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July 29, 2015

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW, Room TW-A325
Washington, D.C. 20554

Re: 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

Dear Ms. Dortch:

On July 27, 2015, Kim Kolb of Boeing, Marc Ehudin of Textron, Danny Hankins of Textron Aviation and President Emeritus of AFTRCC (by telephone), Don Tyree of Lockheed Martin (by telephone), and Edward A. Yorkgitis, Jr., of Kelley Drye & Warren, LLP, counsel for Aerospace and Flight Test Radio Coordinating Council, Inc. ("AFTRCC") (collectively, the "AFTRCC representatives") met separately with Jessica Almond (Wireless Legal Advisor to Chairman Thomas Wheeler), Brendan Carr (Wireless Legal Advisor to Commissioner Ajit Pai), David Strickland (Acting Wireless Legal Advisor to Commissioner Mignon Clyburn), Valery Galasso (Policy Advisor to Commissioner Jessica Rosenworcel), and Erin McGrath (Wireless Legal Advisor to Commissioner Michael O'Rielly). In the meetings, the AFTRCC representatives discussed the positions of AFTRCC in the above-referenced proceedings as set forth in its comments and reply comments.

The AFTRCC representatives explained that AFTRCC remains open to the option of the Commission allowing wireless mikes to operate on a licensed, secondary basis in the 1435-1525 MHz band which currently is allocated on a primary, priority basis to Federal and non-Federal aeronautical mobile telemetry ("AMT") used for flight testing. The AFTRCC representatives underscored that this has been and is a critical band for real time safety-of-life AMT operations during both commercial and military flight testing and the importance that AMT operation in the band remains interference-free to ensure safe, successful, and productive flight testing. The

AFTRCC representatives underscored that sharing with wireless mikes in the 1435-1525 MHz band could be accomplished *provided that* a regulatory framework is adopted containing the following elements:

- Only licensed, professional users as proposed in the *Notice of Proposed Rulemaking* are eligible to operate wireless microphones in the 1435-1525 MHz band.

- Prior coordination with AFTRCC (and the federal government) at specific times and places would be required before any operation.

- Immediately prior to commencing coordinated operations, a wireless mike user must register and authenticate the equipment at the coordinated location through an automated mechanism. Where coordination is obtained for a longer period, registration and authentication would have to be repeated regularly, no less than once per day.

- All wireless mike equipment operating in the band must be designed to have deactivation controls that cannot be defeated by the user such that operation cannot commence (or continue, in the case of extended operations) absent a successful registration and electronic authentication at a coordinated time and place. The existence and efficacy of these controls must be demonstrated through the application for equipment authorization process, including the inability of the user to modify or turn off these controls.

- Wireless mikes developed for use in the 1435-1525 MHz band should be required to be tunable across the entire 90 MHz. This would better facilitate coordination in comparison with a framework where wireless mike equipment is restricted to only certain portions of the band because the demands and requirements of both commercial and military flight testing at various locations and times are variable across the band.

The AFTRCC representatives underscored that an integrated control mechanism and an automated authentication mechanism supported by the wireless microphone equipment is essential because of the potential for resale and repurposing of wireless microphone equipment by users other than professional entities (and because of the potential for human error) which, without these controls, could lead to harmful interference to AMT operations with dangerous consequences. That mechanism, the AFTRCC representatives explained, must be coupled with a geolocation capability integrated into the equipment or another adequate solution, such as a

short-range tether to a GPS capability. The AFTRCC representatives stressed that manual entry of coordinates to determine location cannot be the basis of an acceptable solution because of the potential for error and abuse and the resulting potential for harmful interference, which could endanger both life and property in the air and on the ground, as well as the potential for costly flight testing delays with adverse consequences for aerospace manufacturers' production schedules.

The AFTRCC representatives also pressed AFTRCC's position that the Commission should give short shrift to the request of CTIA for the Commission to take no action with regard to the 1435-1525 MHz band at this time because of efforts to make the band available for International Mobile Telephony ("IMT") and before the band has been thoroughly studied for suitability to host commercial mobile radio service ("CMRS") operation. AFTRCC summarized the long history of the Commission in protecting flight testing operations in the 1435-1525 MHz band as a safety of life service, and the current efforts of U.S. representatives in preparation for the 2015 World Radiocommunication Conference ("WRC-15") to preserve the band in the United States for primary operation for AMT relative to other mobile operations, as memorialized in International Telecommunication Union Radio Regulation ("ITU RR") footnote 5.343, which accords priority status to AMT operations over other mobile uses within the band. The AFTRCC representatives explained that, on the basis of studies by the ITU Joint Task Group 4-5-6-7 grounded in Commission-recognized the AMT protection criteria are reflected in Recommendation ITU-R M.1459, the U.S. has developed its position that sharing between AMT and CMRS is infeasible. Indeed, as a consequence, at the February 2015 Inter-American Telecommunication Commission ("CITEL") meeting, the U.S. secured sufficient support for an Inter-American Proposal ("IAP") for No Change to RR 5.343 in Region 2. In return, the U.S. has lent its support to an IAP for a Region 2 identification for IMT coupled with a recognition that, in the United States, the 1435-1525 MHz band is used extensively for AMT and the U.S. has no intention of implementing IMT in the band. (The final CITEL meeting before WRC-15 is in August in Ottawa, Canada, at which the U.S. will work to secure finalization of these IAPs.) AFTRCC submits that any order the Commission adopts in the above-referenced proceedings should reflect and be consistent with the position the U.S. delegation has taken in international fora and make clear that the Commission has no intention of exploring this band for a future potential CMRS allocation.

Attached is a copy of written materials used by the AFTRCC representatives in the meetings.

Please contact the undersigned if there are any questions or if you require further information.

Respectfully submitted,

Edward A. Yorkgitis, Jr.
Counsel for AFTRCC

Attachment

Cc (via e-mail):
Jessica Almond
Brendan Carr
Louis Peraertz
David Strickland
Johanna Thomas
Valery Galasso
Erin McGrath

Aerospace and Flight Test Radio Coordinating Council, Inc. (AFTRCC)

Presentation in
GN Docket No. 14-166
Wireless Microphone Proceeding

July 27, 2015

Aerospace and Flight Test Radio Coordinating Council Members

AFTRCC
AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

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BOEING
Gulfstream
A GENERAL DYNAMICS COMPANY
NORTHROP GRUMMAN
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BOMBARDIER LEARJET
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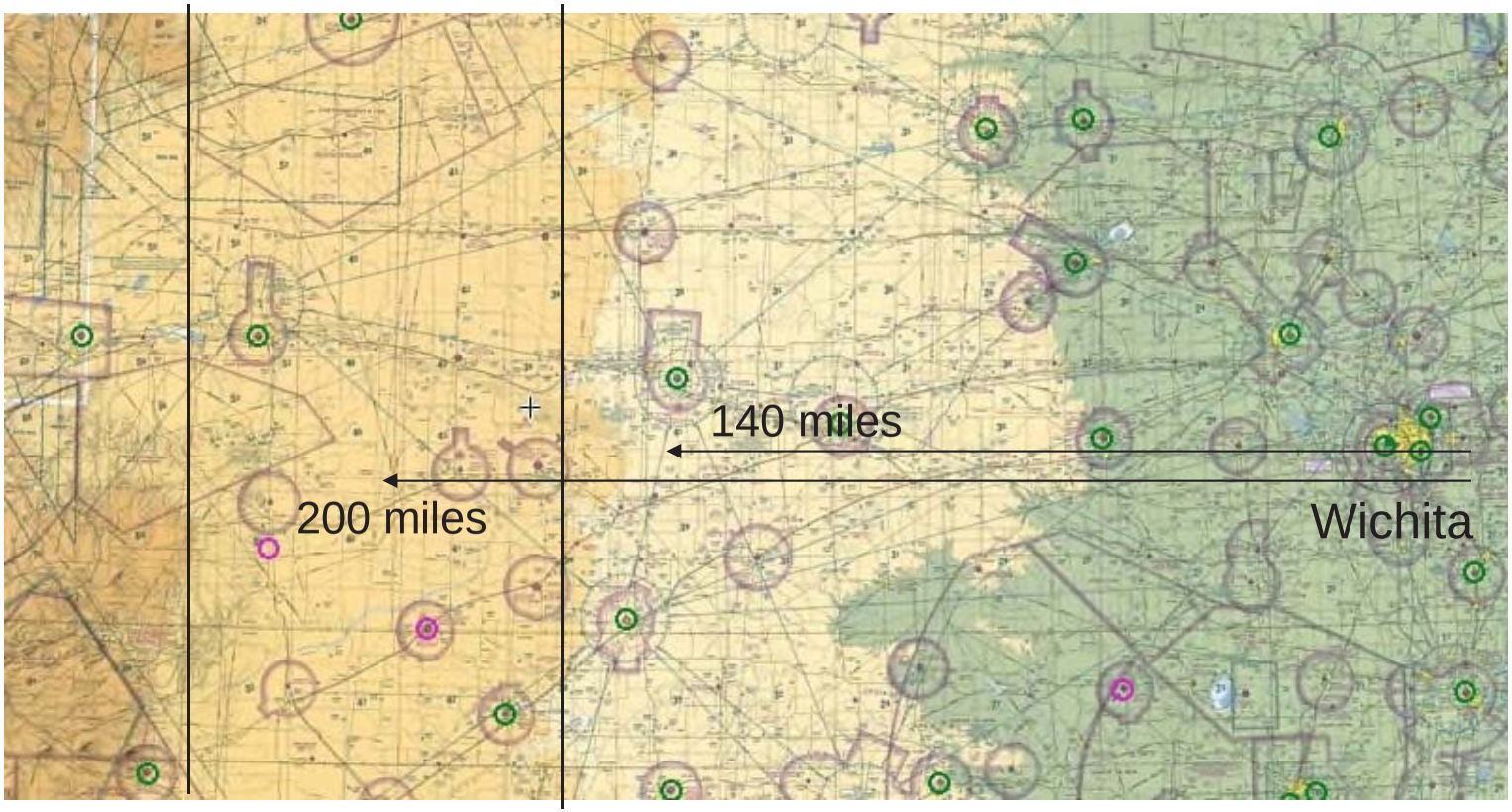
Characteristics of Telemetry in the 1435-1525 MHz Band

- Band utilized for testing aircraft and missiles.
- AMT measures a multitude of parameters from engine temperature, to fluid pressures, to vibration levels, to name just a few.
- Telemetry and video transmitted from test vehicles over distances of 200 miles to highly sensitive, high-gain parabolic antennas, typically mounted on towers, buildings, or mobile vans.
- Signal levels are weak and subject to dramatic fades due to maneuvers of test aircraft and multipath.
- Data and video are telemetered to ground engineers who 1) monitor the performance of the aircraft on a real-time basis, 2) warn the pilot of any trouble detected, and 3) make test adjustments.
- Interference-free telemetry is vital to flight safety in an inherently dangerous operation, as well as to aerospace industry productivity.
- 1435-1525 MHz is a Restricted Band off-limits to fundamental emissions of unlicensed devices. Rule 15.205(a).

Impact to Flight Testing



Maximum operational distance near Wichita of 200 miles is reduced to 140 miles if interferers double the noise floor.

AFTRCC Open to a Properly Crafted Secondary Allocation to Wireless Microphones in L-Band

- AFTRCC has no objection in principle to a secondary allocation in the 1435-1525 MHz AMT Band for the licensed use of wireless microphones where there is need for large number of microphones, *provide that* rules are adopted
  - Limiting licenses to a class of professional users
  - Making prior coordination by AFTRCC (and federal government) at specific places and for specific times mandatory
  - Requiring an *integrated control mechanism* in the wireless mikes that ensures wireless mike equipment can only operate when and where coordinated and confirmed at time of set up and periodically thereafter
- Point of sale requirements helpful but ultimately inadequate to ensure operation limited to eligible users and only after coordination
- Existing equipment that operates pursuant to STAs must be updated to be eligible for licensing under the new framework

FCC Has Repeatedly Recognized Protected Status for Flight Test Band

AFTRCC
AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

- AMT is a "safety service" and must be protected "from harmful interference that could result in loss of life."[1/]
- AMT band at 1435-1525 is "Restricted" and receives extra protection from fundamental emissions of unlicensed devices due to fact it "involv[es] safety of life." [2/]
- Commission has recognized significant potential costs to manufacturers and the public from even brief drop-outs.[3/]

[1/] *In the Matter of Amendment of Part 2 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva,* 1979, FCC 84-306, 98 FCC 2d 905, 906 (1984).

[2/] *In the Matter of Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License,* 4 FCC Rcd 3493, 3502 (1989). *See also* 47 C.F.R. §15.205(a) (1435-1626 MHz is a restricted band).

[3/] *Second Notice of Inquiry in GEN. Docket No. 89-554, In the Matter Of An Inquiry Relating to Preparation for the International Telecommunication Union World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum,* FCC 90-316, 5 FCC Rcd 6046, 6060, ¶101 (1990); *Amendment of the Frequency Allocation and Aviation Services Rules (Parts 2 and 87) to Provide Frequencies for Use by Commercial Space Launch Vehicles*, 5 FCC Rcd 493, 495 (1990)

U.S. Has Protected Flight Test Bands Internationally

- RR 5.343 provides that, "in Region 2, the use of the band 1435-1525 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service."
- In its preparations for WRC-15, the U.S. position has been to reject calls to make all or a portion of 1435-1525 MHz available for mobile commercial service, *i.e.*, International Mobile Telephony ("IMT"), proposing "to retain [RR 5.343] in Region 2 in order to protect the flight safety aspects of AMT operations from domestic and cross-border interference." [4/]
- In February 2015 CITEL meeting, the U.S. secured support for an Inter-American Proposal ("IAP") supporting No Change for the AMT priority in Region 2 over other mobile services (footnote 5.343) (supported by Canada, Brazil, Costa Rica, Mexico, and Colombia, in addition to the U.S.); in return, the U.S. has supported the IAP for a Region 2 identification for IMT -- <u>coupled</u> <u>with</u> a statement that "In the United States, the 1435-1525 MHz band is used extensively for Aeronautical Telemetry (AMT); consequently, the United States has no intention of implementing IMT in the 1427-1518 MHz band."
- Final CITEL meeting before WRC-15 is in August at which positions will be finalized.

4/ United States of America Proposals for the Work of the Conference, Agenda Item 1.1, WRC 2015, found at http://www.ntia.doc.gov/files/ntia/publications/ai_1.1_1435- 1535_mhz_usa_proposal_2014-02-13.pdf (last accessed February 3, 2015).

Comments in ET Docket No. 14-166

- **Shure**: No specific issue raised concerning AFTRCC recommendations. Shure recognizes that any future wireless mike operations in L-Band must be coordinated to ensure protection for critical AMT services. Open to joint efforts toward a workable and "reasonable" regulatory framework.

- **Sennheiser**: Agrees with need for prior AFTRCC coordination at specified locations/times but suggests that manual input of coordinates should be sufficient; integrated control mechanism would be expensive
  - However, manual entry of location would be prone to error and abuse and it offers no protection against ignorance of the rules

- **CTIA**: 1.4 GHz is under consideration in international fora for potential use by mobile broadband services; the Commission should not act with respect to 1435-1525 MHz until it has been "fully examined" for suitability to host CMRS.
  - However, the U.S. recognizes the incompatibility of AMT and CMRS and has worked in preparation for WRC-15 to secure support for an IAP supporting No Change for the AMT priority in Region 2 over other mobile services (RR 5.343)