

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
Washington D.C. 20554**

In the Matter of)	
)	
Unlicensed Operation in the TV Broadcast Bands)	ET Docket No. 04-186
)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band)	ET Docket No. 02-380
)	
)	

**COMMENTS OF
THE MICROPHONE INTERESTS COALITION**

The Microphone Interests Coalition (“MIC”) hereby submits these Comments in response to the Office of Engineering and Technology’s (“OET”) *Public Notice* released July 31, 2007, in the above-captioned proceeding.¹ The members of MIC are involved in the production of many of the most widely watched entertainment and sporting events viewed by the American public (e.g., the *Super Bowl Halftime Show*, the *Academy Awards Presentation*, the *GRAMMY Awards*, the *American Idol* series, and *Cirque du Soleil*), nearly every Broadway performance, and all of the concerts conducted at the historic venues of the Grand Ole Opry.² As a result, MIC has a substantial interest in the FCC’s decisions related to the possible authorization of unlicensed devices in the “white spaces” of TV broadcast bands. MIC applauds the Commission for honoring its commitment to conduct testing to assess the level of harmful interference from low power devices to wireless microphones operating in the TV bands.

¹ See *The Office of Engineering and Technology Announces the Release of Reports of Initial Measurements on TV White Space Devices*, ET Docket No. 04-186, *Public Notice*, DA 07-3457 (rel. July 31, 2007).

² The Microphone Interests Coalition includes: American Federation of Musicians; American Federation of Television & Radio Artists; ATK Audiotek Corp.; Front of House Magazine; The Grand Ole Opry; The iLivetoPlay Network; The League of American Theatres and Producers; Masque Sound; The Professional Audio Manufacturers Alliance; Production Resources Group; Professional Wireless Systems; The National Academy of Recording Arts & Sciences, Inc.; The Recording Artists’ Coalition (RAC); Singer & Musician Magazine; Sound Associates, Inc.; Springboard Productions; Stage Directions Magazine; Wireless First; Ed Greene; and Ed Wiczorek.

As the Commission's test report (the "Report") demonstrates, unlicensed low power devices, if permitted to operate in the band, cannot consistently sense or detect wireless microphone signals and could also cause direct interference to incumbent wireless microphone operations.³ OET's testing confirms everything wireless microphone interests, including MIC, have said over the past three years. MIC is optimistic that the results of the testing will finally put an end to the debate about using the "white spaces" of the TV broadcast channels for unlicensed personal and portable devices.

I. THE REPORT CONFIRMS MIC'S FEARS REGARDING INTERFERENCE TO WIRELESS MICROPHONES IN THE TV BANDS

At the outset, MIC is encouraged that the Commission, through OET, has undertaken this initiative to examine whether the operation of low power unlicensed devices in the TV broadcast bands would cause interference to the band's incumbents, particularly Part 74 wireless microphone systems. After four months of thorough testing, the OET concluded that portable consumer devices that operate in the TV bands interfered with wireless microphone operations and that these devices could not detect wireless microphone operations in order to avoid causing interference to them.⁴

The results of the OET's testing confirmed what MIC had feared all along. In comments submitted in response to the *Further Notice of Proposed Rulemaking* in this proceeding, MIC warned the Commission that the use of personal/portable devices in the "white spaces" of the TV broadcast band risks crippling wireless microphone use.⁵ In its reply comments, MIC made clear

³ See *Initial Evaluation of the Performance of Prototype TV-Band White Space Devices*, OET Report, FCC/OET 07-TR-1006, at 61-67 (July 31, 2007).

⁴ *Id.*

⁵ See Comments of the Microphone Interests Coalition, ET Docket Nos. 04-186 and 02-380, at 4 (filed Feb. 1, 2007).

that spectrum sensing is an unproven technology that cannot be the sole interference protection in the white spaces.⁶ The Report verified these claims.

The two devices tested by the OET, Prototypes A and B, were both found to be deficient in their ability to sense wireless microphones and Prototype A was found to cause significant interference to wireless microphone operations.⁷

Specifically, Prototype A was “tested with wireless microphone signals at various power levels and locations within a TV channel, and with and without the presence of a DTV signal on a different channel and at different power levels.”⁸ The results of these tests indicated that “the Prototype A was generally unable to sense wireless microphones.”⁹ In fact, the OET found that “in many cases, [Prototype A] incorrectly sensed the wireless microphone signal as a DTV signal.”¹⁰ Since Prototype A’s performance in spectrum sensing tests proved to be “very poor,”¹¹ OET found that “no additional insight” could be gained “from testing this device under other conditions....”¹² The tests also concluded that the transmitter in Prototype A “is capable of causing interference to TV broadcasting and wireless microphones.”¹³

⁶ See Reply Comments of the Microphone Interests Coalition, ET Docket Nos. 04-186 and 02-380, at 4-7 (filed Mar. 2, 2007) (“MIC Reply Comments”).

⁷ Prototype B only has spectrum sensing capability and therefore was not tested for its potential to cause interference to wireless microphone operations.

⁸ Report at 63.

⁹ *Id.*

¹⁰ *Id.* at viii.

¹¹ See *Peer Review of Prototype TV White Space Devices Study*, Memorandum, ET Docket No. 04-186, at 4 (Aug. 1, 2007) (“Peer Review”).

¹² While the spectrum sensing testing for Prototype A represented the “best case” for sensing a wireless microphone, upon suggestion by the peer review panel, OET performed additional informal testing on the devices and found that Prototype A “still failed to sense the microphone signal.” *Id.* at 4.

¹³ Report at x.

Although Prototype B fared only slightly better in its spectrum sensing tests, the OET still found that “it also incorrectly indicated the presence of a microphone on channel 24” and that it “incorrectly sensed wireless microphone signals on six additional channels.”¹⁴

In short, the findings in the Report recognize the distinct nature of spectrum requirements for incumbent services in the TV broadcast bands and it makes clear the need for providing greater certainty to wireless microphone incumbents that any new devices permitted in the band will not interfere with existing operations. As MIC had previously cautioned the Commission, spectrum sensing technology is not a ripe technology ready for implementation in a radically new environment.¹⁵ Based on the serious interference threat these devices represent, and their apparent immature state of development, the Commission should stand firmly behind its initial decision and restrict the unlicensed operations in the “white spaces” to fixed applications.

II. THE PEER REVIEW FOUND THE OET’S TESTING METHODOLOGY OF THE PROTOTYPES TO BE “WELL DONE AND THOROUGH”

If there were any doubt as to the OET’s testing methodologies used to evaluate the prototypes, the conclusions of the peer review quelled any of those concerns. Under the Information Improvement Act, the Office of Management and Budget requires that influential scientific assessments be subject to peer review to enhance the quality and credibility of the government’s scientific information. The peer review addressed the scope of testing, methodologies used in testing, and whether the tests were performed consistently with the selected methodologies.¹⁶ The peer review panel found that:

the overall scope of the spectrum sensing testing was appropriate, that the measurement methodologies used in the testing of the prototype devices were appropriate, that the scope of the testing of the Prototype A devices for its

¹⁴ *Id.* at 64.

¹⁵ *See* MIC Reply Comments at 9.

¹⁶ *See* Peer Review at 1.

potential to cause interference to digital TV and wireless microphones was appropriate, given the study's stated constraints, and that the tests were properly conducted consistent with the selected methodologies.¹⁷

MIC fully supports the conclusions of the peer review, as the peer review process helps to ensure the reasonableness of the OET's testing on these highly technical matters.

III. WIRELESS MICROPHONES ARE ESSENTIAL TO DELIVER ENTERTAINMENT AND SPORTS PRODUCTIONS TO MILLIONS OF AMERICANS

The wireless microphone industry is vital to the distribution of arts, sports, news, religious, political, business, educational, and cultural information to the American public.¹⁸ In these productions, wireless microphones are ubiquitous and the scope of their applications is enormous. MIC represents the "front end" of the content chain. Wireless microphones must work perfectly or content will be damaged, destroyed, or, in the case of live events, potentially lost forever. Wireless microphones also give artists and performers freedom of movement, enabling innovative and even acrobatic productions such as Cirque du Soleil that could not possibly be performed with wired products.

Wireless microphones are essential for numerous productions and events that define American culture. For example, MIC's members include all of the major audio providers for all Broadway productions, which are all heavily dependent on wireless microphones. An estimated 12 million people attended Broadway shows in 2006, with gross tickets receipts of approximately \$906 million.¹⁹ MIC members help produce American Idol, which logged

¹⁷ *Id.*

¹⁸ Wireless microphones are also used for other essential purposes such as law enforcement, public safety, and utility operations that are not discussed in these comments.

¹⁹ See Broadway Calendar - Year Statistics, The League of American Theatres and Producers available at http://www.livebroadway.com/index.php?url_identifier=calendar-year-stats-1 (visited August 14, 2007). In the Broadway theatre district, there are as many as 400 wireless microphone systems operating simultaneously as part of musicals, plays and other entertainment productions. These devices are all able to operate simultaneously because they have been meticulously coordinated.

approximately 30 million viewers a week and 37.3 million viewers for its 2007 season premiere.²⁰ The two most-watched telecasts of 2006 were the Super Bowl and Academy Awards, live events also extremely dependent on wireless microphones. Approximately 39.9 million people watched the Academy Awards in 2007,²¹ and a staggering 90.7 million people watched Super Bowl XL.²² Wireless microphones make these events possible, delivering the content, the access, and the feeling of “being there” that audiences crave.

IV. CONCLUSION

The results of the Commission’s testing clearly demonstrate the risk to wireless microphones and other users of allowing unlicensed devices to operate in the “white spaces” of the TV broadcast band. The Test Report and the Peer Review report clearly require that the Commission follow its initial decision and restrict unlicensed operations in the “white spaces” to fixed applications. Any purported technology advancements to improve interference detection and avoidance by the manufacturers of the prototypes at this juncture is pure speculation.

Respectfully submitted,

Members of the **MICROPHONE INTERESTS
COALITION**

²⁰ See Rick Kissell, “*Idol*” *Bigger Than Ever*, VARIETY.COM (Jan. 17, 2007) available at <http://www.mediavillage.com/jmentr/2007/01/21/AmericanIdol-01-21-07/> (visited August 14, 2007).

²¹ See Scott Collins, *Oscar Ratings Report Card*, LOS ANGELES TIMES (Feb. 26, 2007).

²² See David Bauder, *Super Bowl Earns Super Ratings*, CBS NEWS.COM (Feb. 6, 2006) available at <http://www.cbsnews.com/stories/2006/02/06/superbowl/main1288104.shtml> (visited August 14, 2007).

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Dated: August 15, 2007