IEEE P802.11
Wireless LANs

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| **TGbe CC36 Comment Resolutions for Pilot** |
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| **Author(s):** |

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| **Name** | **Affiliation** | **Address** | **Phone** | **Email** |
| Jinyoung Chun | LG Electronics | 19, Yangjae-daero 11gil, Seocho-gu, Seoul 137-130, Korea  |   | jiny.chun@lge.com  |
| Dongguk Lim |  | dongguk.lim@lge.com |
| Eunsung Park |  | esung.park@lge.com |
| Jinsoo Choi |  | js.choi@lge.com |

Abstract

This submission proposes a resolution for 12 CIDs: CID 4685, 5013, 5014, 5015, 5016, 5017, 5018, 7249, 7250, 7251, 7314, 7478

Revisions:

* Rev 0: Initial version of the document.

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 TGbe D1.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe D1.0 Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

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| **CID** | **Clause** | **PP.LL** | **Comment** | **Proposed Change** | **Resolution** |
| 4685 | 36.3.2.4 | 367.38 | "For an EHT TB PPDU with 1xEHT-LTF, pilot subcarriers are not present in the EHT-LTF field.". "not present" is not clear, may means left unused or no pilot subcarrier | For an EHT TB PPDU with 1xEHT-LTF, there is no pilot subcarrier since no pilot model is used. | RevisedThere’s no pilot model is used. So change the text like the below.Editor instruction:Change ‘For an EHT TB PPDU with 1× EHT-LTF, pilot subcarriers are not present in the EHT-LTF field.’ To ‘For an EHT TB PPDU with 1x EHT-LTF, pilots are not used (see 36.3.12.10).’ |
| 5013 | 36.3.13.11 | 495.46 | Change"26/52/106/242/484-tone RU in a 20/40 MHz PPDU bandwidth," to "26-, 52-, 106-, 242-, 484-tone RU in a 20 MHz or 40 MHz PPDU bandwidth". | See the comment. | RevisedAgree in principle and add ‘and’ between ‘242-‘ and ‘484-‘.TGbe editor to make the changes shown in 11-21/1134r1. |
| 7314 | 36.3.13.11 | 495.47 | Change “shall be followed” to “shall be used” | See comment | Accepted |
| 5014 | 36.3.13.11 | 496.01 | Change "80/160/320 MHz" to "80 MHz, 160 MHz or 320 MHz". Ditto P496L35, P497L5, P497L34, P498L1, P498L29. | See comment | Accepted |
| 7250 | 36.3.13.11 | 496.01 | "For a user transmitting on the i-th 26-tone RU in 80/160/320 MHz PPDU bandwidth". Reference Tables 36-5, ... to clarify the index i. | See comment. Same comment for all other RU sizes throughout the section. | RevisedAgree in principle with the commenter. Add the reference table in each i-th RU’s explanation.TGbe editor to make the changes shown in 11-21/1134r1. |
| 7249 | 36.3.13.11 | 496.02 | Change "inserted in subcarriers" to "inserted at subcarriers" | See comment. Also at various other places in the section. | RevisedAgree and replace all sentences in the section.TGbe editor to make the changes shown in 11-21/1134r1. |
| 7478 | 36.3.13.11 | 496.31 | Remove the "from" in this sentence. | As in comment | RevisedAgree and delete all ‘from' in the other same sentences.TGbe editor to make the changes shown in 11-21/1134r1. |
| 5015 | 36.3.13.11 | 499.01 | Change "160/320 MHz" to "160 MHz or 320 MHz". | See the comment. | Accepted |
| 7251 | 36.3.13.11 | 499.26 | "For a user transmitting on the i-th 4×996-tone RU in 320 MHz PPDU bandwidth". There is only one such RU. | Change to "For a user transmitting on a 4×996-tone RU in 320 MHz PPDU bandwidth" | Revised Agree and delete all ‘i-th' in 4×996-tone RU in this section.TGbe editor to make the changes shown in 11-21/1134r1. |
| 5016 | 36.3.13.11 | 500.31 | For 52+26 and 106+26 MRUs, the pilot subcarriers shall follow the pilot subcarriers of each component RU. Correct the sentence. | See the comment. | RevisedThe pilot subcarriers follow the pilot subcarriers of each component RU for 52+26 and 106+26 MRUs, but the mapping and values are changed. So for the clarification, modify some text about values.TGbe editor to make the changes shown in 11-21/1134r1. |
| 5017 | 36.3.13.11 | 500.41 | In Equation (36-82) and (36-83) change "26+52" to "52+26". In Equation (36-84) and (36-85) chagne "26+106" to "106+26". | See the comment. | Accepted |
| 5018 | 36.3.13.11 | 500.41 | Define K\_R26+52\_i and K\_R26+106\_i. | See the comment. | RevisedAgree and add the definition.TGbe editor to make the changes shown in 11-21/1134r1. |

*TGbe Editor: Please make the following changes in Section 36.3.13.11 of D1.01:*

* + - 1. **Pilot subcarriers**

For a user transmitting on the *i*-th 26-, 52-, 106-, 242- and 484-tone RU in a 20 MHz or a 40 MHz(#5013) PPDU bandwidth(#1313) (see Table 27-7 (Data and pilot subcarrier indices for RUs in a 20 MHz HE PPDU and in a non-OFDMA 20 MHz HE PPDU) and Table 27-8 (Data and pilot subcarrier indices for RUs in a 40 MHz HE PPDU and in a non-OFDMA 40 MHz HE PPDU))(#7250), the pilot subcarriers defined in 27.3.12.13 (Pilot subcarriers) shall be used(#7314).

For a user transmitting on the *i*-th 26-tone RU in an 80 MHz, a 160 MHz or a 320 MHz(#5014) PPDU bandwidth(#1313) (see Table 36-5 (Data and pilot subcarrier indices for RUs in an 80 MHz EHT PPDU), Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU) and Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU))(#7250), the pilot subcarriers shall be inserted at(#7249) subcarriers $k\in K\_{R26\_{i}}$, where $K\_{R26\_{i}} $is given by the *i*-th pilot index set in the row of given PPDU bandwidth(#1313) of [Table 36-52 (Pilot indices for a 26-tone RU transmission)](#bookmark238).

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The pilot mapping $P\_{n}^{k} $for the subcarrier k for symbol n shall be as specified in Equation (27-101) in 27.3.12.13 (Pilot subcarriers).

For a user transmitting on the *i*-th 52-tone RU in an 80 MHz, a 160 MHz or a 320 MHz(#5014) PPDU bandwidth(#1313) (see Table 36-5 (Data and pilot subcarrier indices for RUs in an 80 MHz EHT PPDU), Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU) and Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU))(#7250), the pilot subcarriers shall be inserted at(#7249) subcarriers $k\in K\_{R52\_{i}}$, where $K\_{R52\_{i}}$ is given by the *i*-th pilot index set in the row of given PPDU bandwidth(#1313) of [Table 36-53 (Pilot indices for a 52-tone RU transmission)](#bookmark239).

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The pilot mapping $P\_{n}^{k} $for the subcarrier k for symbol n shall be as specified in Equation (27-102) in 27.3.12.13 (Pilot subcarriers).

For a user transmitting on the *i*-th 106-tone RU in an 80 MHz, a 160 MHz or a 320 MHz(#5014) PPDU bandwidth(#1313) (see Table 36-5 (Data and pilot subcarrier indices for RUs in an 80 MHz EHT PPDU), Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU) and Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU))(#7250), the pilot subcarriers shall be inserted at(#7249) subcarriers $k\in K\_{R106\_{i}}$, where $K\_{R106\_{i}} $ is given by the *i*-th pilot index set in the row of given PPDU bandwidth(#1313) of [Table 36-54 (Pilot indices for a 106-tone RU transmission)](#bookmark240).

(···)

The pilot mapping $P\_{n}^{k} $for the subcarrier k for symbol n shall be as specified in Equation (27-103) in 27.3.12.13 (Pilot subcarriers).

For a user transmitting on the *i*-th 242-tone RU in an 80 MHz, a 160 MHz or a 320 MHz(#5014) PPDU bandwidth(#1313) (see Table 36-5 (Data and pilot subcarrier indices for RUs in an 80 MHz EHT PPDU), Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU) and Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU))(#7250), the pilot subcarriers shall be inserted at(#7249) subcarriers $k\in K\_{R242\_{i}}$, where $K\_{R242\_{i}} $ is given by the *i*-th pilot index set in the row of given PPDU bandwidth(#1313) of [Table 36-55 (Pilot indices for a 242-tone RU transmission)](#bookmark241).

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The pilot mapping $P\_{n}^{k} $for the subcarrier k for symbol n shall be as specified in Equation (27-104) in 27.3.12.13 (Pilot subcarriers).

For a user transmitting on the *i*-th 484-tone RU in an 80 MHz, a 160 MHz or a 320 MHz(#5014) PPDU bandwidth(#1313) (see Table 36-5 (Data and pilot subcarrier indices for RUs in an 80 MHz EHT PPDU), Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU) and Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU))(#7250), the pilot subcarriers shall be inserted at(#7249) subcarriers $k\in K\_{R484\_{i}}$, where $K\_{R484\_{i}} $ is given by the *i*-th pilot index set in the row of given PPDU bandwidth(#1313) of [Table 36-56 (Pilot indices for a 484-tone RU transmission)](#bookmark242).

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The pilot mapping $P\_{n}^{k} $for the subcarrier k for symbol n shall be as specified in Equation (27-105) in 27.3.12.13 (Pilot subcarriers).

For a user transmitting on the *i*-th 996-tone RU in an 80 MHz, a 160 MHz or a 320 MHz(#5014) PPDU bandwidth(#1313) (see Table 36-5 (Data and pilot subcarrier indices for RUs in an 80 MHz EHT PPDU), Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU) and Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU))(#7250), the pilot subcarriers shall be inserted at(#7249) subcarriers $k\in K\_{R996\_{i}}$, where $K\_{R996\_{i}} $ is given by the *i*-th pilot index set in the row of given PPDU bandwidth(#1313) of [Table 36-57 (Pilot indices for a 996-tone RU transmission)](#bookmark243).

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For a user transmitting on the *i*-th 2×996-tone RU in a 160 MHz or a 320 MHz(#5015) PPDU bandwidth(#1313) (see Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU) and Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU))(#7250), the pilot subcarriers shall be inserted at(#7249) subcarriers $k\in K\_{R2×996\_{i}}$ , where $K\_{R2×996\_{i}} $ is given by the i-th pilot index set in the row of given PPDU bandwidth(#1313) of [Table 36-58 (Pilot indices for a 2×996-tone RU transmission)](#bookmark244).

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For a user transmitting on a(#7251) 4×996-tone RU in a 320 MHz PPDU bandwidth(#1313) (see Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU))(#7250), the pilot subcarriers shall be inserted at(#7249) subcarriers $k\in K\_{R4×996\_{}}$, where $K\_{R4×996\_{}} $ is given by the pilot index set in the row of given PPDU bandwidth(#1313) of [Table 36-59 (Pilot indices for a 4×996-tone RU transmission)](#bookmark245).

**Table 36-59—Pilot indices for a 4**×**996-tone RU transmission**

|  |  |
| --- | --- |
| **PPDU****bandwidth**(#1313)(#1590) | $$K\_{R4×996\_{}}$$ |
| 320 MHz | {–2004, –1936, –1870, –1802, –1756, –1688, –1622, –1554,–1518, –1450, –1384, –1316, –1270, –1202, –1136, –1068, –980,–912, –846, –778, –732, –664, –598, –530, –494, –426, –360,–292, –246, –178, –112, –44, 44, 112, 178, 246, 292, 360, 426,494, 530, 598, 664, 732, 778, 846, 912, 980, 1068, 1136, 1202,1270, 1316, 1384, 1450, 1518, 1554, 1622, 1688, 1756, 1802,1870, 1936, 2004} |

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For a user transmitting on the MRUs, the pilot subcarriers, mapping and values of MRUs shall follow the pilot subcarriers, mapping and values of each component RU of the MRU except the following pilot mapping and values(#5016).

For a user transmitting on the 52+26-tone MRU and 106+26-tone MRU, the pilot mapping $P\_{n}^{k}$ for the subcarrier *k* for symbol *n* and the pilot values(#5016) shall be as specified in from [Equation (36-82)](#bookmark248) to [Equation (36-86)](#bookmark250).

$P\_{n}^{K\_{R52\_{i}}}=\{Ψ\_{n mod 6}, Ψ\_{(n+1) mod 6}, Ψ\_{(n+2) mod 6}, Ψ\_{(n+3) mod 6}, Ψ\_{(n+4) mod 6}, Ψ\_{(n+5) mod 6}\}$ (36-82)

$P\_{n}^{k\notin K\_{R52\_{i}}}=0$ (36-83)

$P\_{n}^{K\_{R106\_{i}}}=\{Ψ\_{n mod 6}, Ψ\_{(n+1) mod 6}, Ψ\_{(n+2) mod 6}, Ψ\_{(n+3) mod 6}, Ψ\_{(n+4) mod 6}, Ψ\_{(n+5) mod 6}\}$ (36-84)

$P\_{n}^{k\notin K\_{R106\_{i}}}=0$ (36-85)

where

Ψ0=1, Ψ1=1, Ψ2=1, Ψ3=-1, Ψ4=-1, Ψ5=1 (36-86)

*KR*52+26*i*  and *KR*106+26*i* are the pilot subcarrier index sets for *i*-th 52+26-tone MRU and *i*-th 106+26-tone MRU, respectively. (see from Table 36-8 (Indices for small size MRUs in an OFDMA 20 MHz EHT PPDU) to Table 36-12 (Indices for small size MRUs in an OFDMA 320 MHz EHT PPDU))(#5018)

The above pilot mapping shall be copied to all spatial streams before the spatial stream cyclic shifts are applied.