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Title	MS Periodic Ranging with Transparent RS	
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Re:	IEEE 802.16j-06/034: "Call for Technical Proposals regarding IEEE Project P802.16j"	
Abstract	This contribution proposes procedures for MS periodic ranging with transparent RS	
Purpose	Text proposal for 802.16j Baseline Document	
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MS Periodic Ranging with Transparent RS

Introduction

This contribution describes MS periodic ranging with transparent RS under centralized scheduling scheme. In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026r1 are listed below.

Text Proposal

6.3.10 Ranging

6.3.10.3 OFDMA based ranging

6.3.10.3.4 Relaying support for OFDMA based ranging

6.3.10.3.4.3 MS periodic ranging and automatic adjustments with transparent RS

The periodic ranging process shall begin by sending a periodic-ranging CDMA codes on the UL allocation dedicated for that purpose.

The code may be received by the MR-BS and RSs near the MS. RSs receiving the code shall transmit a RLY_RC-REP message to the serving MR-BS through the relay path. The RLY_RC-REP message is defined in xxx. When RS receives multiple codes in the ranging subchannel of a frame, the RLY_RC-REP message sent by the RS to serving MR-BS may contain information of multiple received codes.

When the MR-BS receives ranging code, it shall wait for RLY_RC-REP message from its subordinate RSs for T48 timer. Once T48 timer expired, the MR-BS could compare the measured signal information at each access station to decide adjustment information for RNG-RSP. Algorithms to decide adjustment information are out of scope of this specification. Afterward, the MR-BS shall transmit an RNG-RSP to the MS directly.

The message sequence charts (Table xxx) and flow charts (Figure xxx and Figure yyy) define the ranging and adjustment process that shall be followed by compliant RSs and MR-BSs.

Table xxx – RLY-BST message format

<u>Syntax</u>	<u>Size</u>	<u>Notes</u>
<u>RLY-BST Message Format(){</u>		
<u>Management Message Type = xx</u>	<u>8 bits</u>	
<u>Encoded Information</u>	<u>variable</u>	<u>TBD</u>
<u>}</u>		

Table xxx – RLY_RC-REP message format

<u>Syntax</u>	<u>Size</u>	<u>Notes</u>
<u>RLY_RC-REP Message Format(){</u>		

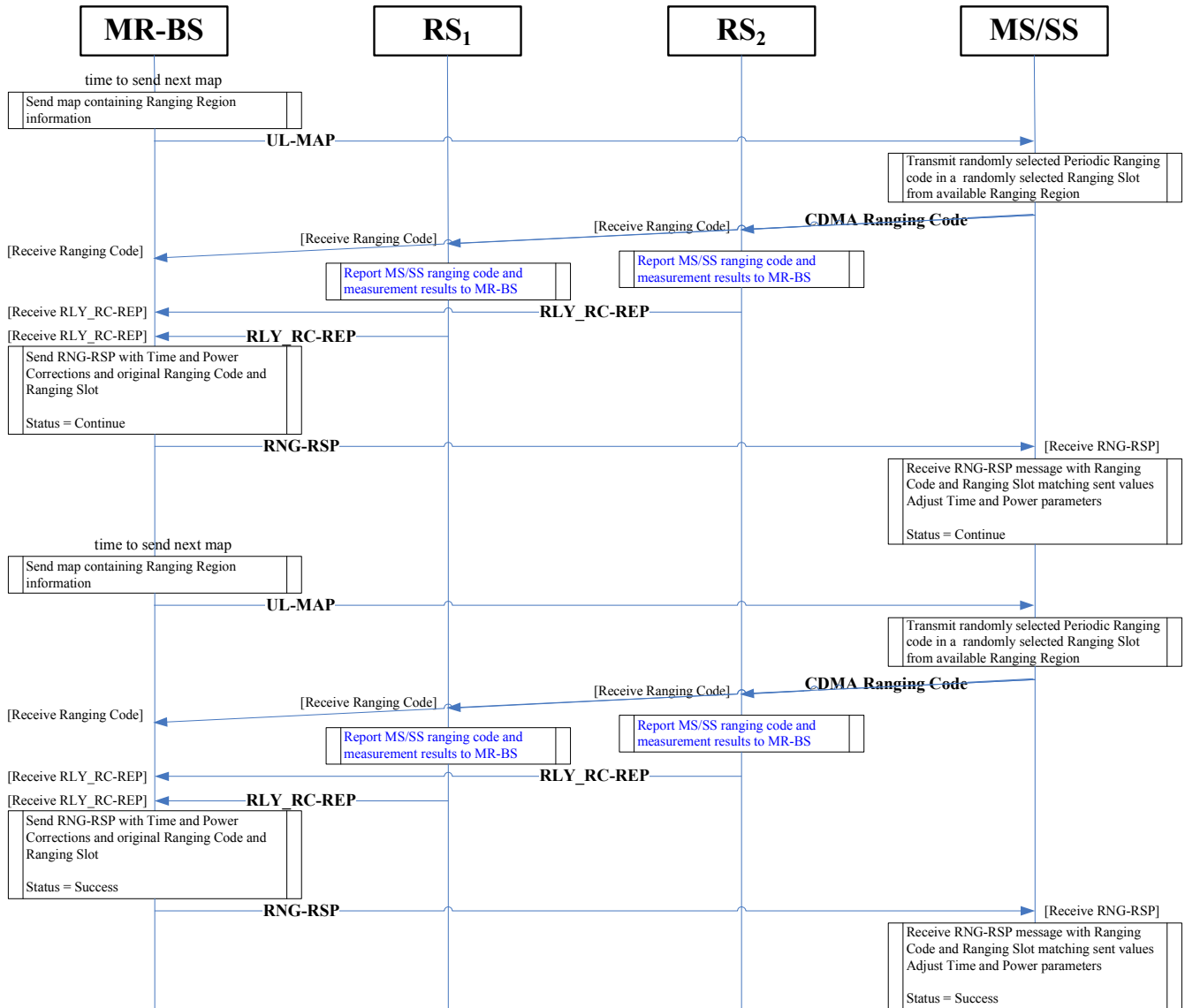
<u>Management Message Type = xx</u>	<u>8 bits</u>	
<u>TLV Encoded Information</u>	<u>variable</u>	<u>TLV specific</u>
<u>↓</u>		

Table xxx – RLY RC-REP message encodings

	<u>Type</u> (1 byte)	<u>Length</u>	<u>Value</u> (Variable-length)	<u>PHY</u> <u>Scope</u>
<u>Timing Adjust</u>	<u>TBA</u>	<u>4</u>	<u>Tx timing offset adjustment (signed 32-bit). The amount of time required to adjust MS transmission so the bursts will arrive at the expected time instance at the RS. Units are PHY specific (see 10.3). The SS shall advance its burst transmission time if the value is negative and delay its burst transmission if the value is positive.</u>	<u>OFDMA</u>
<u>Power Level Adjust</u>	<u>TBA</u>	<u>1</u>	<u>Tx Power offset adjustment (signed 8-bit, 0.25 dB units). Specifies the relative change in transmission power level that the MS is to make in order that transmissions arrive at the RS at the desired power. When subchannelization is employed, the subscriber shall interpret the power offset adjustment as a required change to the transmitted power density.</u>	<u>OFDMA</u>
<u>Offset Frequency Adjust</u>	<u>TBA</u>	<u>4</u>	<u>Tx frequency offset adjustment (signed 32-bit, Hz units). Specifies the relative change in transmission frequency that the MS is to make in order to better match the RS. (This is fine-frequency adjustment within a channel, not reassignment to a different channel.). The MS shall increase its transmit frequency if the value is positive and decrease its transmit frequency if the value is negative.</u>	<u>OFDMA</u>
<u>Ranging Status</u>	<u>TBA</u>	<u>1</u>	<u>Used to indicate whether uplink messages are received within acceptable limits by RS. 1 = continue, 2 = abort, 3 = success</u>	<u>OFDMA</u>
<u>Received Ranging Code Attributes</u>	<u>TBA</u>	<u>4</u>	<u>Bits 31:22 – Used to indicate the OFDM time symbol reference that was used to transmit the ranging code. Bits 21:16 – Used to indicate the OFDMA subchannel reference that was used to transmit the ranging code. Bits 15:8 – Used to indicate the ranging code index that was sent by the MS.</u>	<u>OFDMA</u>

			<u>Bits 7:0 – The 8 least significant bits of the frame number of the OFDMA frame where the MS sent the ranging code.</u>	
<u>MS CINR mean</u>	<u>TBA</u>	<u>1</u>	<u>The MS CINR mean parameter indicates the CINR measured by the RS from the MS. The value shall be interpreted as a signed byte with units of (TBD) dB. The measurement shall be performed on the CDMA ranging signal sent by the MS and averaged over the measurement period.</u>	<u>OFDMA</u>
<u>MS RSSI mean</u>	<u>TBA</u>	<u>1</u>	<u>The MS RSSI mean parameter indicates the Received Signal Strength measured by the RS from the MS. The value shall be interpreted as an unsigned byte with units of (TBD) dB, such that 0x00 is interpreted as (TBD) dBm, an RS shall be able to report values in the range (TBD) dBm to (TBD) dBm. The measurement shall be performed on the CDMA ranging signal sent by the MS and averaged over the measurement period</u>	<u>OFDMA</u>

Table xxx: Ranging and automatic adjustment procedure in transparent RS systems



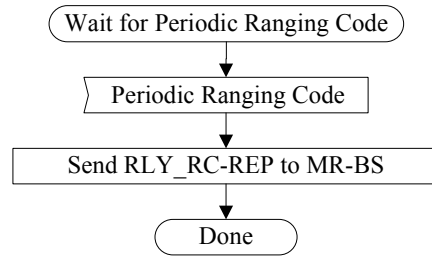


Figure xxx MS CDMA Periodic Ranging – Transparent Access RS

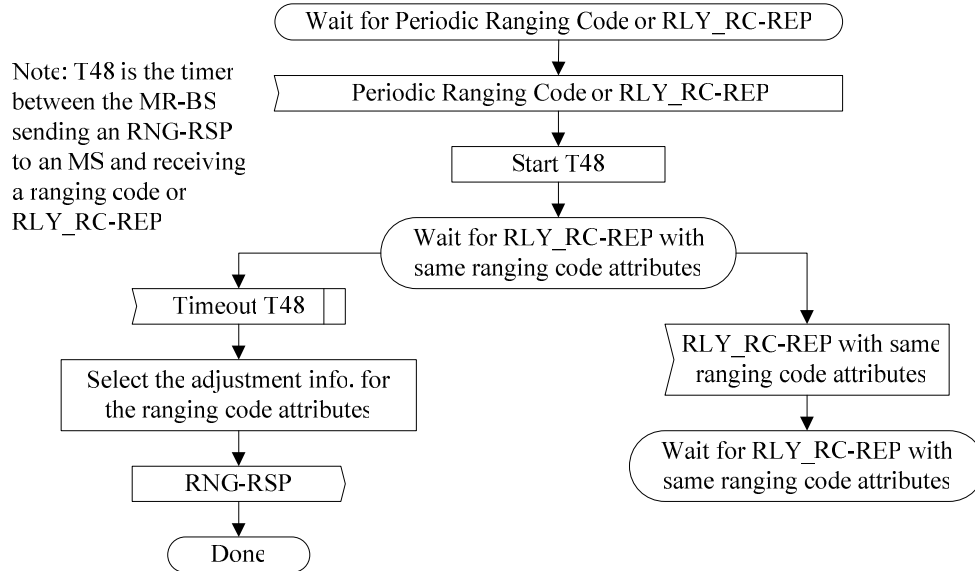


Figure yyy MS CDMA Periodic Ranging with Transparent RS– MR-BS