

## IEEE 802

Local and Metropolitan Area Network Standards Committee  
Homepage at <http://ieee802.org/>

March 15, 2002

To: Mr. William F. Caton  
Acting Secretary  
Federal Communications Commission  
236 Massachusetts Ave., NE, Suite 110  
Washington, DC 20002

Reply to: Carl R. Stevenson  
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Dear Mr. Caton:

Please find attached the Reply Comments of the IEEE Project 802 Local and Metropolitan Area Network Standards Committee ("the IEEE 802 LMSC") in RM-10371.

Should you have any questions regarding this filing, please feel free to contact Mr. Carl R. Stevenson, the Interim Chair of the IEEE 801.18 Radio Regulatory Technical Advisory Group ("TAG").

Respectfully submitted,

/s/  
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**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Petition for Rulemaking of the Wireless	)	
Ethernet Compatibility Alliance To Permit	)	RM-10371
Unlicensed National Information Infrastructure	)	
Devices To Operate in the 5.470-5.725 GHz	)	
Band	)	

To: The Commission

**Reply Comments of IEEE 802 in RM-10371**

IEEE 802 appreciates the opportunity to file these Reply Comments in response to comments previously filed in the above-captioned proceeding and in support of the instant Petition for Rulemaking (“the WECA Petition”).

As stated in the WECA Petition, the Commission is to be commended for its foresight in anticipating the need and providing for a robust unlicensed wireless industry when it adopted the 5 GHz unlicensed rules.

Access to more bandwidth in the 5 GHz frequency range, and very importantly, globally harmonized spectrum segments there, will be critical to the continuation of the stunning success story that Part 15 license exempt devices, and the services that they provide to the public, represent to date. Examples of such devices include Wireless Local Area Networks (“WLANs”), Wireless Metropolitan Area Networks (“WMANs”), and Wireless Personal Area Networks (“WPANs”).

IEEE 802 firmly supports the WECA Petition and urges the Commission to expeditiously issue a Notice of Proposed Rulemaking proposing the modifications to its rules requested by WECA, in order to provide adequate, globally harmonized spectrum segments for WLANs, WMANs, and WPANs in the 5 GHz frequency range.

As the primary international industry body developing industry standards for wireless networks, IEEE 802 is an interested party in this proceeding.

### **Background on IEEE 802**

1. IEEE 802 operates under the rules of the Institute of Electrical and Electronics Engineers, Inc. (“IEEE”) and the IEEE Standards Association (“IEEE-SA”). It is formally known as the Local and Metropolitan Area Networks (“LAN/MAN”) Standards Committee. IEEE 802 is sponsored by the IEEE Computer Society. This response was prepared by the Radio Regulatory Ad-Hoc Group at the March 2002 IEEE 802 meeting and was subsequently approved by the IEEE 802 Sponsor Executive Committee after review by each of its three wireless Working Groups.
2. IEEE 802 has the basic charter to develop and maintain networking standards and recommended practices, using an open and accredited process, and to enable and advocate them on a global basis.
3. IEEE 802 was formed in February 1980 and has met at least three times per year as a plenary body ever since that time. IEEE 802 has grown from a participation of 500 individuals in the 1990s to over 1000 individuals in the plenary sessions in 2002.
4. The IEEE 802.11a standard is designed to operate in the 5 GHz frequency range, providing data rates of up to 54 Mbps. Task Group “h” within the IEEE 802.11 Working Group is currently developing extensions to the base IEEE 802.11 standard for Dynamic Frequency Selection and Transmit Power Control (“DFS” and “TPC”) to facilitate sharing with other users in the 5 GHz band.

5. The IEEE 802.16a standard is also designed to operate in 5 GHz frequency range, providing similar data rates to IEEE 802.11a. Similarly, Dynamic Frequency Selection and Transmit Power Control (“DFS” and “TPC”) are used within this standard to facilitate sharing with other users in the 5 GHz band.

**The Preponderance of Comments Support the WECA Petition and the Commission Should Move Forward with an NPRM**

6. The overwhelming majority of commenters expressed strong support for the Petition. Only three commenters opposed the Petition. We believe that the record in this proceeding more than amply supports the issuance of a Notice of Proposed Rulemaking.

7. We believe that the petition and the comments in favor thereof stand on their own merits. However, we would like to take the opportunity to rebut some of the arguments presented by those who opposed the Petition.

**Response to the Comments of the American Radio Relay League (“ARRL”)**

8. In its comments, ARRL claims that the WECA Petition is “fatally flawed,” asserting that the Petition “fails to establish any current need” and that it “presupposes the outcome of the 2003 World Radiocommunication Conference” (“WRC-03”).<sup>1</sup> We disagree with these assertions.

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<sup>1</sup> See Comments of ARRL at 1.

9. In the first case, the Petition cites a spectrum requirements study which was done using an established methodology, accepted by ITU-R, which projects a spectrum shortfall of at least 240 MHz by the year 2010.<sup>2</sup> While WECA admits in its Petition that the cited spectrum requirements study considered requirements within the European Union, IEEE 802 agrees fully with WECA's contention that the conclusions of the ETSI study should be a reliable (perhaps even conservative) indicator of 5 GHz WLAN/WMAN/WPAN spectrum requirements in the United States.

10. In the second case, IEEE 802 does not agree that the Petition "presupposes the outcome of WRC-03."<sup>3</sup> On the contrary, while the Petition recognized that a globally harmonized allocation consistent with what WECA requests in the Petition is on the agenda for WRC-03, WECA's request for access to the requested spectrum is an immediate request and is not contingent in any way on the outcome of WRC-03. We also believe that it is necessary for the Commission to act now, before the impending shortfall takes its toll on both the wireless networking industry and the millions of users that it serves. To wait until the shortfall is acute would be contrary to the public interest and poor public policy because by the time the regulatory process could be completed to rectify the situation, the damage would already have been done.

11. Another major thrust of the ARRL's comments is that other uses in the 5 GHz frequency range have "... all but rendered the band unusable to the Amateur Service." The fact that the level of usage of the 5 GHz spectrum allocated to the Amateur Service is negligible leads, in our viewpoint, to the conclusion that this concern is exaggerated. Furthermore, the use of interference mitigation techniques within IEEE 802 standards, which are designed to facilitate spectrum sharing with other users of the subject band will further negate this concern.

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<sup>2</sup> See the Petition *at III*.

<sup>3</sup> *Id.*

## **Response to the Comments of the Amherst Alliance**

12. IEEE 802 believes that the goals embodied in the Petition actually support the stated objectives of the Amherst Alliance as outlined in their comments to the Commission in this proceeding.<sup>4</sup>

13. We have noted, for instance, a very high acceptance of unlicensed wireless WLAN equipment conforming to the IEEE 802.11b standard by community network and “freenet” users, and we expect the same to occur with the new IEEE 802.11a and 802.16a standards developed for 5 GHz U-NII band operation.

14. Today there are many thousands of unlicensed wireless users forming virtual internet communities, both in metropolitan areas and in rural and underserved areas, within which valuable data communications and information is exchanged to support daily needs.

15. We believe that equipment based on the new standards such as 802.11a and 802.16a now being fielded will accelerate the growth of such virtual communities by making affordable wireless broadband services available on a large scale. As mentioned above, this would seem to actually support the stated goals of the Amherst Alliance.

16. Furthermore, the Amherst Alliance implies, without any supporting rationale, that, should the Petition be granted, significant harmful interference would occur, resulting in a “major reduction in the number of hams.” As an initial matter, IEEE 802 does not believe that the use of the requested bands would cause harmful interference to ham operators. As pointed out above, interference mitigation techniques employed in WLAN/WMAN/WPAN devices will significantly reduce the potential for harmful interference to the Amateur Radio Service. Moreover, IEEE 802 believes that this implication is greatly exaggerated. If the 5 GHz band was a highly populated, popular

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<sup>4</sup> See Written Comments of the Amhurst Alliance and Americans for Radio Diversity at page 2.

amateur band, there might be some factual basis for such a contention, but that is simply not the case in this instance.

17. We believe that low cost, high bandwidth equipment conforming to IEEE 802 standards are directly applicable to, and will actually enable and facilitate, the amateur radio community's own wireless network developments at 5 GHz. We foresee only winners in this scenario. IEEE 802 believes that the objectives of the Amherst Alliance will be preserved and extended in a more effective and consolidating manner by the availability of low cost, high performance equipment which will result from extending the U-NII bands to the 5470-5725 MHz range.

### **Response to the Comments of the Nickolaus E. Leggett**

18. The comments filed by Mr. Leggett address an important issue that IEEE 802 concurs with concerning mobile safety. The issue of driver distraction by data delivery devices is of paramount importance and is a concern that is always being addressed by the wireless industry and by IEEE 802.

19. With regard to Mr. Leggett's assertion that Internet Service Providers ("ISPs") are victims of "theft" by freenets, ISPs supporting small rural areas are actively deploying unlicensed WLAN/WMAN equipment to provide needed high data rate wireless internet services at nominal cost. Unlicensed WLAN/WMAN links are also employed by many large ISPs to provide backhaul services that would be difficult and costly to provide by technology requiring licensed band operation and costly installation. Overall, the rapidly growing demand for unlicensed WLAN/WMAN devices has brought the price and availability of wireless equipment to such a level that has benefited both the ISP's and the community based operators of "freenets."

20. Mr. Leggett expresses concern about "foreign models and decisions influencing U.S. regulatory policies." The Petition in its reference to global harmonization does not suggest to the FCC that foreign models or decisions regarding unlicensed 5 GHz wireless be applied to or used to influence the spectrum allocation process in the United States.

“Harmonization” is a process which is guided by a combination of the work of standards bodies and marketplace forces and the resulting economies of scale production both lowers the costs to the consumer and facilitates the ability to use the equipment worldwide.

21. With regard Mr. Leggett’s concern, the development of wireless standards such as IEEE 802.11a and IEEE 802.11b was not done principally in an effort to deal with cabling issues but to provide a low cost and mobile means of providing needed communications services that would otherwise not be available. For example, IEEE 802.11b equipment was used extensively in the aftermath of the recent tragedy in New York City to provide emergency communications.

22. Finally, Mr. Leggett raises an issue concerning problems that may arise with unlicensed 5 GHz WLANs/WMANs/WPANs interfering with amateur radio “moonbounce” communications, often referred to in amateur circles as “Earth-Moon-Earth” (“EME”), due to its use of the moon as a passive reflector. Because such communications rely on the reception of very low power signals there is some possibility of co-channel interference generated by WLAN/WMAN/WPAN devices. However, the level of usage of this mode in the 5 GHz band by amateurs appears to be miniscule.<sup>5</sup> Consequently we believe that the probability of harmful interference is remote. Additionally, since EME operation is traditionally accomplished by using very narrowband receivers and slow speed Morse code transmissions, such operations could conceivably be conducted in the guard bands between WLAN/WMAN/WPAN channels, such as those specified in the IEEE 802.11a standard.

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<sup>5</sup> The ARRL website contains an article at <http://www.arrl.org/contests/results/99/EME.pdf> that lists the results for the 1999 ARRL International EME Contest (the latest EME contest scores we were able to find on the ARRL website). This article indicates only 3 participating amateur stations worldwide actually used the 5 GHz amateur allocation, only one of which was a US amateur. Thus, even if one gratuitously assumed that since 1999 the number of amateurs worldwide using the 5 GHz band increased 100 fold, there would still only be ~300 amateurs worldwide actually using the 5 GHz band for EME communications.



**Response to the Comments of the Wireless Communications Association  
International, Inc. (“WCA”)**

23. IEEE 802 generally supports the WCA in the comments it has set forth concerning the WECA Petition for Rulemaking. We believe, as do the WCA and WECA, that the extension of the U-NII band into the 5470-5725 MHz band will result in major benefits to the consumer who will see lower prices and improved internet access resulting from a fully competitive market for unlicensed broadband wireless devices and services having more bandwidth than currently available.

24. IEEE 802 fully supports and endorses the WCA observation that co-existence with incumbent primary users of the 5470-5725 MHz band is of paramount importance and that interference mitigation techniques<sup>6</sup> be incorporated to minimize potential interference.

25. The specification of interference mitigation criteria is a major objective of the IEEE 802 wireless standards development process. Indeed, the establishment of effective interference mitigation techniques will not only ensure protection for primary users such as the Radiolocation Services, but will lead to technologies and techniques that will support improved co-existence amongst all wireless communications users of the proposed band. In this way, valuable radio spectrum will see improved and efficient use in the support of future unlicensed broadband wireless services

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<sup>6</sup>(such as *Dynamic Frequency Selection* (“DFS”))

## **Summary and Conclusions**

IEEE 802 firmly supports the WECA petition and urges the Commission to expeditiously issue a Notice of Proposed Rulemaking proposing the modifications to its rules for Part 15 unlicensed devices in the 5 GHz frequency range that are requested in the Petition.

Access to more bandwidth in the 5 GHz frequency range will be critical to the future continuation of the stunning success story of service to the public by Part 15 unlicensed devices, including WLANs, WMANs, and WPANs. This increased bandwidth will afford manufacturing economies of scale especially for equipment operating in the proposed new globally harmonized spectrum bands.

Respectfully submitted,

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## Certificate of Service

I the undersigned hereby certify that on March 15, 2002, I served, by delivery to the US Postal Service, true and complete copies of the attached Reply Comments of IEEE 802 in RM-10371, to the following persons or entities as required by the Commission's rules:

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