

## Engineering Statement

Intelsat North America LLC (“Intelsat”) proposes to relocate its Intelsat 709 (“IS 709”) spacecraft to operate from 54.85° E.L. The spacecraft will utilize the frequency bands 5925 – 6425 MHz, 14000 – 14500 MHz, 3700 – 4200 MHz, 10950 – 11200 MHz, 11450 – 11700 MHz and 12500 – 12750 MHz to provide service to Europe, Africa, Asia and a portion of Australia.<sup>1</sup> Intelsat 709 will replace Intelsat 706, which currently operates at 54.85° E.L.

Intelsat also requests that the Part 25 waivers originally granted to the Intelsat 709 spacecraft continue to apply at the 54.85° E.L. location, namely, the waivers of Sections 25.202(g), 25.210(a)(1), 25.210(a)(3), 25.210(i)(1) and 25.211(a) of the Commission’s rules.<sup>2</sup>

On July 2007, the Commission granted Intelsat authorization to operate Intelsat 709 from 85.15° E.L. (see FCC File Nos.: SAT-MOD-20060901-00095). As part of its overall satellite fleet management, Intelsat now proposes to relocate Intelsat 709 from 85.15° E.L. to 54.85° E.L. and replace the existing Intelsat 706 spacecraft at that location. Once traffic has been transferred from Intelsat 706 to Intelsat 709, Intelsat 706 will be moved to another orbital location.

From the 54.85° E.L. orbital location, Intelsat will operate Intelsat 709 in accordance with the coordination agreements that the administration of India has reached with the operators of adjacent networks and their respective administrations. Intelsat will also comply with the FCC rules governing operations at the nominal 55° E.L. orbital location in relation to adjacent locations.

This engineering statement updates the following technical information for Intelsat 709: (1) frequency plan (2) beam performance and gain contours, (3) emissions designators, (4) power flux density calculations, (5) link budget analysis, (6) adjacent satellite link analysis, (7) Schedule S information and (8) orbital debris mitigation plan. In all other respects, the characteristics of the Intelsat 709 spacecraft are the same as those described in SAT-MOD-20060901-00095.

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<sup>1</sup> Intelsat 709 also has the capability to transmit in the 11700-11950 MHz frequency band. Because this frequency band will not be utilized from the proposed orbital location, however, Intelsat is not herein seeking authority to operate in the band.

<sup>2</sup> See Applications of Intelsat LLC for Authority to Operate and Further Construct, Launch, and Operate C-Band and Ku-Band Satellites that Form a Global Communications System in Geostationary Orbit, 15 FCC Rcd 15460, 15529 (Appendix C)(2000)(Memorandum Opinion and Order and Authorization), *recon. denied*, 15 FCC Rcd 25234 (2000) (Order on Reconsideration).

### Frequency Plan

The Intelsat 709 frequency and polarization plan is provided in Exhibit 1.

### Gain Contours

The co-polarized coverage patterns of Intelsat 709 operating from 54.85° E.L. are shown in Exhibits 2-1 through 2-42. The peak antenna gain, G/T, SFD (“Saturated Flux Density”) and EIRP levels for each uplink and downlink beam, as appropriate, are also provided in these exhibits.

Given that the cross-polarization isolation performance of Intelsat 709 with respect to the axis of each satellite beam will not change as a result of the proposed relocation of Intelsat 709 from 85.15° E.L. to 54.85° E.L., no cross-polarization patterns are provided herein.

### Emission Designators

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

### Power Flux Density Levels

The power flux density (“PFD”) limits for space stations operating in the 3700 – 4200 MHz, 10950 – 11200 MHz and 11450 – 11700 MHz bands are contained in section 25.208 of the Commission’s rules. With respect to the 12500 – 12750 MHz band, the PFD limits are specified in No. 21.16 of the ITU Radio Regulations.

The maximum PFD levels for the Intelsat 709 transmissions were calculated for a number of TV/FM and/or digital carriers listed in Exhibit 3 operating in the 3700 – 4200 MHz, 10950 – 11200 MHz, 11450 – 11700 MHz and 12500 – 12750 MHz bands. These carriers were chosen because they generally produce high PFD levels on the Earth’s surface. The results are provided in Exhibit 4 and show that the downlink power flux density levels of the Intelsat 709 carriers do not exceed limits specified in section 25.208 of the Commission’s rules and No. 21.16 of the ITU Radio Regulations.

### Link Budgets and Interference Analysis

Link analysis for Intelsat 709 was conducted for a number of representative carriers. For the analyses, it was assumed that the nearest satellites to Intelsat 709 were a hypothetical satellite operating from 52.85° E.L. and a hypothetical satellite operating from 56.85° E.L. The hypothetical satellites were assumed to have the

same operational parameters as Intelsat 709.

At C-band, the uplink power density of the emissions to each of the hypothetical satellites was assumed to be -38.7 dBW/Hz, the maximum level specified in section 25.212(d) of the Commission's rules for digital C-band carriers. At Ku-band, the uplink power density of the emissions to each of the hypothetical satellites was assumed to be -50 dBW/Hz, and the downlink EIRP density was assumed to be -26 dBW/Hz, the maximum levels specified in section 25.212(c) of the Commission's rules for digital Ku-band carriers.

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 Regulations.
- b) All transmitting and receiving earth stations have a cross-polarization isolation value of at least 30 dB within their main beam lobe.
- c) At C-band frequencies, degradation due to rain is not considered, given that rain (attenuation) effects are insignificant at C-band.
- d) At Ku-band frequencies rain attenuation predictions are derived using Recommendation ITU-R 618.
- e) At Ku-band frequencies, increase in noise temperature of the receiving earth station due to rain is taken into account.
- f) For the cases where the transponder operates in a multi-carrier mode, the effects due to intermodulation interference are taken into account.

The impact of the TV/FM carriers from the adjacent satellites at 52.85° E.L. and 56.85° E.L on the transmissions of Intelsat 709 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.

As shown in Exhibit 1, the Intelsat 709 beam connectivity is extensive. In order to keep the number the Intelsat 709 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 IS 709 uplink and downlink beam combinations. The worst-case beam performance for each IS 709 beam type is provided below:

Beam Name	Aggregate Beam Designation	Worst-Case Beam Peak G/T (dB/K)	Worst-Case Beam SFD Range @ Peak G/T (dBW/m <sup>2</sup> )	Worst-Case Beam EIRP (dBW)
Global A	Global	-7.0	-91.9 to -77.9	29.5
Global B				
East Hemi	Hemi	-1.5	-92.7 to -78.7	36.8
West Hemi				
Northwest Zone	Zone	1.0	-92.5 to -78.5	35.9
Northeast Zone				
Southwest Zone				
Southeast Zone				
Combined Northwest and Southeast Zone				
Combined Northeast and Southwest Zone	C-Spot	3.0	-94.0 to -80.0	36.3
C-Spot B				
Spot 1	Ku-Spot	10	-93.1 to -79.1	47.2
Spot 2				
Spot 2A				
Spot 3				

As shown in Exhibit 1, Intelsat 709 employs, with each beam, channels having varying bandwidths. In an effort to keep the number of link calculations to a manageable level, link calculations were not performed for each channel size, but rather for only one channel size. The channel size chosen for each beam was based

upon the level of adjacent satellite downlink interference. As an example, if a channel having a bandwidth of 77 MHz and a channel having a bandwidth of 34 MHz have the same associated adjacent satellite downlink interfering EIRP density, then link budgets were performed only for emissions that were transmitted through the 77 MHz channel, since the carrier level would typically have less (uplink and downlink) power in comparison to those which would be transmitted through the 34 MHz channel; and thus the impact of the adjacent satellite interference would be greater on the former. As a second example, if the level of downlink interfering EIRP density to which the 34 MHz channel was subjected was larger than that for the 77 MHz channel (as may happen for the C-band link budgets), and if this additional level of interference was larger than ten times the logarithmic ratio of the two channel bandwidths (i.e.  $10\log[77/34]$ ), then link calculations were performed only for the emissions of the 34 MHz channel, since the impact of adjacent satellite interference is greater on emissions of this channel (in comparison to those being transmitted through the 77 MHz channel).

As previously mentioned, at Ku-band, Intelsat 709 can utilize the downlink frequency bands of 10950 – 11200 MHz, 11450 – 11700 MHz and 12500 – 12750 MHz. In order to keep the number the Intelsat 709 link calculations to a manageable number, all Ku-band link calculations were conducted at the single representative uplink frequency of 14250 MHz and downlink frequency of 11950 MHz (that is approximately midway between 10950 MHz and 12750 MHz). At C-band, all calculations were conducted at the single representative frequency of 6175 MHz for the uplink and 3950 MHz for the downlink.

The results of the C-band and Ku-band analyses are shown in Exhibit 5 and demonstrate that operation of the Intelsat 709 satellite from 54.85° E.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 FCC rules governing operations at 55° E.L. orbital location as well as the limits contained in section 25.212(c) and 25.212(d) of the Commission's rules.

#### Adjacent Satellite Link Analysis

The impact of the Intelsat 709 emissions on the transmissions of adjacent satellites was not analyzed because the power levels of Intelsat 709 transmissions will be limited to those levels contained in section 25.212(c) and (d) of the FCC's rules as well as the FCC rules governing operations at 55° E.L. In those cases where Intelsat may need to transmit carriers with higher power levels, it will coordinate

with the affected adjacent satellite operators as part of the normal coordination process.

### Schedule S Submission

Intelsat is providing with its application a Schedule S for the operations of Intelsat 709 from 54.85° E.L. The Schedule S contains only those Intelsat 709 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.

In column “g” of section S13 of the Schedule S, a link budget file has been included for the first link (i.e. the first of row of data) contained in that section. This link budget file is applicable to all of the links listed in section S13 and should have been included with each row of data in that section of the Schedule S. However, given that the link budget file is rather large and its inclusion with each link (or data row) would lead to the Schedule S file having an unmanageable size, all other links (or rows of data) contain a small ASCII file that references the link budget file that is attached to the first link (i.e. the link budget file attached to the first row of data).

### 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.

**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.

**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.

**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 709 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.

The proposed orbital location of Intelsat 709 is 54.85° E.L. With the exception of Intelsat 706, 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 Intelsat 709. Intelsat is also not aware of any non-Intelsat system with an overlapping stationkeeping volume with Intelsat 709 that is the subject of an ITU filing and that is either in orbit or progressing towards launch. During the brief period in which traffic from Intelsat 706 is transferred to Intelsat 709, Intelsat shall take all necessary measures in order to minimize the probability of collision of the two spacecraft and becoming a source of orbital debris.

**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.<sup>3</sup> 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 Intelsat 709, would be designated as grandfathered satellites not subject to a specific disposal altitude. Therefore, the Intelsat 709 planned disposal orbit complies with the FCC's rules.

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<sup>3</sup> Intelsat has reserved 20.42 kilograms of fuel for this purpose. The fuel gauging uncertainty has been taken into account in these calculations.

In addition, Intelsat provides the following information:

- 1) Planned orbital eccentricity: 1.7846E-04 (This is a best estimate of optimal eccentricity to match the natural eccentricity circle due to Sun and Moon perturbations after decommission.<sup>4</sup>)
- 2) Planned apogee altitude: 165 km<sup>5</sup>
- 3) Information concerning the methods that will be used to assess and provide adequate margins concerning fuel gauging uncertainty: For the Intelsat 709 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.

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<sup>4</sup> 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.

<sup>5</sup> 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.

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/s/ Jose Albuquerque

Jose Albuquerque  
Intelsat  
Senior Director  
Spectrum Engineering

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October 30, 2009

Date

## Exhibit 1: Frequency and Beam 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)	Channel Gain (dB)
AUA	Global A	LHCP	6280	ADA	Global A	RHCP	4055	36	117.9
AUB	Global A	LHCP	6320	ADB	Global A	RHCP	4095	36	117.9
AUC	Global A	LHCP	6360	ADC	Global A	RHCP	4135	36	117.9
AUD	Global A	LHCP	6402.5	ADD	Global A	RHCP	4177.5	41	117.9
AUA	Global A	LHCP	6280	CDA	C-Spot A	RHCP	4055	36	117.7
AUB	Global A	LHCP	6320	CDB	C-Spot A	RHCP	4095	36	117.7
AUC	Global A	LHCP	6360	CDC	C-Spot A	RHCP	4135	36	117.7
AUD	Global A	LHCP	6402.5	CDD	C-Spot A	RHCP	4177.5	41	117.7
AUA	Global A	LHCP	6280	EDA	West Hemi	RHCP	4055	36	121.9
BUA	Global B	RHCP	6280	BDA	Global B	LHCP	4055	36	118.3
BUB	Global B	RHCP	6320	BDB	Global B	LHCP	4095	36	118.3
BUC	Global B	RHCP	6360	BDC	Global B	LHCP	4135	36	118.3
BUD	Global B	RHCP	6402.5	BDD	Global B	LHCP	4177.5	41	118.3
BUA	Global B	RHCP	6280	DDA	C-Spot B	LHCP	4055	36	117.6
BUB	Global B	RHCP	6320	DDB	C-Spot B	LHCP	4095	36	117.6
BUC	Global B	RHCP	6360	DDC	C-Spot B	LHCP	4135	36	117.6
BUD	Global B	RHCP	6402.5	DDD	C-Spot B	LHCP	4177.5	41	117.6
BUA	Global B	LHCP	6280	FDA	East Hemi	RHCP	4055	36	119.1
CUA	C-Spot A	LHCP	6280	CDA	C-Spot A	RHCP	4055	36	109.8
CUB	C-Spot A	LHCP	6320	CDB	C-Spot A	RHCP	4095	36	109.8
CUC	C-Spot A	LHCP	6360	CDC	C-Spot A	RHCP	4135	36	109.8
CUD	C-Spot A	LHCP	6402.5	CDD	C-Spot A	RHCP	4177.5	41	109.8
CUA	C-Spot A	LHCP	6280	ADA	Global A	RHCP	4055	36	110.0
CUB	C-Spot A	LHCP	6320	ADB	Global A	RHCP	4095	36	110.0
CUC	C-Spot A	LHCP	6360	ADC	Global A	RHCP	4135	36	110.0
CUD	C-Spot A	LHCP	6402.5	ADD	Global A	RHCP	4177.5	41	110.0
CUA	C-Spot A	LHCP	6280	EDA	West Hemi	RHCP	4055	36	114.0
DUA	C-Spot B	RHCP	6280	DDA	C-Spot B	LHCP	4055	36	110.2
DUB	C-Spot B	RHCP	6320	DDB	C-Spot B	LHCP	4095	36	110.2
DUC	C-Spot B	RHCP	6360	DDC	C-Spot B	LHCP	4135	36	110.2
DUD	C-Spot B	RHCP	6402.5	DDD	C-Spot B	LHCP	4177.5	41	110.2
DUA	C-Spot B	RHCP	6280	ADA	Global B	LHCP	4055	36	110.9
DUB	C-Spot B	RHCP	6320	ADB	Global B	LHCP	4095	36	110.9
DUC	C-Spot B	RHCP	6360	ADC	Global B	LHCP	4135	36	110.9
DUD	C-Spot B	RHCP	6402.5	ADD	Global B	LHCP	4177.5	41	110.9
DUA	C-Spot B	RHCP	6280	EDA	East Hemi	RHCP	4055	36	111.7
EU1	West Hemi	LHCP	5967.5	ED1	West Hemi	RHCP	3742.5	77	118.3
EU2	West Hemi	LHCP	6050	ED2	West Hemi	RHCP	3825	72	118.3
EU3	West Hemi	LHCP	6111	ED3	West Hemi	RHCP	3886	34	118.3
EU4	West Hemi	LHCP	6149	ED4	West Hemi	RHCP	3924	34	118.3
EU5	West Hemi	LHCP	6130	ED5	West Hemi	RHCP	3905	72	118.3
EU6	West Hemi	LHCP	6220	ED6	West Hemi	RHCP	3995	72	118.3
EUA	West Hemi	LHCP	6280	EDA	West Hemi	RHCP	4055	36	118.3
EU1	West Hemi	LHCP	5967.5	FD1	East Hemi	RHCP	3742.5	77	116.1
EU2	West Hemi	LHCP	6050	FD2	East Hemi	RHCP	3825	72	116.1

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)	Channel Gain (dB)
EU3	West Hemi	LHCP	6111	FD3	East Hemi	RHCP	3886	34	116.1
EU4	West Hemi	LHCP	6149	FD4	East Hemi	RHCP	3924	34	116.1
EU5	West Hemi	LHCP	6130	FD5	East Hemi	RHCP	3905	72	116.1
EU6	West Hemi	LHCP	6220	FD6	East Hemi	RHCP	3995	72	116.1
EUA	West Hemi	LHCP	6280	FDA	East Hemi	RHCP	4055	36	116.1
EU1	West Hemi	LHCP	5967.5	GD1	NW Zone	LHCP	3742.5	77	112.7
EU2	West Hemi	LHCP	6050	GD2	NW Zone	LHCP	3825	72	112.7
EU3	West Hemi	LHCP	6111	GD3	NW Zone	LHCP	3886	34	112.7
EU4	West Hemi	LHCP	6149	GD4	NW Zone	LHCP	3924	34	112.7
EU5	West Hemi	LHCP	6130	GD5	NW Zone	LHCP	3905	72	112.7
EU6	West Hemi	LHCP	6220	GD6	NW Zone	LHCP	3995	72	112.7
EUA	West Hemi	LHCP	6280	GDA	NW Zone	LHCP	4055	36	112.7
EU1	West Hemi	LHCP	5967.5	JD1	SE Zone	LHCP	3742.5	77	115.7
EU2	West Hemi	LHCP	6050	JD2	SE Zone	LHCP	3825	72	115.7
EU3	West Hemi	LHCP	6111	JD3	SE Zone	LHCP	3886	34	115.7
EU4	West Hemi	LHCP	6149	JD4	SE Zone	LHCP	3924	34	115.7
EU5	West Hemi	LHCP	6130	JD5	SE Zone	LHCP	3905	72	115.7
EU6	West Hemi	LHCP	6220	JD6	SE Zone	LHCP	3995	72	115.7
EUA	West Hemi	LHCP	6280	JDA	SE Zone	LHCP	4055	36	115.7
EU1	West Hemi	LHCP	5967.5	HD1	NE Zone	LHCP	3742.5	77	113.0
EU2	West Hemi	LHCP	6050	HD2	NE Zone	LHCP	3825	72	113.0
EU3	West Hemi	LHCP	6111	HD3	NE Zone	LHCP	3886	34	113.0
EU4	West Hemi	LHCP	6149	HD4	NE Zone	LHCP	3924	34	113.0
EU5	West Hemi	LHCP	6130	HD5	NE Zone	LHCP	3905	72	113.0
EU6	West Hemi	LHCP	6220	HD6	NE Zone	LHCP	3995	72	113.0
EUA	West Hemi	LHCP	6280	HDA	NE Zone	LHCP	4055	36	113.0
EU1	West Hemi	LHCP	5967.5	ID1	SW Zone	LHCP	3742.5	77	113.5
EU2	West Hemi	LHCP	6050	ID2	SW Zone	LHCP	3825	72	113.5
EU3	West Hemi	LHCP	6111	ID3	SW Zone	LHCP	3886	34	113.5
EU4	West Hemi	LHCP	6149	ID4	SW Zone	LHCP	3924	34	113.5
EU5	West Hemi	LHCP	6130	ID5	SW Zone	LHCP	3905	72	113.5
EU6	West Hemi	LHCP	6220	ID6	SW Zone	LHCP	3995	72	113.5
EUA	West Hemi	LHCP	6280	IDA	SW Zone	LHCP	4055	36	113.5
EUA	West Hemi	LHCP	6280	ADA	Global A	RHCP	4055	36	114.3
EUA	West Hemi	LHCP	6280	CDA	C-Spot A	RHCP	4055	36	114.1
FU1	East Hemi	LHCP	5967.5	FD1	East Hemi	RHCP	3742.5	77	115.2
FU2	East Hemi	LHCP	6050	FD2	East Hemi	RHCP	3825	72	115.2
FU3	East Hemi	LHCP	6111	FD3	East Hemi	RHCP	3886	34	115.2
FU4	East Hemi	LHCP	6149	FD4	East Hemi	RHCP	3924	34	115.2
FU5	East Hemi	LHCP	6130	FD5	East Hemi	RHCP	3905	72	115.2
FU6	East Hemi	LHCP	6220	FD6	East Hemi	RHCP	3995	72	115.2
FUA	East Hemi	LHCP	6280	FDA	East Hemi	RHCP	4055	36	115.2
FU1	East Hemi	LHCP	5967.5	ED1	West Hemi	RHCP	3742.5	77	117.4
FU2	East Hemi	LHCP	6050	ED2	West Hemi	RHCP	3825	72	117.4
FU3	East Hemi	LHCP	6111	ED3	West Hemi	RHCP	3886	34	117.4
FU4	East Hemi	LHCP	6149	ED4	West Hemi	RHCP	3924	34	117.4
FU5	East Hemi	LHCP	6130	ED5	West Hemi	RHCP	3905	72	117.4
FU6	East Hemi	LHCP	6220	ED6	West Hemi	RHCP	3995	72	117.4
FUA	East Hemi	LHCP	6280	EDA	West Hemi	RHCP	4055	36	117.4
FU1	East Hemi	LHCP	5967.5	GD1	NW Zone	LHCP	3742.5	77	111.8
FU2	East Hemi	LHCP	6050	GD2	NW Zone	LHCP	3825	72	111.8
FU3	East Hemi	LHCP	6111	GD3	NW Zone	LHCP	3886	34	111.8

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)	Channel Gain (dB)
FU4	East Hemi	LHCP	6149	GD4	NW Zone	LHCP	3924	34	111.8
FU5	East Hemi	LHCP	6130	GD5	NW Zone	LHCP	3905	72	111.8
FU6	East Hemi	LHCP	6220	GD6	NW Zone	LHCP	3995	72	111.8
FUA	East Hemi	LHCP	6280	GDA	NW Zone	LHCP	4055	36	111.8
FU1	East Hemi	LHCP	5967.5	JD1	SE Zone	LHCP	3742.5	77	114.8
FU2	East Hemi	LHCP	6050	JD2	SE Zone	LHCP	3825	72	114.8
FU3	East Hemi	LHCP	6111	JD3	SE Zone	LHCP	3886	34	114.8
FU4	East Hemi	LHCP	6149	JD4	SE Zone	LHCP	3924	34	114.8
FU5	East Hemi	LHCP	6130	JD5	SE Zone	LHCP	3905	72	114.8
FU6	East Hemi	LHCP	6220	JD6	SE Zone	LHCP	3995	72	114.8
FUA	East Hemi	LHCP	6280	JDA	SE Zone	LHCP	4055	36	114.8
FU1	East Hemi	LHCP	5967.5	HD1	NE Zone	LHCP	3742.5	77	112.1
FU2	East Hemi	LHCP	6050	HD2	NE Zone	LHCP	3825	72	112.1
FU3	East Hemi	LHCP	6111	HD3	NE Zone	LHCP	3886	34	112.1
FU4	East Hemi	LHCP	6149	HD4	NE Zone	LHCP	3924	34	112.1
FU5	East Hemi	LHCP	6130	HD5	NE Zone	LHCP	3905	72	112.1
FU6	East Hemi	LHCP	6220	HD6	NE Zone	LHCP	3995	72	112.1
FUA	East Hemi	LHCP	6280	HDA	NE Zone	LHCP	4055	36	112.1
FU1	East Hemi	LHCP	5967.5	ID1	SW Zone	LHCP	3742.5	77	112.6
FU2	East Hemi	LHCP	6050	ID2	SW Zone	LHCP	3825	72	112.6
FU3	East Hemi	LHCP	6111	ID3	SW Zone	LHCP	3886	34	112.6
FU4	East Hemi	LHCP	6149	ID4	SW Zone	LHCP	3924	34	112.6
FU5	East Hemi	LHCP	6130	ID5	SW Zone	LHCP	3905	72	112.6
FU6	East Hemi	LHCP	6220	ID6	SW Zone	LHCP	3995	72	112.6
FUA	East Hemi	LHCP	6280	IDA	SW Zone	LHCP	4055	36	112.6
FUA	East Hemi	LHCP	6280	BDA	Global B	LHCP	4055	36	114.4
FUA	East Hemi	LHCP	6280	DDA	C-Spot B	LHCP	4055	36	113.7
GU1	NW Zone	RHCP	5967.5	GD1	NW Zone	LHCP	3742.5	77	110.3
GU2	NW Zone	RHCP	6050	GD2	NW Zone	LHCP	3825	72	110.3
GU3	NW Zone	RHCP	6111	GD3	NW Zone	LHCP	3886	34	110.3
GU4	NW Zone	RHCP	6149	GD4	NW Zone	LHCP	3924	34	110.3
GU5	NW Zone	RHCP	6130	GD5	NW Zone	LHCP	3905	72	110.3
GU6	NW Zone	RHCP	6220	GD6	NW Zone	LHCP	3995	72	110.3
GUA	NW Zone	RHCP	6280	GDA	NW Zone	LHCP	4055	36	110.3
GU1	NW Zone	RHCP	5967.5	JD1	SE Zone	LHCP	3742.5	77	113.3
GU2	NW Zone	RHCP	6050	JD2	SE Zone	LHCP	3825	72	113.3
GU3	NW Zone	RHCP	6111	JD3	SE Zone	LHCP	3886	34	113.3
GU4	NW Zone	RHCP	6149	JD4	SE Zone	LHCP	3924	34	113.3
GU5	NW Zone	RHCP	6130	JD5	SE Zone	LHCP	3905	72	113.3
GU6	NW Zone	RHCP	6220	JD6	SE Zone	LHCP	3995	72	113.3
GUA	NW Zone	RHCP	6280	JDA	SE Zone	LHCP	4055	36	113.3
GU1	NW Zone	RHCP	5967.5	HD1	NE Zone	LHCP	3742.5	77	110.6
GU2	NW Zone	RHCP	6050	HD2	NE Zone	LHCP	3825	72	110.6
GU3	NW Zone	RHCP	6111	HD3	NE Zone	LHCP	3886	34	110.6
GU4	NW Zone	RHCP	6149	HD4	NE Zone	LHCP	3924	34	110.6
GU5	NW Zone	RHCP	6130	HD5	NE Zone	LHCP	3905	72	110.6
GU6	NW Zone	RHCP	6220	HD6	NE Zone	LHCP	3995	72	110.6
GUA	NW Zone	RHCP	6280	HDA	NE Zone	LHCP	4055	36	110.6
GU1	NW Zone	RHCP	5967.5	ID1	SW Zone	LHCP	3742.5	77	111.1
GU2	NW Zone	RHCP	6050	ID2	SW Zone	LHCP	3825	72	111.1
GU3	NW Zone	RHCP	6111	ID3	SW Zone	LHCP	3886	34	111.1
GU4	NW Zone	RHCP	6149	ID4	SW Zone	LHCP	3924	34	111.1

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)	Channel Gain (dB)
GU5	NW Zone	RHCP	6130	ID5	SW Zone	LHCP	3905	72	111.1
GU6	NW Zone	RHCP	6220	ID6	SW Zone	LHCP	3995	72	111.1
GUA	NW Zone	RHCP	6280	IDA	SW Zone	LHCP	4055	36	111.1
GU1	NW Zone	RHCP	5967.5	ED1	West Hemi	RHCP	3742.5	77	115.9
GU2	NW Zone	RHCP	6050	ED2	West Hemi	RHCP	3825	72	115.9
GU3	NW Zone	RHCP	6111	ED3	West Hemi	RHCP	3886	34	115.9
GU4	NW Zone	RHCP	6149	ED4	West Hemi	RHCP	3924	34	115.9
GU5	NW Zone	RHCP	6130	ED5	West Hemi	RHCP	3905	72	115.9
GU6	NW Zone	RHCP	6220	ED6	West Hemi	RHCP	3995	72	115.9
GUA	NW Zone	RHCP	6280	EDA	West Hemi	RHCP	4055	36	115.9
GU1	NW Zone	RHCP	5967.5	FD1	East Hemi	RHCP	3742.5	77	113.7
GU2	NW Zone	RHCP	6050	FD2	East Hemi	RHCP	3825	72	113.7
GU3	NW Zone	RHCP	6111	FD3	East Hemi	RHCP	3886	34	113.7
GU4	NW Zone	RHCP	6149	FD4	East Hemi	RHCP	3924	34	113.7
GU5	NW Zone	RHCP	6130	FD5	East Hemi	RHCP	3905	72	113.7
GU6	NW Zone	RHCP	6220	FD6	East Hemi	RHCP	3995	72	113.7
GUA	NW Zone	RHCP	6280	FDA	East Hemi	RHCP	4055	36	113.7
JU1	SE Zone	RHCP	5967.5	GD1	NW Zone	LHCP	3742.5	77	110.2
JU2	SE Zone	RHCP	6050	GD2	NW Zone	LHCP	3825	72	110.2
JU3	SE Zone	RHCP	6111	GD3	NW Zone	LHCP	3886	34	110.2
JU4	SE Zone	RHCP	6149	GD4	NW Zone	LHCP	3924	34	110.2
JU5	SE Zone	RHCP	6130	GD5	NW Zone	LHCP	3905	72	110.2
JU6	SE Zone	RHCP	6220	GD6	NW Zone	LHCP	3995	72	110.2
JUA	SE Zone	RHCP	6280	GDA	NW Zone	LHCP	4055	36	110.2
JU1	SE Zone	RHCP	5967.5	JD1	SE Zone	LHCP	3742.5	77	113.2
JU2	SE Zone	RHCP	6050	JD2	SE Zone	LHCP	3825	72	113.2
JU3	SE Zone	RHCP	6111	JD3	SE Zone	LHCP	3886	34	113.2
JU4	SE Zone	RHCP	6149	JD4	SE Zone	LHCP	3924	34	113.2
JU5	SE Zone	RHCP	6130	JD5	SE Zone	LHCP	3905	72	113.2
JU6	SE Zone	RHCP	6220	JD6	SE Zone	LHCP	3995	72	113.2
JUA	SE Zone	RHCP	6280	JDA	SE Zone	LHCP	4055	36	113.2
JU1	SE Zone	RHCP	5967.5	HD1	NE Zone	LHCP	3742.5	77	110.5
JU2	SE Zone	RHCP	6050	HD2	NE Zone	LHCP	3825	72	110.5
JU3	SE Zone	RHCP	6111	HD3	NE Zone	LHCP	3886	34	110.5
JU4	SE Zone	RHCP	6149	HD4	NE Zone	LHCP	3924	34	110.5
JU5	SE Zone	RHCP	6130	HD5	NE Zone	LHCP	3905	72	110.5
JU6	SE Zone	RHCP	6220	HD6	NE Zone	LHCP	3995	72	110.5
JUA	SE Zone	RHCP	6280	HDA	NE Zone	LHCP	4055	36	110.5
JU1	SE Zone	RHCP	5967.5	ID1	SW Zone	LHCP	3742.5	77	111.0
JU2	SE Zone	RHCP	6050	ID2	SW Zone	LHCP	3825	72	111.0
JU3	SE Zone	RHCP	6111	ID3	SW Zone	LHCP	3886	34	111.0
JU4	SE Zone	RHCP	6149	ID4	SW Zone	LHCP	3924	34	111.0
JU5	SE Zone	RHCP	6130	ID5	SW Zone	LHCP	3905	72	111.0
JU6	SE Zone	RHCP	6220	ID6	SW Zone	LHCP	3995	72	111.0
JUA	SE Zone	RHCP	6280	IDA	SW Zone	LHCP	4055	36	111.0
JU1	SE Zone	RHCP	5967.5	ED1	West Hemi	RHCP	3742.5	77	115.8
JU2	SE Zone	RHCP	6050	ED2	West Hemi	RHCP	3825	72	115.8
JU3	SE Zone	RHCP	6111	ED3	West Hemi	RHCP	3886	34	115.8
JU4	SE Zone	RHCP	6149	ED4	West Hemi	RHCP	3924	34	115.8
JU5	SE Zone	RHCP	6130	ED5	West Hemi	RHCP	3905	72	115.8
JU6	SE Zone	RHCP	6220	ED6	West Hemi	RHCP	3995	72	115.8
JUA	SE Zone	RHCP	6280	EDA	West Hemi	RHCP	4055	36	115.8
JU1	SE Zone	RHCP	5967.5	FD1	East Hemi	RHCP	3742.5	77	113.6

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)	Channel Gain (dB)
JU2	SE Zone	RHCP	6050	FD2	East Hemi	RHCP	3825	72	113.6
JU3	SE Zone	RHCP	6111	FD3	East Hemi	RHCP	3886	34	113.6
JU4	SE Zone	RHCP	6149	FD4	East Hemi	RHCP	3924	34	113.6
JU5	SE Zone	RHCP	6130	FD5	East Hemi	RHCP	3905	72	113.6
JU6	SE Zone	RHCP	6220	FD6	East Hemi	RHCP	3995	72	113.6
JUA	SE Zone	RHCP	6280	FDA	East Hemi	RHCP	4055	36	113.6
HU1	NE Zone	RHCP	5967.5	GD1	NW Zone	LHCP	3742.5	77	107.9
HU2	NE Zone	RHCP	6050	GD2	NW Zone	LHCP	3825	72	107.9
HU3	NE Zone	RHCP	6111	GD3	NW Zone	LHCP	3886	34	107.9
HU4	NE Zone	RHCP	6149	GD4	NW Zone	LHCP	3924	34	107.9
HU5	NE Zone	RHCP	6130	GD5	NW Zone	LHCP	3905	72	107.9
HU6	NE Zone	RHCP	6220	GD6	NW Zone	LHCP	3995	72	107.9
HUA	NE Zone	RHCP	6280	GDA	NW Zone	LHCP	4055	36	107.9
HU1	NE Zone	RHCP	5967.5	JD1	SE Zone	LHCP	3742.5	77	110.9
HU2	NE Zone	RHCP	6050	JD2	SE Zone	LHCP	3825	72	110.9
HU3	NE Zone	RHCP	6111	JD3	SE Zone	LHCP	3886	34	110.9
HU4	NE Zone	RHCP	6149	JD4	SE Zone	LHCP	3924	34	110.9
HU5	NE Zone	RHCP	6130	JD5	SE Zone	LHCP	3905	72	110.9
HU6	NE Zone	RHCP	6220	JD6	SE Zone	LHCP	3995	72	110.9
HUA	NE Zone	RHCP	6280	JDA	SE Zone	LHCP	4055	36	110.9
HU1	NE Zone	RHCP	5967.5	HD1	NE Zone	LHCP	3742.5	77	108.2
HU2	NE Zone	RHCP	6050	HD2	NE Zone	LHCP	3825	72	108.2
HU3	NE Zone	RHCP	6111	HD3	NE Zone	LHCP	3886	34	108.2
HU4	NE Zone	RHCP	6149	HD4	NE Zone	LHCP	3924	34	108.2
HU5	NE Zone	RHCP	6130	HD5	NE Zone	LHCP	3905	72	108.2
HU6	NE Zone	RHCP	6220	HD6	NE Zone	LHCP	3995	72	108.2
HUA	NE Zone	RHCP	6280	HDA	NE Zone	LHCP	4055	36	108.2
HU1	NE Zone	RHCP	5967.5	ID1	SW Zone	LHCP	3742.5	77	108.7
HU2	NE Zone	RHCP	6050	ID2	SW Zone	LHCP	3825	72	108.7
HU3	NE Zone	RHCP	6111	ID3	SW Zone	LHCP	3886	34	108.7
HU4	NE Zone	RHCP	6149	ID4	SW Zone	LHCP	3924	34	108.7
HU5	NE Zone	RHCP	6130	ID5	SW Zone	LHCP	3905	72	108.7
HU6	NE Zone	RHCP	6220	ID6	SW Zone	LHCP	3995	72	108.7
HUA	NE Zone	RHCP	6280	IDA	SW Zone	LHCP	4055	36	108.7
HU1	NE Zone	RHCP	5967.5	ED1	West Hemi	RHCP	3742.5	77	113.5
HU2	NE Zone	RHCP	6050	ED2	West Hemi	RHCP	3825	72	113.5
HU3	NE Zone	RHCP	6111	ED3	West Hemi	RHCP	3886	34	113.5
HU4	NE Zone	RHCP	6149	ED4	West Hemi	RHCP	3924	34	113.5
HU5	NE Zone	RHCP	6130	ED5	West Hemi	RHCP	3905	72	113.5
HU6	NE Zone	RHCP	6220	ED6	West Hemi	RHCP	3995	72	113.5
HUA	NE Zone	RHCP	6280	EDA	West Hemi	RHCP	4055	36	113.5
HU1	NE Zone	RHCP	5967.5	FD1	East Hemi	RHCP	3742.5	77	111.3
HU2	NE Zone	RHCP	6050	FD2	East Hemi	RHCP	3825	72	111.3
HU3	NE Zone	RHCP	6111	FD3	East Hemi	RHCP	3886	34	111.3
HU4	NE Zone	RHCP	6149	FD4	East Hemi	RHCP	3924	34	111.3
HU5	NE Zone	RHCP	6130	FD5	East Hemi	RHCP	3905	72	111.3
HU6	NE Zone	RHCP	6220	FD6	East Hemi	RHCP	3995	72	111.3
HUA	NE Zone	RHCP	6280	FDA	East Hemi	RHCP	4055	36	111.3
IU1	SW Zone	RHCP	5967.5	GD1	NW Zone	LHCP	3742.5	77	108.4
IU2	SW Zone	RHCP	6050	GD2	NW Zone	LHCP	3825	72	108.4
IU3	SW Zone	RHCP	6111	GD3	NW Zone	LHCP	3886	34	108.4
IU4	SW Zone	RHCP	6149	GD4	NW Zone	LHCP	3924	34	108.4
IU5	SW Zone	RHCP	6130	GD5	NW Zone	LHCP	3905	72	108.4
IU6	SW Zone	RHCP	6220	GD6	NW Zone	LHCP	3995	72	108.4

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)	Channel Gain (dB)
IUA	SW Zone	RHCP	6280	GDA	NW Zone	LHCP	4055	36	108.4
IU1	SW Zone	RHCP	5967.5	JD1	SE Zone	LHCP	3742.5	77	111.4
IU2	SW Zone	RHCP	6050	JD2	SE Zone	LHCP	3825	72	111.4
IU3	SW Zone	RHCP	6111	JD3	SE Zone	LHCP	3886	34	111.4
IU4	SW Zone	RHCP	6149	JD4	SE Zone	LHCP	3924	34	111.4
IU5	SW Zone	RHCP	6130	JD5	SE Zone	LHCP	3905	72	111.4
IU6	SW Zone	RHCP	6220	JD6	SE Zone	LHCP	3995	72	111.4
IUA	SW Zone	RHCP	6280	JDA	SE Zone	LHCP	4055	36	111.4
IU1	SW Zone	RHCP	5967.5	HD1	NE Zone	LHCP	3742.5	77	108.7
IU2	SW Zone	RHCP	6050	HD2	NE Zone	LHCP	3825	72	108.7
IU3	SW Zone	RHCP	6111	HD3	NE Zone	LHCP	3886	34	108.7
IU4	SW Zone	RHCP	6149	HD4	NE Zone	LHCP	3924	34	108.7
IU5	SW Zone	RHCP	6130	HD5	NE Zone	LHCP	3905	72	108.7
IU6	SW Zone	RHCP	6220	HD6	NE Zone	LHCP	3995	72	108.7
IUA	SW Zone	RHCP	6280	HDA	NE Zone	LHCP	4055	36	108.7
IU1	SW Zone	RHCP	5967.5	ID1	SW Zone	LHCP	3742.5	77	109.2
IU2	SW Zone	RHCP	6050	ID2	SW Zone	LHCP	3825	72	109.2
IU3	SW Zone	RHCP	6111	ID3	SW Zone	LHCP	3886	34	109.2
IU4	SW Zone	RHCP	6149	ID4	SW Zone	LHCP	3924	34	109.2
IU5	SW Zone	RHCP	6130	ID5	SW Zone	LHCP	3905	72	109.2
IU6	SW Zone	RHCP	6220	ID6	SW Zone	LHCP	3995	72	109.2
IUA	SW Zone	RHCP	6280	IDA	SW Zone	LHCP	4055	36	109.2
IU1	SW Zone	RHCP	5967.5	ED1	West Hemi	RHCP	3742.5	77	114.0
IU2	SW Zone	RHCP	6050	ED2	West Hemi	RHCP	3825	72	114.0
IU3	SW Zone	RHCP	6111	ED3	West Hemi	RHCP	3886	34	114.0
IU4	SW Zone	RHCP	6149	ED4	West Hemi	RHCP	3924	34	114.0
IU5	SW Zone	RHCP	6130	ED5	West Hemi	RHCP	3905	72	114.0
IU6	SW Zone	RHCP	6220	ED6	West Hemi	RHCP	3995	72	114.0
IUA	SW Zone	RHCP	6280	EDA	West Hemi	RHCP	4055	36	114.0
IU1	SW Zone	RHCP	5967.5	FD1	East Hemi	RHCP	3742.5	77	111.8
IU2	SW Zone	RHCP	6050	FD2	East Hemi	RHCP	3825	72	111.8
IU3	SW Zone	RHCP	6111	FD3	East Hemi	RHCP	3886	34	111.8
IU4	SW Zone	RHCP	6149	FD4	East Hemi	RHCP	3924	34	111.8
IU5	SW Zone	RHCP	6130	FD5	East Hemi	RHCP	3905	72	111.8
IU6	SW Zone	RHCP	6220	FD6	East Hemi	RHCP	3995	72	111.8
IUA	SW Zone	RHCP	6280	FDA	East Hemi	RHCP	4055	36	111.8
KU1	Combined NW+SE Zone	RHCP	5967.5	GD1	NW Zone	LHCP	3742.5	77	112.5
KU2	Combined NW+SE Zone	RHCP	6050	GD2	NW Zone	LHCP	3825	72	112.5
KU3	Combined NW+SE Zone	RHCP	6111	GD3	NW Zone	LHCP	3886	34	112.5
KU4	Combined NW+SE Zone	RHCP	6149	GD4	NW Zone	LHCP	3924	34	112.5
KU5	Combined NW+SE Zone	RHCP	6130	GD5	NW Zone	LHCP	3905	72	112.5
KU6	Combined NW+SE Zone	RHCP	6220	GD6	NW Zone	LHCP	3995	72	112.5
KUA	Combined NW+SE Zone	RHCP	6280	GDA	NW Zone	LHCP	4055	36	112.5
KU1	Combined NW+SE Zone	RHCP	5967.5	JD1	SE Zone	LHCP	3742.5	77	115.5
KU2	Combined NW+SE Zone	RHCP	6050	JD2	SE Zone	LHCP	3825	72	115.5
KU3	Combined NW+SE Zone	RHCP	6111	JD3	SE Zone	LHCP	3886	34	115.5
KU4	Combined NW+SE Zone	RHCP	6149	JD4	SE Zone	LHCP	3924	34	115.5
KU5	Combined NW+SE Zone	RHCP	6130	JD5	SE Zone	LHCP	3905	72	115.5
KU6	Combined NW+SE Zone	RHCP	6220	JD6	SE Zone	LHCP	3995	72	115.5
KUA	Combined NW+SE Zone	RHCP	6280	JDA	SE Zone	LHCP	4055	36	115.5
KU1	Combined NW+SE Zone	RHCP	5967.5	HD1	NE Zone	LHCP	3742.5	77	112.8
KU2	Combined NW+SE Zone	RHCP	6050	HD2	NE Zone	LHCP	3825	72	112.8
KU3	Combined NW+SE Zone	RHCP	6111	HD3	NE Zone	LHCP	3886	34	112.8

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)	Channel Gain (dB)
KU4	Combined NW+SE Zone	RHCP	6149	HD4	NE Zone	LHCP	3924	34	112.8
KU5	Combined NW+SE Zone	RHCP	6130	HD5	NE Zone	LHCP	3905	72	112.8
KU6	Combined NW+SE Zone	RHCP	6220	HD6	NE Zone	LHCP	3995	72	112.8
KUA	Combined NW+SE Zone	RHCP	6280	HDA	NE Zone	LHCP	4055	36	112.8
KU1	Combined NW+SE Zone	RHCP	5967.5	ID1	SW Zone	LHCP	3742.5	77	113.3
KU2	Combined NW+SE Zone	RHCP	6050	ID2	SW Zone	LHCP	3825	72	113.3
KU3	Combined NW+SE Zone	RHCP	6111	ID3	SW Zone	LHCP	3886	34	113.3
KU4	Combined NW+SE Zone	RHCP	6149	ID4	SW Zone	LHCP	3924	34	113.3
KU5	Combined NW+SE Zone	RHCP	6130	ID5	SW Zone	LHCP	3905	72	113.3
KU6	Combined NW+SE Zone	RHCP	6220	ID6	SW Zone	LHCP	3995	72	113.3
KUA	Combined NW+SE Zone	RHCP	6280	IDA	SW Zone	LHCP	4055	36	113.3
KU1	Combined NW+SE Zone	RHCP	5967.5	ED1	West Hemi	RHCP	3742.5	77	118.1
KU2	Combined NW+SE Zone	RHCP	6050	ED2	West Hemi	RHCP	3825	72	118.1
KU3	Combined NW+SE Zone	RHCP	6111	ED3	West Hemi	RHCP	3886	34	118.1
KU4	Combined NW+SE Zone	RHCP	6149	ED4	West Hemi	RHCP	3924	34	118.1
KU5	Combined NW+SE Zone	RHCP	6130	ED5	West Hemi	RHCP	3905	72	118.1
KU6	Combined NW+SE Zone	RHCP	6220	ED6	West Hemi	RHCP	3995	72	118.1
KUA	Combined NW+SE Zone	RHCP	6280	EDA	West Hemi	RHCP	4055	36	118.1
KU1	Combined NW+SE Zone	RHCP	5967.5	FD1	East Hemi	RHCP	3742.5	77	115.9
KU2	Combined NW+SE Zone	RHCP	6050	FD2	East Hemi	RHCP	3825	72	115.9
KU3	Combined NW+SE Zone	RHCP	6111	FD3	East Hemi	RHCP	3886	34	115.9
KU4	Combined NW+SE Zone	RHCP	6149	FD4	East Hemi	RHCP	3924	34	115.9
KU5	Combined NW+SE Zone	RHCP	6130	FD5	East Hemi	RHCP	3905	72	115.9
KU6	Combined NW+SE Zone	RHCP	6220	FD6	East Hemi	RHCP	3995	72	115.9
KUA	Combined NW+SE Zone	RHCP	6280	FDA	East Hemi	RHCP	4055	36	115.9
LU1	Combined NE+SW Zone	RHCP	5967.5	GD1	NW Zone	LHCP	3742.5	77	110.6
LU2	Combined NE+SW Zone	RHCP	6050	GD2	NW Zone	LHCP	3825	72	110.6
LU3	Combined NE+SW Zone	RHCP	6111	GD3	NW Zone	LHCP	3886	34	110.6
LU4	Combined NE+SW Zone	RHCP	6149	GD4	NW Zone	LHCP	3924	34	110.6
LU5	Combined NE+SW Zone	RHCP	6130	GD5	NW Zone	LHCP	3905	72	110.6
LU6	Combined NE+SW Zone	RHCP	6220	GD6	NW Zone	LHCP	3995	72	110.6
LUA	Combined NE+SW Zone	RHCP	6280	GDA	NW Zone	LHCP	4055	36	110.6
LU1	Combined NE+SW Zone	RHCP	5967.5	JD1	SE Zone	LHCP	3742.5	77	113.6
LU2	Combined NE+SW Zone	RHCP	6050	JD2	SE Zone	LHCP	3825	72	113.6
LU3	Combined NE+SW Zone	RHCP	6111	JD3	SE Zone	LHCP	3886	34	113.6
LU4	Combined NE+SW Zone	RHCP	6149	JD4	SE Zone	LHCP	3924	34	113.6
LU5	Combined NE+SW Zone	RHCP	6130	JD5	SE Zone	LHCP	3905	72	113.6
LU6	Combined NE+SW Zone	RHCP	6220	JD6	SE Zone	LHCP	3995	72	113.6
LUA	Combined NE+SW Zone	RHCP	6280	JDA	SE Zone	LHCP	4055	36	113.6
LU1	Combined NE+SW Zone	RHCP	5967.5	HD1	NE Zone	LHCP	3742.5	77	110.9
LU2	Combined NE+SW Zone	RHCP	6050	HD2	NE Zone	LHCP	3825	72	110.9
LU3	Combined NE+SW Zone	RHCP	6111	HD3	NE Zone	LHCP	3886	34	110.9
LU4	Combined NE+SW Zone	RHCP	6149	HD4	NE Zone	LHCP	3924	34	110.9
LU5	Combined NE+SW Zone	RHCP	6130	HD5	NE Zone	LHCP	3905	72	110.9
LU6	Combined NE+SW Zone	RHCP	6220	HD6	NE Zone	LHCP	3995	72	110.9
LUA	Combined NE+SW Zone	RHCP	6280	HDA	NE Zone	LHCP	4055	36	110.9
LU1	Combined NE+SW Zone	RHCP	5967.5	ID1	SW Zone	LHCP	3742.5	77	111.4
LU2	Combined NE+SW Zone	RHCP	6050	ID2	SW Zone	LHCP	3825	72	111.4
LU3	Combined NE+SW Zone	RHCP	6111	ID3	SW Zone	LHCP	3886	34	111.4
LU4	Combined NE+SW Zone	RHCP	6149	ID4	SW Zone	LHCP	3924	34	111.4
LU5	Combined NE+SW Zone	RHCP	6130	ID5	SW Zone	LHCP	3905	72	111.4
LU6	Combined NE+SW Zone	RHCP	6220	ID6	SW Zone	LHCP	3995	72	111.4
LUA	Combined NE+SW Zone	RHCP	6280	IDA	SW Zone	LHCP	4055	36	111.4



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)	Channel Gain (dB)
LU1	Combined NE+SW Zone	RHCP	5967.5	ED1	West Hemi	RHCP	3742.5	77	116.2
LU2	Combined NE+SW Zone	RHCP	6050	ED2	West Hemi	RHCP	3825	72	116.2
LU3	Combined NE+SW Zone	RHCP	6111	ED3	West Hemi	RHCP	3886	34	116.2
LU4	Combined NE+SW Zone	RHCP	6149	ED4	West Hemi	RHCP	3924	34	116.2
LU5	Combined NE+SW Zone	RHCP	6130	ED5	West Hemi	RHCP	3905	72	116.2
LU6	Combined NE+SW Zone	RHCP	6220	ED6	West Hemi	RHCP	3995	72	116.2
LUA	Combined NE+SW Zone	RHCP	6280	EDA	West Hemi	RHCP	4055	36	116.2
LU1	Combined NE+SW Zone	RHCP	5967.5	FD1	East Hemi	RHCP	3742.5	77	114.0
LU2	Combined NE+SW Zone	RHCP	6050	FD2	East Hemi	RHCP	3825	72	114.0
LU3	Combined NE+SW Zone	RHCP	6111	FD3	East Hemi	RHCP	3886	34	114.0
LU4	Combined NE+SW Zone	RHCP	6149	FD4	East Hemi	RHCP	3924	34	114.0
LU5	Combined NE+SW Zone	RHCP	6130	FD5	East Hemi	RHCP	3905	72	114.0
LU6	Combined NE+SW Zone	RHCP	6220	FD6	East Hemi	RHCP	3995	72	114.0
LUA	Combined NE+SW Zone	RHCP	6280	FDA	East Hemi	RHCP	4055	36	114.0
SU1	Spot 1	H	14042.5	S1D1	Spot 1	V	10992.5	77	114.4
SU2	Spot 1	H	14125	S1D2	Spot 1	V	11075	72	114.4
SU3	Spot 1	H	14186	S1D3	Spot 1	V	11136	34	114.4
SU4	Spot 1	H	14224	S1D4	Spot 1	V	11174	34	114.4
SU5	Spot 1	H	14205	S1D5	Spot 1	V	11155	72	114.4
SU6	Spot 1	H	14314	S1D6	Spot 1	V	11514	112	114.4
SU7	Spot 1	H	14438	S1D7	Spot 1	V	11638	112	114.4
SU1	Spot 1	H	14042.5	U1D1	Spot 2	H	10992.5	77	115.1
SU2	Spot 1	H	14125	U1D2	Spot 2	H	11075	72	115.1
SU3	Spot 1	H	14186	U1D3	Spot 2	H	11136	34	115.1
SU4	Spot 1	H	14224	U1D4	Spot 2	H	11174	34	115.1
SU5	Spot 1	H	14205	U1D5	Spot 2	H	11155	72	115.1
SU6	Spot 1	H	14314	U1D6	Spot 2	H	11514	112	115.1
SU7	Spot 1	H	14438	U1D7	Spot 2	H	11638	112	115.1
SU1	Spot 1	H	14042.5	Y1D1	Spot 2A	H	10992.5	77	115.0
SU2	Spot 1	H	14125	Y1D2	Spot 2A	H	11075	72	115.0
SU3	Spot 1	H	14186	Y1D3	Spot 2A	H	11136	34	115.0
SU4	Spot 1	H	14224	Y1D4	Spot 2A	H	11174	34	115.0
SU5	Spot 1	H	14205	Y1D5	Spot 2A	H	11155	72	115.0
SU6	Spot 1	H	14314	Y1D6	Spot 2A	H	11514	112	115.0
SU7	Spot 1	H	14438	Y1D7	Spot 2A	H	11638	112	115.0
SU1	Spot 1	H	14042.5	W1D1	Spot 3	V	10992.5	77	114.4
SU2	Spot 1	H	14125	W1D2	Spot 3	V	11075	72	114.4
SU3	Spot 1	H	14186	W1D3	Spot 3	V	11136	34	114.4
SU4	Spot 1	H	14224	W1D4	Spot 3	V	11174	34	114.4
SU5	Spot 1	H	14205	W1D5	Spot 3	V	11155	72	114.4
SU6	Spot 1	H	14314	W1D6	Spot 3	V	11514	112	114.4
SU7	Spot 1	H	14438	W1D7	Spot 3	V	11638	112	114.4
SU1	Spot 1	H	14042.5	X1D1	Spot 3X	H	10992.5	77	114.4
SU2	Spot 1	H	14125	X1D2	Spot 3X	H	11075	72	114.4
SU3	Spot 1	H	14186	X1D3	Spot 3X	H	11136	34	114.4
SU4	Spot 1	H	14224	X1D4	Spot 3X	H	11174	34	114.4
SU5	Spot 1	H	14205	X1D5	Spot 3X	H	11155	72	114.4
SU6	Spot 1	H	14314	X1D6	Spot 3X	H	11514	112	114.4
SU7	Spot 1	H	14438	X1D7	Spot 3X	H	11638	112	114.4
UU1	Spot 2	V	14042.5	S1D1	Spot 1	V	10992.5	77	116.5
UU2	Spot 2	V	14125	S1D2	Spot 1	V	11075	72	116.5
UU3	Spot 2	V	14186	S1D3	Spot 1	V	11136	34	116.5
UU4	Spot 2	V	14224	S1D4	Spot 1	V	11174	34	116.5
UU5	Spot 2	V	14205	S1D5	Spot 1	V	11155	72	116.5

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)	Channel Gain (dB)
UU6	Spot 2	V	14314	S1D6	Spot 1	V	11514	112	116.5
UU7	Spot 2	V	14438	S1D7	Spot 1	V	11638	112	116.5
UU1	Spot 2	V	14042.5	U1D1	Spot 2	H	10992.5	77	117.2
UU2	Spot 2	V	14125	U1D2	Spot 2	H	11075	72	117.2
UU3	Spot 2	V	14186	U1D3	Spot 2	H	11136	34	117.2
UU4	Spot 2	V	14224	U1D4	Spot 2	H	11174	34	117.2
UU5	Spot 2	V	14205	U1D5	Spot 2	H	11155	72	117.2
UU6	Spot 2	V	14314	U1D6	Spot 2	H	11514	112	117.2
UU7	Spot 2	V	14438	U1D7	Spot 2	H	11638	112	117.2
UU1	Spot 2	V	14042.5	Y1D1	Spot 2A	H	10992.5	77	117.1
UU2	Spot 2	V	14125	Y1D2	Spot 2A	H	11075	72	117.1
UU3	Spot 2	V	14186	Y1D3	Spot 2A	H	11136	34	117.1
UU4	Spot 2	V	14224	Y1D4	Spot 2A	H	11174	34	117.1
UU5	Spot 2	V	14205	Y1D5	Spot 2A	H	11155	72	117.1
UU6	Spot 2	V	14314	Y1D6	Spot 2A	H	11514	112	117.1
UU7	Spot 2	V	14438	Y1D7	Spot 2A	H	11638	112	117.1
UU1	Spot 2	V	14042.5	W1D1	Spot 3	V	10992.5	77	116.5
UU2	Spot 2	V	14125	W1D2	Spot 3	V	11075	72	116.5
UU3	Spot 2	V	14186	W1D3	Spot 3	V	11136	34	116.5
UU4	Spot 2	V	14224	W1D4	Spot 3	V	11174	34	116.5
UU5	Spot 2	V	14205	W1D5	Spot 3	V	11155	72	116.5
UU6	Spot 2	V	14314	W1D6	Spot 3	V	11514	112	116.5
UU7	Spot 2	V	14438	W1D7	Spot 3	V	11638	112	116.5
UU1	Spot 2	V	14042.5	X1D1	Spot 3X	H	10992.5	77	116.5
UU2	Spot 2	V	14125	X1D2	Spot 3X	H	11075	72	116.5
UU3	Spot 2	V	14186	X1D3	Spot 3X	H	11136	34	116.5
UU4	Spot 2	V	14224	X1D4	Spot 3X	H	11174	34	116.5
UU5	Spot 2	V	14205	X1D5	Spot 3X	H	11155	72	116.5
UU6	Spot 2	V	14314	X1D6	Spot 3X	H	11514	112	116.5
UU7	Spot 2	V	14438	X1D7	Spot 3X	H	11638	112	116.5
YU1	Spot 2A	V	14042.5	S1D1	Spot 1	V	10992.5	77	118.6
YU2	Spot 2A	V	14125	S1D2	Spot 1	V	11075	72	118.6
YU3	Spot 2A	V	14186	S1D3	Spot 1	V	11136	34	118.6
YU4	Spot 2A	V	14224	S1D4	Spot 1	V	11174	34	118.6
YU5	Spot 2A	V	14205	S1D5	Spot 1	V	11155	72	118.6
YU6	Spot 2A	V	14314	S1D6	Spot 1	V	11514	112	118.6
YU7	Spot 2A	V	14438	S1D7	Spot 1	V	11638	112	118.6
YU1	Spot 2A	V	14042.5	U1D1	Spot 2	H	10992.5	77	119.3
YU2	Spot 2A	V	14125	U1D2	Spot 2	H	11075	72	119.3
YU3	Spot 2A	V	14186	U1D3	Spot 2	H	11136	34	119.3
YU4	Spot 2A	V	14224	U1D4	Spot 2	H	11174	34	119.3
YU5	Spot 2A	V	14205	U1D5	Spot 2	H	11155	72	119.3
YU6	Spot 2A	V	14314	U1D6	Spot 2	H	11514	112	119.3
YU7	Spot 2A	V	14438	U1D7	Spot 2	H	11638	112	119.3
YU1	Spot 2A	V	14042.5	Y1D1	Spot 2A	H	10992.5	77	119.2
YU2	Spot 2A	V	14125	Y1D2	Spot 2A	H	11075	72	119.2
YU3	Spot 2A	V	14186	Y1D3	Spot 2A	H	11136	34	119.2
YU4	Spot 2A	V	14224	Y1D4	Spot 2A	H	11174	34	119.2
YU5	Spot 2A	V	14205	Y1D5	Spot 2A	H	11155	72	119.2
YU6	Spot 2A	V	14314	Y1D6	Spot 2A	H	11514	112	119.2
YU7	Spot 2A	V	14438	Y1D7	Spot 2A	H	11638	112	119.2
YU1	Spot 2A	V	14042.5	W1D1	Spot 3	V	10992.5	77	118.6
YU2	Spot 2A	V	14125	W1D2	Spot 3	V	11075	72	118.6

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)	Channel Gain (dB)
YU3	Spot 2A	V	14186	W1D3	Spot 3	V	11136	34	118.6
YU4	Spot 2A	V	14224	W1D4	Spot 3	V	11174	34	118.6
YU5	Spot 2A	V	14205	W1D5	Spot 3	V	11155	72	118.6
YU6	Spot 2A	V	14314	W1D6	Spot 3	V	11514	112	118.6
YU7	Spot 2A	V	14438	W1D7	Spot 3	V	11638	112	118.6
YU1	Spot 2A	V	14042.5	X1D1	Spot 3X	H	10992.5	77	118.6
YU2	Spot 2A	V	14125	X1D2	Spot 3X	H	11075	72	118.6
YU3	Spot 2A	V	14186	X1D3	Spot 3X	H	11136	34	118.6
YU4	Spot 2A	V	14224	X1D4	Spot 3X	H	11174	34	118.6
YU5	Spot 2A	V	14205	X1D5	Spot 3X	H	11155	72	118.6
YU6	Spot 2A	V	14314	X1D6	Spot 3X	H	11514	112	118.6
YU7	Spot 2A	V	14438	X1D7	Spot 3X	H	11638	112	118.6
WU1	Spot 3	H	14042.5	S1D1	Spot 1	V	10992.5	77	112.4
WU2	Spot 3	H	14125	S1D2	Spot 1	V	11075	72	112.4
WU3	Spot 3	H	14186	S1D3	Spot 1	V	11136	34	112.4
WU4	Spot 3	H	14224	S1D4	Spot 1	V	11174	34	112.4
WU5	Spot 3	H	14205	S1D5	Spot 1	V	11155	72	112.4
WU6	Spot 3	H	14314	S1D6	Spot 1	V	11514	112	112.4
WU7	Spot 3	H	14438	S1D7	Spot 1	V	11638	112	112.4
WU1	Spot 3	H	14042.5	U1D1	Spot 2	H	10992.5	77	113.1
WU2	Spot 3	H	14125	U1D2	Spot 2	H	11075	72	113.1
WU3	Spot 3	H	14186	U1D3	Spot 2	H	11136	34	113.1
WU4	Spot 3	H	14224	U1D4	Spot 2	H	11174	34	113.1
WU5	Spot 3	H	14205	U1D5	Spot 2	H	11155	72	113.1
WU6	Spot 3	H	14314	U1D6	Spot 2	H	11514	112	113.1
WU7	Spot 3	H	14438	U1D7	Spot 2	H	11638	112	113.1
WU1	Spot 3	H	14042.5	Y1D1	Spot 2A	H	10992.5	77	113.0
WU2	Spot 3	H	14125	Y1D2	Spot 2A	H	11075	72	113.0
WU3	Spot 3	H	14186	Y1D3	Spot 2A	H	11136	34	113.0
WU4	Spot 3	H	14224	Y1D4	Spot 2A	H	11174	34	113.0
WU5	Spot 3	H	14205	Y1D5	Spot 2A	H	11155	72	113.0
WU6	Spot 3	H	14314	Y1D6	Spot 2A	H	11514	112	113.0
WU7	Spot 3	H	14438	Y1D7	Spot 2A	H	11638	112	113.0
WU1	Spot 3	H	14042.5	W1D1	Spot 3	V	10992.5	77	112.4
WU2	Spot 3	H	14125	W1D2	Spot 3	V	11075	72	112.4
WU3	Spot 3	H	14186	W1D3	Spot 3	V	11136	34	112.4
WU4	Spot 3	H	14224	W1D4	Spot 3	V	11174	34	112.4
WU5	Spot 3	H	14205	W1D5	Spot 3	V	11155	72	112.4
WU6	Spot 3	H	14314	W1D6	Spot 3	V	11514	112	112.4
WU7	Spot 3	H	14438	W1D7	Spot 3	V	11638	112	112.4
XU1	Spot 3X	V	14042.5	S1D1	Spot 1	V	10992.5	77	112.4
XU2	Spot 3X	V	14125	S1D2	Spot 1	V	11075	72	112.4
XU3	Spot 3X	V	14186	S1D3	Spot 1	V	11136	34	112.4
XU4	Spot 3X	V	14224	S1D4	Spot 1	V	11174	34	112.4
XU5	Spot 3X	V	14205	S1D5	Spot 1	V	11155	72	112.4
XU6	Spot 3X	V	14314	S1D6	Spot 1	V	11514	112	112.4
XU7	Spot 3X	V	14438	S1D7	Spot 1	V	11638	112	112.4
XU1	Spot 3X	V	14042.5	U1D1	Spot 2	H	10992.5	77	113.1
XU2	Spot 3X	V	14125	U1D2	Spot 2	H	11075	72	113.1
XU3	Spot 3X	V	14186	U1D3	Spot 2	H	11136	34	113.1
XU4	Spot 3X	V	14224	U1D4	Spot 2	H	11174	34	113.1
XU5	Spot 3X	V	14205	U1D5	Spot 2	H	11155	72	113.1
XU6	Spot 3X	V	14314	U1D6	Spot 2	H	11514	112	113.1
XU7	Spot 3X	V	14438	U1D7	Spot 2	H	11638	112	113.1

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)	Channel Gain (dB)
XU1	Spot 3X	V	14042.5	Y1D1	Spot 2A	H	10992.5	77	113.0
XU2	Spot 3X	V	14125	Y1D2	Spot 2A	H	11075	72	113.0
XU3	Spot 3X	V	14186	Y1D3	Spot 2A	H	11136	34	113.0
XU4	Spot 3X	V	14224	Y1D4	Spot 2A	H	11174	34	113.0
XU5	Spot 3X	V	14205	Y1D5	Spot 2A	H	11155	72	113.0
XU6	Spot 3X	V	14314	Y1D6	Spot 2A	H	11514	112	113.0
XU7	Spot 3X	V	14438	Y1D7	Spot 2A	H	11638	112	113.0
XU1	Spot 3X	V	14042.5	X1D1	Spot 3X	H	10992.5	77	112.4
XU2	Spot 3X	V	14125	X1D2	Spot 3X	H	11075	72	112.4
XU3	Spot 3X	V	14186	X1D3	Spot 3X	H	11136	34	112.4
XU4	Spot 3X	V	14224	X1D4	Spot 3X	H	11174	34	112.4
XU5	Spot 3X	V	14205	X1D5	Spot 3X	H	11155	72	112.4
XU6	Spot 3X	V	14314	X1D6	Spot 3X	H	11514	112	112.4
XU7	Spot 3X	V	14438	X1D7	Spot 3X	H	11638	112	112.4
SU1	Spot 1	H	14042.5	S2D1	Spot 1	V	12547.5	77	114.4
SU2	Spot 1	H	14125	S2D2	Spot 1	V	12630	72	114.4
SU3	Spot 1	H	14186	S2D3	Spot 1	V	12691	34	114.4
SU4	Spot 1	H	14224	S2D4	Spot 1	V	12729	34	114.4
SU5	Spot 1	H	14205	S2D5	Spot 1	V	12710	72	114.4
SU6	Spot 1	H	14314	S2D6	Spot 1	V	11514	112	114.4
SU7	Spot 1	H	14438	S2D7	Spot 1	V	11638	112	114.4
SU1	Spot 1	H	14042.5	U2D1	Spot 2	H	12547.5	77	115.1
SU2	Spot 1	H	14125	U2D2	Spot 2	H	12630	72	115.1
SU3	Spot 1	H	14186	U2D3	Spot 2	H	12691	34	115.1
SU4	Spot 1	H	14224	U2D4	Spot 2	H	12729	34	115.1
SU5	Spot 1	H	14205	U2D5	Spot 2	H	12710	72	115.1
SU6	Spot 1	H	14314	U2D6	Spot 2	H	11514	112	115.1
SU7	Spot 1	H	14438	U2D7	Spot 2	H	11638	112	115.1
SU1	Spot 1	H	14042.5	Y2D1	Spot 2A	H	12547.5	77	115.0
SU2	Spot 1	H	14125	Y2D2	Spot 2A	H	12630	72	115.0
SU3	Spot 1	H	14186	Y2D3	Spot 2A	H	12691	34	115.0
SU4	Spot 1	H	14224	Y2D4	Spot 2A	H	12729	34	115.0
SU5	Spot 1	H	14205	Y2D5	Spot 2A	H	12710	72	115.0
SU6	Spot 1	H	14314	Y2D6	Spot 2A	H	11514	112	115.0
SU7	Spot 1	H	14438	Y2D7	Spot 2A	H	11638	112	115.0
SU1	Spot 1	H	14042.5	W2D1	Spot 3	V	12547.5	77	114.4
SU2	Spot 1	H	14125	W2D2	Spot 3	V	12630	72	114.4
SU3	Spot 1	H	14186	W2D3	Spot 3	V	12691	34	114.4
SU4	Spot 1	H	14224	W2D4	Spot 3	V	12729	34	114.4
SU5	Spot 1	H	14205	W2D5	Spot 3	V	12710	72	114.4
SU6	Spot 1	H	14314	W2D6	Spot 3	V	11514	112	114.4
SU7	Spot 1	H	14438	W2D7	Spot 3	V	11638	112	114.4
SU1	Spot 1	H	14042.5	X2D1	Spot 3X	H	12547.5	77	114.4
SU2	Spot 1	H	14125	X2D2	Spot 3X	H	12630	72	114.4
SU3	Spot 1	H	14186	X2D3	Spot 3X	H	12691	34	114.4
SU4	Spot 1	H	14224	X2D4	Spot 3X	H	12729	34	114.4
SU5	Spot 1	H	14205	X2D5	Spot 3X	H	12710	72	114.4
SU6	Spot 1	H	14314	X2D6	Spot 3X	H	11514	112	114.4
SU7	Spot 1	H	14438	X2D7	Spot 3X	H	11638	112	114.4
UU1	Spot 2	V	14042.5	S2D1	Spot 1	V	12547.5	77	116.5
UU2	Spot 2	V	14125	S2D2	Spot 1	V	12630	72	116.5
UU3	Spot 2	V	14186	S2D3	Spot 1	V	12691	34	116.5
UU4	Spot 2	V	14224	S2D4	Spot 1	V	12729	34	116.5

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)	Channel Gain (dB)
UU5	Spot 2	V	14205	S2D5	Spot 1	V	12710	72	116.5
UU6	Spot 2	V	14314	S2D6	Spot 1	V	11514	112	116.5
UU7	Spot 2	V	14438	S2D7	Spot 1	V	11638	112	116.5
UU1	Spot 2	V	14042.5	U2D1	Spot 2	H	12547.5	77	117.2
UU2	Spot 2	V	14125	U2D2	Spot 2	H	12630	72	117.2
UU3	Spot 2	V	14186	U2D3	Spot 2	H	12691	34	117.2
UU4	Spot 2	V	14224	U2D4	Spot 2	H	12729	34	117.2
UU5	Spot 2	V	14205	U2D5	Spot 2	H	12710	72	117.2
UU6	Spot 2	V	14314	U2D6	Spot 2	H	11514	112	117.2
UU7	Spot 2	V	14438	U2D7	Spot 2	H	11638	112	117.2
UU1	Spot 2	V	14042.5	Y2D1	Spot 2A	H	12547.5	77	117.1
UU2	Spot 2	V	14125	Y2D2	Spot 2A	H	12630	72	117.1
UU3	Spot 2	V	14186	Y2D3	Spot 2A	H	12691	34	117.1
UU4	Spot 2	V	14224	Y2D4	Spot 2A	H	12729	34	117.1
UU5	Spot 2	V	14205	Y2D5	Spot 2A	H	12710	72	117.1
UU6	Spot 2	V	14314	Y2D6	Spot 2A	H	11514	112	117.1
UU7	Spot 2	V	14438	Y2D7	Spot 2A	H	11638	112	117.1
UU1	Spot 2	V	14042.5	W2D1	Spot 3	V	12547.5	77	116.5
UU2	Spot 2	V	14125	W2D2	Spot 3	V	12630	72	116.5
UU3	Spot 2	V	14186	W2D3	Spot 3	V	12691	34	116.5
UU4	Spot 2	V	14224	W2D4	Spot 3	V	12729	34	116.5
UU5	Spot 2	V	14205	W2D5	Spot 3	V	12710	72	116.5
UU6	Spot 2	V	14314	W2D6	Spot 3	V	11514	112	116.5
UU7	Spot 2	V	14438	W2D7	Spot 3	V	11638	112	116.5
UU1	Spot 2	V	14042.5	X2D1	Spot 3X	H	12547.5	77	116.5
UU2	Spot 2	V	14125	X2D2	Spot 3X	H	12630	72	116.5
UU3	Spot 2	V	14186	X2D3	Spot 3X	H	12691	34	116.5
UU4	Spot 2	V	14224	X2D4	Spot 3X	H	12729	34	116.5
UU5	Spot 2	V	14205	X2D5	Spot 3X	H	12710	72	116.5
UU6	Spot 2	V	14314	X2D6	Spot 3X	H	11514	112	116.5
UU7	Spot 2	V	14438	X2D7	Spot 3X	H	11638	112	116.5
YU1	Spot 2A	V	14042.5	S2D1	Spot 1	V	12547.5	77	118.6
YU2	Spot 2A	V	14125	S2D2	Spot 1	V	12630	72	118.6
YU3	Spot 2A	V	14186	S2D3	Spot 1	V	12691	34	118.6
YU4	Spot 2A	V	14224	S2D4	Spot 1	V	12729	34	118.6
YU5	Spot 2A	V	14205	S2D5	Spot 1	V	12710	72	118.6
YU6	Spot 2A	V	14314	S2D6	Spot 1	V	11514	112	118.6
YU7	Spot 2A	V	14438	S2D7	Spot 1	V	11638	112	118.6
YU1	Spot 2A	V	14042.5	U2D1	Spot 2	H	12547.5	77	119.3
YU2	Spot 2A	V	14125	U2D2	Spot 2	H	12630	72	119.3
YU3	Spot 2A	V	14186	U2D3	Spot 2	H	12691	34	119.3
YU4	Spot 2A	V	14224	U2D4	Spot 2	H	12729	34	119.3
YU5	Spot 2A	V	14205	U2D5	Spot 2	H	12710	72	119.3
YU6	Spot 2A	V	14314	U2D6	Spot 2	H	11514	112	119.3
YU7	Spot 2A	V	14438	U2D7	Spot 2	H	11638	112	119.3
YU1	Spot 2A	V	14042.5	Y2D1	Spot 2A	H	12547.5	77	119.2
YU2	Spot 2A	V	14125	Y2D2	Spot 2A	H	12630	72	119.2
YU3	Spot 2A	V	14186	Y2D3	Spot 2A	H	12691	34	119.2
YU4	Spot 2A	V	14224	Y2D4	Spot 2A	H	12729	34	119.2
YU5	Spot 2A	V	14205	Y2D5	Spot 2A	H	12710	72	119.2
YU6	Spot 2A	V	14314	Y2D6	Spot 2A	H	11514	112	119.2
YU7	Spot 2A	V	14438	Y2D7	Spot 2A	H	11638	112	119.2
YU1	Spot 2A	V	14042.5	W2D1	Spot 3	V	12547.5	77	118.6

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)	Channel Gain (dB)
YU2	Spot 2A	V	14125	W2D2	Spot 3	V	12630	72	118.6
YU3	Spot 2A	V	14186	W2D3	Spot 3	V	12691	34	118.6
YU4	Spot 2A	V	14224	W2D4	Spot 3	V	12729	34	118.6
YU5	Spot 2A	V	14205	W2D5	Spot 3	V	12710	72	118.6
YU6	Spot 2A	V	14314	W2D6	Spot 3	V	11514	112	118.6
YU7	Spot 2A	V	14438	W2D7	Spot 3	V	11638	112	118.6
YU1	Spot 2A	V	14042.5	X2D1	Spot 3X	H	12547.5	77	118.6
YU2	Spot 2A	V	14125	X2D2	Spot 3X	H	12630	72	118.6
YU3	Spot 2A	V	14186	X2D3	Spot 3X	H	12691	34	118.6
YU4	Spot 2A	V	14224	X2D4	Spot 3X	H	12729	34	118.6
YU5	Spot 2A	V	14205	X2D5	Spot 3X	H	12710	72	118.6
YU6	Spot 2A	V	14314	X2D6	Spot 3X	H	11514	112	118.6
YU7	Spot 2A	V	14438	X2D7	Spot 3X	H	11638	112	118.6
WU1	Spot 3	H	14042.5	S2D1	Spot 1	V	12547.5	77	112.4
WU2	Spot 3	H	14125	S2D2	Spot 1	V	12630	72	112.4
WU3	Spot 3	H	14186	S2D3	Spot 1	V	12691	34	112.4
WU4	Spot 3	H	14224	S2D4	Spot 1	V	12729	34	112.4
WU5	Spot 3	H	14205	S2D5	Spot 1	V	12710	72	112.4
WU6	Spot 3	H	14314	S2D6	Spot 1	V	11514	112	112.4
WU7	Spot 3	H	14438	S2D7	Spot 1	V	11638	112	112.4
WU1	Spot 3	H	14042.5	U2D1	Spot 2	H	12547.5	77	113.1
WU2	Spot 3	H	14125	U2D2	Spot 2	H	12630	72	113.1
WU3	Spot 3	H	14186	U2D3	Spot 2	H	12691	34	113.1
WU4	Spot 3	H	14224	U2D4	Spot 2	H	12729	34	113.1
WU5	Spot 3	H	14205	U2D5	Spot 2	H	12710	72	113.1
WU6	Spot 3	H	14314	U2D6	Spot 2	H	11514	112	113.1
WU7	Spot 3	H	14438	U2D7	Spot 2	H	11638	112	113.1
WU1	Spot 3	H	14042.5	Y2D1	Spot 2A	H	12547.5	77	113.0
WU2	Spot 3	H	14125	Y2D2	Spot 2A	H	12630	72	113.0
WU3	Spot 3	H	14186	Y2D3	Spot 2A	H	12691	34	113.0
WU4	Spot 3	H	14224	Y2D4	Spot 2A	H	12729	34	113.0
WU5	Spot 3	H	14205	Y2D5	Spot 2A	H	12710	72	113.0
WU6	Spot 3	H	14314	Y2D6	Spot 2A	H	11514	112	113.0
WU7	Spot 3	H	14438	Y2D7	Spot 2A	H	11638	112	113.0
WU1	Spot 3	H	14042.5	W2D1	Spot 3	V	12547.5	77	112.4
WU2	Spot 3	H	14125	W2D2	Spot 3	V	12630	72	112.4
WU3	Spot 3	H	14186	W2D3	Spot 3	V	12691	34	112.4
WU4	Spot 3	H	14224	W2D4	Spot 3	V	12729	34	112.4
WU5	Spot 3	H	14205	W2D5	Spot 3	V	12710	72	112.4
WU6	Spot 3	H	14314	W2D6	Spot 3	V	11514	112	112.4
WU7	Spot 3	H	14438	W2D7	Spot 3	V	11638	112	112.4
XU1	Spot 3X	V	14042.5	S2D1	Spot 1	V	12547.5	77	112.4
XU2	Spot 3X	V	14125	S2D2	Spot 1	V	12630	72	112.4
XU3	Spot 3X	V	14186	S2D3	Spot 1	V	12691	34	112.4
XU4	Spot 3X	V	14224	S2D4	Spot 1	V	12729	34	112.4
XU5	Spot 3X	V	14205	S2D5	Spot 1	V	12710	72	112.4
XU6	Spot 3X	V	14314	S2D6	Spot 1	V	11514	112	112.4
XU7	Spot 3X	V	14438	S2D7	Spot 1	V	11638	112	112.4
XU1	Spot 3X	V	14042.5	U2D1	Spot 2	H	12547.5	77	113.1
XU2	Spot 3X	V	14125	U2D2	Spot 2	H	12630	72	113.1
XU3	Spot 3X	V	14186	U2D3	Spot 2	H	12691	34	113.1
XU4	Spot 3X	V	14224	U2D4	Spot 2	H	12729	34	113.1
XU5	Spot 3X	V	14205	U2D5	Spot 2	H	12710	72	113.1
XU6	Spot 3X	V	14314	U2D6	Spot 2	H	11514	112	113.1

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)	Channel Gain (dB)
XU7	Spot 3X	V	14438	U2D7	Spot 2	H	11638	112	113.1
XU1	Spot 3X	V	14042.5	Y2D1	Spot 2A	H	12547.5	77	113.0
XU2	Spot 3X	V	14125	Y2D2	Spot 2A	H	12630	72	113.0
XU3	Spot 3X	V	14186	Y2D3	Spot 2A	H	12691	34	113.0
XU4	Spot 3X	V	14224	Y2D4	Spot 2A	H	12729	34	113.0
XU5	Spot 3X	V	14205	Y2D5	Spot 2A	H	12710	72	113.0
XU6	Spot 3X	V	14314	Y2D6	Spot 2A	H	11514	112	113.0
XU7	Spot 3X	V	14438	Y2D7	Spot 2A	H	11638	112	113.0
XU1	Spot 3X	V	14042.5	X2D1	Spot 3X	H	12547.5	77	112.4
XU2	Spot 3X	V	14125	X2D2	Spot 3X	H	12630	72	112.4
XU3	Spot 3X	V	14186	X2D3	Spot 3X	H	12691	34	112.4
XU4	Spot 3X	V	14224	X2D4	Spot 3X	H	12729	34	112.4
XU5	Spot 3X	V	14205	X2D5	Spot 3X	H	12710	72	112.4
XU6	Spot 3X	V	14314	X2D6	Spot 3X	H	11514	112	112.4
XU7	Spot 3X	V	14438	X2D7	Spot 3X	H	11638	112	112.4
SU1	Spot 1	H	14042.5	S3D1	Spot 1	V	11747.5	77	114.4
SU2	Spot 1	H	14125	S3D2	Spot 1	V	11830	72	114.4
SU3	Spot 1	H	14186	S3D3	Spot 1	V	11891	34	114.4
SU4	Spot 1	H	14224	S3D4	Spot 1	V	11929	34	114.4
SU5	Spot 1	H	14205	S3D5	Spot 1	V	11910	72	114.4
SU6	Spot 1	H	14314	S3D6	Spot 1	V	11514	112	114.4
SU7	Spot 1	H	14438	S3D7	Spot 1	V	11638	112	114.4
SU1	Spot 1	H	14042.5	U3D1	Spot 2	H	11747.5	77	115.1
SU2	Spot 1	H	14125	U3D2	Spot 2	H	11830	72	115.1
SU3	Spot 1	H	14186	U3D3	Spot 2	H	11891	34	115.1
SU4	Spot 1	H	14224	U3D4	Spot 2	H	11929	34	115.1
SU5	Spot 1	H	14205	U3D5	Spot 2	H	11910	72	115.1
SU6	Spot 1	H	14314	U3D6	Spot 2	H	11514	112	115.1
SU7	Spot 1	H	14438	U3D7	Spot 2	H	11638	112	115.1
SU1	Spot 1	H	14042.5	Y3D1	Spot 2A	H	11747.5	77	115.0
SU2	Spot 1	H	14125	Y3D2	Spot 2A	H	11830	72	115.0
SU3	Spot 1	H	14186	Y3D3	Spot 2A	H	11891	34	115.0
SU4	Spot 1	H	14224	Y3D4	Spot 2A	H	11929	34	115.0
SU5	Spot 1	H	14205	Y3D5	Spot 2A	H	11910	72	115.0
SU6	Spot 1	H	14314	Y3D6	Spot 2A	H	11514	112	115.0
SU7	Spot 1	H	14438	Y3D7	Spot 2A	H	11638	112	115.0
SU1	Spot 1	H	14042.5	W3D1	Spot 3	V	11747.5	77	114.4
SU2	Spot 1	H	14125	W3D2	Spot 3	V	11830	72	114.4
SU3	Spot 1	H	14186	W3D3	Spot 3	V	11891	34	114.4
SU4	Spot 1	H	14224	W3D4	Spot 3	V	11929	34	114.4
SU5	Spot 1	H	14205	W3D5	Spot 3	V	11910	72	114.4
SU6	Spot 1	H	14314	W3D6	Spot 3	V	11514	112	114.4
SU7	Spot 1	H	14438	W3D7	Spot 3	V	11638	112	114.4
SU1	Spot 1	H	14042.5	X3D1	Spot 3X	H	11747.5	77	114.4
SU2	Spot 1	H	14125	X3D2	Spot 3X	H	11830	72	114.4
SU3	Spot 1	H	14186	X3D3	Spot 3X	H	11891	34	114.4
SU4	Spot 1	H	14224	X3D4	Spot 3X	H	11929	34	114.4
SU5	Spot 1	H	14205	X3D5	Spot 3X	H	11910	72	114.4
SU6	Spot 1	H	14314	X3D6	Spot 3X	H	11514	112	114.4
SU7	Spot 1	H	14438	X3D7	Spot 3X	H	11638	112	114.4
UU1	Spot 2	V	14042.5	S3D1	Spot 1	V	11747.5	77	116.5
UU2	Spot 2	V	14125	S3D2	Spot 1	V	11830	72	116.5
UU3	Spot 2	V	14186	S3D3	Spot 1	V	11891	34	116.5

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)	Channel Gain (dB)
UU4	Spot 2	V	14224	S3D4	Spot 1	V	11929	34	116.5
UU5	Spot 2	V	14205	S3D5	Spot 1	V	11910	72	116.5
UU6	Spot 2	V	14314	S3D6	Spot 1	V	11514	112	116.5
UU7	Spot 2	V	14438	S3D7	Spot 1	V	11638	112	116.5
UU1	Spot 2	V	14042.5	U3D1	Spot 2	H	11747.5	77	117.2
UU2	Spot 2	V	14125	U3D2	Spot 2	H	11830	72	117.2
UU3	Spot 2	V	14186	U3D3	Spot 2	H	11891	34	117.2
UU4	Spot 2	V	14224	U3D4	Spot 2	H	11929	34	117.2
UU5	Spot 2	V	14205	U3D5	Spot 2	H	11910	72	117.2
UU6	Spot 2	V	14314	U3D6	Spot 2	H	11514	112	117.2
UU7	Spot 2	V	14438	U3D7	Spot 2	H	11638	112	117.2
UU1	Spot 2	V	14042.5	Y3D1	Spot 2A	H	11747.5	77	117.1
UU2	Spot 2	V	14125	Y3D2	Spot 2A	H	11830	72	117.1
UU3	Spot 2	V	14186	Y3D3	Spot 2A	H	11891	34	117.1
UU4	Spot 2	V	14224	Y3D4	Spot 2A	H	11929	34	117.1
UU5	Spot 2	V	14205	Y3D5	Spot 2A	H	11910	72	117.1
UU6	Spot 2	V	14314	Y3D6	Spot 2A	H	11514	112	117.1
UU7	Spot 2	V	14438	Y3D7	Spot 2A	H	11638	112	117.1
UU1	Spot 2	V	14042.5	W3D1	Spot 3	V	11747.5	77	116.5
UU2	Spot 2	V	14125	W3D2	Spot 3	V	11830	72	116.5
UU3	Spot 2	V	14186	W3D3	Spot 3	V	11891	34	116.5
UU4	Spot 2	V	14224	W3D4	Spot 3	V	11929	34	116.5
UU5	Spot 2	V	14205	W3D5	Spot 3	V	11910	72	116.5
UU6	Spot 2	V	14314	W3D6	Spot 3	V	11514	112	116.5
UU7	Spot 2	V	14438	W3D7	Spot 3	V	11638	112	116.5
UU1	Spot 2	V	14042.5	X3D1	Spot 3X	H	11747.5	77	116.5
UU2	Spot 2	V	14125	X3D2	Spot 3X	H	11830	72	116.5
UU3	Spot 2	V	14186	X3D3	Spot 3X	H	11891	34	116.5
UU4	Spot 2	V	14224	X3D4	Spot 3X	H	11929	34	116.5
UU5	Spot 2	V	14205	X3D5	Spot 3X	H	11910	72	116.5
UU6	Spot 2	V	14314	X3D6	Spot 3X	H	11514	112	116.5
UU7	Spot 2	V	14438	X3D7	Spot 3X	H	11638	112	116.5
YU1	Spot 2A	V	14042.5	S3D1	Spot 1	V	11747.5	77	118.6
YU2	Spot 2A	V	14125	S3D2	Spot 1	V	11830	72	118.6
YU3	Spot 2A	V	14186	S3D3	Spot 1	V	11891	34	118.6
YU4	Spot 2A	V	14224	S3D4	Spot 1	V	11929	34	118.6
YU5	Spot 2A	V	14205	S3D5	Spot 1	V	11910	72	118.6
YU6	Spot 2A	V	14314	S3D6	Spot 1	V	11514	112	118.6
YU7	Spot 2A	V	14438	S3D7	Spot 1	V	11638	112	118.6
YU1	Spot 2A	V	14042.5	U3D1	Spot 2	H	11747.5	77	119.3
YU2	Spot 2A	V	14125	U3D2	Spot 2	H	11830	72	119.3
YU3	Spot 2A	V	14186	U3D3	Spot 2	H	11891	34	119.3
YU4	Spot 2A	V	14224	U3D4	Spot 2	H	11929	34	119.3
YU5	Spot 2A	V	14205	U3D5	Spot 2	H	11910	72	119.3
YU6	Spot 2A	V	14314	U3D6	Spot 2	H	11514	112	119.3
YU7	Spot 2A	V	14438	U3D7	Spot 2	H	11638	112	119.3
YU1	Spot 2A	V	14042.5	Y3D1	Spot 2A	H	11747.5	77	119.2
YU2	Spot 2A	V	14125	Y3D2	Spot 2A	H	11830	72	119.2
YU3	Spot 2A	V	14186	Y3D3	Spot 2A	H	11891	34	119.2
YU4	Spot 2A	V	14224	Y3D4	Spot 2A	H	11929	34	119.2
YU5	Spot 2A	V	14205	Y3D5	Spot 2A	H	11910	72	119.2
YU6	Spot 2A	V	14314	Y3D6	Spot 2A	H	11514	112	119.2
YU7	Spot 2A	V	14438	Y3D7	Spot 2A	H	11638	112	119.2



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)	Channel Gain (dB)
YU1	Spot 2A	V	14042.5	W3D1	Spot 3	V	11747.5	77	118.6
YU2	Spot 2A	V	14125	W3D2	Spot 3	V	11830	72	118.6
YU3	Spot 2A	V	14186	W3D3	Spot 3	V	11891	34	118.6
YU4	Spot 2A	V	14224	W3D4	Spot 3	V	11929	34	118.6
YU5	Spot 2A	V	14205	W3D5	Spot 3	V	11910	72	118.6
YU6	Spot 2A	V	14314	W3D6	Spot 3	V	11514	112	118.6
YU7	Spot 2A	V	14438	W3D7	Spot 3	V	11638	112	118.6
YU1	Spot 2A	V	14042.5	X3D1	Spot 3X	H	11747.5	77	118.6
YU2	Spot 2A	V	14125	X3D2	Spot 3X	H	11830	72	118.6
YU3	Spot 2A	V	14186	X3D3	Spot 3X	H	11891	34	118.6
YU4	Spot 2A	V	14224	X3D4	Spot 3X	H	11929	34	118.6
YU5	Spot 2A	V	14205	X3D5	Spot 3X	H	11910	72	118.6
YU6	Spot 2A	V	14314	X3D6	Spot 3X	H	11514	112	118.6
YU7	Spot 2A	V	14438	X3D7	Spot 3X	H	11638	112	118.6
WU1	Spot 3	H	14042.5	S3D1	Spot 1	V	11747.5	77	112.4
WU2	Spot 3	H	14125	S3D2	Spot 1	V	11830	72	112.4
WU3	Spot 3	H	14186	S3D3	Spot 1	V	11891	34	112.4
WU4	Spot 3	H	14224	S3D4	Spot 1	V	11929	34	112.4
WU5	Spot 3	H	14205	S3D5	Spot 1	V	11910	72	112.4
WU6	Spot 3	H	14314	S3D6	Spot 1	V	11514	112	112.4
WU7	Spot 3	H	14438	S3D7	Spot 1	V	11638	112	112.4
WU1	Spot 3	H	14042.5	U3D1	Spot 2	H	11747.5	77	113.1
WU2	Spot 3	H	14125	U3D2	Spot 2	H	11830	72	113.1
WU3	Spot 3	H	14186	U3D3	Spot 2	H	11891	34	113.1
WU4	Spot 3	H	14224	U3D4	Spot 2	H	11929	34	113.1
WU5	Spot 3	H	14205	U3D5	Spot 2	H	11910	72	113.1
WU6	Spot 3	H	14314	U3D6	Spot 2	H	11514	112	113.1
WU7	Spot 3	H	14438	U3D7	Spot 2	H	11638	112	113.1
WU1	Spot 3	H	14042.5	Y3D1	Spot 2A	H	11747.5	77	113.0
WU2	Spot 3	H	14125	Y3D2	Spot 2A	H	11830	72	113.0
WU3	Spot 3	H	14186	Y3D3	Spot 2A	H	11891	34	113.0
WU4	Spot 3	H	14224	Y3D4	Spot 2A	H	11929	34	113.0
WU5	Spot 3	H	14205	Y3D5	Spot 2A	H	11910	72	113.0
WU6	Spot 3	H	14314	Y3D6	Spot 2A	H	11514	112	113.0
WU7	Spot 3	H	14438	Y3D7	Spot 2A	H	11638	112	113.0
WU1	Spot 3	H	14042.5	W3D1	Spot 3	V	11747.5	77	112.4
WU2	Spot 3	H	14125	W3D2	Spot 3	V	11830	72	112.4
WU3	Spot 3	H	14186	W3D3	Spot 3	V	11891	34	112.4
WU4	Spot 3	H	14224	W3D4	Spot 3	V	11929	34	112.4
WU5	Spot 3	H	14205	W3D5	Spot 3	V	11910	72	112.4
WU6	Spot 3	H	14314	W3D6	Spot 3	V	11514	112	112.4
WU7	Spot 3	H	14438	W3D7	Spot 3	V	11638	112	112.4
XU1	Spot 3X	V	14042.5	S3D1	Spot 1	V	11747.5	77	112.4
XU2	Spot 3X	V	14125	S3D2	Spot 1	V	11830	72	112.4
XU3	Spot 3X	V	14186	S3D3	Spot 1	V	11891	34	112.4
XU4	Spot 3X	V	14224	S3D4	Spot 1	V	11929	34	112.4
XU5	Spot 3X	V	14205	S3D5	Spot 1	V	11910	72	112.4
XU6	Spot 3X	V	14314	S3D6	Spot 1	V	11514	112	112.4
XU7	Spot 3X	V	14438	S3D7	Spot 1	V	11638	112	112.4
XU1	Spot 3X	V	14042.5	U3D1	Spot 2	H	11747.5	77	113.1
XU2	Spot 3X	V	14125	U3D2	Spot 2	H	11830	72	113.1
XU3	Spot 3X	V	14186	U3D3	Spot 2	H	11891	34	113.1
XU4	Spot 3X	V	14224	U3D4	Spot 2	H	11929	34	113.1
XU5	Spot 3X	V	14205	U3D5	Spot 2	H	11910	72	113.1

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)	Channel Gain (dB)
XU6	Spot 3X	V	14314	U3D6	Spot 2	H	11514	112	113.1
XU7	Spot 3X	V	14438	U3D7	Spot 2	H	11638	112	113.1
XU1	Spot 3X	V	14042.5	Y3D1	Spot 2A	H	11747.5	77	113.0
XU2	Spot 3X	V	14125	Y3D2	Spot 2A	H	11830	72	113.0
XU3	Spot 3X	V	14186	Y3D3	Spot 2A	H	11891	34	113.0
XU4	Spot 3X	V	14224	Y3D4	Spot 2A	H	11929	34	113.0
XU5	Spot 3X	V	14205	Y3D5	Spot 2A	H	11910	72	113.0
XU6	Spot 3X	V	14314	Y3D6	Spot 2A	H	11514	112	113.0
XU7	Spot 3X	V	14438	Y3D7	Spot 2A	H	11638	112	113.0
XU1	Spot 3X	V	14042.5	X3D1	Spot 3X	H	11747.5	77	112.4
XU2	Spot 3X	V	14125	X3D2	Spot 3X	H	11830	72	112.4
XU3	Spot 3X	V	14186	X3D3	Spot 3X	H	11891	34	112.4
XU4	Spot 3X	V	14224	X3D4	Spot 3X	H	11929	34	112.4
XU5	Spot 3X	V	14205	X3D5	Spot 3X	H	11910	72	112.4
XU6	Spot 3X	V	14314	X3D6	Spot 3X	H	11514	112	112.4
XU7	Spot 3X	V	14438	X3D7	Spot 3X	H	11638	112	112.4
EU1	West Hemi	LHCP	5967.5	S1D1	Spot 1	V	10992.5	77	119.2
EU2	West Hemi	LHCP	6050	S1D2	Spot 1	V	11075	72	119.2
EU3	West Hemi	LHCP	6111	S1D3	Spot 1	V	11136	34	119.2
EU4	West Hemi	LHCP	6149	S1D4	Spot 1	V	11174	34	119.2
EU5	West Hemi	LHCP	6130	S1D5	Spot 1	V	11155	72	119.2
EU6	West Hemi	LHCP	6220	S1DC	Spot 1	V	11495	72	119.2
EU1	West Hemi	LHCP	5967.5	U1D1	Spot 2	H	10992.5	77	119.9
EU2	West Hemi	LHCP	6050	U1D2	Spot 2	H	11075	72	119.9
EU3	West Hemi	LHCP	6111	U1D3	Spot 2	H	11136	34	119.9
EU4	West Hemi	LHCP	6149	U1D4	Spot 2	H	11174	34	119.9
EU5	West Hemi	LHCP	6130	U1D5	Spot 2	H	11155	72	119.9
EU6	West Hemi	LHCP	6220	U1DC	Spot 2	H	11495	72	119.9
EU1	West Hemi	LHCP	5967.5	Y1D1	Spot 2A	H	10992.5	77	119.8
EU2	West Hemi	LHCP	6050	Y1D2	Spot 2A	H	11075	72	119.8
EU3	West Hemi	LHCP	6111	Y1D3	Spot 2A	H	11136	34	119.8
EU4	West Hemi	LHCP	6149	Y1D4	Spot 2A	H	11174	34	119.8
EU5	West Hemi	LHCP	6130	Y1D5	Spot 2A	H	11155	72	119.8
EU6	West Hemi	LHCP	6220	Y1DC	Spot 2A	H	11495	72	119.8
EU1	West Hemi	LHCP	5967.5	W1D1	Spot 3	V	10992.5	77	119.2
EU2	West Hemi	LHCP	6050	W1D2	Spot 3	V	11075	72	119.2
EU3	West Hemi	LHCP	6111	W1D3	Spot 3	V	11136	34	119.2
EU4	West Hemi	LHCP	6149	W1D4	Spot 3	V	11174	34	119.2
EU5	West Hemi	LHCP	6130	W1D5	Spot 3	V	11155	72	119.2
EU6	West Hemi	LHCP	6220	W1DC	Spot 3	V	11495	72	119.2
EU1	West Hemi	LHCP	5967.5	X1D1	Spot 3X	H	10992.5	77	119.2
EU2	West Hemi	LHCP	6050	X1D2	Spot 3X	H	11075	72	119.2
EU3	West Hemi	LHCP	6111	X1D3	Spot 3X	H	11136	34	119.2
EU4	West Hemi	LHCP	6149	X1D4	Spot 3X	H	11174	34	119.2
EU5	West Hemi	LHCP	6130	X1D5	Spot 3X	H	11155	72	119.2
EU6	West Hemi	LHCP	6220	X1DC	Spot 3X	H	11495	72	119.2
FU1	East Hemi	LHCP	5967.5	S1D1	Spot 1	V	10992.5	77	118.3
FU2	East Hemi	LHCP	6050	S1D2	Spot 1	V	11075	72	118.3
FU3	East Hemi	LHCP	6111	S1D3	Spot 1	V	11136	34	118.3
FU4	East Hemi	LHCP	6149	S1D4	Spot 1	V	11174	34	118.3
FU5	East Hemi	LHCP	6130	S1D5	Spot 1	V	11155	72	118.3
FU6	East Hemi	LHCP	6220	S1DC	Spot 1	V	11495	72	118.3

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)	Channel Gain (dB)
FU1	East Hemi	LHCP	5967.5	U1D1	Spot 2	H	10992.5	77	119.0
FU2	East Hemi	LHCP	6050	U1D2	Spot 2	H	11075	72	119.0
FU3	East Hemi	LHCP	6111	U1D3	Spot 2	H	11136	34	119.0
FU4	East Hemi	LHCP	6149	U1D4	Spot 2	H	11174	34	119.0
FU5	East Hemi	LHCP	6130	U1D5	Spot 2	H	11155	72	119.0
FU6	East Hemi	LHCP	6220	U1DC	Spot 2	H	11495	72	119.0
FU1	East Hemi	LHCP	5967.5	Y1D1	Spot 2A	H	10992.5	77	118.9
FU2	East Hemi	LHCP	6050	Y1D2	Spot 2A	H	11075	72	118.9
FU3	East Hemi	LHCP	6111	Y1D3	Spot 2A	H	11136	34	118.9
FU4	East Hemi	LHCP	6149	Y1D4	Spot 2A	H	11174	34	118.9
FU5	East Hemi	LHCP	6130	Y1D5	Spot 2A	H	11155	72	118.9
FU6	East Hemi	LHCP	6220	Y1DC	Spot 2A	H	11495	72	118.9
FU1	East Hemi	LHCP	5967.5	W1D1	Spot 3	V	10992.5	77	118.3
FU2	East Hemi	LHCP	6050	W1D2	Spot 3	V	11075	72	118.3
FU3	East Hemi	LHCP	6111	W1D3	Spot 3	V	11136	34	118.3
FU4	East Hemi	LHCP	6149	W1D4	Spot 3	V	11174	34	118.3
FU5	East Hemi	LHCP	6130	W1D5	Spot 3	V	11155	72	118.3
FU6	East Hemi	LHCP	6220	W1DC	Spot 3	V	11495	72	118.3
FU1	East Hemi	LHCP	5967.5	X1D1	Spot 3X	H	10992.5	77	118.3
FU2	East Hemi	LHCP	6050	X1D2	Spot 3X	H	11075	72	118.3
FU3	East Hemi	LHCP	6111	X1D3	Spot 3X	H	11136	34	118.3
FU4	East Hemi	LHCP	6149	X1D4	Spot 3X	H	11174	34	118.3
FU5	East Hemi	LHCP	6130	X1D5	Spot 3X	H	11155	72	118.3
FU6	East Hemi	LHCP	6220	X1DC	Spot 3X	H	11495	72	118.3
GU1	NW Zone	RHCP	5967.5	S1D1	Spot 1	V	10992.5	77	116.8
GU2	NW Zone	RHCP	6050	S1D2	Spot 1	V	11075	72	116.8
GU3	NW Zone	RHCP	6111	S1D3	Spot 1	V	11136	34	116.8
GU4	NW Zone	RHCP	6149	S1D4	Spot 1	V	11174	34	116.8
GU5	NW Zone	RHCP	6130	S1D5	Spot 1	V	11155	72	116.8
GU6	NW Zone	RHCP	6220	S1DC	Spot 1	V	11495	72	116.8
GU1	NW Zone	RHCP	5967.5	U1D1	Spot 2	H	10992.5	77	117.5
GU2	NW Zone	RHCP	6050	U1D2	Spot 2	H	11075	72	117.5
GU3	NW Zone	RHCP	6111	U1D3	Spot 2	H	11136	34	117.5
GU4	NW Zone	RHCP	6149	U1D4	Spot 2	H	11174	34	117.5
GU5	NW Zone	RHCP	6130	U1D5	Spot 2	H	11155	72	117.5
GU6	NW Zone	RHCP	6220	U1DC	Spot 2	H	11495	72	117.5
GU1	NW Zone	RHCP	5967.5	Y1D1	Spot 2A	H	10992.5	77	117.4
GU2	NW Zone	RHCP	6050	Y1D2	Spot 2A	H	11075	72	117.4
GU3	NW Zone	RHCP	6111	Y1D3	Spot 2A	H	11136	34	117.4
GU4	NW Zone	RHCP	6149	Y1D4	Spot 2A	H	11174	34	117.4
GU5	NW Zone	RHCP	6130	Y1D5	Spot 2A	H	11155	72	117.4
GU6	NW Zone	RHCP	6220	Y1DC	Spot 2A	H	11495	72	117.4
GU1	NW Zone	RHCP	5967.5	W1D1	Spot 3	V	10992.5	77	116.8
GU2	NW Zone	RHCP	6050	W1D2	Spot 3	V	11075	72	116.8
GU3	NW Zone	RHCP	6111	W1D3	Spot 3	V	11136	34	116.8
GU4	NW Zone	RHCP	6149	W1D4	Spot 3	V	11174	34	116.8
GU5	NW Zone	RHCP	6130	W1D5	Spot 3	V	11155	72	116.8
GU6	NW Zone	RHCP	6220	W1DC	Spot 3	V	11495	72	116.8
GU1	NW Zone	RHCP	5967.5	X1D1	Spot 3X	H	10992.5	77	116.8
GU2	NW Zone	RHCP	6050	X1D2	Spot 3X	H	11075	72	116.8
GU3	NW Zone	RHCP	6111	X1D3	Spot 3X	H	11136	34	116.8
GU4	NW Zone	RHCP	6149	X1D4	Spot 3X	H	11174	34	116.8
GU5	NW Zone	RHCP	6130	X1D5	Spot 3X	H	11155	72	116.8

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)	Channel Gain (dB)
GU6	NW Zone	RHCP	6220	X1DC	Spot 3X	H	11495	72	116.8
JU1	SE Zone	RHCP	5967.5	S1D1	Spot 1	V	10992.5	77	116.7
JU2	SE Zone	RHCP	6050	S1D2	Spot 1	V	11075	72	116.7
JU3	SE Zone	RHCP	6111	S1D3	Spot 1	V	11136	34	116.7
JU4	SE Zone	RHCP	6149	S1D4	Spot 1	V	11174	34	116.7
JU5	SE Zone	RHCP	6130	S1D5	Spot 1	V	11155	72	116.7
JU6	SE Zone	RHCP	6220	S1DC	Spot 1	V	11495	72	116.7
JU1	SE Zone	RHCP	5967.5	U1D1	Spot 2	H	10992.5	77	117.4
JU2	SE Zone	RHCP	6050	U1D2	Spot 2	H	11075	72	117.4
JU3	SE Zone	RHCP	6111	U1D3	Spot 2	H	11136	34	117.4
JU4	SE Zone	RHCP	6149	U1D4	Spot 2	H	11174	34	117.4
JU5	SE Zone	RHCP	6130	U1D5	Spot 2	H	11155	72	117.4
JU6	SE Zone	RHCP	6220	U1DC	Spot 2	H	11495	72	117.4
JU1	SE Zone	RHCP	5967.5	Y1D1	Spot 2A	H	10992.5	77	117.3
JU2	SE Zone	RHCP	6050	Y1D2	Spot 2A	H	11075	72	117.3
JU3	SE Zone	RHCP	6111	Y1D3	Spot 2A	H	11136	34	117.3
JU4	SE Zone	RHCP	6149	Y1D4	Spot 2A	H	11174	34	117.3
JU5	SE Zone	RHCP	6130	Y1D5	Spot 2A	H	11155	72	117.3
JU6	SE Zone	RHCP	6220	Y1DC	Spot 2A	H	11495	72	117.3
JU1	SE Zone	RHCP	5967.5	W1D1	Spot 3	V	10992.5	77	116.7
JU2	SE Zone	RHCP	6050	W1D2	Spot 3	V	11075	72	116.7
JU3	SE Zone	RHCP	6111	W1D3	Spot 3	V	11136	34	116.7
JU4	SE Zone	RHCP	6149	W1D4	Spot 3	V	11174	34	116.7
JU5	SE Zone	RHCP	6130	W1D5	Spot 3	V	11155	72	116.7
JU6	SE Zone	RHCP	6220	W1DC	Spot 3	V	11495	72	116.7
JU1	SE Zone	RHCP	5967.5	X1D1	Spot 3X	H	10992.5	77	116.7
JU2	SE Zone	RHCP	6050	X1D2	Spot 3X	H	11075	72	116.7
JU3	SE Zone	RHCP	6111	X1D3	Spot 3X	H	11136	34	116.7
JU4	SE Zone	RHCP	6149	X1D4	Spot 3X	H	11174	34	116.7
JU5	SE Zone	RHCP	6130	X1D5	Spot 3X	H	11155	72	116.7
JU6	SE Zone	RHCP	6220	X1DC	Spot 3X	H	11495	72	116.7
HU1	NE Zone	RHCP	5967.5	S1D1	Spot 1	V	10992.5	77	114.4
HU2	NE Zone	RHCP	6050	S1D2	Spot 1	V	11075	72	114.4
HU3	NE Zone	RHCP	6111	S1D3	Spot 1	V	11136	34	114.4
HU4	NE Zone	RHCP	6149	S1D4	Spot 1	V	11174	34	114.4
HU5	NE Zone	RHCP	6130	S1D5	Spot 1	V	11155	72	114.4
HU6	NE Zone	RHCP	6220	S1DC	Spot 1	V	11495	72	114.4
HU1	NE Zone	RHCP	5967.5	U1D1	Spot 2	H	10992.5	77	115.1
HU2	NE Zone	RHCP	6050	U1D2	Spot 2	H	11075	72	115.1
HU3	NE Zone	RHCP	6111	U1D3	Spot 2	H	11136	34	115.1
HU4	NE Zone	RHCP	6149	U1D4	Spot 2	H	11174	34	115.1
HU5	NE Zone	RHCP	6130	U1D5	Spot 2	H	11155	72	115.1
HU6	NE Zone	RHCP	6220	U1DC	Spot 2	H	11495	72	115.1
HU1	NE Zone	RHCP	5967.5	Y1D1	Spot 2A	H	10992.5	77	115.0
HU2	NE Zone	RHCP	6050	Y1D2	Spot 2A	H	11075	72	115.0
HU3	NE Zone	RHCP	6111	Y1D3	Spot 2A	H	11136	34	115.0
HU4	NE Zone	RHCP	6149	Y1D4	Spot 2A	H	11174	34	115.0
HU5	NE Zone	RHCP	6130	Y1D5	Spot 2A	H	11155	72	115.0
HU6	NE Zone	RHCP	6220	Y1DC	Spot 2A	H	11495	72	115.0
HU1	NE Zone	RHCP	5967.5	W1D1	Spot 3	V	10992.5	77	114.4
HU2	NE Zone	RHCP	6050	W1D2	Spot 3	V	11075	72	114.4
HU3	NE Zone	RHCP	6111	W1D3	Spot 3	V	11136	34	114.4

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)	Channel Gain (dB)
HU4	NE Zone	RHCP	6149	W1D4	Spot 3	V	11174	34	114.4
HU5	NE Zone	RHCP	6130	W1D5	Spot 3	V	11155	72	114.4
HU6	NE Zone	RHCP	6220	W1DC	Spot 3	V	11495	72	114.4
HU1	NE Zone	RHCP	5967.5	X1D1	Spot 3X	H	10992.5	77	114.4
HU2	NE Zone	RHCP	6050	X1D2	Spot 3X	H	11075	72	114.4
HU3	NE Zone	RHCP	6111	X1D3	Spot 3X	H	11136	34	114.4
HU4	NE Zone	RHCP	6149	X1D4	Spot 3X	H	11174	34	114.4
HU5	NE Zone	RHCP	6130	X1D5	Spot 3X	H	11155	72	114.4
HU6	NE Zone	RHCP	6220	X1DC	Spot 3X	H	11495	72	114.4
IU1	SW Zone	RHCP	5967.5	S1D1	Spot 1	V	10992.5	77	114.9
IU2	SW Zone	RHCP	6050	S1D2	Spot 1	V	11075	72	114.9
IU3	SW Zone	RHCP	6111	S1D3	Spot 1	V	11136	34	114.9
IU4	SW Zone	RHCP	6149	S1D4	Spot 1	V	11174	34	114.9
IU5	SW Zone	RHCP	6130	S1D5	Spot 1	V	11155	72	114.9
IU6	SW Zone	RHCP	6220	S1DC	Spot 1	V	11495	72	114.9
IU1	SW Zone	RHCP	5967.5	U1D1	Spot 2	H	10992.5	77	115.6
IU2	SW Zone	RHCP	6050	U1D2	Spot 2	H	11075	72	115.6
IU3	SW Zone	RHCP	6111	U1D3	Spot 2	H	11136	34	115.6
IU4	SW Zone	RHCP	6149	U1D4	Spot 2	H	11174	34	115.6
IU5	SW Zone	RHCP	6130	U1D5	Spot 2	H	11155	72	115.6
IU6	SW Zone	RHCP	6220	U1DC	Spot 2	H	11495	72	115.6
IU1	SW Zone	RHCP	5967.5	Y1D1	Spot 2A	H	10992.5	77	115.5
IU2	SW Zone	RHCP	6050	Y1D2	Spot 2A	H	11075	72	115.5
IU3	SW Zone	RHCP	6111	Y1D3	Spot 2A	H	11136	34	115.5
IU4	SW Zone	RHCP	6149	Y1D4	Spot 2A	H	11174	34	115.5
IU5	SW Zone	RHCP	6130	Y1D5	Spot 2A	H	11155	72	115.5
IU6	SW Zone	RHCP	6220	Y1DC	Spot 2A	H	11495	72	115.5
IU1	SW Zone	RHCP	5967.5	W1D1	Spot 3	V	10992.5	77	114.9
IU2	SW Zone	RHCP	6050	W1D2	Spot 3	V	11075	72	114.9
IU3	SW Zone	RHCP	6111	W1D3	Spot 3	V	11136	34	114.9
IU4	SW Zone	RHCP	6149	W1D4	Spot 3	V	11174	34	114.9
IU5	SW Zone	RHCP	6130	W1D5	Spot 3	V	11155	72	114.9
IU6	SW Zone	RHCP	6220	W1DC	Spot 3	V	11495	72	114.9
IU1	SW Zone	RHCP	5967.5	X1D1	Spot 3X	H	10992.5	77	114.9
IU2	SW Zone	RHCP	6050	X1D2	Spot 3X	H	11075	72	114.9
IU3	SW Zone	RHCP	6111	X1D3	Spot 3X	H	11136	34	114.9
IU4	SW Zone	RHCP	6149	X1D4	Spot 3X	H	11174	34	114.9
IU5	SW Zone	RHCP	6130	X1D5	Spot 3X	H	11155	72	114.9
IU6	SW Zone	RHCP	6220	X1DC	Spot 3X	H	11495	72	114.9
KU1	Combined NW+SE Zone	RHCP	5967.5	S1D1	Spot 1	V	10992.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	S1D2	Spot 1	V	11075	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	S1D3	Spot 1	V	11136	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	S1D4	Spot 1	V	11174	34	119.0
KU5	Combined NW+SE Zone	RHCP	6130	S1D5	Spot 1	V	11155	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	S1DC	Spot 1	V	11495	72	119.0
KU1	Combined NW+SE Zone	RHCP	5967.5	U1D1	Spot 2	H	10992.5	77	119.7
KU2	Combined NW+SE Zone	RHCP	6050	U1D2	Spot 2	H	11075	72	119.7
KU3	Combined NW+SE Zone	RHCP	6111	U1D3	Spot 2	H	11136	34	119.7
KU4	Combined NW+SE Zone	RHCP	6149	U1D4	Spot 2	H	11174	34	119.7
KU5	Combined NW+SE Zone	RHCP	6130	U1D5	Spot 2	H	11155	72	119.7
KU6	Combined NW+SE Zone	RHCP	6220	U1DC	Spot 2	H	11495	72	119.7
KU1	Combined NW+SE Zone	RHCP	5967.5	Y1D1	Spot 2A	H	10992.5	77	119.6

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)	Channel Gain (dB)
KU2	Combined NW+SE Zone	RHCP	6050	Y1D2	Spot 2A	H	11075	72	119.6
KU3	Combined NW+SE Zone	RHCP	6111	Y1D3	Spot 2A	H	11136	34	119.6
KU4	Combined NW+SE Zone	RHCP	6149	Y1D4	Spot 2A	H	11174	34	119.6
KU5	Combined NW+SE Zone	RHCP	6130	Y1D5	Spot 2A	H	11155	72	119.6
KU6	Combined NW+SE Zone	RHCP	6220	Y1DC	Spot 2A	H	11495	72	119.6
KU1	Combined NW+SE Zone	RHCP	5967.5	W1D1	Spot 3	V	10992.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	W1D2	Spot 3	V	11075	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	W1D3	Spot 3	V	11136	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	W1D4	Spot 3	V	11174	34	119.0
KU5	Combined NW+SE Zone	RHCP	6130	W1D5	Spot 3	V	11155	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	W1DC	Spot 3	V	11495	72	119.0
KU1	Combined NW+SE Zone	RHCP	5967.5	X1D1	Spot 3X	H	10992.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	X1D2	Spot 3X	H	11075	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	X1D3	Spot 3X	H	11136	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	X1D4	Spot 3X	H	11174	34	119.0
KU5	Combined NW+SE Zone	RHCP	6130	X1D5	Spot 3X	H	11155	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	X1DC	Spot 3X	H	11494	72	119.0
LU1	Combined NE+SW Zone	RHCP	5967.5	S1D1	Spot 1	V	10992.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	S1D2	Spot 1	V	11075	72	117.1
LU3	Combined NE+SW Zone	RHCP	6111	S1D3	Spot 1	V	11136	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	S1D4	Spot 1	V	11174	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	S1D5	Spot 1	V	11155	72	117.1
LU6	Combined NE+SW Zone	RHCP	6220	S1DC	Spot 1	V	11495	72	117.1
LU1	Combined NE+SW Zone	RHCP	5967.5	U1D1	Spot 2	H	10992.5	77	117.8
LU2	Combined NE+SW Zone	RHCP	6050	U1D2	Spot 2	H	11075	72	117.8
LU3	Combined NE+SW Zone	RHCP	6111	U1D3	Spot 2	H	11136	34	117.8
LU4	Combined NE+SW Zone	RHCP	6149	U1D4	Spot 2	H	11174	34	117.8
LU5	Combined NE+SW Zone	RHCP	6130	U1D5	Spot 2	H	11155	72	117.8
LU6	Combined NE+SW Zone	RHCP	6220	U1DC	Spot 2	H	11495	72	117.8
LU1	Combined NE+SW Zone	RHCP	5967.5	Y1D1	Spot 2A	H	10992.5	77	117.7
LU2	Combined NE+SW Zone	RHCP	6050	Y1D2	Spot 2A	H	11075	72	117.7
LU3	Combined NE+SW Zone	RHCP	6111	Y1D3	Spot 2A	H	11136	34	117.7
LU4	Combined NE+SW Zone	RHCP	6149	Y1D4	Spot 2A	H	11174	34	117.7
LU5	Combined NE+SW Zone	RHCP	6130	Y1D5	Spot 2A	H	11155	72	117.7
LU6	Combined NE+SW Zone	RHCP	6220	Y1DC	Spot 2A	H	11495	72	117.7
LU1	Combined NE+SW Zone	RHCP	5967.5	W1D1	Spot 3	V	10992.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	W1D2	Spot 3	V	11075	72	117.1
LU3	Combined NE+SW Zone	RHCP	6111	W1D3	Spot 3	V	11136	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	W1D4	Spot 3	V	11174	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	W1D5	Spot 3	V	11155	72	117.1
LU6	Combined NE+SW Zone	RHCP	6220	W1DC	Spot 3	V	11495	72	117.1
LU1	Combined NE+SW Zone	RHCP	5967.5	X1D1	Spot 3X	H	10992.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	X1D2	Spot 3X	H	11075	72	117.1
LU3	Combined NE+SW Zone	RHCP	6111	X1D3	Spot 3X	H	11136	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	X1D4	Spot 3X	H	11174	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	X1D5	Spot 3X	H	11155	72	117.1
LU6	Combined NE+SW Zone	RHCP	6220	X1DC	Spot 3X	H	11495	72	117.1
EU1	West Hemi	LHCP	5967.5	S2D1	Spot 1	V	12547.5	77	119.2
EU2	West Hemi	LHCP	6050	S2D2	Spot 1	V	12630	72	119.2
EU3	West Hemi	LHCP	6111	S2D3	Spot 1	V	12691	34	119.2
EU4	West Hemi	LHCP	6149	S2D4	Spot 1	V	12729	34	119.2
EU5	West Hemi	LHCP	6130	S2D5	Spot 1	V	12710	72	119.2
EU6	West Hemi	LHCP	6220	S2DC	Spot 1	V	11495	72	119.2

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)	Channel Gain (dB)
EU1	West Hemi	LHCP	5967.5	U2D1	Spot 2	H	12547.5	77	119.9
EU2	West Hemi	LHCP	6050	U2D2	Spot 2	H	12630	72	119.9
EU3	West Hemi	LHCP	6111	U2D3	Spot 2	H	12691	34	119.9
EU4	West Hemi	LHCP	6149	U2D4	Spot 2	H	12729	34	119.9
EU5	West Hemi	LHCP	6130	U2D5	Spot 2	H	12710	72	119.9
EU6	West Hemi	LHCP	6220	U2DC	Spot 2	H	11495	72	119.9
EU1	West Hemi	LHCP	5967.5	Y2D1	Spot 2A	H	12547.5	77	119.8
EU2	West Hemi	LHCP	6050	Y2D2	Spot 2A	H	12630	72	119.8
EU3	West Hemi	LHCP	6111	Y2D3	Spot 2A	H	12691	34	119.8
EU4	West Hemi	LHCP	6149	Y2D4	Spot 2A	H	12729	34	119.8
EU5	West Hemi	LHCP	6130	Y2D5	Spot 2A	H	12710	72	119.8
EU6	West Hemi	LHCP	6220	Y2DC	Spot 2A	H	11495	72	119.8
EU1	West Hemi	LHCP	5967.5	W2D1	Spot 3	V	12547.5	77	119.2
EU2	West Hemi	LHCP	6050	W2D2	Spot 3	V	12630	72	119.2
EU3	West Hemi	LHCP	6111	W2D3	Spot 3	V	12691	34	119.2
EU4	West Hemi	LHCP	6149	W2D4	Spot 3	V	12729	34	119.2
EU5	West Hemi	LHCP	6130	W2D5	Spot 3	V	12710	72	119.2
EU6	West Hemi	LHCP	6220	W2DC	Spot 3	V	11495	72	119.2
EU1	West Hemi	LHCP	5967.5	X2D1	Spot 3X	H	12547.5	77	119.2
EU2	West Hemi	LHCP	6050	X2D2	Spot 3X	H	12630	72	119.2
EU3	West Hemi	LHCP	6111	X2D3	Spot 3X	H	12691	34	119.2
EU4	West Hemi	LHCP	6149	X2D4	Spot 3X	H	12729	34	119.2
EU5	West Hemi	LHCP	6130	X2D5	Spot 3X	H	12710	72	119.2
EU6	West Hemi	LHCP	6220	X2DC	Spot 3X	H	11495	72	119.2
FU1	East Hemi	LHCP	5967.5	S2D1	Spot 1	V	12547.5	77	118.3
FU2	East Hemi	LHCP	6050	S2D2	Spot 1	V	12630	72	118.3
FU3	East Hemi	LHCP	6111	S2D3	Spot 1	V	12691	34	118.3
FU4	East Hemi	LHCP	6149	S2D4	Spot 1	V	12729	34	118.3
FU5	East Hemi	LHCP	6130	S2D5	Spot 1	V	12710	72	118.3
FU6	East Hemi	LHCP	6220	S2DC	Spot 1	V	11495	72	118.3
FU1	East Hemi	LHCP	5967.5	U2D1	Spot 2	H	12547.5	77	119.0
FU2	East Hemi	LHCP	6050	U2D2	Spot 2	H	12630	72	119.0
FU3	East Hemi	LHCP	6111	U2D3	Spot 2	H	12691	34	119.0
FU4	East Hemi	LHCP	6149	U2D4	Spot 2	H	12729	34	119.0
FU5	East Hemi	LHCP	6130	U2D5	Spot 2	H	12710	72	119.0
FU6	East Hemi	LHCP	6220	U2DC	Spot 2	H	11495	72	119.0
FU1	East Hemi	LHCP	5967.5	Y2D1	Spot 2A	H	12547.5	77	118.9
FU2	East Hemi	LHCP	6050	Y2D2	Spot 2A	H	12630	72	118.9
FU3	East Hemi	LHCP	6111	Y2D3	Spot 2A	H	12691	34	118.9
FU4	East Hemi	LHCP	6149	Y2D4	Spot 2A	H	12729	34	118.9
FU5	East Hemi	LHCP	6130	Y2D5	Spot 2A	H	12710	72	118.9
FU6	East Hemi	LHCP	6220	Y2DC	Spot 2A	H	11495	72	118.9
FU1	East Hemi	LHCP	5967.5	W2D1	Spot 3	V	12547.5	77	118.3
FU2	East Hemi	LHCP	6050	W2D2	Spot 3	V	12630	72	118.3
FU3	East Hemi	LHCP	6111	W2D3	Spot 3	V	12691	34	118.3
FU4	East Hemi	LHCP	6149	W2D4	Spot 3	V	12729	34	118.3
FU5	East Hemi	LHCP	6130	W2D5	Spot 3	V	12710	72	118.3
FU6	East Hemi	LHCP	6220	W2DC	Spot 3	V	11495	72	118.3
FU1	East Hemi	LHCP	5967.5	X2D1	Spot 3X	H	12547.5	77	118.3
FU2	East Hemi	LHCP	6050	X2D2	Spot 3X	H	12630	72	118.3
FU3	East Hemi	LHCP	6111	X2D3	Spot 3X	H	12691	34	118.3
FU4	East Hemi	LHCP	6149	X2D4	Spot 3X	H	12729	34	118.3

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)	Channel Gain (dB)
FU5	East Hemi	LHCP	6130	X2D5	Spot 3X	H	12710	72	118.3
FU6	East Hemi	LHCP	6220	X2DC	Spot 3X	H	11495	72	118.3
GU1	NW Zone	RHCP	5967.5	S2D1	Spot 1	V	12547.5	77	116.8
GU2	NW Zone	RHCP	6050	S2D2	Spot 1	V	12630	72	116.8
GU3	NW Zone	RHCP	6111	S2D3	Spot 1	V	12691	34	116.8
GU4	NW Zone	RHCP	6149	S2D4	Spot 1	V	12729	34	116.8
GU5	NW Zone	RHCP	6130	S2D5	Spot 1	V	12710	72	116.8
GU6	NW Zone	RHCP	6220	S2DC	Spot 1	V	11495	72	116.8
GU1	NW Zone	RHCP	5967.5	U2D1	Spot 2	H	12547.5	77	117.5
GU2	NW Zone	RHCP	6050	U2D2	Spot 2	H	12630	72	117.5
GU3	NW Zone	RHCP	6111	U2D3	Spot 2	H	12691	34	117.5
GU4	NW Zone	RHCP	6149	U2D4	Spot 2	H	12729	34	117.5
GU5	NW Zone	RHCP	6130	U2D5	Spot 2	H	12710	72	117.5
GU6	NW Zone	RHCP	6220	U2DC	Spot 2	H	11495	72	117.5
GU1	NW Zone	RHCP	5967.5	Y2D1	Spot 2A	H	12547.5	77	117.4
GU2	NW Zone	RHCP	6050	Y2D2	Spot 2A	H	12630	72	117.4
GU3	NW Zone	RHCP	6111	Y2D3	Spot 2A	H	12691	34	117.4
GU4	NW Zone	RHCP	6149	Y2D4	Spot 2A	H	12729	34	117.4
GU5	NW Zone	RHCP	6130	Y2D5	Spot 2A	H	12710	72	117.4
GU6	NW Zone	RHCP	6220	Y2DC	Spot 2A	H	11495	72	117.4
GU1	NW Zone	RHCP	5967.5	W2D1	Spot 3	V	12547.5	77	116.8
GU2	NW Zone	RHCP	6050	W2D2	Spot 3	V	12630	72	116.8
GU3	NW Zone	RHCP	6111	W2D3	Spot 3	V	12691	34	116.8
GU4	NW Zone	RHCP	6149	W2D4	Spot 3	V	12729	34	116.8
GU5	NW Zone	RHCP	6130	W2D5	Spot 3	V	12710	72	116.8
GU6	NW Zone	RHCP	6220	W2DC	Spot 3	V	11495	72	116.8
GU1	NW Zone	RHCP	5967.5	X2D1	Spot 3X	H	12547.5	77	116.8
GU2	NW Zone	RHCP	6050	X2D2	Spot 3X	H	12630	72	116.8
GU3	NW Zone	RHCP	6111	X2D3	Spot 3X	H	12691	34	116.8
GU4	NW Zone	RHCP	6149	X2D4	Spot 3X	H	12729	34	116.8
GU5	NW Zone	RHCP	6130	X2D5	Spot 3X	H	12710	72	116.8
GU6	NW Zone	RHCP	6220	X2DC	Spot 3X	H	11495	72	116.8
JU1	SE Zone	RHCP	5967.5	S2D1	Spot 1	V	12547.5	77	116.7
JU2	SE Zone	RHCP	6050	S2D2	Spot 1	V	12630	72	116.7
JU3	SE Zone	RHCP	6111	S2D3	Spot 1	V	12691	34	116.7
JU4	SE Zone	RHCP	6149	S2D4	Spot 1	V	12729	34	116.7
JU5	SE Zone	RHCP	6130	S2D5	Spot 1	V	12710	72	116.7
JU6	SE Zone	RHCP	6220	S2DC	Spot 1	V	11495	72	116.7
JU1	SE Zone	RHCP	5967.5	U2D1	Spot 2	H	12547.5	77	117.4
JU2	SE Zone	RHCP	6050	U2D2	Spot 2	H	12630	72	117.4
JU3	SE Zone	RHCP	6111	U2D3	Spot 2	H	12691	34	117.4
JU4	SE Zone	RHCP	6149	U2D4	Spot 2	H	12729	34	117.4
JU5	SE Zone	RHCP	6130	U2D5	Spot 2	H	12710	72	117.4
JU6	SE Zone	RHCP	6220	U2DC	Spot 2	H	11495	72	117.4
JU1	SE Zone	RHCP	5967.5	Y2D1	Spot 2A	H	12547.5	77	117.3
JU2	SE Zone	RHCP	6050	Y2D2	Spot 2A	H	12630	72	117.3
JU3	SE Zone	RHCP	6111	Y2D3	Spot 2A	H	12691	34	117.3
JU4	SE Zone	RHCP	6149	Y2D4	Spot 2A	H	12729	34	117.3
JU5	SE Zone	RHCP	6130	Y2D5	Spot 2A	H	12710	72	117.3
JU6	SE Zone	RHCP	6220	Y2DC	Spot 2A	H	11495	72	117.3
JU1	SE Zone	RHCP	5967.5	W2D1	Spot 3	V	12547.5	77	116.7
JU2	SE Zone	RHCP	6050	W2D2	Spot 3	V	12630	72	116.7



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)	Channel Gain (dB)
JU3	SE Zone	RHCP	6111	W2D3	Spot 3	V	12691	34	116.7
JU4	SE Zone	RHCP	6149	W2D4	Spot 3	V	12729	34	116.7
JU5	SE Zone	RHCP	6130	W2D5	Spot 3	V	12710	72	116.7
JU6	SE Zone	RHCP	6220	W2DC	Spot 3	V	11495	72	116.7
JU1	SE Zone	RHCP	5967.5	X2D1	Spot 3X	H	12547.5	77	116.7
JU2	SE Zone	RHCP	6050	X2D2	Spot 3X	H	12630	72	116.7
JU3	SE Zone	RHCP	6111	X2D3	Spot 3X	H	12691	34	116.7
JU4	SE Zone	RHCP	6149	X2D4	Spot 3X	H	12729	34	116.7
JU5	SE Zone	RHCP	6130	X2D5	Spot 3X	H	12710	72	116.7
JU6	SE Zone	RHCP	6220	X2DC	Spot 3X	H	11495	72	116.7
HU1	NE Zone	RHCP	5967.5	S2D1	Spot 1	V	12547.5	77	114.4
HU2	NE Zone	RHCP	6050	S2D2	Spot 1	V	12630	72	114.4
HU3	NE Zone	RHCP	6111	S2D3	Spot 1	V	12691	34	114.4
HU4	NE Zone	RHCP	6149	S2D4	Spot 1	V	12729	34	114.4
HU5	NE Zone	RHCP	6130	S2D5	Spot 1	V	12710	72	114.4
HU6	NE Zone	RHCP	6220	S2DC	Spot 1	V	11495	72	114.4
HU1	NE Zone	RHCP	5967.5	U2D1	Spot 2	H	12547.5	77	115.1
HU2	NE Zone	RHCP	6050	U2D2	Spot 2	H	12630	72	115.1
HU3	NE Zone	RHCP	6111	U2D3	Spot 2	H	12691	34	115.1
HU4	NE Zone	RHCP	6149	U2D4	Spot 2	H	12729	34	115.1
HU5	NE Zone	RHCP	6130	U2D5	Spot 2	H	12710	72	115.1
HU6	NE Zone	RHCP	6220	U2DC	Spot 2	H	11495	72	115.1
HU1	NE Zone	RHCP	5967.5	Y2D1	Spot 2A	H	12547.5	77	115.0
HU2	NE Zone	RHCP	6050	Y2D2	Spot 2A	H	12630	72	115.0
HU3	NE Zone	RHCP	6111	Y2D3	Spot 2A	H	12691	34	115.0
HU4	NE Zone	RHCP	6149	Y2D4	Spot 2A	H	12729	34	115.0
HU5	NE Zone	RHCP	6130	Y2D5	Spot 2A	H	12710	72	115.0
HU6	NE Zone	RHCP	6220	Y2DC	Spot 2A	H	11495	72	115.0
HU1	NE Zone	RHCP	5967.5	W2D1	Spot 3	V	12547.5	77	114.4
HU2	NE Zone	RHCP	6050	W2D2	Spot 3	V	12630	72	114.4
HU3	NE Zone	RHCP	6111	W2D3	Spot 3	V	12691	34	114.4
HU4	NE Zone	RHCP	6149	W2D4	Spot 3	V	12729	34	114.4
HU5	NE Zone	RHCP	6130	W2D5	Spot 3	V	12710	72	114.4
HU6	NE Zone	RHCP	6220	W2DC	Spot 3	V	11495	72	114.4
HU1	NE Zone	RHCP	5967.5	X2D1	Spot 3X	H	12547.5	77	114.4
HU2	NE Zone	RHCP	6050	X2D2	Spot 3X	H	12630	72	114.4
HU3	NE Zone	RHCP	6111	X2D3	Spot 3X	H	12691	34	114.4
HU4	NE Zone	RHCP	6149	X2D4	Spot 3X	H	12729	34	114.4
HU5	NE Zone	RHCP	6130	X2D5	Spot 3X	H	12710	72	114.4
HU6	NE Zone	RHCP	6220	X2DC	Spot 3X	H	11495	72	114.4
IU1	SW Zone	RHCP	5967.5	S2D1	Spot 1	V	12547.5	77	114.9
IU2	SW Zone	RHCP	6050	S2D2	Spot 1	V	12630	72	114.9
IU3	SW Zone	RHCP	6111	S2D3	Spot 1	V	12691	34	114.9
IU4	SW Zone	RHCP	6149	S2D4	Spot 1	V	12729	34	114.9
IU5	SW Zone	RHCP	6130	S2D5	Spot 1	V	12710	72	114.9
IU6	SW Zone	RHCP	6220	S2DC	Spot 1	V	11495	72	114.9
IU1	SW Zone	RHCP	5967.5	U2D1	Spot 2	H	12547.5	77	115.6
IU2	SW Zone	RHCP	6050	U2D2	Spot 2	H	12630	72	115.6
IU3	SW Zone	RHCP	6111	U2D3	Spot 2	H	12691	34	115.6
IU4	SW Zone	RHCP	6149	U2D4	Spot 2	H	12729	34	115.6
IU5	SW Zone	RHCP	6130	U2D5	Spot 2	H	12710	72	115.6
IU6	SW Zone	RHCP	6220	U2DC	Spot 2	H	11495	72	115.6

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)	Channel Gain (dB)
IU1	SW Zone	RHCP	5967.5	Y2D1	Spot 2A	H	12547.5	77	115.5
IU2	SW Zone	RHCP	6050	Y2D2	Spot 2A	H	12630	72	115.5
IU3	SW Zone	RHCP	6111	Y2D3	Spot 2A	H	12691	34	115.5
IU4	SW Zone	RHCP	6149	Y2D4	Spot 2A	H	12729	34	115.5
IU5	SW Zone	RHCP	6130	Y2D5	Spot 2A	H	12710	72	115.5
IU6	SW Zone	RHCP	6220	Y2DC	Spot 2A	H	11495	72	115.5
IU1	SW Zone	RHCP	5967.5	W2D1	Spot 3	V	12547.5	77	114.9
IU2	SW Zone	RHCP	6050	W2D2	Spot 3	V	12630	72	114.9
IU3	SW Zone	RHCP	6111	W2D3	Spot 3	V	12691	34	114.9
IU4	SW Zone	RHCP	6149	W2D4	Spot 3	V	12729	34	114.9
IU5	SW Zone	RHCP	6130	W2D5	Spot 3	V	12710	72	114.9
IU6	SW Zone	RHCP	6220	W2DC	Spot 3	V	11495	72	114.9
IU1	SW Zone	RHCP	5967.5	X2D1	Spot 3X	H	12547.5	77	114.9
IU2	SW Zone	RHCP	6050	X2D2	Spot 3X	H	12630	72	114.9
IU3	SW Zone	RHCP	6111	X2D3	Spot 3X	H	12691	34	114.9
IU4	SW Zone	RHCP	6149	X2D4	Spot 3X	H	12729	34	114.9
IU5	SW Zone	RHCP	6130	X2D5	Spot 3X	H	12710	72	114.9
IU6	SW Zone	RHCP	6220	X2DC	Spot 3X	H	11495	72	114.9
KU1	Combined NW+SE Zone	RHCP	5967.5	S2D1	Spot 1	V	12547.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	S2D2	Spot 1	V	12630	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	S2D3	Spot 1	V	12691	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	S2D4	Spot 1	V	12729	34	119.0
KU5	Combined NW+SE Zone	RHCP	6130	S2D5	Spot 1	V	12710	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	S2DC	Spot 1	V	11495	72	119.0
KU1	Combined NW+SE Zone	RHCP	5967.5	U2D1	Spot 2	H	12547.5	77	119.7
KU2	Combined NW+SE Zone	RHCP	6050	U2D2	Spot 2	H	12630	72	119.7
KU3	Combined NW+SE Zone	RHCP	6111	U2D3	Spot 2	H	12691	34	119.7
KU4	Combined NW+SE Zone	RHCP	6149	U2D4	Spot 2	H	12729	34	119.7
KU5	Combined NW+SE Zone	RHCP	6130	U2D5	Spot 2	H	12710	72	119.7
KU6	Combined NW+SE Zone	RHCP	6220	U2DC	Spot 2	H	11495	72	119.7
KU1	Combined NW+SE Zone	RHCP	5967.5	Y2D1	Spot 2A	H	12547.5	77	119.6
KU2	Combined NW+SE Zone	RHCP	6050	Y2D2	Spot 2A	H	12630	72	119.6
KU3	Combined NW+SE Zone	RHCP	6111	Y2D3	Spot 2A	H	12691	34	119.6
KU4	Combined NW+SE Zone	RHCP	6149	Y2D4	Spot 2A	H	12729	34	119.6
KU5	Combined NW+SE Zone	RHCP	6130	Y2D5	Spot 2A	H	12710	72	119.6
KU6	Combined NW+SE Zone	RHCP	6220	Y2DC	Spot 2A	H	11495	72	119.6
KU1	Combined NW+SE Zone	RHCP	5967.5	W2D1	Spot 3	V	12547.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	W2D2	Spot 3	V	12630	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	W2D3	Spot 3	V	12691	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	W2D4	Spot 3	V	12729	34	119.0
KU5	Combined NW+SE Zone	RHCP	6130	W2D5	Spot 3	V	12710	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	W2DC	Spot 3	V	11495	72	119.0
KU1	Combined NW+SE Zone	RHCP	5967.5	X2D1	Spot 3X	H	12547.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	X2D2	Spot 3X	H	12630	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	X2D3	Spot 3X	H	12691	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	X2D4	Spot 3X	H	12729	34	119.0
KU5	Combined NW+SE Zone	RHCP	6130	X2D5	Spot 3X	H	12710	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	X2DC	Spot 3X	H	11495	72	119.0
LU1	Combined NE+SW Zone	RHCP	5967.5	S2D1	Spot 1	V	12547.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	S2D2	Spot 1	V	12630	72	117.1
LU3	Combined NE+SW Zone	RHCP	6111	S2D3	Spot 1	V	12691	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	S2D4	Spot 1	V	12729	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	S2D5	Spot 1	V	12710	72	117.1

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)	Channel Gain (dB)
LU6	Combined NE+SW Zone	RHCP	6220	S2DC	Spot 1	V	11495	72	117.1
LU1	Combined NE+SW Zone	RHCP	5967.5	U2D1	Spot 2	H	12547.5	77	117.8
LU2	Combined NE+SW Zone	RHCP	6050	U2D2	Spot 2	H	12630	72	117.8
LU3	Combined NE+SW Zone	RHCP	6111	U2D3	Spot 2	H	12691	34	117.8
LU4	Combined NE+SW Zone	RHCP	6149	U2D4	Spot 2	H	12729	34	117.8
LU5	Combined NE+SW Zone	RHCP	6130	U2D5	Spot 2	H	12710	72	117.8
LU6	Combined NE+SW Zone	RHCP	6220	U2DC	Spot 2	H	11495	72	117.8
LU1	Combined NE+SW Zone	RHCP	5967.5	Y2D1	Spot 2A	H	12547.5	77	117.7
LU2	Combined NE+SW Zone	RHCP	6050	Y2D2	Spot 2A	H	12630	72	117.7
LU3	Combined NE+SW Zone	RHCP	6111	Y2D3	Spot 2A	H	12691	34	117.7
LU4	Combined NE+SW Zone	RHCP	6149	Y2D4	Spot 2A	H	12729	34	117.7
LU5	Combined NE+SW Zone	RHCP	6130	Y2D5	Spot 2A	H	12710	72	117.7
LU6	Combined NE+SW Zone	RHCP	6220	Y2DC	Spot 2A	H	11495	72	117.7
LU1	Combined NE+SW Zone	RHCP	5967.5	W2D1	Spot 3	V	12547.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	W2D2	Spot 3	V	12630	72	117.1
LU3	Combined NE+SW Zone	RHCP	6111	W2D3	Spot 3	V	12691	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	W2D4	Spot 3	V	12729	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	W2D5	Spot 3	V	12710	72	117.1
LU6	Combined NE+SW Zone	RHCP	6220	W2DC	Spot 3	V	11495	72	117.1
LU1	Combined NE+SW Zone	RHCP	5967.5	X2D1	Spot 3X	H	12547.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	X2D2	Spot 3X	H	12630	72	117.1
LU3	Combined NE+SW Zone	RHCP	6111	X2D3	Spot 3X	H	12691	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	X2D4	Spot 3X	H	12729	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	X2D5	Spot 3X	H	12710	72	117.1
LU6	Combined NE+SW Zone	RHCP	6220	X2DC	Spot 3X	H	11495	72	117.1
EU1	West Hemi	LHCP	5967.5	S3D1	Spot 1	V	11747.5	77	119.2
EU2	West Hemi	LHCP	6050	S3D2	Spot 1	V	11830	72	119.2
EU3	West Hemi	LHCP	6111	S3D3	Spot 1	V	11891	34	119.2
EU4	West Hemi	LHCP	6149	S3D4	Spot 1	V	11929	34	119.2
EU5	West Hemi	LHCP	6130	S3D5	Spot 1	V	11910	72	119.2
EU6	West Hemi	LHCP	6220	S3DC	Spot 1	V	11495	72	119.2
EU1	West Hemi	LHCP	5967.5	U3D1	Spot 2	H	11747.5	77	119.9
EU2	West Hemi	LHCP	6050	U3D2	Spot 2	H	11830	72	119.9
EU3	West Hemi	LHCP	6111	U3D3	Spot 2	H	11891	34	119.9
EU4	West Hemi	LHCP	6149	U3D4	Spot 2	H	11929	34	119.9
EU5	West Hemi	LHCP	6130	U3D5	Spot 2	H	11910	72	119.9
EU6	West Hemi	LHCP	6220	U3DC	Spot 2	H	11495	72	119.9
EU1	West Hemi	LHCP	5967.5	Y3D1	Spot 2A	H	11747.5	77	119.8
EU2	West Hemi	LHCP	6050	Y3D2	Spot 2A	H	11830	72	119.8
EU3	West Hemi	LHCP	6111	Y3D3	Spot 2A	H	11891	34	119.8
EU4	West Hemi	LHCP	6149	Y3D4	Spot 2A	H	11929	34	119.8
EU5	West Hemi	LHCP	6130	Y3D5	Spot 2A	H	11910	72	119.8
EU6	West Hemi	LHCP	6220	Y3DC	Spot 2A	H	11495	72	119.8
EU1	West Hemi	LHCP	5967.5	W3D1	Spot 3	V	11747.5	77	119.2
EU2	West Hemi	LHCP	6050	W3D2	Spot 3	V	11830	72	119.2
EU3	West Hemi	LHCP	6111	W3D3	Spot 3	V	11891	34	119.2
EU4	West Hemi	LHCP	6149	W3D4	Spot 3	V	11929	34	119.2
EU5	West Hemi	LHCP	6130	W3D5	Spot 3	V	11910	72	119.2
EU6	West Hemi	LHCP	6220	W3DC	Spot 3	V	11495	72	119.2
EU1	West Hemi	LHCP	5967.5	X3D1	Spot 3X	H	11747.5	77	119.2
EU2	West Hemi	LHCP	6050	X3D2	Spot 3X	H	11830	72	119.2
EU3	West Hemi	LHCP	6111	X3D3	Spot 3X	H	11891	34	119.2

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)	Channel Gain (dB)
EU4	West Hemi	LHCP	6149	X3D4	Spot 3X	H	11929	34	119.2
EU5	West Hemi	LHCP	6130	X3D5	Spot 3X	H	11910	72	119.2
EU6	West Hemi	LHCP	6220	X3DC	Spot 3X	H	11495	72	119.2
FU1	East Hemi	LHCP	5967.5	S3D1	Spot 1	V	11747.5	77	118.3
FU2	East Hemi	LHCP	6050	S3D2	Spot 1	V	11830	72	118.3
FU3	East Hemi	LHCP	6111	S3D3	Spot 1	V	11891	34	118.3
FU4	East Hemi	LHCP	6149	S3D4	Spot 1	V	11929	34	118.3
FU5	East Hemi	LHCP	6130	S3D5	Spot 1	V	11910	72	118.3
FU6	East Hemi	LHCP	6220	S3DC	Spot 1	V	11495	72	118.3
FU1	East Hemi	LHCP	5967.5	U3D1	Spot 2	H	11747.5	77	119.0
FU2	East Hemi	LHCP	6050	U3D2	Spot 2	H	11830	72	119.0
FU3	East Hemi	LHCP	6111	U3D3	Spot 2	H	11891	34	119.0
FU4	East Hemi	LHCP	6149	U3D4	Spot 2	H	11929	34	119.0
FU5	East Hemi	LHCP	6130	U3D5	Spot 2	H	11910	72	119.0
FU6	East Hemi	LHCP	6220	U3DC	Spot 2	H	11495	72	119.0
FU1	East Hemi	LHCP	5967.5	Y3D1	Spot 2A	H	11747.5	77	118.9
FU2	East Hemi	LHCP	6050	Y3D2	Spot 2A	H	11830	72	118.9
FU3	East Hemi	LHCP	6111	Y3D3	Spot 2A	H	11891	34	118.9
FU4	East Hemi	LHCP	6149	Y3D4	Spot 2A	H	11929	34	118.9
FU5	East Hemi	LHCP	6130	Y3D5	Spot 2A	H	11910	72	118.9
FU6	East Hemi	LHCP	6220	Y3DC	Spot 2A	H	11495	72	118.9
FU1	East Hemi	LHCP	5967.5	W3D1	Spot 3	V	11747.5	77	118.3
FU2	East Hemi	LHCP	6050	W3D2	Spot 3	V	11830	72	118.3
FU3	East Hemi	LHCP	6111	W3D3	Spot 3	V	11891	34	118.3
FU4	East Hemi	LHCP	6149	W3D4	Spot 3	V	11929	34	118.3
FU5	East Hemi	LHCP	6130	W3D5	Spot 3	V	11910	72	118.3
FU6	East Hemi	LHCP	6220	W3DC	Spot 3	V	11495	72	118.3
FU1	East Hemi	LHCP	5967.5	X3D1	Spot 3X	H	11747.5	77	118.3
FU2	East Hemi	LHCP	6050	X3D2	Spot 3X	H	11830	72	118.3
FU3	East Hemi	LHCP	6111	X3D3	Spot 3X	H	11891	34	118.3
FU4	East Hemi	LHCP	6149	X3D4	Spot 3X	H	11929	34	118.3
FU5	East Hemi	LHCP	6130	X3D5	Spot 3X	H	11910	72	118.3
FU6	East Hemi	LHCP	6220	X3DC	Spot 3X	H	11495	72	118.3
GU1	NW Zone	RHCP	5967.5	S3D1	Spot 1	V	11747.5	77	116.8
GU2	NW Zone	RHCP	6050	S3D2	Spot 1	V	11830	72	116.8
GU3	NW Zone	RHCP	6111	S3D3	Spot 1	V	11891	34	116.8
GU4	NW Zone	RHCP	6149	S3D4	Spot 1	V	11929	34	116.8
GU5	NW Zone	RHCP	6130	S3D5	Spot 1	V	11910	72	116.8
GU6	NW Zone	RHCP	6220	S3DC	Spot 1	V	11495	72	116.8
GU1	NW Zone	RHCP	5967.5	U3D1	Spot 2	H	11747.5	77	117.5
GU2	NW Zone	RHCP	6050	U3D2	Spot 2	H	11830	72	117.5
GU3	NW Zone	RHCP	6111	U3D3	Spot 2	H	11891	34	117.5
GU4	NW Zone	RHCP	6149	U3D4	Spot 2	H	11929	34	117.5
GU5	NW Zone	RHCP	6130	U3D5	Spot 2	H	11910	72	117.5
GU6	NW Zone	RHCP	6220	U3DC	Spot 2	H	11495	72	117.5
GU1	NW Zone	RHCP	5967.5	Y3D1	Spot 2A	H	11747.5	77	117.4
GU2	NW Zone	RHCP	6050	Y3D2	Spot 2A	H	11830	72	117.4
GU3	NW Zone	RHCP	6111	Y3D3	Spot 2A	H	11891	34	117.4
GU4	NW Zone	RHCP	6149	Y3D4	Spot 2A	H	11929	34	117.4
GU5	NW Zone	RHCP	6130	Y3D5	Spot 2A	H	11910	72	117.4
GU6	NW Zone	RHCP	6220	Y3DC	Spot 2A	H	11495	72	117.4
GU1	NW Zone	RHCP	5967.5	W3D1	Spot 3	V	11747.5	77	116.8

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)	Channel Gain (dB)
GU2	NW Zone	RHCP	6050	W3D2	Spot 3	V	11830	72	116.8
GU3	NW Zone	RHCP	6111	W3D3	Spot 3	V	11891	34	116.8
GU4	NW Zone	RHCP	6149	W3D4	Spot 3	V	11929	34	116.8
GU5	NW Zone	RHCP	6130	W3D5	Spot 3	V	11910	72	116.8
GU6	NW Zone	RHCP	6220	W3DC	Spot 3	V	11495	72	116.8
GU1	NW Zone	RHCP	5967.5	X3D1	Spot 3X	H	11747.5	77	116.8
GU2	NW Zone	RHCP	6050	X3D2	Spot 3X	H	11830	72	116.8
GU3	NW Zone	RHCP	6111	X3D3	Spot 3X	H	11891	34	116.8
GU4	NW Zone	RHCP	6149	X3D4	Spot 3X	H	11929	34	116.8
GU5	NW Zone	RHCP	6130	X3D5	Spot 3X	H	11910	72	116.8
GU6	NW Zone	RHCP	6220	X3DC	Spot 3X	H	11495	72	116.8
JU1	SE Zone	RHCP	5967.5	S3D1	Spot 1	V	11747.5	77	116.7
JU2	SE Zone	RHCP	6050	S3D2	Spot 1	V	11830	72	116.7
JU3	SE Zone	RHCP	6111	S3D3	Spot 1	V	11891	34	116.7
JU4	SE Zone	RHCP	6149	S3D4	Spot 1	V	11929	34	116.7
JU5	SE Zone	RHCP	6130	S3D5	Spot 1	V	11910	72	116.7
JU6	SE Zone	RHCP	6220	S3DC	Spot 1	V	11495	72	116.7
JU1	SE Zone	RHCP	5967.5	U3D1	Spot 2	H	11747.5	77	117.4
JU2	SE Zone	RHCP	6050	U3D2	Spot 2	H	11830	72	117.4
JU3	SE Zone	RHCP	6111	U3D3	Spot 2	H	11891	34	117.4
JU4	SE Zone	RHCP	6149	U3D4	Spot 2	H	11929	34	117.4
JU5	SE Zone	RHCP	6130	U3D5	Spot 2	H	11910	72	117.4
JU6	SE Zone	RHCP	6220	U3DC	Spot 2	H	11495	72	117.4
JU1	SE Zone	RHCP	5967.5	Y3D1	Spot 2A	H	11747.5	77	117.3
JU2	SE Zone	RHCP	6050	Y3D2	Spot 2A	H	11830	72	117.3
JU3	SE Zone	RHCP	6111	Y3D3	Spot 2A	H	11891	34	117.3
JU4	SE Zone	RHCP	6149	Y3D4	Spot 2A	H	11929	34	117.3
JU5	SE Zone	RHCP	6130	Y3D5	Spot 2A	H	11910	72	117.3
JU6	SE Zone	RHCP	6220	Y3DC	Spot 2A	H	11495	72	117.3
JU1	SE Zone	RHCP	5967.5	W3D1	Spot 3	V	11747.5	77	116.7
JU2	SE Zone	RHCP	6050	W3D2	Spot 3	V	11830	72	116.7
JU3	SE Zone	RHCP	6111	W3D3	Spot 3	V	11891	34	116.7
JU4	SE Zone	RHCP	6149	W3D4	Spot 3	V	11929	34	116.7
JU5	SE Zone	RHCP	6130	W3D5	Spot 3	V	11910	72	116.7
JU6	SE Zone	RHCP	6220	W3DC	Spot 3	V	11495	72	116.7
JU1	SE Zone	RHCP	5967.5	X3D1	Spot 3X	H	11747.5	77	116.7
JU2	SE Zone	RHCP	6050	X3D2	Spot 3X	H	11830	72	116.7
JU3	SE Zone	RHCP	6111	X3D3	Spot 3X	H	11891	34	116.7
JU4	SE Zone	RHCP	6149	X3D4	Spot 3X	H	11929	34	116.7
JU5	SE Zone	RHCP	6130	X3D5	Spot 3X	H	11910	72	116.7
JU6	SE Zone	RHCP	6220	X3DC	Spot 3X	H	11495	72	116.7
HU1	NE Zone	RHCP	5967.5	S3D1	Spot 1	V	11747.5	77	114.4
HU2	NE Zone	RHCP	6050	S3D2	Spot 1	V	11830	72	114.4
HU3	NE Zone	RHCP	6111	S3D3	Spot 1	V	11891	34	114.4
HU4	NE Zone	RHCP	6149	S3D4	Spot 1	V	11929	34	114.4
HU5	NE Zone	RHCP	6130	S3D5	Spot 1	V	11910	72	114.4
HU6	NE Zone	RHCP	6220	S3DC	Spot 1	V	11495	72	114.4
HU1	NE Zone	RHCP	5967.5	U3D1	Spot 2	H	11747.5	77	115.1
HU2	NE Zone	RHCP	6050	U3D2	Spot 2	H	11830	72	115.1
HU3	NE Zone	RHCP	6111	U3D3	Spot 2	H	11891	34	115.1
HU4	NE Zone	RHCP	6149	U3D4	Spot 2	H	11929	34	115.1
HU5	NE Zone	RHCP	6130	U3D5	Spot 2	H	11910	72	115.1
HU6	NE Zone	RHCP	6220	U3DC	Spot 2	H	11495	72	115.1

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)	Channel Gain (dB)
HU1	NE Zone	RHCP	5967.5	Y3D1	Spot 2A	H	11747.5	77	115.0
HU2	NE Zone	RHCP	6050	Y3D2	Spot 2A	H	11830	72	115.0
HU3	NE Zone	RHCP	6111	Y3D3	Spot 2A	H	11891	34	115.0
HU4	NE Zone	RHCP	6149	Y3D4	Spot 2A	H	11929	34	115.0
HU5	NE Zone	RHCP	6130	Y3D5	Spot 2A	H	11910	72	115.0
HU6	NE Zone	RHCP	6220	Y3DC	Spot 2A	H	11495	72	115.0
HU1	NE Zone	RHCP	5967.5	W3D1	Spot 3	V	11747.5	77	114.4
HU2	NE Zone	RHCP	6050	W3D2	Spot 3	V	11830	72	114.4
HU3	NE Zone	RHCP	6111	W3D3	Spot 3	V	11891	34	114.4
HU4	NE Zone	RHCP	6149	W3D4	Spot 3	V	11929	34	114.4
HU5	NE Zone	RHCP	6130	W3D5	Spot 3	V	11910	72	114.4
HU6	NE Zone	RHCP	6220	W3DC	Spot 3	V	11495	72	114.4
HU1	NE Zone	RHCP	5967.5	X3D1	Spot 3X	H	11747.5	77	114.4
HU2	NE Zone	RHCP	6050	X3D2	Spot 3X	H	11830	72	114.4
HU3	NE Zone	RHCP	6111	X3D3	Spot 3X	H	11891	34	114.4
HU4	NE Zone	RHCP	6149	X3D4	Spot 3X	H	11929	34	114.4
HU5	NE Zone	RHCP	6130	X3D5	Spot 3X	H	11910	72	114.4
HU6	NE Zone	RHCP	6220	X3DC	Spot 3X	H	11495	72	114.4
IU1	SW Zone	RHCP	5967.5	S3D1	Spot 1	V	11747.5	77	114.9
IU2	SW Zone	RHCP	6050	S3D2	Spot 1	V	11830	72	114.9
IU3	SW Zone	RHCP	6111	S3D3	Spot 1	V	11891	34	114.9
IU4	SW Zone	RHCP	6149	S3D4	Spot 1	V	11929	34	114.9
IU5	SW Zone	RHCP	6130	S3D5	Spot 1	V	11910	72	114.9
IU6	SW Zone	RHCP	6220	S3DC	Spot 1	V	11495	72	114.9
IU1	SW Zone	RHCP	5967.5	U3D1	Spot 2	H	11747.5	77	115.6
IU2	SW Zone	RHCP	6050	U3D2	Spot 2	H	11830	72	115.6
IU3	SW Zone	RHCP	6111	U3D3	Spot 2	H	11891	34	115.6
IU4	SW Zone	RHCP	6149	U3D4	Spot 2	H	11929	34	115.6
IU5	SW Zone	RHCP	6130	U3D5	Spot 2	H	11910	72	115.6
IU6	SW Zone	RHCP	6220	U3DC	Spot 2	H	11495	72	115.6
IU1	SW Zone	RHCP	5967.5	Y3D1	Spot 2A	H	11747.5	77	115.5
IU2	SW Zone	RHCP	6050	Y3D2	Spot 2A	H	11830	72	115.5
IU3	SW Zone	RHCP	6111	Y3D3	Spot 2A	H	11891	34	115.5
IU4	SW Zone	RHCP	6149	Y3D4	Spot 2A	H	11929	34	115.5
IU5	SW Zone	RHCP	6130	Y3D5	Spot 2A	H	11910	72	115.5
IU6	SW Zone	RHCP	6220	Y3DC	Spot 2A	H	11495	72	115.5
IU1	SW Zone	RHCP	5967.5	W3D1	Spot 3	V	11747.5	77	114.9
IU2	SW Zone	RHCP	6050	W3D2	Spot 3	V	11830	72	114.9
IU3	SW Zone	RHCP	6111	W3D3	Spot 3	V	11891	34	114.9
IU4	SW Zone	RHCP	6149	W3D4	Spot 3	V	11929	34	114.9
IU5	SW Zone	RHCP	6130	W3D5	Spot 3	V	11910	72	114.9
IU6	SW Zone	RHCP	6220	W3DC	Spot 3	V	11495	72	114.9
IU1	SW Zone	RHCP	5967.5	X3D1	Spot 3X	H	11747.5	77	114.9
IU2	SW Zone	RHCP	6050	X3D2	Spot 3X	H	11830	72	114.9
IU3	SW Zone	RHCP	6111	X3D3	Spot 3X	H	11891	34	114.9
IU4	SW Zone	RHCP	6149	X3D4	Spot 3X	H	11929	34	114.9
IU5	SW Zone	RHCP	6130	X3D5	Spot 3X	H	11910	72	114.9
IU6	SW Zone	RHCP	6220	X3DC	Spot 3X	H	11495	72	114.9
KU1	Combined NW+SE Zone	RHCP	5967.5	S3D1	Spot 1	V	11747.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	S3D2	Spot 1	V	11830	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	S3D3	Spot 1	V	11891	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	S3D4	Spot 1	V	11929	34	119.0

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)	Channel Gain (dB)
KU5	Combined NW+SE Zone	RHCP	6130	S3D5	Spot 1	V	11910	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	S3DC	Spot 1	V	11495	72	119.0
KU1	Combined NW+SE Zone	RHCP	5967.5	U3D1	Spot 2	H	11747.5	77	119.7
KU2	Combined NW+SE Zone	RHCP	6050	U3D2	Spot 2	H	11830	72	119.7
KU3	Combined NW+SE Zone	RHCP	6111	U3D3	Spot 2	H	11891	34	119.7
KU4	Combined NW+SE Zone	RHCP	6149	U3D4	Spot 2	H	11929	34	119.7
KU5	Combined NW+SE Zone	RHCP	6130	U3D5	Spot 2	H	11910	72	119.7
KU6	Combined NW+SE Zone	RHCP	6220	U3DC	Spot 2	H	11495	72	119.7
KU1	Combined NW+SE Zone	RHCP	5967.5	Y3D1	Spot 2A	H	11747.5	77	119.6
KU2	Combined NW+SE Zone	RHCP	6050	Y3D2	Spot 2A	H	11830	72	119.6
KU3	Combined NW+SE Zone	RHCP	6111	Y3D3	Spot 2A	H	11891	34	119.6
KU4	Combined NW+SE Zone	RHCP	6149	Y3D4	Spot 2A	H	11929	34	119.6
KU5	Combined NW+SE Zone	RHCP	6130	Y3D5	Spot 2A	H	11910	72	119.6
KU6	Combined NW+SE Zone	RHCP	6220	Y3DC	Spot 2A	H	11495	72	119.6
KU1	Combined NW+SE Zone	RHCP	5967.5	W3D1	Spot 3	V	11747.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	W3D2	Spot 3	V	11830	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	W3D3	Spot 3	V	11891	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	W3D4	Spot 3	V	11929	34	119.0
KU5	Combined NW+SE Zone	RHCP	6130	W3D5	Spot 3	V	11910	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	W3DC	Spot 3	V	11495	72	119.0
KU1	Combined NW+SE Zone	RHCP	5967.5	X3D1	Spot 3X	H	11747.5	77	119.0
KU2	Combined NW+SE Zone	RHCP	6050	X3D2	Spot 3X	H	11830	72	119.0
KU3	Combined NW+SE Zone	RHCP	6111	X3D3	Spot 3X	H	11891	34	119.0
KU4	Combined NW+SE Zone	RHCP	6149	X3D4	Spot 3X	H	11929	34	119.0
KU5	Combined NW+SE Zone	RHCP	6130	X3D5	Spot 3X	H	11910	72	119.0
KU6	Combined NW+SE Zone	RHCP	6220	X3DC	Spot 3X	H	11495	72	119.0
LU1	Combined NE+SW Zone	RHCP	5967.5	S3D1	Spot 1	V	11747.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	S3D2	Spot 1	V	11830	72	117.1
LU3	Combined NE+SW Zone	RHCP	6111	S3D3	Spot 1	V	11891	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	S3D4	Spot 1	V	11929	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	S3D5	Spot 1	V	11910	72	117.1
LU6	Combined NE+SW Zone	RHCP	6220	S3DC	Spot 1	V	11495	72	117.1
LU1	Combined NE+SW Zone	RHCP	5967.5	U3D1	Spot 2	H	11747.5	77	117.8
LU2	Combined NE+SW Zone	RHCP	6050	U3D2	Spot 2	H	11830	72	117.8
LU3	Combined NE+SW Zone	RHCP	6111	U3D3	Spot 2	H	11891	34	117.8
LU4	Combined NE+SW Zone	RHCP	6149	U3D4	Spot 2	H	11929	34	117.8
LU5	Combined NE+SW Zone	RHCP	6130	U3D5	Spot 2	H	11910	72	117.8
LU6	Combined NE+SW Zone	RHCP	6220	U3DC	Spot 2	H	11495	72	117.8
LU1	Combined NE+SW Zone	RHCP	5967.5	Y3D1	Spot 2A	H	11747.5	77	117.7
LU2	Combined NE+SW Zone	RHCP	6050	Y3D2	Spot 2A	H	11830	72	117.7
LU3	Combined NE+SW Zone	RHCP	6111	Y3D3	Spot 2A	H	11891	34	117.7
LU4	Combined NE+SW Zone	RHCP	6149	Y3D4	Spot 2A	H	11929	34	117.7
LU5	Combined NE+SW Zone	RHCP	6130	Y3D5	Spot 2A	H	11910	72	117.7
LU6	Combined NE+SW Zone	RHCP	6220	Y3DC	Spot 2A	H	11495	72	117.7
LU1	Combined NE+SW Zone	RHCP	5967.5	W3D1	Spot 3	V	11747.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	W3D2	Spot 3	V	11830	72	117.1
LU3	Combined NE+SW Zone	RHCP	6111	W3D3	Spot 3	V	11891	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	W3D4	Spot 3	V	11929	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	W3D5	Spot 3	V	11910	72	117.1
LU6	Combined NE+SW Zone	RHCP	6220	W3DC	Spot 3	V	11495	72	117.1
LU1	Combined NE+SW Zone	RHCP	5967.5	X3D1	Spot 3X	H	11747.5	77	117.1
LU2	Combined NE+SW Zone	RHCP	6050	X3D2	Spot 3X	H	11830	72	117.1

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)	Channel Gain (dB)
LU3	Combined NE+SW Zone	RHCP	6111	X3D3	Spot 3X	H	11891	34	117.1
LU4	Combined NE+SW Zone	RHCP	6149	X3D4	Spot 3X	H	11929	34	117.1
LU5	Combined NE+SW Zone	RHCP	6130	X3D5	Spot 3X	H	11910	72	117.1
LU6	Combined NE+SW Zone	RHCP	6220	X3DC	Spot 3X	H	11495	72	117.1
SU1	Spot 1	H	14042.5	ED1	West Hemi	RHCP	3742.5	77	113.5
SU2	Spot 1	H	14125	ED2	West Hemi	RHCP	3825	72	113.5
SU3	Spot 1	H	14186	ED3	West Hemi	RHCP	3886	34	113.5
SU4	Spot 1	H	14224	ED4	West Hemi	RHCP	3924	34	113.5
SU5	Spot 1	H	14205	ED5	West Hemi	RHCP	3905	72	113.5
SUC	Spot 1	H	14295	ED6	West Hemi	RHCP	3995	72	113.5
SU1	Spot 1	H	14042.5	FD1	East Hemi	RHCP	3742.5	77	111.3
SU2	Spot 1	H	14125	FD2	East Hemi	RHCP	3825	72	111.3
SU3	Spot 1	H	14186	FD3	East Hemi	RHCP	3886	34	111.3
SU4	Spot 1	H	14224	FD4	East Hemi	RHCP	3924	34	111.3
SU5	Spot 1	H	14205	FD5	East Hemi	RHCP	3905	72	111.3
SUC	Spot 1	H	14295	FD6	East Hemi	RHCP	3995	72	111.3
SU1	Spot 1	H	14042.5	GD1	NW Zone	LHCP	3742.5	77	107.9
SU2	Spot 1	H	14125	GD2	NW Zone	LHCP	3825	72	107.9
SU3	Spot 1	H	14186	GD3	NW Zone	LHCP	3886	34	107.9
SU4	Spot 1	H	14224	GD4	NW Zone	LHCP	3924	34	107.9
SU5	Spot 1	H	14205	GD5	NW Zone	LHCP	3905	72	107.9
SUC	Spot 1	H	14295	GD6	NW Zone	LHCP	3995	72	107.9
SU1	Spot 1	H	14042.5	JD1	SE Zone	LHCP	3742.5	77	110.9
SU2	Spot 1	H	14125	JD2	SE Zone	LHCP	3825	72	110.9
SU3	Spot 1	H	14186	JD3	SE Zone	LHCP	3886	34	110.9
SU4	Spot 1	H	14224	JD4	SE Zone	LHCP	3924	34	110.9
SU5	Spot 1	H	14205	JD5	SE Zone	LHCP	3905	72	110.9
SUC	Spot 1	H	14295	JD6	SE Zone	LHCP	3995	72	110.9
SU1	Spot 1	H	14042.5	HD1	NE Zone	LHCP	3742.5	77	108.2
SU2	Spot 1	H	14125	HD2	NE Zone	LHCP	3825	72	108.2
SU3	Spot 1	H	14186	HD3	NE Zone	LHCP	3886	34	108.2
SU4	Spot 1	H	14224	HD4	NE Zone	LHCP	3924	34	108.2
SU5	Spot 1	H	14205	HD5	NE Zone	LHCP	3905	72	108.2
SUC	Spot 1	H	14295	HD6	NE Zone	LHCP	3995	72	108.2
SU1	Spot 1	H	14042.5	ID1	SW Zone	LHCP	3742.5	77	108.7
SU2	Spot 1	H	14125	ID2	SW Zone	LHCP	3825	72	108.7
SU3	Spot 1	H	14186	ID3	SW Zone	LHCP	3886	34	108.7
SU4	Spot 1	H	14224	ID4	SW Zone	LHCP	3924	34	108.7
SU5	Spot 1	H	14205	ID5	SW Zone	LHCP	3905	72	108.7
SUC	Spot 1	H	14295	ID6	SW Zone	LHCP	3995	72	108.7
UU1	Spot 2	V	14042.5	ED1	West Hemi	RHCP	3742.5	77	115.6
UU2	Spot 2	V	14125	ED2	West Hemi	RHCP	3825	72	115.6
UU3	Spot 2	V	14186	ED3	West Hemi	RHCP	3886	34	115.6
UU4	Spot 2	V	14224	ED4	West Hemi	RHCP	3924	34	115.6
UU5	Spot 2	V	14205	ED5	West Hemi	RHCP	3905	72	115.6
UUC	Spot 2	V	14295	ED6	West Hemi	RHCP	3995	72	115.6
UU1	Spot 2	V	14042.5	FD1	East Hemi	RHCP	3742.5	77	113.4
UU2	Spot 2	V	14125	FD2	East Hemi	RHCP	3825	72	113.4
UU3	Spot 2	V	14186	FD3	East Hemi	RHCP	3886	34	113.4
UU4	Spot 2	V	14224	FD4	East Hemi	RHCP	3924	34	113.4
UU5	Spot 2	V	14205	FD5	East Hemi	RHCP	3905	72	113.4
UUC	Spot 2	V	14295	FD6	East Hemi	RHCP	3995	72	113.4



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)	Channel Gain (dB)
UU1	Spot 2	V	14042.5	GD1	NW Zone	LHCP	3742.5	77	110.0
UU2	Spot 2	V	14125	GD2	NW Zone	LHCP	3825	72	110.0
UU3	Spot 2	V	14186	GD3	NW Zone	LHCP	3886	34	110.0
UU4	Spot 2	V	14224	GD4	NW Zone	LHCP	3924	34	110.0
UU5	Spot 2	V	14205	GD5	NW Zone	LHCP	3905	72	110.0
UUC	Spot 2	V	14295	GD6	NW Zone	LHCP	3995	72	110.0
UU1	Spot 2	V	14042.5	JD1	SE Zone	LHCP	3742.5	77	113.0
UU2	Spot 2	V	14125	JD2	SE Zone	LHCP	3825	72	113.0
UU3	Spot 2	V	14186	JD3	SE Zone	LHCP	3886	34	113.0
UU4	Spot 2	V	14224	JD4	SE Zone	LHCP	3924	34	113.0
UU5	Spot 2	V	14205	JD5	SE Zone	LHCP	3905	72	113.0
UUC	Spot 2	V	14295	JD6	SE Zone	LHCP	3995	72	113.0
UU1	Spot 2	V	14042.5	HD1	NE Zone	LHCP	3742.5	77	110.3
UU2	Spot 2	V	14125	HD2	NE Zone	LHCP	3825	72	110.3
UU3	Spot 2	V	14186	HD3	NE Zone	LHCP	3886	34	110.3
UU4	Spot 2	V	14224	HD4	NE Zone	LHCP	3924	34	110.3
UU5	Spot 2	V	14205	HD5	NE Zone	LHCP	3905	72	110.3
UUC	Spot 2	V	14295	HD6	NE Zone	LHCP	3995	72	110.3
UU1	Spot 2	V	14042.5	ID1	SW Zone	LHCP	3742.5	77	110.8
UU2	Spot 2	V	14125	ID2	SW Zone	LHCP	3825	72	110.8
UU3	Spot 2	V	14186	ID3	SW Zone	LHCP	3886	34	110.8
UU4	Spot 2	V	14224	ID4	SW Zone	LHCP	3924	34	110.8
UU5	Spot 2	V	14205	ID5	SW Zone	LHCP	3905	72	110.8
UUC	Spot 2	V	14295	ID6	SW Zone	LHCP	3995	72	110.8
YU1	Spot 2A	V	14042.5	ED1	West Hemi	RHCP	3742.5	77	117.7
YU2	Spot 2A	V	14125	ED2	West Hemi	RHCP	3825	72	117.7
YU3	Spot 2A	V	14186	ED3	West Hemi	RHCP	3886	34	117.7
YU4	Spot 2A	V	14224	ED4	West Hemi	RHCP	3924	34	117.7
YU5	Spot 2A	V	14205	ED5	West Hemi	RHCP	3905	72	117.7
YUC	Spot 2A	V	14295	ED6	West Hemi	RHCP	3995	72	117.7
YU1	Spot 2A	V	14042.5	FD1	East Hemi	RHCP	3742.5	77	115.5
YU2	Spot 2A	V	14125	FD2	East Hemi	RHCP	3825	72	115.5
YU3	Spot 2A	V	14186	FD3	East Hemi	RHCP	3886	34	115.5
YU4	Spot 2A	V	14224	FD4	East Hemi	RHCP	3924	34	115.5
YU5	Spot 2A	V	14205	FD5	East Hemi	RHCP	3905	72	115.5
YUC	Spot 2A	V	14295	FD6	East Hemi	RHCP	3995	72	115.5
YU1	Spot 2A	V	14042.5	GD1	NW Zone	LHCP	3742.5	77	112.1
YU2	Spot 2A	V	14125	GD2	NW Zone	LHCP	3825	72	112.1
YU3	Spot 2A	V	14186	GD3	NW Zone	LHCP	3886	34	112.1
YU4	Spot 2A	V	14224	GD4	NW Zone	LHCP	3924	34	112.1
YU5	Spot 2A	V	14205	GD5	NW Zone	LHCP	3905	72	112.1
YUC	Spot 2A	V	14295	GD6	NW Zone	LHCP	3995	72	112.1
YU1	Spot 2A	V	14042.5	JD1	SE Zone	LHCP	3742.5	77	115.1
YU2	Spot 2A	V	14125	JD2	SE Zone	LHCP	3825	72	115.1
YU3	Spot 2A	V	14186	JD3	SE Zone	LHCP	3886	34	115.1
YU4	Spot 2A	V	14224	JD4	SE Zone	LHCP	3924	34	115.1
YU5	Spot 2A	V	14205	JD5	SE Zone	LHCP	3905	72	115.1
YUC	Spot 2A	V	14295	JD6	SE Zone	LHCP	3995	72	115.1
YU1	Spot 2A	V	14042.5	HD1	NE Zone	LHCP	3742.5	77	112.4
YU2	Spot 2A	V	14125	HD2	NE Zone	LHCP	3825	72	112.4
YU3	Spot 2A	V	14186	HD3	NE Zone	LHCP	3886	34	112.4
YU4	Spot 2A	V	14224	HD4	NE Zone	LHCP	3924	34	112.4
YU5	Spot 2A	V	14205	HD5	NE Zone	LHCP	3905	72	112.4

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)	Channel Gain (dB)
YUC	Spot 2A	V	14295	HD6	NE Zone	LHCP	3995	72	112.4
YU1	Spot 2A	V	14042.5	ID1	SW Zone	LHCP	3742.5	77	112.9
YU2	Spot 2A	V	14125	ID2	SW Zone	LHCP	3825	72	112.9
YU3	Spot 2A	V	14186	ID3	SW Zone	LHCP	3886	34	112.9
YU4	Spot 2A	V	14224	ID4	SW Zone	LHCP	3924	34	112.9
YU5	Spot 2A	V	14205	ID5	SW Zone	LHCP	3905	72	112.9
YUC	Spot 2A	V	14295	ID6	SW Zone	LHCP	3995	72	112.9
WU1	Spot 3	H	14042.5	ED1	West Hemi	RHCP	3742.5	77	111.5
WU2	Spot 3	H	14125	ED2	West Hemi	RHCP	3825	72	111.5
WU3	Spot 3	H	14186	ED3	West Hemi	RHCP	3886	34	111.5
WU4	Spot 3	H	14224	ED4	West Hemi	RHCP	3924	34	111.5
WU5	Spot 3	H	14205	ED5	West Hemi	RHCP	3905	72	111.5
WUC	Spot 3	H	14295	ED6	West Hemi	RHCP	3995	72	111.5
WU1	Spot 3	H	14042.5	FD1	East Hemi	RHCP	3742.5	77	109.3
WU2	Spot 3	H	14125	FD2	East Hemi	RHCP	3825	72	109.3
WU3	Spot 3	H	14186	FD3	East Hemi	RHCP	3886	34	109.3
WU4	Spot 3	H	14224	FD4	East Hemi	RHCP	3924	34	109.3
WU5	Spot 3	H	14205	FD5	East Hemi	RHCP	3905	72	109.3
WUC	Spot 3	H	14295	FD6	East Hemi	RHCP	3995	72	109.3
WU1	Spot 3	H	14042.5	GD1	NW Zone	LHCP	3742.5	77	105.9
WU2	Spot 3	H	14125	GD2	NW Zone	LHCP	3825	72	105.9
WU3	Spot 3	H	14186	GD3	NW Zone	LHCP	3886	34	105.9
WU4	Spot 3	H	14224	GD4	NW Zone	LHCP	3924	34	105.9
WU5	Spot 3	H	14205	GD5	NW Zone	LHCP	3905	72	105.9
WUC	Spot 3	H	14295	GD6	NW Zone	LHCP	3995	72	105.9
WU1	Spot 3	H	14042.5	JD1	SE Zone	LHCP	3742.5	77	108.9
WU2	Spot 3	H	14125	JD2	SE Zone	LHCP	3825	72	108.9
WU3	Spot 3	H	14186	JD3	SE Zone	LHCP	3886	34	108.9
WU4	Spot 3	H	14224	JD4	SE Zone	LHCP	3924	34	108.9
WU5	Spot 3	H	14205	JD5	SE Zone	LHCP	3905	72	108.9
WUC	Spot 3	H	14295	JD6	SE Zone	LHCP	3995	72	108.9
WU1	Spot 3	H	14042.5	HD1	NE Zone	LHCP	3742.5	77	106.2
WU2	Spot 3	H	14125	HD2	NE Zone	LHCP	3825	72	106.2
WU3	Spot 3	H	14186	HD3	NE Zone	LHCP	3886	34	106.2
WU4	Spot 3	H	14224	HD4	NE Zone	LHCP	3924	34	106.2
WU5	Spot 3	H	14205	HD5	NE Zone	LHCP	3905	72	106.2
WUC	Spot 3	H	14295	HD6	NE Zone	LHCP	3995	72	106.2
WU1	Spot 3	H	14042.5	ID1	SW Zone	LHCP	3742.5	77	106.7
WU2	Spot 3	H	14125	ID2	SW Zone	LHCP	3825	72	106.7
WU3	Spot 3	H	14186	ID3	SW Zone	LHCP	3886	34	106.7
WU4	Spot 3	H	14224	ID4	SW Zone	LHCP	3924	34	106.7
WU5	Spot 3	H	14205	ID5	SW Zone	LHCP	3905	72	106.7
WUC	Spot 3	H	14295	ID6	SW Zone	LHCP	3995	72	106.7
XU1	Spot 3X	V	14042.5	ED1	West Hemi	RHCP	3742.5	77	111.5
XU2	Spot 3X	V	14125	ED2	West Hemi	RHCP	3825	72	111.5
XU3	Spot 3X	V	14186	ED3	West Hemi	RHCP	3886	34	111.5
XU4	Spot 3X	V	14224	ED4	West Hemi	RHCP	3924	34	111.5
XU5	Spot 3X	V	14205	ED5	West Hemi	RHCP	3905	72	111.5
XUC	Spot 3X	V	14295	ED6	West Hemi	RHCP	3995	72	111.5
XU1	Spot 3X	V	14042.5	FD1	East Hemi	RHCP	3742.5	77	109.3
XU2	Spot 3X	V	14125	FD2	East Hemi	RHCP	3825	72	109.3
XU3	Spot 3X	V	14186	FD3	East Hemi	RHCP	3886	34	109.3

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)	Channel Gain (dB)
XU4	Spot 3X	V	14224	FD4	East Hemi	RHCP	3924	34	109.3
XU5	Spot 3X	V	14205	FD5	East Hemi	RHCP	3905	72	109.3
XUC	Spot 3X	V	14295	FD6	East Hemi	RHCP	3995	72	109.3
XU1	Spot 3X	V	14042.5	GD1	NW Zone	LHCP	3742.5	77	105.9
XU2	Spot 3X	V	14125	GD2	NW Zone	LHCP	3825	72	105.9
XU3	Spot 3X	V	14186	GD3	NW Zone	LHCP	3886	34	105.9
XU4	Spot 3X	V	14224	GD4	NW Zone	LHCP	3924	34	105.9
XU5	Spot 3X	V	14205	GD5	NW Zone	LHCP	3905	72	105.9
XUC	Spot 3X	V	14295	GD6	NW Zone	LHCP	3995	72	105.9
XU1	Spot 3X	V	14042.5	JD1	SE Zone	LHCP	3742.5	77	108.9
XU2	Spot 3X	V	14125	JD2	SE Zone	LHCP	3825	72	108.9
XU3	Spot 3X	V	14186	JD3	SE Zone	LHCP	3886	34	108.9
XU4	Spot 3X	V	14224	JD4	SE Zone	LHCP	3924	34	108.9
XU5	Spot 3X	V	14205	JD5	SE Zone	LHCP	3905	72	108.9
XUC	Spot 3X	V	14295	JD6	SE Zone	LHCP	3995	72	108.9
XU1	Spot 3X	V	14042.5	HD1	NE Zone	LHCP	3742.5	77	106.2
XU2	Spot 3X	V	14125	HD2	NE Zone	LHCP	3825	72	106.2
XU3	Spot 3X	V	14186	HD3	NE Zone	LHCP	3886	34	106.2
XU4	Spot 3X	V	14224	HD4	NE Zone	LHCP	3924	34	106.2
XU5	Spot 3X	V	14205	HD5	NE Zone	LHCP	3905	72	106.2
XUC	Spot 3X	V	14295	HD6	NE Zone	LHCP	3995	72	106.2
XU1	Spot 3X	V	14042.5	ID1	SW Zone	LHCP	3742.5	77	106.7
XU2	Spot 3X	V	14125	ID2	SW Zone	LHCP	3825	72	106.7
XU3	Spot 3X	V	14186	ID3	SW Zone	LHCP	3886	34	106.7
XU4	Spot 3X	V	14224	ID4	SW Zone	LHCP	3924	34	106.7
XU5	Spot 3X	V	14205	ID5	SW Zone	LHCP	3905	72	106.7
XUC	Spot 3X	V	14295	ID6	SW Zone	LHCP	3995	72	106.7
CMD1	Global	LHCP	6173.7					1.0	
CMD2	Global	LHCP	6176.3					1.0	
				TM1	Global	RHCP	3947.5	0.5	
				TM2	Global	RHCP	3952.5	0.5	
				TM3	Global	RHCP	3948	0.5	
				TM4	Global	RHCP	3952	0.5	
				BC1	Global	V	3950	0.025	
				BK1	Global	RHCP	11198	0.025	
				BK2	Global	RHCP	11452	0.025	
				BK3	Spot 1	V	11701	0.025	
				BK4	Spot 2	H	11701	0.025	
				BK5	Spot 2A	H	11701	0.025	
				BK6	Spot 3	V	11701	0.025	
				BK7	Spot 3X	H	11701	0.025	
				BK8	Spot 1	V	12501	0.025	
				BK9	Spot 2	H	12501	0.025	
				BK10	Spot 2A	H	12501	0.025	
				BK11	Spot 3	V	12501	0.025	
				BK12	Spot 3X	H	12501	0.025	

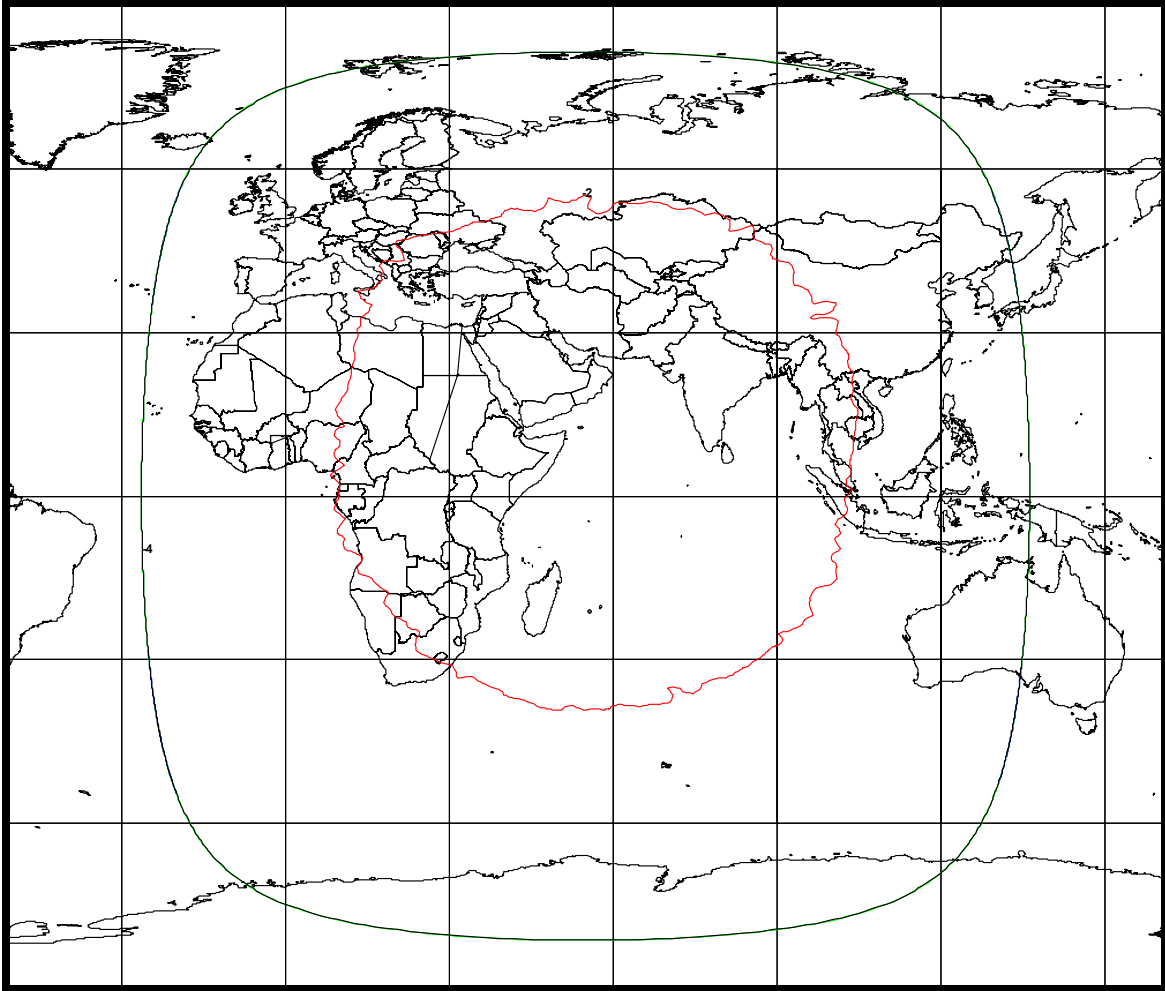
**Note:**

H: Linear horizontal polarization  
V: Linear vertical polarization

RHCP: Right hand circular polarization  
LHCP: Left hand circular polarization

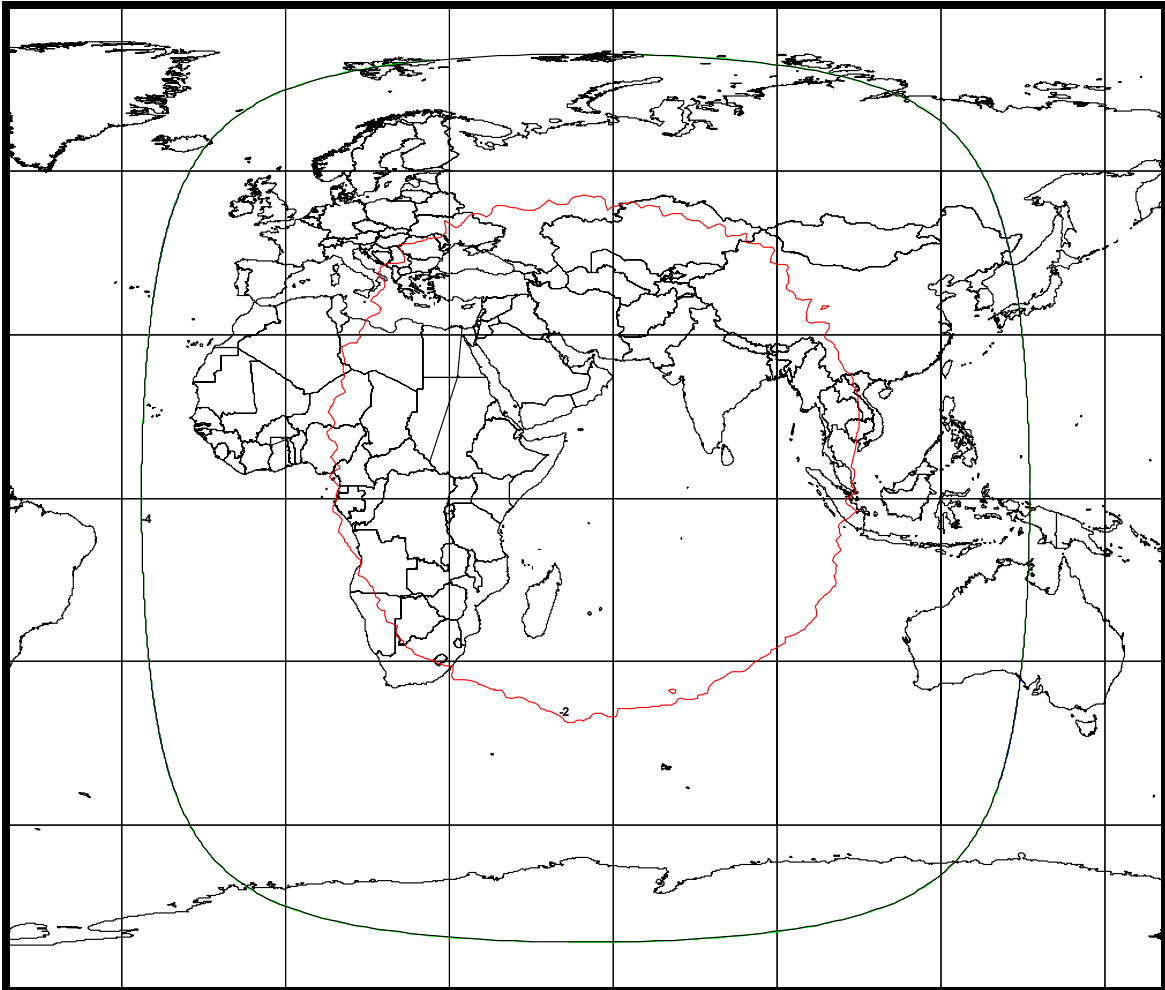
**Exhibit 2-1: C-Band Global A Uplink Beam**  
[Schedule S Beam Designation: GAUL]

Beam Peak Gain: 20.3 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak G/T: -7 dB/K  
Saturated Flux Density @ Beam Peak G/T: -91.9 to -77.9 dBW/m<sup>2</sup>



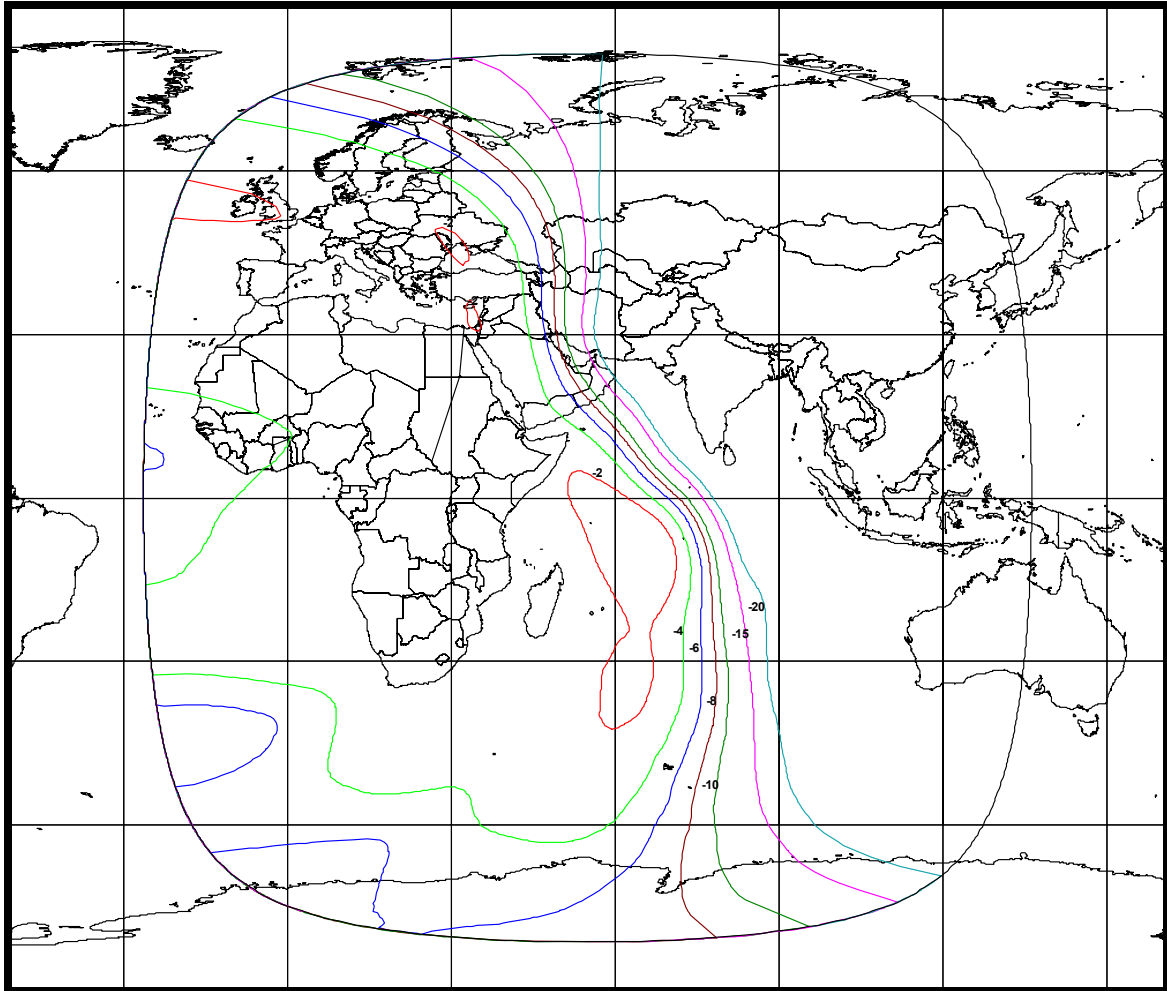
**Exhibit 2-2: C-Band Global B Uplink Beam**  
[Schedule S Beam Designation: GBUL]

Beam Peak Gain: 20.3 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak G/T: -7 dB/K  
Saturated Flux Density @ Beam Peak G/T: -91.3 to -77.3 dBW/m<sup>2</sup>



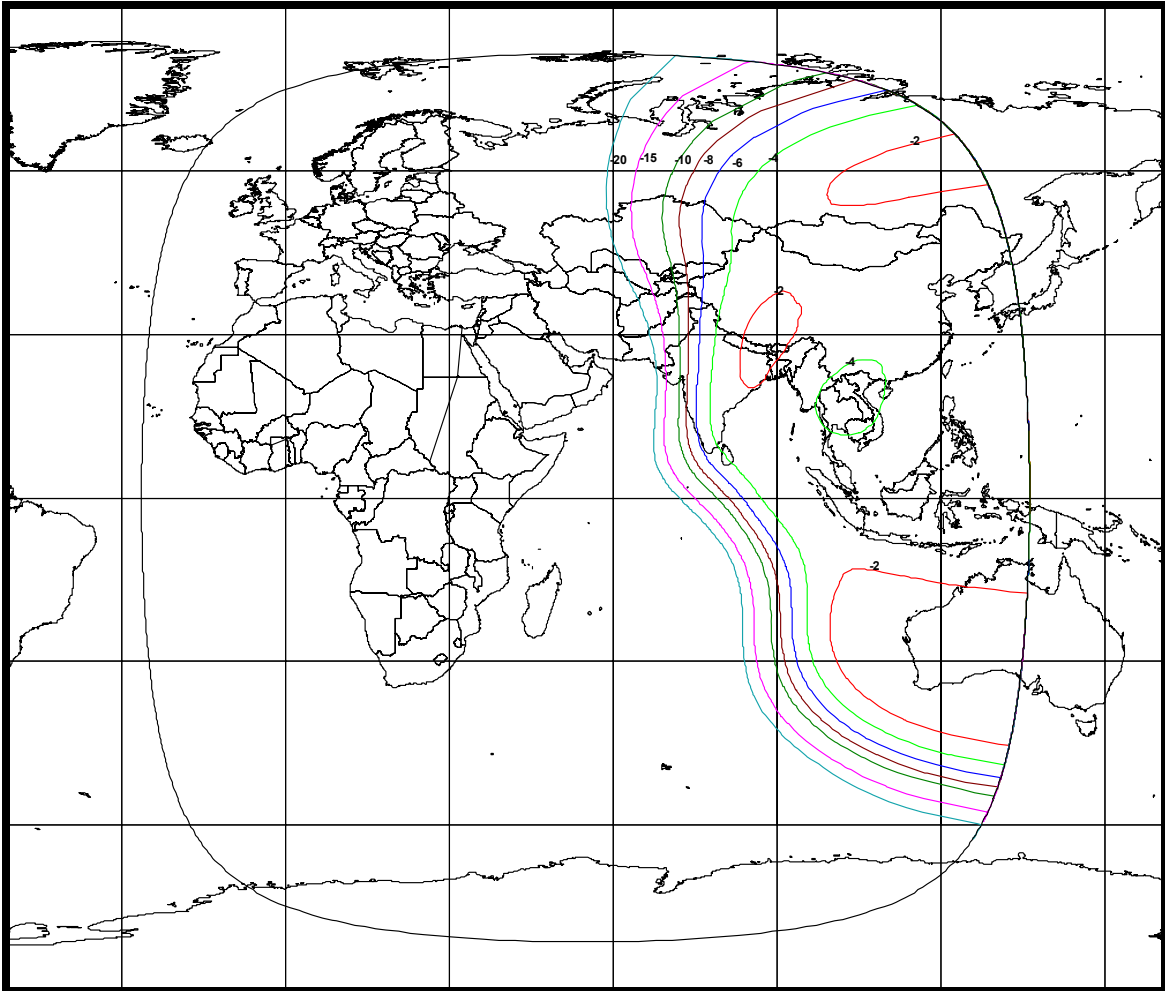
**Exhibit 2-3: C-Band West Hemi Uplink Beam**  
[Schedule S Beam Designation: WHUL]

Beam Peak Gain: 24.1 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak G/T: -3 dB/K  
Saturated Flux Density @ Beam Peak G/T: -92.1 to -78.1 dBW/m<sup>2</sup>



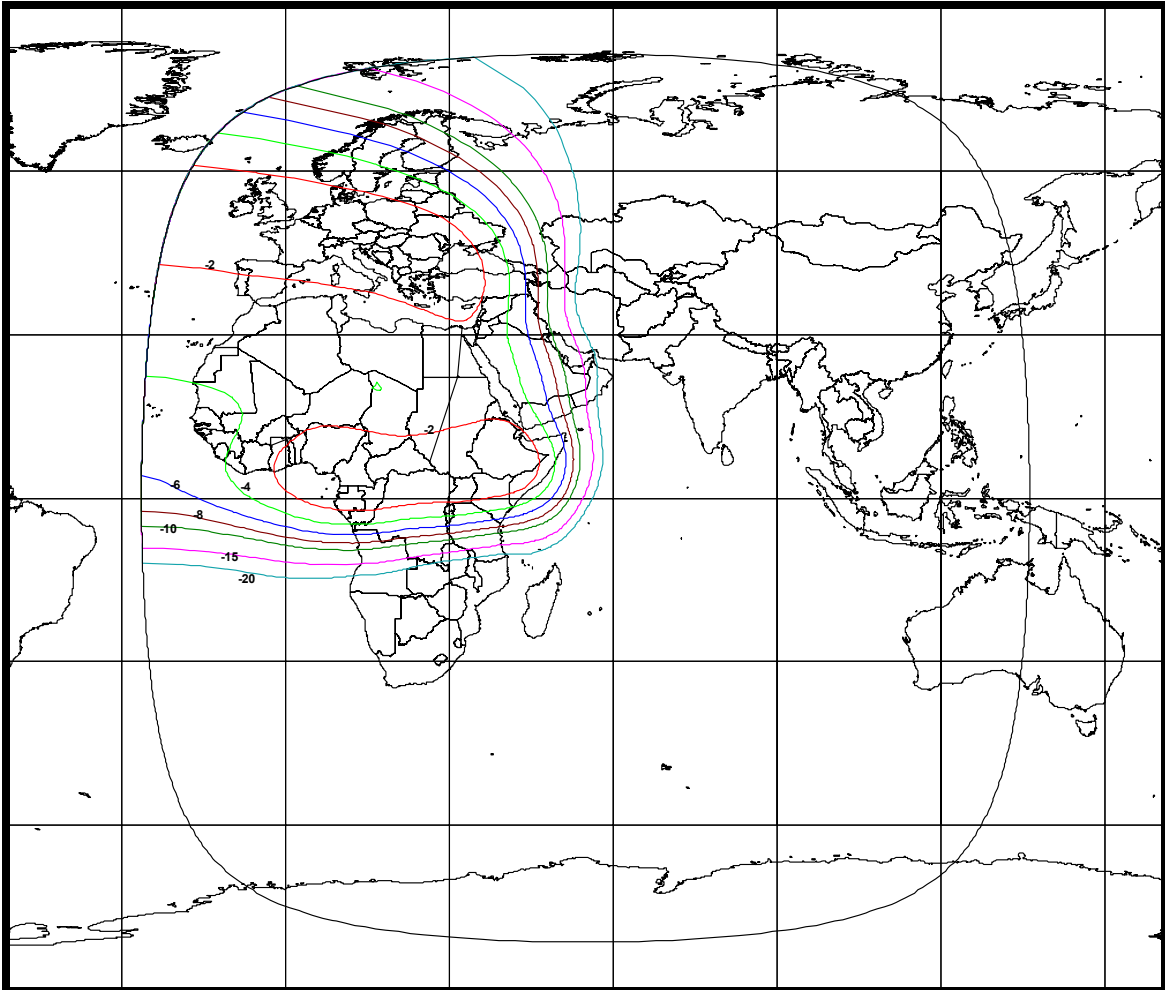
**Exhibit 2-4: C-Band East Hemi Uplink Beam**  
[Schedule S Beam Designation: EHUL]

Beam Peak Gain: 25.6 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak G/T: -1.5 dB/K  
Saturated Flux Density @ Beam Peak G/T: -92.7 to -78.7 dBW/m<sup>2</sup>



**Exhibit 2-5: C-Band Northwest Zone Uplink Beam**  
[Schedule S Beam Designation: NWUL]

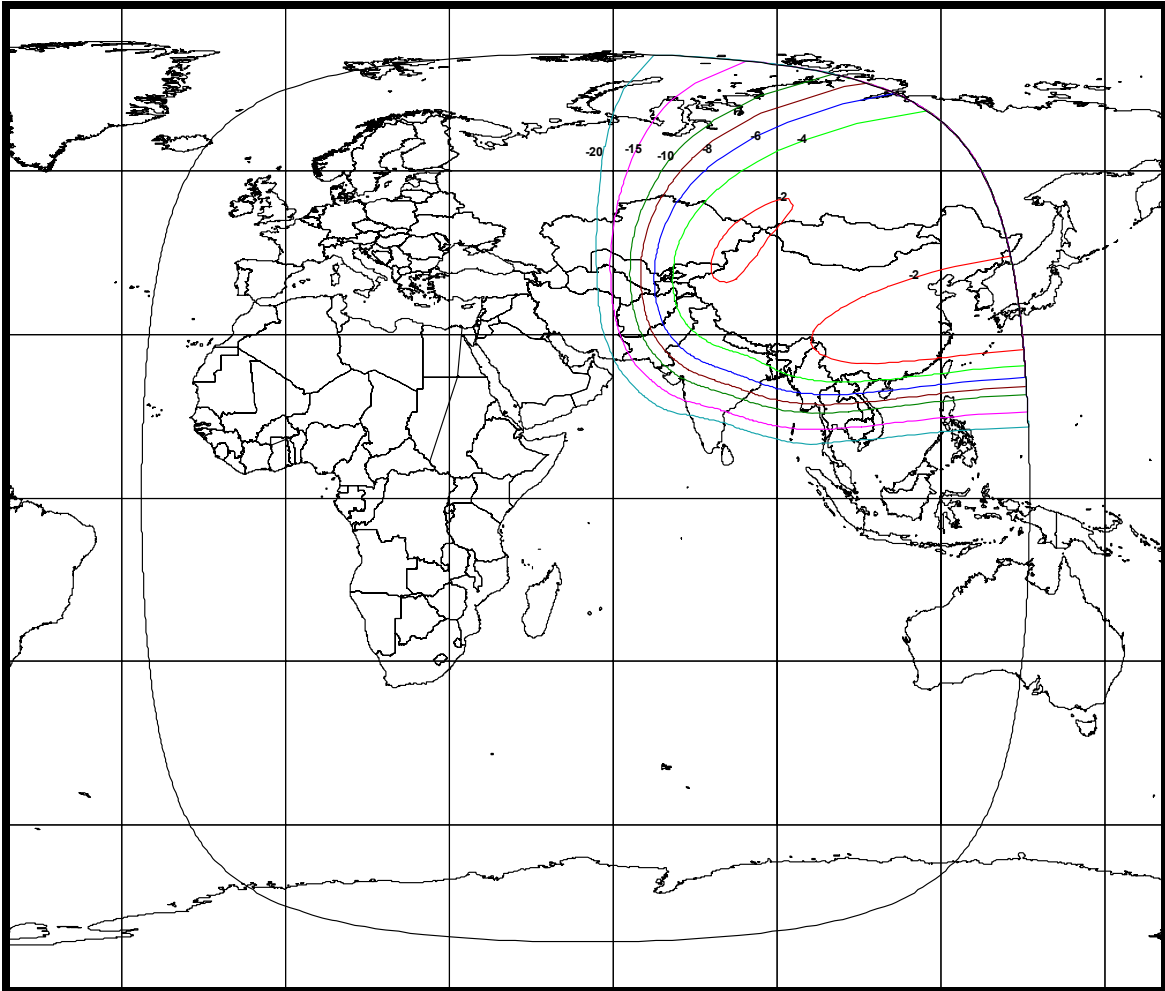
Beam Peak Gain: 26.8 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak G/T: -0.5 dB/K  
Saturated Flux Density @ Beam Peak G/T: -92.4 to -78.4 dBW/m<sup>2</sup>





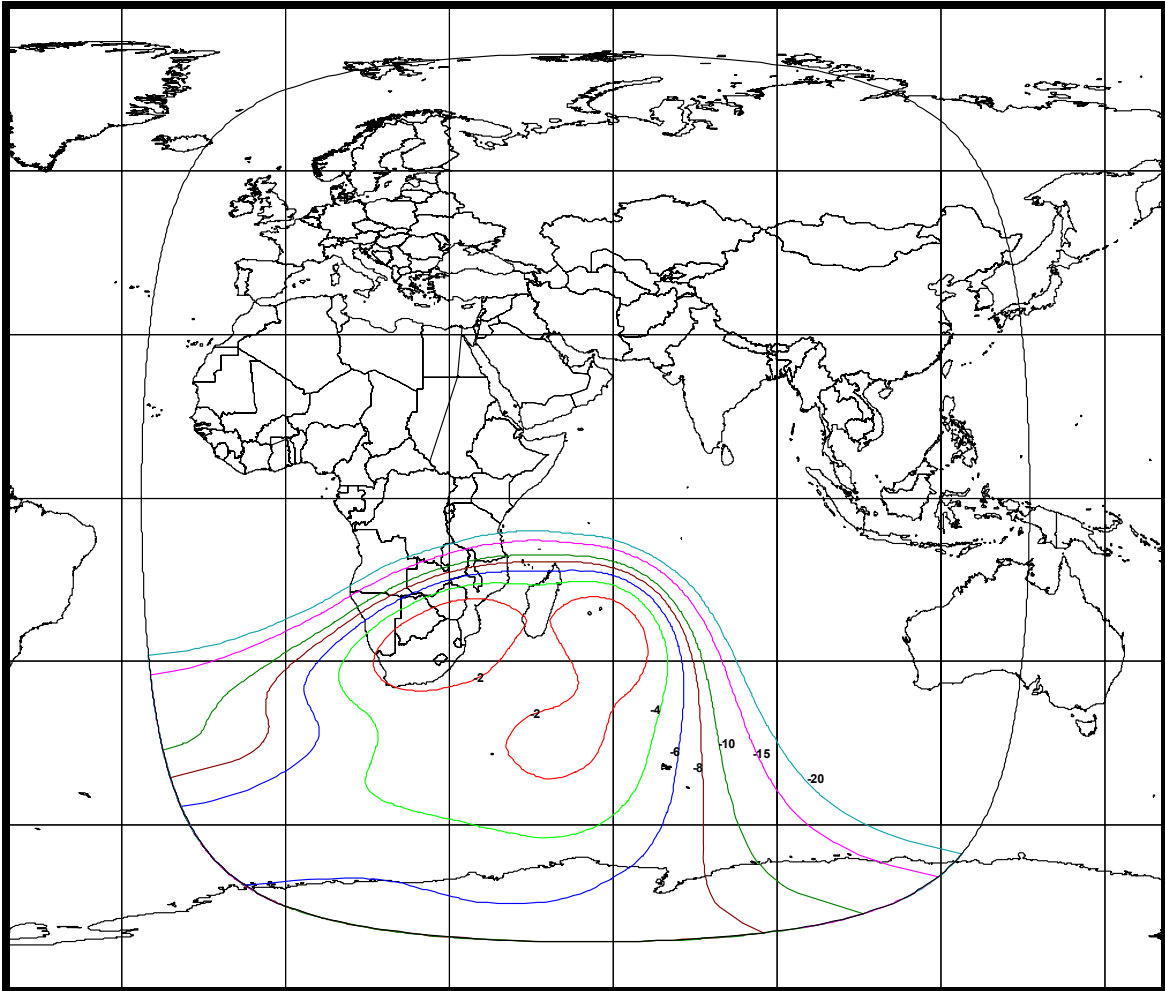
**Exhibit 2-6: C-Band Northeast Zone Uplink Beam**  
[Schedule S Beam Designation: NEUL]

Beam Peak Gain: 28.7 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak G/T: 0.9 dB/K  
Saturated Flux Density @ Beam Peak G/T: -91.9 to -77.9 dBW/m<sup>2</sup>



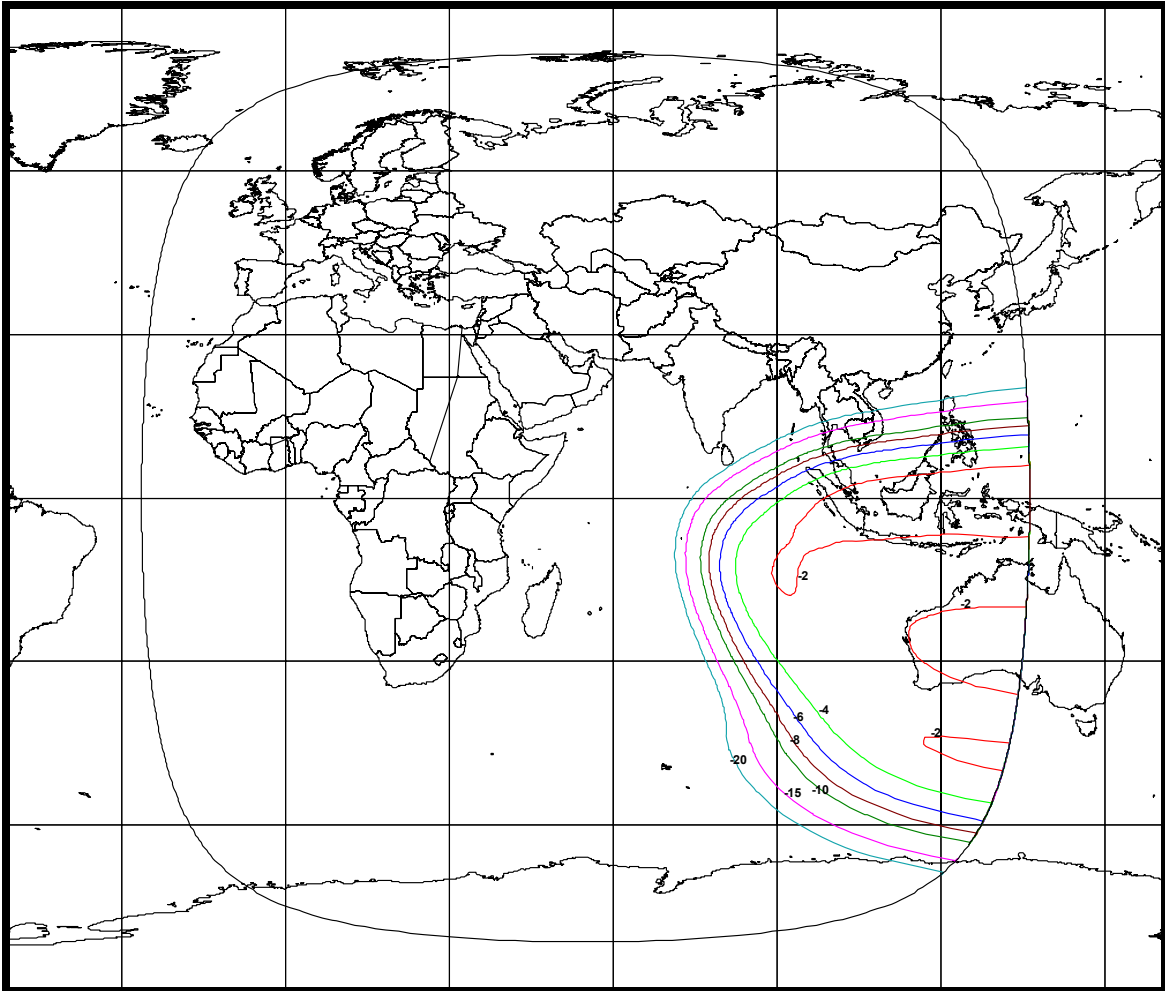
**Exhibit 2-7: C-Band Southwest Zone Uplink Beam**  
[Schedule S Beam Designation: SWUL]

Beam Peak Gain: 27.9 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak G/T: 1 dB/K  
Saturated Flux Density @ Beam Peak G/T: -91.6 to -77.6 dBW/m<sup>2</sup>



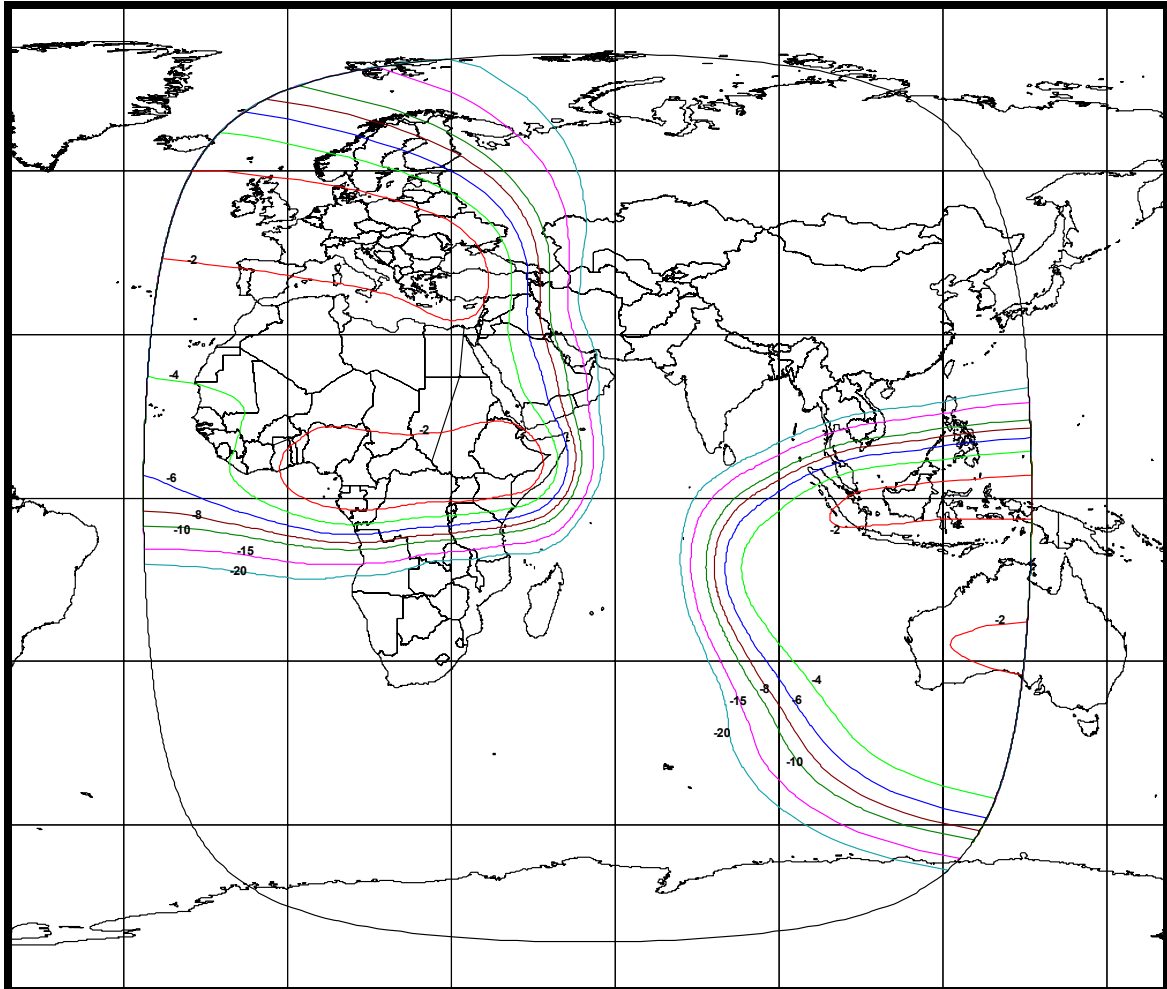
**Exhibit 2-8: C-Band Southeast Zone Uplink Beam**  
[Schedule S Beam Designation: SEUL]

Beam Peak Gain: 27.0 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak G/T: 0 dB/K  
Saturated Flux Density @ Beam Peak G/T: -92.5 to -78.5 dBW/m<sup>2</sup>



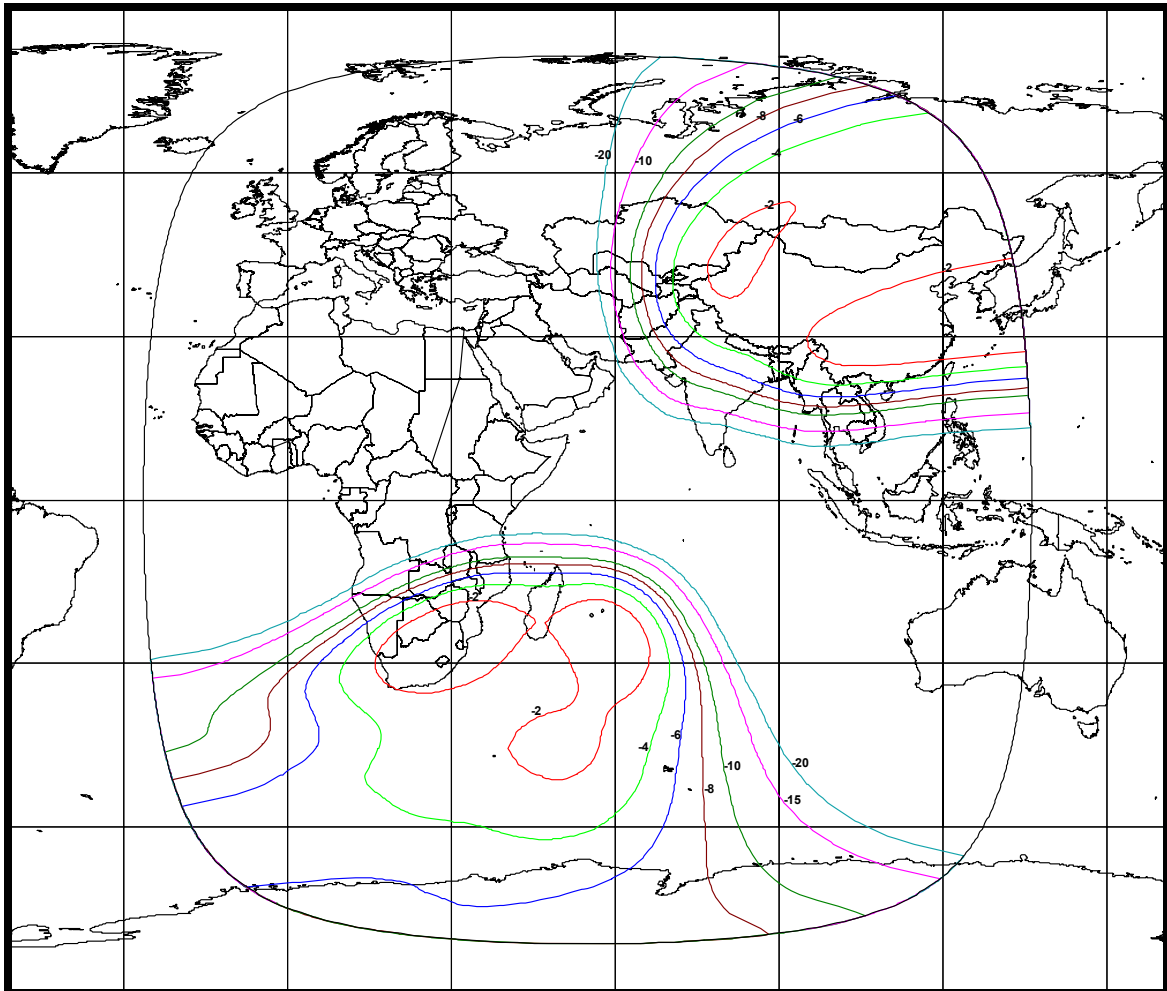
**Exhibit 2-9: C-Band Combined Northwest and Southeast Zone Uplink Beam**  
[Schedule S Beam Designation: X1UL]

Beam Peak Gain: 23.9 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak G/T: -3.5 dB/K  
Saturated Flux Density @ Beam Peak G/T: -91.7 to -77.7 dBW/m<sup>2</sup>



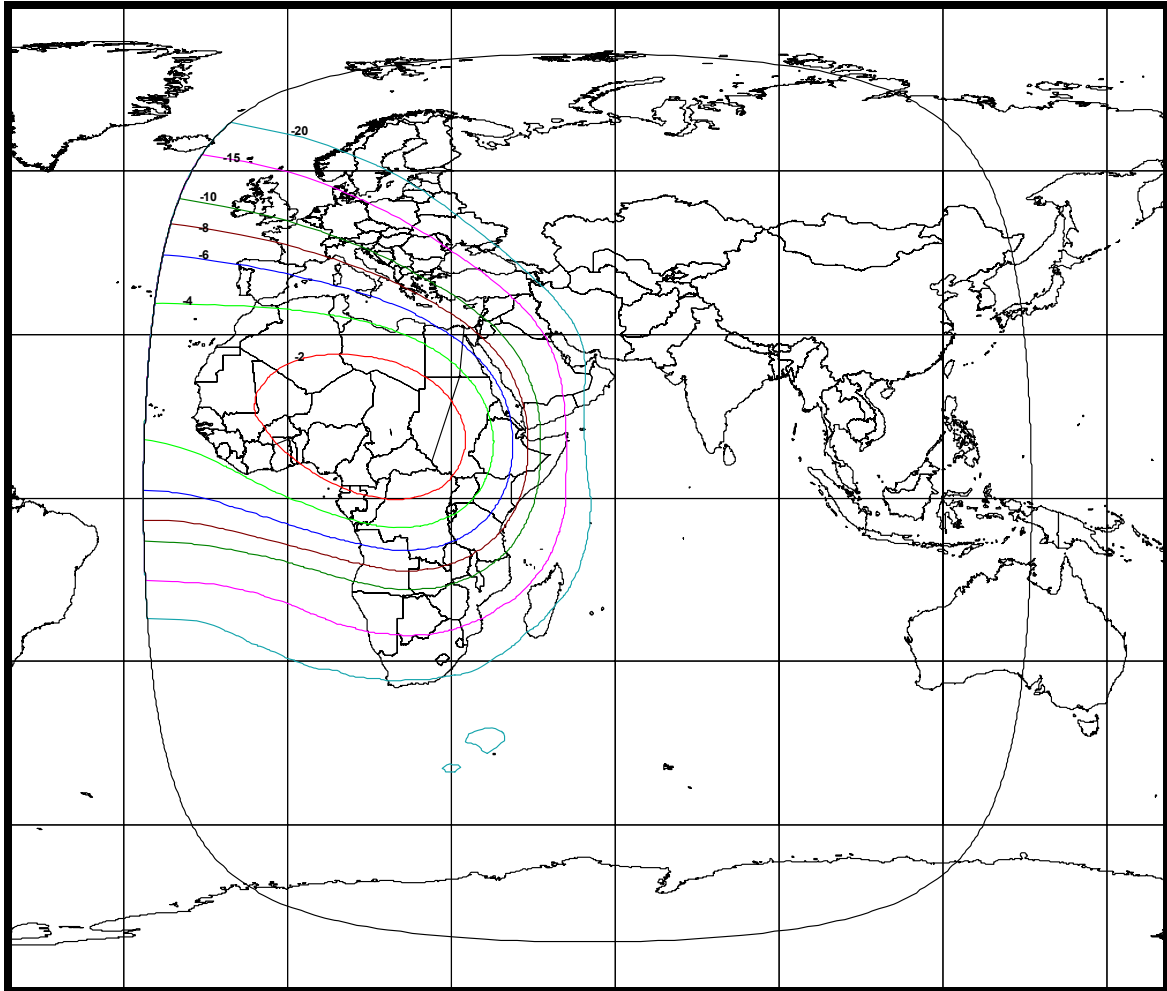
**Exhibit 2-10: C-Band Combined Northeast and Southwest Zone Uplink Beam**  
[Schedule S Beam Designation: X2UL]

Beam Peak Gain: 24.9 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak G/T: -2.5 dB/K  
Saturated Flux Density @ Beam Peak G/T: -90.8 to -76.8 dBW/m<sup>2</sup>



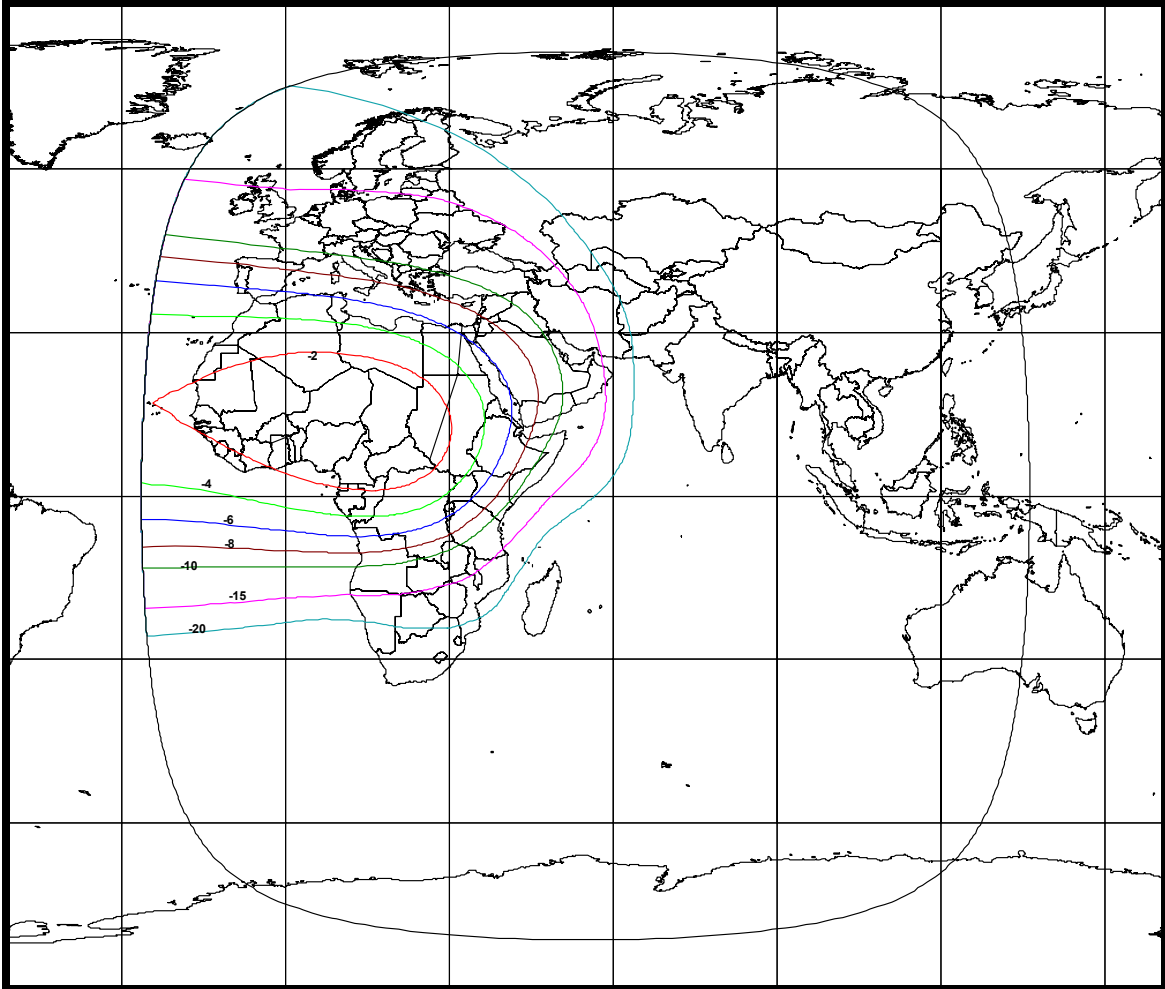
**Exhibit 2-11: C-Spot A Uplink Beam**  
[Schedule S Beam Designation: CAUL]

Beam Peak Gain: 30.3 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak G/T: 3 dB/K  
Saturated Flux Density @ Beam Peak G/T: -94.0 to -80.0 dBW/m<sup>2</sup>



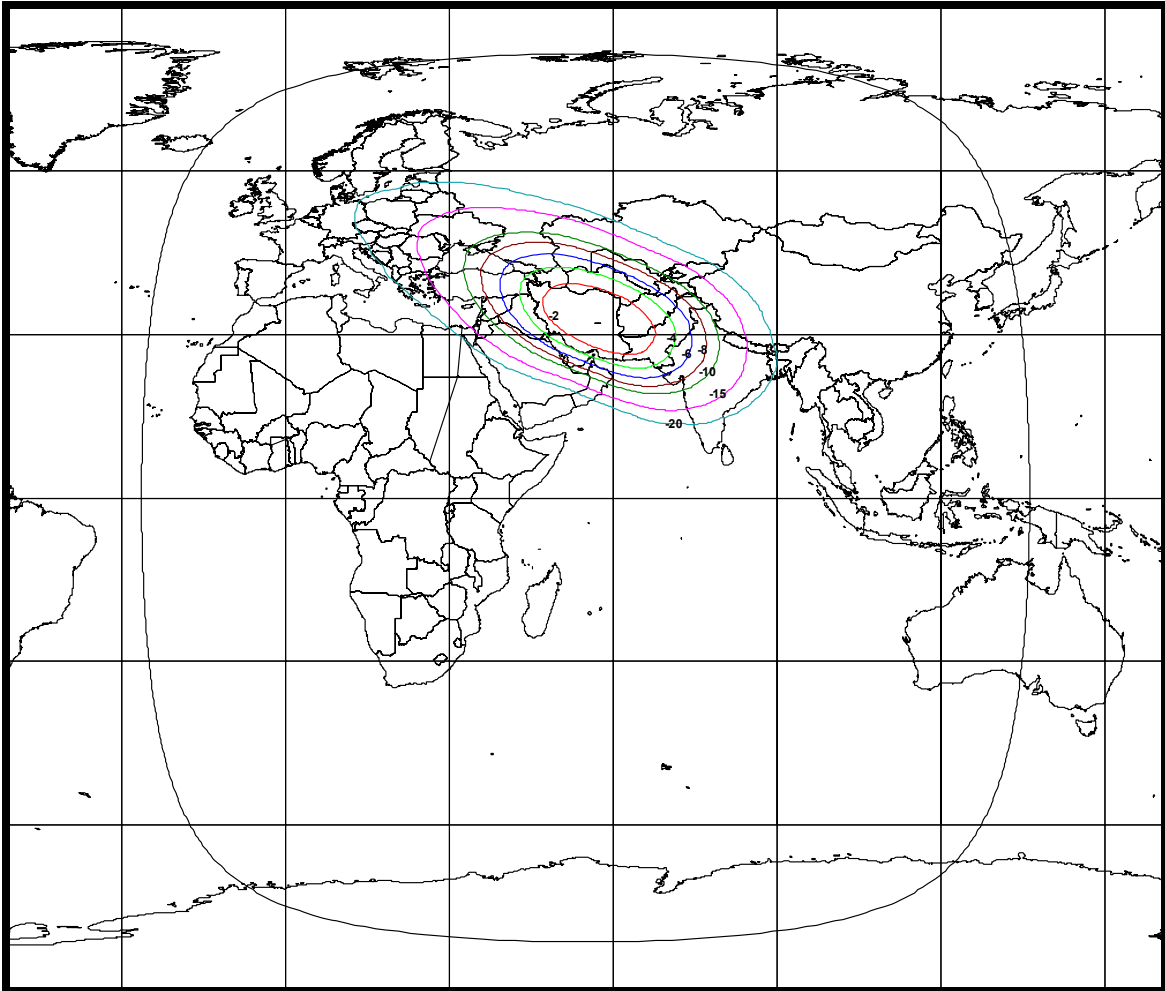
**Exhibit 2-12: C-Spot B Uplink Beam**  
[Schedule S Beam Designation: CBUL]

Beam Peak Gain: 30.3 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak G/T: 3 dB/K  
Saturated Flux Density @ Beam Peak G/T: -93.9 to -79.9 dBW/m<sup>2</sup>



**Exhibit 2-13: Ku-Band Spot 1 Uplink Beam**  
[Schedule S Beam Designation: S1UL]

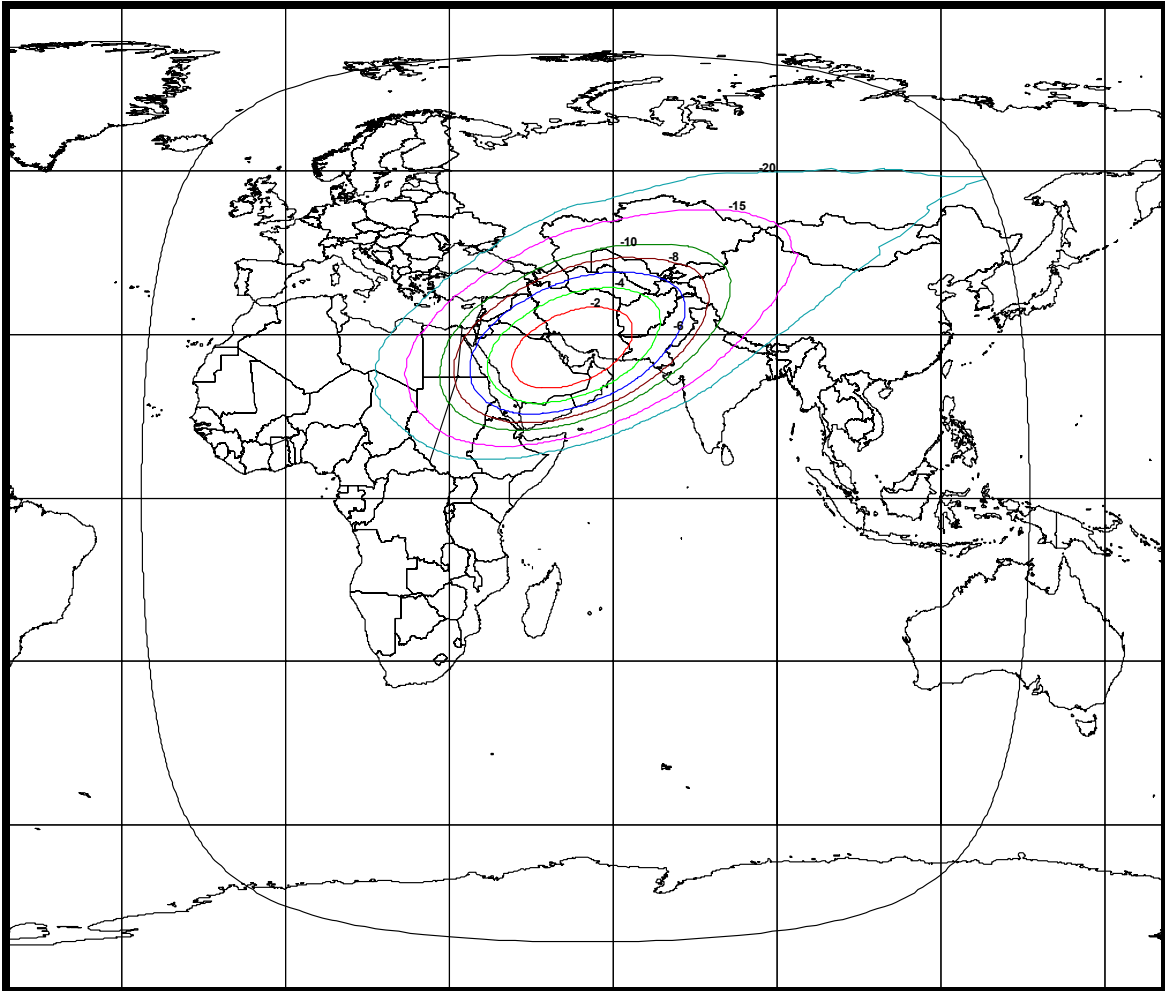
Beam Peak Gain: 36.9 dBi  
Beam Polarization: Horizontal  
Beam Peak G/T: 9.5 dB/K  
Saturated Flux Density @ Beam Peak G/T: -92.9 to -78.9 dBW/m<sup>2</sup>





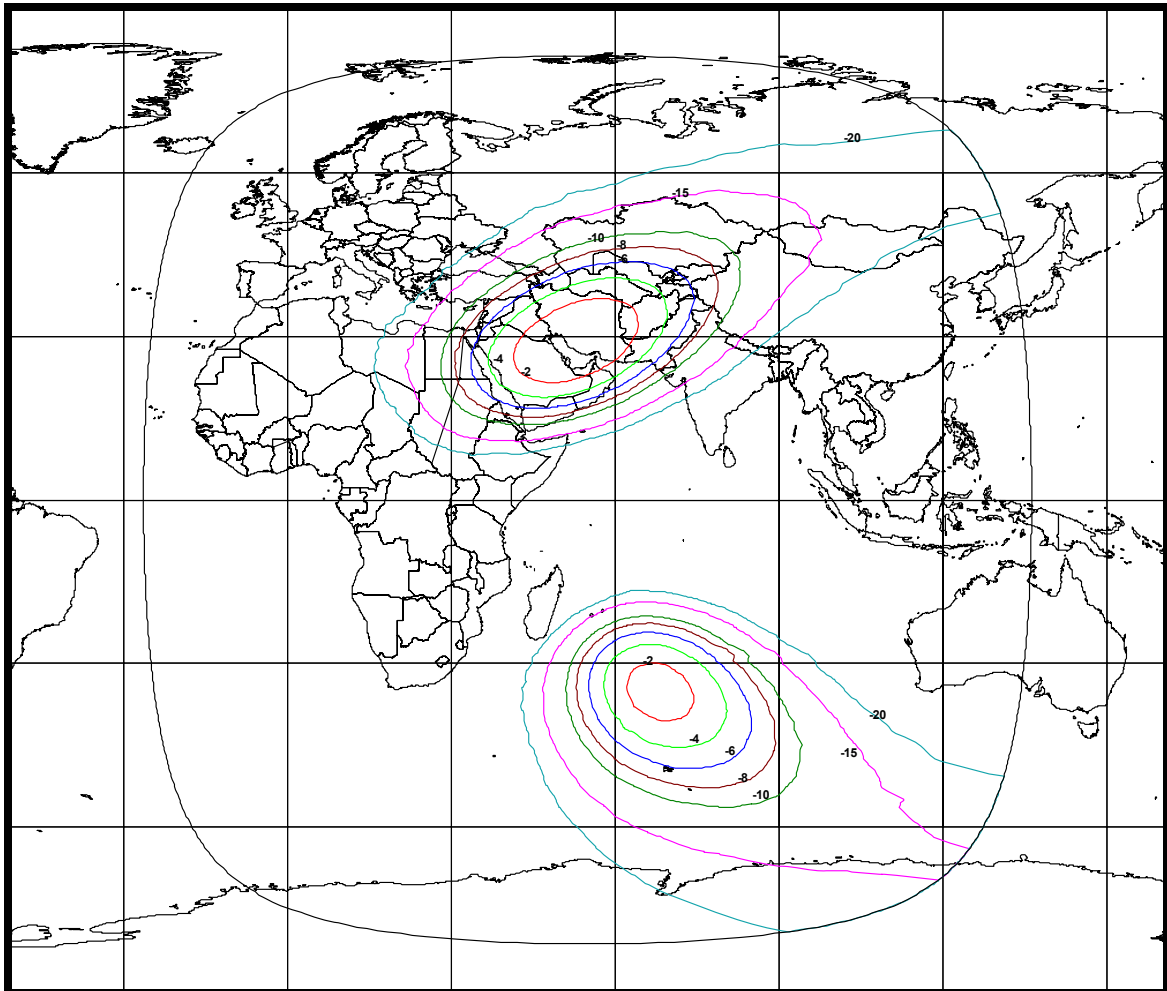
**Exhibit 2-14: Ku-Band Spot 2 Uplink Beam**  
[Schedule S Beam Designation: S2UL]

Beam Peak Gain: 34.8 dBi  
Beam Polarization: Vertical  
Beam Peak G/T: 7 dB/K  
Saturated Flux Density @ Beam Peak G/T: -92.9 to -78.9 dBW/m<sup>2</sup>



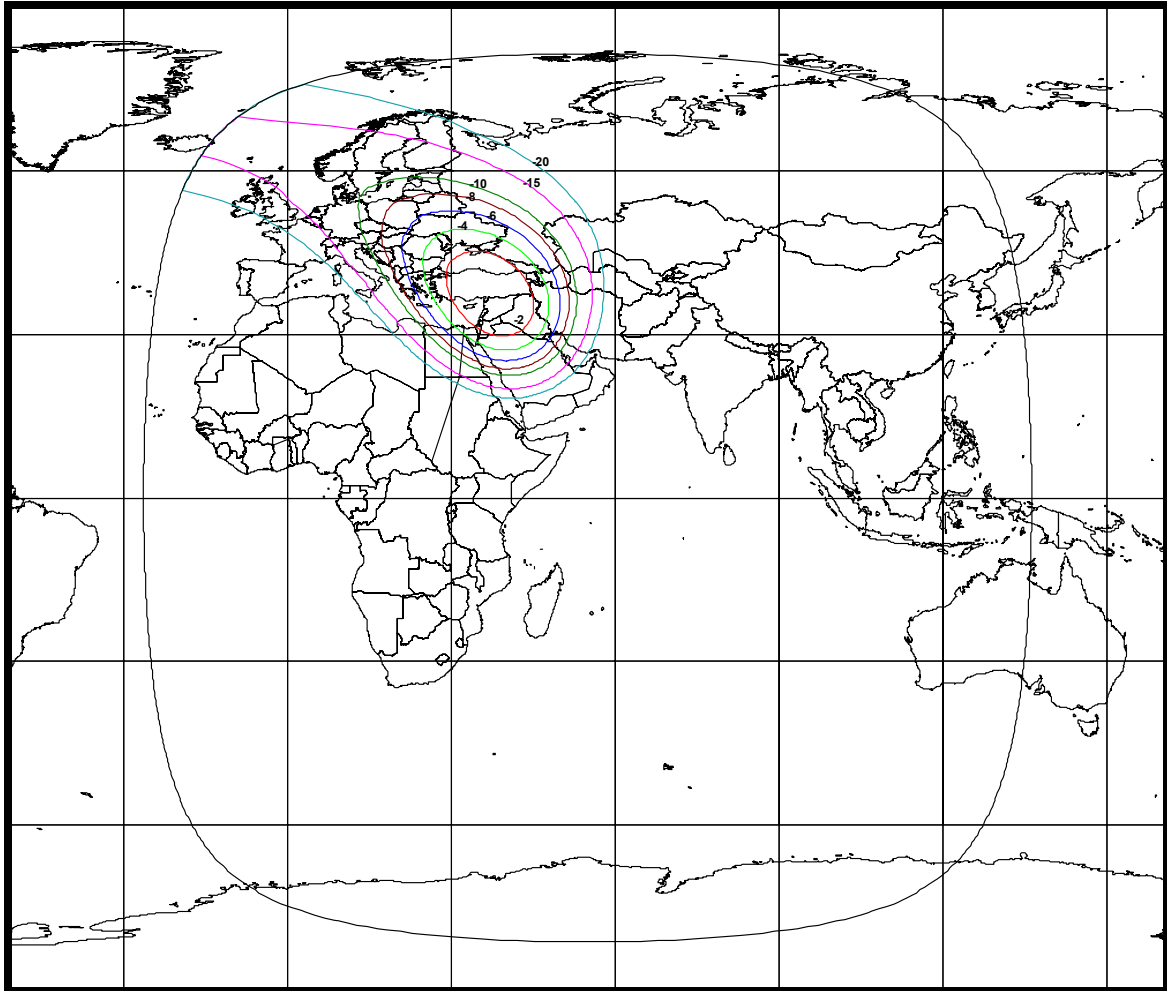
**Exhibit 2-15: Ku-Band Spot 2A Uplink Beam**  
[Schedule S Beam Designation: S2AU]

Beam Peak Gain: 32.9 dBi  
Beam Polarization: Vertical  
Beam Peak G/T: 5 dB/K  
Saturated Flux Density @ Beam Peak G/T: -93.1 to -79.1 dBW/m<sup>2</sup>



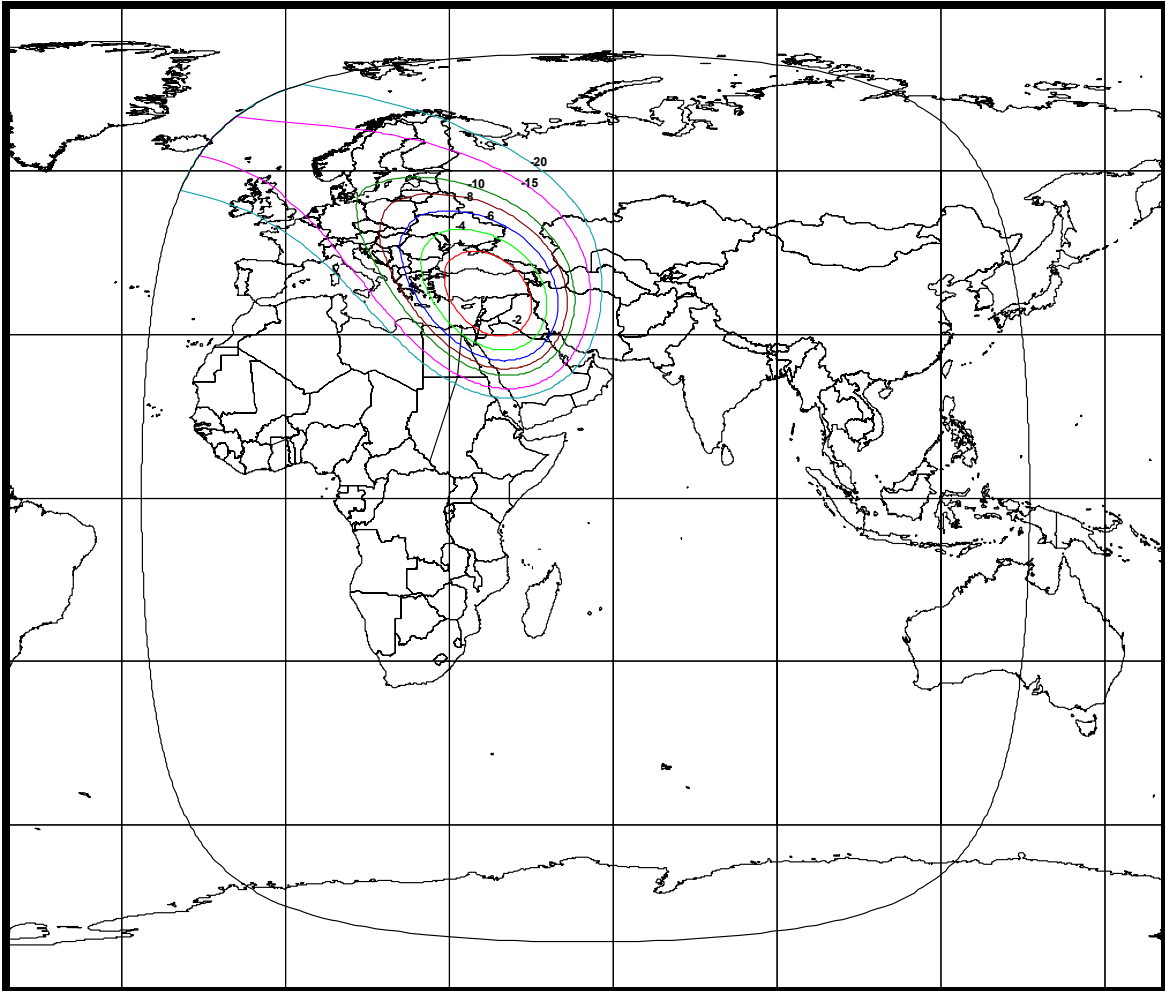
**Exhibit 2-16: Ku-Band Spot 3 Uplink Beam**  
[Schedule S Beam Designation: S3UL]

Beam Peak Gain: 37.8 dBi  
Beam Polarization: Horizontal  
Beam Peak G/T: 10 dB/K  
Saturated Flux Density @ Beam Peak G/T: -91.8 to -77.8 dBW/m<sup>2</sup>



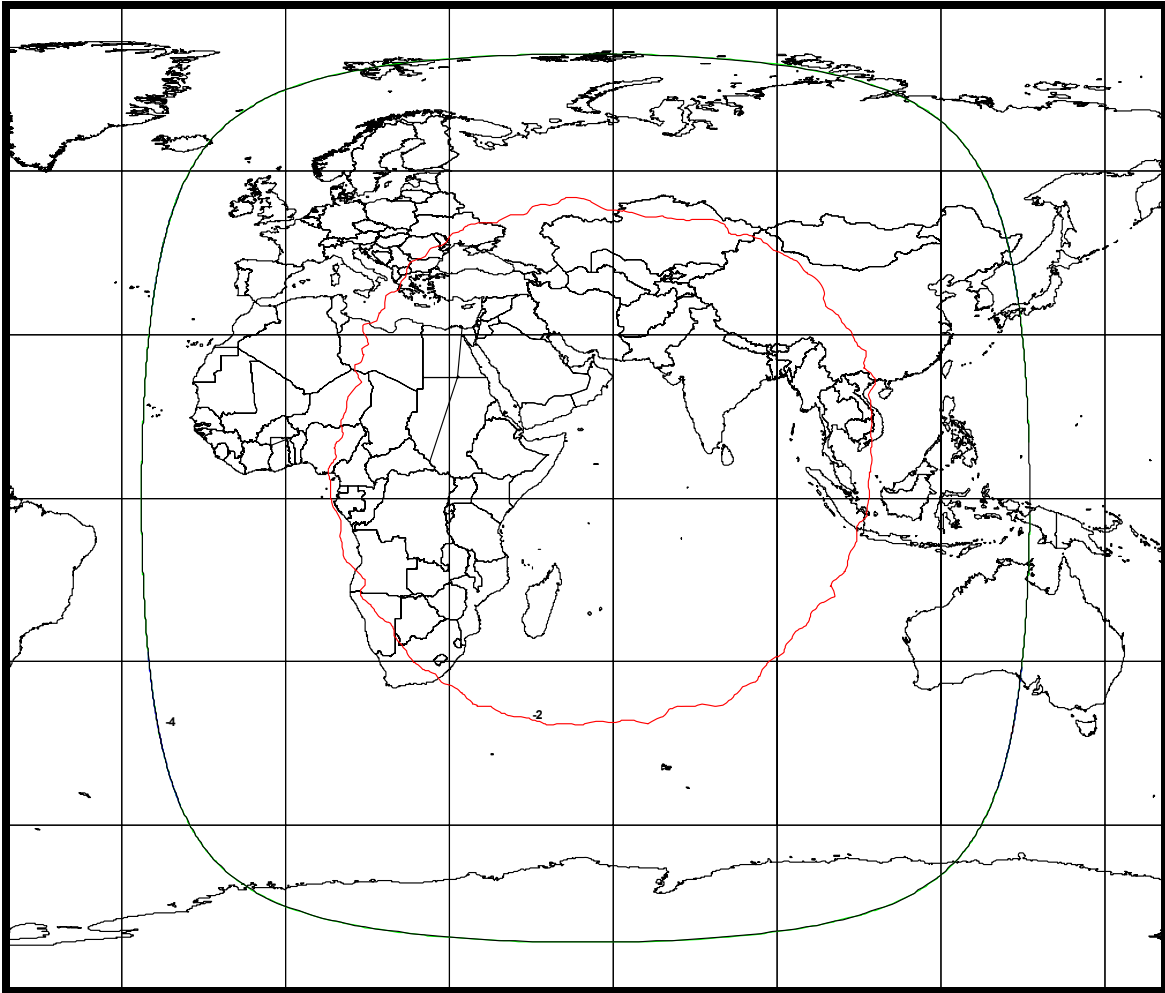
**Exhibit 2-17: Ku-Band Spot 3X Uplink Beam**  
[Schedule S Beam Designation: S3XU]

Beam Peak Gain: 37.8 dBi  
Beam Polarization: Vertical  
Beam Peak G/T: 10 dB/K  
Saturated Flux Density @ Beam Peak G/T: -91.8 to -77.8 dBW/m<sup>2</sup>



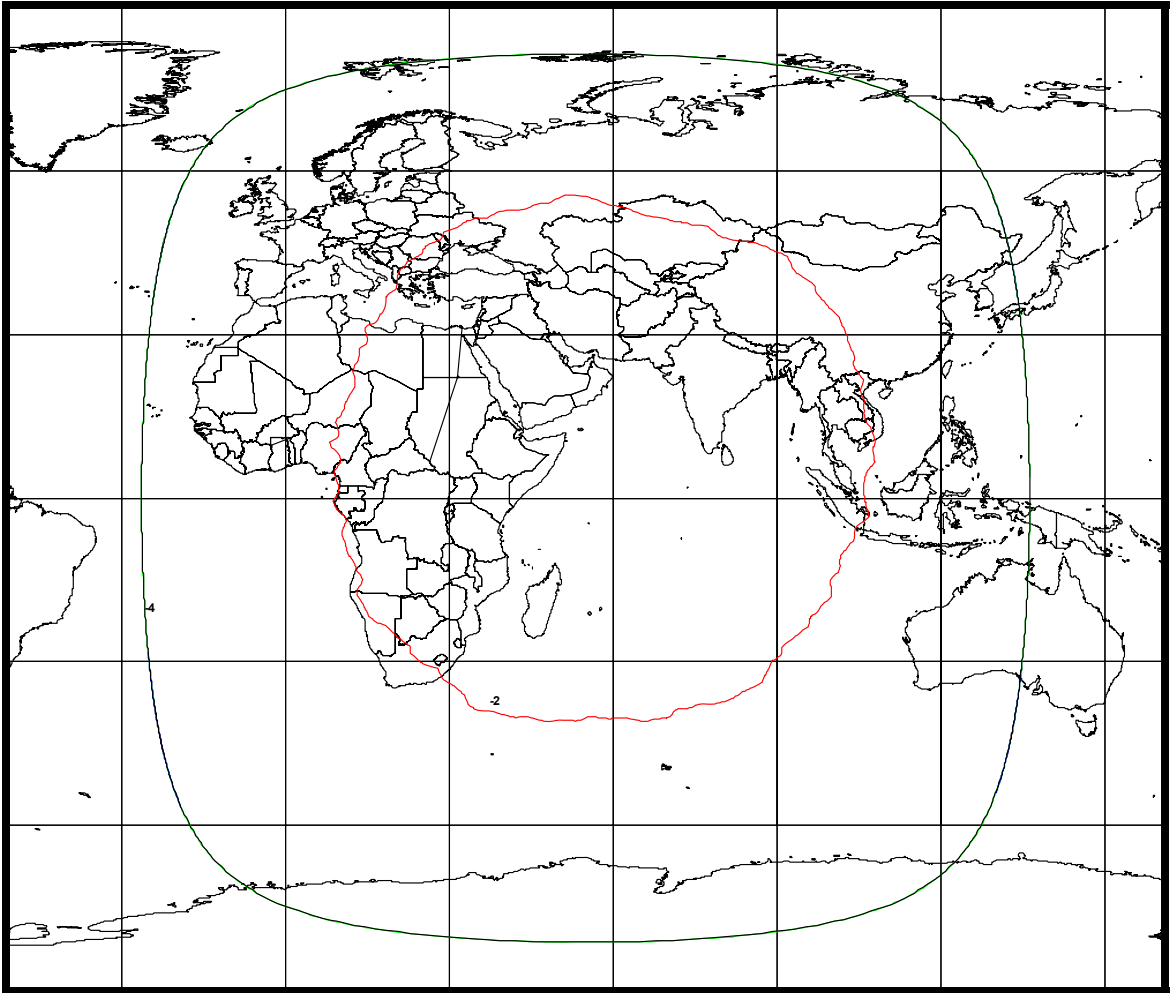
**Exhibit 2-18: C-Band Global A Downlink Beam**  
[Schedule S Beam Designation: GADL]

Beam Peak Gain: 20.5 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak EIRP: 29.5 dBW



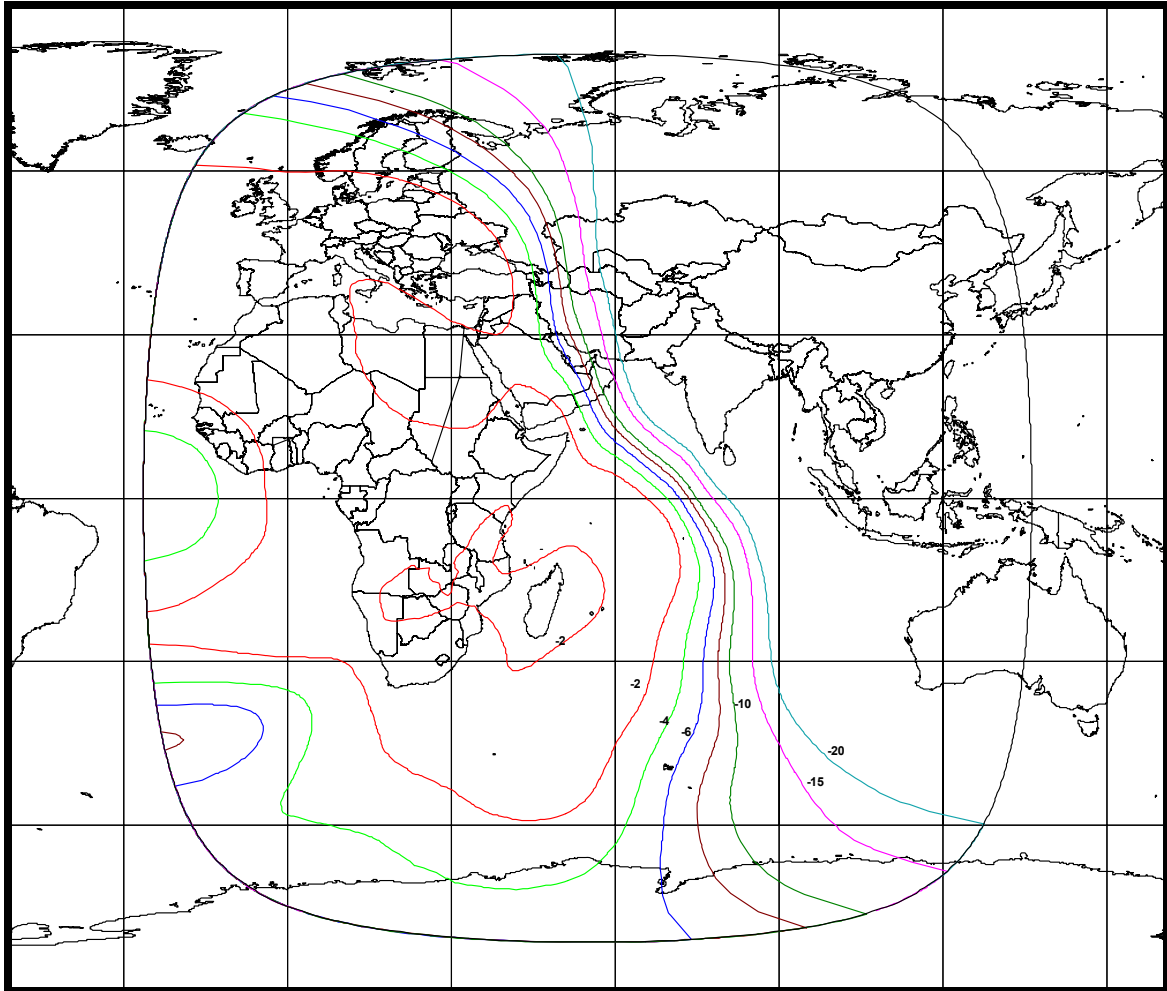
**Exhibit 2-19: C-Band Global B Downlink Beam**  
[Schedule S Beam Designation: GBDL]

Beam Peak Gain: 20.5 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak EIRP: 30.5 dBW



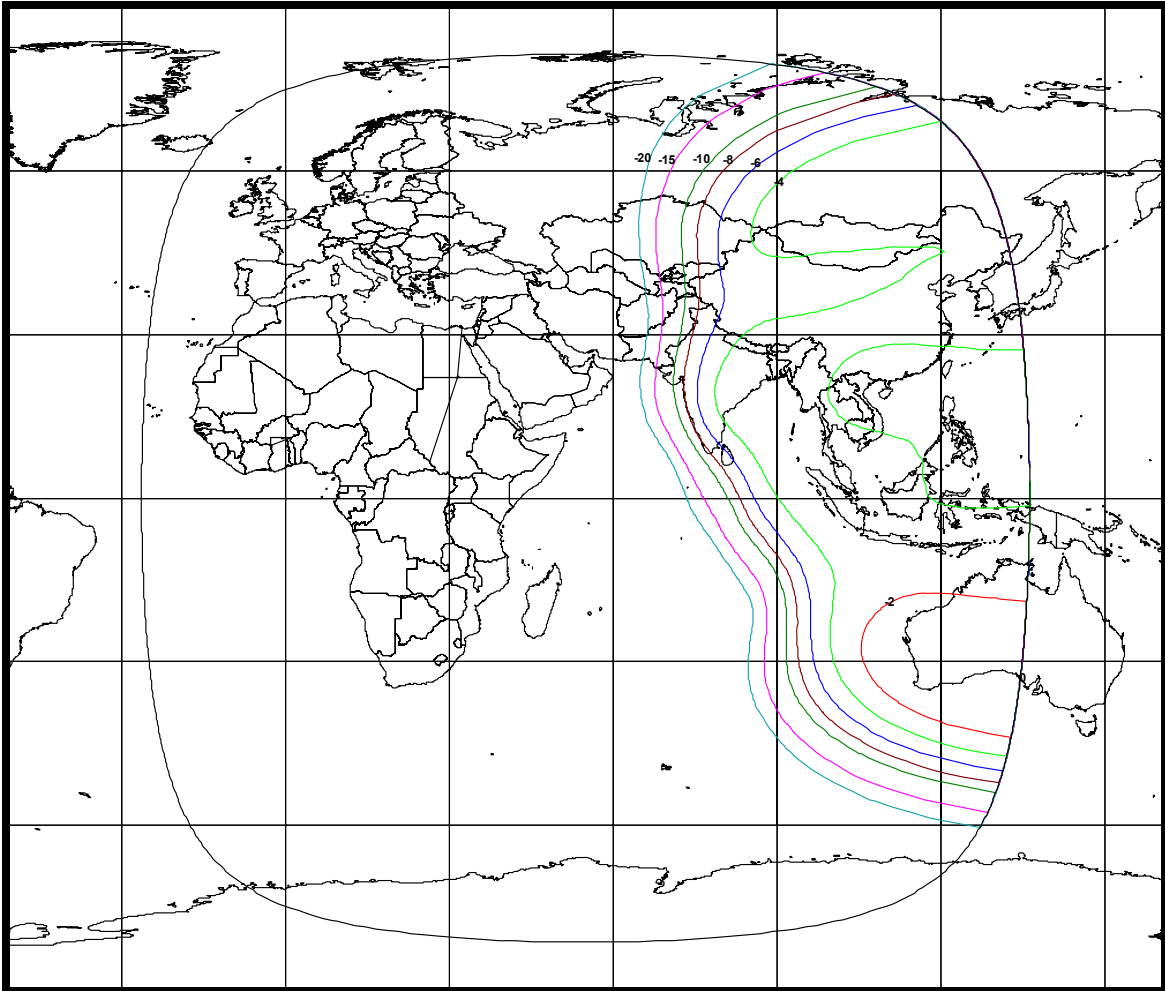
**Exhibit 2-20: C-Band West Hemi Downlink Beam**  
[Schedule S Beam Designation: WHDL]

Beam Peak Gain: 23.8 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak EIRP: 36.8 dBW



**Exhibit 2-21: C-Band East Hemi Downlink Beam**  
[Schedule S Beam Designation: EHDL]

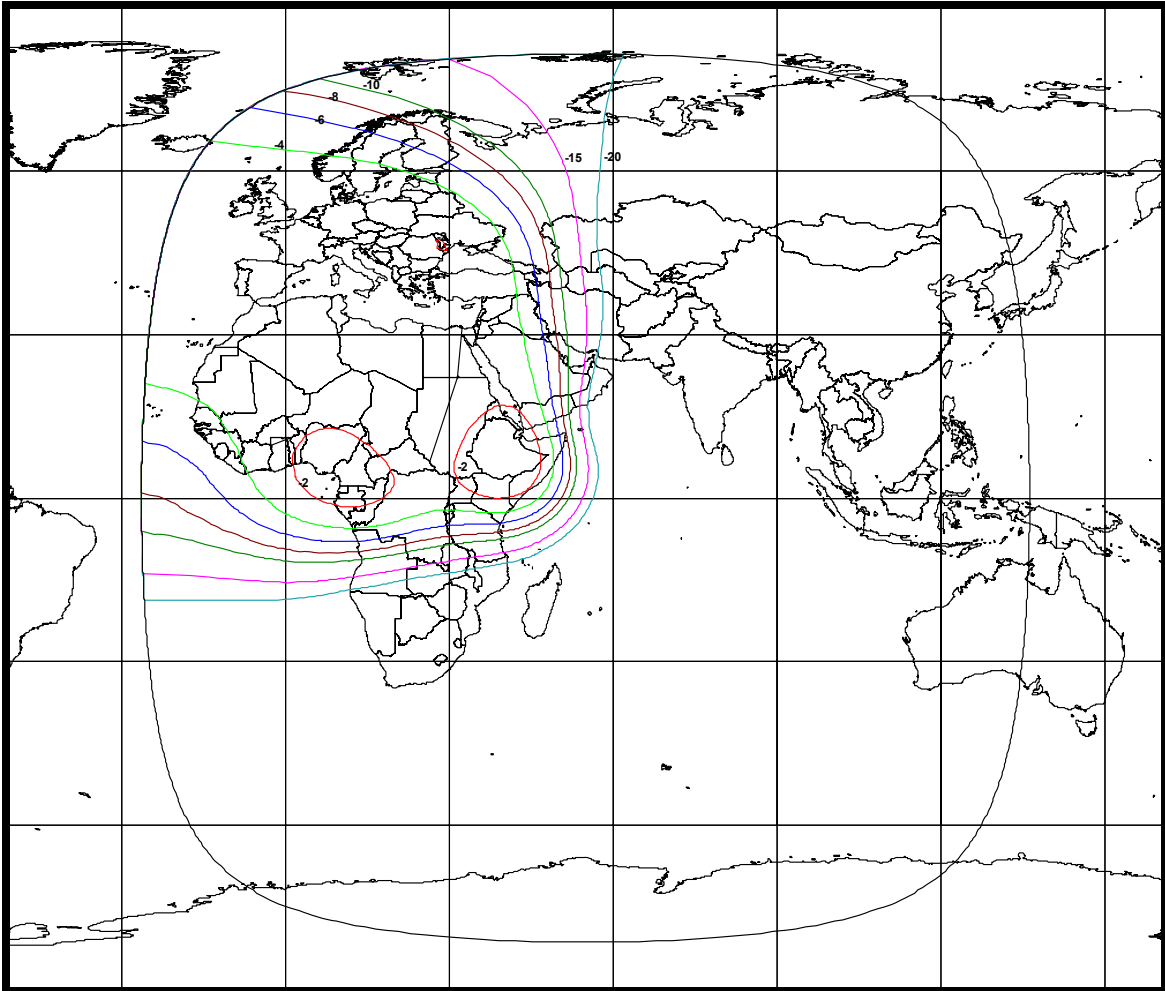
Beam Peak Gain: 27.5 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak EIRP: 38.3 dBW





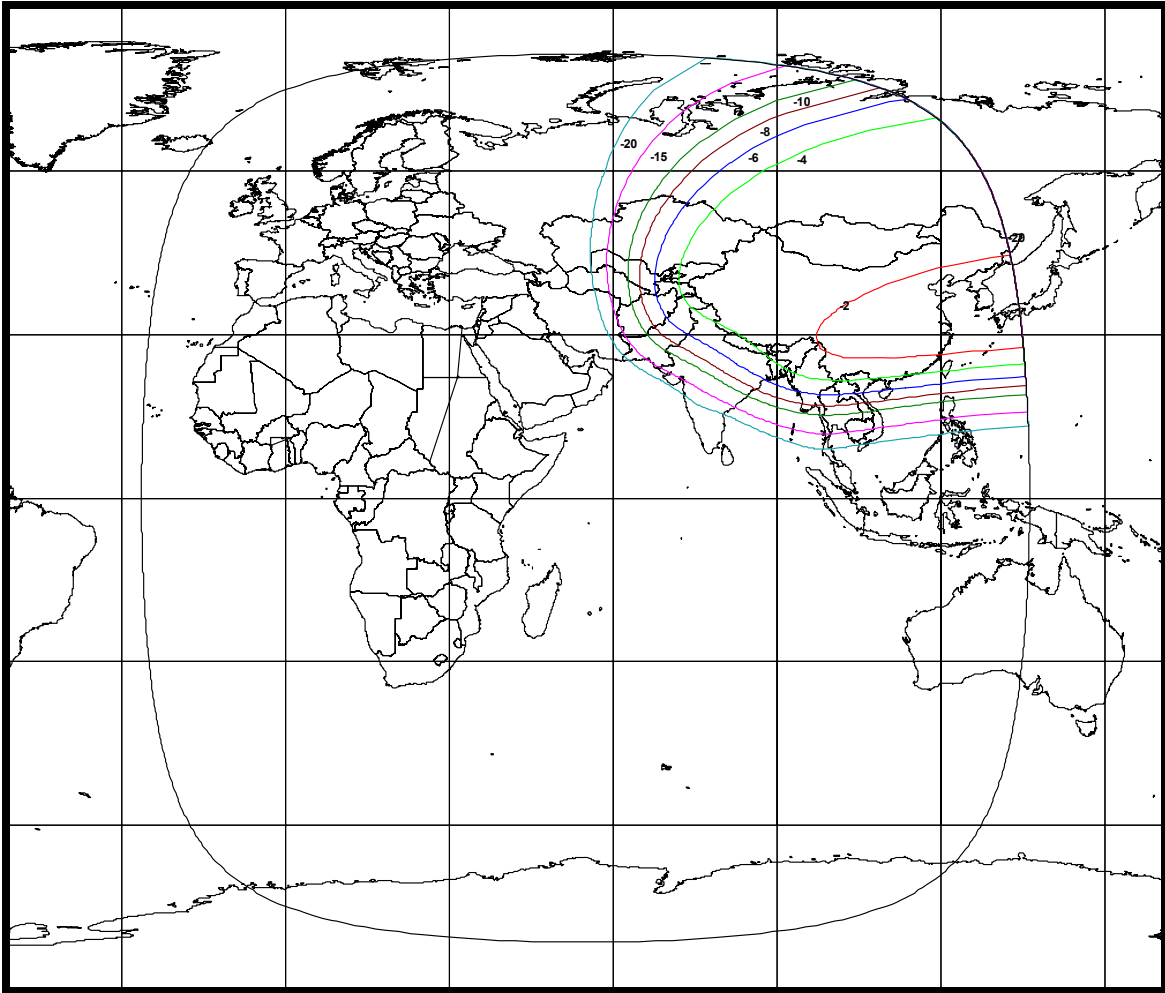
**Exhibit 2-22: C-Band Northwest Downlink Beam**  
[Schedule S Beam Designation: NWDL]

Beam Peak Gain: 28.5 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak EIRP: 35.9 dBW



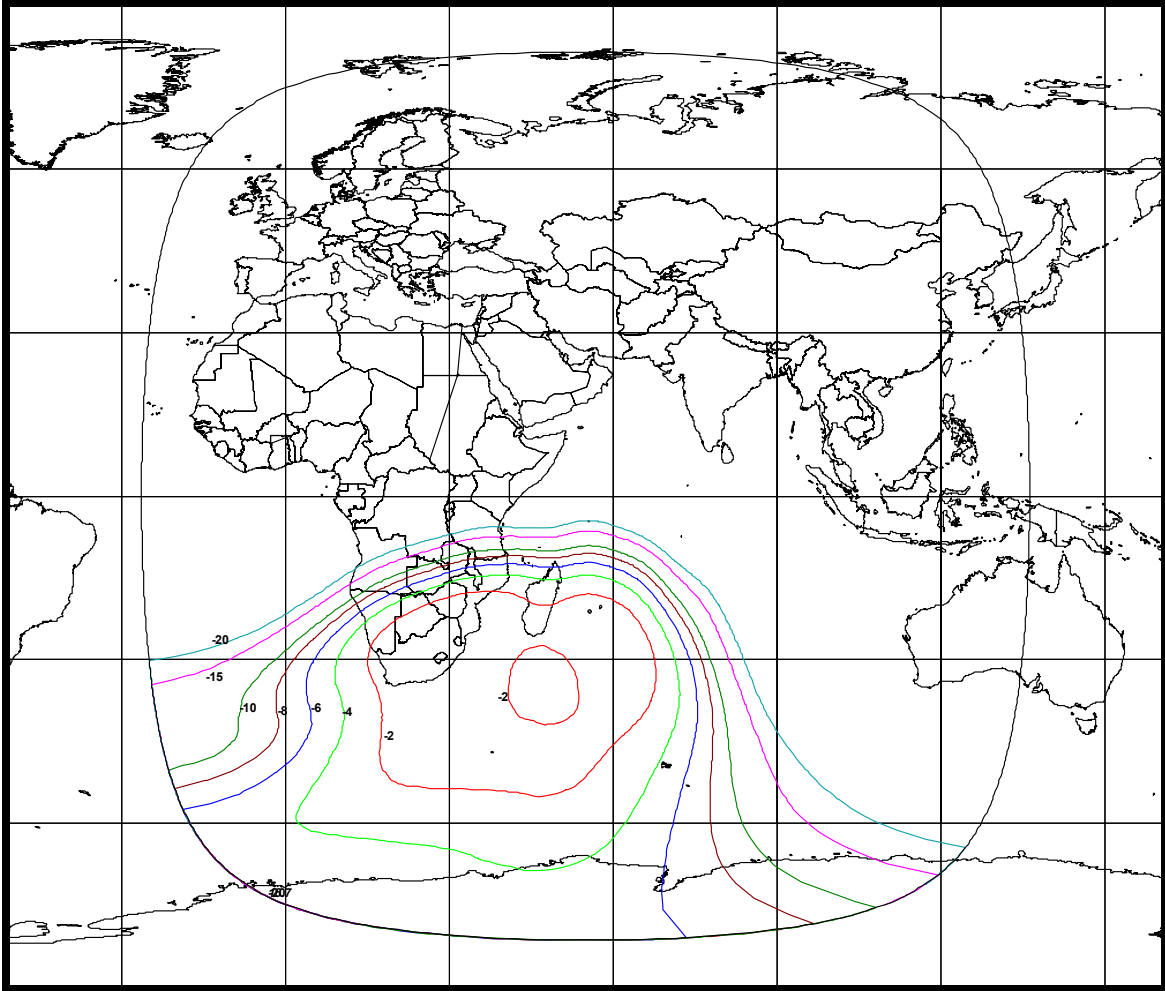
**Exhibit 2-23: C-Band Northeast Downlink Beam**  
[Schedule S Beam Designation: NEDL]

Beam Peak Gain: 30.7 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak EIRP: 38.4 dBW



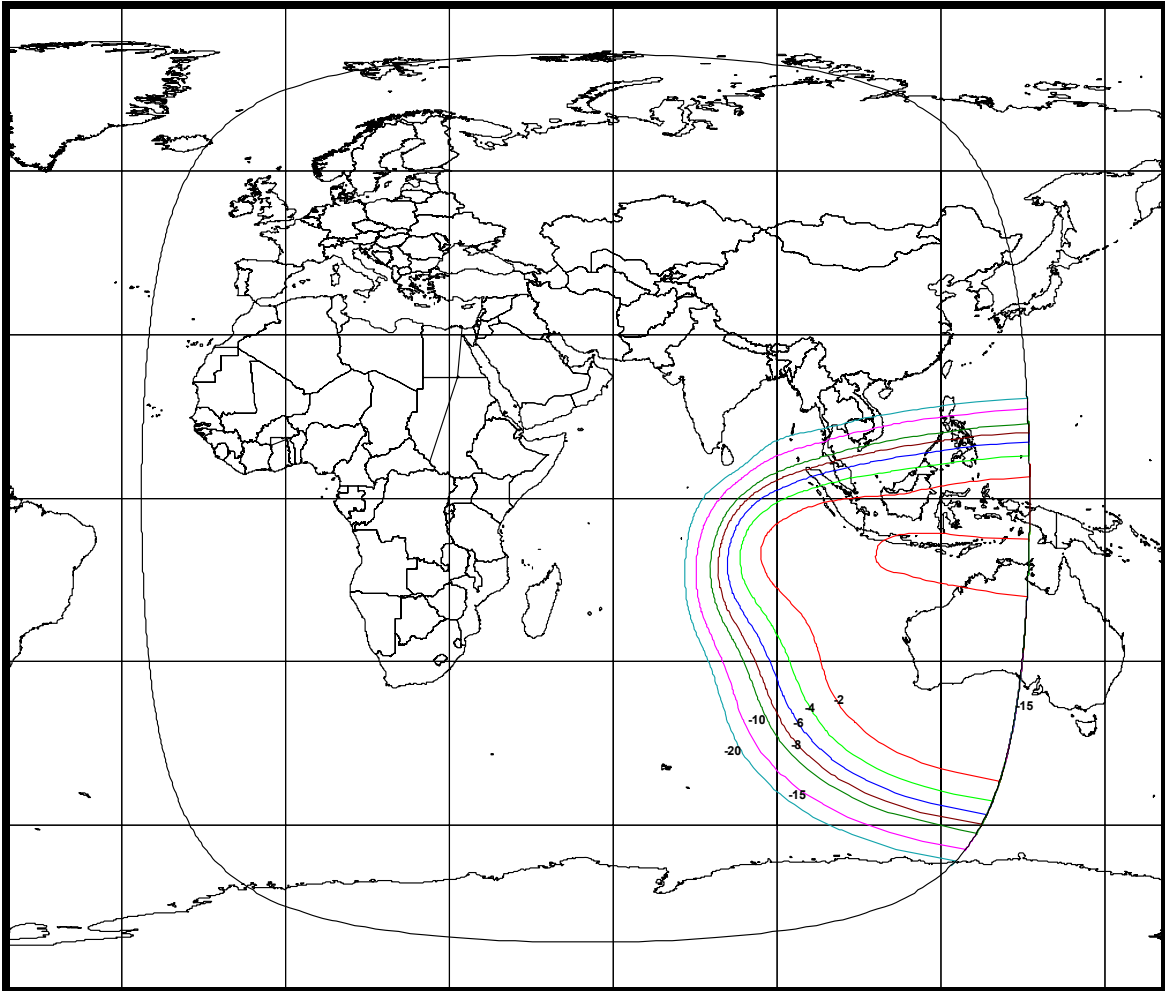
**Exhibit 2-24: C-Band Southwest Downlink Beam**  
[Schedule S Beam Designation: SWDL]

Beam Peak Gain: 28.5 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak EIRP: 36.7 dBW



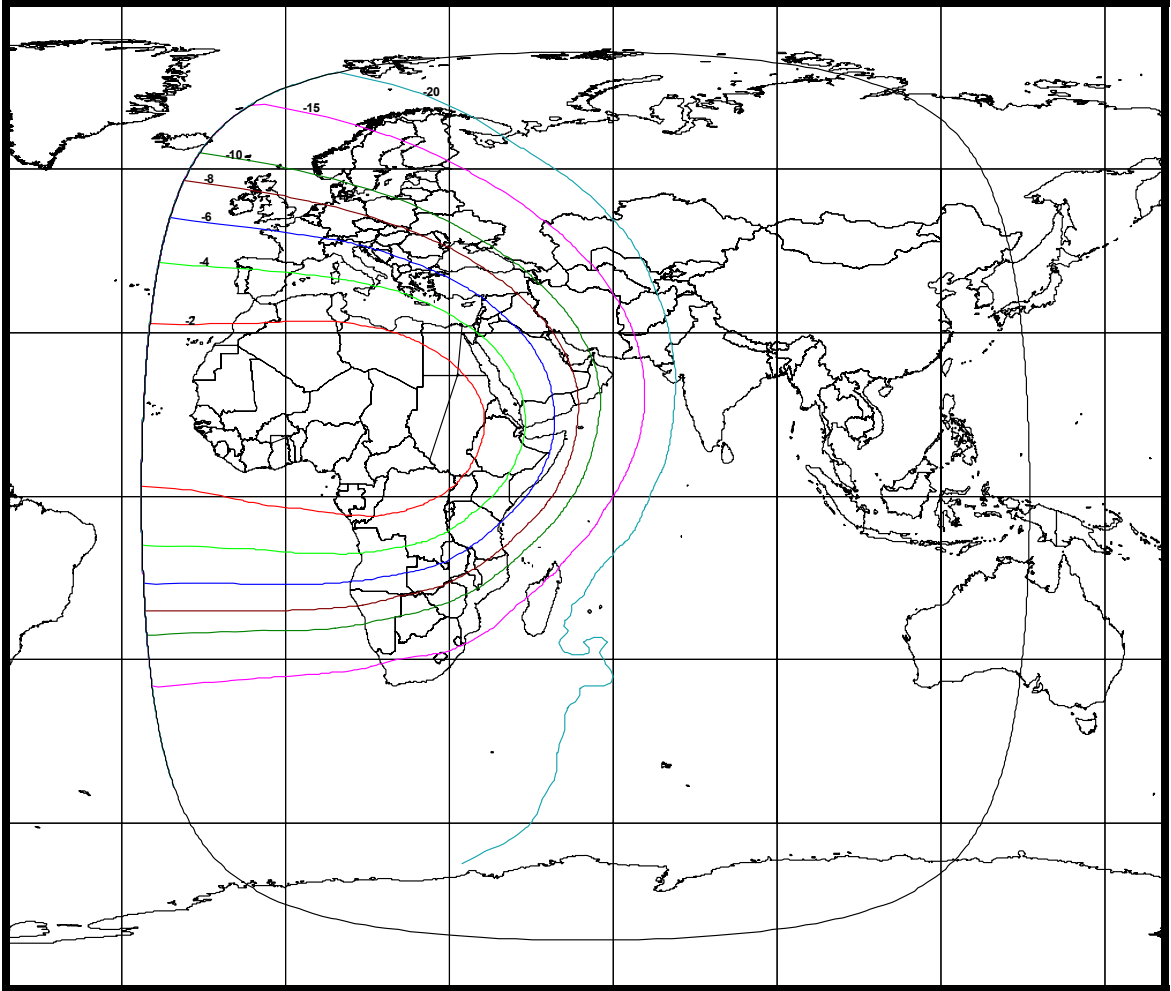
**Exhibit 2-25: C-Band Southeast Downlink Beam**  
[Schedule S Beam Designation: SEDL]

Beam Peak Gain: 28.1 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak EIRP: 38.5 dBW



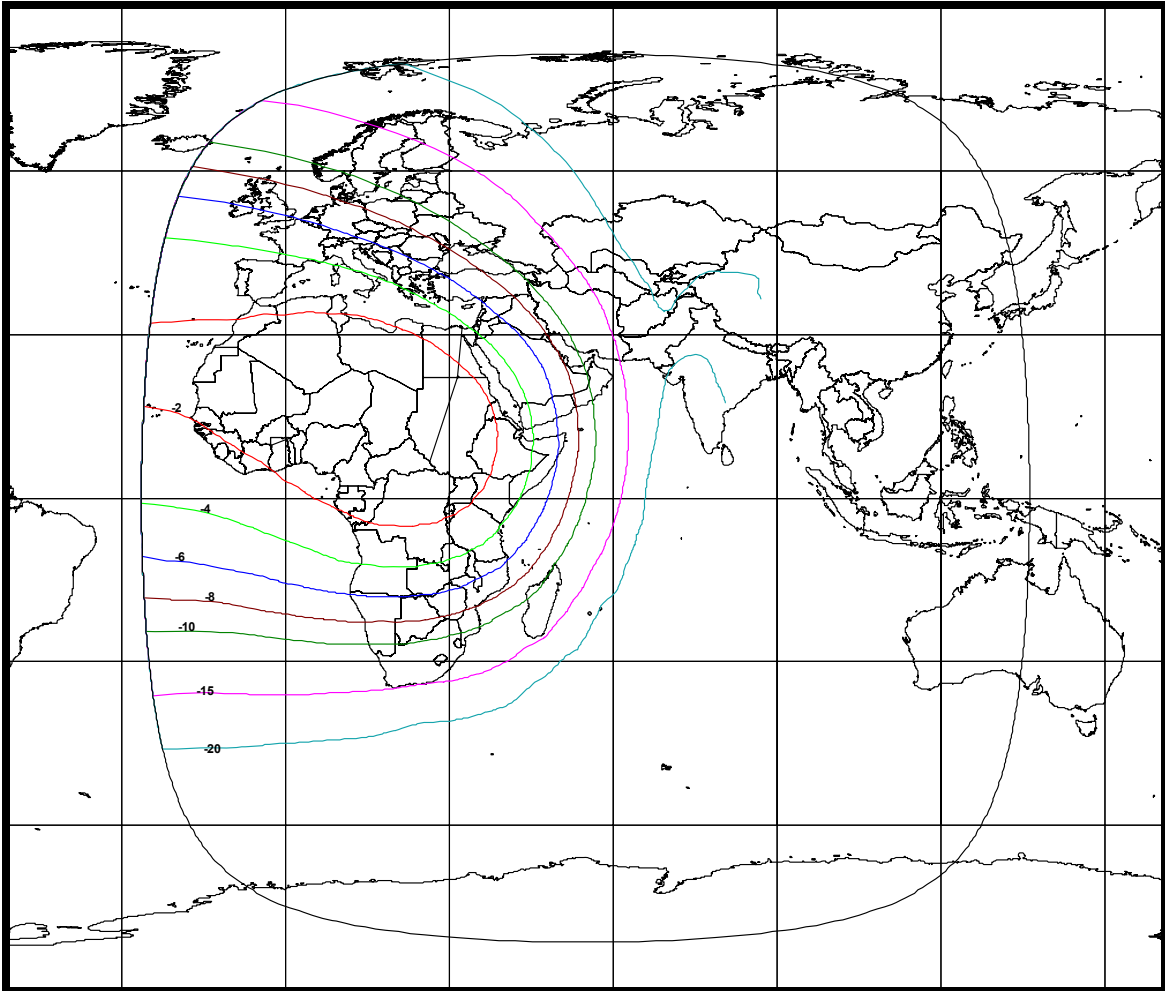
**Exhibit 2-26: C-Spot A Downlink Beam**  
[Schedule S Beam Designation: CADL]

Beam Peak Gain: 27.5 dBi  
Beam Polarization: Right Hand Circular  
Beam Peak EIRP: 36.3 dBW



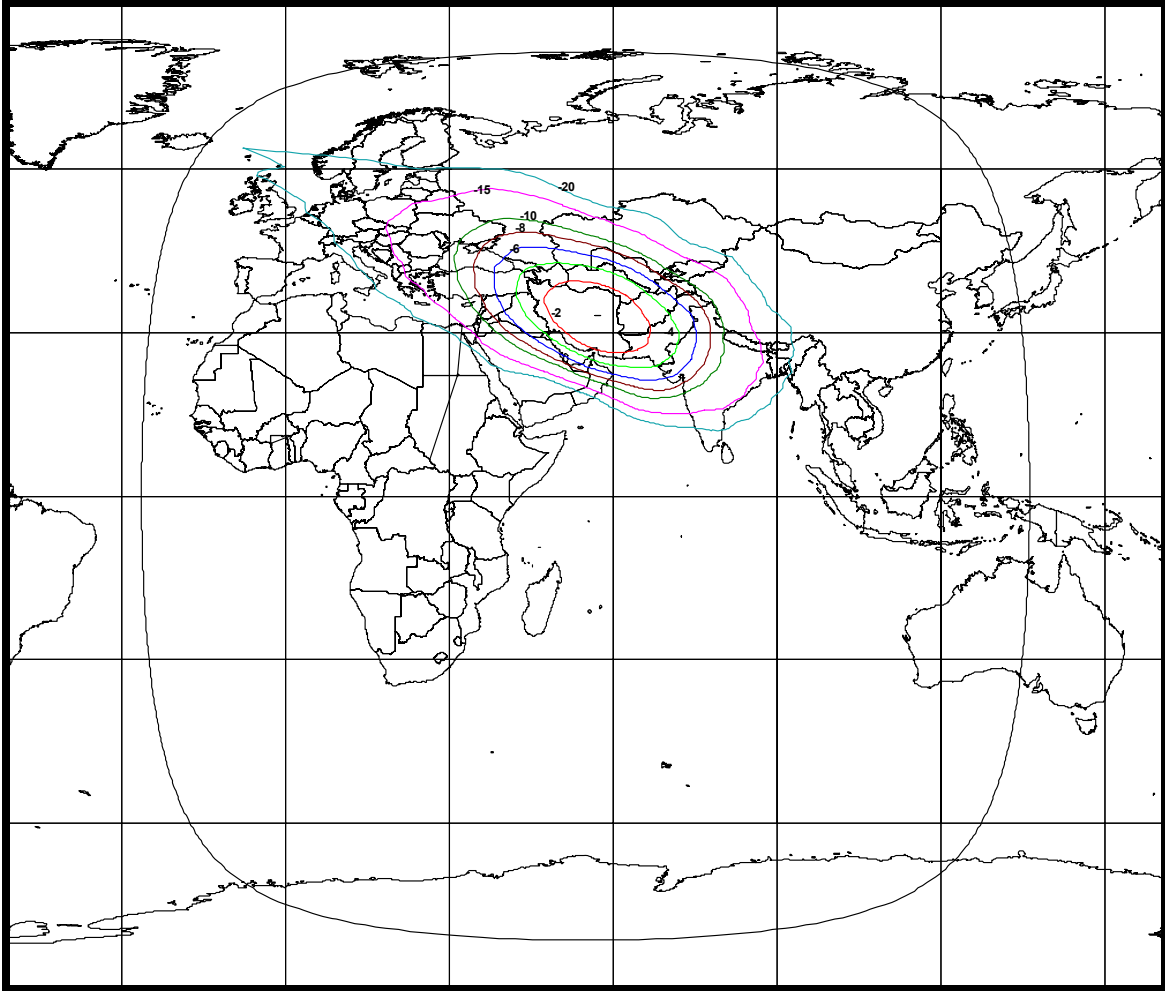
**Exhibit 2-27: C-Spot B Downlink Beam**  
[Schedule S Beam Designation: CBDL]

Beam Peak Gain: 27.5 dBi  
Beam Polarization: Left Hand Circular  
Beam Peak EIRP: 36.8 dBW



**Exhibit 2-28: Ku-Band Spot 1 Downlink Beam**  
[Schedule S Beam Designation: S1DL]

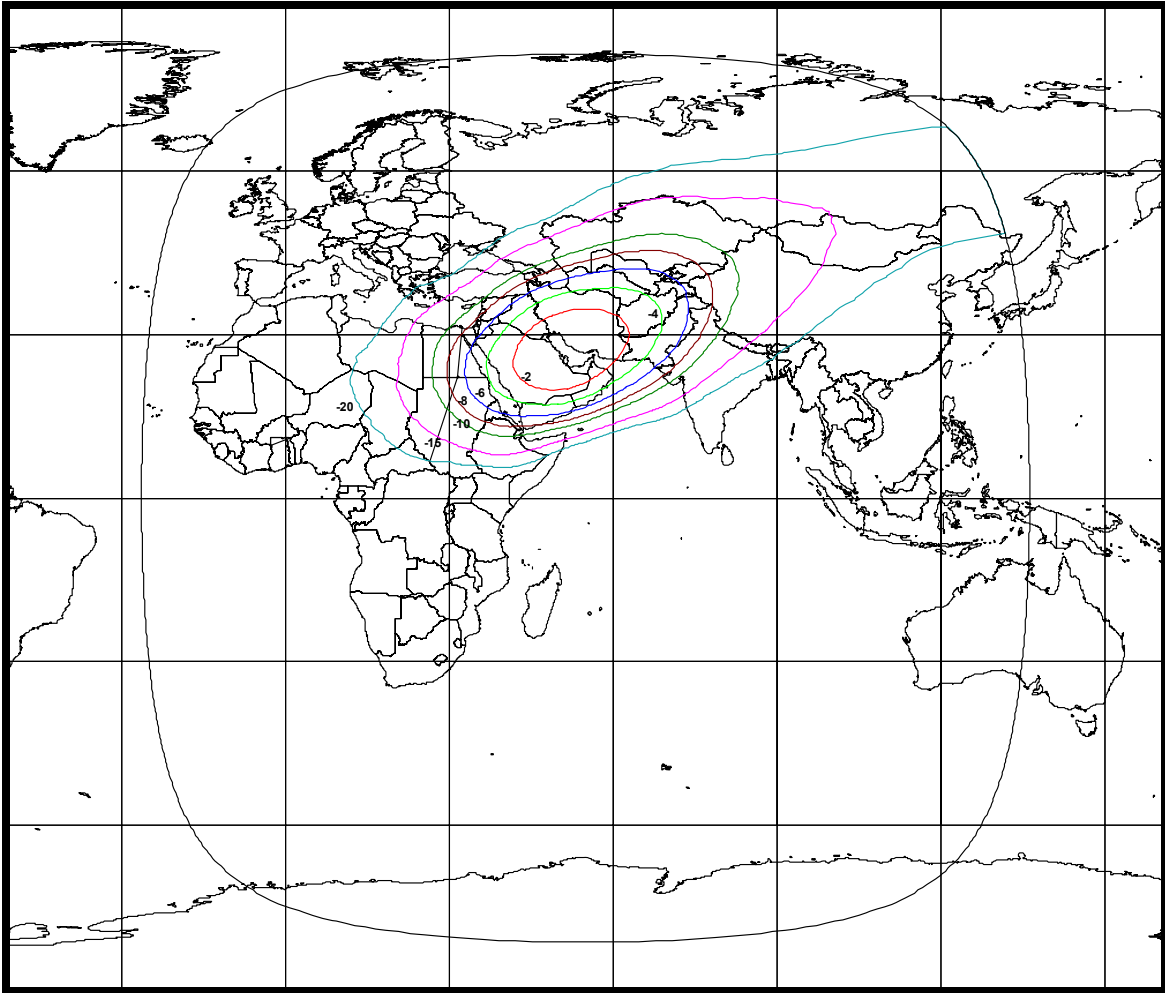
Beam Peak Gain: 36.2 dBi  
Beam Polarization: Vertical  
Beam Peak EIRP: 50.1 dBW



**Note:** This beam can also be operated in a low power mode with a corresponding beam peak EIRP of 48.9 dBW.

**Exhibit 2-29: Ku-Band Spot 2 Downlink Beam**  
[Schedule S Beam Designation: S2DL]

Beam Peak Gain: 34.5 dBi  
Beam Polarization: Horizontal  
Beam Peak EIRP: 49.1 dBW



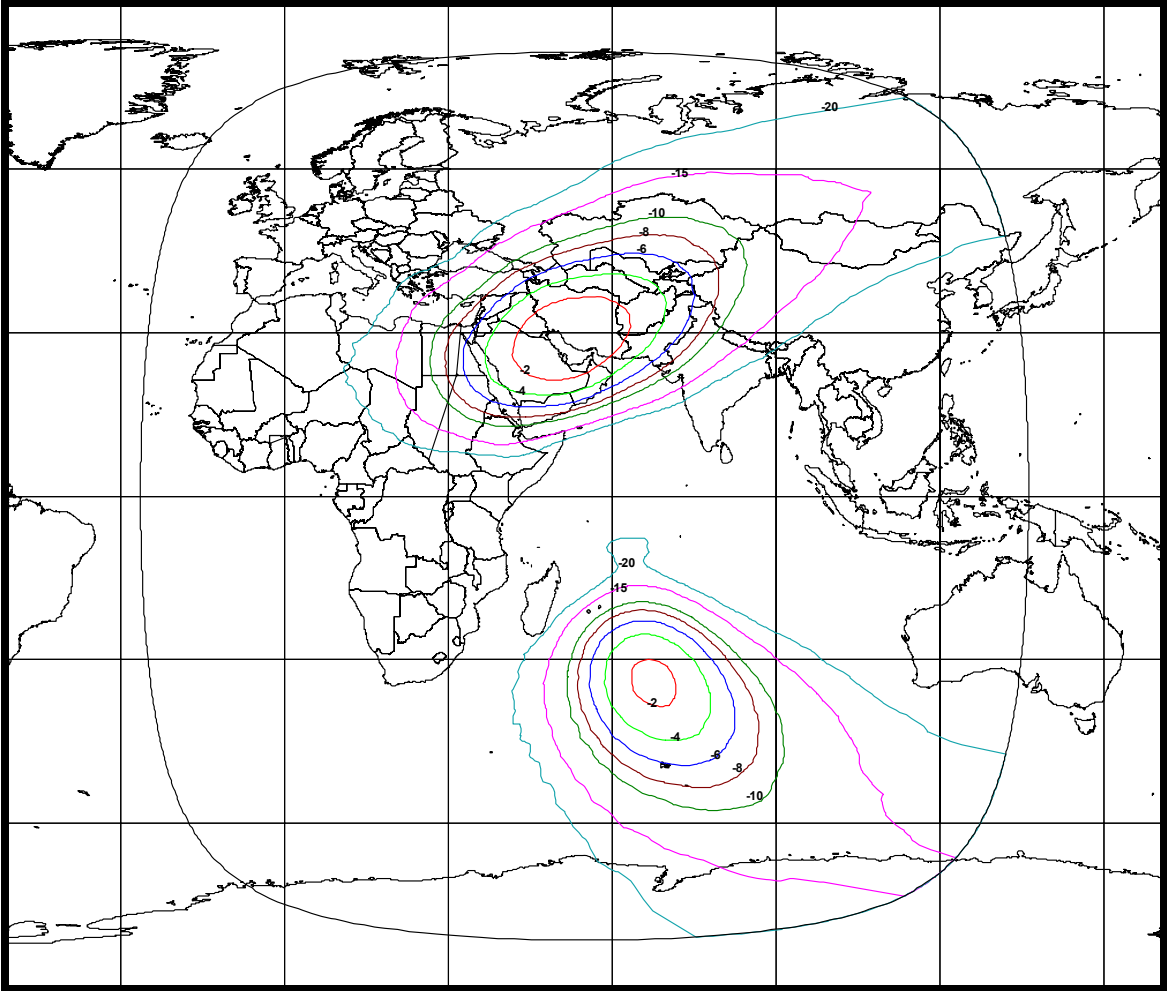
**Note:** This beam can also be operated in a low power mode with a corresponding beam peak EIRP of 47.9 dBW.



**Exhibit 2-30: Ku-Band Spot 2A Downlink Beam**

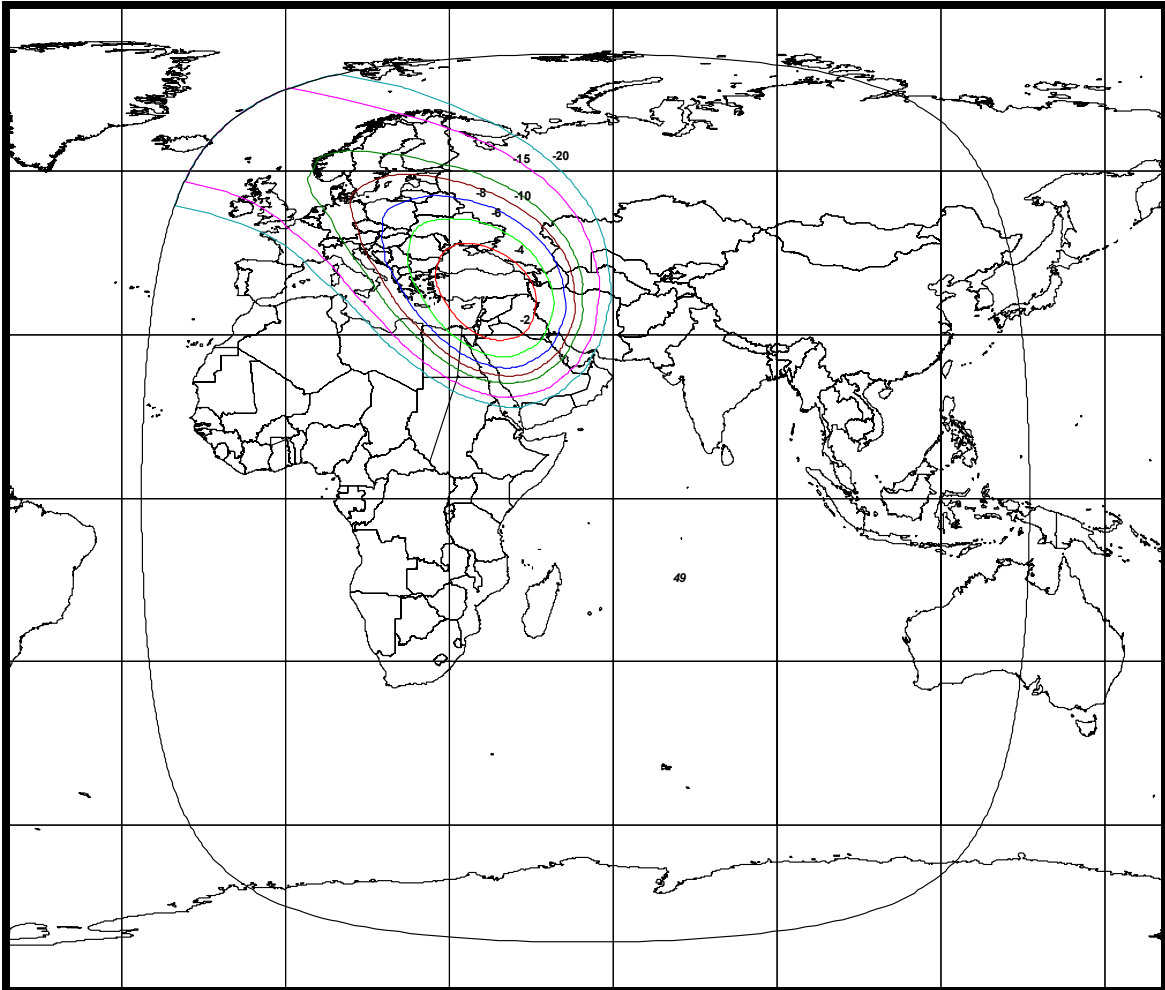
[Schedule S Beam Designation: S2AD]

Beam Peak Gain: 32.7 dBi  
Beam Polarization: Horizontal  
Beam Peak EIRP: 47.2 dBW



**Exhibit 2-31: Ku-Band Spot 3 Downlink Beam**  
[Schedule S Beam Designation: S3DL]

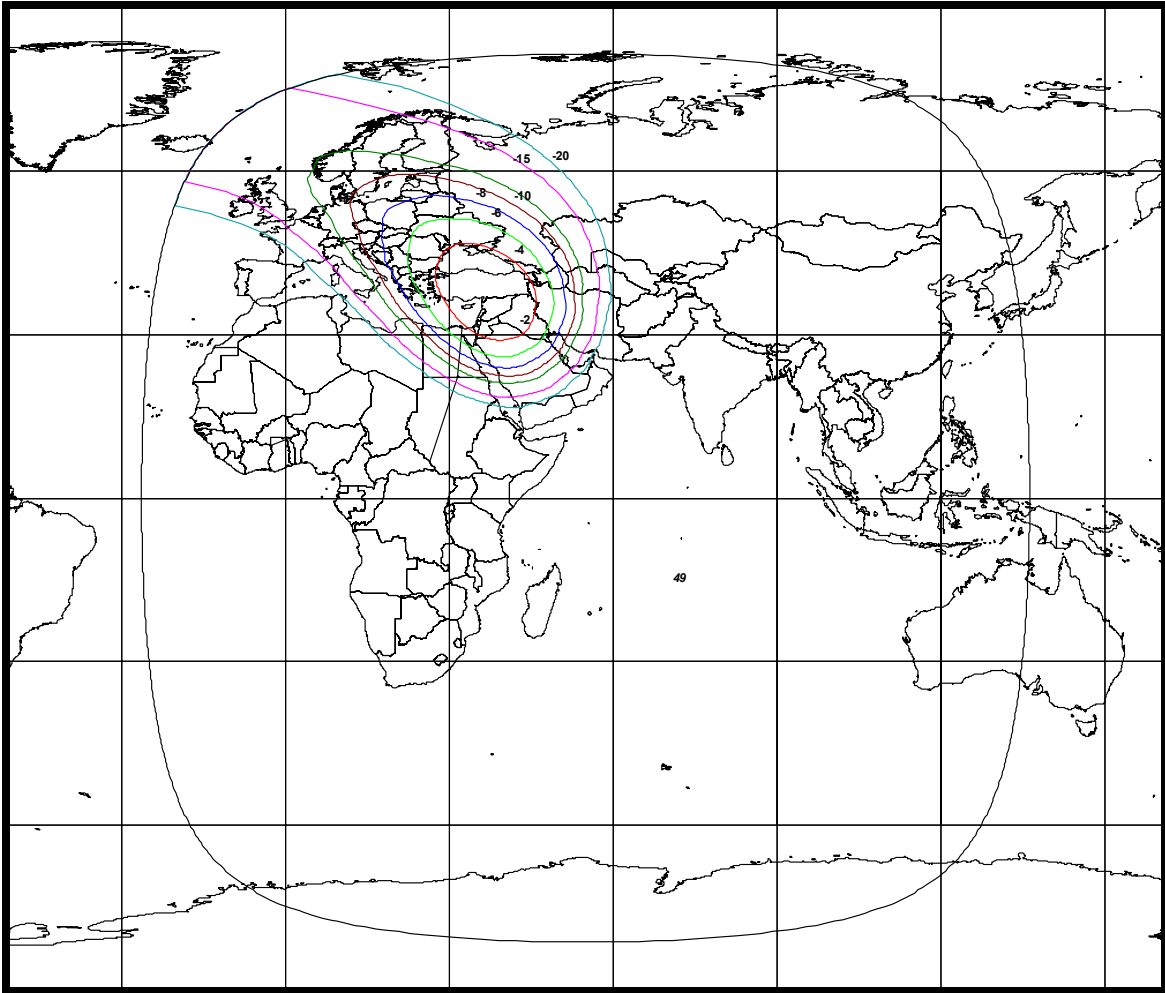
Beam Peak Gain: 36.6 dBi  
Beam Polarization: Vertical  
Beam Peak EIRP: 50.5 dBW



**Note:** This beam can also be operated in a low power mode with a corresponding beam peak EIRP of 49.0 dBW.

**Exhibit 2-32: Ku-Band Spot 3X Downlink Beam**  
[Schedule S Beam Designation: S3XD]

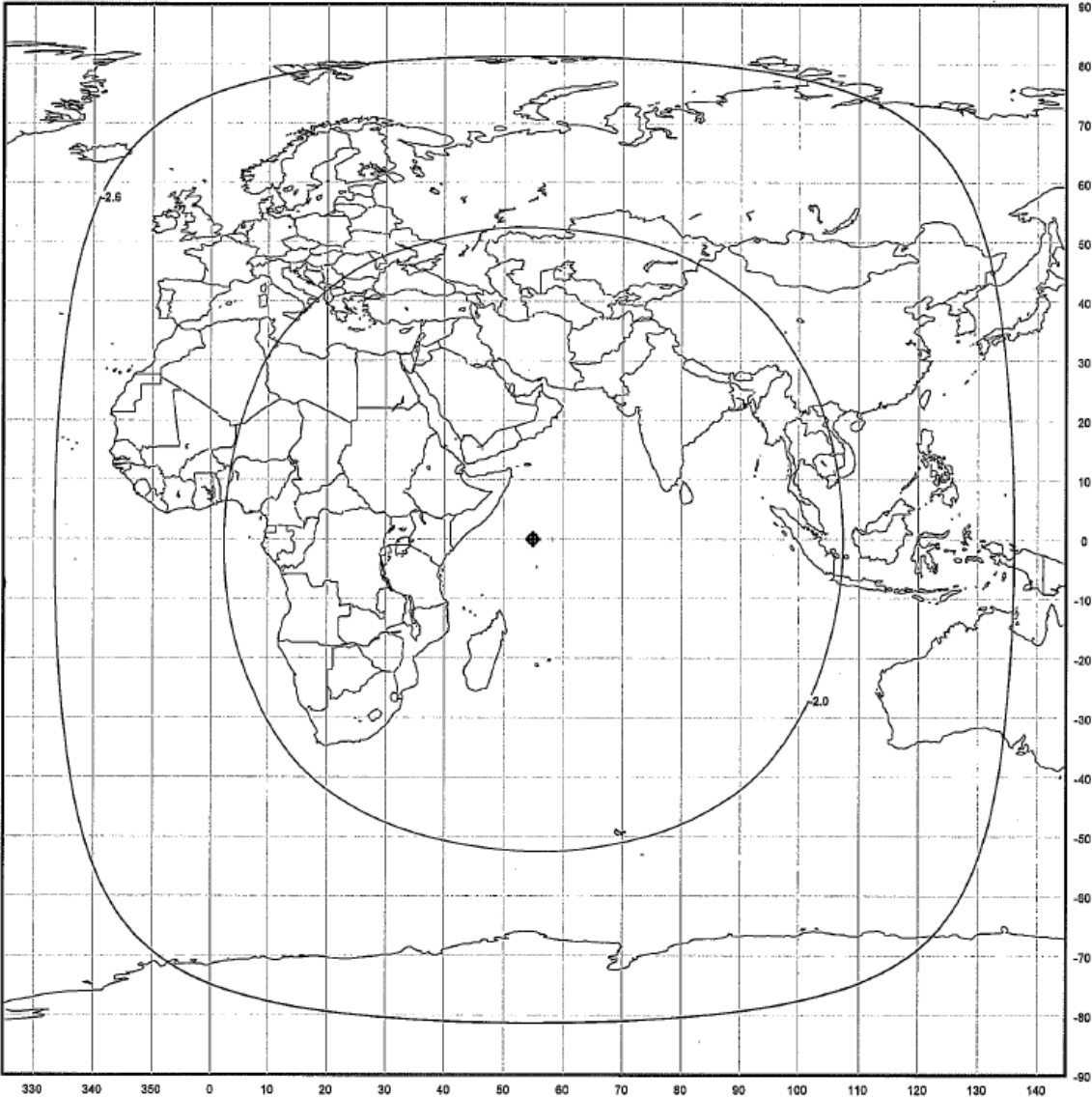
Beam Peak Gain: 36.6 dBi  
Beam Polarization: Horizontal  
Beam Peak EIRP: 50.5 dBW



**Note:** This beam can also be operated in a low power mode with a corresponding beam peak EIRP of 49.0 dBW.

**Exhibit 2-33: Command Uplink Beam**  
[Schedule S Beam Designation: CMD]

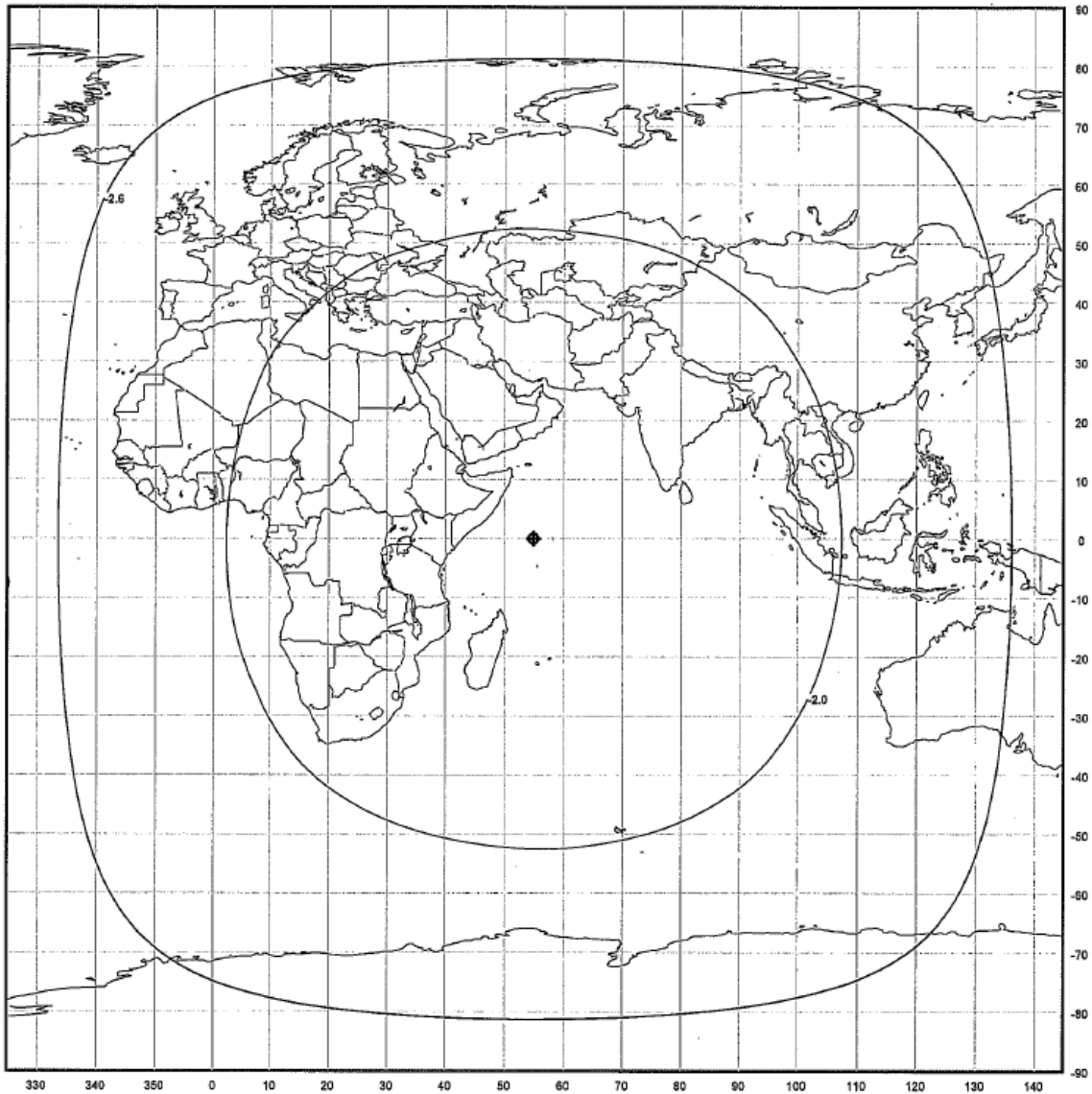
Peak Beam Gain: 8.3 dBi  
Polarization: Left Hand Circular  
Peak G/T: -28.5 dB/K  
Command Threshold Flux Density @ Peak G/T: -107.4 dBW/m<sup>2</sup>



Relative Gain Contours Shown: -2.0, -2.6 dB

**Exhibit 2-34: On-Station Telemetry Downlink Beam**  
[Schedule S Beam Designation: TLMO]

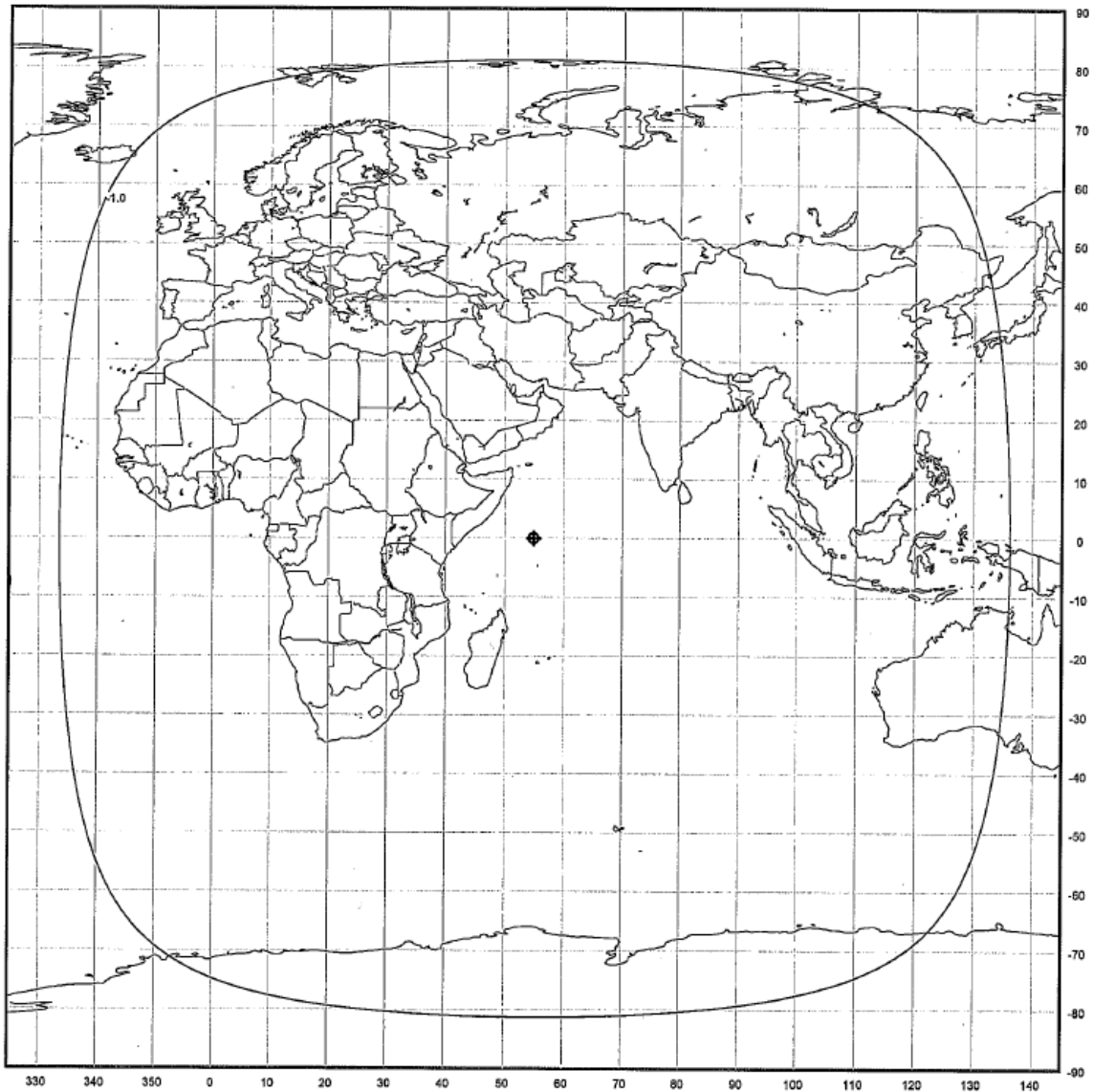
Peak Beam Gain: 16.5 dBi  
Polarization: Right Hand Circular  
Peak EIRP: 8.2 dBW



Relative Gain Contours Shown: -2.0, -2.6 dB

**Exhibit 2-35: Back-up Telemetry Downlink Beam**  
[Schedule S Beam Designation: TLMB]

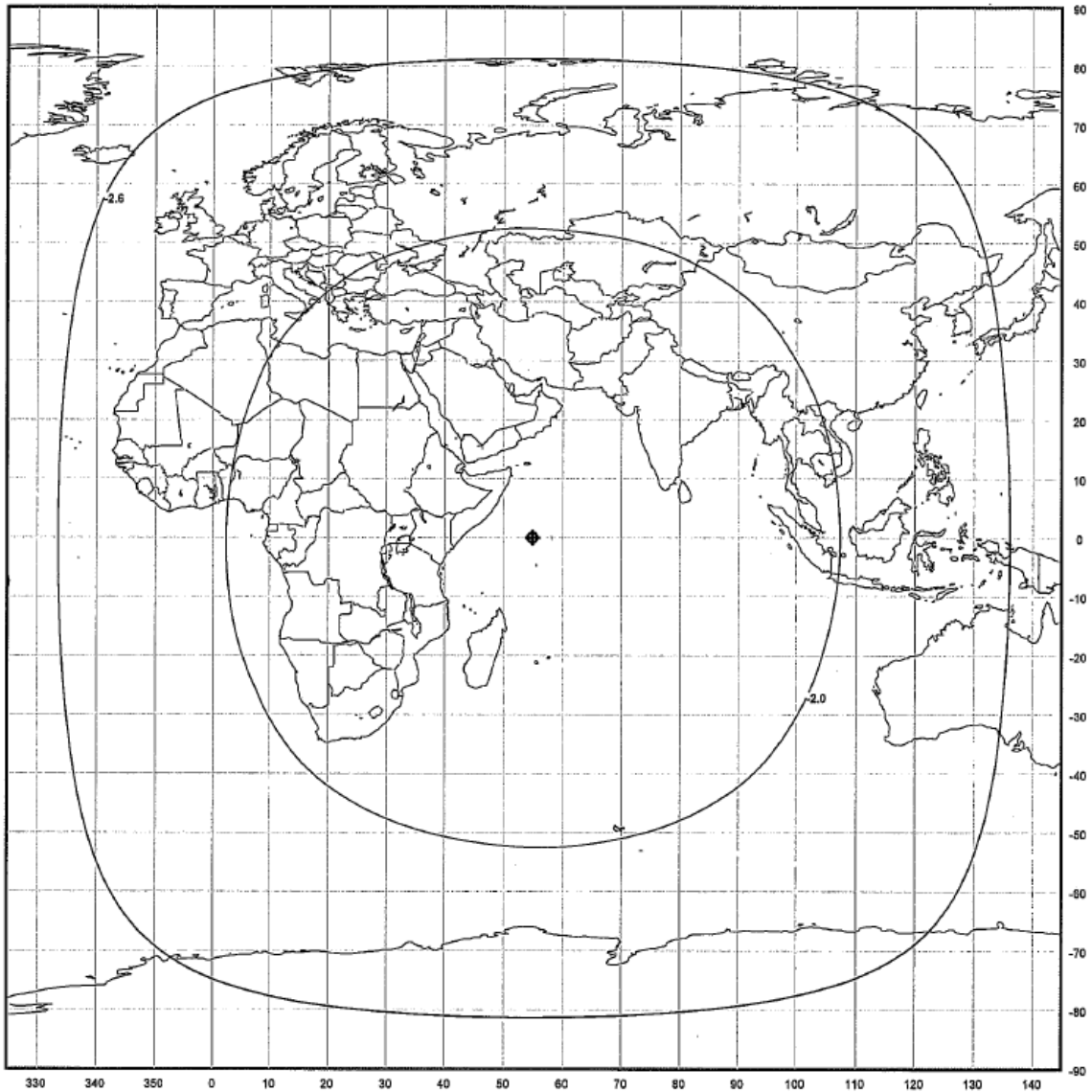
Peak Beam Gain: -5.3 dBi  
Polarization: Right Hand Circular  
Peak EIRP: 0.7 dBW



Relative Gain Contour Shown: -1 dB

**Exhibit 2-36: C-Band Uplink Power Control Downlink Beam**  
[Schedule S Beam Designation: BNC]

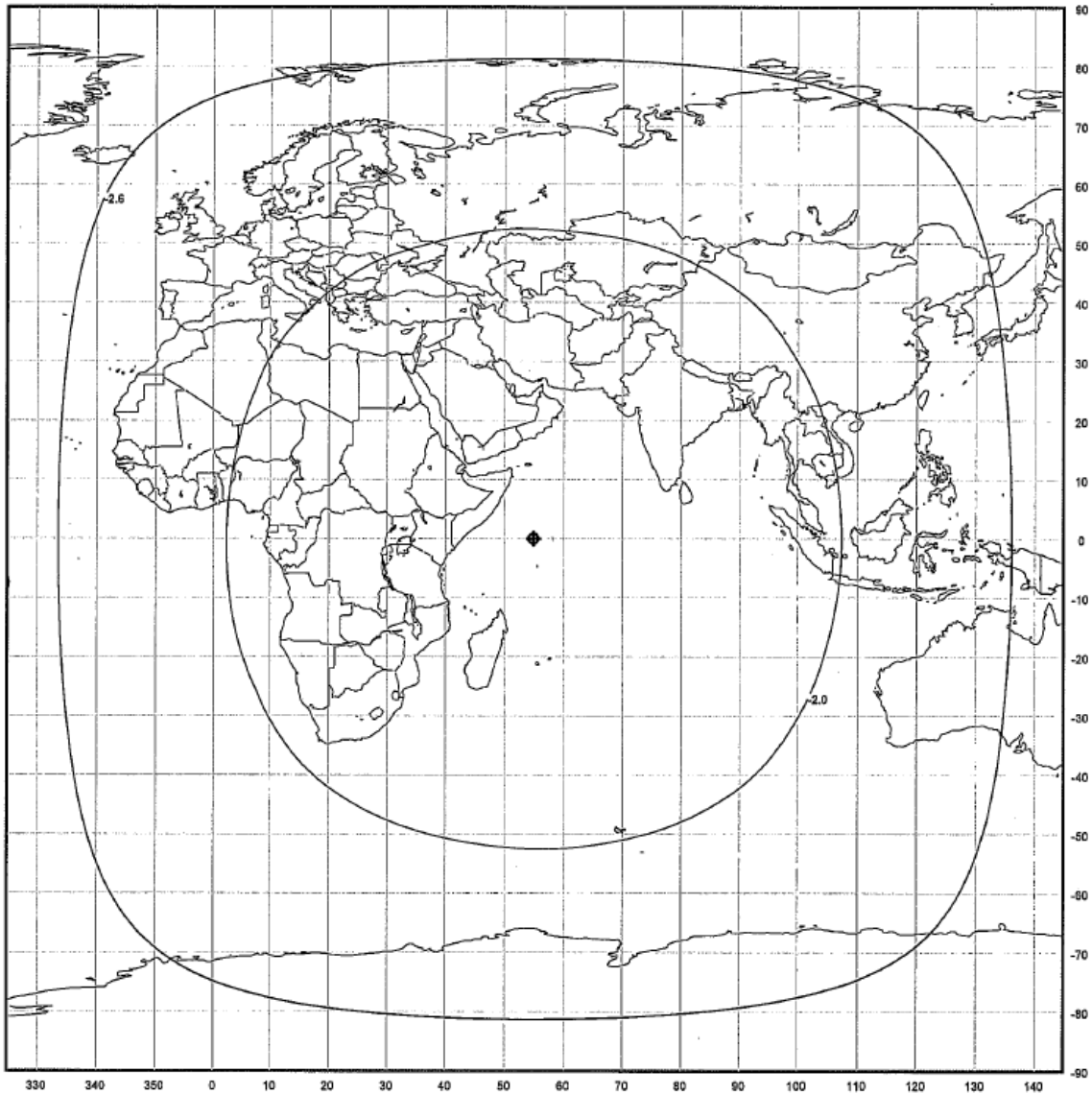
Peak Beam Gain: 10.7 dBi  
Polarization: Linear Vertical  
Peak EIRP: 11.8 dBW



Relative Gain Contours Shown: -2.0, -2.6 dB

**Exhibit 2-37: Ku-Band Uplink Power Control Downlink Beam**  
[Schedule S Beam Designation: BNK1]

Peak Beam Gain: 16.7 dBi  
Polarization: Right Hand Circular  
Peak EIRP: 8.0 dBW



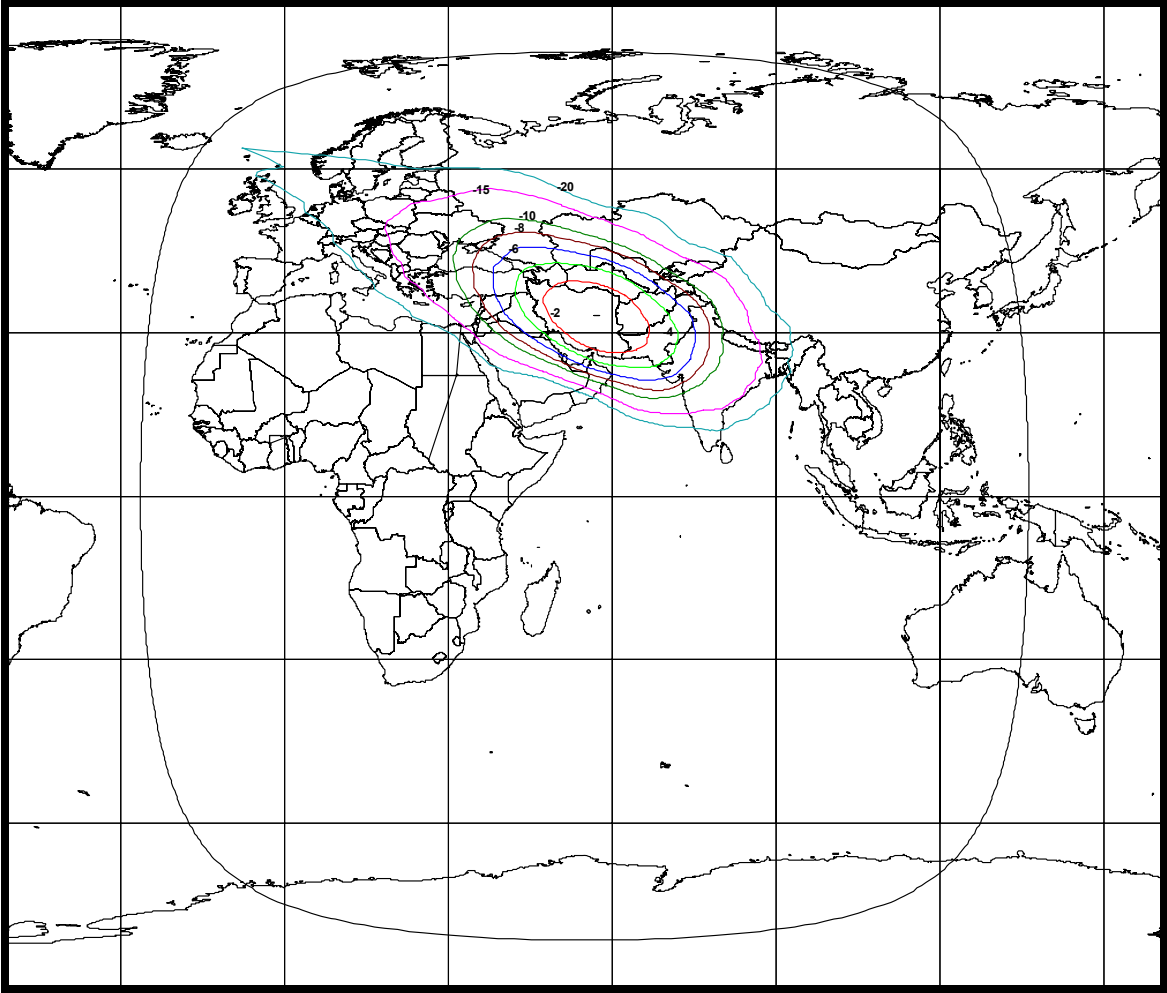
Relative Gain Contours Shown: -2.0, -2.6 dB



**Exhibit 2-38: Ku-Band Uplink Power Control Downlink Beam (Spot 1)**

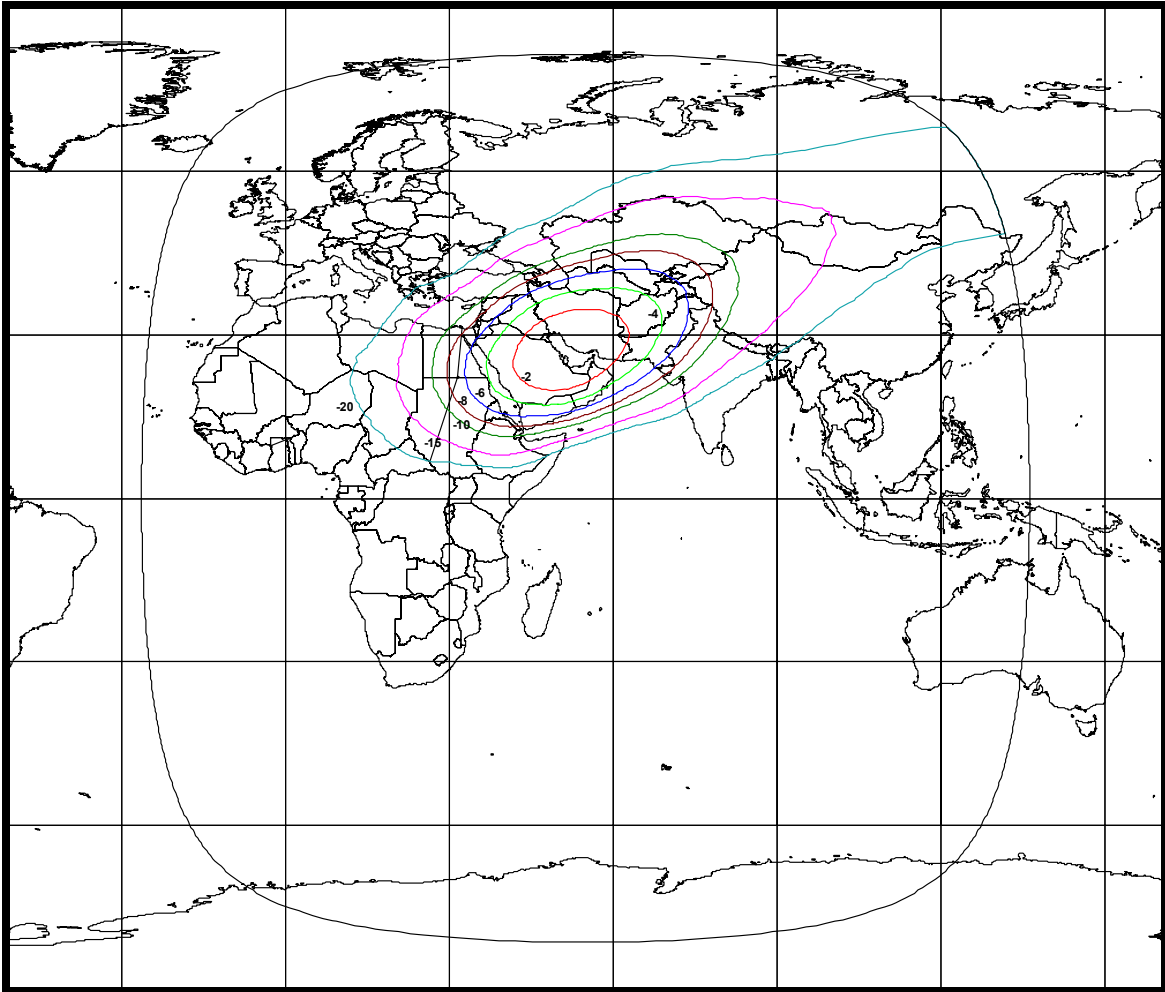
[Schedule S Beam Designation: BNK2]

Peak Beam Gain: 36.2 dBi  
Polarization: Linear Vertical  
Peak EIRP: 20.2 dBW



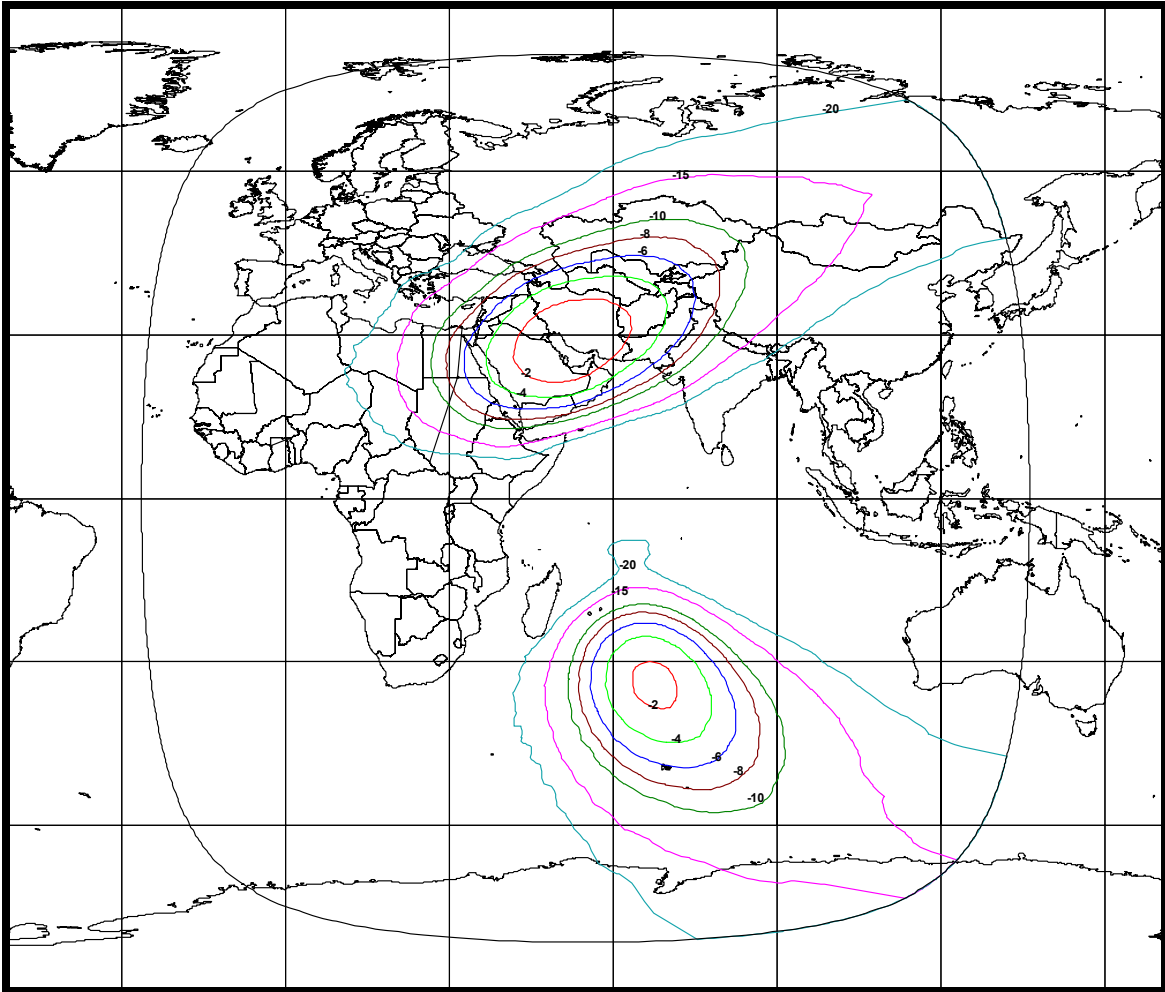
**Exhibit 2-39: Ku-Band Uplink Power Control Downlink Beam (Spot 2)**  
[Schedule S Beam Designation: BNK3]

Peak Beam Gain: 34.5 dBi  
Polarization: Linear Horizontal  
Peak EIRP: 20.1 dBW



**Exhibit 2-40: Ku-Band Uplink Power Control Downlink Beam (Spot 2A)**  
[Schedule S Beam Designation: BNK4]

Peak Beam Gain: 32.7 dBi  
Polarization: Linear Horizontal  
Peak EIRP: 18.3 dBW



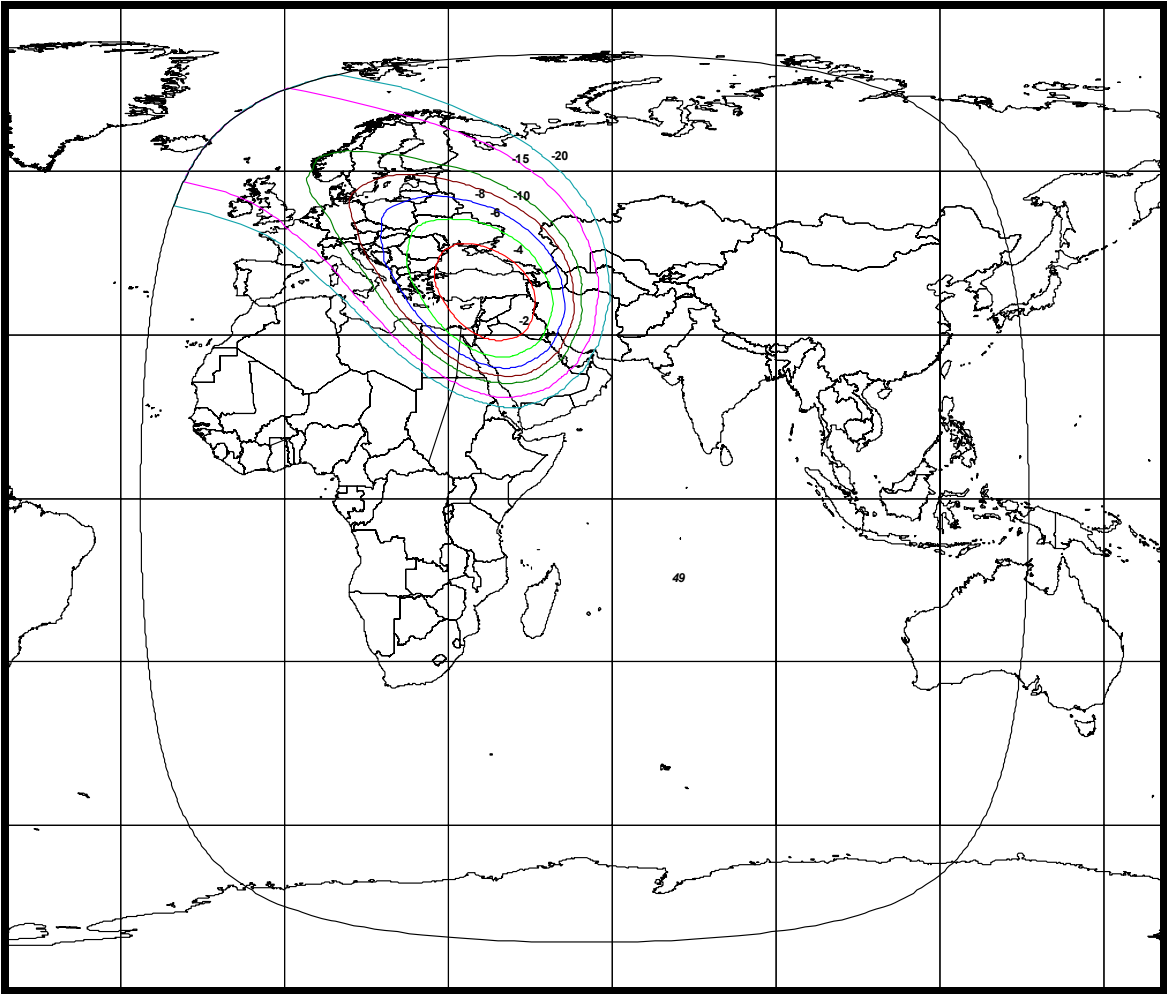
**Exhibit 2-41: Ku-Band Uplink Power Control Downlink Beam (Spot 3)**

[Schedule S Beam Designation: BNK5]

Peak Beam Gain: 36.6 dBi

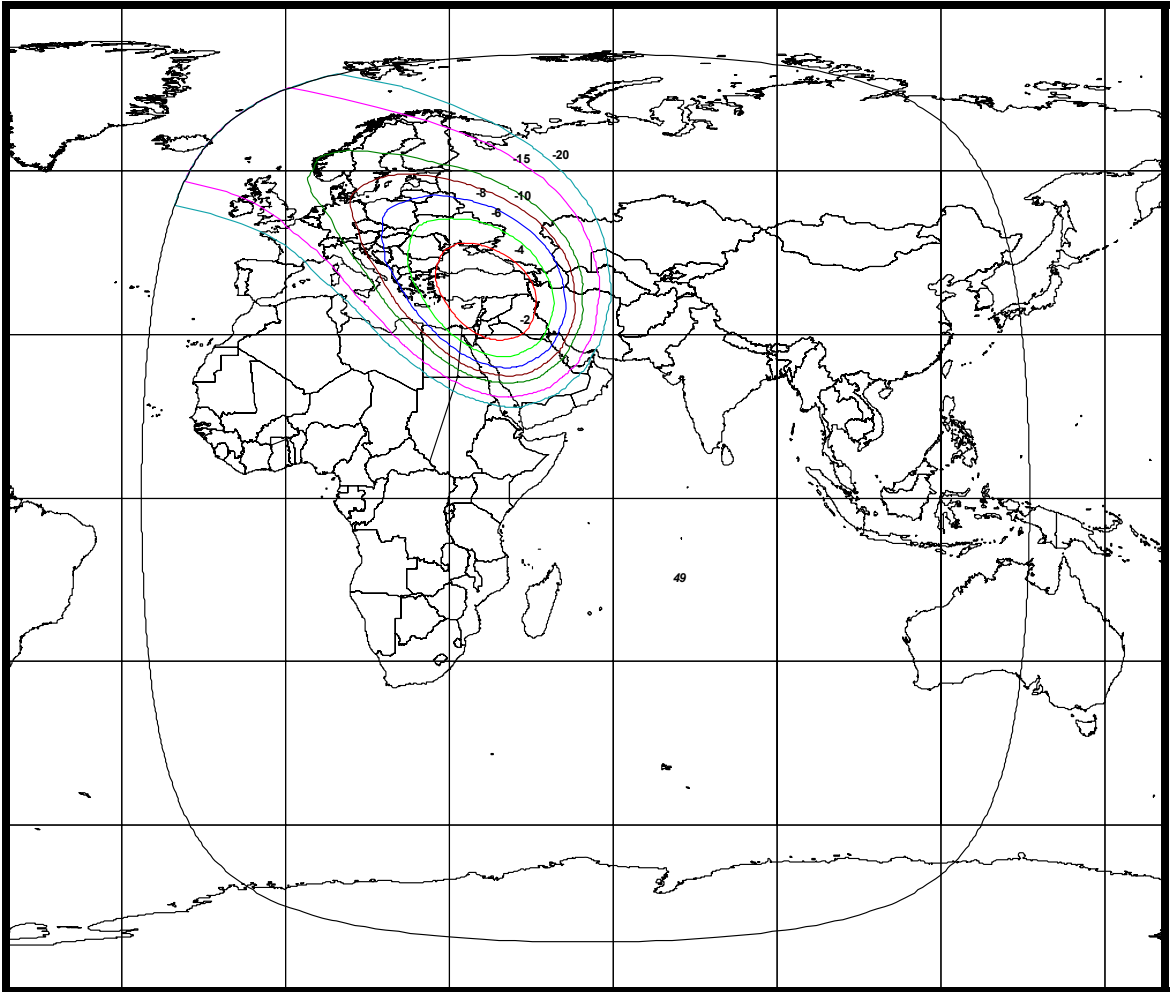
Polarization: Linear Vertical

Peak EIRP: 19.8 dBW



**Exhibit 2-42: Ku-Band Uplink Power Control Downlink Beam (Spot 3X)**  
[Schedule S Beam Designation: BNK6]

Peak Beam Gain: 36.6 dBi  
Polarization: Linear Vertical  
Peak EIRP: 19.8 dBW



**EXHIBIT 3: EMISSION DESIGNATORS**

<b>Signal Type</b>	<b>Emission Designator</b>	<b>Allocated Bandwidth (kHz)</b>
Analog TV/FM Carrier	30M0F3F	30000
Analog TV/FM Carrier	36M0F3F	36000
76436 kbps Carrier	112MG7W	112000
52550 kbps Carrier	77M0G7W	77000
49138 kbps Carrier	72M0G7W	72000
27981 kbps Carrier	41M0G7W	41000
24575 kbps Carrier	36M0G7W	36000
23204 kbps Carrier	34M0G7W	34000
6000 kbps carrier	10M3G7W	10300
64 kbps Carrier	100KG7W	100
512 kbps Carrier	1M45G7W	1450
128 kbps Carrier	400KG7W	400

## EXHIBIT 4: POWER FLUX DENSITY CALCULATIONS

FREQUENCY BAND : 3.7 - 4.2 GHz							
<b>Global A Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-163.9	-163.8	-163.7	-163.5	-163.4	-163.3	-162.6
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	11.9	11.8	14.2	16.5	18.9	21.3	20.6
<b>Global A Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-172.4	-172.3	-172.2	-172.1	-172.0	-171.8	-171.1
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	20.4	20.3	22.7	25.1	27.5	29.8	29.1
<b>Global B Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	30.5	30.5	30.5	30.5	30.5	30.5	30.5
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-162.9	-162.8	-162.7	-162.5	-162.4	-162.3	-161.6
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	10.9	10.8	13.2	15.5	17.9	20.3	19.6
<b>Global B Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	30.5	30.5	30.5	30.5	30.5	30.5	30.5
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-171.4	-171.3	-171.2	-171.1	-171.0	-170.8	-170.1
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0

Margin (dB)	19.4	19.3	21.7	24.1	26.5	28.8	28.1
<b>West Hemi Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	36.8	36.8	36.8	36.8	36.8	36.8	36.8
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-156.6	-156.5	-156.4	-156.2	-156.1	-156.0	-155.3
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	4.6	4.5	6.9	9.2	11.6	14.0	13.3
<b>West Hemi Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	36.8	36.8	36.8	36.8	36.8	36.8	36.8
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-165.1	-165.0	-164.9	-164.8	-164.7	-164.5	-163.8
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	13.1	13.0	15.4	17.8	20.2	22.5	21.8
<b>East Hemi Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	38.3	38.3	38.3	38.3	38.3	38.3	38.3
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-155.1	-155.0	-154.9	-154.7	-154.6	-154.5	-153.8
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	3.1	3.0	5.4	7.7	10.1	12.5	11.8
<b>East Hemi Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	38.3	38.3	38.3	38.3	38.3	38.3	38.3
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-163.6	-163.5	-163.4	-163.3	-163.2	-163.0	-162.3
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	11.6	11.5	13.9	16.3	18.7	21.0	20.3
<b>Northwest Zone Beam: 30M0F3F</b>							



Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	35.9	35.9	35.9	35.9	35.9	35.9	35.9
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-157.5	-157.4	-157.3	-157.1	-157.0	-156.9	-156.2
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	5.5	5.4	7.8	10.1	12.5	14.9	14.2
<b>Northwest Zone Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	35.9	35.9	35.9	35.9	35.9	35.9	35.9
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-166.0	-165.9	-165.8	-165.7	-165.6	-165.4	-164.7
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	14.0	13.9	16.3	18.7	21.1	23.4	22.7
<b>Northeast Zone Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	38.4	38.4	38.4	38.4	38.4	38.4	38.4
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-155.0	-154.9	-154.8	-154.6	-154.5	-154.4	-153.7
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	3.0	2.9	5.3	7.6	10.0	12.4	11.7
<b>Northeast Zone Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	38.4	39.4	44.4	49.4	50.4	51.4	52.4
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-163.5	-162.4	-157.3	-152.2	-151.1	-149.9	-148.2
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	11.5	10.4	7.8	5.2	6.6	7.9	6.2
<b>Southwest Zone Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	36.7	36.7	36.7	36.7	36.7	36.7	36.7

Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-156.7	-156.6	-156.5	-156.3	-156.2	-156.1	-155.4
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	4.7	4.6	7.0	9.3	11.7	14.1	13.4
<b>Southwest Zone Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	36.7	36.7	36.7	36.7	36.7	36.7	36.7
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-165.2	-165.1	-165.0	-164.9	-164.8	-164.6	-163.9
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	13.2	13.1	15.5	17.9	20.3	22.6	21.9
<b>Southeast Zone Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	38.5	38.5	38.5	38.5	38.5	38.5	38.5
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-154.9	-154.8	-154.7	-154.5	-154.4	-154.3	-153.6
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	2.9	2.8	5.2	7.5	9.9	12.3	11.6
<b>Southeast Zone Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	38.5	38.5	38.5	38.5	38.5	38.5	38.5
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-163.4	-163.3	-163.2	-163.1	-163.0	-162.8	-162.1
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	11.4	11.3	13.7	16.1	18.5	20.8	20.1
<b>C-Spot A Beam: 36M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	36.3	36.3	36.3	36.3	36.3	36.3	36.3
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1

Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-157.1	-157.0	-156.9	-156.7	-156.6	-156.5	-155.8
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	5.1	5.0	7.4	9.7	12.1	14.5	13.8
<b>C-Spot A Beam: 36M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	36.3	36.3	36.3	36.3	36.3	36.3	36.3
Occupied Bandwidth (kHz)	30133	30133	30133	30133	30133	30133	30133
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-165.9	-165.7	-165.6	-165.5	-165.4	-165.3	-164.5
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	13.9	13.7	16.1	18.5	20.9	23.3	22.5
<b>C-Spot B Beam: 36M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	36.8	36.8	36.8	36.8	36.8	36.8	36.8
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-156.6	-156.5	-156.4	-156.2	-156.1	-156.0	-155.3
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	4.6	4.5	6.9	9.2	11.6	14.0	13.3
<b>C-Spot B Beam: 36M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	36.8	36.8	36.8	36.8	36.8	36.8	36.8
Occupied Bandwidth (kHz)	30133	30133	30133	30133	30133	30133	30133
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-165.4	-165.2	-165.1	-165.0	-164.9	-164.8	-164.0
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	13.4	13.2	15.6	18.0	20.4	22.8	22.0
<b>Telemetry - Global Beam (On-Station Operation)</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Occupied Bandwidth (kHz)	250	250	250	250	250	250	250
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-173.1	-173.0	-172.9	-172.8	-172.7	-172.6	-171.8
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0

Margin (dB)	21.1	21.0	23.4	25.8	28.2	30.6	29.8
<b>Telemetry - Global Beam (Back-up Operation)</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Occupied Bandwidth (kHz)	250	250	250	250	250	250	250
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-180.6	-180.5	-180.4	-180.3	-180.2	-180.1	-179.3
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	28.6	28.5	30.9	33.3	35.7	38.1	37.3
<b>C-Band ULPC -- Global Beam</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	11.8	11.8	11.8	11.8	11.8	11.8	11.8
Occupied Bandwidth (kHz)	25	25	25	25	25	25	25
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-159.5	-159.4	-159.3	-159.2	-159.1	-159.0	-158.2
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152	-152	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	7.5	7.4	9.8	12.2	14.6	17.0	16.2
<b>FREQUENCY BAND : 10.95 - 11.7 GHz &amp; 11.45 - 11.70 GHz</b>							
<b>Spot 1 Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	43.4*	43.3*	45.7*	48.0*	50.1	50.1	50.1
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-150.0	-150.0	-147.5	-145.0	-142.8	-142.7	-142.0
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.0	0.3	2.7	2.0
<b>Spot 1 Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	50.1	50.1	50.1	50.1	50.1	50.1	50.1
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.8	-151.7	-151.6	-151.5	-151.4	-151.2	-150.5
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	1.8	1.7	4.1	6.5	8.9	11.2	10.5

<b>Spot 2 Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	43.4*	43.3*	45.7*	48.0*	49.1	49.1	49.1
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-150.0	-150.0	-147.5	-145.0	-143.8	-143.7	-143.0
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.0	1.3	3.7	3.0
<b>Spot 2 Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	49.1	49.1	49.1	49.1	49.1	49.1	49.1
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-152.8	-152.7	-152.6	-152.5	-152.4	-152.2	-151.5
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	2.8	2.7	5.1	7.5	9.9	12.2	11.5
<b>Spot 2A Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	43.4*	43.3*	45.7*	47.2	47.2	47.2	47.2
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-150.0	-150.0	-147.5	-145.8	-145.7	-145.6	-144.9
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.8	3.2	5.6	4.9
<b>Spot 2A Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	47.2	47.2	47.2	47.2	47.2	47.2	47.2
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-154.7	-154.6	-154.5	-154.4	-154.3	-154.1	-153.4
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	4.7	4.6	7.0	9.4	11.8	14.1	13.4
<b>Spot 3 Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90

Assumed EIRP (dBW)	43.4*	43.3*	45.7*	48.0*	50.4*	50.5	50.5
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-150.0	-150.0	-147.5	-145.0	-142.5	-142.3	-141.6
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.0	0.0	2.3	1.6
<b>Spot 3 Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	50.5	50.5	50.5	50.5	50.5	50.5	50.5
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.4	-151.3	-151.2	-151.1	-151.0	-150.8	-150.1
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	1.4	1.3	3.7	6.1	8.5	10.8	10.1
<b>Spot 3X Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	43.4*	43.3*	45.7*	48.0*	50.4	50.5	50.5
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-150.0	-150.0	-147.5	-145.0	-142.5	-142.3	-141.6
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.0	0.0	2.3	1.6
<b>Spot 3X Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	50.5	50.5	50.5	50.5	50.5	50.5	50.5
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.4	-151.3	-151.2	-151.1	-151.0	-150.8	-150.1
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	3.4	3.3	5.7	6.1	8.5	10.8	10.1
<b>Ku-Band ULPC (Global Beam)</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Occupied Bandwidth (kHz)	25	25	25	25	25	25	25

Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-163.3	-163.2	-163.1	-163.0	-162.9	-162.8	-162.0
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-150	-150	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	13.3	13.2	15.6	18.0	20.4	22.8	22.0
<b>FREQUENCY BAND : 12.50 - 12.750 GHz</b>							
<b>Spot 1 Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	45.4*	45.3*	47.7*	50.0*	50.1	50.1	50.1
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-148.0	-148.0	-145.5	-143.0	-142.8	-142.7	-142.0
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.0	0.0	2.3	4.7	4.0
<b>Spot 1 Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	50.1	50.1	50.1	50.1	50.1	50.1	50.1
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.8	-151.7	-151.6	-151.5	-151.4	-151.2	-150.5
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	3.8	3.7	6.1	8.5	10.9	13.2	12.5
<b>Spot 2 Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	45.4*	45.3*	47.7*	49.1	49.1	49.1	49.1
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-148.0	-148.0	-145.5	-143.9	-143.8	-143.7	-143.0
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.0	0.9	3.3	5.7	5.0
<b>Spot 2 Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	49.1	49.1	49.1	49.1	49.1	49.1	49.1
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1

Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-152.8	-152.7	-152.6	-152.5	-152.4	-152.2	-151.5
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	4.8	4.7	7.1	9.5	11.9	14.2	13.5
<b>Spot 2A Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	45.4*	45.3*	47.2	47.2	47.2	47.2	47.2
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-148.0	-148.0	-146.0	-145.8	-145.7	-145.6	-144.9
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.5	2.8	5.2	7.6	6.9
<b>Spot 2A Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	47.2	47.2	47.2	47.2	47.2	47.2	47.2
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-154.7	-154.6	-154.5	-154.4	-154.3	-154.1	-153.4
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	6.7	6.6	9.0	11.4	13.8	16.1	15.4
<b>Spot 3 Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	45.4*	45.3*	47.7*	50.0*	50.5	50.5	50.5
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-148.0	-148.0	-145.5	-143.0	-142.4	-142.3	-141.6
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.0	0.0	1.9	4.3	3.6
<b>Spot 3 Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	50.5	50.5	50.5	50.5	50.5	50.5	50.5
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.4	-151.3	-151.2	-151.1	-151.0	-150.8	-150.1
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0



Margin (dB)	3.4	3.3	5.7	8.1	10.5	12.8	12.1
<b>Spot 3X Beam: 30M0F3F</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	45.4*	45.3*	47.7*	50.0	50.5	50.5	50.5
Occupied Bandwidth (kHz)	4000	4000	4000	4000	4000	4000	4000
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-148.0	-148.0	-145.5	-143.0	-142.4	-142.3	-141.6
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.0	0.0	1.9	4.3	3.6
<b>Spot 3X Beam: 34M0G7W</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	50.5	50.5	50.5	50.5	50.5	50.5	50.5
Occupied Bandwidth (kHz)	28452	28452	28452	28452	28452	28452	28452
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.4	-151.3	-151.2	-151.1	-151.0	-150.8	-150.1
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	3.4	3.3	5.7	8.1	10.5	12.8	12.1
<b>Ku-Band ULPC (Spot 1)</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	20.2	20.2	20.2	20.2	20.2	20.2	20.2
Occupied Bandwidth (kHz)	25	25	25	25	25	25	25
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.1	-151.0	-150.9	-150.8	-150.7	-150.6	-149.8
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	3.1	3.0	5.4	7.8	10.2	12.6	11.8
<b>Ku-Band ULPC (Spot 2)</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Occupied Bandwidth (kHz)	25	25	25	25	25	25	25
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.2	-151.1	-151.0	-150.9	-150.8	-150.7	-149.9
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	3.2	3.1	5.5	7.9	10.3	12.7	11.9
<b>Ku-Band ULPC (Spot 2A)</b>							

Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	18.3	18.3	18.3	18.3	18.3	18.3	18.3
Occupied Bandwidth (kHz)	25	25	25	25	25	25	25
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-153.0	-152.9	-152.8	-152.7	-152.6	-152.5	-151.7
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	5.0	4.9	7.3	9.7	12.1	14.5	13.7
<b>Ku-Band ULPC (Spot 3)</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	19.8	19.8	19.8	19.8	19.8	19.8	19.8
Occupied Bandwidth (kHz)	25	25	25	25	25	25	25
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.5	-151.4	-151.3	-151.2	-151.1	-151.0	-150.2
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	3.5	3.4	5.8	8.2	10.6	13.0	12.2
<b>Ku-Band ULPC (Spot 3X)</b>							
Elevation Angle (degrees)	0	5	10	15	20	25	90
Assumed EIRP (dBW)	19.8	19.8	19.8	19.8	19.8	19.8	19.8
Occupied Bandwidth (kHz)	25	25	25	25	25	25	25
Spreading Loss (dB/m <sup>2</sup> )	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m <sup>2</sup> /4kHz)	-151.5	-151.4	-151.3	-151.2	-151.1	-151.0	-150.2
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-148	-148	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	3.5	3.4	5.8	8.2	10.6	13.0	12.2

\* This is the maximum allowable EIRP level at the specified elevation angle. The actual EIRP level of the beam at this particular elevation angle will be made to be equal to or lower than the value listed in the table through reduction in the output power of the channel and/or restriction on the movement/placement of the beam.

## Exhibit 5: Link Budgets

UPLINK BEAM INFORMATION								
Uplink Beam Name	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	6.175	6.175	6.175	6.175
Uplink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0
Uplink SFD (dBW/m2)	-80.9	-87.9	-82.9	-82.9	-82.9	-80.9	-75.9	-75.9
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DOWNLINK BEAM INFORMATION								
Downlink Beam Name	GLOBAL	GLOBAL	GLOBAL	GLOBAL	HEMI	HEMI	HEMI	HEMI
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Downlink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	25.5	25.5	25.5	25.5	30.8	30.8	30.8	30.8
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ADJACENT SATELLITE 1								
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.1	-37.1	-37.1	-37.1	-37.3	-37.3	-37.3	-37.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2								
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.1	-37.1	-37.1	-37.1	-37.3	-37.3	-37.3	-37.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION								
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	N/A	24575	6000	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS
Occupied Bandwidth(kHz)	36000	30133	6771.1	75.4	36000	30133	6771.1	75.4
Allocated Bandwidth(kHz)	36000	36000	10300	100	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	10.0	3.36	3.87	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	10.0	3.36	3.57	2.79
UPLINK EARTH STATION								
Earth Station Diameter (meters)	15.2	15.2	15.2	15.2	13.0	8.1	15.2	15.2
Earth Station Gain (dBi)	58.4	58.4	58.4	58.4	56.4	52.8	58.4	58.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
DOWNLINK EARTH STATION								
Earth Station Diameter (meters)	13.1	6.1	7.0	7.0	8.1	15.2	8.1	8.1
Earth Station Gain (dBi)	53.5	46.5	47.5	47.5	49.3	55.0	49.3	49.3
Earth Station G/T (dB/K)	33.0	26.2	26.6	26.6	28.4	34.5	28.4	28.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
LINK FADE TYPE								
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE								
Uplink Earth Station EIRP (dBW)	82.0	75.0	68.1	47.7	80.0	68.8	68.6	48.2
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Uplink C/N(dB)	23.8	17.6	17.2	16.3	21.8	11.4	17.7	16.8
DOWNLINK PERFORMANCE								
Downlink EIRP per Carrier (dBW)	25.5	25.5	18.3	-2.2	30.8	23.5	17.1	-3.3
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	33.0	26.2	26.6	26.6	28.4	34.5	28.4	28.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Downlink C / N(dB)	14.7	8.7	8.3	7.5	15.4	15.0	9.0	8.1
COMPOSITE LINK PERFORMANCE								
C/N Uplink (dB)	23.8	17.6	17.2	16.3	21.8	11.4	17.7	16.8
C/N Downlink (dB)	14.7	8.7	8.3	7.5	15.4	15.0	9.0	8.1
C/I Intermodulation (dB)	N/A	N/A	20.2	19.3	N/A	N/A	13.7	12.8
C/I Uplink Co-Channel (dB)*	25.0	25.0	26.7	26.4	25.0	25.0	20.3	20.0
C/I Downlink Co-Channel (dB)*	25.0	25.0	26.7	26.4	25.0	25.0	20.3	20.0
C/I Uplink Adjacent Satellite 1 (dB)	23.1	16.9	16.5	15.6	21.1	10.7	17.0	16.1
C/I Downlink Adjacent Satellite 1 (dB)	18.6	11.8	12.3	11.4	19.6	19.1	13.2	12.3
C/I Uplink Adjacent Satellite 2 (dB)	23.1	16.9	16.5	15.6	21.1	10.7	17.0	16.1
C/I Downlink Adjacent Satellite 2 (dB)	19.4	13.7	13.8	12.9	21.0	19.9	14.6	13.7
C/(N+I) Composite (dB)	11.0	5.1	4.9	4.0	11.2	5.2	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.0	4.1	3.9	3.0	10.2	4.2	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	0.0	.8	0.0	0.0	.2	.8	0.0	0.0
Number of Carriers	1	1.0	2.4	259.5	1	1.0	3.5	360.0
CARRIER DENSITY LEVELS								
Uplink Power Density (dBW/Hz)	-42.4	-58.2	-58.6	-59.5	-42.4	-58.8	-58.1	-59.0
Downlink EIRP Density At Beam Peak (dBW/Hz)	-36.5	-45.3	-46.0	-46.9	-29.2	-45.3	-45.2	-46.1

## Exhibit 5: Link Budgets (continued)

UPLINK BEAM INFORMATION								
Uplink Beam Name	GLOBAL	GLOBAL	GLOBAL	GLOBAL	HEMI	HEMI	HEMI	HEMI
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	6.175	6.175	6.175	6.175
Uplink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-11.0	-11.0	-11.0	-11.0	-7.5	-7.5	-7.5	-7.5
Uplink SFD (dBW/m2)	-82.9	-78.9	-77.9	-77.9	-79.7	-86.7	-82.7	-82.7
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DOWNLINK BEAM INFORMATION								
Downlink Beam Name	CSPOT	CSPOT	CSPOT	CSPOT	GLOBAL	GLOBAL	GLOBAL	GLOBAL
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Downlink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	32.3	32.3	32.3	32.3	25.5	25.5	25.5	25.5
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ADJACENT SATELLITE 1								
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2								
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION								
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	N/A	24575	6000	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS
Occupied Bandwidth(kHz)	36000	30133	6771.1	75.4	36000	30133	6771.1	75.4
Allocated Bandwidth(kHz)	36000	36000	10300	100	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	10.0	3.36	3.87	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	10.0	3.36	3.57	2.79
UPLINK EARTH STATION								
Earth Station Diameter (meters)	13.0	11.0	15.2	13.0	15.2	11.0	15.2	15.2
Earth Station Gain (dBi)	56.4	55.4	58.4	56.4	58.4	55.4	58.4	58.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
DOWNLINK EARTH STATION								
Earth Station Diameter (meters)	7.0	6.1	7.0	7.0	13.1	7.0	7.0	7.0
Earth Station Gain (dBi)	47.5	46.5	47.5	47.5	53.5	47.5	47.5	47.5
Earth Station G/T (dB/K)	26.6	26.2	26.6	26.6	33.0	26.6	26.6	26.6
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
LINK FADE TYPE								
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE								
Uplink Earth Station EIRP (dBW)	80.0	71.6	67.3	46.8	83.2	72.2	68.4	48.0
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-11.0	-11.0	-11.0	-11.0	-7.5	-7.5	-7.5	-7.5
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Uplink C/N(dB)	21.8	14.2	16.4	15.5	28.5	18.3	21.0	20.1
DOWNLINK PERFORMANCE								
Downlink EIRP per Carrier (dBW)	32.3	25.8	19.3	-1.2	25.5	25.2	18.4	-2.0
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	26.6	26.2	26.6	26.6	33.0	26.6	26.6	26.6
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Downlink C / N(dB)	15.1	9.0	9.4	8.4	14.7	8.8	8.5	7.6
COMPOSITE LINK PERFORMANCE								
C/N Uplink (dB)	21.8	14.2	16.4	15.5	28.5	18.3	21.0	20.1
C/N Downlink (dB)	15.1	9.0	9.4	8.4	14.7	8.8	8.5	7.6
C/I Intermodulation (dB)	N/A	N/A	14.4	13.5	N/A	N/A	20.3	19.4
C/I Uplink Co-Channel (dB)*	25.0	25.0	20.9	20.6	25.0	25.0	26.9	26.6
C/I Downlink Co-Channel (dB)*	25.0	25.0	20.9	20.6	25.0	25.0	26.9	26.6
C/I Uplink Adjacent Satellite 1 (dB)	21.1	13.5	15.7	14.8	22.3	12.1	14.8	13.9
C/I Downlink Adjacent Satellite 1 (dB)	19.0	12.1	13.3	12.4	18.6	12.7	12.4	11.5
C/I Uplink Adjacent Satellite 2 (dB)	21.1	13.5	15.7	14.8	22.3	12.1	14.8	13.9
C/I Downlink Adjacent Satellite 2 (dB)	20.6	14.0	14.8	13.9	19.4	14.3	14.0	13.1
C/(N+I) Composite (dB)	11.0	4.4	4.9	4.0	11.1	4.4	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.0	3.4	3.9	3.0	10.1	3.4	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	0.0	.1	0.0	0.0	.1	0.0	0.0	0.0
Number of Carriers	1	1.0	3.5	360.0	1	1.0	2.3	250.2
CARRIER DENSITY LEVELS								
Uplink Power Density (dBW/Hz)	-42.4	-58.6	-59.4	-58.3	-41.2	-58.0	-58.3	-59.2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-29.7	-45.0	-45.0	-45.9	-36.5	-45.6	-45.9	-46.8

## Exhibit 5: Link Budgets (continued)

UPLINK BEAM INFORMATION								
Uplink Beam Name	HEMI	HEMI	HEMI	HEMI	HEMI	HEMI	HEMI	HEMI
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	6.175	6.175	6.175	6.175
Uplink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5
Uplink SFD (dBW/m2)	-82.7	-74.7	-76.7	-76.7	-80.7	-76.7	-76.7	-76.7
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DOWNLINK BEAM INFORMATION								
Downlink Beam Name	HEMI	HEMI	HEMI	HEMI	ZONE	ZONE	ZONE	ZONE
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Downlink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	30.8	30.8	30.8	30.8	31.9	31.9	31.9	31.9
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ADJACENT SATELLITE 1								
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.3	-37.3	-37.3	-37.3	-37.1	-37.1	-37.1	-37.1
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2								
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.3	-37.3	-37.3	-37.3	-37.1	-37.1	-37.1	-37.1
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION								
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	N/A	24575	6000	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS
Occupied Bandwidth(kHz)	36000	30133	6771.1	75.4	36000	30133	6771.1	75.4
Allocated Bandwidth(kHz)	36000	36000	10300	100	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	10.0	3.36	3.87	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	10.0	3.36	3.57	2.79
UPLINK EARTH STATION								
Earth Station Diameter (meters)	13.0	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Earth Station Gain (dBi)	56.4	58.4	58.4	58.4	58.4	58.4	58.4	58.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
DOWNLINK EARTH STATION								
Earth Station Diameter (meters)	8.1	8.1	9.2	8.1	7.0	6.1	7.0	6.1
Earth Station Gain (dBi)	49.3	49.3	50.3	49.3	47.5	46.5	47.5	46.5
Earth Station G/T (dB/K)	28.4	28.4	29.4	28.4	26.6	26.2	26.6	26.2
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
LINK FADE TYPE								
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE								
Uplink Earth Station EIRP (dBW)	80.2	75.2	67.6	47.8	82.2	74.2	68.7	48.7
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Uplink C/N(dB)	25.5	21.3	20.2	19.9	27.5	20.3	21.3	20.8
DOWNLINK PERFORMANCE								
Downlink EIRP per Carrier (dBW)	30.8	23.7	16.9	-3.0	31.9	25.8	19.1	-9
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	28.4	28.4	29.4	28.4	26.6	26.2	26.6	26.2
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Downlink C / N(dB)	15.4	9.1	9.8	8.5	14.7	9.0	9.1	8.3
COMPOSITE LINK PERFORMANCE								
C/N Uplink (dB)	25.5	21.3	20.2	19.9	27.5	20.3	21.3	20.8
C/N Downlink (dB)	15.4	9.1	9.8	8.5	14.7	9.0	9.1	8.3
C/I Intermodulation (dB)	N/A	N/A	13.5	13.2	N/A	N/A	14.6	14.1
C/I Uplink Co-Channel (dB)*	25.0	25.0	20.1	20.3	25.0	25.0	21.1	21.2
C/I Downlink Co-Channel (dB)*	25.0	25.0	20.1	20.3	25.0	25.0	21.1	21.2
C/I Uplink Adjacent Satellite 1 (dB)	19.3	15.1	14.0	13.7	21.3	14.1	15.1	14.6
C/I Downlink Adjacent Satellite 1 (dB)	19.6	13.3	14.1	12.7	18.6	12.1	13.1	11.4
C/I Uplink Adjacent Satellite 2 (dB)	19.3	15.1	14.0	13.7	21.3	14.1	15.1	14.6
C/I Downlink Adjacent Satellite 2 (dB)	21.0	14.7	15.3	14.0	20.2	14.0	14.6	13.3
C/(N+I) Composite (dB)	11.0	5.5	4.9	4.0	11.0	4.9	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.0	4.5	3.9	3.0	10.0	3.9	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	0.0	1.2	0.0	0.0	0.0	.6	0.0	0.0
Number of Carriers	1	1.0	3.5	360.0	1	1.0	3.5	360.0
CARRIER DENSITY LEVELS								
Uplink Power Density (dBW/Hz)	-42.2	-58.0	-59.1	-59.4	-42.2	-59.0	-58.0	-58.5
Downlink EIRP Density At Beam Peak (dBW/Hz)	-29.2	-45.1	-45.4	-45.7	-30.1	-45.0	-45.2	-45.7

## Exhibit 5: Link Budgets (continued)

UPLINK BEAM INFORMATION								
Uplink Beam Name	HEMI	HEMI	HEMI	HEMI	CSPOT	CSPOT	CSPOT	CSPOT
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	6.175	6.175	6.175	6.175
Uplink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	-7.5	-7.5	-7.5	-7.5	-1.0	-1.0	-1.0	-1.0
Uplink SFD (dBW/m2)	-80.7	-76.7	-76.7	-76.7	-82.0	-90	-83	-83
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DOWNLINK BEAM INFORMATION								
Downlink Beam Name	CSPOT	CSPOT	CSPOT	CSPOT	GLOBAL	GLOBAL	GLOBAL	GLOBAL
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Downlink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	32.3	32.3	32.3	32.3	25.5	25.5	25.5	25.5
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ADJACENT SATELLITE 1								
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2								
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION								
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	N/A	24575	6000	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS
Occupied Bandwidth(kHz)	36000	30133	6771.1	75.4	36000	30133	6771.1	75.4
Allocated Bandwidth(kHz)	36000	36000	10300	100	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	10.0	3.36	3.87	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	10.0	3.36	3.57	2.79
UPLINK EARTH STATION								
Earth Station Diameter (meters)	15.2	15.2	15.2	15.2	15.2	13.0	15.2	15.2
Earth Station Gain (dBi)	58.4	58.4	58.4	58.4	58.4	56.4	58.4	58.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
DOWNLINK EARTH STATION								
Earth Station Diameter (meters)	7.0	6.1	7.0	6.1	13.1	6.1	6.1	6.1
Earth Station Gain (dBi)	47.5	46.5	47.5	46.5	53.5	46.5	46.5	46.5
Earth Station G/T (dB/K)	26.6	26.2	26.6	26.2	33.0	26.2	26.2	26.2
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
LINK FADE TYPE								
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE								
Uplink Earth Station EIRP (dBW)	82.2	73.8	68.4	48.4	80.9	72.9	68.3	47.9
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-7.5	-7.5	-7.5	-7.5	-1.0	-1.0	-1.0	-1.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Uplink C/N(dB)	27.5	19.9	21.0	20.5	32.7	25.5	27.4	26.5
DOWNLINK PERFORMANCE								
Downlink EIRP per Carrier (dBW)	32.3	25.8	19.2	-8	25.5	25.5	18.6	-1.8
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	26.6	26.2	26.6	26.2	33.0	26.2	26.2	26.2
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Downlink C / N(dB)	15.1	9.0	9.3	8.4	14.7	8.7	8.3	7.4
COMPOSITE LINK PERFORMANCE								
C/N Uplink (dB)	27.5	19.9	21.0	20.5	32.7	25.5	27.4	26.5
C/N Downlink (dB)	15.1	9.0	9.3	8.4	14.7	8.7	8.3	7.4
C/I Intermodulation (dB)	N/A	N/A	14.3	13.8	N/A	N/A	20.5	19.6
C/I Uplink Co-Channel (dB)*	25.0	25.0	20.9	21.0	25.0	25.0	27	26.7
C/I Downlink Co-Channel (dB)*	25.0	25.0	20.9	21.0	25.0	25.0	27	26.7
C/I Uplink Adjacent Satellite 1 (dB)	21.3	13.7	14.8	14.3	22.0	14.8	16.7	15.8
C/I Downlink Adjacent Satellite 1 (dB)	19.0	12.1	13.2	11.6	18.6	11.8	11.4	10.5
C/I Uplink Adjacent Satellite 2 (dB)	21.3	13.7	14.8	14.3	22.0	14.8	16.7	15.8
C/I Downlink Adjacent Satellite 2 (dB)	20.6	14.0	14.8	13.4	19.4	13.7	13.3	12.4
C/(N+I) Composite (dB)	11.3	4.8	4.9	4.0	11.1	5.0	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.3	3.8	3.9	3.0	10.1	4.0	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	.3	.5	0.0	0.0	.1	.6	0	0.0
Number of Carriers	1	1.0	3.5	360.0	1	1.0	2.2	240.7
CARRIER DENSITY LEVELS								
Uplink Power Density (dBW/Hz)	-42.2	-59.4	-58.3	-58.8	-43.5	-58.3	-58.4	-59.3
Downlink EIRP Density At Beam Peak (dBW/Hz)	-29.7	-45.0	-45.1	-45.6	-36.5	-45.3	-45.7	-46.6

## Exhibit 5: Link Budgets (continued)

UPLINK BEAM INFORMATION								
Uplink Beam Name	CSPOT	CSPOT	CSPOT	CSPOT	ZONE	ZONE	ZONE	ZONE
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	6.175	6.175	6.175	6.175
Uplink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	-1.0	-1.0	-1.0	-1.0	-3.0	-3.0	-3.0	-3.0
Uplink SFD (dBW/m2)	-85	-80	-78	-78	-84.5	-75.5	-77.5	-77.5
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DOWNLINK BEAM INFORMATION								
Downlink Beam Name	HEMI	HEMI	HEMI	HEMI	HEMI	HEMI	HEMI	HEMI
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Downlink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ADJACENT SATELLITE 1								
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.3	-37.3	-37.3	-37.3	-37.3	-37.3	-37.3	-37.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2								
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.3	-37.3	-37.3	-37.3	-37.3	-37.3	-37.3	-37.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION								
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	N/A	24575	6000	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS
Occupied Bandwidth(kHz)	36000	30133	6771.1	75.4	36000	30133	6771.1	75.4
Allocated Bandwidth(kHz)	36000	36000	10300	100	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	10.0	3.36	3.87	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	10.0	3.36	3.57	2.79
UPLINK EARTH STATION								
Earth Station Diameter (meters)	10.0	10.0	13.0	13.0	11.0	15.2	15.2	15.2
Earth Station Gain (dBi)	54.1	54.1	56.4	56.4	55.4	58.4	58.4	58.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
DOWNLINK EARTH STATION								
Earth Station Diameter (meters)	8.1	8.1	8.1	8.1	8.1	7.0	8.1	8.1
Earth Station Gain (dBi)	49.3	49.3	49.3	49.3	49.3	47.5	49.3	49.3
Earth Station G/T (dB/K)	28.4	28.4	28.4	28.4	28.4	26.6	28.4	28.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
LINK FADE TYPE								
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE								
Uplink Earth Station EIRP (dBW)	77.9	69.9	66.7	46.2	78.4	74.4	67.1	46.7
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-1.0	-1.0	-1.0	-1.0	-3.0	-3.0	-3.0	-3.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Uplink C/N(dB)	29.7	22.5	25.8	24.8	28.2	25.0	24.2	23.3
DOWNLINK PERFORMANCE								
Downlink EIRP per Carrier (dBW)	30.8	23.7	17.3	-3.2	30.8	23.7	17.2	-3.3
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	28.4	28.4	28.4	28.4	28.4	26.6	28.4	28.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Downlink C / N(dB)	15.4	9.1	9.1	8.2	15.4	7.3	9.1	8.2
COMPOSITE LINK PERFORMANCE								
C/N Uplink (dB)	29.7	22.5	25.8	24.8	28.2	25.0	24.2	23.3
C/N Downlink (dB)	15.4	9.1	9.1	8.2	15.4	7.3	9.1	8.2
C/I Intermodulation (dB)	N/A	N/A	13.9	12.9	N/A	N/A	13.8	12.9
C/I Uplink Co-Channel (dB)*	25.0	25.0	20.4	20.1	25.0	25.0	20.3	20.0
C/I Downlink Co-Channel (dB)*	25.0	25.0	20.4	20.1	25.0	25.0	20.3	20.0
C/I Uplink Adjacent Satellite 1 (dB)	19.0	11.8	15.1	14.2	19.5	16.3	15.5	14.6
C/I Downlink Adjacent Satellite 1 (dB)	19.6	13.3	13.4	12.5	19.6	11.4	13.3	12.4
C/I Uplink Adjacent Satellite 2 (dB)	19.0	11.8	15.1	14.2	19.5	16.3	15.5	14.6
C/I Downlink Adjacent Satellite 2 (dB)	21.0	14.7	14.7	13.8	21.0	13.0	14.6	13.7
C/(N+I) Composite (dB)	11.0	4.6	4.9	4.0	11.1	4.4	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.0	3.6	3.9	3.0	10.1	3.4	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	0.0	.2	0.0	0.0	.1	0.0	0.0	0.0
Number of Carriers	1	1.0	3.5	360.0	1	1.0	3.5	360.0
CARRIER DENSITY LEVELS								
Uplink Power Density (dBW/Hz)	-42.2	-59.0	-58.0	-58.9	-43.0	-58.8	-59.6	-60.5
Downlink EIRP Density At Beam Peak (dBW/Hz)	-29.2	-45.1	-45.0	-46.0	-29.2	-45.1	-45.1	-46.0

## Exhibit 5: Link Budgets (continued)

UPLINK BEAM INFORMATION								
Uplink Beam Name	ZONE	ZONE	ZONE	ZONE	CSPOT	CSPOT	CSPOT	CSPOT
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	6.175	6.175	6.175	6.175
Uplink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	-3.0	-3.0	-3.0	-3.0	-1.0	-1.0	-1.0	-1.0
Uplink SFD (dBW/m2)	-82.5	-80.5	-77.5	-77.5	-82	-80	-77	-77
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DOWNLINK BEAM INFORMATION								
Downlink Beam Name	ZONE	ZONE	ZONE	ZONE	CSPOT	CSPOT	CSPOT	CSPOT
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Downlink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	31.9	31.9	31.9	31.9	32.3	32.3	32.3	32.3
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ADJACENT SATELLITE 1								
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2								
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1	-37.1
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION								
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	N/A	24575	6000	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS
Occupied Bandwidth(kHz)	36000	30133	6771.1	75.4	36000	30133	6771.1	75.4
Allocated Bandwidth(kHz)	36000	36000	10300	100	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	10.0	3.36	3.87	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	10.0	3.36	3.57	2.79
UPLINK EARTH STATION								
Earth Station Diameter (meters)	13.0	10.0	15.2	15.2	15.2	10.0	15.2	15.2
Earth Station Gain (dBi)	56.4	54.1	58.4	58.4	58.4	54.1	58.4	58.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
DOWNLINK EARTH STATION								
Earth Station Diameter (meters)	7.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Earth Station Gain (dBi)	47.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5
Earth Station G/T (dB/K)	26.6	26.2	26.2	26.2	26.2	26.2	26.2	26.2
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
LINK FADE TYPE								
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE								
Uplink Earth Station EIRP (dBW)	80.4	70.4	68.1	47.6	80.9	70.4	68.2	47.8
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-3.0	-3.0	-3.0	-3.0	-1.0	-1.0	-1.0	-1.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Uplink C/N(dB)	30.2	21.0	25.2	24.3	32.7	23.0	27.3	26.4
DOWNLINK PERFORMANCE								
Downlink EIRP per Carrier (dBW)	31.9	25.8	19.3	-1.2	32.3	25.7	19.3	-1.1
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	26.6	26.2	26.2	26.2	26.2	26.2	26.2	26.2
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-75.6	-74.8	-68.3	-48.8
Downlink C / N(dB)	14.7	9.0	8.9	8.0	14.7	8.9	9.0	8.1
COMPOSITE LINK PERFORMANCE								
C/N Uplink (dB)	30.2	21.0	25.2	24.3	32.7	23.0	27.3	26.4
C/N Downlink (dB)	14.7	9.0	8.9	8.0	14.7	8.9	9.0	8.1
C/I Intermodulation (dB)	N/A	N/A	14.8	13.9	N/A	N/A	14.4	13.5
C/I Uplink Co-Channel (dB)*	25.0	25.0	21.3	21.0	25.0	25.0	21.0	20.6
C/I Downlink Co-Channel (dB)*	25.0	25.0	21.3	21.0	25.0	25.0	21.0	20.6
C/I Uplink Adjacent Satellite 1 (dB)	21.5	12.3	16.5	15.6	22.0	12.3	16.6	15.7
C/I Downlink Adjacent Satellite 1 (dB)	18.6	12.1	12.1	11.2	17.9	12.0	12.1	11.2
C/I Uplink Adjacent Satellite 2 (dB)	21.5	12.3	16.5	15.6	22.0	12.3	16.6	15.7
C/I Downlink Adjacent Satellite 2 (dB)	20.2	14.0	14.0	13.1	19.7	13.9	14.0	13.1
C/(N+I) Composite (dB)	11.1	4.5	4.9	4.0	11.0	4.4	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.1	3.5	3.9	3.0	10.0	3.4	3.9	3.0
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	.1	.1	0.0	0.0	0.0	.1	0.0	0.0
Number of Carriers	1	1.0	3.5	360.0	1	1.0	3.5	360.0
CARRIER DENSITY LEVELS								
Uplink Power Density (dBW/Hz)	-42.0	-58.5	-58.6	-59.5	-43.5	-58.5	-58.5	-59.4
Downlink EIRP Density At Beam Peak (dBW/Hz)	-30.1	-45.0	-45.0	-45.9	-29.7	-45.1	-45.0	-45.9



## Exhibit 5: Link Budgets (continued)

UPLINK BEAM INFORMATION						
Uplink Beam Name	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	Circular	Circular	Circular	Circular	Linear	Linear
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	6.0	6.0	6.0	6.0	6.0	6.0
Uplink SFD (dBW/m2)	-75.1	-83.1	-80.1	-80.1	-80.1	-80.1
Rain Rate (mm/hr)	42.0	n/a	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT
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)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	43.2	43.2	43.2	43.2	43.2	43.2
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-50	-50	-50	-50	-50	-50
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26	-26	-26	-26	-26	-26
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-50	-50	-50	-50	-50	-50
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26	-26	-26	-26	-26	-26
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION						
Carrier ID	36M0F3F	112MG7W	10M3G7W	1M45G7W	400KG7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	BPSK	BPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	76436	6000	512	128	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	R1/2	R1/2	1/2 w/ RS
Occupied Bandwidth(kHz)	36000	93724	6771.1	1229.0	307.0	75.4
Allocated Bandwidth(kHz)	36000	112000	10300	1450.0	400.0	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	3.4	3.4	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.7	2.7	2.79
UPLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	3.0	6.1
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	49.7	56.9
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	11.0	2.4	6.1	3.0	6.1	6.1
Earth Station Gain (dBi)	60.4	47.5	55.5	49.2	55.5	55.5
Earth Station G/T (dB/K)	38.0	25.0	33.1	26.7	33.1	33.1
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	74.4	79.8	60.2	57.4	45.9	39.9
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)	6.0	6.0	6.0	6.0	6.0	6.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-79.7	-68.3	-60.9	-54.9	-48.8
Uplink C/N(dB)	25.9	27.2	19.0	23.7	18.1	18.2
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	32.9	43.2	23.7	21.0	9.4	3.4
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)	38.0	25.0	33.1	26.7	33.1	33.1
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-79.7	-68.3	-60.9	-54.9	-48.8
Downlink C / N(dB)	17.5	10.6	10.7	8.9	9.8	9.9
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	25.9	27.2	19.0	23.7	18.1	18.2
C/N Downlink (dB)	17.5	10.6	10.7	8.9	9.8	9.9
C/I Intermodulation (dB)	22.8	N/A	20.9	25.6	20.0	20.1
C/I Uplink Co-Channel (dB)*	24.7	25.0	21.0	26.7	20.7	20.8
C/I Downlink Co-Channel (dB)*	24.7	25.0	21.0	26.7	20.7	20.8
C/I Uplink Adjacent Satellite 1 (dB)	26.8	28.1	19.9	24.6	19.0	19.1
C/I Downlink Adjacent Satellite 1 (dB)	22.1	14.7	15.1	13.1	14.2	14.3
C/I Uplink Adjacent Satellite 2 (dB)	26.8	28.1	19.9	24.6	19.0	19.1
C/I Downlink Adjacent Satellite 2 (dB)	22.4	16.2	15.7	14.4	14.8	14.9
C/(N+I) Composite (dB)	13.1	8.1	7.0	6.3	6.1	6.2
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.1	7.1	6.0	5.3	5.1	5.2
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.4	-3.4	-3.0
Excess Link Margin (dB)	2.1	3.7	2.1	1.9	1.7	2.2
Number of Carriers	3.3	1.0	10.9	51.9	280.0	1120.0
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-48.5	-56.8	-65.0	-60.3	-58.7	-65.8
Downlink EIRP Density At Beam Peak (dBW/Hz)	-29.1	-32.5	-40.6	-35.9	-41.5	-41.4

## Exhibit 5: Link Budgets (continued)

UPLINK BEAM INFORMATION								
Uplink Beam Name	HEMI	HEMI	HEMI	HEMI	ZONE	ZONE	ZONE	ZONE
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	6.175	6.175	6.175	6.175
Uplink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	-7.5	-7.5	-7.5	-7.5	-3.0	-3.0	-3.0	-3.0
Uplink SFD (dBW/m2)	-72.7	-84.7	-77.7	-77.7	-75.5	-85.5	-80.5	-80.5
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DOWNLINK BEAM INFORMATION								
Downlink Beam Name	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT
Downlink Frequency (GHz)	11.950	11.950	11.950	11.950	11.950	11.950	11.950	11.950
Downlink Beam Polarization	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	43.2	43.2	43.2	43.2	43.2	43.2	43.2	43.2
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1								
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2								
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION								
Carrier ID	36M0F3F	77M0G7W	10M3G7W	100KG7W	36M0F3F	77M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	52550	6000	64	N/A	52550	6000	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS
Occupied Bandwidth(kHz)	36000	64435	6771.1	75.4	36000	64435	6771.1	75.4
Allocated Bandwidth(kHz)	36000	77000	10300	100	36000	77000	10300	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	10.0	3.36	3.87	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	10.0	3.36	3.57	2.79
UPLINK EARTH STATION								
Earth Station Diameter (meters)	11.0	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Earth Station Gain (dBi)	55.4	58.4	58.4	58.4	58.4	58.4	58.4	58.4
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
DOWNLINK EARTH STATION								
Earth Station Diameter (meters)	11.0	2.4	3.0	3.0	13.0	1.8	2.4	2.4
Earth Station Gain (dBi)	60.4	47.5	49.2	49.2	62.7	44.8	47.5	47.5
Earth Station G/T (dB/K)	38.0	25.0	26.7	26.7	41.9	22.3	25.0	25.0
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
LINK FADE TYPE								
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE								
Uplink Earth Station EIRP (dBW)	79.1	78.2	68.4	48.1	76.0	77.4	67.1	46.8
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-7.5	-7.5	-7.5	-7.5	-3.0	-3.0	-3.0	-3.0
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-78.1	-68.3	-48.8	-75.6	-78.1	-68.3	-48.8
Uplink C/N(dB)	24.4	21.0	21.0	20.2	25.8	24.7	24.2	23.4
DOWNLINK PERFORMANCE								
Downlink EIRP per Carrier (dBW)	35.2	43.2	29.6	9.2	35.0	43.2	31.0	10.7
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-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	0.0	0.0
Earth Station G/T (dB/K)	38.0	25.0	26.7	26.7	41.9	22.3	25.0	25.0
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-78.1	-68.3	-48.8	-75.6	-78.1	-68.3	-48.8
Downlink C / N(dB)	19.8	12.2	10.1	9.3	23.5	9.5	9.8	9.0
COMPOSITE LINK PERFORMANCE								
C/N Uplink (dB)	24.4	21.0	21.0	20.2	25.8	24.7	24.2	23.4
C/N Downlink (dB)	19.8	12.2	10.1	9.3	23.5	9.5	9.8	9.0
C/I Intermodulation (dB)	23.5	N/A	25.1	24.3	24.0	N/A	26.6	25.8
C/I Uplink Co-Channel (dB)*	25.4	25.0	25.2	25.0	25.3	25.0	26.6	26.4
C/I Downlink Co-Channel (dB)*	25.4	25.0	25.2	25.0	25.3	25.0	26.6	26.4
C/I Uplink Adjacent Satellite 1 (dB)	18.2	14.8	14.8	14.1	17.1	16.0	15.5	14.7
C/I Downlink Adjacent Satellite 1 (dB)	24.3	16.3	14.3	13.5	26.4	13.3	13.9	13.1
C/I Uplink Adjacent Satellite 2 (dB)	18.2	14.8	14.8	14.1	17.1	16.0	15.5	14.7
C/I Downlink Adjacent Satellite 2 (dB)	24.7	17.9	15.6	14.8	26.7	15.4	15.5	14.7
C/(N+I) Composite (dB)	12.1	7.5	6.1	5.3	12.2	6.1	6.2	5.4
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.1	6.5	5.1	4.3	11.2	5.1	5.2	4.4
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	1.1	3.1	1.2	1.3	1.2	1.7	1.3	1.4
Number of Carriers	2.0	1.0	7.2	770.0	2.0	1.0	5.1	552.2
CARRIER DENSITY LEVELS								
Uplink Power Density (dBW/Hz)	-42.3	-58.3	-58.3	-59.1	-48.4	-59.1	-59.6	-60.4
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.8	-30.9	-34.8	-35.5	-27.0	-30.9	-33.3	-34.1

## Exhibit 5: Link Budgets (continued)

UPLINK BEAM INFORMATION								
Uplink Beam Name	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT	KU SPOT
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Uplink SFD (dBW/m2)	-82.1	-75.1	-75.1	-75.1	-82.1	-75.1	-76.1	-76.1
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION								
Downlink Beam Name	HEMI	HEMI	HEMI	HEMI	ZONE	ZONE	ZONE	ZONE
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Downlink Beam Polarization	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Circular
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	30.8	30.8	30.8	30.8	31.9	31.9	31.9	31.9
Rain Rate (mm/hr)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ADJACENT SATELLITE 1								
Satellite 1 Orbital Location	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E	52.85E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.0	-37.0	-37.0	-37.0	-36.8	-36.8	-36.8	-36.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2								
Satellite 1 Orbital Location	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E	56.85E
Uplink Power Density (dBW/Hz)	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-37.0	-37.0	-37.0	-37.0	-36.8	-36.8	-36.8	-36.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION								
Carrier ID	30M0F3F	34M0G7W	10M3G7W	100KG7W	30M0F3F	34M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	23204	6000	64	N/A	23204	6000	64
Code Rate	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS	N/A	1/2 w/ RS	1/2 w/ RS	1/2 w/ RS
Occupied Bandwidth(kHz)	30000	28452	6771.1	75.4	30000	28452	6771.1	75.4
Allocated Bandwidth(kHz)	30000	34000	10300	100	30000	34000	10300	100
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	10.0	3.36	3.87	2.99
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	10.0	3.36	3.57	2.79
UPLINK EARTH STATION								
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	56.9	56.9	56.9	56.9
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
DOWNLINK EARTH STATION								
Earth Station Diameter (meters)	7.0	8.1	8.1	8.1	6.1	7.0	6.1	6.1
Earth Station Gain (dBi)	47.5	49.3	49.3	49.3	46.5	47.5	46.5	46.5
Earth Station G/T (dB/K)	26.6	28.4	28.4	28.4	26.2	26.6	26.2	26.2
Earth Station Elevation Angle	20	20	20	20	20	20	20	20
LINK FADE TYPE								
Link Fade Type	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE								
Uplink Earth Station EIRP (dBW)	80.8	74.7	70.1	49.8	80.8	75.4	70.4	50.2
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-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	0.0	0.0
Satellite G/T(dB/K)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-74.5	-68.3	-48.8	-74.8	-74.5	-68.3	-48.8
Uplink C/N(dB)	33.2	27.3	28.9	28.1	33.2	28.0	29.2	28.5
DOWNLINK PERFORMANCE								
Downlink EIRP per Carrier (dBW)	30.8	23.6	16.2	-4.1	31.9	25.4	18.6	-1.6
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3	-196.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	26.6	28.4	28.4	28.4	26.2	26.6	26.2	26.2
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-74.5	-68.3	-48.8	-74.8	-74.5	-68.3	-48.8
Downlink C / N(dB)	14.4	9.2	8.1	7.3	15.1	9.2	8.3	7.6
COMPOSITE LINK PERFORMANCE								
C/N Uplink (dB)	33.2	27.3	28.9	28.1	33.2	28.0	29.2	28.5
C/N Downlink (dB)	14.4	9.2	8.1	7.3	15.1	9.2	8.3	7.6
C/I Intermodulation (dB)	N/A	N/A	20.6	19.9	N/A	N/A	21.9	21.2
C/I Uplink Co-Channel (dB)*	25.5	25.0	20.7	20.5	25.5	25.0	22.0	21.9
C/I Downlink Co-Channel (dB)*	25.5	25.0	20.7	20.5	25.5	25.0	22.0	21.9
C/I Uplink Adjacent Satellite 1 (dB)	34.0	28.2	29.8	29.0	34.0	28.9	30.1	29.4
C/I Downlink Adjacent Satellite 1 (dB)	18.2	13.2	12.0	11.2	18.0	12.9	11.1	10.4
C/I Uplink Adjacent Satellite 2 (dB)	34.0	28.2	29.8	29.0	34.0	28.9	30.1	29.4
C/I Downlink Adjacent Satellite 2 (dB)	19.8	14.5	13.3	12.6	19.8	14.4	13.0	12.3
C/(N+I) Composite (dB)	11.6	6.7	5.3	4.6	11.9	6.6	5.2	4.6
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.6	5.7	4.3	3.6	10.9	5.6	4.2	3.6
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	.6	2.3	.4	.6	.9	2.3	.4	.6
Number of Carriers	1	1.0	3.3	340.0	1	1.0	3.3	340.0
CARRIER DENSITY LEVELS								
Uplink Power Density (dBW/Hz)	-42.1	-56.7	-55.1	-55.9	-42.1	-56.0	-54.8	-55.5
Downlink EIRP Density At Beam Peak (dBW/Hz)	-29.2	-45.0	-46.1	-46.9	-30.1	-45.1	-45.7	-46.4