IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)	
Title	**Channel page table reformatting**	
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Re:	[P802-15-4g-D03.pdf]	
Abstract	[This document provides a simplification of the description of the SUN PHY channel page tables.]	
Purpose	[To simplify 802.15.4g draft.]	
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This resolves editorial comment 384.

6. PHY specification

6.0.0.1 Channel pages for SUN PHYs

Channel page seven is used to specify the standard-defined PHY operating modes, and channel page eight is used to specify the Generic PHY operating modes. A device that implements more than one PHY operating mode described by channel page seven may have multiple channel page seven entries in the *phySUNPageEntriesSupported* table.

The structures of channel pages seven and eight are shown in Figure 22a. For more detail on channel page seven and channel page eight, see 6.0.0.1.1 and 6.0.0.1.2, respectively.

<table>
<tr><th>Bits: 31–27</th><th>26–22</th><th>21–20</th><th>19–16</th><th colspan="4">15–0</th></tr>
<tr><td rowspan="3">Channel page seven</td><td rowspan="3">Frequency band</td><td>Modulation scheme = Filtered FSK</td><td colspan="4">Bits 19…4
Reserved</td><td>Bits 3…0 (bitmap)
FSK modes supported</td></tr>
<tr><td>Modulation scheme = O-QPSK</td><td colspan="3">Bits 19…5
Reserved</td><td>Bit 4
Spreading mode</td><td>Bit 3...0 (bitmap)
Rate modes supported</td></tr>
<tr><td>Modulation scheme = OFDM</td><td colspan="2">Bits 19…13
Reserved</td><td>Bits 12...9 (integer)
OFDM Option 1,2,3, or 4 (range 0...3)</td><td colspan="2">Bit 8...0 (bitmap)
MCS values supported (for Option)</td></tr>
<tr><td>Channel page eight</td><td colspan="3">Reserved</td><td colspan="4">Generic-PHY-defined PHY modes (see 6.0.0.1.2)
Bitmap, where a set bit indicates a Generic PHY mode supported by the device
Each set bit position corresponds to an array in phySUNGenericPHYDescriptors</td></tr>
</table>

Figure 22a—Channel page structure for channel pages seven and eight

6.0.0.1.1 Channel page structure for standard-defined PHY modes

Channel page seven specifies each standard-defined SUN PHY operating mode supported by the device.

As shown in Figure 22a, channel page seven consists of the frequency band(s), modulation scheme(s), and PHY mode(s) to specify the SUN operating modes. The values used to define the frequency bands are shown in Tab. 3. 4a. The values used to define the modulation scheme are shown in Tab. 3. 4b. ~~Each bit in the PHY Mode field corresponds to a standard-defined PHY mode for the particular frequency band and modulation scheme. A bit set to zero shall indicate that a particular standard-defined PHY mode is not supported by the device. A bit set to one shall indicate that a particular standard-defined PHY mode is supported by the device.~~ A device may support more than one standard-defined PHY mode.

Table 4a—Frequency band definitions

Frequency band identifier (binary) (b_{26} b_{25} b_{24} b_{23} b_{22})	Frequency (MHz)	Designation
0 0 0 0 0	450–470 (US FCC Part 90)	450 MHz band
0 0 0 0 1	470–510 (China)	470 MHz band
0 0 0 1 0	779–787 (China)	780 MHz band
0 0 0 1 1	863–870 (Europe)	863 MHz band
0 0 1 0 0	896–901 (US FCC Part 90)	896 MHz band
0 0 1 0 1	901–902 (US FCC Part 24)	901 MHz band
0 0 1 1 0	902–928 (US)	915 MHz band
0 0 1 1 1	917–923.5 (Korea)	917 MHz band
0 1 0 0 0	928–960 (US, non-contiguous)	928 MHz band
0 1 0 0 1	950–958 (Japan)	950 MHz band
0 1 0 1 0	1427–1518 (US and Canada, non-contiguous)	1427 MHz band
0 1 0 1 1	2400–2483.5	2450 MHz band
0 1 1 0 0–1 1 1 1 1	Reserved	

Table 4b—Modulation scheme representation

Modulation scheme identifier (binary) (b_{21} b_{20})	Description
0 0	Filtered FSK
0 1	OFDM
1 0	O-QPSK
1 1	Reserved

The FSK mode supported bitmap for each of the supported frequency bands is defined in Table 4c. For all frequency bands, the mode indicated by bit 0 is operating mode #1. The channel spacing for the FSK modes is defined in Table 75a.

For theO-QPSK SUN PHY mode, the spreading mode bit shall be set to zero for DSSS mode and shal be set to one for MDSSS mode. The allowed combination of spreading mode, frequency band and PHY modes is defined in Table 4d.

For the OFDM SUN PHY mode, the frequency band field may be shall be set to one of the freqeuncy bands identified in Table 1 for OFDM using the encoding given in Table 4a. The OFDM option field shall be set as indicated in Table 4e

The MCS values supported bitmap for the OFDM SUN PHY is defined in Table 4f.

Table 4c—FSK modes supported bitmap definition

Band	Bit 3	Bit 2	Bit 1	Bit 0
450 MHz	Reserved	Reserved	9.6 kb/s, filtered 4FSK, mod. index = 1/3	4.8 kb/s, filtered FSK, mod. index = 1.0
470 MHz	Reserved	200 kb/s, filtered 4FSK, mod. index = 1/3	100 kb/s, filtered FSK, mod. index = 1.0	50 kb/s, filtered FSK, mod. index = 1.0
863 MHz	Reserved	200 kb/s, filtered 4FSK, mod. index = 1/3	100 kb/s, filtered FSK, mod. index = 1.0	50 kb/s, filtered FSK, mod. index = 1.0
896 MHz	Reserved	40 kb/s, filtered FSK, mod. index = 0.5	20 kb/s, filtered FSK, mod. index = 0.5	10 kb/s, filtered FSK, mod. index = 0.5
901 MHz	Reserved	40 kb/s, filtered FSK, mod. index = 0.5	20 kb/s, filtered FSK, mod. index = 0.5	10 kb/s, filtered FSK, mod. index = 0.5
915 MHz	Reserved	200 kb/s, filtered FSK, mod. index = 0.5	150 kb/s, filtered FSK, mod. index = 0.5	50 kb/s, filtered FSK, mod. index = 1.0
917 MHz	Reserved	200 kb/s, filtered FSK, mod. index = 0.5	150 kb/s, filtered FSK, mod. index = 0.5	50 kb/s, filtered FSK, mod. index = 1.0
928 MHz	Reserved	40 kb/s, filtered FSK, mod. index = 0.5	20 kb/s, filtered FSK, mod. index = 0.5	10 kb/s, filtered FSK, mod. index = 0.5
950 MHz	400 kb/s, filtered 4FSK, mod. index = 1/3	200 kb/s, filtered FSK, mod. index = 1.0	150 kb/s, filtered FSK, mod. index = 1.0	50 kb/s, filtered FSK, mod. index = 1.0
1427 MHz	Reserved	40 kb/s, filtered FSK, mod. index = 0.5	20 kb/s, filtered FSK, mod. index = 0.5	10 kb/s, filtered FSK, mod. index = 0.5
2450 MHz	Reserved	200 kb/s, filtered FSK, mod. index = 0.5	150 kb/s, filtered FSK, mod. index = 0.5	50 kb/s, filtered FSK, mod. index = 1.0

Table 4d—Encoding for O-QPSK SUN PHY

Band	Spreading mode	Chip rate (kchips/s)	Rate modes supported			
			Bit 3	Bit 2	Bit 1	Bit 0
470 MHz	0	100	Reserved	Reserved	50 kb/s, no spreading, rate 1/2 FEC	12.5 kb/s, (4,1) spreading, 1/2 rate FEC
780 MHz	0	1000	500 kb/s, no spreading, rate 1/2 FEC	250 kb/s, (8,4) spreading, rate 1/2 FEC	125 kb/s, (16,4) spreading, rate 1/2 FEC	31.25 kb/s, (16,1) spreading, rate 1/2 FEC.
780 MHz	1	1000	500 kb/s, (16,8) spreading, no FEC	250 kb/s, (32,8) spreading, no FEC	125 kb/s, (32,8) spreading, rate 1/2 FEC	62.5 kb/s, (64,8) spreading, rate 1/2 FEC.
868 MHz	0	100	Reserved	Reserved	50 kb/s, no spreading, rate 1/2 FEC	12.5 kb/s, (4,1) spreading, 1/2 rate FEC
915 MHz	0	1000	500 kb/s, no spreading, rate 1/2 FEC	250 kb/s, (8,4) spreading, rate 1/2 FEC	125 kb/s, (16,4) spreading, rate 1/2 FEC	31.25 kb/s, (16,1) spreading, rate 1/2 FEC.
915 MHz	1	1000	500 kb/s, (16,8) spreading, no FEC	250 kb/s, (32,8) spreading, no FEC	125 kb/s, (32,8) spreading, rate 1/2 FEC	62.5 kb/s, (64,8) spreading, rate 1/2 FEC.
917 MHz	1	1000	500 kb/s, (16,8) spreading, no FEC	250 kb/s, (32,8) spreading, no FEC	125 kb/s, (32,8) spreading, rate 1/2 FEC	62.5 kb/s, (64,8) spreading, rate 1/2 FEC.
950 MHz	0	100	Reserved	Reserved	50 kb/s, no spreading, rate 1/2 FEC	12.5 kb/s, (4,1) spreading, 1/2 rate FEC
2450 MHz	0	2000	500 kb/s, (8,4) spreading, rate 1/2 FEC	250 kb/s, (16,4) spreading, rate 1/2 FEC	125 kb/s, (32,4) spreading, rate 1/2 FEC	31.25 kb/s, (32,1) spreading, rate 1/2 FEC.
2450 MHz	1	2000	500 kb/s, (128,8) spreading, no FEC	250 kb/s, (64,8) spreading, no FEC	125 kb/s, (64,8) spreading, rate 1/2 FEC	62.5 kb/s, (32,8) spreading, rate 1/2 FEC.

Table 4e—OFDM option field values for OFDM SUN PHY

Option	Encoding, bits 12…9
1	0 0 0 0
2	0 0 0 1
3	0 0 1 0
4	0 0 1 1

Table 4f—OFDM SUN PHY MCS values supported mapping

Bit	Option 1	Option 2	Option 3	Option 4
0	MCS0	MCS0	MCS1	MCS2
1	MCS1	MCS1	MCS2	MCS3
2	MCS2	MCS2	MCS3	MCS4
3	MCS3	MCS3	MCS4	MCS5
4	Reserved	MCS4	MCS5	MCS6
5	Reserved	MCS5	MCS6	Reserved
6	Reserved	Reserved	Reserved	Reserved
7	Reserved	Reserved	Reserved	Reserved
8	Reserved	Reserved	Reserved	Reserved

7. Changes for Draft d3

7.1 CID 139

Accept.

For reference, the new table would look like thise.

The FSK mode supported bitmap for each of the supported frequency bands is defined in Table 4c. The operating mode for MR-FSK is defined in Table 116 and Table 117. The channel spacing for the FSK modes is defined in Table 75a.

Table 4g—FSK modes supported bitmap definition

Bit 3	Bit 2	Bit 1	Bit 0
Support for Operating mode #4	Support for Operating mode #3	Support for Operating mode #2	Support for Operating mode #1

7.2 CID 237

Accept in principle, resolve as indicated in 15-11-0093-01, subclause 7.2.

In 16.3.2.2 SHR coding and spreading

Delete "The SHR field shall consist of $N_{preamble}$ = 56 zero bits (for the 780 MHz, 915 MHz, 917 MHz, and 2450 MHz frequency bands) or $N_{preamble}$ = 32 zero bits (for the 470 MHz, 868 MHz, and 950 MHz frequency bands), and 16 additional SFD bits, according to Table 143."

After the equation for c_{SHR} add the following:

"where $N_{preamble}$ is the number of bits in the preamble, as defined in 16.3.1.1."

In Table 145, delete the column N_{SHR} (# of bits).

In 16.3.2.8, page 102, line 10 change as shown:

BDE shall be ~~always~~ applied to the ~~N_{SHR}~~ bits of the SHR field~~, with N_{SHR} given in Table 145,~~ resulting in a sequence <keep equation> of differentially encoded bits, where $N_{SH.}$ is the total number of bits in the SHR, as defined in 16.3.1.1 and 16.3.1.2. The initial state ~~is assumed to~~ shall be zero.

Also change "shall be always" to be "shall be" in the next paragraph (and all other locations).

Reason: This is already defined in 16.3.1.1 and 16.3.1.2. Defining terms after the equation is correct editorial format from the style guide.

7.3 CID 241

Accept in principle, resolve as indicated in 15-11-0093-01, subclause 7.3.

Change the end of the sentence on page 100 line 4 to read:

"bits, N_{PAD}, is computed from the number of blocks, N_B, the total number of uncoded bits, N_D, and the inter-leaver depth, N_{INTRLV}, as follows:'

7.4 CID 243

Accept in principle, resolve as indicated in 15-11-0093-01, subclause 7.4.

Change from:

Let

$M = M_p/N$

be the ratio of pilot spacing according to Table 163 and the parameter N of (N,1)-DSSS according to Table 147

to be

The ratio of pilot spacing, M, is calculated using:

$M = M_p/N$

where

M_p	pilot spacing
N	parameter of (N, 1)-DSSS

7.5 CID 247

Accept in principle, resolve as indicated in 15-11-0093-01, subclause 7.5.

Change "where t^3_i," to be "where T_{unit} is the matrix of parallel bit streams and t^3_i,