

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

Amendment of the Commission’s Rules with)	
Respect to Commercial Operations in the 3550-)	GN Docket No. 12-354
3650 MHz Band)	

**PETITION FOR RECONSIDERATION OF THE
NATIONAL ASSOCIATION OF BROADCASTERS**

The National Association of Broadcasters (NAB)¹ hereby seeks reconsideration of certain aspects of the Commission’s Report and Order in the above-captioned proceeding.² In particular, NAB seeks reconsideration of the Commission’s rule permitting the location of Citizens Broadband Service Devices (CBSDs) to be determined by a so-called “professional installer” rather than by automated geolocation capability built into the device. There is a strong record establishing that failure to require geolocation in CBSDs will lead to location inaccuracies and thus fail to provide adequate interference protection. Experience with the professional installation option for determining the location of TV White Spaces (TVWS)

¹ The National Association of Broadcasters is a nonprofit trade association that advocates on behalf of free local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

² *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, GN Docket No. 12-354, FCC 15-47 (April 21, 2015) (Report and Order).

devices has demonstrated the unreliability of this approach, and the Commission should not expand its use into other bands.

I. SUCCESSFUL SPECTRUM SHARING MUST PREVENT HARMFUL INTERFERENCE

As a general matter, spectrum sharing holds great promise, potentially allowing more efficient use of finite spectrum resources. NAB supports spectrum sharing that makes more efficient use of radio spectrum without increasing the likelihood of harmful interference. For example, NAB took a lead role in negotiating an agreement to share with the Department of Defense (DOD) spectrum broadcasters currently use exclusively at 2025-2110 MHz.

Facilitating DOD's move out of the 1755-1780 MHz band, in turn, led the way for including this spectrum in the AWS-3 auction, where it was paired with spectrum in the 2155-2180 MHz band. This agreement allowed the Commission to auction nationwide, paired spectrum that complements carriers' existing spectrum portfolios. NAB is currently working with the Society of Broadcasting Engineers (SBE) and DOD to implement this agreement.

The bedrock of any successful sharing approach must be the avoidance of harmful interference to incumbent primary operations. NAB and its members seek to ensure that the new Citizens Broadband Service is successful and does not create harmful interference to important incumbent operations. Many of NAB's members and content providers use the adjacent Fixed Satellite Service (FSS) band for the distribution of television programs and content material that is aired on member TV stations.

That is why NAB is concerned that the Commission elected to import elements of the TV White Spaces (TVWS) spectrum sharing regime that NAB has demonstrated are unreliable. Even worse, unlike TVWS, where the amount of "white space" spectrum in most major markets is limited to a few channels and there are only a few hundred devices currently in operation, there will be 150 MHz of spectrum available for Citizens Broadband Service and,

ideally, many more devices.³ Deployment in the Citizen’s Broadband Service could proceed far more quickly than it has in TVWS. NAB has documented a significant number of inaccuracies in the TVWS database. However, the impacts of such errors will likely pale in comparison to what we will see with thousands of CBSDs that could be deployed with inaccurate location information either due to simple human error or deliberate misleading registrations designed to attain more favorable operating parameters. Accordingly, NAB seeks reconsideration of the Commission’s determination to allow professional installation as an alternative mechanism for determining the location of CBSDs.

A. SPECTRUM SHARING CANNOT WORK WITH UNRELIABLE LOCATION INFORMATION

As the Commission noted in adopting rules for sharing in the 3.5 GHz band, “(a)ccurate CBSD location is essential for coordinating interactions between and among users in the band and for protecting Incumbent Users from harmful interference.”⁴ Protection of FSS, a weak-signal service provided from orbiting satellites located some 22,000 miles above the Earth’s surface, entails complicated calculations based on the earth station’s geographic location and antenna gain, azimuth, and elevation patterns among other factors. Aggregate interference from multiple CBSDs have to be taken into account. All of these calculations and protections are meaningless, however, if the locations of the CBSDs are unknown or inaccurate. The Commission correctly states that, “(w)ithout accurate location data, SASs will be unable to effectively determine where and at what power levels CBSDs should be

³ For example, there are currently no TV “white space” channels available in New York or Los Angeles, only one (6MHz) channel in Miami, only two (12 MHz) channels in San Francisco and only three (18 MHz) in both Dallas and Houston for fixed TV white space devices.

⁴ Report and Order at ¶ 220.

authorized or effectively discontinue their operations to protect Incumbent Users.”⁵ Thus, without accurate location data, the SAS cannot protect exiting fixed satellite service operations in the 3625-3700 MHz and 3700-4200 MHz bands as required under Section 96.17 of the Commission’s rules.

Unfortunately, the Commission relies on a flawed aspect of the current TVWS database model that permits “professional installation” of TVWS devices.⁶ NAB has demonstrated that professional installation is unreliable in providing accurate device location information, as well as other information the Commission’s rules require.⁷ In fact, 62 entries, representing more than 10 percent of all registrations in the TVWS database, were deleted at the request of the Commission because they contained obviously false location and other required TVWS registration information. Subsequently, as NAB has continued to point out additional errors, dozens of additional entries have been deleted or amended.

These errors were not insignificant. We found devices registered under false names, such as “Sue Q. Public,” or “John Doe.”⁸ We found invalid FCC IDs and fake serial numbers. We found falsified contact information, including e-mail addresses such as “jd@example.com,” and “john@doe.com,” together with addresses such as “456 Main Street, Anytown, USA” and phone numbers such as “888-123-1234” or “(999) 999-9999.”⁹ Most troublingly, we found plainly erroneous location information, including dozens of devices

⁵ *Id.*

⁶ Report and Order at ¶ 221.

⁷ National Association of Broadcasters Emergency Motion for Suspension of Operations and Petition for Rulemaking, RM-11745 (March 19, 2015) (NAB Petition).

⁸ *Id.* at 10.

⁹ *Id.*

registered in the middle of vacant fields, in the middle of a street, in the ocean, or in a lake.¹⁰ This experience does not suggest that the TVWS regime should serve as a model for spectrum sharing in other bands.

Many of the devices were installed by well-meaning professionals that were not intent on falsifying information or fooling the TVWS system. However, as we have conclusively demonstrated, humans make mistakes, and even simple typos in entering strings of coordinates can lead to inaccurate location information and, as a result, inappropriate authorization to transmit. In the Citizens Broadband Radio Service, where thousands or millions of devices could be deployed in short order and in close proximity to spectrum used by satellites, the potential for widespread inference problems is more acute.

We urge the Commission to abandon a rule that would allow what we have shown is a fundamental spectrum sharing database design flaw. Information critical to preventing harmful interference, including the geographic location of a device, should be entered into a database automatically, without reliance on human intervention.

B. THE PROFESSIONAL INSTALLATION OPTION CANNOT BE REHABILITATED

The Report and Order acknowledges the importance of accurate reporting by professional installers, and “strongly encourage[s] the SAS and user community, through multi-stakeholder fora or industry associations, to develop programs for accrediting professional installers.”¹¹ Unfortunately, the professional installation approach to determining device location is fatally flawed and cannot be corrected.

¹⁰ See *id.* at 10-11; see also Letter from Patrick McFadden to Marlene H. Dortch, Attachment at 5, RM-11745 (June 25, 2015).

¹¹ Report and Order at ¶ 222.

The FCC currently requires authorized TVWS devices to be professionally installed by an installer *authorized by the device manufacturer*, and that manufacturers must provide installers with installation and operating conditions for satisfying all compliance requirements.¹² This is a vastly more stringent requirement than a hypothetical accreditation program developed by multi-stakeholder fora or industry associations. Yet, as NAB has demonstrated, this requirement has not resulted in accurate information in the TVWS database. Professional installation cannot be tweaked or legitimized by multi-stakeholder fora. It is a flawed theory that simply must be abandoned.

Moreover, even if professional installation were a reliable option, which it is not, the Commission cannot assume that all devices will actually be professionally installed in practice. The Citizens Broadband Radio Service is designed to support a wide variety of users, deployment models, and business cases, including solutions not adequately served by conventional licensed or unlicensed operations.¹³ A General Authorized Access (GAA) User is defined as “(a) authorized user of one or more CBSDs operating on a General Authorized Access basis, consistent with section 96.33, *et seq.*”¹⁴ Nothing in the Commission’s rules would prevent consumer applications, which could range from in-home wireless speakers to an in-home network to send pictures and video from a camera to multiples TV in the home.¹⁵

¹² See, e.g., equipment authorization grants for Equipment Class: WGF-White Space Device with Geo-location- Fixed at <https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm>.

¹³ Report and Order at ¶ 6.

¹⁴ 47 C.F.R. § 96.3.

¹⁵ In these cases, the CBSD would be a central device that contacts the SAS while the speakers and camera would be associated End User Devices.

The assumption that mass-market consumer devices will actually be professionally installed is unrealistic.

C. INDOOR DEVICES NEED NOT RELY ON PROFESSIONAL INSTALLATION

The Commission notes that automated reporting of geolocation to its location accuracy requirements may be challenging for indoor devices, which may not have a clear line of site to GPS.¹⁶ The Commission's rules provide that a fixed TVWS device must determine its geographic coordinates to an accuracy of ± 50 meters either through a geolocation capability built into the device or through the services of a professional installer. As an initial matter, NAB has submitted a joint proposal with four white spaces device manufacturers to amend the Commission's rules to require automatic geolocation capability, or be under the control of a device that includes such capability.¹⁷ These parties agreed that the rules should require a transition to a system that minimizes human intervention to reduce the risk of error.¹⁸ Many of these devices will be used outdoors, but many are designed for indoor operation.¹⁹

Further, with respect to the 3.5 GHz band specifically, at least one commenter, Iposi, Inc., claims that its technology can meet the accuracy requirements in the rules for almost all indoor and outdoor sites that use assisted GPS solutions.²⁰ Even if Iposi is wrong, however,

¹⁶ Report and Order at ¶ 220.

¹⁷ Letter from Adaptrum, Inc., Carlson Wireless Technologies, Inc., Koos Technical Services, Inc., MELD Technology, Inc. and NAB to Julius P. Knapp, ET Docket No. 14-165, RM-11745 (filed July 17, 2015) (Joint TVWS Letter).

¹⁸ NAB notes that, due to the amount of spectrum that will be made available in the 3.5 GHz band and the likely number of devices that will be deployed rapidly in this band, it will likely be less costly on a per-unit basis to incorporate automatic geolocation capability in devices used in the 3.5 GHz band.

¹⁹ While automatic geolocation may prove more challenging for indoor devices, the parties' proposal addresses that issue by relaxing the geolocation accuracy requirement slightly, and adding this uncertainty to the protection distances to prevent potential harmful interference. Joint TVWS Letter, Appendix at 1-2.

²⁰ Comments of Iposi, Inc. at 9, GN Docket No. 12-354 (July 14, 2014).

this does not mean that indoor devices cannot rely on automatic location capability. It may simply mean that the Commission's accuracy requirements must be relaxed if an indoor device cannot meet them and, accordingly, required separation distances must be increased to match the relaxed requirements.

NAB is not the only party to have advanced this suggestion. Google, for example, has recently suggested that the accuracy of location information automatically reported by a device could be used as an input for determining available spectrum on which the device may operate.²¹ This is a wholly reasonable solution to any perceived inadequacy of certain mechanisms, such as GPS, for automatically determining device location indoors.

II. CONCLUSION

Nearly five years of experience with the TVWS database confirms that professional installation is not a reasonable means of determining a device's location. Without accurate location information, the entire database regime for spectrum sharing is called into question. To avoid the potential for harmful interference, the Commission must require that devices automatically determine report their location, without the potential for human intervention and error. We urge the Commission to reconsider its rules and eliminate professional installation as an option for determining device location in the 3.5 GHz band.

²¹ Letter from Aparna Sridhar to Marlene H. Dortch, ET Docket No. 14-165, GN Docket No. 12-268 (July 9, 2015).

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Rick Kaplan", with a long horizontal line extending to the right from the end of the signature.

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July 23, 2015