IEEE P802.15
Wireless PANs

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| 1st SB Comment Resolutions #1  |
| Date: 2015-4-9 |
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Abstract

This submission proposes resolutions for the following CIDs of the 1st sponsor ballot.

i-1, 5, 13, 15, 19, 27, 29, 43, 44, 45, 46 and 47.

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 TG4n Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TG4n Draft (i.e. they are instructions to the 802.15 editor on how to merge the text with the baseline documents).***

***TG4n Editor: Editing instructions preceded by “TG4n Editor” are instructions to the TG4n editor to modify existing material in the TG4n draft. As a result of adopting the changes, the TG4n editor will execute the instructions rather than copy them to the TG4n Draft.***

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-1 | 12 | 8.1.1 | 12 | Table 66c Data Parameters seems to be not correct. A 125ksps 8-ary modulation should lead to 375kbps bit rate. From what I read in Sec. 22.1 it seems all O-QPSK constellations count 16 symbols | Correct 8-ary with 16-ary in all 500kbps occurrences in Tab. 66c | Reject |

**Discussion:***.*

The following calculation shows how to get symbol rate and bit rate of CMN O-QPSK PHY.

When a chip rate, a spreading sequence length and number of bits per symbol are denoted by *Rchip*, *Nspread* and *Nsym* respectively, symbol rate *Rsym*and bit rate *Rbit* of CMB O-QPSK PHY can be written as the next equation.

In the CMB O-QPSK PHY, the above parameters are as below.

|  |  |  |
| --- | --- | --- |
| Chip rateRchip | Spreading sequence lengthNspread | Number of bits per symbolN |
| 1000 kchip/s | (16,4)-DSSS | (8,4)-DSSS | (16,4)-DSSS | (8,4)-DSSS |
| 16 bits | 8 bits | 4 | 4 |

From the above calculation formula and the table, bit rates for CMB O-QPSK PHY can be written as the next.

Therefore, table 66c information is correct.

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-5 | 4 | 8.1.1 | 1 | Optional GFSK modes of modulation index 0.5 or 1.0? | Standardise on one modulation index. Either 0.5 or 1.0. | Reject |

**Discussion:**

There is no rule to specify one modulation index in this standard. This modulation index should be dpend on an application. This means that this value should be decided by a vendor or a system integrater. When two systems with different modulation index have to communicate with each other, mandatory mode can be used. Considering these things, this specification is not a problem.

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-13 | 11 | 22.2.1 | 3 | "... except the explanation PHR. PHR..." is incorrect. | Correct it to "... except for the PHR. The PHR...". | Accept |

**Discussion:**

Thre is no discussion point on this comment.

***Instruction to TG4n editor: Insert a word “The” before the word “PHR” in line 4 of page 11 as shown in below.***

**“The PHR of the CMB GFSK PPDU shall be as specified in subclause 22.2.1.3.”**

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-15 | 12 | 22.2.2.1 | 21 | "The modulation for CMB GFSK PHY is a 2-level Gaussian filtered FSK that meets the transmission mask, as defined in 22.2.4.5 GFSK with a BT value of 0.7 should be used in Mode #1 to Mode #5." is incorrect. | Correct it to "The modulation for CMB GFSK PHY shall be a 2-level Gaussian filtered FSK that meets the transmission mask, as defined in 22.2.4.5 GFSK with a BT value of 0.7 for all modes (1-5)." | Accept |
| i-47 | 12 | 22.2.2.1 | 21 | What BT should be used for Modes #2,3,4? If a BT value other than 0.7 is used, does it affect interoperability (since this is "should" and not "shall")? | Clarify | Revise |

**Discussion:**

The above two comments point out the same issue.

Intention of this draft is that BT = 0.7 shall be used for all modes, Mode #1, 2, 3, 4 and 5. From this point of view, the proposal of CID i-15 is acceptable.

***Instruction to TG4n editor: Replace the whole sentence in line 21 and 22 of page 12 as the below.***

**“The modulation for CMB GFSK PHY shall be a 2-level Gaussian filtered FSK that meets the transmission mask, as defined in 22.2.4.5 GFSK with a BT value of 0.7 for all modes (1-5).”**

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-19 | 11 | 22.2.1.3 | 22 | The PHR specifies data whitening being run-time configurable on a per-frame basis, similar to 802.15.4g. However, also in 15.4g, this is somewhat of a flaw in the standard. The issue arises when convolutional encoding is applied, and since there is not enough space between the data whitening bit field (bit index 4) and the first bit which is going to be whitened or not. Commonly in litterature, the traceback history needs to be 4-5 times the constraint length in order to achieve proper error correction. In this proposed standard, there is only 12 bits from bit index 4, to bit index 16. The implementer either needs to add more design complexity (for instance attempting decoding both with and without data whitening), or needs to accept less gain from the convolutional decoding. There is really no reason why the data whitening should be made run-time configurable. | For instance specify that all frames that use convolutional encoding also shall use data whitening (i.e. also setting the Data Whitening PHR field to one.)Or specify that data whitening shall be used for all frames, and simply remove the bit-field from the PHR | Reject |

**Discussion:**

As the commenter mentions, this comment can be applied to IEEE802.15.4g daraft. So this comment should be discussed in IEEE802.15.4 standard. This means that it is out of our scope. From this point of view, this comment cannot be discussed in TG4n. Hence, this this time, this comment is rejected by TG4n.

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-27 | 4 | 8.1.2.15 | 10 | This parameter also comes from the tables 68 | insert "as specified in 8.1.2.15.1 and 8.1.15.2" | Revise |

**Discussion:**

This comment is basically correct but the subclause number “8.1.15.2” written in the proposed change is a typo.

***Instruction to TG4n editor: Insert the phrase “as specified in 8.1.2.15.1 and 8.1.2.15.2” at the end of line 10 of page 4 as below.***

***“FreqBandEdge* is the band edge for the frequency band in MHz as specified in 8.1.2.15.1 and 8.1.2.15.2.”**

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-29 | 4 | 8.1.2.15 | 12 | "phyChannelSpacing" is not the channel spacing you are looking for. ChanSpacing in the formula is actually the value given in table 68o and 68p. Se | change "(phyChannelSpacing)" to "as specified in 8.1.2.15.1 and 8.1.15.2" | Revise |

**Discussion:**

This comment is basically correct but there is one typo in the propsed change. Subclause number of “8.1.15.2” should be “8.1.2.15.2.”

***Instruction to TG4n editor: Change the phrase*** "(***phyChannelSpacing***)" ***line 12 of page 4 to*** **“as specified in 8.1.2.15.1 and 8.1.2.15.2.”**

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-43 | 11 | 22.2.1.1 | 6 | phyFSKPreambleLength can be up to 1000 symbols, which would prevent the 802.15.4 MAC protocol from functioning. Really, you don't want to copy this error of a past amendment. A more realistic range is from 8 to 30 repititions of the 8 symbol pattern. It need not be known to either the higher layer nor other devices to achieve interoperation, so it need not be a PHY PIB attribute. | The preamble field shall contain form 8 to 30 repititions of the 8-bit sequence deined in 18.1.1.1. | Revise |

**Discussion:**

This comment is acceptable but it may not be easier to understand a correct preamble pattern for CMB GFSK because subclause 18.1.1.1 specifies 2FSK and 4FSK PHY preamble patterns. To avoid misunderstanding of CMB GFSK PHY preamble pattern, it should be better to mention the preamble pattern for CMB GFSK PHY clearly. Besides this, the minimum repetition number of preamble pattern should not be specified by this draft because this specification depends on chip performance and it should be decided by vendors.

***Instruction to TG4n editor: Detele the phrase “phyFSKPreambleLength* (as defined in subclause 9.3) multiples*” in the line 6 of page 11 and insert a phrase of “*up to 30 repetitions*” after the word “contain“ as shown in below.***

**“The Preamble field shall contain up to 30 repetitions *~~phyFSKPreambleLength~~* ~~(as defined in subclause 9.3) multiples~~ of the 8-bit sequence “01010101” for CMB GFSK.”**

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-44 | 11 | 22.2.2.1 | 8 | Why are four SFD values needed? The SFD is used to differentiate FEC coded and not coded packets, which is 2 states. What is the prupose of having the second row? | Replace sub-clause with: "The SFD values for coded and uncoded PPDU are as defiend in Table 131 for phyMRFSKSFD = 0" | Revise |

**Discussion:**

As this commenter mentions, CMB GFSK PHY needs PIB attribute in 1 bit to indicate coded PPDU and uncoded PPDU. Hence, *phyCMBGFSK* = 1 should be removed from this draft. This point is acceptable. But reusing the same name of PIB attribute, *phyMRFSKSFD* which is used for MRFSK specified by IEEE802.15.4g, may not be a good idea because it may cause misunderstanding to set CMB GFSK PHY condition properly. Considering from above things just removing the case of *phyCMBGFSK* = 1 and insertion of an explanation of not using *phyCMBGFSK* = 0 should be enough.

***Instruction to TG4n editor: Change Table 224 in subclause 22.2.1.2 as below and insert the next sentence before the Table 224.***

PIB attribute *phyCMBGFSK* = 0 shall be used and *phyCMBGFSK* = 1 shall not be used for CMB GFSK PHY.

1. —CMB GFSK PHY SFD values for GFSK

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| --- | --- | --- |
|  | SFD value for coded(PHR + PSDU)(*b*0–*b*15) | SFD value for uncoded(PHR + PSDU)(*b*0–*b*15) |
|  *phyCMBGFSK*= 0 | 0110 1111 0100 1110 | 1001 0000 0100 1110 |
|  *phyCMBGFSK*= 1 | ~~0110 0011 0010 1101~~Not applicable | ~~0111 1010 0000 1110~~ Not Applicable |

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-45 | 11 | 22.2.2.1 | 20 | This is redundant as the referecne to 18.1.1.3 provides the transmit order of the length field (which is the only multi-bit field in the PHR). | Delete sentence "All mluti-bit fields...." | Reject |

**Discussion:**

Figure 196 is very similar to Figure 114 shown in subclause 18.1.1.3 but content of Figure 196 is different from ones of Figure 114. Bit width of “Reserved” and “Frame length” are different. Hence, this Figure 196 cannot be refered to Figure 114. Hence, this Figure 196 is necessary for this draft.

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| CID | Page | Sub-clause | Line | Comment | Proposed Change | Response |
| i-46 | 12 | 22.2.2.1 | 19 | What is "2 x 0.5" ?? I thnk some words are missing. | Clarify the intended integration period. | Revise |

**Discussion:**

The "2×0.5" indicates a range of integration written in line 20 of page 12. As the commenter mentions, it may not be easy to understand this meaning. Hece, this phrase should be replaced with "a period of at least from -0.5 to +0.5."

***Instruction to TG4n editor: Replace the phrase of "2 × 0.5" in line 19 of page 12 with "from -0.5 to +0.5 normalized symbol duration time."***