

Before the
Communications Com
Washington DC 20554

In the Matter of)
)
 Authorizing Permissive Use of the “Next) GN Docket No. 16-142
 Generation” Broadcast Television Standard)

COMMENTS OF SENNHEISER ELECTRONIC CORPORATION

Sennheiser Electronic Corporation (“Sennheiser”) hereby comments on the Federal Communications Commission’s (“FCC” or “Commission”) REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING in the above-captioned proceeding.¹

Sennheiser products find wide use in the TV industry. Sennheiser supports the advancement of TV technology, including the transition from ATSC-1.0 to ATSC-3.0. Nevertheless, the Commission should mandate means to enable the transition other than simulcasting on vacant TV channels.

ABOUT SENNHEISER

Sennheiser Electronic GmbH & Co. KG, headquartered in Germany, 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

¹ *Authorizing Permissive Use of the “Next Generation” Broadcast Television Standard*, GN Docket No. 16-142, Report and Order and Further Notice of Proposed Rulemaking, FCC 17-158 (released Nov. 20, 2017).

Mexico that produces the majority of Sennheiser wireless microphones sold in North America, South America, and Asia.

ATSC-3 WILL ADVANCE WITHOUT USE OF VACANT CHANNELS

We acknowledge that it would be convenient for broadcasters to simulcast on vacant TV channels. Even proponents, however, concede that it would not be feasible to provide an ATSC-3.0 transition channel for each station.² Proponents have told the Commission that alternate, available methods can be used, leveraging advances in compression coding and multiplexing that are compatible for facilitating the ATSC-1.0 to ATSC-3.0 transition:

The deployment plan proffered in the [original ATCS 3.0 Petition for Rulemaking] is premised on one station hosting the program content of another in recognition that no new spectrum would be generally available for simultaneous carriage of both ATSC 1.0 and 3.0 signals ... Dramatic advances in compression coding and multiplexing of multiple high definition signals on a single channel have been made since the initial adoption of the ATSC 1.0 standard, and those improvements are expected to continue during the simultaneous signal deployment period so that current expectations of over-the-air viewers will be maintained.³

In contrast to ATSC 3.0 broadcasters, wireless microphones *need* vacant TV channels for hyper-critical applications. Any broadcast standard transmits programing only after the post production progress, when a variety of compression algorithms can be applied. In contrast, wireless microphones are used in the front end, acquisition stage of production. They cannot use heavy data compression or reduction because those add latency, diminish audio quality, or both. Wireless microphones must capture high fidelity sound in real time with negligible latency. Any

² Ex Parte of One Media, LLC, page 2, ¶ 3 (filed July 3, 2017)

³ Reply Comments of One Media, LLC, page 5, ¶ 1 (filed June 27, 2016) (emphasis added).

reduction in quality becomes a limiting factor all the way downstream to the finished product. Data lost in compression in the early stages cannot be recovered later. This is why recordings made early in the last century will always have sub-telephone quality, regardless of the format that carries the recording. Even the lack of fidelity that results from moderate compression would be unacceptable and out of context today. Modern productions demand high resolution. Immersive multi-channel audio (*i.e.*, 3D and virtual reality) now imposes additional demands on content creation.

ADEQUATE SPECTRUM RESOURCES ARE REQUIRED FOR CONTENT CREATION

Broadcasters not only use spectrum to transmit their programs, they use it to create them as well, through the use of wireless microphones and video links. Worldwide, virtually all professional wireless microphones operate in UHF because UHF spectrum fulfills the requirements of demanding microphone applications. Wireless microphone owners and operators, especially licensed professionals, have been deeply impacted, more than any other population, by the 700 MHz reallocation, the recent 600 MHz incentive auction, and the subsequent repacking of TV stations that is congesting the lower UHF channels. Currently, a typical studio or live production will use six to ten UHF TV channels to operate their wireless links, often over a hundred microphones. The Super Bowl assigns over 1500 frequencies for microphones. Within three years UHF for wireless microphones operators will become scarce.

The reallocations of UHF from traditional over-the-air TV to mobile broadband have facilitated the *distribution* of content to wireless consumers, but have reduced needed spectrum for the *creation* of content. Whether news, entertainment, or emergency alerts arrive through your TV, radio, smart phone, tablet, computer, or at a live event, if it has audio then most of it

was captured with wireless microphones. Thus, hundreds of millions of Americans benefit each day from wireless microphones.

Many wireless mics can operate outside the UHF TV spectrum, but hyper-critical situations demand and deserve the propagation characteristics that only UHF can provide. This is vital for professional audio engineers: when millions are watching live, there is no chance for a second take. Such productions occur throughout the U.S. on a daily basis.

The United States is the undisputed global leader in content creation. The federal government measures Core Copyright, which includes TV, radio, film, and recorded music, as a \$1 trillion industry. It is responsible for over 5 million private industry jobs with an average compensation 27% greater than the national average. The “royalties and licensing” category has a 3-to-1 export-to-import ratio, the highest of any American made product or service. Wireless mics aren’t merely a convenience, they are essential tools fueling this ecosystem. Demand for content creation has never been more robust. The trend for increasingly complex productions continues.


Other portions within the 600 MHz band plan that will allow for wireless microphones – the duplex gap and the guard band – are buffers for out-of-band emissions for wireless services. Studies show this noisy spectrum could cause harmful interference to microphones. This problem is exacerbated by the very low power levels allowed. The duplex gap and the guard band do not qualify for mission critical microphones. That is why UHF vacant channels are so vital.

CONCLUSION

Sennheiser opposes the use of vacant TV channels to simulcast ATSC-3.0 signals during a transition phase from the ATSC-1.0 standard because those channels are not necessary to usher in this next generation of broadcast technology, while they are essential for wireless microphone operation.

Relatedly, we urge the Commission to approve its proposal to reserve at least one vacant UHF channel for wireless microphone operation, post-auction repacking of the TV band.⁴

Respectfully Submitted,



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⁴ *Promoting Spectrum Access for Wireless Microphone Operations*, Order on Reconsideration and Further Notice of Proposed Rulemaking, 32 FCC Rcd 6077 at ¶¶ 84-93 (2017).