Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
Application of Panasonic Avionics	)	Call Sign WF2XMD
Corporation To Modify Experimental	)	File No. _____
License To Replace Two Satellites as	)	
Authorized Points of Communication	)	
	)	

APPLICATION FOR EXPERIMENTAL LICENSE MODIFICATION

Panasonic Avionics Corporation ("Panasonic"), licensee of the "eXConnect" Ku-band aeronautical mobile-satellite system ("AMSS") ("eXConnect System"), seeks to modify its experimental license[1] by replacing two satellites as authorized points of communication on its existing authorization. Panasonic seeks to replace two currently-authorized satellites which are no longer utilized for eXConnect operations, Horizons-1 and Galaxy 19, with two other satellites, Satmex 8 and SES-6, with which Panasonic must conduct testing and demonstration for FAA certification and other purposes.

The proposed operations are consistent with the coordinated parameters of the requested satellites, the Federal Communication Commission's ("Commission" or "FCC") two-degree spacing rules and the Commission's rules and policies recently adopted for Ku-

[1] *See* ELS File No. 0210-EX-RR-2013, Call Sign WF2XMD (granted July 12, 2011). Panasonic subsequently modified this authorization to confirm compliance with ITU regulations and other applicable regulatory requirements. ELS File No. 0143-EX-ML-2012 (granted August 21, 2012). Panasonic then renewed this authorization. ELS File No. 0210-EX-RR-2013 (granted June 7, 2013) ("Experimental License").

band earth stations aboard aircraft ("ESAAs").[2] For the reasons described herein, grant of the proposed experimental license modification would serve the public interest.

I. DESCRIPTION OF EXPERIMENTAL OPERATIONS

Panasonic currently is authorized under its experimental license to operate twenty aircraft earth stations ("AESs") of two types – ten Mitsubishi Electronics Company ("MELCO") reflector terminals and ten Aura LE terminals[3] – with the following four satellite points of communication: Horizons-1, Telstar 14, Galaxy 17 and Galaxy 19.[4] Panasonic requires the ability to access Satmex 8 and SES-6 satellites points of communications to address certification testing and integration issues associated with operations onboard foreign-registered aircraft on flights to and from the United States. Access to Satmex 8 and SES-6 would substitute for Horizons-1 and Galaxy 19; therefore, there is no increase in the potential for interference because Panasonic seeks authority to communicate using the same number of terminals with the same number of satellite points of communication.

Concurrent herewith, Panasonic is filing an application to modify its commercial aeronautical mobile-satellite service ("AMSS") blanket license to add Satmex 8 and SES-6, as

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[2] *See 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 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] The Aura LE terminal, previously manufactured by EMS Technologies, is now manufactured by Panasonic Avionics. The design and operational characteristics of the terminal have not changed.

[4] *See* Experimental License at 1.

well as other satellites, as authorized points of communication.[5] However, during the pendency of that application, there is a near-term need to access the proposed satellites for limited certification and network integration purposes.

Panasonic will conduct operations with Satmex 8 and SES-6 consistent with its existing experimental authority[6] and incorporates by reference the technical information submitted in that proceeding. That technical information, as well as the detailed information filed in connection with Panasonic's recent Authorization[7] and pending Modification Application,[8] demonstrates the non-interfering operations of the eXConnect terminals and consistency with Ku-band AES licensing policies. Other than substituting access to Satmex 8 and SES-6 for Horizons 1 and Galaxy-19 as proposed herein, Panasonic seeks no changes to its existing experimental authority.

[5] *See* 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-20130930-00845 (filed Sept. 30, 2013) ("Modification Application").

[6] *Id.*

[7] Radio Station Authorization to Panasonic Avionics Corporation, File No. SES-MFS-20120913-00818, Call Sign: E100089 (July 24, 2013) (granting authority to Panasonic to operate up to 50 (.68 cm antennas) MELCO remote terminals in CONUS, AK, HI and U.S. Territories and operate up to 2000 (.89 M. antennas) remote AURA LE remote terminals) ("Authorization"); Radio Station Authorization to Panasonic Avionics Corporation, File No. SES-AFS-20130220-00189, Call Sign: E100089 (July 24, 2013) (granting authority to Panasonic to operate up to 15 (.68 cm antennas) MELCO remote terminals in CONUS, AK, HI and U.S. Territories and operate up to 2000 (.89 M. antennas) remote AURA LE remote terminals) ("Authorization"); Satellite Communications Services Information re: Actions Taken, *Public Notice*, Report No. SES-01573 (July 31, 2013).

[8] Extensive technical information is available in the record of Panasonic's pending commercial license modification. *See* Modification Application at Technical Appendix.

II. SATELLITE POINTS OF COMMUNICATION

Panasonic seeks authority for the Aura LE terminal to communicate with Satmex 8 and SES-6 satellites, and for the MELCO terminal to communicate with SES-6. In addition, Panasonic seeks to remove Horizons-1 and Galaxy 19 points of communication from its experimental license because Panasonic no longer utilizes these two satellites for eXConnect operations. Panasonic, therefore, need not conduct further demonstration or certification testing with these satellites.

Panasonic proposes to modify its existing experimental license by listing the following satellites as authorized points of communication:

- Galaxy 17 at 91°W
- Telstar 14R at 63°W
- Satmex 8 at 116.8°W
- SES-6 at 40.5°W

Panasonic will access these satellites within parameters consistent with its existing experimental license. Accordingly, grant of the requested license modification would not increase the potential for interference from Panasonic's experimental operations.

Satmex 8 is a Mexico-licensed satellite included on the Commission's Permitted Space Station List for Fixed Satellite Service ("FSS").[9] SES-6, which successfully launched in June 2013,[10] is a Netherlands-licensed space station included on the Permitted Space Station List for

[9] Satelites Mexicanos S. A. de C. V. Petition for Declaratory Ruling to add the Satmex 8 satellite to the Permitted Space Station List, File No. SAT-PPL-20120823-00140 (Call Sign S2873) (granted Dec 6, 2012).

[10] Letter from Daniel C.H. Mah, Regulatory Counsel for New Skies Satellites B.V., to Marlene H. Dortch, Sec'y of the Fed. Commc'ns Comm'n (June 13, 2013) *in* File No. SAT-PPL-2012-0717-00117 (Call Sign S2870).

FSS.[11] In support of this application, Panasonic is submitting letters from the operators of Satmex 8 and SES-6 to Panasonic confirming that the proposed Ku-band AMSS operations are consistent with each operators' coordination agreements and will not result in unacceptable interference to other satellite operations.[12]

eXConnect terminals have operated with satellites around the world without a single reported case of interference. Panasonic does not seek to extend the term of its existing authorization or add to the number of terminals.[13] Panasonic seeks to ensure its authority to address certification, integration and implementation issues while it actively pursues full commercial licensing.[14]

Given that the subject terminals installed on foreign aircraft already communicate with the above-referenced satellites outside U.S. airspace without causing interference, no material concerns would be raised by adding these satellites to Panasonic's existing experimental license authorization. Panasonic's track record of non-interfering operations further establish that authority for the proposed experimental operations can be granted expeditiously as requested herein.

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[11] New Skies Satellites B.V., Request for U.S. Market Access for SES-6, Petition, File No. SAT-PPL-2012-0717-00117 (Call Sign S2870) (granted July 17, 2013); Policy Branch Information Actions Taken, *Public Notice*, Report No. SAT-00962, File No. SAT-PPL-2012-0717-00117 (Call Sign S2870) (July 19, 2013).

[12] *See* Attached Technical Appendix.

[13] Because the eXConnect network is a TDMA-based system, Panasonic would note that only one terminal ever transmits at one particular time.

[14] *See* Modification Application.

IV. CONCLUSION

Grant of the license modification application would enable Panasonic to address certification and implementation issues and further develop its eXConnect System for U.S. and foreign-registered aircraft operating on flights to and from the United States. Panasonic respectfully requests that the Commission expeditiously grant the proposed experimental license modification in order to facilitate the continued implementation of in-flight connectivity offerings to passengers and crews onboard foreign-registered aircraft.

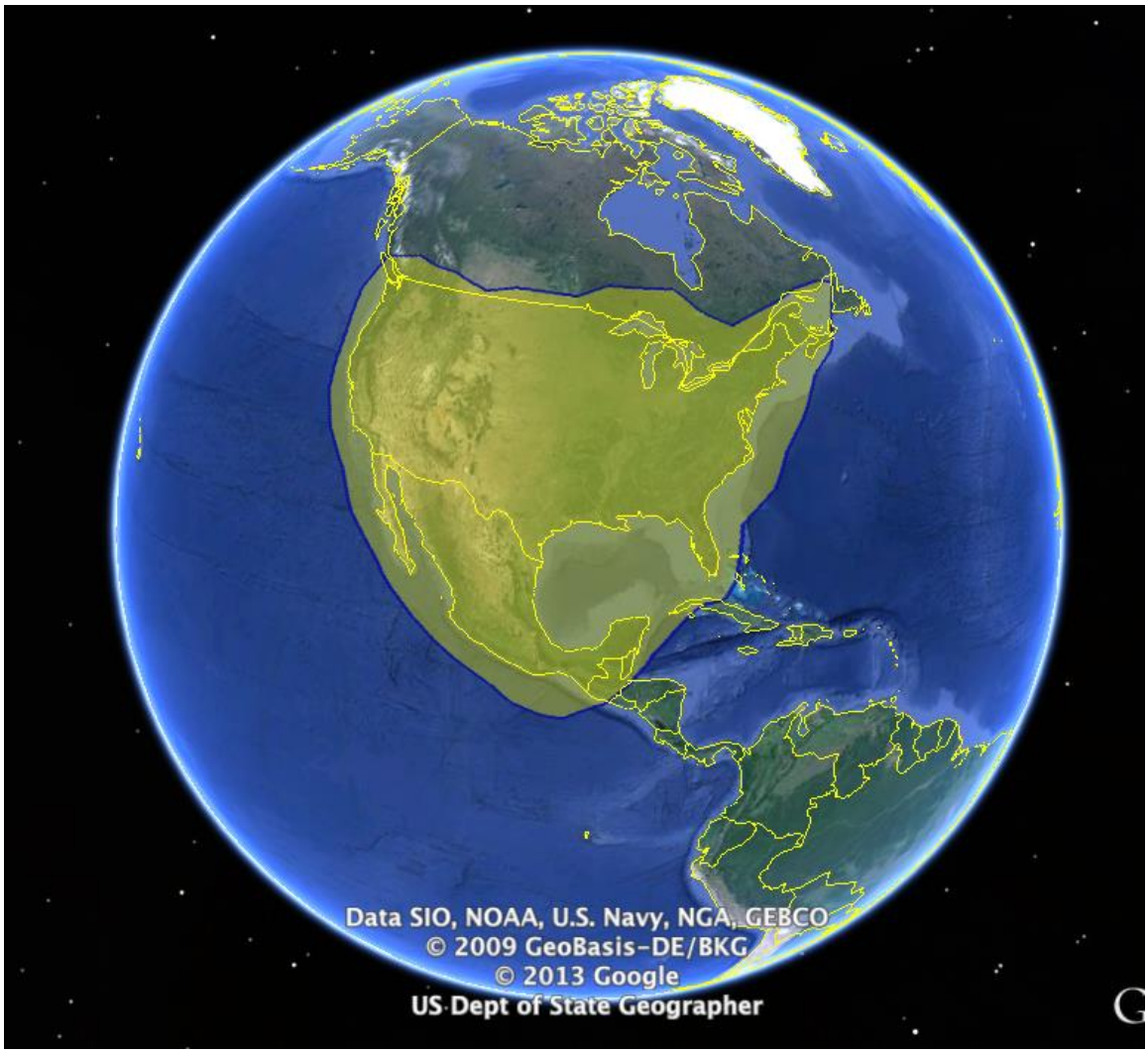
ATTACHMENT 1

Technical Appendix

Technical Appendix

Contents Summary

Satmex 8
Coverage Map



Satmex 8
Link Budget

Forward Link Budget		
eXConnect Terminal		
Site	Maine	
Antenna Type	AURA LE	
Lat	44.5	deg
Lon	-69.2	deg
EIRP max	42.9	dBW
G/T	10.1	dB/K
Satellite		
Name	SM8	
Longitude	-116.8	deg
Hub Earth Station		
Site	Brewster	
Lat	48.1	deg
Lon	-119.8	deg
EIRP max	77.0	dBW
G/T	37.4	dB/K
Signal		
Waveform	DVB-S2 iDX2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.83	
Overhead Rate	0.93	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	1.56	bps/Hz
Data Rate	4.67E+07	bps
Information Rate (Data + Overhead)	5.00E+07	bps
Symbol Rate	3.00E+07	Hz
Chip Rate (Noise Bandwidth)	3.00E+07	Hz
Occupied Bandwidth	3.60E+07	Hz
Power Equivelent Bandwidth	3.60E+07	Hz
C/N Threshold	5.6	dB
Uplink		
Frequency	14.250	GHz
Back off	3.9	dB
EIRP Spectral Density	34.3	dBW/4kHz
Slant Range	38211	km
Space Loss, Ls	207.2	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	1.0	dB
Radome, Lr	0.0	dB
Transponder G/T @ Hub	4.0	dB/K
Thermal Noise, C/No	97.6	dBHz
C/(No+Io)	97.1	dBHz
Satellite		
Flux Density	-90.5	dBW/m2
SFD @ Hub	-88.2	dBW/m2
Small Signal Gain (IBO/OBO)	1.3	dB
OBO	1.0	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	51.7	dBW
Transponder Sat. EIRP @ Terminal	50.9	dBW
DL PSD Limit	14.5	dBW/4kHz
DL PSD @ Beam Peak	11.9	dBW/4kHz
Carrier EIRP @ Beam Peak	50.7	dBW
Carrier EIRP @ Terminal	49.9	dBW
Slant Range	39503	km
Space Loss, Ls	205.9	dB
Pointing Loss, Lpnt	0.1	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	82.6	dBHz
C/(No+Io)	82.4	dBHz
End to End		
End to End C/(No+Io)	82.2	dBHz
Implementation Loss	1.5	dB
End to End C/N w/ Imp Loss	5.9	dB
Link Margin	0.3	dB

Return Link Budget		
eXConnect Terminal		
Site	Maine	
Antenna Type	AURA LE	
Lat	44.5	deg
Lon	-69.2	deg
EIRP max	42.9	dBW
G/T	10.1	dB/K
Satellite		
Name	SM8	
Longitude	-116.8	deg
Hub Earth Station		
Site	Brewster	
Lat	48.1	deg
Lon	-119.8	deg
EIRP max	77.0	dBW
G/T	37.4	dB/K
Signal		
Waveform	iDirect	
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	2	
Coding Rate	0.67	
Overhead Rate	0.72	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.24	bps/Hz
Data Rate	1.61E+06	bps
Information Rate (Data + Overhead)	2.22E+06	bps
Symbol Rate	3.34E+06	Hz
Chip Rate (Noise Bandwidth)	6.67E+06	Hz
Occupied Bandwidth	8.00E+06	Hz
Power Equivelent Bandwidth	8.34E+04	Hz
C/N Threshold	-1.2	dB
Uplink		
Frequency	14.250	GHz
Back off	0.0	dB
EIRP Spectral Density	10.7	dBW/4kHz
Slant Range	39503	km
Space Loss, Ls	207.5	dB
Pointing Loss, Lpnt	0.1	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
Transponder G/T @ Terminal	5.0	dB/K
Thermal Noise, C/No	68.9	dBHz
C/(No+Io)	68.4	dBHz
Satellite		
Flux Density	-120.2	dBW/m2
SFD @ Terminal	-89.2	dBW/m2
Small Signal Gain (IBO/OBO)	1.3	dB
OBO	29.7	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	51.7	dBW
Transponder Sat. EIRP @ Hub	48.9	dBW
DL PSD Limit	14.5	dBW/4kHz
DL PSD @ Beam Peak	-10.2	dBW/4kHz
Carrier EIRP @ Beam Peak	22.0	dBW
Carrier EIRP @ Hub	19.3	dBW
Slant Range	38211	km
Space Loss, Ls	205.7	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	1.2	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	78.3	dBHz
C/(No+Io)	77.8143	dBHz
End to End		
End to End C/(No+Io)	67.9	dBHz
Implementation Loss	0.0	dB
End to End C/N w/ Imp Loss	-0.3	dB
Link Margin	0.9	dB

SATMEX
REACHING HIGHER

September 26, 2013

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

Re: Certification of Conformance with Satellite Operator Coordination Agreements

Dear Mr. DeFazio:

You have requested that Satelites Mexicanos S. A. de C.V. ("Satmex") confirm it has reviewed the technical characteristics of Panasonic Avionics Corporation's ("Panasonic") Ku-band aeronautical mobile-satellite service ("AMSS") operations with the Satmex 8 satellite at 116.8° W.L., using the "North American" beam of this satellite. You have further requested that Satmex certify that such operations are consistent with Satmex's coordination agreements and will not result in unacceptable interference to other satellite operations within +/- 6 degrees of Satmex 8.

As set forth in materials submitted to the U.S. Federal Communications Commission ("FCC"), the basic characteristics of the Panasonic phased-array ("PPA") aircraft earth station ("AES") terminal (referred to previously as the "Aura LE" terminal) for operation with the Satmex 8 satellite include:

Antenna Dimensions	0.89 m (0.17m in height)
Type of Antenna	Dual panel waveguide feed phased array
SSPA Rated Output Power	16 watts
Bandwidth	Receive: 11.7 GHz to 12.2 GHz Transmit: 14.0 GHz to 14.5 GHz
Transmit Gain	37 dBi at 14.25 GHz
EIRP	48 dBW
Transmit Polarization	Linear: Horizontal or Vertical
Receive G/T	10 to 14 dB/K
Transmit Azimuth Beamwidth	1.5 degrees
Transmit Elevation Beamwidth	4 degrees
Pointing Accuracy	0.2 degrees (3-sigma, automatic cut-off at 0.35 degrees offset)

SATMEX
REACHING HIGHER

We understand that the PPA AES terminal is designed to comply with the FCC's rules and policies governing Ku-band earth stations aboard aircraft ("ESAAs") adopted in new Section 25.227 of the rules.[1] In addition, the PPA AES terminal has operated without interference under various FCC experimental and commercial authorizations.[2]

The PPA AES terminal avoids interference to other satellite operations by limiting off-axis EIRP spectral density towards orbital slots 118.7° and 114.9° to no more than 27 dBW/ MHz, through various means, including: (i) limiting transmit power spectral density by controlling the transmit power of the terminal and using spread spectrum technology (selecting appropriate carrier bandwidths and spread factors); (ii) controlling the off-axis gain of the antenna along the GSO by inhibiting transmissions when the skew angle exceeds a specified threshold; and (iii) controlling pointing error and inhibiting transmissions when the pointing offset exceeds the specified threshold of 0.35 degrees.

When operating as described in the materials submitted to the FCC and with the associated off-axis EIRP density envelope for the Satmex 8 satellite (which is consistent with the Commission's two-degree spacing requirements), Panasonic's proposed operations comply with the off-axis EIRP density level requirements necessary to protect potentially affected satellites up to and including 6° off-axis from the Satmex 8 satellite (including the satellites in applicable coordination agreements) and it is not expected to cause unacceptable interference into these adjacent satellites. The skew angle is constantly monitored by the antenna control system and the aircraft transmission will be muted in the event the skew angle of +/-35° is exceeded.

Satmex understands that the maximum downlink satellite EIRP density of 13.0 dBW/4kHz, the operational level of the Ku-band AMSS network operated by Panasonic, is routinely used without causing unacceptable interference to adjacent satellite operations.

Satmex understands that the maximum uplink off-axis EIRP spectral density limit of -50 + (29– 25 * Log10(theta)) dBW/Hz with a maximum uplink EIRP of 48dBW up to a 1668ksps carrier, where theta is the off-axis angle, is the operational level of the Ku-band AMSS network operated by Panasonic, and is routinely used without causing unacceptable interference to adjacent satellite operations.

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[1] 47 C.F.R. § 25.227.

[2] *See* File Nos. SES-LIC-20100805-00992, SES-AMD-20100914-01163, SES-AMD-20101115-01432, SES-AMD-20110325-00358; SES-AFS-20110405-00402, SES-STA-20110104-00005 (Call Sign: E100089) (granted Aug. 31, 2011); ELS File Nos. 0210-EX-RR-2013 (granted July 12, 2011), 0143-EX-ML-2012 (granted August 21, 2012), 0210-EX-RR-2013 (granted June 7, 2013) (Call Sign WF2XMD).

SATMEX
REACHING HIGHER

In view of the foregoing and consultations between Satmex engineering staff and Panasonic, Satmex hereby confirms the following:

1. Satmex is familiar with the technical characteristics of the PPA AES terminal.

2. The proposed operations of the PPA AES terminal with the Satmex 8 satellite have the potential to receive harmful interference from adjacent satellite networks that may be unacceptable.

3. The power density levels and associated off-axis gain performance of its PPA AES terminal that Panasonic provided to Satmex are consistent with the existing coordination agreements between Satmex and the adjacent satellite systems within 6° of orbital separation from the Satmex 8 satellite.

4. Pursuant to the international regulation for the AMSS services, Satmex will include the power-density levels and associated off-axis gain performance of its PPA AES terminal of the proposed operations in all future coordination agreements for the Satmex 8 satellite.

5. Operation of the PPA AES terminal will not cause unacceptable interference into other operations on Satmex 8, or adjacent satellites, and are otherwise in accordance with Satmex's technical requirements and applicable operational limitations, including coordinated off-axis EIRP density levels.

Please let me know if you require any additional information regarding Panasonic's operation of the Ku-band PPA AMSS terminal with the Satmex 8 satellite.

Sincerely,

Hector Fortis
SATMEX
International and Regulatory Affairs

Satmex 8

Emissions Designators

Satellite and Beam Name	Tx/Rx	Emission Designator	Bandwdith (Hz)	Max EIRP per Carrier (dBW)	Max EIRP Density Per Carrier (dBW/4kHz)
Satmex-8	Tx	500KG7D	500,000	34.70	14.52
Satmex-8	Tx	9M00G7D	9,000,000	47.25	14.52
Satmex-8	Rx	1M20G7D	1,200,000		
Satmex-8	Rx	36M0G7D	36,000,000		

SES-6
Coverage Map

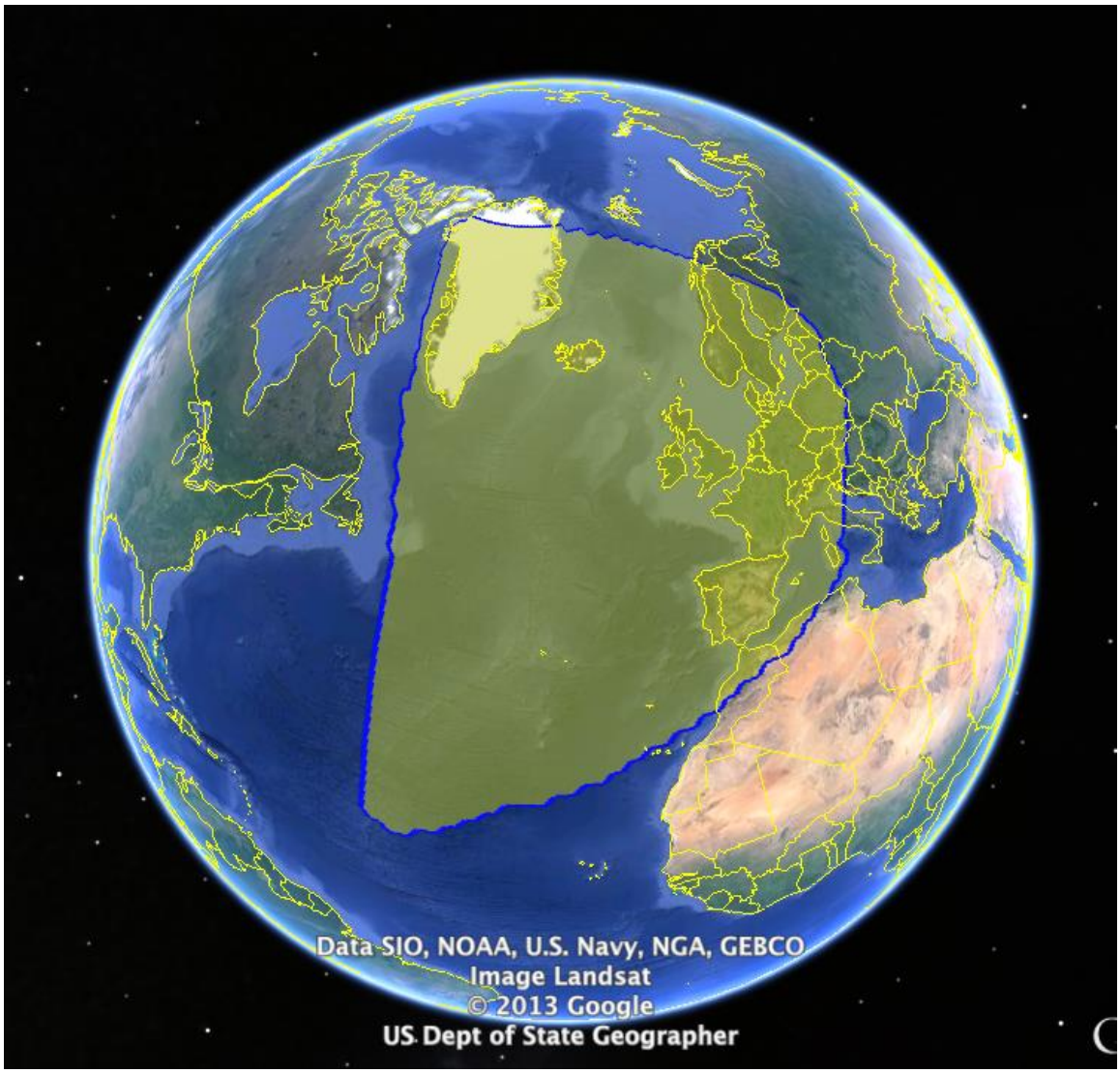

Figure 1: SES-6 AE Coverage

Figure 2: SES-6 AW Coverage

SES-6
Link Budget

Forward Link Budget		
eXConnect Terminal		
Antenna Type	AURA LE	
Lat	63.7	deg
Lon	-18.4	deg
EIRP max	42.5	dBW
G/T	10.0	dB/K
Satellite		
Name	SES-6	
Longitude	-40.5	deg
Hub Earth Station		
Site	Cologne	
Lat	50.863	deg
Lon	6.848	deg
EIRP max	80.0	dBW
G/T	35.0	dB/K
Signal		
Waveform	DVB-S2 iDX2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.67	
Overhead Rate	0.94	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	1.26	bps/Hz
Data Rate	5.66E+07	bps
Information Rate (Data + Overhead)	6.00E+07	bps
Symbol Rate	4.50E+07	Hz
Chip Rate (Noise Bandwidth)	4.50E+07	Hz
Occupied Bandwidth	5.40E+07	Hz
Power Equivelent Bandwidth	7.20E+07	Hz
C/N Threshold	3.5	dB
Uplink		
Frequency	14.250	GHz
Back off	1.7	dB
EIRP Spectral Density	37.8	dBW/4kHz
Slant Range	39858	km
Space Loss, Ls	207.4	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	2.5	dB
Radome, Lr	0.0	dB
Transponder G/T @ Hub	1.0	dB/K
Thermal Noise, C/No	98.1	dBHz
C/(No+Io)	97.6	dBHz
Satellite		
Flux Density	-87.2	dBW/m2
SFD @ Hub	-87.2	dBW/m2
Small Signal Gain (IBO/OBO)	0.0	dB
OBO	0.0	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	49.2	dBW
Transponder Sat. EIRP @ Terminal	49.0	dBW
DL PSD Limit	13.0	dBW/4kHz
DL PSD @ Beam Peak	8.7	dBW/4kHz
Carrier EIRP @ Beam Peak	49.2	dBW
Carrier EIRP @ Terminal	49.0	dBW
Slant Range	39969	km
Space Loss, Ls	205.4	dB
Pointing Loss, Lpnt	0.1	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	82.1	dBHz
C/(No+Io)	81.9	dBHz
End to End		
End to End C/(No+Io)	81.8	dBHz
Implementation Loss	1.5	dB
End to End C/N w/ Imp Loss	3.7	dB
Link Margin	0.2	dB

Return Link Budget		
eXConnect Terminal		
Antenna Type	AURA LE	
Lat	63.7	deg
Lon	-18.4	deg
EIRP max	42.5	dBW
G/T	10.0	dB/K
Satellite		
Name	SES-6	
Longitude	-40.5	deg
Hub Earth Station		
Site	Cologne	
Lat	50.863	deg
Lon	6.848	deg
EIRP max	80.0	dBW
G/T	35.0	dB/K
Signal		
Waveform	iDirect	
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	4	
Coding Rate	0.66	
Overhead Rate	0.75	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.12	bps/Hz
Data Rate	8.27E+05	bps
Information Rate (Data + Overhead)	1.10E+06	bps
Symbol Rate	1.67E+06	Hz
Chip Rate (Noise Bandwidth)	6.67E+06	Hz
Occupied Bandwidth	8.00E+06	Hz
Power Equivelent Bandwidth	6.09E+05	Hz
C/N Threshold	-3.5	dB
Uplink		
Frequency	14.250	GHz
Back off	0.0	dB
EIRP Spectral Density	10.3	dBW/4kHz
Slant Range	39969	km
Space Loss, Ls	207.4	dB
Pointing Loss, Lpnt	0.1	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
Transponder G/T @ Terminal	3.0	dB/K
Thermal Noise, C/No	66.6	dBHz
C/(No+Io)	66.1	dBHz
Satellite		
Flux Density	-120.7	dBW/m2
SFD @ Terminal	-89.2	dBW/m2
Small Signal Gain (IBO/OBO)	3.0	dB
OBO	28.5	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	49.2	dBW
Transponder Sat. EIRP @ Hub	47.0	dBW
DL PSD Limit	13.0	dBW/4kHz
DL PSD @ Beam Peak	-11.5	dBW/4kHz
Carrier EIRP @ Beam Peak	20.7	dBW
Carrier EIRP @ Hub	18.5	dBW
Slant Range	39858	km
Space Loss, Ls	205.4	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	2.6	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	74.0	dBHz
C/(No+Io)	73.1616	dBHz
End to End		
End to End C/(No+Io)	65.3	dBHz
Implementation Loss	0.0	dB
End to End C/N w/ Imp Loss	-2.9	dB
Link Margin	0.6	dB

Figure 1: SES-6 AE Link Budget

Forward Link Budget		
eXConnect Terminal		
Antenna Type	AURA LE	
Lat	74.4	deg
Lon	-71.9	deg
EIRP max	42.5	dBW
G/T	10.0	dB/K
Satellite		
Name	SES-6	
Longitude	-40.5	deg
Hub Earth Station		
Site	Cologne	
Lat	50.86	deg
Lon	6.848	deg
EIRP max	74.5	dBW
G/T	35.0	dB/K
Signal		
Waveform	DVB-S2 iDX2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.33	
Overhead Rate	0.92	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.61	bps/Hz
Data Rate	2.32E+07	bps
Information Rate (Data + Overhead)	2.53E+07	bps
Symbol Rate	3.79E+07	Hz
Chip Rate (Noise Bandwidth)	3.79E+07	Hz
Occupied Bandwidth	4.55E+07	Hz
Power Equivelent Bandwidth	7.20E+07	Hz
C/N Threshold	-0.8	dB
Uplink		
Frequency	14.250	GHz
Back off	1.1	dB
EIRP Spectral Density	33.7	dBW/4kHz
Slant Range	39858	km
Space Loss, Ls	207.4	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	2.5	dB
Radome, Lr	0.0	dB
Transponder G/T @ Hub	0.0	dB/K
Thermal Noise, C/No	92.2	dBHz
C/(No+Io)	91.7	dBHz
Satellite		
Flux Density	-92.1	dBW/m2
SFD @ Hub	-86.1	dBW/m2
Small Signal Gain (IBO/OBO)	3.0	dB
OBO	3.0	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	48.1	dBW
Transponder Sat. EIRP @ Terminal	47.0	dBW
DL PSD Limit	13.0	dBW/4kHz
DL PSD @ Beam Peak	5.3	dBW/4kHz
Carrier EIRP @ Beam Peak	45.1	dBW
Carrier EIRP @ Terminal	44.0	dBW
Slant Range	41170	km
Space Loss, Ls	205.7	dB
Pointing Loss, Lpnt	0.1	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	76.8	dBHz
C/(No+Io)	76.6	dBHz
End to End		
End to End C/(No+Io)	76.5	dBHz
Implementation Loss	1.5	dB
End to End C/N w/ Imp Loss	-0.8	dB
Link Margin	0.0	dB

Return Link Budget		
eXConnect Terminal		
Antenna Type	AURA LE	
Lat	74.4	deg
Lon	-71.9	deg
EIRP max	42.5	dBW
G/T	10.0	dB/K
Satellite		
Name	SES-6	
Longitude	-40.5	deg
Hub Earth Station		
Site	Cologne	
Lat	50.86	deg
Lon	6.848	deg
EIRP max	74.5	dBW
G/T	35.0	dB/K
Signal		
Waveform	iDirect	
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	8	
Coding Rate	0.67	
Overhead Rate	0.72	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.06	bps/Hz
Data Rate	4.03E+05	bps
Information Rate (Data + Overhead)	5.56E+05	bps
Symbol Rate	8.33E+05	Hz
Chip Rate (Noise Bandwidth)	6.67E+06	Hz
Occupied Bandwidth	8.00E+06	Hz
Power Equivelent Bandwidth	2.88E+05	Hz
C/N Threshold	-7.2	dB
Uplink		
Frequency	14.250	GHz
Back off	0.0	dB
EIRP Spectral Density	10.3	dBW/4kHz
Slant Range	41170	km
Space Loss, Ls	207.6	dB
Pointing Loss, Lpnt	0.1	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
Transponder G/T @ Terminal	0.0	dB/K
Thermal Noise, C/No	63.3	dBHz
C/(No+Io)	62.8	dBHz
Satellite		
Flux Density	-120.9	dBW/m2
SFD @ Terminal	-86.2	dBW/m2
Small Signal Gain (IBO/OBO)	3.0	dB
OBO	31.7	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	47.0	dBW
Transponder Sat. EIRP @ Hub	47.0	dBW
DL PSD Limit	13.0	dBW/4kHz
DL PSD @ Beam Peak	-17.0	dBW/4kHz
Carrier EIRP @ Beam Peak	15.3	dBW
Carrier EIRP @ Hub	15.3	dBW
Slant Range	39858	km
Space Loss, Ls	205.4	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	2.6	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	70.8	dBHz
C/(No+Io)	69.9147	dBHz
End to End		
End to End C/(No+Io)	62.0	dBHz
Implementation Loss	0.0	dB
End to End C/N w/ Imp Loss	-6.2	dB
Link Margin	1.0	dB

Figure 2: SES-6 AW Link Budget

SES

30 August 2013

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

Re: Certification of Coordination for Operation with SES-6

Dear Mr. DeFazio:

You have requested that New Skies Satellites B.V. ("New Skies," doing business as "SES") confirm it has reviewed the technical characteristics of Panasonic Avionics Corporation's ("Panasonic") Ku-band aeronautical mobile-satellite service ("AMSS") operations with the SES-6 satellite at 40.5° W.L., using the East Atlantic ("ATE") and West Atlantic ("ATW") Ku-band beams of this satellite. You have further requested that SES certify such operations have been included in and are consistent with SES's coordination agreements, and will not result in unacceptable interference to other satellite operations within +/- 6 degrees of SES-6.

Given the location and coverage area of the SES-6 satellite, we understand that Panasonic seeks to operate in excess of the two-degree spacing levels adopted by the U.S. Federal Communications Commission ("FCC") for routine Ku-band earth station licensing[1] and embodied in off-axis EIRP spectral density mask applicable to Ku-band mobile VSAT operations.[2] Specifically, Panasonic seeks to operate at off-axis EIRP spectral density levels up to 5 dB higher than the FCC mask, which is consistent with the coordinated levels of the SES-6 satellite and permitted by the FCC rules.[3] In addition, SES understands that the FCC has granted Panasonic with authority for such higher power operations with other satellites (up to the coordinated levels of the serving satellite).[4]

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[1] *See* 47 C.F.R. §25.218(f).

[2] *See* 47 C.F.R. §§25.222(a)(1)(i)(a), 25.226(a)(1)(i)(a) and 25.227(a)(1)(i)(a).

[3] *See* 47 C.F.R. §§25.222(a)(2), 25.226(a)(2) and 25.227(a)(2).

[4] Panasonic Avionics Corporation, Radio Station Authorization, Call Sign E100089, File No. SES-MFS-20120913-00818 (granted July 24, 2013) ("Blanket AES License") and Application

The FCC has authorized Panasonic to operate two Ku-band AMSS aircraft earth station ("AES") terminal types: the Panasonic phased-array ("PPA") terminal (referred to previously as the "Aura LE") and the MELCO terminal.[5] The basic characteristics of these terminals set forth in the FCC authorization and associated materials submitted to the FCC include:

Antenna	PPA AES	MELCO
Dimensions	0.89 m (0.17 m in height)	0.68 m (0.18 m in height)
Type of Antenna	Dual panel waveguide fed phased array	Elliptical, mechanically steered cassegrain
Max. Input Power at Antenna Flange	16 watts	9.9 watts
Bandwidth	10.95-11.2 GHz; 11.45-12.2 GHz (receive); 14.0-14.5 GHz (transmit)	10.95-11.2 GHz; 11.45-12.2 GHz (receive); 14.0-14.4 GHz (transmit)
Transmit Gain	37 dBi at 14.25 GHz	32.2 dBi at 14.25 GHz
Max. EIRP	48 dBW	42.1 dBW
Transmit Polarization	Horizontal or Vertical	Horizontal or Vertical
Receive G/T	10 to 14 dB/K	8.0 to 9.3 dB/K
Transmit Azimuth Beamwidth	1.5 degrees	1.5 degrees
Transmit Elevation Beamwidth	4 degrees	5.6 degrees
Pointing Accuracy	0.2 degrees (3-sigma, automatic cut-off at 0.35 degrees offset)	0.25 degrees (3-sigma, automatic cut-off at 0.5 degrees offset)

We understand that the PPA AES and MELCO terminals are designed to comply with the FCC's rules and policies governing Ku-band earth stations aboard aircraft ("ESAAs") adopted in new Section 25.227 of the rules.[6] In addition, the terminals have operated without interference under various FCC experimental and commercial authorizations.[7]

Narrative at 8-10, 14 (confirming higher power operations with certain satellite points of communication, including Eutelsat 10A).

[5] *See* Blanket AES License at 3 (Section E – Antenna Facilities).

[6] 47 C.F.R. § 25.227.

[7] *See* File Nos. SES-LIC-20100805-00992, SES-AMD-20100914-01163, SES-STA-20110104-00005 (Call Sign: E100089); ELS File Nos. 0210-EX-RR-2013 (granted July 12, 2011), 0143-EX-

The PPA AES and MELCO terminals avoid interference to other satellite operations by limiting off-axis EIRP spectral density to no more than coordinated levels through various means, including: (i) limiting transmit power spectral density by controlling the transmit power of the terminal and using spread spectrum technology (selecting appropriate carrier bandwidths and spread factors); (ii) controlling the off-axis gain of the antenna along the GSO by inhibiting transmissions when the skew angle exceeds a specified threshold; and (iii) controlling pointing error and inhibiting transmissions when the pointing offset exceeds the specified threshold (0.35 degrees for the PPA AES; 0.5 degrees for the MELCO).

When operating in the manner authorized by the FCC and with the associated off-axis EIRP density envelope for the SES-6 satellite (which is 5 dB higher than the Commission's two-degree spacing levels), Panasonic's proposed operations comply with the off-axis EIRP density levels necessary to protect potentially affected satellites up to and including 6° off-axis from the SES-6 satellite and will not cause unacceptable interference into these adjacent satellites.

SES confirms that the maximum downlink satellite EIRP density of 13.0 dBW/KHz, the operational level of the Ku-band AMSS network operated by Panasonic, is routinely used without causing unacceptable interference to adjacent satellite operations.

In view of the foregoing and consultations between SES engineering staff and Panasonic, SES hereby confirms the following:

1. SES is familiar with the technical characteristics of the PPA AES and MELCO terminals.

2. The proposed operations of the PPA AES and MELCO terminals with the SES-6 satellite have the potential to receive harmful interference from adjacent satellite networks that may be unacceptable.

3. The power density levels and associated off-axis gain performance of its PPA AES and MELCO terminals that Panasonic provided to SES are consistent with the existing coordination agreements between SES and the adjacent satellite systems within 6° of orbital separation from the SES-6 satellite.

4. SES will include the power-density levels and associated off-axis gain performance of its PPA AES and MELCO terminals of the proposed operations in all future coordination agreements for the SES-6 satellite.

ML-2012 (granted August 21, 2012), 0210-EX-RR-2013 (granted June 7, 2013) (Call Sign WF2XMD).

5. Operation of the PPA AES and MELCO terminals will not cause unacceptable interference into other operations on SES-6, or adjacent satellites, and are otherwise in accordance with SES' technical requirements and applicable operational limitations, including coordinated off-axis EIRP density levels.

Please let me know if you require any additional information regarding Panasonic's operation of the PPA AES or MELCO terminals on the SES-6 satellite.

Sincerely,

Kimberly M. Baum
Vice President, Spectrum Management and Development

SES-6

Emissions Designators for PPA (Aura LE)

Satellite and Beam Name	Tx/Rx	Emission Designator	Bandwdith (Hz)	Max EIRP per Carrier (dBW)	Max EIRP Density Per Carrier (dBW/4kHz)
SES-6 AW	Tx	500KG7D	500,000	40.00	19.82
SES-6 AW	Tx	9M00G7D	9,000,000	48.00	15.27
SES-6 AW	Rx	1M20G7D	1,200,000		
SES-6 AW	Rx	54M0G7D	54,000,000		
SES-6 AE	Tx	500KG7D	500,000	41.60	21.42
SES-6 AE	Tx	9M00G7D	9,000,000	48.00	15.27
SES-6 AE	Rx	1M20G7D	1,200,000		
SES-6 AE	Rx	54M0G7D	54,000,000		

SES-6-AE MELCO
Link Budget

Forward Link Budget		
eXConnect Terminal		
Antenna Type	MELCO	
Lat	69.7	deg
Lon	-39.4	deg
EIRP max	47.2	dBW
G/T	9.3	dB/K
Satellite		
Name	SES-6-AE	
Longitude	-40.5	deg
Hub Earth Station		
Site	Cologne	
Lat	50.863	deg
Lon	6.848	deg
EIRP max	75.5	dBW
G/T	35.0	dB/K
Signal		
Waveform	DVB-S2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.50	
Overhead Rate	0.83	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.83	bps/Hz
Data Rate	1.86E+07	bps
Information Rate (Data + Overhead)	2.25E+07	bps
Symbol Rate	2.25E+07	Hz
Chip Rate (Noise Bandwidth)	2.25E+07	Hz
Occupied Bandwidth	2.70E+07	Hz
Power Equivelent Bandwidth	7.20E+07	Hz
C/N Threshold	0.9	dB
Uplink		
Frequency	14.250	GHz
Back off	0.2	dB
EIRP Spectral Density	37.8	dBW/4kHz
Slant Range	39858	km
Space Loss, Ls	207.4	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	2.5	dB
Radome, Lr	0.0	dB
Transponder G/T @ Hub	1.0	dB/K
Thermal Noise, C/No	95.1	dBHz
C/(No+Io)	94.6	dBHz
Satellite		
Flux Density	-90.2	dBW/m2
SFD @ Hub	-87.2	dBW/m2
Small Signal Gain (IBO/OBO)	2.0	dB
OBO	1.0	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	49.2	dBW
Transponder Sat. EIRP @ Terminal	48.0	dBW
DL PSD Limit	13.0	dBW/4kHz
DL PSD @ Beam Peak	10.7	dBW/4kHz
Carrier EIRP @ Beam Peak	48.2	dBW
Carrier EIRP @ Terminal	47.0	dBW
Slant Range	40395	km
Space Loss, Ls	205.5	dB
Pointing Loss, Lpnt	0.3	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	79.1	dBHz
C/(No+Io)	77.1	dBHz
End to End		
End to End C/(No+Io)	77.1	dBHz
Implementation Loss	1.5	dB
End to End C/N w/ Imp Loss	2.0	dB
Link Margin	1.1	dB

Return Link Budget		
eXConnect Terminal		
Antenna Type	MELCO	
Lat	69.7	deg
Lon	-39.4	deg
EIRP max	47.2	dBW
G/T	9.3	dB/K
Satellite		
Name	SES-6-AE	
Longitude	-40.5	deg
Hub Earth Station		
Site	Cologne	
Lat	50.863	deg
Lon	6.848	deg
EIRP max	75.5	dBW
G/T	35.0	dB/K
Signal		
Waveform	iDirect	
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	4	
Coding Rate	0.43	
Overhead Rate	0.68	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.07	bps/Hz
Data Rate	4.86E+05	bps
Information Rate (Data + Overhead)	7.19E+05	bps
Symbol Rate	1.67E+06	Hz
Chip Rate (Noise Bandwidth)	6.67E+06	Hz
Occupied Bandwidth	8.00E+06	Hz
Power Equivelent Bandwidth	6.65E+05	Hz
C/N Threshold	-5.0	dB
Uplink		
Frequency	14.250	GHz
Back off	2.0	dB
EIRP Spectral Density	13.0	dBW/4kHz
Slant Range	40395	km
Space Loss, Ls	207.5	dB
Pointing Loss, Lpnt	0.4	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
Transponder G/T @ Terminal	1.0	dB/K
Thermal Noise, C/No	67.0	dBHz
C/(No+Io)	66.5	dBHz
Satellite		
Flux Density	-118.3	dBW/m2
SFD @ Terminal	-87.2	dBW/m2
Small Signal Gain (IBO/OBO)	3.0	dB
OBO	28.1	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	49.2	dBW
Transponder Sat. EIRP @ Hub	47.0	dBW
DL PSD Limit	13.0	dBW/4kHz
DL PSD @ Beam Peak	-11.2	dBW/4kHz
Carrier EIRP @ Beam Peak	21.1	dBW
Carrier EIRP @ Hub	18.9	dBW
Slant Range	39858	km
Space Loss, Ls	205.4	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	2.6	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	74.4	dBHz
C/(No+Io)	73.5499	dBHz
End to End		
End to End C/(No+Io)	65.7	dBHz
Implementation Loss	0.0	dB
End to End C/N w/ Imp Loss	-2.6	dB
Link Margin	2.4	dB

SES-6-AW MELCO
Link Budget

Forward Link Budget		
eXConnect Terminal		
Antenna Type	MELCO	
Lat	74.4	deg
Lon	-71.9	deg
EIRP max	47.2	dBW
G/T	9.3	dB/K
Satellite		
Name	SES-6-AW	
Longitude	-40.5	deg
Hub Earth Station		
Site	Cologne	
Lat	50.86	deg
Lon	6.848	deg
EIRP max	75.5	dBW
G/T	35.0	dB/K
Signal		
Waveform	DVB-S2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.40	
Overhead Rate	0.93	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.74	bps/Hz
Data Rate	1.67E+07	bps
Information Rate (Data + Overhead)	1.80E+07	bps
Symbol Rate	2.25E+07	Hz
Chip Rate (Noise Bandwidth)	2.25E+07	Hz
Occupied Bandwidth	2.70E+07	Hz
Power Equivelent Bandwidth	7.20E+07	Hz
C/N Threshold	0.2	dB
Uplink		
Frequency	14.250	GHz
Back off	0.1	dB
EIRP Spectral Density	37.9	dBW/4kHz
Slant Range	39858	km
Space Loss, Ls	207.4	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	2.5	dB
Radome, Lr	0.0	dB
Transponder G/T @ Hub	0.0	dB/K
Thermal Noise, C/No	94.2	dBHz
C/(No+Io)	93.7	dBHz
Satellite		
Flux Density	-90.1	dBW/m2
SFD @ Hub	-86.1	dBW/m2
Small Signal Gain (IBO/OBO)	3.0	dB
OBO	1.0	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	48.1	dBW
Transponder Sat. EIRP @ Terminal	47.0	dBW
DL PSD Limit	13.0	dBW/4kHz
DL PSD @ Beam Peak	9.6	dBW/4kHz
Carrier EIRP @ Beam Peak	47.1	dBW
Carrier EIRP @ Terminal	46.0	dBW
Slant Range	41170	km
Space Loss, Ls	205.7	dB
Pointing Loss, Lpnt	0.3	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	77.9	dBHz
C/(No+Io)	76.0	dBHz
End to End		
End to End C/(No+Io)	75.9	dBHz
Implementation Loss	1.5	dB
End to End C/N w/ Imp Loss	0.9	dB
Link Margin	0.7	dB

Return Link Budget		
eXConnect Terminal		
Antenna Type	MELCO	
Lat	74.4	deg
Lon	-71.9	deg
EIRP max	47.2	dBW
G/T	9.3	dB/K
Satellite		
Name	SES-6-AW	
Longitude	-40.5	deg
Hub Earth Station		
Site	Cologne	
Lat	50.86	deg
Lon	6.848	deg
EIRP max	75.5	dBW
G/T	35.0	dB/K
Signal		
Waveform	iDirect	
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	4	
Coding Rate	0.43	
Overhead Rate	0.68	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.07	bps/Hz
Data Rate	4.86E+05	bps
Information Rate (Data + Overhead)	7.18E+05	bps
Symbol Rate	1.67E+06	Hz
Chip Rate (Noise Bandwidth)	6.67E+06	Hz
Occupied Bandwidth	8.00E+06	Hz
Power Equivelent Bandwidth	3.96E+05	Hz
C/N Threshold	-5.0	dB
Uplink		
Frequency	14.250	GHz
Back off	3.1	dB
EIRP Spectral Density	11.9	dBW/4kHz
Slant Range	41170	km
Space Loss, Ls	207.6	dB
Pointing Loss, Lpnt	0.4	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.0	dB
Transponder G/T @ Terminal	0.0	dB/K
Thermal Noise, C/No	64.7	dBHz
C/(No+Io)	64.2	dBHz
Satellite		
Flux Density	-119.6	dBW/m2
SFD @ Terminal	-86.2	dBW/m2
Small Signal Gain (IBO/OBO)	3.0	dB
OBO	30.4	dB
Downlink		
Frequency	12.000	GHz
Transponder Sat. EIRP @ Beam Peak	47.0	dBW
Transponder Sat. EIRP @ Hub	47.0	dBW
DL PSD Limit	13.0	dBW/4kHz
DL PSD @ Beam Peak	-15.6	dBW/4kHz
Carrier EIRP @ Beam Peak	16.6	dBW
Carrier EIRP @ Hub	16.6	dBW
Slant Range	39858	km
Space Loss, Ls	205.4	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	2.6	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	72.2	dBHz
C/(No+Io)	71.2930	dBHz
End to End		
End to End C/(No+Io)	63.4	dBHz
Implementation Loss	0.0	dB
End to End C/N w/ Imp Loss	-4.8	dB
Link Margin	0.2	dB

SES-6

Emissions Designators for MELCO

Satellite and Beam Name	Tx/Rx	Emission Designator	Bandwdith (Hz)	Max EIRP per Carrier (dBW)	Max EIRP Density Per Carrier (dBW/4kHz)
SES-6 AW - MELCO	Tx	500KG7D	500,000	32.10	11.92
SES-6 AW - MELCO	Tx	9M00G7D	9,000,000	44.65	11.92
SES-6 AW - MELCO	Rx	1M20G7D	1,200,000		
SES-6 AW - MELCO	Rx	54M0G7D	54,000,000		
SES-6 AE - MELCO	Tx	500KG7D	500,000	33.20	13.02
SES-6 AE - MELCO	Tx	9M00G7D	9,000,000	45.75	13.02
SES-6 AE - MELCO	Rx	1M20G7D	1,200,000		
SES-6 AE - MELCO	Rx	54M0G7D	54,000,000		