Engineering Statement

Intelsat License LLC ("Intelsat") proposes herein to operate the Intelsat 16 satellite from 79.0° W.L. From 79.0° W.L., Intelsat 16 would utilize the TT&C frequencies 13997.5 MHz and 14499.5 MHz in the uplink and 12198.25 MHz and 12198.75 MHz in the downlink as well as communications in the frequency bands 14000 – 14500 MHz and 11700 – 12200 MHz for uplink and downlink, respectively, to provide service to North and Central America.[1]

To take the impact of the proposed change in the Intelsat 16 orbital location into account, this engineering statement provides the following technical information for Intelsat 16 at 79.0° W.L.: (1) frequency plan; (2) antenna gain contours; (3) emission designators; (4) link budgets; (5) adjacent satellite link analysis; (6) power flux density ("PFD") levels; (7) orbital debris mitigation plan; (8) arrangement for telemetry, tracking and control; and (9) Schedule S.

1) Frequency Plan

The Intelsat 16 frequency plan is provided in Exhibit 1.

2) Antenna Gain Contours

The co-polarized coverage patterns for the Intelsat 16 that will be utilized when operating from 79.0º W.L. are shown in Exhibits 2A through 2N. These exhibits specify for each beam the maximum antenna gain, the minimum Saturated Flux Density ("SFD") and maximum G/T for each uplink beam, and the maximum EIRP for each downlink beam.

The antenna pattern information is in the form of antenna gain contours with the exception of the Telemetry, Command and Ranging's ("TC&R's") Global Horn Antennas, Wide Coverage Antennas ("WCAs") and Omnidirectional Antennas ("Omni"). The antenna patterns in Exhibits 2F through 2L show the variation in gain with respect to elevation angle. The full description of the antenna gain patterns, provided in the initial application (SAT−LOA−20080416−00085), is also applicable at the proposed 79.0° W.L. orbital location.

3) Emission Designators

Emission designators and allocated bandwidths for representative communication carriers are provided in Exhibit 3.

4) Link Budgets and Interference Analysis

[1] The satellite is also equipped with the 12750-13250 MHz, 13750-14000 MHz and 10700-11700 MHz bands but they will not be used at the 79.0° W.L. orbital location except for the 13997.5 MHz frequency used for uplink TT&C, noted above. Intelsat 16 will operate 13997.5 MHz on a non-interference, non-protected basis.

Link analysis for Intelsat 16 was conducted for a number of representative carriers. For the analysis, it was assumed that the satellites nearest to Intelsat 16 were AMC-2 operating from 80.8° W.L. and a hypothetical Ku-band satellite operating from 77.0° W.L.[2] The hypothetical satellite was assumed to have the same operational parameters as Intelsat 16.

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'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 Ku-band frequencies rain attenuation predictions are derived using Recommendation ITU-R P.618-7.
d. At Ku-band frequencies, increase in noise temperature of the receiving earth station due to rain is taken into account.
e. For the cases where the transponder operates in a multi-carrier mode, the effects due to intermodulation interference are taken into account.

In order to reduce the number the Intelsat 16 link calculations to a manageable number, worst-case performance values were assumed for each beam type. The worst-case beam parameters were derived from the beam parameters listed in Exhibit 2 and chosen in such a manner that would make carrier links utilizing any specific uplink /downlink beam combination as sensitive to adjacent satellite interference as possible. This would ensure that the link performance objectives would be achieved for all possible Intelsat 16 uplink and downlink beam combinations. The worst-case beam performance for each Intelsat 16 beam type is provided below:

Beam Name (Polarization)	Beam Designation	Worst Case Beam Peak G/T (dB/K)	Worst-Case Beam SFD Range @ Peak G/T (dBW/m^2)	Worst-Case Beam EIRP (dBW)
Mexico 1 (H)	Mexico 1	11.0	-106.3 to - 81.3	55.1
Mexico 1 (V)				
Mexico 2 (V)	Mexico 2	-	-	57.5

The results of the link analysis are shown in Exhibit 4 and demonstrate that operation of the Intelsat 16 satellite from 79.0º W.L. would permit the intended services to achieve their respective performance objectives while maintaining sufficient link margin. Additionally, the EIRP density levels of the carriers listed in Exhibit 5 comply with the levels contained in the Section 25.212(c) of the Commission's rules.

5) Adjacent Satellite Link Analysis

[2] The Venesat-1 satellite is operating at 78.0° W.L. but was not used in the analysis. The satellite is co-frequency to Intelsat 16 but only in the uplink direction and has a different uplink coverage area.

The impact of the proposed Intelsat 16 emissions on the transmissions of AMC-2 operating from 80.8° W.L. and a hypothetical satellite operating from 77.0° W.L. were evaluated. AMC-2 utilizes the bands 5925-6425 MHz, 3700-4200 MHz, 14000-14500 MHz and 11700-12200 MHz with linear polarization[3]. The worst-case EIRP at beam peak is 53 dBW.[4] There were no G/T or SFD values available so Intelsat 16 parameters were assumed. The hypothetical satellite was assumed to have the same operational parameters as Intelsat 16.

For AMC-2, it was assumed that the adjacent satellites were Intelsat 16, located at 79.0º W.L and AMC-9 located at 83.0º W.L. For the hypothetical satellite operating from 77.0° W.L, it was assumed that the adjacent satellites were Intelsat 16, located at 79.0º W.L., and a hypothetical satellite having the same operating characteristics as Intelsat 16 located at 75.0º W.L.[5]

The assumptions made in Section 5 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 given in Exhibits 5 and 6. The Intelsat 16 transmissions in the bands addressed in Exhibits 5 and 6 will be limited to those levels contained in Sections 25.212(c), as applicable, unless higher levels are coordinated with affected adjacent satellite operators.

6) Power Flux Density Levels

The power flux density limits for space stations are specified in section 25.208 of the Commission's Rules. With respect to the 11700 – 12200 MHz band, section 25.208 of the Rules does not specify any PFD limits for geo-stationary FSS satellites. With respect to the 10950 – 11200 MHz band, section 25.208 of the Rules does specify PFD limits for geo-stationary FSS satellites. However, Intelsat does not intend to utilize this frequency band from the proposed 79.0° W.L. orbital location.

7) 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:

a. 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

[3] The bands 5925-6425 MHz and 3700-4200 MHz do not overlap with Intelsat 16 frequencies and were therefore not considered in this analysis.

[4] This value was taken from the SES website (http://www.ses.com/4628194/ses-2).

[5] Star One C3 is located at 75.0º W.L. but was not used in the analysis since it is co-frequency with the hypothetical satellite operating at 77.0º W.L. but not co-coverage. A hypothetical satellite operating at 75.0º W.L. that is co-frequency/co-coverage was used for the analysis to show a worst-case interference environment.

spacecraft does not use any subsystems for end-of-life disposal (orbit-raising to safe altitude above GEO) that are not used for normal operations.

b. 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 plans to remove the stored energy on the spacecraft by depleting all propellant tanks and turning off all active units.

c. 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. 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 station-keeping volume with Intelsat 16[6]. Intelsat is also not aware of any non-Intelsat system with an overlapping station-keeping volume with Intelsat 16 that is the subject of an ITU filing and that is either in orbit or progressing towards launch.

d. Post Mission Disposal

At the end of the mission, Intelsat plans to dispose of the spacecraft by moving it to a planned minimum altitude of 300 kilometers above the geostationary arc. This exceeds the minimum altitude established by the IADC formula. Intelsat has reserved 6.8 kilograms of fuel for this purpose. The reserved fuel figure was determined by the spacecraft manufacturer and provided for in the propellant budget. To calculate this figure, the manufacturer used the "rocket equation", taking into account the expected mass of the satellite at the end of life and the required delta-velocity to achieve the desired orbit.

Intelsat has assessed the fuel gauging uncertainty and has provided an adequate margin of fuel reserve to address the assessed uncertainty in remaining propellant.

In calculating the disposal orbit, Intelsat has used simplifying assumptions as permitted under the Commission's Orbital Debris Report and Order. For reference, the effective area to mass ratios (Cr*A/M) of the Intelsat 16 spacecraft is 0.04 m2/kg, resulting in a minimum perigee disposal altitude under the IADC formula of at most 280.4 kilometers above the geostationary arc, which is lower than the 300 kilometers above geostationary disposal altitude specified by Intelsat in this filing. Accordingly, the Intelsat 16 planned disposal orbit complies with the FCC rules.

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[6] As stated in the legal narrative, the Intelsat 16 satellite will operate at the 79.0° W.L. location until the DIRECTV KU-79W satellite arrives at the 78.8° W.L. location and traffic is transferred from Intelsat 16 to DIRECTV KU-79W. After that time it is expected that Intelsat 16 will be redeployed.

8) Arrangement For Telemetry, Tracking and Control

Intelsat will conduct TC&R operations through one or more of the following earth stations: Castle Rock, Colorado and Fillmore, California. Additionally, Intelsat is capable of remotely controlling Intelsat 16 from its facility in Washington D.C.

9) Schedule S Submission

Intelsat is providing with its application a Schedule S for the operations of Intelsat 16 from 79.0º W.L. The Schedule S contains only: (1) those Intelsat 16 data items that have changed from those that were listed in the Schedule S for SAT-LOA-20080416-00085; and (2) data items whose inclusion was required in order for the software application to function properly.

It is noted that the antenna gain patterns for the Intelsat 16 TC&R Global Horn, WCA and Omni antennas are not in the format prescribed in Section 25.114(c)(4)(vi)(A) of the Commission's rules due to the fact that the satellite manufacturer does not provide the patterns in the required form. In lieu of the format prescribed in Section 25.114(c)(4)(vi)(A) of the Commission's rules, the antenna patterns provided show the variation in gain with respect to elevation angle. The full description of the antenna gain patterns, provided in the initial application (SAT−LOA−20080416−00085), is also applicable at the proposed 79.0° W.L. orbital location. It is Intelsat's understanding that the antenna patterns provided together with the descriptive characterization given in the SAT−LOA−20080416−00085, fulfill the requirements of Section 25.114(c)(4)(vi)(A). However, in case the Commission disagrees, a waiver of the requirements of Section 25.114(c)(4)(vi)(A) of the FCC's rules with respect to the presentation of these antenna patterns is respectfully requested. Consequently, for the above-mentioned antennas, the antenna gain patterns were included in column "e" (instead of column "f") of Section S8 of the Schedule S, since they are not in GIMS-readable format.

Certification Statement

I hereby certify that I am a technically qualified person and am familiar with Part 25 of the Commission's rules. 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/	December 23, 2014
Roya Shambayati Intelsat Director, Spectrum Strategy	Date

Exhibit 1: 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)
1MB	Mexico 1	Vertical	14020	1M	Mexico 1	Horizontal	11720	36	132
3MB	Mexico 1	Vertical	14060	3M	Mexico 1	Horizontal	11760	36	132
5MB	Mexico 1	Vertical	14100	5M	Mexico 1	Horizontal	1180	36	132
7MB	Mexico 1	Vertical	14140	7M	Mexico 1	Horizontal	11840	36	132
9MB	Mexico 1	Vertical	14180	9M	Mexico 1	Horizontal l	11880	36	132
11MB	Mexico 1	Vertical	14220	11M	Mexico 1	Horizontal	11920	36	132
13M	Mexico 1	Vertical	14260	13M	Mexico 1	Horizontal	11960	36	132
15M	Mexico 1	Vertical	14300	15M	Mexico 1	Horizontal	12000	36	132
17M	Mexico 1	Vertical	14340	17M	Mexico 1	Horizontal	12040	36	132
19M	Mexico 1	Vertical	14380	19M	Mexico 1	Horizontal	12080	36	132
21M	Mexico 1	Vertical	14420	21M	Mexico 1	Horizontal	12120	36	132
23M	Mexico 1	Vertical	14460	23M	Mexico 1	Horizontal	12160	36	132
2M	Mexico 1	Horizontal	14040	2MA	Mexico 1	Vertical	11740	36	132
				2MB	Mexico 2	Vertical	11740	36	132
4M	Mexico 1	Horizontal	14080	4MA	Mexico 1	Vertical	11780	36	132
				4MB	Mexico 2	Vertical	11780	36	132
6M	Mexico 1	Horizontal	14120	6MA	Mexico 1	Vertical	11820	36	132
				6MB	Mexico 2	Vertical	11820	36	132
8M	Mexico 1	Horizontal	14160	8MA	Mexico 1	Vertical	11860	36	132
				8MB	Mexico 2	Vertical	11860	36	132
10M	Mexico 1	Horizontal	14200	10MA	Mexico 1	Vertical	11900	36	132
				10MB	Mexico 2	Vertical	11900	36	132
12M	Mexico 1	Horizontal	14240	12MA	Mexico 1	Vertical	11940	36	132
				12MB	Mexico 2	Vertical	11940	36	132
14M	Mexico 1	Horizontal	14280	14M	Mexico 1	Vertical	11980	36	132
16M	Mexico 1	Horizontal	14320	16M	Mexico 1	Vertical	12020	36	132
18M	Mexico 1	Horizontal	14360	18M	Mexico 1	Vertical	12060	36	132
20M	Mexico 1	Horizontal	14400	20M	Mexico 1	Vertical	12100	36	132
22M	Mexico 1	Horizontal	14400	22M	Mexico 1	Vertical	12140	36	132
24M	Mexico 1	Horizontal	14480	24M	Mexico 1	Vertical	12180	36	132
Command 1	Global	Horizontal	13997.5					1	N/A
Command 2	Global	Vertical	14499.5					1	N/A
Command 3	Global	Left Hand Circular	13997.5					1	N/A
Command 4	Global	Left Hand Circular	14499.5					1	N/A
Command 5	Global	Left Hand Circular	13997.5					1	N/A
Command 6	Global	Left Hand Circular	14499.5					1	N/A
				Telemetry 1	Global	Horizontal	12198.25	0.5	N/A
				Telemetry 2	Global	Horizontal	12198.75	0.5	N/A
				Telemetry 3	Global	Right Hand Circular	12198.25	0.5	N/A
				Telemetry 4	Global	Right Hand Circular	12198.75	0.5	N/A
				Telemetry 5	Global	Right Hand Circular	12198.25	0.5	N/A
				Telemetry 6	Global	Right Hand Circular	12198.75	0.5	N/A
				ULPC 1	Global	Vertical	11701.25	0.025	N/A
				ULPC 2	Global	Horizontal	12199.75	0.025	N/A

Exhibit 2A: Mexico 1 Receive Beam

Beam Polarization: Horizontal
Peak Antenna Gain: 37.2 dBi
Peak G/T: 10.7 dB/K
Saturated Flux Density at Peak G/T: -105.6 to -80.6 dBW/m^2
(Schedule S Beam Designation: MHUL)

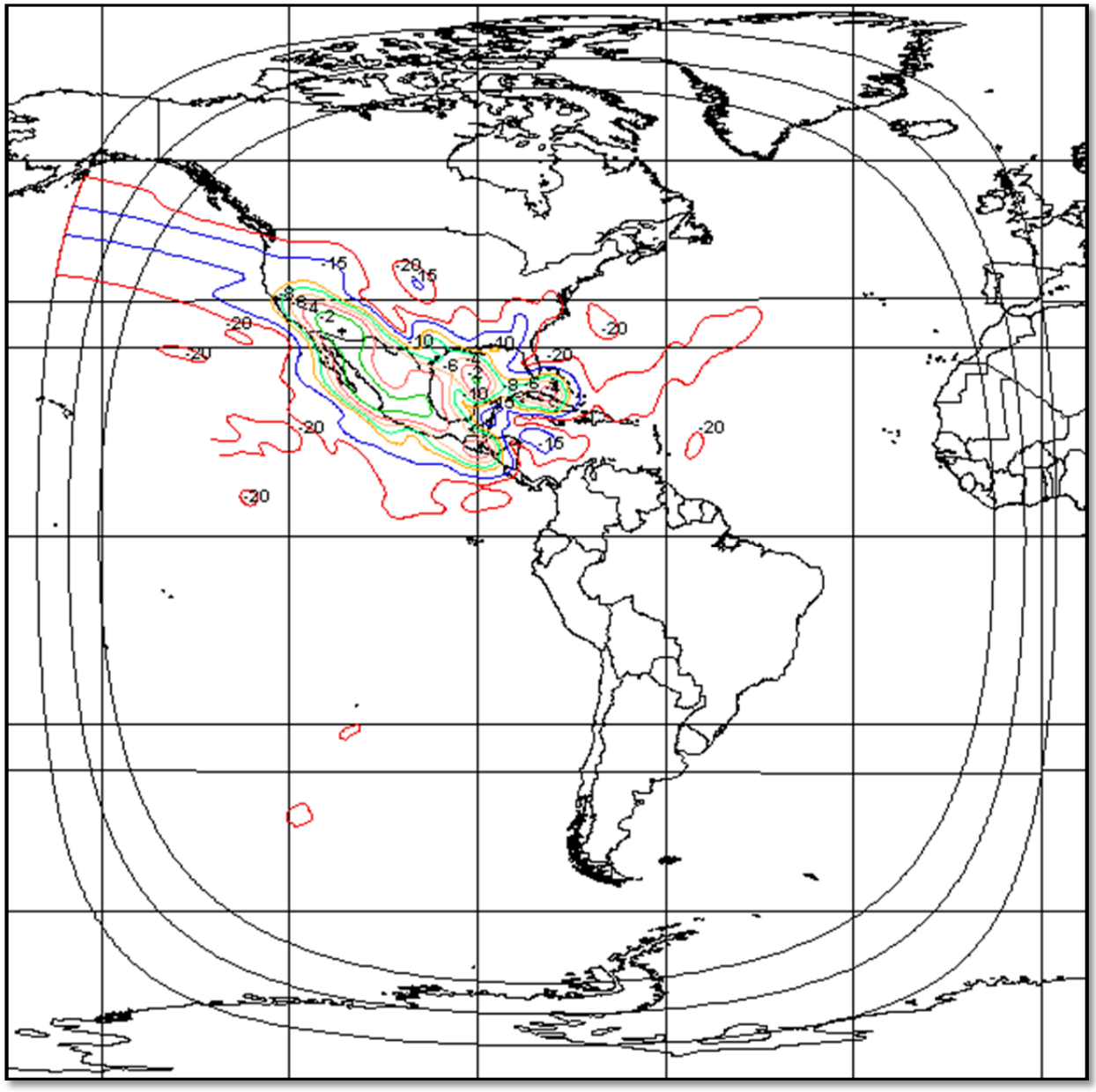

Exhibit 2B: Mexico 1 Receive Beam

Beam Polarization: Vertical
Peak Antenna Gain: 37.6 dBi
Peak G/T: 11.0 dB/K
Saturated Flux Density at Peak G/T: -106.3 to -81.3 dBW/m2
(Schedule S Beam Designation: MVUL)

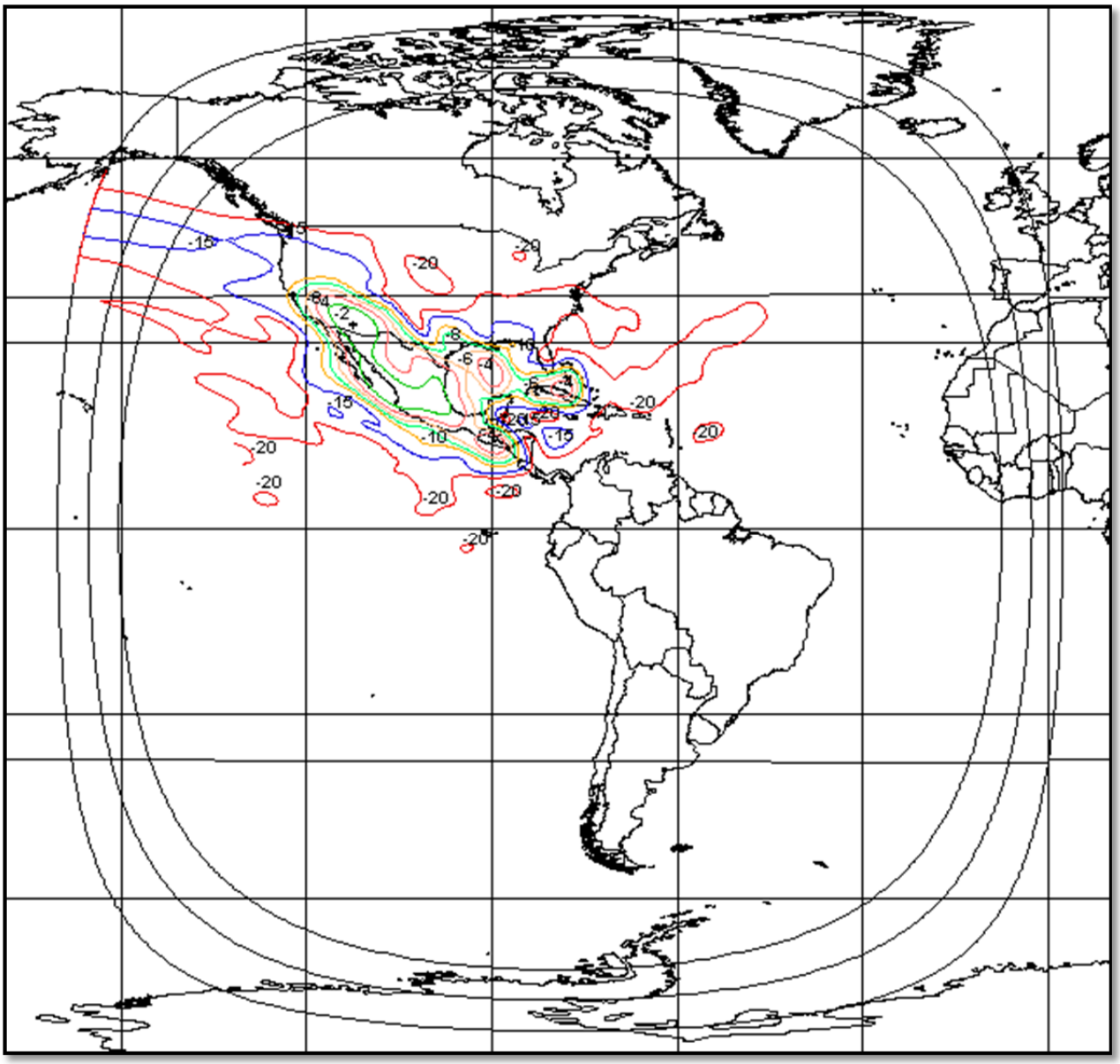

Exhibit 2C: Mexico 1 Transmit Beam

Beam Polarization: Horizontal
Peak Antenna Gain: 35.8 dBi
Peak EIRP: 55.1 dBW
(Schedule S Beam Designation: MHDL)

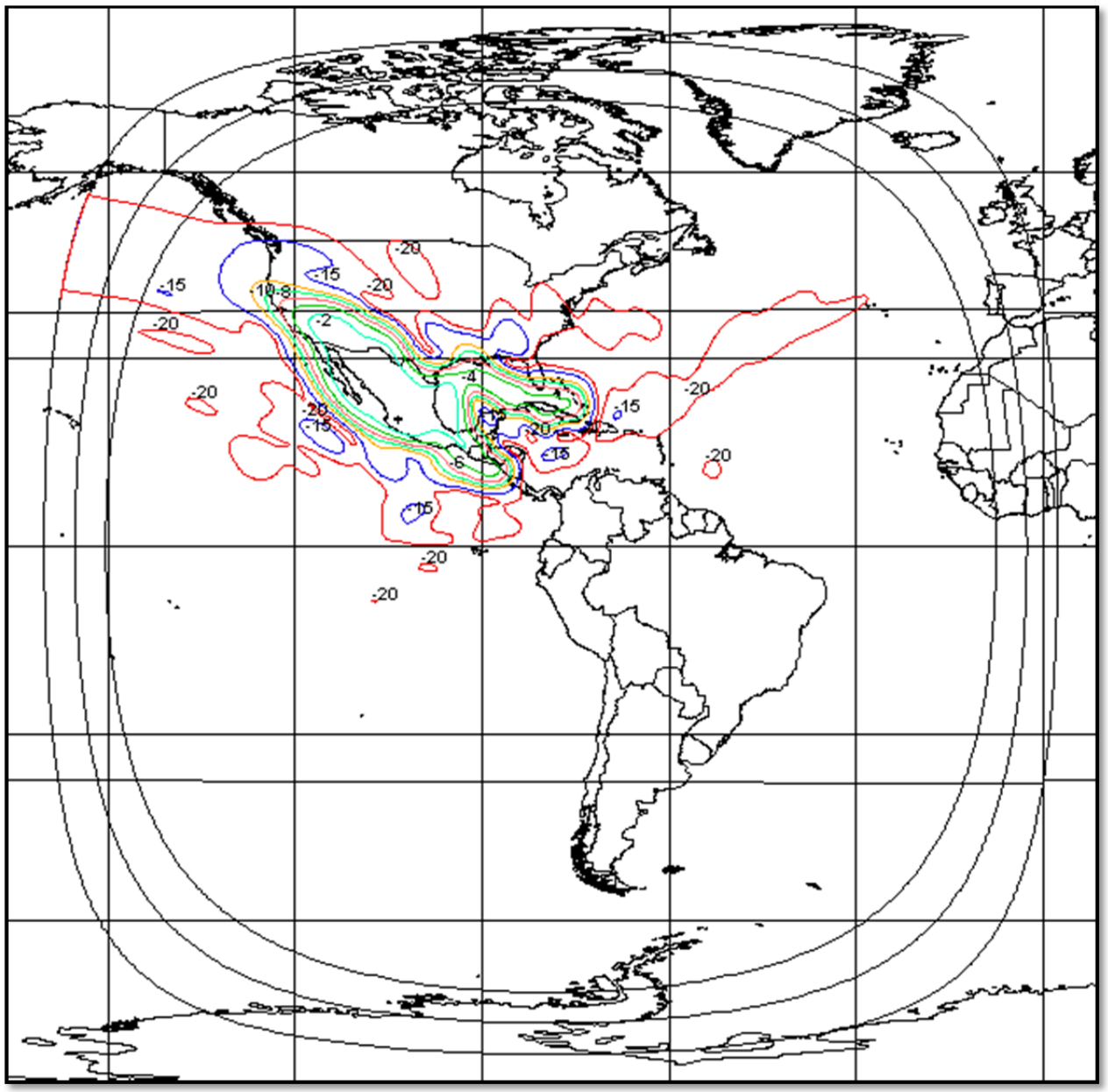

Exhibit 2D: Mexico 1 Transmit Beam

Beam Polarization: Vertical
Peak Antenna Gain: 35.5 dBi
Peak EIRP: 54.5 dBW
(Schedule S Beam Designation: MVDL)

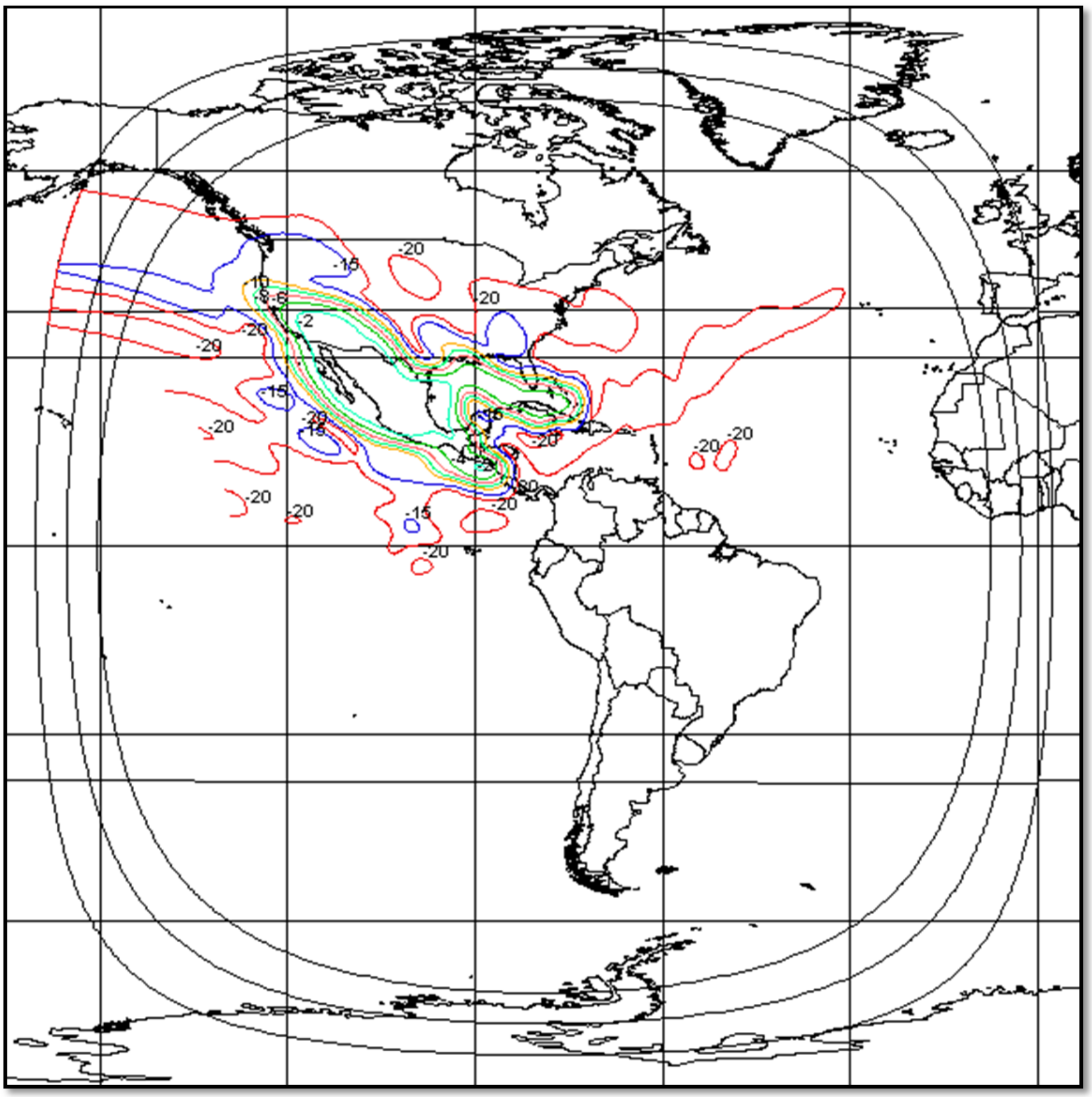

Exhibit 2E: Mexico 2 Transmit Beam

Beam Polarization: Vertical
Peak Antenna Gain: 39.0 dBi
Peak EIRP: 57.5 dBW
(Schedule S Beam Designation: M2DL)

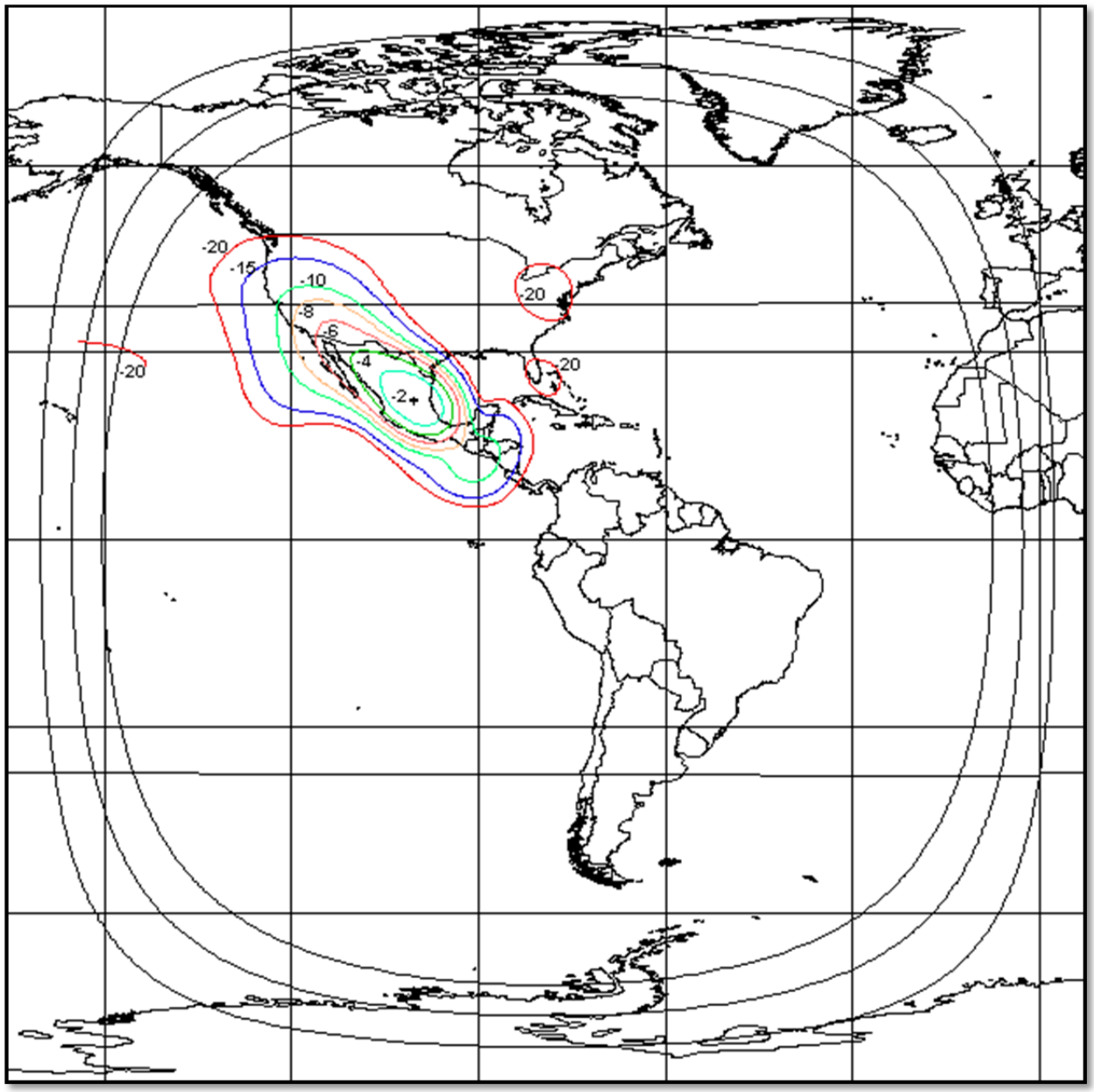

Exhibit 2F: On-Station Command Beam
[Global Horn Antenna]

Beam Polarization: Horizontal
Peak Antenna Gain: 20.3 dBi
Peak G/T: -13.3 dB/K
Command Threshold Flux Density at Peak G/T: -112 dBW/m^2
(Schedule S Beam Designation: CMDH)

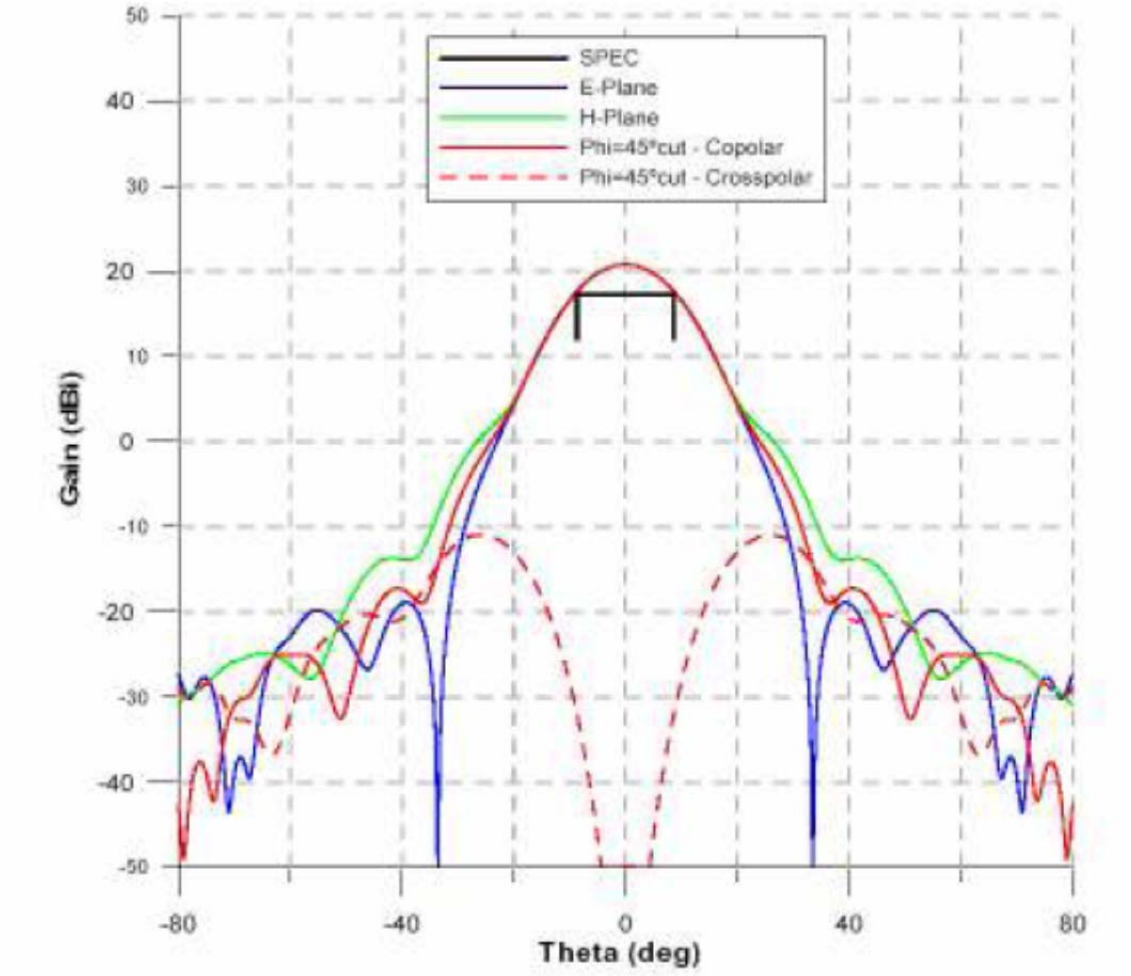

Exhibit 2G: On-Station Command Beam
[Global Horn Antenna]

Beam Polarization: Vertical
Peak Antenna Gain: 20.3 dBi
Peak G/T: -13.3 dB/K
Command Threshold Flux Density at Peak G/T: -112 dBW/m^2
(Schedule S Beam Designation: CMDV)

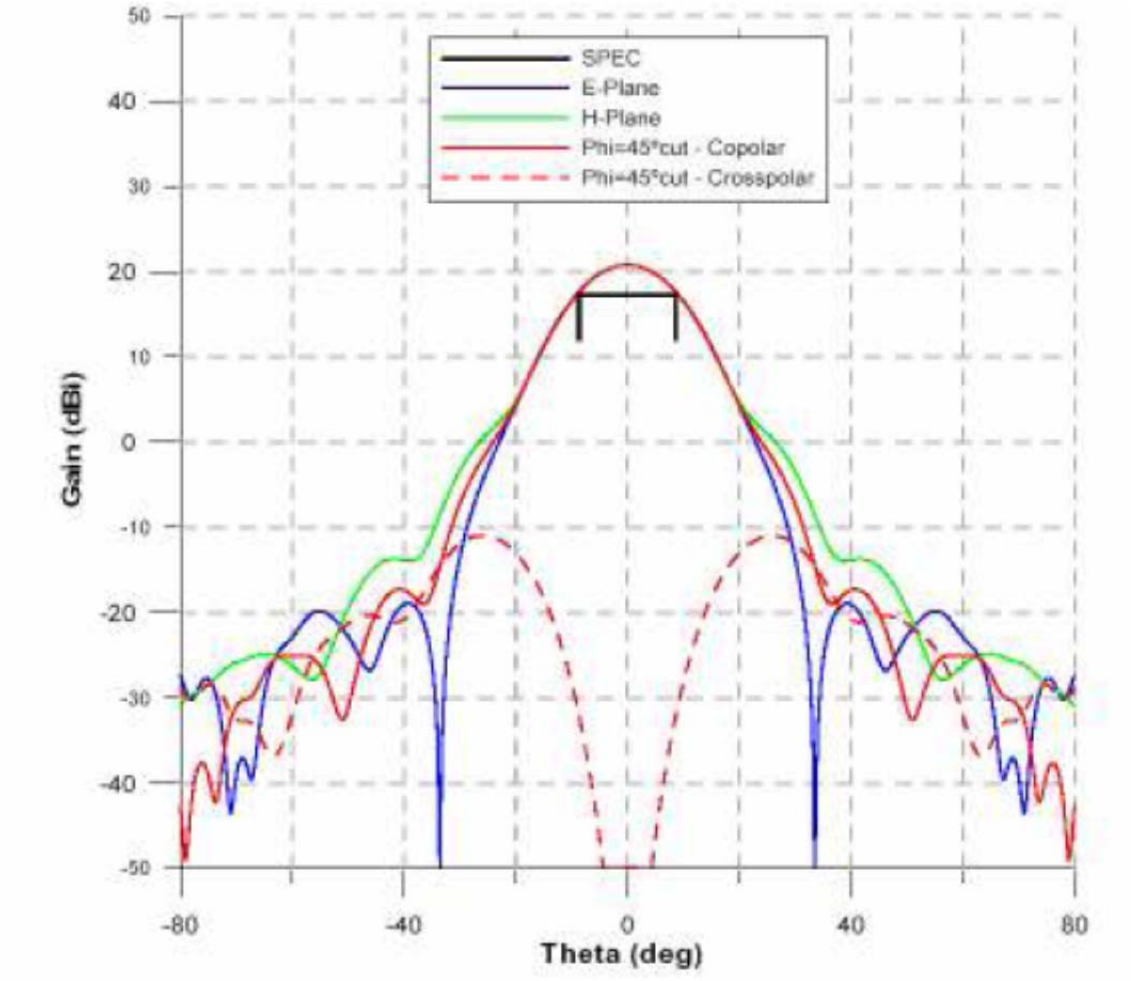

Exhibit 2H: Back-Up Command Beam

Antenna Type: Omni
Polarization: Left Hand Circular
Peak Antenna Gain: 3.0 dBi
Peak G/T: -34.5 dB/K
Command Threshold Flux Density At Peak G/T: -90.8 dBW/m^2
(Schedule S Beam Designation: CMDO)

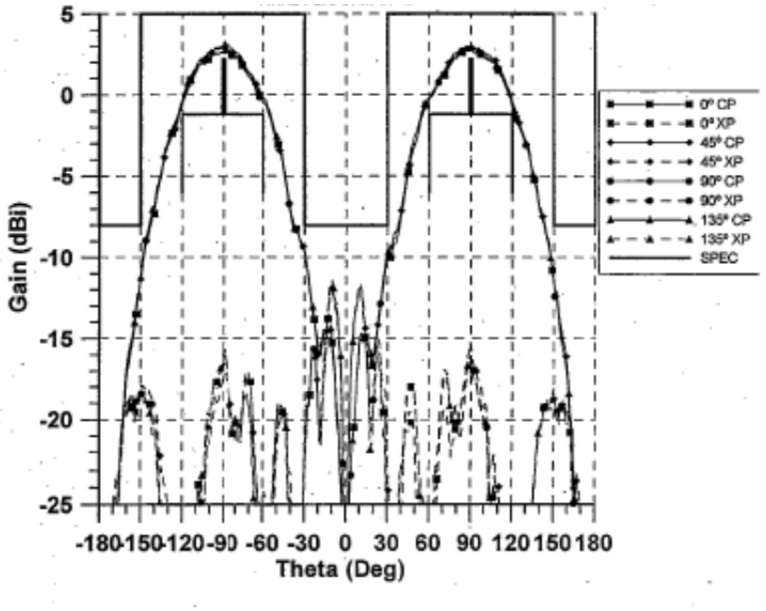

Exhibit 2I: Back-Up Command Beam

Antenna Type: Wide Coverage
Polarization: Left Hand Circular
Peak Antenna Gain: 13.0 dBi
Peak G/T: -30.3 dB/K
Command Threshold Flux Density At Peak G/T: -94.9 dBW/m2
(Schedule S Beam Designation: CMDW)

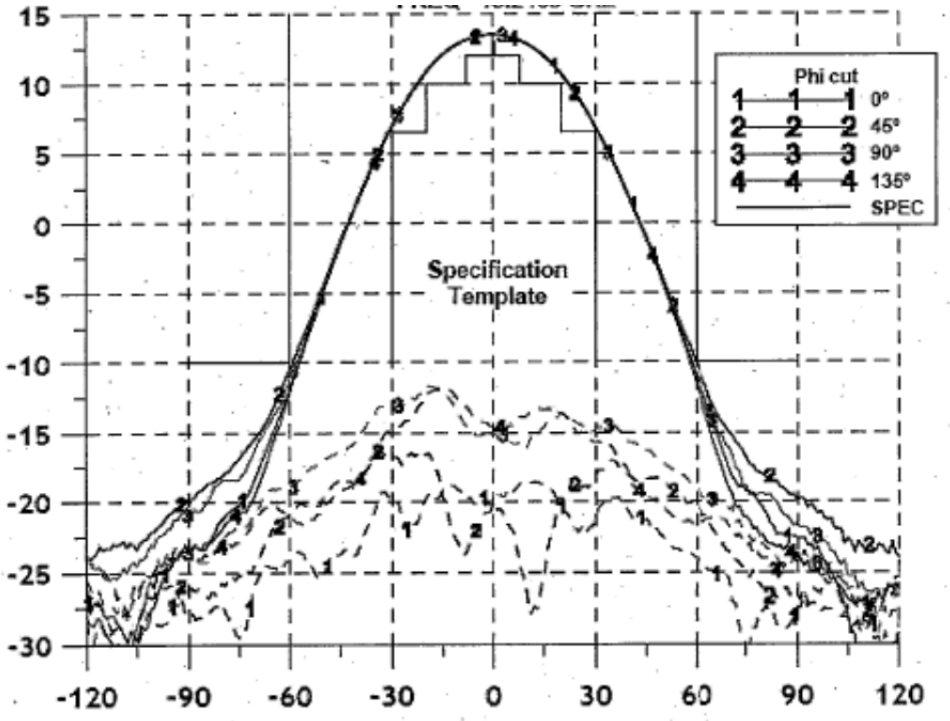

Exhibit 2J: On-Station Telemetry Beam [Global Horn Antenna]

Beam Polarization: Horizontal
Peak Antenna Gain: 21.3 dBi
Peak EIRP: 13.1 dBW
(Schedule S Beam Designation: TLMH)

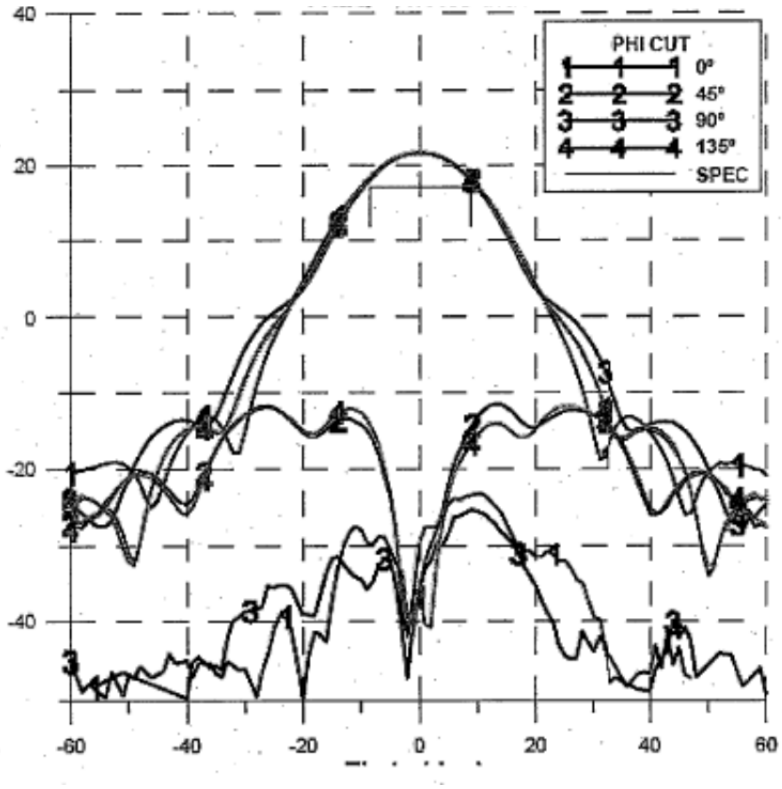

Exhibit 2K: Back-Up Telemetry Beam

Antenna Type: Omni
Polarization: Right Hand Circular
Peak Antenna Gain: 3.0 dBi
Peak EIRP: 6.4 dBW
(Schedule S Beam Designation: TLMO)

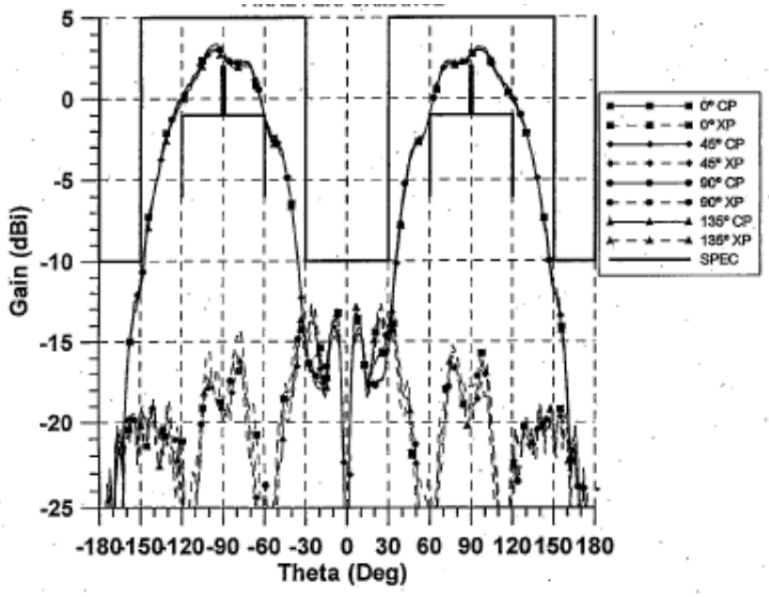

Exhibit 2L: Back-Up Telemetry Beam

Antenna Type: WCA
Polarization: Right Hand Circular
Peak Antenna Gain: 13.0 dBi
Peak EIRP: 13.4 dBW
(Schedule S Beam Designation: TLMW)

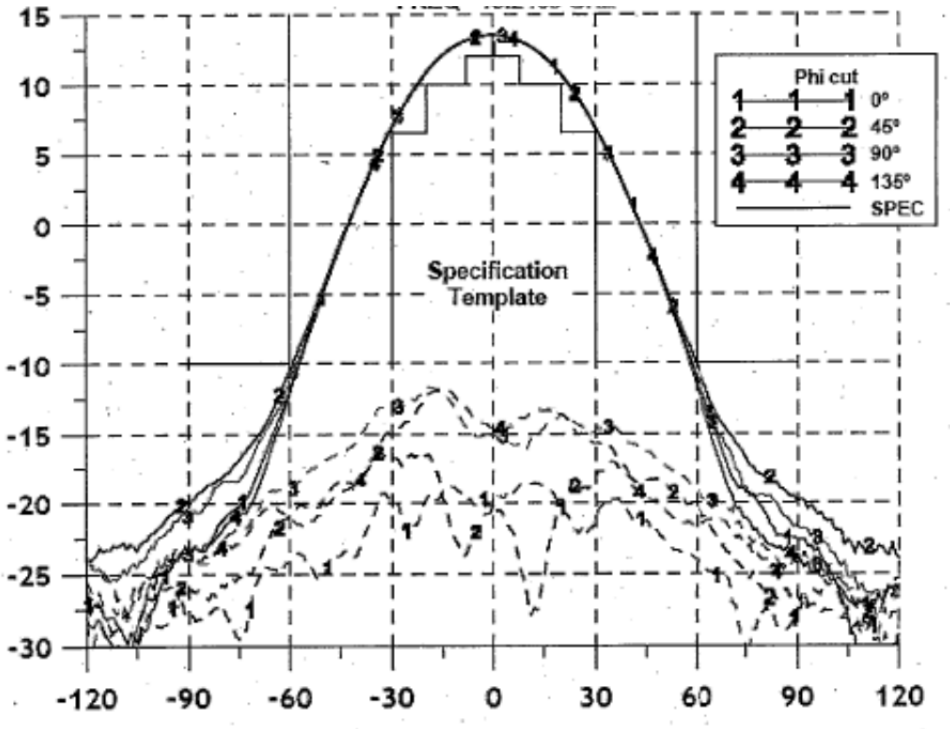

Exhibit 2M: Uplink Power Control Beam

Beam Polarization: Horizontal
Peak Antenna Gain: 21 dBi
Peak EIRP: 15.6 dBW
(Schedule S Beam Designation: UPCH)

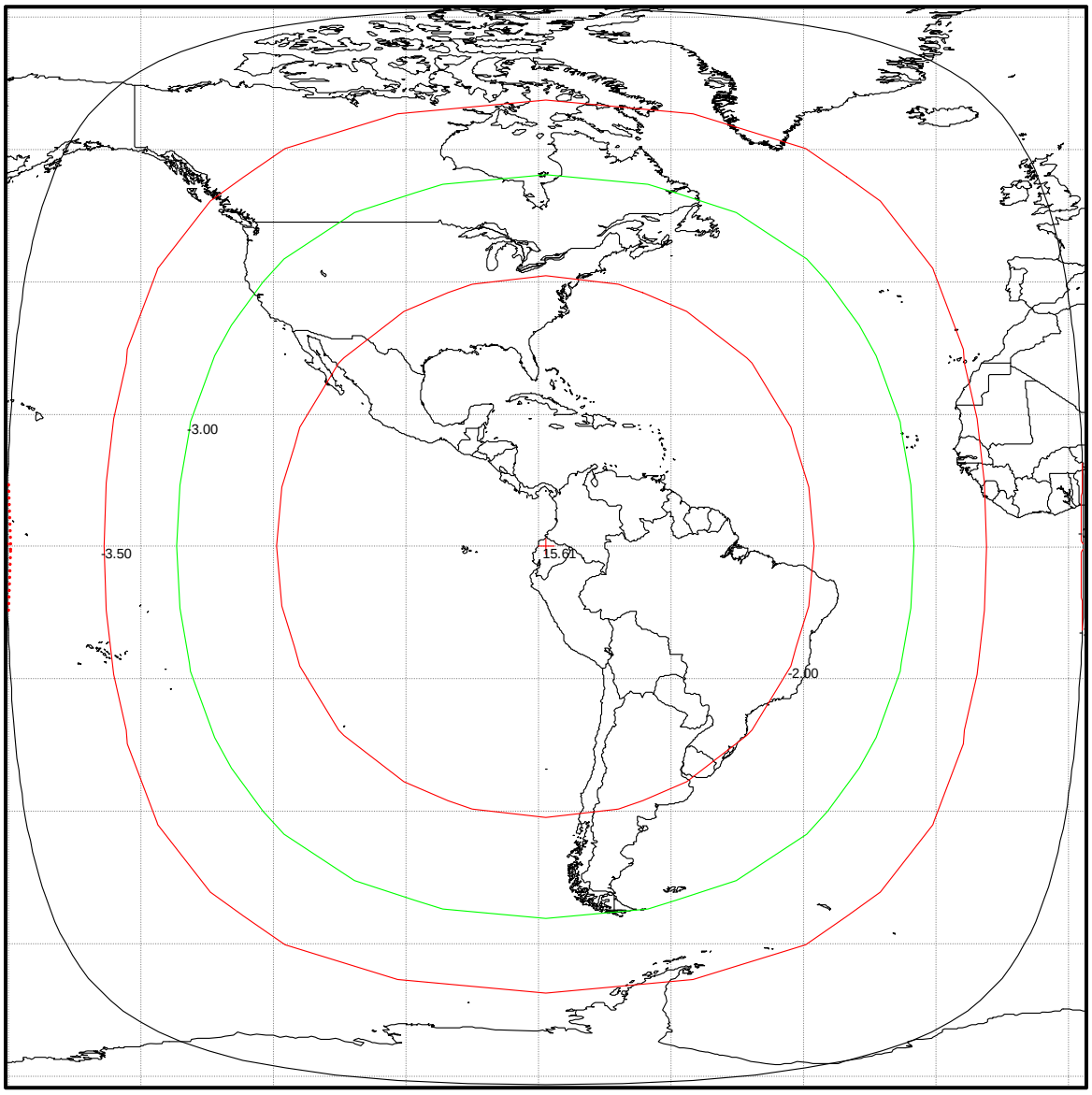

Exhibit 2N: Uplink Power Control Beam

Beam Polarization: Horizontal
Peak Antenna Gain: 21 dBi
Peak EIRP: 15.6 dBW
(Schedule S Beam Designation: UPCV)

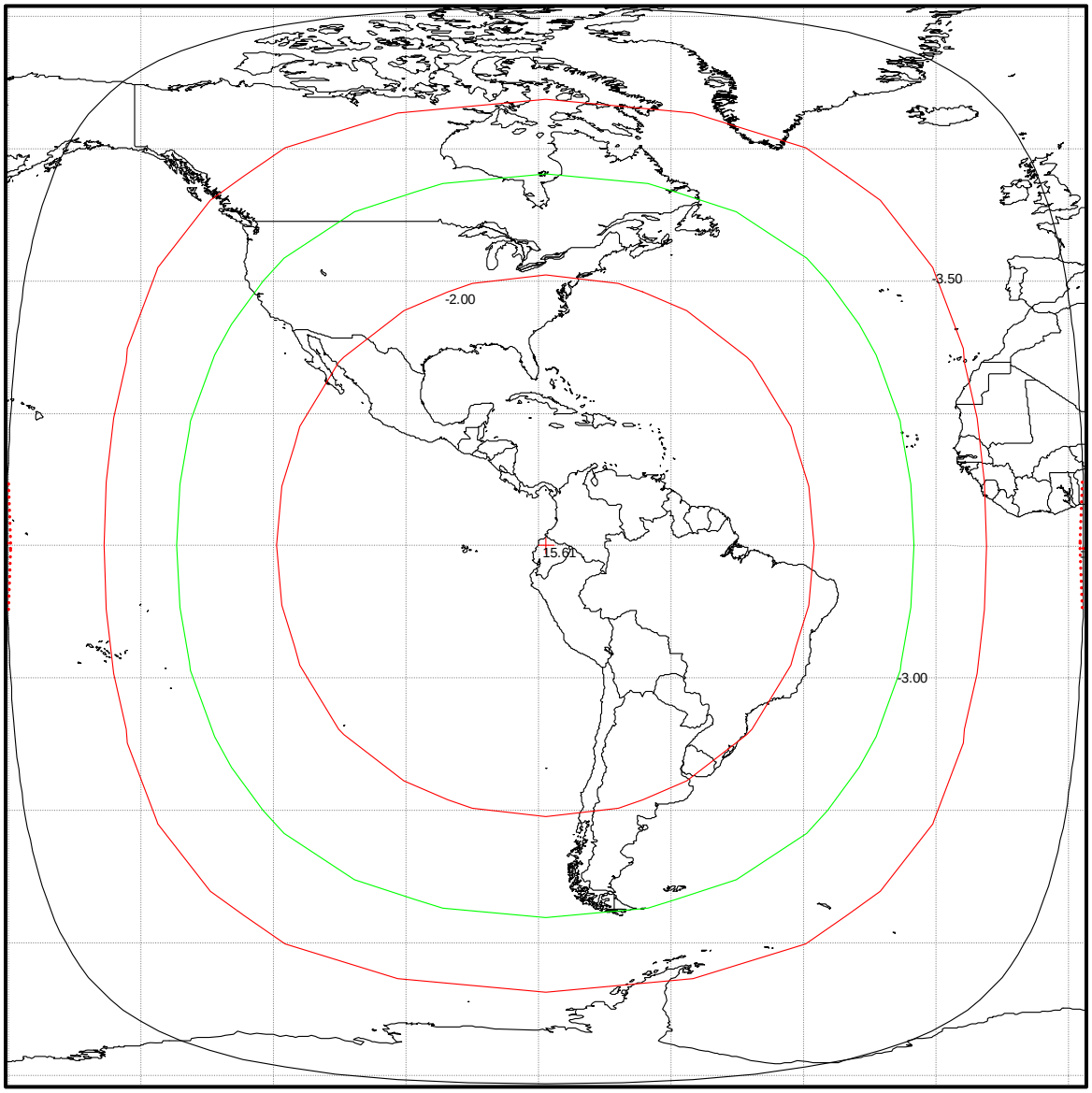

EXHIBIT 3: EMISSION DESIGNATORS

Signal Type	Emission Designator	Allocated Bandwidth (kHz)
36860 kbps Carrier	36M0G7W	36000
8448 kbps Carrier	8M25G7W	8250.5
1024 kbps Carrier	1M54G7W	1541.5
256 kbps Carrier	239KG7W	239

Exhibit 4: INTELSAT 16 LINK BUDGETS

UPLINK BEAM INFORMATION				
Uplink Beam Name	Mexico 1	Mexico 1	Mexico 1	Mexico 1
Uplink Frequency (GHz)	14.0-14.5	14.0-14.5	14.0-14.5	14.0-14.5
Uplink Beam Polarization	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Uplink Beam Peak G/T (dB/K)	11.0	11.0	11.0	11.0
Uplink Beam Peak SFD (dBW/m2)	-94.3	-83.3	-83.3	-83.3
Uplink Relative Contour Level (dB)	-6	-6	-6	-6
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	Mexico 1	Mexico 1	Mexico 1	Mexico 1
Downlink Frequency (GHz)	11.7-12.2	11.7-12.2	11.7-12.2	11.7-12.2
Downlink Beam Polarization	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Downlink Beam Peak EIRP (dBW)	55.1	55.1	55.1	55.1
Downlink Relative Contour Level (dB)	-6	-6	-6	-6
ADJACENT SATELLITE 1				
Satellite Name	AMC-2	AMC-2	AMC-2	AMC-2
Orbital Location	80.8W	80.8W	80.8W	80.8W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2				
Satellite Name	HYP 77W	HYP 77W	HYP 77W	HYP 77W
Orbital Location	77.0W	77.0W	77.0W	77.0W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	8M25G7W	1M54G7W	239KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Information Rate(kbps)	36860	8.448	1024	256
Code Rate	3/4x188/203	3/4	1/2	3/4
Occupied Bandwidth(kHz)	26664.7	6111.3	1232.9	170.7
Allocated Bandwidth(kHz)	36000	8250.5	1541.5	239
Minimum C/N, Rain (dB)	7.3	7.3	1.6	4.6
UPLINK EARTH STATION				
Earth Station Diameter (meters)	1.2	1.2	1.2	1.2
Earth Station Gain (dBi)	42.6	42.6	42.6	42.6
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	1.8	1.2	1.2
Earth Station Gain (dBi)	44.5	44.5	40.9	40.9
Earth Station G/T (dB/K)	23.3	23.3	19.8	19.8
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	64.8	59.6	52.6	44.1
Uplink Path Loss, Clear Sky (dB)	-207.1	-207.1	-207.1	-207.1
Satellite G/T(dB/K)	5.1	5.1	5.1	5.1
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Uplink Thermal C/N(dB)	17.1	18.3	18.3	18.4
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	42.6	36.4	29.4	20.8
Downlink Path Loss, Clear Sky (dB)	-205.5	-205.5	-205.5	-205.5
Downlink Earth Station G/T (dB/K)	23.3	23.3	19.8	19.8
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Downlink Thermal C / N(dB)	14.7	14.9	11.4	11.4
COMPOSITE LINK PERFORMANCE				
Uplink Earth Station HPA Intermodulation C/N (dB)	27.0	28.2	28.1	28.1
C/N Thermal Uplink (dB)	17.1	18.3	18.3	18.4
Uplink Interference C/I (dB)	24.2	26.5	22.8	22.8
Uplink Adjacent Satellite C/I (dB)	15.4	16.6	16.5	16.5
Intermodulation C/IM (dB)	200.0	39.9	40.7	41.8
Downlink Thermal C/N (dB)	14.7	14.9	11.4	11.4
Downlink Interference C/I (dB)	28.8	24.4	22.7	23.1
Downlink Adjacent Satellite C/I (dB)	13.7	13.9	9.3	9.2
Subtotal C/N (dB)	8.9	9.4	6.2	6.2
Antenna Mispointing and Other Losses (dB)	1.5	1.5	1.5	1.5
Total C/N (dB)	7.4	7.9	4.7	4.7
Minimum Required C/N (dB)	7.3	7.3	1.6	4.6
Number of Carriers	1	4	23	151
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-52.1	-50.9	-50.9	-50.8
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.2	-26.0	-26.0	-26.0

UPLINK BEAM INFORMATION				
Uplink Beam Name	Mexico 1	Mexico 1	Mexico 1	Mexico 1
Uplink Frequency (GHz)	14.0-14.5	14.0-14.5	14.0-14.5	14.0-14.5
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Beam Peak G/T (dB/K)	11.0	11.0	11.0	11.0
Uplink Beam Peak SFD (dBW/m2)	-91.3	-85.3	-85.3	-85.3
Uplink Relative Contour Level (dB)	-6	-6	-6	-6
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	Mexico 2	Mexico 2	Mexico 2	Mexico 2
Downlink Frequency (GHz)	11.7-12.2	11.7-12.2	11.7-12.2	11.7-12.2
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical
Downlink Beam Peak EIRP (dBW)	57.5	57.5	57.5	57.5
Downlink Relative Contour Level (dB)	-6	-6	-6	-6
ADJACENT SATELLITE 1				
Satellite Name	AMC-2	AMC-2	AMC-2	AMC-2
Orbital Location	80.8W	80.8W	80.8W	80.8W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2				
Satellite Name	HYP 77W	HYP 77W	HYP 77W	HYP 77W
Orbital Location	77.0W	77.0W	77.0W	77.0W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	8M25G7W	1M54G7W	239KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Information Rate(kbps)	36860	8.448	1024	256
Code Rate	3/4x188/203	3/4	1/2	3/4
Occupied Bandwidth(kHz)	26664.7	6111.3	1232.9	170.7
Allocated Bandwidth(kHz)	36000	8250.5	1541.5	239
Minimum C/N, Rain (dB)	7.3	7.3	1.6	4.6
UPLINK EARTH STATION				
Earth Station Diameter (meters)	1.2	1.8	1.8	2.4
Earth Station Gain (dBi)	42.6	46.2	46.2	48.7
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	1.8	1.2	1.2
Earth Station Gain (dBi)	44.5	44.5	40.9	40.9
Earth Station G/T (dB/K)	23.3	23.3	19.8	19.8
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	64.7	64.1	57.1	48.9
Uplink Path Loss, Clear Sky (dB)	-207.1	-207.1	-207.1	-207.1
Satellite G/T(dB/K)	5.1	5.1	5.1	5.1
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Uplink Thermal C/N(dB)	17.0	22.8	22.8	23.2
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	42.5	36.0	29.0	20.8
Downlink Path Loss, Clear Sky (dB)	-205.5	-205.5	-205.5	-205.5
Downlink Earth Station G/T (dB/K)	23.3	23.3	19.8	19.8
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Downlink Thermal C / N(dB)	14.6	14.5	11.0	11.4
COMPOSITE LINK PERFORMANCE				
Uplink Earth Station HPA Intermodulation C/N (dB)	26.9	32.7	32.6	33.0
C/N Thermal Uplink (dB)	17.0	22.8	22.8	23.2
Uplink Interference C/I (dB)	31.4	38.6	34.1	34.4
Uplink Adjacent Satellite C/I (dB)	15.2	21.0	20.9	21.3
Intermodulation C/IM (dB)	200.0	34.3	35.9	36.4
Downlink Thermal C/N (dB)	14.6	14.5	10.6	11.4
Downlink Interference C/I (dB)	27.5	24.0	21.9	22.4
Downlink Adjacent Satellite C/I (dB)	13.5	13.4	8.0	8.4
Subtotal C/N (dB)	8.8	10.1	5.7	6.3
Antenna Mispointing and Other Losses (dB)	1.5	1.5	1.5	1.5
Total C/N (dB)	7.3	8.6	4.2	4.8
Minimum Required C/N (dB)	7.3	7.3	1.6	4.6
Number of Carriers	1	4	23	151
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-52.2	-50.0	-50.0	-52.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.3	-26.4	-26.4	-26.0

Exhibit 5: AMC-2 (80.8°W.L.) LINK BUDGETS

UPLINK BEAM INFORMATION				
Uplink Beam Name	Ku-Band	Ku-Band	Ku-Band	Ku-Band
Uplink Frequency (GHz)	14-14.5	14-14.5	14-14.5	14-14.5
Uplink Beam Polarization	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Uplink Beam Peak G/T (dB/K)	11.0	11.0	11.0	11.0
Uplink Beam Peak SFD (dBW/m2)	-93.3	-93.3	-93.3	-93.3
Uplink Relative Contour Level (dB)	-6	-6	-6	-6
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	Ku-Band	Ku-Band	Ku-Band	Ku-Band
Downlink Frequency (GHz)	11.7-12.2	11.7-12.2	11.7-12.2	11.7-12.2
Downlink Beam Polarization	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Downlink Beam Peak EIRP (dBW)	53.0	53.0	53.0	53.0
Downlink Relative Contour Level (dB)	-6	-6	-6	-6
ADJACENT SATELLITE 1				
Satellite Name	Intelsat 16	Intelsat 16	Intelsat 16	Intelsat 16
Orbital Location	79.0W	79.0W	79.0W	79.0W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2				
Satellite Name	AMC-9	AMC-9	AMC-9	AMC-9
Orbital Location	83.0W	83.0W	83.0W	83.0W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	8M25G7W	1M54G7W	239KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Information Rate(kbps)	36860	8.448	1024	256
Code Rate	3/4x188/203	3/4	1/2	3/4
Occupied Bandwidth(kHz)	26664.7	6111.3	1232.9	170.7
Allocated Bandwidth(kHz)	36000	8250.5	1541.5	239
Minimum C/N, Rain (dB)	7.3	7.3	1.6	4.6
UPLINK EARTH STATION				
Earth Station Diameter (meters)	1.2	1.2	1.2	1.2
Earth Station Gain (dBi)	42.6	42.6	42.6	42.6
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	1.8	1.2	1.8
Earth Station Gain (dBi)	44.5	44.5	40.9	44.5
Earth Station G/T (dB/K)	23.3	23.3	19.8	23.3
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	66.0	59.6	52.5	43.9
Uplink Path Loss, Clear Sky (dB)	-207.1	-207.1	-207.1	-207.1
Satellite G/T(dB/K)	5.1	5.1	5.1	5.1
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Uplink Thermal C/N(dB)	18.3	18.3	18.2	18.2
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	42.8	36.4	29.3	20.7
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9
Downlink Earth Station G/T (dB/K)	23.3	23.3	19.8	23.3
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Downlink Thermal C / N(dB)	14.5	14.5	10.9	14.4
COMPOSITE LINK PERFORMANCE				
Uplink Earth Station HPA Intermodulation C/N (dB)	28.1	28.2	28.0	28.0
C/N Thermal Uplink (dB)	18.3	18.3	18.2	18.2
Uplink Interference C/I (dB)	20.7	21.8	17.9	17.9
Uplink Adjacent Satellite C/I (dB)	16.5	16.6	16.4	16.4
Intermodulation C/IM (dB)	200.0	39.8	40.5	41.7
Downlink Thermal C/N (dB)	14.5	14.5	10.9	14.4
Downlink Interference C/I (dB)	28.0	24.1	22.2	22.5
Downlink Adjacent Satellite C/I (dB)	13.6	13.6	8.0	13.5
Subtotal C/N (dB)	9.0	9.0	5.2	8.5
Antenna Mispointing and Other Losses (dB)	1.5	1.5	1.5	1.5
Total C/N (dB)	7.5	7.5	3.7	7.0
Minimum Required C/N (dB)	7.3	7.3	1.6	4.6
Number of Carriers	1	4	23	151
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-50.9	-50.9	-51.0	-51.0
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.0	-26.1	-26.1

Exhibit 6: HYPOTHETICAL SATELLITE AT 77.0° W.L. LINK BUDGETS

UPLINK BEAM INFORMATION				
Uplink Beam Name	Mexico 1	Mexico 1	Mexico 1	Mexico 1
Uplink Frequency (GHz)	14.0-14.5	14.0-14.5	14.0-14.5	14.0-14.5
Uplink Beam Polarization	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Uplink Beam Peak G/T (dB/K)	11.0	11.0	11.0	11.0
Uplink Beam Peak SFD (dBW/m2)	-93.3	-93.3	-93.3	-93.3
Uplink Relative Contour Level (dB)	-6	-6	-6	-6
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	Mexico 1	Mexico 1	Mexico 1	Mexico 1
Downlink Frequency (GHz)	11.7-12.2	11.7-12.2	11.7-12.2	11.7-12.2
Downlink Beam Polarization	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Downlink Beam Peak EIRP (dBW)	55.1	55.1	55.1	55.1
Downlink Relative Contour Level (dB)	-6	-6	-6	-6
ADJACENT SATELLITE 1				
Satellite Name	Intelsat 16	Intelsat 16	Intelsat 16	Intelsat 16
Orbital Location	79.0W	79.0W	79.0W	79.0W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2				
Satellite Name	HYP 75W	HYP 75W	HYP 75W	HYP 75W
Orbital Location	75.0W	75.0W	75.0W	75.0W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	8M25G7W	1M54G7W	239KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Information Rate(kbps)	36860	8.448	1024	256
Code Rate	3/4x188/203	3/4	1/2	3/4
Occupied Bandwidth(kHz)	26664.7	6111.3	1232.9	170.7
Allocated Bandwidth(kHz)	36000	8250.5	1541.5	239
Minimum C/N, Rain (dB)	7.3	7.3	1.6	4.6
UPLINK EARTH STATION				
Earth Station Diameter (meters)	1.2	1.2	1.2	1.2
Earth Station Gain (dBi)	42.6	42.6	42.6	42.6
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	1.8	1.2	1.2
Earth Station Gain (dBi)	44.5	44.5	40.9	40.9
Earth Station G/T (dB/K)	23.3	23.3	19.8	19.8
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	65.3	58.9	51.8	43.2
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4
Satellite G/T(dB/K)	5.1	5.1	5.1	5.1
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Uplink Thermal C/N(dB)	17.3	17.3	17.2	17.2
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	42.8	36.4	29.3	20.7
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9
Downlink Earth Station G/T (dB/K)	23.3	23.3	19.8	19.8
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Downlink Thermal C / N(dB)	14.5	14.5	10.9	10.9
COMPOSITE LINK PERFORMANCE				
Uplink Earth Station HPA Intermodulation C/N (dB)	28.1	28.1	28.0	28.0
C/N Thermal Uplink (dB)	17.3	17.3	17.2	17.2
Uplink Interference C/I (dB)	20.4	21.5	17.7	17.7
Uplink Adjacent Satellite C/I (dB)	15.8	15.8	15.7	15.7
Intermodulation C/IM (dB)	200.0	39.8	40.5	41.7
Downlink Thermal C/N (dB)	14.5	14.5	10.9	10.9
Downlink Interference C/I (dB)	28.1	24.1	22.2	22.6
Downlink Adjacent Satellite C/I (dB)	14.8	14.8	10.9	10.9
Subtotal C/N (dB)	9.1	9.1	6.3	6.4
Antenna Mispointing and Other Losses (dB)	1.5	1.5	1.5	1.5
Total C/N (dB)	7.6	7.6	4.8	4.9
Minimum Required C/N (dB)	7.3	7.3	1.6	4.6
Number of Carriers	1	4	23	151
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-51.6	-51.6	-51.7	-51.7
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.0	-26.1	-26.1

UPLINK BEAM INFORMATION				
Uplink Beam Name	Mexico 1	Mexico 1	Mexico 1	Mexico 1
Uplink Frequency (GHz)	14.0-14.5	14.0-14.5	14.0-14.5	14.0-14.5
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Beam Peak G/T (dB/K)	11.0	11.0	11.0	11.0
Uplink Beam Peak SFD (dBW/m2)	-91.3	-90.3	-90.3	-90.3
Uplink Relative Contour Level (dB)	-6	-6	-6	-6
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	Mexico 2	Mexico 2	Mexico 2	Mexico 2
Downlink Frequency (GHz)	11.7-12.2	11.7-12.2	11.7-12.2	11.7-12.2
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical
Downlink Beam Peak EIRP (dBW)	57.5	57.5	57.5	57.5
Downlink Relative Contour Level (dB)	-6	-6	-6	-6
ADJACENT SATELLITE 1				
Satellite Name	Intelsat 16	Intelsat 16	Intelsat 16	Intelsat 16
Orbital Location	79.0W	79.0W	79.0W	79.0W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
ADJACENT SATELLITE 2				
Satellite Name	HYP 75W	HYP 75W	HYP 75W	HYP 75W
Orbital Location	75.0W	75.0W	75.0W	75.0W
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0
Beam Peak Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	8M25G7W	1M54G7W	239KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Information Rate(kbps)	36860	8.448	1024	256
Code Rate	3/4x188/203	3/4	1/2	3/4
Occupied Bandwidth(kHz)	26664.7	6111.3	1232.9	170.7
Allocated Bandwidth(kHz)	36000	8250.5	1541.5	239
Minimum C/N, Rain (dB)	7.3	7.3	1.6	4.6
UPLINK EARTH STATION				
Earth Station Diameter (meters)	1.2	1.2	1.2	1.2
Earth Station Gain (dBi)	42.6	42.6	42.6	42.6
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	1.8	1.2	1.2
Earth Station Gain (dBi)	44.5	44.5	40.9	40.9
Earth Station G/T (dB/K)	23.3	23.3	19.8	19.8
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	64.6	58.9	51.9	43.7
Uplink Path Loss, Clear Sky (dB)	-207.3	-207.3	-207.3	-207.3
Satellite G/T(dB/K)	5.1	5.1	5.1	5.1
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Uplink Thermal C/N(dB)	16.7	17.4	17.4	17.8
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	42.5	36.0	29.0	20.8
Downlink Path Loss, Clear Sky (dB)	-205.6	-205.6	-205.6	-205.6
Downlink Earth Station G/T (dB/K)	23.3	23.3	19.8	19.8
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (MHz)	26.7	6.1	1.2	0.2
Downlink Thermal C / N(dB)	14.5	14.4	10.9	11.3
COMPOSITE LINK PERFORMANCE				
Uplink Earth Station HPA Intermodulation C/N (dB)	26.9	27.6	27.6	27.9
C/N Thermal Uplink (dB)	16.7	17.4	17.4	17.8
Uplink Interference C/I (dB)	31.4	29.8	25.1	25.5
Uplink Adjacent Satellite C/I (dB)	15.2	15.9	15.8	16.2
Intermodulation C/IM (dB)	200.0	34.3	35.9	36.4
Downlink Thermal C/N (dB)	14.5	14.4	10.6	11.3
Downlink Interference C/I (dB)	27.5	22.5	19.5	20.0
Downlink Adjacent Satellite C/I (dB)	13.5	14.2	10.4	10.8
Subtotal C/N (dB)	8.7	9.0	6.2	6.7
Antenna Mispointing and Other Losses (dB)	1.5	1.5	1.5	1.5
Total C/N (dB)	7.2	7.5	4.7	5.2
Minimum Required C/N (dB)	7.3	7.3	1.6	4.6
Number of Carriers	1	4	23	151
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-52.3	-51.6	-51.6	-51.2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.3	-26.4	-26.4	-26.0