Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	**Clarification on relay function for HR-MS over IEEE 802.16.1a**	
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Re:	"IEEE 802.16-12-0142," in response to Letter Ballot #38 on P802.16.1a/D1	
Abstract	Multimode operation on GRIDMAN Draft Standard	
Purpose	To discuss and adopt the proposed text in the draft amendment document on GRIDMAN	
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Clarification on relay function for HR-MS over IEEE 802.16.1a

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1. Introduction

This document provides clarification on the multimode operation of HR-MS maintaining relay link.

2. References

[1] IEEE 802.16-12-0132, GRIDMAN System Requirement Document including SARM annex, January 2012.
[2] IEEE P802.16n[TM]/D1, Air Interface for Broadband Wireless Access Systems - Draft Amendment: Higher Reliability Networks, February 2012.
[3] IEEE P802.16.1a[TM]/D1, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, February 2012.
[4] EEE P802.16Rev3/D4, IEEE Draft Standard for Local and metropolitan area networks; Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems," February 2012.
[5] IEEE P802.16.1[TM]/D4, IEEE Draft for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, February 2012.

3. Proposed Text on the IEEE 802.16.1a Amendment Draft Standard

[------------------------------------Start of Text Proposal---]

[*Remedy1: Change 6.12.1.2.1 Relay link establishment in page 103 on P802.16.1a/D1 as follows:*]

6.12.1.2.1 Relay link establishment

To support relay function for HR-MS, HR-MS capable of relay function shall establish relay link with HR-BS.

An HR-MS acting as HR-RS is operated in either TTR mode or STR mode and its relay mode is determined by HR-BS.

To request subordinate HR-MS to change its role as HR-RS, HR-BS transmits AAI-MM-RS-REQ message described in 6.2.3.65.2 including relay mode (i.e., either TTR or STR mode).

In response to AAI-MM-RS-REQ, the HR-MS transmits AAI-MM-RS-RSP message described in 6.2.3.65.3.

To establish relay link with an HR-BS, HR-MS having a role as HR-RS transmits AAI-MM-RS-REQ message described in 6.2.3.65.2 including relay mode, i.e., either TTR or STR mode. In response to AAI-MM-RS-REQ, the serving HR-BS transmits MM-RS-RSP message described in 6.2.3.65.3 to inform whether the request is accepted or rejected. Upon receiving the AAI-MM-RS-RSP message, the HR-MS starts establishing the relay link with serving HR-BS immediately or retransmits AAI-MM-RS-REQ message at the action time expires. If the serving HR-BS rejects the request, the serving HR-BS informs the HR-MS the rejection of the request. Upon receiving the AAI-MM-RS-RSP message with rejection information, the HR-MS either tries to establish relay link with another HR-BS or follows base station function described in 6.12.1.3.

During establishing relay link, HR-BS transmits AAI-ARS-CONFIG-CMD message described in 6.2.3.57 to configure PHY layer parameter set including superframe number indicating the time to start acting as HR-RS.

To support handover as a part of robustness against SPOF as described in 6.12.7.2, an indication of whether MAC context information of the subordinate HR-MS is being shared by infrastructure stations shall be transmitted to HR-MS.

[*Remedy2: Change 6.12.1.2.4 Relay link release in page 104 on P802.16.1a/D1 as follows:*]

16.1.2.4 Relay link release

An HR-MS acting as RS may end its relay service and remove the relay link from the HR-BS. During the HR-MS' relay mode release process, all subordinate HR-MSs of the HR-MS acting as RS shall be transferred to another infrastructure station prior to HR-MS' relay mode release. The HR-MS acting as RS sets Cell Bar bit to 1 in order to prevent HR-MS (re)entry and transmits AAI-MM-ADV message to transfer all subordinate HR-MSs to another infrastructure station. An HR-MS acting as RS may transmit an AAI-MM-RL-REQ message described in 6.2.3.65.4 in UL relay zone to an HR-BS so that it initiates the release procedure and requests handover of all its subordinate HR-MSs. Upon receiving the AAI-MM-RL-REQ message, the HR-BS decides whether it allows the HR-MS' relay mode release. If the request is accepted, the HR-BS may transmit the AAI-MM-RL-RSP message described in 6.2.3.65.5 in DL relay zone to inform the acceptance and start BS-initiated handover process for the requested HR-MSs. After handover procedures between the HR-BS and HR-MS acting as RS' subordinate HR-MSs are completed, the HR-BS informs the HR-MS acting as RS that handover is completed by transmitting an AAI-MM-RL-RSP message in DL relay zone. Upon receiving the AAI-MM-RL-RSP message, the HR-MS acting as RS starts relay mode release process immediately or at action time expires. If the HR-BS rejects the request, the HR-BS informs the HR-MS acting as RS the rejection of the request by transmitting the AAI-MM-RL-RSP message in DL relay zone. Upon receiving the AAI-MM-RL-RSP message with rejection information, the HR-MS acting as RS continues

operating in relay mode. After action time expires, the HR-MS acting as RS retransmits an AAI-MM-RL-REQ message in UL relay zone to the HR-BS.

The mode release process may be initiated by an HR-BS through transmitting an unsolicited AAI-MM-RL-RSP message in DL relay zone.

After mode release process, all the relay-related connections and resource are released between the HR-BS and the HR-MS.

If the HR-MS receives the request of relay link release from the serving HR-BS, the HR-BS either tries to establish relay link with another HR-BS as described in 6.12.1.2.1 or follows base station function described in 6.12.1.3.

[----------------------------------End of Text Proposal---]