Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 1, 2, 15, 25, 27, 74, 78, 80, 87, 90, 97, and 101 of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2007) (WRC-07), Other Allocated Issues, and Related Rule Updates	)	ET Docket No. 12-338 (Proceeding Terminated)
	)	
Amendment of Parts 2, 15, 80, 90, 97, and 101 of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2012) (WRC-12), Other Allocation Issues, and Related Rule Updates	)	ET Docket No. 15-99
	)	
Petition for Rulemaking of Xanadoo Company and Spectrum Five LLC to Establish Rules Permitting Blanket Licensing of Two-Way Earth Stations With End-User Uplinks in the 24.75-25.05 GHz Band	)	IB Docket 06-123
	)	
Petition for Rulemaking of James E. Whedbee to Amend Parts 2 and 97 of the Commission's Rules to Create a Low Frequency Allocation for the Amateur Radio Service	)	
	)	
Petition for Rulemaking of ARRL to Amend Parts 2 and 97 of the Commission's Rules to Create a New Medium-Frequency Allocation for the Amateur Radio Service	)	

To: The Commission

REPLY COMMENTS OF AEROSPACE AND FLIGHT TEST RADIO COORDINATING COUNCIL, INC.

Aerospace and Flight Test Radio Coordinating Council, Inc. ("AFTRCC"), by its counsel, hereby replies to certain of the opening Comments filed in this proceeding. As discussed below, the Commission should adopt the proposed Aeronautical Mobile Telemetry ("AMT") allocations in the 4400-4940 MHz and 5925-6700 MHz bands.

DISCUSSION

Nearly a decade ago, the United States identified a "large and growing shortfall" in the spectrum available for critical AMT operations. The causes of this shortfall, including "increasing complexity of aircraft design, pressure to shorten timescales for the development of new aircraft, and telemetry spectrum being diverted to other uses," have only continued to increase as aerospace and communications systems have matured in the intervening years. NPRM at para. 207. As a result of this urgency, the United States proposed at WRC-07, and the international community adopted, a Region 2 allocation for AMT in both the 4400-4940 MHz and 5925-6700 MHz bands. Now it is time to implement this much-needed allocation. The new allocation, and its accompanying operational restrictions, recognize the dual realities of intensive spectrum use across the band and the critical need for increased AMT spectrum. Given the international support for increased AMT spectrum, and the framework established to ensure its harmonious integration with existing services, the time has come to adopt these much needed allocations, and AFTRCC strongly urges the Commission to do so without delay.

AFTRCC, The Boeing Company, and The Small UAS Coalition have filed Comments explaining the policy supporting the allocation as agreed at WRC-07.[1] Comments opposing the allocation were filed by the Fixed Wireless Communications Coalition ("FWCC") and the National Spectrum Management Association ("NSMA"), on behalf of Fixed Service ("FS") operators. The Society of Broadcast Engineers, Incorporated ("SBE"), also filed Comments in opposition on behalf of broadcast, video production, and related entities.

As explained below, the FS community appears to systematically underestimate the true extent of spectrum sharing feasible in the 4400-4940 MHz and 5925-6700 MHz bands, as well as

[1] The Small UAS Coalition Comments address UAS use of the spectrum. As explained later, however, there are issues with this proposal.

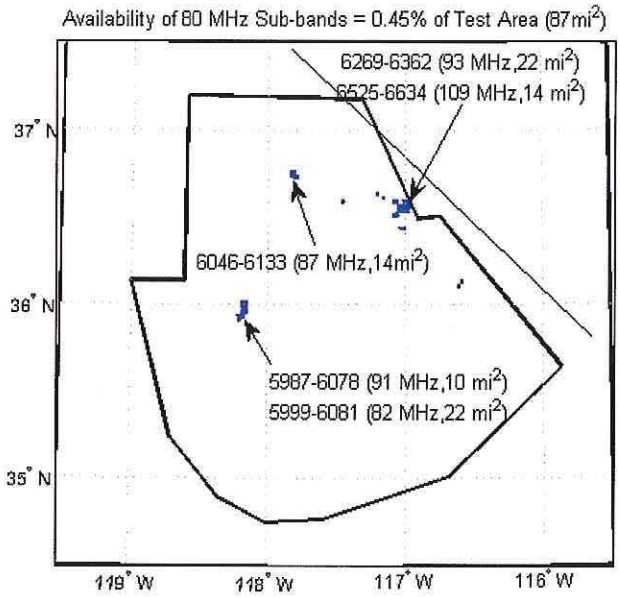
disregards the substantial inter-agency and international agreement establishing a framework for successful sharing between incumbent FS and new AMT operations.

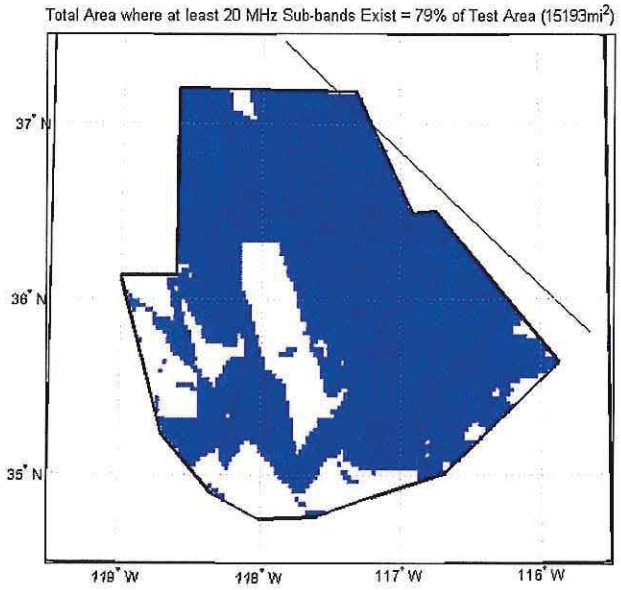
FWCC and NSMA maintain that sharing is infeasible in the bands 4400-4940 and 5925-6425/6525-6700 MHz on the grounds of potential interference to terrestrial microwave links. Among other things, they argue that the number of FS stations has increased since the time ITU-R Report M. 2119 was prepared in 2007. FWCC also contends, based on data provided by Comsearch, that "there are no geographic areas in the continental U.S. where AMT test areas would fall outside of the exclusion zones created by lower 6 GHz receiver rectangles" (FWCC, page 4); and that numerous FS stations could be affected by a single test flight. NSMA similarly asserts that there are "no unused geographic areas or unused frequencies when viewed from the airborne AMT transmitter's perspective" (pages 5-6).

These comments fail to demonstrate that sharing is infeasible throughout these bands in any area, let alone all areas. Neither Commenter shows, or even attempts to show, on a site-specific basis that there is no unused spectrum available in the vicinity of various test ranges. For example, FWCC's Figures 1 and 2 focus on only two discrete lower 6 GHz channels; no showing is made as to the other channels in the band 5925-6425 MHz. Likewise, its Figure 3 purports to show that there are no channels at all which would fall entirely outside the exclusion zone of each of the various flight test areas ("AMT Zones"). However, the relevant inquiry is not whether there is any area free of all FS channel receiver zones; the relevant inquiry is whether there are areas where at least one FS channel might be available for AMT use. And on that score, FWCC's Figures are much too generalized; for example, the Figures make no allowance for the availability of FS channels in areas smaller than that of an entire Range. To be

probative, any analysis of sharing feasibility requires a more detailed site-specific, channel-specific perspective.

Prior to WRC-07, the AMT community undertook a careful analysis of FS licensing in this band with an eye toward evaluating channel availability. Material from that analysis is attached as an Exhibit to these Comments. The analysis demonstrates the method by which careful analysis of the existing geographic and spectrum usage can reveal large contiguous geographic areas in which substantial contiguous sub-bands are available for flight test operations. For example, the test range at Edwards Air Force Base at first glance appears to be a zone where, as FWCC asserts, "successful sharing…[is] highly improbable (if not impossible)." (FWCC, page 2). More detailed analysis, however, reveals that large expanses of airspace were available for 20 and even 30 MHz of spectrum. The excepts from the analysis below demonstrate the difference between the FS community approach and the analysis used by the U.S. government and the international community. The diagram on the left shows the exceedingly limited regions available for spectrum sharing when seeking 80 MHz of contiguous unused sub-bands. In contrast, the diagram on the right shows the dramatic difference in available spectrum when seeking only 20 MHz of contiguous spectrum.





While the situation is more challenging today given growth in the FS, the Exhibit shows that sharing is feasible through detailed, site-specific analysis utilizing co-channel avoidance and spatial separation techniques. And of course, the analysis did not account for the substantial evolution over the last eight years in technologies capable of aggregating disparate unused bands into usable spectrum.[2]

AFTRCC believes that the operational restrictions and emerging technical solutions discussed above can ensure that integration of the incumbent FS and new AMT operations serve the Commission's goals of increased efficiency of spectrum use, non-interference, and sufficient spectrum for critical services.

Formulation of the original U.S. proposals for AMT in the 4400-4940 MHz and 5925-6700 MHz bands benefitted from significant input from, and cooperation with, representatives of the FS (and Fixed Satellite Service) communities. It is to be hoped that the Commenters will exhibit a similar spirit of cooperation as this proceeding unfolds.[3]

With respect to the 6425-6525 MHz band, SBE argues that the band is heavily used for mobile electronic newsgathering ("ENG") operations; that these operations are unpredictable, and difficult to coordinate "other than on an intra-service basis" (para. 1); that AMT footprints are large with "unpredictable flight paths" (para. 8), and that use of the "entirety of the 6425-6525 MHz band" over an area of up to 500 miles in diameter for hours at a time could not be

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[2] At the end of its pleading, FWCC expresses the same concerns with respect to sharing 4400-4940 MHz as it does with respect to 5.9-6.7 GHz. AFTRCC is at a loss to understand the basis for this. There is no non-Federal FS allocation in this band. Nor does the Commission propose a new non-Federal allocation other than for AMT.

[3] AFTRCC anticipates that updated analyses will be provided reflecting growth in the FS since the original sharing studies were done.

coordinated in advance with broadcast auxiliary use (*ibid*). SBE further maintains that its operations could cause interference to AMT ground stations unless the Commission were to constrain use of the band by broadcasters whose spectrum has already been compromised by earlier allocation decisions.

The SBE Comments do not warrant a conclusion that sharing is not feasible. In this regard, AFTRCC's earlier observations as to 5925-6425/6525-6700 MHz are in large measure applicable to the sub-band 6425-6525 MHz -- with one conspicuous distinction: There are far fewer stations in 6425-6525 MHz than in the larger band, i.e. about 3,263 broadcast auxiliary and satellite earth stations versus 103,034 microwave and satellite earth stations, according to the Commission's own count. NPRM at para. 213.

Moreover, SBE makes no showing of channel occupancy or assignments in any given market in an attempt to demonstrate sharing will be difficult. And it should also be stressed that, by virtue of Resolution 416 (WRC-07), AMT operations in 5.9-6.7 GHz would not be for safety-related communications. Unlike AMT operations in other bands where safety-of-flight concerns are paramount, incumbent operators in this spectrum would not be burdened with the special obligations attendant to sharing with safety communications.

Insofar as coordination is concerned, AFTRCC appreciates that the broadcast community is accustomed to coordinating usage between and among themselves, and has well-established procedures for same. However, AFTRCC likewise has long experience coordinating frequency usage and is confident that the aeronautical and broadcast communities could work together harmoniously. Finally, AFTRCC does not anticipate AMT using "the entirety of the 6425-6525 MHz band" for hours at a time in any given area (Comments at para. 8).

With respect to The Small UAS Coalition, the Commenter maintains that the band should also be made available for UAS purposes. However, the U.S. studies upon which the proposal and the allocation are based, contemplated AMT use only. No studies have been done showing UAS compatibility with the incumbent services. Likewise, Resolution 416 (WRC-07) speaks only to AMT and conditions for use of the spectrum by AMT. Under the circumstances, AFTRCC does not see how UAS use would comport with these principles.

Finally, AFTRCC submits that Federal AMT users should be granted access to the 5925-6700 MHz band, and non-Federal AMT users access to the 4400-4940 MHz band. Federal and non-Federal AMT users have worked together throughout this long process in order to secure additional spectrum resources for the AMT community, it being understood that access to the respective bands would be reciprocal. Nothing in the opposition Comments undermines this basic premise.[4]

CONCLUSION

The Notice of Proposed Rulemaking makes the point that, in its proposals to the World Radiocommunication Conference, the United States stated that:

> "[T]here was a large and growing shortfall in the spectrum available for AMT use. Further, due to rapidly increasing data rates associated with the testing of new and emerging technologies, 'as much as an additional 650 megahertz may be required for aeronautical flight test telemetry.'"

Notice, at para. 207 (footnotes omitted). Thus, the U.S. proposed, and the international community endorsed, the allocations which are the basis for this domestic proposal. The conditions which gave rise to the U.S. proposal have not changed: If anything, the need is greater.

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[4] With respect to adjacent, 4 GHz public safety users (NPRM at para. 221), AFTRCC does not envision that special coordination procedures need be applied beyond any already in use; however, this is a matter which can be examined further, if warranted.

Accordingly, for the foregoing reasons, the Commission should conclude that coordination with incumbent operators in the 5.9-6.7 GHz is indeed feasible, and proceed as expeditiously as possible to finalize the proposed 4/6 GHz allocation which the AMT community and the U.S. have been working towards for the last ten years.

Respectfully submitted,

AEROSPACE AND FLIGHT TEST RADIO
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