

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band)	WT Docket No. 08-166
)	
)	
Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition)	WT Docket No. 08-167
)	
)	
Amendment of Parts 15, 74, and 90 of the Commission's Rules Regarding Low Power Auxiliary Stations, Including Wireless Microphones)	ET Docket No. 10-24
)	
)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions)	GN Docket No. 12-268
)	

To: The Commission

**COMMENTS OF
THE NATIONAL ASSOCIATION OF BROADCASTERS**

Jane E. Mago
Jerianne Timmerman
Larry Walke
Victor Tawil
Bruce Franca
NATIONAL ASSOCIATION OF
BROADCASTERS

Jennifer A. Johnson
Eve R. Pogoriler
COVINGTON & BURLING LLP
*Counsel for the National Association of
Broadcasters*

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Summary

The National Association of Broadcasters (NAB) continues to support a limited expansion of Part 74 licensing eligibility to allow new classes of wireless microphone users — theaters, live music producers, government bodies, and houses of worship — to license their wireless microphone use. Any expansion of Part 74 eligibility, however, should be subject to restricting *unlicensed* wireless microphone operations in the television band, to avoid additional spectrum congestion and interference.

NAB strongly urges the Commission to continue to provide two safe harbor channels for wireless microphone operations. The Commission established the safe harbor channels to ensure an interference-free home for licensed wireless microphone operations used for important electronic news gathering (ENG) and other non-scheduled events (including weather and other emergencies), following the introduction of unlicensed “white space” devices in the television band. These two channels will become more, not less, important, in light of the Commission’s proposal in the incentive auction proceeding to repack the television band more tightly.

Should the Commission ultimately decide to eliminate or reduce the safe harbor channels, such a decision should be accompanied by improved protections for licensed wireless microphones to help safeguard critical ENG and other broadcast operations used in the production of programming and services valued by viewers.

Finally, regarding digital wireless microphones, NAB is cautiously optimistic about the future benefits of such technology. However, as digital wireless microphones are still nascent in the market, there is insufficient real-world experience with digital

wireless microphones to allow NAB to comment at this time on their performance, efficiency, or the desirability of transitioning to all-digital technology.

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**COMMENTS OF
THE NATIONAL ASSOCIATION OF BROADCASTERS**

The National Association of Broadcasters (NAB)¹ respectfully submits its comments to help update the record in the wireless microphones proceeding.² NAB continues to support a limited expansion of Part 74 licensing eligibility, subject to ensuring that unlicensed wireless microphone users do not create congestion in the

¹ NAB is a nonprofit trade association that advocates on behalf of local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

² *Public Notice*, "The Wireless Telecommunications Bureau and the Office of Engineering and Technology Seek to Update and Refresh Record in the Wireless Microphones Proceeding," WT Docket Nos. 08-166 and 08-167 and ET Docket No. 10-24, DA 12-1570 (Oct. 5, 2012) ("*Public Notice*").

television band or interference risks for licensed wireless microphone operations. With respect to digital wireless microphones, the lack of sufficient real-world experience with this nascent technology makes it difficult to comment on their performance or to support a transition to all-digital wireless microphone equipment at this time. Additional testing and experience is needed to determine how digital wireless microphones actually perform before a decision about transitioning to digital can be made.

NAB also supports the continued maintenance of two safe harbor channels for wireless microphone operations. The Commission established the safe harbor channels to ensure an interference-free home for licensed wireless microphone operations used for important electronic news gathering (ENG) and other non-scheduled events following the introduction of unlicensed TV White Space devices (TVWS devices or TVBDs). These two channels will become even more vital for such licensed operations under the proposals for tighter repacking of the television band made in the spectrum incentive auctions proceeding.

I. NAB SUPPORTS A LIMITED EXPANSION OF PART 74 LICENSED WIRELESS MICROPHONE ELIGIBILITY

Part 74 of the rules provides for licensed operations of low power auxiliary stations (LPAS) on a secondary, non-exclusive basis. These operations include wireless microphones, cueing and control communications and synchronization of TV camera signals. These operations are used in the production of broadcast programming and ENG activities essential to the services that broadcasters provide to the viewing public. Licensed wireless microphones, for example, are used in ENG for news and weather reporting that provides the public with critical information during

emergencies.³ As the Office of Engineering and Technology seeks to refresh the record on the Commission's inquiry as to whether it should allow additional categories of users under Part 74 of the rules, we urge the Commission to prevent harm to today's critical *licensed* Part 74 operations.

NAB previously has supported a limited expansion of Part 74 eligibility, subject to restricting *unlicensed* wireless microphone operations in the television band.⁴ As we explained earlier, given the risks of interference to essential television operations, a narrow approach to expanding Part 74 eligibility is necessary.⁵ Conditioning this expansion on prohibiting unlicensed wireless microphone operations in the TV band is particularly important now, in light of the reductions in spectrum available for licensed wireless microphone operations after the repacking proposed in the spectrum incentive auctions proceeding.

³ See *Impact of the June 2012 Derecho on Communications Networks and Services*, A Report of the Public Safety and Homeland Security Bureau, FCC (Jan. 2013), at 14: "The key role broadcasters played during and following the derecho should also be recognized. As in many times of crisis, broadcasters served as 'first informers,' providing the public with information on the storm's path, the damage it caused, and its effects on other communications services. Even where citizens affected by the storm lost commercial power, many could still receive radio and television broadcasts on battery-powered devices." The Report can be found online at http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0110/DOC-318331A1.pdf. See also CBS News interview with Federal Emergency Management Agency Administrator Craig Fugate (Oct. 29, 2012), in which Mr. Fugate urged citizens in the path of Hurricane Sandy to stay informed during the emergency by tuning into local broadcasting, available at http://www.cbsnews.com/8301-505263_162-57541910/fema-administrator-gives-last-minute-hurricane-tips-warns-against-power-outages/.

⁴ See Comments of the Association for Maximum Service Television, Inc. ("MSTV") and NAB, WT Docket Nos. 08-166 and 08-167 and ET Docket No. 10-24 (March 1, 2010) ("*MSTV and NAB Comments*"); Reply Comments of MSTV and NAB, WT Docket Nos. 08-166 and 08-167 and ET Docket No. 10-24 (March 22, 2010).

⁵ MSTV and NAB Comments at 16-19.

As discussed in detail previously,⁶ NAB supports extending eligibility under Part 74 to allow four additional categories of wireless microphone users to obtain licenses for their wireless microphone operations: theaters, live music producers, government bodies, and houses of worship.⁷ These four categories are similar to those types of users already authorized to license their wireless microphone use under Part 74, such as television and radio station licensees, broadcast network entities, and motion picture and television program producers. For example, theaters and live music producers produce and distribute entertainment to the public.

Moreover, these four categories of users will, by their nature, operate in a manner that avoids interference to full-power television stations. First, their venues typically are located away from residential areas and therefore are unlikely to cause interference to TV reception. Second, these potential licensees generally have access to professional technicians who install and maintain their wireless microphone equipment and are familiar with Part 74's frequency coordination requirements, mitigating the risk of interference. And third, the identities of these entities will be known, through FCC licensing records, so that if interference issues do arise, they can be addressed promptly (in contrast to interference problems caused by unlicensed - and therefore anonymous - users).

⁶ *Id.* at 17-20.

⁷ NAB also would not object to a limited extension of Part 74 eligibility to nuclear power plants, for indoor use of wireless microphones, consistent with our reasoning herein for expansion to certain other users, and provided they comply with all frequency coordination and other obligations. See *MSTV and NAB Comments* at 18-19; *Public Notice* at 5.

As noted above, NAB's support for expanding Part 74's wireless microphone eligibility is premised on restricting unlicensed wireless microphone use in the television band.⁸ Unlicensed wireless microphone users can operate in several other, less congested frequency bands, such as 900 MHz, 2.4 GHz, and 49 MHz. Ensuring that unlicensed wireless microphone users operate outside of the television band will help to address congestion in the band and to mitigate the risk of interference to essential television operations. If, however, unlicensed wireless microphone users are permitted to operate in the television bands, then they should be required to comply with the Commission's rules concerning the operation of unlicensed devices in the TV "white spaces."

II. THE COMMISSION SHOULD PROTECT THE SAFE HARBOR CHANNELS FOR WIRELESS MICROPHONE USE.

In its recent Notice of Proposed Rulemaking on the repacking of the television band and related incentive auction process, the Commission observed that "[t]he repacking of television stations may result in a reduced amount of spectrum being available in the core television bands for use on a secondary basis by licensed wireless microphones under the LPAS rules."⁹ At the same time, the Commission asks for comment in the Public Notice on whether it should eliminate the reservation of two channels as "safe harbor" channels for wireless microphones — *i.e.*, whether to make these channels available for unlicensed white space device operations.¹⁰

⁸ *Id.* at 16-20.

⁹ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, FCC 12-118 (*rel.* Oct. 2, 2012), at para. 224.

¹⁰ *Id.* at para. 238.

NAB strongly objects to the potential elimination of the two safe harbor channels. NAB notes that the recent notice on incentive auctions proposes to establish guard bands between television and new wireless broadband operation and sees no reason why the Commission could not designate and reserve these guard bands for licensed wireless microphones rather than propose the elimination of the existing two reserved channels. Broadcasters' wireless microphone operations are essential for newsroom, newsgathering, and other operations.¹¹ These operations serve the public interest and help to protect public safety, as when broadcasters provide live reporting on severe weather conditions and other emergencies. The channels available for such operations already are congested, and the safe harbor channels are needed to ensure that essential wireless microphone operations can perform without interference from unlicensed devices. With the prospect of repacking causing further squeezing in the television band, the Commission should ensure protection of licensed wireless microphone operations — and it should not take action in the wireless microphones proceeding that would disregard the interrelated repacking proceeding.¹²

If the Commission ultimately decides to eliminate or reduce the current two channel safe harbor, such a decision must be accompanied by improved protections for

¹¹ For example, the recent Presidential Inauguration involved hundreds of wireless microphones, intercom systems and other Part 74 operations used by major broadcast networks, such as ABC, CBS, Fox, NBC, NPR, Telemundo and Univision; local television stations, such as WJLA, WRC, WTTG, and WUSA; cable networks, such as C-SPAN, CNN, and MSNBC; foreign broadcasters, such as the BBC; parade route announcers and many others. Developing channel plans required weeks of planning and frequency coordination. However, despite extensive planning, new channel assignments are required to accommodate changes, especially last minute ones. Ensuring that two dedicated channels are available for such changes is essential.

¹² See Public Notice at 1-2 (acknowledging interplay of the wireless microphones proceeding with the repacking proposals).

licensed wireless microphones so as to safeguard critical ENG and other broadcast operations. As the Commission has noted, “[o]peration under Part 15 is subject to the condition that a device does not cause harmful interference to authorized services,”¹³ and its white spaces rules include “safeguards to prevent harmful interference to incumbent communications services.”¹⁴ The Commission established the safe harbor channel requirement to “ensure that at least two channels remain available for wireless microphones in all markets.”¹⁵ In doing so, the Commission noted that licensed low power auxiliary operations — including broadcasters’ ENG operations — would have been protected under the spectrum sensing provisions it had previously adopted, but noted that it was repealing the sensing requirements. Thus, the safe harbor channels are essential to provide protection for licensed wireless microphone operations, and a reduction or elimination of the safe harbor framework should be accompanied by a corresponding increase in other forms of protection from unlicensed white space devices.

Any alternative to the safe harbor channels must recognize that broadcast stations use licensed wireless microphones to support ENG operations, such as live, on-the-scene reporting, which by their nature occur at locations and on channels impossible to identify very far in advance. This unpredictability makes it difficult for licensees to register in advance for protection in the white spaces database, as the Commission has noted.¹⁶ Accordingly, if the safe harbor framework is eliminated, the

¹³ *Unlicensed Operation in the TV Broadcast Bands*, Second Memorandum Opinion and Order, ET Docket Nos. 04-186 and 02-380, 25 FCC Rcd 18661 (2010), para. 5.

¹⁴ *Id.* at para. 15.

¹⁵ *Id.* at para. 132.

¹⁶ *Id.*

Commission should amend the existing white space rules to require that the TV bands databases share information more quickly, and to require that unlicensed white space devices check the database more frequently. In other words, the Commission could offset the inherent delays that broadcasters will face in registering their licensed wireless microphone operations in the database when covering breaking news, going to the scene of emergencies, covering weather developments, and the like, by ensuring that once broadcasters *are* able to register such operations, the information propagates quickly through the database and to the end-user unlicensed devices that are checking that database. NAB proposes the following two measures to offset any reduction to or elimination of the safe harbor:

First, NAB recommends that database administrators exchange registrations and changes in the database in real- or near real-time, as they occur and as suggested in the Interoperability Specification developed by the White Space Database Administrator Group. All changes and registrations should be implemented within 10 minutes of receipt by the database administrator. Nine of the ten database administrators have adopted an interoperability specification that already provides this capability,¹⁷ and they have demonstrated its effectiveness at the FCC-hosted white spaces workshops in the FCC Laboratory. Registration records were passed from one database administrator to another database administrator almost instantaneously.

¹⁷ See *Database-to-Database Synchronization Interoperability Specification*, Version 1.1 February 29, 2012, by the White Space Database Administrator Group. The White Space Database Administrator Group includes Airity, Inc., Comsearch, Frequency Finder, Inc., Google Inc., LS Telcom AG, Microsoft Corporation, Neustar, Inc., Spectrum Bridge, Inc., and Telecordia Technologies, Inc.

Second, the Commission should require TV band devices to check the database every twenty minutes instead of every 24 hours. This will help ensure that a channel previously identified by the database as available for use has not subsequently become necessary for licensed wireless microphone operations. There are likely several acceptable methods for implementing this approach. For example, the database could provide the device with a token to allow the device to operate for each twenty minute period. After that period, the token would expire if not renewed. There may also be other ways to accomplish this result.

NAB submits that more frequent contact with the database will have little or no impact on the performance of TVWS devices. For modern communications systems and devices, communications between devices and the database can be accomplished in milliseconds and repeated many times in a very short period of time without any negative impact on the communications carried out by the device. For example, Mode I TVBDs must determine their location or listen to an authorizing signal at least once every 60 seconds. Contacting the database once every twenty minutes would be significantly less burdensome and would allow the TVWS device to make many attempts to establish contact and confirm the continued availability of channels during this period.¹⁸ NAB notes that this twenty minute check can be a much shorter and less complex communication by the TV band device than the initial contact and registration

¹⁸ NAB has been informed that the timing and frequency of contacting the database is completely software-controlled in the recently approved fixed TVBD built by Adaptrum, Inc., and that this device would have no difficulties meeting any change in this capability. NAB would not object to a phase-in of this requirement over a period of six months to one year, or, given the limited number of TVWS devices approved to date, the grandfathering of existing TVBD devices.

with the database, as this communication is merely a simple query whether the channel is still available for use.

Modifying the rules as proposed above would not only help protect the important services of incumbent, licensed users of the spectrum, but also would enable more efficient spectrum use by unlicensed TVBDs. For example, rather than providing the same channel list to all TVBDs at the same location, the administrators could use the more frequent database contact to ensure that such devices operate on different channels, thereby avoiding conflicts between TVBDs. In addition, under the current rules, a database administrator must ensure that any channel assigned will be available for 48 hours (to avoid interference with any upcoming licensed or unlicensed wireless microphone event that has been registered with the database). Requiring more frequent updates and database contacts would permit unlicensed TVBDs greater access to more channels and would shorten this “48 hour” reserved time to almost instantaneous access on any channel, greatly improving spectrum efficiency.

III. A DECISION TO TRANSITION TO DIGITAL WIRELESS MICROPHONES IS PREMATURE AND SHOULD BE BASED ON SUFFICIENT REAL-WORLD EXPERIENCE

The *Public Notice* seeks comment on “whether and how the Commission should facilitate a transition to digital wireless microphones.”¹⁹ NAB agrees that long-term solutions should be developed to address the continuing and increasing need for licensed wireless microphones operations, and we look forward to working with the Commission towards any measures to improve those operations and increase their

¹⁹ *Public Notice* at 6.

efficiency. At this stage, however, it is premature to consider requiring broadcasters to transition to digital wireless microphone equipment.

As the Commission notes, manufacturers have only recently started to introduce digital wireless microphone systems. See *Public Notice* at 6, citing new equipment that Shure and Sennheiser report allow operation of more wireless microphones on a six megahertz channel than currently enabled by analog technology. NAB has informally surveyed a sizeable number of our larger member television groups, and the responses we received demonstrate that digital wireless microphones are still nascent in the market.

It is not yet clear how these systems will perform once widely deployed, or how much more efficient they may be than today's analog systems. Based on NAB's preliminary analysis, it appears that digital systems may be only marginally more spectrally efficient than analog wireless microphone systems when all relevant factors are considered. Beyond the number of wireless microphones that can squeeze into a television channel, other considerations such as communications range, audio quality, robustness to interference, latency and signal degradation are also important factors for evaluating the efficacy of digital wireless microphone systems.

NAB agrees that it is important to explore this issue. We are cautiously optimistic that digital wireless microphone technology will prove useful, but NAB cannot comment fully until the market for digital wireless microphones has matured and a record can be developed on the basis of real-world experience. Once this equipment has been on the market long enough for the industry to gain practical experience, NAB looks forward to

working with the Commission in its consideration of a possible transition to digital wireless microphone technology.

NAB also observes that broadcasters recently undertook an involuntary transition in their wireless microphone use, vacating channels 52-69. In connection with this process, many broadcasters were required to make major investments in new equipment (analog, given that digital equipment is only just now coming onto the market). The Commission should not strand the substantial equipment investments that broadcasters have just made in connection with the requirement to vacate channels 52-69, by imposing a premature decision to require a transition to digital equipment.

IV. Conclusion

For the reasons stated above, NAB respectfully requests that the Commission carefully consider a narrow expansion of Part 74 licensing eligibility, and preserve the two safe harbor channels for wireless microphone operations.

Respectfully submitted,



Jane E. Mago
Jerianne Timmerman
Larry Walke
Victor Tawil
Bruce Franca
NATIONAL ASSOCIATION OF
BROADCASTERS
1771 N Street, NW
Washington, D.C. 20036
(202) 429-5430



Jennifer A. Johnson
Eve R. Pogoriler
COVINGTON & BURLING LLP
1201 Pennsylvania Avenue, N.W.
Washington, DC 20004-2401
(202) 662-6000
*Counsel for the National Association of
Broadcasters*

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