

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	MS Periodic Ranging in Transparent RS System	
Date	2006-03-05	
Submitted		
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Re:	IEEE 802.16j-07/007r2: "Call for Technical Comments and Contributions regarding IEEE Project 802.16j"	
Abstract	This contribution proposes procedures for MS periodic ranging in transparent RS	
Purpose	Text proposal for 802.16j Baseline Document	
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MS Periodic Ranging in Transparent RS System

Introduction

This contribution describes MS periodic ranging in transparent RS system. In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026r2 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

6.3.10.3.4.1 MS periodic ranging and automatic adjustments in transparent RS systems

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 RNG-REQ message with the RS basic CID to the serving MR-BS through the relay path. When RS receives multiple codes in the ranging subchannel of a frame, the RNG-REQ 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 RNG-REQ message containing the same ranging code attribute 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 364 and 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: Ranging and automatic adjustment procedure in transparent RS systems

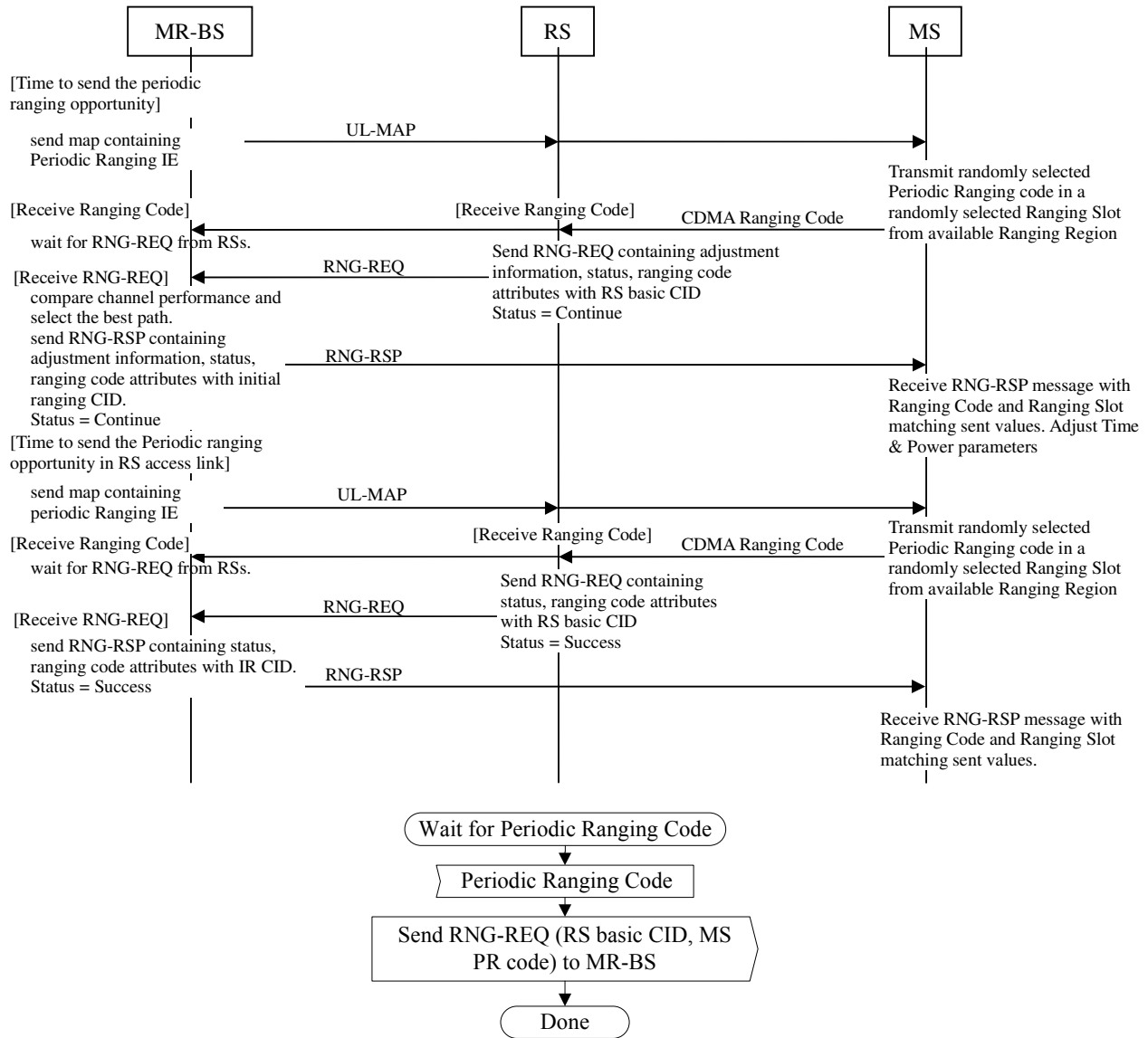


Figure xxx MS CDMA-based periodic ranging in transparent RS systems – Access Transparent RS

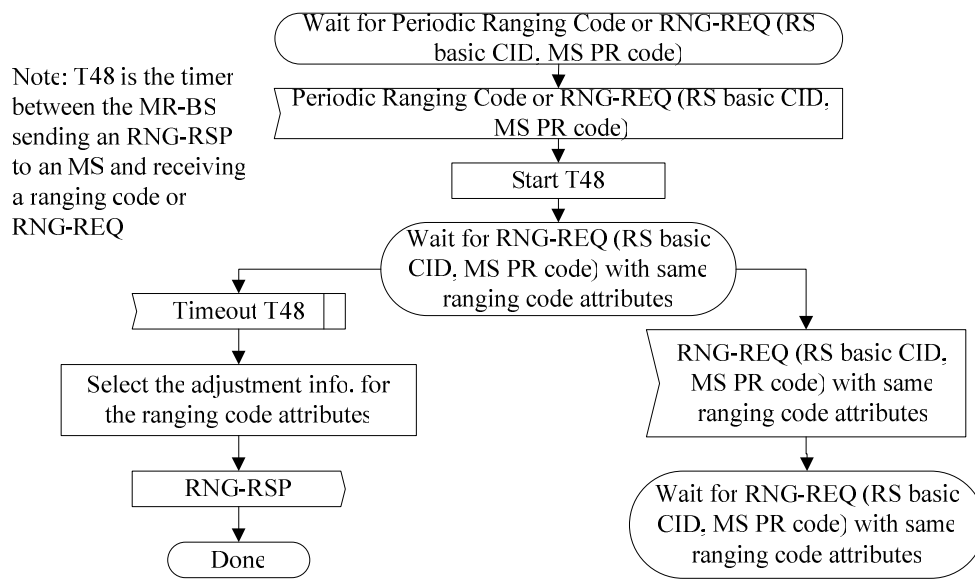


Figure yyy MS CDMA-based periodic ranging in transparent RS systems – MR-BS

Insert the following rows into Table 364 at 11.5 RNG-REQ TLV:

Table 364—RNG-REQ message encodings

System	Name	Time reference	Minimum value	Default value	Maximum value
MR-BS	T48	Wait for RNG-REQ from the subordinate RS	tbd	tbd	

Insert the following rows into Table 364 at 11.5 RNG-REQ TLV:

Table 364—RNG-REQ message encodings

Name	Type (1 byte)	Length	Value (variable-length)	PHY Scope
Received Ranging Codes	TBA	Variable	Received Ranging Codes is a compound TLV value that indicates received code information.	OFDMA
Timing Adjust	TBA.1	4	Tx timing offset adjustment (signed 32-bit). The amount of time required to adjust SS transmission so the bursts will arrive at the expected time instance at the BS. Units are PHY specific (see 10.3).	OFDMA
Power Level Adjust	TBA.2	1	Tx Power offset adjustment (signed 8-bit, 0.25 dB units). Specifies the relative change in transmission power level that the SS is to make in order that transmissions arrive at the BS at the desired power. When subchannelization is employed, the subscriber shall interpret the power offset adjustment as a required change	OFDMA

			<u>to the transmitted power density.</u>	
<u>Offset Frequency Adjust</u>	<u>TBA.3</u>	<u>4</u>	<u>Tx frequency offset adjustment (signed 32-bit, Hz units). Specifies the relative change in transmission frequency that the SS is to make in order to better match the BS. (This is fine-frequency adjustment within a channel, not reassignment to a different channel.)</u>	<u>OFDMA</u>
<u>Ranging Status</u>	<u>TBA.4</u>	<u>1</u>	<u>Used to indicate whether uplink messages are received within acceptable limits by BS. 1 = continue, 2 = abort, 3 = success</u>	<u>OFDMA</u>
<u>Ranging code attributes</u>	<u>TBA.5</u>	<u>4</u>	<u>Bits 31:22 – Used to indicate the OFDM time symbol reference that was used to transmit the ranging code.</u> <u>Bits 21:16 – Used to indicate the OFDMA subchannel reference that was used to transmit the ranging code.</u> <u>Bits 15:8 – Used to indicate the ranging code index that was sent by the SS.</u> <u>Bits 7:0 – The 8 least significant bits of the frame number of the OFDMA frame where the SS sent the ranging code.</u>	<u>OFDMA</u>
<u>Channel Measurement Information</u>	<u>TBA.6</u>	<u>TBA</u>	<u>TBD</u>	