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Source(s)	Kanchei (Ken) Loa, Yi-Hsueh Tsai, Yung-Ting Lee, Hua-Chiang Yin, Shiann-Tsong Sheu, Youn-Tai Lee, Frank C.D. Tsai, Chih-Chiang Hsieh, Heng-Iang Hsu Institute for Information Industry 8F., No. 218, Sec. 2, Dunhua S. Rd., Taipei City, Taiwan. [add co-authors here]	Voice: +886-2-2739-9616 loa@iii.org.tw
Re:	IEEE 802.16j-07/013: “Call for Technical Comments Regarding IEEE Project 802.16j”	
Abstract	This contribution provides R-FCH	
Purpose	Text proposal for 802.16j Baseline Document	
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R-FCH for Relay Zone

Introduction

In IEEE 802.16j-026r3, there are three issues in section 8.4.4.7.3 R-FCH channel:

(1) The subchannel allocation of R-FCH in RS_Zone with FUSC or AMC permutation is not defined

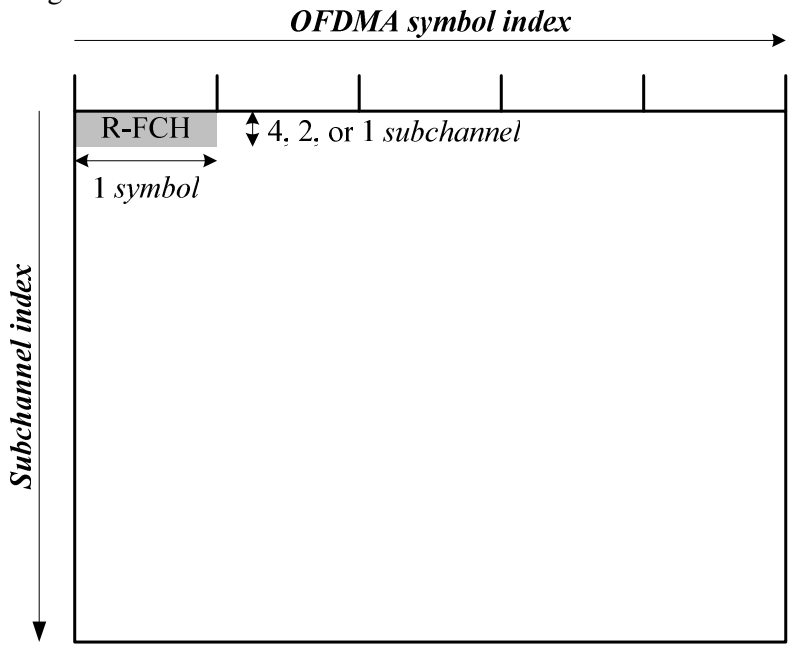
(2) FEC Code type and modulation type is not flexible enough.

(3) RS-Zone prefix format for 128 FFT is not defined whose length is only 12 bits.

Remedy

If RS_Zone is FUSC or AMC permutation, the R-FCH shall be allocated as follows. For FFT sizes other than 128, the first 4 slots in the downlink part of subchannel contain the R-FCH. These slots contain 48 bits modulated by QPSK with coding rate 1/2 and repetition coding of 4. For FFT-128, the first slot in the downlink part of the subchannel is dedicated to R-FCH and repetition is not applied. Figure 3d depicts this structure.

Figure 3c R-FCH subchannel allocation for FUSC or AMC zone



The R-FCH shall be transmitted using QPSK rate 1/2 with four repetitions using the mandatory coding scheme (i.e., the R-FCH information will be sent on four subchannels with successive logical subchannel numbers). For FFT sizes other than 128, **the 24-bit DL Frame Prefix shall be duplicated to form a 48-bit block**, which is the minimal FEC block size. For the case of 128 FFT, the following compressed format shall be used for R-FCH. Before being mapped to the R-FCH, **the 12-bit DL Frame Prefix shall be repeated four times to form a 48-bit block**, which is the minimal FEC block size.

Figure 3a OFDMA FCH allocation for all FFT sizes except 128

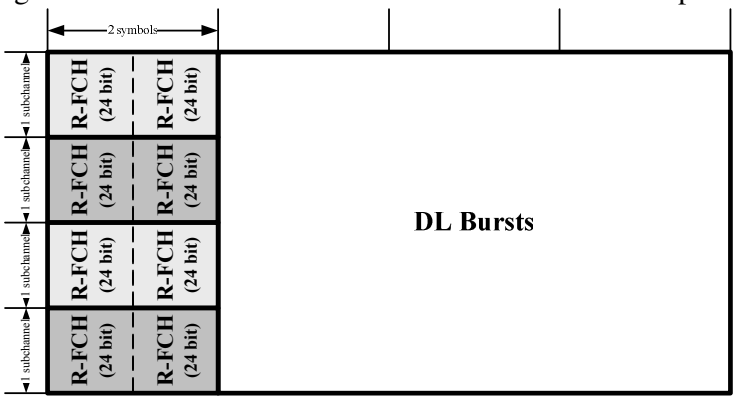
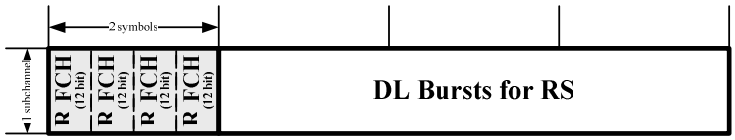


Figure 3b OFDMA FCH allocation for 128 FFT



Text Proposal

8.4.4.7.2 Frame structure for non-transparent mode

[Change the following text in the second paragraph of page 100 as indicated]:

8.4.4.7.2.1 MR-BS frame structure

The first non-AAS DL Relay_Zone shall include a R-FCH and a R-MAP. In the DL Relay_Zone, the subchannel allocation may be the same as that in the DL Access_Zone. The R-FCH may be the same as the CH in the DL Access_Zone. Other attributes of the MR-BS frame and the RS frame such as transition between modulation and coding presence of multiple zones, may be the same as those described in 8.4.4.2.

[Change the following text in 38th line of page 101 as indicated]:

8.4.4.7.2.2 Relay frame structure

The R-FCH and the R-DL-MAP shall be transmitted in the first non-AAS DL Relay zone that is in Tx mode

[Change the following text in page 101 as indicated]:

8.4.4.7.3 R-FCH channel

If a DL RS_Zone contains a R-FCH channel, the R-FCH channel shall be transmitted as FCH described in 8.4.4.2. The R-FCH contains the RS-Zone Prefix as described in 8.4.4.7.4. In case that RS_Zone is PUSC permutation, the subchannel of R-FCH shall be allocated as FCH described in 8.4.4.4. In case that RS_Zone is FUSC or AMC permutation, the first 4 slots in the downlink part of subchannel contain the R-FCH for FFT sizes other than 128. The first slot in the downlink part of the subchannel is dedicated to R-FCH for FFT-128.

[Change the following text in page 102 as indicated]:

8.4.4.7.4 RS-Zone prefix

The RS-Zone prefix is a data structure transmitted on R-FCH of a DL RS_Zone. The RS-Zone prefix includes information regarding the location of the first RS_Zone in the next frame and the information required for decoding R-MAP. Table XXX defines the format of RS_Zone prefix.

Table xxx-a: RS-Zone prefix format for all FFT sizes except 128

Syntax	Size(bits)	Notes
RS_Zone_Prefix_format () {		
RS_Zone location	8~~7~~	The field indicates the OFDM symbol index reference to the beginning of next frame in unit of ~~2~~ OFDM symbol~~s~~
If(RS_Zone is PUSC zone) {		
Used_subchannel_bitmap	6	Bit #0: Subchannel group 0 Bit #1: Subchannel group 1 Bit #2: Subchannel group 2 Bit #3: Subchannel group 3 Bit #4: Subchannel group 4 Bit #5: Subchannel group 5
} else {		
Reserved	6	Shall be zero
}		
R-MAP length	5	Length in unit of slot
FEC Code type and modulation type	~~5~~4	0b0000 = QPSK (CTC) 1/2 0b0001 = QPSK (CTC) ¾3/4 0b0010 = 16-QAM (CTC) 1/2 0b0011 = 16-QAM (CTC) 3/4 0b0100 = 64-QAM (CTC) 1/2 0b0101 = 64-QAM (CTC) 2/3 0b011~~1~~0 = 64-QAM (CTC) 3/4 0b~~100~~0111 = 64-QAM (CTC) 5/6 0b1000 = QPSK (CC) 1/2 0b1001 = QPSK (CC) 3/4 0b1010 = 16-QAM (CC) 1/2 0b1011 = 16-QAM (CC) 3/4 0b1100 = 64-QAM (CC) 1/2 0b1101 = 64-QAM (CC) 2/3 0b1110 = 64-QAM (CC) 3/4 ~~0b1001~~ 0b1111 reserved
Repetition_Coding_Indication	1	0: No repetition coding on R-MAP 1: Repetition coding of 2 used on R-MAP
}		

Table xxx-b: RS-Zone prefix format for 128 FFT

Syntax	Size(bits)	Notes
RS_Zone_Prefix_format () {		
Used subchannel indicator	1	0: Subchannel 0 is used for segment 0, Subchannel 1 is used for segment 1, Subchannel 2 is used for segment 2, 1: Use all subchannels

R-MAP length	5	Length in unit of slot
FEC Code type and modulation type	4	0b0000 = QPSK (CTC) 1/2 0b0001 = QPSK (CTC) ¾3/4 0b0010 = 16-QAM (CTC) 1/2 0b0011 = 16-QAM (CTC) 3/4 0b0100 = 64-QAM (CTC) 1/2 0b0101 = 64-QAM (CTC) 2/3 0b0110 = 64-QAM (CTC) 3/4 0b0111 = 64-QAM (CTC) 5/6 0b1000 = QPSK (CC) 1/2 0b1001 = QPSK (CC) 3/4 0b1010 = 16-QAM (CC) 1/2 0b1011 = 16-QAM (CC) 3/4 0b1100 = 64-QAM (CC) 1/2 0b1101 = 64-QAM (CC) 2/3 0b1110 = 64-QAM (CC) 3/4 0b1111 reserved
Repetition_Coding_Indication	1	0: No repetition coding on R-MAP 1: Repetition coding of 2 used on R-MAP
reserved	1	Shall be zero
}		

RS_Zone location

An indicator regarding the location of RS_Zone in the next frame. The first OFDM symbol in each frame is indexed as 0. The RS_Zone location indicates the OFDM symbol index relative to the first OFDM symbol in next frame. The unit is ~~2~~ OFDM symbol~~s~~.