

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

In the Matter of
Application of Panasonic Avionics)
Corporation for Special Temporary Authority)
To Permit Operation of Up to 20) Call Sign E100089
Technically Identical Aeronautical Mobile-) File No.
Satellite Service (“AMSS”) Aircraft Earth)
Stations (“AESs”) in the 14.0-14.5 GHz and)
11.7-12.2 GHz Frequency Bands)

APPLICATION FOR SPECIAL TEMPORARY AUTHORITY

Mark DeFazio
Manager, GCS Regulatory
and Business Operations
Panasonic Avionics Corporation
26200 Enterprise Way
Lake Forest, CA 92630

Carlos M. Nalda
Squire Sanders
1200 19th Street, NW
Suite 300
Washington, DC 20036
(202) 626-6659

Counsel for Panasonic Avionics Corporation

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In the Matter of
Application of Panasonic Avionics Corporation for Special Temporary Authority to Permit Operation of Up to 20 Technically Identical Aeronautical Mobile-Satellite Service (“AMSS”) Aircraft Earth Stations (“AESs”) in the 14.0-14.5 GHz and 11.7-12.2 GHz Frequency Bands)
)
) Call Sign E100089
) File No.
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APPLICATION FOR SPECIAL TEMPORARY AUTHORIZATION

Panasonic Avionics Corporation (“Panasonic”), pursuant to Section 25.120(b)(3) of the Commission’s Rules, 47 C.F.R. § 25.120(b)(3), seeks 60-day special temporary authority (“STA”) to permit commercial operation of a second aircraft earth station (“AES”) type with its licensed “eXConnect” aeronautical mobile-satellite service (“AMSS”) system¹ during the pendency of a license modification application filed concurrently with this STA application.² The new AES, the Aura LE terminal, will operate in the continental United States with the Galaxy 17 satellite in accordance with the terms of the *Panasonic AMSS Order*, prior Commission precedent governing U.S.-licensed AMSS systems, and regulatory requirements designed to protect co-frequency services from harmful interference.

¹ Panasonic Avionics Corporation, Radio Station Authorization, Call Sign E100089, File No. SES-MOD-20111128-01386 and other associated file numbers (“*Panasonic AMSS 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*, 26 FCC Rcd 12557 (Rel. Aug. 31, 2011) (“*Panasonic AMSS Order*”).

² Application of Panasonic Avionics Corporation To Modify AMSS License To Permit Operation of Up to 2000 Technically Identical Aeronautical Mobile-Satellite Service (“AMSS”) Aircraft Earth Stations (“AESs”) in the 14.0-14.5 GHz and 10.7-12.75 GHz Frequency Bands, Call Sign E100089, File No. SES-MFS-20120913-00818, IBFS Submission No. IB2012002134 (filed September 13, 2012) (“*Modification Application*”).

This STA application also requests a minor correction to the *Panasonic AMSS License*. Specifically, although Panasonic amended its original blanket license application to increase the number of authorized MELCO from 15 to 50 (*see* File No. SES-AMD-20110325-00358), the *Panasonic AMSS License* was issued for 15 terminals. The number of MELCO terminals was not a material issue in the original application proceeding and satellite operator coordination was not numerically limited, so Panasonic believes that the lower number was inadvertently retained from the original application. Panasonic requests that this issue be addressed on an interim basis through the requested STA and on a long-term basis through the associated license modification.

I. INTRODUCTION

The eXConnect System provides in-flight broadband connectivity to aircraft passengers and crew in the United States and around the world. The Aura LE is Panasonic's next-generation AES antenna designed to supplement the previously licensed MELCO antenna. Panasonic hereby incorporates by reference the technical information associated with the Commission's prior grant of AMSS operating authority, which fully details the operational characteristics of the eXConnect System.³ This application focuses on the technical aspects of Aura LE operations for the limited period requested herein.

In addition to a number of foreign airline customers, Panasonic is pleased to inform the Commission that U.S. airlines, including a fleet-wide deployment for United Airlines, will utilize the eXConnect System and the Aura LE antenna. Initial operation of the Aura LE terminal onboard a limited number of United Airlines domestic flights is contemplated in the coming

³ *See* n.1, *supra*.

months.⁴ Panasonic therefore seeks a 60-day STA to permit these U.S.-registered aircraft to utilize the next-generation Aura LE terminal to access the licensed eXConnect System on a limited basis during the pendency of its modification application to add the terminal to its commercial license (filed concurrently with this STA request). Panasonic expressly acknowledges that any action on the requested STA will not affect the Commission's ultimate determination with respect to the underlying modification application.

II. GRANT OF 60-DAY SPECIAL TEMPORARY AUTHORITY WILL SERVE THE PUBLIC INTEREST

Panasonic is currently operating the older generation MELCO AES onboard Lufthansa aircraft on a commercial basis in U.S. airspace under blanket license authority granted by the Commission.⁵ Panasonic also operates the Aura LE antenna on a limited basis onboard foreign aircraft traversing U.S. airspace, and on a full commercial basis onboard foreign aircraft serving other regions of the world.⁶

United Airlines soon plans to introduce interim eXConnect service onboard aircraft serving domestic routes in the continental United States. During this introductory period, Panasonic will work with the airline to ensure stable operations, study demand for the service, and fine-tune network loading and related factors.

⁴ The precise timing of introduction is dependent on final equipment check-out and other factors, but we understand that the schedule has been accelerated from the prior target date given the desire of the airline to commence interim operations and work through implementation details. Panasonic will provide additional information on the timing of interim Aura LE operations as it becomes available.

⁵ See n. 1, *supra*.

⁶ Aura LE operations are fully authorized by regulatory authorities of Panasonic's customer airlines and throughout the regions in which it operates.

Although Panasonic maintains limited market study authority for Aura LE operations, it believes that a commercial STA authority may be more appropriate to support initial operations onboard United Airlines. Specifically, given the potential uncertainty regarding operation under limited market study authority and the unique customer relationships in the AMSS context (*e.g.*, Panasonic's customer is the airline rather than the end-user passenger), it may be prudent to rely on commercial STA authority in the context of interim service onboard U.S. airlines.

In the still nascent AMSS market and in the absence of AMSS service rules, Panasonic is submitting the instant STA request out of an abundance of caution if such commercial STA authority is deemed necessary or appropriate to support the introduction of service on U.S. airlines while Panasonic's AMSS license modification application remains pending.

A. Aura LE Antenna Performance

The next-generation Aura LE was developed to optimize performance of the eXConnect System. It is a dual-panel, mechanically steered antenna designed for installation and operation onboard aircraft. The basic characteristics of the Aura LE terminal are summarized in Table 1. The Aura LE has been fully certified for aviation safety, is currently in operation onboard foreign airlines and is superior in performance to the presently authorized MELCO terminal.⁷

⁷ See generally Attachment 1 (Antenna Specifications).

Table 1. Aura LE Characteristics

Antenna Dimensions	34.7 inches (0.88 m) 6.6 inches height (0.17 m)
Type of Antenna	Dual-panel waveguide fed phased array
SSPA Rated Output Power	16 watts
Bandwidth	10.70 GHz to 12.75 GHz 14.0 GHz to 14.5 GHz
Transmit Gain	38 dBi
EIRP	48 dBW
Transmit Polarization	Horizontal or Vertical
Receive G/T	10 to 14 dB/K
Transmit Azimuth Beamwidth	1.5 degrees
Transmit Elevation Beamwidth	4 degrees

The Aura LE fully complies with the provisions governing Ku-band AMSS operations embodied in Recommendation ITU-R M.1643, as well as other applicable rules and policies governing such operations. With respect to U.S. operations, the Aura LE terminal was previously examined by the Commission and authorized in experimental Call Signs WD9XQT and WF2XMD.⁸

Consistent with Commission policy and precedent, interference will be avoided by controlling the off-axis EIRP spectral density emissions along the GSO arc to protect adjacent FSS satellites, and by coordination, frequency avoidance and/or exclusion zones with respect to other users of the Ku-band. A detailed technical description of the Aura LE and an overview of eXConnect control functionality are set forth in the attached Technical Appendix.⁹ Panasonic highlights certain operational characteristics of the Aura LE below.

⁸ See File No. 0544-EX-ST-2008 (ground testing); File No. 0281-EX-PL-2010 (in-flight operations).

⁹ See Attachment 2 (Technical Appendix).

1. Antenna Pointing

Pointing for the Aura LE is accomplished via mechanical steering of the antenna and uses the aircraft attitude data (*i.e.*, yaw, roll, pitch and heading vector), together with location of the terminal (latitude, longitude, and altitude) to calculate the command vectors. This data, available from the ARINC 429 bus, is used in conjunction with the satellite coordinates to yield continuously updated steering commands for the antenna elevation, azimuth, and polarization. A local inertial sensor package placed on the antenna base plate itself provides high rate antenna attitude sensing, which compensates for possible aircraft inertial navigation system (“INS”) errors caused by airframe deformation and data latency.

The pointing error of the Aura LE will be less than 0.2 degrees 1-sigma, which is consistent with interference-free operations.¹⁰ Pointing error will be monitored and emissions will be inhibited within 100 milliseconds if the pointing error ever exceeds 0.35 degrees. Panasonic has taken a conservative approach in setting the off-axis value for muting transmission and including Aura LE pointing offset and skew in setting maximum permissible transmit powers and skew angles such that even if mispointed 0.35 degrees (the point at which the antenna automatically mutes transmissions), the Aura LE will not exceed permissible main beam off-axis EIRP spectral density levels.

2. Antenna Gain Patterns and Out-of-Band Emissions

Antenna gain patterns for the Aura LE are included in the attached Technical Appendix. Azimuth patterns are plotted against the 25.209(a)(2) antenna pattern mask. Elevation patterns

¹⁰ Operational and test flight data confirms these conclusions regarding pointing accuracy. Indeed, in a recent assessment, there were no instances above 10,000 feet where the measured error exceeded 0.2 degrees peak (excluding beam switches, of course, which involve antenna repointing to a new satellite while muted). Panasonic collected data every 5 milliseconds and analyzed over 1.5 million data points. Our analysis shows that the standard deviation (1-sigma) for pointing error is 0.02 degrees.

are plotted against the 47 C.F.R. §25.209(a)(4) antenna pattern mask. Because the Aura LE is a dual-panel antenna with one panel behind the other, its antenna gain patterns change at lower elevation angles due to blockage from the front panel.

The Aura LE antenna complies with the out of band emissions limitations in 47 C.F.R. §25.202(f).

3. Antenna Control

The attached Technical Appendix includes detailed information on other AES antenna control characteristics, including: (i) satellite access techniques; (ii) AES commissioning and log-in; (iii) automatic beam selection; (iv) return link power and frequency control; and (v) fault management. With respect to the last issue, the Aura LE ceases transmission in the event of the following conditions:

- loss of ARINC-429 data from the aircraft's inertial reference system ("IRS");
- invalid status message from the IRS;
- loss of the AES's 10 MHz reference signal;
- antenna pointing error exceeds 0.35 degrees, where the antenna ceases transmission within 100 ms and will not resume transmission until the pointing error is within 0.2 degrees; or
- any critical fault detected by the AES.

Furthermore, any event that results in the loss of modem lock to the AES downlink will cause the modem to cease all transmission.

4. Link Budgets

Example edge of coverage link budgets for the Aura LE antenna forward and return links in the U.S. coverage area are shown in the attached Technical Appendix. Link performance is similar for other satellite points of communication. As shown by the link budgets, the Aura LE is able to close the links with positive margin.

B. Protection of Co-Frequency Spectrum Users and Compliance with FCC Operational Requirements

Consistent with the *Panasonic AMSS Order*, the Aura LE employs a tracking algorithm that is resistant to capturing and tracking adjacent satellite signals and is capable of inhibiting its own transmission in the event it detects unintended satellite tracking. It is also monitored and controlled by a ground-based NOC, which monitors operation of each AES to determine if it is malfunctioning. The Aura LE self-monitors and automatically ceases transmission on detecting an operational fault that could cause harmful interference to an FSS network. The Aura LE is also able to receive “enable transmission” and “disable transmission” commands from the NOC, and will cease transmission immediately after receiving a “parameter change” command from the NOC.¹¹

Pursuant to paragraph 28(k) of the *Panasonic AMSS Order*, Panasonic logs records of aircraft and AES operating characteristics every 30 seconds to assist in addressing any potential interference event. This information is obtained from the ARINC 429 bus (aircraft data) and onboard modem (AES data). An example series of logs from and operating aircraft is set forth in Table 2.

¹¹ *Panasonic AMSS Order* at ¶26.

Table 2: Data Logging¹²

time	lat	long	alt	pitch	roll	heading	eirp	track erraz	track errel1	track errel2	sat long	txfreq	txbw	txdatarate	ant tx	mod tx
7/17/12 3:04:44	47.53	-118.88	39002	2.78	0.43	95.08	38.67	-0.065	0.004	-0.006	-91	14334.7	1666000	358743	1	1
7/17/12 3:05:13	47.53	-118.8	38994	2.92	0.16	95.55	38.58	-0.018	0.003	0.007	-91	14334.7	1666000	358743	1	1
7/17/12 3:05:42	47.53	-118.72	38998	3.01	0.05	95.88	38.64	-0.009	0.000	-0.001	-91	14334.7	1666000	358743	1	1
7/17/12 3:06:13	47.53	-118.63	39005	2.88	0.31	96.09	38.52	-0.009	0.008	-0.001	-91	14334.7	1666000	358743	1	1
7/17/12 3:06:44	47.53	-118.54	38997	2.98	0.77	95.83	38.58	0.018	0.006	-0.004	-91	14334.7	1666000	358743	1	1
7/17/12 3:07:12	47.53	-118.46	38997	3.08	0.75	95.83	38.77	-0.039	0.009	0.013	-91	14334.7	1666000	358743	1	1
7/17/12 3:07:43	47.52	-118.37	39002	3.02	0.46	96.12	-3	-0.026	-0.015	-0.010	-91	14334.7	1666000	358743	1	0
7/17/12 3:08:15	47.52	-118.28	38999	3.03	0.91	96.36	-3	0.030	0.003	-0.009	-91	14334.7	1666000	358743	1	0
7/17/12 3:08:43	47.52	-118.2	39008	2.74	0.53	96.67	-3	-0.008	-0.003	-0.016	-91	14334.7	1666000	358743	1	0

The information will assist Panasonic in identifying and addressing any interference incidents that may occur. There have been no incidents of interference since the eXConnect System commenced operations. Other operational provisions necessary for protection of other co-frequency services are discussed below. Other operational provisions necessary for protection of other co-frequency services are discussed below.

¹² Panasonic would note the extremely small azimuth pointing offsets, demonstrating the precise accuracy of Aura LE antenna pointing, and two elevation offset entries (associated with independently pointed front and rear panels of the Aura LE). The reported transmit frequency is the center frequency of the in-route (return link/AES-to-hub) group. Also note the cessation of transmission (EIRP and mod tx columns), which occurred in the context of AES repointing to another serving satellite.

1. Protection of GSO FSS Systems

Control of off-axis EIRP spectral density is essential to protect adjacent satellites operating in the Ku-band. The eXConnect System will control the off-axis EIRP spectral density generated by a single terminal so that it is no greater than is accepted for other Ku-band terminals operating with FSS satellites. This is consistent with FCC licensing conditions in the AMSS context, as well as the Commission's ESV and VMES rules and international regulations.

To the extent that any adjacent satellite operator experiences harmful interference from Aura LE terminal operations, Panasonic will cease terminal transmissions immediately. In addition, if another co-frequency, co-coverage GSO FSS satellite commences operation at a location within six degrees of one of Panasonic's serving satellites, Panasonic will cease operations absent a coordination agreement or demonstration that it will not cause harmful interference to the new satellite.

An example off-axis EIRP spectral density plot is shown in Figures 1 and 2, below. Panasonic has taken the conservative approach of including the Aura LE's maximum pointing offset and skew angles in setting maximum transmit power levels. Thus, the terminal's main lobe off-axis EIRP spectral density remains well below the U.S. off-axis EIRP spectral density limit, shown in the solid red line, even at maximum pointing offset.¹³

¹³ The minor excursion at more than 40° off-axis in Figure 2 is consistent with the Commission's rules. *See, e.g.*, 47 C.F.R. § 25.222(a)(1)(i)(A).

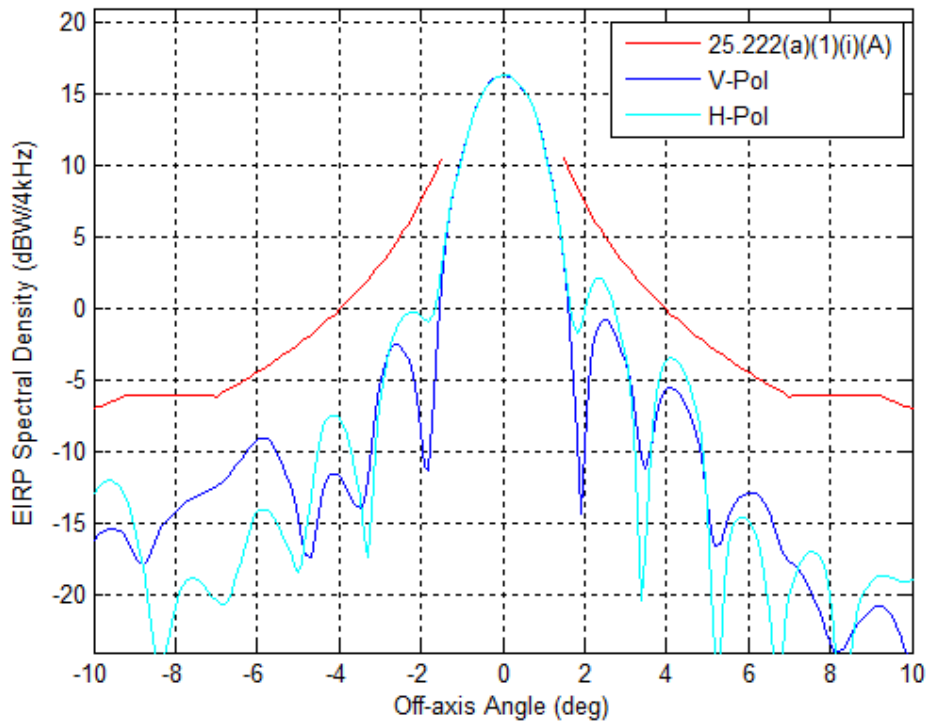


Figure 1. Maximum Off-axis EIRP Spectral Density of the Aura LE Antenna (0°-10° Off-Axis)

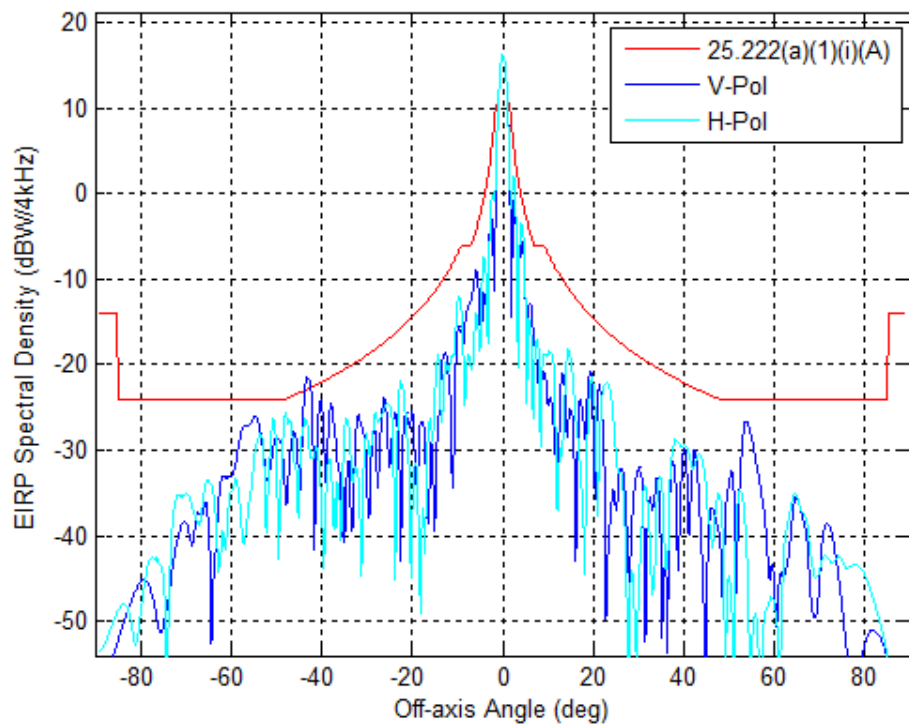


Figure 1. Maximum Off-axis EIRP Spectral Density of the Aura LE Antenna (0°-90° Off-Axis)

It should be emphasized that the example in Figures 1 and 2 is an extreme case: worst-case power, edge of coverage, worst-case skew, etc. (14.25 GHz, 35° skew angle, 45° elevation angle in San Diego, CA), and reaching the limits in this way will only occur very rarely and briefly if at all.

Finally, and importantly, Panasonic's satellite operator has coordinated the operation of the Aura LE antenna in the United States and potentially affected operators within +/- 6 degrees of the Galaxy 17 satellite have accepted the operation of the Aura LE terminal.¹⁴

2. Protection of Future NGSO FSS Systems

The Aura LE exceeds the off-axis EIRP spectral density values set forth in the Commission's rules in directions away from the geostationary arc. This separate off-axis EIRP spectral density mask was intended to protect Ku-band NGSO FSS systems. However, no systems of this type are presently planned or are operating. Panasonic will enter into coordination arrangements with any future Ku-band NGSO FSS system to protect such systems from interference from Aura LE transmissions.

3. Protection of Terrestrial Fixed Services

Panasonic has examined current spectrum use in the 14.0-14.5 GHz band and has determined that there are no active FCC-licensed terrestrial services with which its proposed operations could conflict.

¹⁴ See Attachment 3 (Coordination Information). The same coordination information supported Commission grant of the *Panasonic AMSS License* for the MELCO antenna.

4. Protection of Radio Astronomy Services

Within the United States, Panasonic will limit aggregate PFD in the 14.47-14.5 GHz band when in the vicinity of U.S. RAS sites.¹⁵ Panasonic has entered into a coordination agreement with the National Science Foundation obligating Panasonic to limit aggregate PFD to specified levels.

5. Protection of Space Research Services

Panasonic recognizes the utilization of the frequency band from 14.0-14.05 GHz (and the possible use of the band from 14.05-14.2 GHz) allocated to the Space Research Service (SRS), including the National Aeronautics and Space Administration (“NASA”) Tracking and Data Relay Satellite System (“TDRSS”) for space research operations. Panasonic has entered into a coordination agreement with NASA regarding the protection of current and future TDRSS sites.¹⁶

C. Public Interest Considerations

Grant of the requested STA will serve the public interest by enabling the interim introduction of eXConnect connectivity on U.S. airlines for limited domestic operations using the Aura LE antenna, and will avoid potential disruption associated with Aura LE operations onboard foreign aircraft. Furthermore, there is no potential for interference from these interim operation pursuant to STA since the Aura LE terminal is already operating with the Galaxy 17 satellite on aircraft located in U.S. and international airspace.

¹⁵ -221 dBW/m²/Hz (for protection of Green Bank, Arecibo and Socorro); -189 dBW/m²/Hz (for protection of all other RAS sites).

¹⁶ Outside the United States, where necessary, Panasonic will avoid or cease AES emissions on frequencies used by the SRS systems when operating in the vicinity of SRS sites.

U.S. airline passengers will benefit from near-term access in-flight connectivity supported by the improved Aura LE terminal during the initial introduction of domestic eXConnect service onboard United Airlines. This, in turn, will enhance competition in the mobile telecommunications market in the United States by enabling United States aircraft equipped with the new Aura LE terminal to compete with carriers offering terrestrial-based and other aeronautical connectivity services.

Limited commercial authority for domestic operation of the Aura LE will also enable early implementation of international services onboard U.S. aircraft by allowing Panasonic and its airline customers to work through technical issue during interim domestic operations, which will allow U.S. airlines to better compete with foreign carriers offering in-flight broadband over eXConnect and other aeronautical connectivity systems. It also ensures that there is no potential disruption to current Aura LE operations onboard a small number of foreign aircraft, including those of Lufthansa and several other foreign airlines, that intermittently traverse U.S. airspace.

Grant of the associated request to increase the number of authorized MELCO terminals will avoid potential disruption of foreign airline operations. In this case, formally implementing the previously requested increase in the number of MELCO terminals from 15 to 50 for operations onboard Lufthansa aircraft located in U.S. airspace will confirm full commercial authority for the maximum number of MELCO-equipped aircraft.

Importantly, the increase in the number of MELCO terminals and limited STA authority for the Aura LE terminal will not increase the potential for interference from the eXConnect System. Both of these AES terminals transmit on individually assigned frequencies and time slots, so regardless of the number of authorized terminals only one terminal transmits at any given time and frequency (there is no aggregation). In addition, the new Aura LE terminal has

improved operational characteristics over the older generation MELCO terminal and operated in the United States and globally for more than two years without a single reported case of interference. Aura LE operations include access to the Galaxy 17 satellite from foreign-registered aircraft located in U.S. and international airspace. Similarly allowing U.S. aircraft interim access to the eXConnect System using the Aura LE antenna will not increase the potential for interference and will not adversely affect other users of the band.

Finally, failure to grant the STA will curtail near-term use of the improved terminal and prevent U.S. airline passengers from benefitting from U.S. innovation in aeronautical connectivity services. It will also delay implementation of these important offerings on U.S. airlines that must compete domestically and internationally with carriers that can offer aeronautical connectivity as an additional amenity to their passengers.

Panasonic again acknowledges that any action on the requested STA will not affect the Commission's ultimate determination with respect to the underlying modification application filed concurrently with this STA request. Panasonic also acknowledges and accepts that any authorization granted by the Commission will be conditioned upon compliance with any additional conditions or requirements concerning operation of its AMSS system adopted in the Commission's pending Ku-band AMSS rulemaking proceeding.¹⁷

III. WAIVER REQUEST

Panasonic seeks a waiver of the allocation table to permit the Aura LE terminal to receive transmissions in the FSS space-to-earth band at 11.7-12.2 GHz. All downlink transmissions to Panasonic's AES terminals operate within the space station authorizations and coordinated limits

¹⁷ *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 No. 05-20, Notice of Proposed Rulemaking, 20 FCC Rcd 51 (2005).

for downlink EIRP spectral density of the Galaxy 17 and Telstar 14 satellites, as agreed by the operators of adjacent satellites within +/- 6 degrees. Panasonic will accept interference from lawful operation of any station in the 11.7-12.2 GHz band in accordance with the U.S. Table of Frequency Allocations, 47 C.F.R. § 2.106. In addition, Panasonic will immediately terminate eXConnect operations upon notification that such operations are not permitted under the terms of a coordination agreement with, or are causing harmful interference to, any lawfully operating radio system in the 11.7-12.2 GHz band in conformance with the U.S. Table of Frequency Allocations.

The Commission has previously granted such a waiver to Panasonic to operate the MELCO AES antenna, as well as to other Ku-band AMSS licensees. In so doing, the Commission has concluded that the purpose of the rules would not be undermined because potential for interference from these AES receive operations is *de minimis*, particularly in the context of coordination with potentially affected operators. The Commission should reach the same conclusion here. Given the unique circumstances of this application, there is ample ground for the Commission to waive this and any other rules or policies necessary to authorize the limited, temporary Aura LE operations proposed herein.

IV. CONCLUSION

In view of the foregoing, extraordinary circumstances exist for the grant of the instant STA application to the extent necessary to support interim Aura LE operations.¹⁸ The Aura LE has superior performance to the currently licensed MELCO AES terminal, Panasonic has fully coordinated Aura LE operations with potentially affected satellite operators, and the Aura LE is

¹⁸ See 47 C.F.R. § 25.120(b)(1).

already operating internationally and on a limited basis in U.S. airspace. Panasonic has also filed an application to modify its commercial blanket license authority to add the Aura LE antenna.

The authority requested herein will enable further introduction of the Aura LE terminal on an interim basis during the pendency of Panasonic's commercial license application. In particular, near-term initial introduction of the Aura LE terminal on U.S. airlines will enhance competition in the U.S. broadband services market and better position U.S. airlines to compete domestically and internationally. Grant of STA authority, including appropriate correction of the number of authorized MELCO terminals, will also enhance regulatory certainty associated with eXConnect operations in the United States.

In the absence of any public interest harm, and given the significant public interest benefits associated with limited, near-term introduction of the next-generation Aura LE terminal -- including enhanced competition and early access to advanced aeronautical connectivity offerings -- grant of the requested STA is consistent with past Commission precedent and will serve the public interest. Accordingly, Panasonic respectfully requests that the Commission grant a 60-day STA to permit operation of the Aura LE with the eXConnect system.

Technical Certificate

I, Paul Sarraffe, hereby certify that I am the technically qualified person responsible for the preparation of the technical discussion contained in this Application for Special Temporary Authority and associated Technical Appendix, that I am familiar with Part 25 of the Commission's Rules (47 C.F.R. Part 25), and that I have either prepared or reviewed the technical information submitted in this application and found it to be complete and accurate to the best of my knowledge and belief.

By: Paul R Sarraffe

Paul Sarraffe
Panasonic Avionics Corporation
eXConnect Systems Engineering

September 13, 2012