Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>	
Title	**R-FCH Pointer**	
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Re:	IEEE 802.16-08/007: "IEEE 802.16 Working Group Letter Ballot Recirc #28b: Announcement"	
Abstract	This contribution proposes a scheme to re-acquire R-link MAC synchronization when the R-FCH is lost	
Purpose	Text proposal for 802.16j Draft Document.	
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R-FCH Pointer

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Introduction

In D3, the MR-BS or nontransparent RS shall send either DL-MAP_IE with DIUC = 13 or STC_DL_Zone_IE with dedicated pilots bit set to 1 in the DL-MAP message in the access zone to ensure the MS does not process the signal transmitted in the relay zone.

We propose to use the reserved bit in the DL-MAP_IE with DIUC = 13 to indicate the location of the DL relay zone containing the R-FCH, and hence the non-transparent RS can directly re-synchronize with the access RS though it lost the R-FCH in the previous frames.

In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the draft standard P802.16j/D3 are listed below.

Specification Changes

6.3.9.9.3 Obtaining R-link parameter

[Modify the text in Section 6.3.9.18.1 as follows]

During this phase, the MR-BS shall determine the RS's operation parameters and send an RS_Config-CMD message to configure these parameters at the RS (see 6.3.2.3.69) and start a T63 timer. The message shall contain the RS mode. It may also contain parameters for proper RS operation, such as the preamble index, R-amble index, the allocated management CID if the RS is operating in local CID allocation mode, RS frame offset etc. The RS shall respond by sending an MR_Generic-ACK message to the MR-BS and stop the T62 timer. After receiving the MR_Generic-ACK message from the RS, the MR-BS and the RS shall complete the RS network entry process, enter the operational state, and stop the T63 timer. The RS shall apply the configuration specified in the RS_Config-CMD message at the time indicated by the Frame Number Action. If the T63 timer expires before the MR-BS receives an MR_Generic-ACK message from the RS, the MR-BS shall retransmit the RS_Config-CMD message to the RS.

When the RS is configured as a non-transparent RS, the RS shall decode the R-FCH and R-MAP messages within the relay zone which location is indicated by the RCD message or the first received Rx relay zone indicator in DL-MAP IE with DIUC = 13. In order to obtain the R-link parameters, the RS shall first search for the R-MAP message. Once the RS has received at least one R-MAP message and is able to decode a burst in the R-link successfully, the RS will achieve R-link MAC synchronization. The processes of acquiring synchronization and maintaining synchronization of R-MAP and RCD are illustrated in Figure 94g and Figure 94h, respectively. If the RS, achieving R-link MAC synchronization, does not successfully decode a valid R-MAP message in a period equal to the Lost R-MAP Interval or does not successfully decode a valid RCD message in a period equal to the Lost RCD Interval, it shall start initial network entry process. If the RS does not successfully decode the R-FCH in a frame, the RS may re-acquire R-link MAC synchronization with the original access RS by the stored RCD message or by the first Tx relay zone indicator in DL-MAP IE with

DIUC = 13.

8.4.5.3 DL-MAP IE format

[Modify Table 380 in line 18 of page 192 as indicated:]

Table 380—OFDMA DL-MAP_IE format

Syntax	Size	Notes
DL-MAP_IE() {		
DIUC	4 bits	
if (DIUC == 14 {		
Extended-2 DIUC dependent IE	*variable*	
} else if (DIUC == 15) {		
Extended DIUC dependent IE	*variable*	See subclauses following 8.4.5.3.1
} else {		
if (INC_CID == 1) {		The DL-MAP starts with INC_CID =0. INC_CID is toggled between 0 and 1 by the CID-SWITCH_IE() (8.4.5.3.7)
N_CID	8 bits	Number of CIDs assigned for this IE
for (n=0; n< N_CID; n++) {		
If (included in SUB-DL-UL-MAP) {	-	-
RCID_IE()	-	For SUB-DL-UL-MAP, reduced CID format is used
} else {	-	-
CID	16 bits	Represents the assignment of the IE to a broadcast, multicast, or unicast address.
}		
}		
}		
OFDMA Symbol offset	8 bits	
if (Permutation = 0b11 and (AMC type is 2x3 or 1x6)) {		0b11 = Adjacent subcarrier permutation
Subchannel offset	8 bits	
If(DIUC == 13) {	-	-
Relay zone indicator	~~1~~2 bit~~s~~	0b00: Normal ~~G~~gap/PAPR/safety zone 0b01: Tx ~~R~~relay zone indicator 0b10: Rx relay zone indicator 0b11: Reserved
Reserved	~~2~~1 bit~~s~~	Shall be zero
} else {		
Boosting	3 bits	000: normal (not boosted); 001: +6dB; 010: -6dB; 011: +9dB; 100: +3dB; 101: -3dB; 110: -9dB; 111: -12dB;
}		
No. OFDMA triple symbol	5 bits	Number of OFDMA symbols is given in multiples

		of 3 symbols
No. Subchannels	6 bits	
} else {		
Subchannel offset	6 bits	
If(DIUC == 13) {	-	-
Relay zone indicator	~~1~~2 bits	0b00: Normal ~~G~~gap/PAPR/safety zone 0b01: Tx ~~R~~relay zone indicator 0b10: Rx relay zone indicator 0b11: Reserved
Reserved	~~2~~1 bit~~s~~	Shall be zero
} else {		
Boosting	3 bits	000: normal (not boosted); 001: +6dB; 010: -6dB; 011: +9dB; 100: +3dB; 101: -3dB; 110: -9dB; 111: -12dB;
}		
No. OFDMA Symbols	7 bits	
No. Subchannels	6 bits	
}		
Repetition Coding Indication	2 bits	0b00 – No repetition coding 0b01 – Repetition coding of 2 used 0b10 – Repetition coding of 4 used 0b11 – Repetition coding of 6 used
}		
}		