

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

| | | |
|---|---|----------------------|
| In the Matter of |) | |
| |) | |
| |) | |
| Use of Spectrum Bands Above 24 GHz For Mobile Radio Services |) | GN Docket No. 14-177 |
| |) | |
| |) | |
| Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands |) | IB Docket No. 15-256 |
| |) | |
| |) | |
| Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 to Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services |) | WT Docket No. 10-112 |
| |) | |
| |) | |
| Allocation and Designation of Spectrum for Fixed- Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations |) | IB Docket No. 97-95 |
| |) | |
| |) | |

COMMENTS OF THE SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association (“SIA”)¹ comments in response to the Commission’s Second Further Notice of Proposed Rulemaking (“*Second Notice*”)² in the above referenced proceeding on a single issue: use of the 24.75-25.25 GHz band (the “24 GHz band”) by Fixed-Satellite Service (“FSS”) systems. SIA supports the Commission’s proposal to license FSS earth

¹ These comments are supported by all SIA members except for DIRECTV and Ligado Networks, which abstain from participation.

² See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Second Report and Order, Second Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order, FCC 17-152 (rel. Nov. 22, 2017) (“*Second Notice*”).

stations in this band on a co-primary basis with terrestrial fixed and mobile systems in the Upper Microwave Flexible Use Service (“UMFUS”) under the provisions of Section 25.136(d) of the Commission’s rules. SIA also appreciates the Commission’s recognition of the need to protect Broadcasting-Satellite Service (“BSS”) feeder link earth stations in this band, and agrees that BSS uplink operations will be adequately protected by the Commission’s two-degree spacing regime, such that rules that prioritize BSS feeder links over all other FSS uses in the 24 GHz band can be eliminated. Adoption of these rule revisions is consistent with the Commission’s goal of promoting efficient use of millimeter-wave spectrum by all radio services, and will help to unleash the potential of FSS satellite systems to provide advanced broadband services throughout the United States, including in areas underserved and unserved by terrestrial alternatives.

INTRODUCTION

The satellite industry has long been a critical component of the national and international communications infrastructure. By its nature, satellite service provides ubiquitous coverage, including to areas underserved or even completely unserved by terrestrial alternatives. Moreover, even in areas that are also served by terrestrial wired and wireless communications systems, satellite provides a competitive alternative, backhaul capacity, and a critical backup during emergencies and following natural disasters.

The market demand for broadband data capacity continues to grow at a rapid and unabated pace. Yet many parts of the United States lack access to reliable broadband connectivity. The Commission continues to conclude that advanced telecommunications capability is not being deployed to all Americans in a reasonable and timely fashion.

Despite the increase in the number of Americans that are able to obtain advanced telecommunications capability, these advances are not occurring broadly enough or quickly enough to achieve our statutory objective. Nationwide, one in ten Americans lacks access to 25 Mbps/3 Mbps broadband. As importantly, there continues to be a significant disparity of access to advanced telecommunications capability across America with more than 39 percent of Americans living in rural areas lacking access to advanced telecommunications capability, as compared to 4 percent of Americans living in urban areas, and approximately 41 percent of Americans living on Tribal lands lacking access to advanced telecommunications capability. We note that small businesses tend to subscribe to mass market broadband service. Thus, the rural-urban disparity in deployment of these broadband services also disproportionately impacts the ability of small businesses operating in rural areas to successfully compete in the 21st century economy.³

On his very first day in office, Chairman Pai noted the importance of this issue and made addressing it a priority.

One of the most significant things that I've seen during my time here is that there is a digital divide in this country – between those who can use from [*sic*] cutting-edge communications services and those who do not. I believe one of our core priorities going forward should be to close that divide – to do what's necessary to help the private sector build networks, send signals, and distribute information to American consumers, regardless of race, gender, religion, sexual orientation, or anything else. We must work to bring the benefits of the digital age to all Americans.⁴

Thus, the nation faces twin challenges – meeting the exploding demand for broadband services and bringing those services to those who do not currently have access to them.

As the Commission has recently acknowledged, satellite broadband systems can help to address these issues,⁵ as they are an essential part of the broadband ecosystem serving U.S.

³ See *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, 2016 Broadband Progress Report, 31 FCC Rcd. 699, ¶ 4 (2016) (“2016 Broadband Progress Report”).

⁴ Remarks of Ajit Pai, Chairman, Federal Communications Commission, at 2 (Jan. 24, 2017), available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0124/DOC-343184A1.pdf.

⁵ 2016 Broadband Progress Report, ¶ 46.

consumers. The satellite segment continues to grow and to introduce important new services, including increasingly faster broadband and direct-to-home services that are necessary components of the communications marketplace. For example, EchoStar recently launched a new satellite (Jupiter 2) to support HughesNet Gen5, which can now offer or exceed Commission-defined broadband speeds – 25 Mbps download and 3 Mbps upload – from coast-to-coast,⁶ and also recently filed an application for a new satellite (HNS 95W) that will operate in several spectrum bands above 24 GHz and will provide service at speeds well in excess of the Commission-defined standard.⁷ ViaSat launched its ViaSat-2 Ka-band satellite in June 2017; the satellite has now reached its assigned orbital location and will soon begin providing more than 300 gigabits per second of total network capacity to support true broadband service throughout the U.S. and the Americas.⁸ Intelsat recently launched several Intelsat Epic^{NG} satellites that will offer compressed digital video and digital single data channels, as well as high speed digital data for broadband connectivity. In particular, Intelsat’s North America Intelsat Epic^{NG} fleet currently consists of IS-29e (50W), IS-35e (34.5W) and IS-37e (to be operational at 18W). All those satellites have coverage over the United States, with traditional wide beams as well as spot beams in the C-, Ku-, and Ka-bands.

Further, Intelsat also has filed for two replacement satellites (G-14R and G-15R), each of which will have Ku- and Ka-band spot beams in addition to C-band wide beams to support future

⁶ See Press Release, “HughesNet Gen5 Surpasses 100,000 Subscribers in Just Two Months” (June 5, 2017), *available at* <http://echostar.com/Press/Newsandmedia/HughesNet%20Gen5%20Surpasses%20100000%20Subscribers%20In%20Just%20Two%20Months.aspx>.

⁷ Application of Hughes Network Systems, LLC, IBFS File No. SAT-LOA-20170621-00092.

⁸ See Press Release, “ViaSat-2 Satellite Reaches Geostationary Orbit; Successfully Receives and Transmits First Data from Space” (Dec. 5, 2017), *available at* <https://www.viasat.com/news/viasat-2-satellite-reaches-geostationary-orbit-successfully-receives-and-transmits-first-data>.

broadband demand over North America, including Alaska. Telesat's Telstar 19 VANTAGE satellite, which is expected to begin providing service in mid-2018, will enable the provision of high-speed broadband services to ships and aircraft along the U.S. east coast, in the Caribbean, and in the North Atlantic, through its high-throughput Ka-band spot beams. Inmarsat's Global Xpress system has been delivering seamless, high-speed broadband connectivity all around the world since December 2015. The GX constellation is made up of four Ka-band, high-speed mobile broadband communications satellites that operate with a combination of fixed narrow spot beams that enable Inmarsat to deliver higher speeds through more compact terminals, plus steerable beams so additional capacity can be directed in real-time to where it is needed. SES also recently initiated service on its SES-15 satellite, a high-throughput satellite operating in the Ku- and Ka-bands at 129° W.L., which will serve the thriving aeronautical sector and enable other traffic intensive data applications such as government, VSAT networks, and maritime.⁹ Satellite service will also be an integral component of future 5G infrastructure, providing not only direct service to end users, but also backhaul, machine-to-machine connectivity, and resiliency from disasters.

In order to continue this growth and the satellite industry's important contributions to broadband competition and coverage, satellite operators must have sufficient protected access to spectrum in the millimeter wave bands that support higher speeds and more intensive broadband capabilities. Fortunately, the Commission has recognized the need to provide such access, and in this proceeding has proposed rules that would open another band to use by advanced FSS broadband systems.

⁹ See Press Release, "SES-15 Enters Commercial Service to Serve the Americas" (Jan. 15, 2018), available at <https://www.ses.com/press-release/ses-15-enters-commercial-service-serve-americas>.

DISCUSSION

A. The Commission Should Adopt Its Proposal to License 24 GHz FSS Earth Stations on a Co-Primary Basis Under the Provisions of Section 25.136(d)

Both the domestic and international allocation tables allocate the 24 GHz band to FSS on a primary basis. Under footnote NG535 of the U.S. Table of Allocations, BSS feeder links have priority over all other FSS uses in the 24.75-25.05 GHz band, and FSS use of the 25.05-25.25 GHz band is restricted to BSS feeder links.¹⁰ The Commission recently adopted changes to the domestic allocation table to support flexible Fixed and Mobile operations by UMFUS licensees throughout the 24 GHz band.¹¹ Accordingly, the *Second Notice* seeks comment on how satellite and terrestrial systems should share this frequency band.

The Commission has proposed to license 24 GHz FSS earth stations on a co-primary basis under Section 25.136(d), the provision applicable to FSS earth stations operating in the 47.2-48.2 GHz uplink band.¹² That rule would make the band available for individually-licensed FSS earth stations that meet specific requirements and limitations that the Commission has previously found sufficient to enable FSS operators to share spectrum “with minimal impact on terrestrial operations.”¹³ Earth stations that satisfy the rule would not be required to take any additional actions to provide interference protection to UMFUS licensees.¹⁴

SIA supports the Commission’s proposal. It strikes an appropriate balance between the spectrum needs of satellite and terrestrial systems that wish to operate in the 24 GHz band, and

¹⁰ See 47 C.F.R. § 2.106, NG535.

¹¹ See *Second Notice*, ¶ 22.

¹² See *id.*, ¶ 94. The Commission also proposed several conforming amendments to various earth station requirements.

¹³ *Id.*, ¶ 54 (adopting sharing rules for 47.2-48.2 GHz uplink band).

¹⁴ See 47 C.F.R. § 25.136(d).

thereby furthers the Commission's goal of promoting efficient use of millimeter-wave spectrum by all radio services.¹⁵ In addition, by allowing FSS operators to use this band to support their broadband networks, the Commission will afford them additional flexibility in designing their systems and siting gateway earth stations. This additional option for uplinking broadband traffic in the 24-30 GHz range provides a much needed alternative for those FSS operators that are unable to use the 28 GHz band because of siting restrictions.

The Commission correctly acknowledges that the issue of aggregate interference into satellite receivers in the 24 GHz band is identical to that same issue in the context of the 28 GHz and 47 GHz bands.¹⁶ As such, the Commission should ensure that the operating parameters of UMFUS services adequately protect all spacecraft from the aggregate interference resulting from their operations in the 24 GHz band.

According to the International Bureau Filing System database, there are currently nine BSS feeder link earth station sites licensed in this band. The Commission has stated that all earth stations either authorized or for which applications have been filed prior to the effective date of any rule adopted in this proceeding will be grandfathered, such that licensed earth stations may continue to operate under the terms of their existing authorizations without taking into account possible interference from UMFUS operations, and pending applications will be processed under current rules and thereafter allowed to operate as licensed.¹⁷ SIA supports this approach, which

¹⁵ See, e.g., *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd. 8014, ¶¶ 2-3 (2016) ("*Spectrum Frontiers R&O*").

¹⁶ See *Second Notice*, ¶ 95.

¹⁷ See *id.*, ¶ 39 and Appendix E, Proposed Section 25.136(d)(3).

is consistent with the approach the Commission took with respect to FSS earth stations in the 28 GHz band.¹⁸

The Commission also seeks comment on whether to add a footnote to the U.S. Table of Allocations specifying the relative interference protection obligations of FSS and UMFUS stations operating in the 24 GHz band, and if so, what the content of that footnote should be.¹⁹ Given that the Commission proposes to license FSS earth stations in the 24 GHz band under the provision applicable to the 47.2-48.2 GHz band, SIA believes that the footnote setting out the relative interference protection obligations in that band would be an appropriate template for use in this band as well. Specifically, footnote NG65 provides as follows:

In the band 47.2-48.2 GHz, stations in the fixed and mobile services may not claim protection from individually licensed earth stations authorized pursuant to 47 C.F.R. 25.136. However, nothing in this footnote shall limit the right of UMFUS licensees to operate in conformance with the technical rules contained in 47 C.F.R. Part 30. The Commission reserves the right to monitor developments and to undertake further action concerning interference between UMFUS and FSS, including aggregate interference to satellite receivers, if appropriate.²⁰

The Commission need only add a reference to the 24 GHz band in the initial clause of this footnote to extend its applicability, and SIA would support such a modification.

B. The Commission Should Adopt Its Proposal to Eliminate Limitations That Impede Full FSS Use of the 24 GHz Band

Footnote NG535 to the U.S. Table of Allocations limits the ability of FSS operators to use the 24 GHz band by (1) prioritizing BSS feeder links in the 24.75-25.05 GHz band, and (2) restricting FSS use of the 25.05-25.25 GHz band to BSS feeder links only. In order to provide

¹⁸ See *Spectrum Frontiers R&O*, ¶ 59.

¹⁹ See *Second Notice*, ¶ 95.

²⁰ *Id.*, Appendix A (revisions to Section 2.106).

for more flexible FSS use of the band, the Commission proposes to eliminate that footnote.²¹ In addition, to accommodate more diverse FSS operations in the band and further increase flexibility, it also proposes to eliminate the Appendix F orbital location restrictions for 17/24 GHz BSS space stations specified in Section 25.262(a).²²

SIA supports both of these proposals. As discussed above, the FSS industry continues to grow and innovate, launching a new generation of more advanced satellites capable of delivering the broadband speeds consumers demand even in areas that other systems do not reach. But the demand for broadband services continues to grow rapidly as well. In order to keep up, FSS operators must have access to spectrum to support the increased capacity needs of broadband traffic. The 500 MHz of spectrum in the 24 GHz band would provide a much needed source of uplink capacity for satellite broadband systems, and would give operators the flexibility to optimize their networks in light of licensing and operating constraints. Thus, by removing the limitations on FSS use of this band, the Commission would take an important step in promoting satellite broadband capabilities.

At the same time, allowing broader and more flexible FSS use of the 24 GHz band would not present a meaningful concern for BSS operators, which have made significant investments in developing innovative BSS systems in the 24 GHz band. As the Commission recognizes, the 24 GHz uplink band is used by a small number of BSS feeder link earth stations, and the two-degree spacing rules apply, thereby protecting these BSS feeder links from interference from other FSS earth stations in the band.²³ Decades of experience under those rules has proven that satellites can differentiate signals intended for their reception from signals intended for reception by a

²¹ See *id.*, ¶ 94.

²² *Id.*

²³ See *id.*

satellite located two degrees away, whether the transmissions are BSS feeder links or other FSS uplinks. Notably, the four-degree spacing that gives the 17/24 GHz BSS service an advantage on the *downlink* to consumer terminals would not be affected by the proposed change and is an important predicate for SIA's support for the proposed changes in the *uplink* band.²⁴ Accordingly, SIA agrees with the Commission that it is not necessary "to give BSS feeder link earth station transmissions priority over other uses of the FSS for earth stations located within the United States, or to preclude other FSS stations from claiming protection from feeder link earth station transmissions located within the United States."²⁵ Eliminating the orbital location restrictions in Section 25.262(a) would further increase flexibility for all FSS operations in the 24 GHz band, and should be implemented as well.

CONCLUSION

The Commission has proposed a licensing regime that will enable 24 GHz FSS earth station operators to deploy in support of advanced satellite broadband services with minimal impact on UMFUS operations in the band. In addition, it has proposed to lift restrictions on FSS use of the band that favored BSS feeder links, which will give FSS operators additional flexibility while still protecting BSS operations. Accordingly, SIA supports the Commission's proposals for the 24 GHz band.

²⁴ *See id.* n.249.

²⁵ *Id.*, ¶ 94.

Respectfully submitted,

THE SATELLITE INDUSTRY ASSOCIATION

By: /s/ Tom Stroup
Tom Stroup, President
The Satellite Industry Association
1200 18th Street N.W., Suite 1001
Washington, D.C. 20036
(202) 503-1560

January 23, 2018