Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380
	)	

To: The Commission

CONSOLIDATED REPLY TO OPPOSITIONS TO PETITIONS FOR RECONSIDERATION

The Wireless Internet Service Providers Association ("WISPA"), pursuant to Section 1.429(g) of the Commission's Rules, hereby replies to the Oppositions to its Petition for Reconsideration filed in the above-captioned proceeding.[1]

Discussion

I. SPECTRUM SENSING REQUIREMENTS SHOULD BE ELIMINATED NOT TOUGHENED.

A. Sensing Adds No Benefits To Wireless Microphones Entitled To Protection, And Less Restrictive Means Are Available To Ensure Continued Operation Of Unlicensed Wireless Microphones.

Despite overwhelming evidence that spectrum sensing technology proved to be an "outright failure"[2] and is unnecessary to protect wireless microphones in light of the

[1] *See Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band,* Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807 (2008) ("*Second R&O/MO&O*"). WISPA filed its Petition for Reconsideration on March 19, 2009 ("WISPA Petition") and its Consolidated Opposition to Petitions for Reconsideration on May 8, 2009 ("WISPA Opposition"). By *Order* dated April 22, 2009, the Commission's Office of Engineering and Technology extended the deadline for filing replies to May 18, 2009. *See Order*, DA 09-900, ET Docket Nos. 04-186 and 02-380, rel. Apr. 22, 2009. Accordingly, this Reply is timely filed.

geolocation and database requirements,[3] a few parties cling to the view that spectrum sensing should be retained and, in some cases, argue for toughened sensing requirements to protect the interests of wireless microphone users. Shure asks the Commission to retain the sensing rules because wireless microphones "are inherently dynamic and portable" such that sensing "is necessary to protect those wireless microphones operating in a manner that makes registration in the Database impractical."[4]

This view, however, glosses over the fact that there are two very different classes of wireless microphones – the relatively few that are licensed under Part 74 and are entitled to protection, and the hundreds of thousands that are not licensed or registered at all.[5] For those that are licensed under Part 74, the Commission's rules afford them a one-kilometer zone in which no TVBDs can operate. For those that are not presently licensed, WISPA proposed a plan in its Opposition that would specify two channels for non-exclusive use by unlicensed wireless microphones, including those that operate on an

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[2] Opposition and Comments of MSTV and NAB to Petitions for Reconsideration and Clarification, ET Docket Nos. 04-186 and 02-380, filed May 8, 2009 ("MSTV/NAB Opposition"), at 10. *See also* Opposition of the Coalition of Wireless Microphone Users to Petitions for Reconsideration, ET Docket Nos. 04-186 and 02-380, filed May 8, 2009 ("CWMU Opposition"), at ii ("spectrum sensing technology has never successfully demonstrated an ability to protect Wireless Microphones").

[3] *See, e.g.*, Opposition and Comments of Google Inc., ET Docket Nos. 04-186 and 02-380, filed May 8, 2009, at 4-11.

[4] Opposition to Petitions for Reconsideration of Shure Incorporated, ET Docket Nos. 04-186 annd 02-380, filed May 8, 2009 ("Shure Opposition"), at 6. *See also* Comments of Sennheiser Electronic Corporation, ET Docket Nos. 04-186 and 02-380, filed May 8, 2009 ("Sennheiser Comments"), at 4. The Society of Broadcast Engineers, Incorporated, apparently opposes WISPA's proposal to eliminate the requirement that TVBDs vacate a channel within two seconds of finding a channel occupied. *See* Consolidated Opposition to Petitions for Reconsideration of the Society of Broadcast Engineers, Incorporated, ET Docket No. 04-186, filed Apr. 28, 2009 ("SBE Opposition"), at 7.

[5] Sennheiser, too, is guilty of equating the interests of licensed wireless microphones with those that have not been licensed, and makes the unsupportable statement that TVBDs "are dead last in the interference food chain, and should remain so." Sennheiser Comments at 4. Part 15 devices have at least been certified through a rigorous process, whereas rogue uses of unlicensed wireless microphones have no interference protection whatsoever. Given recent findings by the Commission that Sennheiser has been willfully and repeatedly marketing unauthorized wireless microphones – *i.e.*, those that have not been approved for marketing under Part 15 – its caustic statement about the status of TVBDs is somewhat hypocritical. *See Sennheiser Electronic Corporation*, Notice of Apparent Liability for Forfeiture, DA 09-1031, rel. May 11, 2009. *See also* CWMU Opposition at 4 (noting that many of CWMU members have been unable to obtain FCC licenses but are nonetheless using wireless microphones).

itinerant or intermittent basis.[6] Rather than enjoying no interference protection whatsoever, as is currently the case, these microphones would be granted co-equal status with TVBDs and, by being segregated into designated spectrum that fixed TVBD operators would avoid wherever possible, could be reasonably assured that they would not suffer interference.[7] Where practical, unlicensed wireless microphones not operating at fixed times and locations would be required to register with the database and would be required to access the database to avoid causing interference.[8] This plan would appear to alleviate Shure's concerns about the viability of unlicensed wireless microphones which, it should be remembered, are not now entitled to any interference protection.

WISPA opposes additional arguments by Shure, Sennheiser and SBE[9] that likewise would serve only to increase the costs of TVBDs, discourage investment in broadband and, ultimately would not appropriately balance the interests of those that will share the white space. First, Shure and Sennheiser offer no credible information to support an increase in the size of the wireless microphone protection zones, a proposal that WISPA[10] and others have strongly and cogently rebuked.[11] Moreover, while SBE may be accurate in stating that "wireless microphones are entitled to protection from interference when operating anywhere in their operational areas" as defined in ULS,[12] this does not mean that Part 74 wireless microphones are protected at all times throughout

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[6] *See* WISPA Opposition at 7-8.
[7] This view is also supported by the Wi-Fi Alliance. *See* Comments of the Wi-Fi Alliance to Deny the Shure Petition for Reconsideration, ET Docket No. 04-186, filed Apr. 27, 2009 ("Wi-Fi Alliance Comments"), at 3.
[8] WISPA also does not object to CWMU's plan to allow for expanded eligibility under Part 74 so that some wireless microphones that are in use can be given protected status. *See* CWMU Opposition at 4-5.
[9] *See* Shure Opposition at 6-7; Sennheiser Comments at 4; SBE Opposition at 12.
[10] *See* WISPA Opposition at 5-6.
[11] *See, e.g.*, Opposition to Petitions for Reconsideration of the Public Interest Spectrum Coalition, ET Docket Nos. 04-186 and 02-380, filed May 8, 2009 ("PISC Opposition"), at 14-15; Motorola, Inc. Opposition to Petitions for Reconsideration, ET Docket Nos. 04-186 and 02-380, filed May 8, 2009 ("Motorola Opposition"), at 20; Wi-Fi Comments at 3.
[12] SBE Opposition at 8. *See* Section 74.832(f) (defining "usual area of operation").

the entire operational area – which may be as large as an 80 kilometer radius or a major metropolitan area. In fact, Section 15.712(f)(1) provides assurance to licensed wireless microphones that they can register coordinates in the database and be entitled to a one-kilometer protection zone, more than sufficient to protect wireless microphones that "are intended to transmit over distances of approximately 100 meters."[13] SBE offers no reason for the Commission to depart from its well-conceived rule of providing a one-kilometer protection zone for licensed wireless microphones.

Second, WISPA disagrees with Shure's reasons for wanting to preserve the distributed sensing requirements set out in Section 15.711(c)(7).[14] As a general proposition, distributed sensing would only be useful in those rare instances where one fixed TVBD could not hear the signal from a nearby licensed wireless microphone and another fixed TVBD in the network would be able to detect that signal. It would be ludicrous to require WISPs and other community networks – including those that are used for public safety – to incorporate "group sensing" capabilities that would shut down an entire regional fixed TVBD network because one legal or illegal wireless microphone designed to cover only 100 meters was detected. Moreover, in stating that "[r]ural WISPs will have access to multiple clean channels . . . with no perceptible disruption to a WISP's underlying customers,"[15] Shure completely ignores the fact that different TV channels have different propagation characteristics.[16] For instance, if a fixed TVBD wide-area network is operating on Channel 22 and an unlicensed wireless microphone (or

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[13] Section 74.801. WISPA opposes CWMU's suggestion that fixed TVBDs should respect a four-kilometer zone for wireless microphones if it is not possible to use a table to define the protection area. *See* CWMU Opposition at 9. CWMU offers no technical basis to support this proposition although, as stated below, WISPA agrees with CWMU that the database should be as accurate as possible.
[14] *See* Shure Opposition at 8-9.
[15] *Id.* at 9.
[16] *See* WISPA Petition at 11.

even a "false positive") is "sensed" and forces a frequency change to Channel 45, the smaller coverage area for Channel 45 could result in end users and public safety officials losing connectivity and service.[17] Entire fixed TVBD networks that serve hundreds of end-users should not be expected to randomly or rapidly change frequencies, thereby dropping customers during and after the frequency-change process simply because of the presence of one unlicensed wireless microphone or one intentional, malevolent wireless hacker somewhere within the 200-square mile service area of the fixed TVBD network.

B. Sensing Is Unnecessary To Protect Cable Headends From Database Errors.

NCTA argues that spectrum sensing requirements should be retained as "an important back-up safeguard for [cable] headends" that will help ensure against database errors.[18] Like other parties, NCTA argues for a restrictive and unreliable solution – installing expensive and burdensome technology that is unproven – when less restrictive solutions will do. Indeed, in acknowledging that spectrum sensing "has never tested successfully,"[19] CWMU offered a detailed plan that it believes would ensure the security, integrity and accuracy of the database. Elements of this proposal include the selection of a single database administrator, use of strong cryptography, supervision by the Commission and input of the most accurate information possible.[20] Taking a different approach to ensuring the accuracy of the database, Key Bridge Global encouraged the Commission to authorize multiple database managers and require active channel

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[17] *See id.*
[18] Comments of the National Cable & Telecommunications Association on Petitions for Reconsideration, ET Docket Nos. 04-186 and 02-380, filed May 8, 2009 ("NCTA Comments"), at 12.
[19] CWMU Opposition at 5.
[20] *See id.* at 6-9. *See also* MSTV/NAB Opposition at 13-14 (proposing single administrator to improve database accuracy).

management.[21] The Public Interest Spectrum Coalition advocated full transparency of the database so that any errors could be identified and communicated to the database administrator and/or the Commission, calling this "the most potent disinfectant for flawed or out-of-date information."[22] Regardless of which proposal or combination the Commission selects to better ensure the accuracy of the database, the point is clear – the Commission's objective should be to make the database accurate, current and secure, not to strangle TVBDs with a plethora of sensing regulations that won't solve NCTA's stated problem.[23]

NCTA also asserts that the distributed sensing rules should be retained to detect interference at headends.[24] WISPA notes that distributed sensing requirements were imposed only to protect wireless microphones, and never to protect cable headends,[25] and should not be retained for the new purpose NCTA now suggests.

II. THE COMMISSION SHOULD PERMIT FIXED TVBDs TO OPERATE WITH INCREASED POWER AND HEIGHT, SO LONG AS INCUMBENT STATIONS RETAIN AN EQUIVALENT LEVEL OF INTERFERENCE PROTECTION.

In its Petition, WISPA reiterated its request to allow fixed TVBD base stations to operate at up to 20 watts transmit power in rural areas and to increase the maximum base station antenna height to 100 meters.[26] WISPA explained that these rule changes

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[21] *See* Consolidated Opposition to Petitions for Reconsideration of Key Bridge Global LLC, ET Docket Nos. 04-186 and 02-380, filed May 8, 2009, at 2-4.
[22] Petition for Reconsideration of the Public Interest Spectrum Coalition, ET Docket Nos. 04-186 and 02-380, filed March 19, 2009 ("PISC Petition"), at 14.
[23] In its Opposition, WISPA included a detailed criticism of NCTA's testing procedures and results regarding the potential for direct pickup interference. *See* WISPA Opposition at 13-16. WISPA's points apply equally to the arguments advanced by DIRECTV, Inc. and need not be repeated here. *See* Comments in Support of Petitions for Reconsideration of DIRECTV, Inc., ET Docket Nos. 04-186 and 02-380, filed May 8, 2009.
[24] *See* NCTA Comments, Technical Analysis, at 15.
[25] *See Second R&O/MO&O* at ¶249.
[26] *See* WISPA Petition at 13-16.

would afford fixed TVBDs greater flexibility in network design, would reduce the costs of site acquisition and equipment and increase the base station coverage area.[27] Motorola supported WISPA's proposal, agreeing that its recommendation would "enhance the ability [of] fixed [TVBDs] to provide economical broadband coverage in many of this country's underserved areas."[28] NCTA,[29] MSTV/NAB[30] and Shure[31] oppose WISPA's proposals on grounds that their adoption would increase interference to cable headends, television receivers and wireless microphones.

A. The Commission Can Raise The Maximum Power For Fixed TVBDs To 20 Watts Transmit Power Without Increasing The Potential For Additional Interference.

WISPA's proposal to allow fixed TVBD operation at higher power in rural areas is intended to fully protect all entities entitled to interference protection at the levels and boundaries specified in Commission rules. For every 6 dB increase in power above 4 watts EIRP (+36 dBm), the TVBD transmitter would need to be twice as far from the applicable protected contour in the case of TV stations, twice as far from the "keyhole" boundary in the case of headends and twice as far from the "keep-out" zone for licensed wireless microphones. In all cases, the power at which the fixed TVBD transmitter could legally operate would ensure that the same level of interference protection is being provided, meaning there would be no increase in interference to protected facilities.

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[27] *See id. See also* PISC Petition at 10-12.
[28] Motorola Opposition at 11.
[29] *See* NCTA Comments at 10-11. NCTA mistakenly states that WISPA proposed an increase in power to 20 watts EIRP. In fact, WISPA requested an increase to 20 watts transmitter power.
[30] *See* MSTV/NAB Opposition at 7, 9.
[31] *See* Shure Opposition at 12. Shure opposed only the proposed power increase.

WISPA believes that a sliding scale for power above 4 watts EIRP is preferable to a blanket enlargement or modification of existing protection zones, as Shure suggests.[32] The sliding scale would be easy to calculate and administer through the geolocation database, and enforced by considering only the power and distance from the protected contour or boundary.

MSTV/NAB misstates the potential for interference when it relies on the Commission's test report[33] to support its view that operation at higher power would cause to DTV receivers.[34] Although MSTV/NAB makes no specific reference to the applicable language in either of the Commission's test reports, it appears that they are referring to the testing of personal/portable devices located in close proximity to DTV receivers, and not the testing of fixed TVBDs located outdoors some distance from the DTV receiver. Indeed, the language MSTV/NAB uses on page 7 of its Opposition to help makes its case is identical to the language on page 6 in its discussion of interference from personal/portable devices. Without further information, MSTV/NAB's claim of interference from increased fixed TVBD power levels is likely overstated (if not totally unsupported by the test reports) and can be given no credibility.

In sum, WISPA believes that, in some uncongested areas of the country, WISPs and their subscribers can enjoy the benefits of increased power, while still preserving existing interference protection standards for *all* incumbents entitled to protection.[35]

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[32] *See id.* (suggesting a seven-kilometer protection zone for wireless microphones if a TVBD is operating at 20 watts of effective power).

[33] *See* S. Jones, *et al.*, "Evaluation of the Performance of Prototype TV-Band White Space Devices Phase II," OET Report FCC/OET 08-TR-1005, Oct. 15, 2008; S. Jones, *et al.*, "Initial Evaluation of the Performance of Prototype TV-Band White Space Devices," OET Report FCC/OET 07-TR-1007, July 31, 2007.

[34] *See* MSTV/NAB Opposition at 7.

[35] WISPA agrees with Motorola that the Commission should not redefine the headend protection wedge or increase the size of the co-channel protection radius. *See* Motorola Opposition at 8. WISPA further

B. The Commission Should Approve WISPA's Proposal To Increase The Maximum Antenna Height For Fixed TVBDs.

In its Petition, WISPA proposed to increase the maximum height of base station transmit antennas to 100 meters, so long as the distance from the transmitter to protected contours is increased proportionately in accordance with a distance separation table.[36] NCTA argues that WISPA's proposal does not protect headends and that the headend protection zone should be expanded if the Commission increases the maximum height.[37] WISPA clarifies that it did not intend to reduce protection for headends, and believes that a similar table of separation distances for fixed TVBD antennas above 30 meters in height can be incorporated into the Commission's rules to provide an appropriate level of protection for headends. If accurate, NCTA's statement that increasing the antenna height from 30 to 100 meters increases the line of sight to a headend receiving antenna located 150 meters above ground from 90 kilometers to 113 kilometers[38] could be used to help establish a distance separation table for fixed TVBDs to follow. Requiring a fixed TVBD to maintain a distance separation proportionate to its height between 30 and 100 meters above ground would be more appropriate than simply mandating a blanket increase in the size of the headend protection zones, irrespective of the actual height of the fixed TVBD antenna.

In keeping with its desire to increase broadband access for unserved and underserved members of the public, WISPA reaffirms its commitment to do so in a

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concurs with PISC that headends located beyond 80 kilometers from a TV station should not be entitled to protection in light of the fact that the current protection zone will be "effective for the majority of cable headends" (as NCTA itself states) and the uncertainty surrounding the number and location of headends. *See* PISC Opposition at 15-17.

[36] *See* WISPA Petition at 13-15. Motorola made a similar proposal. *See* Motorola Petition at 5-6. Both WISPA and Motorola included tables showing the required separation distance to TV contours as height is increased.

[37] *See* NCTA Comments at 10.

[38] *See* NCTA Comments, Technical Analysis at 11.

responsible manner. Concurrent with relaxing the existing 30-meter AGL TVBD base station antenna height limitation and allowing fixed TVBD base station antennas to be mounted up to 100 meters AGL, WISPA would support an additional rule to add appropriate HAAT height requirements and thereby assure that effective protection is afforded both to incumbent broadcasters and to existing headends.

Conclusion

WISPA believes that its views appropriately balance the interest of incumbents entitled to interference protection with those of prospective fixed TV white space users. Sensing presents a huge barrier to broadband deployment in rural, unserved and underserved areas of the country. If it does nothing else on reconsideration, the Commission should eliminate sensing requirements to open the door for effective fixed broadband Internet deployment.

Respectfully submitted,

THE WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION

May 18, 2009

By: */s/ Richard Harnish, President*
/s/ Jack Unger, Chair of FCC Committee and Board Secretary

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CERTIFICATE OF SERVICE

I, Kenn Wolin, a paralegal at the law firm of Rini Coran, PC, hereby certify that I have caused copies of the foregoing "Consolidated Reply To Oppositions to Petitions for Reconsideration" to be submitted to the Commission in Docket Nos. 04-186 and 02-380 via ECFS and sent by first class mail, postage prepaid (except as noted), this 18th day of May, 2009, to:

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