

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Amendment of Parts 15, 73, 74 of the)	MB Docket No. 15-146
Commission's Rules to Provide for the)	
Preservation of One Vacant Channel in the UHF)	
Television Band For Use By White Space Devices)	
and Wireless Microphones)	
)	
)	
Expanding the Economic and Innovation)	GN Docket No. 12-268
Opportunities of Spectrum Through Incentive)	
Auctions)	

COMMENTS OF SHURE INCORPORATED

Mark Brunner
Senior Director, Global Brand Management

Ahren Hartman
Senior Director, Engineering

Edgar Reihl
Director, Spectrum Policy

Catherine Wang
Timothy Bransford

Morgan, Lewis & Bockius LLP
2020 K Street, N.W.
Washington, DC 20006
Bus.: 202.373.6000
Fax.: 202.373.6001

Counsel to Shure Incorporated

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SUMMARY

Shure Incorporated (“Shure”) appreciates the Federal Communications Commission’s (“FCC’s” or “Commission’s”) reaffirmation in the Notice of Proposed Rulemaking (“NPRM” or “Notice”) that wireless microphones serve a critical and irreplaceable role in the creation of the dynamic content driving the demand for broadband connectivity, and welcomes the Commission’s commitment to maintaining the important public benefits of wireless microphones during the process underway to repurpose the 600 MHz band, a massive undertaking that requires a careful and fair balancing of interests and creative regulatory approaches to minimize harm and disruption to important existing uses to the greatest extent possible.

Against this backdrop, Shure believes that with modest modifications the Notice’s current proposals can help achieve the Commission’s objective of maintaining the public benefits of wireless microphones. Specifically, Shure urges the Commission to preserve at least two (2) vacant channels for shared wireless microphone and White Space Device use. The Commission anticipates multiple vacant channels over the vast majority of the country, and has already committed to reserve two vacant channels for such shared use in certain markets. Without the preservation of at least two vacant channels, the possibility increases of a near-term crisis where large-scale events cannot be supported by the remaining available wireless microphone spectrum. Shure asks that the Commission reaffirm that eligible wireless microphones can register for interference protection on all available preserved vacant channels. Preserved channels have significantly reduced utility for high quality professional use if professional microphone users cannot register for interference protection. Finally, the Commission must ensure that preserved vacant

channels after the incentive auction and broadcaster repacking are permanently protected. Wireless microphone users will rely on these channels for high-priority, “on-air” talent, and displacing or eliminating them at a later date would create significant disruption and equipment obsolescence

Although these modest modifications will not serve as a complete replacement for the marked reduction in access to UHF spectrum, including the discontinued interference-free reserve channels presently available to wireless microphones in each market, the availability of two vacant/shared UHF channels that can be registered for interference protection will provide professional wireless microphone users with a modicum of reliable, interference-free spectrum critical to meeting the existing and growing demand for wireless microphones.

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COMMENTS OF SHURE INCORPORATED

Shure Incorporated (“Shure”) hereby submits these comments in response to the Federal Communications Commission (“FCC” or “Commission”) Notice of Proposed Rulemaking (“NPRM”) in the above-captioned proceeding,¹ which proposes preservation of vacant television channels (“TV channels”) for shared wireless microphone and white space device use in ultra-high frequency broadcast spectrum (“UHF spectrum”). Shure

¹ *In the Matter of Amendment of Parts 15, 73 and 74 of the Commission’s Rules to Provide for the Preservation of One Vacant Channel in the UHF Television Band For Use By White Space Devices and Wireless Microphones, et al.*, Notice of Proposed Rulemaking, MB Docket No. 15-146, GN Docket No. 12-268, FCC 15-68 (rel. Jun. 16, 2015) (“NPRM”). These Comments also respond to the proposal to preserve a second television channel for shared use by wireless microphones and white space devices in areas where television stations have been assigned to the 600 MHz band “duplex gap” in the channel repacking process following the incentive auction. *See Procedures for Competitive Bidding in Auction 1000 Including Initial Clearing Target Determination, Qualifying to Bid and Bidding in Auctions 1001 (Reverse) and 1002 (Forward)*, AU Docket No. 14-252, GN Docket No. 12-268, WT Docket No. 12-269, MB Docket No. 15-146, Public Notice, FCC 15-78, at para. 32 (rel. Aug. 11, 2015) (“Auctions Procedures PN”). *See also* Order, MB Docket No. 15-146, GN Docket No. 12-268, FCC 15-918 (rel. Aug. 12, 2015) (Order establishing comment and reply comment dates for vacant channel proposals).

appreciates the Commission’s reaffirmation in the NPRM that wireless microphones serve a critical and irreplaceable role in the creation of the dynamic content driving the demand for broadband connectivity.² The process underway to repurpose the 600 MHz band after many decades of successful widespread usage by broadcasters, wireless microphone users, and, more recently, white space devices, is a massive undertaking that requires a careful and fair balancing of interests and creative regulatory approaches to minimize harm and disruption to important existing uses to the greatest extent possible. With that in mind, Shure welcomes the Commission’s commitment to considering the interests of all users of TV channel spectrum with the aim of “ensur[ing] that the public continues to have access across the nation to the significant benefits of [wireless microphones and white space devices.]”³

With modest changes to the NPRM’s proposals, Shure believes the Commission can achieve this objective. Specifically, Shure urges the Commission to implement the following recommendations to better preserve the utility of UHF spectrum for professional wireless microphone use:

- At least two (2) vacant UHF channels must be preserved for professional wireless microphone and white space device use. The Commission’s extensive modeling anticipates the availability of multiple vacant channels in the vast majority of areas, making the preservation of at least two vacant channels where they occur after the incentive auction and broadcaster repacking an achievable goal. Without the preservation of at least two vacant channels, the possibility increases of a near-term

² The Commission specifically recognized that wireless microphones “‘provide many important functions that serve the public interest’ by playing ‘an essential role in enabling broadcasters and other video programming networks to serve consumers’ by ‘significantly enhanc[ing]’ event productions in a variety of settings,’ and by ‘creating high quality content that consumers demand and value, contribut[ing] substantially to our economy.’” *NPRM* at ¶ 10(citations omitted.)

³ *Id.*

crisis where large-scale events cannot be supported by the remaining available wireless microphone spectrum.

- The Commission must reaffirm that eligible wireless microphones can register for interference protection on all available preserved vacant channels. Preserved channels have dramatically reduced utility for high quality professional use if microphone users cannot register for interference protection.
- Preserved vacant channels after the incentive auction and broadcaster repacking must be permanently protected. Wireless microphone users will rely on these channels for high-priority, “on-air” talent, and displacing or eliminating them at a later date would create significant disruption and equipment obsolescence.
- The Commission possesses significant authority under Title III of the Communications Act to regulate radiofrequency spectrum. The preservation of vacant channels for wireless microphones and white space devices falls squarely within this authority.

I. INTRODUCTION

Shure is the leading U.S.-based manufacturer of high-quality wireless microphones⁴ and other professional audio products⁵ classified as low-power auxiliary devices authorized under Part 74 of the Commission’s Rules to operate on a secondary basis in the TV broadcasting spectrum.⁶ Wireless microphones have successfully

⁴ “Wireless microphones,” as used herein, includes a variety of audio devices authorized under Part 74 and/or Part 15 of the Commission’s Rules as secondary users of locally unoccupied television channels. In addition to microphones, this equipment includes in-ear monitors, wireless intercoms, wireless assist video devices (“WAVDs”) and wireless cueing (“IFB”) systems.

⁵ “Professional audio” microphones are used as a medium for transmission of multimedia and artistic content, and have corresponding and unique performance requirements. They must capture full audio range, have less than three (3) milliseconds of transmission latency (for some applications less than one (1) millisecond), and have reliability that meets or exceeds the expectations of a wired microphone user. These performance requirements necessitate a wider emission and require adequate, clean spectrum.

⁶ Wireless microphones have historically operated on a secondary basis principally in the UHF television bands pursuant to Subpart H of Part 74. See 47 CFR §§ 74.801-74.882. Recently, the Commission established rules authorizing wireless microphones as a low power device under Part 15. [cite] Certain wireless microphone applications have also been accommodated on a secondary basis in the VHF television bands, in a narrow Part 90 VHF allocation, and in certain Industrial, Scientific and Medical bands under Part 15 unlicensed rules. Recently, the Commission identified supplemental spectrum for secondary wireless microphone operations in the 900, MHz, 1.4 GHz and 7 GHz band. See *Promoting Spectrum Access for Wireless Microphone Operations*, Notice of Proposed Rulemaking, GN Docket No. 14-166, 29 FCC Rcd. 12343 (rel. Sep. 30, 2014) (“*Supplemental Spectrum NPRM*”).

operated, on a secondary basis, on unassigned channels in the TV spectrum for decades. Wireless microphone use has grown rapidly as consumers consistently demand higher quality productions across a broad range of activities experienced live and/or delivered through programming distributed via online platforms, FCC-licensed broadcasters, cable TV, film, etc. Today, these devices provide critical support to a wide range of sectors including TV broadcasting, news casting, live music, theater, sports, religious, civic and academic institutions. It is noteworthy that wireless microphones are an integral component to much of the multimedia content streamed or webcast through broadband connections to fixed broadband and personal/portable devices.

While wireless microphone use has grown considerably in recent decades, most dramatically in the last 4-5 calendar years, the demand for spectrum for wireless broadband uses has prompted the Commission to take multiple steps to repurpose a significant amount of spectrum previously available for wireless microphones to high-power wireless and low-power broadband.⁷ Accordingly, in a relatively short period of time, the Commission has announced measures that have rapidly squeezed wireless microphone operations into significantly less spectrum, much of which may be subject to interference. This reduction in available spectrum makes it increasingly likely that in the near future there will not be adequate wireless microphone support for larger-scale productions⁸ unless

⁷ See, e.g., *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 60 CR 497, at ¶ 24 (2014) (“*Incentive Auction Order*”) (clarifying that the Commission “will also initiate a proceeding in the near future to find additional spectrum for microphone users in other bands in order to help address their long-term needs”); see also *Supplemental Spectrum NPRM*.

⁸ Just a few examples of larger scale events that require many wireless microphones include major news events such as the Democratic and Republican political conventions, inaugural events, crisis and disaster coverage, major sporting events, such as NFL games, major golf and tennis tournaments and NASCAR races, entertainment events, such as July 4th celebrations, Grammy, Oscar, and other major award

the Commission takes affirmative steps to preserve a reasonable amount of UHF spectrum and expedites plans to enable shared use of supplemental spectrum.⁹

II. MODEST CHANGES TO THE COMMISSION’S PROPOSAL WOULD GREATLY IMPROVE THE UTILITY OF PRESERVED VACANT UHF SPECTRUM FOR PROFESSIONAL WIRELESS MICROPHONE USERS

The NPRM broadly seeks “comment on preserving in each area of the country at least one vacant television channel for use by white space devices and wireless microphones after repacking.”¹⁰ The NPRM seeks specific feedback on a technical proposal that will protect available (*i.e.*, unassigned) TV channels in the UHF band from being occupied by certain broadcast licensees after the incentive auction and television channel repacking unless and until the prospective licensee can affirmatively demonstrate that its proposed operations will leave at least one UHF channel available for wireless microphones and white space devices.¹¹ Under this proposal a channel is vacant and available for use if it can accommodate a wireless microphone or 40 mW personal/portable white space device under the Commission’s current rules authorizing secondary low-power broadcast auxiliary and unlicensed operations in UHF spectrum.¹² Prospective licensees (or in some instances existing licensees seeking modification of their authority) must first consult a Commission-approved geolocation database and engineer their proposed facilities so as not to eliminate a sole remaining vacant channel. An applicant will

shows, half-time shows, large music festivals, corporate events, such as major product launches and large business conventions, etc.

⁹ While Shure strongly supports the Commission’s actions that create the potential that spectrum in other bands, *e.g.*, 900 MHz, 1.4 GHz and 7 GHz, can someday supplement the spectrum currently available for wireless microphone operations, that supplemental spectrum cannot compensate for the dramatic loss of UHF spectrum resulting from recent FCC action at time when consumer demand for wireless microphone-supported productions is soaring.

thus need to confirm that at least one vacant channel as described above remains available within its desired area of operation.¹³

Shure strongly supports this proposal, which, with modest changes, can improve the utility of remaining UHF spectrum for professional wireless microphone use after the incentive auction and broadcaster repacking. Shure provides specific recommendations below that it urges the Commission to adopt to improve the probability that professional wireless microphones have a minimum level of clean, known UHF spectrum available for use, and that reduce the likelihood of a near-term crisis where large scale events are significantly compromised by the unavailability of wireless microphone support.

A. The Commission Must Preserve At Least Two Vacant Channels for Professional Wireless Microphone Users and White Space Devices

The Commission expressly contemplates that “[a]fter the final channel assignments are made following the incentive auction, multiple vacant channels will exist in most areas as a result of the co- and adjacent-channel separation requirements necessary to protect primary broadcast stations from interference.”¹⁴ The NPRM further clarifies that over 100 repacking simulations run by the Commission “show that the area encompassing the vast majority of population across the country would have at least two vacant channels

¹⁰ NPRM at ¶ 9.

¹¹ For example, low power television (“LPTV”), TV translators, Broadcast Auxiliary Service (“BAS”) would need to make a vacant channel demonstration. See NPRM at ¶¶ 13-19.

¹² See NPRM at ¶ 37; see also 47 CFR ¶¶ 74.802(b)(1) and 15.712(a)(2).

¹³ See NPRM at ¶¶ 41-50. Given that channel availability within a broadcast licensee’s geographic territory may vary, the Commission also proposes to implement a grid scheme whereby a licensee’s protected contour area will be broken in 2 kilometer by 2 kilometer grid sections. The licensee will need to confirm that its proposed or modified operation leaves at least one available channel for wireless microphone and white space device use in each grid section.

¹⁴ NPRM at 11.

available.”¹⁵ Moreover, in certain markets the Commission has already tentatively committed to preserving at least two vacant channels for wireless microphone and white space device use.¹⁶

Given that the Commission anticipates multiple vacant channels being available in most areas, and sophisticated modeling supports this expectation, Shure urges the Commission to revise its current proposal and preserve at least two (2) vacant channels for professional wireless microphone and white space device use in areas where two or more such channels occur after completion of the incentive auction and broadcaster repacking. The preservation of two vacant channels for professional wireless microphone use would provide meaningful relief for wireless microphone users that may in some instances lose 50% or more of the UHF spectrum that presently enables a significant majority of productions that involve a wireless audio component.¹⁷

Since the introduction of white space technology and the implementation of the first Commission-approved geolocation database in TV band spectrum, wireless microphones have been able to rely on two (2) “reserved” broadcast television channels nearest to Channel 37 under the Commission’s soon to be superseded rules.¹⁸ These reserved channels serve as a home for high-priority wireless microphone operations, including, for instance, “on-air” talent at broadcast and streamed live events, as well as for

¹⁵ *Id.*

¹⁶ Specifically, to the extent that in a given market the 600 MHz duplex gap band is populated with a broadcast channel, the Commission will preserve two channels. *See Auction Procedures PN at para. 32.*

¹⁷ VHF tunable devices have historically held a small fraction of the market share for professional audio wireless microphone due to a number of factors, including, among other reasons, higher levels of ambient noise in VHF channels.

¹⁸ *See Unlicensed Operation in the TV Broadcast Bands, Second Report and Order and Memorandum Opinion and Order*, ET Docket No. 04-186, 23 FCC Rcd 16807 (rel. Nov. 14, 2008)

itinerant electronic news-gathering (“ENG”) crews that cannot rely on database registration for protection. The preservation of at least two UHF vacant channels is, by no means, a complete replacement for dramatically reduced access to UHF spectrum including the discontinued interference-free reserve channels presently available to wireless microphones in each market. However, the availability of two vacant/shared UHF channels would provide professional wireless microphone users with a modicum of reliable, interference-free spectrum critical to meeting the existing and growing demand for wireless microphones.

B. The Commission Should Reaffirm that Eligible Wireless Microphone Users May Register Their Operations for Interference Protection in Preserved Vacant Channels

The Incentive Auction Report and Order expressly provided that white space device operation would be permissible in vacant channels “except at those specified times and locations where wireless microphones users have registered their operations for interference protection in the TV bands databases.”¹⁹ Shure requests that the Commission reaffirm that eligible wireless microphone users retain the ability to register in the database for their operations on preserved vacant channels for interference protection in any forthcoming decision. Preserved vacant channels that cannot be registered would present an unreliable radiofrequency environment compromised by interference. Such channels would have greatly diminished utility for professional wireless microphone users that require clean, known spectrum.

¹⁹ *Expanding the Economic and Innovative Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, Report and Order, 29 FCC Rcd 6567 at ¶ 309 (2014).

C. The Commission Should Make Clear That Preserved Vacant Channels Cannot Be Eliminated

Once vacant channels have been preserved after the incentive auction and initial broadcaster repacking, the Commission must implement appropriate procedures and safeguards to ensure that such channels are not subsequently eliminated.²⁰ For nearly ten years, the wireless microphone community -- including users, manufacturers and the many consumers and businesses who demand high quality audio in their programming and productions -- have been impacted by significant and unpredictable changes in Commission spectrum policy that have upended well-established operations, obsoleted expensive equipment well before the end of its useful life, and created uncertainty in the market. While no policy can be guaranteed to last forever, it is imperative that the Commission evince a clear commitment to the long-term preservation of vacant channels that will serve as a small, yet stable spectrum platform upon which the wireless microphone community will be able to rely in serving the needs of the growing number of events and productions.

Commission rules must incorporate a process that will give continuing protection to the presence of vacant channels in each market. At a minimum, once a preserved vacant channel has been identified in a particular market, it should be added to the TV White Space databases and become available solely for use by wireless microphones and white space devices in that area. Thereafter, the number of preserved vacant channels in an area

²⁰ Shure understands that the specific frequency assignment for preserved vacant channels may change.

should be protected against further loss due to discretionary post-auction channel changes, license transfers, modifications and other regulatory actions.²¹

III. THE COMMISSION HAS AMPLE AUTHORITY TO PRESERVE CHANNELS FOR WIRELESS MICROPHONES AND UNLICENSED USERS

The Commission has the authority to preserve vacant channels for use by wireless microphones under Title III of the Communications Act of 1934 as well as the Spectrum Act. Title III, as amended, “endow[s] the Commission with expansive powers,” including “broad authority to manage spectrum ... in the public interest.”²² Courts have long recognized that although the Communications Act does not “confer an unlimited power,” it does grant “expansive powers” and a “comprehensive mandate to ‘encourage the larger and more effective use of radio in the public interest.’”²³ In the *NPRM*, the Commission illustrated that preserving a vacant channel in every area for use by wireless microphones and other white space devices would serve the public interest by “ensuring continued access across the nation to the significant benefits provided by white space devices and wireless microphones without significantly burdening broadcast applicants.”²⁴ Moreover, as the Commission noted, courts have recognized that Congress intended to leave decisions

²¹ Shure notes that it is possible that a vacant channel would not be available in the event that multiple applicants are simultaneously or near simultaneously filed each with a vacant channel demonstration that relies on out of date channel assignments. The Commission’s rules should therefore incorporate a process by which the Commission or the database administrators periodically confirm that vacant channels are in fact available.

²² *NPRM* at ¶ 18; quoting 47 USC §§301 et. seq.

²³ See *Cellco P'ship v. FCC*, 700 F.3d 534, 541, 542 (D.C. Cir. 2012) (holding that the FCC had authority under Title III of the Act to adopt a data roaming rule because Section 303 allows the FCC to “prescribe the nature of the service to be rendered” by licensed entities consistent with the public interest.) (“*Cellco*”); quoting *NBC v. United States*, 319 U.S. 190, 216 (1943).

²⁴ *NPRM* at ¶ 18.

with respect to spectrum management policy to the broad discretion of the Commission under section 303 of the Communications Act.²¹⁵

Moreover, the Commission correctly concluded that the proposal to preserve a vacant channel for use by wireless microphones and white space devices is consistent the Spectrum Act. As the Commission explained, section 6403(b) “does not affect the Commission’s broad authority to manage spectrum in the public interest.”²⁶ Moreover, the Commission recognized that the Spectrum Act preserves that authority by stating that nothing in section 6403(b) “shall be construed to... expand or contract the authority of the Commission, except as otherwise expressly provided.”²⁷ Because the Spectrum Act sustains the long-recognized authority the Commission holds in making determinations related to spectrum management, the Commission is well within its authority to propose preserving at least one vacant UHF channel for wireless microphone and white space use.

²⁵ *NPRM* at footnote 48; *see also Cellco*.

²⁶ *NPRM* at ¶ 18.

²⁷ *See id.*

IV. CONCLUSION

Shure supports the Commission's efforts in this proceeding, and looks forward to contributing further input on the various technical and regulatory issues that must be addressed to implement preserved vacant channels for shared wireless microphone use.

Respectfully submitted,

/s/ _____

Mark Brunner
Senior Director, Global Brand Management

Ahren Hartman
Senior Director, Engineering

Edgar Reihl
Director, Spectrum Policy

Catherine Wang
Timothy Bransford

Morgan, Lewis & Bockius LLP
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