IEEE P802.11
Wireless LANs

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| Changes to D0.5 |
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Abstract

This submission proposes clarifications and corrections to D0.5

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 TGax Draft. This introduction is not part of the adopted material.

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

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

**Proposed change 1: 26.3.9.10 HE-LTF**

Discussion: In draft D0.5, the existing P-matrix masked HE-LTF has the following issues need to be changed and updated. 1) 1x HE-LTF is not masked in UL-MUMIMO; 2) Per stream masking instead of per STA masking; 3) Tone mapping is not correct for 2x HE-LTF.

*To the TGax Editor: In page 255, replace equation (26-54) to line 42 in 26.3.9.10 HE-LTF with the following highlighted equations and text.*

In an UL MU-MIMO transmission not using single stream pilots, the generation of the HE-LTF sequence
per frequency segment is to mask the non-zero elements in the common HE-LTF sequence repeatedly by a
distinct orthogonal code as defined by Equation (26-54).

 (26-54)

Where is the *k*-th element of the common HE-LTF sequence generated by the one of the equations from (26-39) to (26-57) depends on the bandwidth and the HE-LTF mode (excluding the 1x HE-LTF). is defined in equation (22-46). is the row of the  corresponding to the spatial time stream of user *u* in the *r*-th RU. Depending on the HE-LTF modes is defind in (26-55).

 (26-55)

**Proposed change 2: Subclause 26.3.3, Page 178, Line 63**

Discussion: Replace “DFT size” by “PPDU BW” since “DFT size” is not defined.

*To the TGax Editor: change this line as follows*

In OFDMA, an OFDM symbol is constructed of subcarriers, the number of which is a function of the ~~DFT size~~ PPDU BW.

**Proposed change 3: Subclause 26.3.3.3, Page 186, Line 32**

Discussion: suggest to change all "pilot tone" in this subsection to "pilot subcarrier".

*To the TGax Editor: make the following changes*

Replace all "pilot tone" in this subsection to "pilot subcarrier".

**Proposed change 4: Subclause 26.3.3.3, Page 186, Line 35**

Discussion: the statement of "If pilot tones are present in the HE-LTF field, the pilot tone locations in the HE-LTF field and Data field shall be the same" is not accurate, as the pilots in 1x HE-LTF is only a subset of the pilots in data.

*To the TGax Editor: make the following changes*

If pilot tones are present in the HE-LTF field, the pilot tone locations in the HE-LTF field and Data field
shall be the same except for 1x HE-LTF. In the 1x HE-LTF, the pilot locations are the pilot subcarrier indices that are multiples of 4 in the pilot subcarriers for data field.

**Proposed change 5: Subclause 26.3.3.5, Page 188, Line 1**

Discussion: The statement is informal and not accurate.

*To the TGax Editor: make the following changes*

~~It is indicated in the capability field, whether an HE STA is 20 MHz only, 80 MHz, 160MHz or 80+80MHz capable.~~ The supported channel bandwidth is indicated in the *Channel width set* in the HE capabilities element.

**Proposed change 6: Subclause 26.3.3.7.2, Page 188, Line 36, 40**

Discussion: Wrong capability is referred.

*To the TGax Editor: make the following changes*

An HE STA shall support reception of DL MU-MIMO transmissions on full bandwidth with maximum number of space-time streams (per user) equal to minimum of 4 and the maximum number of space-time streams supported for reception of HE SU PPDUs. The maximum number of space-time streams supported for reception of HE SU PPDUs is indicated for various bandwidths in ~~'HE-MCS and Nss Map'~~ 'Tx Rx HE MCS Support' field in the HE Capabilities element.
An HE STA shall support reception of DL MU-MIMO transmissions on full bandwidth with the total number of space-time streams (across NUM\_USERS) less than or equal to a maximum value indicated by the ~~Beamformee STS Capability in the HE Capabilities element~~ 'Nsts\_Total support for BW <= 80 MHz' and 'Nsts\_Total support for BW > 80 MHz' in the HE capabilities element.

**Proposed change 7: Subclause 26.3.3.7, Page 188**

Discussion: 11-16/866r4 not correctly implemented

*To the TGax Editor: make the following changes to subclause 26.3.3.7.3 and 26.3.3.7.4*

Delete 26.3.3.7.3 since the information in this section is covered in 26.3.3.7.2.

Rename the title of 26.3.3.7.4 to be “Resource indication and STA self-identification in an HE MU PPDU”.

Replace “MU MIMO” in 2nd line of 26.3.3.7.4 with “MU-MIMO”.

Replace the typo “User fblock fields” in page 189, line 10 of 26.3.3.7.4 with “User block fields”.

**Proposed change 8: Subclause 26.3.3.9.4, Page 190, Line 30**

Discussion: Wrong capability is referred.

*To the TGax Editor: make the following changes*

The maximum number of space-time streams supported for transmission of HE SU PPDUs is indicated for various
bandwidths in '~~HE-MCS and Nss Map~~ Tx Rx HE MCS Support ' field in the HE Capabilities element.

**Proposed change 9: Subclause 26.3.5, Page 194, Line 43**

Discussion: Clarification needed.

*To the TGax Editor: make the following changes*

In the HE trigger-based PPDU, the pre-HE-STF preamble, which includes legacy preamble, RL-SIG and HE-SIG-A fields, is sent only on the 20 MHz channels where the STA’s HE modulated fields are located.

**Proposed change 10: Subclause 26.3.5, Page 193, Line 38 and Page 194, Line 9**

Discussion: Constellation mapper is not needed for L-STF/LTF generation either.

*To the TGax Editor: make the following changes*

In particular, Figure 26-9 (Transmitter block diagram for the L-SIG, RL-SIG and HE-SIG-A fields for an HE
SU PPDU and HE extended range SU PPDU when the Beam Change field is 1 and the HE MU
PPDU(#1659)) shows the transmit process for the L-SIG, RL-SIG, and HE-SIG-A fields of an(#2829) HE
PPDU using one frequency segment, when the Beam Change subfield in HE-SIG-A field is set to 1. These
transmit blocks are also used to generate the L-STF and L-LTF fields(#470) of the HE PPDU when the
Beam Change subfield in HE-SIG-A field is set to 1, with the following exceptions(#Ed):
— The BCC encoder and interleaver as well as constellation mapper are not used when generating the L-STF and L-LTF fields.

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Figure 26-10 (Transmitter block diagram for the L-SIG, RL-SIG and HE-SIG-A fields for an HE SU PPDU
and HE extended range SU PPDU when the Beam Change field is 0(#2360)(#1659)) shows the transmit
process for the L-SIG, RL-SIG, and HE-SIG-A fields of an(#2829) HE PPDU using one frequency segment,
when the Beam Change subfield in HE-SIG-A field is set to 0. These transmit blocks are also used to
generate the L-STF and L-LTF fields(#471) of the HE PPDU when the Beam Change subfield in HE-SIG-A
field is set to 0, with the following exceptions:
— The BCC encoder and interleaver as well as constellation mapper are not used when generating the L-STF and L-LTF fields.

**Proposed change 11: Subclause 26.3.3, Page 180, Line 1**

Discussion: The statement creates ambiguity about if the central RU26 in 80MHz allowed to assign to OFDMA user not, which is not within RU242 boundary.

*To the TGax Editor: make the following changes*

An HE MU PPDU using OFDMA transmission can carry a mixture of 26-, 52-, 106-, 242-, 484-, and 996-tone RUs ~~within any of the 242-tone RU(#838) boundaries(#888)~~.

**Proposed change 12: 26.3.10.8.3 Time domain encoding, Page 233, Line 1**

Discussion: The statement creates ambiguity about if pre-FEC or post-FEC padding is used in HE-SIGB user field encoding.

*To the TGax Editor: make the following changes*

If the number of users in the content channel is odd, the User Block field corresponding to the last user, who is not grouped, is encoded after adding tail and CRC bits. Pre-FEC padding is applied ~~After encoding, padding bits are added~~ to each content channel to round up the number of symbols the content channel occupies to the nearest integer value. Also the pre-FEC padding is applied ~~Further padding is added~~ to each content channel until the number of OFDM symbols in the content channel equals the Number of HE-SIG-B symbols signaled by a 4-bit field in the HE-SIG-A field for an HE MU PPDU. Thus, padding ensures that the content channels in different 20 MHz bands end at the same OFDM symbol.(#306) (#2027)For both the Common Block and User Specific fields, when the code rate is not equal to ½, the
convolutional encoder output bits for each field ~~(including padding bits) are concatenated, then the
concatenated bit streams~~ are punctured as described in 17.3.5.6 (Convolutional encoder)(#307)(#2028)