IEEE P802.11  
Wireless LANs

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| D0.1 PHY comment resolution | | | | |
| Date: 2010-11-07 | | | | |
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Abstract

This document proposes resoltions to comments on Draft 1.0 of TGad classified as PHY commnets.

# PHY related Comments

All resolution are based on D1.0

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| 744 | 117 | 33 | E | "transmitted by a STA requesting another STA", as all transmissions are by STAs, and as no STA is going to transmit something to itself, this is meaningless. | Replace sentence with: "The DTP Request Frame requests DTP information." |

Proposed Resolution: **Accept**

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| 1028 | 238 | 14 | TR | "shall only employ DTP modulation if both STAs"  This is incorrect, because the STAs do many other things, such as transmission of mmWaveBeacons. i.e. only before an action means that any other action is not permitted.  Which did this mean: 1. "shall employ DTP modulation only if both STAs" or 2. "shall employ only DTP modulation if both STAs" | Reword to one of the two alternative. |

Proposed Resolution: Counter (Accept first option)

***TGad Editor modify P238L14 of D1.0 as follows:***

A pair of communicating STAs shall employ DTP modulation only if both STAs support DTP as

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| 1029 | 238 | 17 | TR | "A DTP capable STA may use DTP with another DTP capable STA by setting the Tone Pairing Type 17 field within the PLCP header to one,"  We're in the MAC, folks. And it don't know diddly-squat about PLCP headers. | Reword in terms of TXVECTOR parameters |

Proposed Resolution: Counter

***TGad Editor add the following field to the TX and RX vector***

DTP-TYPE, Enumerated: Static (Indicating Static Tone paring (see 21.5.3.2.3.5.1))/ Dynamic indicating Dynamic tone pairing (see 21.5.3.2.3.5.2)

***TGad Editor add the following field to the TX and RX vector***

DTP-INDICATOR: takes values of 0/1 to indicate a DTP update.

***TGad Editor: modify P238L17-20 as follwos***

A DTP capable STA may use DTP with another DTP capable STA by setting the DTP-TYPE in TXVECTOR to Dynamic , otherwise the DTP-TYPE is set to static. The transmitting STA may stop using DTP by setting the DTP-TYPE in the TXVECTOR to static.

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| 1042 | 261 | 27 | TR | "requested in FBCK-REQ field"  This is a field in a MAC PDU, not visible to the PHY | Reword in terms of VECTOR parameters or other SAP interfaces |

Proposed Resolution: Counter

***TGad Editor: modify P361L27-28 of D1.0 as follows:***

that will be measured around the tap with the largest amplitude, according to dot11ChanMeasFBCKNtaps. It can select a contiguous set of taps or select a non-contiguous set of

***TGad Editor: Add a new MIB variable dot11ChanMeasFBCKNtaps, default value 1.***

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| 598 | 314 | 15 | TR | Two disparate PHYs are specified. | PHY downselection should be conducted to avoid this difficulty with excision of the appropriate PHY in the next draft. Specification of both OFDM and SC PHYs will result in user confusion, loss of application interoperability and higher complexity in APs (if both PHYs are implemented). |

Proposed Resolution: Reject

Explanation: Each PHY serves a purpose; the SC PHY is good for low power transmission, The OFDM for high performance in frequency selective channels.

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| 509 | 315 | 7 | T | formula does not align with figure. | Fix formula, align with ODFM 16-QAM |

Propsoed Resolution: Counter

***TGad Editor: replace the formula at P351L13 as follows:***



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| 1144 | 317 | Table 69 | T | Value of SNR might be 53.75 instead of 53.73. typo? | Please check it. |

Proposed Resolution: Counter

***TGad Editor: in table 69, replace the allowed values for SNR to -13 to 50.75. In other place in the document, replace the SNR range of -10 to 53.75 with -13 to 50.75. Also fix the equation in P100L33, P121L7.***

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| 1082 | 317 |  | TR | There should be a third enumeration value for PACKET-TYPE specifying no TRN fields. | Add it. |

Proposed Resolution: Reject

Explanation: No TRN fields is specified by setting TRAINING-LENGTH to zero.

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| 1083 | 317 |  | TR | "control PHY packet" - what is this. The only control packets I know about are in the MAC layer. | Reword to something unambiguously phy-esque. |

Proposed Resolution: Reject

There is a clear distinction between control PHY packets and Control Packets. The alternative of MCS0 packets is confusing.

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| 42 | 318 | T | The formula to determine channel starting frequencies should be given in channelization. | Include wording: "Channel center frequencies are defined at every integral multiple of Channel spacing above Channel starting frequency. The relationship between center frequency and channel number is given by Equation (21-1): Channel center frequency = Channel starting frequency + Channel Spacing × nch (MHz) (21-1) where nch = 0, 1,…200. |

Proposed Resolution: Counter

The text refers the reader to Annex J which lists all the channels and specifies the starting frequencies. However, Annex J has an error in the specification of the starting channel for regulatory classes in Europe and Japan and it should be the same as the one for regulatory classes in the US.

**TGad editor: in Annex J, change the starting freqeucy for the regulatory classes to be 56.16GHz**

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| 1084 | 320 | 11 | TR | It is not clear whether (in OFDM) is a condition or a comment for this normative statement. | Clearly state that this applies to OFDM only. |

Proposed Resolution: Counter

***TGad Editor: Modify the text P320L12-13 as follows:***

power, or, equivalently, in OFDM (MCS13-24), +2.5 dB relative to the average power of a subcarrier, measured over a subcarrier spacing bandwidth.

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| 909 | 321 | 5 | ER | Table 72 defines a number of terms, and references OFDM, SC and control PHY values. But nothing prior to this table describes these different modes of operation of the PHY, or relates them to TXVECTOR parameters. | Add a section introducing the three phy modes and describing their capabilities. Add any necessary linkage between TXVECTOR parameters and these three modes. |

Proposed Resolution: Counter

***TGad Editor: Insert the following text after the title of 21.1.1***

The mmWave PHY is composed of three physical layer modulation methods: A Single Carrier (SC) PHY (see 21.6), in MCS1-MCS12 and MCS25-MCS27, An OFDM PHY, in MCS13-MCS24 (see 21.5) and a Control PHY in MCS0 (see 21.4). All these modulation methods share a common preamble (see 21.3.6).

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| 508 | 322 | 1 | T | Number of sequences in T\_{STF} is incorrect | replace 15 with 17 |

Proposed Resolution: Accept

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| 1147 | 322 | Table 72 | T | The definition of Control PHY chip time might be 1/F\_CCP not 1/F\_CP. Typo? | Please check it. |

Proposed Resolution: Counter

***TGad Editor: change 1/F\_{CP} to 1/F\_{CCP} in table 72***

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| 1149 | 323 | 19 | T | wrong expression? | Add "Ts" after "n" in the argument of w\_T\_field. |

Proposed Resolution: Accept

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| 913 | 324 | 2 | ER | "the n‘th constellation point." - yet another way of "th"-thing | Replace with "constallation point n", and italic n. |

Proposed Resolution: Accept

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| 1150 | 324 | Fig.139 | E | It is better to use "CE" for consistency with other figures. | Replace "CEF" to "CE". |

Proposed Resolution: Accept

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| 1151 | 326 | 23 | TR | "T\_CE" in r\_CE(.) might be "T\_STF". | Please check it. |

Proposed Resolution: Counter

***TGad Editor: Replace T\_CE with t\_ce in P326L23***.

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| 1085 | 332 | 1 | TR | "The rest of the bits are set to one" is not part of the description of the PHY header, and redundant to 332.19. | Remove cited text. |

Proposed Resolution: Accept

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| 1086 | 332 | 1 | TR | Presumable Packet type is reserved when training length is zero  Same comment p336 and p346 | Show it as reserved in this case |

Proposed Resolution: Counter

***TGad Editor: In All Header bit tables P332, P336 and P346, add the following qualifier to the Packet Type field:***

Packet type is reserved when training length is zero.

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| 1087 | 332 | 1 | TR | "ignored by the receiver". Learning from experience, we need a "shall" statement somewhere (not in this table). | Add statement in Clause 21 somewhere "Reserved bits shall be set to 1 by a transmitter, and shall be ignored by a receiver." |

Proposed Resolution: Counter

***TGad Editor: After each of the tables 78, 80,83, add the following text:***

Reserved bits are set to 0 by the transmitter and shall be ignored by the receiver.

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| 1153 | 334 | 31 | E | typo? | Delete "I\_i, Q\_i" after "(I\_i, Q\_i)". |

Proposed Resolution: Accept

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| 66 | 334 | 22-23 | T | It is not appropriate to impose that the instrumentation mitigates multipath with a rake receiver. Other technical (and better) means exist. | replace the sentence  "The instrumentation shall incorporate a rake receiver to minimize error resulting from multipath."   by  "The instrumentation shall incorporate means to minimize error resulting from multipath." |

Proposed Resolution: Reject

Explanation: the specification is needed to enable the design of the transmitter.

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| 1088 | 335 | 25 | TR | I don't see any specification in 21.5 of where the AGC and TRN subfields are defined. | Add references to definitions in 21.5.2 |

Proposed Resolution: Counter

***TGad Editor: Modify the text in P335L23 as follows:***

the Header, OFDM symbols and optional training fields (see 21.8.2.2.1), as shown in Figure 146.

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| 915 | 337 | 2 | E | "for each Tx and Rx of a device" - doesn't say what it meant to | Reword, "A device that supports OFDM shall support MCSs 13-17 for both Tx and Rx." |

Proposed Resolution: Accept

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| 1218 | 338 | 1 | ER | Unlike the 21.4.3.3 (Control PHY), the scrambling process is not described explicitly. | Add this after the first sentence: "The header is scrambled starting from bit 7." |

Proposed Resolution: Reject

The fact that the header is scrambled is clearly specified in 21.3.9. Repeating this statement here will create a redundancy.

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| 1089 | 338 | 2 | TR | "The scrambling of the data field continues the 2 scrambling of the header with no reset." - does the scrambling of the header include the generation of the one-time pad bits or not? | Clarify number of cycles of scrambler evolution have taken place at this point. |

Proposed Resolution: Reject

The text of 21.3.9 is clear enough about this.

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| 1090 | 341 | 16 | TR | "A STA is DTP-capable 17 if the DTP Supported field within the STA‘s mmWave Capability element is set to one (7.3.2.91)."  The PHY knows nothing about the contents of this capability element. | Remove cited statement or move into MAC. |

Proposed Resolution: Counter

TGad Editor: remove the marked text from P341L16-18:

transmitting to a DTP-capable STA, from which it has received DTP feedback.

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| 507 | 343 | 8 | T | In the formula n should start from n or, when n is used in the formula, use (n-1) to avoid negative times. Also it is unclear what value of p\_n is used for the header symbol. | change n to (n-1) |

Proposed Resolution: Counter

***WGA Editor: replace the formula in P343L8 with the following***:



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| 1219 | 348 | 25 | ER | Unlike the 21.4.3.3 (Control PHY), the scrambling process is not described explicitly. | Add this after the first sentence: "The header is scrambled starting from bit 7." |

Proposed Resolution: Reject

The text of 21.3.9 is clear enough about this.

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| 1154 | 21.6.4.1.1 | 18 | E | typo? | Delete "I\_i, Q\_i" before "(I\*\_i, Q\*\_i)". |

Proposed Resolution: Accept

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| 1091 | 354 | 28 | TR | "A STA supports the mmWave low power SC PHY if the low power SC PHY supported subfield within 28 its mmWave Capability element is set to one.". The PHY knows nothing about the contents of this element. | Remove cited statement or move into MAC. |
| 1092 | 354 | 29 | TR | "A STA that supports the mmWave low power SC PHY 29 shall not transmit a PPDU using the mmWave low power SC PHY if the STA identified in the RA 30 field of the PPDU does not support the mmWave low power SC PHY."  The MAC is the entity that decides on TXVECTOR parameters, the PHY has no ability to say to the MAC "oops, didn't you realize that you're doing something non-compliant. Let's find another TXVECTOR parameter set, shall we, old chum?" | Move to MAC (In the area of old-number 9.7) |
| 1093 | 354 | 31 | TR | "A STA can use the procedure 31 described in 11.31.1 to discover the capabilities of another STA."  Actually, it's the MAC that uses this procedure, not the PHY. | Remove cited statement or move into MAC. |

Proposed Resolution: Counter

***TGad Editor: modify the text in P354L24 as follows:***

The mmWave low power SC PHY is an optional SC mode that can provide lower processing power requirements for mmWave tranceivers.

***TGad Editor: remove the text in P354L28-32***

***TGad Editor: Add the following text at the last paragraph in 9.23.4:***

The mmWave low power SC PHY is an optional SC mode that is used only within SPs (11.4.1).

A STA supports the mmWave low power SC PHY if the low power SC PHY supported subfield within its mmWave Capability element is set to one. A STA that supports the mmWave low power SC PHY shall not transmit a PPDU using the mmWave low power SC PHY if the STA identified in the RA field of the PPDU does not support the mmWave low power SC PHY. A STA can use the procedure described in 11.31.1 to discover the capabilities of another STA.

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| 1222 | 356 | 21 | TR | Related to the previous comment: Need to define N\_EO for all MCSs. | For MCS 26 and 27, define N\_EO = Length + N\_RS\*16 |
| 1221 | 356 | 25 | TR | The substep is numbered with the wrong alphabet. Also, this is a step that should be common to all LP-SC MCSs, and not MCS 25, only. In the current description, N\_BLK\_PAD is only defined for MCS 25, but later used in step 5) for all 3 LP-SC MCSs. | Renumber lines 25-26 as step 1-c). |
| 1220 | 356 | 31 | ER | Step 4 should be done for MCS 25, only. | At the beginning of the sentence, add "For MCS 25," |

Proposed Resolution: counter

***TGad Editor, remove references to MCS25 from* 21.7.1.3.2.2.**

***TGad Editor, modify P335L30-31 as follows:***

Data is encoded by a block code. In MCSs 26, 27 the data is encoded by a RS(224,208) block code as described in 21.7.1.3.2.1. In MCS 25 that data is further encoded by a (16,8) block code as descrbed in 21.7.1.3.2.2.

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| 1094 | 359 | 12 | TR | "MPDU, A-MPDU or MMPDU" - chalk and cheese  Worse, it doesn't relate to figure 154 | Replace with PHY preamble, header and data fields |

Proposed Resolution: Counter

TGad Editor, modify P359L12 as follows:

Each Beam Refinement packet is composed of an STF, a CE field and a data field followed by a

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| 1095 | 359 | 19 | TR | "The receiver should 20 receive that data part of the packet using a quasi-omni antenna pattern."  As I understand it, the training protocol is described in the MAC sections and controlled by the MAC.  Also, I don't see any PHY SAP that provides the MAC control of the Rx antenna patterns. | 1. Move this any any other statement that describe the protocol across multiple PPDUs into the MAC. (e.g. lines 18-29) 2. Ensure that the MAC has a means of controlling the PHY antenna mode for Rx. |

Proposed Resolution: Counter

***TGad Editor, remove P359L18-29.***

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| 1096 | 360 | 3 | TR | LIne 3 and line 10 disagree about whether there are 5N or 4N TRN subfields. | Harmonize them |

Proposed Resolution:

***TGad Editor: in P360L3, replace 5N with 4N. Remove P360L9-10.***

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| 1097 | 360 | 15 | TR | "The zeros 15 shall be added before the scrambler." - this is certainly an exception to and conflicts with the description given earler in the phy.  Ditto line 19 | Note this exception when describing conversion of the PSDU to the scrambled PSDU. |

Proposed Resolution: Counter

***TGad Editor, Modify P360L14-22 as follows:***

The minimum duration of the Data field of a beam refinement packet when sent in an SC PHY is 18 SC blocks (see 21.6.3.2.4) and, if needed, the Data field of the packet shall be extended using zero padding to this length. The zeros shall be added before the scrambler. The length field in the packet header shall indicate the length of the data before padding.

The minimum duration of the Data field of a beam refinement packet when sent in an OFDM PHY is 20 OFDM symbols and, if needed, the Data field of the packet shall be extended using zero padding to this length. The zeros shall be added before the scrambler. The length field in the packet header shall indicate the length of the data before padding.

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| 1098 | 360 | 32 | TR | "In a BRP-TX packet, the transmitter may change the TX AWV configuration at the beginning of each 32 AGC subfield."  There's a problem here because the MAC orchestrates the training protocol, and there is MAC-level OTA signalling of best AWV configuration etc. So the MAC needs to tell the PHY the list of AWV settings to use. | Ensure the TXVECTOR encompases any instructions from the MAC on AWVs to use, and reword to describe the PHY using the AWVs passed down in the TXVECTOR. |

Proposed Resolution: reject

Explanation: the ANT-CONFIG TXVECTOR variable deals with setting the AWV configuration. The text only explains what can be done with these settings.

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| 1099 | 360 | 42 | TR | "in which case the TRN-R fields shall be transmitted"  This is dependent on the values of local and peer capabilities, not something known to the PHY. | Replace with dependency on TXVECTOR parameters. |
| 1100 | 361 | 1 | TR | "the best known TX AWV configuration" - passive voice considered harmful.  Which entity knows the best AWV configuration for the current transmission? It is surely not the PHY. | Move this requirement into the MAC. |

Proposed Resolution: Counter

***TGad Editor: modify the text in P361L38-42, P360L1-2, as follows:***

The TRN-R fields will have the form:

***TGad Editor: Add the following text to 9.25.5.3.3***

In a BRP-RX packet, all TRN-R fields are transmitted using the same TX AWV configuration as the preamble and data fields of the frame, except if both the transmitting and receiving STAs support the Other\_AID subfield as indicated through the Supports Other\_AID field set to one within the STA‘s mmWave Capability element and the value of the Other\_AID subfield within the BRP Request field is different than zero, in which case the TRN-R fields shall be transmitted using the best known TX AWV configuration for transmitting to the STA with AID equal to the value of the Other\_AID subfield within the BRP Request field

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| 1101 | 361 | 19 | TR | "shall completely settle" - absolutes have a nasty habit of being wrong.  I doubt whether any transient completely settles, if you used enough resolution in looking for it. | Replace with a more measurable requirement. |

Proposed resolution: counter

***TGad Editor: modify the text in P361L19-20 as follows:***

TX AWV configuration changes between subfields shall settle by the end of the first 64 samples of the subfield.

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| 1155 | 21.4.4.1.1 & 21.6.4.1.1 | 334 & 335 | E | In 21.4.4.1.1, (I\*, Q\*) is the complex coordinates of the measured symbol and (I, Q) is the one of the ideal constellation. In 21.6.4.1.1, (I, Q) is measured symbol and (I\*, Q\*) is ideal one. Why don't you use same notification? | Unify them. |

Proposed Resolution: accept (use the notation in 21.6.4.1.1)