_DUP\_2M, for S1G 2 MHz Duplicated PPDUs

— S1G\_DUP\_1M, for S1G 1 MHz Duplicated PPDUs

The PPDU bandwidth is determined by the CH\_BANDWIDTH parameter, and the preamble type (i.e. S1G\_1M\_PREAMBLE, S1G\_SHORT\_PREAMBLE, S1G\_LONG\_PREAMBLE) is determined by the PREAMBLE\_TYPE parameter.

—The 1 MHz Format PPDU (S1G\_1M) is used for non-duplicate S1G transmissions at 1MHz bandwidth (i.e. CH\_BANDWIDTH = CBW1) and for S1G\_DUP\_1M transmissions of any bandwidth (i.e. CH\_BANDWIDTH = CBW1, CBW2, CBW4, CBW8, or CBW16). The PREAMBLE\_TYPE = S1G\_1M\_PREAMBLE. Support for S1G\_1M is mandatory.

—The Greater than or Equal to 2 MHz Short Format PPDU (S1G\_SHORT) is used for non-duplicate S1G transmissions and for S1G\_DUP\_2M transmissions, at bandwidths of 2MHz and higher (i.e. CH\_BANDWIDTH = CBW2, CBW4, CBW8, or CBW16). The PREAMBLE\_TYPE = S1G\_SHORT\_PREAMBLE. This PPDU format is similar to the HT Greenfield format in Clause 20, which does not contain a legacy portion in the preamble. Support for S1G\_SHORT is mandatory.

—The Greater than or equal to 2 MHz Long Format (S1G\_LONG) is used for non-duplicate S1G transmissions at bandwidths of 2MHz and higher (i.e. CH\_BANDWIDTH = CBW2, CBW4, CBW8, or CBW16). The S1G\_LONG format is not used for S1G\_DUP\_2M transmissions. The PREAMBLE\_TYPE = S1G\_LONG\_PREAMBLE. This PPDU format is similar to the HT-Mixed format in Clause 20. Support for S1G\_LONG is optional if a STA supports only 1 MHz and 2 MHz PPDUs, and is mandatory if a STA supports wider than 2 MHz PPDUs. All S1G STAs shall support detecting and decoding up to the SIG-A field of S1G\_LONG PPDUs.

## Changes for CID 8543, 8544

Instruction to Editor: Modify text on Page 463 in TGah\_D5.0

* LDPC coding

The LDPC operation for S1G PPDUs is the same as those specified in 22.3.10.5.4 (LDPC coding).

* Padding for LDPC

For LDPC encoding, the number of PHY padding bits for user , is as

Where

is the value of the PSDU\_LENGTH parameter in TXVECTOR for user *u*

is the initial number of symbols for the Data field when using LDPC,given in 24.4.3 (TXTIME and PSDU\_LENGTH calculation) by Equation (24-75) for S1G SU PPDUs and Equation (24-77) for S1G MU PPDUs.

For SU, there is only one user, hence .(#3527, 3528, 3529, 3530, 3612, 3613, 3614)

The padding flow for LDPC encoded PPDUs is as follows:

The initial parameter computation , and are identical to those defined in 22.3.10.5.4 (LDPC coding).

## Changes for CID 8533

Instruction to Editor: Modify text on Page 457, Line 24-25 in TGah\_D5.0

where

, , and are defined in Table 24-4 (Timing-related constants)

## Changes for CID 8327, 8328

Instruction to Editor: Modify text on Page 409 in TGah\_D5.0

Figure 22-10shows the transmitter blocks used to generate the BCC encoded Data field of a 2 MHz, 4 MHz and 8 MHz SU PPDU in short or long format, and of an S1G\_1M PPDU except MCS10. It should be noted that the number of encoders is fixed to one for BCC (i.e. N\_ES = 1), in S1G operation. A subset of these transmitter blocks consisting of the constellation mapper and CSD blocks, as well as the blocks to the right of, and including, the spatial mapping block, are also used to generate the STF and LTF fields in S1G\_1M and S1G\_SHORT, or the D-STF and D-LTF fields in S1G\_LONG. This is illustrated in Figure 24-6 (Generation of LTF symbols) in subclause 24.3.8.2.1.3 (LTF definition) for the mentioned LTF fields. A similar set of transmit blocks is used to generate the mentioned STF fields.

Figure 22-11 shows the transmitter blocks used to generate the LDPC encoded Data field of a 2 MHz, 4 MHz and 8 MHz SU PPDU in short or long format, and of an S1G\_1M PPDU except MCS10.

Figure 22-12shows the transmit process for generating the Data field of a 2 MHz, 4 MHz and 8 MHz MU PPDU in long format with BCC and/or LDPC encoding. The number of encoders is fixed to one (i.e. N\_ES = 1) for BCC in S1G operation.

Figure 22-13and Figure 22-14 show the transmit process for generating the Data field of a 16 MHz SU PPDU in short or long format, with BCC and LDPC encoding, respectively. The number of encoders is fixed to one (i.e. N\_ES = 1) for BCC in S1G operation.