### **IEEE P802.11Wireless LANs**

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| Comment Resolutions on Various PHY Comments |
| Date: 2019-01-15 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Steve Shellhammer | Qualcomm |  |  | shellhammer@ieee.org |
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**Abstract**

The document provides comment resolutions for CID 156, 177, 178, 179, 180, 408, 409, 930, 931, 1036, 1042, 1043, 1213, and 1252.

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| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 156 | 32.2.7 | 76.56 | "OOK Symbol" should be defined or change it "OOK waveform" | See comment | **Revised**TGba Editor makes changes as shown in 802.11-19/73r3 |

**Discussion**

This table refers specifically to the duration of the OOK Symbol, so the use of the term “OOK Waveform” would not be appropriate. Also, the terms “On symbol,” “Off symbol,” “OOK symbol” and “MC-OOK symbol” are used throughout the draft. It is important to be able to refer to these symbols.

**Proposed Resolution**

TGba Editor: Add the following to Clause 3.2:

**MC-OOK symbol**: A multicarrier on-off keying symbol. The MC-OOK symbol can be either an On symbol where the multicarrier signal is present or an Off symbol where the multicarrier signal is not present. (#156)

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| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 1036 | 32.1 | 65.44 | The following statement is confusing. It does not clearly specify how the WUR PHY signal is generated. It says that the subcarrier coefficients are taken from the BPSK, QPSK, 16-QAM, 64-QAM, and 256-QAM, which is not mandatory: "The Wake-up radio PHY subcarriers are modulated using the Multicarrier On-Off Keying (MC-OOK) and the BPSK, QPSK, 16-QAM, 64-QAM, and 256-QAM are used for the coefficient of Wake-up radio PHY subcarriers." | Replace the sentence with the following: "The Wake-up radio PHY shall use the Multicarrier On-Off Keying (MC-OOK) modulation, and the coefficients of Wake-up radio PHY subcarriers may take values from BPSK, QPSK, 16-QAM, 64-QAM, or 256-QAM constellation symbols." | **Accept** |
| 177 | 32.1 | 65.44 | Change "and the BPSK, QPSK, 16-QAM, 64-QAM, and 256-QAM are used for the coefficient of Wake-up radio PHY subcarriers" to "and the BPSK, QPSK, 16-QAM, 64-QAM, and 256-QAM can be used for the coefficient of Wake-up radio PHY subcarriers' | as in the comment | **Revised**Replace the sentence with the following: "The Wake-up radio PHY shall use the Multicarrier On-Off Keying (MC-OOK) modulation, and the coefficients of Wake-up radio PHY subcarriers may take values from BPSK, QPSK, 16-QAM, 64-QAM, or 256-QAM constellation symbols." |

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| 178 | 32.2 | 65.49 | Remove "single stream" in line 49,51, and 56; No need to mention single stream since WUR only uses OOK. Modify line 30 as "The Wake-up Radio PHY provides support for Low Data Rate of 62.5 kb/s and High Data Rate of 250 kb/s". | as in the comment | **Accept** |

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| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 179 | 32.1 | 65.62 | Add a sentence to describe the optional requirement for WUR receiver like receive beacon and WUR frame in different channel | as in the comment | **Revised**TGba Editor makes changes as shown in 802.11-19/73r3 |

**Discussion**

There is currently no text on optional features for the STA, so it makes sense to add some text on optional STA features.

**Proposed Resolution**

TGba Editor: Add the following text to the draft on Page 65 after Line 61:

A WUR receiver STA may support the following feature:

* A WUR PPDU with 20 MHz channel width, High Data Rate
* Receive a WUR beacon frame in one channel and a WUR Wake-up frame in a different channel (#179)

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| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 180 | 32.1 | 65.64 | Change “WUR AP” to “WUR transmitter” to be consistent with other texts in this subclause | as in the comment | **Reject** The preferred terminolgy being adopted by the text is “WUR AP” |

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| 408 | 32.1 | 65.33 | Keep using the term manchester code but it is not strictly true. Yes, there are two symbols per bit, but it’s not strictly a manchester code because the DC component of the signal does not average out to zero. Suggest introducing it somewhere as a manchester-like code, and then not using the term Manchester Code anywhere else in the standard. |  | **Revised**TGba Editor makes changes as shown in 802.11-19/73r3 |

**Discussion**

Some references to Manchester encoding mention that the DC value is zero, but not all references. However, Ethernet standard However, there are two encoding techniques used in the draft. The HDR uses the encoding: $0\rightarrow 10$ and $1\rightarrow 01$. The LDR uses the encoding: : $0\rightarrow 1010$ and $1\rightarrow 0101$. The HDR encoding is Manchester with no reference to the levels of the 1 and 0. However, the LDR encoding, converts each bit into four bits versus two bits for Manchester encoding. So, for LDR the use of Manchester encoding is more of a stretch. Maybe “Manchester-like” encoding is a reasonable term.

**Proposed Resolution**

TGba Editior: Make the following changes to the draft,

Replace all occurrences of the “Manchester encoding” with “Manchester-like encoding”

Replace all occurrences of the “Manchester-based encoding” with “Manchester-like encoding” (#408)

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| 409 |  |  | The terms HDR and LDR are used. I recommend changing it to Rate 0 and Rate 1 which allows for better extensibility in future amendments. |  | **Reject**The Task Group selected those terms for clarity and are preferred over the suggested alternatives. |

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| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 930 | 32.1 | 65.08 | "system" should be "systems" | See comment | **Accept** |

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| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 931 | 32.1 | 65.08 | "Multicarrier On-Off Keying (MC-OOK)" is an incorrect term. The WUR signal defined in this spec is actually a single carrier signal using Manchester coded On-Off Keying modulation with 4 MHz bandwidth. Although the OOK signal may be generated by transmitting some symbols in multiple subcarriers of an OFDM symbol as one of possible methods, those symbols has no meaning to the typical WUR receiver, such as an envelope detector. | Change this term to "Manchester-Coded On-Off Keying (MC-OOK)". Also, define MC-OOK once here. There is no need to repeat the definition in the rest of the spec (e.g., see line 43 on the same page). | **Reject**It is interesting that “Manchester Code” and “Multicarrier” both can be represented by “MC”, but the MC has always meant to indicate Multicarrier. Earlier the term “OFDM-OOK” was used but that was replaced since the underlying OFDM waveform does not carry information. |

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| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 1042 | 32.2.2 | 68.61 | Fig. 32-2 is inconsistent with the Fig. 32-1. In Fig. 32-2, the width of the WUR-Sync and WUR-Data are shown to be smaller than the legacy fields. In Fig 32-1, the width of all the fields are the same. This can potentially confuse the reader. | Update Fig. 32-2, to show equal width for Legacy fields, WUR-Sync, WUR-Data, Padding fields. | **Reject**The Task Group prefers that in the three figures 32-1, 32-2 and 32-3, that the WUR portion is shown as smaller bandwidth than the Legacy portion. |
| 1043 | 32.2.2 | 69.10 | Fig. 32-3 is inconsistent with the Fig. 32-1. In Fig. 32-3, the width of the WUR-Sync and WUR-Data are shown to be smaller than the legacy fields. In Fig 32-1, the width of all the fields are the same. This can potentially confuse the reader. | Update Fig. 32-3, to show equal width for Legacy fields, WUR-Sync, WUR-Data, Padding fields. | **Reject**The Task Group prefers that in the three figures 32-1, 32-2 and 32-3, that the WUR portion is shown as smaller bandwidth than the Legacy portion. |
| 1252 | 32.2.2 | 68.13 | The styles of Figures 32-1 and 32-2 are inconsistent, i.e., one showing the bandwidth difference (20 MHz vs. 4MHz), the other not. Up to this point in the draft, there is no description that the WUR portion is of 4 MHz bandwidth. Therefore, Figure 32-1 may give a wrong expression that the WUR signal is also of 20 MHz bandwidth. | Change Figure 32-1 to show the bandwidths are different from the preamble portion and the WUR portion. | **Accept** |

**Discussion**

Figures 32-1, 32-2 and 32-3 are inconsistent. Figure 32-1 does not indicate the bandwidth difference between the Legacy portion and the WUR portion, while Figures 32-2 and 32-3 do indicate the difference in bandwidth. Indicating the bandwidth difference is useful to the reader.

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| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 1213 | 32.2.8.1 | 80.59 | ([W W]) should be in bold/italic letter to indicate vector in Equation (32-4). In "Here, W is a 64 ╬╝s long sequence.", add the reference subclause or equation at the end of the sentence. | as in comment | **Revised**TGba Editor makes changes as shown in 802.11-19/73r3 |

**Discussion**

The parameter W should in in Italics

**Proposed Resolution**

The Editor is instructed to make the following changes to the draft,

Format “W” in Italics on Page 80, Line 59.

Add the text below as shown in Red,

Here, W is a 64 μs long sequence, where *W* is defined in Equation (32-4). (#1213)