Engineering Statement

Intelsat License LLC ("Intelsat") proposes to modify the license of Galaxy 26 to specify operation of the spacecraft from 50º E.L. From this orbital location, Galaxy 26 would provide coverage of Europe and portions of Asia and Africa. Galaxy 26 has the capability to operate on the C-band frequencies of 5925 – 6425 MHz and 3700 – 4200 MHz and the Ku-band frequencies of 14000 – 14500 MHz and 11700 – 12200 MHz. However, Intelsat intends to use only the Ku-band communication channel frequencies at 50° E.L. to provide service to the aforementioned coverage areas, and use C-band frequencies to perform telemetry and control functions. Moreover, as described below, a portion of the C-band and Ku-band communications payload frequency bands will be used for TC&R operations.

When on-station, Intelsat will normally control Galaxy 26 through telemetry and command channels that operate on C-band frequencies. Additionally, Intelsat will use approximately 1 MHz of bandwidth within one of the C-band communication channels for spacecraft ranging.

Galaxy 26 is currently licensed to operate by the Commission from 50.75° E.L. (see FCC File No.: SAT-MOD-20090309-00034). In order to meet customer requirements, Intelsat now seeks authorization from the Commission to relocate Galaxy 26 from 50.75° E.L. to 50° E.L. and to provide Ku-band service. At the proposed orbital location of 50° E.L, Galaxy 26 will be operated in accordance with ITU filings of the Turkish administration.

To take into account the impact of the proposed change in the Galaxy 26 orbital location, this engineering statement provides the following technical information: (1) frequency plan, (2) gain contours, (3) TC&R, (4) PFD levels, (5) link budget analysis, (6) adjacent satellite link analysis, (7) Schedule S and (8) orbital debris mitigation plan.

1) Frequency Plan

The frequency plan for the Galaxy 26 satellite, when operating from 50° E.L, is provided in Exhibits 1A and 1B.

2) Gain Contours

The coverage patterns of Galaxy 26 operating from 50.75º E.L. are shown in Exhibits 2A through 2R. The peak antenna gain, G/T, SFD ("Saturated Flux

Density") and EIRP level for each uplink and downlink beam, as appropriate, are also provided in these exhibits.

3) Telemetry, Command and Ranging ("TC&R")

The Galaxy 26 command and telemetry channel frequency information is provided in Exhibits 1A and 1B. The TC&R beam information is provided in Exhibits 2I through 2P.

Of the two command receivers on Galaxy 26, only that corresponding to the frequency 5926.5 MHz is currently functional. For that reason, Intelsat will use a back-up command carrier centered at 6411 MHz (10 MHz bandwidth).

Since only one of the command receivers is currently functional, Intelsat has chosen to conduct ranging operations through the use of a carrier centered at 6315 MHz (V-pol) in the uplink and 4090 MHz (H-pol) in the downlink. This carrier will be transmitted through the communications payload and has a bandwidth of 1 MHz.

Intelsat may also utilize approximately 10 MHz of bandwidth within the Ku-band payload frequency band for back-up commanding and/or 1 MHz of bandwidth for back-up ranging. In this mode of operation, the ranging/command signals will be sent to and received from the spacecraft through the Ku-band horizontally or vertically polarized beams, depending on the specific frequency chosen.

Intelsat will coordinate its TC&R operations with operators of other adjacent, co-frequency satellites, prior to the arrival of Galaxy 26 at its on-station location of 50° E.L.

Section 25.202(g) of the Commission's rules requires that the telemetry, tracking and telecommand functions for U.S. domestic satellites be conducted at either or both edges of the allocated band(s). Although from the 50° E.L. orbital location, Galaxy 26 will operate outside of the U.S. domestic orbital arc, Intelsat requests a waiver of the provisions of Section 25.202(g), to the extent necessary, with respect to the frequency that is proposed to be used for ranging (or tracking) of Galaxy 26 as well as for the back-up command and ranging frequencies.

Waiver is justified here to ensure safe operation of Galaxy 26. Access to the above-specified ranging frequencies allows Intelsat to track the satellite. Unfortunately, health issues with the Galaxy 26 satellite prevent the ranging and the back-up command frequencies from being located at the edge of the C-band.

Moreover, grant of the waiver will not cause harmful interference to adjacent satellites. Intelsat is coordinating all its TC&R C-band frequencies with the affected satellite operators.

4) Power Flux Density Levels

The power flux density ("PFD") limits for space stations operating in the 3700 - 4200 MHz band are contained in Section 25.208 of the Commission's rules. With respect to the 11700 – 12200 MHz band, no PFD limits are specified in Section 25.208 of the FCC Rules or in No. 21.16 of the ITU Radio Regulations with respect to the operation of geostationary satellites.

As previously indicated Intelsat intends to use the C-band frequencies on Galaxy 26 for spacecraft telemetry and ranging. In this regard, the maximum PFD levels for the Galaxy 26 telemetry and ranging carriers was calculated for the 3700 – 4200 MHz band. The results are provided in Exhibit 3 and show that the downlink power flux density levels of the Galaxy 26 telemetry and ranging carrier do not exceed the limits specified in Section 25.208 of the Commission's rules.

5) Link Budgets Analysis

For the link budget analysis, it was assumed that the nearest satellites to Galaxy 26 were a hypothetical satellite operating from 48° E.L. and a hypothetical satellite operating from 52° E.L.[1] The hypothetical satellites were assumed to have the same operational parameters as Galaxy 26.

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 FCC 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 Ku-band frequencies, rain attenuation predictions are derived using Recommendation ITU-R 618.
d) At Ku-band frequencies, increase in noise temperature of the receiving earth station due to rain is taken into account.

[1] Although there are satellites that are located within the 48º E.L. and 52º E.L the operational status of these spacecraft could not be determined and/or no information on their payload characteristics could be found. The only exception was Yamal-20 (49º E.L), which utilizes C-band – which Galaxy 26 does not intend to utilize except for TC&R purposes. Accordingly, for the purposes of performing the link budget calculations the assumptions on adjacent satellites as described in section 5 were made.

e) For the cases where the transponder operates in a multi-carrier mode, the effects due to intermodulation interference are taken into account.

The impact of the TV/FM carriers from the adjacent satellites at 48° E.L. and 52° E.L on the transmissions of Galaxy 26 was not considered 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 operator, 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.

A portion of the C-band and Ku-band communications payload will be used only for ranging and back-up TC&R. Accordingly, no link budgets were performed for these TC&R carriers as they will be coordinated separately with the affected adjacent satellite operators.

Ku-band link analysis for Galaxy 26 was conducted for a number of representative carriers. The uplink power density of the emissions to each of the hypothetical satellites was assumed to be -45 dBW/Hz. The maximum downlink EIRP density of the emissions from each of the hypothetical satellites was assumed to be -24.3 dBW/Hz.

The results of the analysis are shown in Exhibit 4. Ku-band link budgets demonstrate that operation of the Galaxy 26 satellite from 50º E.L. would permit the intended Ku-band services to achieve their respective performance objectives while maintaining sufficient link margin. Moreover, the uplink power density and downlink EIRP density of the Galaxy 26 digital emissions would not exceed the levels in Section 25.212 (c) of the Commission's rules.

6) Adjacent Satellite Link Analysis

At C-band, the impact of the Galaxy 26 TC&R emissions on other adjacent co-frequency satellites was not evaluated, since Intelsat will coordinate these carriers separately with the adjacent operators.

At Ku-band, the impact of the proposed Galaxy 26 emissions on the transmissions of a hypothetical adjacent satellite located at 48º E.L and a hypothetical satellite

located at 52º E.L was analyzed. It was assumed that the hypothetical satellites had the same operating characteristics as Galaxy 26.

For the satellite located at 48º E.L, it was assumed that the adjacent satellites were Galaxy 26, located at 50º E.L, and a hypothetical satellite having the same operating characteristics as Galaxy 26 located at 46º E.L. For the satellite located at 52º E.L, it was assumed that the adjacent satellites were Galaxy 26, located at 50º E.L, and a hypothetical satellite having the same operating characteristics as Galaxy 26 located at 54º E.L.

For the Ku-band analysis, it was assumed that the Galaxy 26 and the hypothetical satellites located at 46º E.L. and 52º E.L. operated with the maximum uplink power density of -45 dBw/Hz and a downlink EIRP density of -24.3 dBW/Hz. The assumptions made in section 4 pertaining to Earth station off-axis gain performance, Earth station cross-polarization performance and rain attenuation were also applied in the analysis.

The results of the analysis are listed in Exhibits 5 and 6. The Galaxy 26 transmissions will be limited to those levels contained in Sections 25.212(c) and (d), as applicable. Higher Ku-band levels will be used if coordinated with affected adjacent satellite operators. In any case, pursuant to the results in Exhibits 5 and 6, the uplink power density and downlink EIRP density level of Galaxy 26 Ku-band digital carriers will not exceed -45 dBW/Hz and -24.3 dBW/Hz, respectively.

7) Schedule S Submission

Intelsat is providing with its application a Schedule S for the operations of Galaxy 26 from 50º E.L. The Schedule S contains only those Galaxy 26 data items that have changed as a result of the proposed modification and data items whose inclusion was required in order for the software application to function properly.

8) Orbital Debris Mitigation Plan

Intelsat is proactive in ensuring safe operation and disposal of this and all spacecraft under its control. The four elements of debris mitigation are addressed below:

8.1) Spacecraft Hardware Design

The spacecraft is designed such that no debris will be released during normal operations. Intelsat has assessed the probability of collision with meteoroids and other small debris (<1 cm diameter) and has taken the following steps to limit the effects of such collisions: (1) critical spacecraft components are located inside the

protective body of the spacecraft and properly shielded; and (2) all spacecraft subsystems have redundant components to ensure no single-point failures. The spacecraft does not use any subsystems for end-of-life disposal that are not used for normal operations.

8.2) Minimizing Accidental Explosions

Intelsat has assessed the probability of accidental explosions during and after completion of mission operations. The spacecraft is designed in a manner to minimize the potential for such explosions. Propellant tanks and thrusters are isolated using redundant valves and electrical power systems are shielded in accordance with standard industry practices. At the completion of the mission, and upon disposal of the spacecraft, Intelsat will ensure the removal of all stored energy on the spacecraft by depleting all propellant tanks, venting all pressurized systems and turning off all active units.

8.3) Safe Flight Profiles

Intelsat has assessed and limited the probability of the space station becoming a source of debris as a result of collisions with large debris or other operational space stations. Galaxy 26 will not be located at the same orbital location as another satellite or at an orbital location that has an overlapping stationkeeping volume with another satellite.

Intelsat is not aware of any other FCC licensed system, or any other system applied for and under consideration by the FCC, having an overlapping stationkeeping volume with Galaxy 26. Similarly, Intelsat is not aware of any other system with an overlapping stationkeeping volume with Galaxy 26 that is the subject of an ITU filing and that is either in orbit or progressing towards launch.

8.4) Post Mission Disposal

At the end of the mission, Intelsat expects to dispose of the spacecraft by moving it to a planned minimum altitude of 150 kilometers (perigee) above the geostationary arc.[2] Nevertheless, as the Commission is aware, because there is no mechanism for precisely calculating the amount of fuel left on the spacecraft once it is in orbit, it is possible that the spacecraft will not meet the planned minimum de-orbit altitude.

In its Second Report and Order in IB Docket 02-54 (FCC Document Number: 04-130), the FCC declared that satellites launched prior to March 18, 2002, such as

[2] Intelsat has reserved 63.5 kilograms of fuel for this purpose. The fuel gauging uncertainty has been taken into account in these calculations.

Galaxy 26, would be designated as grandfathered satellites not subject to a specific disposal altitude. Therefore, the Galaxy 26 planned disposal orbit complies with the FCC's rules.

In addition, Intelsat provides the following information:

1) Planned orbital eccentricity: 0.0004 (This is a best estimate of optimal eccentricity to match the natural eccentricity circle due to Sun and Moon perturbations after decommission.[3])
2) Planned apogee altitude: 185 km[4]
3) Information concerning the methods that will be used to assess and provide adequate margins concerning fuel gauging uncertainty: For the Galaxy 26 spacecraft, in addition to the nominal hold-back and reserves provided to us by the manufacturer, Intelsat propulsion engineers review the current propellant usage – particularly the mixing ratio – to properly allocate sufficient margin to account for unavailable propellant that may result from a non-optimal mixing ratio. In addition, Intelsat performs thermal gauging near the spacecraft's end of life by inferring the remaining propellant from the thermal signature when Intelsat applies heat to different parts of the propellant tank system. This information is considered when determining the additional hold-back and adjustments to book values to attempt to ensure sufficient propellant to achieve the planned minimum altitude. There are, however, many uncertainties to both methods that could lead to incorrect conclusions regarding remaining fuel.

[3] Because it is extremely difficult to anticipate end-of-life thruster performance and operational conditions, it is extremely difficult to achieve the planned eccentricity. Intelsat's priority is to achieve the planned minimum perigee of 150 kilometers. In order to achieve the planned eccentricity, not only must there be sufficient propellant reserved but, in addition, individual thrusters must be fired at specific times during satellite decommissioning because the timing of thruster firing will affect eccentricity. Due to difficulties in predicting the thruster end-of-life performance, as well as earth station availability and visibility as the satellite drifts, it may not be possible to fire the right thrusters at the optimal times. Thus, optimal eccentricity may not be achieved, which, in turn, will affect the apogee altitude.

[4] See n. 2.

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	April 20, 2011
Jose Albuquerque Intelsat Senior Director Spectrum Strategy	Date

Exhibit 1A: Frequency Plan

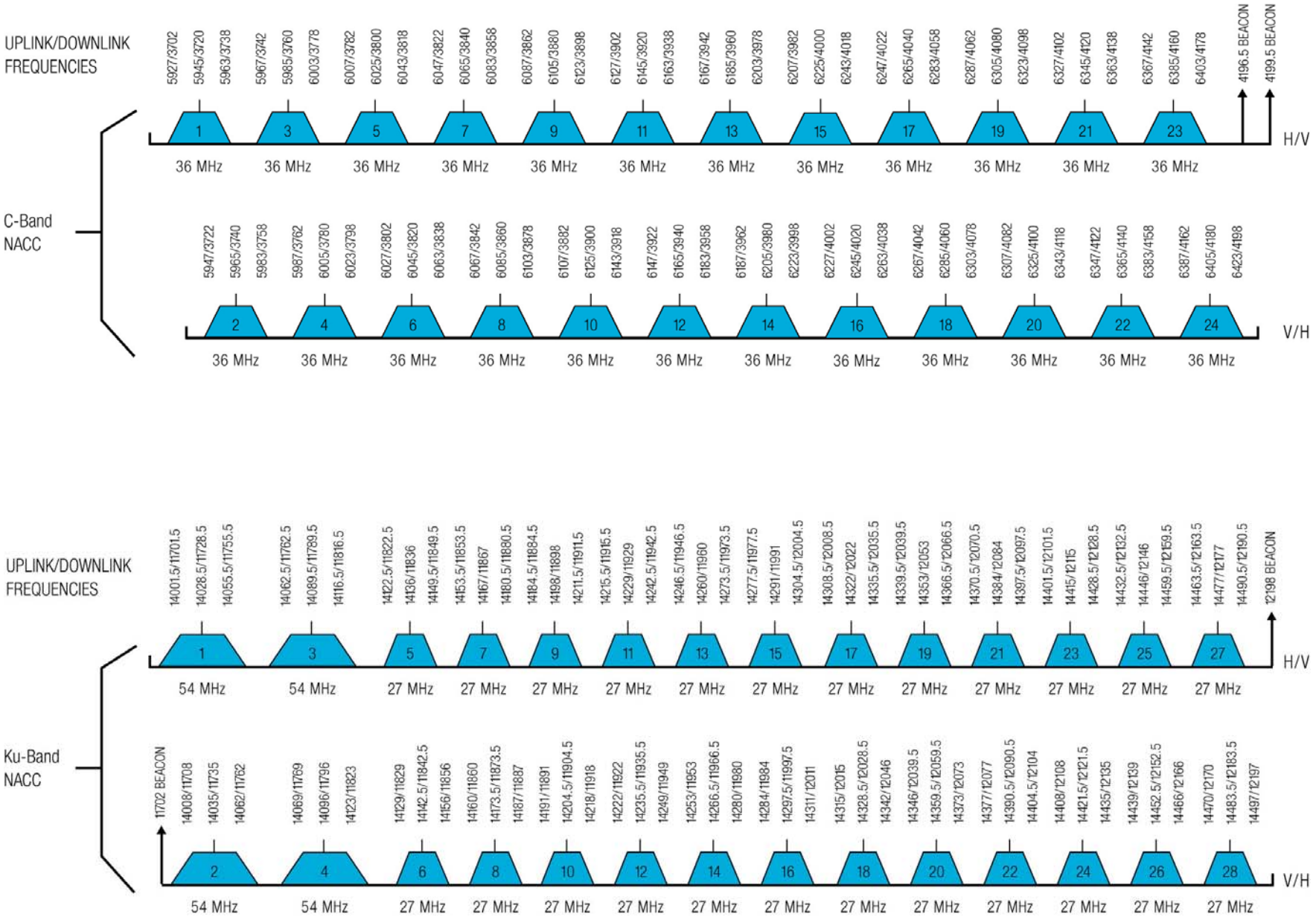

Exhibit 1B: Frequency Assignments

Uplink Transponder Designation	Uplink Beam Name	Uplink Polarization	Uplink Center Frequency (MHz)	Downlink Transponder Designation	Downlink Beam Name	Downlink Polarization	Downlink Center Frequency (MHz)	Channel Bandwidth (MHz)	Maximum Transponder Gain (dB)
1C	Europe-Asia-Africa	HORIZONTAL	5945	1C	Europe-Asia-Africa	VERTICAL	3720	36	113.8
3C	Europe-Asia-Africa	HORIZONTAL	5985	3C	Europe-Asia-Africa	VERTICAL	3760	36	113.8
5C	Europe-Asia-Africa	HORIZONTAL	6025	5C	Europe-Asia-Africa	VERTICAL	3800	36	113.8
7C	Europe-Asia-Africa	HORIZONTAL	6065	7C	Europe-Asia-Africa	VERTICAL	3840	36	113.8
9C	Europe-Asia-Africa	HORIZONTAL	6105	9C	Europe-Asia-Africa	VERTICAL	3880	36	113.8
11C	Europe-Asia-Africa	HORIZONTAL	6145	11C	Europe-Asia-Africa	VERTICAL	3920	36	113.8
13C	Europe-Asia-Africa	HORIZONTAL	6185	13C	Europe-Asia-Africa	VERTICAL	3960	36	113.8
15C	Europe-Asia-Africa	HORIZONTAL	6225	15C	Europe-Asia-Africa	VERTICAL	4000	36	113.8
17C	Europe-Asia-Africa	HORIZONTAL	6265	17C	Europe-Asia-Africa	VERTICAL	4040	36	113.8
19C	Europe-Asia-Africa	HORIZONTAL	6305	19C	Europe-Asia-Africa	VERTICAL	4080	36	113.8
21C	Europe-Asia-Africa	HORIZONTAL	6345	21C	Europe-Asia-Africa	VERTICAL	4120	36	113.8
23C	Europe-Asia-Africa	HORIZONTAL	6385	23C	Europe-Asia-Africa	VERTICAL	4160	36	113.8
2C	Europe-Asia-Africa	VERTICAL	5965	2C	Europe-Asia-Africa	HORIZONTAL	3740	36	112.5
4C	Europe-Asia-Africa	VERTICAL	6005	4C	Europe-Asia-Africa	HORIZONTAL	3780	36	112.5
6C	Europe-Asia-Africa	VERTICAL	6045	6C	Europe-Asia-Africa	HORIZONTAL	3820	36	112.5
8C	Europe-Asia-Africa	VERTICAL	6085	8C	Europe-Asia-Africa	HORIZONTAL	3860	36	112.5
10C	Europe-Asia-Africa	VERTICAL	6125	10C	Europe-Asia-Africa	HORIZONTAL	3900	36	112.5
12C	Europe-Asia-Africa	VERTICAL	6165	12C	Europe-Asia-Africa	HORIZONTAL	3940	36	112.5
14C	Europe-Asia-Africa	VERTICAL	6205	14C	Europe-Asia-Africa	HORIZONTAL	3980	36	112.5
16C	Europe-Asia-Africa	VERTICAL	6245	16C	Europe-Asia-Africa	HORIZONTAL	4020	36	112.5
18C	Europe-Asia-Africa	VERTICAL	6285	18C	Europe-Asia-Africa	HORIZONTAL	4060	36	112.5
20C	Europe-Asia-Africa	VERTICAL	6325	20C	Europe-Asia-Africa	HORIZONTAL	4100	36	112.5
22C	Europe-Asia-Africa	VERTICAL	6365	22C	Europe-Asia-Africa	HORIZONTAL	4140	36	112.5
24C	Europe-Asia-Africa	VERTICAL	6405	24C	Europe-Asia-Africa	HORIZONTAL	4180	36	112.5
Command 1	Global (Wide Beam)	Horizontal	5926.5					1	
Command 2	Global (Wide Beam)	Horizontal	6423.5					1	
Command 3	Global (Wide Beam)	Horizontal	6411.0					15	
Command 4	Global (Wide Beam)	Vertical	5926.5					1	
Command 5	Global (Wide Beam)	Vertical	6423.5					1	
Command 6	Global (Wide Beam)	Vertical	6411.0					15	
Command 7	Global (Narrow Beam)	Horizontal	5926.5					1	
Command 8	Global (Narrow Beam)	Horizontal	6423.5					1	
Command 9	Global (Narrow Beam)	Horizontal	6411.0					15	
Command 10	Global (Narrow Beam)	Vertical	5926.5					1	
Command 11	Global (Narrow Beam)	Vertical	6423.5					1	
Command 12	Global (Narrow Beam)	Vertical	6411.0					15	
				Telemetry 1	Europe-Asia-Africa	Horizontal	4196.5	0.5	
				Telemetry 2	Europe-Asia Africa	Horizontal	4199.5	0.5	
				Telemetry 3	Europe-Asia-Africa	Vertical	4196.5	0.5	
				Telemetry 4	Europe-Asia-Africa	Vertical	4199.5	0.5	
				Telemetry 5	Global (Wide Beam)	Vertical	4196.5	0.5	
				Telemetry 6	Global (Wide Beam)	Vertical	4199.5	0.5	
				Telemetry 7	Global (Narrow Beam)	Vertical	4196.5	0.5	
				Telemetry 8	Global (Narrow Beam)	Vertical	4199.5	0.5	

Exhibit 1B: Frequency Assignments (continued)

Uplink Transponder Designation	Uplink Beam Name	Uplink Polarization	Uplink Center Frequency (MHz)	Downlink Transponder Designation	Downlink Beam Name	Downlink Polarization	Downlink Center Frequency (MHz)	Channel Bandwidth (MHz)	Maximum Transponder Gain (dB)
1K	Europe-Asia-Africa	HORIZONTAL	14208.5	1K	Europe-Asia-Africa	VERTICAL	11728.5	54	131.8
3K	Europe-Asia-Africa	HORIZONTAL	14089.5	3K	Europe-Asia-Africa	VERTICAL	11789.5	54	131.8
5K	Europe-Asia-Africa	HORIZONTAL	14136	5K	Europe-Asia-Africa	VERTICAL	11836	27	131.8
7K	Europe-Asia-Africa	HORIZONTAL	14167	7K	Europe-Asia-Africa	VERTICAL	11867	27	131.8
9K	Europe-Asia-Africa	HORIZONTAL	14198	9K	Europe-Asia-Africa	VERTICAL	11898	27	131.8
11K	Europe-Asia-Africa	HORIZONTAL	14229	11K	Europe-Asia-Africa	VERTICAL	11929	27	131.8
13K	Europe-Asia-Africa	HORIZONTAL	14260	13K	Europe-Asia-Africa	VERTICAL	11960	27	131.8
15K	Europe-Asia-Africa	HORIZONTAL	14291	15K	Europe-Asia-Africa	VERTICAL	11991	27	131.8
17K	Europe-Asia-Africa	HORIZONTAL	14322	17K	Europe-Asia-Africa	VERTICAL	12022	27	131.8
19K	Europe-Asia-Africa	HORIZONTAL	14353	19K	Europe-Asia-Africa	VERTICAL	12053	27	131.8
21K	Europe-Asia-Africa	HORIZONTAL	14384	21K	Europe-Asia-Africa	VERTICAL	12084	27	131.8
23K	Europe-Asia-Africa	HORIZONTAL	14415	23K	Europe-Asia-Africa	VERTICAL	12115	27	131.8
25K	Europe-Asia-Africa	HORIZONTAL	14446	25K	Europe-Asia-Africa	VERTICAL	12146	27	131.8
27K	Europe-Asia-Africa	HORIZONTAL	14477	27K	Europe-Asia-Africa	VERTICAL	12177	27	131.8
2K	Europe-Asia-Africa	VERTICAL	14035	2K	Europe-Asia-Africa	HORIZONTAL	11735	54	131.8
4K	Europe-Asia-Africa	VERTICAL	14096	4K	Europe-Asia-Africa	HORIZONTAL	11796	54	131.8
6K	Europe-Asia-Africa	VERTICAL	14142.5	6K	Europe-Asia-Africa	HORIZONTAL	11842.5	27	131.8
8K	Europe-Asia-Africa	VERTICAL	14173.5	8K	Europe-Asia-Africa	HORIZONTAL	11873.5	27	131.8
10K	Europe-Asia-Africa	VERTICAL	14204.5	10K	Europe-Asia-Africa	HORIZONTAL	11904.5	27	131.8
12K	Europe-Asia-Africa	VERTICAL	14235.5	12K	Europe-Asia-Africa	HORIZONTAL	11935.5	27	131.8
14K	Europe-Asia-Africa	VERTICAL	14266.5	14K	Europe-Asia-Africa	HORIZONTAL	11966.5	27	131.8
16K	Europe-Asia-Africa	VERTICAL	14297.5	16K	Europe-Asia-Africa	HORIZONTAL	11997.5	27	131.8
18K	Europe-Asia-Africa	VERTICAL	14328.5	18K	Europe-Asia-Africa	HORIZONTAL	12028.5	27	131.8
20K	Europe-Asia-Africa	VERTICAL	14359.5	20K	Europe-Asia-Africa	HORIZONTAL	12059.5	27	131.8
22K	Europe-Asia-Africa	VERTICAL	14390.5	22K	Europe-Asia-Africa	HORIZONTAL	12090.5	27	131.8
24K	Europe-Asia-Africa	VERTICAL	14421.5	24K	Europe-Asia-Africa	HORIZONTAL	12121.5	27	131.8
26K	Europe-Asia-Africa	VERTICAL	14452.5	26K	Europe-Asia-Africa	HORIZONTAL	12152.5	27	131.8
28K	Europe-Asia-Africa	VERTICAL	14483.5	28K	Europe-Asia-Africa	HORIZONTAL	12183.5	27	131.8
				ULPC 1	Europe-Asia-Africa	Horizontal	11702	0.025	
				ULPC 2	Europe-Asia-Africa	Vertical	12198	0.025	

EXHIBIT 2A: C-Band Europe-Asia-Africa Uplink Beam

Beam Polarization: Horizontal

Peak Antenna Gain: 30.9 dBi

Peak G/T: 4.4 dB/K

Saturated Flux Density at Peak G/T: -95.7 to -74.7 dBW/m^2

(Schedule S Beam Designation: CHUL)

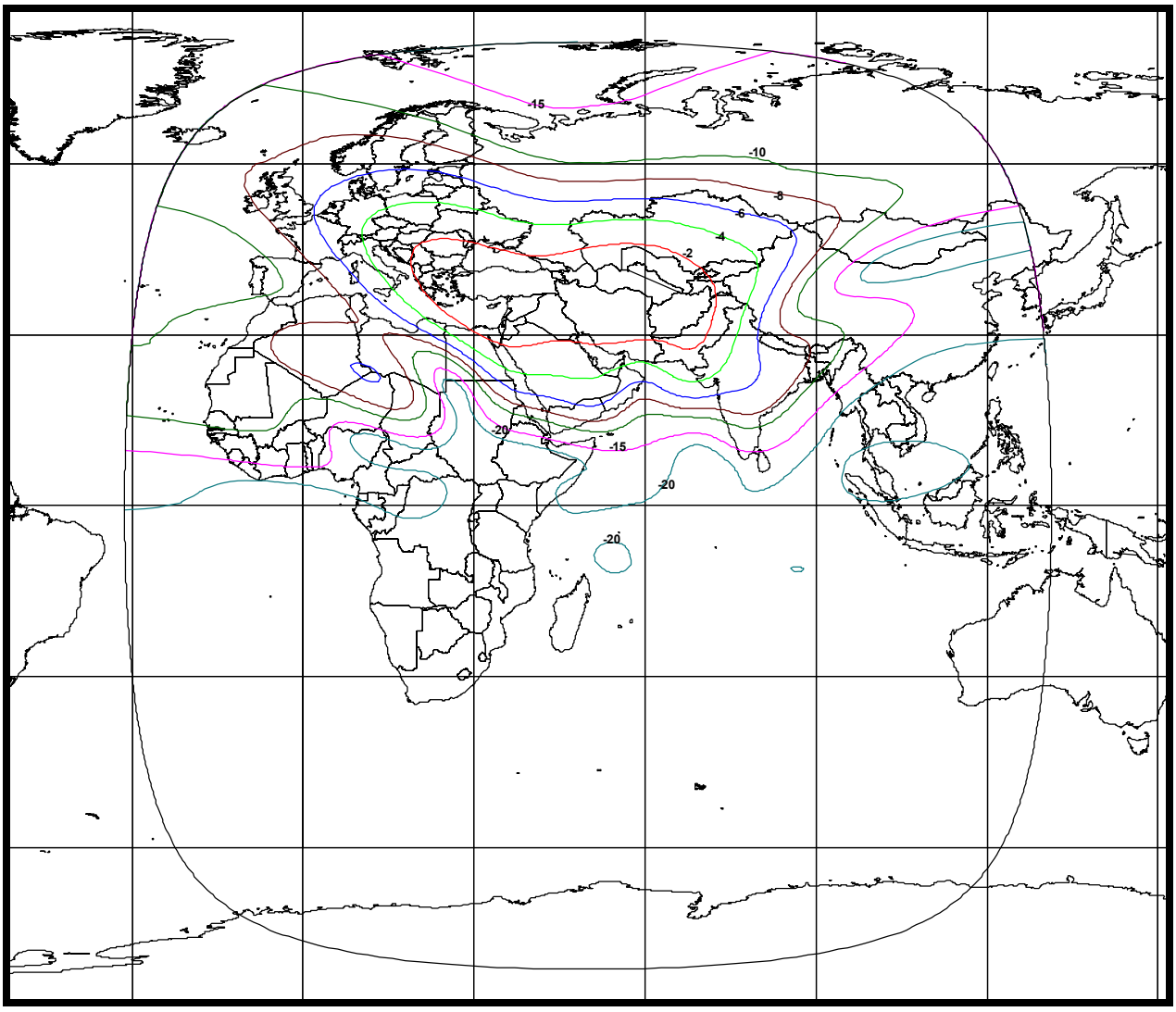

EXHIBIT 2B: C-Band Europe-Asia-Africa Uplink Beam

Beam Polarization: Vertical

Peak Antenna Gain: 30.9 dBi

Peak G/T: 4.4 dB/K

Saturated Flux Density at Peak G/T: -94.4 to -73.4 dBW/m^2

(Schedule S Beam Designation: CVUL)

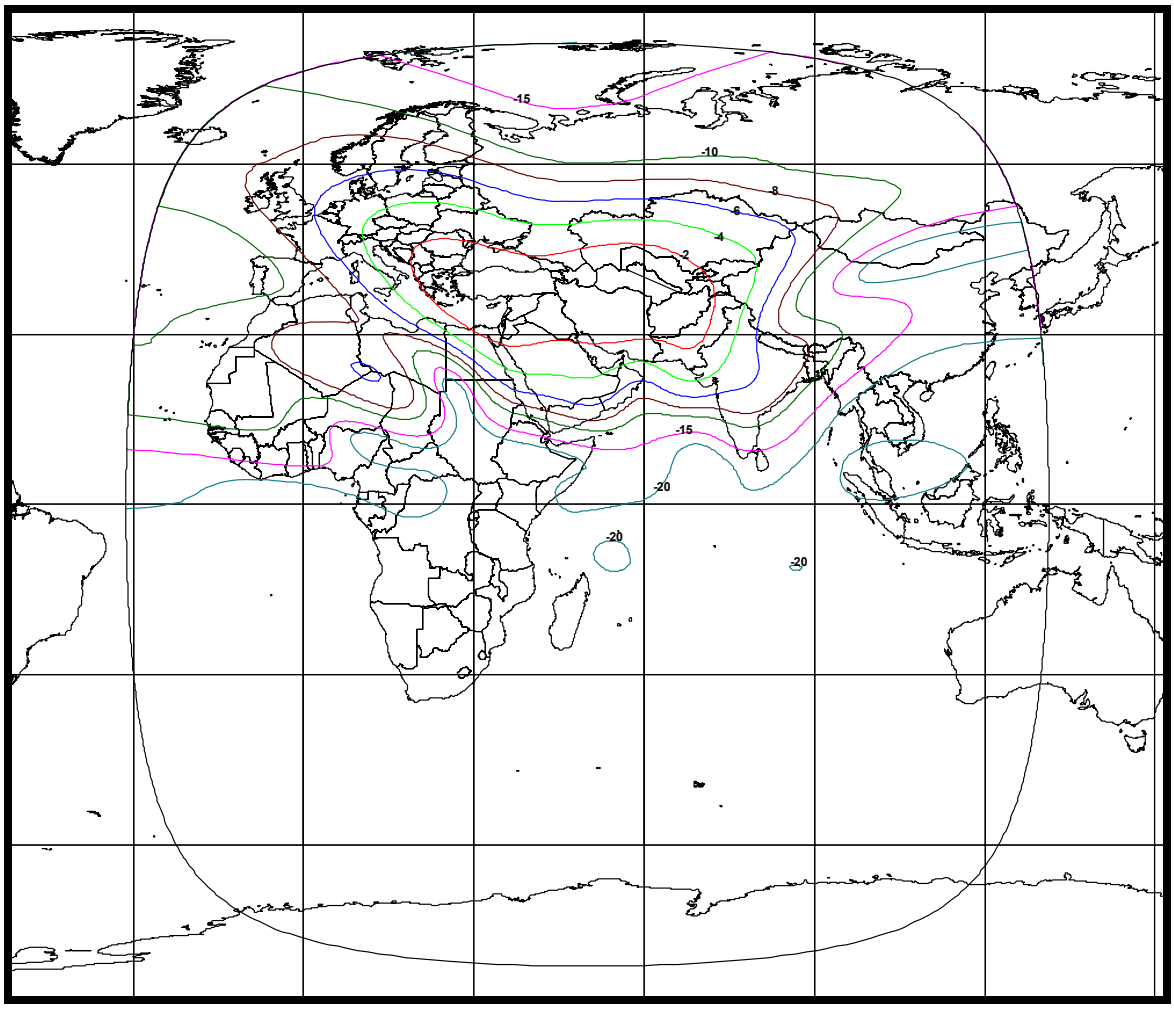

EXHIBIT 2C: Ku-Band Europe-Asia-Africa Uplink Beam

Beam Polarization: Horizontal

Peak Antenna Gain: 30.1 dBi

Peak G/T: 2.3 dB/K

Saturated Flux Density at Peak G/T: -99.3 to -78.3 dBW/m^2

(Schedule S Beam Designation: KHUL)

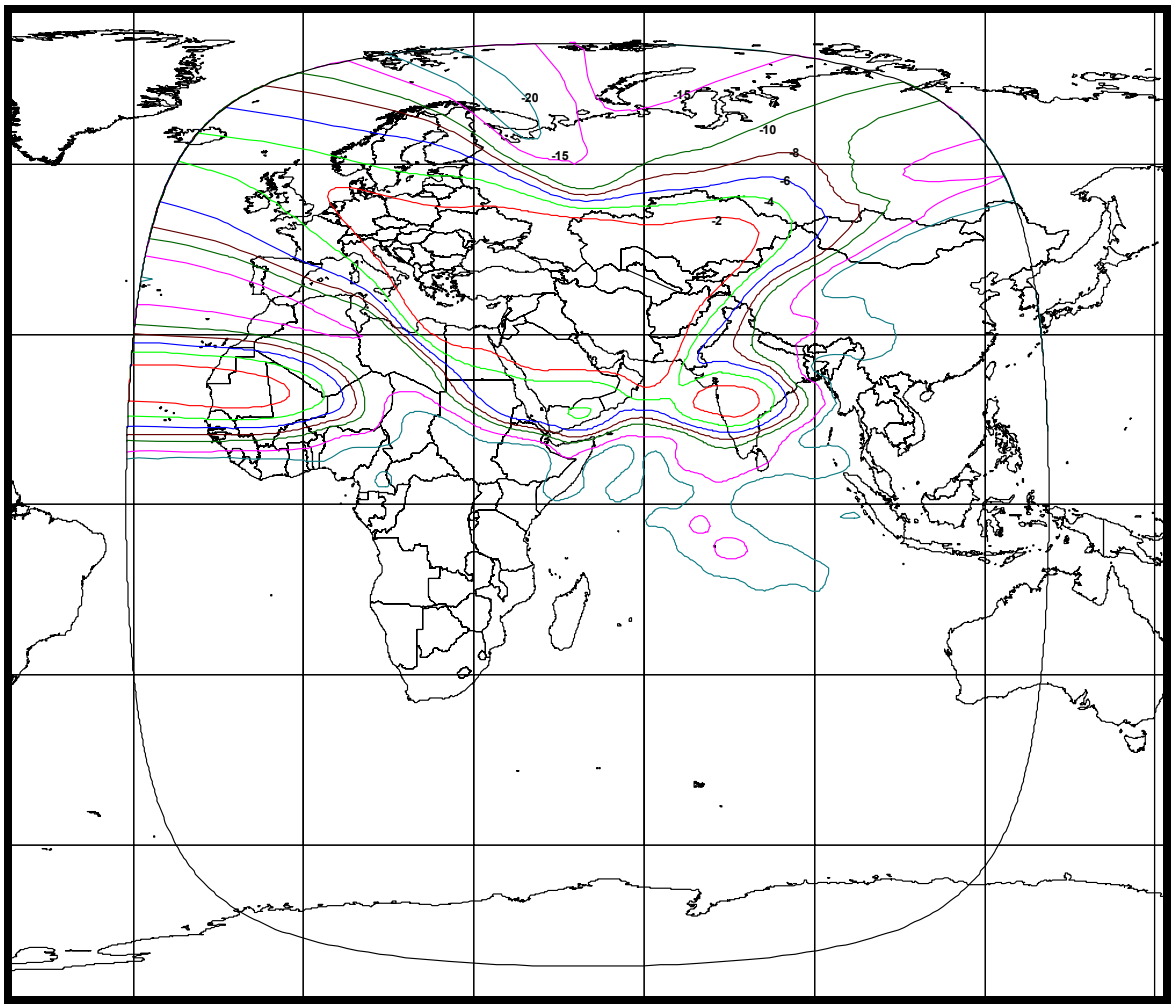

EXHIBIT 2D: Ku-Band Europe-Asia-Africa Uplink Beam

Beam Polarization: Vertical

Peak Antenna Gain: 30.1 dBi

Peak G/T: 2.3 dB/K

Saturated Flux Density at Peak G/T: -99.3 to -78.3 dBW/m^2

(Schedule S Beam Designation: KVUL)

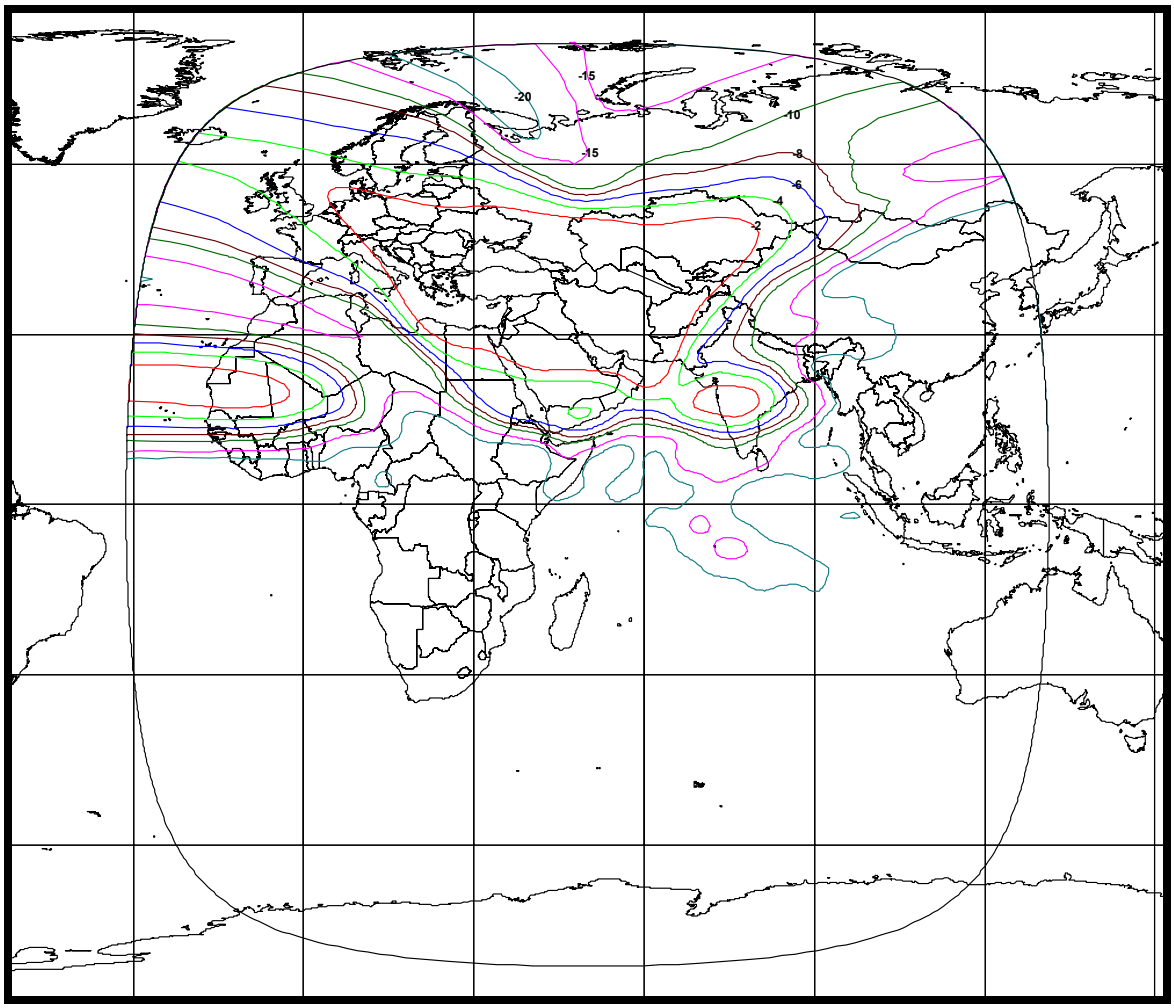

EXHIBIT 2E: C-Band Europe-Asia-Africa Downlink Beam

Beam Polarization: Horizontal

Peak Antenna Gain: 28.6 dBi

Peak EIRP: 40.3 dBW

(Schedule S Beam Designation: CHDL)

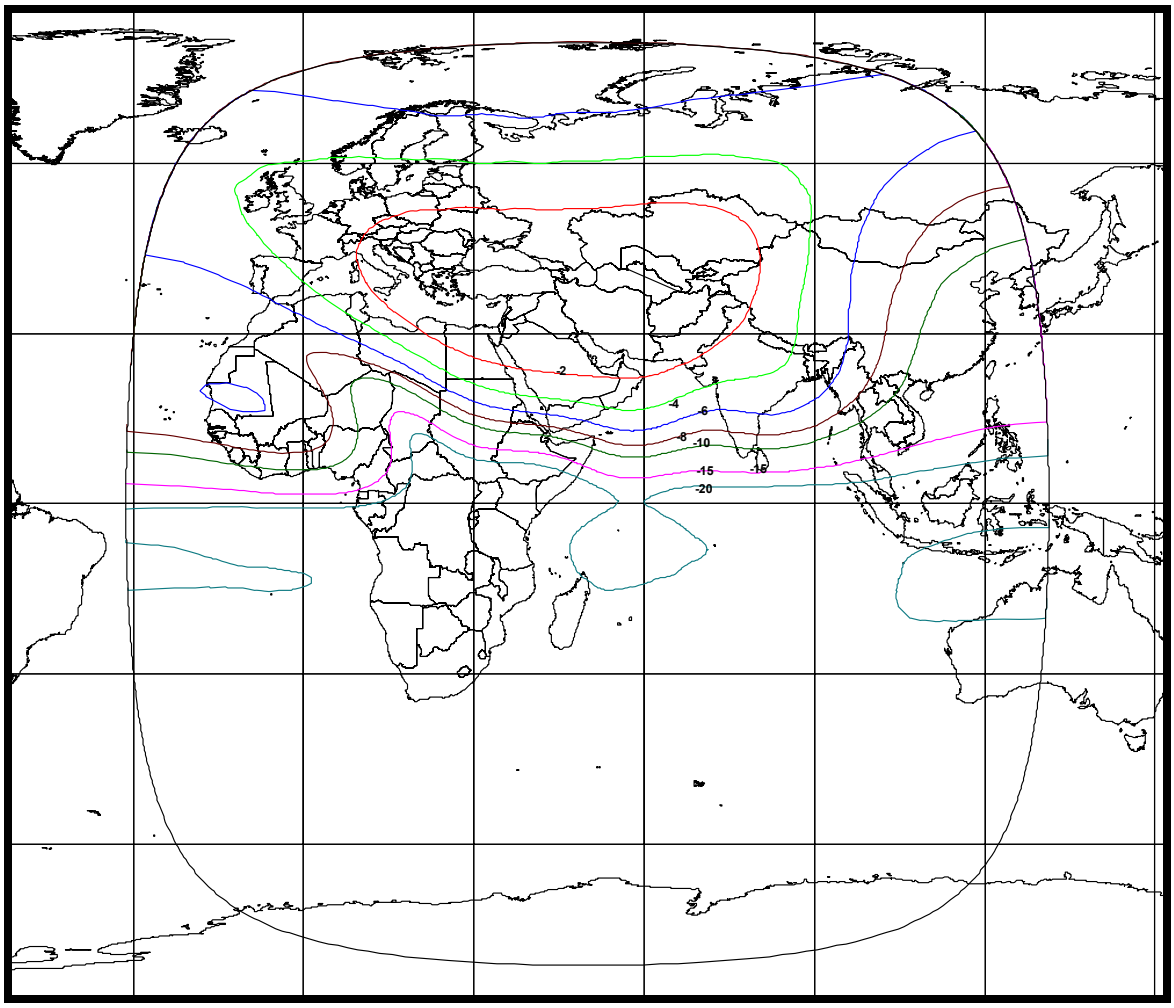

EXHIBIT 2F: C-Band Europe-Asia-Africa Downlink Beam

Beam Polarization: Vertical

Peak Antenna Gain: 28.6 dBi

Peak EIRP: 40.3 dBW

(Schedule S Beam Designation: CVDL)

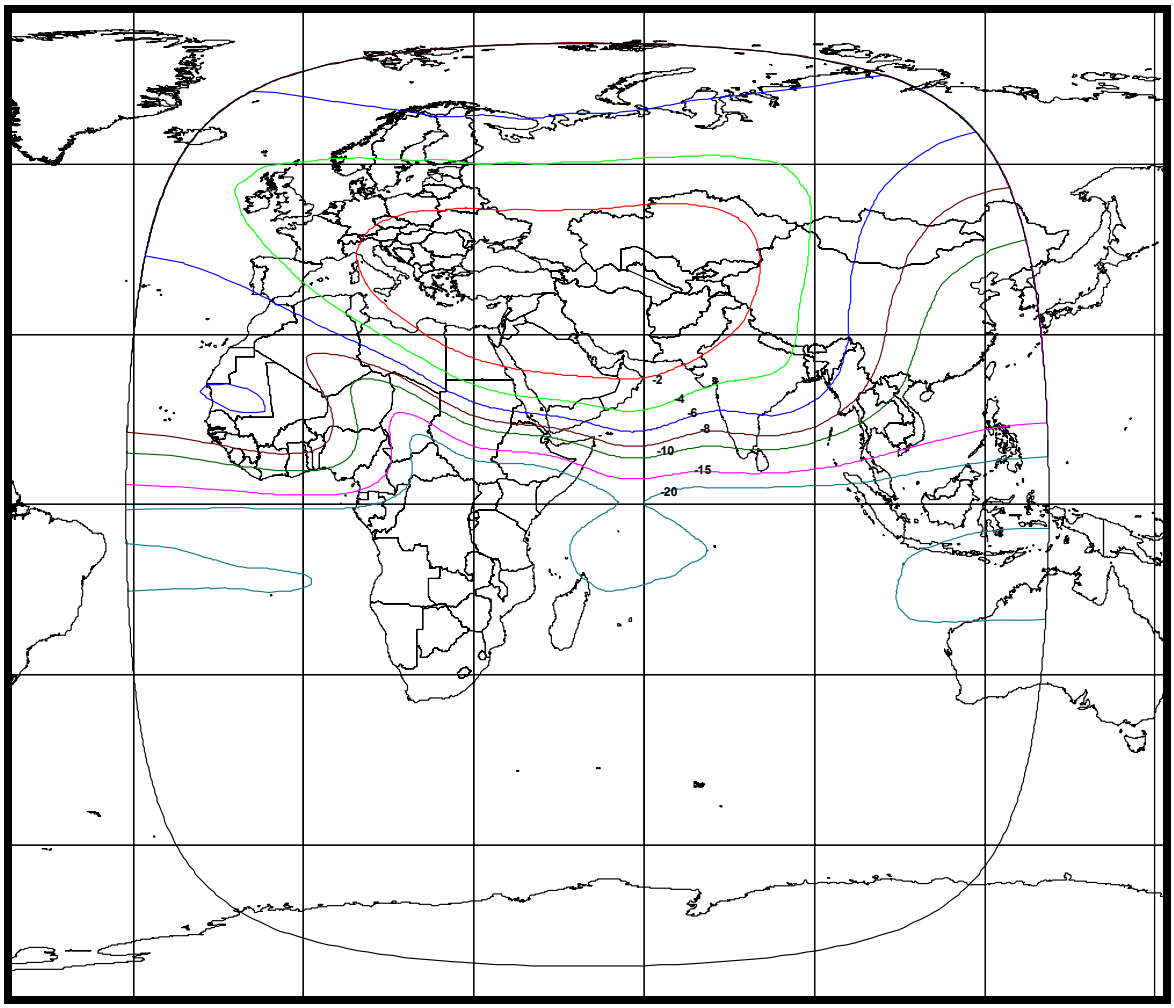

EXHIBIT 2G: Ku-Band Europe-Asia-Africa Downlink Beam

Beam Polarization: Horizontal

Peak Antenna Gain: 31.0 dBi

Peak EIRP: 49.2 dBW

(Schedule S Beam Designation: KHDL)

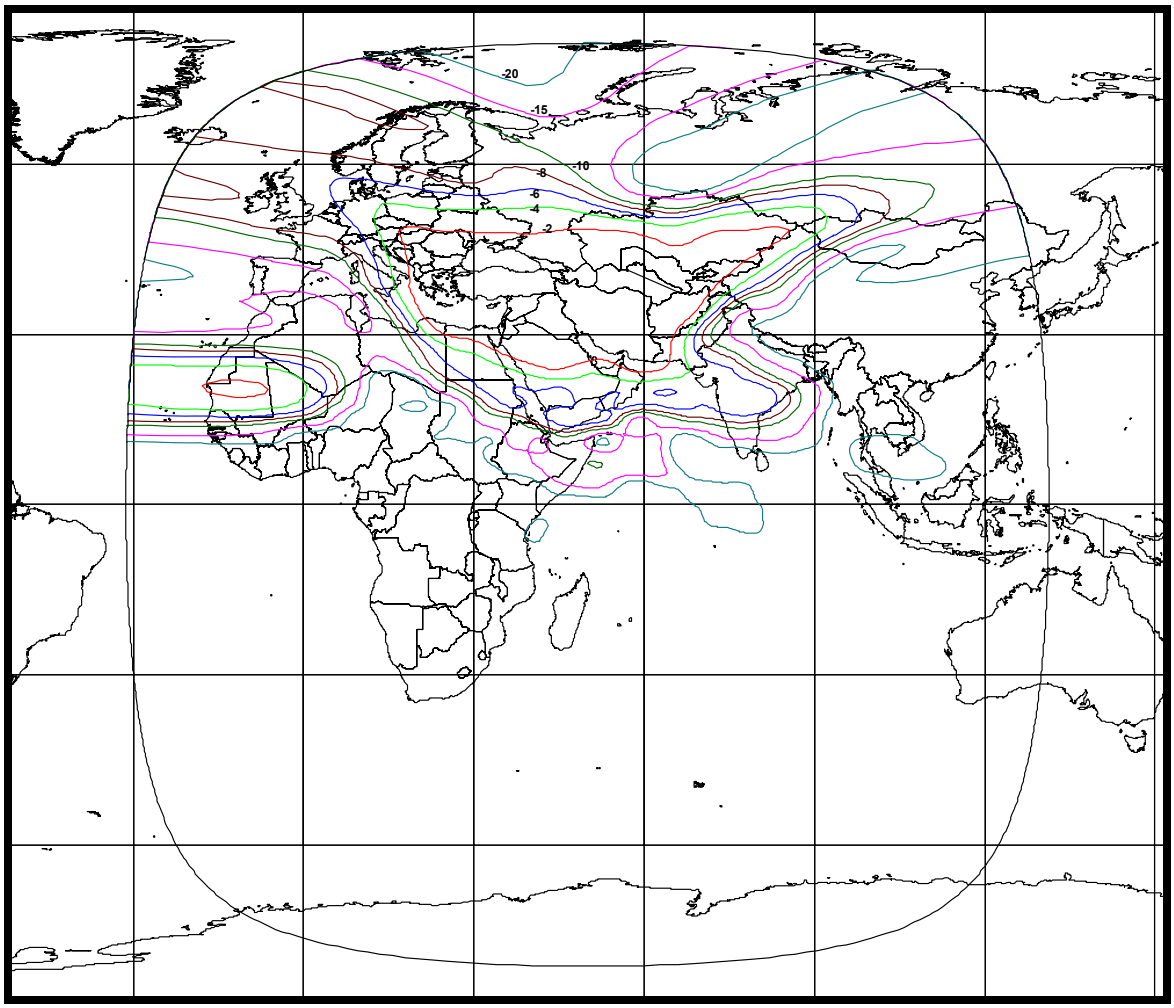

EXHIBIT 2H: Ku-Band Europe-Asia-Africa Downlink Beam

Beam Polarization: Vertical

Peak Antenna Gain:31.0 dBi

Peak EIRP: 49.2 dBW

(Schedule S Beam Designation: KVDL)

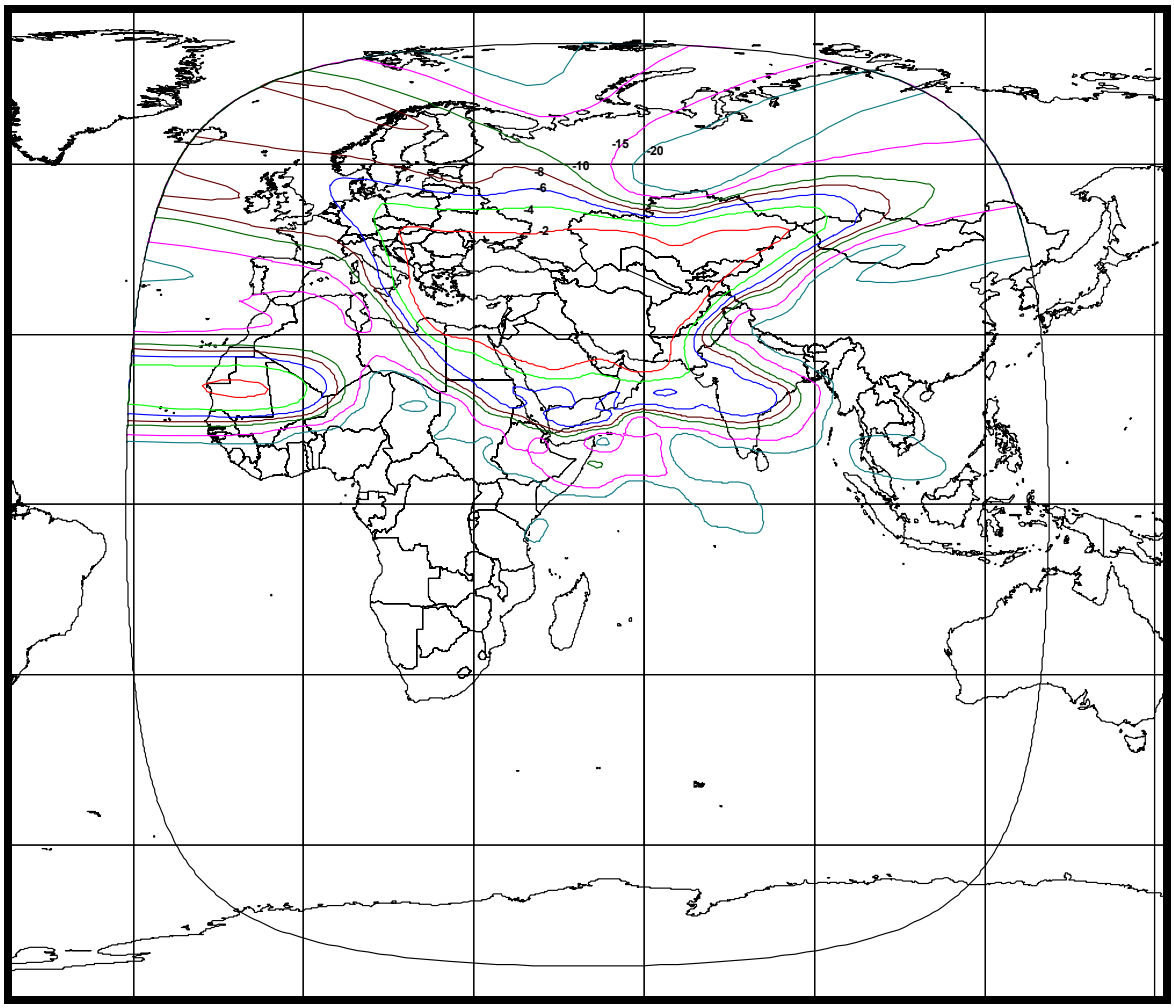

EXHIBIT 2I: Command Uplink Beam

[Wide Beam Antenna]
Beam Polarization: Horizontal
Peak Antenna Gain: 2 dBi
Peak G/T: -32.9 dB/K
Command Threshold Flux Density at Peak G/T: -99.3 dBW/m^2
(Schedule S Beam Designation: CMHL)

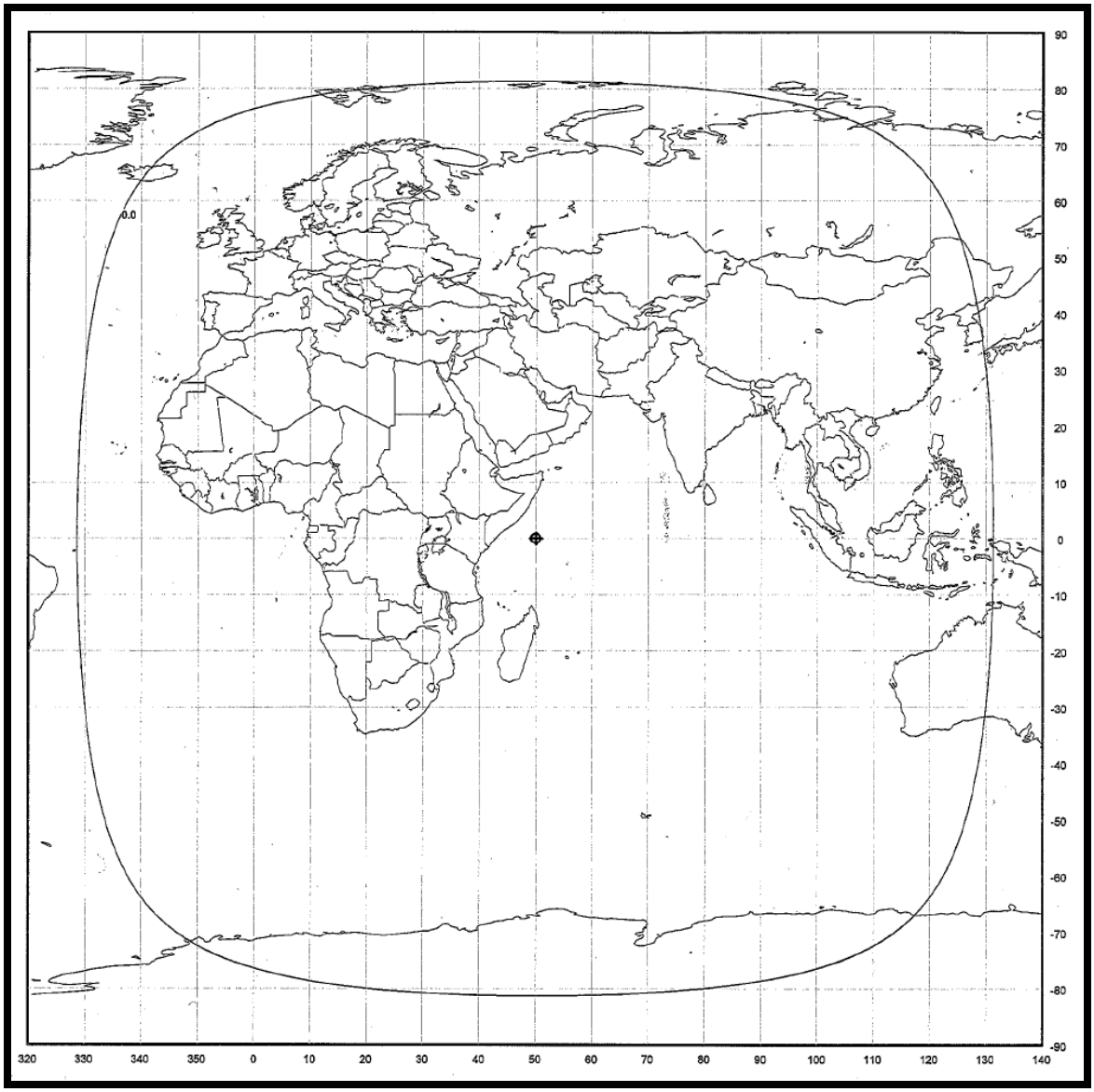

EXHIBIT 2J: Command Uplink Beam

[Wide Beam Antenna]
Beam Polarization: Vertical
Peak Antenna Gain: 2 dBi
Peak G/T: -32.9 dB/K
Command Threshold Flux Density at Peak G/T: -99.3 dBW/m^2
(Schedule S Beam Designation: CMVL)

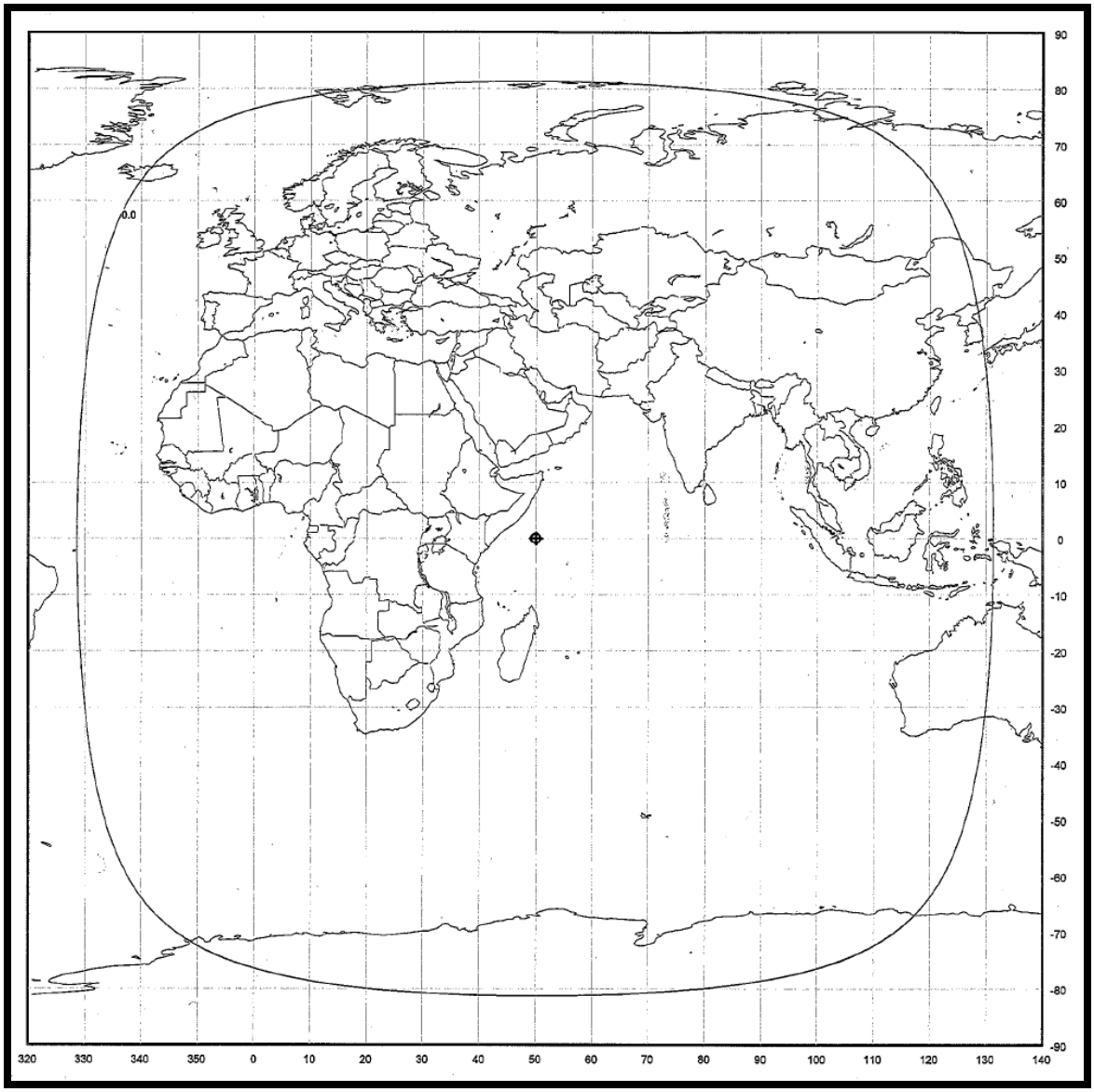

EXHIBIT 2K: Command Uplink Beam

[Narrow Beam Antenna]
Beam Polarization: Horizontal
Peak Antenna Gain: 7 dBi
Peak G/T: -34.0 dB/K
Command Threshold Flux Density at Peak G/T: -98.2 dBW/m^2
(Schedule S Beam Designation: CMHH)

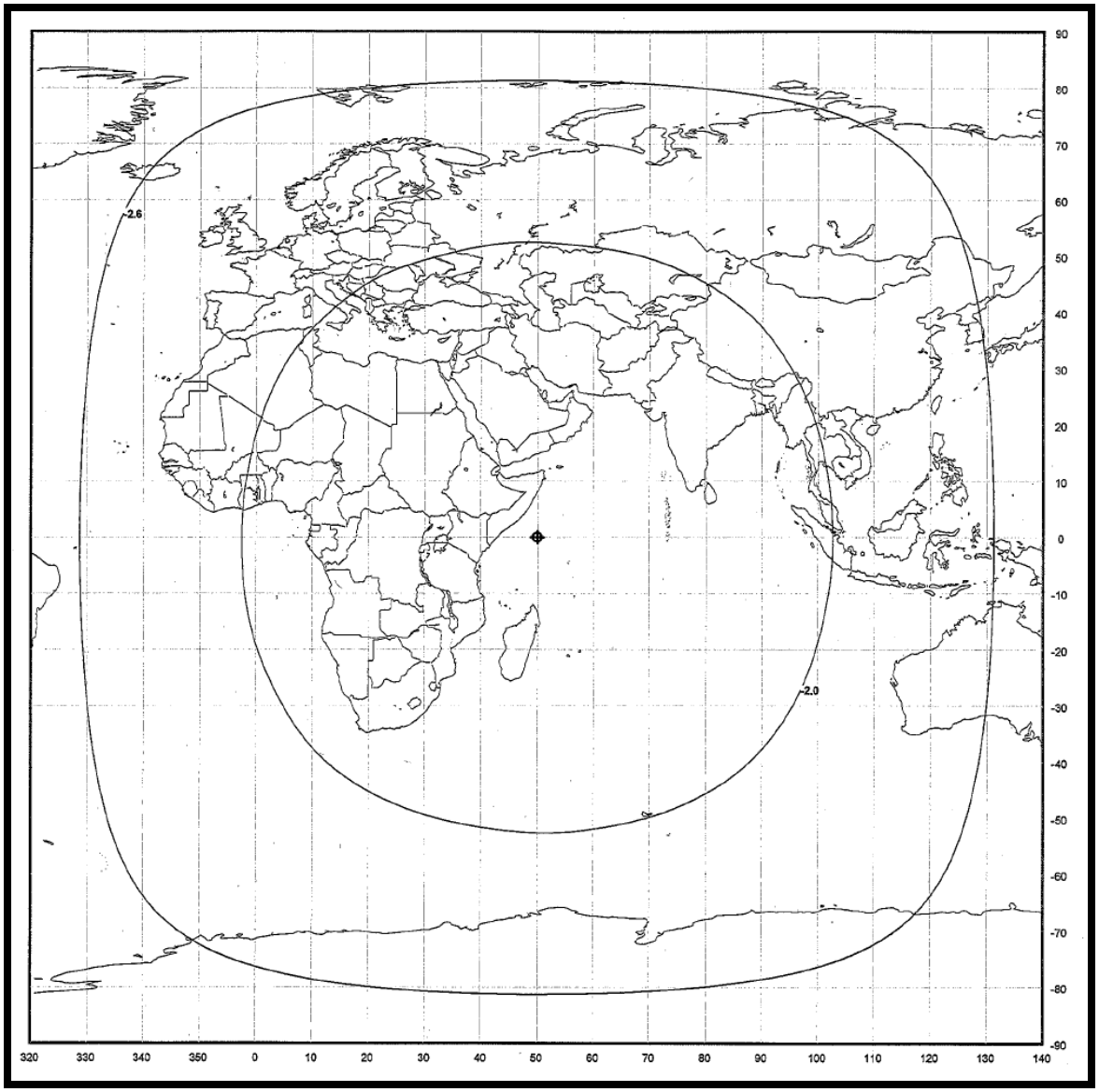

EXHIBIT 2L: Command Uplink Beam

[Narrow Beam Antenna]
Beam Polarization: Vertical
Peak Antenna Gain: 7 dBi
Peak G/T: -34.0 dB/K
Command Threshold Flux Density at Peak G/T: -98.2 dBW/m^2
(Schedule S Beam Designation: CMVH)

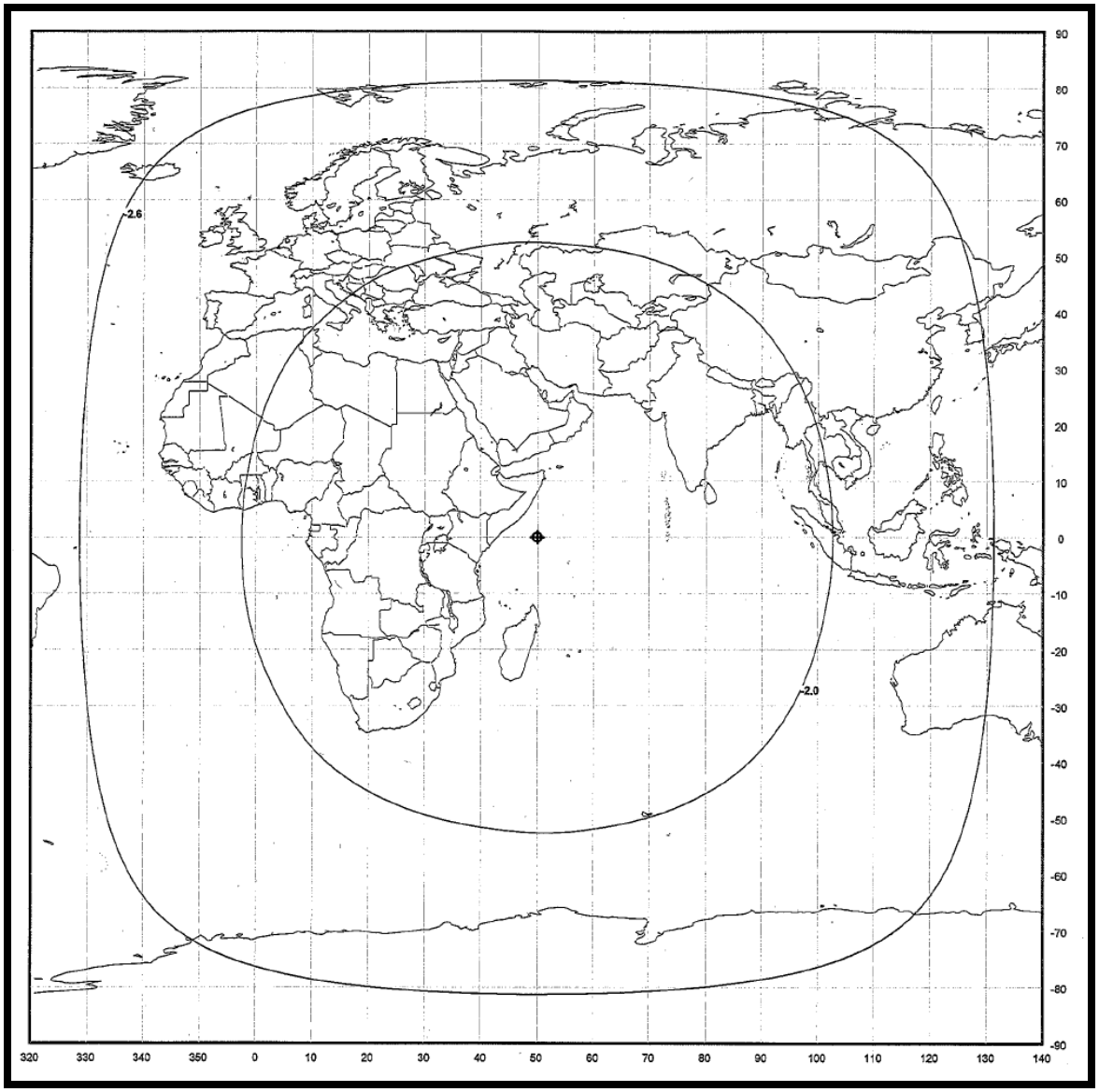

EXHIBIT 2M: Telemetry Downlink Beam

Beam Polarization: Horizontal

Peak Antenna Gain: 28.6 dBi

Peak EIRP: 21.0 dBW

(Schedule S Beam Designation: TMHR)

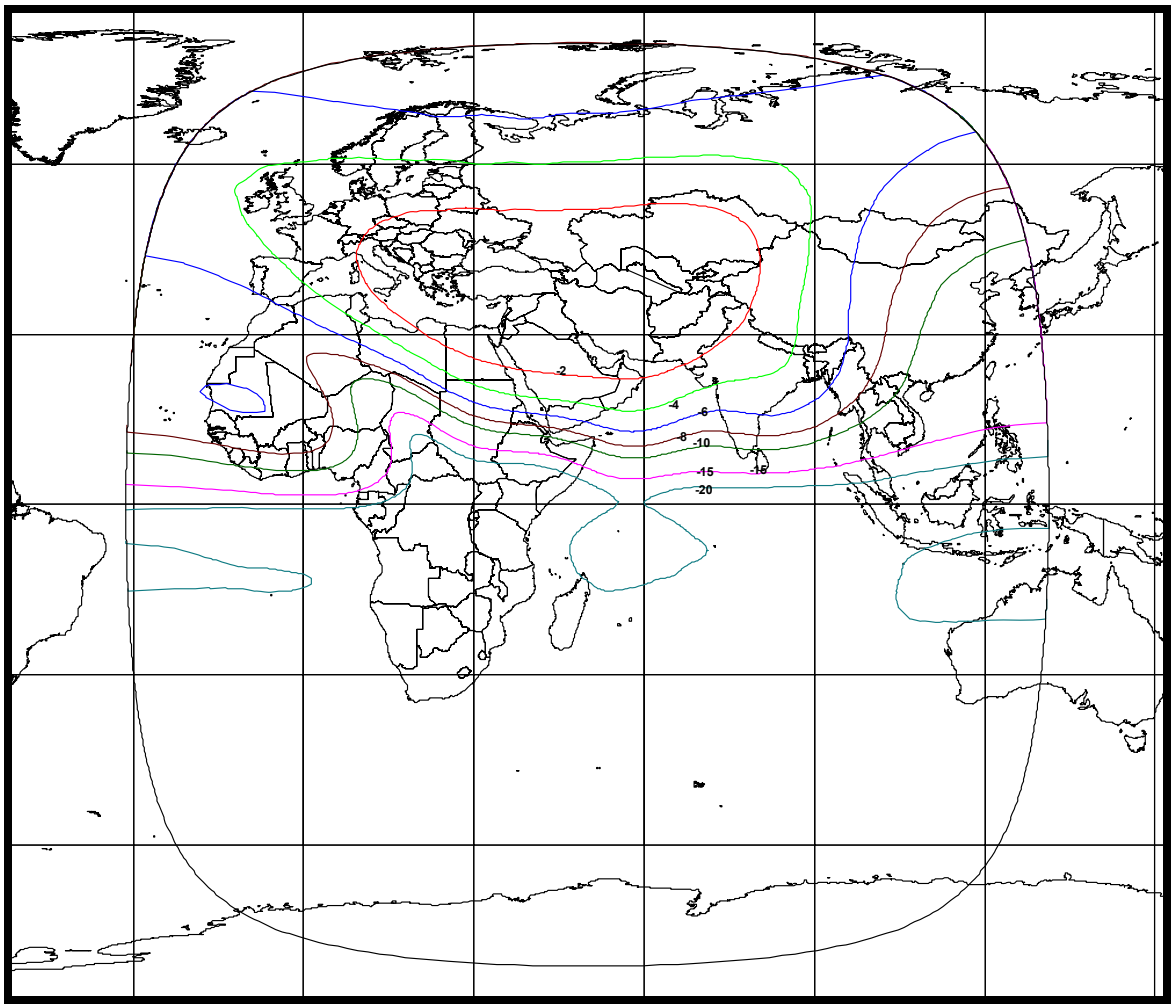

EXHIBIT 2N: Telemetry Downlink Beam

Beam Polarization: Vertical

Peak Antenna Gain: 28.6 dBi

Peak EIRP: 21.0 dBW

(Schedule S Beam Designation: TMVR)

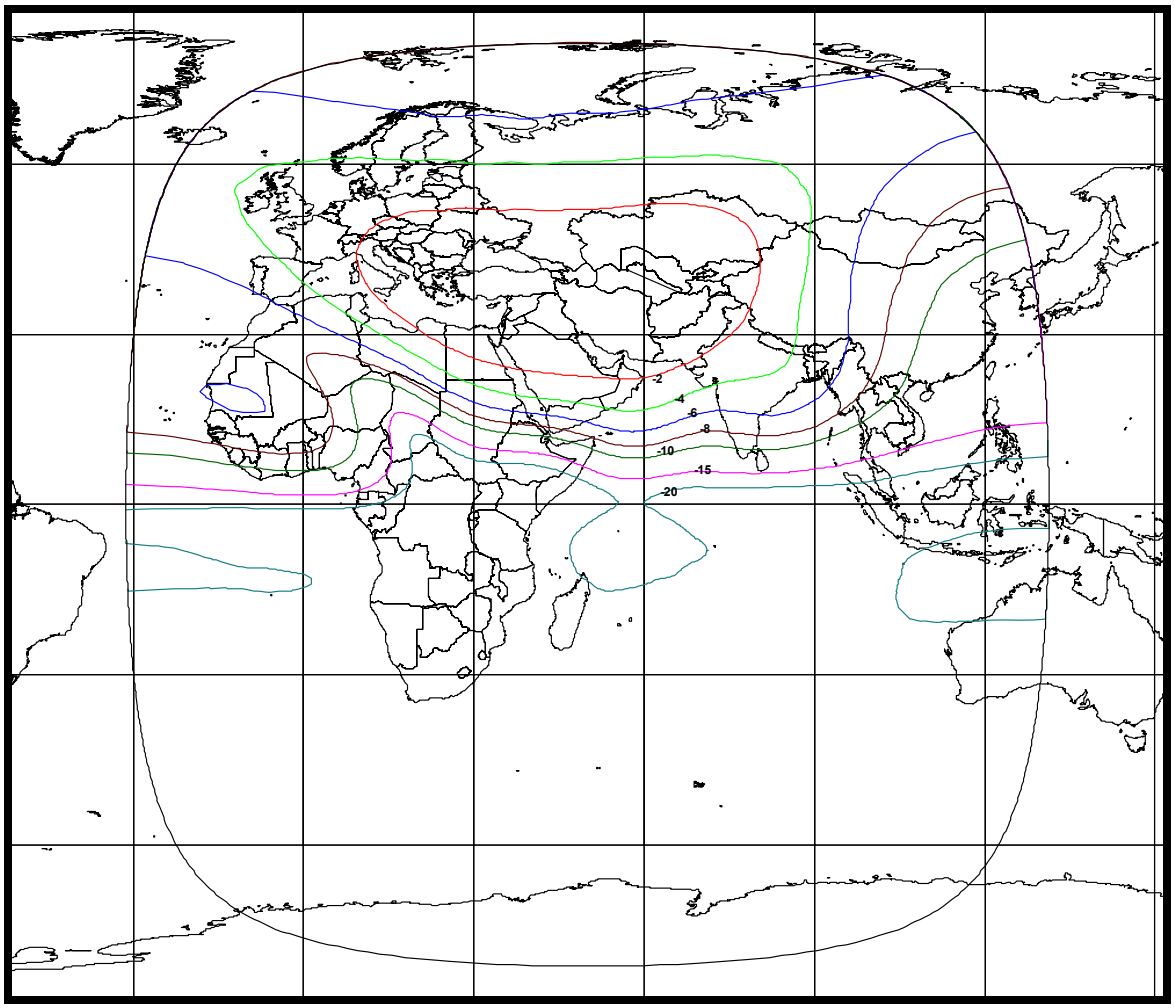

EXHIBIT 2O: Telemetry Downlink Beam

[Wide Beam Antenna]
Beam Polarization: Vertical
Peak Antenna Gain: 2 dBi
Peak EIRP: 7.5 dBW
(Schedule S Beam Designation: TMVL)

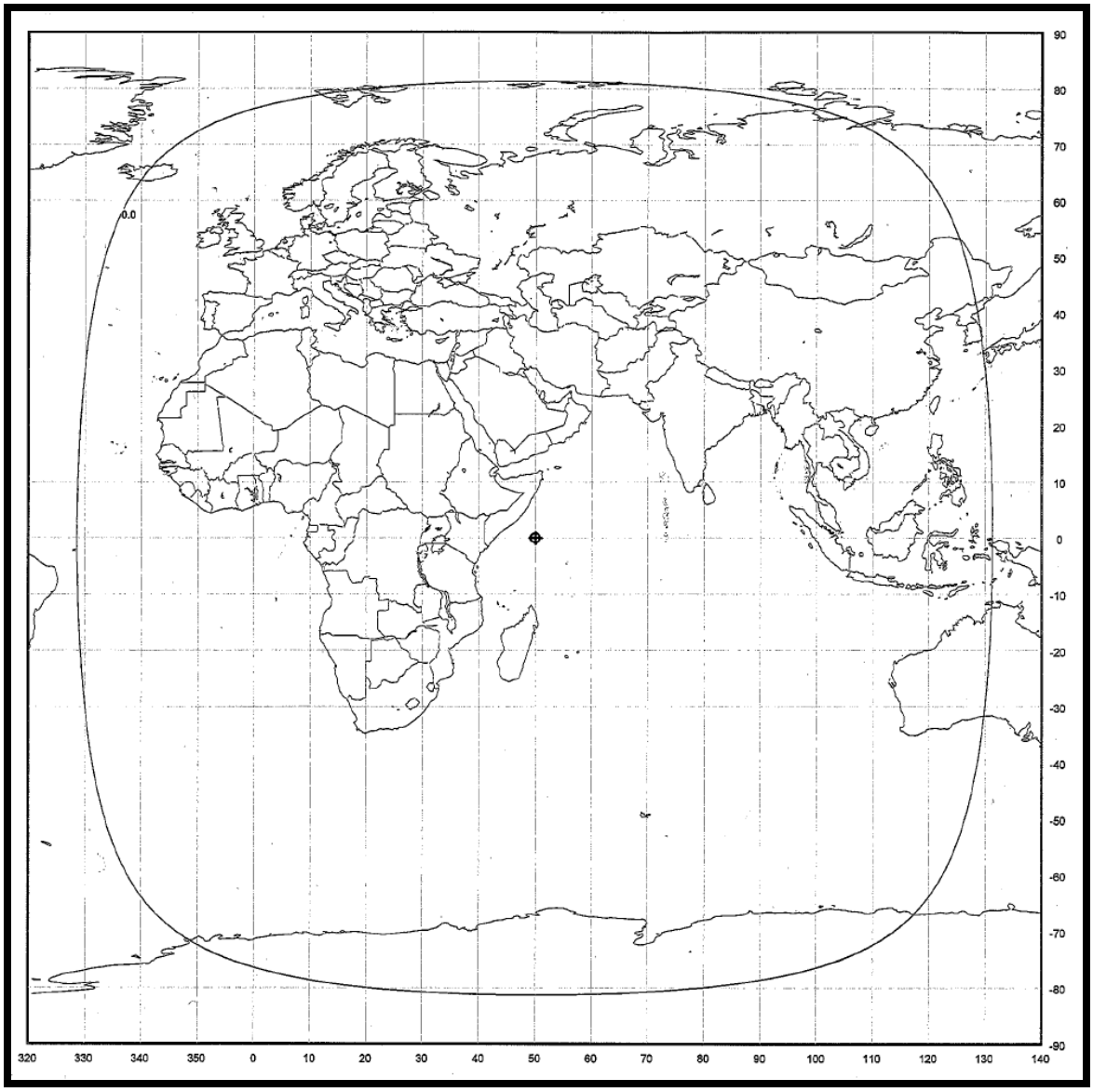

EXHIBIT 2P: Telemetry Downlink Beam

[Narrow Beam Antenna]
Beam Polarization: Vertical
Peak Antenna Gain: 7 dBi
Peak EIRP: 7.0 dBW
(Schedule S Beam Designation: TMVH)

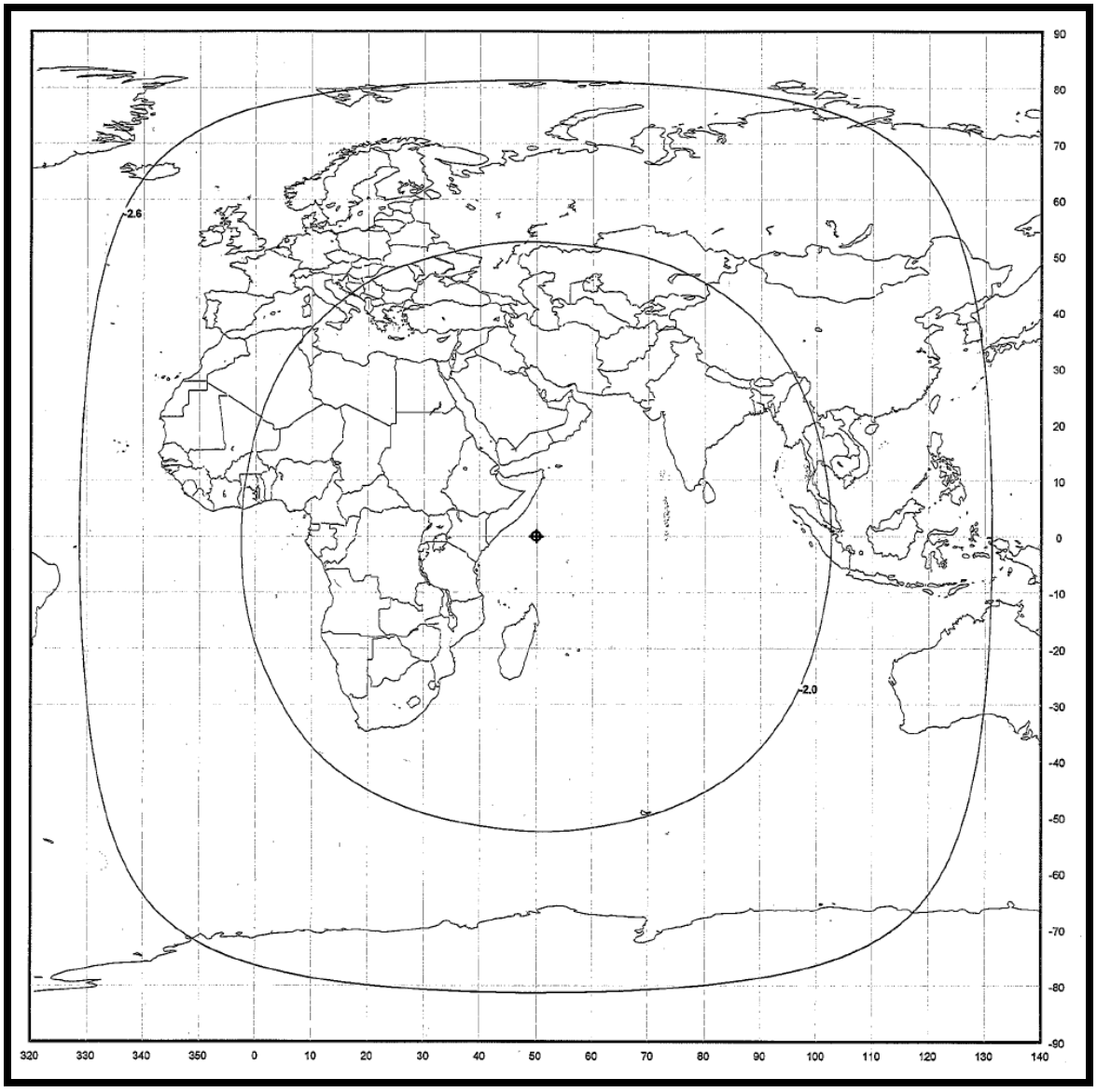

EXHIBIT 2Q: ULPC Downlink Beam

Beam Polarization: Horizontal

Peak Antenna Gain: 31.0 dBi

Peak EIRP: 20.3 dBW

(Schedule S Beam Designation: UPHR)

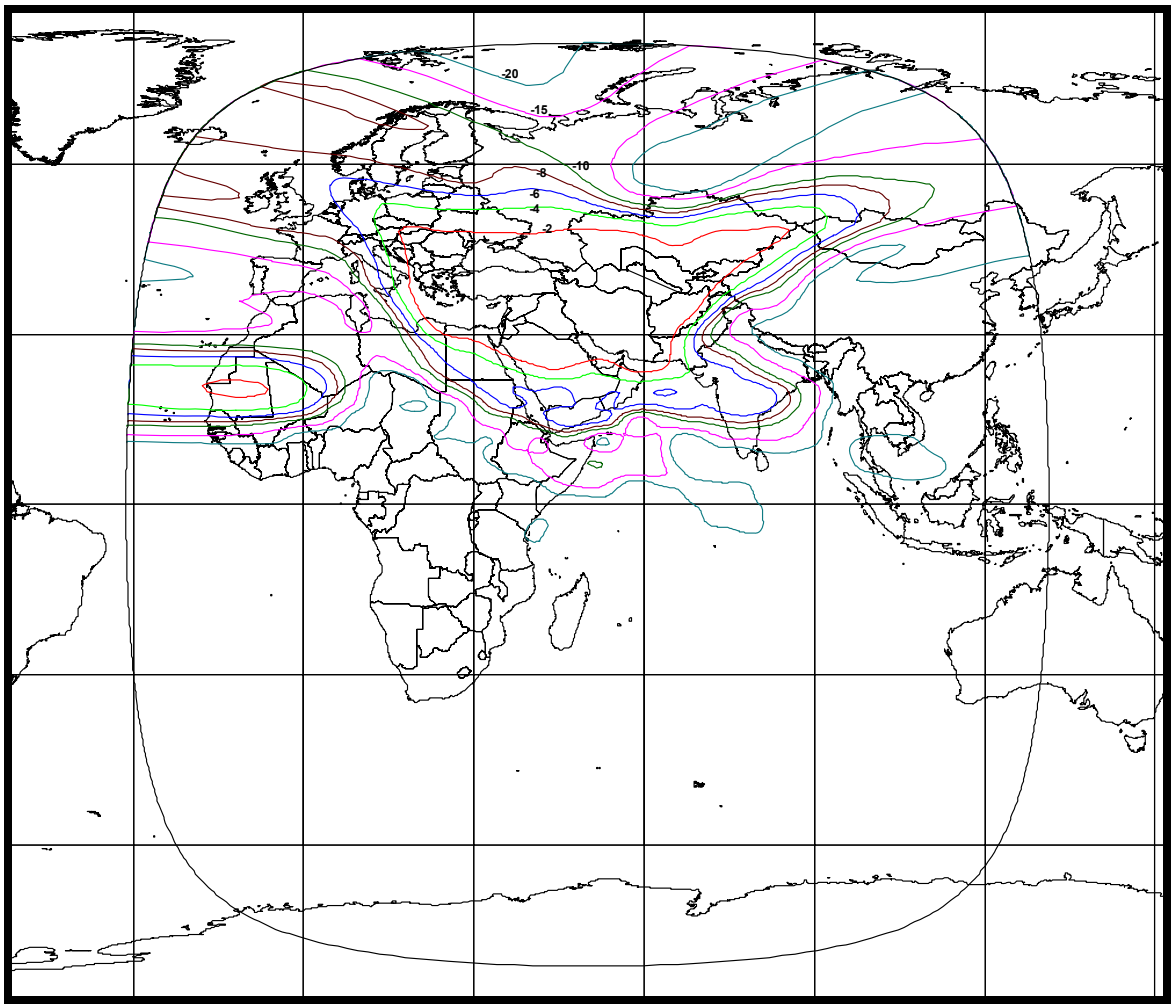

EXHIBIT 2R: ULPC Downlink Beam

Beam Polarization: Vertical

Peak Antenna Gain: 31.0 dBi

Peak EIRP: 20.3 dBW

(Schedule S Beam Designation: UPVR)

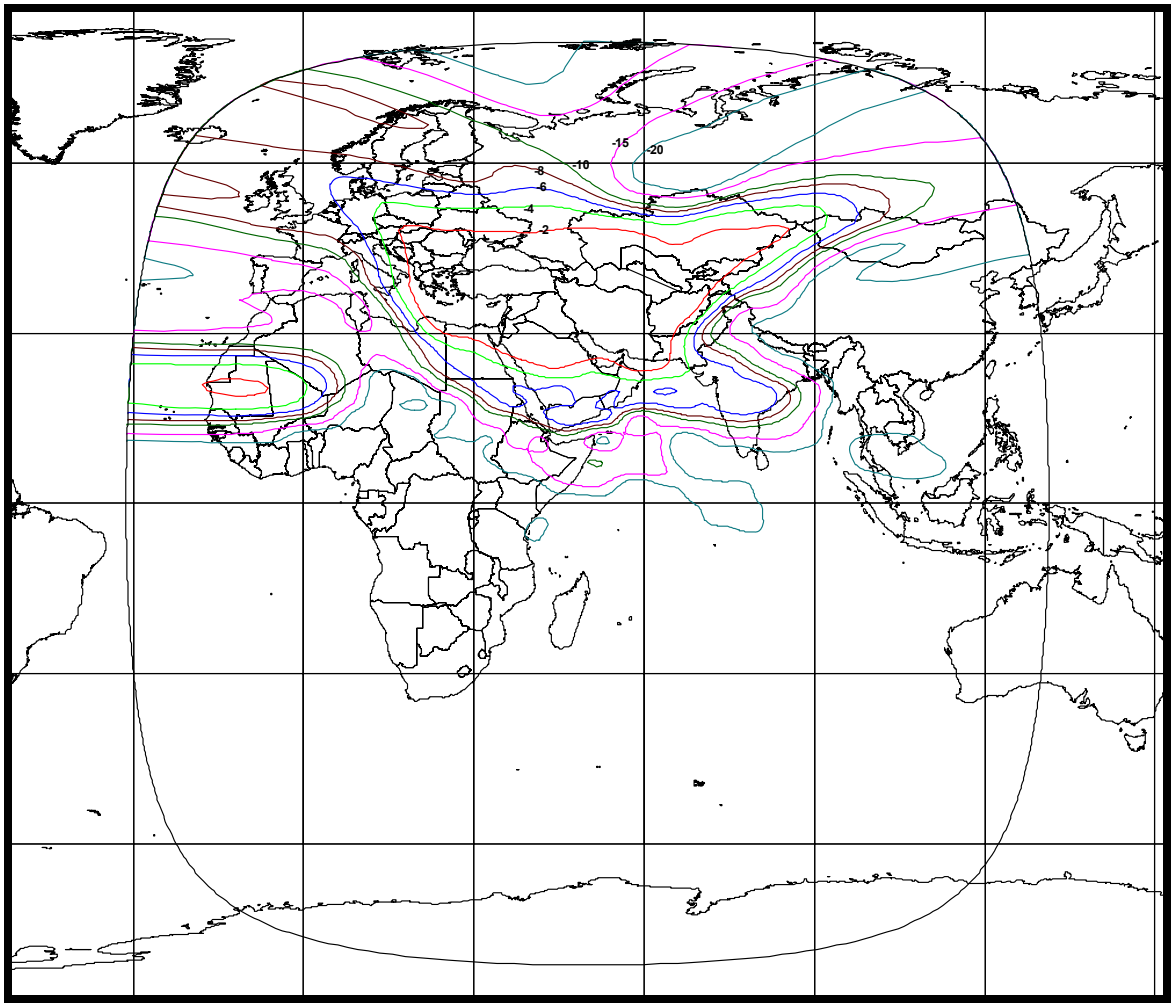

EXHIBIT 3: Power Flux Density Calculations

FREQUENCY BAND : 3.7 - 4.2 GHz							
Telemetry (Communications Reflector)							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Occupied Bandwidth (kHz)	300	300	300	300	300	300	300
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum Power Flux Density (dBW/m2/4kHz)	-161.1	-161.0	-160.9	-160.8	-160.7	-160.6	-159.8
FCC Limit (dBW/m^2/4kHz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	9.1	9.0	11.4	13.8	16.2	18.6	17.8
Telemetry (Wide Beam Global Horn Antenna)							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Occupied Bandwidth (kHz)	300	300	300	300	300	300	300
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum Power Flux Density (dBW/m2/4kHz)	-174.6	-174.5	-174.4	-174.3	-174.2	-174.1	-173.3
PFD Limit (dBW/m^2/4kHz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	22.6	22.5	24.9	27.3	29.7	32.1	31.3
Telemetry (Narrow Beam Global Horn Antenna)							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Occupied Bandwidth (kHz)	300	300	300	300	300	300	300
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum Power Flux Density (dBW/m2/4kHz)	-175.1	-175.0	-174.9	-174.8	-174.6	-174.5	-173.8
PFD Limit (dBW/m^2/4kHz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	23.1	23.0	25.4	27.8	30.1	32.5	31.8
Ranging (Communication Antenna)							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Occupied Bandwidth (kHz)	1000	1000	1000	1000	1000	1000	1000
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum Power Flux Density (dBW/m2/4kHz)	-171.4	-171.3	-171.1	-171.0	-170.9	-170.8	-170.0
PFD Limit (dBW/m^2/4kHz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	19.4	19.3	21.6	24.0	26.4	28.8	28.0

Exhibit 4: Galaxy 26 Link Budgets

[27 MHz Channel Bandwidth]

UPLINK BEAM INFORMATION						
Uplink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Uplink SFD (dBW/m2)	-76.3	-76..3	-84.3	-84.3	-84.3	-84.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Downlink Frequency (GHz)	11.950	11.950	11.950	11.950	11.950	11.950
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	43.2	43.2	43.2	43.2	43.2	43.2
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	48.0E	48.0E	48.0E	48.0E	48.0E	48.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	52.0E	52.0E	52.0E	52.0E	52.0E	52.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION						
Carrier ID	27M0F3F	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	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	13.0	6.1	6.1	6.1	6.1	1.2
Earth Station Gain (dBi)	63.6	56.9	56.9	56.9	56.9	42.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	1.8	1.2	1.2	1.2	1.2	6.1
Earth Station Gain (dBi)	44.8	41.3	41.3	41.3	41.3	55.5
Earth Station G/T (dB/K)	22.3	18.8	18.8	18.8	18.8	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)	86.6	79.6	66.9	46.8	58.8	46.9
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
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)	30.2	23.5	16.0	15.4	15.3	9.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	43.2	41.6	36.2	16.1	28.1	16.2
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	22.3	18.8	18.8	18.8	18.8	33.1
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)	13.8	9.0	8.8	8.2	8.1	16.6
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	30.2	23.5	16.0	15.4	15.3	9.5
C/N Downlink (dB)	13.8	9.0	8.8	8.2	8.1	16.6
C/I Intermodulation (dB)	N/A	N/A	19.2	18.5	18.4	12.6
C/I Uplink Co-Channel (dB)*	27.5	27.0	27.7	27.7	28.1	21.8
C/I Downlink Co-Channel (dB)*	27.5	27.0	27.7	27.7	28.1	21.8
C/I Uplink Adjacent Satellite 1 (dB)	33.8	27.1	19.6	19.0	18.9	13.0
C/I Downlink Adjacent Satellite 1 (dB)	21.9	16.2	16.0	15.4	15.3	25.3
C/I Uplink Adjacent Satellite 2 (dB)	33.8	27.1	19.6	19.0	18.9	13.0
C/I Downlink Adjacent Satellite 2 (dB)	24.0	19.6	19.5	18.8	18.7	25.9
C/(N+I) Composite (dB)	12.4	7.6	6.4	5.8	5.7	5.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.4	6.6	5.4	4.8	4.7	4.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	1.4	3.2	1.5	1.8	1.3	.7
Number of Carriers	1	1.0	2.2	230.5	14.5	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.0	-50.8	-58.3	-58.9	-59.0	-50.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-16.8	-26.0	-26.1	-26.7	-26.8	-32.7

Exhibit 4: Galaxy 26 Link Budgets (continued)

[54 MHz Channel Bandwidth]

UPLINK BEAM INFORMATION						
Uplink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Uplink SFD (dBW/m2)	-72.3	-82.3	-85.3	-85.3	-85.3	-85.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Downlink Frequency (GHz)	11.950	11.950	11.950	11.950	11.950	11.950
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	43.2	43.2	43.2	43.2	43.2	43.2
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	48.0E	48.0E	48.0E	48.0E	48.0E	48.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	52.0E	52.0E	52.0E	52.0E	52.0E	52.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION						
Carrier ID	27M0F3F	54M0G7W	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	36862	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	45200	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	54000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	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)	4.6	1.2	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	53.5	41.3	44.8	44.8	44.8	55.5
Earth Station G/T (dB/K)	31.0	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)	79.4	80.6	63.7	43.4	55.4	46.2
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-76.6	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	23.0	21.5	12.8	12.1	12.0	8.7
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	37.0	43.2	33.9	13.7	25.7	16.5
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	31.0	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)	-73.8	-76.6	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.4	7.6	10.1	9.4	9.3	16.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	23.0	21.5	12.8	12.1	12.0	8.7
C/N Downlink (dB)	16.4	7.6	10.1	9.4	9.3	16.9
C/I Intermodulation (dB)	N/A	N/A	19.9	19.2	19.1	15.9
C/I Uplink Co-Channel (dB)*	27.5	27.0	28.5	28.4	28.8	25.1
C/I Downlink Co-Channel (dB)*	27.5	27.0	28.5	28.4	28.8	25.1
C/I Uplink Adjacent Satellite 1 (dB)	26.6	25.1	16.4	15.7	15.6	12.3
C/I Downlink Adjacent Satellite 1 (dB)	25.1	14.8	18.2	17.5	17.3	25.6
C/I Uplink Adjacent Satellite 2 (dB)	26.6	25.1	16.4	15.7	15.6	12.3
C/I Downlink Adjacent Satellite 2 (dB)	26.0	18.2	20.2	19.5	19.4	26.2
C/(N+I) Composite (dB)	13.8	6.2	6.3	5.6	5.5	5.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.8	5.2	5.3	4.6	4.5	4.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.8	1.8	1.4	1.6	1.1	.7
Number of Carriers	2	1.0	3.7	395.0	24.8	135.0
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.5	-52.9	-61.5	-62.2	-62.3	-55.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-23.0	-27.4	-28.4	-29.1	-29.2	-32.4

Exhibit 5: Adjacent Satellite (48º E.L.) Link Budgets

[27 MHz Channel Bandwidth]

UPLINK BEAM INFORMATION						
Uplink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Uplink SFD (dBW/m2)	-82.3	-82.3	-84.3	-84.3	-84.3	-84.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Downlink Frequency (GHz)	11.950	11.950	11.950	11.950	11.950	11.950
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	43.2	43.2	43.2	43.2	43.2	43.2
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	50.0E	50.0E	50.0E	50.0E	50.0E	50.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	46.0E	46.0E	46.0E	46.0E	46.0E	46.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
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	64	6000	512	128
Code Rate	N/A	1/2x188/204	1/2x239/256	1/2x188/204	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	75.4	6771.1	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	100	10300	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.36	2.99	3.87	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.36	2.79	3.57	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.2
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	56.9	42.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.2	1.2	1.2	1.2	6.1
Earth Station Gain (dBi)	47.5	41.3	41.3	41.3	41.3	55.5
Earth Station G/T (dB/K)	25.0	18.8	18.8	18.8	18.8	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	73.6	46.8	66.9	58.8	46.9
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
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	-48.8	-68.3	-60.9	-54.9
Uplink C/N(dB)	24.2	17.5	15.4	16.0	15.3	9.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	43.2	41.6	16.1	36.2	28.1	16.2
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	25.0	18.8	18.8	18.8	18.8	33.1
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	-48.8	-68.3	-60.9	-54.9
Downlink C / N(dB)	16.5	9.0	8.2	8.8	8.1	16.6
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	24.2	17.5	15.4	16.0	15.3	9.5
C/N Downlink (dB)	16.5	9.0	8.2	8.8	8.1	16.6
C/I Intermodulation (dB)	N/A	N/A	18.5	19.2	18.4	12.6
C/I Uplink Co-Channel (dB)*	27.5	27.0	27.7	27.7	28.1	21.8
C/I Downlink Co-Channel (dB)*	27.5	27.0	27.7	27.7	28.1	21.8
C/I Uplink Adjacent Satellite 1 (dB)	27.8	21.1	19.0	19.6	18.9	13.0
C/I Downlink Adjacent Satellite 1 (dB)	24.9	16.2	15.4	16.0	15.3	25.3
C/I Uplink Adjacent Satellite 2 (dB)	27.8	21.1	19.0	19.6	18.9	13.0
C/I Downlink Adjacent Satellite 2 (dB)	26.5	19.6	18.8	19.5	18.7	25.9
C/(N+I) Composite (dB)	14.2	7.0	5.8	6.4	5.7	5.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	13.2	6.0	4.8	5.4	4.7	4.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.0	-3.9	-3.4	-3.4
Excess Link Margin (dB)	3.2	2.6	1.8	1.5	1.3	.7
Number of Carriers	1	1.0	230.5	2.2	14.5	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-42.3	-56.8	-58.9	-58.3	-59.0	-50.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-16.8	-26.0	-26.7	-26.1	-26.8	-32.7

Exhibit 5: Adjacent Satellite (48º E.L.)Link Budgets (continued)

[54 MHz Channel Bandwidth]

UPLINK BEAM INFORMATION						
Uplink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Uplink SFD (dBW/m2)	-72.3	-82.3	-85.3	-85.3	-85.3	-85.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Downlink Frequency (GHz)	11.950	11.950	11.950	11.950	11.950	11.950
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	43.2	43.2	43.2	43.2	43.2	43.2
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	50.0E	50.0E	50.0E	50.0E	50.0E	50.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	46.0E	46.0E	46.0E	46.0E	46.0E	46.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	54M0G7W	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	36862	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	45200	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	54000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	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)	4.6	1.2	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	53.5	41.3	44.8	44.8	44.8	55.5
Earth Station G/T (dB/K)	31.0	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)	79.4	80.6	63.7	43.4	55.4	46.2
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-76.6	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	23.0	21.5	12.8	12.1	12.0	8.7
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	37.0	43.2	33.9	13.7	25.7	16.5
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	31.0	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)	-73.8	-76.6	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.4	7.6	10.1	9.4	9.3	16.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	23.0	21.5	12.8	12.1	12.0	8.7
C/N Downlink (dB)	16.4	7.6	10.1	9.4	9.3	16.9
C/I Intermodulation (dB)	N/A	N/A	19.9	19.2	19.1	15.9
C/I Uplink Co-Channel (dB)*	27.5	27.0	28.5	28.4	28.8	25.1
C/I Downlink Co-Channel (dB)*	27.5	27.0	28.5	28.4	28.8	25.1
C/I Uplink Adjacent Satellite 1 (dB)	26.6	25.1	16.4	15.7	15.6	12.3
C/I Downlink Adjacent Satellite 1 (dB)	25.1	14.8	18.2	17.5	17.3	25.6
C/I Uplink Adjacent Satellite 2 (dB)	26.6	25.1	16.4	15.7	15.6	12.3
C/I Downlink Adjacent Satellite 2 (dB)	26.0	18.2	20.2	19.5	19.4	26.2
C/(N+I) Composite (dB)	13.8	6.2	6.3	5.6	5.5	5.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.8	5.2	5.3	4.6	4.5	4.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.8	1.8	1.4	1.6	1.1	.7
Number of Carriers	2	1.0	3.7	395.0	24.8	135.0
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.5	-52.9	-61.5	-62.2	-62.3	-55.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-23.0	-27.4	-28.4	-29.1	-29.2	-32.4

Exhibit 6: Adjacent Satellite (52º E.L.) Link Budgets

[27 MHz Channel Bandwidth]

UPLINK BEAM INFORMATION						
Uplink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Uplink SFD (dBW/m2)	-82.3	-82.3	-84.3	-84.3	-84.3	-84.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Downlink Frequency (GHz)	11.950	11.950	11.950	11.950	11.950	11.950
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	43.2	43.2	43.2	43.2	43.2	43.2
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	50.0E	50.0E	50.0E	50.0E	50.0E	50.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	54.0E	54.0E	54.0E	54.0E	54.0E	54.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
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	64	6000	512	128
Code Rate	N/A	1/2x188/204	1/2x239/256	1/2x188/204	R1/2	R1/2
Occupied Bandwidth(kHz)	24000	22600	75.4	6771.1	1229.0	307.0
Allocated Bandwidth(kHz)	24000	27000	100	10300	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.36	2.99	3.87	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.36	2.79	3.57	2.7	2.7
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	1.2
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	56.9	42.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	2.4	1.2	1.2	1.2	1.2	6.1
Earth Station Gain (dBi)	47.5	41.3	41.3	41.3	41.3	55.5
Earth Station G/T (dB/K)	25.0	18.8	18.8	18.8	18.8	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	73.6	46.8	66.9	58.8	46.9
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
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	-48.8	-68.3	-60.9	-54.9
Uplink C/N(dB)	24.2	17.5	15.4	16.0	15.3	9.5
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	43.2	41.6	16.1	36.2	28.1	16.2
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	25.0	18.8	18.8	18.8	18.8	33.1
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	-48.8	-68.3	-60.9	-54.9
Downlink C / N(dB)	16.5	9.0	8.2	8.8	8.1	16.6
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	24.2	17.5	15.4	16.0	15.3	9.5
C/N Downlink (dB)	16.5	9.0	8.2	8.8	8.1	16.6
C/I Intermodulation (dB)	N/A	N/A	18.5	19.2	18.4	12.6
C/I Uplink Co-Channel (dB)*	27.5	27.0	27.7	27.7	28.1	21.8
C/I Downlink Co-Channel (dB)*	27.5	27.0	27.7	27.7	28.1	21.8
C/I Uplink Adjacent Satellite 1 (dB)	27.8	21.1	19.0	19.6	18.9	13.0
C/I Downlink Adjacent Satellite 1 (dB)	24.9	16.2	15.4	16.0	15.3	25.3
C/I Uplink Adjacent Satellite 2 (dB)	27.8	21.1	19.0	19.6	18.9	13.0
C/I Downlink Adjacent Satellite 2 (dB)	26.5	19.6	18.8	19.5	18.7	25.9
C/(N+I) Composite (dB)	14.2	7.0	5.8	6.4	5.7	5.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	13.2	6.0	4.8	5.4	4.7	4.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.0	-3.9	-3.4	-3.4
Excess Link Margin (dB)	3.2	2.6	1.8	1.5	1.3	.7
Number of Carriers	1	1.0	230.5	2.2	14.5	67.5
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-42.3	-56.8	-58.9	-58.3	-59.0	-50.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-16.8	-26.0	-26.7	-26.1	-26.8	-32.7

Exhibit 6: Adjacent Satellite (52º E.L.)Link Budgets (continued)

[54 MHz Channel Bandwidth]

UPLINK BEAM INFORMATION						
Uplink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Uplink SFD (dBW/m2)	-72.3	-82.3	-85.3	-85.3	-85.3	-85.3
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA	EUR-AF-ASA
Downlink Frequency (GHz)	11.950	11.950	11.950	11.950	11.950	11.950
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	43.2	43.2	43.2	43.2	43.2	43.2
Rain Rate (mm/hr)	22.0	22.0	22.0	22.0	22.0	22.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	50.0E	50.0E	50.0E	50.0E	50.0E	50.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	54.0E	54.0E	54.0E	54.0E	54.0E	54.0E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-30.3	-30.3	-30.3	-30.3	-30.3	-30.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION						
Carrier ID	24M0F3F	54M0G7W	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	36862	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	45200	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	24000	54000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	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)	4.6	1.2	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	53.5	41.3	44.8	44.8	44.8	55.5
Earth Station G/T (dB/K)	31.0	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)	79.4	80.6	63.7	43.4	55.4	46.2
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-3.7	-3.7	-3.7	-3.7	-3.7	-3.7
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.8	-76.6	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	23.0	21.5	12.8	12.1	12.0	8.7
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	37.0	43.2	33.9	13.7	25.7	16.5
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	31.0	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)	-73.8	-76.6	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	16.4	7.6	10.1	9.4	9.3	16.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	23.0	21.5	12.8	12.1	12.0	8.7
C/N Downlink (dB)	16.4	7.6	10.1	9.4	9.3	16.9
C/I Intermodulation (dB)	N/A	N/A	19.9	19.2	19.1	15.9
C/I Uplink Co-Channel (dB)*	27.5	27.0	28.5	28.4	28.8	25.1
C/I Downlink Co-Channel (dB)*	27.5	27.0	28.5	28.4	28.8	25.1
C/I Uplink Adjacent Satellite 1 (dB)	26.6	25.1	16.4	15.7	15.6	12.3
C/I Downlink Adjacent Satellite 1 (dB)	25.1	14.8	18.2	17.5	17.3	25.6
C/I Uplink Adjacent Satellite 2 (dB)	26.6	25.1	16.4	15.7	15.6	12.3
C/I Downlink Adjacent Satellite 2 (dB)	26.0	18.2	20.2	19.5	19.4	26.2
C/(N+I) Composite (dB)	13.8	6.2	6.3	5.6	5.5	5.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.8	5.2	5.3	4.6	4.5	4.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.8	1.8	1.4	1.6	1.1	.7
Number of Carriers	2	1.0	3.7	395.0	24.8	135.0
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-43.5	-52.9	-61.5	-62.2	-62.3	-55.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-23.0	-27.4	-28.4	-29.1	-29.2	-32.4