

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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| In the Matter of |) | |
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| Modernizing and Expanding Access to the 70/80/90 GHz Bands |) | WT Docket No. 20-133 |
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| Amendment of Part 101 of the Commission's |) | WT Docket No. 10-153 |
| 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 |) | |
| |) | |
| Aeronet Global Communications Inc. |) | RM-11824 (Aviation) |
| 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-11825 (Maritime) |
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| 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) |
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COMMENTS OF THE SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association (“SIA”)¹ hereby submits its comments in response to the FCC’s Notice of Proposed Rulemaking (the “Notice”) in the above-referenced proceeding.² As discussed below, SIA urges the FCC to ensure that its rules for these bands continue to provide for co-primary fixed-satellite and mobile-satellite services. Doing so will enable the most efficient use of these bands and help ensure that satellite broadband operators have sufficient capacity to meet growing demands to address the need for broadband connectivity across the United States, including in the most rural and remote regions.

I. Introduction

These comments are filed in response to the FCC’s invitation for parties to address the potential impact of changes in the rules on future users of the 70, 80, and 90 GHz bands.³ SIA has a strong interest in this proceeding because the 71-76 GHz band (“70 GHz band”) and 81-86 GHz band (“80 GHz band”) are central to member companies’ plans to expand the provision of satellite services in the United States. Given the encumbrances imposed on other spectrum allocated for satellite use, these bands will be used as additional capacity for links to and from

¹ SIA Executive Members include: Amazon; AT&T Services, Inc.; The Boeing Company; EchoStar Corporation; Intelsat S.A.; Iridium Communications Inc.; Kratos Defense & Security Solutions; Ligado Networks; Lockheed Martin Corporation; OneWeb; SES Americom, Inc.; Space Exploration Technologies Corp.; Spire Global Inc.; and Viasat Inc. SIA Associate Members include: ABS US Corp.; AIRBUS U.S. Space & Defense, Inc.; Amazon Web Services; Analytical Graphics, Inc.; Artel, LLC; Astranis Space Technologies Corp; Blue Origin; Eutelsat America Corp.; ExoAnalytic Solutions; HawkEye 360; Hughes; Inmarsat, Inc.; Kymeta Corporation; Leonardo DRS; Lynk; Omnispace; OneWeb Satellites; Panasonic Avionics Corporation; Peraton; Planet; Telesat Canada; and XTAR, LLC. For more information on SIA, see www.sia.org.

² Modernizing and Expanding Access to the 70/80/90 GHz Bands, 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, 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, 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, *Notice of Proposed Rulemaking and Order*, WT Docket No. 20-133, WT Docket No. 10-153, RM-11824, RM-11825, WT Docket No. 15-244 (rel. June 10, 2020).

³ Notice, ¶ 17

gateway earth stations to both geostationary satellite orbit (“GSO”) and non-geostationary satellite orbit (“NGSO”) satellites, making new content available to customers of all kinds across the country as part of the satellite systems that are now begin designed. In fact, SpaceX has already sought authority to operate in these frequency bands to support its second-generation NGSO system.⁴

The 70 and 80 GHz bands will expand capacity for the gateway links beyond the Ka and Q/V bands used by existing satellites and satellites under construction. While SIA anticipates that there will be only a relatively limited number of gateway earth stations operating in these frequency bands, use of these bands will be a vital for the satellite sector’s ability to relieve the strains on more encumbered bands. These comments focus on ensuring that all allocated services – satellite and terrestrial, fixed and mobile – are afforded a fair opportunity to operate in these bands.

II. The Registration System Should Be Reformed to Prevent Warehousing and Protect All Co-Primary Users

An important element of ensuring that there is an opportunity for future innovative uses of the 70, 80, and 90 GHz bands is protecting the bands from warehousing and other practices that will unfairly preclude such uses. As the Notice recognizes, the registration system is critical to that effort. To meet those goals, SIA suggests the following changes to the registration system.

First, as recognized in the Notice, the registration system should prevent licensees from warehousing link authorizations that they do not use.⁵ The simplest approach, as suggested in the Notice, is to require link registrants to certify to the registration administrator that

⁴ See Application for Approval for Orbital Deployment and Operating Authority for the SPACEX GEN2 NGSO Satellite System, IBFS File No. SAT-LOA-20200526-00055 (filed May 26, 2020).

⁵ Notice, ¶¶ 18-22.

construction has been completed within 30 days after the construction deadline.⁶ If the construction and notification requirements are not met, the registration should expire automatically. Requiring timely construction is critical to preventing warehousing and maintaining efficient use of these bands – absent a certification of construction, the bands could appear to be congested and block future users even if in fact they are largely unused. Moreover, a requirement for actual use is not unusual or burdensome; the FCC commonly sets deadlines for construction and mandates automatic cancelation of authorizations when construction is not timely completed.⁷ Indeed, the FCC rules already set a deadline for constructing registered links, so removing unconstructed links from the registration database would be a logical step.⁸

Second, the FCC should adopt reasonable limits on first-in-time rights for registrants that modify their registered links.⁹ It is appropriate for registrants to retain their first-in-time rights if a modification does not cause more interference or require more protection than the original parameters and hence does not preclude or affect other users. However, if the modification would require more protection or cause interference at any location than the original registered link then the modification should not retain the applications first-in-time rights. Instead, the incremental area where an increase in interference is caused should be treated as newly-filed.

There are strong reasons for the FCC to adopt this approach. First, allowing changes that cause new interference to retain first-in-time rights would create significant complications and potential conflicts with licensees that have registered links in the time between the original

⁶ *Id.*, ¶ 20.

⁷ *See, e.g.*, 47 C.F.R. §§ 90.155(a) and 101.63(a) (18-month construction period for most fixed common carrier services). Although a registration in the 70, 80, and 90 GHz bands is not technically a construction permit, it is the functional equivalent, since it creates a right to construct specific facilities within the band.

⁸ 47 C.F.R. § 101.63(b).

⁹ *See* Notice, ¶ 21 (requesting comments on the types of “amendments, if any, should be allowed without losing first-in-time status”).

registration and the modification. Second, if a revised link does not affect other registered links, the change in first-in-time rights will have no impact. In addition, this approach is consistent with FCC practice in other contexts. For instance, the rules generally treat amendments that expand interference contours as major amendments that start the application process over again.¹⁰

Finally, the registration system should, on a going-forward basis, account for both terrestrial and satellite users. As operators begin to use these bands for broadband satellite services and start to put gateway earth stations in place, it will be critical for both satellite operators and terrestrial users to avoid interference between their operations. The registration database is ideally suited to that purpose and should be designed for that use. Specifically, the database should include defined protection criteria appropriate for fixed-satellite service (“FSS”) gateway earth stations operating in these bands and Section 101.1523 of the Commission’s rules should include or refer to those criteria so that terrestrial links cannot be registered if they would interfere with earth station operation.¹¹

III. Rules for Endpoints in Motion Should Provide for Appropriate Protection for Co-primary Uses

The Notice seeks comment on potential maritime and aeronautical uses of these bands.¹² As the Notice acknowledges, there are significant unanswered questions about how these uses could be accommodated within the current framework, particularly given the existing co-primary allocations for these bands to terrestrial fixed and satellite operations.¹³ In particular, in light of

¹⁰ See, e.g., 47 C.F.R. § 1.929(c) (defining major amendments for wireless services to include any change that expands interference contours or establishes a new fixed transmission path).

¹¹ 47 C.F.R. § 101.1523 (describing requirements for registration process). SIA will provide additional detail on appropriate criteria at a later time.

¹² Notice, ¶¶ 23-45.

¹³ The Notice proposes to classify aeronautical and maritime uses as mobile. Notice, ¶ 30. SIA agrees that a mobile classification is appropriate given that users would be in motion.

the many questions concerning aeronautical operations, the FCC should not adopt rules without making a more specific proposal and seeking additional comment.

A. Limitations on Aeronautical Operations Should Be Required to Avoid Foreclosing FSS Uses

The proposed aeronautical use of the 70 and 80 GHz bands by Aeronet would create new risks of interference that the Commission must address before it can move forward to consider rules to allow such use in these bands. These risks are particularly acute in the 71-76 GHz band, where transmissions when an aircraft is in-line or near in-line with a gateway earth station could disrupt communications between the earth station and its corresponding satellite, and would be exacerbated if aeronautical users were permitted to operate at higher power levels than are authorized for other users of these bands. Moreover, there is a risk that widespread deployment could effectively preempt other uses of these bands.

Unlike terrestrial or maritime uses of these bands, aeronautical uses require transmission in three dimensions, potentially over a wide area around each base station.¹⁴ The risk of disruption to satellite communications is particularly great for air-to-ground transmissions and for transmissions between aircraft in satellite downlink bands. There are also other interference scenarios to assess, such as the risk for interference from transmitting FSS earth stations into receiving aeronautical stations in satellite uplink bands. These are the interference scenarios:

Interference into receiving FSS earth stations from air-to-ground and air-to-air links. Air-to-ground transmissions that are inline or close to inline with a gateway FSS earth station could interfere with the signal the FSS earth station receives from the satellite, blotting it out. The only reliable way to prevent this kind of interference is to prohibit aircraft-to-ground communications in the 71-76 GHz

¹⁴ For instance, if a base station is intended to cover an area with a 20-mile radius up to an altitude of 40,000 feet, the total coverage of the base station would be more than 2,000 cubic miles. The area where it would cause interference would be much wider.

band.¹⁵ Aircraft-to-aircraft transmissions also could interfere with gateway earth station reception of satellite signals in the 71-76 GHz band unless the FCC sets appropriate power flux density limits on the ground.

Interference from transmitting FSS earth stations into ground-to-air and air-to-air links. In the 81-86 GHz band, the FCC should limit aeronautical operations to the air-to-ground direction to avoid the potential for interference from transmitting FSS earth stations when they are inline with aeronautical receivers. Limiting the direction of transmission of the aeronautical service in these bands would provide for meaningful future use by FSS systems.

Interference into receiving FSS space stations from ground-to-air and air-to-air links. Ground-to-aircraft (if allowed) and aircraft-to-aircraft transmissions could interfere with reception at the satellite in the 81-86 GHz band unless the FCC sets appropriate power flux density limits towards the geostationary arc.

Ground-based interference between FSS earth stations and aeronautical ground stations. With respect to interference between aeronautical ground stations and FSS earth stations, a coordination mechanism could ensure compatibility and take into account multiple pointing directions for the aeronautical ground stations.

Further, the FCC should reject the proposal to allow Aeronet to operate at higher powers than currently authorized.¹⁶ Higher power levels for Aeronet will mean, among other things, that those users will have an advantage over both terrestrial fixed and satellite operations in the band, and that their operations will preclude deploying links and earth stations that could be deployed under the current rules. In effect, allowing higher power levels for Aeronet could crowd the other users out of these bands.

Finally, significant questions concerning aeronautical services are not addressed or effectively are left entirely open by the Notice. For instance, the Notice does not consider the

¹⁵ The Commission asked if it should limit the 81-86 GHz band to ground-to-air communications to protect the Radio Astronomy Service in that band. Notice, ¶ 47. However, given the limited number of radio astronomy observatories in the United States, a better approach would be to establish coordination zones around radio astronomy observatories as the Commission has done in other frequency bands where aeronautical use occurs near to or in radio astronomy frequency bands. *See, e.g.,* footnote US133 and § 25.228(j)(3) of the Commission's rules that require coordination with the National Science Foundation in the band 14.47-14.5 GHz for earth stations on aircraft operations within radio line-of-sight of the radio astronomy stations specified in § 25.228(j)(3).

¹⁶ Notice, ¶ 42.

nature of the deployment, and how that would affect other uses. A commercially viable aeronautical broadband service has to be available throughout the country, and would require myriad base stations with wide coverage areas.¹⁷ Yet there is little or no information in the record about how many base stations would be deployed, where they would be located, or how deployment of such base stations would affect the ability of terrestrial and satellite users to operate within these bands. There also is no information on the potential number of airborne stations, the level of interference they would cause, or the areas where they would operate. Without this information about the scope of any planned deployment, it is impossible for the FCC and other interested parties to understand the impact that Aeronet's application to use the 70, 80, and 90 GHz bands would have on existing co-primary users. Given the absence of this critical data, the FCC should not act without a further opportunity to comment. Even if these information gaps are filled, additional comment on specific proposals to avoid interference with co-primary terrestrial fixed and satellite users will be necessary to evaluate the impact of aeronautical services properly.¹⁸

B. Maritime Uses Can Be Accommodated with Reasonable Limitations

Maritime operations do not pose the same risk to co-primary users of the 70, 80, and 90 GHz bands as aeronautical uses because the characteristics of maritime operations are not like those of aeronautical operations. In particular, maritime services typically will operate only in two dimensions, links from maritime base stations generally will be pointed offshore, and maritime base stations will be located in coastal areas. Nevertheless, to the extent the FCC

¹⁷ One reason that airlines increasingly rely on satellite-based services for their onboard Internet access is the difficulty of offering sufficient bandwidth on a nationwide basis from terrestrial facilities.

¹⁸ Any request for additional comment, whether via a public notice or a further notice of proposed rulemaking, should include specific proposals to address interference issues and practical deployment requirements.

decides to authorize maritime uses of these bands, it should take appropriate steps to integrate those uses into the current regulatory regime, including ensuring that interference issues are addressed in a way that does not have an unnecessary impact on other users.

C. Any Mobile Operations in the 70, 80, and 90 GHz Bands Should Be Subject to Registration Requirements Tailored to Those Uses

As described in Section II, an effective registration system is critical to protect both current and future users of the 70, 80, and 90 GHz bands. Any mobile operations that the FCC authorizes in the future should be subject to the registration requirements as well, with appropriate modifications to account for the differences in how those services affect use of these bands while preserving the overall goal of allowing many users to operate in them.

As a baseline, mobile operations should be required to register all links. The area covered by the registration should be limited to the area that will be used by the planned mobile operations, and only areas that will be used a specified minimum percentage of time should be included in the registration.¹⁹ In particular, without some limitation on the multi-dimensional area that can be registered, aeronautical operations could block future registrations across large parts of the United States. The rules for first-in-time priority should apply to mobile links in the same way they apply to fixed links: a one-year period for construction and no first-in-time priority for changes that result in new interference in any location.²⁰

In addition, the FCC should confirm that the database managers are capable of accepting coordination data for air-based and maritime links using antennas in motion. Registrations for mobile uses should not be permitted until the FCC has reviewed and approved proposals from third-party database managers to accommodate multi-dimensional registration. This step is

¹⁹ For instance, the FCC might specify that a registration will encompass only areas that will be used a specified percentage of the time during normal operations.

²⁰ See *supra* Section II.

critical to ensuring that coordination is managed appropriately and that the specific approach adopted by a database manager will not disadvantage later users of the 70, 80, and 90 GHz bands.

IV. Conclusions

For all of these reasons, the FCC should adopt rules that are consistent with these comments.

Respectfully submitted,

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