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**Before the**
**FEDERAL COMMUNICATIONS COMMISSION**
**Washington, D.C. 20554**

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|---|---|---|
| In the Matter of | ) | |
| | ) | |
| Modernizing and Expanding Access to the 70/80/90 GHz Bands | ) | WT Docket No. 20-133 |
| | ) | |
| Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees | ) | WT Docket No. 10-153 |
| | ) | |
| Aeronet Global Communications Inc. Petitions for Rulemaking to Amend the Commission's Allocation and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz Bands to Authorize Aviation and Maritime Scheduled Dynamic Datalinks | ) | RM-11824 (Aviation)<br>RM-11825 (Maritime) |
| | ) | |
| Requests of Aviat Networks and CBF Networks, Inc. d/b/a Fastback Networks for Waiver of Certain Antenna Requirements in the 71-76 and 81-86 GHz Bands | ) | WT Docket No. 15-244 (Terminated) |

# COMMENTS OF THE DYNAMIC SPECTRUM ALLIANCE

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August 5, 2020

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## INTRODUCTION AND SUMMARY

The Dynamic Spectrum Alliance ("DSA")[1] is pleased to submit these comments in support of the Commission's proposed modernization of its pioneering 70/80 GHz light-licensing framework.[2] In establishing its 2003 framework, the Commission recognized that the unique "pencil-beam" nature of links in the 70/80 GHz bands enabled a market-driven, self-coordinated, and database-enabled regulatory framework.[3] In this proceeding, the Commission proposes to build upon its successful model by incorporating endpoints in motion, and seeks comment on ways to accomplish that goal through "3D" spectrum management techniques.[4] DSA applauds the Commission's proposal, which will catalyze innovation while helping to promote competition and close the digital divide. As explained in more detail below, we encourage the Commission to adopt a comprehensive, technology-neutral approach to managing static and moving point-to-point links in the 70/80 GHz bands, and to set a path toward a dynamic spectrum access model that will spur even more efficient use of this valuable spectrum in the future.

[1] The Dynamic Spectrum Alliance is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. The membership spans multinational companies, small- and medium-sized enterprises, academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the utilization of available spectrum to the benefit of consumers and businesses alike. A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members.

[2] *See Modernizing and Expanding Access to the 70/80/90 GHz Bands, et al.*, WT Docket No. 20-133, et al., Notice of Proposed Rulemaking and Order, FCC 20-76 (rel. June 10, 2020) (NPRM). In these comments, DSA focuses solely on modifications to the 70/80 GHz bands to accommodate links involving antennas in motion and prospective new services.

[3] *Allocations and Service Rules for 71–76 GHz, 81–86 GHz and 92–95 GHz Bands*, WT Docket No. 02-146, Report and Order, 18 FCC Rcd 23318, 23322, ¶ 45 (2003) (2003 Order).

[4] *See* NPRM ¶ 24.

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## I. DSA SUPPORTS THE PROPOSAL TO ACCOMMODATE ANTENNAS IN MOTION IN THE EXISTING 70/80 GHZ LIGHT-LICENSING FRAMEWORK

DSA supports the Commission's proposal to retain the light-licensing model for the 70/80 GHz bands and modernize its link registration process to permit antennas in motion to operate within the existing model.[5] The Commission has long recognized that the "unique characteristics" of the 70/80 GHz bands make them ideally suited for a self-coordinated, database-driven approach to spectrum management.[6] In establishing the self-coordinated light-licensing framework, the Commission found that fixed links in the 70/80 GHz bands "may be engineered to operate in close proximity to other systems so that many operations can co-exist in the same vicinity without causing interference to one another."[7] The Commission further found that a self-coordinated approach would be particularly appropriate for deployment to underserved areas, "where there is an even lower chance of interference."[8]

As the record reflects, the existing light-licensing and link registration model can accommodate antennas in motion with only "minor changes" to the link registration databases.[9] Further, with adequate physical distance and frequency planning, which can be accommodated through self-coordination, antennas in motion--including stratospheric platforms--will pose

[5] *See id.* ¶ 35.

[6] *See* 2003 Order ¶ 45.

[7] *Id.*

[8] *See id.*

[9] *See* Comsearch, Aeronet Aviation and Maritime Communications Systems; Compatibility with Incumbent E-band Fixed Services and Link Registration System, 42 (May 2, 2019) (Comsearch Report), attached to Letter from Samuel L. Feder, Counsel to Aeronet Global Communications Inc. to Marlene H. Dortch, Secretary, FCC, RM-11824 and RM-11825 (filed May 10, 2019).

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minimal risk of interference to ground-based static links or satellite networks.[10] Indeed, we see no technical reason why the 70/80 GHz database could not serve as a comprehensive repository of all non-Federal links, whether they are traditional fixed point-to-point links; links to, from, and between antennas in motion on ships or aircraft; or gateway links in a nongeostationary satellite network.[11]

While DSA supports the proposed multidimensional areas and polyhedrons model as an important and innovative step toward welcoming new use cases into the 70/80 GHz bands, the Commission should also establish a roadmap toward a more dynamic spectrum access system that maximizes the efficiency of the bands and openness to new services. DSA understands that software-defined networking platforms with temporospatial features (Temporospatial SDN) have already been deployed in production that can orchestrate and facilitate coexistence between static point-to-point links and networks of moving antennas, whether they are on land, at sea, in the sky, or in space.[12] These systems can be used to model the movement of antennas in motion and both anticipate and avoid potential in-line events by adopting interference mitigation techniques or preventing interfering links from being formed in the first place.

[10] *See* Comsearch Report at 22-23; *see also* ITU Report ITU-R F.2475-0 (demonstrating how frequency planning and physical separation can effectively avoid harmful interference between high-altitude platform stations and fixed-service satellites in the 39 GHz band).

[11] The Commission need not and should not limit its authorization of aircraft antennas in motion to commercial airplanes or for in-flight broadband. The multidimensional area/polyhedron approach could equally accommodate links to and between aircraft in the stratosphere, which need not be manned or follow predetermined flight paths. *See* Comsearch Report at 22 (assuming a worst case of a 50,000-foot altitude and five-degree minimum elevation angle).

[12] Brian Barritt and Vint Cerf, "Loon SDN: Applicability to NASA's Next-Generation Space Communications Architecture," 2018 IEEE Aerospace Conference, *available at* https://research.google/pubs/pub47138/.

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To implement dynamic spectrum in the 70/80 GHz bands, DSA envisions a system that first would augment the current third-party link registration databases with accurate, real-time information about moving links, such as antenna locations, radiation patterns, ephemerides, and beam-pointing information.[13] Over time, the system could transition to dynamic spectrum access, for example, by making information available through an application programming interface (API) that would enable operators to self-coordinate. Importantly, the system would continue to support coordination with and protection of in-band and adjacent-band Federal users. We submit that incorporation of these features into the existing model would represent an important evolution in the current framework that would ready the 70/80 GHz bands for deployments of and competition between several planned aerospace networks that share co-primary allocations.

A dynamic spectrum model for the 70/80 GHz bands would have a number of important benefits. First, it would improve database hygiene by enabling monitoring of link usage and obviating the need for construction certificates. Moreover, it would provide a comprehensive view of the bands across all non-Federal users to enable better network planning and rapid deployment to rural areas and in response to emergencies. It also would accurately reflect beamwidths of links in the bands, including a real-time view of antennas in motion, to facilitate greater spectrum use (and reuse) within the bands. With a comprehensive, accurate, and real-time view of the bands, a dynamic spectrum model would facilitate coordination between and coexistence of services, anticipating and avoiding in-line events while respecting users with co-primary status. Moreover, a dynamic spectrum model would maximize the possible efficiency

[13] To the extent that there are concerns about proprietary information, the databases could be entrusted to maintain confidentiality and only make available information necessary for coordination and coexistence.

and utilization of the 70/80 GHz bands, which would benefit both users of the bands and the public, particularly in unserved and underserved areas. Finally, by including all users of the 70/80 GHz bands within a third-party clearinghouse, dynamic spectrum sharing could even facilitate future innovation, such as hybrid networks that incorporate combinations of ground-based, stratospheric, and satellite links.

## II. THE COMMISSION SHOULD TAKE A TECHNOLOGY NEUTRAL APPROACH TO BACKHAUL NETWORKS IN THE 70/80 GHZ BANDS

In the NPRM, the Commission asks how it might incorporate a number of proposed uses of the 70/80 GHz bands, including 5G fixed wireless backhaul, antennas in motion (including aeronautical mobile services and maritime mobile services), stratospheric Internet platforms, and fixed satellites. The Commission seeks comment on whether these services can coexist, and whether to prioritize certain services within the bands.[14] DSA respectfully submits that the Commission should maintain its successful technology neutral framework and not favor some prospective uses of the bands over others.

Because fixed, mobile, and fixed satellite services enjoy co-primary allocations in the Commission's table of frequency allocations for the 70/80 GHz bands,[15] the Commission's focus must be on enabling coexistence, including for innovative new services, rather than prioritization or prohibition of certain services. Accommodating innovative new services in the bands aligns with the original purpose of the Commission's light-licensing framework and its stated goal in

[14] NPRM ¶¶ 41, 28, 51.

[15] 47 C.F.R. § 2.106.

this proceeding.[16] As the Commission explained in its 2005 Order on Reconsideration, its "flexible and streamlined regulatory framework was designed to encourage innovative uses of the 'millimeter wave' spectrum, facilitate future development in technology and equipment, [and] promote competition in the communications services, equipment, and related markets . . . ."[17]

Accommodating each of the proposed new uses would also align with a fundamental philosophy of this Commission: regulatory humility. The record reflects a number of highly innovative prospective and planned uses of the 70/80 GHz bands, all of which are designed to address critical needs, including rural broadband, disaster preparedness, enterprise IoT connectivity, and in-flight passenger connectivity.[18] Rather than erect regulatory barriers to innovation by excluding promising new services from the bands, the Commission should build upon its existing framework, leveraging dynamic spectrum access to promote coexistence and connectivity for all.

## III. CONCLUSION

DSA supports the Commission's proposal to incorporate antennas in motion into the existing light-licensing framework for the 70/80 GHz bands. While we believe that the use of multi-dimensional areas and polyhedrons to represent antennas in motion is an important step in

[16] *See* NPRM ¶ 1.

[17] *See Allocations and Service Rules for the 71–76 GHz, 81–86 GHz, and 92–95 GHz Bands*, WT Docket No. 02-146, Memorandum Opinion and Order, 20 FCC Rcd 4889, 4905, ¶ 3 (2005) (2005 Reconsideration Order).

[18] *See* NPRM ¶¶ 41, 51.

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the right direction, the Commission should establish a path toward a dynamic spectrum management in the 70/80 GHz bands to enable even more efficient use of the bands. Importantly, the Commission should ensure that whatever framework it establishes is technology neutral and flexible enough to accommodate all prospective services that meet the technical requirements for the bands, whether the links are at sea, in the air, or in space. In this way, the Commission will set the stage for tremendous innovation while meaningfully addressing the digital divide.

Respectfully submitted,

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August 5, 2020