IEEE P802.11
Wireless LANs

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| 11bn PDT PHY UHR-SIG |
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Abstract

This document contains Proposed Draft Text (PDT) for the UHR-SIG of the TGbn (UHR, Ultra High Reliability) amendment to the 802.11 standard.

# Revision information

The following is a summary of the important changes that occurred within each revision of this document:

|  |  |
| --- | --- |
| **Revision** | **Major changes** |
| 0 | Initial revision |
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# Introduction

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 TGbn Draft. The abstract, revision information, introduction, explanation of the proposed changes, and references sections are not part of the adopted material.

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

## Explanation of the proposed changes:

The proposed changes to the 802.11 TGbn draft within this document are based on the following motions adopted by the TGbn task group.

### Relevant passing motions:

[Motion #40, [1]]

* For a (non-ELR) UHR MU PPDU, there exists a 1-bit EQM/UEQM indication in a User field for non-MU-MIMO in the UHR-SIG field.

[Motion #84, [1]]

* For a (non-ELR) UHR MU PPDU, when EQM/UEQM indicates UEQM in a User field for non-MU-MIMO, there exists a MCS field, a NSS field and a 2 bit field indicating UEQM patterns.

[Motion #52, [1]]

* UEQM patterns for Nss=2 are limited to two as:
	+ [M, M-1]
	+ [M, M-2]

Note: M is the constellation index; M-1 refers to the constellation that is one order lower than M; M-2 refers to the constellation that is two orders lower than M.

[Motion #43, [1]]

* UEQM patterns for Nss=3 are limited to three:
	+ [M, M, M-1]
	+ [M, M, M-2]
	+ [M, M-1, M-2]

Note: M is the constellation index; M-1 refers to the constellation that is one order lower than M; M-2 refers to the constellation that is two orders lower than M.

[Motion #39, [1]]

* For 4 SS, the UEQM patterns only include:
	+ 1st ss, 2nd ss, 3rd ss, 4th ss,
	+ [M, M, M, M-1]
	+ [M,M,M,M-2]
	+ [M,M,M-1,M-2]
	+ [M,M-1,M-1,M-2]

Note: M is the constellation index; M-1 refers to the constellation that is one order lower than M; M-2 refers to the constellation that is two orders lower than M.

[Motion #111, [1]]

* The pre-UHR portion (the portion up-to and including UHR-SIG) of the COBF PPDU shall be transmitted in a non-beamformed (omni) manner.

# Text to be adopted begins here:

***TGbn editor: Please add the following new subclauses for UHR-SIG to the 802.11bn draft D0.1 (NOTE: The following subclauses are based on 11-24-1993r0):***

# 38. Ultra High Reliability (UHR) PHY specification

## 38.3 UHR PHY

### 38.3.14 UHR preamble

#### **38.3.14.9 UHR-SIG**

##### **38.3.14.9.1 General**

##### **38.3.14.9.2 UHR-SIG Content Channels**

##### **38.3.14.9.3 Common field for OFDMA transmission**

##### **38.3.14.9.4 Common field for non-OFDMA transmission**

##### **38.3.14.9.5 Common field for Co-BF transmission**

##### **38.3.14.9.6 User specific field**

The User field format for a non-MU-MIMO allocation is defined in Table 38-X (User field format for a non-MU-MIMO allocation).

###### Table 38-x—User field format for a non-MU-MIMO allocation

|  |  |  |  |
| --- | --- | --- | --- |
| Bit | Subfield | Number of bits | Description |
| EQM | UEQM |
| … | … | … | … |
| … | … | … | … |
| … | EQM/UEQM | 1 | If the STA-ID subfield is not equal to 2046, it indicates whether EQM or UEQM is used:Set to 0 for EQM.Set to 1 for UEQM.Set to an arbitrary value if the STA-ID subfield is equal to 2046 |
| … | MCS | … | If the STA-ID subfield is not equal to 2046, it indicates the related modulation and coding scheme.Set to an arbitrary value if the STA-ID subfield is equal to 2046… |
| … | NSS | … | If the STA-ID subfield is not equal to 2046, it indicates the number of spatial streams for up to eight spatial streams.Set to the number of spatial streams minus 1.Set to an arbitrary value if the STA-ID subfield is equal to 2046.If the UL/DL subfield of the U-SIG field is set to 0:— If the value of STA-ID subfield matches the user’s STA-ID and if the EQM/UEQM indicates EQM, values indicating more than eight spatial streams are Validate.— If the value of STA-ID subfield matches the user’s STA-ID and if the EQM/UEQM indicates UEQM, values other than 1-3 are Validate.— If the value of STA-ID subfield does not match the user’s STA-ID, all values are Disregard.If the UL/DL subfield of the U-SIG field is set to 1, values indicating more than eight spatial streams are Validate. |
| … | … | UEQM Pattern | 2 | If the STA-ID subfield is not equal to 2046, it indicates the UEQM Pattern subfield if UEQM is used:See Table 38-y (UEQM Pattern Subfield Encoding)Set to an arbitrary value if the STA-ID subfield is equal to 2046. |
| … | … | … | … |

Table 38-y (UEQM Pattern Subfield Encoding) shows the UEQM pattern of the above UEQM Pattern subfield.

###### Table 38-y—UEQM Pattern Subfield Encoding

|  |  |  |  |
| --- | --- | --- | --- |
| NSS Subfield | Number of Spatial Streams | UEQM Pattern Subfield | UEQM Pattern |
| Stream 1 | Stream 2 | Stream 3 | Stream 4 |
| 1 | 2 | 0 | M | M-1 | N/A | N/A |
|  |  | 1 | M | M-2 | N/A | N/A |
| 2 | 3 | 0 | M | M | M-1 | N/A |
|  |  | 1 | M | M | M-2 | N/A |
|  |  | 2 | M | M-1 | M-2 | N/A |
| 3 | 4 | 0 | M | M | M | M-1 |
| 1 | M | M | M | M-2 |
| 2 | M | M | M-1 | M-2 |
| 3 | M | M-1 | M-1 | M-2 |

NOTE 1 **—** M is the constellation index; M-1 refers to the constellation that is one order lower than M; M-2 refers to the constellation that is two orders lower than M.

NOTE 2 **—** The values of UEQM Pattern subfield are Validate if those values corresponding to a certain NSS subfield value are not listed in the above table.

##### **38.3.14.9.7 Encoding and modulation**

The UHR-SIG of a COBF PPDU shall be transmitted in a non-beamformed (omni) manner.

# Text to be adopted ends here.

# References:

1. [11-24-0171r21](https://mentor.ieee.org/802.11/dcn/24/11-24-0171-21-00bn-tgbn-motions-list-part-1.pptx): 11-24-0171-21-00bn-tgbn-motions-list-part-1, Alfred Asterjadhi (Qualcomm Inc.)
2. 11-24-1993r0: 11-24-1993-00-00bn-tgbn-d0-1-spec-skeleton, Ross Jian Yu (Huawei)