

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

In the Matter of)	
)	
Amendment of the Commission’s Rules to Promote Aviation Safety)	WT Docket No. 19-140
)	
WiMAX Forum Petition to Adopt Service Rules for the Aeronautical Mobile Airport Communications System (AeroMACS))	RM-11793
)	
Petition of Sierra Nevada Corporation for Amendment of the Commission’s Rules to Allow for Enhanced Flight Vision System Radar under Part 87)	RM-11799
)	
Petition of Aviation Spectrum Resources, Inc. for Amendment of Sections 87.173(b) and 87.263(a) of the FCC’s Rules to Allow Use of the Lower 136 MHz Band by Aeronautical Enroute Stations)	RM-11818
)	
Petition of Airports Council International-North America Regarding Aeronautical Utility Mobile Stations)	RM-11832

COMMENTS OF AVIATION SPECTRUM RESOURCES, INC.

Aviation Spectrum Resources, Inc. (“ASRI”) hereby submits comments in response to the Commission’s Notice of Proposed Rule Making (“*NPRM*”) released June 7, 2019, FCC 19-53.¹ ASRI is the communications company of the U.S. air transport industry and is owned by U.S. airlines and other airspace users. It is the principal licensee for U.S. Aeronautical Enroute Service (“AES”) frequencies and the sponsor of the Aeronautical Frequency Committee

¹ A summary of the *NPRM* was published in the Federal Register at 84 FR 31542 (July 2, 2019).

(“AFC”).² This enables ASRI to draw on expertise and opinions from across the U.S. aviation sector, promoting the safe and efficient operation of commercial aviation radio communications systems operating within the U.S. By coordinating with the AFC, ASRI also supports the safe operation of U.S. aviation in an international environment through participation with ICAO, the International Air Transport Association (“IATA”), and International Telecommunications Union Radiocommunications Sector (“ITU-R”).

Summary. For the reasons discussed herein ASRI urges the Commission to move promptly to revise the rules pertaining to the Aeronautical Enroute Service to facilitate use of the entire 136 MHz band for the provision of data communications service so that AES stations may be used to transmit both air traffic control (“ATC”) messages and aeronautical operational control (“AOC”) messages in support of the FAA’s NextGen initiative designed to modernize the nation’s air traffic control system. ASRI also asks the Commission to take appropriate regulatory steps to lead to the introduction of Aeronautical Mobile Airport Communications Systems (“AeroMACS”) while at the same time balancing the access requirements of the Aeronautical Mobile Telemetry Service (“AMTS”) that is essential to the development of safe and efficient aircraft in the United States. The Commission should also move to address the issues that it has raised concerning the Aeronautical Mobile (Route) Service systems in the 108-

² Current AFC participants include Airlines for America (A4A), Air Line Pilots Association (ALPA), Alaska Airlines, American Airlines, Aircraft Owners and Pilots Association (AOPA), ARINC/Rockwell Collins IMS, Aviation Spectrum Resources, Inc. (ASRI), Boeing Corporation, Bristow Helicopters, Chevron, Delta Airlines, Era Helicopters, Federal Express (FedEx), Frontier Airlines, Harris Corporation, Helicopter Association International (HAI), Helicopter Safety Advisory Conference (HSAC), International Air Transport Association (IATA), JetBlue Airways, National Air Transportation Association (NATA), PHI, Inc., Societe Internationale de Telecommunications Aeronautique (SITA), Southwest Airlines, United Airlines, and United Parcel Service (UPS). The Federal Aviation Administration (FAA) is also a long-standing invited participant in AFC discussions.

117.975 MHz and 960-1164 MHz bands by adding any necessary regulatory language to reflect usage while relying on industry standards to the extent possible in an effort to avoid unnecessary conflict between the agency's rules and the evolution of such standards. Finally, the Commission can aid the advancement of flight safety by implementing regulations to enable the operation of Enhanced Flight Vision System radar in the 92 - 95.5 GHz frequency range. In all of the above issues, ASRI strongly encourages the Commission to avoid replicating verbatim existing international aviation standards in Part 87, and instead only specify essential regulatory requirements and appropriate references.

1. Air Traffic Control and Aeronautical Operational Control Communications in the 136-137 MHz Band

As the *NPRM* notes, ASRI petitioned the Commission to amend the rules to permit aeronautical enroute service stations to be licensed in the 136.000 – 136.475 MHz sub-band (the lower half of the 136 – 137 MHz band). ASRI whole-heartedly concurs with the Commission's tentative decision “ that permitting both aeronautical operational control and air traffic control communications throughout the 136-137 MHz band in support of Data Comm would enhance aviation safety and efficiency by permitting pilots to obtain critical information through a single integrated data link.”³ ASRI filed its petition in order to support the air transport industry's cooperation with the FAA in the implementation of the Data Comm program to improve the nation's air traffic control as part of the FAA's NextGen initiative. This program employs the VHF Datalink Mode 2 (VDLM2) non-voice data protocol to transmit both routine ATC messages originating from the FAA and AOC communications originating from aircraft operating agencies over aeronautical enroute service ground stations licensed to ASRI. The

³ *NPRM* at ¶32.

program operates pursuant to a contract between the FAA and Harris Corporation. Initial implementation uses existing industry assignments and infrastructure in the non-Federal 136.475 – 136.975 MHz band. The lower half of the 136 – 137 MHz band is needed to accommodate growth of the system in order facilitate automation of routine ATC procedures and augment voice traffic from the FAA’s ATC ground stations, which will remain available for communications in exigent circumstances and for ATC messages directed to and from aircraft that are not equipped with Data Comm.

The Data Comm program requires that ATC traffic be accorded priority over AOC traffic on the VDLM2 network and establishes performance levels that the system must meet.⁴ Thus, the FAA contractually mandates the performance requirements for the Data Comm program. These arrangements have been reached through intensive discussions among the FAA, its contractor Harris, ASRI, and the communications service providers Collins Aerospace and SITA. The specific frequencies and traffic sharing methodology and service level mandates are thus agreed to by the FAA, Harris, Collins Aerospace, SITA, and ASRI. ASRI submits that this approach accords both the FAA and the air transport industry the ability to meet demands for service as those needs evolve. The flexibility inherent in such an approach ensures that the FAA can monitor performance of the network and insist that the system continues to perform as required. As such, additional provisions in the FCC’s rules that may duplicate or eventually conflict with the FAA’s requirements and industry standards could prove counterproductive.

The proposed rule change would allow the licensing of aeronautical enroute stations by the aviation industry across the entire 136-137 MHz band so that the lower portion of the band

⁴ According priority to ATC traffic is also consistent with international obligations. See ICAO Annex 10, vol. 2, par. 5.1.8.

can be used to accommodate growth. Based on traffic forecasting for channel capacity, ASRI estimates that access to the lower portion of the band next year will require two channels to meet the performance requirements, and that additional channels will be needed in near future as Data Comm is expanded in geographic coverage and in scope. The rule change will also afford flexibility to reconfigure channel use. Thus, situations may arise where it is more desirable from a network management standpoint to utilize channels from the lower portion of the band and to adjust operations to facilitate deployment of upper channels at other locations.

In the *NPRM* the Commission inquired as to possible alternatives to the Data Comm system as addressed in ASRI's petition for rule making.⁵ The Data Comm program is the only controller-to-pilot link communications system that has been authorized by the FAA for domestic air traffic control communications under NextGen. The FAA first awarded a contract to Harris in 2012 to develop Data Comm. Since that time, the program has been implemented at over 62 airport towers and several Air Route Traffic Control Centers ("ARTCC") across the United States.⁶ Given the implementation of Data Comm to date, including the federal government's investment and the aviation industry's investment in infrastructure and training, consideration of an alternative system would be highly disruptive and delay the modernization of the nation's air traffic control system.

Since the first applications of Data Comm were implemented in 2016, the benefits of Data Comm to date are numerous:

- Over 1.23 million minutes of radio airtime have been saved thereby making far more efficient use of limited spectrum;

⁵ *NPRM*, ¶ 32.

⁶ FAA website re Data Comm Schedule and Stats:

<https://www.faa.gov/nextgen/snapshots/priorities/?area=dcom>

- Over 59,300 readback errors have been prevented;
- Over 4.2 million flights have been cleared
- Over 775,600 minutes of airspace user time have been saved;
- More than 6.5 million kilograms of CO₂ emissions have been prevented; and
- More than 614 million passengers have been served.⁷

While the federal government has expended funds in the design and development of software and systems to implement Data Comm, the government has not had to build additional radio facilities. Instead, the ground stations are industry-owned facilities licensed to ASRI and operated by Collins Aerospace and SITA with ASRI coordinating with the FAA, Harris, Collins Aerospace, SITA and the users of the system.

With respect to the questions raised in the *NPRM*:

- Traffic sharing/prioritization is dealt with contractually and by existing industry standards and monitored by the FAA's prime contractor for performance;
- A VDL M2 channel plan is agreed upon by the aviation industry through ASRI in cooperation with FAA input and endorsement;
- An ongoing sub-group chaired by ASRI with FAA involvement proactively monitors growth/changes and makes the necessary channel changes; and
- Data Comm has already proven to be a significant means for enhancing aviation safety and efficiency while saving passengers time and yielding significant environmental benefits.

As such, ASRI respectfully urges the Commission to move promptly to amend the regulations as proposed to allow spectrum in the 136.000 – 136.475 MHz band to be licensed for use by

⁷ Harris provided statistics up to year end 2018.

aeronautical enroute stations and to permit such stations to transmit both ATC and AOC communications.

2. Aeronautical Mobile Airport Communications Systems

Responding to the petition of the Wi-Max Forum, the Commission has proposed rules for implementation of AeroMACS, a broadband aeronautical safety service to provide surface (i.e. ground but not airborne) communications at airports. As noted in its Comments on the Petition for Rule Making filed by the WiMax Forum, ASRI supports the introduction of AeroMACS as a means to augment and support existing AM(R)S communications for aviation safety.⁸ This will require appropriate frequency management arrangements to accord aviation operators the flexibility and interference protection needed to facilitate AeroMACS operations and to maintain the technical integrity of aeronautical mobile telemetry in support of flight test operations.

Licensing. As a safety service intended largely to provide mobile service to aircraft on the ground and to other mobile assets in support of such aircraft, ASRI agrees that AeroMACS should not be authorized under Part 95, but a more comprehensive licensing model. Licensing of ground-based stations will provide a point of contact and facilitate frequency management including the resolution of interference and congestion issues.

The licensee, however, should be well-versed in aeronautical communications and should be representative of the users of AeroMACS service. As such, ASRI urges the Commission not to move forward with its proposal to award AeroMACS licenses only to airport operators. Indeed, history has shown that giving control of a broadband communications service at an

⁸ Comments of Aviation Spectrum Resources, Inc., RM-11793, Aug. 18, 2017.

airport exclusively to the landlord can create perverse incentives to exclude others.⁹ Instead, the Commission should select a single entity as channel manager-licensee to assign channels to any eligible non-federal users under one license at each authorized location.

The use of a channel-manager licensee has worked well for decades in other contexts such as the aviation industry's management of the Aeronautical Mobile Route Service (i.e. with aeronautical enroute stations) by ASRI. This model has allowed aircraft operating entities to receive service from their own enroute facilities or those of communications service providers such as Collins Aerospace and SITA under licenses held by ASRI, which provides frequency management, station inspection, training, interference resolution, and planning support. An entity that is governed and given its remit by its own users ensures a flexible entity able to respond quickly to industry demands while self-controlling costs and other overhead.

Usage and applications. If AeroMACS is to live up to its potential, the service should not simply be a specialized version of Wi-Fi, but rather a service built around the unique needs of aviation. The Commission in its *NPRM* alluded to the needs that AeroMACS could address. The transfer of large data files to and from aircraft on the ground is one such need. However, this service will not likely relieve much congestion from VHF data links. The sorts of large files that are most likely to be transferred using AeroMACS are not typically moved using VHF data links. Instead, these files are now often moved manually using media such as thumb drives. As airlines begin to use AeroMACS, the service may supplant much of the manual transfer of data and new needs for safety-related data may arise that can be addressed using AeroMACS. The service, however, is unlikely to develop if it is permitted to become simply an alternative to

⁹ In the Matter of Continental Airlines, FCC 06-157, 21 FCC Rcd 123201 (rel. Nov. 1, 2006). The Commission found that preclusion of Wi-Fi networks at Logan International Airport, Boston, not operated by the airport operator ran afoul of the Commission's Over-the-Air Reception Devices (OTARD) rules.

wired circuits and other radio systems for linking security cameras or access control, which may be attractive initial uses for airports.

Selection of a channel manager or channel-manager licensee will help in the stewardship of this spectrum to meet aviation safety needs that are evolving. If the governance of the channel-manager licensee is representative of the user population, such a system will also help to ensure that spectrum will be available for all eligible users. Indeed, as with the Aeronautical Enroute Service, such a system would facilitate competition among communications service providers so that eligible users of AeroMACS could have a choice. Additionally, at those airports that support AMT flight testing, having a single experienced licensee as the point of contact could greatly facilitate accommodation of AMT operations.

The Commission wisely focused on the need for end-user licensing of aircraft. ASRI supports the Commission's tentative conclusion to add AeroMACS operating authority to aircraft licenses.¹⁰ Because they may fly to international airports, most air transport aircraft have aircraft licenses as required by treaty. Air transport aircraft are likely to be the typical users of AeroMACS. Other mobile end-users could be accommodated by the AeroMACS licensee at the airport, either directly or through a service provider authorized by the licensee.

Coordination. The Commission proposed that interested prospective licensees first coordinate with regional FAA offices before filing applications. Then, the Commission would go through another round of coordination with the FAA after the application was filed.¹¹ In support of this scheme, the *NPRM* notes that the Commission already follows this approach with respect to Automated Weather Observing System (AWOS), Automatic Terminal Information

¹⁰ *NPRM*, ¶ 37.

¹¹ *Id.* ¶39.

Service (ATIS), and Automatic Surface Observing System (ASOS).¹² In contrast, AeroMACS is a new service that is likely to operate largely with privately owned infrastructure. AeroMACS was designed to not have co-site considerations for adjacent channels, and attempting frequency re-use between different networks would be extremely inefficient within the confines of an airport. Accordingly, a site-by-site channel plan must be worked out, but coordination is not needed for each channel once such a plan is developed at each airport.

Federal users of AeroMACS. The Commission, in collaboration with NTIA, should work with the FAA to migrate federal AeroMACS usage to the 5000 – 5030 MHz portion of the band. First, this would ease the necessary coordination requirements between federal and non-federal users at the same location, providing national allotments and therefore preventing potential RF interactions. Second, the 5091 – 5150 MHz band is an internationally harmonized band for AeroMACS, while 5000 – 5030 MHz is currently only allocated domestically in the US for AeroMACS usage. FAA’s current usage of AeroMACS is for fixed links to allow aviation data backhaul.¹³ Given the restrictions to protect federally operated RNSS systems in the 5010-5030 MHz, moving a federally managed fixed link system into this spectrum would be the obvious solution to create a known interference environment that can be deconflicted within NTIA without further action from the Commission. Third, usage by the FAA of the 5091 – 5150 MHz risks industry adoption of the system, as it may not meet the necessary capacity to deploy at airports. If this portion of the band is used by AMT, FAA, and Airports there may be limited capacity left for Aircraft Operators and/or Service Providers to deploy a sufficient network to meet operational needs. Lastly, the channel manager-licensee could be a single point of contact

¹² *Id.* ¶ 39 and fn. 104.

¹³ ASRI does not support use of fixed links by non-federal users. This appears to be an FAA only usage case and should not set a precedent for the Commission

to coordinate with the FAA initial federal and non-federal channel plans at airports and thereby reduce the burden of coordination and speed the initiation of service while still ensuring that the requisite analysis is accomplished to minimize the chance of interference.

Aeronautical Mobile Telemetry (AMT). As the Commission notes, AeroMACS has priority in the allocation proposed for its use in the 5091 – 5150 MHz band.¹⁴ Nevertheless, the Commission must still reach a decision that is in the public interest. To that end, the Commission has encouraged the aeronautical flight test community and the AeroMACS proponents to work together to find solutions that do not impair ability of aircraft developers to obtain the telemetry services so essential to the development of aircraft and that also make it possible for AeroMACS to be implemented. AFC members have made known in discussions of the *NPRM* that they recognize benefits to the aviation industry from both AeroMACS and AMT. The dialog between AeroMACS proponents and the flight-testing community should continue and those that rely on AMT should declare all necessary sites that require service or may conflict with AeroMACS operations. If an agreement cannot be reached in a timely manner between the respective parties, the Commission could direct the single AeroMACS licensee to limit the number of channels at those specified locations until an appropriate sharing compromise can be agreed. Such a process would avoid any delays with non-federal AeroMACS implementation while still giving time for the appropriate negotiations to occur.

GlobalStar. The use of 5091 – 5250 MHz by GlobalStar for feeder links would appear to be another technical challenge to the implementation of AeroMACS. Yet, this too, has already been subject to engineering solutions that should be a part of the implementation of AeroMACS. As the Commission notes, AeroMACS must be operated in accordance with Resolution 748

¹⁴ *NPRM*, ¶35.

(Rev. WRC-12), which incorporates ITU-R M. 1827-1. ASRI submits that significant study has shown that AeroMACS deployment, with the necessary antenna elevation limitations, will not exceed the 5% rise over thermal limits for the GlobalStar links.¹⁵ Nevertheless, AeroMACS systems must be constructed and operated with adherence to these requirements and sensitivity to anomalous situations. Selection of a single channel manager-licensee will facilitate the resolution of interference questions that implementation of AeroMACS may pose for GlobalStar.

In sum the Commission should not simply make the airport operator the AeroMACS licensee. Instead, the Commission should select a single channel manager-licensee experienced in aeronautical communications and charge this entity with being a single point of contact for eligible AeroMACS users under a site-license issued for the airport location and immediate surroundings. Aircraft licenses should be modified to conduct AeroMACS operations. The Commission should continue to encourage the dialog between the AMT community and the AeroMACS proponents with the goal of reaching an accommodation that preserves essential AMT operations while bringing the benefits of AeroMACS to those aviation users that desire to utilize the service.

3. Aeronautical Mobile (Route) Service Systems in the 108-117.975 MHz and 960-1164 MHz Bands

With respect to the Aeronautical Mobile (Route) service systems in the 108 – 117.975 MHz band, the *NPRM* seeks comments on several issues. As a general principle, the Commission should try to avoid simply copying existing aviation standards into Part 87. Instead, it should, if appropriate, reference such standards.

¹⁵ See NASA Study on Simulating Global AeroMACS Airport GroundStation Antenna Power Transmission Limits To Avoid Interference With Mobile Satellite Service Feeder Uplinks, dated April 2013. <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20130014336.pdf>

4. Enhanced Flight Vision Systems

ASRI supports the Commission's proposal to facilitate the introduction of enhanced flight vision systems (EFVS) using millimeter wave radar in the 92 – 95.5 GHz range. The Commission correctly proposes to use the FAA's definition of EFVS. The *NPRM* proposes that EFVS spectrum be shown in the Table of Allocations as "Radio Navigation."

ASRI supports the introduction of EFVS as both a navigational tool and additional means of aviation safety in low visibility conditions. Noting the current work to develop an international foreign object debris (FOD) detection system in the 92-100 GHz band, ASRI believes additional technical work should be conducted to show how the systems would share the spectrum. While implementation of FOD systems is limited¹⁶, both FOD systems and EFVS have benefits for aviation that should drive both proponents to find a way to coexist.

Conclusion

This proceeding can foster significant improvements in aeronautical communications and navigation. ASRI urges the Commission to move forward to adopt the proposed rule changes needed to facilitate use of the entire 136 – 137 MHz band in support of the Data Comm system so essential to the success of the FAA's NextGen program to improve the management of the National Air Space. The Commission should also adopt a regulatory program for AeroMACS that is largely implemented with the assistance of a spectrum manager-licensee knowledgeable about aeronautical safety communications and representative of the prospective users of such a system and the Commission should work with NTIA, to move the limited FAA usage of

¹⁶ See ICAO Airports Group response https://www.icao.int/safety/FSMP/MeetingDocs/FSMP%20WG9/WP/FSMP-WG09-WP14_LS%20from%20ITU%20WP5B%20Deployment%20of%20FOD%20Detection%20Radar%20in%20the%2092-100%20GHz%20at%20airports%20globally.doc

AeroMACS to the 5000 – 5030 MHz portion of the band. Additionally, the Commission should make use of aviation industry standards to ensure that operations in the 108 – 117.975 MHz band reflect the high degree of compatibility and interoperability needed for radio navigation services in support of critical safety-of-life operations. Furthermore, ASRI urges the Commission to seek options that will allow the implementation of Enhanced Flight Vision Systems in the 92 – 95.5 GHz band to give aircraft operators an additional tool to address low visibility situations at critical times during a flight, while also maintaining options for airport FOD systems. Lastly, ASRI would reiterate that with the appropriate measures in place as proposed by ASRI for many of the above topics, replicating external regulations or requiring burdensome FAA coordination would be counterproductive to the efficient and successful usage of the proposed systems.

Respectfully Submitted,

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