**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |
| --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **LB207/D01 comment resolution -- No censensus -- CIDs 12, 13, 94, 150, 204, 275, 967, 975, 977, 978, 979, 982, 983, 984, 985, 988, 989, 994, 996, 1008, 1013, 1174, 1321, 1356, 1358, 1359, 1387, 1397** |
| Date Submitted | February 10, 2025 |
| Sources | Alex Krebs (Apple)krebs @ apple.com |
| Re: |   |
| Abstract |  |
| Purpose | To propose resolution for MMS related comments for “P802.15.4ab™/D (pre-ballot) C Draft Standard for Low-Rate Wireless Networks”. |
| Notice | This document does not represent the agreed views of the IEEE 802.15 Working Group or IEEE 802.15.4ab Task Group. It represents only the views of the participants listed in the “Sources” field above.It is offered as a basis for discussion and is not binding on the contributing individuals. The material in this document is subject to change in form and content after further study. The contributors reserve the right to add, amend or withdraw material contained herein. |

**Table of contents**

[CID 994, 1008, 1397 (objection raised during Waikoloa F2F) 3](#_Toc187501237)

[CID 982, 983, 984, 985, 1174, 1321, 1387 (Revised) 4](#_Toc187501238)

[Various comments asking to mandate LBT (Rejected) 6](#_Toc187501239)

# CID 994, 1008, 1397 (objection raised during Waikoloa F2F)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** | **Proposed Resolution. Disposition Detail** |
| Carlos Aldana | 994 | 125 | 10.38.10.1 | 1 | macMmsNbInitChannel should be carefully selected and not have a wide range from 0-249 to prevent it from being interfered with. Change it so that it covers the union of the following 2 sets : 1) from 5725 to 5732.5 (0 to 2) MHz 2) from 5835 to 5850 MHz (44 to 49) | As in comment | Reject. Discussed before in DCN 15-23-591r1, more channels is better. |
| Alex Krebs | 1397 | 124 | 10.38.10.1  | 16 | ChannelAllowList 0-249 is not a good default configuration, as it interferes with the initialization channel and possibly licensed spectrum. | Change default value to 4-49, 58-249. | Accepted. |
| Carlos Aldana | 1008 | 125 | 10.38.10.1 | 1 | The range of both macMmsRcpPollNSlots and macMmsRcpRespNSlots is quite large (up to 7.5ms when slot duration is set to 0.5ms and 15 ms when slot duration is set to 1ms). Consider limiting duration to 1ms. | As in comment | Reject. Particular values mentioned don't justify reducing bits, as reducing the bits for slots would require more bits for rounds and blocks. |

# CID 982, 983, 984, 985, 1174, 1321, 1387 (Revised)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| B. Rolfe | 1321 | 71 | 10.38.7.3  | 4 |  The behavior defined in this clause already exists in the standard, though it might not be clear to the reader this is so. Clarify that either of the methods defined in the standard as Random access methods (6.3.2), CSMA-CA and SSBD, can be used to achieve the described behavior. | Change "then the device shall perform CCA before" to "then one of the channel access methods defined in 6.4.3 shall be used, with CCA mode 1 or 3 used, configured to meet the following constraints:"  |
| Alex Krebs | 1387 | 71 | 10.38.7.3 | 5 to 15 | The specifics of this LBT implementation are taken from ETSI BRAN, and are not valid for other regions outside the EU. | ReplaceAfter...users.byLBT may be applied to improve coexistence with other spectrum users.and remove reference B1 on p.223. |
| Billy Verso | 1174 | 71 | 10.38.7.3 | 9 | "as needed during the UWB MMS control phase." is wrong on two fronts. It is only appropriate for the NBA case, and, it is only needed (mandated) is certain regulatory domains. | Change to "as applicable to the control phase of NBA UWB MMS". |
| Carlos Aldana | 982 | 71 | 10.38.7.3 | 12 | How long is the CCA duration? Figure 35 suggests at least 9us, but there is no text that says that. Please add text that specifies the minimum CCA duration. | As in comment |
| Carlos Aldana | 983 | 71 | 10.38.7.3 | 12 | In Figure 35, there is at least 100us of idle time between successive transmissions. There is no normative text that describes this idle time. Please add corresponding text that accomodates required idle time. | As in comment |
| Carlos Aldana | 984 | 71 | 10.38.7.3 | 12 | In Figure 35, there is at least 100us of idle time between successive transmissions. If the ranging slot duration is 300 RSTU (250us), will there be enough time to accommodate this idle time? If there is not enough time, what is expected behavior? | Please clarify behavior |
| Carlos Aldana | 985 | 71 | 10.38.7.3 | 12 | In Figure 35, there is an upper bound of 95% of the ranging slot on the transmission duration. There is no text associated with this. Please add such text.  | As in comment |

Discussion: Both comments CID 1321 and 1387 address to achieve the same thing and can be combined. This also removes the questioned fields at issue to comments 1174, and 982 to 985.

Proposed Resolution: Revised

Disposition Detail: Change the text on p.71 l.4 to 16 as follows:

If LBT is required before a transmission, either for regulatory reasons or as a coexistence mechanism, then

then one of the channel access methods defined in 6.4.3 with CCA mode 1 or 3. shall be applied by initiator and responder independently in each

transmission slot, even if the same channel is used in consecutive slots. If LBT is not required, the same methods may be used to improve coexistence with other spectrum users.

# Various comments asking to mandate LBT (Rejected)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| Li Ma | 204 | 33 | 10 | 1 | There are numerous simulations in 802.15 and 802.11 sessions shown NB impact to wifi coex. Suggest to adopt a mandatory LBT for NB transmission if aggregated NB duty cycle is more than a threshold | as in comment |
| Li-Hsiang Sun | 275 | 33 | 10 | 1 | There are numerous simulations in 802.15 and 802.11 in prior meetings shown NB impact to wifi coex. Suggest to adopt a mandatory LBT for NB transmission if aggregated NB duty cycle is more than a threshold | as in comment |
| Koorosh Akhavan | 967 | 68 | 10.38.4.2 | 10 | The draft needs to define a mechanism for NB channel access, to provide good coexistence of NB functionality with other devices and technologies operating in the UNII3/5 bands.  | Define a mandatory coexistence mechanism for NB OQPSK in UNII-3/5 with clear implementation details. |
| Pooria Pakrooh | 1356 | 68 | 10.38.4.2 | 10 | The draft needs to define a mandatory mechanism to ensure good coexistence of NB functionality with other 4ab NB decives, as well as other technologies in UNII-3 and UNII-5 bands. Specifying that LBT "may be used" is not a good coexistence practice as it causes confusion for the implementers, due to lack of details. The "NBA channel access" subclause needs to specify a detailed mandatory mechanism for the implementers of the 15.4ab, to ensure good coexistence with other NB devices as well as other technologies such as 802.11 devices.  | Adopt a mandatory coexistence mechanism for NB operation in UNII-3 and UNII-5 bands. A good proposal has been presented and evaluated in DCN 15-24-212/r5, which does not impact low duty cycle ranging operations. Further details such as ED threshold need to be discussed and specified as well.Change FROM:"For the NBA, channel access may use the listen-before-talk (LBT) functionality defined in 10.38.7.3."TO:"A NB capable device operating in UNII-3 or UNII-5 band shall measure its NB transmission duty cycle.For a NB capable device, if its NB transmission duty cycle is more than 2.5% (exact threshold value to be discussed further), it shall perform listen-before-talk (LBT) before any NB transmission. Otherwise, LBT is optional." |
| Carlos Aldana | 996 | 68 | 10.38.4.2 | 68 | given there is no baseline coexistence mechanism for NB, we should use LBT as the baseline. change "may" to "shall" | As in comment |
| Bin Tian | 12 | 71 | 10.38.7.3 | 5 | The details of CCA need to be specified like ED threshold | as in the comment |
| Bin Tian | 13 | 71 | 10.38.7.3 | 13 | Even for channel number below 50, LBT shall be applied for NB OQPSK transmission unless its operation duty cycle is very low.  | as in the comment |
| Stephen Shellhammer | 94 | 71 | 10.38.7.3 | 13 | NB coexistence with other technologies in UNII-3 and UNII-5 bands needs to be addressed by defining a mandatory channel access mechanism for NB operation in UNII-3/5, with clear guidance for the implementers.A good option is the LBT mechanism proposed and evaluated in DCN 15-24-212/r5. | Adopt a mandatory coexistence mechanism for NB operation in UNII-3 and UNII-5 bands. A good proposal is presented and evaluated in DCN 15-24-212/r5. Add the following text from DCN 15-24-212/r5 following:"A NB capable device operating in UNII-3 or UNII-5 band shall measure its NB transmission duty cycle.For a NB capable device, if its NB transmission duty cycle is more than 2.5% (exact threshold value to be discussed further), it shall perform listen-before-talk (LBT) before any NB transmission. Otherwise, LBT is optional." |
| Bin Qian | 150 | 71 | 10.38.7.3 | 13 | NB coexistence in UNII-3 band needs to be addressed | LBT shall be applied to channels 0-49 if NB duty cycle per ranging block >=TBD% |
| Carlos Aldana | 977 | 71 | 10.38.7.3 | 13 | The statement "LBT shall be applied to channel numbers 50 to 249 according to regulatory constraints." should be clarified as the word "according" is ambiguous. After reading the subsequent sentence, I think the author meant "in the presence of regulatory constraints". If that's the case, then regulatory constraints are already mandating LBT and the aforementioned statement does not provides additional information. Replace with "LBT shall be applied to channel numbers 0 to 249 to improve coexistence with other spectrum users." and remove subsequent sentence. | As in comment |
| Carlos Aldana | 978 | 71 | 10.38.7.3 | 13 | LBT is proven to be a great coexistence technique. Given that there is no baseline coexistence technique for narrowband, LBT should be made the baseline Replace the sentence "LBT may be applied to all channels in the absence of regulatory constraints, for example, to improve coexistence with other spectrum users." with "LBT shall be applied to channel numbers 0 to 249 to improve coexistence with other spectrum users". | As in comment |
| Carlos Aldana | 979 | 71 | 10.38.7.3 | 13 | replace "may" with "shall" and also add the following sentence: "phyCcaEdThreshold should be set to a value that is inversely proportional to the transmit power, in dB. For UNII-3, the phyCcaEdThreshold is set to -67 dBm/MHz - Pmax\_dBm and for UNII-5 it is set to -74 dBm/MHz - Pmax\_dBm. | As in comment |
| Pooria Pakrooh | 1358 | 71 | 10.38.7.3 | 13 | NB coexistence with other technologies in UNII-3 and UNII-5 bands needs to be addressed by defining a mandatory channel access mechanism for NB operation in UNII-3/5, with clear guidance for the implementers.A good option is the LBT mechanism proposed and evaluated in DCN 15-24-212/r5. | 1. Adopt a mandatory coexistence mechanism for NB operation in UNII-3 and UNII-5 bands. 2. Define specific parameters for NB (such as LBT with ED threshold value, CCA duration, etc.)such that they are clear to the implementers.A good proposal is presented and evaluated in DCN 15-24-212/r5. Add the following text from DCN 15-24-212/r5 following:"A NB capable device operating in UNII-3 or UNII-5 band shall measure its NB transmission duty cycle.For a NB capable device, if its NB transmission duty cycle is more than 2.5% (exact threshold value to be discussed further), it shall perform listen-before-talk (LBT) before any NB transmission. Otherwise, LBT is optional." |
| Pooria Pakrooh | 1359 | 71 | 10.38.7.3 | 13 | Sentence is unclear. What does "according to regulatory constraints" mean?  | Clarify what is the mandatory requirement here? Specify that mandatory LBT needs to be applied to all channels 0-249. |
| Carlos Aldana | 975 | 176 | 10.44.2 | 10 | We should be explicit in how we set phyCcaEdThreshold and phyCcaDuration. phyCcaDuration can be set to the value of 16 us. For 2.5MHz transmissions, phyCcaEdThreshold can be set to a value that is inversely proportional to the transmit power, in dB. For UNII-3, the ED threshold can be set to -67 dBm/MHz - Pmax\_dBm and for UNII-5 it can be set to -74 dBm/MHz - Pmax\_dBm. | As in comment |
| Carlos Aldana | 1013 | 173 | 10.43.2 | 15 | NB data communications should use LBT as a baseline channel access mechanism. Please add the followign text at the end of the paragraph: "Channel access using listen before talk shall be used for improved coexistence performance. When used for narrowband assist, SSBD shall use the following control attribute values:phyCcaDuration should be set as required by local regulations;macSsbdMinBf and macSsbdMaxBf shall be set to 0;macSsbdMaxBackoffs shall be set to 0;macSsbdTxOnEnd shall be set to FALSE;macSsbdPersistence shall be set to FALSE;phyCcaMode shall be set to 1 (energy above threshold)phyCcaEdThreshold shall be set to -67 dBm/MHz - Ptx for channels 0 to 49 and to -74 dBm/MHz - Ptx for channels 50 to 249, where Ptx is the equipment’s instantaneous transmit power in dBm." | As in comment |
| Carlos Aldana | 988 | 71 | 10.38.7.3 | 13 | SSBD can be used to specify LBT behavior. Please add the following text: "Channel access using listen before talk shall be used for improved coexistence performance. When used for narrowband assist, SSBD shall use the following control attribute values:phyCcaDuration should be set as required by local regulations;macSsbdMinBf and macSsbdMaxBf shall be set to 0;macSsbdMaxBackoffs shall be set to 0;macSsbdTxOnEnd shall be set to FALSE;macSsbdPersistence shall be set to FALSE;phyCcaMode shall be set to 1 (energy above threshold)phyCcaEdThreshold shall be set to -67 dBm/MHz - Ptx for channels 0 to 49 and to -74 dBm/MHz - Ptx for channels 50 to 249, where Ptx is the equipment’s instantaneous transmit power in dBm." | As in comment |
| Carlos Aldana | 989 | 179 | 11.1.3.15 | 10 | Ths frequency channel plan only covers UNII-3. UNII-4 is available in some regions and should be added. Please add channels to cover 5725 up to 5875 MHz along with LBT-based mechanism. | As in comment |

Discussion: Has been sufficiently discussed, no consensus achieved.

Proposed Resolution: Rejected.

Disposition Detail: No consensus.