

Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Material for SFF Related Comment Resolutions]

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Re: [In response to TG4g Call for Proposals]

Abstract: [SFF comment resolutions]

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Summary

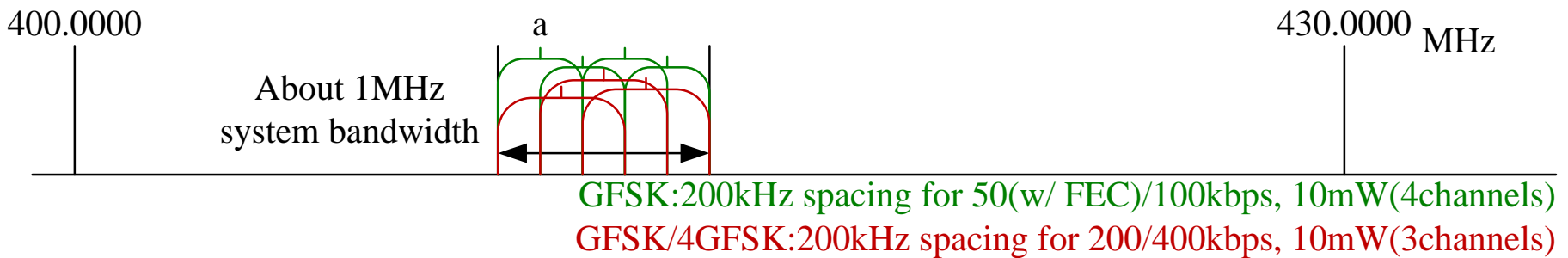
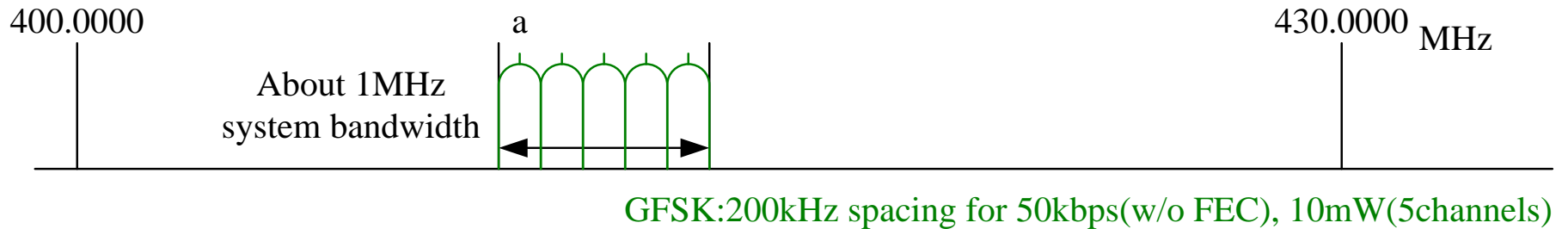
This document provides resolutions to 25-SFF-related comments that are allocated in the second Open ConfCall on Jan. 14

- CID#73: Japan frequency allocation(1)
- CID#148, 1, 46, 200, 209: PHY mode(5)
- CID#2: GenericPHY(1)
- CID#147: *Confirming details*(1)
- CID#20: Data rate in China(1)
- CID#50, 78, 154, 228, 3, 51, 134, 229, 21, 52, 79: Channel page(11)
- CID#22, 81, 129, 210, 230: TX power(5)

CID#73: Japan frequency allocation

Comment: "The exact 1 MHz frequency band within the 400-430 MHz is TBD."

Resolution: Keep it open until confirmation by Japanese ministry.



CID#148, 1, 46, 200, 209: PHY mode

Comment(extract): “Table 1: This entry specifies a data rate with FEC used. This is inconsistent with all other entries in this table. Also, the text elsewhere implies FEC is optional but 50kbps in this band is mandatory, which is inconsistent. .”

Resolution:

- For CID#46, Add the following sentence before Table 1 (or Table in 6.12a.2)
“The data rates are selected so as to achieve efficient utilization of available spectrum in each region, where mask requirements are different greatly from one to another.”
- For CID#148, 1, 200 and 209;
Change Table 1 to specify only Frequency (MHz), Modulation and Raw bit rate (kb/s), while adding another table in 6.12a.2 to specify Frequency (MHz), Modulation, Data rate (kb/s; after FEC), FEC (on/off) and Modulation order

CID#148, 1, 46, 200, 209: PHY mode (contd.)

Table 1

PHY(MHz)	Frequency (MHz)	Modulation	Raw bit rate (kb/s)		
			Low	Medium	High
950	950-956	GFSK	50	100	200/400
400	TBD (1MHz within 400-430MHz)	GFSK	50	100	200/400
...

CID#148, 1, 46, 200, 209: PHY mode (contd.)

Table in 6.12a.2

PHY (MHz)	Frequency (MHz)	Modulation	Data rate (kb/s)	Symbol rate (ksample/s)	FEC	Modulation order
400	TBD (1MHz within 400-430MHz)	GFSK	50	50	No	2
		GFSK	50	100	Yes	2
		GFSK	100	100	No	2
		GFSK	200	200	No	2
		4GFSK	400	200	No	4
950	950-956	GFSK	50	50	No	2
		GFSK	50	100	Yes	2
		GFSK	100	100	No	2
		GFSK	200	200	No	2
		4GFSK	400	200	No	4
...

CID#2: GenericPHY

Comment: ""the derivation of a broader set of data rates and parameters" should be outside the scope of this standard as there are no specific parameters defined in the normative text. Therefore, Generic PHY mechanism itself shall also be an optional feature.."

Resolution:

- Replace the following text, "In addition to the modes in Table 1a and Table 1b, the MRFSK PHY **shall** support a generic PHY mechanism to enable the derivation of a broader set of data rates and parameters" as follows;
"In addition to the modes in Table 1a and Table 1b, the MRFSK PHY **may** support a generic PHY mechanism to enable the derivation of a broader set of data rates and parameters, **where values of such data rates and parameters are outside the scope of this standard.**"

CID#147: *Confirming details*

Comment: “*Confirming details*”

Resolution: Not yet.

CID#20: Data rate in China

Comment: “Data rate set still includes TBDs.”

Resolution: SFF proposes the following PHY parameter for China allocation

Frequency band	PHY parameter	Low rate		Medium rate	High rate
		Non FEC	FEC		
470~510MHz (China)	Data rate (kbps)	50	50	100	200/400
	Symbol rate (ksymbol/s)	50	100	100	200
	Channel spacing (kHz)	200	400	400	600
	Channel separation (kHz)	200	200	200	200
	Modulation	2GFSK	2GFSK	2GFSK	2GFSK/ 4GFSK
	Mod. index	1.0	1.0	1.0	1.0/0.33
	Channel overlap	N	Y	Y	Y

CID#50, 78, 154, 228, 3, 51, 134, 229, 21, 52, 79 : Channel page (1/4)

Comment(extract): “Data rate set still includes TBDs.”

Resolution:

- Keeping the same mechanism for channel page and providing extensibility to support large amount of channels for TG4g
- Additional details considering SFF proposal are shown in the following slides

CID#50, 78, 154, 228, 3, 51, 134, 229, 21, 52, 79 : Channel page (2/4)

SFF proposes the following description of channel pages in the draft, where “*SFF400start*” and “*SFF950start*” shows first values of successive indices allocated for SFF proposal

In channel *index SFF400start+0*, there are 5 channels using GFSK at 50kbps in 400MHz band:

$$F_c = (a + 0.1) + 0.2k \text{ MHz, for } k = 0, \dots, 4$$

In channel *index SFF400start+1*, there are 4 channels using GFSK at 50kbps with FEC in 400MHz band:

$$F_c = (a + 0.2) + 0.2k \text{ MHz, for } k = 0, \dots, 3$$

In channel *index SFF400start+2*, there are 4 channels using GFSK at 100kbps in 400MHz band:

$$F_c = (a + 0.2) + 0.2k \text{ MHz, for } k=0, \dots, 3$$

In channel *index SFF400start+3*, there are 3 channels using GFSK at 200kbps in 400MHz band:

$$F_c = (a+0.3) + 0.2k \text{ MHz, for } k=0, \dots, 2$$

In channel *index SFF400start+4*, there are 3 channels using 4GFSK at 400kbps in 400MHz band:

$$F_c = (a+0.3) + 0.2k \text{ MHz, for } k=0, \dots, 2$$

where a (MHz) is the lower band edge frequency, which is currently under consideration in Japan.

In channel *index SFF950start+0*, there are 33 channels using GFSK at 50kbps:

$$F_c = 951.0 + 0.2k \text{ MHz, for } k=0, \dots, 32$$

In channel *index SFF950start+1*, there are 32 channels using GFSK at 50kbps with FEC:

$$F_c = 951.1 + 0.2k \text{ MHz, for } k = 0, \dots, 31$$

In channel *index SFF950start+2*, there are 32 channels using GFSK at 100kbps:

$$F_c = 951.1 + 0.2k \text{ MHz, for } k = 0, \dots, 31$$

In channel *index SFF950start+3*, there are 31 channels using GFSK at 200kbps:

$$F_c = 951.2 + 0.2k \text{ MHz, for } k = 0, \dots, 30$$

In channel *index SFF950start+4*, there are 31 channels using 4GFSK at 400kbps:

$$F_c = 951.2 + 0.2k \text{ MHz, for } k = 0, \dots, 30$$

CID#50, 78, 154, 228, 3, 51, 134, 229, 21, 52, 79 : Channel page (3/4)

The new definition of channel pages shall be depicted in the following table

Channel page (decimal)	Channel index (decimal)	Channel number(?) (decimal)	Channel number description
7	SFF400start+0	0 – 4	Channels 0 to 4 in 400 MHz band using GFSK at 50kbps (w/o FEC)
		5 – 503	Reserved
7	SFF400start+1	0 – 3	Channels 0 to 4 in 400 MHz band using GFSK at 50kbps (w/ FEC)
		4 – 503	Reserved
7	SFF400start+2	0 – 3	Channels 0 to 3 in 400 MHz band using GFSK at 100kbps
		4 – 503	Reserved
7	SFF400start+3	0 – 2	Channels 0 to 2 in 400 MHz band using GFSK at 200kbps
		3 – 503	Reserved
7	SFF400start+4	0 – 2	Channels 0 to 2 in 400 MHz band using 4GFSK at 400kbps
		3 – 503	Reserved
7	SFF950start+0	0 – 32	Channels 0 to 32 in 950 MHz band using GFSK at 50 kbps (w/o FEC)
		33 – 503	Reserved
7	SFF950start+1	0 – 31	Channels 0 to 31 in 950 MHz band using GFSK at 50 kbps (w/ FEC)
		32 – 503	Reserved
7	SFF950start+2	0 – 31	Channels 0 to 31 in 950 MHz band using GFSK at 100 kbps
		32 – 503	Reserved
7	SFF950start+3	0 – 30	Channels 0 to 30 in 950 MHz band using GFSK at 200 kbps
		31 – 503	Reserved
7	SFF950start+4	0 – 30	Channels 0 to 30 in 950 MHz band using 4GFSK at 400 kbps
		31 – 503	Reserved

CID#50, 78, 154, 228, 3, 51, 134, 229, 21, 52, 79 : Channel page (4/4)

Graphic image of 950MHz allocation is shown

	Frequency (MHz)	50kbps (w/o FEC)	50kbps (w/ FEC)	100kbps	200kbps	400kbps
Index SFF950start+0	951.0	0				
50kbps (w/o FEC)	951.2	1	0	0	0	0
Index SFF950start+1	951.4	2	1	1	1	1
50kbps (w/ FEC)	951.6	3	2	2	2	2
Index SFF950start+2	951.8	4	3	3	3	3
100kbps	952.0	5	4	4	4	4
Index SFF950start+3	952.2	6	5	5	5	5
200kbps	952.4	7	6	6	6	6
Index SFF950start+4	952.6	8	7	7	7	7
400kbps	952.8	9	8	8	8	8
	953.0	10	9	9	9	9
	953.2	11	10	10	10	10
	953.4	12	11	11	11	11
	953.6	13	12	12	12	12
	953.8	14	13	13	13	13
	954.0	15	14	14	14	14
	954.2	16	15	15	15	15
	954.4	17	16	16	16	16
	954.6	18	17	17	17	17
	954.8	19	18	18	18	18
	955.0	20	19	19	19	19
	955.2	21	20	20	20	20
	955.4	22	21	21	21	21
	955.6	23	22	22	22	22
	955.8	24	23	23	23	23
	956.0	25	24	24	24	24
	956.2	26	25	25	25	25
	956.4	27	26	26	26	26
	956.6	28	27	27	27	27
	956.8	29	28	28	28	28
	957.0	30	29	29	29	29
	957.2	31	30	30	30	30
	957.4	32	31	31	31	31

CID#22, 81, 129, 210, 2: TX power

Comment(extract): “Transmission power is TBD.”

Resolution: Introduce a new PIB parameter `phyTransmitPowerArray`, which is an array storing the transmit power values, in dBm, for each transmit power level and allow the current transmit power to be set to one of those levels.