Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Clarification on power control for HR-MS to HR-MS direct communication over IEEE 802.16.1a**
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Re:	"IEEE 802.16-12-400-00-Gdoc," in response to Letter Ballot Recirc #38b on P802.16.1a/D3
Abstract	Comments on power control for HR-MS to HR-MS direct communication in GRIDMAN Draft Standard
Purpose	To discuss and adopt the proposed text in the draft amendment document on GRIDMAN
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Clarification on power control for HR-MS to HR-MS direct communication over IEEE 802.16.1a

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1. Introduction

This document provides clarification on the power control under HR-MS to HR-MS direct communication over IEEE 802.16.1a focusing on the removing unnecessary sentence and fixing typos.

2. References

[1] IEEE 802.16-12-0132-00, GRIDMAN System Requirement Document including SARM annex, January 2012.
[2] IEEE P802.16n^{TM}/D3, Air Interface for Broadband Wireless Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.
[3] IEEE P802.16.1a^{TM}/D3, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.
[4] EEE P802.16Rev3/D6, IEEE Draft Standard for Local and metropolitan area networks; Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems," April 2012.
[5] IEEE P802.16.1^{TM}/D6, IEEE Draft for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, April 2012.

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

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

[Remedy: change section 6.12.2.2.2.3 (line #4, page 129 to line#13, page 131) in P802.16.1a/D3 as follows:]

6.12.2.2.2.3 Power control for mobile to mobile communications

6.12.2.2.2.3.1 Power control for at least one HR-MS associated with an HR-BS

The transmission power of a forwarding HR-MS transmitting data or control channels to another HR-MS is controlled by ~~messages from the receiving HR-MS that are derived from~~ HR-BS ~~controls~~.

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~~The HR-BS signals power control parameters to all HR-MS with active links. HR-MS may be instructed by the HR-BS to estimate path loss between HR-MSs. The receiver of data generates offset controls that are based on constraints or parameters, signaled from HR-BS.~~

~~Cross link interference is handled by augmenting the PC to include SIR measured on crosslink resources. The same procedure is applied for BS-controlled FTN and BS-controlled direct communication.~~

Power control parameters that are generated by ~~the~~an HR-BS are sent directly to both ~~HR-MS~~HR-MSs provided both have a link to the HR-BS. When one of the ~~HR-MS~~HR-MSs does not have a link to the HR-BS, then ~~its~~ power control parameters are transmitted by an HR-MS associating the HR-BS directly to the HR-MS having no link to the HR-BS.~~signaled to the one that does. The associated HR-MS signals them to the forwarded HR-MS.~~

The operation of power control requires that measurements be performed by the forwarding and forwarded HR-MS.

6.12.2.2.2.3.1.1 Power control for control channels

Power control is performed as in 6.3.8.4.2 except as detailed in this section.

~~Power control for control channels transmitted between HR-MS:~~

~~SINRTarget parameters are the same as those used per AAI-OFDMA.~~ If the transmitting HR-MS is associated with the HR-BS then it receives them from HR-BS directly. If it is not**,** then the transmitting HR-MS shall receive them from the receiving HR-MS which in turn receives them from the HR-BS.

NI is generated by the transmitting HR-MS from an ~~IoT~~IOT_C value included in AAI-HR-PCC message described in 6.2.3.65.14 signaled to it from the receiving HR-MS.

~~Offset~~Offset_C is a correction term derived by the receiving HR-MS based on $Offset_{MIN\_FWD\_C}$ and $Offset_{MAX\_FWD\_C}$ constraints, which are included in AAI-SCD message described in 6.2.3.31, ~~signaled by the HR-BS on a modified AAI-SCD message~~ such that

$Offset_{MIN\_FWD\_C} \leq$ ~~Offset~~Offset_C $\leq Offset_{MAX\_FWD\_C}$.

A receiving ~~HR-BS~~HR-MS that is directly associated with the HR-BS receives $Offset_{MIN\_FWD\_C}$ and $Offset_{MAX\_FWD\_C}$ from it. A receiving ~~HR-BS~~HR-MS that is not directly associated with the HR-BS receives ~~it~~$Offset_{MIN\_FWD\_C}$ and $Offset_{MAX\_FWD\_C}$ from the ~~one~~HR-MS that is which in turn receives ~~it~~$Offset_{MIN\_FWD\_C}$ and $Offset_{MAX\_FWD\_C}$ from the HR-BS.

6.12.2.2.2.3.1.2 Power control for data channels

Power control is performed as in 6.3.8.4.3 except as detailed in this section.

Determination of target SINR follows a modified equation ~~292~~(303) as follows:

$$SINR_{Target} = 10\log_{10}\left[\max\left(10^{SINR_{MIN}(\text{dB})/10}, \gamma_{IoT} SIR_{DL} + \delta_{XL} SIR_{XL} - \alpha\right)\right] - 10\beta\log_{10}\left((TNS)\right)$$

Where the following descriptors included in AAI-SCD message are added and rest parameters are described in 6.3.8.4.1:

¾ δ_{XL} is a fairness parameters for interference to other MS-MS transmissions, and

¾ SIR_{XL} sent as DeltaXL_X is the linear ratio of the signal to interference power as received by the power controlled MS, measured on HR-MS preamble of the HR-MS it is transmitting to.

~~Power control of data channels transmitted to the HR-BS~~

~~This case is applicable to any HR-MS in DC or FTN states if it transmits any data channels to the HR-BS. Power is controlled as per AAI-OFDMA as modified by equation xxx where~~ SIR_{XL} ~~is calculated on the HR-MS preamble. All control parameters are sent as per AAI-OFDMA other than as defined below:~~

~~δ_{XL} is also sent by the HR-BS on AAI-SCD as DeltaXL_T.~~

~~Power control for data channels transmitted between HR-MS~~

~~Power control parameters in equation xxx are sent to the forwarding HR-MS in AAI-SCD message in .~~ ~~δ_{XL} is sent as DeltaXL_X.~~ If the transmitting HR-MS is associated with the HR-BS then it receives them from it directly. If it is not then the transmitting HR-MS shall receive them from the receiving HR-MS which in turn receives them from the HR-BS.

NI is generated by the transmitting HR-MS from an ~~IoT~~IOT_D value included in AAI-HR-PCC message described in 6.2.3.65.14 signaled to it from the receiving HR-MS.

~~*Offset*~~*Offset_D* is a correction term derived by the receiving HR-MS based on *Offset*$_{MIN\_FWD\_D}$ and *Offset*$_{MAX\_FWD\_D}$ constraints, which are included in AAI-SCD message described in 6.2.3.31, ~~signaled by the HR-BS on a modified AAI-SCD message~~ such that

Offset$_{MIN\_FWD\_D}$ ≤ ~~Offset~~Offset_D ≤ Offset$_{MAX\_FWD\_D}$.

A receiving ~~HR-BS~~HR-MS that is directly associated with the HR-BS receives ~~*Offset*$_{MIN\_FWD\_C}$~~*Offset*$_{MIN\_FWD\_D}$ and ~~*Offset*$_{MAX\_FWD\_C}$~~*Offset*$_{MAX\_FWD\_D}$ from it. A receiving ~~HR-BS~~HR-MS that is not directly associated with the HR-BS receives ~~it~~*Offset*$_{MIN\_FWD\_D}$ and *Offset*$_{MAX\_FWD\_D}$ from the ~~one~~HR-MS that is which in turn receives ~~it~~*Offset*$_{MIN\_FWD\_D}$ and *Offset*$_{MAX\_FWD\_D}$ from the HR-BS.

6.12.2.2.2.3.2 Forwarding of MAC messages to and from the HR-BS

A forwarding HR-MS shall forward power and measurement control and related messages from the HR-BS to the forwarded HR-MS and measurement results from the forwarded HR-MS to the HR-BS.

6.12.2.2.2.3.3 Measurements used for HR-MS power control

The HR-BS may request HR-MS that have a direct link to other HR-MS to perform the ~~following~~ measurements and report their results. ~~In addition the HR-BS may define conditions for event based reporting. The allowed conditions for event based reporting are the same as for the corresponding measurements performed on HR-BS signals.~~

Average CINR_C mean is the average CINR of an HR-MS with which the reporting HR-MS has a direct communication link;

RSSI_C mean is the received signal strength from the HR-MS.

BLER_C is the average BLER of a channel received from the HR-MS.

These measurements are requested and reported as described in 6.3.8.4.

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