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December 15, 2010

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VIA IBFS

Robert G. Nelson
Chief, Satellite Division
International Bureau
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

**Re: PanAmSat Licensee Corp. Application to Modify Authorization
for Galaxy 11, IBFS File No. SAT-MOD-20101102-00229
(Call Sign S2253)**

Dear Mr. Nelson:

PanAmSat Licensee Corp. (“PanAmSat”) hereby provides additional information regarding the above referenced application. In the attached Engineering Statement, PanAmSat provides an interference analysis of the effect of the Galaxy 11 (call sign S2253) transmissions from the 304.5° E.L. (55.5° W.L.) orbital location on adjacent satellites. As set forth in Sections 25.114(d)(7) and 25.140(b)(2) of the Commission’s rules, this analysis demonstrates the compatibility of Galaxy 11 two degrees from any authorized space station.¹

Please contact Susan Crandall of Intelsat at (202) 944-7848 or me with any questions.

Respectfully Submitted,

/s/ Jennifer D. Hindin

Jennifer D. Hindin
Counsel for PanAmSat Licensee Corp.

¹ 47 C.F.R. §§ 25.114(d)(7) and 25.140(b)(2). See also *International Bureau Satellite Division Information: Clarification of 47 C.F.R. § 25.140(b)(2), Space Station Application Interference Analysis*, Report No. SPB-195, DA 03-3863 (Dec. 3, 2003) (Public Notice); *International Bureau Satellite Division Information: Clarification of 47 C.F.R. § 25.140(b)(2), Space Station Application Interference Analysis*, Report No. SPB-207, DA 04-1708 (June 16, 2004) (Public Notice).

Engineering Statement

PanAmSat Licensee Corp. (“PanAmSat”) has pending before the Commission an application to modify the license of Galaxy 11 to permit operation of this spacecraft from 55.5° W.L. (see FCC File Number: SAT-MOD-20101102-00229). PanAmSat provides, herein, link budgets that show the effect of the Galaxy 11 transmissions from 55.5° W.L on adjacent satellites.

There are currently no operational or proposed satellites that are co-frequency with Galaxy 11 and are associated with an orbital location 2° away from 55.5° W.L. The nearest co-frequency satellites are Intelsat 707, located at 53° W.L, and Intelsat 9, located at 58° W.L. Hence, for the analysis it was assumed that the nearest co-frequency adjacent satellites to Galaxy 11 were two hypothetical satellites located at 53.5° W.L and 57.5° W.L and assumed to have the same technical characteristics as Galaxy 11.

For the hypothetical satellite located at 53.5° W.L, it was assumed that the nearest co-frequency satellites were Galaxy 11 operating from 55.5° W.L. and another hypothetical satellite, having the same operating characteristics as Galaxy 11, operating from 51.5° W.L. Similarly, for the hypothetical satellite located at 57.5° W.L, it was assumed that the nearest co-frequency satellites were Galaxy 11 operating from 55.5° W.L. and another hypothetical satellite, having the same operating characteristics as Galaxy 11, operating from 59.5° W.L.

At C-band, it was assumed that the uplink power density level of the Galaxy 11 emissions was no greater than -38.7 dBW/Hz, the maximum level specified in Section 25.212(d) of the Commission’s rules. Moreover, it was assumed that the maximum downlink EIRP density of the Galaxy 11 emissions at the edge of the service area of the hypothetical satellite was no greater than -38.6 dBW/Hz in the horizontal polarization and no greater than -38.7 dBW/Hz in the vertical polarization, as specified in SAT-MOD-20101102-00229.

At Ku-band, the uplink power density of the emissions of Galaxy 11 satellites was assumed to be -50 dBW/Hz, the maximum level specified in Sections 25.212(c) of the Commission’s rules for digital Ku-band carriers. The maximum downlink EIRP density of the Galaxy 11 emissions was assumed to be -26 dBW/Hz, the maximum level specified in Section

25.212(c) of the Commission's rules.

Other assumptions made for the link budget analysis were as follows:

- a) In the plane of the geostationary satellite orbit, all transmitting and receiving earth station antennas have off-axis co-polar gains that are compliant with the limits specified in Section 25.209(a)(1) of the Commission's rules.
- b) All transmitting and receiving earth stations have a cross-polarization isolation value of at least 30 dB within their main beam lobe.
- c) At C-band frequencies, degradation due to rain is not considered, given that rain (attenuation) effects are insignificant at C-band.
- d) At Ku-band frequencies rain attenuation predictions are derived using Recommendation ITU-R 618-8.
- e) At Ku-band frequencies, increase in noise temperature of the receiving earth station due to rain is taken into account.
- f) For the cases where the transponder operates in a multi-carrier mode, the effects due to intermodulation interference are taken into account.

For both the C- and Ku-band analysis, the impact of the TV/FM carriers from Galaxy 11 on the transmissions of the adjacent satellites was not considered. This is due to the fact that TV/FM carriers are known to be high-density carriers with most of the energy contained within the near vicinity of the carrier center frequency. Operation of sensitive narrow-band carriers is typically precluded within these high power density areas of the TV/FM carrier. Accordingly, placement and operation of TV/FM carriers are normally achieved through internal coordination and/or coordination discussions with the adjacent satellite operators, whichever may be the case, rather than through C/I calculations – since the results of such calculations would show that narrow-band carriers typically could not operate on a co-frequency basis with TV/FM carriers.

The results of the C-band and Ku-band analyses are provided in Exhibits 1 and 2. Exhibits 3A and 3B provide the combined uplink and downlink carrier-to-interference (“C/I”) contribution into each of the hypothetical satellites due to the Galaxy 11 transmission. The C/I values listed in Exhibits 3A and 3B were calculated using the individual uplink and downlink C/I values listed for Galaxy 11 in Exhibits 1 and 2.

In Exhibits 4A and 4B, the calculated C/I margins, associated with the interfering Galaxy 11 transmissions, are provided for each of the hypothetical satellites located at 53.5° W.L and 57.5° W.L. In calculating the C/I margin, it was assumed that for each emission of the hypothetical satellite, as listed in Exhibits 1 and 2, the minimum single entry C/I requirement was equal to the minimum required C/N value (in dB) listed in Exhibits 1 and 2 plus 12.2 dB. Subsequently, the C/I margin associated with the interfering Galaxy 11 is the difference between the C/I values listed in Exhibits 3A and 3B and the minimum required single entry C/I.

With regard to the data contained in Exhibits 3A, 3B, 4A and 4B, only the those values associated with the hypothetical satellite's digital carriers are listed. This is due to the fact that, as previously stated, TV/FM carriers are known to be high-density carriers; hence, placement and operation of TV/FM carriers are normally achieved through coordination discussions with the adjacent satellite operators rather than through C/I calculations.

As demonstrated in these exhibits 1 and 2, the Galaxy 11 emissions from 55.5° W.L. would not have a significant impact on the transmission links of an adjacent satellite located at 53.5° W.L. or 57.5° W.L. Moreover, an adjacent satellite would be able to support carrier links similar those proposed for use through Galaxy 11.

Certification Statement

I hereby certify that I am a technically qualified person and am familiar with Part 25 of the Commission's rules and regulations. The contents of this engineering statement were prepared by me or under my direct supervision and to the best of my knowledge are complete and accurate.

 /s/ Jose Albuquerque

 December 15, 2010

Jose Albuquerque

Date

PanAmSat

Senior Director, Spectrum
Engineering

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS

UPLINK BEAM INFORMATION				
Uplink Beam Name	North America	North America	North America	North America
Uplink Frequency (GHz)	5.925 – 6.425	5.925 – 6.425	5.925 – 6.425	5.925 – 6.425
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-1.5	-1.5	-1.5	-1.5
Uplink Contour SFD (dBW/m ²)	-85.0	-90.0	-90.0	-90.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	North America	North America	North America	North America
Downlink Frequency (GHz)	3.70 – 4.20	3.70 – 4.20	3.70 – 4.20	3.70 – 4.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	36.1	36.1	36.1	36.1
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Downlink EIRP Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
ADJACENT SATELLITE 2				
Satellite 2 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Downlink EIRP Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
CARRIER INFORMATION				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Information Rate (kbps)	N/A	24575	6000	64
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a
Code Rate	N/A	1/2 - RS	1/2 - RS	1/2-RS
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4
Allocated Bandwidth (kHz)	36000	36000	10300	100
Required Minimum C/N (dB)	10.0	3.4	3.9	3.0
UPLINK EARTH STATION				
Earth Station Diameter (meters)	8.1	6.1	6.1	6.1
Earth Station Gain (dBi)	52.8	49.4	49.4	49.4
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	4.5	3.0	3.0	3.0
Earth Station Gain (dBi)	43.9	39.7	39.7	39.7
Earth Station G/T (dB/K)	23.6	19.2	19.2	19.2
Earth Station Elevation Angle	20	20	20	20
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	77.9	72.9	64.6	44.2
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2
Satellite G/T (dB/K)	-1.5	-1.5	-1.5	-1.5
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Uplink C/N (dB)	29.2	25.0	23.2	22.3
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	36.1	36.1	28.1	7.7
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3
Earth Station G/T (dB/K)	23.6	19.2	19.2	19.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Downlink C/N (dB)	15.9	12.3	10.8	9.9
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	29.2	25.0	23.2	22.3
C/N Downlink (dB)	15.9	12.3	10.8	9.9
C/I Intermodulation (dB)	n/a	n/a	19.5	18.6
C/I Uplink Co-Channel (dB)*	27.0	27.0	27.9	27.6
C/I Downlink Co-Channel (dB)*	27.0	27.0	27.9	27.6
C/I Uplink Adjacent Satellite 1 (dB)	19.0	14.8	13.0	12.1
C/I Downlink Adjacent Satellite 1 (dB)	20.3	11.2	9.7	8.8
C/I Uplink Adjacent Satellite 2 (dB)	19.0	14.8	13.0	12.1
C/I Downlink Adjacent Satellite 2 (dB)	22.8	19.9	18.4	17.5
C/(N+I) Composite (dB)	11.5	6.6	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.5	5.6	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	0.5	2.2	0.0	0.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-40.9	-51.3	-53.1	-54.0
Downlink EIRP Density At Beam Peak	-25.9	-34.7	-36.2	-37.1
Number of Carriers	1.0	1.0	2.8	311.4

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	North America	North America	North America	North America
Uplink Frequency (GHz)	5.925 – 6.425	5.925 – 6.425	5.925 – 6.425	5.925 – 6.425
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	0.2	0.2	0.2	0.2
Uplink Contour SFD (dBW/m ²)	-86.2	-91.2	-91.2	-91.2
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	North America	North America	North America	North America
Downlink Frequency (GHz)	3.70 – 4.20	3.70 – 4.20	3.70 – 4.20	3.70 – 4.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	36.2	36.2	36.2	36.2
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Downlink EIRP Density (dBW/Hz)	-38.6	-38.6	-38.6	-38.6
ADJACENT SATELLITE 2				
Satellite 2 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Downlink EIRP Density (dBW/Hz)	-38.6	-38.6	-38.6	-38.6
CARRIER INFORMATION				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Information Rate (kbps)	N/A	24575	6000	64
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a
Code Rate	N/A	1/2 - RS	1/2 - RS	1/2-RS
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4
Allocated Bandwidth (kHz)	36000	36000	10300	100
Required Minimum C/N (dB)	10.0	3.4	3.9	3.0
UPLINK EARTH STATION				
Earth Station Diameter (meters)	8.1	6.1	6.1	6.1
Earth Station Gain (dBi)	52.8	49.4	49.4	49.4
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	4.5	3.0	3.0	3.0
Earth Station Gain (dBi)	43.9	39.7	39.7	39.7
Earth Station G/T (dB/K)	23.6	19.2	19.2	19.2
Earth Station Elevation Angle	20	20	20	20
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	76.7	71.7	63.8	43.3
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2
Satellite G/T (dB/K)	0.2	0.2	0.2	0.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Uplink C/N (dB)	29.7	25.5	24.0	23.2
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	36.2	36.2	28.6	8.2
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3
Earth Station G/T (dB/K)	23.6	19.2	19.2	19.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Downlink C/N (dB)	16.0	12.4	11.2	10.4
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	29.7	25.5	24.0	23.2
C/N Downlink (dB)	16.0	12.4	11.2	10.4
C/I Intermodulation (dB)	n/a	n/a	19.8	19.0
C/I Uplink Co-Channel (dB)*	27.0	27.0	28.3	28.0
C/I Downlink Co-Channel (dB)*	27.0	27.0	28.3	28.0
C/I Uplink Adjacent Satellite 1 (dB)	17.8	13.6	12.2	11.3
C/I Downlink Adjacent Satellite 1 (dB)	20.3	11.2	10.1	9.2
C/I Uplink Adjacent Satellite 2 (dB)	17.8	13.6	12.2	11.3
C/I Downlink Adjacent Satellite 2 (dB)	22.8	19.9	18.8	17.9
C/(N+I) Composite (dB)	11.1	6.2	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.1	5.2	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	0.1	1.8	0.0	0.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-42.1	-52.5	-53.9	-54.8
Downlink EIRP Density At Beam Peak	-25.8	-34.6	-35.7	-36.6
Number of Carriers	1.0	1.0	2.6	285.4

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	North America	North America	North America	North America	North America	North America
Uplink Frequency (GHz)	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	0.3	0.3	0.3	0.3	0.3	0.3
Uplink Contour SFD (dBW/m ²)	-82.8	-78.8	-90.8	-90.8	-90.8	-90.8
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	North America	North America	North America	North America	North America	North America
Downlink Frequency (GHz)	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	45.7	45.7	45.7	45.7	45.7	45.7
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Information Rate (kbps)	N/A	24575	6000	64	512	128
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a	n/a	n/a
Code Rate	N/A	1/2 - RS	1/2 - RS	1/2-RS	1/2	1/2
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4	1229	307
Assumed Allocated Bandwidth (kHz)	36000	36000	10300	100	1450	400
Required Minimum C/N (dB) – Clear Sky	10.0	3.4	3.9	3.0	3.4	3.4
Required Minimum C/N (dB) – Rain	10.0	3.4	3.5	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	56.9	46.4
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.2	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	47.5	41.3	44.8	44.8	44.8	55.5
Earth Station G/T (dB/K)	25.0	18.8	22.3	22.3	22.3	33.1
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	80.1	80.3	59.9	39.7	51.7	43.2
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Satellite G/T (dB/K)	0.3	0.3	0.3	0.3	0.3	0.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Uplink C/N (dB)	26.0	26.9	13.0	12.4	12.3	9.7
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	45.7	44.8	36.9	16.7	28.7	20.1
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Earth Station G/T (dB/K)	25.0	18.8	22.3	22.3	22.3	33.1
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Downlink C/N (dB)	17.3	10.9	13.0	12.4	12.3	20.5
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	26.0	26.9	13.0	12.4	12.3	9.7
C/N Downlink (dB)	17.3	10.9	13.0	12.4	12.3	20.5
C/I Intermodulation (dB)	n/a	n/a	17.2	16.6	16.5	13.9
C/I Uplink Co-Channel (dB)*	27.0	27.0	28.2	28.2	28.6	25.6
C/I Downlink Co-Channel (dB)*	27.0	27.0	28.2	28.2	28.6	25.6
C/I Uplink Adjacent Satellite 1 (dB)	30.5	31.5	17.6	17.0	16.8	14.3
C/I Downlink Adjacent Satellite 1 (dB)	21.3	13.8	16.8	16.1	16.0	25.0
C/I Uplink Adjacent Satellite 2 (dB)	30.5	31.5	17.6	17.0	16.8	14.3
C/I Downlink Adjacent Satellite 2 (dB)	22.9	17.2	18.9	18.2	18.1	25.6
C/(N+I) Composite (dB)	14.0	8.3	7.2	6.6	6.5	6.2
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	13.0	7.3	6.2	5.6	5.5	5.2
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	3.0	3.9	2.3	2.6	2.1	1.8
Carrier Density Levels						
Uplink Power Density (dBW/Hz)	-42.8	-51.4	-65.3	-65.9	-66.1	-58.1
Downlink EIRP Density At Beam Peak	-16.3	-26.0	-27.4	-28.1	-28.2	-30.7
Number of Carriers	1.0	1.0	2.6	273.6	17.2	90.0

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	North America	North America	North America	North America	North America	North America
Uplink Frequency (GHz)	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2
Uplink Contour SFD (dBW/m ²)	-82.3	-78.3	-90.3	-90.3	-90.3	-90.3
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	North America	North America	North America	North America	North America	North America
Downlink Frequency (GHz)	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	45.7	45.7	45.7	45.7	45.7	45.7
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Information Rate (kbps)	N/A	24575	6000	64	512	128
Carrier Modulation	TV/FM	OPSK	OPSK	OPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a	n/a	n/a
Code Rate	N/A	1/2 - RS	1/2 - RS	1/2-RS	1/2	1/2
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4	1229	307
Assumed Allocated Bandwidth (kHz)	36000	36000	10300	100	1450	400
Required Minimum C/N (dB) – Clear Sky	10.0	3.4	3.9	3.0	3.4	3.4
Required Minimum C/N (dB) – Rain	10.0	3.4	3.5	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	56.9	46.4
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.2	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	47.5	41.3	44.8	44.8	44.8	55.5
Earth Station G/T (dB/K)	25.0	18.8	22.3	22.3	22.3	33.1
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	80.6	80.9	60.5	40.3	52.3	43.8
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Satellite G/T (dB/K)	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Uplink C/N (dB)	25.0	26.0	12.1	11.4	11.3	8.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	45.7	44.8	36.9	16.8	28.8	20.2
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Earth Station G/T (dB/K)	25.0	18.8	22.3	22.3	22.3	33.1
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Downlink C/N (dB)	17.3	11.0	13.1	12.4	12.3	20.6
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.0	26.0	12.1	11.4	11.3	8.8
C/N Downlink (dB)	17.3	11.0	13.1	12.4	12.3	20.6
C/I Intermodulation (dB)	n/a	n/a	17.3	16.6	16.5	14.0
C/I Uplink Co-Channel (dB)*	27.0	27.0	28.3	28.2	28.6	25.7
C/I Downlink Co-Channel (dB)*	27.0	27.0	28.3	28.2	28.6	25.7
C/I Uplink Adjacent Satellite 1 (dB)	31.0	32.1	18.1	17.5	17.4	14.9
C/I Downlink Adjacent Satellite 1 (dB)	21.3	13.9	16.8	16.2	16.1	25.1
C/I Uplink Adjacent Satellite 2 (dB)	31.0	32.1	18.1	17.5	17.4	14.9
C/I Downlink Adjacent Satellite 2 (dB)	22.9	17.3	18.9	18.3	18.2	25.7
C/(N+I) Composite (dB)	14.0	8.3	7.0	6.4	6.3	5.9
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	13.0	7.3	6.0	5.4	5.3	4.9
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	3.0	3.9	2.1	2.4	1.9	1.5
Carrier Density Levels						
Uplink Power Density (dBW/Hz)	-42.3	-50.8	-64.8	-65.4	-65.5	-57.5
Downlink EIRP Density At Beam Peak	-16.3	-26.0	-27.4	-28.0	-28.1	-30.6
Number of Carriers	1.0	1.0	2.6	270.9	17.1	90.0

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Uplink Frequency (GHz)	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Uplink SFD (dBW/m ²)	-85.3	-73.3	-85.3	-85.3	-85.3	-85.3
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	46.0	46.0	46.0	46.0	46.0	46.0
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.7	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	44.1	44.1	44.1	44.1	44.1	54.8
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	77.6	79.6	64.4	44.2	56.2	47.1
Uplink Path Loss, Clear Sky (dB)	-207.2	-207.2	-207.2	-207.2	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	22.4	24.6	14.7	14.0	13.9	10.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.0	41.4	36.2	16.0	28.0	18.9
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.6	12.3	12.3	11.7	11.6	19.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	22.4	24.6	14.7	14.0	13.9	10.8
C/N Downlink (dB)	16.6	12.3	12.3	11.7	11.6	19.3
C/I Intermodulation (dB)	N/A	N/A	15.0	14.3	14.2	11.1
C/I Uplink Co-Channel (dB)*	24.5	24.0	23.0	23.0	23.3	19.8
C/I Downlink Co-Channel (dB)*	24.5	24.0	23.0	23.0	23.3	19.8
C/I Uplink Adjacent Satellite 1 (dB)	27.8	30.1	20.1	19.5	19.3	16.2
C/I Downlink Adjacent Satellite 1 (dB)	19.7	15.3	15.4	14.7	14.6	23.0
C/I Uplink Adjacent Satellite 2 (dB)	27.8	30.1	20.1	19.5	19.3	16.2
C/I Downlink Adjacent Satellite 2 (dB)	21.9	17.5	17.6	16.9	16.8	23.7
C/(N+I) Composite (dB)	12.6	9.2	7.0	6.4	6.3	6.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.6	8.2	6.0	5.4	5.3	5.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	1.6	4.9	2.1	2.4	1.9	1.6
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.1	-50.6	-60.6	-61.2	-61.3	-53.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-14.0	-26.1	-26.1	-26.7	-26.9	-30.0

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Uplink Frequency (GHz)	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Uplink SFD (dBW/m ²)	-85.2	-73.2	-85.2	-85.2	-85.2	-85.2
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	46.1	46.1	46.1	46.1	46.1	46.1
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.7	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	44.1	44.1	44.1	44.1	44.1	54.8
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	77.7	79.7	64.3	44.1	56.1	46.9
Uplink Path Loss, Clear Sky (dB)	-207.2	-207.2	-207.2	-207.2	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	22.5	24.7	14.6	13.9	13.8	10.6
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.1	41.5	36.1	15.9	27.9	18.7
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.7	12.4	12.2	11.6	11.4	19.1
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	22.5	24.7	14.6	13.9	13.8	10.6
C/N Downlink (dB)	16.7	12.4	12.2	11.6	11.4	19.1
C/I Intermodulation (dB)	N/A	N/A	14.8	14.1	14.0	10.8
C/I Uplink Co-Channel (dB)*	24.5	24.0	22.8	22.7	23.1	19.5
C/I Downlink Co-Channel (dB)*	24.5	24.0	22.8	22.7	23.1	19.5
C/I Uplink Adjacent Satellite 1 (dB)	27.9	30.2	20.0	19.4	19.2	16.0
C/I Downlink Adjacent Satellite 1 (dB)	19.8	15.4	15.3	14.6	14.5	22.9
C/I Uplink Adjacent Satellite 2 (dB)	27.9	30.2	20.0	19.4	19.2	16.0
C/I Downlink Adjacent Satellite 2 (dB)	22.0	17.6	17.5	16.8	16.7	23.5
C/(N+I) Composite (dB)	12.7	9.3	6.9	6.2	6.1	5.8
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.7	8.3	5.9	5.2	5.1	4.8
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	1.7	5.0	2.0	2.2	1.7	1.4
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.0	-50.5	-60.7	-61.3	-61.4	-54.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13.9	-26.0	-26.2	-26.9	-27.0	-30.2

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Uplink Frequency (GHz)	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Uplink SFD (dBW/m2)	-82.3	-73.3	-83.3	-83.3	-83.3	-83.3
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	45.9	45.9	45.9	45.9	45.9	45.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.7	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	46.8	44.1	44.1	44.1	44.1	54.8
Earth Station G/T (dB/K)	24.3	21.6	21.6	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	80.6	79.8	66.6	46.4	58.4	48.3
Uplink Path Loss, Clear Sky (dB)	-207.2	-207.2	-207.2	-207.2	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	25.4	24.8	16.9	16.2	16.1	12.0
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	45.9	41.5	36.3	16.1	28.1	18.0
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.2	-205.2	-205.2	-205.2	-205.2
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	24.3	21.6	21.6	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	19.2	12.4	12.4	11.8	11.7	18.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.4	24.8	16.9	16.2	16.1	12.0
C/N Downlink (dB)	19.2	12.4	12.4	11.8	11.7	18.4
C/I Intermodulation (dB)	N/A	N/A	15.2	14.5	14.4	10.3
C/I Uplink Co-Channel (dB)*	24.5	24.0	23.2	23.2	23.5	19.0
C/I Downlink Co-Channel (dB)*	24.5	24.0	23.2	23.2	23.5	19.0
C/I Uplink Adjacent Satellite 1 (dB)	30.8	30.3	22.3	21.7	21.5	17.4
C/I Downlink Adjacent Satellite 1 (dB)	22.6	15.4	15.5	14.8	14.7	22.1
C/I Uplink Adjacent Satellite 2 (dB)	30.8	30.3	22.3	21.7	21.5	17.4
C/I Downlink Adjacent Satellite 2 (dB)	24.2	17.6	17.6	17.0	16.9	22.7
C/(N+I) Composite (dB)	14.8	9.3	7.6	6.9	6.8	6.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	13.8	8.3	6.6	5.9	5.8	5.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	3.8	4.9	2.7	3.0	2.4	1.7
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-42.1	-50.4	-58.4	-59.0	-59.1	-52.7
Downlink EIRP Density At Beam Peak (dBW/Hz)	-14.1	-26.1	-26.0	-26.7	-26.8	-30.9

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Uplink Frequency (GHz)	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Uplink SFD (dBW/m ²)	-80.2	-73.2	-82.2	-82.2	-82.2	-82.2
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	46.5	46.5	46.5	46.5	46.5	46.5
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	9.0	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	60.0	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	44.1	44.1	44.1	44.1	44.1	54.8
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	82.7	79.2	67.2	46.9	58.9	48.7
Uplink Path Loss, Clear Sky (dB)	-207.2	-207.2	-207.2	-207.2	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	27.5	24.2	17.4	16.7	16.6	12.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.5	41.5	36.3	16.1	28.1	17.9
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	17.1	12.3	12.5	11.8	11.7	18.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	27.5	24.2	17.4	16.7	16.6	12.4
C/N Downlink (dB)	17.1	12.3	12.5	11.8	11.7	18.3
C/I Intermodulation (dB)	N/A	N/A	14.6	13.9	13.8	9.6
C/I Uplink Co-Channel (dB)*	24.5	24.0	22.7	22.6	22.9	18.3
C/I Downlink Co-Channel (dB)*	24.5	24.0	22.7	22.6	22.9	18.3
C/I Uplink Adjacent Satellite 1 (dB)	32.9	29.7	22.9	22.2	22.0	17.9
C/I Downlink Adjacent Satellite 1 (dB)	20.2	15.4	15.5	14.8	14.7	22.1
C/I Uplink Adjacent Satellite 2 (dB)	32.9	29.7	22.9	22.2	22.0	17.9
C/I Downlink Adjacent Satellite 2 (dB)	22.4	17.6	17.7	17.0	16.9	22.7
C/(N+I) Composite (dB)	13.5	9.3	7.6	6.9	6.8	5.9
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.5	8.3	6.6	5.9	5.8	4.9
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.5	4.9	2.7	2.9	2.4	1.5
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.3	-51.0	-57.8	-58.5	-58.6	-52.3
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13.5	-26.1	-26.0	-26.7	-26.8	-31.0

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Uplink Frequency (GHz)	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/m2)	-83.3	-74.3	-83.3	-83.3	-83.3	-83.3
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	45.9	45.9	45.9	45.9	45.9	45.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	2.4
Earth Station Gain (dBi)	56.8	56.8	56.8	56.8	56.8	48.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	1.8	2.4	2.4	2.4	6.1
Earth Station Gain (dBi)	54.8	44.1	46.8	46.8	46.8	54.8
Earth Station G/T (dB/K)	32.4	21.6	24.3	24.3	24.3	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	79.6	78.8	66.6	46.5	58.5	50.2
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant(dBW/K -Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	24.7	24.2	17.2	16.7	16.5	14.2
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	45.9	41.5	36.3	16.2	28.2	19.8
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	32.4	21.6	24.3	24.3	24.3	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	27.4	12.4	15.1	14.6	14.4	20.2
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	24.7	24.2	17.2	16.7	16.5	14.2
C/N Downlink (dB)	27.4	12.4	15.1	14.6	14.4	20.2
C/I Intermodulation (dB)	N/A	N/A	15.1	14.6	14.5	12.2
C/I Uplink Co-Channel (dB)*	24.5	24.0	23.2	23.3	23.6	20.9
C/I Downlink Co-Channel (dB)*	24.5	24.0	23.2	23.3	23.6	20.9
C/I Uplink Adjacent Satellite 1 (dB)	29.8	29.3	22.3	21.8	21.6	19.3
C/I Downlink Adjacent Satellite 1 (dB)	31.1	15.4	18.4	17.9	17.8	24.0
C/I Uplink Adjacent Satellite 2 (dB)	29.8	29.3	22.3	21.8	21.6	19.3
C/I Downlink Adjacent Satellite 2 (dB)	31.7	17.6	20.1	19.6	19.4	24.6
C/(N+I) Composite (dB)	18.0	9.3	9.0	8.5	8.4	8.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	17.0	8.3	8.0	7.5	7.4	7.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	7.0	4.9	4.1	4.5	4.0	3.7
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.2	-51.6	-58.6	-59.1	-59.2	-53.6
Downlink EIRP Density At Beam Peak (dBW/Hz)	-14.1	-26.1	-26.0	-26.5	-26.7	-29.0

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Uplink Frequency (GHz)	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Uplink SFD (dBW/m2)	-82.9	-75.9	-82.9	-82.9	-82.9	-82.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Downlink Frequency (GHz)	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	46.5	46.5	46.5	46.5	46.5	46.5
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	2.4
Earth Station Gain (dBi)	56.8	56.8	56.8	56.8	56.8	48.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.8	2.4	2.4	2.4	6.1
Earth Station Gain (dBi)	46.8	44.1	46.8	46.8	46.8	54.8
Earth Station G/T (dB/K)	24.3	21.6	24.3	24.3	24.3	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	80.0	76.5	66.3	46.1	58.1	49.8
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	25.7	22.5	17.5	16.9	16.7	14.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.5	41.5	36.2	16.0	28.0	19.7
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	24.3	21.6	24.3	24.3	24.3	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	19.8	12.3	15.0	14.4	14.2	20.1
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.7	22.5	17.5	16.9	16.7	14.4
C/N Downlink (dB)	19.8	12.3	15.0	14.4	14.2	20.1
C/I Intermodulation (dB)	N/A	N/A	14.4	13.8	13.7	11.4
C/I Uplink Co-Channel (dB)*	24.5	24.0	22.5	22.5	22.8	20.1
C/I Downlink Co-Channel (dB)*	24.5	24.0	22.5	22.5	22.8	20.1
C/I Uplink Adjacent Satellite 1 (dB)	30.2	27.0	22.0	21.4	21.2	18.9
C/I Downlink Adjacent Satellite 1 (dB)	23.2	15.4	18.3	17.7	17.6	23.9
C/I Uplink Adjacent Satellite 2 (dB)	30.2	27.0	22.0	21.4	21.2	18.9
C/I Downlink Adjacent Satellite 2 (dB)	24.8	17.6	20.0	19.4	19.2	24.5
C/(N+I) Composite (dB)	15.2	9.1	8.7	8.2	8.1	7.7
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	14.2	8.1	7.7	7.2	7.1	6.7
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	4.2	4.8	3.8	4.2	3.7	3.3
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-42.8	-53.9	-58.9	-59.4	-59.6	-54.0
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13.5	-26.1	-26.1	-26.7	-26.9	-29.2

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Uplink Frequency (GHz)	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/m2)	-80.3	-74.3	-84.3	-84.3	-84.3	-84.3
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Downlink Frequency (GHz)	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	46.0	46.0	46.0	46.0	46.0	46.0
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	9.0	6.1	6.1	6.1	6.1	2.4
Earth Station Gain (dBi)	60.1	56.8	56.8	56.8	56.8	48.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	2.4	2.4	2.4	6.1
Earth Station Gain (dBi)	44.1	44.1	46.8	46.8	46.8	54.8
Earth Station G/T (dB/K)	21.6	21.6	24.3	24.3	24.3	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	82.6	78.6	65.5	45.4	57.4	49.5
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	27.7	24.0	16.1	15.6	15.4	13.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.0	41.4	36.3	16.2	28.2	20.2
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	24.3	24.3	24.3	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.6	12.3	15.1	14.6	14.4	20.6
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	27.7	24.0	16.1	15.6	15.4	13.5
C/N Downlink (dB)	16.6	12.3	15.1	14.6	14.4	20.6
C/I Intermodulation (dB)	N/A	N/A	15.0	14.5	14.4	12.5
C/I Uplink Co-Channel (dB)*	24.5	24.0	23.1	23.1	23.5	21.2
C/I Downlink Co-Channel (dB)*	24.5	24.0	23.1	23.1	23.5	21.2
C/I Uplink Adjacent Satellite 1 (dB)	32.8	29.1	21.2	20.7	20.5	18.6
C/I Downlink Adjacent Satellite 1 (dB)	19.7	15.3	18.4	17.9	17.8	24.4
C/I Uplink Adjacent Satellite 2 (dB)	32.8	29.1	21.2	20.7	20.5	18.6
C/I Downlink Adjacent Satellite 2 (dB)	21.9	17.5	20.1	19.6	19.4	25.0
C/(N+I) Composite (dB)	13.1	9.2	8.7	8.2	8.0	8.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.1	8.2	7.7	7.2	7.0	7.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.1	4.8	3.8	4.2	3.6	3.6
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.5	-51.8	-59.7	-60.2	-60.3	-54.3
Downlink EIRP Density At Beam Peak (dBW/Hz)	-14.0	-26.1	-26.0	-26.6	-26.7	-28.6

EXHIBIT 1: ADJACENT SATELLITE 1 (53.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Uplink Frequency (GHz)	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Uplink SFD (dBW/m ²)	-81.9	-75.9	-80.9	-80.9	-80.9	-80.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Downlink Frequency (GHz)	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	46.1	46.1	46.1	46.1	46.1	46.1
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.	51.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	7.0	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	58.0	56.8	56.8	56.8	56.8	46.3
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	2.4	1.8	1.8	6.1
Earth Station Gain (dBi)	44.1	44.1	46.8	44.1	44.1	54.8
Earth Station G/T (dB/K)	21.6	21.6	24.3	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	81.0	77.0	67.9	49.3	61.2	51.1
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	26.7	23.0	19.1	20.0	19.8	15.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.1	41.5	35.4	16.8	28.7	18.6
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	24.3	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.7	12.4	14.2	12.4	12.3	19.0
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	26.7	23.0	19.1	20.0	19.8	15.8
C/N Downlink (dB)	16.7	12.4	14.2	12.4	12.3	19.0
C/I Intermodulation (dB)	N/A	N/A	14.1	15.0	14.8	10.7
C/I Uplink Co-Channel (dB)*	24.5	24.0	22.1	23.6	23.9	19.4
C/I Downlink Co-Channel (dB)*	24.5	24.0	22.1	23.6	23.9	19.4
C/I Uplink Adjacent Satellite 1 (dB)	31.2	27.5	23.6	24.5	24.3	20.3
C/I Downlink Adjacent Satellite 1 (dB)	19.8	15.4	16.6	15.5	15.3	22.8
C/I Uplink Adjacent Satellite 2 (dB)	31.2	27.5	23.6	24.5	24.3	20.3
C/I Downlink Adjacent Satellite 2 (dB)	22.0	17.6	18.5	17.7	17.5	23.4
C/(N+I) Composite (dB)	13.1	9.2	8.3	7.9	7.8	7.6
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.1	8.2	7.3	6.9	6.8	6.6
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.1	4.8	3.4	4.0	3.4	3.2
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.0	-53.4	-57.2	-56.3	-56.5	-50.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13.9	-26.0	-26.9	-26.0	-26.2	-30.3

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS

UPLINK BEAM INFORMATION				
Uplink Beam Name	North America	North America	North America	North America
Uplink Frequency (GHz)	5.925 – 6.425	5.925 – 6.425	5.925 – 6.425	5.925 – 6.425
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-1.5	-1.5	-1.5	-1.5
Uplink Contour SFD (dBW/m ²)	-85.0	-90.0	-90.0	-90.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	North America	North America	North America	North America
Downlink Frequency (GHz)	3.70 – 4.20	3.70 – 4.20	3.70 – 4.20	3.70 – 4.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	36.1	36.1	36.1	36.1
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Downlink EIRP Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
ADJACENT SATELLITE 2				
Satellite 2 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Downlink EIRP Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
CARRIER INFORMATION				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Information Rate (kbps)	N/A	24575	6000	64
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a
Code Rate	N/A	1/2 - RS	1/2 - RS	1/2-RS
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4
Allocated Bandwidth (kHz)	36000	36000	10300	100
Required Minimum C/N (dB)	10.0	3.4	3.9	3.0
UPLINK EARTH STATION				
Earth Station Diameter (meters)	8.1	6.1	6.1	6.1
Earth Station Gain (dBi)	52.8	49.4	49.4	49.4
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	4.5	3.0	3.0	3.0
Earth Station Gain (dBi)	43.9	39.7	39.7	39.7
Earth Station G/T (dB/K)	23.6	19.2	19.2	19.2
Earth Station Elevation Angle	20	20	20	20
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	77.9	72.9	64.6	44.2
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2
Satellite G/T (dB/K)	-1.5	-1.5	-1.5	-1.5
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Uplink C/N (dB)	29.2	25.0	23.2	22.3
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	36.1	36.1	28.1	7.7
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3
Earth Station G/T (dB/K)	23.6	19.2	19.2	19.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Downlink C/N (dB)	15.9	12.3	10.8	9.9
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	29.2	25.0	23.2	22.3
C/N Downlink (dB)	15.9	12.3	10.8	9.9
C/I Intermodulation (dB)	n/a	n/a	19.5	18.6
C/I Uplink Co-Channel (dB)*	27.0	27.0	27.9	27.6
C/I Downlink Co-Channel (dB)*	27.0	27.0	27.9	27.6
C/I Uplink Adjacent Satellite 1 (dB)	19.0	14.8	13.0	12.1
C/I Downlink Adjacent Satellite 1 (dB)	20.3	11.2	9.7	8.8
C/I Uplink Adjacent Satellite 2 (dB)	19.0	14.8	13.0	12.1
C/I Downlink Adjacent Satellite 2 (dB)	22.8	19.9	18.4	17.5
C/(N+I) Composite (dB)	11.5	6.6	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.5	5.6	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	0.5	2.2	0.0	0.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-40.9	-51.3	-53.1	-54.0
Downlink EIRP Density At Beam Peak	-25.9	-34.7	-36.2	-37.1
Number of Carriers	1.0	1.0	2.8	311.4

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	North America	North America	North America	North America
Uplink Frequency (GHz)	5.925 – 6.425	5.925 – 6.425	5.925 – 6.425	5.925 – 6.425
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	0.2	0.2	0.2	0.2
Uplink Contour SFD (dBW/m ²)	-86.2	-91.2	-91.2	-91.2
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	North America	North America	North America	North America
Downlink Frequency (GHz)	3.70 – 4.20	3.70 – 4.20	3.70 – 4.20	3.70 – 4.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	36.2	36.2	36.2	36.2
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Downlink EIRP Density (dBW/Hz)	-38.6	-38.6	-38.6	-38.6
ADJACENT SATELLITE 2				
Satellite 2 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Downlink EIRP Density (dBW/Hz)	-38.6	-38.6	-38.6	-38.6
CARRIER INFORMATION				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Information Rate (kbps)	N/A	24575	6000	64
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a
Code Rate	N/A	1/2 - RS	1/2 - RS	1/2-RS
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4
Allocated Bandwidth (kHz)	36000	36000	10300	100
Required Minimum C/N (dB)	10.0	3.4	3.9	3.0
UPLINK EARTH STATION				
Earth Station Diameter (meters)	8.1	6.1	6.1	6.1
Earth Station Gain (dBi)	52.8	49.4	49.4	49.4
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	4.5	3.0	3.0	3.0
Earth Station Gain (dBi)	43.9	39.7	39.7	39.7
Earth Station G/T (dB/K)	23.6	19.2	19.2	19.2
Earth Station Elevation Angle	20	20	20	20
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	76.7	71.7	63.8	43.3
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2
Satellite G/T (dB/K)	0.2	0.2	0.2	0.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Uplink C/N (dB)	29.7	25.5	24.0	23.2
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	36.2	36.2	28.6	8.2
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3
Earth Station G/T (dB/K)	23.6	19.2	19.2	19.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Downlink C/N (dB)	16.0	12.4	11.2	10.4
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	29.7	25.5	24.0	23.2
C/N Downlink (dB)	16.0	12.4	11.2	10.4
C/I Intermodulation (dB)	n/a	n/a	19.8	19.0
C/I Uplink Co-Channel (dB)*	27.0	27.0	28.3	28.0
C/I Downlink Co-Channel (dB)*	27.0	27.0	28.3	28.0
C/I Uplink Adjacent Satellite 1 (dB)	17.8	13.6	12.2	11.3
C/I Downlink Adjacent Satellite 1 (dB)	20.3	11.2	10.1	9.2
C/I Uplink Adjacent Satellite 2 (dB)	17.8	13.6	12.2	11.3
C/I Downlink Adjacent Satellite 2 (dB)	22.8	19.9	18.8	17.9
C/(N+I) Composite (dB)	11.1	6.2	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.1	5.2	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	0.1	1.8	0.0	0.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-42.1	-52.5	-53.9	-54.8
Downlink EIRP Density At Beam Peak	-25.8	-34.6	-35.7	-36.6
Number of Carriers	1.0	1.0	2.6	285.4

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	North America	North America	North America	North America	North America	North America
Uplink Frequency (GHz)	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	0.3	0.3	0.3	0.3	0.3	0.3
Uplink Contour SFD (dBW/m ²)	-82.8	-78.8	-90.8	-90.8	-90.8	-90.8
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	North America	North America	North America	North America	North America	North America
Downlink Frequency (GHz)	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	45.7	45.7	45.7	45.7	45.7	45.7
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Information Rate (kbps)	N/A	24575	6000	64	512	128
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a	n/a	n/a
Code Rate	N/A	1/2 - RS	1/2 - RS	1/2-RS	1/2	1/2
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4	1229	307
Assumed Allocated Bandwidth (kHz)	36000	36000	10300	100	1450	400
Required Minimum C/N (dB) – Clear Sky	10.0	3.4	3.9	3.0	3.4	3.4
Required Minimum C/N (dB) – Rain	10.0	3.4	3.5	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	56.9	46.4
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.2	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	47.5	41.3	44.8	44.8	44.8	55.5
Earth Station G/T (dB/K)	25.0	18.8	22.3	22.3	22.3	33.1
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	80.1	80.3	59.9	39.7	51.7	43.2
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Satellite G/T (dB/K)	0.3	0.3	0.3	0.3	0.3	0.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Uplink C/N (dB)	26.0	26.9	13.0	12.4	12.3	9.7
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	45.7	44.8	36.9	16.7	28.7	20.1
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Earth Station G/T (dB/K)	25.0	18.8	22.3	22.3	22.3	33.1
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Downlink C/N (dB)	17.3	10.9	13.0	12.4	12.3	20.5
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	26.0	26.9	13.0	12.4	12.3	9.7
C/N Downlink (dB)	17.3	10.9	13.0	12.4	12.3	20.5
C/I Intermodulation (dB)	n/a	n/a	17.2	16.6	16.5	13.9
C/I Uplink Co-Channel (dB)*	27.0	27.0	28.2	28.2	28.6	25.6
C/I Downlink Co-Channel (dB)*	27.0	27.0	28.2	28.2	28.6	25.6
C/I Uplink Adjacent Satellite 1 (dB)	30.5	31.5	17.6	17.0	16.8	14.3
C/I Downlink Adjacent Satellite 1 (dB)	21.3	13.8	16.8	16.1	16.0	25.0
C/I Uplink Adjacent Satellite 2 (dB)	30.5	31.5	17.6	17.0	16.8	14.3
C/I Downlink Adjacent Satellite 2 (dB)	22.9	17.2	18.9	18.2	18.1	25.6
C/(N+I) Composite (dB)	14.0	8.3	7.2	6.6	6.5	6.2
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	13.0	7.3	6.2	5.6	5.5	5.2
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	3.0	3.9	2.3	2.6	2.1	1.8
Carrier Density Levels						
Uplink Power Density (dBW/Hz)	-42.8	-51.4	-65.3	-65.9	-66.1	-58.1
Downlink EIRP Density At Beam Peak	-16.3	-26.0	-27.4	-28.1	-28.2	-30.7
Number of Carriers	1.0	1.0	2.6	273.6	17.2	90.0

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	North America	North America	North America	North America	North America	North America
Uplink Frequency (GHz)	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50	14.00 – 14.50
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2
Uplink Contour SFD (dBW/m ²)	-82.3	-78.3	-90.3	-90.3	-90.3	-90.3
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	North America	North America	North America	North America	North America	North America
Downlink Frequency (GHz)	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20	11.70 – 12.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	45.7	45.7	45.7	45.7	45.7	45.7
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 2 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Information Rate (kbps)	N/A	24575	6000	64	512	128
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a	n/a	n/a
Code Rate	N/A	1/2 - RS	1/2 - RS	1/2-RS	1/2	1/2
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4	1229	307
Assumed Allocated Bandwidth (kHz)	36000	36000	10300	100	1450	400
Required Minimum C/N (dB) – Clear Sky	10.0	3.4	3.9	3.0	3.4	3.4
Required Minimum C/N (dB) – Rain	10.0	3.4	3.5	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	56.9	46.4
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.2	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	47.5	41.3	44.8	44.8	44.8	55.5
Earth Station G/T (dB/K)	25.0	18.8	22.3	22.3	22.3	33.1
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	80.6	80.9	60.5	40.3	52.3	43.8
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Satellite G/T (dB/K)	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Uplink C/N (dB)	25.0	26.0	12.1	11.4	11.3	8.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	45.7	44.8	36.9	16.8	28.8	20.2
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Earth Station G/T (dB/K)	25.0	18.8	22.3	22.3	22.3	33.1
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Downlink C/N (dB)	17.3	11.0	13.1	12.4	12.3	20.6
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.0	26.0	12.1	11.4	11.3	8.8
C/N Downlink (dB)	17.3	11.0	13.1	12.4	12.3	20.6
C/I Intermodulation (dB)	n/a	n/a	17.3	16.6	16.5	14.0
C/I Uplink Co-Channel (dB)*	27.0	27.0	28.3	28.2	28.6	25.7
C/I Downlink Co-Channel (dB)*	27.0	27.0	28.3	28.2	28.6	25.7
C/I Uplink Adjacent Satellite 1 (dB)	31.0	32.1	18.1	17.5	17.4	14.9
C/I Downlink Adjacent Satellite 1 (dB)	21.3	13.9	16.8	16.2	16.1	25.1
C/I Uplink Adjacent Satellite 2 (dB)	31.0	32.1	18.1	17.5	17.4	14.9
C/I Downlink Adjacent Satellite 2 (dB)	22.9	17.3	18.9	18.3	18.2	25.7
C/(N+I) Composite (dB)	14.0	8.3	7.0	6.4	6.3	5.9
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	13.0	7.3	6.0	5.4	5.3	4.9
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	3.0	3.9	2.1	2.4	1.9	1.5
Carrier Density Levels						
Uplink Power Density (dBW/Hz)	-42.3	-50.8	-64.8	-65.4	-65.5	-57.5
Downlink EIRP Density At Beam Peak	-16.3	-26.0	-27.4	-28.0	-28.1	-30.6
Number of Carriers	1.0	1.0	2.6	270.9	17.1	90.0

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Uplink Frequency (GHz)	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Uplink SFD (dBW/m ²)	-85.3	-73.3	-85.3	-85.3	-85.3	-85.3
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	46.0	46.0	46.0	46.0	46.0	46.0
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.7	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	44.1	44.1	44.1	44.1	44.1	54.8
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	77.6	79.6	64.4	44.2	56.2	47.1
Uplink Path Loss, Clear Sky (dB)	-207.2	-207.2	-207.2	-207.2	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	22.4	24.6	14.7	14.0	13.9	10.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.0	41.4	36.2	16.0	28.0	18.9
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.6	12.3	12.3	11.7	11.6	19.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	22.4	24.6	14.7	14.0	13.9	10.8
C/N Downlink (dB)	16.6	12.3	12.3	11.7	11.6	19.3
C/I Intermodulation (dB)	N/A	N/A	15.0	14.3	14.2	11.1
C/I Uplink Co-Channel (dB)*	24.5	24.0	23.0	23.0	23.3	19.8
C/I Downlink Co-Channel (dB)*	24.5	24.0	23.0	23.0	23.3	19.8
C/I Uplink Adjacent Satellite 1 (dB)	27.8	30.1	20.1	19.5	19.3	16.2
C/I Downlink Adjacent Satellite 1 (dB)	19.7	15.3	15.4	14.7	14.6	23.0
C/I Uplink Adjacent Satellite 2 (dB)	27.8	30.1	20.1	19.5	19.3	16.2
C/I Downlink Adjacent Satellite 2 (dB)	21.9	17.5	17.6	16.9	16.8	23.7
C/(N+I) Composite (dB)	12.6	9.2	7.0	6.4	6.3	6.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.6	8.2	6.0	5.4	5.3	5.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	1.6	4.9	2.1	2.4	1.9	1.6
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.1	-50.6	-60.6	-61.2	-61.3	-53.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-14.0	-26.1	-26.1	-26.7	-26.9	-30.0

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Uplink Frequency (GHz)	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Uplink SFD (dBW/m ²)	-85.2	-73.2	-85.2	-85.2	-85.2	-85.2
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	46.1	46.1	46.1	46.1	46.1	46.1
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.7	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	44.1	44.1	44.1	44.1	44.1	54.8
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	77.7	79.7	64.3	44.1	56.1	46.9
Uplink Path Loss, Clear Sky (dB)	-207.2	-207.2	-207.2	-207.2	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	22.5	24.7	14.6	13.9	13.8	10.6
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.1	41.5	36.1	15.9	27.9	18.7
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.7	12.4	12.2	11.6	11.4	19.1
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	22.5	24.7	14.6	13.9	13.8	10.6
C/N Downlink (dB)	16.7	12.4	12.2	11.6	11.4	19.1
C/I Intermodulation (dB)	N/A	N/A	14.8	14.1	14.0	10.8
C/I Uplink Co-Channel (dB)*	24.5	24.0	22.8	22.7	23.1	19.5
C/I Downlink Co-Channel (dB)*	24.5	24.0	22.8	22.7	23.1	19.5
C/I Uplink Adjacent Satellite 1 (dB)	27.9	30.2	20.0	19.4	19.2	16.0
C/I Downlink Adjacent Satellite 1 (dB)	19.8	15.4	15.3	14.6	14.5	22.9
C/I Uplink Adjacent Satellite 2 (dB)	27.9	30.2	20.0	19.4	19.2	16.0
C/I Downlink Adjacent Satellite 2 (dB)	22.0	17.6	17.5	16.8	16.7	23.5
C/(N+I) Composite (dB)	12.7	9.3	6.9	6.2	6.1	5.8
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.7	8.3	5.9	5.2	5.1	4.8
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	1.7	5.0	2.0	2.2	1.7	1.4
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-45.0	-50.5	-60.7	-61.3	-61.4	-54.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13.9	-26.0	-26.2	-26.9	-27.0	-30.2

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Uplink Frequency (GHz)	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Uplink SFD (dBW/m2)	-82.3	-73.3	-83.3	-83.3	-83.3	-83.3
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	45.9	45.9	45.9	45.9	45.9	45.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.7	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	46.8	44.1	44.1	44.1	44.1	54.8
Earth Station G/T (dB/K)	24.3	21.6	21.6	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	80.6	79.8	66.6	46.4	58.4	48.3
Uplink Path Loss, Clear Sky (dB)	-207.2	-207.2	-207.2	-207.2	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	25.4	24.8	16.9	16.2	16.1	12.0
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	45.9	41.5	36.3	16.1	28.1	18.0
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.2	-205.2	-205.2	-205.2	-205.2
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	24.3	21.6	21.6	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	19.2	12.4	12.4	11.8	11.7	18.4
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.4	24.8	16.9	16.2	16.1	12.0
C/N Downlink (dB)	19.2	12.4	12.4	11.8	11.7	18.4
C/I Intermodulation (dB)	N/A	N/A	15.2	14.5	14.4	10.3
C/I Uplink Co-Channel (dB)*	24.5	24.0	23.2	23.2	23.5	19.0
C/I Downlink Co-Channel (dB)*	24.5	24.0	23.2	23.2	23.5	19.0
C/I Uplink Adjacent Satellite 1 (dB)	30.8	30.3	22.3	21.7	21.5	17.4
C/I Downlink Adjacent Satellite 1 (dB)	22.6	15.4	15.5	14.8	14.7	22.1
C/I Uplink Adjacent Satellite 2 (dB)	30.8	30.3	22.3	21.7	21.5	17.4
C/I Downlink Adjacent Satellite 2 (dB)	24.2	17.6	17.6	17.0	16.9	22.7
C/(N+I) Composite (dB)	14.8	9.3	7.6	6.9	6.8	6.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	13.8	8.3	6.6	5.9	5.8	5.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	3.8	4.9	2.7	3.0	2.4	1.7
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-42.1	-50.4	-58.4	-59.0	-59.1	-52.7
Downlink EIRP Density At Beam Peak (dBW/Hz)	-14.1	-26.1	-26.0	-26.7	-26.8	-30.9

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Uplink Frequency (GHz)	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00	13.75 – 14.00
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Uplink SFD (dBW/m ²)	-80.2	-73.2	-82.2	-82.2	-82.2	-82.2
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	46.5	46.5	46.5	46.5	46.5	46.5
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	9.0	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	60.0	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	44.1	44.1	44.1	44.1	44.1	54.8
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	82.7	79.2	67.2	46.9	58.9	48.7
Uplink Path Loss, Clear Sky (dB)	-207.2	-207.2	-207.2	-207.2	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	27.5	24.2	17.4	16.7	16.6	12.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.5	41.5	36.3	16.1	28.1	17.9
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	21.6	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	17.1	12.3	12.5	11.8	11.7	18.3
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	27.5	24.2	17.4	16.7	16.6	12.4
C/N Downlink (dB)	17.1	12.3	12.5	11.8	11.7	18.3
C/I Intermodulation (dB)	N/A	N/A	14.6	13.9	13.8	9.6
C/I Uplink Co-Channel (dB)*	24.5	24.0	22.7	22.6	22.9	18.3
C/I Downlink Co-Channel (dB)*	24.5	24.0	22.7	22.6	22.9	18.3
C/I Uplink Adjacent Satellite 1 (dB)	32.9	29.7	22.9	22.2	22.0	17.9
C/I Downlink Adjacent Satellite 1 (dB)	20.2	15.4	15.5	14.8	14.7	22.1
C/I Uplink Adjacent Satellite 2 (dB)	32.9	29.7	22.9	22.2	22.0	17.9
C/I Downlink Adjacent Satellite 2 (dB)	22.4	17.6	17.7	17.0	16.9	22.7
C/(N+I) Composite (dB)	13.5	9.3	7.6	6.9	6.8	5.9
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.5	8.3	6.6	5.9	5.8	4.9
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.5	4.9	2.7	2.9	2.4	1.5
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.3	-51.0	-57.8	-58.5	-58.6	-52.3
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13.5	-26.1	-26.0	-26.7	-26.8	-31.0

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Uplink Frequency (GHz)	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/m2)	-83.3	-74.3	-83.3	-83.3	-83.3	-83.3
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Downlink Frequency (GHz)	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20	10.95–11.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	45.9	45.9	45.9	45.9	45.9	45.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	2.4
Earth Station Gain (dBi)	56.8	56.8	56.8	56.8	56.8	48.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	1.8	2.4	2.4	2.4	6.1
Earth Station Gain (dBi)	54.8	44.1	46.8	46.8	46.8	54.8
Earth Station G/T (dB/K)	32.4	21.6	24.3	24.3	24.3	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	79.6	78.8	66.6	46.5	58.5	50.2
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant(dBW/K -Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	24.7	24.2	17.2	16.7	16.5	14.2
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	45.9	41.5	36.3	16.2	28.2	19.8
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	32.4	21.6	24.3	24.3	24.3	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	27.4	12.4	15.1	14.6	14.4	20.2
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	24.7	24.2	17.2	16.7	16.5	14.2
C/N Downlink (dB)	27.4	12.4	15.1	14.6	14.4	20.2
C/I Intermodulation (dB)	N/A	N/A	15.1	14.6	14.5	12.2
C/I Uplink Co-Channel (dB)*	24.5	24.0	23.2	23.3	23.6	20.9
C/I Downlink Co-Channel (dB)*	24.5	24.0	23.2	23.3	23.6	20.9
C/I Uplink Adjacent Satellite 1 (dB)	29.8	29.3	22.3	21.8	21.6	19.3
C/I Downlink Adjacent Satellite 1 (dB)	31.1	15.4	18.4	17.9	17.8	24.0
C/I Uplink Adjacent Satellite 2 (dB)	29.8	29.3	22.3	21.8	21.6	19.3
C/I Downlink Adjacent Satellite 2 (dB)	31.7	17.6	20.1	19.6	19.4	24.6
C/(N+I) Composite (dB)	18.0	9.3	9.0	8.5	8.4	8.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	17.0	8.3	8.0	7.5	7.4	7.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	7.0	4.9	4.1	4.5	4.0	3.7
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.2	-51.6	-58.6	-59.1	-59.2	-53.6
Downlink EIRP Density At Beam Peak (dBW/Hz)	-14.1	-26.1	-26.0	-26.5	-26.7	-29.0

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Uplink Frequency (GHz)	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Uplink SFD (dBW/m2)	-82.9	-75.9	-82.9	-82.9	-82.9	-82.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Downlink Frequency (GHz)	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	46.5	46.5	46.5	46.5	46.5	46.5
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	2.4
Earth Station Gain (dBi)	56.8	56.8	56.8	56.8	56.8	48.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.8	2.4	2.4	2.4	6.1
Earth Station Gain (dBi)	46.8	44.1	46.8	46.8	46.8	54.8
Earth Station G/T (dB/K)	24.3	21.6	24.3	24.3	24.3	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	80.0	76.5	66.3	46.1	58.1	49.8
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	25.7	22.5	17.5	16.9	16.7	14.4
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.5	41.5	36.2	16.0	28.0	19.7
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	24.3	21.6	24.3	24.3	24.3	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	19.8	12.3	15.0	14.4	14.2	20.1
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.7	22.5	17.5	16.9	16.7	14.4
C/N Downlink (dB)	19.8	12.3	15.0	14.4	14.2	20.1
C/I Intermodulation (dB)	N/A	N/A	14.4	13.8	13.7	11.4
C/I Uplink Co-Channel (dB)*	24.5	24.0	22.5	22.5	22.8	20.1
C/I Downlink Co-Channel (dB)*	24.5	24.0	22.5	22.5	22.8	20.1
C/I Uplink Adjacent Satellite 1 (dB)	30.2	27.0	22.0	21.4	21.2	18.9
C/I Downlink Adjacent Satellite 1 (dB)	23.2	15.4	18.3	17.7	17.6	23.9
C/I Uplink Adjacent Satellite 2 (dB)	30.2	27.0	22.0	21.4	21.2	18.9
C/I Downlink Adjacent Satellite 2 (dB)	24.8	17.6	20.0	19.4	19.2	24.5
C/(N+I) Composite (dB)	15.2	9.1	8.7	8.2	8.1	7.7
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	14.2	8.1	7.7	7.2	7.1	6.7
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	4.2	4.8	3.8	4.2	3.7	3.3
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-42.8	-53.9	-58.9	-59.4	-59.6	-54.0
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13.5	-26.1	-26.1	-26.7	-26.9	-29.2

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Uplink Frequency (GHz)	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Contour G/T (dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Uplink SFD (dBW/m2)	-80.3	-74.3	-84.3	-84.3	-84.3	-84.3
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Downlink Frequency (GHz)	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Contour EIRP (dBW)	46.0	46.0	46.0	46.0	46.0	46.0
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	9.0	6.1	6.1	6.1	6.1	2.4
Earth Station Gain (dBi)	60.1	56.8	56.8	56.8	56.8	48.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	2.4	2.4	2.4	6.1
Earth Station Gain (dBi)	44.1	44.1	46.8	46.8	46.8	54.8
Earth Station G/T (dB/K)	21.6	21.6	24.3	24.3	24.3	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	82.6	78.6	65.5	45.4	57.4	49.5
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	27.7	24.0	16.1	15.6	15.4	13.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.0	41.4	36.3	16.2	28.2	20.2
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	24.3	24.3	24.3	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.6	12.3	15.1	14.6	14.4	20.6
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	27.7	24.0	16.1	15.6	15.4	13.5
C/N Downlink (dB)	16.6	12.3	15.1	14.6	14.4	20.6
C/I Intermodulation (dB)	N/A	N/A	15.0	14.5	14.4	12.5
C/I Uplink Co-Channel (dB)*	24.5	24.0	23.1	23.1	23.5	21.2
C/I Downlink Co-Channel (dB)*	24.5	24.0	23.1	23.1	23.5	21.2
C/I Uplink Adjacent Satellite 1 (dB)	32.8	29.1	21.2	20.7	20.5	18.6
C/I Downlink Adjacent Satellite 1 (dB)	19.7	15.3	18.4	17.9	17.8	24.4
C/I Uplink Adjacent Satellite 2 (dB)	32.8	29.1	21.2	20.7	20.5	18.6
C/I Downlink Adjacent Satellite 2 (dB)	21.9	17.5	20.1	19.6	19.4	25.0
C/(N+I) Composite (dB)	13.1	9.2	8.7	8.2	8.0	8.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.1	8.2	7.7	7.2	7.0	7.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.1	4.8	3.8	4.2	3.6	3.6
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.5	-51.8	-59.7	-60.2	-60.3	-54.3
Downlink EIRP Density At Beam Peak (dBW/Hz)	-14.0	-26.1	-26.0	-26.6	-26.7	-28.6

EXHIBIT 2: ADJACENT SATELLITE 2 (57.5° W.L.) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	S. America	S. America	S. America	S. America	S. America	S. America
Uplink Frequency (GHz)	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25	14.0 – 14.25
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Contour G/T (dB/K)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Uplink SFD (dBW/m2)	-81.9	-75.9	-80.9	-80.9	-80.9	-80.9
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America	Extended Ku N. America
Downlink Frequency (GHz)	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20	10.95 – 11.20
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Contour EIRP (dBW)	46.1	46.1	46.1	46.1	46.1	46.1
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.	55.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.	59.5 W.L.
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	27M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	18432	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.4	3.9	3.0	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.4	3.6	2.8	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	7.0	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	58.0	56.8	56.8	56.8	56.8	46.3
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.8	2.4	1.8	1.8	6.1
Earth Station Gain (dBi)	44.1	44.1	46.8	44.1	44.1	54.8
Earth Station G/T (dB/K)	21.6	21.6	24.3	21.6	21.6	32.4
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	81.0	77.0	67.9	49.3	61.2	51.1
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Boltzman Constant(dBW/K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	26.7	23.0	19.1	20.0	19.8	15.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	46.1	41.5	35.4	16.8	28.7	18.6
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.3	-205.3	-205.3	-205.3	-205.3	-205.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	21.6	21.6	24.3	21.6	21.6	32.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-73.5	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.7	12.4	14.2	12.4	12.3	19.0
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	26.7	23.0	19.1	20.0	19.8	15.8
C/N Downlink (dB)	16.7	12.4	14.2	12.4	12.3	19.0
C/I Intermodulation (dB)	N/A	N/A	14.1	15.0	14.8	10.7
C/I Uplink Co-Channel (dB)*	24.5	24.0	22.1	23.6	23.9	19.4
C/I Downlink Co-Channel (dB)*	24.5	24.0	22.1	23.6	23.9	19.4
C/I Uplink Adjacent Satellite 1 (dB)	31.2	27.5	23.6	24.5	24.3	20.3
C/I Downlink Adjacent Satellite 1 (dB)	19.8	15.4	16.6	15.5	15.3	22.8
C/I Uplink Adjacent Satellite 2 (dB)	31.2	27.5	23.6	24.5	24.3	20.3
C/I Downlink Adjacent Satellite 2 (dB)	22.0	17.6	18.5	17.7	17.5	23.4
C/(N+I) Composite (dB)	13.1	9.2	8.3	7.9	7.8	7.6
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.1	8.2	7.3	6.9	6.8	6.6
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.1	4.8	3.4	4.0	3.4	3.2
Number of Carriers	1	1.0	2.6	270.0	18.6	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.0	-53.4	-57.2	-56.3	-56.5	-50.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13.9	-26.0	-26.9	-26.0	-26.2	-30.3

**Exhibit 3A: Adjacent Satellite 1 (53.5° W.L.) C/I Associated With
Galaxy 11 Digital Emissions**

Uplink Beam Name	C-Band North America (H)	C-Band North America (V)
Downlink Beam Name	C-Band North America (V)	C-Band North America (H)
Protected Carrier: 36M0G7W	9.6	9.2
Protected Carrier: 10M3G7W	8.0	8.0
Protected Carrier: 100KG7W	7.1	7.1
Uplink Beam Name	North America (H)	North America (V)
Downlink Beam Name	North America (V)	North America (H)
Protected Carrier: 36M0G7W	13.7	13.8
Protected Carrier: 10M3G7W	14.2	14.4
Protected Carrier: 100KG7W	13.5	13.8
Protected Carrier: 1M45G7W	13.4	13.7
Protected Carrier: 400KG7W	13.9	14.5
Uplink Beam Name	Extended Ku North America (H)	Extended Ku North America (V)
Downlink Beam Name	Extended Ku North America (V)	Extended Ku North America (H)
Protected Carrier: 27M0G7W	15.2	15.3
Protected Carrier: 10M3G7W	14.1	14.0
Protected Carrier: 100KG7W	13.5	13.4
Protected Carrier: 1M45G7W	13.3	13.2
Protected Carrier: 400KG7W	15.4	15.2
Uplink Beam Name	Extended Ku North America (H)	Extended Ku North America (V)
Downlink Beam Name	South America (V)	South America (H)
Protected Carrier: 27M0G7W	15.3	15.2
Protected Carrier: 10M3G7W	14.7	14.8
Protected Carrier: 100KG7W	14.0	14.1
Protected Carrier: 1M45G7W	13.9	14.0
Protected Carrier: 400KG7W	16.1	16.5
Uplink Beam Name	South America (H)	South America (V)
Downlink Beam Name	South America (V)	South America (H)
Protected Carrier: 27M0G7W	15.2	15.1
Protected Carrier: 10M3G7W	16.9	16.8
Protected Carrier: 100KG7W	16.4	16.2
Protected Carrier: 1M45G7W	16.3	16.0
Protected Carrier: 400KG7W	18.0	17.7
Uplink Beam Name	South America (H)	South America (V)
Downlink Beam Name	Extended Ku North America (V)	Extended Ku North America (H)
Protected Carrier: 27M0G7W	15.1	15.1
Protected Carrier: 10M3G7W	16.6	15.8
Protected Carrier: 100KG7W	16.1	15.0
Protected Carrier: 1M45G7W	15.9	14.8
Protected Carrier: 400KG7W	17.6	18.4

**Exhibit 3B: Adjacent Satellite 1 (57.5° W.L.) C/I Associate With
Galaxy 11 Digital Emissions**

Uplink Beam Name	C-Band North America (H)	C-Band North America (V)
Downlink Beam Name	C-Band North America (V)	C-Band North America (H)
Protected Carrier: 36M0G7W	9.6	9.2
Protected Carrier: 10M3G7W	8.0	8.0
Protected Carrier: 100KG7W	7.1	7.1
Uplink Beam Name	North America (H)	North America (V)
Downlink Beam Name	North America (V)	North America (H)
Protected Carrier: 36M0G7W	13.7	13.8
Protected Carrier: 10M3G7W	14.2	14.4
Protected Carrier: 100KG7W	13.5	13.8
Protected Carrier: 1M45G7W	13.4	13.7
Protected Carrier: 400KG7W	13.9	14.5
Uplink Beam Name	Extended Ku North America (H)	Extended Ku North America (V)
Downlink Beam Name	Extended Ku North America (V)	Extended Ku North America (H)
Protected Carrier: 27M0G7W	15.2	15.3
Protected Carrier: 10M3G7W	14.1	14.0
Protected Carrier: 100KG7W	13.5	13.4
Protected Carrier: 1M45G7W	13.3	13.2
Protected Carrier: 400KG7W	15.4	15.2
Uplink Beam Name	Extended Ku North America (H)	Extended Ku North America (V)
Downlink Beam Name	South America (V)	South America (H)
Protected Carrier: 27M0G7W	15.3	15.2
Protected Carrier: 10M3G7W	14.7	14.8
Protected Carrier: 100KG7W	14.0	14.1
Protected Carrier: 1M45G7W	13.9	14.0
Protected Carrier: 400KG7W	16.1	16.5
Uplink Beam Name	South America (H)	South America (V)
Downlink Beam Name	South America (V)	South America (H)
Protected Carrier: 27M0G7W	15.2	15.1
Protected Carrier: 10M3G7W	16.9	16.8
Protected Carrier: 100KG7W	16.4	16.2
Protected Carrier: 1M45G7W	16.3	16.0
Protected Carrier: 400KG7W	18.0	17.7
Uplink Beam Name	South America (H)	South America (V)
Downlink Beam Name	Extended Ku North America (V)	Extended Ku North America (H)
Protected Carrier: 27M0G7W	15.1	15.1
Protected Carrier: 10M3G7W	16.6	15.8
Protected Carrier: 100KG7W	16.1	15.0
Protected Carrier: 1M45G7W	15.9	14.8
Protected Carrier: 400KG7W	17.6	18.4

**Exhibit 4A: Adjacent Satellite 1 (53.5° W.L.) C/I Margin Associated With
Galaxy 11 Digital Emissions**

Uplink Beam Name	C-Band North America (H)	C-Band North America (V)
Downlink Beam Name	C-Band North America (V)	C-Band North America (H)
Protected Carrier: 36M0G7W	-6.0	-6.4
Protected Carrier: 10M3G7W	-8.1	-8.1
Protected Carrier: 100KG7W	-8.1	-8.1
Uplink Beam Name	North America (H)	North America (V)
Downlink Beam Name	North America (V)	North America (H)
Protected Carrier: 36M0G7W	-1.9	-1.8
Protected Carrier: 10M3G7W	-1.9	-1.7
Protected Carrier: 100KG7W	-1.7	-1.4
Protected Carrier: 1M45G7W	-2.2	-1.9
Protected Carrier: 400KG7W	-1.7	-1.1
Uplink Beam Name	Extended Ku North America (H)	Extended Ku North America (V)
Downlink Beam Name	Extended Ku North America (V)	Extended Ku North America (H)
Protected Carrier: 27M0G7W	-0.4	-0.3
Protected Carrier: 10M3G7W	-2.0	-2.1
Protected Carrier: 100KG7W	-1.7	-1.8
Protected Carrier: 1M45G7W	-2.3	-2.4
Protected Carrier: 400KG7W	-0.2	-0.4
Uplink Beam Name	Extended Ku North America (H)	Extended Ku North America (V)
Downlink Beam Name	South America (V)	South America (H)
Protected Carrier: 27M0G7W	-0.3	-0.4
Protected Carrier: 10M3G7W	-1.4	-1.3
Protected Carrier: 100KG7W	-1.2	-1.1
Protected Carrier: 1M45G7W	-1.7	-1.6
Protected Carrier: 400KG7W	0.5	0.9
Uplink Beam Name	South America (H)	South America (V)
Downlink Beam Name	South America (V)	South America (H)
Protected Carrier: 27M0G7W	-0.4	-0.5
Protected Carrier: 10M3G7W	0.8	0.7
Protected Carrier: 100KG7W	1.2	1.0
Protected Carrier: 1M45G7W	0.7	0.4
Protected Carrier: 400KG7W	2.4	2.1
Uplink Beam Name	South America (H)	South America (V)
Downlink Beam Name	Extended Ku North America (V)	Extended Ku North America (H)
Protected Carrier: 27M0G7W	-0.5	-0.5
Protected Carrier: 10M3G7W	0.5	-0.3
Protected Carrier: 100KG7W	0.9	-0.2
Protected Carrier: 1M45G7W	0.3	-0.8
Protected Carrier: 400KG7W	2.0	2.8

**Exhibit 4B: Adjacent Satellite 1 (57.5° W.L.) C/I Margin Associated With
Galaxy 11 Digital Emissions**

Uplink Beam Name	C-Band North America (H)	C-Band North America (V)
Downlink Beam Name	C-Band North America (V)	C-Band North America (H)
Protected Carrier: 36M0G7W	-6.0	-6.4
Protected Carrier: 10M3G7W	-8.1	-8.1
Protected Carrier: 100KG7W	-8.1	-8.1
Uplink Beam Name	North America (H)	North America (V)
Downlink Beam Name	North America (V)	North America (H)
Protected Carrier: 36M0G7W	-1.9	-1.8
Protected Carrier: 10M3G7W	-1.9	-1.7
Protected Carrier: 100KG7W	-1.7	-1.4
Protected Carrier: 1M45G7W	-2.2	-1.9
Protected Carrier: 400KG7W	-1.7	-1.1
Uplink Beam Name	Extended Ku North America (H)	Extended Ku North America (V)
Downlink Beam Name	Extended Ku North America (V)	Extended Ku North America (H)
Protected Carrier: 27M0G7W	-0.4	-0.3
Protected Carrier: 10M3G7W	-2.0	-2.1
Protected Carrier: 100KG7W	-1.7	-1.8
Protected Carrier: 1M45G7W	-2.3	-2.4
Protected Carrier: 400KG7W	-0.2	-0.4
Uplink Beam Name	Extended Ku North America (H)	Extended Ku North America (V)
Downlink Beam Name	South America (V)	South America (H)
Protected Carrier: 27M0G7W	-0.3	-0.4
Protected Carrier: 10M3G7W	-1.4	-1.3
Protected Carrier: 100KG7W	-1.2	-1.1
Protected Carrier: 1M45G7W	-1.7	-1.6
Protected Carrier: 400KG7W	0.5	0.9
Uplink Beam Name	South America (H)	South America (V)
Downlink Beam Name	South America (V)	South America (H)
Protected Carrier: 27M0G7W	-0.4	-0.5
Protected Carrier: 10M3G7W	0.8	0.7
Protected Carrier: 100KG7W	1.2	1.0
Protected Carrier: 1M45G7W	0.7	0.4
Protected Carrier: 400KG7W	2.4	2.1
Uplink Beam Name	South America (H)	South America (V)
Downlink Beam Name	Extended Ku North America (V)	Extended Ku North America (H)
Protected Carrier: 27M0G7W	-0.5	-0.5
Protected Carrier: 10M3G7W	0.5	-0.3
Protected Carrier: 100KG7W	0.9	-0.2
Protected Carrier: 1M45G7W	0.3	-0.8
Protected Carrier: 400KG7W	2.0	2.8