

July 5, 2017

Via Electronic Filing

Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, D.C. 20554

**Re:** Promoting Spectrum Access for Wireless Microphone Operations, GN Docket No. 14-166; 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, ET Docket No. 14-165  
**Ex Parte filing of Sennheiser Electronic Corporation**

Dear Ms. Dortch:

Sennheiser Electronic Corporation ("Sennheiser") responds to the July 3, 2017, *ex parte* filing of Microsoft Corporation ("Microsoft").<sup>1</sup> Sennheiser is compelled to respond because the filing indicates that Microsoft wholly misunderstands wireless microphone technologies and the Commission's licensing process. Yet, it suggests numerous questions for comment in the Commission's Further Notice of Proposed Rulemaking (FNPRM), questions which are based on faulty and speculative premises.

---

<sup>1</sup> Letter from Paul Margie, Counsel for Microsoft Corporation to Marlene H. Dortch, Secretary, FCC, Docket Nos. 14-166 and 14-165 (filed July 3, 2017).

Microsoft fails to point out that unlicensed microphone operators are losing their pathway to reserve white space channels in the database system. The net number of microphone operators that will have this privilege will actually be drastically lower, even after expansion of Part 74 license eligibility.

Microsoft conflates the amount of alternate spectrum the Commission has made available to wireless microphone operators. This spectrum only partially compensates for the loss of UHF available to microphone operators and is not “additional” spectrum as Microsoft characterizes. Furthermore, the TV station repacking will fill the lower portion of the UHF band, making the spectrum loss to microphone operators far greater than the 84 MHz in the LTE band that Microsoft references.

Microsoft also has major misunderstandings of wireless microphone technology and its marketing. Spectral efficiency has been a design criteria of Sennheiser, and other microphone manufacturers, for decades. This accounts for the large number of wireless microphones in operation in areas such as Times Square and the Vegas Strip where available spectrum has always been limited. Microsoft calls for microphone manufacturers “...to make the digital transition...” The audio industry has led the digital revolution. Sennheiser introduced digital microphone equipment in 2000. Since then, there have been frequent introductions of new digital systems launched by Sennheiser and all other major manufacturers. Regardless, technology

should be dictated by market demands. Furthermore, digital is not inherently more spectrally efficient than analog. Digital does allow for data compression or reduction, which can result in denser packing of microphones, but only at the cost of audio quality, latency (sound lag), transmission reliability, range, transmitter size, battery life, or a combination of these variables. Critical applications with high end demands preclude compromise, such as historical events broadcast live to millions that need to be archived in a high resolution format. Such applications require uncompressed digital audio, which necessitates sufficient bandwidth. However, there is a wide variety of digital microphone systems available today targeted at less demanding applications that can pack dozens of microphones into a 6 MHz channel. The spectral efficiency demanded by Microsoft is already offered by microphone manufacturers.

Microsoft suggests that smaller performing arts organizations could be accommodated in the alternate bands 900 MHz, 1.4 GHz, and 7 GHz. This suggests a distinct new class of users in addition to licensed and unlicensed. The Commission has already rejected in these proceedings a proposal by Sennheiser to establish another class of users. The Commission also has made clear that the newly allocated 1.4 GHz band is reserved for rare situations where a user is staging mega-events requiring an extraordinary number of microphones. And, the record well establishes that the 7 GHz band is only appropriate for short range, line-of-sight applications (e.g., a reporter with a handheld stick microphone 10 feet in front of a video camera). This band would be

Sennheiser Electronic Corporation

1 Enterprise Drive

Old Lyme, CT 06371

Phone: +1 (860) 434-9190

Fax: +1 (860) 434-1759

[www.sennheiserusa.com](http://www.sennheiserusa.com)

unreliable for the stage productions in question, especially for use of body pack microphone transmitters.

We do agree with Microsoft that the privilege of licensing should be reserved for those staging professional productions. It is hard to imagine that Microsoft would truly want to impede legitimate performing arts. We look forward to working with them and all other concerned parties on the FNPRM to provide a common sense expansion of Part 74 licensing qualifications.

Please contact me with any questions.

Respectfully submitted,  
Joe Ciaudelli



Director, Spectrum Affairs  
**SENNHEISER ELECTRONIC CORPORATION**  
[Joe.Ciaudelli@Sennheiser.com](mailto:Joe.Ciaudelli@Sennheiser.com)  
860-848-3132