Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

Application of Panasonic Avionics	)	
Corporation to Modify its Existing Ku-band	)	Call Sign E100089
Earth Stations Aboard Aircraft ("ESAA")	)	
Blanket License	)	File No.

APPLICATION TO MODIFY EXISTING ESAA BLANKET LICENSE

By this application, Panasonic Avionics Corporation ("Panasonic") seeks Commission authority to modify its existing earth stations aboard aircraft ("ESAA") license, Call Sign E100089, by adding 1,000 of its next-generation Single-Panel Antenna ("SPA") terminals to its Ku-band ESAA license for the "eXConnect" aeronautical mobile-satellite service ("AMSS") system for operation within the United States.[1] In addition, Panasonic seeks to add the Telstar 12 Vantage ("Telstar 12V") as an authorized point of communication for its previously licensed Panasonic Phased Array ("PPA") terminal.

The SPA terminal, which is fully certified for operation on the subject commercial aircraft, is a single-panel variant of the previously licensed PPA that will operate in accordance with the terms of the Panasonic Order, the Panasonic ESAA License, and Section 25.227 of the Commission's rules governing ESAA operations. In addition, proposed PPA operations with Telstar 12V will enhance the in-flight broadband connectivity services available to U.S.-

[1] *See* Panasonic Avionics Corporation, Radio Station Authorization, Call Sign E100089, File No. SES-MFS-20130930-00845 and other associated file numbers ("*Panasonic ESAA License*"); *Panasonic Avionics Corporation Application for Authority to Operate Up to 50 Technically Identical Aeronautical Mobile-Satellite Service Aircraft Earth Stations in the 14.0-14.4 GHz and 11.7-12.2 GHz Frequency Bands, Order and Authorization*, DA 11-1480 (rel. Aug. 31, 2011) ("*Panasonic Order*").

registered aircraft flying within the relevant service area of the satellite. As discussed herein, grant of this modification application is consistent with Commission precedent and will strongly serve the public interest.

I. BACKGROUND

Panasonic is the world leader in in-flight entertainment and connectivity ("IFEC") systems and services. Panasonic operates the Ku-band PPA and MELCO terminals with the eXConnect System as part of Panasonic's Global Communication Suite ("GCS") offering for U.S. and foreign airlines to provide broadband connectivity to passengers and crew on both short-haul domestic and long-haul international routes. In this application, Panasonic seeks to operate its next-generation SPA terminal in the United States while communicating with certain U.S.-licensed satellites currently authorized as satellite points of communication for the PPA terminal under the ESAA License, and add the Telstar 12V satellite as an authorized point of communication for the PPA terminal.

The Panasonic ESAA blanket license was the subject of a prior commercial modification application to add certain satellite points of communication,[2] which effectively precluded the filing of this modification application during the pendency of the prior modification application. As a result, Panasonic requested special temporary authorization ("STA") to operate the SPA terminal.[3] This application serves as Panasonic's request for long-term commercial authority to operate the SPA terminal and access Telstar 12V under the ESAA blanket license.

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[2] *See* File Nos. SES-MFS-20150609-00349, SES-AFS-20150820-00538 & SES-AFS-20160107-00003 (Call Sign E100089).

[3] *See* Application of Panasonic Avionics Corporation for a 60-Day Special Temporary Authorization To Operate Earth Stations Aboard Aircraft ("ESAA") Terminals in the Ku-Band, Call Sign E100089 (filed February 18, 2016) ("*60-day STA*") and Application of Panasonic Avionics Corporation for a 180-Day Special Temporary Authorization To Operate ESAA Terminals in the Ku-Band, Call Sign E100089 (filed February 18, 2016) ("*180-day STA*").

II. DISCUSSION

A. SPA Terminal Operations

1. The SPA Terminal and the eXConnect System

The SPA terminal is a single-panel variant of the dual-panel PPA terminal and utilizes the same proven antenna and positioner technologies as the PPA. Panasonic has developed the SPA terminal as a lighter, less-costly alternative that can be installed on smaller aircraft and that has performance characteristics equal to or better than the PPA terminal. The SPA terminal has been tested extensively pursuant to experimental authority granted by the Commission.[4]

As set forth in the enclosed application materials, the SPA terminal transmits within the same operational envelope as the PPA terminal and complies with the requirements set forth in 25.227 of the Commission's rules. In particular, the SPA terminal operates in accordance with the coordination agreements of proposed satellite points of communications, complies with the Commission's two-degree spacing policies, has a pointing accuracy of 0.2º and will automatically cease transmissions if point offset is 0.5º or greater, and otherwise will comply with the Panasonic ESAA license. Thus, grant of this modification application will not increase the potential for interference from eXConnect System operations in the United States.

Panasonic has fully described the eXConnect System in prior submissions and hereby incorporates by reference the technical showing regarding the control functionality and other

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[4] *See, e.g.,* Panasonic Avionics Corporation, Experimental Radio Station License, Call Sign WF2XMD, File No. 0184-EX-ML-2013; *see also* Letter from Carlos Nalda, Counsel to Panasonic Avionics Corporation, to Nnake Nweke, Chief, Experimental Licensing Branch (March 6, 2014).

operational characteristics submitted in connection with prior applications.[5] The Technical Appendix, FCC Form 312 and Schedule B contain relevant information relating to the technical parameters, antenna performance information, satellite operator certifications, radiation hazard analysis and general antenna specifications for the SPA terminal.[6] Furthermore, Panasonic certifies that SPA operations will be consistent with the terms, conditions and operational parameters that are currently authorized under Panasonic's ESAA License.

2. Satellite Points of Communication

In the instant modification application, Panasonic seeks authority for the SPA terminals to operate in the United States with the following four (4) points of communication and downlink frequency ranges.[7]

Table 1. Satellites and Downlink Frequencies (SPA)

Satellite	Orbital Location	Downlink Frequencies	ITU Region	Service To U.S.
AMC-16	85° W	11.7-12.2 GHz	2	Yes
Galaxy 16	99° W	11.7-12.2 GHz	2	Yes
Galaxy 17	91° W	11.7-12.2 GHz	2	Yes
Eutelsat 172A	172° E	10.95-11.2 GHz; 11.45-11.7 GHz	2	Yes

[5] *See*, *e.g.,* Panasonic Avionics Corporation, Radio Station Authorization, Call Sign E100089, File No. SES-LIC-20100805-00992 (granted August 31, 2011) and subsequent amendment and modification applications.

[6] Panasonic would note that because it is relying on satellite operator certifications to demonstrate compatibility with other Ku-band operations, it need not submit the full range of technical data required in the absence of such certifications under Section 25.227. Nonetheless, Panasonic is submitting substantial technical detail that provides the Commission and interested parties with a comprehensive understanding of the operational characteristics of the SPA terminal.

[7] Panasonic SPA terminals will operate in the uplink direction within the 14.0-14.5 GHz band and consistent with its coordination agreements with co-frequency users, the Commission's rules and applicable international requirements. Authority to operate the SPA terminal with other satellites in Panasonic's ESAA License is not sought at this time.

All of these proposed satellite points of communication are U.S.-licensed satellites with technical parameters that are well known to the Commission. The operators of each satellite identified above have reviewed the technical characteristics of Panasonic's SPA ESAA terminal operations and confirmed that such operations are consistent with their coordination agreements and will not result in unacceptable interference to other satellites within +/- 6 degrees of the subject satellite.[8]

3. SPA Terminal Performance

The SPA terminal fully complies with the provisions governing Ku-band AMSS operations embodied in Recommendation ITU-R M.1643, as well as applicable FCC rules and policies governing ESAA operations. Interference will be avoided principally by controlling off-axis EIRP spectral density of emissions along the GSO arc to protect adjacent FSS satellites. The fundamental operational characteristics of the eXConnect System have been approved by the Commission in the prior application proceedings and, as noted, Panasonic's serving satellite operators have confirmed that the proposed operations are consistent with the coordinated parameters of their satellites.

In addition, the SPA terminal operates in a manner that avoids interference to other co-frequency systems and services, and complies with the coordination agreements Panasonic has entered into with the National Science Foundation to protect radio astronomy operations and with NASA to protect TDRSS operations. The transmission and other principal operational characteristics of the SPA terminal are described more fully in the attached Technical Appendix.

[8] *See* Technical Appendix, II (Operator Certification Letters).

It is important to note that Panasonic's ESAA terminals transmit on individually assigned frequencies and time slots such that, regardless of the number of authorized terminals, only one terminal transmits at a time (*i.e.*, there is no aggregation). Thus, operation of the new SPA terminal will not increase the potential for interference from ESAAs communicating with the eXConnect System. The attached Technical Appendix provides a detailed description and test data on the operational characteristics of the SPA terminal.

B. Adding Telstar 12V as Point of Communication for PPA Terminal

Panasonic also seeks to modify its license by adding the Telstar 12V satellite as an authorized point of communication for its previously licensed PPA terminal. The technical characteristics of PPA terminal operations with Telstar 12V are provided in the associated FCC Form 312 and Schedule B, and in the attached Technical Appendix. Panasonic certifies the remaining information in support of its ESAA License, including the technical information previously submitted for the PPA terminal, has not changed.

1. PPA Terminal Satellite Point of Communication

Panasonic seeks to operate the PPA terminal with Telstar 12V (Call Sign S2933), a U.S.-licensed satellite operated by Skynet Satellite Corporation ("Skynet").[9] A summary of PPA operations with Telstar 12V are set for the below.[10]

[9] *See* Skynet Satellite Corporation, File No. SAT-LOA-20141010-00107 (Call Sign S2933) (granted Oct. 29, 2015).

[10] Panasonic PPA terminals will operate in the uplink direction within the 14.0-14.5 GHz band and consistent with its coordination agreements with co-frequency users, the Commission's rules and applicable international requirements.

Table 2. Satellite and Downlink Frequencies (PPA)

Satellite	Orbital Location	Downlink Frequencies	ITU Region	Service To U.S.
Telstar 12V	15° W	10.95-12.2 GHz	1	No

Although the Telstar 12V satellite is capable of providing service to large areas of Regions 1 and 2, including the United States, Panasonic notes that its seeks to access certain satellite beams located in Region 1 only. Utilizing Telstar 12V capacity, Panasonic will provide the "very latest in inflight Wi-Fi to carriers across the region."[11]

Telesat Canada, a company related to Skynet for Telstar 12V coordination and operation, has reviewed the technical characteristics of Panasonic's PPA ESAA terminal operations and confirmed that such operations are consistent with its coordination agreements and will not result in unacceptable interference to other satellites within +/- 6 degrees of Telstar 12V. Attached hereto is a letter confirming that the power levels associated with Panasonic's ESAA terminal operations with Telstar 12V have been coordinated with operators of adjacent satellites.[12]

III. GRANT OF THE REQUESTED MODIFICATION WILL SERVE THE PUBLIC INTEREST

A. SPA Terminal Public Interest Considerations

Grant of the requested modification will serve the public interest by enabling the introduction of the SPA terminal and provide direct benefits to U.S. consumers that will be able to access new in-flight mobile broad applications and will further enhance U.S. leadership in in-

[11] *See* Panasonic Press Release, *Panasonic Signs Multi-year Contract for High Throughput Capacity on Telesat's New Telstar 12 VANTAGE Satellite*, http://www.panasonic.aero/News/Articles/PanasonicSignsMultiyearContractforHighThrou.aspx (posted on February 15, 2016).

[12] *See* Technical Appendix, II. (Operator Certification Letters).

flight mobile broadband services. This, in turn, will enhance competition in the mobile broadband market by enabling additional commercial aircraft equipped with the eXConnect System to better compete with other carriers offering terrestrial-based services and with other airlines offering satellite-based connectivity.

Authorizing the new SPA terminal also will facilitate the introduction of this new ESAA terminal for more regularized commercial operations. Because the terminal is lighter-weight and lower-cost, it will strengthen the demand for in-flight connectivity services and will enhance their prospects for long-term success.

B. PPA Terminal Public Interest Considerations

Grant of this modification to add the Telstar 12V as an authorized point of communication for the PPA terminal on U.S.-registered aircraft will serve the public interest by extending the coverage and increasing the capacity of the global eXConnect network for U.S. airlines and their passengers. Telstar 12V will provide additional bandwidth for the eXConnect System and ensure that Panasonic has sufficient bandwidth to meet increasing demand and enhance the in-flight user experience within the relevant service area of the satellite.

IV. CONCLUSION

Based on the foregoing, Panasonic respectfully request that the Commission grant its request to modify its existing ESAA blanket license, Call Sign E100089, by adding the SPA terminal for ESAA operations in the United States and adding the Telstar 12V satellite as an authorized point of communication for the PPA terminal.

Approved by OMB
3060-0678

Date & Time Filed:
File Number: ---

FCC APPLICATION FOR SPACE AND EARTH STATION:MOD OR AMD - MAIN FORM FCC 312 MAIN FORM FOR OFFICIAL USE ONLY	FCC Use Only

APPLICANT INFORMATION

Enter a description of this application to identify it on the main menu:
Application to Modify Existing Ku-band ESAA Blanket License, Call Sign E100089

1-8. Legal Name of Applicant

Name:	Panasonic Avionics Corporation	Phone Number:	949-672-2364
DBA Name:		Fax Number:	
Street:	26200 Enterprise Way	E-Mail:	mark.defazio@panasonic.aero
City:	Lake Forest	State:	CA
Country:	USA	Zipcode:	92630 -
Attention:	Mark DeFazio		

9-16. Name of Contact Representative

Name:	Carlos M. Nalda	Phone Number:	571-332-5626
Company:	LMI Advisors	Fax Number:	
Street:	8601 James Creek Drive	E-Mail:	cnalda@lmiadvisors.com
City:	Springfield	State:	VA
Country:	USA	Zipcode:	22152-
Attention:	Mr. Carlos Nalda	Relationship:	Other

CLASSIFICATION OF FILING

17. Choose the button next to the classification that applies to this filing for both questions a. and b. Choose only one for 17a and only one for 17b.

- (●) a1. Earth Station
- ( ) a2. Space Station

- (N/A) b1. Application for License of New Station
- (N/A) b2. Application for Registration of New Domestic Receive-Only Station
- ( ) b3. Amendment to a Pending Application
- (●) b4. Modification of License or Registration
- b5. Assignment of License or Registration
- b6. Transfer of Control of License or Registration
- ( ) b7. Notification of Minor Modification
- (N/A) b8. Application for License of New Receive-Only Station Using Non-U.S. Licensed Satellite
- (N/A) b9. Letter of Intent to Use Non-U.S. Licensed Satellite to Provide Service in the United States
- (N/A) b10. Other (Please specify)
- (N/A) b11. Application for Earth Station to Access a Non-U.S.satellite Not Currently Authorized to Provide the Proposed Service in the Proposed Frequencies in the United States.

17c. Is a fee submitted with this application?
(●) If Yes, complete and attach FCC Form 159.

If No, indicate reason for fee exemption (see 47 C.F.R.Section 1.1114).
( ) Governmental Entity ( ) Noncommercial educational licensee
( ) Other(please explain):

17d.
Fee Classification CGB - Mobile Satellite Earth Stations

18. If this filing is in reference to an existing station, enter:
(a) Call sign of station:
E100089

19. If this filing is an amendment to a pending application enter both fields, if this filing is a modification please enter only the file number:
(a) Date pending application was filed:
(b) File number:
SESMFS2013093000845

TYPE OF SERVICE

20. NATURE OF SERVICE: This filing is for an authorization to provide or use the following type(s) of service(s): Select all that apply:

☐ a. Fixed Satellite
☐ b. Mobile Satellite
☐ c. Radiodetermination Satellite
☐ d. Earth Exploration Satellite
☐ e. Direct to Home Fixed Satellite
☐ f. Digital Audio Radio Service
☒ g. Other (please specify)
ESAA

21. STATUS: Choose the button next to the applicable status. Choose only one.
○ Common Carrier ◉ Non-Common Carrier

22. If earth station applicant, check all that apply.
☒ Using U.S. licensed satellites
☒ Using Non-U.S. licensed satellites

23. If applicant is providng INTERNATIONAL COMMON CARRIER service, see instructions regarding Sec. 214 filings. Choose one. Are these facilities:
○ Connected to a Public Switched Network ○ Not connected to a Public Switched Network ◉ N/A

24. FREQUENCY BAND(S): Place an 'X' in the box(es) next to all applicable frequency band(s).
☐ a. C-Band (4/6 GHz) ☒ b. Ku-Band (12/14 GHz)
☐ c.Other (Please specify upper and lower frequencies in MHz.)
Frequency Lower: Frequency Upper: (Please specify additional frequencies in an attachment)

TYPE OF STATION

25. CLASS OF STATION: Choose the button next to the class of station that applies. Choose only one.
○ a. Fixed Earth Station
○ b. Temporary-Fixed Earth Station
○ c. 12/14 GHz VSAT Network
○ d. Mobile Earth Station
○ e. Geostationary Space Station
○ f. Non-Geostationary Space Station
◉ g. Other (please specify) ESAA

26. TYPE OF EARTH STATION FACILITY:
◉ Transmit/Receive ○ Transmit-Only ○ Receive-Only ○ N/A
"For Space Station applications, select N/A."

PURPOSE OF MODIFICATION

27. The purpose of this proposed modification is to: (Place an 'X' in the box(es) next to all that apply.)

☐ a -- authorization to add new emission designator and related service
☐ b -- authorization to change emission designator and related service
☐ c -- authorization to increase EIRP and EIRP density
☐ d -- authorization to replace antenna
☒ e -- authorization to add antenna
☐ f -- authorization to relocate fixed station
☐ g -- authorization to change frequency(ies)
☐ h -- authorization to add frequency
☒ i -- authorization to add Points of Communication (satellites & countries)
☐ j -- authorization to change Points of Communication (satellites & countries)
☐ k -- authorization for facilities for which environmental assessment and radiation hazard reporting is required
☐ l -- authorization to change orbit location
☐ m -- authorization to perform fleet management
☐ n -- authorization to extend milestones
☐ o -- Other (Please specify)

ENVIRONMENTAL POLICY

28. Would a Commission grant of any proposal in this application or amendment have a significant environmental impact as defined by 47 CFR 1.1307? If YES, submit the statement as required by Sections 1.1308 and 1.1311 of the Commission's rules, 47 C.F.R. 1.1308 and 1.1311, as an exhibit to this application.A Radiation Hazard Study must accompany all applications for new transmitting facilities, major modifications, or major amendments. ○ **Yes** ◉ **No**

ALIEN OWNERSHIP Earth station applicants not proposing to provide broadcast, common carrier, aeronautical en route or aeronautical fixed radio station services are not required to respond to Items 30-34.

29. Is the applicant a foreign government or the representative of any foreign government?	○ Yes ◉ No
30. Is the applicant an alien or the representative of an alien?	○ Yes ○ No ◉ N/A
31. Is the applicant a corporation organized under the laws of any foreign government?	○ Yes ○ No ◉ N/A
32. Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	○ Yes ○ No ◉ N/A
33. Is the applicant a corporation directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	○ Yes ○ No ◉ N/A
34. If any answer to questions 29, 30, 31, 32 and/or 33 is Yes, attach as an exhibit an identification of the aliens or foreign entities, their nationality, their relationship to the applicant, and the percentage of stock they own or vote.	

BASIC QUALIFICATIONS

35. Does the Applicant request any waivers or exemptions from any of the Commission's Rules? If Yes, attach as an exhibit, copies of the requests for waivers or exceptions with supporting documents.	○ Yes ◉ No
36. Has the applicant or any party to this application or amendment had any FCC station authorization or license revoked or had any application for an initial, modification or renewal of FCC station authorization, license, or construction permit denied by the Commission? If Yes, attach as an exhibit, an explination of circumstances.	○ Yes ◉ No
37. Has the applicant, or any party to this application or amendment, or any party directly or indirectly controlling the applicant ever been convicted of a felony by any state or federal court? If Yes, attach as an exhibit, an explination of circumstances.	○ Yes ◉ No
38. Has any court finally adjudged the applicant, or any person directly or indirectly controlling the applicant, guilty of unlawfully monopolizing or attemptiing unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement or any other means or unfair methods of competition?If Yes, attach as an exhibit, an explanation of circumstances	○ Yes ◉ No
39. Is the applicant, or any person directly or indirectly controlling the applicant, currently a party in any pending matter referred to in the preceding two items? If yes, attach as an exhinit, an explanation of the circumstances.	○ Yes ◉ No
40. If the applicant is a corporation and is applying for a space station license, attach as an exhibit the names, address, and citizenship of those stockholders owning a record and/or voting 10 percent or more of the Filer's voting stock and the percentages so held. In the case of fiduciary control, indicate the beneficiary(ies) or class of beneficiaries. Also list the names and addresses of the officers and directors of the Filer.	
41. By checking Yes, the undersigned certifies, that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. *See 47 CFR 1.2002(b) for the meaning of "party to the application" for these purposes.*	◉ Yes ○ No
42a. Does the applicant intend to use a non-U.S. licensed satellite to provide service in the United States? If Yes, answer 42b and attach an exhibit providing the information specified in *47 C.F.R. 25.137, as appropriate*. If No, proceed to question 43.	○ Yes ◉ No
42b. What administration has licensed or is in the process of licensing the space station? If no license will be issued, what administration has coordinated or is in the process of coordinating the space station?	

43. Description. (Summarize the nature of the application and the services to be provided). Panasonic seeks Commission authority to modify its existing ESAA license by adding the SPA terminal to the license and adding the Telstar 12V as an authorized point of communication for its previously licensed PPA terminal.

43a. Geographic Service Rule Certification By selecting A, the undersigned certifies that the applicant is not subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25.	◉ A
By selecting B, the undersigned certifies that the applicant is subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25 and will comply with such requirements.	○ B
By selecting C, the undersigned certifies that the applicant is subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25 and will not comply with such requirements because it is not feasible as a technical matter to do so, or that, while technically feasible, such services would require so many compromises in satellite design and operation as to make it economically unreasonable. A narrative description and technical analysis demonstrating	○ C

this claim are attached.

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CERTIFICATION

The Applicant waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. The applicant certifies that grant of this application would not cause the applicant to be in violation of the spectrum aggregation limit in 47 CFR Part 20. All statements made in exhibits are a material part hereof and are incorporated herein as if set out in full in this application. The undersigned, individually and for the applicant, hereby certifies that all statements made in this application and in all attached exhibits are true, complete and correct to the best of his or her knowledge and belief, and are made in good faith.

44. Applicant is a (an): (Choose the button next to applicable response.)

- ○ Individual
- ○ Unincorporated Association
- ○ Partnership
- ◉ Corporation
- ○ Governmental Entity
- ○ Other (please specify)

45. Name of Person Signing	46. Title of Person Signing
Mark DeFazio	Manager, GCS Regulatory and Business Operations

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).

SATELLITE EARTH STATION AUTHORIZATIONS
FCC Form 312 - Schedule B:(Technical and Operational Description)

FOR OFFICIAL USE ONLY

Location of Earth Station Site

E1: Site Identifier:	PPA	E5. Call Sign:	E100089		
E2: Contact Name	Mission Control Center	E6. Phone Number:	425-415-9800		
E3. Street:	26200 Enterprise Way	E7. City:	Lake Forest		
		E8. County:	Orange		
E4. State	CA	E9. Zip Code	92630		
E10. Area of Operation:		U.S. and International			
E11. Latitude:	0 ° 0 ' 0.0 "				
E12. Longitude:	0 ° 0 ' 0.0 "				
E13. Lat/Lon Coordinates are:		○ NAD-27	○ NAD-83	◉ N/A	
E14. Site Elevation (AMSL):		0.0 meters			

E15. If the proposed antenna(s) operate in the Fixed Satellite Service (FSS) with geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a) and (b) as demonstrated by the manufacturer's qualification measurement? If NO, provide as a technical analysis showing compliance with two-degree spacing policy.	○ Yes ◉ No ○ N/A
E16. If the proposed antenna(s) do not operate in the Fixed Satellite Service (FSS), or if they operate in the Fixed Satellite Service (FSS) with non-geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a2) and (b) as demonstrated by the manufacturer's qualification measurements?	○ Yes ○ No ◉ N/A
E17. Is the facility operated by remote control? If YES, provide the location and telephone number of the control point.	◉ Yes ○ No
E18. Is frequency coordination required? If YES, attach a frequency coordination report as	○ Yes ◉ No
E19. Is coordination with another country required? If YES, attach the name of the country(ies) and plot of coordination contours as	○ Yes ◉ No
E20. FAA Notification - (See 47 CFR Part 17 and 47 CFR part 25.113(c)) Where FAA notification is required, have you attached a copy of a completed FCC Form 854 and/or the	

FAA's study regarding the potential hazard of the structure to aviation? FAILURE TO COMPLY WITH 47 CFR PARTS 17 AND 25 WILL RESULT IN THE RETURN OF THIS APPLICATION.	○ Yes ◉ No

POINTS OF COMMUNICATION

Satellite Name:OTHER | OTHER | If you selected OTHER, please enter the following:	
E21. Common Name: Telstar 12 Vantage	E22. ITU Name: Telstar 12 Vantage
E23. Orbit Location: 15	E24. Country: USA

Satellite Name:OTHER | OTHER | If you selected OTHER, please enter the following:	
E21. Common Name:	E22. ITU Name:
E23. Orbit Location:	E24. Country: USA

POINTS OF COMMUNICATION (Destination Points)

E25. Site Identifier: PPA	
E26. Common Name:Telstar 12 Vantage	E27. Country: USA

ANTENNA

Site ID	E28. Antenna Id	E29. Quantity	E30. Manufacturer	E31. Model	E32. Antenna Size	E41/42. Antenna Gain Transmint and/or Recieve(____dBi at _____GHz)
PPA	PPA	2000	Panasonic	Aura LE	0.89	37.0 dBi at 14.250

E28. Antenna Id	E33/34. Diameter Minor/Major(meters)	E35. Above Ground Level(meters)	E36. Above Sea Level(meters)	E37. Building Height Above Ground Level(meters)	E38. Total Input Power at antenna flange(Watts)	E39. Maximum Antenna Height Above Rooftop(meters)	E40. Total EIRP for al carriers(dBW)
PPA	0.0/0.0	0.0	0.0	0.0	16.0	0.0	48.0

FREQUENCY

E28. Antenna Id	E43/44. Frequency Bands(MHz)	E45. T/R Mode	E46. Antenna Polarization(H,V,L,R)	E47. Emission Designator	E48. Maximum EIRP per Carrier(dBW)	E49. Maximum ERIP Density per Carrier(dBW/4kHz)
PPA	10950 12200	R	Horizontal and Vertical	1M20KG7D	0.0	0.0
E50. Modulation and Services PSK						
PPA	10950 12200	R	Horizontal and Vertical	54M0KG7D	0.0	0.0
E50. Modulation and Services PSK						
PPA	14000 14500	T	Horizontal and Vertical	500KG7D	36.6	16.42
E50. Modulation and Services BPSK, Spread Spectrum						
PPA	14000 14500	T	Horizontal and Vertical	9M00KG7D	48.0	15.27
E50. Modulation and Services BPSK, Spread Spectrum						

FREQUENCY COORDINATION

E28. Antenna Id	E51. Satellite Orbit Type	E52/53. Frequency Limits(MHz)	E54/55. Range of Satellite Arc Eastern/Western Limit	E56. Earth Station Azimuth Angle Eastern Limit	E57. Antenna Elevation Angle Eastern Limit	E58. Earth Station Azimuth Angle Western Limit	E59. Antenna Elevation Angle Western Limit	E60. Maximum EIRP Density toward the Horizon(dBW/4kHz)
			/					

REMOTE CONTROL POINT LOCATION

E61. Call Sign N/A NOTE: Please enter the callsign of the controlling station, not the callsign for which this application is being filed.	E66. Phone Number 1-425-415-9800
E62. Street Address 26200 Enterprise Way	

E63. City	E68. County	E67/68. State/Country	E64. Zip Code
Lake Forest	Orange	CA/ USA	92630

SATELLITE EARTH STATION AUTHORIZATIONS

FCC Form 312 - Schedule B:(Technical and Operational Description)

FOR OFFICIAL USE ONLY

Location of Earth Station Site				
E1: Site Identifier:	SPA	E5. Call Sign:	E100089	
E2: Contact Name	Mission Control Center	E6. Phone Number:	425-415-9800	
E3. Street:	26200 Enterprise Way	E7. City:	Lake Forest	
		E8. County:	Orange	
E4. State	CA	E9. Zip Code	92630	
E10. Area of Operation:		U.S. and International		
E11. Latitude:	0 ° 0 ' 0.0 "			
E12. Longitude:	0 ° 0 ' 0.0 "			
E13. Lat/Lon Coordinates are:		○ NAD-27	○ NAD-83	◉ N/A
E14. Site Elevation (AMSL):		0.0 meters		

E15. If the proposed antenna(s) operate in the Fixed Satellite Service (FSS) with geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a) and (b) as demonstrated by the manufacturer's qualification measurement? If NO, provide as a technical analysis showing compliance with two-degree spacing policy.	○ Yes ◉ No ○ N/A
E16. If the proposed antenna(s) do not operate in the Fixed Satellite Service (FSS), or if they operate in the Fixed Satellite Service (FSS) with non-geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a2) and (b) as demonstrated by the manufacturer's qualification measurements?	○ Yes ○ No ◉ N/A
E17. Is the facility operated by remote control? If YES, provide the location and telephone number of the control point.	◉ Yes ○ No
E18. Is frequency coordination required? If YES, attach a frequency coordination report as	○ Yes ◉ No
E19. Is coordination with another country required? If YES, attach the name of the country(ies) and plot of coordination contours as	○ Yes ◉ No
E20. FAA Notification - (See 47 CFR Part 17 and 47 CFR part 25.113(c)) Where FAA notification is required, have you attached a copy of a completed FCC Form 854 and/or the FAA's study regarding the potential hazard of the structure to aviation? FAILURE TO COMPLY WITH 47 CFR PARTS 17 AND 25 WILL RESULT IN THE RETURN OF THIS APPLICATION.	○ Yes ◉ No

POINTS OF COMMUNICATION

Satellite Name:GALAXY 17 (S2715) | GALAXY 17 | 91 W.L. If you selected OTHER, please enter the following:	
E21. Common Name:	E22. ITU Name:
E23. Orbit Location:	E24. Country:

Satellite Name:GALAXY 16 | GALAXY 16 | 99 W.L. If you selected OTHER, please enter the following:	
E21. Common Name:	E22. ITU Name:
E23. Orbit Location:	E24. Country:

Satellite Name:EUTELSAT 172A(S2610) | EUTELSAT172A(S2610) | 172 E. L. If you selected OTHER, please enter the following:	
E21. Common Name:	E22. ITU Name:
E23. Orbit Location:	E24. Country:

Satellite Name:AMC-16 | AMC 16 | 85 W.L. If you selected OTHER, please enter the following:	
E21. Common Name:	E22. ITU Name:
E23. Orbit Location:	E24. Country:

POINTS OF COMMUNICATION (Destination Points)

E25. Site Identifier: SPA	
E26. Common Name:	E27. Country: USA

E25. Site Identifier: SPA	
E26. Common Name:	E27. Country: USA
E25. Site Identifier: SPA	
E26. Common Name:	E27. Country: USA
E25. Site Identifier: SPA	
E26. Common Name:	E27. Country: USA

ANTENNA

Site ID	E28. Antenna Id	E29. Quantity	E30. Manufacturer	E31. Model	E32. Antenna Size	E41/42. Antenna Gain Transmint and/or Recieve(____dBi at _____GHz)
SPA	SPA	1000	Panasonic	SPA	0.949	35.0 dBi at 14.250

E28. Antenna Id	E33/34. Diameter Minor/Major(meters)	E35. Above Ground Level(meters)	E36. Above Sea Level(meters)	E37. Building Height Above Ground Level(meters)	E38. Total Input Power at antenna flange(Watts)	E39. Maximum Antenna Height Above Rooftop(meters)	E40. Total EIRP for al carriers(dBW)
SPA	0.0/0.0	0.0	0.0	0.0	10.0	0.0	45.0

FREQUENCY

E28. Antenna Id	E43/44. Frequency Bands(MHz)	E45. T/R Mode	E46. Antenna Polarization(H,V,L,R)	E47. Emission Designator	E48. Maximum EIRP per Carrier(dBW)	E49. Maximum ERIP Density per Carrier(dBW/4kHz)
SPA	10950 11200	R	Horizontal and Vertical	54M0KG7D	0.0	0.0
E50. Modulation and Services QPSK, 8PSK, 16APSK						
SPA	14000 14500	T	Horizontal and Vertical	500KG7D	22.28	42.46
E50. Modulation and Services QPSK, 8PSK, 16APSK						
SPA	10950 11200	R	Horizontal and Vertical	1M20KG7D	0.0	0.0
E50. Modulation and Services QPSK, 8PSK, 16APSK						
SPA	11450 11700	R	Horizontal and Vertical	1M20KG7D	0.0	0.0
E50. Modulation and Services QPSK, 8PSK, 16APSK						
SPA	11450 11700	R	Horizontal and Vertical	54M0KG7D	0.0	0.0
E50. Modulation and Services QPSK, 8PSK, 16APSK						
SPA	11700 12200	R	Horizontal and Vertical	1M20KG7D	0.0	0.0
E50. Modulation and Services QPSK, 8PSK, 16APSK						
SPA	11700 12200	R	Horizontal and Vertical	36M0KG7D	0.0	0.0
E50. Modulation and Services QPSK, 8PSK, 16APSK						
SPA	11700 12200	R	Horizontal and Vertical	54M0KG7D	0.0	0.0
E50. Modulation and Services QPSK, 8PSK, 16APSK						
SPA	14000 14500	T	Horizontal and Vertical	9M00KG7D	22.28	45.0
E50. Modulation and Services QPSK, 8PSK, 16APSK						

FREQUENCY COORDINATION

E28. Antenna Id	E51. Satellite Orbit Type	E52/53. Frequency Limits(MHz)	E54/55. Range of Satellite Arc Eastern/Western Limit	E56. Earth Station Azimuth Angle Eastern Limit	E57. Antenna Elevation Angle Eastern Limit	E58. Earth Station Azimuth Angle Western Limit	E59. Antenna Elevation Angle Western Limit	E60. Maximum EIRP Density toward the Horizon(dBW/4kHz)
SPA	Geostationary	10950 11200	85.0/172.0	90.0	10.0	270.0	10.0	0.0
	Geostationary	11450 11700	85.0/172.0	90.0	10.0	270.0	10.0	0.0
	Geostationary	11700 12200	85.0/172.0	90.0	10.0	270.0	10.0	0.0
	Geostationary	14000 14500	85.0/172.0	90.0	10.0	270.0	10.0	-8.657

REMOTE CONTROL POINT LOCATION

E61. Call Sign N/A NOTE: Please enter the callsign of the controlling station, not the callsign for which this application is being filed.			E66. Phone Number 1-425-415-9800
E62. Street Address 26200 Enterprise Way			
E63. City Lake Forest	E68. County Orange	E67/68. State/Country CA/ USA	E64. Zip Code 92630

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