

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLKSWAGEN GROUP OF AMERICA, INC.,
Petitioner

v.

NEO WIRELESS, LLC
Patent Owner

Case IPR2023-00426
U.S. Patent No. 8,467,366

DECLARATION OF RICHARD M. BEMBEN

Mail Stop “PATENT BOARD”
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

I, Richard M. Bemben, declare the following:

1. I am a Director in the Electronics Practice Group at Sterne, Kessler, Goldstein & Fox, P.L.L.C. Unless otherwise stated, the facts stated in this Declaration are based on my personal knowledge. If called as witness, I could and would testify competently to the information set forth in this Declaration.

2. Attachments 1-8 are true and correct copies of printouts I personally obtained using a web browser from the Internet Archive (<https://archive.org/>). Other than adding page numbers to the bottom of every page, to my knowledge, no other alterations were made to Attachments 1-8.

3. Attachment 1 is a true and correct copy of a printout of a webpage titled "Using The WayBack Machine," available at <https://help.archive.org/help/using-the-wayback-machine/>, that I personally obtained using a web browser. This webpage explains the date code that is embedded in URL archived by the Internet Archive's WayBack Machine: "This is the list of numbers in the middle; it translates as yyyyymmddhhmmss. For example in this url <http://web.archive.org/web/20000229123340/http://www.yahoo.com/> the date the site was crawled was Feb 29, 2000 at 12:33 and 40 seconds." Attachment 1 at 9.

4. Attachment 2 is a true and correct copy of a printout of the IEEE 802.16 working group's homepage that was archived on June 5, 2002

("20020605"), and is available at the URL:

<https://web.archive.org/web/20020605074528/https://www.ieee802.org/16/>. I

personally obtained Attachment 2 using a web browser.

5. Attachment 3 is a true and correct copy of a printout of the webpage titled "Search 802.16 Webpace" that was archived on June 15, 2002

("20020615"), and is available at the URL:

<https://web.archive.org/web/20020615102517/http://ieee802.org/16/search.html>. I

personally obtained Attachment 3 using a web browser by selecting the link titled "Search 802.16 Webpace" at the bottom of the webpage shown in Attachment 2.

Attachment 2 at 13.

6. Attachment 4 is a true and correct copy of a printout of the webpage titled "IEEE Standards Websearch: Search" that was archived on July 9, 2000

("20000709"), and is available at the URL:

<https://web.archive.org/web/20000709175956/http://odysseus.ieee.org/?rq=0&col=stds&op0=+&fl0=url:&ty0=w&tx0=802/16&op1=+&fl1=&ty1=w&tx1=author:&op2=->

[&fl2=&ty2=w&tx2=&dt=an&inthe=604800&amo=10&ady=6&ayr=1999&bmo=10&bdy=13&byr=1999&nh=10&rfl=1&lk=1&qp=&qt=&qsl=&qsc=stds+allieee&pw=100%&qm=0&st=1&oq=&rq=0&ql=a](https://web.archive.org/web/20000709175956/http://odysseus.ieee.org/?rq=0&col=stds&op0=+&fl0=url:&ty0=w&tx0=802/16&op1=+&fl1=&ty1=w&tx1=author:&op2=-&fl2=&ty2=w&tx2=&dt=an&inthe=604800&amo=10&ady=6&ayr=1999&bmo=10&bdy=13&byr=1999&nh=10&rfl=1&lk=1&qp=&qt=&qsl=&qsc=stds+allieee&pw=100%&qm=0&st=1&oq=&rq=0&ql=a). I personally obtained Attachment 4 using

a web browser by selecting the link titled “Search By Document Author” in the webpage shown in Attachment 3. Attachment 3 at 15.

7. Attachment 5 is a true and correct copy of a printout of the webpage titled “IEEE 802.16 News” that was archived on March 5, 2002 (“20020305”), and is available at the URL:

<https://web.archive.org/web/20020305043248/http://ieee802.org/16/news.html>. I personally obtained Attachment 5 using a web browser by selecting the link titled “802.16 News Archive” in the webpage shown in Attachment 2 (the IEEE 802.16 working group’s homepage). Attachment 2 at 13. The webpage shown in Attachment 5 includes a link (“*Letter from ETSI BRAN*”) to a letter dated October 26, 2001, a copy of which was provided as Exhibit 1016 in this proceeding. Attachment 5 at 19.

8. Attachment 6 is a true and correct copy of a printout of the webpage that was archived on June 15, 2002 (“20020615”), and is available at the URL: <https://web.archive.org/web/20020615102532/http://ieee802.org/16/tgs.html>. I personally obtained Attachment 6 using a web browser by selecting the link titled “Task Groups and Committees” in the webpage shown in Attachment 2 (the IEEE 802.16 working group’s homepage). Attachment 2 at 13.

9. Attachment 7 is a true and correct copy of a printout of the webpage titled “IEEE 802.16 Task Group 3” that was archived on June 11, 2002

(“20020611”, and is available at the URL:

<https://web.archive.org/web/20020611183108/http://ieee802.org/16/tg3/index.html>

. I personally obtained Attachment 7 using a web browser by selecting the link titled “Task Group 3: Licensed Bands” in the webpage shown in Attachment 6.

Attachment 6 at 25.

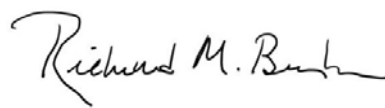
10. Attachment 8 is a true and correct copy of a printout of the webpage titled “IEEE 802.16 Task Group 3/4 Documents” that was archived on June 18, 2002 (“20020618”), and is available at the URL:

https://web.archive.org/web/20020618005409/http://www.ieee802.org/16/tg3_4/index.html. I personally obtained Attachment 8 using a web browser by selecting the

link titled “Task Group 3/4 Joint Documents” in the webpage shown in Attachment 7. Attachment 7 at 27. In the webpage shown in Attachment 8, the last link under the heading “Documents” is to “802.16ab-01/01r2.” Attachment 8 at 35.

11. I declare and state that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed on this 20th day of January 2023, in Arlington, VA,

A handwritten signature in cursive script, reading "Richard M. Bemben". The signature is written in black ink and is positioned above a horizontal line.

Richard M. Bemben

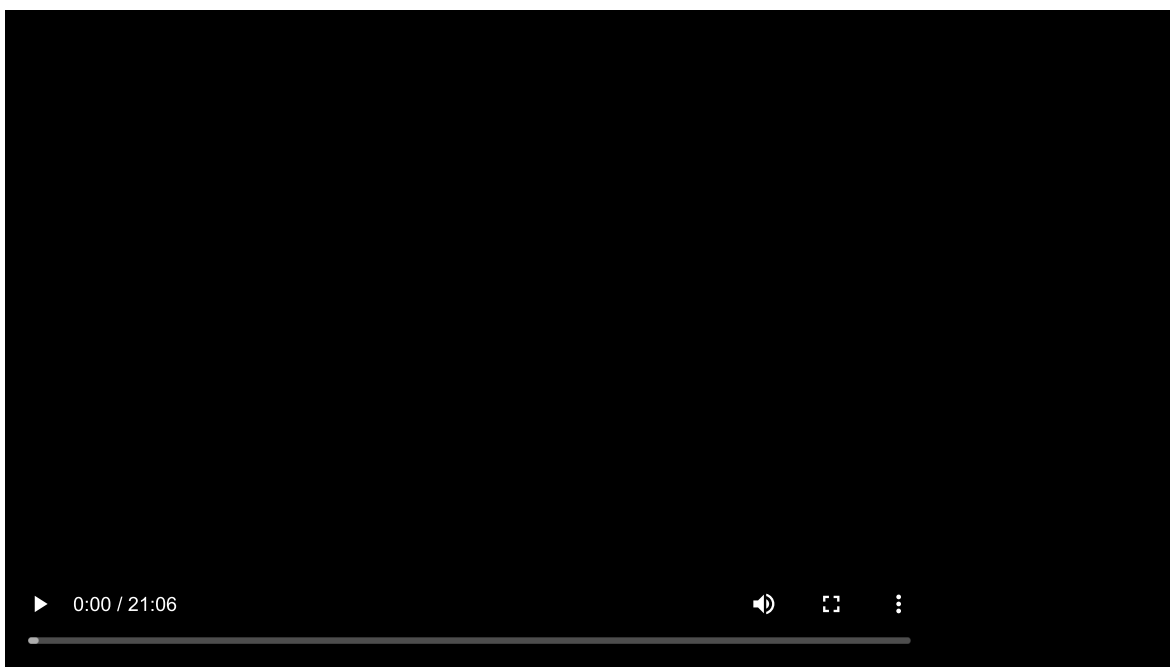
ATTACHMENT 1

USING THE WAYBACK MACHINE

[Home](#) / [The Wayback Machine](#) / [Wayback Machine & Web Archiving](#) / Using The Wayback Machine

 0  198  95

This introduction video provides an overview for how to use the Wayback Machine, including information about searching by URL or keyword, understanding provenance, and saving your own pages, along with other features.



Can I link to old pages on the Wayback Machine?

Yes! The Wayback Machine is built so that it can be used and referenced. If you find an archived page that you would like to reference on your Web page or in an article, you can copy the URL. You can even use fuzzy URL matching and date specification... but that's a bit more advanced.

How can I use the Wayback Machine's Site Search to find websites?

The Site Search feature of the Wayback Machine is based on an index built by evaluating terms from hundreds of billions of links to the homepages of more than 350 million sites. Search results are ranked by the number of captures in the Wayback and the number of relevant links to the site's homepage.

Can I search the Archive?

Using the Internet Archive Wayback Machine, it is possible to search for the names of sites contained in the Archive (URLs) and to specify date ranges for your search. We hope to implement a full text search engine at some point in the future.

Why isn't the site I'm looking for in the archive?

Some sites may not be included because the automated crawlers were unaware of their existence at the time of the crawl. It's also possible that some sites were not archived because they were password protected, blocked by robots.txt, or otherwise inaccessible to our automated systems. Site owners might have also requested that their sites be excluded from the Wayback Machine.

How can I exclude or remove my site's pages from the Wayback Machine?

If you would like to submit a request for archives of your site or account to be excluded from web.archive.org, send us a request to info@archive.org and indicate:

- the URL or URLs of the material
- the time period that you wish to have excluded
- the time period during which you had control of the site or relevant user account (if applicable) and
- any other information that you think would be helpful for us to better understand your request.

This will initiate a review by our team. We do not make any guarantees beforehand about the outcome of a request.

How can I use the Wayback Machine's Site Search to find websites?

The Site Search feature of the Wayback Machine is based on an index built by evaluating terms from hundreds of billions of links to the homepages of more than 350 million sites. Search results are ranked by the number of captures in the Wayback and the number of relevant links to the site's homepage.

How can I get a copy of the pages on my Web site? If my site got hacked or damaged, could I get a backup from the Archive?'

Our terms of use do not cover backups for the general public. However, you may use the Internet Archive Wayback Machine to locate and access archived versions of a site to which you own the rights. We can't guarantee that your site has been or will be archived. We can no longer offer the service to pack up sites that have been lost.

Can I add pages to the Wayback Machine?

On <https://archive.org/web> you can use the "Save Page Now" feature to save a specific page one time. This does not currently add the URL to any future crawls nor does it save more than that one page. It does not save multiple pages, directories or entire sites.

Where is the rest of the archived site? Why am I getting broken or gray images on a site?

Broken images occur when the images are not available on our servers. Usually this means that we did not archive them.

You can tell if the image or link you are looking for is in the Wayback Machine by entering the image or link's URL into the Wayback Machine search box. Whatever archives we have are viewable in the Wayback Machine.

The best way to see all the files we have archived of the site is: http://web.archive.org/*/www.yoursite.com/*

There is a 3-10 hour lag time between the time a site is crawled and when it appears in the Wayback Machine.

Why are some sites harder to archive than others?

If you look at our collection of archived sites, you will find some broken pages, missing graphics, and some sites that aren't archived at all. Some of the things that may cause this are:

Robots.txt — A site's robots.txt document may have prevented the crawling of a site.

Javascript — Javascript elements are often hard to archive, but especially if they generate links without having the full name in the page. Plus, if javascript needs to contact the originating server in order to work, it will fail when archived.

Server side image maps — Like any functionality on the web, if it needs to contact the originating server in order to work, it will fail when archived.

Orphan pages — If there are no links to your pages, the robot won't find it (the robots don't enter queries in search boxes.)

As a general rule of thumb, simple html is the easiest to archive.

Can I find sites by searching for words that are in their pages?

No, at least not yet. Site Search for the Wayback Machine will help you find the homepages of sites, based on words people have used to describe those sites, as opposed to words that appear on pages from sites.

Can I still find sites in the Wayback Machine if I just know the URL?

Yes, just enter a domain or URL the way you have in the past and press the "Browse History" button.

Why are some of the dots on the calendar page different colors?

We color the dots, and links, associated with individual web captures, or multiple web captures, for a given day. Blue means the web server result code the crawler got for the related capture was a 2nn (good); Green means the crawlers got a status code 3nn (redirect); Orange means the crawler got a status code 4nn (client error), and Red means the crawler saw a 5nn (server error). Most of the time you will probably want to select the blue dots or links.

How does the Wayback Machine behave with Javascript turned off?

If you have Javascript turned off, images and links will be from the live web, not from our archive of old Web files.

How did I end up on the live version of a site? or I clicked on X date, but now I am on Y date, how is that possible?

Not every date for every site archived is 100% complete. When you are surfing an incomplete archived site the Wayback Machine will grab the closest available date to the one you are in for the links that are missing. In the event that we do not have the link archived at all, the Wayback Machine will look for the link on the live web and grab it if available. Pay attention to the date code embedded in the archived url. This is the list of numbers in the middle; it translates as yyymmddhhmmss. For example in this url <http://web.archive.org/web/20000229123340/http://www.yahoo.com/> the date the site was crawled was Feb 29, 2000 at 12:33 and 40 seconds.

You can see a listing of the dates of the specific URL by replacing the date code with an asterisk (*), ie:
http://web.archive.org/*/www.yoursite.com

How do I cite Wayback Machine urls in MLA format?

This question is a newer one. We asked MLA to help us with how to cite an archived URL in correct format. They did say that there is no established format for resources like the Wayback Machine, but it's best to err on the side of more information. You should cite the webpage as you would normally, and then give the Wayback Machine information. They provided the following example: McDonald, R. C. "Basic Canary Care." _Robirda Online_. 12 Sept. 2004. 18 Dec. 2006 [http://www.robirda.com/cancare.html]. _Internet Archive_. [http://web.archive.org/web/20041009202820/http://www.robirda.com/cancare.html]. They added that if the date that the information was updated is missing, one can use the closest date in the Wayback Machine. Then comes the date when the page is retrieved and the original URL. Neither URL should be underlined in the bibliography itself. Thanks MLA!

How can I get pages authenticated from the Wayback Machine? How can I use the pages in court? While the Wayback Machine tool was not expressly designed with legal use in mind, we receive regular requests for certified records for use in legal proceedings. Our affidavit request procedure can be found [here](#). Please review that information including our standard affidavit and the legal request FAQ section linked there to prior to contacting us.

Some sites are not available because of robots.txt or other exclusions. What does that mean?

Such sites may have been excluded from the Wayback Machine due to a robots.txt file on the site or at a site owner's direct request.

How can I get my site included in the Wayback Machine?

Much of our archived web data comes from our own crawls or from Alexa Internet's crawls. Neither organization has a "crawl my site now!" submission process. Internet Archive's crawls tend to find sites that are well linked from other sites. The best way to ensure that we find your web site is to make sure it is included in online directories and that similar/related sites link to you.

Alexa Internet uses its own methods to discover sites to crawl. It may be helpful to install the free Alexa toolbar and visit the site you want crawled to make sure they know about it.

Regardless of who is crawling the site, you should ensure that your site's 'robots.txt' rules and in-page META robots directives do not tell crawlers to avoid your site.

What is the Archive-It service of the Internet Archive Wayback Machine?

For information on the Archive-It subscription service that allows institutions to build and preserve collections of born digital content, see <https://www.archive.org/about/faqs.php#Archive-It>

Was this helpful?



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Search

Search

- [Accounts](#)
- [Archive-it Service](#)
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[How to archive your Tweets with the Wayback Machine](#)

[Media Types for Donations](#)

[Does the Internet Archive Have My Media](#)

[File Formats](#)

[How do I request to remove something from archive.org?](#)

ATTACHMENT 2

The Wayback Machine - <https://web.archive.org/web/20020605074528/http://www.ieee802.org:80/16/>



The IEEE 802.16 Working Group on Broadband Wireless Access Standards

creating the IEEE 802.16 **WirelessMAN™** Standard for Wireless Metropolitan Area Networks

The IEEE 802.16 Working Group on Broadband Wireless Access Standards develops standards and recommended practices to support the development and deployment of broadband Wireless Metropolitan Area Networks. 802.16 is a unit of the [IEEE 802 LAN/MAN Standards Committee](#), the premier transnational forum for wireless networking standardization.

People often take the view that standardization is the enemy of creativity. But I think that standards help make creativity possible -- by allowing for the establishment of an infrastructure, which then leads to enormous entrepreneurialism, creativity, and competitiveness.

-[Vint Cerf](#), TCP/IP co-developer and Internet pioneer, in [Fast Company](#), April 2000.

News

- [Session #19](#) took place in Calgary, Canada on 20-24 May 2002. The [Session #19 Report](#) overviews the highlights.
- [Session #20](#): 7-12 July in Vancouver, BC, Canada
- [IEEE Standard 802.16 published on 8 April 2002](#)
- [IEEE Std 802.16.2 now available as free download](#)
- [802.16 Project Status Summary](#)
- [802.16 News Archive](#)
- [IEEE 802 News Bulletin](#)

General Information

- New: [Technical Tutorial Article on IEEE Std 802.16](#)
- [Background Information on IEEE 802.16](#)
- [What People Are Saying about IEEE 802.16](#)
- [Published IEEE 802.16 Standards and Drafts](#)
- [Free IEEE 802 Standards](#)

Details for Participants

- [Upcoming Meetings](#) (and [previous ones](#))
- [Task Groups and Committees](#)
- [Participants, Participation, and Membership](#)
- [Internet Resources](#)
- [Editorial Resources](#)
- [Legal Issues](#)
- [Working Group Documents](#) (also see TG & Liaison pages)
- [Tutorials](#)
- [Liaisons](#)
- [Submitting Documents](#)
- [Important Links](#)
- [Search 802.16 Webspace](#)

This site was updated on 4 June 2002 by:

Roger Marks

Chair, IEEE 802.16 Working Group on Broadband Wireless Access Standards

[National Wireless Electronic Systems Testbed \(N-WEST\)](#)

*National Institute of Standards and Technology, U.S. Department of Commerce
Boulder, CO, USA tel: +1-303-497-3037 fax: +1-303-497-7828*

ATTACHMENT 3

The Wayback Machine - <https://web.archive.org/web/20020615102517/http://ieee802.org:80/16/search.html>

Search 802.16 Webpace

This is a full-text search of all formats, including HTML, PDF, & DOC!

- [General Search](#)
- [Search by Document Number](#) {enter data at colon}
- [Search by Document Author](#) {enter data at colon}

Return to [802.16 Page](#)

ATTACHMENT 4

The Wayback Machine - <https://web.archive.org/web/20000709175956/http://odysseus.ieee.org:80/?rq=0&col=stds&op0=+&fl0=url:&ty0=w&tx0=...>


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for documents that

should contain in the URL the words

802/16

and

should contain in the body the words

author:

and

must not contain in the body the words

and were last updated

☒ Anytime

☐ in the last week

☐ on or after October 6, 1999

and on or before October 13, 1999

and show

10 hits sorted by date with summaries

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[\(IEEE Standards Systems/Network Staff\)](#)



ATTACHMENT 5

The Wayback Machine - <https://web.archive.org/web/20020305043248/http://ieee802.org:80/16/news.html>

The IEEE 802.16 Working Group on Broadband Wireless Access Standards

IEEE 802.16 News

This news compilation is not exhaustive but covers key highlights. For additional unofficial reports, see [N-WEST News](#).

26 February 2002

[P802.16/D2 offered for sale in IEEE catalog](#)

25 February 2002

Recirculation Ballot #4a [Reply Comment Period](#) opens

25 February 2002

[Working Group Recirculation Ballot #4a](#) closed

21 February 2002

IEEE issues Invitation to Ballot on P802.16a

14 February 2002

IEEE-SA Standards Board approves merger of 802.16b PAR into 802.16a

08 February 2002

Issue [P802.16/D2](#) and initiate [WG Recirculation Ballot #4a](#)

04 February 2002

[Request that IEEE issue Invitation to Ballot on P802.16a](#)

04 February 2002

IEEE-SA NesCom approves PAR merger

24 January 2002

Working Group Letter Ballot #4 [declared passed, pending comment resolution and recirculation](#).

21-25 January 2002

[Session #17](#) was held in Levi, Finland. The [Session #17 Report](#) provides the details.

16 January 2002

[Reply Comment Period](#) in Working Group Letter Ballot #4 closed.

7 January 2002

[Reply Comment Period](#) opened following Working Group Letter Ballot #4.

4 January 2002

Working Group Letter Ballot #4 closed. See the [details](#).

6 December 2001

[IEEE Standard 802.16 is now an IEEE Standard](#), following [approval by the IEEE-SA Standards Board](#) on 6 December 2001. See the [press release](#) (or the [IEEE version](#)) for more details. Until publication, the final [balloted draft remains available in IEEE Catalog](#).

5 December 2001

Standards Review Committee (RevCom) of the IEEE-SA Standards Board recommends approval of IEEE P802.16/D5 by the full board as IEEE Standard 802.16.

30 November 2001

[Working Group Letter Ballot](#) on P802.16a/D1 opens; runs through 4 January 2002.

16 November 2001

IEEE 802 SEC passes motion to [affirm submission of P802.16/D5 to RevCom](#).

16 November 2001

The Working Group (with the concurrence of IEEE 802 Executive Committee) approved a [merger of Project P802.16b into an expanded P802.16a](#).

16 November 2001

A Working Group motion elevated P802.16a/D1 to Draft Standard status, with a Working Group Letter Ballot to start the week of 26 November.

12-16 November 2001

[Session #16](#) was held in Austin, Texas, USA. The [Session #16 Report](#) provides the details.

7 November 2001

A [Letter from ETSI BRAN](#) informed IEEE 802.16 that, following consideration of several base-line proposals (based on IEEE 802.16, BWIF, and DVB-RCT), its HIPERMAN group has decided to choose, as its MAC baseline, the MAC-related clauses from IEEE P802.16/D5-2001 and IEEE P802.16ab-01/01r2. The same group made a "working assumption" that its baseline PHY would be the OFDM PHY from IEEE P802.16ab-01/01r2. ETSI BRAN noted that "These conclusions were motivated by the goal to provide one interoperable worldwide standard for the 2-11 GHz licensed bands."

2 November 2001

[Reply-Comment Resolution Phase of Working Group Review](#) underway through 8 November

2 November 2001

[Reply-Comment Phase of Working Group Review](#) closes

28 October 2001

[Ballot of IEEE P802.16 WirelessMANTM Air Interface Closes Successfully](#)

28 October 2001

[Confirmation Ballot of IEEE P802.16 WirelessMANTM Air Interface Closes](#)

26 October 2001

New [P802.16a&b: Ballot Schedule](#) shows complete timeline through final approval

22 October 2001

[Reply-Comment Phase of Working Group Review](#) underway through 2 November

22 October 2001

[IEEE P802.16 WirelessMANTM Air Interface \(Draft 5\) now available in IEEE Catalog](#)
 19 October 2001
[Working Group Review of 2-11 GHz document closed](#)
 19 October 2001
[Confirmation Ballot of IEEE P802.16 WirelessMANTM Air Interface Opens](#)
 18 October 2001
[Draft 5 of IEEE P802.16 WirelessMANTM Air Interface released](#)
 4 October 2001
[Recirculation Ballot of IEEE P802.16 WirelessMANTM Air Interface Closed with 97% Approval](#)
 28 September 2001
[Latest version of 2-11 GHz Working Document released: Working Group Review](#) underway through 19 October
 25 September 2001
[Recirculation Ballot of IEEE P802.16 WirelessMANTM Air Interface Opens](#)
 10-14 September 2001
[Session #15](#) was held in Denver, Colorado, USA. The [Session #15 Report](#) provides the details.
 11 September 2001
[IEEE P802.16 WirelessMANTM Air Interface Draft available for sale in IEEE catalog](#)
 10 September 2001
[IEEE Std 802.16.2 published by IEEE](#)
 09 September 2001
[IEEE P802.16 WirelessMANTM Air Interface Completes IEEE Sponsor Ballot](#)
 27 August 2001
[Comments collected in Final Task Group Review of 802.16a/802.16b Working Document](#)
 17 August 2001
[Project Authorization Request P802.16.2a, to enhance 802.16.2, approved by IEEE-SA Standards Board](#)
 10 August 2001
[IEEE P802.16 WirelessMANTM Air Interface Proceeds to IEEE Sponsor Ballot](#)
 09 August 2001
[IEEE 802 Sponsor Executive Committee forwards P802.16 for Sponsor Ballot](#)
 04 August 2001
[Open of IEEE 802 SEC Email Ballot motion to forward P802.16/D4-2001 for Sponsor Ballot](#)
 03 August 2001
[P802.16/D4 Approved by Working Group as Letter Ballot Concludes Successfully](#)
 02 August 2001
[IEEE 802.16 Confirmation Ballot #3b closed.](#)
 30 July 2001
[802.16a/802.16b Working Document](#) released; in [Final Task Group Review](#) through August 27
 23 July 2001
[Confirmation Ballot #3b](#) began on IEEE P802.16/D2-2001.
 13 July 2001
 The Sponsor Executive Committee of the IEEE LAN MAN Standards Committee approved the initiation of a Sponsor Ballot (the final balloting stage) of the base 802.16 draft, conditional on successful completion of a confirmation ballot. The Working Group expects to initiate Sponsor Ballot by early August and continues to expect publication of the standard in the fourth quarter of 2001.
 13 July 2001
 The Sponsor Executive Committee of the IEEE LAN MAN Standards Committee approved [Project Authorization Request P802.16.2a](#) to initiate work to enhance Recommended Practice 802.16.2 by including licensed bands from 2-11 GHz and expanding the recommendations for coexistence of point-to-multipoint with point-to-point communications at millimeter-wave bands. The request has been forwarded to the IEEE Standards Board for final approval, which is expected on August 16.
 9-13 July 2001
[Session #14](#) was held in Portland, Oregon, USA. The [Session #14 Report](#) provides the details.
 06 July 2001
 Document IEEE 802.16.2/D3-2001 ("Recommended Practice for Coexistence of Broadband Wireless Access Systems") was [formally approved by the IEEE-SA Standards Board.](#)
 14 June 2001
 Document IEEE 802.16.2/D3-2001 ("Recommended Practice for Coexistence of Broadband Wireless Access Systems") was [approved by the IEEE-SA Standards Board.](#) The approval was conditional on completing a few formalities.
 7-8 June 2001
 Task Groups 3 and 4 held an editorial meeting to unite their working documents.
 14-18 May 2001
[Session #13](#) was held in Orlando, Florida, USA. The [Session #13 Report](#) provides the details.
 4 May 2001
 Document IEEE 802.16.2/D3-2001 ("Recommended Practice for Coexistence of Broadband Wireless Access Systems") was submitted for approval to the IEEE-SA Standards Board's Review Committee. The document was in the final stages of Sponsor Ballot, which it completed, with 100% approval, on 16 May 2001.
 20 March 2001
 IEEE-SA News Release: [IEEE 802.16 Group Achieves Key Milestones](#)
 17 March 2001
 IEEE 802.16 is now working to create a unified Working Group air interface document with a common, flexible medium access control (MAC) platform supporting multiple physical layers (PHYs). The base document, entitled IEEE [802.16](#), will include the basic MAC and the 10-66 GHz PHY. Amendment [802.16a](#) will include enhancements for 2-11 GHz licensed bands, and Amendment [802.16b](#) will include enhancements for

license-exempt operation. The new project alignment was given final approval by the IEEE-SA Standards Board following a decision by the Working Group on 12 March, approved by the IEEE 802 Executive Committee on 15 March and the IEEE-SA New Standards Committee on 16 March.

12-15 March 2001

[Session #12](#) was held in Hilton Head, South Carolina, USA. 178 people attended. The session was marked by final agreement to create a unified Working Group air interface document with a common, flexible medium access control (MAC) platform supporting multiple physical layers (PHYs). The [Session #12 Report](#) provides the details.

15 March 2001

IEEE Working Group 802.16 formed a [Study Group](#) to investigate future enhancements to "Coexistence of Broadband Wireless Access Systems". Phil Whitehead is the Chair.

14 March 2001

The 802.16a group agreed to incorporate both a single-carrier mode (based on [802.16.3c-01/32](#)) and an OFDM mode (based on [802.16.3c-01/33r2](#)). Drafting has been initiated on both PHY and MAC documents.

14 March 2001

Sponsor Ballot opened on "Coexistence of Broadband Wireless Access Systems", following 100% approval in Working Group Letter Ballot. The ballot will close on 12 April.

13 March 2001

[Working Group Letter Ballot #3](#) closed. "Draft Standard Air Interface for Fixed Broadband Wireless Access Systems" was approved, pending comment resolution.

17 February 2001

[IEEE 802.16 Recirculation Ballot #2b](#) closed, with 100% approval of proceeding to Sponsor Ballot with "Coexistence of Broadband Wireless Access Systems".

07 February 2001

[IEEE 802.16 Recirculation Ballot #2b](#) seeks approval to close [IEEE 802.16 Letter Ballot #2](#).

6 February 2001

"Draft Standard Air Interface for Fixed Broadband Wireless Access Systems" went to ballot as [Working Group Letter Ballot #3](#) opened, with a closing date of 13 March.

30 January 2001

EE Times provided a full report on 802.16's Session #11 in the article [IEEE group gains ground on wireless standards](#).

22-26 January 2001

[Session #11](#) was held in Ottawa, Ontario, Canada. 167 people registered and attended. The session was marked by an agreement to create a unified Working Group air interface document, with a common, flexible MAC platform supporting multiple spectrum-dependent physical layers. The first stage (the 10-66 GHz physical layer and MAC to support it) was approved for a [Working Group Letter Ballot](#). In the development of the 2-11 GHz physical layer, the focus was narrowed and consolidation is underway. The WirelessHUMANTM Task Group held its first formal meetings to address licensed-exempt operations and found general consensus. A Recommended Practice on Coexistence was readied for Sponsor Ballot (its final round of balloting). The [Session #11 Report](#) provides the details.

20 January 2001

[IEEE 802.16 Recirculation Ballot #2a](#) closed.

18 January 2001

IEEE 802.16 held a "Meet and Greet" session, handing out literature and showing current drafts, at the 7th Annual Technical Symposium of the [Wireless Communications Association](#).

16 January 2001

IEEE-SA News Release: [New IEEE WirelessHUMANTM Project Developing Standards for Fixed Wireless Access in License-Exempt Bands](#)

10 January 2001

[IEEE 802.16 Recirculation Ballot #2a](#) seeks to approve resolution of the comments received in [IEEE 802.16 Letter Ballot #2](#).

2 January 2001

[Task Group 1](#) issued a [Call for Comments on IEEE 802.16.1/D1-2000](#) with a deadline of 16 January.

30 December 2000

[Task Group 1](#) issued Draft 1 of its Draft Standard for Air Interface for Fixed Broadband Wireless Access Systems ([IEEE 802.16.1/D1-2000](#)). The file is [password-protected](#).

27 December 2000

Document IEEE 802.16.2/D1-2000 ("Recommended Practice for Coexistence of Broadband Wireless Access Systems") was approved, pending comment resolution and recirculation, in [IEEE 802.16 Letter Ballot #2](#).

15 December 2000

Five focused 802.16 email reflectors have been launched, for TG1, TG2, TG3, TG4, and the MAC. [Details are available](#).

14 December 2000

Task Group 3 issued a [Call For Contributions on Proposed MAC Enhancements, Key Characteristics, and Evaluation Criteria](#) with a 17 January deadline.

12-14 December 2000

[Task Group 1](#) Only held a [Session #10.5](#) in San Diego, CA, USA.

7 December 2000

The IEEE-SA Standards Board approved 802.16's [WirelessHUMANTM PAR](#) for License-Exempt Bands. [Task Group 4](#) has issued a [Call for Contributions](#) with a deadline of 13 January 2001.

2 December 2000

Task Group 3 issued an [Invitation To Contribute PHY Proposals](#) with a 17 January deadline.

21 November 2000

The [Session #10 Report](#) was published.

20 November 2000

IEEE-SA News Release: [IEEE 802.16 Group Makes Key Decisions on Fixed Broadband Wireless Access](#)

17 November 2000

The Draft Recommended Practice for Coexistence of Broadband Wireless Access Systems went to ballot as [Working Group Letter Ballot #2](#) opened, with a closing date of 27 December 2000.

6-9 November 2000

[Session #10](#) was held in Tampa, Florida, USA. 211 people attended. A [report](#) is available.

25-26 October 2000

An [Interim Meeting of TG2](#) (Coexistence Task Group) was held in Ottawa, Ontario, Canada.

2 October 2000

802.16 initiated a [Marketing Committee](#), with [Dean Chang](#) of Aperto Networks as Chair.

1 October 2000

The 802.16 web site served up [432,351 file downloads](#) during September. Revisions 1 and 2 of the IEEE 802.16.1 Air Interface for Broadband Wireless Access Systems (10-66 GHz) were downloaded 19749 times in August and September. Revisions 3 and 4 of the "Functional Requirements for the 802.16.3 Interoperability Standard" were downloaded 4329 times in August and September.

20 September 2000

The [Session #9 Report](#) was published.

11-15 September 2000

[Session #9](#) was held in Denver, Colorado, USA. 144 people attended. 126 people attended during enough meeting intervals to receive credit for having "participated" in the session for membership purposes; this was just shy of the record 128 set at Session #8.

1 September 2000

The 802.16 web site served up [356,963 file downloads](#) during August.

8 August 2000

Task Group 1 initiated a [Final Task Group Review](#) of the current version of the [802.16.1 Air Interface for Fixed Broadband Wireless Access Systems](#). The process is open to all, with comments due 1 September 2000. The intent is to use Session #9 to ready the document for a Working Group Letter Ballot.

1 August 2000

The 802.16 web site served up [350,020 file downloads](#) during July.

25 July 2000

The IEEE Computer Society Standards Activities Board adopted the following motion: "Resolved that the IEEE Computer Society Standards Activities Board affirms the [IEEE 802 Position Statement on IEEE 802.16 Broadband Wireless Access \(BWA\) Working Group Conflict of Interest with recent IEEE-ISTO announcement](#)."

21 July 2000

IEEE 802.16 was mentioned in an EE Times article entitled [Wireless Coalition Prompts IEEE Eruption](#).

20 July 2000

The Wireless Communications Association International (WCA) reported on the progress of 802.16 in an article entitled [IEEE Groups Promote BWA Standards Planning, Dispute Overlapping Role](#).

17 July 2000

IEEE 802 issued a [IEEE 802 Position Statement on IEEE 802.16 Broadband Wireless Access \(BWA\) Working Group Conflict of Interest with recent IEEE-ISTO announcement](#)

21 July 2000

The [Session #8 Report](#) was published.

10-14 July 2000

[Session #8](#) was held in La Jolla, California, USA. 165 people attended.

1 July 2000

IEEE's [Computer Magazine](#) ([July 2000 issue](#)) featured an article entitled "Broadband Fixed Wireless Travels the Last Mile" including a highlight box on "IEEE 802.16: A Fixed-Wireless Standard".

1 July 2000

The 802.16 web site served up [248,299 file downloads](#) during June.

12-14 June 2000

[802.16.2 Interim Meeting](#) was held in Ottawa, Ontario, Canada.

2 June 2000

The 802.16 Working Group created [Observer Status](#)

1 June 2000

802.16.1 added a detailed MAC description to the [invitation to a team of 36 individuals from 21 companies to present a unified MAC proposal at Session #8](#)

1 June 2000

The 802.16 web site served up [230,777 file downloads](#) during May. This was more than double the previous month.

30 May - 2 June 2000

802.16 [Session #7.5](#) was held in Boulder, Colorado, USA; 18 people attended. This was a meeting only of the 802.16.1 Task Group, with a focus on the MAC.

8 May 2000

[WirelessHUMANTM](#) Study Group participated at IEEE 802.11/802.15 session in Seattle

5 May 2000

802.16.1 decided to meet on 30 May - 2 June 2000 in Boulder, Colorado, USA in [Session #7.5](#).

5 May 2000

802.16 agreed to proposal for [cooperation agreement with ETSI standardization group](#)

4 May 2000

802.16.1 accepted plans to withdraw two MAC proposals and instead [invite a unified MAC proposal](#) from team of 36 individuals from 21 companies

4 May 2000

802.16.1 selected [initial draft physical layer](#) based on merged proposal submitted by team of 27 people from 20 companies

1-5 May 2000

[Session #7](#) was held in Gaithersburg, Maryland, USA; 158 people attended. The HIPERACCESS group of ETSI BRAN held a co-located session, and joint meetings were held.

19-20 April 2000

[802.16.2 Meeting](#) was held in Montreal, PQ, Canada

18 April 2000

New [802.16 Patent Policy and Procedures](#) and [Contribution Release](#) incorporated in Revision 8 of the IEEE 802.16 [Document Submission Template](#) and [Presentation Submission Template](#)

30 March 2000

[802.16.3 Project](#) was approved by the IEEE-SA Standards Board

9 March 2000

[802.16.3 Task Group](#) created by 802.16 to develop air interface for Licensed Frequencies from 2-11 GHz; project was approved by IEEE 802

9 March 2000

The new [WirelessHUMANTM](#) Study Group created for License-Exempt Bands

9 March 2000

New [Regulatory Affairs Committee](#) created.

6-9 March 2000

[Session #6](#) held in Albuquerque, New Mexico, USA; 126 people attended

10-14 January 2000

[Session #5](#) held in Richardson, Texas, USA; 119 people attended.

28 December 1999

IEEE 802.16 began formation of a [Sponsor Balloting Pool](#) [△]. Future 802.16 draft standards will be balloted by a Balloting Group drawn from members of the Balloting Pool. Participation in 802.16 is not a requirement for becoming a member of the Balloting Pool or Balloting Group.

17 December 1999

IEEE 802.16 published [802.16.1 Functional Requirements, Rev. 1](#) [△], which provides functional requirements for developing an interoperable 802.16.1 air interface. The document had been approved by 802.16 on November 11 during Session #4.

8-11 November 1999

[Session #4](#) held in Koloa, Hawaii, USA

13-17 September 1999

[Session #3](#) held in Boulder, Colorado, USA

4-6 August 1999

[Session #2](#) held in Denver, Colorado, USA

6-8 July 1999

[Session #1](#) held in Montreal, Quebec, Canada

10-12 May 1999

[Session #0](#) held in Boulder, Colorado, USA

19 April 1999

IEEE-SA News Release: [IEEE P802 LMSC Launches New Working Group, P802.16, on Broadband Wireless Access](#)

15 April 1999

[Final Report of the IEEE 802 Executive Committee Study Group on Broadband Wireless Access](#) issued.

30 March 1999

[802.16 email reflector "stds-802-16@ieee.org"](#) goes on-line

22 March 1999

[802.16 Web Site](#) goes online

11 March 1999

[IEEE 802.16 Working Group on Broadband Wireless Access](#) created by IEEE 802. PAR for air interface (10-66 GHz) approved by IEEE 802.

9-11 March 1999

Second Session of [IEEE 802 Study Group on Broadband Wireless Access](#). 54 people participated. Project Authorization Request (PAR) edited and submitted.

13-15 January 1999

First Session of [IEEE 802 Study Group on Broadband Wireless Access](#), concurrently with meetings of IEEE 802.11 (Wireless LANs) and ETSI BRAN. Draft Project Authorization Request (PAR) developed.

12 November 1998

IEEE 802 creates [Executive Committee Study Group on Broadband Wireless Access](#) by unanimous vote.

10 November 1998

Nearly 50 people participated in an [N-WEST Standardization Meeting](#) held in conjunction with the Plenary Meeting of the IEEE "802" LAN/MAN Standards Committee.

9 November 1998

An N-WEST-organized [Tutorial on Broadband Wireless Access Technology and Standards](#) was presented to more 200 attendees at the IEEE "802" LAN/MAN Standards Committee Plenary Meeting.

9-10 August 1998

The [N-WEST Kickoff Meeting](#) was held, with 45 people in attendance.

This news compiled by:

Roger Marks (marks@nist.gov)

Chair, IEEE 802.16 Working Group on Broadband Wireless Access Standards

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ATTACHMENT 6

The Wayback Machine - <https://web.archive.org/web/20020615102532/http://ieee802.org:80/16/tgs.html>

802.16 Task Groups

- [Task Group a](#): Developing P802.16a (2-11 GHz).
Formerly organized as two Task Groups:
 - [Task Group 3: Licensed Bands](#)
 - [Task Group 4: License-Exempt Bands](#)
- [Task Group c](#): Developing P802.16c (10-66 GHz Profiles)
- [Task Group 2](#): Developing P802.16.2a (Coexistence)
- [IEEE 802.16 Study Group on Mobile Broadband Wireless Access](#)

802.16 Completed Projects

- [IEEE Standard 802.16: Air Interface for 10-66 GHz](#)
- [IEEE Standard 802.16.2: Coexistence for 10-66 GHz](#)

802.16 Committees

- [Regulatory Affairs](#)
- [Publicity](#)
- [Ad Hoc IF Interface](#) (expired)

Return to [802.16 Page](#)

ATTACHMENT 7

The Wayback Machine - <https://web.archive.org/web/20020611183108/http://ieee802.org:80/16/tg3/index.html>

IEEE 802.16 Task Group 3

Task Group 3 has been merged into [IEEE 802.16 Task Group a](#).

IEEE 802.16's Task Group 3 had been developing, under IEEE PAR 802.16a, an amendment to IEEE Standard 802.16 ("Air Interface for Fixed Broadband Wireless Access Systems"). This portion of the amendment covers "MAC Modifications and Additional Physical Layer for 2-11 GHz" in licensed bands.

- [IEEE-SA Project Authorization Request \(PAR\) 802.16a](#) (revision approved 2001-03-17)
- [Archives of the 802.16 TG3 email reflector](#)
- [Subscribing to the 802.16 focused email reflectors](#)
- [Functional Requirements Document](#)

Documents

- See also [Task Group 3/4 Joint Documents](#)
- [802.16.3-01/26](#)
IEEE 802.16a Task Group 3 Session #15 Minutes (01/09/14)
- [802.16.3-01/25](#)
TG3 Closing Plenary Report, Session 15 (01/07/13)
- [802.16.3-01/24](#)
IEEE 802.16 TG3 Session #14 Minutes (01/07/13)
- [802.16.3-01/23](#)
Call for Contributions on the Preamble Design for the OFDM-Based PHY (01/07/13)
- [802.16.3-01/22](#)
IEEE 802.16a Session #14 Closing Report (01/07/13)
- [802.16.3-01/21r1](#)
TG3 Agenda for Session #14 (01/07/09)
- [802.16.3-01/20](#)
IEEE 802.16a Session #13 Closing Report (01/05/18)
- [802.16.3-01/19r1](#) [Draft: 01/05/18]
IEEE 802.16 TG3 Session #13 Minutes, Approved (01/07/17)
- [802.16.3-01/18](#)
Call for Comments and Improvements to Physical Layer Specifications [DRAFT] (01/05/17)
- [802.16.3-01/17](#)
Outline: Air Interface for Fixed Broadband Wireless Access Systems (2-11 GHz) (01/05/16)
- [802.16.3-01/16r1](#)
MAC Topics Identified by PHY Group (802.16.3) (01/05/15)
- [802.16.3-01/15](#)
TG3 Agenda for Session #13 (Draft) (01/05/14)
- [802.16.3-01/14](#)
Call for Comments: TG3 Draft Physical Layers (01/05/07)
- [802.16.3-01/13](#)
TG3 PHY Draft TOC
- [802.16.3-01/12](#)
TG3 MAC Draft TOC
- [802.16.3-01/11](#)
IEEE 802.16 TG3 Session #12 Closing Report
- [802.16.3-01/10](#)
IEEE 802.16 TG3 Session #12 Minutes
- [802.16.3-01/09r2](#)
TG3 Agenda for Session #12
- [802.16.3-01/08](#)
Call for Improvements and Mergers, TG3 PHY
- [802.16.3-01/07](#)
PHY Evaluation Criteria for Session #12
- [802.16.3-01/06](#)
802.16 Task Group 3 Call For Contributions: Proposed MAC Enhancements, Session #12
- [802.16.3-01/05](#)
802.16 Task Group 3 Invitation To Contribute PHY Proposals: Session #12
- [802.16.3-01/04](#)
IEEE 802.16.3 Session #11 Minutes
- [802.16.3-01/03](#)
IEEE 802.16.3 Session #11 Closing Report
- [802.16.3-01/02](#) (private)
Individual Voter Records - IEEE 802.16.3 Session #11 PHY Evaluation
- [802.16.3-01/01](#)
Report of IEEE 802.16.3 Session #11 PHY Evaluation
- [802.16.3-00/26r1](#) [update of [802.16.3-00/26](#)] (private)
Individual Voter Records - IEEE 802.16.3 Session #10 PHY Evaluation

- [802.16.3-00/25](#)
IEEE 802.16 Task Group 3 Call For Contributions: Proposed MAC Enhancements, Key Characteristics, and Evaluation Criteria: Session #11
- [802.16.3-00/24](#)
802.16.3 Task Group: Invitation To Contribute PHY Proposals: Session #11
- [802.16.3-00/23r1](#) [update of [802.16.3-00/23](#)]
Report of IEEE 802.16.3 Session #10 PHY Evaluation
- [802.16.3-00/22](#)
IEEE 802.16.3 Session #10 Minutes
- [802.16.3-00/21](#)
802.16.3 Closing Plenary Report
- [802.16.3-00/20r1](#)
Voting Instructions for TG3 Initial PHY Proposals
- [802.16.3-00/19r1](#)
IEEE 802.16.3 Session #10 Evaluation Scoresheet
- [802.16.3-00/18](#)
802.16.3 Midweek Plenary Report
- [802.16.3-00/17r1](#)
IEEE 802.16.3 Session #10 Agenda - Tampa, FL
- [802.16.3-00/16](#)
IEEE 802.16.3 Session #9 Minutes
- [802.16.3-00/15](#)
802.16.3 Functional Requirements Comments Resolved at Session #9
- [802.16.3-00/14](#)
802.16.3 Task Group: Call for Contributions for Session #10 (inviting initial PHY proposals)
- [802.16.3-00/13](#)
802.16.3 Task Group: Call for Contributions for Session #10 (Traffic, Deployment, and Channel Models)
- [802.16.3-00/12](#)
802.16.3 Functional Requirements Comments for Session #9
- [802.16.3-00/11r0](#)
Call for Comments on IEEE 802.16.3-00/02r3 (Functional Requirements for the 802.16.3 Air Interface Standard)
- [802.16.3-00/10](#)
IEEE 802.16.3 Session #8 Minutes
- [802.16.3-00/09r1](#)
802.16.3 Invitation to Contribute: Session #9
- [802.16.3-00/08](#)
802.16.3 Task Group reactions to a press release from the IEEE-ISTO
- [802.16.3-00/07r1](#)
Key Characteristics of 802.16.3 Air Interface Standard
- [802.16.3-00/06](#)
Call for Comments on IEEE 802.16.3-00/02r2, Functional Requirements for the 802.16.3 Air Interface Standard
- [802.16.3-00/05r1](#)
IEEE 802.16.3 Session #7 Minutes
- [802.16.3-00/04](#)
IEEE 802.16.3 Session #7 Tentative Agenda
- [802.16.3-00/03r2](#)
Development Plan for 802.16.3 Air Interface Standard - Task Group Revision
- [802.16.3-00/02r4](#) [also [ZIPed Word and figure source](#)]
Functional Requirements for the 802.16.3 Interoperability Standard
Note: the current version is dated 00-09-26. The version dated 00-09-22 has a figure error.
- [802.16.3-00/01](#)
Proposed PAR for Broadband Wireless Access Systems in Licensed Bands from 2 to 11 GHz - Five Criteria
- [802.16.3-00/00r1](#)
Project Authorization Request (PAR): Air Interface for Fixed Broadband Wireless Access Systems in Licensed Bands from 2 to 11 GHz
[*obsolete*]
- **Contributions, 2001**
- See also [Task Group 3/4 Joint Contributions](#)
- [802.16.3c-01/81](#)
New Adaptive Antenna MAC Section (substitute for section 6.2.7.13) (Einan Regev and Huanchun Ye, 01/09/06)
- [802.16.3c-01/80](#)
Propagation models for coexistence studies (Avi Freedman and Ofer Kelman, 01/09/06)
- [802.16.3c-01/79](#)
Channel models for 30km and 50km range (Avi Freedman, et al., 01/09/06)
- [802.16.3c-01/78](#)
Proposed Revision to Section 8.3.5.12 (Unique Word Specification) (Brian Eidson and Russell McKown, 01/09/02)
- [802.16.3c-01/77](#)
Options and results for reducing FEC complexity in 802.16a OFDM modes (Einan Regev, 01/08/12)
- [802.16.3c-01/76](#) [Presentation [802.16.3p-01/76](#)]
Channel models for long range deployments (Avi Freedman, 01/07/09)
- [802.16.3c-01/75](#)
Proposal to Amend Section 8.3.5.11.4 of TG3&4 Draft Document (Brian Eidson, 01/07/06)

- [802.16.3c-01/74](#)
Proposal to Add a New Section between 8.3.5.11 and 8.3.5.12 of TG3&4 Draft Document (Brian Eidson, 01/07/06)
- [802.16.3c-01/73](#)
Proposal to Amend Section 8.3.5.5.2.1 of TG3&4 Draft Document (Brian Eidson, 01/07/06)
- [802.16.3c-01/72r1](#) [Rev. 0, 01/07/06]
Proposal to Amend Section 8.3.5.16 of TG3&4 Draft Document (Russell McKown, Wayne Music, Brian Eidson, 01/07/06)
- [802.16.3p-01/71](#)
802.16.3 MAC Synchronization (Robert L. Phenicie, Jr., 01/07/02)
- [802.16.3c-01/70](#)
TG3 Channel Model - Protested Status and Voting (David Trinkwon, 01/07/02)
- [802.16.3c-01/69](#)
802.16 Improvements in Optional FEC for TG3 (Dave Williams, Garik Markarian, Allen Risley, Sean Sonander, Neil McSparron, Zion Hadad, Yossi Segal, Jose Kukielka, Andrew Middleton, 01/06/29)
- [802.16.3c-01/68](#) [Presentation [802.16.3p-01/68](#)]
Outline: Air Interface for Fixed Broadband Wireless Access Systems (2-11 GHz) (Vladimir Yanover, 01/05/16)
- [802.16.3p-01/67](#)
IEEE 802.16.3 Turbo Product Code Performance Under Multipath Channels (Vladimir Yanover, 01/05/11)
- [802.16.3c-01/66](#) {also for TG4}
Changes in the 802.16 Fragmentation and Packing Function (Vladimir Yanover, 01/05/11)
- [802.16.3c-01/65](#)
A Proposal for ARQ Procedures Based on the IEEE 802.2 Standard (Huanchun Ye, 01/05/11)
- [802.16.3c-01/64](#)
TG3 MAC Support for Advanced Antenna Technologies (Huanchun Ye, 01/05/11)
- [802.16.3c-01/63](#) {also for TG4}
A Contribution to the TG3 and TG4 MAC: Ranging/Timing Control (Lei Wang, Brian Gieschen, and Nghi Lao, 01/05/11)
- [802.16.3c-01/62](#) {also for TG4}
Contribution to the TG3 and TG4 MAC: MPDU Formats (Lei Wang, Brian Gieschen, and Nghi Lao, 01/05/10)
- [802.16.3c-01/61r1](#) {also for TG4} [Rev. 1: 05/10]
Proposed TG3 MAC Document (Vladimir Yanover, 01/05/17)
- [802.16.4c-01/31](#) {also for TG4}
Proposal for Integrating TG3 and TG4
(Anader Benyamin-Seeyar, et al., 01/05/08)
- [802.16.3c-01/60](#)
Detailed ARQ Proposal for 802.16a and 802.16b MAC (Vladimir Yanover, 01/05/04)
- [802.16.3c-01/59r2](#) [Rev. 1: 05/01]
OFDM mode for the IEEE 802.16a PHY draft standard (Nico van Waes, et al., 01/05/17)
- [802.16.3c-01/58r2](#) [Rev. 1: 05/09; Rev. 0: 04/30]
Draft Document for SC-FDE PHY Layer System for Sub 11 GHz BWA (Anader Benyamin-Seeyar, et al., 01/05/17)
- [802.16.3c-01/57](#) {also for TG4}
OFDMA/OFDM Considerations in TG3 and TG4 (Itzik Kitroser, Yossi Segal, Zion Hadad, Vladimir Yanover, 01/04/30)
- [802.16.3c-01/56](#) {also for TG4}
MAC-PHY Interface for TG3 (Subir Varma, 01/04/26)
- [802.16.3c-01/55](#) {also for TG4}
Bandwidth Request Using CDMA Codes in OFDMA(OFDM) Base PHY (Itzik Kitroser, Yossi Segal, Zion Hadad, 01/04/25)
- [802.16.3c-01/54](#) {also for TG4}
OFDM based Ranging Enhancement for the TG3 and TG4 (Itzik Kitroser, Yossi Segal, Zion Hadad, 01/04/25)
- [802.16.3c-01/53](#)
Simulating the SUI Channel Models ([Daniel S. Baum](#), 01/04/11)
- [802.16.3p-01/52](#)
Merger of ARQ Proposals for 802.16 TG3 and 802.16 TG4 ([Vladimir Yanover](#), 01/03/14)
- [802.16.3c-01/51](#)
Reconciliation proposal for joint OFDM-SC 802.16a PHY ([Naftali Chayat](#), 01/03/14)
- [802.16.3c-01/50](#)
An Operator's Perspective ([Anthony Klinkert](#), 01/03/14)
- [802.16.3c-01/49](#)
Performance aspects of OFDM PHY proposal ([Tal Kaitz](#), 01/03/13)
- [802.16.3c-01/48](#) [Presentation [802.16.3p-01/48](#)]
Examples of uncoded BER performance for proposed 802.16.3 OFDM Phy layer in Multipath ([Robert M. Ward](#), 01/03/12)
- [802.16.3c-01/47](#)
Proposed Enhancement to Framing Structure in OFDM proposal ([Anish Tolia](#), [Yonatan Manor](#), [Chet Shirali](#), [Menashe Shahar](#), 01/03/09)
- [802.16.3c-01/46](#)
Analysis of PHY waveform Peak to Mean Ratio and Impact on RF Amplification ([Paul Struhsaker](#), [Kirk Griffin](#), 01/03/09)
- [802.16.3c-01/45](#)
Proposed MAC Enhancements to support adaptive antenna array processing in 802.16.3 ([Einan Regev](#), 01/03/09)
- [802.16.3c-01/44](#) [Presentation [802.16.3p-01/44](#)]
Spectral Mask and Preliminary Field Trials of a COFDM Modem ([Jonathan Labs](#), Yvon Belec, J. Pierre Lamoureux, Stephan Leclerc, Rainer Ullmann, Donovan Young, Xiaode Yu 01/03/09)
- [802.16.3c-01/43](#)
IEEE 802.16 TG3: Possible Strategies for the development of the PHY layer ([Zion Hadad](#), 01/03/09)
- [802.16.3c-01/42](#) [Presentation [802.16.3p-01/42](#)]
802.16a PHY Proposals - Proposed Improvements and Mergers ([David Trinkwon](#), 01/03/08)

- [802.16.3c-01/41](#) [Presentation [802.16.3p-01/41](#)]
Key System Characteristics and Evaluation Criteria for the TG3 Air Interface Standard ([David Trinkwon](#), 01/03/08)
- [802.16.3c-01/40](#) {also for TG4}
ARQ for TG3 and TG4 Systems ([Subbu Ponnuswamy](#) and [Jacob Jorgensen](#), 01/03/08)
- [802.16.3c-01/39](#) [Presentation [802.16.3p-01/39](#)]
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- [802.16.3c-00/05](#)
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- [802.16.3p-00/04](#)
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Session #10 TG1 Contributions related to 802.16.3 MAC Issues

- [802.16.1c-00/17](#) (2000-11-03)
Proposal for MAC enhancements to 802.16.1 MAC for 802.16.3 Application ([George Fishel](#), [Chet Shirali](#), [Menashe Shahar](#), [Chris Tappenden](#), [Jose Costa](#), [Mike Rude](#), [Eric Jacobsen](#), [John Sanford](#))
- [802.16.1c-00/13](#) (2000-10-30)
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MAC to PLCP sublayers interface for 802.16 ([Vladimir Yanover](#))

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IEEE 802.16 Task Group 3/4 Documents

This page lists the documents **prior to the year 2002** which were common to Task Group 3 (developing P802.16a) and Task Group 4 (developing P802.16b).

For documents beginning in 2002, see [IEEE 802.16 Task Group a](#).

Documents

- [802.16ab-01/12](#)
Joint TG3/TG4 MAC Minutes for Session #15 (Draft) (01/11/15)
- [802.16ab-01/11](#)
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