Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**IEEE 802.16 Working Group Confirmation Ballot #7a Announcement**
Date Submitted	**2002-07-20**
Source(s)	Roger Marks NIST 325 Broadway Boulder, CO 80305 Voice: +1-303-497-3037 Fax: +1-303-497-3037 mailto:r.b.marks@ieee.org
Re:	IEEE 802.16-02/33r3 and IEEE P802.16a/D5-2002
Abstract	This document announces and details the procedure for IEEE 802.16 Confirmation Ballot #7a, a Recirculation of IEEE 802.16 Working Group Letter Ballot #7.
Purpose	To document the process of Confirmation Ballot #7a.
Notice	
Release	
Patent Policy and Procedures	

IEEE 802.16 Working Group Confirmation Ballot #7a Announcement

1. Introduction

This announcement opens IEEE 802.16's Confirmation Ballot #7a.

On the question: To accept the comment resolutions from Working Group Letter Ballot #7, as recorded in IEEE 802.16-02/33r3:

<http://ieee802.org/16/docs/02/80216-02_33r3.zip>

and to forward, for IEEE 802 LMSC Sponsor Ballot, IEEE P802.16a/D5-2002:

<http://ieee802.org/16/private/drafts/tga/P80216a_D5.zip>

Ballot opening date: **20 July 2002**

Ballot closing date: **4 August 2002** (anytime in the world).

Note: This ballot is being conducted under the procedure for conditional approval of the IEEE 802 Operating Rules <**http://ieee802.org/rules.pdf**>.

2. Procedure

2.1 Results of Letter Ballot #7

The **Results of Letter Ballot #7** are available at

http://ieee802.org/16/tga/ballot07/report7.html. The ballot passed, pending recirculation.

2.2 Previous Votes Carried Forward

If you cast a ballot in Letter Ballot #7 but do not participate in this confirmation ballot, your previous vote will be carried forward.

2.3 No Obligation of Working Group Members to Participate in Ballot

Working Group Members are not obliged to participate in this ballot, nor in any recirculation ballot. Participation or lack of participation will not affect Working Group Membership.

2.4 Scope of Ballot

The scope of the recirculation ballot includes only the Comments under Review and their resolutions.

The following "Technical, Binding" comments remain in the database following comment resolution: 008, 016, 017, 116, 134, 137, 145, 157, 159, 165, 166, 189, 191, 208, 244. In each case, the Working Group response to the comment is recorded in the database. The comments and their resolutions are attached to this announcement.

2.5 To submit a ballot with no comments

If you are a member of the Ballot Group (see **Results of Letter Ballot #7**) and wish to submit a ballot with no comments, you may send an email to **<mailto:ballot@wirelessman.org>** or **<mailto:r.b.marks@ieee.org>** with the following fields:

Subject: *802.16 Confirmation Ballot #7*

Body: ***choose one of the following only***

- *Approve with no comments*
- *Abstain for Lack of Technical Expertise*
- *Abstain for Lack of Time*

2.6 Disapprove Votes

Disapprove votes must include specific "Technical, Binding" comments on what must be done to the comment resolutions to change the vote to "Approve".

2.7 To submit a ballot with comments or to submit comments only

If you wish to submit a ballot with comments (with or without a vote), you must download the standalone program *Commentary* (version 1.5 or higher) and use it to prepare your vote and comments. Submission instructions are included. *Commentary* is available at:

http://ieee802.org/16/docs/Commentary

3. Working Group Letter Ballot Process

802 rules specify that "the decision to submit a draft standard or a revised standard to the Sponsor Ballot Group must be ratified by a letter ballot." The decision to carry out this confirmation ballot was made at the Closing Plenary of 802.16 Session #20.

3.1 Criteria for Approval

3.1.1 50% Return Rate

The required 50% return rate was met in Letter Ballot #7. There is no return rate requirement for a recirculation ballot.

3.1.2 75% Approval Rate

The ballot will not be considered successful unless approved by at least 75% of the ballot group members voting “Approve” or “Disapprove”.

3.1.3 Comment Resolution

The Working Group shall attempt to resolve all in-scope comments collected in the ballot process. All substantive technical changes, and all unresolved negative votes, together with the reasons of the negative voter and the rebuttal by the members conducting the resolution of the ballots, shall be subject to a recirculation ballot of at least fifteen days.

3.1.4 Failed Ballots

Should the approval rate be less than 75%, the Working Group shall nevertheless proceed with comment resolution and then offer “Disapprove” voters the opportunity to change their vote to “Approve”. Should this process result in a 75% or higher approval rate, the approval criterion in 3.1.2 shall be considered met.

Should this process fail to achieve the 75% approval rate, a new draft shall be prepared in accordance with the comment resolutions. A new Working Group Letter Ballot of the resulting draft shall be initiated by vote of the Working Group or at the discretion of the Working Group Chair.

3.2 Draft Availability

Following IEEE guidelines, the document under review is considered a Draft Standard. IEEE requires that Draft Standards carry the IEEE copyright notice and be restricted in distribution. As a result, the document has been posted on the 802.16 password-protected web site. Members and Observers shall not share the password. Other interested parties should see the URL:

http://ieee802.org/16/published.html

and contact the Chair <**mailto:r.b.marks@ieee.org**> with any questions.

3.3 Ballot Group

The Ballot Group for Recirculation Ballot #7 is provided in Annex A. It includes the 119 individuals who were Members of IEEE 802.16 as of the start of Letter Ballot #7. Except to remedy errors in the this membership list, the Ballot Group will not change through the course of Letter

Ballot #7, including its resulting recirculation ballots, even as the Working Group membership changes.

3.4 Participation by Individuals outside the Ballot Group

Individuals who are not Ballot Group members are not encouraged to submit ballot comments at this stage of the process.

3.5 Public Release of Individual Ballots

Detailed ballot results will be posted to the 802.16 Web Site.

4. Patent Policy and Procedures

Please take note of the IEEE 802.16 Patent Policy

<http://ieee802.org/16/ipr/patents/policy.html>.

Note that "anyone, whether participating in IEEE 802.16 or not, should notify the Chair of any patents (granted or under application, and regardless of the assignee or the patent nationality) that may cover technology that is under consideration by or has been approved by IEEE 802.16."

Annex A: Ballot Group

Agrawal, Aditya	An, Song	Antonello, Gordon
Arefi, Reza	Ariyavisitakul, S. Lek	Arrakoski, Jori
Audeh, Malik	Avivi, Eli	Baugh, C.R.
Belec, Yvon	Benyamin-Seeyar, Anader	Bushue, Carl
Buskila, Baruch	Chang, Yuankai	Chang, Dean
Chauncey, David	Chayat, Naftali	Chayer, Rémi
Chung, KiHo	Edmonston, Brian	Eidson, Brian
Eilts, Henry	Eklund, Carl	Erceg, Vinko
Freedman, Avraham	Garrett, Andrew	Garrison, G. Jack
Gieschen, Brian	Goldhammer, Marianna	Hadad, Zion
Hakim, Joseph	Harteneck, Moritz	Hebron, Yoav
Hunter, Wayne	Husson, David	Jackson, Du Wayne
Jacobsen, Eric	Jamali, Hamadi	Joo, Panyuh
Jorgensen, Jacob	Kaitz, Tal	Kasslin, Mika
Kelly, Phil	Kelman, Ofer	Kiernan, Brian
Kitroser, Itzik	Klein, Jay	Kolze, Thomas
Krinock, Jerome	Krishnamoorthy, Rajeev	Kwak, Joseph
Labs, Jonathan	Langley, John	Lee, Chin-Chen
Leiba, Yigal	Leng, Minfei	Levinson, Moshe
Lewis, Barry	Li, Xiaodong	Li, Lingjie
Liebetreu, John	Lindh, Lars	Lou, Hui-Ling
Lycklama, Heinz	Markarian, Garik	Marks, Roger
McKown, Russell	Meyer, Ronald	Middleton, Andrew
Mody, Apurva	Murias, Ronald	Nelson, Robert
Olszewski, Kim	Padan, Uzi	Paff, Mike
Patel, Manish	Peirce, Kenneth	Ponnuswamy, Subbu
Ran, Moshe	Reible, Stanley	Robinson, Gene
Rogers, Shane	Sarajedini, Amir	Sarca, Octavian
Sari, Hikmet	Satapathy, Durga	Scarpa, Carl
Schwartz, Randall	Segal, Yossi	Selea, Radu
Seller, Olivier	Shenhav, Chaim	Shirali, Chet
Simkins, James	Singh, Manoneet	Son, Jung Je
Sonander, Sean	Stanwood, Kenneth	Stewart, Michael
Struhsaker, Paul	Sydor, John	Taylor, Shawn
Tellado, Jose	Tiram-Regev, Ayelet	Trinkwon, David
van Waes, Nico	Varma, Subir	Wang, Arthur
Wang, Lei	Wang, Stanley	Watkins, Larry
Whitehead, Philip	Whiting, Robert	Wise, Curt
Yanover, Vladimir	Ye, Huanchun	Yu, Heejung
Zhang, Wenhan	Zyskowski, Paul	

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 008 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 19 **Starting Line #** 27 **Fig/Table#** 145 **Section** 1.2.4

FDD should be mandatory in the license-exempt bands

Suggested Remedy

add FDD to the license exempt bands

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

FDD introduces additional interference considerations for license-exempt bands for which there is no appropriate DFS or other mitigation mechanism currently defined in this standard.
Adding FDD to license-exempt bands will severely complicate, if not totally prevent, co-existence with 802.11a.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 016 **Comment submitted by:** Nico van Waes Member

Comment Type Technical, Binding **Starting Page #** 19 **Starting Line #** 52 **Fig/Table#** **Section** 1.2.4

Resolve license-exempt compatibility problems

Suggested Remedy

page 19, line 52:
Explain what "may comply" means in this context. I.e., what's the impact of the PHY being optional.
Or else delete the option.

page 44, line 40:
Explain how this works between the optional and mandatory PHY, or else insert:
The DRFM message shall be broadcasted using the mandatory PHY. The maximum allowed period between two DRFM messages shall be 2 minutes.

page 102, line 13:
Explain how one does this detection between the mandatory and the optional PHY.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

insert page 44 line 40:
The DRFM message shall be broadcasted using the mandatory PHY.
vote: in favor 7
against 7

insert page 44 line 40:
The maximum allowed period between two DRFM messages shall be 2 minutes.
vote: in favor 8
against 0

insert page 102 line 13:
"using the same PHY"
vote: in favor 14
against 0

replace page 19 line 52
"its ... 8.3.3" with "OFDM PHY as defined in 8.3.2 or the OFDMA PHY as defined in 8.3.3"
vote: in favor: 10
against: 7

Reason for Group's Decision/Resolution

The DRFM method is not required for co-existence between 802.16 license-exempt systems using different PHYs. However, DRFM is useful to facilitate co-existence between 802.16 systems using the same PHY.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 017 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 19 **Starting Line #** 54 **Fig/Table#** **Section** 1.2.4

"The system shall only support TDD operation." --- This is unnecessarily restrictive.

Suggested Remedy

FDD should be mandatory in the license-exempt bands. TDD should not be mandatory.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

FDD introduces additional interference considerations for license-exempt bands for which there is no appropriate DFS or other mitigation mechanism currently defined in this standard.
Adding FDD to license-exempt bands will severely complicate, if not totally prevent, co-existence with 802.11a.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 116 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 88 **Starting Line #** 58 **Fig/Table#** **Section** 6.2.7.7.4

an AAS SS may synchronize to a DL but fail to obtain parameters owing to lack of trained antenna system at BS. the only proposed alternative is for the SS to attempt initial ranging on the AAS-alert-slots. "the SS shall use all available contention slots, in order to allow the BS adaptive array enough time and processing gain..."

a more efficient solution should be sought and is available.

Suggested Remedy

provide narrowband channels for AAS-alert-slots... slice the frequency domain "thin" ... this will provide higher SNR for the detection and processing, and thus reduce the amount of time needed to train, and will allow multiple contention opportunities in the frequency domain. the idea is to "show" the BS the direction of the SS, and this mode should be provided for this important part of the system operation.

the robust narrow channels have other uses, too, and thus provide multiple benefits.

note that with frequency selective fading, hopping among the frequency domain contention bands from attempt to attempt will eventually provide a good band.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

vote: in favor 1
against 11

Reason for Group's Decision/Resolution

1) no specific text provided
2) sufficient processing gain exists in the preambles of each PHY
3) lack of support

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 134 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 109 **Starting Line #** 49 **Fig/Table#** **Section** 8.3.2.1.2.1

allowing NO byte interleaving as a possible transmission mode is very poor

Suggested Remedy

some interleaving should be mandatory in the downstream concatenated FEC

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

vote: 1 in favor
7 against

Reason for Group's Decision/Resolution

1) Multiple adaptive modulation types must be supported in a single 802.16 MAC frame.
2) Interleavers cannot span modulation types. This greatly reduces the length of an interleaver that could be used---and therefore its interleaver gain.
3) In a University of Hawaii study, median IP packet sizes were found to be 300 bytes. A single RS codeword contains 239 bytes. Use of an interleaver may not buy much (other than hardware expense) for the median case.
4) Sending large packets (to individual users) over a slowly fading NLOS channel may not be a capacity optimizing strategy. It may be better to send smaller packets. The interleaver can benefit LOS operation, where there is not fading. That's one of the reasons why we included the interleaver as an option.
5) Due to the block adaptive modulation requirement, a block (rather than convolutional) interleaver must be used.
This doubles the memory size of the interleaver implementation. So the interleaver is going to cost more.
6) Latency (such as that introduced by the interleaver) can reduce the benefits of ARQ.
7) Interleaver is available through negotiation (depending on support by SSs).
8) Usage of interleaving on DL makes HFDD difficult.
9) The FCH cannot be interleaved.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 137 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 110 **Starting Line #** 43 **Fig/Table#** **Section** 8.3.2.1.2.1.2

support for interleaving between the inner and outer codes is optional. there should be a mandatory minimum amount of interleaving provided.

Suggested Remedy

determine a minimum amount of interleaving to be provided. perhaps no interleaving is still an option, but at least make every SS and BS support a minimal amount of interleaving to mitigate some of the inner code burst errors.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

1) Multiple adaptive modulation types must be supported in a single 802.16 MAC frame.
2) Interleavers cannot span modulation types. This greatly reduces the length of an interleaver that could be used---and therefore its interleaver gain.
3) In a University of Hawaii study, median IP packet sizes were found to be 300 bytes. A single RS codeword contains 239 bytes. Use of an interleaver may not buy much (other than hardware expense) for the median case.
4) Sending large packets (to individual users) over a slowly fading NLOS channel may not be a capacity optimizing strategy. It may be better to send smaller packets. The interleaver can benefit LOS operation, where there is not fading. That's one of the reasons why we included the interleaver as an option.
5) Due to the block adaptive modulation requirement, a block (rather than convolutional) interleaver must be used.
This doubles the memory size of the interleaver implementation. So the interleaver is going to cost more.
6) Latency (such as that introduced by the interleaver) can reduce the benefits of ARQ.
7) Interleaver is available through negotiation (depending on support by SSs).
8) Usage of interleaving on DL makes HFDD difficult.
9) The FCH cannot be interleaved.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 145 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 128 **Starting Line #** 13 **Fig/Table#** **Section** 8.3.2.1.4.1

it is NOT acceptable to force an SS operating in FDD mode to have to use a burst DL.

Suggested Remedy

do not require SS in FDD mode to have to use a burst DL.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

vote: 1 in favor
8 against

Reason for Group's Decision/Resolution

1) Support of adaptive modulation is mandatory, even with FDD.
2) To support adaptive modulation, A DL frame begins with a preamble, followed by a Frame Control Header (which includes MAPs), and then TDM-ed payloads that are adaptively modulated in the order of decreasing robustness. The lower CINR SSs will not be able to track (using decision-assisted tracking) through the higher-order modulations at the end of a frame, and thus will generally lose demod lock. However, if they have a burst receiver, they may reacquire (using the preamble of the next frame).
3) In order to reduce the number of modes, we specifically decided that the burst mode is the mandatory mode. This does not preclude the continuous mode, which is a subset of the burst mode achieved by zero-padding.
4) Burst mode reduces interference in a multi-cell environment.
5) Burst mode is necessary to support STC and AAS.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 157 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 150 **Starting Line #** 47 **Fig/Table#** **Section** 8.3.2.4.1.2

this paragraph is inadequate for specifying phase noise. as one point, the phase noise is integrated up to 2 MHz, but symbol rates as high as almost 20 Msym/sec are anticipated. also, as a fine detail, there is no variation in phase noise performance as a function of carrier frequency, perhaps implying that higher cost is required at for the higher carrier freq SS and BS? a comment on this in this section... i.e., is the phase noise req independent of freq from 2 to 11 GHz... might be in order

Suggested Remedy

redo the phase noise specifications to cover frequency ranges of importance consistent with bandwidths and symbol rates to be used, and carrier frequencies of the spec.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

move 8.3.2.4.1 up to 8.3.2.4
change all "should"s within 8.3.2.4 to "shall" and remove any word "recommendation"
delete 8.3.2.4.1.2

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 159 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 151 **Starting Line #** 33 **Fig/Table#** **Section** 8.3.2.4.1.4

2% symbol period symbol variation could intorduce significant degradation at 64QAM, which is mandatory in the downstream, especially in severely distorted channels.

Suggested Remedy

develop a more reasonable fidelity specification.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Rejected**

vote: in favor 0
against 7

Reason for Group's Decision/Resolution

Known preambles occur every MAC frame of approx 5 ms, and additional training (pilot) symbols may also be added. This greatly assists channel estimation algorithms.
Recall that the stated 2% variation is specified over a 2 second period.
No data is provided to justify the claim that 2% is not adequate.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 165 **Comment submitted by:** Tom Kolze Member

Comment Type Technical, Binding **Starting Page #** 157 **Starting Line #** 1 **Fig/Table#** **Section** 8.3.3.2.2

In license-expemt bands only TDD shall be supported. This should be FDD, with TDD perhaps an option

Suggested Remedy

make FDD mandatory, with TDD an option (perhaps)

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

FDD introduces additional interference considerations for license-exempt bands for which there is no appropriate DFS or other mitigation mechanism currently defined in this standard.
Adding FDD to license-exempt bands will severely complicate, if not totally prevent, co-existence with 802.11a.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 166 **Comment submitted by:** Heinz Lycklama Member 2002/07/01

Comment Type Technical, Binding **Starting Page #** 157 **Starting Line #** 3 **Fig/Table#** **Section** 8.3.3.2.2

The 802.16a standard needs to support both FDD and TDD for the UNII License-Exempt bands. Support of FDD is necessary to make it possible to use both the 5.25 GHz and the 5.725 GHz bands using the same equipment. Chipsets exist today that support FDD in both Licensed and License-Exempt bands. See IEEE 802.16a Contribution C802.16a-02/71 for details.

Suggested Remedy

Change the first paragraph of Section 8.3.3.2.2 to read:
To provision bi-directional operation, the PHY shall support FDD, H-FDD or TDD.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

vote: 7 in favor, 9 against

Reason for Group's Decision/Resolution

FDD introduces additional interference considerations for license-exempt bands for which there is no appropriate DFS or other mitigation mechanism currently defined in this standard.
Adding FDD to license-exempt bands will severely complicate, if not totally prevent, co-existence with 802.11a.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 189 **Comment submitted by:** Nico van Waes Member

Comment Type Technical, Binding **Starting Page #** 175 **Starting Line #** 45 **Fig/Table#** 219 **Section** 8.3.3.2.12

There are too many frame durations, and some of the defined values are absurd.
The number of symbols that fit in a frame of the order of 2.5 ms is far too low to be efficient.

Suggested Remedy

For OFDM, change frame durations to:
round(4E-3 /Ts)*Ts s
round(5E-3 /Ts)*Ts s
round(8E-3 /Ts)*Ts s
round(10E-3 /Ts)*Ts s
round(16E-3 /Ts)*Ts s
round(20E-3 /Ts)*Ts s

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

motion: change minimum frame duration to 4 ms:
vote: in favor 9
against 7

motion: change maximum frame duration to 20 ms:
vote: in favor 11
opposed 6

motion: to modify Table 219 to add:
255 TDD framing: UIUC= 14 in UL-MAP plus RTG Reserved
FDD framing: DIUC= 14 in DL-MAP plus RTG
and add:
The nominal frame duration shall never exceed 10 ms and never be less than 2 ms.
vote: in favor 13
against 6

motion: add "actual" columns in table for OFDM:

0-6 round(((N/2)+2)E-3/Ts)*Ts round((N+4)E-3/Ts)*Ts
7-11 round((N-1)E-3/Ts)*Ts round((N+4)E-3/Ts)*Ts
replace "is nearest to the nominal frameduration" with "as listed in Table 219."
vote: in favor 12
against 0

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 191 **Comment submitted by:** Nico van Waes Member

Comment Type Technical, Binding **Starting Page #** 176 **Starting Line #** 8 **Fig/Table#** **Section** 8.3.3.3

resolve the granularity issue for OFDM

Suggested Remedy

adopt sub-channelization for OFDM (per latest HM decision)

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Rejected

vote: in favor 13
against 10

Reason for Group's Decision/Resolution

Insufficient support.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 208 **Comment submitted by:** David Trinkwon Member

Comment Type Technical, Binding **Starting Page #** 209 **Starting Line #** 37 **Fig/Table#** **Section** 8.3.3.4.4.3

It does not seem technically feasible for a basestation using AAS option with the Adjacent Carrier Permutation to also support the registration / initialiazion or ongoing operation of one or more Subscriber stations using the Distributed Carrier Permutation. The two permutation schemes should be optional alternatives on a per sector or per cell basis. To be compliant with the Standard, and facilitate relocation of CPE (possibly by the customer) into different sectors or cells, OFDMA CPE should be capable of recognizing / supporting both alternatives.

Suggested Remedy

Add a sentence :

To be compliant with the Standard, an OFDMA base-station need only support one of the two alternative carrier permutation schemes, whereas an OFDMA AAS-enabled Subscriber Station must be capable of recognizing and supporting both.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Rejected**

Add: An OFDMA AAS-enabled Subscriber Station must be capable of recognizing and supporting both permutations.
vote: 3 in favor
4 against

Reason for Group's Decision/Resolution

When the BS is using the optional adjacent permutation for AAS, use of the mandatory permutation does not preclude connectivity within the non-AAS cell-range for any SS.
The added complexity of providing connectivity to SSs in the AAS-extended cell-range, by mandating both permutation schemes, is not warranted.

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items

Document under Review: 802.16a/D4-2002 **Ballot Number:** 7 **Comment Date**

Comment # 244 **Comment submitted by:** Nico van Waes

Comment Type Technical, Binding **Starting Page #** 159 **Starting Line #** **Fig/Table#** **Section**

adopt HM decisions

Regarding item 15:
TGa argues that the average packet size is 300 bytes (comment 134).
This means that doing zero-tailing adds at most 0.33% overhead, which is the sole disadvantage. Especially in the uplink, this extra byte is only relevant when the packet ends exactly on an OFDM symbol boundary, which would force another symbol for this one byte overhead. This is however not necessarily a problem, since the remaining bytes could be easily used for maintenance, such as REP messages.
The advantage is that it does not require the increase of 25 to 50% (depending on who you ask) in clocking speed that tail-biting does. This is not only a cost issue for the chip (which may not be so much an issue for OFDMA, which is hugely complex anyway, but it is for OFDM), but also a cost issue for the heat sink.
Lastly, since most of TGa is jumping up and down like little kids for icecream to move into the mobile arena, where battery life and heat dissipation are crucial factors, mandating significant extra clocking speed for virtually no gain, which results in higher power consumption and heat generation, seems a technically odd decision.

Suggested Remedy

4. Add in section 8.3.3.3.1:

In FDD mode, a HFDD terminal will not receive data before the start of a new frame, after it has transmitted.
vote: in favor: 14 against: 0

5. Add in section 8.3.3.3.2.2.3:

Subsequent AAS bursts shall include a short preamble.

6. Add in section 6.2.7.7.2:

In Table 13, "broadcast" must be changed into "broadcast (or basic for AAS)"

7. Delete in table 259, the line with the Frame Duration Code.

8. Replace in 8.3.3.2.4.2 the first sentence with:

"Rate_ID's, which indicate modulation and coding to be used in the first DL burst immediately following the FCH, are shown in Table 214."

9. Renumber FEC Code Type in Table 260 for OFDM to make them consistent with table 214:
0=QPSK(RS+CC)

…
5=QAM-64(RS+CC) ı

10. Delete the row defining the Cyclic Prefix in Table 260.

11. Under Table 220, add to the description of "Length":

"The minimum value of the Length parameter shall be 6."

12. Delete in Table 221 the parameter Allocation_Start_Time.

13. Replace in sections 8.3.3.2.7.2 and 8.3.3.2.7.3 "message" by "OFDM DL preamble"

14. In Table 227, change offset into duration and change definition into:

· Duration
The duration indicates the duration, in units of mini slots, of the burst

15. Replace the first line of 8.3.3.3.4.2.1:

The encoding is performed by first passing the data in block format through the RS encoder and then pass it through a convolutional encoder. Eight tail bits are introduced at the end of each allocation. In the RS encoder, the redundant bits are sent before the input bits, keeping the tail bits at the end of the allocation.

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

4. Add in section 8.3.3.3.1:
In FDD mode, a HFDD terminal will not receive data before the start of a new frame, after it has transmitted.
vote: unanimous agreement

5. Add in section 8.3.3.3.2.2.3:
Subsequent AAS bursts shall include a short preamble.
vote: unanimous agreement

6. Already accepted (see comment 038).

7. Delete in table 259, the line with the Frame Duration Code.
vote: unanimous agreement

8. Replace in 8.3.3.2.4.2 the first sentence with:
"Rate_ID's, which indicate modulation and coding to be used in the first DL burst immediately following the FCH, are shown in Table 214."
Fix also for OFDMA
vote: unanimous agreement

9. Renumber FEC Code Type in Table 260 for OFDM to make them consistent with table 214:
0=QPSK(RS+CC)
…
5=QAM-64(RS+CC)
Fix also for OFDMA
Add also CTC numbers for all PHYs
vote: unanimous agreement

10. Delete the row defining the Cyclic Prefix in Table 260.
vote: unanimous agreement

11. Under Table 220, add to the description of "Length":
"The minimum value of the Length parameter shall be 6."
vote: 9 in favor, 1 opposed

12. Delete in Table 221 the parameter Allocation_Start_Time.
Already rejected (see 194)

13. Replace in sections 8.3.3.2.7.2 and 8.3.3.2.7.3 "message" by "OFDM DL preamble"

Reason for Group's Decision/Resolution

Lack of support

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items