IEEE P802.11
Wireless LANs

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| Some LB 249 Passive TB Ranging CR – Part II |
| Date: 2020-09-17 |
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Abstract

This document proposes resolutions to TGaz LB249 comments, for the most related to Passive TB Ranging. The changed described here are in relation to [1].

The 36 TGaz LB249 CIDs addressed in this document are CIDs:

3858, 3307, 3052, 3053, 3874, 3558, 3554, 3555, 3556, 3655, 3654, 3659, 3800, 3801, 3808, 3165, 3166, 3890, 3891, 3308, 3309, 3547, 3548, 3789, 3790, 3791.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3858 | 99.05 | 9.6.7.51 | "an Action NoAck frame of category Ranging" -- there is no such category (see Table 9-53--Category values) | "an Action NoAck frame of category Ranging" -- there is no such category (see Table 9-53--Category values) | Revised. TGaz editor, make the changes as shown below in document 11/20-1487. |

**Discussion for CID 3858:** The Secundus Broadcast RSTA Passive TB Ranging Measurement Report frame is an Action No Ack frame of category “Public”. Change accordingly.

***TGaz Editor: Change the text in Subclause 9.6.7.51 (Secundus RSTA Broadcast Passive TB Ranging Measurement Report frame format) starting on P100L21 as follows:***

**9.6.7.51 Secundus RSTA Broadcast Passive TB Ranging Measurement Report frame format**

The Secundus Broadcast RSTA Passive TB Ranging Measurement Report frame is an Action No Ack frame of category Public. The Secundus RSTA Broadcast Passive TB Ranging Measurement Report frame is used to support the Passive TB Ranging mechanisms of the FTM procedure described in 11.22.6 (Fine timing measurement (FTM) procedure). The format of the Secundus RSTA Broadcast Passive TB Ranging Measurement Report Action field is shown in Figure 9-981g (Secundus RSTA Broadcast Passive TB Ranging Measurement Report Action field format). **(#3858)**

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3307 | 111.06 | 11.22.6.1.3 | The standard needs a description description for how the (sounding) dialog token should be managed by the RSTA in the Passive TB Ranging case. | Add description description for how the (sounding) dialog token should be managed by the RSTA in the Passive TB Ranging case. | Reject. The Sounding Dialog Token for Passive TB Ranging is managed by the RSTA same as for TB Ranging, which is described. |

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3052 | 97.28 | 9.6.7.50 | The word "Primus" and "Secundus" are new for 802.11. Do we realy need to use such new words from Latin? | Suggest to find a better word (less rare and not from Latin). Why not "First"? | Revised. Change to ‘Primus’ to ‘First’ and ‘Secundus’ to ‘Second’, with the appropriate capitalizations, throughout the draft, as directed in document 11/20-1487. |
| 3053 | 99.03 | 9.6.7.51 | The word "Primus" and "Secundus" are new for 802.11. Do we realy need to use such new words from Latin? | Suggest to find a better word (less rare and not from Latin) Why not "Second"? | This is a duplicate CID. See resolution for CID 3052. |
| 3874 | 99.03 |  | Primus and secondus could be primary and secondary - continuing existing usage in the spec | Change as suggested | This is a duplicate CID. See resolution for CID 3052. |

**Discussion for CIDs 3052, 3053, and 3874:** The naming of these frames with “Primus” and “Secundus” seems to be controversial. We can avoid this by changing their names to “Primary” and “Secondary”.

***TGaz Editor: Change ‘Primus’ to ‘Primary’, ‘Secundus’ to ‘Secondary’, and***

***‘Secondus’ to ‘Secondary’ with the appropriate capitalizations, throughout the draft.***

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3558 | 112.38 | 11.22.6.1.3 | "In addition to the ranging exchanges between the ISTAs and RSTA1, the Passive TB Ranging protocol also allows the ISTAs to measure time of arrivals of each other's ranging NDPs. An example of one such occurrence is depicted in Figure 11-35b in form of the dotted double arrow between ISTA1 and ISTA2. " is not clear as to what "the ISTAs" refers to, i.e. the ISTAs that are doing a Passive TB Ranging exchange, or the STAs that are listening in to these | As it says in the comment | Revised. TGaz editor, make the changes as shown below in document 11/20-1487. |

**Discussion for CID 3558:** The ISTAs that measure time of arrivals of each other’s ranging NDPs are the *same* ISTAs that are performing ranging exchanges with the RSTA. We are adding a qualifier indicating that.

***TGaz Editor: Change the text in Subclause 11.22.6.1.3 (Passive Location Ranging overview) as follows:***

**11.22.6.1.3 Passive Location Ranging overview**

… <Scroll to P116L29>

In addition to the ranging exchanges between the ISTAs and RSTA1, the Passive TB Ranging protocol also allows the same ISTAs to measure time of arrivals of each other’s ranging NDPs. An example of one such occurrence is depicted in Figure 11-35b in form of the dotted double arrow between ISTA1 and ISTA2. **(#3558)**

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3554 | 112.43 | 11.22.6.1.3 | "Passive TB Ranging opportunity" -- this notion is not defined | As it says in the comment | Revised. TGaz editor, make the changes as shown below in document 11/20-1487. |

**Discussion for CID 3554: Change** "Passive TB Ranging opportunity" to the more generic "Passive TB Ranging operation".

***TGaz Editor: Change the text in Subclause 11.22.6.1.3 (Passive Location Ranging overview) as follows:***

**11.22.6.1.3 Passive Location Ranging overview**

… <Scroll to P116L34>

Furthermore, if one of the other APs in Figure 11-35b temporarily takes on the role of being an ISTA, it may also participate in RSTA1’s Passive TB Ranging operation and perform Passive TB Ranging exchanges with RSTA1. **(#3554)**

***TGaz Editor: Change the caption of Figure 11-35b (Example of Passive TB Ranging used for PSTA location – RSTA1) starting on P117L3 as follows:***

**Figure 11-35b— Example of Passive TB Ranging used for PSTA location – RSTA1 (AP1) operating Passive TB Ranging. (#1577, #3554)**

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3555 | 113.10 | 11.22.6.1.3 | "a RSTA Availability Window element for Passive TB Ranging" -- nothing in the element indicates what its purpose is, so this cannot be done | Delete "for Passive TB Ranging". Also in next sentence | Revised. TGaz editor, make the changes as shown below in document 11/20-1487. |

**Discussion for CID 3555:** The RSTA Availability Window element may not be "for Passive TB Ranging", but the ranging availability window is be "for Passive TB Ranging". Change to reflect this.

***TGaz Editor: Change the text in Subclause 11.22.6.1.3 (Passive Location Ranging overview) as follows:***

**11.22.6.1.3 Passive Location Ranging overview**

… <Scroll to P117L9>

Each of the access points operating as RSTA1, RSTA2, and RSTA3, announces the timing and bandwidth of its ranging availability window for Passive TB Ranging in its beacon in a RSTA Availability Window element. By listening to the AP’s beacons, the PSTA is informed about the timing and bandwidth of the different RSTA availability windows for Passive TB Ranging. **(#3555)**

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3556 | 113.16 | 11.22.6.1.3 | "blocked LOS" -- not defined | Change to "non-LOS" | Revised. TGaz editor, make the changes as shown below in document 11/20-1487. |

**Discussion for CID 3556:** Change from using the term "blocked LOS" to using the term “non-LOS”.

***TGaz Editor: Change the text in Subclause 11.22.6.1.3 (Passive TB Ranging overview) as follows):***

**11.22.6.1.3 Passive TB Ranging overview**

**…** <Scroll to P117L13>

The PSTA listens to all of these ranging exchanges. Considering all ranging exchanges between all RSTAs and all ISTAs, the PSTA has the opportunity to overhear a large set of ranging exchanges between RSTAs and ISTAs in different locations, enabling the use of all of them towards its location estimation and also mitigate non-LOS issues between the ISTA(s)/RSTA involved in the ranging measurements. **(#3556)**

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3655 | 127.32 | 11.22.6.3.8 | It's not "Section" it's "Subclause" | As it says in the comment | Revised. Agree in principal with the commenter. TGaz editor delete the word Section from D2.0 P127L32. |

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3654 | 127.33 | 11.22.6.3.8 | In another subclause (11.22.6.1.3) there was an explicit list of subclauses to refer to, and an informative list of exceptions. Why not here? | As it says in the comment | Reject. We have that list of subclauses and exceptions appear in the overview section. No need to repeat it. |

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3659 | 128.11 | 11.22.6.3.8 | "unsolicited LCI Report " not defined. Also I think it's "report" per the rules on what "$foo report" is to be understood as meaning | Change to "LCI report" | Revised. Agree in principal with the commenter. TGaz editor, make the changes as shown below in document 11/20-1487. |

**Discussion for CID 3659:** Yes, no need to state that the LCI Report is unsolicited. Change to that effect.

***TGaz Editor: Change the text in Subclause 11.22.6.3.8 (Passive TB Ranging measurement negotiation) as follows:***

**11.22.6.3.8 Passive TB Ranging measurement negotiation**

… <Scroll to P132L41>

If the ISTA sets the Passive TB Ranging field to 1 it shall include an LCI report in the Fine Timing Measurement Request frame **(#1103, #3659).**

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3800 | 168.13 | 11.22.6.4.8.1 | "Figure 11-36t--Example Timing diagram of a Measurement Sounding phase in Passive 13TB Ranging (#1575, #1576) " needs to show the LMRs, which the PSTA needs to receive to find out t1-t4 | As it says in the comment | Reject. We don't need to show the LMR reporting. The point of the diagram is to show the ranging and tranmsissions, reception and time-stamping. We are not showing the LMR reporting in Figure 11-36i-1 for Non-TB Ranging, Figure 11-36g for TB Ranging, and Figure 11-36f for TB Ranging. |

**Discussion for CID 3800:**

We don't need to show the LMR reporting. The point of the diagram is to show the ranging and tranmsissions, reeption and time-stamping. We are not showing the LMR reporting in Figure 11-36i-1 for Non-TB Ranging, Figure 11-36g for TB Ranging, and Figure 11-36f for TB Ranging.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3801 |  |  | "At the PSTA, the mechanism by which t2' and t3' is derived from t2, t3, and the PSTA's CFO measured with respect to the RSTA, is implementation dependent. " -- missing the CFO (cf. prev sentence) | After "t3, " add "the RSTA's reported CFO," | Reject. The RSTA does not report its CFO so the PSTA cannot use such a report. It’s the PSTA’s CFO w.r.t. the RSTA that should be used. |

**Discussion:**

The RSTA does not report its CFO so the PSTA cannot use such a report. It’s the PSTA’s CFO w.r.t. the RSTA that should be used

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3808 |  | 11.22.6.4.8.5 | Technical comments on 11.22.6.4.8.3 on the figure and equations also apply to 11.22.6.4.8.5 | As it says in the comment | Reject. The comment does not provide sufficient detail to identify a specific problem in a meaningful way. It is not possible to understand what specific issue is identified.   |

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3165 | 115.04 | 11.22.6.2 | "If the STA in which dot11FineTimingMsmtRespActivated is true supports Passive TB Ranging." - the "then" part of the "if" is missing - probably the next sentece | Replace "." with "," at the end of the sentence, Replace "It" with "it" at the beginning of the next sentence. | Revised. TGaz editor, make the changes as shown below in document 11/20-1487. This resolution supreceeds the resolution 11/20-126. |
| 3890 | 115.04 | 11.22.6.2 | should be dot11PassiveTBRangingResponderImplemented instead of dot11FineTimingMsmtRespActivated | as in comment | Revised. TGaz editor, make the changes as shown below in document 11/20-1487. |
| 3166 | 115.09 | 11.22.6.2 | "If the STA in which dot11FineTimingMsmtInitActivated is true supports Passive TB Ranging. It" - the "then" part of the "if" is missing - probably the next sentece | Replace "If the STA in which dot11FineTimingMsmtInitActivated is true supports Passive TB Ranging. It" with "If the STA in which dot11FineTimingMsmtInitActivated is true supports Passive TB Ranging, it" | Revised. TGaz editor, make the changes as shown below in document 11/20-1487. This resolution supreceeds the resolution 11/20-126. |
| 3891 | 115.09 | 11.22.6.2 | should be dot11PassiveTBRangingInitiatorImplemented instead of dot11FineTimingMsmtInitActivated | as in comment | Revised. TGaz editor, make the changes as shown in document 11/20-1487. |

**Discussion for resolution to CIDs 3165 and 3890:** The commenter is correct. It should be “dot11PassiveTBRangingResponderImplemented” instead of “dot11FineTimingMsmtRespActivated”. However, in 802.11az Draft 2.2 the text has as a resolution to LB249 CIDs 3165 and 3166 been changed to “dot11FineTimingMsmtRespActivated and dot11PassiveTBRangingResponderImplemented”. We there should change it to only say “dot11PassiveTBRangingResponderImplemented”.

**Discussion for resolution to CIDs 3166 and 3891:** The commenter is correct. It should be “dot11PassiveTBRangingInitiatorImplemented” instead of “dot11FineTimingMsmtInitActivated”. However, in 802.11az Draft 2.2 the text has as a resolution to LB249 CIDs 3165 and 3166 been changed to “dot11FineTimingMsmtInitActivated and dot11PassiveTBRangingInitiatorImplemented”. We there should change it to only say “dot11PassiveTBRangingInitiatorImplemented”.

***TGaz Editor: Change the text in Subclause 11.22.6.2 (FTM capabilities) as follows:***

**11.22.6.2 FTM capabilities**

… <Scroll to P118L38>

A STA in which dot11PassiveTBRangingResponderImplemented **(#3165, #3890)** is true shall set the Passive TB Ranging Responder Measurement Support field of the Extended Capabilities element to 1. Otherwise it shall set the Passive TB Ranging Responder Measurement Support field of the Extended Capabilities element to 0.

A STA in which dot11PassiveTBRangingInitiatorImplemented **(#3166, #3891)** is true shall set the Passive TB Ranging Initiator Measurement Support field of the Extended Capabilities element to 1. Otherwise it shall set the Passive TB Ranging Initiator Measurement Support field of the Extended Capabilities element to 0.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed change** | **Proposed resolution** |
| 3308 | 111.14 | 11.22.6.1.3 | It may not be necessary to in subclause 11.22.6.1.3 give a list of what subclauses 'applies to Passive TB Ranging'. In fact it can be missleading as we already have a general statement saying that except where explicitly stated differently, the Passive TB Ranging mode, its protocols, procedures, components, and definitions follow the rules for TB ranging. | Consider removing the list of what subclauses applies to Passive TB Ranging. | Revised. This is a duplicate of 3309. Please refer to resolution for 3309 in document 11/20-1487. |
| 3309 | 111.14 | 11.22.6.1.3 | It may not be necessary to in subclause 11.22.6.1.3 give a list of what subclauses 'applies to Passive TB Ranging'. In fact it can be missleading as we already have a general statement saying that except where explicitly stated differently, the Passive TB Ranging mode, its protocols, procedures, components, and definitions follow the rules for TB ranging. | Consider removing the list of what subclauses applies to Passive TB Ranging. | Revised. TGaz editor, make the changes as shown in document 11/20-1487. |
| 3547 | 111.26 | 11.22.6.1.3 | A list of "example exceptions" is not useful | Give the full list of exceptions | Revised. TGaz editor, make the changes as shown in document 11/20-1487. |
| 3548 | 111.26 | 11.22.6.1.3 | Revised. TGaz editor, make th A list of "example exceptions" is not useful | Change to a "NOTE--Examples of cases where passive TB ranging where does not follow the rules for TB ranging are: " | Revised. TGaz editor, make the changes as shown in document 11/20-1487. |
| 3789 | 165.30 | 11.22.6.4.8.1 | A list of "example exceptions" is not useful | Give the full list of exceptions | Revised. TGaz editor, make the changes as shown in document 11/20-1487. |
| 3790 | 165.30 | 11.22.6.4.8.1 | A list of "example exceptions" is not useful | Change to a "NOTE--Examples of cases where passive TB ranging where does not follow the rules for TB ranging are: " | Revised. TGaz editor, make the changes as shown in document 11/20-1487. |
| 3791 | 165.30 | 11.22.6.4.8.1. | Doesn't this duplicate 11.22.6.1.3, which is also about passive TB ranging? | Delete 11.22.6.4.8 | Revised. The draft has some of the same content in 11.22.6.1.3 which are changed to be included in notes. TGaz editor, make the changes as shown in document 11/20-1487. |

**Discussion for CIDs 3308 and 3309:** The list of what subclauses of what applies to Passive TB Ranging is still informative. For this reason we are moving it to a note.

**Discussion for CIDs 3547 and 3548:** The list of Give the full list of exceptions, even if it may not be complete is stil useful. Moving it to a note.

**Discussion for CIDs 3789 and 3790:** The ‘exceptions’ listed are true. No need to say that they are ‘some of the exceptions’. Removing the text stating that these are ‘some of the exceptions’.

**Discussion for CID 3791:** The draft has some of the same content in 11.22.6.1.3 which we are changing to be included in notes.

***TGaz Editor: Change the text in Subclause 11.22.6.1.3 (Passive TB Ranging overview) starting on P115L1 as follows:***

**11.22.6.1.3 Passive TB Ranging overview**

(#**1520**, #**1542**, #**1543**, #**1544**, #**1548**, #**1551**, #**1552**, #**1553**, #**1554**, #**1555**, #**1556**, #**1561**, #**1562**, #**1564**, #**1565**, and #**1574**)

Passive TB Ranging is a variant of the TB ranging mode referred to in 11.22.6 (Fine timing measurement (FTM) procedure). In all aspects, except where explicitly stated differently, the Passive TB Ranging mode, its protocols, procedures, components, and definitions follow the rules for TB ranging.

NOTE—For example, the text in the following subclauses, and their subclauses, apply also to Passive TB Ranging: **(#3308, #3309, #3791)**

* Subclause 11.22.6.1.1 (EDCA based Ranging and TB Ranging overview)
* Subclause 11.22.6.3.3 (Negotiation for TB and Non-TB Ranging measurement exchange)
* Subclause 11.22.6.4.3 (TB ranging measurement exchange)
* Subclause 11.22.6.5 (Fine Timing Measurement parameter modification)
* Subclause 11.22.6.5.1 (Availability Window parameter modification)
* Subclause 11.22.6.6.2 (TB Ranging and Non-TB Ranging session termination)

NOTE--Below are a list of example exceptions for Passive TB Ranging where it does *not* follow the rules for TB Ranging: **(#3547, #3548, #3791)**

* The rules and procedures specific for the secure version of TB Ranging does not apply to Passive TB Ranging.
* The RSTA uses the Ranging Trigger frame of subtype Passive TB Ranging for its sounding trigger frames.
* The ISTAs use HE Ranging NDPs for its I2R NDPs.
* The ISTAs does not use the Location Measurement Report frame for reporting of I2R 24 LMR but instead uses the ISTA Passive TB Ranging Measurement Report frame for this purpose, with its associated different measurements.
* The RSTA send the Primus and Secundus RSTA Broadcast Passive TB Ranging Measurement Report frames at the end of the measurement reporting phase.
* The number of spatial streams (NSTS) for Passive TB Ranging is limited to 4.
* When phase shift feedback is negotiated for Passive TB Ranging, both the RSTA and the ISTA measures and reports PS-TOAs, in addition to measuring and reporting TOAs.

***TGaz Editor: Change the text in Subclause 11.22.6.4.8.1 (General) in Subclause 11.22.6.4.8 (Measurement exchange in Passive TB Ranging mode) as follows:***

**11.22.6.4.8 Measurement exchange in Passive TB Ranging mode (#1807, #1808)**

**11.22.6.4.8.1 General**

As stated in 11.22.6.1.3 (Passive TB Ranging), the Passive TB Ranging mode is a variant of the TB ranging mode. In all aspects, except where explicitly stated differently, the Passive TB Ranging mode, its protocols, procedures, components, and definitions follow the rules for TB ranging mode. (#**1520**, #**1542**, #**1543**, #**1544**, #**1548**, #**1551**, #**1552**, #**1553**, #**1554**, #**1555**, #**1556**, #**1561**, #**1562**, #**1564**, #**1565**, #**1574**)

In particular the measurement exchanges for Passive TB Ranging follows the rules and procedures described in 11.22.6.4.3 (TB Ranging measurement exchange), with subclauses, unless explicitly stated otherwise.

In Passive TB Ranging, the RSTA sends the Passive TB Ranging subvariant Ranging Trigger frame instead of the TB Sounding Subvariant Ranging Trigger frame. Upon receiving of the Passive TB Ranging Subvariant Ranging Trigger frame, the ISTA shall respond with an HE Ranging NDP instead of an HE TB Ranging NDP; see 11.22.6.4.8.3 (Passive TB Ranging measurement sounding phase) for further details. **(#3789, #3790)**

Furthermore, the RSTA shall broadcast two frames, the Primus and Secundus RSTA Broadcast Passive TB Ranging Measurement Report frames containing measurement data and related information; see 11.22.6.4.8.4 (Passive TB Ranging measurement reporting phase) for further details. **(#3789, #3790)**

The Passive TB Ranging exchanges occur in an availability window used for passive location.

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**References:**

**[1] Draft P802.11az\_D2.3**