

Before the
Federal Communications Commission
Washington DC 20554

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

**COMMENTS OF
SENNHEISER ELECTRONIC CORPORATION**

Sennheiser Electronic Corporation (“Sennheiser”)¹ hereby comments in support of the Federal Communications Commission’s (“FCC” or “Commission”) proposal to preserve vacant white space channels for use by wireless microphones and white space devices.²

BACKGROUND

Sennheiser has participated extensively in the Commission’s proceedings relating to the future of wireless microphone use in the U.S., in both the UHF band and other bands. In many filings, Sennheiser has demonstrated that wireless microphones are vital to American life, and

¹ Sennheiser is part of Sennheiser Electronic GmbH & Co. KG, headquartered in Germany, which is a global leader in advanced microphone technology, RF-wireless and infrared sound transmission, headphone transducer technology, and active noise cancellation. Sennheiser Electronic Corporation is the main U.S. sales and marketing office, located in Old Lyme, Connecticut. Sennheiser also has a research center in San Francisco, California, and a manufacturing plant in Albuquerque, New Mexico that produces the majority of Sennheiser wireless microphones sold in North America, South America, Canada, and Asia.

² *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; In the Matter of Promoting Spectrum Access for Wireless Microphone Operations; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, Docket Nos. 15-146 and 12-268 (rel. June 16, 2015) (“NPRM”).

essential to the U.S. economy through their use by the entertainment and news industries and, as a major component in content creation, key to supporting one of the United States' major export sectors, *i.e.*, the film industry.³ The Commission has consistently recognized the many important functions that wireless microphones provide.⁴

Wireless microphones require clear, reliable channels in frequencies with good propagation characteristics (*i.e.* the TV bands and 600 MHz spectrum). The wireless microphone industry – manufacturers, owners, and users – has faced significant changes in recent years that have made these operations much more complex and difficult. In 2010, the Commission required that wireless microphones transition off the 700 MHz band, eliminating more than a third of available UHF spectrum. Now, because of the upcoming Incentive Auction, wireless microphones must vacate much of the 600 MHz Service Band. Sennheiser supports the Commission's efforts in this proceeding to keep available at least one channel for use by wireless microphones and white space devices.⁵

³ See *Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 60 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 60 MHz Duplex Gap*, Comments of Sennheiser, Docket Nos. 14-165 and 12-268 (filed Feb. 4, 2015) ("Sennheiser Part 15 Comments"); Letter from Laura Stefani, Counsel for Sennheiser Electronic Corporation, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket Nos. 12-268 and 14-166 and ET Docket No. 14-165 (filed April 4, 2015); Letter from Laura Stefani, Counsel for Sennheiser Electronic Corporation, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket Nos. 12-268 and 14-166 and ET Docket No. 14-165 (filed May 22, 2015); Letter from Laura Stefani, Counsel for Sennheiser Electronic Corporation, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket Nos. 12-268 and 14-166 and ET Docket No. 14-165 (filed June 12, 2015).

⁴ See NPRM at ¶ 6.

⁵ The Commission has proposed that, in markets where a television is assigned to the Duplex Gap, it make available a second preserved white spaces channel. Sennheiser opposes placing television stations in the Duplex Gap, as doing so would take away the sole slice of exclusive spectrum left for licensed microphones in the 600 MHz Service Band – the 4 MHz portion of the Duplex Gap. See *Comments of Sennheiser Electronic Corporation in Support of NAB Petition*

DISCUSSION

A. *A Preserved White Space Channel is Needed in all Markets.*

The Commission proposes that it preserve a vacant white space channel in each area.⁶ Certain wireless microphone uses – those where a second take is not available – occur daily in every market and require access to clear and prime (reliable) spectrum. A preserved white space channel, which under current service rules would allow for licensed wireless microphone users to register for protection from white space devices, would allow users access to much needed protected spectrum. A preserved white spaces channel also would be vital for the hyper-critical links in the production of large national events, such as the Super Bowl and Grammy awards telecast, which require use of all prime UHF spectrum currently available to wireless microphones, including spectrum that will no longer be available after the repacking.

The Commission also proposes that the vacant channel be located in the frequency range of Channel 21 and above.⁷ The Commission also notes that, should it later determine that WSDs be allowed to operate below Channel 21, it may locate the preserved white spaces channel to Channel 14 and above.⁸ Although the Commission did open Channels 14-20 to WSD operation,⁹ Sennheiser supports placing the preserved white spaces channel in the ranges of Channel 21 and above for several reasons. Existing land mobile operations used for public

for Reconsideration, Docket Nos. 12-268, 12-269, 14-252 and 15-146 (filed Sept. 21, 2015). Nonetheless, a second preserved white space channel would provide some usefulness if the Commission does place television channels in the Duplex Gap.

⁶ NPRM at ¶ 9.

⁷ NPRM at ¶ 9.

⁸ *Id.*

⁹ *Amendment of Part 15 of the Commission's Rules for Unlicensed Operation 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, Docket Nos. 14-165 and 12-268, at ¶ 87 (rel. Aug. 11, 2015).

safety operate on Channels 14-20 in more than a dozen major cities. Using Channels 21 and above would provide for greater predictability of the location of the preserved white space channel, as land mobile use occurs on different channels within Channels 14-20 in the thirteen metropolitan areas.¹⁰ Placing the preserved white space channel on Channel 21 or above would ensure that the Commission had the option, after the auction and repacking, of placing the channel in the same location in every market, which would simplify frequency planning for unlicensed users and product design for manufacturers.

Even if the preserved white spaces channel did vary by market, placing it within a narrower range between the lower guard band of the re-purposed spectrum and channel 21, rather than all the way down to 470 MHz, offers the option to incorporate sharper filtering components in the microphone transmitters, receivers and their antenna systems, as well as in white space devices. Sharper filters aid in spectral efficiency and higher immunity from adjacent signal interference.

Many existing lower band UHF wireless microphone systems operate on channels below 21 but most operate above it in a range within the 500 MHz band. Considering that many microphone owners replaced their 700 MHz a few years ago and will be replacing 600 MHz shortly, the Commission should set policy that allows them maximum utility of their 500 MHz systems. Since channels below 21 have not been available to portable white space devices previously, placing the preserved white space channel above 21 does not impact WSD manufacturers or their customers.

¹⁰ The white space databases are required to protect land mobile operations, meaning that the particular PLMRS/CMRS channels would not be appropriate for location of the preserved white space channel.

It would also be prudent to encourage WSD operation concentrated above channel 21, as it would provide greater assurance of the peaceful coexistence between untested mobile WSDs with public safety operations.

B. Vacant Channel Demonstration Methodology.

The Commission proposes that broadcasters wishing to construct new, replacement or modified stations on a vacant channel, post repacking, must demonstrate that wireless microphones and white space devices operating in the same area will have access to one vacant channel.¹¹ Additionally, the Commission proposes that vacant channel availability be determined “using the same criteria currently specified in our rules for determining where white space devices and wireless microphones can operate.”¹²

The Commission seeks comment on whether the vacant channel demonstrations should be adjusted accordingly should it modify the required separation distance from 4 km. to 1.3 km.¹³ While the Commission did adopt this new separation distance for WSDs, it did not modify the allowable separation distance for wireless microphones. For this reason, Sennheiser opposes the Commission’s suggestion that the size of the protection zone for co-channel TV stations be reduced for the purposes of performing a vacant channel demonstration. By the Commission’s rules, wireless microphones should be 4 km from a TV station, and this should be the criteria for ensuring that there is a vacant white space channel. Should the Commission allow the vacant channel demonstration to be made using a smaller protection zone for wireless microphones, they would be subject to greater interference and it would preclude their lawful operation in some instances.

¹¹ NPRM at ¶4.

¹² NPRM at ¶ 9.

¹³ NPRM at ¶ 38.

CONCLUSION

Preserving one UHF white space channel in each area will serve an important public interest of providing access to prime spectrum, especially for critical wireless microphone operations – those that must be recorded or broadcast without a second take.

Respectfully submitted,

/s/

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