

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

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
)	

To: The Commission

**OPPOSITION OF BROADCAST SPORTS INTERNATIONAL
TO PETITION FOR RECONSIDERATION**

Broadcast Sports International, formerly known as Broadcast Sports Incorporated (“BSI”), by counsel, hereby respectfully submits its Opposition to the *Petition for Reconsideration* filed on or about December 17, 2015 by Shure, Incorporated (Shure) in the above-captioned proceedings. BSI¹ participated earlier in the proceedings by filing comments which, in material part, supported the continued access of video production companies to the 1435-1525 MHz band (the 1.4 GHz band) for production of large-scale sports, news and entertainment television programming. Such access is now and has for decades been facilitated by: (1) full advance coordination with and approval by the Aerospace and Flight Test Radio Coordinating Council (“AFTRCC”) which has a primary allocation in that band, and (2) grants by the Commission’s Office of Engineering and Technology of Special Temporary Authority (STA), premised invariably on the completion of advance coordination with AFTRCC, for video

¹ BSI is a preeminent producer of video and audio at events around the country for broadcast, cablecast, internet streaming and satellite transmission to end users. Its work includes production and transmission of video for nationally televised sporting events -- especially professional golf and automobile racing events – but it includes as well production of other newsworthy and entertainment events of all types throughout the United States. Its clients include broadcast, cable and satellite networks and other users of video for point-to-multipoint dissemination.

production at specific events at specific locations. The availability of Aeronautical Mobile Telecommunications (AMT) spectrum² in this manner is absolutely critical to the video and audio coverage of large scale news, sports and entertainment that the public has come to expect³ and it is a process that has been in place since the 1980s. Shure, for the first time in its *Petition for Reconsideration*, as part of its effort to expand the availability of the 1.4 GHz band for wireless microphones beyond the 30 megahertz limit imposed by the Commission in the August 11, 2015 Report and Order⁴ in this proceeding, urges among other things that the Commission cease issuing STAs to commercial entities for video production in this band and elsewhere. It is this portion of Shure's *Petition for Reconsideration* that BSI strenuously opposes and urges the Commission to flatly reject. For its *Opposition to the Shure Petition for Reconsideration*, BSI states as follows:

1. BSI is sympathetic to the serious constraints that the Commission has imposed on the use of wireless microphones, intercoms and other short-range RF devices by broadcasters, cablecasters and video production companies among other entities, resulting from their effective displacement from the UHF television bands, where most wireless microphone operation now takes place. Among many ubiquitous applications throughout the United States, wireless microphones play an important role in enabling broadcasters and video and audio production professionals to serve consumers and broadcast, cable and satellite audiences, providing real-

² The same procedures are in place with respect to the 2360-2390 MHz band, also allocated to AMT on a primary basis.

³ The video and audio produced by BSI and other video production companies is now done in high-definition digital formats using state-of-the art equipment, and the video and audio captured using current wireless technology is of sufficient quality that the television viewer is placed at the scene of events as they occur. For example, the viewer is placed inside a series of race cars at NASCAR races, with views forward and aft from the car. Due to the use of bands including 1.4 and 2.3 GHz by STA, the viewer has virtually the same visual and aural experience as does the driver. This is only one example of the experience that television viewers have enjoyed and have come to expect, and which is now possible due to the use of the 1.4 GHz band.

⁴ See *Promoting Spectrum Access for Wireless Microphone Operations; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket Nos. 14-166 and 12-268, Report and Order, 30 FCC Rcd 8739 (rel. Aug. 11, 2015) (“*Report and Order*”).

time coverage of live sports, entertainment and newsworthy events. The Commission's *Report and Order* in this proceeding has made some substantial accommodation via replacement spectrum for wireless microphones, wireless intercoms and low-power broadcast auxiliary applications in various frequency bands. It has done so prior to the time that the shortage in spectrum for these applications at UHF becomes more acute than it is at present.

2. Among the various accommodations the Commission made in the *Report and Order* in this proceeding was to permit by STA the use of up to 30 megahertz of the 1.4 GHz band, premised on prior coordination with AFTRCC. At Paragraph 18 of the *Report and Order*, the Commission stated as follows:

Protection of primary service in the band by this new secondary service is of paramount importance. Wireless microphone use in the band must be coordinated with the non-governmental coordinator for assignment of flight test frequencies in the band (i.e., AFTRCC), and authentication and location verification will be required before a coordinated wireless microphone begins operation. Wireless microphones operating in this band must also be tunable across the entire 1435-1525 MHz band, (footnote omitted) as recommended by AFTRCC. This capability will facilitate coordination with incumbent users whose aeronautical testing may be variable across the band. Additionally, we will authorize all microphones operating in a particular area to access no more than 30 megahertz in the 1435-1525 MHz band. This requirement will facilitate coexistence in the band by ensuring that wireless microphones operating be able to coordinate around AMT operations and by promoting the development of spectrally efficient technologies (e.g., digital technologies). We also emphasize that the STA process remains available to address extraordinary situations or special events requiring more spectrum access.

The limitation of 1.4 GHz wireless microphones to no more than 30 megahertz⁵ in a given area was premised in part⁶ on the need, expressed in this proceeding in the comments of BSI and the Society of Broadcast Engineers, Incorporated (SBE) to continue to permit AFTRCC-coordinated,

⁵ At the events at which BSI produces video, there are typically between 120 and 250 wireless microphones used. The current bandwidth of broadcast-quality wireless microphones is approximately 200 kilohertz per microphone. This translates to approximately 24 to 40 MHz of UHF television spectrum at a given event. At some events such as the NFL Super Bowl® or the political conventions, even greater numbers of wireless microphones must be utilized at any given time during the event. Therefore, the 30 megahertz per location permitted for wireless microphones in the 1.4 GHz band, given the availability of other bands for these devices, is a reasonable limitation.

⁶ The main rationale for the 30 MHz limitation at any one wireless microphone deployment venue at any one time was as an incentive to Shure and other manufacturers to achieve greater spectrum efficiency by using narrower bandwidth devices than the 200 kHz bandwidth devices that are now in widespread use.

STA-based operation of COFDM and other video transmissions⁷ for video production at the same events at which wireless microphones are used in abundance. As BSI explained in comments in this proceeding, BSI and other video production companies operate pursuant to Commission-issued licenses in the Local Television Transmission Service (“LTTS”); the Low Power Broadcast Auxiliary Service (“LPAS”) and Business/Industrial Land Mobile Radio Service. There is now, there has been and in the future there will continue to be woefully insufficient video channel bandwidth spectrum available in the low microwave range which is typically available in a given market due to overcrowding, pursuant to these licenses. Video production is conducted in the same, extremely crowded broadcast auxiliary bands that are used by broadcasters for electronic news gathering on a daily basis. BSI must, therefore, rely on the availability of grants of STA⁸ to permit the use of other spectrum for these purposes as well. BSI has been able to successfully develop, construct and deploy equipment for non-standard video bands including the 1.4 GHz and 2.3 GHz bands. Nevertheless, the ability of a program producer to conduct basic video production operations is largely dependent on the regular availability of the 1.4 and 2.3 GHz band by STA, because of overcrowding and unavailability of the 2025-2110 MHz and 2450-2483.5 MHz bands, or higher frequency Broadcast Auxiliary/LTTS bands.

3. The *Notice of Proposed Rulemaking* in this proceeding,⁹ at Paragraph 175, discussed options for making available the 1.4 GHz band for certain classes of wireless microphone users.

⁷ COFDM video emissions utilize an approximate 8 MHz occupied bandwidth.

⁸ It is, incidentally, necessary to reiterate the ongoing, extremely efficient and professional assistance of the staff of the Experimental Licensing Division of the Office of Engineering and Technology. But for their rapid responsiveness and appreciation of the continuing need for grants of Special Temporary Authority for video and audio production purposes, televised events such as NASCAR races, Formula One and other automobile racing, professional golf tournaments, the NFL Super Bowl® and other professional sports events would not be possible due to the overcrowding of Broadcast Auxiliary/LTTS spectrum generally, and in video bandwidth spectrum in particular.

⁹ *Notice of Proposed Rulemaking*, FCC 14-145, 29 FCC Rcd. 12343, 79 Fed. Reg. 69387 and 69730 (released September 30, 2014) (the “*Notice*”).

BSI urged in its comments that wireless microphones *not* be permitted in this band at all. SBE reached the same conclusion. Because the band is allocated for AMT operations and coordinated for such purpose by AFTRCC, there is limited spectrum available in this band for other purposes. As the *Notice* accurately summarized, broadcasters and program production companies in need of video-bandwidth spectrum for transmission of video for televised sporting events, political conventions and other major entertainment often must obtain STAs to operate wide-bandwidth video equipment in this band on a short-term basis.¹⁰ The need for these video channels for program production (where, and at times when they are not being used for AMT or other Federal government operations) is due to acute spectrum shortages for TV Pickup and video relay in many areas due to normal overloading of the BAS/CARS/LTTS bands at 2025-2110 MHz; 2450-2483.5 MHz; 6425-6525 MHz, and higher bands. But for the AFTRCC coordinated, “secondary market” STA use of the 1.4 GHz band, video production of these major events would not be possible.

4. While the dire shortages of UHF television wireless microphone spectrum that stood to preclude professional program production were acknowledged by BSI in this proceeding, the shortages of COFDM video bandwidth channels at events such as NFL football, NASCAR

¹⁰ Paragraph 175 of the *Notice* stated as follows:

“In recent years, professional sound engineering companies responsible for major event productions have obtained Special Temporary Authority (STA) to operate wireless microphones and similar audio devices, along with video equipment, on a temporary basis (e.g., a few days or a week) to access this spectrum to supplement their access to other spectrum resources (primarily the TV bands) for coverage of sporting events (e.g., golf tournaments or NASCAR races) at specified locations around the country. (footnote omitted) Generally, as these parties represent in their applications for individual STAs, the spectrum resources otherwise available to them at those locations are insufficient to enable them to provide the desired level of coverage for these scheduled events. Prior to grant of each STA, the applicants must demonstrate that they have fully coordinated their proposed spectrum use with AFTRCC. (footnote omitted)The STAs provide the applicants access to up to 90 megahertz of spectrum in the 1435-1525 MHz band, and only when that spectrum is not subject to AMT use at the specified times and locations. Operators generally use equipment that has been specially developed or modified for use of the 1.4 GHz band spectrum.”

racing, PGA golf tournaments and other similar events threatens access to these events by the viewing public as well. Coordinated STA operation in the 1.4 GHz band by BSI and others with AFTRCC works very efficiently and is critically necessary. For those reasons, BSI strongly recommended *against* the allocation of ***any portion*** of the 1.4 GHz band for Low Power Broadcast Auxiliary or wireless microphone use. However, BSI stated, should the Commission nevertheless decide to make the 1.4 GHz band available for wireless microphones, BSI urged that the Commission limit wireless microphone use in that band as proposed at Paragraph 177 of the *Notice*:

Because of the importance of ensuring that the AMT systems are protected against harmful interference, and given that most wireless microphone operations can be accommodated within other spectrum, we propose that use of this band be limited to licensed professional users at specified locations and times, and include specified safeguards designed to protect AMT use of the band... Limiting the licensing for these types of applications, which are typically associated with specific locations, should make sharing of the spectrum manageable. Although we would authorize such use on a secondary basis, in this instance we believe that frequency coordination with federal and non-federal users is critical and is consistent with the practice that already has been used for special temporary authority in this band, although on a more limited basis...

5. Essentially, the *Report and Order* in this proceeding did exactly as proposed in the *Notice*: the Commission carefully balanced the various competing considerations and arrived at an accommodation for all at 1.4 GHz, while providing an incentive for future narrowband conversion of wireless microphones. AMT was protected from interference by utilizing the tried-and-true prior coordination/STA process that has worked well and permitted secondary uses of AMT spectrum in this and other bands for many years. Wireless microphones were given a very substantial amount of replacement spectrum in this band for those large-scale events where professional, licensed wireless microphone operation is needed; and a portion of the band was retained for the important video relay channels that are critical at these same large-scale events

for even marginally adequate video production that the viewing public expects on a continuing basis.

6. However, Shure's *Petition for Reconsideration*, at page 7 states as follows:

The Commission unnecessarily and arbitrarily reduced the viability of the 1435-1525 MHz band as supplemental spectrum for licensed microphone operations when it restricted "all microphones operating in a particular area to access no more than 30 megahertz" in the band (footnote omitted). To Shure's knowledge, no basis exists in the record for the 30 megahertz limit. The Commission did not seek comment on restricting secondary wireless microphone access to the band in such a manner, nor did the Order cite to any comments filed in support of such a limitation. As such, the Commission should correct this inadvertent oversight by making the entirety of the 1435-1525 MHz band available to licensed wireless microphones users pursuant to successful coordination with AFTRCC and federal and non-federal incumbent users.

Contra Shure's argument, there were comments in the record, from both BSI and SBE, urging that the 1.4 GHz band not be made available at all for wireless microphones in view of the importance of retaining the availability of that band for video channels by STA for large-scale events. As noted above, the Commission has acknowledged that the compatible STA use by video production entities premised on prior coordination with AFTRCC is a good example of compatible frequency re-use. And since there are no practical alternatives to the decades-old STA use for video production of the 1.4 and 2.3 GHz bands, the 30 MHz limitation on the use of 1.4 GHz represents a careful balancing by the Commission of competing concerns. To describe the 30 MHz limit as an "inadvertent oversight" to be remedied by making the entirety of the 1.4 GHz band available for wireless microphone operation on an ongoing basis reflects a lack of knowledge on Shure's part about the dynamics of the industry for which Sure is providing equipment and of the spectrum allocations process. Furthermore, Shure's proposal would disenfranchise video production operations and in many markets would foreclose the ability of

broadcast networks and video production companies to provide coverage of news, sports and entertainment events.

7. Far worse, however, is Shure's proposal to the Commission to foreclose all Part 5 STA grants to any commercial entity whatsoever. Gratuitously, and in a selfish effort to normalize licensed wireless microphone use of the entire 1.4 GHz band and eliminate the STA process that ensures coordinated and interference-free operation in AMT spectrum, Shure states at pages 9 and 10 of its *Petition for Reconsideration as follows*:

Although Shure applauds Commission efforts to accommodate wireless microphone and wireless video operations in the 1435-1525 MHz band pursuant to Special Temporary Authority ("STA"), requiring wireless microphone licensees to obtain supplemental access to the 1435-1525 MHz band through the STA process (footnote omitted) to support large-scale events where the coordination process and required protections are already in place for the secondarily licensed spectrum is inefficient and burdensome for wireless microphone licensees and AFTRCC alike. Moreover, Part 5 rules were never intended for the long-term operation of commercial wireless transmitters. Indeed, commercial service involving the lease or sale of hardware for profit is prohibited under FCC rules and is contrary to longstanding FCC policies with respect to Part 5 experimental licensing rules (footnote omitted). As the Commission has recognized, commercial businesses should not be permitted to abuse the Part 5 STA and experimental licensing rules to offer commercial services that would otherwise require a permanent license. The FCC should therefore sunset this practice once permanent Part 74 rules are in place and certificated equipment is available for the 1435-1525 MHz band.

Permitting operation in the 1435-1525 MHz band pursuant to Part 5 STA rules does not provide incumbent aeronautical telemetry users with adequate interference protection. Current devices operated pursuant to Part 5 STA undergo no certification testing. Accordingly, no information is available with respect to emission masks and OOB limits for these devices. It is unclear if these devices even satisfy outgoing Part 74, technical requirements, let alone more rigorous requirements in the future (footnote omitted). Part 5 STA devices are operated solely on the honor system after a manual coordination with AFTRCC without electronic safeguards equivalent to those contemplated by the Order. (footnote omitted). While the Commission's flexibility prior to the development of permanent Part 74 rules was admirable, now that rules are in place, ongoing commercial operations under Part 5 of the Commission's rules should sunset. Shure urges the Commission to discontinue the grant of Part 5 experimental licenses for commercial operations in the 1435-1525 MHz band within 36 months.

So, without the slightest indication of the effect of this broad and completely unjustified proposal on video production companies or broadcast networks, and having raised this subject for the first time in a Petition for Reconsideration, Shure in one fell swoop recklessly proposes to prohibit all STA use of the 1.4 GHz band (and by inference, for the same stated reason, the 2.3 GHz AMT band as well) for video transmission by video production companies. Such a decision would make video coverage of sports events, especially automobile racing and golf tournaments of national interest, and as well all major entertainment events, awards shows, and political conventions impossible. It will be of no benefit to those providing audio and video production at those events to have wireless microphones available in the 1.4 GHz band if the video coverage of those same events is foreclosed due to lack of available spectrum for short-range video feeds.

8. Shure's dislike of the STA process for the accommodation of wireless microphones in the 1.4 GHz band is understandable. It, and the AFTRCC coordination process upon which STA grants in AMT spectrum is predicated is somewhat cumbersome and somewhat expensive for those who must use it. However, it has proven by far the best means of allowing a secondary market in this spectrum in particular and an efficient and interference-free method of making efficient use of spectrum where licensing is not an option. The STA process ensures that users of the AMT spectrum are in fact coordinated with AFTRCC, as the Commission requires that such coordination be completed to AFTRCC's satisfaction prior to the time that the STA is issued. And since the Commission's enforcement resources are completely insufficient to ensure that only eligible users are actually deploying RF devices in the 1.4 GHz band *post-hoc*, the STA process provides an *ex ante* method of regulating access by the secondary users of the spectrum and protecting AMT operations. Far from abusing the Part 5 Experimental Radio Service, granting STAs premised on prior coordination is the highest and best means of providing access

to spectrum to those entities, including video production companies which have no means of obtaining licenses for the spectrum that is necessary to deliver video programming of newsworthy events to the public that expects the quality of video that they have been getting for the past several decades, and keeping others out. Shure's self-serving suggestion that the STA process be phased out at 1.4 GHz is untimely, ill-conceived and completely unjustified.

9. It is easily arguable that the band 1435-1525 MHz should not have been made available for wireless microphones at all, in view of the many other bands that were made available for the purpose in this docket proceeding and in view of the critical use of that band for video feed transmission. However, the Commission made a justifiable accommodation in this band by limiting wireless microphone operation to licensed professional uses on an AFTRCC-coordinated STA basis, and by limiting wireless microphone access under normal circumstances to no more than 30 MHz of the band in any one location at any one time. The action preserved some of this critically necessary video bandwidth spectrum for use at the same large-scale events where both audio and video channels are extremely limited, and ensured that interference to AMT will be prevented through the coordination process.

Accordingly, for the reasons stated herein, Broadcast Sports International respectfully

urges that the Commission deny the portions of Shure's *Petition for Reconsideration* as are addressed herein.

Respectfully submitted,

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