IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CRs on ELR 1520,1531,2069,194,322-324, 589-590, 951,963,1164-1165,2774 | | | | |
| Date: 2025-04-09 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Rethna Pulikkoonattu | Broadcom Inc | 16340 W Bernardo Dr, San Diego, CA, 92127 |  | rethna@broadcom.com |
|  |  |  |  |  |

Abstract

This submission contains proposed comment resolutions to comments on P802.11bn D0.1. The changes are based on P802.11bn D0.1.

The submission provides resolutions to the following CIDs

* 194,322,323,324,589,590,951,963,1164,1165,1520,1531,2069,2774

Revisions:

* Rev 0: Initial version of the document.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1520 | 158.30 | 38.3.15.8.2 | Missing equation number (38-10) in parenthesis. | Add equation number (38-10) | ACCEPTED  Note: Looks like the comment is referencing to the text preceeding the equation (38-10). The first sentence should be ending with, Equation (38-10)  Note to Editor: Please replace the sentence as revised in #1520 |
| 1531 | 160.30 | 38.3.15.8.2 | The graphical view of Figure 38-21 is not complete (column 80-96 missing numerical values) | Replace with the complete graphical view from TGbn 2071r1. | ACCEPTED  The figure in the proofread verion (draft01\_v0204) was verified correct, but in the 0.1 bundle it appears to have messed up. Will work with the editor to validate the SVG and fix this.  Note to Editor: Will work separately to make sure that the image is rendered correctly |
| 2069 | 161.45 | 38.3.15.8.3 | A mistake in calculating the column index of H matrix for D\_k,n when k is not equal to 0,+/-7,+/-21. "k+20" should be replaced with "k+21" in Equation (38-13). | In Equation (38-13), "k+20" should be replaced with "k+21". | ACCEPTED  Note: also resolves CID 194 |
| 194 | 161 | 38.3.15.8.3 | In the ELR-Mark encoding process, the mapping of the H matrix entry to the subcarrier index needs a minor correction. Dk,n = 1 + bsscolor, 48n+k+26 - ceil((sign(k) - 1)/2 + (k+20)/14) should be replaced with Dk,n = 1 + bsscolor, 48n+k+26 - ceil((sign(k) - 1)/2 + (k+21)/14) | Dk,n = 1 + bsscolor, 48n+k+26 - ceil((sign(k) - 1)/2 + (k+20)/14) should be replaced with Dk,n = 1 + bsscolor, 48n+k+26 - ceil((sign(k) - 1)/2 + (k+21)/14) | ACCEPTED  Note: also resolves CID 2069 |
| 322 | 158.18 | 38.3.15.8.1 | "The value of BSS\_COLOR ranges from 0 to 63". More correct to say 1 to 63. |  | ACCEPTED:  Note: Revised. BSSCOLOR in U-SIG has 6 bits. Since color=0 matches all recepients, it is appropriate to assign 1-64 as distinct colors and leave 0 as special case.  CR #194  CR #322 |
| 323 | 161.03 | 38.3.15.8.3 | "A row of the ELR-MARK matrix is chosen ...". Not just any row, rather the the row corresponding to the BSS color |  | ACCEPTED  Note: The text in the sub bullet already has this addressed. Will hear further before revising  **CR # 194,**  **CR #322** |
| 324 | 161.13 | 38.3.15.8.3 | Typos: delete extra commas |  | ACCEPTED  Related to CID: 324 |
| 589 | 161.13 | 38.3.15.8.3 | There are two "," right after "j". Delete one of them. |  | ACCEPTED  Note: addressed by CID 324 |
| 590 | 161.20 | 38.3.15.8.3 | GI should be inserted to construct ELR-MARK-1 and ELR-MARK-2 symbols. Add a relevant text. |  | REJECTED  Note: The time domain signal representation captures this. Open to hear wider opinion and decide if explicit text to be added or not. |
| 951 | 160.14 | 38.3.15.8.3 | Remove extra "," |  | ACCEPTED |
| 963 | 159.44 | 38.3.15.8.2 | Delete the picture of ELR MARK. It does not provide any information but just confusing. | Remove sentence, "The 32 x 48 matrix H is also depicted in Figure 38-20 (The 32 x 48 ELR mark sequence matrix H) for visual clarity.", remove Figure 38-20, remove sentence, "A graphical representation of the complete 64x96 matrix H is shown in Figure 38-21 (Graphical view of the complete 64x96 matrix H corresponding to the ELR-Mark symbols)." and remove Figure 38-21. | REJECTED  Several implementation engineers and readers recognize the importance of these illustrations. The visual representation helps clarify substructure details, proving beneficial for various implementation approaches. Many individuals prefer graphical depictions when working with matrices of this magnitude. |
| 1164 | 161.13 | 38.3.15.8.3 | Change the font and color of M in red |  | ACCEPTED  Note: it appears to have come from the track change |
| 1165 | 161.30 | 38.3.15.8.3 | In the UHR, we define the Eta\_field in 38.3.14.4. Add the eta\_field in equation (38-13) and description of this field at P161L50. |  | REJECTED  The eta value is effectively 1 and is an unnecessary add. |
| 2774 | 158.30 | 38.3.15.8.2 | Missing reference should be updated |  | ACCEPTED  Note: Addressed by CID 1520 |

**CR # 1520**

The 64x96 matrix Ḧ, is derived from a compact orthogonal matrix Ḣ of size 32x48, based on the mapping described by Equation (38-21)

**CR # 322**

## 38.3.14.8 ELR-MARK

The ELR-MARK field in the ELR preamble provides additional signaling to distinguish a UHR ELR PPDU from other PPDUs. It helps to improve the detection by utilizing predefined tone patterns for cross-correlation, enhancing performance in low-SNR environments, and enabling coherent combining across multiple receiving antennas.

Additionally, the ELR-MARK field includes a unique identifier BSS\_COLOR, indicating the station’s BSS color. The value of BSS\_COLOR ranges from 1 to 64 (see 35.11.1.4 BSS\_COLOR). A 64 × 96 matrix Ḧ, called ELR-MARK matrix, specifies 64 orthogonal sequences. Each row corresponds to a BSS Color, while each column corresponds to the data conveyed over each subcarrier of the two ELR-MARK symbols. These orthogonal sequences allow STAs to determine if the UHR ELR PPDU is from OBSS.

**CR # 194**

### 38.3.14.8.2 Encoding and Modulation

A row of the ELR-MARK matrix is chosen as the ELR-MARK sequence and is transmitted in the ELR-MARK field using QBPSK modulation to enhance detection performance and reduce the likelihood of missed or false detections. For a given BSS\_COLOR, the corresposponding row is selected. The ELR-MARK field comprises two OFDM symbols, referred to as ELR-MARK-1 and ELR-MARK-2. In the frequency domain, each OFDM symbol contains 52 tones: 48 data tones modulated using QBPSK and 4 pilot tones modulated using BPSK. The ELR-MARK symbols are generated as follows.

1. For a given BSS\_COLOR 𝑏 ∈ [1,64], the sequence M = [Ḧ]*b*,1:96 (the *b* th row of the matrix Ḧ) is used for the ELR-MARK symbols. The sequence M containing 96 values (± 1), are individually translated to ± , using QBPSK mapping, i.e., 1 → *j*, -1 → -*j*. This sequence M is split into two segments, each of length 48 elements.
2. The first 48 elements of M, namely M 1 = M [1:48], are allocated to the 48 data subcarriers of an OFDM symbol. Pilots with values [-1, -1, -1, 1] are mapped to [-21, -7, 7, 21] subcarriers. This forms the frequency domain representation of the ELR-MARK-1 symbol. An IFFT is then applied to generate the time domain version of the ELR-MARK-1 symbol.
3. The last 48 elements of M, namely M 2 = M[49:96], are assigned to the 48 data subcarriers of an OFDM symbol. Pilots with values [-1, -1, -1, 1] are mapped to [-21, -7, 7, 21] subcarriers. This constitutes the frequency domain representation of the ELR-MARK-2 symbol. An IFFT is subsequently applied to obtain the time domain version of the ELR-MARK-2 symbol.
4. The mathematical representation of the time domain waveform for the ELR-MARK field, transmitted on transmit chain *iTX*, shall be as specified in Equation (38-24).

(38-24)

(38-25)

where is the element of matrix Ḧ at row and column .