Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	Report of the MAC-PHY Interface Ad Hoc Group Rev.1
Date Submitted	2001/09/10
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Re:	
Abstract	Report of the MAC-PHY Interface Ad Hoc Group activity between Sessions #14 and #15 of 802.16 Rev.1
Purpose	The document intended to be reviewed and approved by TG3 and TG4
Notice	
Release	
Patent Policy and Procedures	

Report of the MAC-PHY Interface Ad Hoc Group of 802.16

Vladimir Yanover, Ad Hoc Chair

10-Sep-2001

Changes comparatively to previous version appear in red:
1. Changed status of Single Carrier because of positive vote received
2. Added 2 comments by Tal that were missed in the process of collecting comments.

1. Summary

The following individuals have registered as Ad Hoc members

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Between sessions 11 votes were performed, 4 documents prepared. A wide agreement has been achieved for the TOC of the PHY dependent topics. OFDMA and OFDM parts were approved, SC part has been prepared and the vote for approval called (voting should be done at the Session #15)

2. The TOC of the Relevant Parts of the Document 802.16abc-01/01r1

The following TOC has been approved by more than 80% of Ad Hoc Group. Later some changes were done in the OFDMA part, which were justified by final voting on this topic.

---------- Start of the TOC

8.3.4 MAC Support of PHY Layers

8.3.4.1 Common

8.3.4.2 MAC Support of SC PHY Layer

8.3.4.2.1. Downlink and Uplink Operation
- 8.3.4.2.1.1 Mode A - Continuous Downlink
- 8.3.4.2.1.2 Mode B - Burst Downlink
- 8.3.4.2.1.3 Uplink

8.3.4.2.2 Multiplexing and Multiple Access Technique
- 8.3.4.2.2.1 Duplexing Technique
  - 8.3.4.2.2.1.1 Mode A: Continuous Downstream for FDD Systems
  - 8.3.4.2.2.1.2 Mode B: Burst Downstream for Burst FDD Systems
  - 8.3.4.2.2.1.3 Mode B: Burst Downstream for TDD Systems
- 8.3.4.2.2.2 Uplink Burst Subframe Structure
  - 8.3.4.3.2.2.2.1 Mode A and Mode B: Uplink Burst Profile Modes

8.3.4.2.3 PHY SAP Parameter Definitions
8.3.4.2.4 Downlink Physical Layer
- 8.3.4.2.4.1 Physical layer type (PHY type) encodings
- 8.3.4.2.4.2 Mode A: Continuous Downlink Transmission
- 8.3.4.2.4.3 Downlink Mode A: Message field definitions
- 8.3.4.2.4.4 Mode B: Burst Downlink Transmission

8.3.4.3 OFDM PHY Burst Definition and MAP Messages

8.3.4.3.1 Uplink Channel Descriptor (UCD) Message Parameters
8.3.4.3.2 Downlink Channel Descriptor (DCD) Message Parameters
8.3.4.3.3 Mini-slot Definition
8.3.4.3.4 Frame Structure
8.3.4.3.5 Preambles
8.3.4.3.6 FCH Burst and DL Frame prefix

8.3.4.3.7 MAP Message
8.3.4.3.7.1 Synchronization Field
8.3.4.3.7.2 DL MAP Information Element Format
8.3.4.3.7.3 UL MAP Information Element Format
8.3.4.3.7.4 DIUC Allocation
8.3.4.3.7.5 UIUC Allocation
8.3.4.3.7.6 MAP Relevance and Synchronization

8.3.4.4 OFDMA PHY Burst Definition and MAP Messages

8.3.4.4.1 OFDMA Basic parameters
8.3.4.4.1.1 OFDMA Slot Definition
8.3.4.4.1.2 Region and PHY Burst
8.3.4.4.2 OFDMA Frame Structure

3. Topics Supplied to Update the Document 802.16abc-01/01r1

The following documents have been prepared

Document's name	Approval Status	Supplier
Changes To Sec.6.2 and 8.3.4.1 Proposed by MAC-PHY Ad Ho Group	Approved	Jerry Krinock
MAC Support of SC PHY Layer	**Approved**	Subir Varma
OFDMA MAC-PHY Section Details	Approved by voting	Itzik Kitroser Yigal Leiba
OFDM MAC-PHY Interface 802.16abc-01/26	Approved by voting	Naftali Chayat, Tal Kaitz, Vladimir Yanover

For the Single Carrier topic a call for votes was issued 6-Sep-2001. The delay comparatively to other sections occurred because the initially submitted topic did not fit the agreed TOC.

Only two responses were submitted: (ABSTAIN and APPROVE) so the Chair ruled it to be approved.

The documents listed in the above table are attached to the report.

3.1. Non-resolved Comments

The following comments have been submitted but not resolved yet

3.1.1. Common Section, TOC

#	Submitter	Comment
1	Bob	timing
2	Itzik	Some agreement on terminology should be made between the SC/OFMA/OFDMA PHYs (Like min-slot, burst etc.)
3	Itzik	The OFDMA section should contain the same subsections as in the OFDM section
4	Lei	Comment: need discussion with the PHY groups to make sure 4*GI is not too coarse, for all the PHYs
5	Ofer	Itzik to clarify OFDMA response to the Mini slot definition, since this is a common issue
6	Yigal	Physical-slot definition is fixed to be 4 *sample-time
7	Itzik	I don't agree with the mini-slot definition in this document

3.1.2. Discussion on the Commonality of MAPs

#	Submitter	Comment
8	Bob	[Binding comment to the following vote: "DL-MAP messages for the different PHYs may differ in the format and meaning of Synchronization Field"] If there is a reason why the "common" format is unacceptable for use with a particular PHY, the issues can be presented for discussion and the appropriate changes brought up for a vote
9	Bob	[Binding comment for the Vote: "For UL-MAP the presence and meaning of the Allocation Start and Ack Time may be PHY dependent"] As with #2, document 17 covers the content of the fields. Presence of Allocation Start time was adopted by the MAC committee, but again, if it canbe demonstrated that there is no need for it in for a particular PHY, I don't see a problem with having a variance. The issue of Ack Time is MAC issue, not a PHY issue and needs to be addressed by the group

10	Jerry	Leave all MAP formats in the correspondent PHY-specific Sections and don't define the "common" formats or templates [Literally, Jerry wrote: "The attached Word file contains two tables I made which compare the DL-MAP and UL-MAP Message Formats proposed by each of the other three editors. I spent many hours studying these tables, and have come to the conclusion that it would be pointless, and only make the standard confusing to read, to try and show the "common" aspects of these. They have too little in common"]

3.1.3. SC Section

#	Submitter	Comment
11	Bob	Map compatibility section for single carrier is missing
12	Subir	Disregard the OFDMA sections in the document [their appearance was a result of an editorial mistake]

3.1.4. OFDM Section

#	Submitter	Comment
13	Itzik	The DL-MAP structure (not the MAP IEs) can be in OFDM as in the OFDMA case
14	Lei	Move both the sub-channel based allocation and sub-carrier based polling to OFDMA specific sections.
15	Yigal	Adopt the solution presented in the OFDMA document where the FCH becomes an integral part of the DL-MAP message
16	Itzik	The DL-MAP structure (not the MAP IEs) can be as in the OFDMA case
17	Mike Paff	The table covering both OFDM and OFDMA modes does not mention FFT-4096, which is an optional mode of OFDMA.

3.1.5. OFDMA Section

#	Submitter	Comment
18	Lei	Use DIUCs in the DL frame prefix, instead of defining a new Rate_ID
19	Lei	Specify the reference point for the sub-channel offsets in MAP messages.
20	Tal	The MAP-Prefix should be made at a well-known modulation. The prefix burst may contain elements from the MAP modulated and encoded at the well known rate. The solution of letting the SS try all 6 rate combination seems to cumbersome to me. There are too many synchronization steps.
21	Tal	It should be explained how the SS learns the beginning symbol

		of the DL MAP. Is the first symbol related somehow to the
22	Tal	The UL allocation start time is given in OFDMA symbols. In this case how is TDD supported with arbitrary tx-rx gap
23	Mike Paff	The table covering both OFDM and OFDMA modes does not mention FFT-4096, which is an optional mode of OFDMA.
24	Tal	It should stated explictly that the symbol mapping of that allocation is Frequency first, that is consequent symbols coming from the FEC are written first to all subchannles of same symbol and only then to the next symbol. The motivation for this approach is to save memory on the SS side. Because for the reception of OFDMA the SS needs to process only the FEC blocks that are allocated to this subscriber. This significantly reduces the amount of memory.
25	Tal	The allocations start time given in DL+UL map should not point to the same symbol of the MAP itself. That is if the map occurs between symbols n1 and n2, the first allocation should be in >= n2+1.

3.2. Comments Related to Another Parts of the 01/01r1 Document

#	Submitter	Comment
24	Lei	To consider Lei's contribution about MPDU formats
25	Jerry	See changes for the TOC of 6.2.7.7-8 and 6.2.7.13 suggested in the document "Changes To Sec. 6.2 and 8.3.4.1 Proposed by MAC-PHY Ad Ho Group"