

Narrative

Application for Ka Band Aeronautical Earth Station Authorization

By this application, Viasat, Inc. requests blanket authority to operate Honeywell JetWaveX earth station terminals (the “Terminals”) as Earth Station Aboard Aircraft (“ESAA”) Earth Stations in Motion (“ESIMs”) in the fixed-satellite service (“FSS”). The Terminals would operate in the 17.7-18.8 GHz (space-to-Earth), 19.7-20.2 GHz, (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), and 29.3-30 GHz (Earth-to-Space) band segments and would operate with various satellite points of communication. The Terminals would be used to provide in-flight connectivity services to aircraft throughout the United States and to U.S.-flagged aircraft outside the United States.

Grant of this application would promote the public interest by enabling the provision of expanded broadband service to passengers and crew on aircraft both in the United States and around the world.

Satellite Points of Communication

Viasat seeks to operate the Terminals with geostationary orbit (“GSO”) satellites on the Commission’s Permitted Space Station List (“Permitted List”) in eligible band segments, specifically the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.5-30.0 GHz band segments. Additionally, Viasat seeks to operate the Terminals:

- In the 17.7-18.3 GHz and 27.5-28.35 GHz band segments with the ViaSat-3F1 satellite at 88.9° W.L.,¹ and the ViaSat-2 satellite at 69.9° W.L.;²
- In the 28.1-28.35 GHz band segment with ViaSat-1 satellite at 115.1° W.L.;³ and
- In the 19.7-20.2 GHz and 29.5-30.0 GHz band segments with the Inmarsat 5F1 satellite at 63° E.L.⁴

Operations with any particular satellite point of communication would be limited to the frequencies authorized by the Commission for that satellite. When communicating with any

¹ Viasat, Inc., Call Sign S2917, ICFS File Nos. SAT-LOI-20140204-00013 *et al.* (“VIASAT-3”); Call Sign S3050, ICFS File No. SAT-LOA-20190617-00048 (granted May 27, 2020) (“VIASAT-89US”). VIASAT-3 and VIASAT-89US are collectively referred to as “ViaSat-3F1” herein.

² Viasat, Inc., Call Sign S2902, ICFS File No. SAT-MOD-20160527-00053.

³ Viasat, Inc., Call Sign S2747, ICFS File No. SAT-LOA-20110722-00132.

⁴ The Commission has not granted market access for the Inmarsat 5F1 satellite, but has previously authorized communications with that satellite for operations on aircraft outside the United States in the 19.7-20.2 GHz and 29.5-30.0 GHz band segments. ISAT US Inc., Call Sign E140114, ICFS File No. SES-MFS-20180112-00020. The present application is therefore consistent with prior authorizations for communications with Inmarsat 5F1.

particular satellite, Viasat would work with the satellite operator to ensure that all operations of the Terminals would be consistent with certifications and the terms and conditions of any relevant Commission authorization for the satellite.⁵

Compliance with Technical Rules

All band segments requested in this application are allocated to the FSS on a primary or co-primary basis,⁶ and (with the exception of the 27.5-28.35 GHz band segment as discussed below) the Commission's rules permit blanket licensing of GSO FSS ESIMs in these band segments.⁷ Operation of the Terminals would be consistent with the Commission's regulatory framework for the Ka band. Under that framework, the key elements for ensuring compatibility with the Commission's two-degree spacing policy are: (i) compliance with the off-axis-EIRP density levels specified in Section 25.218 in the uplink direction, (ii) compliance with the power flux density ("PFD") levels referenced in Section 25.208 in the downlink direction, (iii) compliance with the antenna performance standards in Section 25.209, and (iv) coordination with potentially affected satellite systems in the case of any exceedance of those levels. The Terminals would comply with this framework except where otherwise authorized for communications with a particular satellite point of communication. Exhibit B demonstrates compliance with the requirements of Section 25.218. Viasat understands that protection from interference in the receive bands is limited only to the extent that the Terminals comply with the Section 25.209 gain mask. Viasat recognizes that operations in the 29.3-29.5 GHz band segment are subject to the requirements of Section 25.258.⁸

Additionally, Viasat certifies that operations with any GSO satellite would use a contention protocol, and that such contention protocol usage would be reasonable.⁹

Waiver for Operations in the 27.5-28.35 GHz Band Segment

The 27.5-28.35 GHz band segment is allocated for communications with the Upper Microwave Flexible Use Service ("UMFUS"). Notwithstanding this allocation, FSS earth stations satisfying the requirements of Section 25.136 of the Commission's rules may be authorized to operate without providing interference protection to UMFUS stations. Section 25.136 and Commission guidance include various siting restrictions on earth stations, including establishing a maximum of three individually-licensed earth stations per county in the 27.5-28.35

⁵ See 47 C.F.R. § 25.115(a)(1)(ii) (requiring no technical demonstration or other information that would be duplicative or unnecessary due to certification of compliance with space station license requirements).

⁶ 47 C.F.R. § 2.106.

⁷ *Id.* § 25.202(a)(10)(ii).

⁸ 47 C.F.R. § 25.258

⁹ *Id.* § 25.115(i).

GHz band segment.¹⁰ Additionally, the area around each earth station in which it generates a PFD, at 10 meters above ground level, of greater than or equal to $-77.6 \text{ dBmW/m}^2/\text{MHz}$ may not cover certain population thresholds or certain roadways or venues, and must be coordinated with any UMFUS operations within the covered area.¹¹

Viasat seeks to operate the Terminals with the satellites noted above in portions of the 27.5-28.35 GHz band on aircraft only when flying at 10,000 feet or more above ground level. Accordingly, Viasat seeks a waiver of Section 25.136 and the U.S. Table to allow ESIM operations at 27.5-28.35 GHz on a blanket basis and without regard to the number of authorized earth stations.

The Commission may grant a waiver of its rules for good cause shown.¹² Waiver is appropriate if (i) special circumstances warrant a deviation from the general rule, and (ii) such deviation would better serve the public interest than would strict adherence to the general rule.¹³ Generally, the Commission may grant a waiver of its rules in a particular case only if the relief requested would not undermine the policy objective of the rule in question, and would otherwise serve the public interest. Viasat's request for a waiver to operate in the 27.5-28.35 GHz band satisfies these criteria.

In adopting its Section 25.136 framework for sharing with the Commission found that it was in the public interest to have a licensing framework that "allow[s] for continued and expanded sharing between terrestrial operations and FSS earth stations in the 28 GHz band" and that in UMFUS spectrum earth stations can "share the band with minimal impact on terrestrial operations."¹⁴ Viasat's request for waiver is entirely consistent with these considerations by enabling more intensive satellite use of the 27.5-28.35 GHz band without impacting UMFUS operations. As demonstrated in the technical annex attached hereto as Exhibit A, earth station transmissions at 27.5-28.35 GHz on aircraft flying 10,000 feet or more above the ground, which are pointed upward toward the satellite, would protect UMFUS operations anywhere to a limit more than 22.9 dB below the limit established in Section 25.136 for protection of UMFUS operations. In short: by operating the Terminals only above 10,000 feet the impact of the

¹⁰ *Id.* § 25.136; *Space Bureau Updates its Guidance on Siting Methodologies for Earth Stations Seeking to Operate in the 24.75-25.25 GHz, 27.5-28.35 GHz, 37.5-40 GHz, 47.2-48.2 GHz, and 50.4-51.4 GHz Bands to Demonstrate Compliance with Section 25.136*, DA 25-206 (rel. Mar. 10, 2025). Viasat notes that the Commission has an open proceeding considering potential changes to Section 25.136 and the broader sharing framework in the UMFUS bands. Viasat notes that the Commission has an open proceeding considering potential changes to Section 25.136 and the broader sharing framework in the UMFUS bands. *Facilitating More Intensive Use of Upper Microwave Spectrum*, Notice of Proposed Rulemaking, FCC 25-70 (rel. Oct. 29, 2026).

¹¹ 47 C.F.R. § 25.136(a)(4).

¹² *Id.* § 1.3.

¹³ See *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969); *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1166 (D.C. Cir. 1990).

¹⁴ *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, para. 45 (2016).

Terminals on UMFUS operations in the 27.5-28.35 GHz band would be negligible. Because the PFD measured at 10 meters above ground level would not exceed -77.6 dBmW/m²/MHz anywhere, UMFUS licensees would be protected from harmful interference and therefore there is no need for requiring coordination with individual terrestrial licensees. Further, as a non-conforming user of this band segment, Viasat would accept the risk of interference from conforming spectrum uses.

The Commission has previously authorized Viasat to operate ESIMs on aircraft in the 27.5-28.35 GHz under the same conditions requested herein,¹⁵ and Viasat has conducted such operations for years without any complaints of harmful interference. These grants were based on technical showings similar to that in Exhibit A showing that operations of ESIM terminals at 10,000 feet or more above ground level would not cause harmful interference into primary terrestrial wireless services in the 27.5-28.35 GHz band segment. The same considerations warrant grant of a waiver in the present application.

In addition, to the extent necessary to authorize the operation of the earth stations at 27.5-28.35 GHz with ESIMs, Viasat seeks a waiver of Section 25.202(a)(10)(ii) which specifies frequency bands eligible for GSO FSS ESIM operations.¹⁶

Compliance with ESIM Rules

Viasat would operate the Terminals in a manner consistent with the Commission's rules applicable to ESAA ESIMs in the Ka band. Specifically:

1. All transmissions from the Terminals would comport with the applicable EIRP density limits in Section 25.218 unless coordinated pursuant to the requirements in Section 25.220.¹⁷
2. Each Terminal is self-monitoring and, should a condition occur that causes a Terminal to exceed its authorized off-axis EIRP density limits, would automatically cease transmissions within 100 milliseconds and would not resume transmissions until the condition that caused the limits to be exceeded is corrected.¹⁸
3. Each Terminal is monitored and controlled by a network control and monitoring center ("NCMC"). Each Terminal is able to comply with a "disable transmission" command from the NCMC within 100 milliseconds of receiving the command. The NCMC monitors the operation of each Terminal in the network, and transmits a "disable

¹⁵ Viasat, Inc., Call Sign E190201, ICFS File No. SES-LIC-20190411-00503 (granted Nov. 15, 2019); Viasat, Inc., Call Sign E180006, ICFS File No. SES-LIC-20180123-00055 (granted Apr. 17, 2018). Viasat has been authorized to operate aeronautical terminals in a subset of the 27.5-28.35 GHz band for nearly a decade. *See* Viasat, Inc., Call Sign E120075, ICFS File No. SES-MOD-20160108-00029 (granted Jun. 29, 2016) (authorizing aeronautical operations in the 28.1-28.35 GHz band segment).

¹⁶ 47 C.F.R. § 25.202(a)(10)(ii).

¹⁷ *Id.* § 25.228(a).

¹⁸ *Id.* § 25.228(b).

transmission” command to any Terminal that operates in such a way as to exceed the authorized off-axis EIRP density limit. The NCMC would not allow the Terminals to resume transmissions until the condition that caused the limits to be exceeded is corrected.¹⁹

4. Installation of the Terminals on vehicles would be performed by qualified installers who have an understanding of the Terminal’s radiation environment and the measures best suited to maximize protection of the general public and persons operating the vehicle and equipment.²⁰
5. Viasat would comply with the requirements for ESAA ESIMs, including with regard to operation of the Terminals within any foreign nation's airspace.²¹
6. Viasat would maintain a 24/7 point of contact in the United States with authority and ability to cease all emissions from the Terminals who can be reached at the following:²²

349 Inverness Drive South
Englewood, CO 80112
Tel: 720-493-7300

Radiation Hazard Analysis

A radiation hazard analysis for the Terminals is attached hereto as Exhibit C. As demonstrated in Exhibit C, the general population would not be exposed to RF levels in excess of the Commission’s standard, and the Terminals do not present a risk to trained personnel in the controlled area in the immediate vicinity of the Terminals.

¹⁹ *Id.* § 25.228(c).

²⁰ *Id.* § 25.228(d).

²¹ *Id.* § 25.228(g)(2)-(3).

²² *Id.* § 25.228(g)(1).