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| Title | MR_Code-REP header | |
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| Re: | IEEE 802.16j-07/013: “Call for Technical Comments Regarding IEEE Project 802.16j” | |
| Abstract | This contribution proposes a RNG-REP header | |
| Purpose | Text proposal for 802.16j Baseline Document | |
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# MR_Code-REP header

# Introduction

In IEEE 802.16j-026r3 section 6.3.6.8. "*Upon receiving an RS CMDA ranging code, the MR-BS shall respond by allocating uplink bandwidth to each RS along the relay path from the RS specified by the code for the purpose of forwarding an MR_Code-REP message containing information about the CDMA ranging code received from the SS. The MR-BS shall use the CMDA ranging code and transmit region information in the MR_Code-REP to create a CDMA_allocation_IE that allocates bandwidth on which the SS can forward a BW request header to the MR-BS.*"

MS CDMA BR ranging is expected to be used frequently in MR system. However, it takes 17 bytes (= 6-byte GMH + 7-byte MR_Code-REP message + 4-byte CRC) in the relay path to send one MR Code-REP message. We propose 6-byte MR_Code-REP header to replace the 17-byte MR_Code-REP message, and utilizing the same ranging code for forwarding the BW request header and the MR_Code-REP header since the size of both headers is the same (6 bytes).

The benefits of proposed MR_Code-REP header are as follows,

1. to conserve the bandwidth in the relay path,
2. to reduce the number of dedicated BR ranging codes from four to three.

The MR_Code-REP header (see Table 1) provides ranging attributes for MR-BS to generate CDMA Allocation IE (see Table 2).

Table 1 Description of fields in RNG-REP header

| Name | Length | Description |
|---|---|---|
| HT | 1 bit | = 1 |
| EC | 1 bit | = 1 |
| Type | 1 bit | = 1 |
| Extended Type | 3 bits | = 3 |
| **Frame Number Index** | **4 bits** | **LSBs of relevant frame number** |
| **Ranging Code** | **8 bits** | **Indicates the CDMA Code sent by the RS/MS.** |
| **Ranging Symbol** | **7 bits** | **Indicates the OFDMA symbol used by the RS/MS.** |
| **Ranging subchannel** | **7 bits** | **Identifies the Ranging subchannel used by the RS/MS.** |
| RS CID | 8 bits | Reduced basic CID of RS |
| HCS | 8 bits | Header Check Sequence (same usage as HCS entry in Table 5). |

Table 2 CDMA_Allocation_IE()

| Syntax | Size | Note |
|---|---|---|
| CDMA_Allocation_IE () { | | |
| Duration | 6 bits | |
| UIUC | 4 bits | UIUC for transmission |
| Repetition Coding Indication | 2 bits | 0b00: No repetition coding<br>0b01: Repetition coding of 2 used<br>0b10: Repetition coding of 4 used<br>0b11: Repetition coding of 6 used |

| | | |
|---|---|---|
| **Frame Number Index** | **4 bits** | **LSBs of relevant frame number** |
| **Ranging Code** | **8 bits** | |
| **Ranging Symbol** | **8 bits** | |
| **Ranging subchannel** | **7 bits** | |
| BW request mandatory | 1 bits | 1: Yes; 0: No |
| } | | |

In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026r3 are listed below.

# Text Proposal

6.3.2.1.2.2.2 Extended MAC Signaling Header Type II

*[Change the following table in page 6 as indicated]*

Table X-1 Extended Type field encodings for Extended MAC signaling header type II

| Extended Type field | MAC header Type | Reference figure | Reference table |
|---|---|---|---|
| 0 | RS BR header | XX | XX |
| 1 | RS UL_DCH Request Header | | |
| 2 | MR_Code-REP Header | Figure xxx | Table xxx |
| 32-7 | Reserved | | |

*[Insert the following subclause 6.3.2.1.2.2.2.3:]*

6.3.2.1.2.2.2.3 MR_Code-REP Header

MR_Code-REP header is used by RS to notify the MR-BS that it has successfully received CDMA ranging codes. The MR_Code-REP header is illustrated in Figure xxx and Table xxx.

Figure xxx MR_Code-REP Header Format

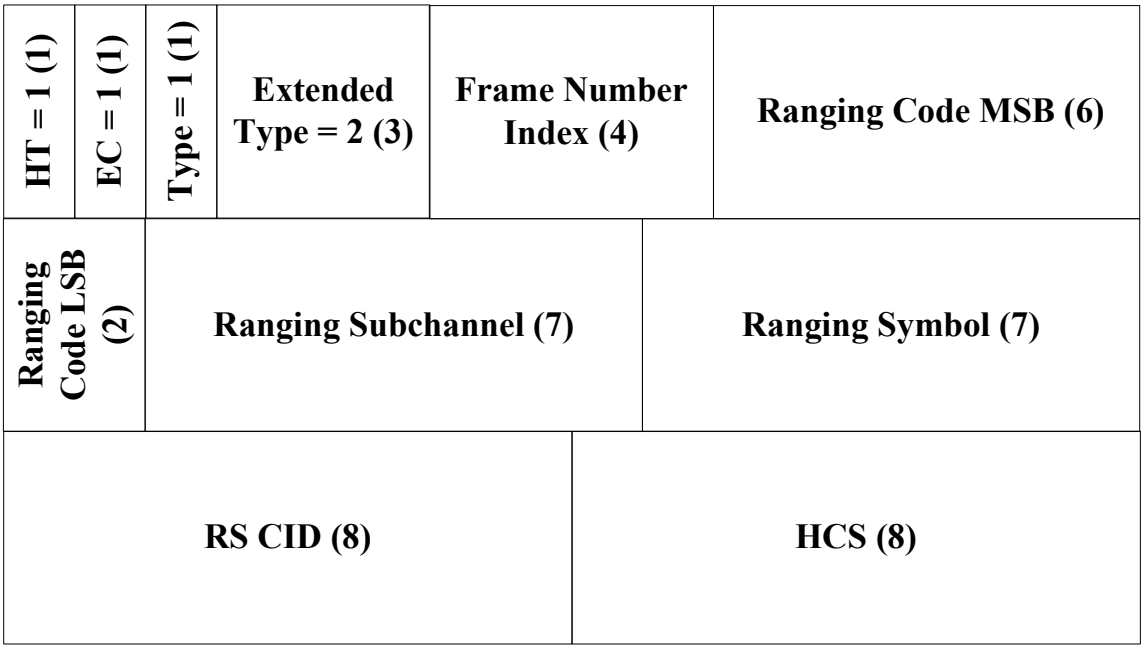


Table xxx Description of fields in MR_Code-REP header

| Name | Length | Description |
|---|---|---|
| Frame Number Index | 4 bits | LSBs of relevant frame number |
| Ranging Code | 8 bits | Indicates the CDMA Code sent by the RS/MS. |
| Ranging Symbol | 7 bits | Indicates the OFDMA symbol used by the RS/MS. |
| Ranging subchannel | 7 bits | Identifies the Ranging subchannel used by the RS/MS. |
| RS CID | 8 bits | Reduced basic CID of RS |
| HCS | 8 bits | Header Check Sequence (same usage as HCS entry in Table 5). |

*[Delete the following subclaus 6.3.2.3.64 in page24 as indicated]*

~~6.3.2.3.64 MR_Code-REP message~~

6.3.6.8 Bandwidth request and allocation mechanisms for MR

*[Change the following text in page 52as indicated]*

Upon receiving an RS CMDA ranging code, the MR-BS shall respond by allocating uplink bandwidth to each RS along the relay path from the RS specified by the code for the purpose of forwarding an MR_Code- REP ~~message~~ header containing information about the CDMA ranging code received from the SS. The MR-BS shall use the CMDA ranging code and transmit region information in the MR_Code-REP header to create a CDMA_allocation_IE that allocates bandwidth on which the SS can forward a BW request header to the MR-BS. Please see the figure <XXX>.

6.3.10.3.5 Ranging in relay networks with centralized bandwidth allocation

*[Change the following text in page 78 as indicated:]*

~~2) Indicate that the RS needs a BW allocation on the relay uplinks along the path to the MR-BS on which to transmit a BW request message.~~

~~4~~2) Indicate that the RS needs BW allocations on the relay uplinks along the path to the MR-BS on which to forward a ~~BW request~~ 6-byte header.

*[Delete the following subclaus 11.X in page 122 as indicated]*

~~11.X MR Code Report management message encodings~~