June 24, 2015

VIA ELECTRONIC FILING
Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC  20554

Re:  EX PARTE MEETING NOTICE:

Dear Ms. Dortch:

On June 22, 2015, representatives from stakeholders in the wireless microphone industry – multiple broadcasters, newscasters, large event spectrum coordinators and producers, other wireless microphone users, and wireless microphone manufacturers – met with FCC staff from the Office of Engineering Technology (“OET”) and the Wireless Telecommunications Bureau (“WTB”) to discuss the Commission’s proposal to identify supplemental spectrum for wireless microphone operations and related issues in connection with the above-captioned proceedings. In attendance were:

Broadcasters, Newscasters and Wireless Microphone Users: Louis Libin, Broadcom, Inc. and NYC frequency coordinator; Henry Cohen, CP Communications; Tom Ferrugia, The Broadway League; Amy Klein and Jeff Willis, ESPN; Anne Lucey, CBS; Roger Charlesworth, DTV Audio Group; Jared Sher, 21st Century Fox; Kevin Parrish and Margaret Tobey, NBC Universal; Bob Weller, National Association of Broadcasters; Kathleen Kirby, Radio Television Digital News Association; Chris Imlay, Society of Broadcast Engineers and Broadcast Sports, Inc.; Kyle Dixon, Time Warner, Inc.; and Keith Murphy, Viacom
Wireless Microphone Manufacturers: Howard Kaufmann, Lectrosonics; Joe Ciaudelli, Sennheiser; and Mark Brunner, Ahren Hartman, Edgar Reihl (by phone), Catherine Wang (outside counsel), Tim Bransford (outside counsel by phone) Shure Incorporated.

FCC Staff: Julius Knapp, Chief, and Ira Keltz, Geraldine Matise, Paul Murray, Rodney Small, Serey Thai, Hugh Van Tuyl, from OET; and Simon Banyai, and Stephen Buenzow (by phone) from WTB.

The group expressed appreciation for the Commission’s efforts to address wireless microphone spectrum shortages with proposals to supplement the UHF spectrum remaining after completion of the Incentive Auction and broadcast repacking with spectrum bands identified in GN Docket 14-166. The group reiterated previous statements that wireless microphone use has expanded significantly since the inception of the technology decades ago, and that UHF is the primary spectrum home for existing technology. Today, wireless microphones are an integral part of broadcasting, news, music, sports, theater, and civic events, among other events and productions.

The wireless microphone community has lost access to a tremendous amount of spectrum by virtue of the Commission’s relatively recent decision to transition wireless microphones out of 700 MHz, which caused many users to replace their 700 MHz equipment with 600 MHz UHF equipment just a short time ago. Further, the Commission intends to eliminate the two reserve channels created when white space devices were first permitted to operate alongside wireless microphones in the same UHF spectrum. Access to more spectrum is needed particularly in light of the FCC’s recently announced plan to permit TV stations to be assigned to 600 MHz frequencies in the duplex gap, including the 4 MHz previously identified by the Commission for exclusive licensed wireless microphone use. This decision is especially burdensome to the extent that TV stations are assigned to the duplex gap in major metropolitan markets because it could effectively remove access to all UHF spectrum exclusively available for wireless microphones in those markets.

Users and manufacturers are working hard to adjust to the new landscape by continuing to innovate in the limited spectrum currently available to wireless microphones. In recent years, the industry has achieved significant gains in spectral efficiency and made greater use of non-UHF spectrum where particular applications can be successfully served by other spectrum choices.

The supplemental frequencies proposed in this docket are helpful but not sufficient, given the great extent of UHF spectrum loss, the fact that practical use of such supplemental spectrum is years away, and that virtually all possible spectrum bands identified are encumbered in some way.

The FCC process to provide access to supplemental spectrum must move quickly so that wireless microphone users may access supplemental spectrum before UHF spectrum is no longer available. We also discussed additional steps to address wireless microphone needs, including
further consideration of co-channel operations, rules that would give the wireless microphone industry the longest possible transition time, and equipment transition rules that do not make working equipment obsolete.

Ahren Hartman, of Shure Incorporated presented the attached material regarding proposed new supplemental sources of wireless microphone spectrum and particular technical and other considerations relevant to introducing wireless microphone operations in each band.

Finally, wireless microphone industry representatives expressed ready willingness to continue to work with FCC staff at OET and WTB toward making available near and long-term solutions for supplemental spectrum.

Sincerely,

/electronically signed/

Catherine Wang

Attachment

CC:
Julius Knapp
Ira Keltz
Geraldine Matise
Paul Murray
Rodney Small
Serey Thai
Hugh Van Tuyl
Simon Banyai
Stephen Buenzow (by phone)
Professional Audio Community

- Spectrum discussion facilitated by DTV Audio Group
- Members include broadcasters, end-users and wireless microphone manufacturers
  - Affiliated with the Sports Video Group
- Relies on UHF spectrum for daily microphone operations across the country
  - Sports, news, entertainment
  - Use has been increasing exponentially
- Licensed UHF spectrum for microphone use will shrink post-600MHz auction while wireless demand continues to grow
- 14-166 NPRM proposed new frequency bands are supplemental to remaining UHF TV spectrum
Supplemental Frequency Bands for Wireless Microphones

- **600MHz Duplex Gap**
  - 4MHz licensed

- **941-960MHz**
  - Expand spectrum above and below 944-952MHz
  - 941-944MHz (3MHz) shared with MAS/Fixed MW
  - 952-960MHz (8MHz) shared with MAS/Fixed MW

- **1435-1525MHz**
  - 90MHz shared with flight telemetry

- **2020-2025MHz**
  - 5MHz open

- **6875-7125MHz**
  - 250MHz shared with broadcast auxiliary service and fixed microwave operations
600MHz Duplex Gap

• 4MHz proposed in NPRM
• Critical for electronic news gathering (ENG)
• Restricted to Part 74 licensed users
• Apply existing Part 74 technical rules through transition period
  – After transition period, occupied bandwidth and spurious becomes ETSI limit(s)
• Wireless microphones compatible with adjacent LTE services
• May not be available in all TV markets
941-960MHz

- 19MHz proposed in NPRM
  - 941-944MHz (3MHz)
  - 952-960MHz (8MHz)
  - 944-952MHz (8MHz already in Part 74 - BAS)

- Shared with Multiple Address Services and Fixed Microwave Services

- Restricted to Part 74 licensed users

- In 941-944/952-960MHz:
  - Apply existing Part 74 technical rules, replace occupied bandwidth and spurious limits with ETSI limit(s) for all new equipment
941-960MHz (cont’d)

• In 944-952MHz:
  – Apply existing Part 74 technical rules through transition period
    • After transition period, occupied bandwidth and spurious becomes ETSI limit(s)

• Incumbent protection
  – 944-952MHz: increase spectrum use through better coordination with SBE, frequency finder tools based on ULS license data
  – 941-944/952-960MHz: integrate MAS/Microwave ULS license and geography information into frequency finder tools
    – Would not require live control by a database
1435-1525MHz

- 90MHz proposed in NPRM
- Shared with flight telemetry service
- Restricted to Part 74 licensed users
- Frequency coordination through AFTRCC in advance of equipment use
- Authentication and location verification required for transmission
- Potentially useful in some situations
- Apply existing Part 74 technical rules, replace occupied bandwidth and spurious limits with ETSI limit(s) for new equipment
2020-2025MHz

- 5MHz proposed in NPRM
- Exclusive to microphone operations
- Apply existing Part 74 technical rules, replace occupied bandwidth and spurious limits with ETSI limit(s) for all new equipment
6875-7125MHz

- 250MHz proposed in NPRM
- Shared with BAS and Fixed Backhaul services
- Restricted to Part 74 licensed users
- Allocate microphones across all 250MHz
- Frequency coordination through SBE/Part 74 users
- Apply existing Part 74 technical rules, replace occupied bandwidth and spurious limits with ETSI limit(s) for all new equipment
  - May aggregate channels for wider-band transmission
VHF Issues

• Improve parity with UHF by permitting power output to be measured either on a conducted or radiated basis to address reduced antenna efficiency in the VHF band

• Update technical rules in 169-172 MHz band to harmonize with rules for operation in the VHF TV channels. Make entire 169-172 MHz band available for wireless microphone use under Part 74
  – Occupied bandwidth = 200 kHz with a 25 kHz channel grid and 50mW transmitting power (conducted or radiated basis)
New bands

- Supplemental bands proposed in 14-166 are not enough to replace lost spectrum in 700MHz and incentive auction
- Consider future wireless microphone operation in 225-380 MHz range
- Consider future wireless microphone operation in a new band above 10 GHz