IEEE P802.11
Wireless LANs

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| Misc CIDs in subclause 38.3 |
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Abstract

This submission proposes resolutions of comments received from TGbn comment collection based on TGbn D0.1.

1174, 1175, 1642, 2308, 2309, 3535, 3730, 2254, 2323, 2324, 2325, 2326, 2327, 2328, 2329

Revisions:

* Rev 0: Initial version of the document.

# ****CID 1174****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.15.11.1 | 188.42 | Add the equation for the UHR-LTF waveform of UHR MU-PPDU based on the equation 36-44. and eta\_field also should be included in the added equation. | As the comment. | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 1174.**Note that the resolutions for CID 1174, CID 1175, CID 1642, CID 3535 and CID 2309 are the same. |

**Discussion:**

The equation for the UHR-LTF waveform of UHR MU PPDU can be added based on equation (36-44), which is the equation for EHT-LTF waveform of EHT MU PPDU.

The equation for the UHR-LTF waveform of UHR TB PPDU can be added based on equation (36-45), which is the equation for EHT-LTF waveform of EHT TB PPDU.

The notation isn’t needed since there is no power boosting for UHR-LTF in UHR MU PPDU and UHR TB PPDU.

**Instructions to the Editor:**

Please add the following in Line 42, Page 293in TGbn Draft D0.3:

In a UHR MU PPDU, the time domain representation of the UHR-LTF waveform transmitted on the transmit chain *iTX* shall be as described in [Equation (38-xx1)](#_bookmark168).

 (38-xx1)

In a UHR TB PPDU, the time domain representation of the UHR-LTF waveform of user *u* in the *r*-th RU or MRU or DRU transmitted on the transmit chain shall be as described in Equation (38-xx2).

 (38-xx2)

In [Equation (38-xx1)](#_bookmark168) and [Equation (38-xx2)](#_bookmark170), the following notations are used.

*Nuser* *r* is the number of

UHR MU PPDU recipients (see [Table 38-21 (Frequently used parameters)](#_bookmark68)) in RU or MRU or DRU *r*.

UHR-LTF*k* *u* *m* is the UHR-LTF sequence applied on subcarrier *k* for spatial stream *m* of user *u*.

UHR-LTF*k* *u* *m* = UHR-LTF*k* for all values of *u* and *m*.

*r* is defined in [38.3.14.4 (Transmitted signal)](#_bookmark75).

 *N*UHR-LTF is the number of OFDM symbols in the UHR-LTF field.

 *TCS* UHR *Mr* *u* + *m*represents the cyclic shift for the spatial stream *Mr*+*m,* as defined in [38.3.15.2.2](#_bookmark90) [(Cyclic shift for UHR modulated fields)](#_bookmark90).

 *Qk* *u* are defined in [38.3.14.4 (Transmitted signal)](#_bookmark75).

 is defined in [Equation (38-xx)](#_bookmark164).

*Mr* *u* is given in [Table 38-21 (Frequently used parameters)](#_bookmark68) for UHR MU PPDU. For a UHR TB PPDU, it is given by the TXVECTOR parameter STARTING\_STS\_NUM.

 is the set of subcarrier indices for the tones in the RU or MRU or DRU *r* as defined in [38.3.14](#_bookmark69) [(Mathematical description of signals)](#_bookmark69).

 and UHR-LTF are defined after [Equation (38-5)](#_bookmark82) in [38.3.14.4 (Transmitted signal)](#_bookmark75).

Other variables in [Equation (38-xx1)](#_bookmark170) and [Equation (38-xx2)](#_bookmark177) are defined in [38.3.13 (Timing-related](#_bookmark62) [parameters)](#_bookmark62) and [38.3.14 (Mathematical description of signals)](#_bookmark69).

# ****CID 1175****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.15.11.1 | 188.46 | Add the equation for the UHR-LTF waveform of UHR TB PPDU based on the equation 36-45. and eta\_field also should be included in the added equation. | As the comment. | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 1174.**Note that the resolutions for CID 1174, CID 1175, CID 1642, CID 3535 and CID 2309 are the same. |

# ****CID 1642****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.15.11 | 188.41 | Define equation (38-e2) and (38-e3) | As the comment. | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 1174.**Note that the resolutions for CID 1174, CID 1175, CID 1642, CID 3535 and CID 2309 are the same. |

# ****CID 3535****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.15.11 | 188.42/46 | missing definition | Equation (38-e2) and (38-e3) are mentioned but not defined. | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 1174.**Note that the resolutions for CID 1174, CID 1175, CID 1642, CID 3535 and CID 2309 are the same. |

# ****CID 2309****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.15.11.1 | 188.45 | DRU should be included in the time domain representations of the UHR-LTF waveform. Please add in the sentence. | As in comment | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 1174.**Note that the resolutions for CID 1174, CID 1175, CID 1642, CID 3535 and CID 2309 are the same. |

# ****CID 2308****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.15.11.1 | 185.44 | Please add that All the equations for UHRLTF listed on page 186-187 only applies to UHR MU PPDU, UHR ELR PPDU and UHR TB PPDU with RRU transmission.The sequences for DRU tranmissions are listed in subclause 38.3.15.11.2. | As in comment | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 2308.** |

**Instructions to the Editor:**

Please make the following changes in Line 41, Page 291in TGbn Draft D0.3:

In a 20MHz transmission, the 1 UHR-LTF sequence transmitted on subcarriers [–122: 122] is given by Equation(27-41) with ** replaced by .

In a 20MHz transmission, the 2 UHR-LTF sequence transmitted on subcarriers [–122: 122] is given by Equation(27-42) with ** replaced by .

In a 20MHz transmission, the 4 UHR-LTF sequence for RRU transmission transmitted on subcarriers [–122: 122] is given by Equation(27-43) with ** replaced by .

In a 40MHz transmission, the 1 UHR-LTF sequence transmitted on subcarriers [–244: 244] is given by Equation(27-44) with ** replaced by .

In a 40MHz transmission, the 2 UHR-LTF sequence transmitted on subcarriers [–244: 244] is given by Equation(27-45) with ** replaced by .

In a 40MHz transmission, the 4 UHR-LTF sequence for RRU transmission transmitted on subcarriers [–244: 244] is given by Equation(27-46) with ** replaced by .

In an 80MHz transmission, the 1 UHR-LTF sequence transmitted on subcarriers [–500: 500] is given by Equation(27-47) with ** replaced by .

In an 80MHz transmission, the 2 UHR-LTF sequence transmitted on subcarriers [–500: 500] is given by Equation(27-48) with ** replaced by .

In an 80MHz transmission, the 4 UHR-LTF sequence for RRU transmission transmitted on subcarriers [–500: 500] is given by Equation(27-49) with ** replaced by .

In a 160MHz transmission, the 1 UHR-LTF sequence transmitted on subcarriers [–1012: 1012] is given by Equation(27-50) with ** replaced by .

In a 160MHz transmission, the 2 UHR-LTF sequence transmitted on subcarriers [–1012: 1012] is given by Equation(27-51) with ** replaced by .

In a 160MHz transmission, the 4 UHR-LTF sequence for RRU transmission transmitted on subcarriers [–1012: 1012] is given by Equation(27-52) with ** replaced by .

In a 320 MHz transmission, the 1 UHR-LTF sequence transmitted on subcarriers [–2036: 2036] is given by Equation (36-38) with  replaced by .

In a 320 MHz transmission, the 2 UHR-LTF sequence transmitted on subcarriers [–2036: 2036] is given by Equation (36-39) with  replaced by  .

In a 320 MHz transmission, the 4 UHR-LTF sequence for RRU transmission transmitted on subcarriers [–2036: 2036] is given by Equation (36-40) with  replaced by  .

# ****CID 2323****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.16.1.1 | 194.40 | 38.3.16.1.1 only mentions UHR ELR PPDU, how about other UHR PPDU formats? Please add those sentences or add references. | As in comment | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 2323.** |

**Instructions to the Editor:**

Please make the following changes in Line 17, Page 300in TGbn Draft D0.3:

The Data field shall be encoded using either BCC defined in 38.3.16.1.2 (BCC coding) or the LDPC code defined in 38.3.16.1.3 (LDPC coding). For a UHR MU PPDU, the coding type is selected by the Beamformed And Coding/

UEQM Pattern subfield in the User field of UHR-SIG for a non-MU-MIMO allocation or Co-SR allocation or by the Coding/BSS Color Indication subfield in the User field of UHR-SIG for an MU-MIMO allocation or Co-BF allocation, as defined in 38.3.15.9 (UHR-SIG). For a UHR TB PPDU, the coding type is selected by the UL FEC Coding Type subfield in User Info field in the soliciting Trigger frame, or the RU size indicated in RU Allocation subfield in the soliciting frame carrying a TRS Control subfield, as defined in 9.3.1.22 (Trigger frame format) and 37.xxx (TXVECTOR parameters for UHR TB PPDU response to TRS Control subfield), respectively. For a UHR ELR PPDU, the coding type is selected by the Coding field in ELR-SIG-1, as defined in 38.3.15.12 (ELR-SIG).

When conducting BCC FEC encoding for a UHR PPDU, the number of encoders is always 1.

# ****CID 2324****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.16.1.2 | 194.44 | 38.3.13.16.1.2 need add contents regarding what conditions BCC coding can be used. For example, UEQM does not use BCC. 27.3.12.5.1 does not include all conditions for UHR PPDU. | As in comment | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 2324.** |

**Instructions to the Editor:**

Please all the following text in Line 28, Page 300in TGbn Draft D0.3:

Support for BCC coding is limited to less than or equal to four spatial streams per user, UHR-MCSs 0 to 9, UHR-MCS 15 (BPSK-DCM with ), UHR-MCS 17, 19, 20, 23 for equal modulation, and RU or MRU or DRU that is the same size as or smaller than a 242-tone RU. BCC support is mandatory (for both transmit and receive) for RU or MRU that is the same size or smaller than a 242-tone RU.

# ****CID 2325****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.16.1.3 | 194.49 | change "codeword lengths" to "codeword nominal lengths". Codeword length can be greater than 1944 with repeatation code bits. | As in comment | Revised.**Instructions to the editor:**Please change"codeword lengths" as "codeword block lengths" to keep consistent with the existing description in the spec. |

# ****CID 2326****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.16.1.4 | 195.49 | 38.3.16.1.4 UHR PPDU padding process is missing contents, e.g., equations for UEQM, and reference to EHT PPDU padding process for EQM. | As in comment | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 2326.** |

**Discussion:**

For EQM and UEQM, the main difference lies in the calculation of ,

, for UEQM

, for EQM

Whilst the EHT PPDU padding process is described based on . Thus, no further clarification is needed for UEQM.

**Instructions to the Editor:**

Please all the following text in Line 24, Page 301in TGbn Draft D0.3:

**38.3.16.1.4 UHR PPDU padding process**

The UHR PPDU padding process can refer to the EHT PPDU padding process in 36.3.13.3.4.

# ****CID 2327****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.16.1.5 | 195.6 | In 38.3.16.1.5, why UEQM only impacts NCBPS,short,u? Please add NCBPS,u equation as well. | As in comment | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 2327.** |

**Instructions to the Editor:**

Please all the following text in Line 52, Page 232in TGbn Draft D0.3:

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| * Frequently used parameters (continued)
 |
| Symbol | Explanation |
|  | For pre-UHR modulated fields, *.*For UHR modulated fields,  represents the number of occupied RU(s) or MRU(s) in the transmission. |
|  | For pre-UHR modulated fields, .For UHR modulated fields,  represents the total number of users in the *r*-th occupied RU or MRU of the transmission. |
|  | Total number of users in all occupied RU(s) or MRU(s) of a UHR transmission, i.e., . |
|  | Number of coded bits per OFDM symbol for user *u*, . , in which, and are defined in Table 38-21 (Frequently used parameters). |
|  | Number of coded bits per OFDM symbol over the *m*-th spatial stream for user *u*, in OFDMA transmission, . |
|  | Effective number of data tones carrying unique data.NOTE—The  value with DCM (when applicable) is half of the  value without DCM, for each RU or MRU size. |
|  | Effective number of data tones carrying unique data for user *u*, . |

# ****CID 2328****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.16.2 | 197.45 | Remove "inclusion of ... is TBD" since PHY motion 199 already exclude BPSK. It is better to start a new paragraph for unequal modulation since the subbullets onl apply to UEQM. | As in comment | Rejected.The comment has been revised in Draft P802.11bn D0.3. |

# ****CID 2329****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.16.4, 38.3.16.5, 38.3.16.6 | 198.3 | 38.3.16.4, 38.3.16.5 and 38.3.16.6 has only description of UHR ELR PPDU, how about other UHR PPDU formats? If it is the same as EHT PPDU, please add reference to subclause 36. | As in comment | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 2329.** |

**Instructions to the Editor:**

Please all the following text in Line 42, Page 303in TGbn Draft D0.3:

* BCC interleavers

The BCC interleavers described in 36.3.13.6 (BCC interleavers) are applied to UHR MU PPDU and UHR TB PPDU.

The interleaver parameters for the UHR ELR PPDU Data field,  and , shall be the same as those defined in Table 27-36 (BCC interleave parameters) for the 52-tone RU size and DCM not used.

NOTE—Since only one spatial stream is used in UHR ELR transmission, is not applicable.

* LDPC tone mapper

The LDPC tone mapper described in 36.3.13.8 (LDPC tone mapper) is applied to UHR MU PPDU and UHR TB PPDU.

The LDPC tone mapping for the UHR ELR PPDU Data field shall be applied to a 52-tone regular RU, using the same LDPC tone mapping distance parameter  as defined in Table 36-52 (LDPC tone mapping distance for each RU or MRU size within an 80 MHz frequency subblock) for the 52-tone RU size.

* Segment deparser

The segment deparser described in 36.3.13.9 (Segment deparser) is applied to UHR MU PPDU and UHR TB PPDU.

The segment deparser is bypassed for a UHR ELR PPDU.

# ****CID 3730****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.2.2 | 107.26 | For the paragraphs from P107L26 to P108L27, the null tones in 160MHz and 320MHz for a given DBW in a given 80MHz frequency subblock are derived from the null tones for a given DBW in 80MHz (in Table 38-10) and duplication of 80MHz PPDU left guard tones, right guard tones, and DC tones. Suggest to use a table like Table 36-16 to describe these null tones. It would be more readable and informative where does the null tones come from. | Refer to the comment. | Rejected.Considering 160MHz and 320MHz support hybrid mode and puncturing, there are too many cases for null tones if described in a table. |

# ****CID 2254****

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| **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 38.3.2.2.3 | 107.26 | "For DRUs corresponding to DBW 20MHz and 40MHz in the first 80MHz frequency subblock of a 160MHz UHR TB PPDU, the null subcarrier indices for a DRU size corresponding to a DBW on frequency subblock i are [-523:-501] and the null subcarrier indices for the same DRU size corresponding to the same DBW on frequency subblock i in a 80MHz UHR TB PPDU minus 512 and, in which, i [1, 2, 3, 4] for a 20MHzfrequency subblock and i [1, 2] for a 40MHz frequency subblock."This sentence is very confusing and hard to understand, please rephrase. If the intention is that null subcarrier indices includes [-523:-501] and other null subcarriers defined for the DRU size, then it is wrong. For DBW20 MHz and 40 MHz in 80 MHz frequency subblock, [-523:-501] should not be included since they are not included in any 20 or 40 MHz subblocks. Same comments for the next paragraph regarding null subcarrier indices for DRUs in the second 80MHz frequency subblock. | As in comment. | Revised.Agreed in principle. Reflect the detailed explanation.**Instructions to the editor:****Please make the changes as shown in 11/25-1189r0 under CID 2254.** |

**Instructions to the Editor:**

Please all the following text in Line 41, Page 202in TGbn Draft D0.3:

For DRUs corresponding to DBW 20 MHz and 40 MHz in the first 80 MHz frequency subblock of a 160MHz UHR TB PPDU, the null subcarrier indices for a DRU size corresponding to a DBW on frequency subblock i are the null subcarrier indices for the same DRU size corresponding to the same DBW on frequency subblock *i* in a 80 MHz UHR TB PPDU minus 512(#3519), in which, *i* ∈ [1, 2, 3, 4] for a 20 MHz frequency subblock and *i* ∈ [1, 2] for a 40 MHz frequency subblock. For DRUs corresponding to DBW 80 MHz in the first 80 MHz frequency subblock of a 160 MHz UHR TB PPDU, the null subcarrier indices for a DRU size are [–523:–501] and the null subcarrier indices for the same DRU size corresponding to DBW 80 MHz in an 80 MHz UHR TB PPDU minus 512.

For DRUs corresponding to DBW 20 MHz and 40 MHz in the second 80 MHz frequency subblock of a 160 MHz UHR TB PPDU, the null subcarrier indices for a DRU size corresponding to a DBW on frequency subblock *i* are the null subcarrier indices for the same DRU size corresponding to the same DBW on frequency subblock *i*-*N*/2 in a 80 MHz UHR TB PPDU plus 512, in which, *i* ∈ [5, 6, 7, 8] for a 20 MHz frequency subblock, *i* ∈ [3, 4] for a 40 MHz frequency subblock, and *N* = max(*i*). For DRUs corresponding to DBW 80 MHz in the second 80 MHz frequency subblock of a 160 MHz UHR TB PPDU, the null subcarrier indices for a DRU size are [501:523] and the null subcarrier indices for the same DRU size corresponding to DBW 80 MHz in an 80 MHz UHR TB PPDU plus 512.

For DRUs corresponding to DBW 20 MHz and 40 MHz in the first 80 MHz frequency subblock of a 320
MHz UHR TB PPDU, the null subcarrier indices for a DRU size corresponding to a DBW on frequency subblock *i* are the null subcarrier indices for the same DRU size corresponding to the same DBW on frequency subblock i in a 80 MHz UHR TB PPDU minus 1536, in which, *i* ∈ [1, 2, 3, 4] for a 20 MHz frequency subblock and *i* ∈ [1, 2] for a 40 MHz frequency subblock. For DRUs corresponding to DBW 80 MHz in the first 80 MHz frequency subblock of a 320 MHz UHR TB PPDU, the null subcarrier indices for a DRU size are [–1547:–1525, –1035:–1025] and the null subcarrier indices for the same DRU size corresponding to DBW 80 MHz in an 80 MHz UHR TB PPDU minus 1536.

For DRUs corresponding to DBW 20 MHz and 40 MHz in the second 80 MHz frequency subblock of a 320 MHz UHR TB PPDU, the null subcarrier indices for a DRU size corresponding to a DBW on frequency subblock *i* are the null subcarrier indices for the same DRU size corresponding to the same DBW on frequency subblock *i*-*N*/2 in a 80 MHz UHR TB PPDU minus 512, in which, *i* ∈ [5, 6, 7, 8] for a 20 MHz frequency subblock, *i* ∈ [3, 4] for a 40 MHz frequency subblock, and *N* = max(*i*). For DRUs corresponding to DBW 80 MHz in the second 80 MHz frequency subblock of a 320 MHz UHR TB PPDU, the null subcarrier indices for a DRU size are [–1024:–1013, –523:–501] and the null subcarrier indices for the same DRU size corresponding to DBW 80 MHz in an 80 MHz UHR TB PPDU minus 512.

For DRUs corresponding to DBW 20 MHz and 40 MHz in the third 80 MHz frequency subblock of a 320
MHz UHR TB PPDU, the null subcarrier indices for a DRU size corresponding to a DBW on frequency
subblock *i* are the null subcarrier indices for the same DRU size corresponding to the same DBW on frequency subblock *i*-2/3×*N* in a 80 MHz UHR TB PPDU plus 512, in which, *i* ∈ [9, 10, 11, 12] for a 20 MHz frequency subblock, *i* ∈ [5, 6] for a 40 MHz frequency subblock, and *N* = max(*i*). For DRUs corresponding to DBW 80 MHz in the third 80 MHz frequency subblock of a 320 MHz UHR TB PPDU, the null subcarrier indices for a DRU size are [501:523, 1013:1023] and the null subcarrier indices for the same DRU size corresponding to DBW 80 MHz in an 80 MHz UHR TB PPDU plus 512.

 For DRUs corresponding to DBW 20 MHz and 40 MHz in the fourth 80 MHz frequency subblock of a 320 MHz UHR TB PPDU, the null subcarrier indices for a DRU size corresponding to a DBW on frequency subblock *i* are the null subcarrier indices for the same DRU size corresponding to the same DBW on frequency subblock *i*-3/4×*N* in a 80 MHz UHR TB PPDU plus 1536, in which, *i* ∈ [13, 14, 15, 16] for a 20 MHz frequency subblock and i ∈ [7, 8] for a 40 MHz frequency subblock, and *N* = max(*i*). For DRUs corresponding to DBW 80 MHz in the fourth 80 MHz frequency subblock of a 320 MHz UHR TB PPDU, the null subcarrier indices for a DRU size are [1024:1035, 1525:1547] and the null subcarrier indices for the same DRU size corresponding to DBW 80 MHz in an 80 MHz UHR TB PPDU plus 1536.