

NEW YORK
LONDON
SINGAPORE
PHILADELPHIA
CHICAGO
WASHINGTON, DC
SAN FRANCISCO
SILICON VALLEY
SAN DIEGO
LOS ANGELES
TAIWAN
BOSTON
HOUSTON
AUSTIN
HANOI
HO CHI MINH CITY

Duane Morris®

FIRM and AFFILIATE OFFICES

WILLIAM K. KEANE
DIRECT DIAL: +1 202 776 5243
PERSONAL FAX: +1 202 478 2160
E-MAIL: KKeane@duanemorris.com

www.duanemorris.com

SHANGHAI
ATLANTA
BALTIMORE
WILMINGTON
MIAMI
BOCA RATON
PITTSBURGH
NEWARK
LAS VEGAS
CHERRY HILL
LAKE TAHOE
MYANMAR
OMAN
A GCC REPRESENTATIVE OFFICE
OF DUANE MORRIS
ALLIANCES IN MEXICO
AND SRI LANKA

November 28, 2018

Ms. Marlene S. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W.
Room 2-B450
Washington, DC 20554

Re: **Ex Parte Filing**
RM-11793

Dear Ms. Dortch:

This is to reflect that on November 26, 2018 the undersigned, counsel for Aerospace and Flight Test Radio Coordinating Council, Inc. ("AFTRCC"); Dan McNeil, The Boeing Company and AFTRCC President; Joseph Cramer, Regional Director, The Boeing Company; Ryan N. Terry, Director, Regulatory Licensing and Policy, Trade & Regulatory Affairs, Lockheed Martin Corporation; Marc Ehudin, Director, Washington Operations, Textron Inc.; Max Fenkell, Aerospace Industries Association; Chip Yorkgitis, Kelley Drye & Warren LLP, counsel for Raytheon Company; and Don Tyree, Lockheed Martin Corporation (by phone) met with Charles Mathias, Associate Bureau Chief, Wireless Telecommunications Bureau ("WTB"); Scot Stone, Deputy Chief, Mobility Division, WTB; Aalok Mehta, Senior Policy Advisor, WTB; Jeff Tobias and Tim McGuire, WTB regarding the above captioned matter. The referenced aerospace parties are referred to collectively herein as the "Aerospace Representatives."

Separately, the Aerospace Representatives (plus Dan Hankins, Senior Spectrum Manager for Textron and former AFTRCC President, who phoned in) met with Rachael Bender, Chairman Pai's Wireless and International Advisor.

The Aerospace Representatives stressed the importance of access to the 5091-5150 MHz band for aeronautical mobile telemetry, or "AMT." They supplied a powerpoint presentation, a

DUANE MORRIS LLP

505 9TH STREET, N.W., SUITE 1000 WASHINGTON, D.C. 20004-2166

PHONE: +1 202 776 7800 FAX: +1 202 776 7801

DM3\5500718.2

Ms. Marlene S. Dortch
November 28, 2018
Page 2

copy of which is attached. Among the points in the presentation, they stressed the exponential increase in bandwidth requirements for flight testing, combined with the loss of AMT spectrum over the years (such as the band 2310-2360 MHz), the problem this creates for the U.S. aerospace industry, and the importance of access to 5091-5150 MHz for AMT as an essential part of the solution.

The Aerospace Representatives observed that spectrum for flight testing is required not just when aircraft and missiles are aloft, but also before take-off when equipment undergoes pre-flight checks, equipment calibration, and the like, and that Department of Defense contracts require delivery of aircraft and missiles to the Ranges with 5091-5150 MHz transmitters installed and tested. The Aerospace Representatives also explained that, for experimental licensing purposes, the FAA has insisted on a 60-mile separation between test aircraft and certain prospective AeroMACS sites per ITU-R Resolution 418 even when, as the Aerospace Representatives understand it, there may be no AeroMACS equipment yet in place. In this regard, the Aerospace Representatives also noted that, while the Companies are supportive of AeroMACS for their commercial aircraft business, actual aircraft modification work to accommodate the technology had not yet been deployed. They observed too that, while AeroMACS has priority under Commission policies, priority does not mean exclusivity for AeroMACS, which would be contrary to the co-primary allocation which AMT enjoys.

The Aerospace Representatives observed that significant time and testing would be required to determine whether co-channel sharing might be possible, most likely requiring new technology developed for the purpose. In the meantime, as AFTRCC has noted previously in its filings, the Companies generally seek dedication of a few of the 16 channels available for one AMT channel (i.e. 20 MHz) either on a national, or a coordinated basis with anticipated AeroMACS locations. The Raytheon Company representative explained that Tucson would be an exception to this general prospective solution given that, due to DOD requirements under multiple programs occurring at the Raytheon Missile Systems plant, use of the entire 5091-5150 MHz band will be required at that location.

Finally, the Representatives noted that talks had resumed between AFTRCC and its Member Companies, on the one hand, and the WiMax Forum, on the other hand. AFTRCC and its Members are hopeful that those talks lead to a positive outcome for all Member requirements. If that should happen, the results could be especially helpful to the Commission in promulgating final service rules for the band.

A copy of this ex parte filing is being submitted for the Docket.

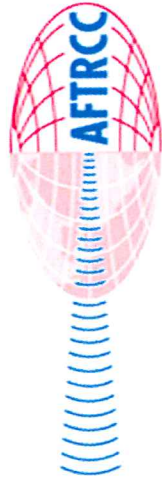
Respectfully submitted,



William K. Keane
Counsel for AFTRCC

Ms. Marlene S. Dortch
November 28, 2018
Page 3

cc: Rachael Bender
Charles Mathias
Scot Stone
Aalok Mehta
Jeff Tobais
Tim McGuire



The Importance of 5 GHz Spectrum to the U.S. and Its Aerospace Industry

Aerospace and Flight Test Radio Coordinating
Council, Inc.

November 26, 2018



AFTRCC Background

- Founded in 1954 to represent aerospace industry interests on flight test spectrum issues.
- Certified by the Commission to coordinate flight test telemetry (aka aeronautical mobile telemetry, or "AMT") and voice frequencies for non-government users.
- Advocates for AMT community in matters impacting radio spectrum available for AMT.



AFTRCC Membership



BOMBARDIER



MISSION INTEGRATION



THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN

Bell Helicopter **TEXTRON**

TEXTRON AVIATION

Aerospace Systems



Information Systems & Global Solutions

NORTHROP GRUMMAN

Electronic Systems

Rockwell
Collins

Aeronautics Company



Raytheon



communications
Communication Systems-West



Quasonix

ZODIAC DATA SYSTEMS





Aerospace Manufacturing Vital to US

- In 2017, U.S. aerospace & defense (A&D) industry:
 - supported **over 2.4 million U.S. jobs** -- approximately 2% of total employment and 20% of U.S. manufacturing workforce.
 - generated \$865 billion in economic output.
 - produced \$348.3 billion in value added products and services -- **1.8% of total U.S. GDP.**
 - contributed trade surplus of approximately \$85.9 billion (exports of \$143 billion less imports of \$56.9 billion) -- **largest of any U.S. industry.**

Source: Facts and Figures, U.S. Aerospace and Defense, Aerospace Industry Association (2018).



Flight Testing is Essential

- For aerospace research and development, and for certifying aircraft to safety standards.
 - FAA, Department of Defense, and NASA all require certification that aircraft and missiles will operate within safety and design specifications.
- Most effective means to show that an aircraft will operate safely, a missile will hit its target, and an unmanned aircraft will perform as directed is to test it.
- Aircraft and missiles subjected to extreme maneuvers to stress the vehicle to maximum limits.



Flight Testing is Costly

- Flight testing marshals scores of test and support personnel, a wide variety of range equipment, search and rescue aircraft, and chase planes, to name just a few elements.
- Flight test costs for advanced aircraft can exceed \$1 million per flight.
- Flight testing represents as much as 15-20% of cost of developing new aircraft.
- The more data collected per flight, the fewer the flights, the lower the total cost.



Flight Test Spectrum is Critical

- FCC allocations for AMT enable real-time telemetry:
 - Spectrum is critical to provide real-time data to ensure protection of pilot and aircrew, the test aircraft, and people and property on the ground.
 - Non-safety uses of spectrum (5091-5150 MHz) provide additional and critical details about aircraft operations and system data.
- Flight testing occurs in the air AND on the ground:
 - Ground calibration essential prior to any flight test.
 - Ground calibration requires same spectrum as that used for flight.



Flight Test Spectrum Requirements

- Exponential increase in measurements required during flight test program to ensure aircraft and missile performance, efficiency and safety.
- Modern aircraft and missiles designed to operate closer to the point of maximum efficiency require more data and more extensive testing.
- Because spectrum demand has increased dramatically -- and AMT has lost a significant amount of spectrum -- WRC-07 allocated 1374 MHz of bandwidth for AMT:
 - However, the only spectrum allocated by the FCC for AMT is the 5091-5150 MHz band.



Flight Test Spectrum Requirements

- Agreement on co-existence measures for AMT and AeroMACS will facilitate service rules which best meet the needs of the two aviation user groups.
- Agreement on co-existence measures will also help inform the Commission's consideration of options for channel management.
- AFTRCC is committed to working with the AeroMACS community toward these ends.



Conclusion

- U.S. has long maintained a policy of protecting and promoting spectrum resources dedicated for flight testing.
- This policy has paid dividends many times over . . . for the economy, for air transportation and for national security.
- Policy helps protect thousands of aerospace jobs while enhancing the global competitiveness of U.S. industry.
- Flight testing, and RF spectrum which enables it, is critical to one of Nation's most important industries.