

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Promoting Spectrum Access for Wireless Microphone Operations)	GN Docket No. 14-166
)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions)	GN Docket No. 12-268
)	
)	

REPLY COMMENTS OF ADEUNIS RF AND ADEUNIS-NA, INC.

Adeunis RF and Adeunis-NA, Inc. (“Adeunis”), through counsel, respectfully file reply comments with the Federal Communications Commission (“Commission” or “FCC”), in the above-captioned proceedings.

I. THE USE OF ETSI EMISSION MASKS WILL PERMIT THE USE OF BOTH ANALOG AND DIGITAL MICROPHONES WITH THE SAME SPECTRUM

Lectrosonics, Inc. (“Lectrosonics”) supports regulatory policies that protect analog microphones, noting that the vast majority of microphones it sells are analog devices.¹ As support for its proposal, Lectrosonics highlights the simple design of analog devices, lower prices and lesser power consumption, as well as lower latency.²

While acknowledging the continued use of analogy wireless microphones, Adeunis submits digital microphones are the appropriate standard for Commission action. Based on 20 plus years of manufacturing wireless microphones, Adeunis has found digital technologies to be mature and cost effective. Indeed, most of the current wireless microphones in the market are already based on digital modulations. Moreover, with Time Division Multiple Access (“TDMA”) spectrum access techniques or other similar digital standards, digital devices can now guarantee an efficient use of the available spectrum.

¹ Lectrosonics Comments, at 3.

² *Id.*, at 8-9.

Adeunis recommends the mandatory use of emission masks, especially those developed by the European Telecommunications Standards Institute (“ETSI”), when digital and analog devices use the same spectrum band. The Commission should, therefore, consider adoption of the ETSI Standard EN 300 422-1.³ The manufacturing of wireless microphones to these analog and digital standards will provide greater protection for all users; permit the simultaneous use of analog and digital equipment in the same general geographic area; and likely allow the same microphones to be sold in both the United States and Europe.

II. SENNHEISER’S PROPOSAL TO PROVIDE SPECIAL PROTECTION TO CERTAIN LPAS USERS AND USES IS UNSUPPORTED AND UNFAIR

Sennheiser Electronic Corporation (“Sennheiser”) makes a variety of proposals, including one that would create tiered classifications for Part 74 Low Power Auxiliary Systems (“LPAS”).⁴ According to Sennheiser, Class A users and uses would obtain priority over other users and uses. Sennheiser would define Class A users as “licensed, professional users” using the spectrum for “TV broadcast, film production, news gathering, professional concert, theater, and historic political events.”⁵ It also argues these users have greater performance requirements, requiring extremely high fidelity and low latency links.

Adeunis opposes the creation of Class A users and uses because the class is too narrow and would likely harm other users and uses with similar needs, most especially large venue sporting events, as described in Adeunis’ comments.⁶ Major sporting events, such as college and professional football or soccer, often draw larger audiences, both on site and through broadcasting and cable-casting, than do some putative “Class A” members and uses. Similarly, these sporting events produce significant revenues. It would be unfair to give wireless microphone devices, such

³ ETSI, “Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones 1 in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement,” available at http://www.etsi.org/deliver/etsi_en/300400_300499/30042201/01.03.02_60/en_30042201v010302p.pdf.

⁴ Sennheiser Comments, at 4.

⁵ *Id.* See also, Comments of Shure, at 33.

⁶ Adeunis Comments, at 6-7.

as the Vokkero[®] radio system, lower interference protection priority simply because they do not meet Sennheiser's narrow definition for Class A users and uses.

As explained in its Comments, Adeunis believes the best approach for LPAS devices used in large venue events is for the LPAS license-holder (likely the large venue owner, but possibly a broadcaster or cable-caster licensee) to allow qualified third-party users, such as game officials using Vokkero microphone systems, to operate under the LPAS licensee's authority, without further regulation from the FCC. The LPAS licensee has every interest in ensuring the proper use of its spectrum by third-parties and can "veto" undesired users. Adeunis' plan is simpler and protects more users. Therefore, Adeunis' proposal trumps Sennheiser's plan for Class A licenses with special protections.

III. XCEL'S CONCERNS ABOUT INTERFERENCE FROM LOW-POWER WIRELESS MICROPHONES ARE EXCESSIVE AND UNSUPPORTED

Xcel Energy Services Inc. ("Xcel"), which owns and operates large utilities, uses various microwave-based services as part of its operations. Xcel opposes LPAS operations in the 941-944 MHz and the 952-960 MHz bands, on the ground that it fears interference from microphones.⁷ The Company states as follows: "Xcel Energy does not believe that wireless microphones can co-exist with licensed incumbent utilities in these bands without causing harmful interference to critical utility operations." It further seeks power limitations and the geographic restriction of wireless microphones in the 941-944 MHz and the 952-960 MHz bands.

Adeunis must disagree with Xcel. Xcel offers no evidence to support its claim of microphone interference. Indeed, wireless microphones, such as the Vokkero radio system, use very low power—-.233 Watts in our case—and are not likely to cause any interference to other users. Analyses filed by Adeunis for Special Temporary Authority ("STA") grants given to Adeunis in 2013 and 2014 support this conclusion.⁸ Further, within a sporting facility such as a college football stadium, a

⁷ Xcel Comments, at 3.

⁸ Call Sign WG9XXH, File Number 0772-EX-ST-2013 (2013 Season). Call Sign WH9XSZ, File Number

soccer stadium or a large indoor arena (e.g., Madison Square Garden), the effective range of a Vokkero microphone is only 100 meters.⁹ Xcel's concerns are excessive and its proposals should not be adopted.

IV. SOME OF SHURE'S PROPOSALS NEED MODIFICATION

Shure Incorporated ("Shure") filed very comprehensive comments in these proceedings. Adeunis offers, herein, remarks on several of Shure's proposals and statements. Adeunis agrees with Shure's recommendation to expand the existing 944-952 MHz band to a 941-960 MHz band, but urges the Commission to couple the expansion with Adeunis' proposal to allow all qualified third-parties to operate under existing LPAS licenses (generally large venue owners and operators) without additional FCC permission. Adeunis has explained why this can provide better access to wireless microphones without increasing harmful interference.¹⁰

Shure's vision for this expanded LPAS service seems to assume LPAS obligations and rights follow the equipment and not the user. To the extent this assumption is accurate, Adeunis disagrees with it. The status of the user should generally control the type of regulation applied.

Under Adeunis' proposal, use of the Vokkero radio as a LPAS device would occur either when an LPAS licensee uses the Adeunis radio directly in conformance with Part 74 or when a third-party uses the radios with the permission of the LPAS licensee. For example, assume the owner of AT&T Stadium in Metro Dallas obtained an LPAS license pursuant to the owner/operator of a large venue rule and that it allowed the officials handling an NCAA playoff game to use Vokkero wireless microphones under the AT&T Stadium license (as would be permitted under new FCC rules recommended by Adeunis). In this instance, the Vokkero radios would hold the Part 74 rights and obligations. But a use of the very same microphones earlier in the same football season in a venue

0630-EX-ST-2014 (2014 Season).

⁹ Adeunis Comments, at 6. Large outdoor sports stadiums are not open fields. Rather, they are generally fields enclosed by substantial structures that limit the range of low-power radios.

¹⁰ *Id.*, at 11-12.

without an LPAS license might well be as a Part 15 (unlicensed) device, outside the protections and duties of Part 74. The FCC should clarify this point for the industry and wireless microphone users.

Shure supports a mandatory reduction in the channel width for the 902-928 MHz band from 500 kHz to 200 kHz,¹¹ in order to provide more efficient use of radio spectrum. Adeunis does not disagree, but also strongly recommends adoption of the ETSI transient requirement standard as set forth in ETSI EN 300 422-1.¹² We further recommend the Commission forbid the synchronization of several hopping systems in the same place by any one user, as explained in Adeunis' comments.¹³

V. CONCLUSION

Adeunis urges the Commission to consider Adeunis' reply comments and should expand the radio spectrum available for use by wireless microphones and incorporate Adeunis' recommendations into revised rules affecting such devices.

Respectfully submitted,
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¹¹ Shure Comments, at 42.

¹² See Adeunis Comments, at 13.

¹³ *Id.*