Before the
Federal Communications Commission
Washington DC 20554

In the Matter of	)	
	)	
Amendment of Part 15 of the Commission's	)	
Rules for Unlicensed Operations in the	)	Docket No. 14-165
Television Bands, Repurposed 600 MHz Band,	)	RM-11840
600 MHz Guard Bands and Duplex Gap, and	)	
Channel 37	)	
	)	

COMMENTS OF SENNHEISER ELECTRONIC CORPORATION

Sennheiser Electronic Corporation ("Sennheiser") provides the following comments on the Petition for Rulemaking submitted by Microsoft Corporation (Microsoft") in the above captioned proceedings.[1]

We agree with Microsoft that providing broadband services to less congested areas in rural America using white space devices (WSDs) is an admirable goal, provided the prerequisite of protecting incumbent services remains intact. Although Microsoft's commentary promotes the spirit of these concepts, some of the suggested rule changes extend beyond the scope of rural deployment. The Commission should limit further revisions so that they apply solely to less congested areas. The history and status of the white space ecosystem are also relevant to considering Microsoft's Petition, specifically the minimal deployment of WSD to date and the collapse of the white space database administration system.

BACKGROUND

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

[1] *Public Notice*, Report No. 3127 (released May 9, 2019).

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, and Asia.

Wireless microphones are vital to a large component of the U.S. economy.[2] They are essential to the production of virtually all content creation and are ubiquitous throughout our society. The Commission's rules make it unambiguous that licensed use of the spectrum takes precedence over unlicensed devices such as white space devices.[3] The Commission should craft WSD policy that ensures maximum flexibility for content creation with wireless microphones into the future.

DISCUSSION

The Commission adopted rules that allowed the introduction of white space devices about a decade ago, with the prerequisite that incumbent services such as TV broadcast and wireless microphones be protected. The Commission developed a white space database system with multiple administers intended to provide channel availability to white space devices while protecting certain wireless microphone operations. The system provided licensed broadcast and wireless microphone operators a means of registering for interference protection by reserving channels in the locale where productions were taking place. **The white space database system,**

[2] Stephen E. Siwek, *Copyright Industries in the U.S. Economy: The 2018 Report* (Economists Incorporated 2018). Available at https://pmcdeadline2.files.wordpress.com/2018/12/copyright-industry-report-wm.pdf

[3] 47 C.F.R. § 15.5.

a cornerstone of the WSD ecosystem, completely collapsed for many months. All TV white space portals of FCC approved administrators were off-line.[4] There was no way to register for interference protection from WSD, or for wireless microphone operators to check for local channel availability. Nor can the FCC TV Query database fill that role. Prior to commencement of the 600 MHz transition, this database was updated daily by the Commission. Today, however, it is woefully out-of-date because none of the repacked TV stations are reflected. The FCC Licensing & Management Radius Search seems current but does not provide the same information and would require a trained RF engineer hours, if not days, to preview the local channel availability that previously only took a few minutes. Channel availability will alter considerably during the remainder of the 600 MHz transition period. The lack of clear and reliable channel availability due to the demise of the white space database system has the potential of undermining a smooth 600 MHz transition. This The Commission should rectify the database issues prior to relaxation of any current WSD rules.

Increased Power & Antenna Height

Microsoft proposes relaxing white space device rules so as to provide broadband services to "less congested areas", defined by the Commission at 47 C.F.R. § 15.703(h):

> (h) *Less congested area*. Geographic areas where at least half of the TV channels for the bands that will continue to be allocated and assigned only for broadcast service are unused for broadcast and other protected services and available for white space device use. Less congested areas in the UHF TV band are also considered to be less congested areas in the 600 MHz service band.

[4] Nominet recently activated a web site that purports to perform database administrator functions, but great uncertainty remains, given the history of all of the prior database administrators.

Areas that fit this criterion after the conclusion of the TV channel repack, scheduled to be completed in July 2020, are likely to have adequate spectrum resources to serve both wireless microphones and white space devices. Sennheiser does not object to Microsoft's request for higher radiated power limits and antenna heights in less congested areas, provided that the interference protection exclusion zones specified in §15.712 (f) are suitably increased.

Microsoft implies low instances of interference caused by WSD. The Commission should not take this as a benchmark for adequate protection of incumbent services. WSD deployment in the United States to date has been sparse, and it is often difficult to attribute interference to a particular source. We do not yet have the experience to support a claim that WSDs have proven to be non-interfering in practice.

IoT

Microsoft also seeks to introduce a new class of narrowband WSD for applications related to the Internet of Things (IoT). We agree the Commission should be flexible regarding bandwidth rules as a technology matures. However, Microsoft attempts to merge this issue with the expansion and affordability of broadband service in rural communities: "Together, these changes will improve the quality of life of rural Americans and strengthen the rural economy".[5] Microsoft's suggested IoT rule change does nothing to limit the deployment of narrowband WSD to "less congested areas" as defined by the Commission. This request exceeds the scope of the rural justification.

Furthermore, Microsoft states that narrowband WSD would transmit for only a fraction of a second.[6] That is irrelevant. Wireless microphones are intolerant of even very brief

[5] Microsoft at 1.

[6] Microsoft at 21.

interruptions. Most applications, such as live news, sports, and stage productions, do not afford the possibility of a second take. This makes any interference unacceptable, regardless of duration. The Commission should reject this change pending further development of adequate protection.

Geofencing

Microsoft promotes the concept of geofencing, in which a high powered WSD is installed on a moving vehicle.[7] We agree the example of a tractor crawling through a large field is a bona fide rural application. But affixing high powered WSD to non-farm vehicles operating on public thoroughfares is very different. Once again, any rule change should be limited to less congested areas. Microsoft's suggested language does not do this. Also, a bus traveling through a town, even within the geofence of a less congested area, may pass by facilities that routinely use wireless microphones—for example, community venues that stage professional productions. The Commission should proceed with its Part 74 expansion of licensed eligibility[8] so that such facilities can register for interference protection. In addition to aircraft and satellites, the Commission should also exclude small vehicles such as personal cars, motorcycles, and the like.

CONCLUSION

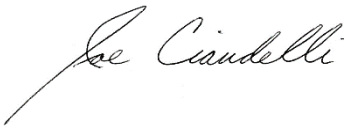
The Commission should work towards closing the "digital divide" so that citizens in rural America can access broadband. Sennheiser supports any changes in WSD rules that further this

[7] Microsoft at 22-26.

[8] *Promoting Spectrum Access for Wireless Microphone Operations,* Order on Reconsideration and Further Notice of Proposed Rulemaking, 32 FCC Rcd 6077 (2017).

objective while maintaining protection for incumbent services, including wireless microphones. Changes pursuant to the present petition should be limited to less congested areas.

Respectfully submitted,



Joe Ciaudelli
Director, Spectrum Affairs
Sennheiser Research & Innovation
1 Enterprise Drive
Old Lyme, CT 06371
(860) 848-3132