

**Astronics AeroSat Corporation
Modification of Existing Two-Year Experimental License:
Antenna System Ground Testing within United States**

MODIFICATION DESCRIPTION

Astronics AeroSat Corporation (“Astronics AeroSat”) hereby requests a modification of its two-year experimental license (Call Sign WH2XJQ: File No. 0579-EX-PL-2014) for operation of up to five (5) aircraft earth stations (“AESs”) in order to conduct ground testing on the operational characteristics of its HR6400 Ku-band antenna system. Authorization is sought to add Galaxy 3C, Telstar-14R, and Telstar-11N as satellite points of communication for terminal testing and demonstration through the scheduled expiration date of the experimental license on September 1, 2016.

Astronics AeroSat’s antenna system will use the Ku-band fixed satellite service (“FSS”) capacity of authorized satellite operators to provide aeronautical communications coverage. Astronics AeroSat seeks to test its antenna with additional satellite operators consistent with their existing coordination agreements.

In accordance with its two-year experimental license, Astronics AeroSat is currently testing the operational characteristics of its antenna system with the Satmex 6 satellite. The instant application seeks Commission approval to utilize commercial FSS capacity on the Galaxy 3C, Telstar-14R, and Telstar-11N satellites for the purpose of conducting ground testing of Astronics AeroSat’s Ku-band antenna system.

1. Galaxy 3C

Galaxy 3C (S2381) is a U.S.-licensed satellite positioned at the 95° W.L. orbital location.¹ Astronics AeroSat seeks authority to use Galaxy 3C capacity for AES experimental operations in the 14.0-14.5 GHz band within the contiguous United States, as well as Alaska and Hawaii.

The operator of Galaxy 3C, Intelsat, has reviewed the technical characteristics of Astronics AeroSat’s proposed AES experimental operations and confirmed that such operations are consistent with its coordination agreements and will not result in unacceptable interference to other satellite operations within +/- 6 degrees of Galaxy 3C. Attached hereto in the Technical Appendix is a copy of a letter confirming that Astronics AeroSat’s proposed operations with Galaxy 3C have been coordinated with operators of adjacent satellites.²

¹ See Call Sign S2381, File No. SAT-LOA-19990812-00082.

² See Technical Appendix. Astronics AeroSat intends to operate the HR6400 terminal at power levels that comply with the off-axis EIRP spectral density limits along the geostationary arc set forth in Section 25.227(a)(1) (i.e., consistent with the FCC’s two-degree spacing policy) with the Galaxy 3C satellite.

2. Telstar-14R

Telstar-14R (S2821), also known as Estrela Do Sul 2, is a non-U.S. licensed satellite positioned at the 63° W.L. orbital location that is licensed by Brazil and authorized to serve the U.S. market through the Commission's Permitted Space Station List.³ Astronics AeroSat seeks authority to use Telstar-14R capacity for AES experimental operations in the 14.0-14.5 GHz band within the contiguous United States.

The operator of Telstar-14R, Telesat, has reviewed the technical characteristics of Astronics AeroSat's proposed AES experimental operations and confirmed that such operations are consistent with its coordination agreements and will not result in unacceptable interference to other satellite operations within +/- 6 degrees of Telstar-14R. Attached hereto in the Technical Appendix is a copy of a letter confirming that Astronics AeroSat's proposed operations with Telstar-14R have been coordinated with operators of adjacent satellites.⁴

3. Telstar-11N

Telstar-11N (S2357) is a U.S.-licensed satellite positioned at the 37.5° W.L. orbital location.⁵ Astronics AeroSat seeks authority to use Telstar-11N capacity for AES experimental operations in the 14.0-14.5 GHz band within the contiguous United States.

The operator of Telstar-11N, Telesat, has reviewed the technical characteristics of Astronics AeroSat's proposed AES experimental operations and confirmed that such operations are consistent with its coordination agreements and will not result in unacceptable interference to other satellite operations within +/- 6 degrees of Telstar-11N. Attached hereto in the Technical Appendix is a copy of a letter confirming that Astronics AeroSat's proposed operations with Telstar-11N have been coordinated with operators of adjacent satellites.⁶

Additionally, Astronics AeroSat acknowledges the conditions imposed in its existing experimental license and will impose the same limitations on transmit power spectral density for operations with these additional satellites as those proposed in its initial license application. Accordingly, grant of the requested modification would not increase the potential for interference from Astronics AeroSat's experimental operations.

³ See Call Sign S2821, File No. SAT-PPL-20110112-00012.

⁴ See Technical Appendix.

⁵ See Call Sign S2357, File No. SAT-MOD-20060306-00024.

⁶ See Technical Appendix.

Furthermore, all experimental operations comply fully with the Commission's two-degrees spacing policies and rules governing Ku-band AES operations.

CONCLUSION

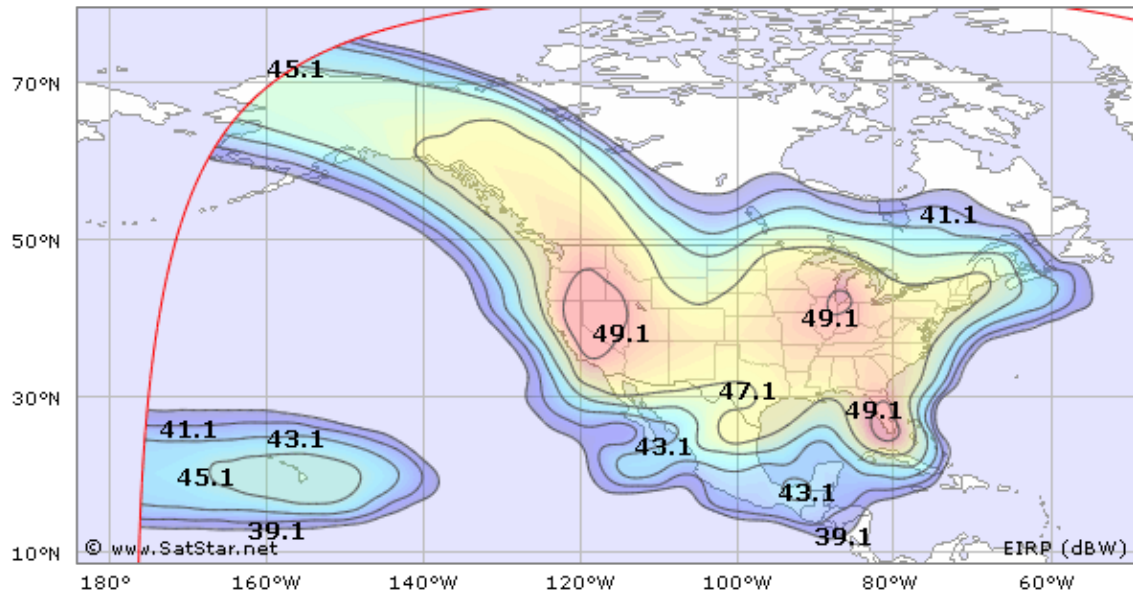
The proposed modification would enhance Astronics AeroSat's ability to test the performance and operational characteristics of the HR6400 Ku-band antenna system. For the foregoing reasons, grant of the experimental license modification would be consistent with FCC Rules and would serve the public interest.

TECHNICAL APPENDIX

GALAXY 3C

A. Galaxy 3C Coverage Map

Figure 1: Galaxy 3C at North America Beam



B. Galaxy 3C Link Budget

G-3C Link Budget		
Forward Link Budget		
Receive Earth Station		
Site	Kent/U.S.A.	
Antenna Type	Aerosat HR6400	
Lat	47.4 deg	
Lon	237.8 deg	
G/T	12.2 dB/K	
Satellite		
Name	G-3C	
Transponder	11K/11K	
Longitude	265.0 deg	
Transmit Earth Station		
Site		
Lat	39.6 deg	
Lon	282.3 deg	
EIRP max	87.5 dBW	
Signal		
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1.00	
coding rate	10/11	
Overhead Rate	1.00	
Channel Spacing	1.35	
Spectral Efficiency (Rate/Noise BW)	0.74 bps/Hz	
Data Rate	4.22E+06 bps	
Information Rate (Data + Overhead)	4.22E+06 bps	
Symbol Rate	5.69E+06 Hz	
Chip Rate (Noise Bandwidth)	5.69E+06 Hz	
Occupied Bandwidth	7.68E+06 Hz	
Power Equivalent Bandwidth	8.53E+06 Hz	
C/N Threshold	0.2 dB	
Uplink		
Frequency	14.230000 GHz	
Power Control Mode	None	
Back off	5.0 dB	
EIRP Spectral Density	29.4 dBW/4kHz	
Slant Range	37710 km	
Space Loss, Ls	207.0 dB	
Pointing Loss, Lpnt	1.0 dB	
Atmosphere / Weather Loss, La	1.0 dB	
Radome, Lr	0.0 dB	
Transponder G/T @ Hub	4.3 dB/K	
Thermal Noise, C/No	85.6 dBHz	
Intra-System Interference, C/lo ISI	97.6 dBHz	
Adj. Satellite Interference, C/lo ASI	85.4 dBHz	
Cross-Pol Interference, C/lo XP	97.6 dBHz	
C/(No+lo)	85.0 dBHz	
Satellite		
Flux Density	-88.2 dBW/m2	
SFD @ Hub	-102.8 dBW/m2	
Small Signal Gain (IBO/OBO)	4.2 dB	
OBO	12.0 dB	
Downlink		
Frequency	11.930000 GHz	
Transponder Sat. EIRP @ Beam Peak	50.1 dBW	
Transponder Sat. EIRP @ Terminal	48.7 dBW	
DL PSD Limit	13.0 dBW/4kHz	
DL PSD @ Beam Peak	6.6 dBW/4kHz	
Carrier EIRP @ Beam Peak	38.1 dBW	
Carrier EIRP @ Terminal	36.7 dBW	
Space Loss, Ls	205.7 dB	
Pointing Loss, Lpnt	0.3 dB	
Atmosphere / Weather Loss, La	0.3 dB	
Radome, Lr	0.0 dB	
Thermal Noise, C/No	85.6 dBHz	
Intermod. Interference, C/Imo	87.6 dBHz	
Intra-System Interference, C/lo ISI	97.6 dBHz	
Adj. Satellite Interference, C/lo ASI	87.6 dBHz	
Cross-Pol Interference, C/lo XP	97.6 dBHz	
C/(No+lo)	81.8 dBHz	
End to End		
End to End C/(No+lo)	80.1 dBHz	
Implementation Loss	0.0 dB	
End to End C/N w/ Imp Loss	3.4 dB	
Link Margin	3.2 dB	

G-3C Link Budget		
Return Link Budget		
Receive Earth Station		
Site		
Antenna Type	,US-Mountainside Teleport (MTN-K11-G3C)	
Lat	39.6 deg	
Lon	282.3 deg	
G/T	39.1 dB/K	
Satellite		
Name	G-3C	
Transponder	11K/11K	
Longitude	265.0 deg	
Transmit Earth Station		
Site	Kent/U.S.A.	
Lat	47.4 deg	
Lon	237.8 deg	
EIRP max	45.2 dBW	
Signal		
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	2.00	
coding rate	1/2	
Overhead Rate	1.00	
Channel Spacing	0.68	
Spectral Efficiency (Rate/Noise BW)	0.25 bps/Hz	
Data Rate	1.22E+06 bps	
Information Rate (Data + Overhead)	1.22E+06 bps	
Symbol Rate	2.43E+06 Hz	
Chip Rate (Noise Bandwidth)	4.86E+06 Hz	
Occupied Bandwidth	6.56E+06 Hz	
Power Equivalent Bandwidth	1.14E+05 Hz	
C/N Threshold	-1.8 dB	
Uplink		
Frequency	14.230000 GHz	
Power Control Mode	None	
Back off	1.0 dB	
EIRP Spectral Density	12.0 dBW/4kHz	
Slant Range	38650 km	
Space Loss, Ls	207.3 dB	
Pointing Loss, Lpnt	0.3 dB	
Atmosphere / Weather Loss, La	0.3 dB	
Radome, Lr	0.0 dB	
Transponder G/T @ Hub	3.4 dB/K	
Thermal Noise, C/No	63.8 dBHz	
Intra-System Interference, C/lo ISI	96.9 dBHz	
Adj. Satellite Interference, C/lo ASI	85.4 dBHz	
Cross-Pol Interference, C/lo XP	96.9 dBHz	
C/(No+lo)	63.8 dBHz	
Satellite		
Flux Density	-88.2 dBW/m2	
SFD @ Hub	-120.6 dBW/m2	
Small Signal Gain (IBO/OBO)	4.2 dB	
OBO	30.8 dB	
Downlink		
Frequency	11.930000 GHz	
Transponder Sat. EIRP @ Beam Peak	50.1 dBW	
Transponder Sat. EIRP @ Terminal	48.0 dBW	
DL PSD Limit	13.0 dBW/4kHz	
DL PSD @ Beam Peak	-11.5 dBW/4kHz	
Carrier EIRP @ Beam Peak	19.3 dBW	
Carrier EIRP @ Terminal	17.2 dBW	
Space Loss, Ls	205.5 dB	
Pointing Loss, Lpnt	1.0 dB	
Atmosphere / Weather Loss, La	0.2 dB	
Radome, Lr	0.0 dB	
Thermal Noise, C/No	63.8 dBHz	
Intermod. Interference, C/Imo	86.9 dBHz	
Intra-System Interference, C/lo ISI	96.9 dBHz	
Adj. Satellite Interference, C/lo ASI	86.9 dBHz	
Cross-Pol Interference, C/lo XP	96.9 dBHz	
C/(No+lo)	63.7 dBHz	
End to End		
End to End C/(No+lo)	60.8 dBHz	
Implementation Loss	0.0 dB	
End to End C/N w/ Imp Loss	-3.4 dB	
Link Margin	-1.6 dB	

C. Galaxy 3C Coordination Letter



28 August 2014

Federal Communications Commission
International Bureau
445 12th Street, S.W.
Washington, D.C. 20554

Re: Engineering Certification of Intelsat

To Whom It May Concern:

This letter certifies that Intelsat is aware that Astronics AeroSat Corporation ("Astronics AeroSat") is planning to seek authorization from the Federal Communications Commission ("FCC") to operate Ku-band transmit/receive earth stations aboard aircraft ("ESAA") terminals with the IS-19 at 166°E, G3C at 95°W, IS-14 at 45°W and IS-22 at 72°E. Specifically, we understand that Astronics AeroSat seeks to operate the HR6400 Ku-band antenna system for development and demonstration purposes consistent with the FCC's experimental licensing rules, and for commercial purposes consistent with the FCC's ESAA rules including Section 25.227.

Based on the information provided by Astronics AeroSat, Intelsat understands the technical characteristics of the HR6400 terminal, and Intelsat (i) recognizes that operation of the HR6400 terminals at the power density levels provided to Intelsat is consistent with existing coordination agreements with all adjacent satellite operators within +/- 6 degrees of orbital separation from IS-19 at 166°E, G3C at 95°W, IS-14 at 45°W and IS-22 at 72°E; (ii) acknowledges that the proposed operation of the HR6400 terminal has the potential to receive harmful interference from adjacent satellite networks that may be unacceptable; and (iii) if the FCC authorizes the operations proposed by Astronics AeroSat, Intelsat will take into consideration the power density levels associated such operations in all future satellite network coordinations with adjacent satellite operators.

Sincerely,

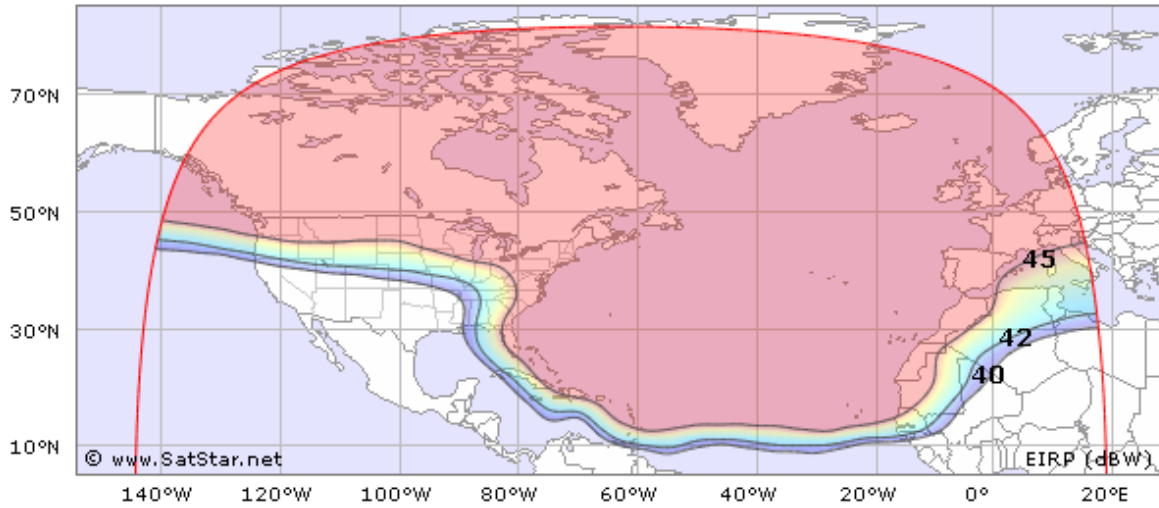
A handwritten signature in blue ink, appearing to read "AYates", is placed over the "Sincerely," text.

Alan Yates,
Senior Technical Advisor,
Spectrum Strategy.

TELSTAR-14R

A. Telstar-14R Coverage Map

Figure 2: Telstar-14R at North Atlantic Ocean Region Beam



B. Telstar-14R Link Budget

Telstar 14R Link Budget		
Forward Link Budget		
Receive Earth Station		
Site	Atlantic Ocean	
Antenna Type	Aerosat HR6400	
Lat	55.0 deg	
Lon	-60.0 deg	
G/T	12.0 dB/K	
Satellite		
Name	Telstar 14R	
Transponder	K46-USV/AOH	
Longitude	297.0 deg	
Transmit Earth Station		
Site	Melbourne Beach/U.S.A.	
Lat	28.1 deg	
Lon	279.4 deg	
EIRP max	75.5 dBW	
Signal		
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1.00	
Coding Rate	10/27	
Overhead Rate	1.00	
Channel Spacing	1.30	
Spectral Efficiency (Rate/Noise BW)	0.74 bps/Hz	
Data Rate	3.70E+06 bps	
Information Rate (Data + Overhead)	3.70E+06 bps	
Symbol Rate	5.00E+06 Hz	
Chip Rate (Noise Bandwidth)	5.00E+06 Hz	
Occupied Bandwidth	6.50E+06 Hz	
Power Equivalent Bandwidth	9.24E+06 Hz	
C/N Threshold	0.2 dB	
Uplink		
Frequency	13.974000 GHz	
Power Control Mode	AUPC	
Back off	0.0 dB	
EIRP Spectral Density	28.3 dBW/4kHz	
Slant Range	36957 km	
Space Loss, Ls	206.7 dB	
Pointing Loss, Lpnt	0.0 dB	
Atmosphere / Weather Loss, La	0.0 dB	
Radome, Lr	0.0 dB	
Transponder G/T @ Hub	2.3 dB/K	
Thermal Noise, C/No	83.2 dBHz	
Intra-System Interference, C/lo ISI	94.0 dBHz	
Adj. Satellite Interference, C/lo ASI	80.0 dBHz	
Cross-Pol Interference, C/lo XP	94.0 dBHz	
C/(No+lo)	82.6 dBHz	
Satellite		
Flux Density	-95.0 dBW/m2	
SFD @ Hub	-103.3 dBW/m2	
Small Signal Gain (IBO/OBO)	2.0 dB	
OBO	8.9 dB	
Downlink		
Frequency	11.674000 GHz	
Transponder Sat. EIRP @ Beam Peak	48.4 dBW	
Transponder Sat. EIRP @ Terminal	44.5 dBW	
DL PSD Limit	13.0 dBW/4kHz	
DL PSD @ Beam Peak	8.5 dBW/4kHz	
Carrier EIRP @ Beam Peak	39.5 dBW	
Carrier EIRP @ Terminal	35.6 dBW	
Space Loss, Ls	205.6 dB	
Pointing Loss, Lpnt	0.3 dB	
Atmosphere / Weather Loss, La	0.3 dB	
Radome, Lr	0.0 dB	
Thermal Noise, C/No	83.2 dBHz	
Intermod. Interference, C/IMo	97.0 dBHz	
Intra-System Interference, C/lo ISI	94.0 dBHz	
Adj. Satellite Interference, C/lo ASI	92.0 dBHz	
Cross-Pol Interference, C/lo XP	94.0 dBHz	
C/(No+lo)	81.9 dBHz	
End to End		
End to End C/(No+lo)	79.2 dBHz	
Implementation Loss	0.0 dB	
End to End C/N w/ Imp Loss	2.8 dB	
Link Margin	2.6 dB	

Telstar 14R Link Budget		
Return Link Budget		
Receive Earth Station		
Site	Melbourne Beach/U.S.A.	
Antenna Type	,US-Melbourne Teleport SES1/G-25	
Lat	28.1 deg	
Lon	279.4 deg	
G/T	34.8 dB/K	
Satellite		
Name	Telstar 14R	
Transponder	K31L-AOV/USH	
Longitude	297.0 deg	
Transmit Earth Station		
Site	Atlantic Ocean	
Lat	55.0 deg	
Lon	-60.0 deg	
EIRP max	45.0 dBW	
Signal		
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	1.00	
Coding Rate	1/2	
Overhead Rate	1.00	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.50 bps/Hz	
Data Rate	4.65E+05 bps	
Information Rate (Data + Overhead)	4.65E+05 bps	
Symbol Rate	9.30E+05 Hz	
Chip Rate (Noise Bandwidth)	9.30E+05 Hz	
Occupied Bandwidth	1.12E+06 Hz	
Power Equivalent Bandwidth	2.37E+05 Hz	
C/N Threshold	1.2 dB	
Uplink		
Frequency	14.020000 GHz	
Power Control Mode	None	
Back off	1.0 dB	
EIRP Spectral Density	19.0 dBW/4kHz	
Slant Range	38851 km	
Space Loss, Ls	207.2 dB	
Pointing Loss, Lpnt	0.3 dB	
Atmosphere / Weather Loss, La	0.3 dB	
Radome, Lr	0.0 dB	
Transponder G/T @ Hub	-0.9 dB/K	
Thermal Noise, C/No	62.5 dBHz	
Intra-System Interference, C/lo ISI	86.7 dBHz	
Adj. Satellite Interference, C/lo ASI	80.0 dBHz	
Cross-Pol Interference, C/lo XP	86.7 dBHz	
C/(No+lo)	62.5 dBHz	
Satellite		
Flux Density	-92.5 dBW/m2	
SFD @ Hub	-120.8 dBW/m2	
Small Signal Gain (IBO/OBO)	2.0 dB	
OBO	28.5 dB	
Downlink		
Frequency	11.720000 GHz	
Transponder Sat. EIRP @ Beam Peak	51.3 dBW	
Transponder Sat. EIRP @ Terminal	49.9 dBW	
DL PSD Limit	13.0 dBW/4kHz	
DL PSD @ Beam Peak	-0.9 dBW/4kHz	
Carrier EIRP @ Beam Peak	22.8 dBW	
Carrier EIRP @ Terminal	21.4 dBW	
Space Loss, Ls	205.2 dB	
Pointing Loss, Lpnt	0.0 dB	
Atmosphere / Weather Loss, La	0.2 dB	
Radome, Lr	0.0 dB	
Thermal Noise, C/No	62.5 dBHz	
Intermod. Interference, C/IMo	89.7 dBHz	
Intra-System Interference, C/lo ISI	86.7 dBHz	
Adj. Satellite Interference, C/lo ASI	84.7 dBHz	
Cross-Pol Interference, C/lo XP	86.7 dBHz	
C/(No+lo)	62.4 dBHz	
End to End		
End to End C/(No+lo)	59.4 dBHz	
Implementation Loss	0.0 dB	
End to End C/N w/ Imp Loss	2.7 dB	
Link Margin	1.5 dB	

C. Telstar-14R Coordination Letter



TELESAT
1601 Telesat Court
Ottawa, ON, Canada K1B 5P4

EN2014-007
11 June 2014

Federal Communications Commission
International Bureau
445 12th Street, S.W.
Washington, D.C. 20554

Re: Astronics AeroSat Application for earth stations aboard aircraft ("ESAA") terminals

To Whom It May Concern:

This letter certifies Telesat is aware that Astronics AeroSat Corporation ("Astronics AeroSat") is planning to seek authorization from the Federal Communications Commission ("FCC") to operate Ku-band transmit/receive earth stations aboard aircraft ("ESAA") terminals with the T14R, T11N, T12 and T18 satellites at orbital positions 63W, 37.5W, 15W and 138E, respectively. Specifically, Telesat understands that Astronics AeroSat seeks to operate the HR6400 Ku-band antenna system for development and demonstration purposes consistent with the FCC's experimental licensing rules, and for commercial purposes consistent with the FCC's Part 25 rules, including Section 25.227.

Based on the information provided by Astronics AeroSat, Telesat (i) recognizes that the operation of the HR6400 terminals in compliance with the FCC Part 25 rules, Section 25.227, will insure compliance with existing coordination agreements with adjacent satellite operators within +/- 6 degrees of the orbital locations identified above; (ii) acknowledges that the proposed operation of the HR6400 terminal has the potential to receive harmful interference from adjacent satellite networks that may be unacceptable; and (iii) if the FCC authorizes the operations proposed by Astronics AeroSat, Telesat will take into consideration the power density levels associated with such operations in future satellite network coordination with adjacent satellite operators.

Sincerely,

A handwritten signature in black ink, appearing to read "Elisabeth Neasmith", written over a horizontal line.

Elisabeth Neasmith, P. Eng
Manager, International Coordination
Department of CTO
TELESAT

TELSTAR-11N

A. Telstar-11N Coverage Maps

Figure 3: Telstar-11N at Europe Beam

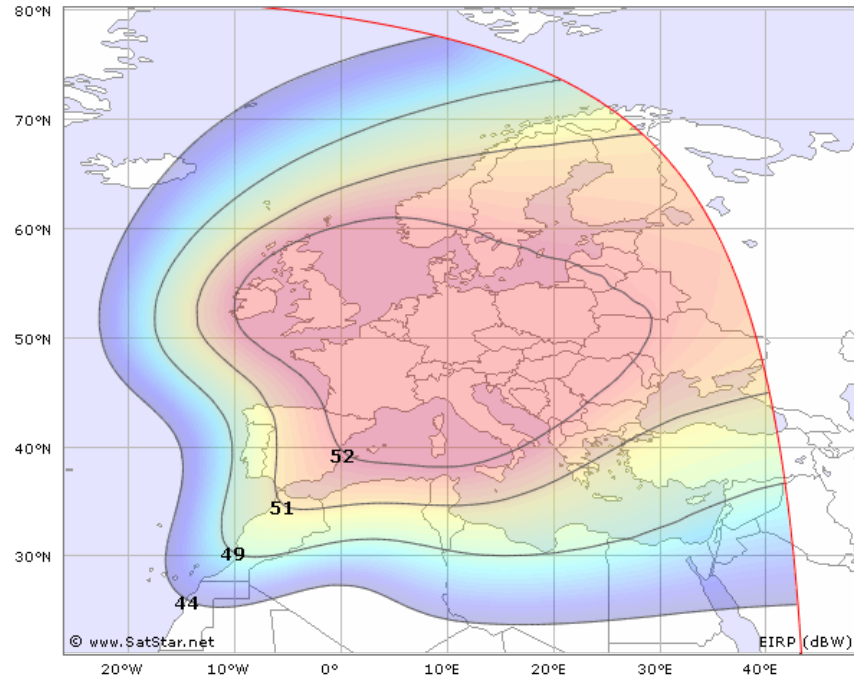
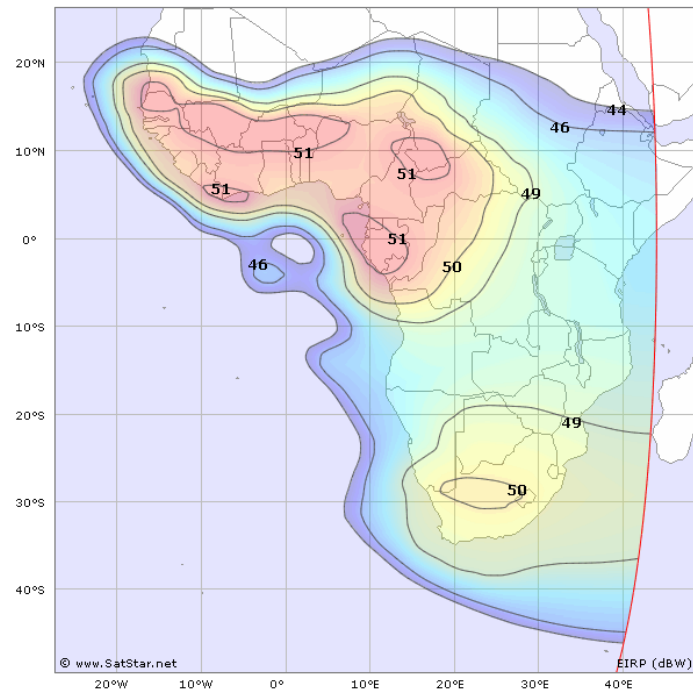


Figure 4: Telstar-11N at Sub-Saharan Africa Beam



B. Telstar-11N Link Budgets

Telstar 11N		Link Budget	Telstar 11N		Link Budget
Forward Link Budget			Return Link Budget		
Receive Earth Station			Receive Earth Station		
Site	South Africa		Site	Aberdeen/UK	
Antenna Type	Aerosat HR6400		Antenna Type	,GB-ABSV (T-11N KU)	
Lat	-16.0 deg		Lat	57.0 deg	
Lon	27.0 deg		Lon	-2.0 deg	
G/T	11.5 dB/K		G/T	34.3 dB/K	
Satellite			Satellite		
Name	Telstar 11N		Name	Telstar 11N	
Transponder	K05-EUV/AFH		Transponder	K03-AFV/EUH	
Longitude	322.5 deg		Longitude	322.5 deg	
Transmit Earth Station			Transmit Earth Station		
Site	Aberdeen/UK		Site	South Africa	
Lat	57.0 deg		Lat	-16.0 deg	
Lon	-2.0 deg		Lon	27.0 deg	
EIRP max	85.6 dBW		EIRP max	45.2 dBW	
Signal			Signal		
Modulation	QPSK		Modulation	BPSK	
Bits per symbol	2		Bits per symbol	1	
Spread Factor	1.00		Spread Factor	4.00	
Coding Rate	31/75		Coding Rate	1/2	
Overhead Rate	1.00		Overhead Rate	1.00	
Channel Spacing	1.35		Channel Spacing	0.30	
Spectral Efficiency (Rate/Noise BW)	0.83 bps/Hz		Spectral Efficiency (Rate/Noise BW)	0.13 bps/Hz	
Data Rate	4.05E+06 bps		Data Rate	6.18E+05 bps	
Information Rate (Data + Overhead)	4.05E+06 bps		Information Rate (Data + Overhead)	6.18E+05 bps	
Symbol Rate	4.90E+06 Hz		Symbol Rate	1.24E+06 Hz	
Chip Rate (Noise Bandwidth)	4.90E+06 Hz		Chip Rate (Noise Bandwidth)	4.94E+06 Hz	
Occupied Bandwidth	6.62E+06 Hz		Occupied Bandwidth	5.93E+06 Hz	
Power Equivalent Bandwidth	1.23E+07 Hz		Power Equivalent Bandwidth	1.15E+05 Hz	
C/N Threshold	0.7 dB		C/N Threshold	-4.8 dB	
Uplink			Uplink		
Frequency	14.401000 GHz		Frequency	14.340000 GHz	
Power Control Mode	None		Power Control Mode	None	
Back off	4.0 dB		Back off	1.0 dB	
EIRP Spectral Density	29.4 dBW/4kHz		EIRP Spectral Density	13.0 dBW/4kHz	
Slant Range	39740 km		Slant Range	39947 km	
Space Loss, Ls	207.6 dB		Space Loss, Ls	207.6 dB	
Pointing Loss, Lpnt	0.5 dB		Pointing Loss, Lpnt	0.3 dB	
Atmosphere / Weather Loss, La	0.5 dB		Atmosphere / Weather Loss, La	0.3 dB	
Radome, Lr	0.0 dB		Radome, Lr	0.0 dB	
Transponder G/T @ Hub	8.0 dB/K		Transponder G/T @ Hub	2.1 dB/K	
Thermal Noise, C/No	88.2 dBHz		Thermal Noise, C/No	60.0 dBHz	
Intra-System Interference, C/lo ISI	93.9 dBHz		Intra-System Interference, C/lo ISI	93.9 dBHz	
Adj. Satellite Interference, C/lo ASI	80.0 dBHz		Adj. Satellite Interference, C/lo ASI	80.0 dBHz	
Cross-Pol Interference, C/lo XP	93.9 dBHz		Cross-Pol Interference, C/lo XP	93.9 dBHz	
C/(No+lo)	86.3 dBHz		C/(No+lo)	60.0 dBHz	
Satellite			Satellite		
Flux Density	-93.5 dBW/m2		Flux Density	-93.0 dBW/m2	
SFD @ Hub	-103.9 dBW/m2		SFD @ Hub	-120.1 dBW/m2	
Small Signal Gain (IBO/OBO)	1.8 dB		Small Signal Gain (IBO/OBO)	2.0 dB	
OBO	9.6 dB		OBO	29.7 dB	
Downlink			Downlink		
Frequency	11.101000 GHz		Frequency	11.040000 GHz	
Transponder Sat. EIRP @ Beam Peak	51.9 dBW		Transponder Sat. EIRP @ Beam Peak	52.6 dBW	
Transponder Sat. EIRP @ Terminal	48.8 dBW		Transponder Sat. EIRP @ Terminal	52.2 dBW	
DL PSD Limit	13.0 dBW/4kHz		DL PSD Limit	13.0 dBW/4kHz	
DL PSD @ Beam Peak	11.4 dBW/4kHz		DL PSD @ Beam Peak	-8.1 dBW/4kHz	
Carrier EIRP @ Beam Peak	42.3 dBW		Carrier EIRP @ Beam Peak	22.9 dBW	
Carrier EIRP @ Terminal	39.2 dBW		Carrier EIRP @ Terminal	22.5 dBW	
Space Loss, Ls	205.4 dB		Space Loss, Ls	205.3 dB	
Pointing Loss, Lpnt	0.3 dB		Pointing Loss, Lpnt	0.0 dB	
Atmosphere / Weather Loss, La	0.5 dB		Atmosphere / Weather Loss, La	0.5 dB	
Radome, Lr	0.0 dB		Radome, Lr	0.0 dB	
Thermal Noise, C/No	88.2 dBHz		Thermal Noise, C/No	60.0 dBHz	
Intermod. Interference, C/I _{Mo}	96.9 dBHz		Intermod. Interference, C/I _{Mo}	96.9 dBHz	
Intra-System Interference, C/lo ISI	93.9 dBHz		Intra-System Interference, C/lo ISI	93.9 dBHz	
Adj. Satellite Interference, C/lo ASI	91.9 dBHz		Adj. Satellite Interference, C/lo ASI	91.9 dBHz	
Cross-Pol Interference, C/lo XP	93.9 dBHz		Cross-Pol Interference, C/lo XP	93.9 dBHz	
C/(No+lo)	85.0 dBHz		C/(No+lo)	60.0 dBHz	
End to End			End to End		
End to End C/(No+lo)	82.6 dBHz		End to End C/(No+lo)	57.0 dBHz	
Implementation Loss	0.0 dB		Implementation Loss	0.0 dB	
End to End C/N w/ Imp Loss	6.0 dB		End to End C/N w/ Imp Loss	-7.1 dB	
Link Margin	5.4 dB		Link Margin	-2.3 dB	

C. Telstar-11N Coordination Letter



TELESAT
1601 Telesat Court
Ottawa, ON, Canada K1B 5P4

EN2014-007
11 June 2014

Federal Communications Commission
International Bureau
445 12th Street, S.W.
Washington, D.C. 20554

Re: Astronics AeroSat Application for earth stations aboard aircraft ("ESAA") terminals

To Whom It May Concern:

This letter certifies Telesat is aware that Astronics AeroSat Corporation ("Astronics AeroSat") is planning to seek authorization from the Federal Communications Commission ("FCC") to operate Ku-band transmit/receive earth stations aboard aircraft ("ESAA") terminals with the T14R, T11N, T12 and T18 satellites at orbital positions 63W, 37.5W, 15W and 138E, respectively. Specifically, Telesat understands that Astronics AeroSat seeks to operate the HR6400 Ku-band antenna system for development and demonstration purposes consistent with the FCC's experimental licensing rules, and for commercial purposes consistent with the FCC's Part 25 rules, including Section 25.227.

Based on the information provided by Astronics AeroSat, Telesat (i) recognizes that the operation of the HR6400 terminals in compliance with the FCC Part 25 rules, Section 25.227, will insure compliance with existing coordination agreements with adjacent satellite operators within +/- 6 degrees of the orbital locations identified above; (ii) acknowledges that the proposed operation of the HR6400 terminal has the potential to receive harmful interference from adjacent satellite networks that may be unacceptable; and (iii) if the FCC authorizes the operations proposed by Astronics AeroSat, Telesat will take into consideration the power density levels associated with such operations in future satellite network coordination with adjacent satellite operators.

Sincerely,

A handwritten signature in black ink, appearing to read "Elisabeth Neasmith", written over a horizontal line.

Elisabeth Neasmith, P. Eng
Manager, International Coordination
Department of CTO
TELESAT