Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Part 15 of the Commission's	)	ET Docket No. 16-56
Rules for Unlicensed White Space Devices	)	RM-11745

COMMENTS OF WI-FI ALLIANCE

Wi-Fi Alliance®[1/] submits these comments in response to the Notice of Proposed Rulemaking ("NPRM") in the above referenced proceeding in which the Commission proposes amendments to its rules to improve the quality of the geolocation and other data submitted for fixed white space devices operating on unused frequencies in the TV bands and, in the future, the 600 MHz band.[2/] Wi-Fi Alliance appreciates the Commission's continued efforts to balance making spectrum available on an unlicensed basis through the use of database access mechanisms and the need to protect licensed services. However, in providing that protection, the Commission must not adopt regulations that will unnecessarily and overly burden white space devices, particularly low-power, fixed white space devices. Instead, in order to facilitate meaningful use of the television bands by unlicensed devices, the Commission's regulations must promote the use of reasonably priced, easy-to-operate devices available for mass market adoption.

[1/] Wi-Fi®, the Wi-Fi logo, the Wi-Fi CERTIFIED logo, Wi-Fi Protected Access® (WPA), WiGig®, the Wi-Fi ZONE logo, the Wi-Fi Protected Setup logo, Wi-Fi Direct®, Wi-Fi Alliance®, WMM®, and Miracast® are registered trademarks of Wi-Fi Alliance. Wi-Fi CERTIFIED™, Wi-Fi Protected Setup™, Wi-Fi Multimedia™, WPA2™, Wi-Fi CERTIFIED Passpoint™, Passpoint™, Wi-Fi CERTIFIED Miracast™, Wi-Fi ZONE™, WiGig CERTIFIED™, Wi-Fi Aware™, Wi-Fi HaLow™, the Wi-Fi Alliance logo and the WiGig CERTIFIED logo are trademarks of Wi-Fi Alliance.

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

I. INTRODUCTION

Wi-Fi Alliance is a global, non-profit industry association of approximately 700 leading companies from dozens of countries devoted to seamless interoperability. With technology development, market building, and regulatory programs, Wi-Fi Alliance has enabled widespread adoption of Wi-Fi® worldwide, certifying thousands of Wi-Fi products each year. The mission of Wi-Fi Alliance is to provide a highly effective collaboration forum for Wi-Fi matters, grow the Wi-Fi industry, lead industry growth with new technology specifications and programs, support industry-agreed standards, and deliver greater product connectivity through interoperability, testing, and certification.

Wi-Fi Alliance has participated in the Commission's important, recent efforts to expand the spectrum resources available for unlicensed operations, including the opening up of portions of the 5 GHz band for unlicensed devices to operate on a shared basis,[3/] creating the Citizens Broadband Radio Service in the 3.5 GHz band,[4/] expanding available spectrum for white space devices in the 600 MHz band,[5/] and increasing the spectrum available for unlicensed uses like

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3/ *See Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, First Report and Order, 29 FCC Rcd. 4127 (2014); *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Notice of Proposed Rulemaking, 28 FCC Rcd. 1769 (2013).

4/ *See 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, 30 FCC Rcd. 3959 (2015).

5/ *See 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 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*, Report and Order, ET Docket No. 14-165 and GN Docket No. 12-268, FCC 15-99 (rel. Aug. 11, 2015) ("*Part 15 Order*"). *See also 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 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*, Notice of Proposed Rulemaking, 29 FCC Rcd. 12248 (2014) ("*Part 15 NPRM*").

WiGig® in the millimeter wave bands.[6/] The need for unlicensed spectrum capacity continues to grow, and different use cases will require spectrum in different bands. For example, it is likely that Internet of Things applications will be well-suited for lower bands, like current TV band spectrum. Wi-Fi Alliance has therefore supported the Commission's efforts to continue to explore ways that TV band spectrum can be used for unlicensed operations.

One way to permit more efficient spectrum access — in the TV bands and potentially elsewhere — is through the use of spectrum databases. Databases are an effective way for white space devices to share spectrum by assessing the spectrum environment and reporting it to a database that can assign or otherwise make spectrum available. The Commission should therefore not diminish or restrict the opportunity for unlicensed operations in the TV bands by unnecessarily hampering the use of devices that will operate there. Unfortunately, the proposed rules may make it more difficult and more expensive to operate fixed white space devices, particularly those operating with lower power. Accordingly, Wi-Fi Alliance urges the Commission to revisit those proposed rules.

II. THE PROPOSED RULES DO NOT ADEQUATELY DISTINGUISH BETWEEN LOW-POWER AND FULL-POWER FIXED DEVICES

In order to provide what it considers improvements to the white space database, the Commission proposes the following changes to its rules: eliminating the option for professional installation of fixed white space devices, instead requiring that a fixed white space device include a geolocation capability that can automatically determine its geographic coordinates, to be stored automatically in the device and transmitted directly to the database (*i.e.*, without any

6/ *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Notice of Proposed Rulemaking, GN Docket No. 14-177, *et al.* (rel. Oct. 23, 2015) ("NPRM").

manual intervention);[7/] when a fixed white space device is moved to another location or its coordinates are altered, requiring the device's geographic coordinates and antenna height above ground to be reestablished and reregistered with the database; [8/] allowing low-power fixed devices operating indoors to establish their location immediately outside the indoor area or other enclosure where the device's geolocation capability does not function, and then to register that location with a database after the device is installed at its fixed location within a certain time period (*e.g.*, 30 minutes);[9/] requiring all fixed white space devices to obtain their geographic coordinates from an external source connected to the device when the device's required internal geolocation capability is not functional.[10/]

These rule changes are not necessary to improve the white space databases, particularly with respect to low-power fixed devices. In last summer's Report and Order, the Commission allowed additional flexibility for lower-power fixed white space devices — treating them more like personal/portable devices. For example, the Commission decided then to allow such low-power, fixed white space devices to, among other things, operate on first-adjacent channels.[11/] The Commission's new proposal ignores the findings that lead to this additional flexibility and would over-regulate low-power, fixed white space devices based on largely unproven concerns about full-power, fixed devices. Accordingly, the Commission should re-examine its proposals that appear to assume that additional regulatory burdens are required for both full-power and low-power devices.

7/ NPRM ¶ 20.

8/ *Id.* ¶¶ 19-22.

9/ *Id.* ¶¶ 26-29.

10/ *Id.* ¶¶ 23-25.

11/ *See* Part 15 Order ¶¶ 28-31, 40-45.

The Commission should continue to recognize the differences between low-power and higher-power fixed white space devices, and permit additional operating flexibility for low-power devices. In the *Part 15 Order*, the Commission recognized a number of factors, coupled with the lower antenna height limit for low-power, fixed devices, that limit the devices' potential for causing harmful interference.[12/] The "worst case" situation for interference — when both the white space device antenna and a TV receive antenna are pointed directly toward each other over a short separation distance — is highly unlikely.[13/] Imposing requirements and technical specifications that go beyond what is necessary for low-power, fixed devices defeats the purpose of providing special, more flexible rules for such low-power devices.

Accordingly, for low-power, fixed white space devices, the professional installation option should not be eliminated. While Wi-Fi Alliance disagrees with the harms purportedly associated with professional installation, any impacts will be unlikely for low power devices. Similarly, an internal geolocation capability should not be mandated for low-power devices because of the low probability that they will cause harmful interference. Re-registration of coordinates whenever a device is moved is also less critical for low-power, fixed devices than for higher-power devices, which are much more likely to affect other operations in the band. Registration should only be required when a low-power, fixed white space device powers up.

The Commission's proposal for low-power, fixed white space devices operating indoors is likewise overly complex and should be rejected. Once a low-power device has obtained initial coordinates on power-up, it should not be required to continue to monitor its location. It is unlikely that a low-power device will, after powering up, move a distance significant enough or emit signals powerful enough that reporting any new coordinates could permit additional

12/ *See* Part 15 Order ¶¶ 28-31.

13/ *See id.* ¶ 31.

operations in the band that would not be permitted otherwise. Further, any potential harmful interference would only occur within a short distance of the low-power device, so identifying an interfering device would be straightforward.[14/] Even additional, less complex mechanisms particularly applicable for low-power devices should be rejected; low-power, fixed white space devices may only cause very limited potential interference, and the rules already require the devices to incorporate transmit power control to limit operating power "to the minimum necessary for successful communication."[15/] Finally, the Commission should also re-examine its proposal that all fixed white space devices be connected to an external geo-location source when the device's geolocation capability is not functional. Such a requirement is particularly unnecessary for low-power, fixed devices unlikely to move significant distances, and would add unneeded complexity to an already complex device.

III. FURTHER RULE CHANGES WILL PERMIT GREATER USE OF LOW-POWER, FIXED DEVICES

Instead of considering rules that will *limit* the utility of low-power, fixed white space devices, the Commission should consider other rule changes that would *promote* their use. For example, the Commission proposes that fixed white space devices be required to report their coordinates to the database daily when they verify that their operating channels continue to be available for use.[16/] Based on that reporting, the database assumes that a channel is unavailable until the device re-checks the database. However, this approach unnecessarily "ties up" channels. If the database were to allow a device to report a shorter time of need (*i.e.*, less than an entire day), additional channels could be made available. For example, small, low-power devices might only require between 5 and 10 minutes of use of TV band spectrum in order to

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14/ *See id.* ¶ 31.

15/ *See id.* ¶ 31; 47 C.F.R. § 15.709(e).

16/ NPRM ¶ 22.

operate effectively. Allowing such reporting would make it more likely for devices to find a channel on which to operate, potentially creating greater availability and promoting efficient spectrum sharing. Indeed, the ETSI specification ETSI EN 301 598 governing access to white spaces does just that, permitting reporting of a shorter time of need than a day.[17/] The Commission should take the same approach.

Another change that would promote further low-power, fixed white space device use would be to allow the possibility for geolocation information to be determined by neighboring devices, thereby eliminating the requirement for low-power, fixed devices' self-reporting of geographic coordinates. This would be similar to the current rule allowing Mode I personal/portable devices not directly connected to the Internet to use fixed or Mode II personal/portable white space devices to pass through information to a database.[18/] Allowing reliance on the geographic information of neighboring devices would provide additional, helpful flexibility for manufacturers and end-users of low-power, fixed white space devices alike.

17/ *See* ETSI EN 301 598 V1.1.1 (2014-04), *available at* http://www.etsi.org/deliver/etsi_en/301500_301599/301598/01.01.01_60/en_301598v010101p.pdf.

18/ NPRM ¶ 6 (citing 47 C.F.R. § 15.711(e)).

IV. CONCLUSION

Wi-Fi Alliance again applauds the Commission's continued efforts to make additional spectrum available for unlicensed operations. Wi-Fi Alliance asks that the Commission take care to not restrict opportunities for unlicensed operations in the TV bands by unnecessarily hampering use of white space devices, and asks that the Commission revisit its proposals as they apply to low-power, fixed white space devices.

Respectfully submitted,

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