IEEE P802.11  
Wireless LANs

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| **TGba D2.0 Comment Resolutions for WUR PHY FDMA and Padding** |
| **Date:** 2019-03-11 |
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Abstract

This submission proposes resolutions for comments of TGba D2.0 with the following CIDs:

* 2372, 2373, 2479, 2517, 2628, 2629, 2671, 2679

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 TGba D1.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGba D1.0 Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

#### *CID 2372, 2373, 2479, 2517, 2628, 2629, 2671, 2679*

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| **CID** | **Clause** | **PP.LL** | **Comment** | **Proposed Change** | **Resolution** |
| 2372 | 3.2 | 19.57 | A definition of "WUR FDMA PPDU" would be helpful | Insert definition, "wake-up radio (WUR) frequency division multiple access (FDMA) protocol data unit (PPDU): A WUR PPDU transmitted with 40 MHz or 80 MHz channel bandwidth." | Accepted- |
| 2373 | 31.2.3 | 88.3 | These are not examples, they are the definitions. | Change "The examples of" to "The format of". Replace "illustrated" with "defined". | Rejected-  These figures show examples because FDMA WUR Signal can be different according to WUR data rate and the amount of information bits. |
| 2479 | 31.2.3 | 88.46 | "can" is not a normative word to use in the draft. | Change "can" to "may" | Accepted- |
| 2517 | 31.2.3 | 88.15 | Figure 31-2 and 31-3 gvies people the false impression that WUR-Sync or WUR-Data is 20 MHz. Use 20 MHz subchannel rather than 20 MHz. Add another note to say that the figure is for description of the existing fields rather than saying that the actual bandwidth is 20 MHz for WUR Sync and WUR Data. | As in comment | Revised-  Agree in principle with the commenter. Modify 20MHz to 20MHz subchannel in these two figures. But, I think spec doesn’t need any additional note for the detailed description of these two figures. These figures are consistent with 31-1 and there are also description for WUR field generation in other sections.  TGba editor to make the changes shown in 11-19/0409r1. |
| 2628 | 31.2.5.7 | 95.44 | The sentence "The samples in Off-WG have zero energy" is not necessary. In some implementation (e.g., the one shown in 17/1419r0), having non-zero samples in Off period can improve some performance (e.g., low out of band leakage) without creating any data detection degradation. In addition, the next step: windowing (or filtering), will introduce non-zero emery samples in the Off period anyway, which makes this sentence meaningless. | Delete sentence "The samples in Off-WG have zero energy." | Rejected-  The WUR waveform is generated by multicarrier on-off keying modulation so the samples in off-WG have zero energy. |
| 2629 | 31.2.5.8 | 96.05 | The sentence "The samples in Off-WG have zero energy" is not necessary. In some implementation (e.g., the one shown in 17/1419r0), having non-zero samples in Off period can improve some performance (e.g., low out of band leakage) without creating any data detection degradation. In addition, the step f): windowing, will introduce non-zero energy samples in the Off period anyway, which makes this sentence meaningless. | Delete sentence "The samples in Off-WG have zero energy." | Rejected-  The WUR waveform is generated by the multicarrier on-off keying modulation so the samples in off-WG have zero energy. |
| 2671 | 31.2.5.8 | 96.04 | The following sentense is confusing: ".....encoder determines which samples to take either from the kth HDR On-WG or LDR On-WG of corresponding 20 MHz subchannel or from Off-WG, depending on the WUR\_BANDWIDTH and the WUR\_DATARATE..." Replace it with the sentence below: "....encoder determines whether to samples from the kth HDR On-WG, LDR On-WG, or Off-WG , depending on the WUR\_DATARATE and the encoded bit of the corresponding 20 MHz subchannel" | As shown in the comment | Revised-  Agree in principle with the commenter. Modify the corresponding sentence.  TGba editor to make the changes shown in 11-19/0409r1. |
| 2679 | 31.2.5.8 | 95.63 | Description of Off symbol for WUR-Sync field is missing. Add description for Off symbol, similar to the one in 31.2.5.7 | Replace item c) in 31.2.5.8 with the following: "Waveform generation for the WUR-Sync field: Generate the MC-OOK waveform for the WUR-Sync field by using either On-WG or Off-WG according to the Sync-bit for each 20 MHz subchannel. The samples in Off-WG have zero energy. Each Sync-bit duration, TSync is 2 ╬╝s." | Accepted- |

*TGba Editor: Please add the following definition (in red) in 3.2 Definitions specific to IEEE Std 802.11 of D2.0:*

**wake-up radio (WUR) frequency division multiple access (FDMA) protocol data unit (PPDU)**: A WUR PPDU transmitted with 40 MHz or 80 MHz channel bandwidth. (#2372)

*TGba Editor: Please make the following changes (in red) in 31.2.3 WUR FDMA PPDU format of D2.0:*

(#2517)

**Figure 31-2 – WUR FDMA PPDU for 40 MHz channel widths**

(#2517)

**Figure 31-3 – WUR FDMA PPDU for 80 MHz channel widths**

For the WUR FDMA PPDUs with 40 MHz and 80 MHz channel bandwidth, different WUR-Sync field according to the rate of the WUR-Data field ~~can~~may (#2479) be applied to each 20 MHz subchannel. (#2517)

*TGba Editor: Please make the following changes (in red) in 31.2.5.8 Construction of the WUR-Sync and WUR-Data for the FDMA transmission of D2.0:*

c) Waveform generation for the WUR-Sync field: Generate the MC-OOK waveform for the WUR-Sync field by using either On-WG or Off-WG according to the Sync-bit for each 20 MHz subchan­nel. The samples in Off-WG have zero energy. Each Sync-bit duration, *T*Sync is 2 μs. (#2679)

d) Waveform generation for the WUR-Data field: The output of the *k*th WUR-based encoder deter­mines ~~which~~whether to sample~~s to take either~~ from the *k*th HDR On-WG ~~or~~, LDR On-WG ~~of corresponding 20 MHz subchannel~~ or ~~from~~ Off-WG, depending on ~~the WUR\_BANDWIDTH and~~ the WUR\_DATA­RATE and the encoded bit of the corresponding 20 MHz subchannel, where k, 0≤*k≤K-*1, is the index of the 20 MHz subchannel. The samples in Off-WG have zero energy. Each symbol duration, *T*Sym is 2 μs for high data rate (*T*SYM-HDR) and 4 μs for low data rate (*T*SYM-LDR). (#2671)