

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

In the Matter of

Application of Astronics AeroSat Corporation) Call Sign E140087
to Modify its Existing Ku-band Earth Stations)
Aboard Aircraft (“ESAA”) Blanket License) File No. _____

APPLICATION FOR ESAA BLANKET LICENSE MODIFICATION

By this application, Astronics AeroSat Corporation (“Astronics AeroSat”) seeks modification of its existing earth stations aboard aircraft (“ESAA”) blanket license, Call Sign E140087,¹ by adding authority to operate its previously authorized HR129 and HR6400 ESAA terminals with satellites on the Commission’s Permitted Space Station List (“Permitted List”) and certain additional satellite points of communication. The modifications sought herein will improve Astronics AeroSat’s operational flexibility and extend the coverage of its FliteStream™ ESAA system.

Pursuant to Section 25.117(c) of the Commission’s Rules, 47 C.F.R. § 25.117(c), Astronics AeroSat provides information regarding the requested modifications in the FCC Form 312 Schedule B and Technical Appendix. Astronics AeroSat confirms that the remaining elements of its *ESAA Blanket License* will not change. The proposed modifications are consistent with the Commission’s rules and policies governing Ku-band ESAAs² and, for the reasons described herein, grant of this modification application would serve the public interest.

¹ See Astronics AeroSat Corporation, Radio Station Authorization, File No. SES-LIC-20140902-00688 and subsequent modifications, Call Sign E140087 (“*ESAA Blanket License*”).

² See 47 C.F.R. § 25.227; see also *Revisions to Parts 2 and 25 of the Commission’s Rules to Govern the Use of Earth Stations Aboard Aircraft Communicating with Fixed-Satellite Service*

I. BACKGROUND

Astronics AeroSat has fully described the FliteStream™ system in prior submissions and hereby incorporates by reference the technical showing regarding the control functionality and other operational characteristics previously submitted.³ The Commission recently granted Astronics AeroSat's request to modify its *ESAA Blanket License* to add satellite points of communication for its previously licensed HR6400 terminal and add the HR129 terminal for regular commercial operations.⁴ Astronics AeroSat also currently has special temporary authorization ("STA") to conduct the Permitted List operations sought herein.⁵ Astronics AeroSat's ESAA terminals will continue to operate in accordance with the terms of the *ESAA Blanket License* and Section 25.227, but seeks to add explicit authority to communicate with Permitted List satellites and the additional points of communication identified herein in accordance with the Commission's two-degree spacing requirements..

II. DISCUSSION

A. Satellite Points of Communication

1. Permitted List Operations

Astronics AeroSat is requesting authority to operate its ESAA terminals with any satellite on the Commission's Permitted List pursuant to Section 25.227(a)(12) of the Commission's rules,

Geostationary-Orbit Space Stations Operating in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz and 14.0-14.5 GHz Frequency Bands; Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service, IB Docket Nos. 12-376 & 05-20, Notice of Proposed Rulemaking and Report and Order, FCC 12- 161 (rel. Dec. 28, 2012) ("*ESAA Order*").

³ See, e.g., File No. SES-LIC-20140902-00688, Call Sign E140087 at Technical Appendix.

⁴ See Astronics AeroSat Corporation, File No. SES-MFS-20161003-00823, Call Sign E140087 (granted on February 28, 2017).

⁵ See Astronics AeroSat Corporation, File No SES-STA-20170305-00232, Call Sign E140087 (60-day STA granted on March 9, 2017).

which permits an ESAA system that complies with the off-axis EIRP spectral density (“ESD”) limits in Section 25.227(a)(1)(i) to request such authority. Astronics AeroSat will operate the ESAA terminals with Permitted List satellites in permissible portions of the 14.0-14.5 GHz band consistent with these uplink off-axis ESD limits, and in the 10.95-11.2 GHz and 11.45-12.2 GHz downlink bands.

As noted, Astronics AeroSat’s existing *ESAA Blanket License* generally authorizes operations pursuant to Section 25.227(a)(2) of the Commission’s rules because, out of an abundance of caution, Astronics AeroSat sought satellite operator certification for all ESAA operations. Although Astronics AeroSat has included satellite operator certifications as required by Section 25.227(b)(2) for its currently authorized ESAA operations, its operations are consistent with the off-axis ESD levels specified in Section 25.227(a)(1)(i) (*i.e.*, consistent with two-degree spacing levels). In this modification, Astronics AeroSat seeks to continue to operate at these levels with Permitted List satellites and the additional satellite points of communication identified below. Astronics AeroSat has previously provided antenna performance information for each ESAA terminal demonstrating compliance with applicable off-axis ESD levels and both the HR129 and HR6400 terminals are operating with two-degree spaced satellites without interference.⁶

2. Additional Satellite Points of Communication

Astronics AeroSat seeks to add four (4) individual satellites (AsiaSat-7, Galaxy 16, IS-33 and JCSAT-2B) as authorized points of communication for the HR6400 and HR129

⁶ See Astronics AeroSat Corporation, File No. SES-LIC-20140902-00688, Call Sign E140087 at Technical Appendix (providing off-axis ESD plots for the HR6400 terminal) and File No. SES-MFS-20161003-00823, Call Sign E140087 at Technical Appendix (providing off-axis ESD plots for the HR129 terminal). Please note that Astronics AeroSat seeks a small upward adjustment to the maximum EIRP level of the HR129 ESAA terminal, but the terminal will remain compliant with Section 25.227(a)(1)(i).

terminals. The following table provides an overview of the basic parameters of ESAA operations with each individual satellite point of communication.⁷ A complete table reflecting all satellites supporting the FliteStream™ system is included in the Technical Appendix.

Table 1. Proposed Satellite Points of Communication

Satellite	Licensing Admin. ⁸	Orbital Location	Downlink Freq. (GHz)	ITU Satellite Network ⁹	ITU Region	Service To U.S. ¹⁰
AsiaSat 7	China	105.5° E	12.25-12.75	ASIASAT-CKX	3	No
Galaxy 16	U.S.	99° W	11.7-12.2	U.S.-licensed	2	Yes
IS-33E	U.S.	60° E	10.95-11.2; 11.45-12.2; 12.5-12.6	U.S.-licensed	1, 3	No
JCSAT-2B	Japan	154° E	11.45-11.7	N-SAT-154E	3	No

Each of these proposed satellites has been previously authorized as points of communication for similar ESAA operations¹¹ or is a U.S.-licensed satellite.¹² Accordingly, the

⁷ The HR129 and HR6400 terminals will operate in the uplink direction within the 14.0-14.5 GHz band consistent with satellite operator coordination agreements, the Commission's rules and applicable international requirements.

⁸ Each foreign licensing administration is a member of the World Trade Organization for services covered under the World Trade Organization Basic Telecommunications Agreement. *See* FCC Form 312 at Item 42; 47 CFR § 25.137(a).

⁹ Astronics AeroSat provides the ITU satellite network filing name for each non-U.S. licensed satellite.

¹⁰ "Yes" indicates that the relevant satellite will be used for ESAA operations in U.S. territory. "No" indicates that ESAA operations will be conducted outside U.S. territory, even if the satellite may have some coverage of the United States.

¹¹ *See, e.g.*, Gogo LLC, File No. SES-MFS-20151022-00735, Call Sign E120106 (granted authority to add AsiaSat-7 and JCSAT-2B as authorized points of communication under its ESAA blanket license).

¹² Galaxy 16 is a U.S.-licensed satellite and currently authorized as a point of communication for similar ESAA operations (*see* Panasonic Avionics Corporation, File No. SES-MFS-20130930-

technical and operational parameters of each satellite are well known to the Commission, including each satellite's orbital debris mitigation and end-of-life plans, and no new showing regarding these issues is required. In the attached Technical Appendix and Form 312 Schedule B, Astronics AeroSat provides information regarding the operational characteristics of the ESAA terminals with each satellite identified in Table 1. Depictions of the geographic areas in which its ESAA terminals will operate with each proposed satellite point of communication are also included.¹³

Although Astronics AeroSat has included satellite operator certifications for its previous ESAA terminal operations, it has not done so for the satellite points of communication sought in this modification application. However, the absence of a Section 25.227(b)(2) certification does not affect the request to communicate with the additional satellites because at all times Astronics AeroSat will operate the HR129 and HR6400 terminals consistent with the off-axis ESD levels in Section 25.227(a)(1).¹⁴ Additionally, out of an abundance of caution, Astronics AeroSat requests a waiver of the U.S. Table of Allocation in Section II.B to the extent necessary to permit its receive ESAA operations with IS-33E in the 12.5-12.6 GHz downlink band and with AsiaSat-7 in the 12.25-12.75 GHz downlink band.

00845, Call Sign E100089). IS-33E is a U.S.-licensed satellite that was recently authorized by the Commission (*see* Intelsat License LLC, File No. SAT-LOA-20150327-00016, Call Sign S2939 (granted on Feb. 25, 2016)).

¹³ *See* Technical Appendix, I; *see also* 47 C.F.R. § 25.227(b)(4).

¹⁴ Although no satellite operator certification is necessary when an ESAA operates in accordance with the Section 25.227(a)(1) mask, Astronics AeroSat reserves the right to supplement the record with a certification should it be deemed necessary or appropriate.

3. Ground Segment

The gateway earth stations for Astronics AeroSat's ESAA network are located in various countries around the world to provide global coverage and vary by satellite. Table 2, below, reflects the gateway earth stations for the satellite points of communication proposed herein. A complete table reflecting all satellites and gateways in the network is included in the Technical Appendix.

Table 2. Gateway Earth Stations Table

Satellite	Satellite Operator	Gateway Earth Station Location	Country	Gateway Operator	FCC Call Sign
AsiaSat-7	AsiaSat	Beijing	China	China Telecom Satellite	N/A
Galaxy 16	Intelsat	Brewster, WA	U.S.	U.S. Electroynamics Inc.	E120043
IS-33 ¹⁵	Intelsat	Moscow	Russia	RuSat	N/A
JCSAT-2B	SPJSAT	Kapolei, HI	U.S.	Hawaii Pacific Teleport LP	N/A

Network control for Astronics AeroSat's proposed operations will be provided pursuant to an agreement with Panasonic Avionics Corporation, subject to Astronics AeroSat's ultimate direction and control using linked Network Operations Centers ("NOCs") located at both companies' facilities. The primary points of contact at both NOC facilities have been previously provided to the Commission by Astronics AeroSat.¹⁶

¹⁵ Effective November 2017, the IS-33 satellite will be supported by a new gateway earth station located at a Cologne, Germany teleport facility operated by Stellar.

¹⁶ See Astronics AeroSat Corporation, File No. File No. SES-MFS-20161003-00688 (Call Sign E140087), Technical Appendix.

B. Waiver Request

Although Astronics AeroSat has previously been granted a waiver of Section 2.106 of the Commission's rules, 47 C.F.R. § 2.106, to operate ESAA terminals in the 12.25-12.75 GHz downlink band, out of an abundance of caution, it respectfully requests a similar waiver here. Specifically, Astronics AeroSat's ESAA terminals will communicate with IS-33E in the 12.5-12.6 GHz downlink band and with AsiaSat-7 in the 12.25-12.75 GHz downlink band.

The FCC's Table of Allocations permits use of the 10.95-11.2 GHz and 11.45-11.7 GHz bands (on an unprotected basis) and the 11.7-12.2 GHz and 14.0-14.5 GHz bands (on a primary basis) for ESAA operations.¹⁷ Astronics AeroSat seeks to utilize FSS satellite capacity available in the 12.25-12.75 GHz band for ESAA receive operations on an unprotected, non-harmful interference basis outside the United States (principally in Regions 1 and 3).¹⁸ The Commission previously waived Section 2.106 with respect to operation of Astronics AeroSat's ESAA system and other in-flight connectivity providers in this additional Ku-band downlink spectrum.¹⁹ The requested waiver would serve the public interest because use of this downlink (receive) spectrum is essential to offering in-flight broadband connectivity in the Ku-band and presents a negligible risk of interference to other spectrum users.

C. Public Interest Statement

Grant of the requested modification to add Permitted List authority and the proposed additional satellite points of communication will serve the public interest by extending the coverage and increasing the capacity of the FliteStream™ system. This will provide a direct

¹⁷ See 47 C.F.R. § 2.106 and n. NG52 and NG55; *see also* 47 C.F.R. § 25.227.

¹⁸ The 12.5-12.75 GHz band is allocated for FSS downlinks in Region 1 and the 12.2-12.75 is allocated for FSS downlinks in Region 3.

¹⁹ See, e.g., Panasonic Avionics Corporation, SES-MFS-20150609-00349, Call Sign E100089.

benefit to U.S. consumers that can access in-flight mobile broad applications, and will further enhance U.S. leadership in in-flight mobile broadband services.

III. CONCLUSION

For the foregoing reasons, Astronics AeroSat respectfully requests that the Commission modify its *ESAA Blanket License*, Call Sign E140087, by adding Permitted List authority and the specified satellites as authorized points of communications for its previously authorized HR6400 and HR129 ESAA terminals.