

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

In the Matter of)	
)	
Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, and)	ET Docket No. 14-165
)	
Amendment of Part 74 of the Commission’s Rules For Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap)	
)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions)	GN Docket No. 12-268
)	

To: The Commission

**REPLY TO OPPOSITION TO PETITIONS FOR RECONSIDERATION
OF THE WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION**

The Wireless Internet Service Providers Association (“WISPA”), pursuant to Section 1.429(g) of the Commission’s Rules,¹ hereby replies to those portions of the Opposition to Petitions for Reconsideration of the National Association of Broadcasters (“NAB”)² filed in this proceeding³ that oppose WISPA’s Petition for Partial Reconsideration.⁴

¹ 47 C.F.R. § 1.429(g).

² See NAB Opposition to Petitions for Reconsideration, ET Docket No. 14-165 and GN Docket No. 12-268 (filed Feb. 29, 2016) (“NAB Opposition”).

³ *Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, et al.*, Report and Order, 30 FCC Rcd 9551 (2015) (“*Report and Order*”).

⁴ See Petition for Partial Reconsideration of WISPA, ET Docket No. 14-165 and GN Docket No. 12-268 (filed Dec. 23, 2015) (“WISPA Petition”).

Introduction

Since 2004, WISPA has been advocating for responsible shared use of TV white space (“TVWS”) spectrum for fixed broadband access “with the utmost care and consideration of the Broadcast industry, their viewers and the best interests of the public at large.”⁵ To this end, the WISPA Petition argued in favor of two additional changes to the Commission’s rules that would enhance spectrum use and efficiency without increasing the potential for harmful interference. First, WISPA requested that the Commission allow the TV white space database to incorporate antenna directivity to determine whether vacant TV channels are available for unlicensed use in a given area by directing transmissions away from broadcast station contours.⁶ Second, WISPA asked the Commission to allow unlicensed TV band operations from higher elevations, with corresponding changes in the distance separation criteria to protect TV stations.⁷ Both of these proposed changes are technically sound and are firmly grounded in the record established in this proceeding and on existing Commission precedent and practices. In its Opposition, the National Association of Broadcasters (“NAB”) argues against both of these requests. As shown below, NAB’s arguments lack merit.

Discussion

I. THE RECORD SUPPORTS DATABASE RECOGNITION OF DIRECTIONAL ANTENNAS.

NAB reiterates the Commission’s incorrect conclusion that “there is not sufficient information in the record to show how to enable the use of antenna directivity without causing

⁵ See Comments of WISPA, ET Docket No. 04-186 (filed Nov. 24, 2004) at 1.

⁶ See WISPA Petition at 4-6.

⁷ See *id.* at 6-7.

harmful interference to authorized services.”⁸ To the contrary, it is clear that by calculating allowable white space channels based on an omnidirectional antenna of 360 degrees, the TVWS database has *already* incorporated antenna directivity (360-degree omnidirectional horizontal beamwidth directivity) into the current algorithm of available white space channels. In other words, the pattern of a directional antenna is a subset of an omnidirectional antenna. Simply substituting horizontal beamwidth values of less than 360 degrees into the current available-channel algorithm utilizes the exact same process as is already used by the TVWS database and will yield TV station interference protection that is equally as valid as the protection already afforded. The benefit, of course, is the ability of the database to return more available channels than if the database treated every antenna as if it has an omnidirectional pattern.

As a practical matter, broadband providers using TVWS spectrum often deploy directional antennas where use of an omnidirectional antenna is permitted by the database. This is a spectrally efficient practice that enables frequency re-use from multiple sectors mounted on a tower. Despite this common practice, there have been no reported instances of interference to protected stations.

NAB further asserts that directional antenna use is unacceptable because the criteria that must be evaluated to determine the suitability of a directional antenna are “complex,” and that “[p]roper and accurate orientation of an antenna is not an appropriate matter for an equipment installer, whether ‘professional’ or not” and that accuracy can only be achieved with “the expertise of a licensed land surveyor.”⁹ NAB offers no support for this conjecture. Although determining where white space device directional coverage intersects with or overlaps protected TV contours would certainly be complex if performed by a human being, these calculations exist inside

⁸ *Report and Order* at ¶ 67.

⁹ NAB Opposition at 3-4.

computerized TVWS databases. There is hardly anything “complex” about the white space database performing protection calculations.

NAB makes a number of additional technical statements that are easily dismissed. First, NAB’s claim that “the physical installation of an antenna may seriously distort the antenna pattern leading to unpredictable coverage and interference”¹⁰ makes sense only if an antenna is mounted on the inside of a tower leg pointing straight up toward the sky or straight down toward the earth instead of being properly mounted on the outside of the tower leg pointing in the proper direction. Also misguided is NAB’s claim that “the accuracy of the measurement of an antenna’s position or direction may change over time.”¹¹ The actual position and orientation of the antenna would remain the same over time, even as the position of magnetic north pole changes slightly over time. While NAB notes that “signals from high-gain antennas may reflect off buildings and other objects causing interference to locations off the main axis of the antenna,”¹² those reflections are not strong enough to travel outside of the desired coverage area and into distant television contour protected areas. If NAB were correct about high-gain antenna signals causing interference then high-gain antennas would be shunned and not used in the communications industry. On the contrary, high-gain antennas are used every day to enhance communications reliability and to reduce interference. Finally, NAB insists that proper directional antenna installation cannot be performed by “equipment installers” and must only be performed by “licensed land surveyors.”¹³ This ignores the fact that directional antennas are used every day by broadcasters, WISPs and thousands of other users to

¹⁰ NAB Opposition at 4.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

reduce interference and to promote spectrum efficiency. It is highly doubtful that NAB's members rely on licensed land surveyors every time they install directional antennas. NAB's technical arguments against database recognition of directional antennas are entirely unavailing.

While WISPA recognizes that there is a separate proceeding now underway that looks to the possibility of eliminating the professional installation option,¹⁴ it agrees with Google's statement in this proceeding that "the Commission should continue to allow fixed device users to rely on a professional installer to determine the geolocation coordinates of a fixed device that does not have automated geolocation capability [as] [t]his approach allows for a more diverse pool of unlicensed devices, furthering broadband access."¹⁵ Moreover, where a TVWS device operator is relying on engineering professionals, the proposed antenna's horizontal beamwidth and azimuth parameters can be entered into the database prior to installation, thereby allowing the TVWS database to determine whether appropriate channels are available for unlicensed use by an antenna with the specified characteristics.

WISPA is actively working both internally and with the Wireless Innovation Forum multi-stakeholder to develop and implement a formal professional installer certification program. Inherent in the program is the requirement for professional installers to disclose their identity and contact information and affirmatively to certify that the specified installation parameters are correct. In the event of an error or violation, the Commission would have the ability to take enforcement

¹⁴ See *Amendment of Part 15 of the Commission's Rules for Unlicensed White Space Devices*, Notice of Proposed Rulemaking and Order, ET Docket No. 16-56, RM-11745, FCC 16-23 (rel. Feb. 26, 2016) ("*Professional Installation NPRM*").

¹⁵ Google Inc. Opposition to Petitions for Reconsideration, ET Docket No. 14-165 and GN Docket No. 12-268 (filed Feb. 29, 2016) at 22.

action not only against the operator but also against the professional installer,¹⁶ including possible debarment of any installer who proves to be a serial violator.¹⁷ These protections will greatly enhance the accuracy and reliability of the TVWS database.

II. THE RECORD SUPPORTS UNLICENSED OPERATION FROM HIGHER ANTENNA HEIGHTS.

NAB opposes WISPA's request for reconsideration of the maximum antenna height limits, arguing that increased antenna height would require greater separation distances, and "calculating adequate protection distances can be complex."¹⁸ Of course, this claim of "complexity" is another example of NAB using hyperbole to hide the fact that it has no case. As a practical matter, proper separation distances are the types of determinations that are part of the Commission's core function – establishing technical criteria to maximize the opportunities for spectrum sharing among multiple users. Indeed, the Commission has already adopted a number of distance separation tables that apply to TVWS operations, so the process of adding more height tiers to those tables seems eminently do-able. The benefits of doing so will go a long way toward meeting the demand for affordable rural broadband access.

NAB appears to be trying to have it both ways. In arguing in favor of an automatic-geo-location-only regime for TVWS devices in its July 17, 2015 letter filed jointly with several device

¹⁶ See also Petition for Reconsideration of GE Healthcare, GN Docket No. 12-268 and GN Docket No. 12-354 (filed Dec. 23, 2015) at 40 (footnote omitted) (arguing in the alternative that, should the professional installer option be preserved, the Commission should "create a secure authentication process to validate the credentials of professional installers ... and store professional installer information in the white space database as part of device registration to support compliance audits, investigations and enforcement actions").

¹⁷ See Letter from Stephen E. Coran, Counsel to WISPA, to Marlene H. Dortch, FCC Secretary ET Docket No. 14-165, GN Docket No. 12-268 and GN Docket No. 12-354 (filed Jan. 21, 2016) at 2.

¹⁸ NAB Opposition at 4.

manufacturers in this docket, NAB also agreed to support “proposed rule changes that permit such TV band device[s] to operate at higher power levels *and increased height above average terrain (HAAT)*” with the proviso that the same level of interference protection is afforded to broadcast stations as under the current rules (i.e., through adequate distance separations).¹⁹ NAB cannot simply change its mind and reduce its “deal” with the manufacturers to only those provisions that suit its purposes, but must be held to the commitment it made last summer. Allowing increased antenna height for TVWS devices that employ automatic geo-location capability, appropriately augmented by additional installer-provided antenna height data²⁰ and with appropriate changes to the distance separation table, will enhance spectrum utilization and improve fixed wireless broadband service to underserved rural consumers.

Conclusion

For the foregoing reasons, as well as those described in its prior pleadings in this proceeding, WISPA urges the Commission to reconsider its original *Report and Order* in two important respects, by allowing the TVWS database to recognize directional antennas to promote efficient spectrum use by avoiding transmission in the direction of incumbent broadcast station

¹⁹ Letter from Haiyun Tang, Adaptrum, Inc.; James Carlson, Carlson Wireless Technologies, Inc.; Larry W. Koos, Koos Technical Services, Inc.; Jordan Du Val, MELD Technology, Inc.; and Rick Kaplan, NAB, to Julius P. Knapp, Chief, Office of Engineering and Technology, RM-11745 (filed July 17, 2015) at 2 (emphasis added).

²⁰ As the Commission acknowledges in the *Professional Installation NPRM*, “the vertical height accuracy of GPS is typically less than the horizontal accuracy” (*Professional Installation NPRM* at 8 (¶ 21)), such that automatic entry of GPS vertical height may limit the identification available 4-Watt channels and compromise the protection provided to broadcasters. *See also* Opposition and Reply of CTIA[®] to Petitions for Reconsideration, ET Docket No. 14-165, GN Docket Nos. 14-166 & 12-268 (filed Feb. 29, 2016) at 10 (“the Commission should make every effort to ensure the quality and accuracy of data in the white space device databases”).

service areas, and by authorizing TVWS operations from higher antenna elevations, with appropriate adjustments in distance separation criteria to avoid harmful interference.

Respectfully submitted,

**WIRELESS INTERNET SERVICE
PROVIDERS ASSOCIATION**

March 10, 2016

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CERTIFICATE OF SERVICE

I, Sharon Krantzman, hereby certify that on this 10th day of March, 2016 a copy of the foregoing Reply to Opposition to Petitions for Reconsideration was sent by first class, postage prepaid mail to the following:

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