### IEEE P802.11 Wireless LANs

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| Comment resolution on WUR transmit procedure (32.2.13) | | | | |
| Date: 2019-01-07 | | | | |
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Abstract

This submission proposes resolutions for comments of TGba Draft D1.0 with the following CIDs:

206, 229, 230, 501, 752, 969, 970, 971, 1216, 1217, 1218, 1219, 972, 973

**NOTE**: Document 1966r3 covered CIDs 206, 229, 230, 501, 752, 969, 970, 971, 1216, 1217, 1218, 1219 and it has been motioned in November IEEE meeting. However, the document was not on the IEEE Mentor at the time of motion. In this document, we added comment resolution for CIDs 972, 973. The other CIDs and the corresponding CR text remains same as document 1966r3.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 206 | 88.22 | 32.2.13 | There is no need to have the different transmit procedure for HDR and LDR. No need to highlight the sync sequence difference since it has no impact to the transmit proedure. Instead, need to have a plot for OFDMA case since potential padding needs to be added. | as in the comment | Revised.  TGba Editor makes changes as shown in 802.11-18/1966r4 |
| 229 | 87.53 | 32.2.13 | BPSK Mark is constructed with MCS0 ( BPSK and Rate 1/2). Specify the applied modulation and rate for BPSK-Mark on figure 32-11. | see the comment. | Revised.  TGba Editor makes changes as shown in 802.11-18/1966r4 |
| 230 | 88.18 | 32.2.13 | BPSK Mark is constructed with MCS0 ( BPSK and Rate 1/2). Specify the applied modulation and rate for BPSK-Mark on figure 32-12. | see the comment. | Revised.  TGba Editor makes changes as shown in 802.11-18/1966r4 |
| 501 | 88.55 | 32.2.13 | "Each PHYTXEND.request" must be "Each PHY-TXEND.request". | Please correct as commented. | Accept. |
| 752 | 88.52 | 32.2.13 | "can" is not a normative text in the sentence: "Transmission can be prematurely terminated by the MAC through the PHY-TXEND.request primitive." Please replace "can" to "may" in the sentence. | As shown in the comment. | Accept. |
| 969 | 87.51 | 32.2.13 | The WUR-Sync is labeled poorly in Figure 32-11 | In Figure 32-11 change "Sync Sequence Sync Sequence" to "WUR-Sync" | Accept. |
| 970 | 88.16 | 32.2.13 | The WUR-Sync is labeled poorly in Figure 32-12 | In Figure 32-12 change "bitwise complement sync sequence" to "WUR-Sync" | Revised.  The Figure has been updated to FDMA case. The comment no longer applies. |
| 971 | 88.48 | 32.2.13 | Poor wording | Change "padding bits are appended to each 20 MHz channel to make the length of the PPDU..." to "padding bits are appended, as needed, to each 20 MHz channel to make the length of the PPDU..." | Accept. |
| 1216 | 87.54 | 32.2.13 | In Fig 32-11, Coded OFDM -> Coded OFDM, BPSK, Rate 1/2 | as in comment | Accept. |
| 1217 | 88.20 | 32.2.13 | In Fig 32-12, Coded OFDM -> Coded OFDM, BPSK, Rate 1/2 | as in comment | Accept. |
| 1218 | 88.58 | 32.2.13 | In "the number of WUR octets indicated by N\_octet (see 32.3.2 (Table of time and length characteristics))." 32.3.2 has nothing to do with the number of data symbols in WUR PPDU. N\_octet should be Nsym refering to 32.3.1. same to FDMA WUR transmission. If intention is to use the number of N\_octet, define N\_octet in 32.3.1 and refer it properly. And modify the SETUP WUR DATA in Fig 32-13 if N\_octet is modified to Nsym | as in comment | Revised.  Agree with the comment in principle.  TGba Editor makes changes as shown in 802.11-18/1966r4 |
| 1219 | 88.61 | 32.2.13 | in "In FDMA WUR transmission, normal termination occurs after the transmission of the final bit of the last WUR octet, according to the number of WUR octets indicated by Nmax\_octet (see 32.3.2 (Table of time and length characteristics)).", it seems to mean that tramsitting FDMA WUR, its length is always N\_max\_octet fixed.If not, it should be something else (not N\_max\_octet). check it at P89L18 and L36 as well. Clarify it. | as in comment | Revised.  Agree with the comment in principle.  TGba Editor makes changes as shown in 802.11-18/1966r4 |
| 972 | 88.65 | 32.2.13 | There may not be a receiver along with the WUR transmitter so I do not believe it makes sense to "enter the receive state" | Change "...PHY entity enters the receive state" to "PHY entity enters the TX idle state" | Reject.  The spec does not support a WUR transmitter STA without receive capabilities. All WUR AP Transmitter has a receiver, and hence the PHY entity goes to RX state after the WUR transmission. |
| 973 | 89.40 | 32.2.13 | In figure 32-13 it may not make sense to switch to RX state in an 802.11ba transmitter. | Change "Switch to RX state" to "TX Idle state" | Reject.  The spec does not support a WUR transmitter STA without receive capabilities. All WUR AP Transmitter has a receiver, and hence the PHY entity goes to RX state after the WUR transmission. |

***TGba editor: Change the 32.2.13 WUR transmit procedure as follows: (Track change on)***

**32.2.13 WUR transmit procedure**

There are two options for the PHY transmit procedure-single channel and FDMA. The typical transmit procedures are shown in Figure 32-11 (PHY transmit procedure for a single channel WUR) and Figure 32-12 (PHY transmit procedure for FDMA). The first option is selected, if the TXVECTOR CHANNEL\_BANDWIDTH parameter is set to WUR\_CBW\_20.(#206)

The second(#206) option is for the optional FDMA to transmit at a wider bandwidth if the TXVECTOR CHANNEL\_BANDWIDTH parameter is equal to WUR\_CBW\_40 or WUR\_CBW\_80. In this option WUR PPDU is simultaneously generated and transmitted on each of the 20 MHz channels.

For both(#206) options, in order to transmit data, the MAC generates a PHY-TXSTART.request primitive, which causes the PHY entity to enter the transmit state. Further, the PHY is set to operate at the appropriate frequency through station management via the PLME, as specified in 32.3 (WUR PLME). Other transmit parameters, such as transmit power, are set via the PHY-SAP using the PHY-TXSTART.request(TXVECTOR) primitive, as described in 32.1.2 (WUR\_TXVECTOR and WUR\_RXVECTOR parameters).

The PHY indicates the state of the primary channel and other channels for FDMA case via the PHYCCA.indication primitive (see 32.2.12.5 (CCA sensitivity) and 8.3.5.12 (PHY-CCA.indication)). Transmission of the PPDU shall be initiated by the PHY after receiving the PHY-TXSTART.request(TXVECTOR) primitive. The TXVECTOR elements for the PHY-TXSTART.request primitive are specified in Table 32-1 (WUR\_TXVECTOR and WUR\_RXVECTOR parameters).

After the PHY legacy preamble transmission is started, the PHY entity immediately initiates BPSK-Mark transmission and performs any required scrambling and data encoding if needed as defined by parameters of the TXVECTOR, as described in 32.1.2 (WUR\_TXVECTOR and WUR\_RXVECTOR parameters). After BPSK-Mark transmission is started, the PHY entity initiates transmission of Sync field according to the data rate defined in TXVECTOR. The Sync transmission is followed by Manchester encoding of data field as described in 32.2.3 (Transmitter block diagram). The data shall be exchanged between the MAC and the PHY through a series of PHY-DATA.request(DATA) primitives issued by the MAC, and PHY-DATA.confirm primitives issued by the PHY. In FDMA case, PHY padding bits are appended, as needed, to each 20 MHz channel to make the length of PPDU equal to the Length indicated in L-SIG.(#971)

Transmission may be prematurely terminated by the MAC through the PHY-TXEND.request primitive.(#752)

WUR transmission is terminated by receiving a PHY-TXEND.request primitive. Each PHY-TXEND.request(#501) primitive is acknowledged with a PHY-TXEND.confirm primitive from the PHY. In a single channel WUR transmission, normal termination occurs after the transmission of the final bit of the last WUR octet, indicated by Noctet , which is defined as the WUR\_MPDU\_LENGTH in octets. The maximum value of the parameter is given in 32.3.2 (Table of time and length characteristics).(#1218) In FDMA WUR transmission, normal termination occurs after the transmission of the final bit of the last WUR octet, indicated by Nmax\_octet, which is defined as the maximum of WUR\_MPDU\_LENGTH in octets, over the 20 MHz channels. For a single channel WUR, Nmax\_octet = Noctet.(#1218,#1219)  
When the WUR transmission is completed the PHY entity enters the receive state.

A typical state machine implementation of the transmit PHY for a WUR transmission is provided in Figure 32-13 (PHY transmit state machine). Request (.request) and confirmation (.confirm) primitives are issued once per state as shown.

***TGba editor: Replace the Figure 32-11 with the figure below and update the figure label as below(#229, #969,#1216)***



**Figure 32-11—PHY transmit procedure for a single channel WUR PPDU**

***TGba editor: Replace the Figure 32-12 with the figure below and update the figure label as below(#206, #230, #970,#1217)***



**Figure 32-12—** **PHY transmit procedure for a WUR PPDU with FDMA**

***TGba editor: Replace the Figure 32-13 PHY transmit state machine with the figure below (#1219)***



**Figure 32-13—PHY transmit state machine**