

## Engineering Statement

Intelsat License LLC (“Intelsat”) proposes to modify its pending application SAT-MOD-20120619-00100 to permit operation of Intelsat 8 at 169° E.L. The spacecraft will utilize the frequency bands 5925 – 6425 MHz, 13997 – 14500 MHz, 3700 – 4200 MHz, and 12250 – 12750 MHz to provide service to East Asia, Australia, New Zealand, Papua New Guinea and the western United States. Intelsat 8 will replace Intelsat 5, which currently operates at 169° E.L.

Intelsat also requests that the Part 25 waiver originally granted to the Intelsat 8 spacecraft at 166° E.L. continue to apply at the 169° E.L. location. Namely, the waiver of Section 2.106 (the “U.S. Table of Frequency Allocation”) of the Commission’s rules to permit Intelsat to operate Intelsat 8 in the 12250 – 12750 MHz frequency band (space-to-Earth) for commercial Fixed-Satellite Service (“FSS”) on a non-interference, non-protected basis in International Telecommunication Union (“ITU”) Region 2.

Intelsat 8 is currently licensed to operate at 166° E.L (*see* FCC File Nos.: SAT-AMD-19990222-00024, SAT-AMD-20020326-00055 and SAT-MOD-20060228-00017). Intelsat currently has pending before the Commission an application to modify the license of Intelsat 8 so as to permit operation from 169.1° E.L (*see* FCC File Nos.: SAT-MOD-20120619-00100). However, Intelsat proposes herein to modify its pending application to permit operation of Intelsat 8 from 169° E.L instead of 169.1° E.L and replace the existing Intelsat 5 spacecraft. Once traffic has been transferred from Intelsat 5 to Intelsat 8, Intelsat 5 will be moved to another orbital location.

This engineering statement provides the following technical information for Intelsat 8: (1) frequency plan, including updating of the transponder gains and the Uplink Power Control (“ULPC”) frequency; (2) updates the beam performance and gain contours; (3) emission designators; (4) power flux density calculations; (5) link budget analysis; (6) adjacent satellite link analysis; (7) Schedule S information; (8) orbital debris mitigation plan; and (9) location of the Telemetry, Command and Ranging (“TC&R”) control earth stations.

### 1.0) Frequency Plan

The Intelsat 8 frequency and polarization plan is provided in Exhibit 1. This exhibit also updates the transponder (or channel) gain for each Intelsat 8 channel and corrects the frequency used for ULPC. With regard to the ULPC, in SAT-

AMD-19990222-00024 the ULPC frequency is listed as 11699 MHz, however, the correct ULPC frequency for Intelsat 8 is 3702 MHz.

In the U.S. Table of Frequency Allocations, the 12250 – 12700 MHz frequency band is allocated for use by the Fixed Service (“FS”) and Broadcast Satellite Service (“BSS”), and the 12700 –12750 MHz frequency band is allocated for use by the FS, Mobile Service (“MS”) and FSS (Earth-to-space). Intelsat requests a waiver of the U.S. Table of Frequency Allocations to permit Intelsat to use the Intelsat 8 satellite to provide commercial FSS (space-to-Earth) using the 12250 – 12750 MHz frequency band at the 169° E.L. orbital location on a non-interference, non-protected basis in ITU Region 2. Specifically, Intelsat requests authority to permit Intelsat 8 transmissions in the 12250 – 12750 MHz frequency band to its Napa, California, earth station as well as to the visible portion of ITU Region 2.

Terrestrial systems operating within the United States will not be subjected to harmful interference from the use of the 12250 – 12750 MHz frequency band by Intelsat 8 because the satellite’s transmissions are compliant with the ITU space-to-Earth power flux density (“PFD”) limits over the Earth. Specifically, to ensure protection of terrestrial communication links from space station transmissions, Article 21.16 of the ITU Radio Regulations imposes PFD limits on satellite transmissions in the space-to-Earth direction.<sup>1</sup> As demonstrated in Exhibit 4, Intelsat 8 would be compliant with the PFD limits specified in Article 21.16 of the ITU Radio Regulations.<sup>2</sup> Accordingly, terrestrial stations operating in ITU Region 2 will not be subjected to harmful levels of interference from Intelsat 8’s transmissions.<sup>3</sup> Intelsat is not aware of any complaints of harmful interference

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<sup>1</sup> ITU Radio Regulations, Art. 21.16 (2008). For ITU Region 2, PFD limits are specified only for non-geostationary satellites operating in the 11.7 – 12.7 GHz band. However, these limits may also be applied to geostationary satellites, since the PFD limit is intended to protect terrestrial stations from space station transmissions irrespective of whether the radiating space station is geostationary or non-geostationary. Moreover, when converted to the same reference bandwidth, the PFD limits are identical to those applicable to geostationary FSS space stations in ITU Region 3 which apply to the 12200 – 12750 MHz frequency band.

<sup>2</sup> The PFD calculations contained in Exhibit 4 assumed a referenced bandwidth of 4 kHz. These calculations may be converted to a reference bandwidth of 1 MHz by adding the value of  $\{[10\text{Log}(1000000 \text{ Hz})]-[10\text{log}(4000 \text{ Hz})]\} = 24 \text{ dB}$  to the ITU limit as well as to the calculated PFD level specified in that exhibit. There is no change to the PFD margin specified in Exhibit 4.

<sup>3</sup> There is precedent for grant of the requested waiver. In its authorization of Intelsat’s request to modify its license and operate Intelsat 805 at 55.5° W.L. in the 12700 – 12750 MHz frequency band, the Commission required Intelsat to comply with the PFD limits as specified in Article 21.16 of the ITU Radio Regulations for satellite downlink transmissions in this band in

from any terrestrial station operating in the 12250 – 12750 MHz frequency band in connection with the existing operation of the Intelsat 8 satellite at 166° E.L. From the proposed orbital location of 169° E.L., Intelsat will not cause interference to, nor claim interference from, lawfully authorized terrestrial stations operating in the 12700 – 12750 MHz frequency band in ITU Region 2.

Earth stations receiving from BSS space stations operating in the 12250 – 12700 MHz frequency band will not be impacted either. According to the ITU Region 2 BSS Plan, where the use of the 12250 – 12700 MHz band is specified, no BSS assignment can be located further west than 175.2° W.L. Hence, there is at least 15.8° of orbital separation between Intelsat 8 at 169° E.L. and the nearest BSS network that could provide service to any portion of ITU Region 2. With this orbital separation, there would be no risk of harmful interference to BSS networks from the operation of Intelsat 8 in the 12250 – 12700 MHz frequency band. Moreover, there are no BSS satellites currently in operation at 175.2° W.L.; the nearest operational BSS satellite to Intelsat 8 that serves any portion of ITU Region 2 in the 12250 – 12700 MHz band is located at 129.0° W.L. Accordingly, no operational BSS satellite providing service to ITU Region 2 would be subjected to harmful interference from the Intelsat 8 transmissions.

Moreover, operation of the 12700 – 12750 MHz frequency band on the Intelsat 8 satellite will not cause harmful interference to any FSS (Earth-to-space) links operating in the 12700 – 12750 MHz frequency band. Two modes of interference to the FSS (Earth-to-space) links are possible. The first mode is interference from a transmitting FSS earth station into an earth station receiving the Intelsat 8 signal. Intelsat will ensure that its receiving earth stations are sufficiently separated from any transmitting FSS earth station operating in the 12700 – 12750 MHz frequency band. If sufficient distance separation cannot be achieved, Intelsat will not claim protection from interference that may be due to the FSS earth station. The second mode of interference is due to interference from the Intelsat 8 downlink transmissions being received by a receiving FSS space station. Intelsat is not aware of any geostationary space station in ITU Region 2 receiving in the 12700 – 12750 MHz frequency band.

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Region 3. See *In the Matter of Intelsat LLC, Application to Modify Authorization for Intelsat 805 to Allow the Provision of Fixed-Satellite Service Between Non-U.S. Points in the 12.7-12.75 GHz Frequency Band*, Order and Authorization, File No. SAT-MOD-200209191-00178 (rel. Feb. 18, 2004).

Previously, the Commission granted a waiver of the U.S. Table of Frequency Allocations to permit Intelsat to use the Intelsat 8 satellite to provide FSS (space-to-Earth) using the 12250 – 12750 MHz frequency band at the 166.0° E.L. orbital location.<sup>4</sup> Grant of this waiver will allow Intelsat to continue providing the same type of services in those frequencies at 169° E.L.

With regard to the use of the 12.25 – 12.5 GHz band on the Intelsat 8 Northeast Asia downlink beam, it is noted that this beam covers a portion of ITU Region 1. The ITU Table of Frequency Allocations specifies that in Region 1, the 12.25 – 12.5 GHz band is allocated for use by FS, MS, Broadcasting and BSS. In this respect, the Intelsat 8 Northeast Asia beam is compliant with the PFD limits specified in Table 21-4 of the ITU Radio Regulations and provides the requisite protection to terrestrial services, *i.e.*, FS, MS and Broadcast, operating in Region 1.<sup>5</sup>

Annex 4 of Appendix 30 of the ITU Radio Regulations states that coordination of a transmitting space station in the FSS (space-to-Earth) of Region 2 or 3 is required when the PFD over any portion of the service area of the overlapping frequency assignments in the BSS of an administration in Region 1 or Region 3 exceeds a set of limits that are dependent on minimum geocentric separation between the wanted (BSS) station and the interfering (FSS) station. In this regard, the Region 1 BSS satellite network filed with the ITU and using the band 12.25-12.5 GHz that is the closest to Intelsat 8 is PACIFICSAT BSS-156E, located at 156° E.L. PACIFICSAT BSS-156E has been filed by the administration of Papua New Guinea and its service area is the visible portion of ITU Region 1.

In accordance with Annex 4 of Appendix 30 of the ITU Radio Regulations, for geocentric orbital separation between the interfering FSS station and the interfered-with (BSS) satellite network equal to or greater than 10.57°, no coordination between the two stations is required if the PFD level of the FSS station does not exceed -103.6 dBW/m<sup>2</sup>/27 MHz (equivalent to -141.9 dBW/m<sup>2</sup>/4kHz) anywhere within the service area of the BSS satellite network. In this regard, Intelsat shall take all necessary steps, including reduction of the signal power, to ensure that the

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<sup>4</sup> See *In the Matter of PanAmSat License Corp. Application for Modification of Authority to Operate the Pas-5 Satellite at the 166° degrees E.L. Orbital Location*, Order and Authorization, DA 06-6, File Nos. SAT-MOD-19980928-00078, SAT-AMD-19990222-00024, SAT-AMD-20020326-00055, SAT-STA-20020705-00097, and SAT-AMD-20051116-00220, 21 FCC Rcd 36, ¶ 1 (Jan. 4, 2006).

<sup>5</sup> See *supra* note 1.

aforementioned PFD level is not exceeded. Should Intelsat be required to transmit a signal would exceed the  $-103.6 \text{ dBW/m}^2/27 \text{ MHz}$  level within any portion of ITU Region 1, it will coordinate with all potentially affected Region 1 administrations that have a BSS satellite network using the 12.25 – 12.5 GHz band. Nevertheless, out of an abundance of caution, Intelsat will file with the ITU for a new BSS satellite network at 169° E.L to cover any operation in ITU Region 1 within the frequency band of 12.25 – 12.5 GHz.

## 2.0) Gain Contours

The co-polarized coverage patterns of Intelsat 8 operating at 169° E.L. are shown in Exhibits 2-1 through 2-14. 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. The beam performance information contained herein updates that currently on file with the Commission.

## 3.0) Emission Designators

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

## 4.0 Power Flux Density Levels

The power flux density (“PFD”) limits for space stations operating in the 3700 – 4200 MHz band is contained in section 25.208 of the Commission’s rules. With respect to the 12250 – 12750 MHz band, the PFD limits are specified in No. 21.16 of the ITU Radio Regulations.

The maximum PFD levels for the Intelsat 8 transmissions were calculated for a number of TV/FM and/or digital carriers listed in Exhibit 3 operating in the 3700 – 4200 MHz and 12250 – 12750 MHz bands. These carriers were chosen because they generally produce high PFD levels on the Earth’s surface. The maximum PFD levels for the Intelsat 8 telemetry and uplink power control beacons were also calculated. The results are provided in Exhibit 4 and show that the downlink power flux density levels of the Intelsat 8 carriers do not exceed the limits specified in section 25.208 of the Commission’s rules or No. 21.16 of the ITU Radio Regulations.

## 5.0) Link Budgets and Interference Analysis

Link analysis for Intelsat 8 was conducted for a number of representative carriers at C- and Ku-band frequencies. It was assumed that the nearest satellites to Intelsat 8 were a hypothetical satellite operating at 167° E.L. and a hypothetical satellite operating at 171° E.L. The hypothetical satellites were assumed to have the same

operational parameters as Intelsat 8.

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

- a) In the plane of the geostationary satellite orbit, all transmitting and receiving earth station antennas have off-axis co-polar gains that are compliant with the limits specified in section 25.209(a)(1) of the FCC's rules.
- b) All transmitting and receiving earth stations have a cross-polarization isolation value of at least 30 dB within their main beam lobe.
- c) At 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 P.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 167° E.L and 171° E.L on the transmissions of Intelsat 8 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.

The results of the C-band and Ku-band analyses are shown in Exhibit 5 and demonstrate that operation of the Intelsat 8 satellite at 169° 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 limits contained in section 25.212(c) and 25.212(d) of the Commission's rules.

#### 6.0) Adjacent Satellite Link Analysis

The impact of the Intelsat 8 emissions on a hypothetical satellite located at 167° E.L, and a hypothetical satellite located at 171° E.L was analyzed. The

hypothetical satellites are assumed to have the same operating characteristics as Intelsat 8.

For the hypothetical satellite at 167° E.L., it was assumed that the nearest co-frequency satellites were Intelsat 8, located at 169° E.L, and a hypothetical satellite located at 165° E.L. The hypothetical satellite at 165° E.L. was assumed to have the same operational parameters as Intelsat 8.

For the hypothetical satellite at 171° E.L., it was assumed that the nearest co-frequency satellites were Intelsat 8, located at 169° E.L, and a hypothetical satellite located at 173° E.L. The hypothetical satellite at 173° E.L. was assumed to have the same operational parameters as Intelsat 8.

The assumptions made in section 5.0 pertaining to earth station off-axis gain performance, earth station cross-polarization performance and rain attenuation were also applied in the C- and Ku-band analysis.

The results of the analysis are given in Exhibits 6 and 7. The Intelsat 8 transmissions will be limited to those levels contained in sections 25.212(c) and (d), as applicable, unless higher levels are coordinated with affected adjacent satellite operators. In any case, pursuant to the results in Exhibits 6 and 7, the uplink power density of the Intelsat 8 digital carriers operating in the 5925 – 6425 MHz and 13997 – 14500 MHz band will not exceed -38.7 dBW/Hz and -45 dBW/Hz, respectively; within the 3700 – 4200 MHz band the downlink EIRP density of the Intelsat 8 digital carriers will not exceed -32 dBW/Hz; and within the 12250 – 12750 MHz bands the downlink EIRP density of the Intelsat 8 digital carriers will not exceed -18.0 dBW/Hz.

#### 7.0) Schedule S Submission

Intelsat is providing with its application a Schedule S for the operations of Intelsat 8 from 169° E.L. The Schedule S contains only those data items contained in this Engineering Statement 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).

#### 8.0) Orbital Debris Mitigation Plan

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

**8.1) Spacecraft Hardware Design:** The spacecraft is designed such that no debris will be released during normal operations. Intelsat has assessed the probability of collision with meteoroids and other small debris (<1 cm diameter) and has taken the following steps to limit the effects of such collisions: (1) critical spacecraft components are located inside the protective body of the spacecraft and properly shielded; and (2) all spacecraft subsystems have redundant components to ensure no single-point failures. The spacecraft does not use any subsystems for end-of-life disposal that are not used for normal operations.

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

**8.3) Safe Flight Profiles:** Intelsat has assessed and limited the probability of the space station becoming a source of debris as a result of collisions with large debris or other operational space stations. With the exception of Intelsat 5 during the transition of traffic period, Intelsat 8 will not be located at the same orbital location as another satellite or at an orbital location that has an overlapping station keeping volume with another satellite.

During the transition of traffic from Intelsat 5, Intelsat will take all the necessary steps, *e.g.*, “pass-in-the-night maneuver” or slight relocation of Intelsat 5 and/or Intelsat 8, to minimize the risk of collision between Intelsat 8 and Intelsat 5.

With the exception of Intelsat 5, Intelsat is not aware of any other FCC licensed system, or any other system applied for and under consideration by the FCC,



having an overlapping station-keeping volume with Intelsat 8. Intelsat is also not aware of any system with an overlapping station-keeping volume with Intelsat 8 that is the subject of an ITU filing and that is either in orbit or progressing towards launch.

**8.4) Post Mission Disposal:** At the end of the mission, Intelsat expects to dispose of the spacecraft by moving it to a planned minimum altitude of 150 kilometers (perigee) above the geostationary arc.<sup>6</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 8, would be designated as grandfathered satellites not subject to a specific disposal altitude. Therefore, the Intelsat 8 planned disposal orbit complies with the FCC's rules.

In addition, Intelsat provides the following information:

- 1) Planned orbital eccentricity: 5.63E-05 (This is a best estimate of optimal eccentricity to match the natural eccentricity circle due to Sun and Moon perturbations after decommission.<sup>7</sup>)
- 2) Planned apogee altitude: 154.6 km<sup>8</sup>
- 3) Information concerning the methods that will be used to assess and provide adequate margins concerning fuel gauging uncertainty: For the Intelsat 8 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

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<sup>6</sup> Intelsat has reserved 28.9 kilograms of fuel for this purpose. The fuel gauging uncertainty has been taken into account in these calculations.

<sup>7</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>8</sup> See *supra* note 6.

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.

#### 9.0) TC&R Control Earth Stations

Intelsat will conduct TC&R operations through earth stations located at one or more of the following locations: Napa, California; Kumsan, South Korea; and Regency Park, Australia. Additionally, Intelsat is capable of remotely controlling Intelsat 8 from its facility in Washington D.C.

## Certification Statement

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

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/s/ Jose Albuquerque

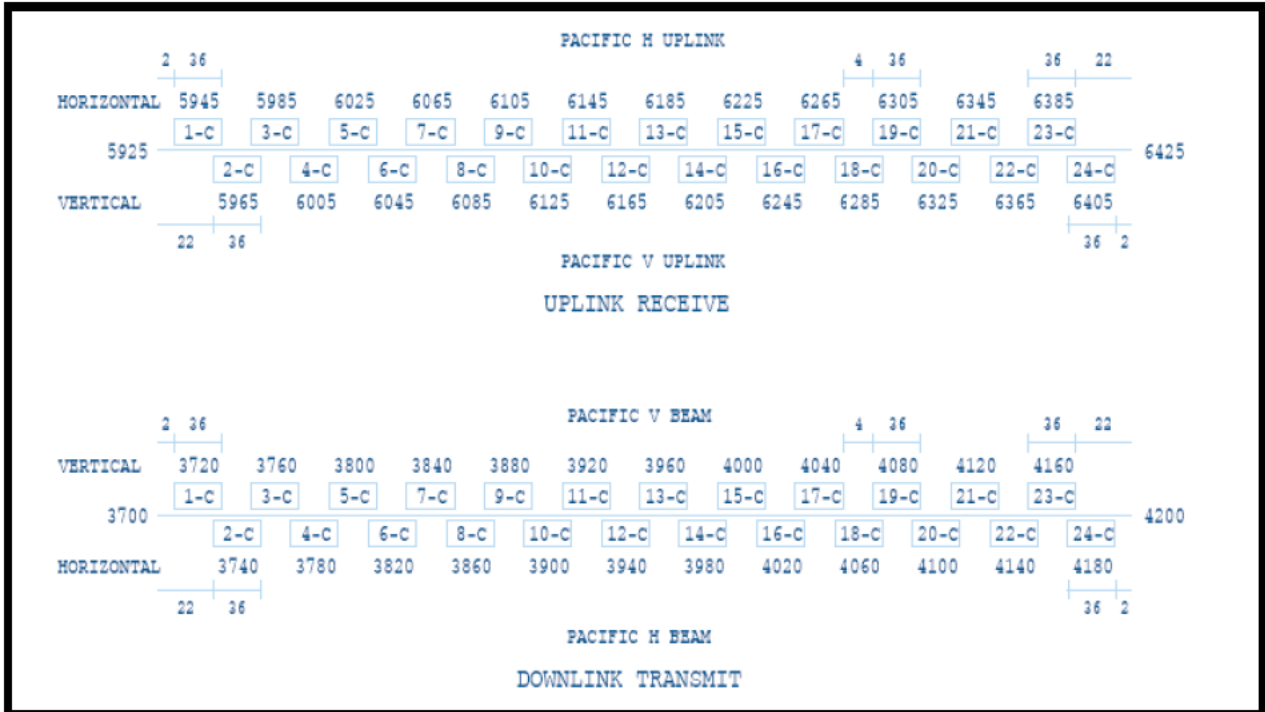
Jose Albuquerque  
Intelsat  
Senior Director  
Spectrum Strategy

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August 14, 2012

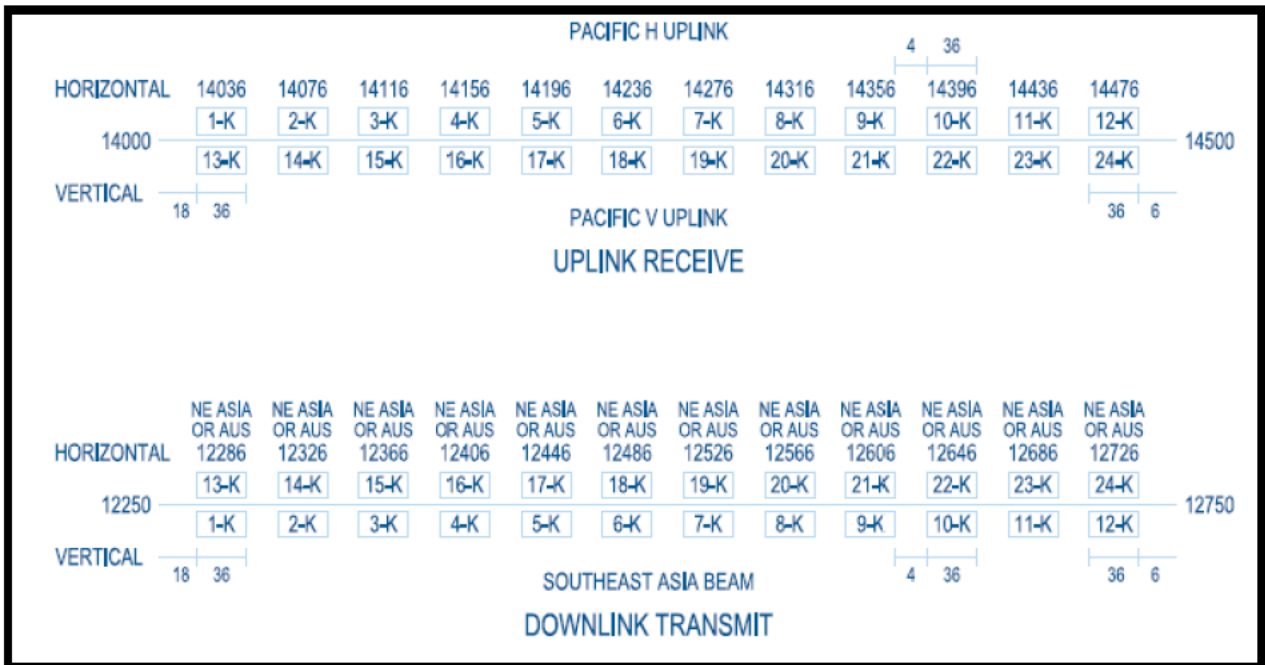
Date

# Exhibit 1a: Frequency Plan

## C-Band



## Ku-Band



## Exhibit 1b: Frequency Assignments

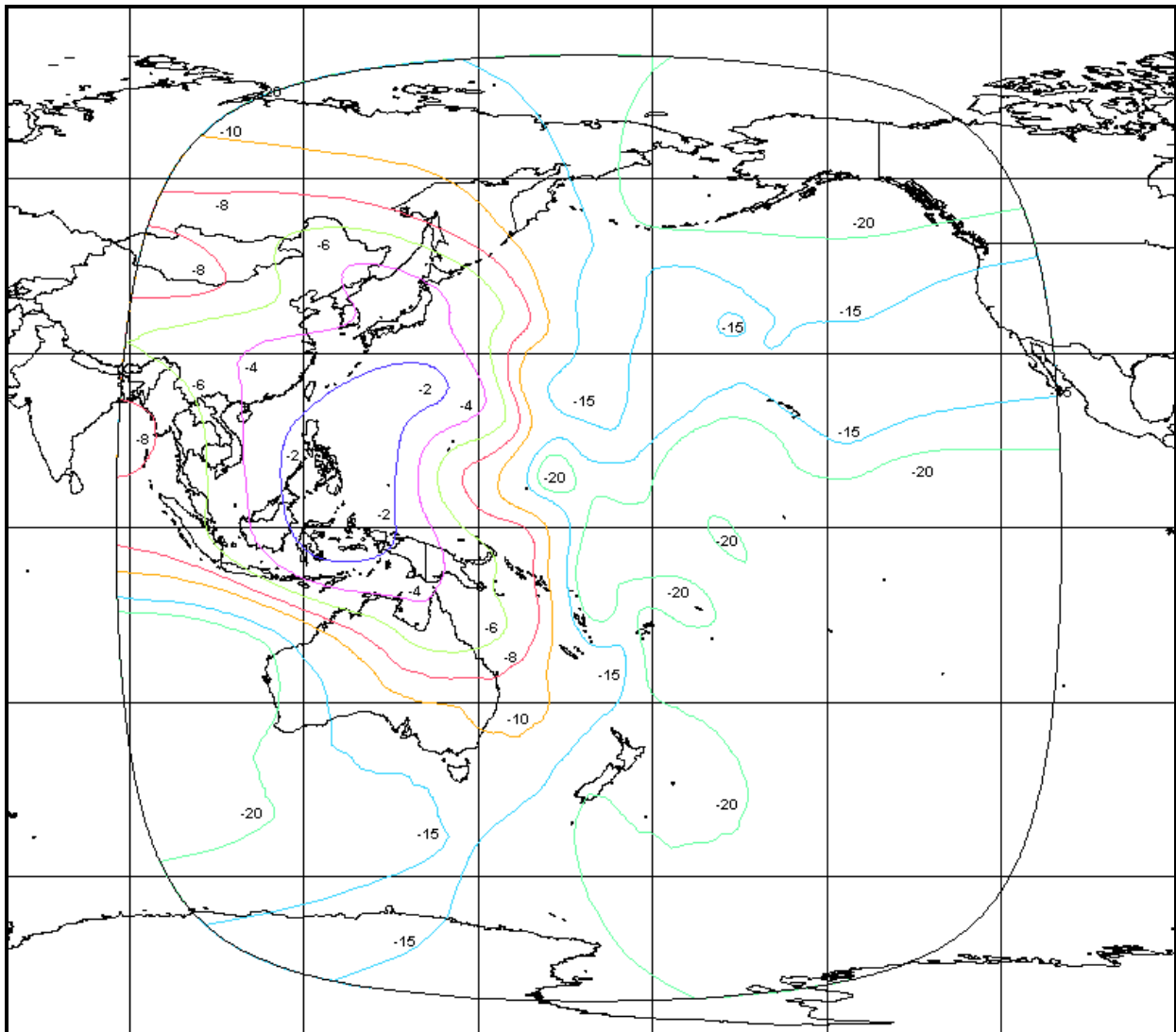
Uplink Transponder Designation	Uplink Beam Name	Uplink Polarization	Uplink Center Frequency (MHz)	Downlink Transponder Designation	Downlink Beam Name	Downlink Polarization	Downlink Center Frequency (MHz)	Channel Bandwidth (MHz)	Channel Gain (dB)
1C	Pacific	Horizontal	5945	1C	Pacific	Vertical	3720	36	117.1
3C	Pacific	Horizontal	5985	3C	Pacific	Vertical	3760	36	117.1
5C	Pacific	Horizontal	6025	5C	Pacific	Vertical	3800	36	117.1
7C	Pacific	Horizontal	6065	7C	Pacific	Vertical	3840	36	117.1
9C	Pacific	Horizontal	6105	9C	Pacific	Vertical	3880	36	117.1
11C	Pacific	Horizontal	6145	11C	Pacific	Vertical	3920	36	117.1
13C	Pacific	Horizontal	6185	13C	Pacific	Vertical	3960	36	117.1
15C	Pacific	Horizontal	6225	15C	Pacific	Vertical	4000	36	117.1
17C	Pacific	Horizontal	6265	17C	Pacific	Vertical	4040	36	117.1
19C	Pacific	Horizontal	6305	19C	Pacific	Vertical	4080	36	117.1
21C	Pacific	Horizontal	6345	21C	Pacific	Vertical	4120	36	117.1
23C	Pacific	Horizontal	6385	23C	Pacific	Vertical	4160	36	117.1
2C	Pacific	Vertical	5965	2C	Pacific	Horizontal	3740	36	116.6
4C	Pacific	Vertical	6005	4C	Pacific	Horizontal	3780	36	116.6
6C	Pacific	Vertical	6045	6C	Pacific	Horizontal	3820	36	116.6
8C	Pacific	Vertical	6085	8C	Pacific	Horizontal	3860	36	116.6
10C	Pacific	Vertical	6125	10C	Pacific	Horizontal	3900	36	116.6
12C	Pacific	Vertical	6165	12C	Pacific	Horizontal	3940	36	116.6
14C	Pacific	Vertical	6205	14C	Pacific	Horizontal	3980	36	116.6
16C	Pacific	Vertical	6245	16C	Pacific	Horizontal	4020	36	116.6
18C	Pacific	Vertical	6285	18C	Pacific	Horizontal	4060	36	116.6
20C	Pacific	Vertical	6325	20C	Pacific	Horizontal	4100	36	116.6
22C	Pacific	Vertical	6365	22C	Pacific	Horizontal	4140	36	116.6
24C	Pacific	Vertical	6405	24C	Pacific	Horizontal	4180	36	116.6
1K	Pacific	Horizontal	14036	1K	SE Asia	Vertical	12286	36	132.1
2K	Pacific	Horizontal	14076	2K	SE Asia	Vertical	12326	36	132.1
3K	Pacific	Horizontal	14116	3K	SE Asia	Vertical	12366	36	132.1
4K	Pacific	Horizontal	14156	4K	SE Asia	Vertical	12406	36	132.1
5K	Pacific	Horizontal	14196	5K	SE Asia	Vertical	12446	36	132.1
6K	Pacific	Horizontal	14236	6K	SE Asia	Vertical	12486	36	132.1
7K	Pacific	Horizontal	14276	7K	SE Asia	Vertical	12526	36	132.1
8K	Pacific	Horizontal	14316	8K	SE Asia	Vertical	12566	36	132.1
9K	Pacific	Horizontal	14356	9K	SE Asia	Vertical	12606	36	132.1
10K	Pacific	Horizontal	14396	10K	SE Asia	Vertical	12646	36	132.1
11K	Pacific	Horizontal	14436	11K	SE Asia	Vertical	12686	36	132.1
12K	Pacific	Horizontal	14476	12K	SE Asia	Vertical	12726	36	132.1
13K	Pacific	Vertical	14036	13K	Australia	Horizontal	12286	36	133.2
14K	Pacific	Vertical	14076	14K	Australia	Horizontal	12326	36	133.2
15K	Pacific	Vertical	14116	15K	Australia	Horizontal	12366	36	133.2
16K	Pacific	Vertical	14156	16K	Australia	Horizontal	12406	36	133.2
17K	Pacific	Vertical	14196	17K	Australia	Horizontal	12446	36	133.2
18K	Pacific	Vertical	14236	18K	Australia	Horizontal	12486	36	133.2
19K	Pacific	Vertical	14276	19K	Australia	Horizontal	12526	36	133.2
20K	Pacific	Vertical	14316	20K	Australia	Horizontal	12566	36	133.2
21K	Pacific	Vertical	14356	21K	Australia	Horizontal	12606	36	133.2
22K	Pacific	Vertical	14396	22K	Australia	Horizontal	12646	36	133.2
23K	Pacific	Vertical	14436	23K	Australia	Horizontal	12686	36	133.2
24K	Pacific	Vertical	14476	24K	Australia	Horizontal	12726	36	133.2

## Exhibit 1b: Frequency Assignments (continued)

Uplink Transponder Designation	Uplink Beam Name	Uplink Polarization	Uplink Center Frequency (MHz)	Downlink Transponder Designation	Downlink Beam Name	Downlink Polarization	Downlink Center Frequency (MHz)	Channel Bandwidth (MHz)	Channel Gain (dB)
13K	Pacific	Vertical	14036	13K	NE Asia	Horizontal	12286	36	133.5
14K	Pacific	Vertical	14076	14K	NE Asia	Horizontal	12326	36	133.5
15K	Pacific	Vertical	14116	15K	NE Asia	Horizontal	12366	36	133.5
16K	Pacific	Vertical	14156	16K	NE Asia	Horizontal	12406	36	133.5
17K	Pacific	Vertical	14196	17K	NE Asia	Horizontal	12446	36	133.5
18K	Pacific	Vertical	14236	18K	NE Asia	Horizontal	12486	36	133.5
19K	Pacific	Vertical	14276	19K	NE Asia	Horizontal	12526	36	133.5
20K	Pacific	Vertical	14316	20K	NE Asia	Horizontal	12566	36	133.5
21K	Pacific	Vertical	14356	21K	NE Asia	Horizontal	12606	36	133.5
22K	Pacific	Vertical	14396	22K	NE Asia	Horizontal	12646	36	133.5
23K	Pacific	Vertical	14436	23K	NE Asia	Horizontal	12686	36	133.5
24K	Pacific	Vertical	14476	24K	NE Asia	Horizontal	12726	36	133.5
CMD	Global	Right Hand Circular	13998					1	
				TLM 1	Global	Horizontal	12747	0.5	
				TLM 2	Global	Vertical	12748	0.5	
				TLM 3	Global	Left Hand Circular	12747	0.5	
				TLM 4	Global	Left Hand Circular	12748	0.5	
				ULPC	Global	Horizontal	3702	0.025	

**Exhibit 2-1: C-Band Pacific Uplink Beam**  
[Schedule S Beam Designation: PCHU]

Beam Peak Gain: 29.6 dBi  
Beam Polarization: Horizontal  
Beam Peak G/T: 1.6 dB/K  
Saturated Flux Density @ Beam Peak G/T: -95.6 to -74.6 dBW/m<sup>2</sup>



## Exhibit 2-2: C-Band Pacific Uplink Beam

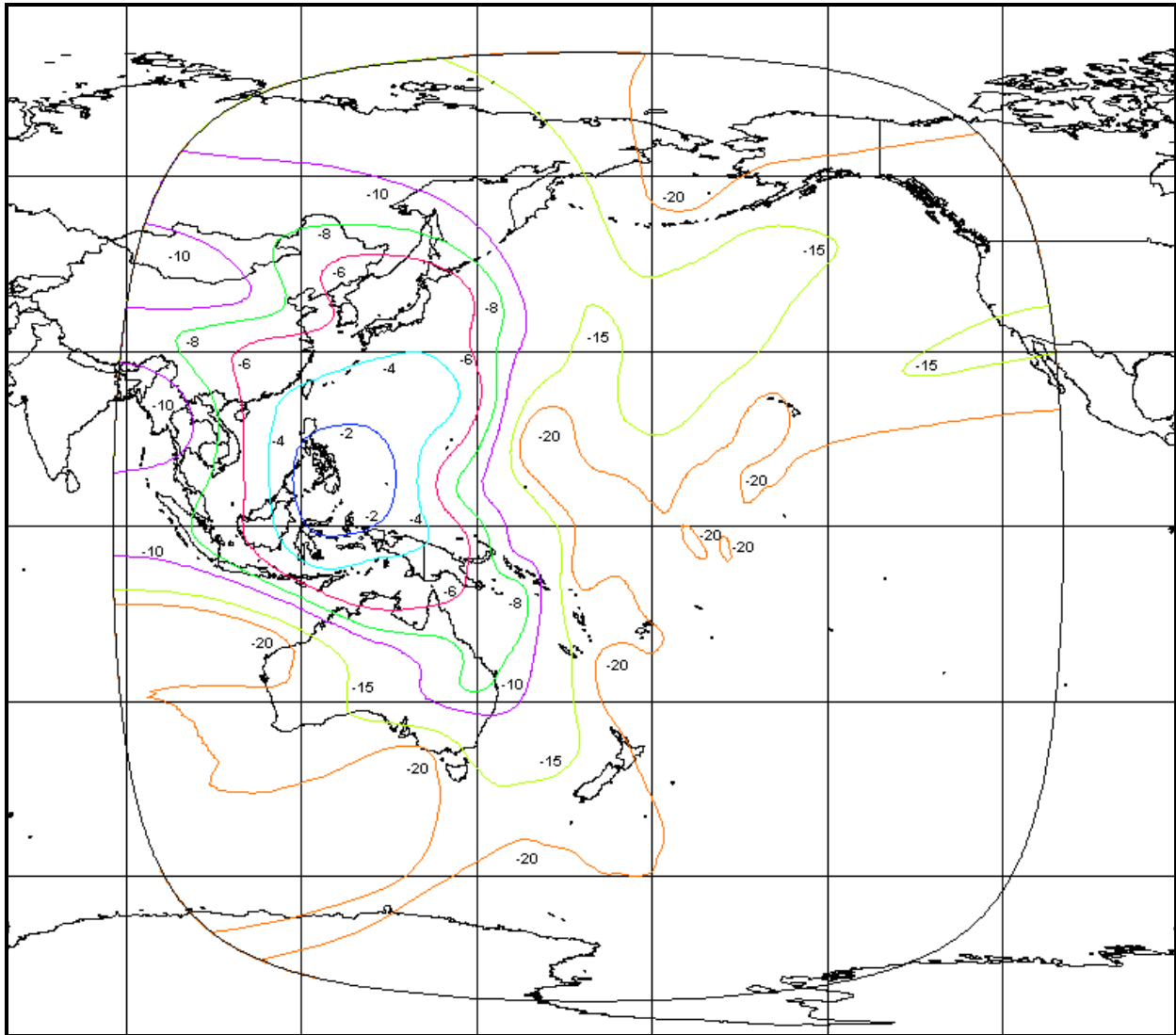
[Schedule S Beam Designation: PCVU]

Beam Peak Gain: 30.5 dBi

Beam Polarization: Vertical

Beam Peak G/T: 2.6 dB/K

Saturated Flux Density @ Beam Peak G/T: -96.6 to -75.6 dBW/m<sup>2</sup>





**Exhibit 2-3 Ku-Band Pacific Uplink Beam**

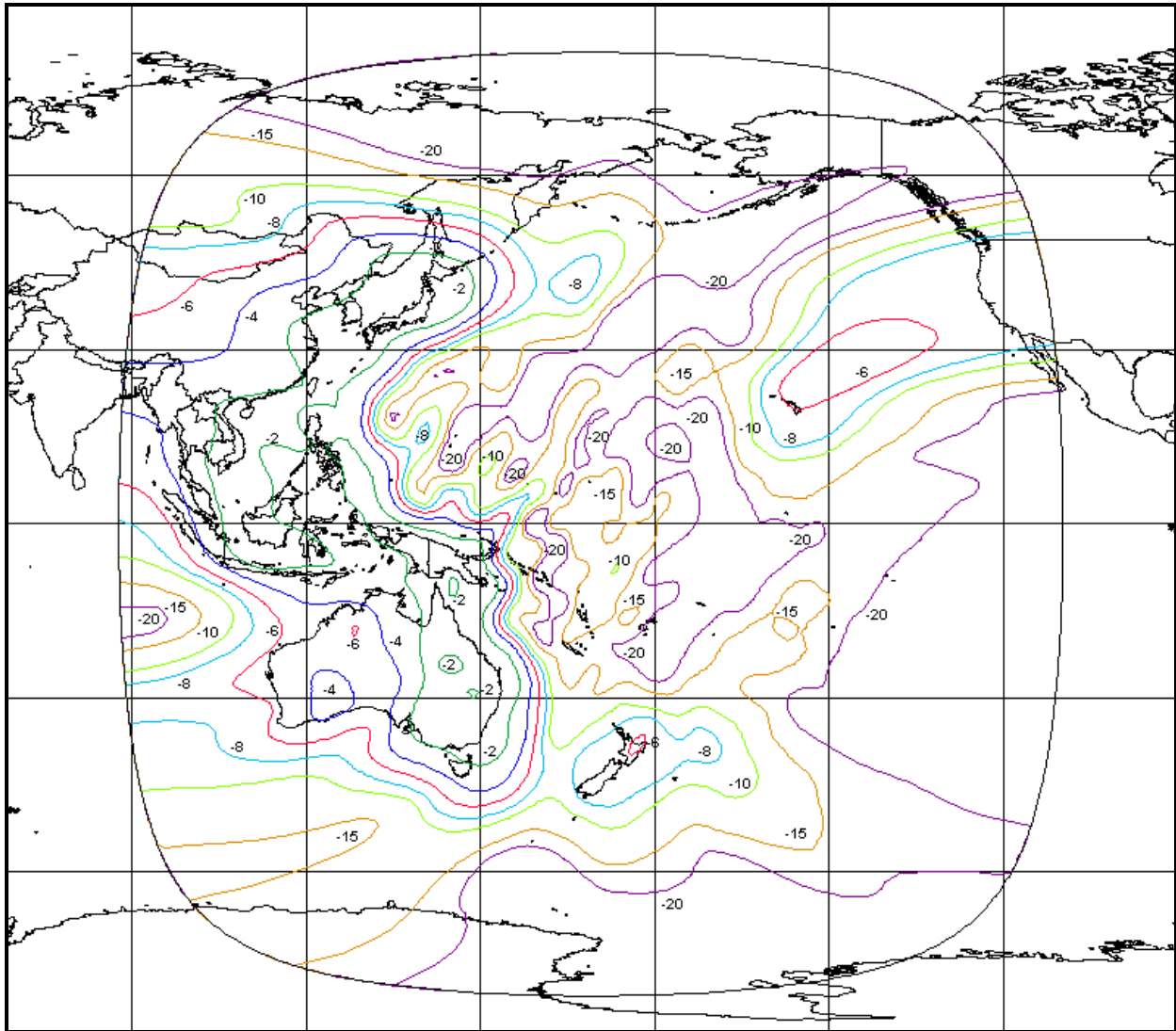
[Schedule S Beam Designation: PKHU]

Beam Peak Gain: 28.7 dBi

Beam Polarization: Horizontal

Beam Peak G/T: 0.4 dB/K

Saturated Flux Density @ Beam Peak G/T: -98.4 to -77.4 dBW/m<sup>2</sup>



## Exhibit 2-4: Ku-Band Pacific Uplink Beam

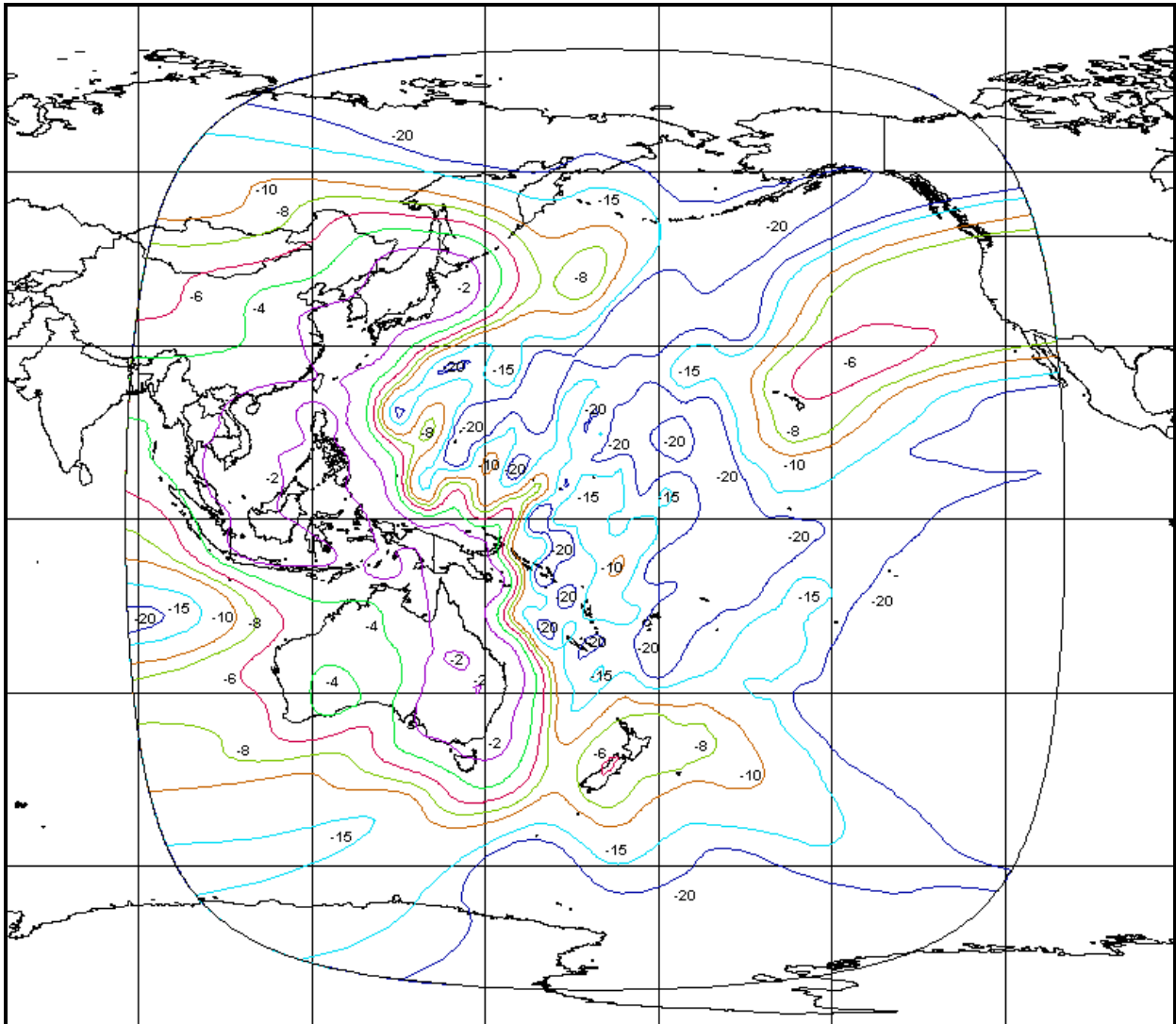
[Schedule S Beam Designation: PKVU]

Beam Peak Gain: 28.5 dBi

Beam Polarization: Vertical

Beam Peak G/T: 0.5 dB/K

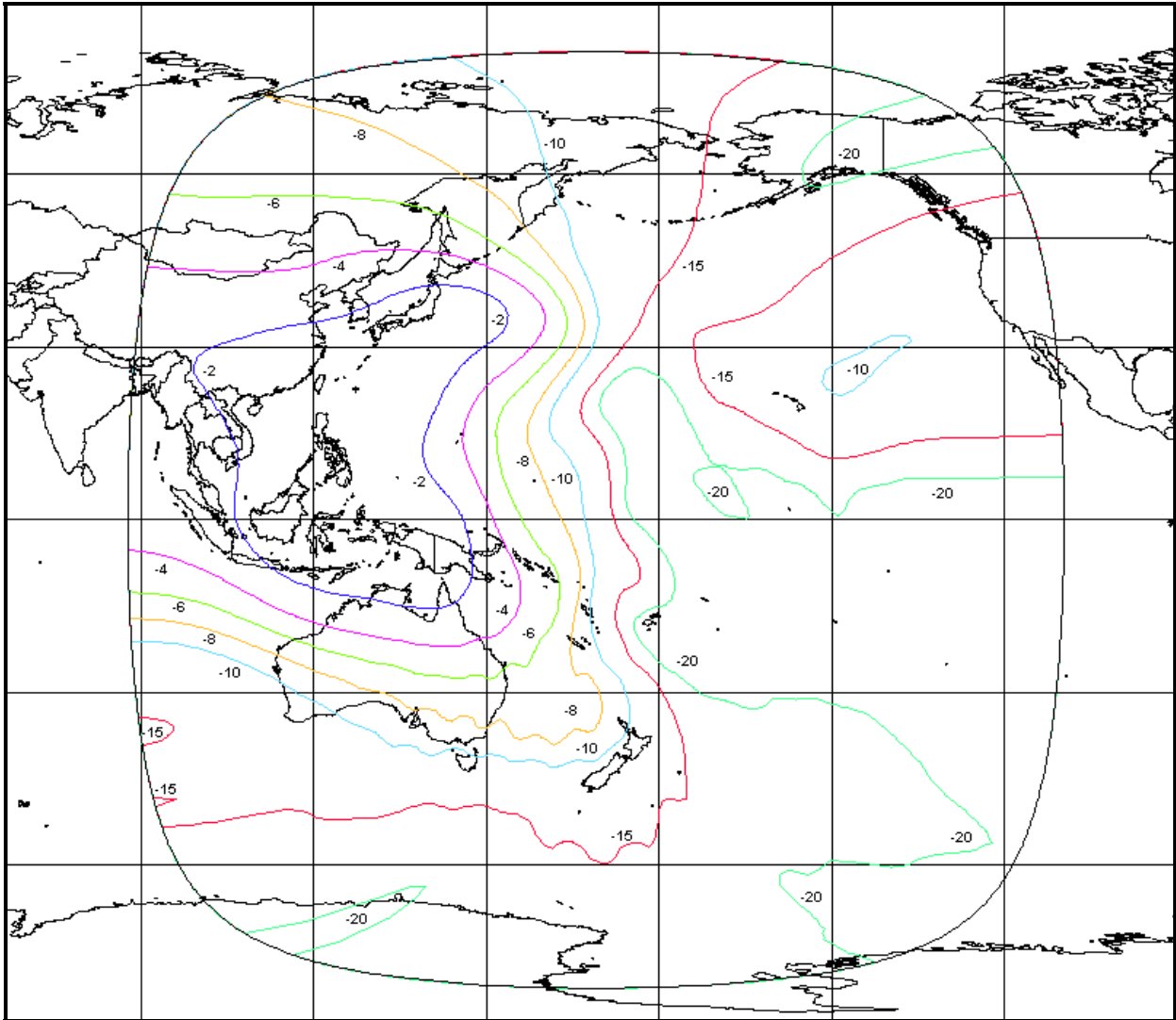
Saturated Flux Density @ Beam Peak G/T: -98.5 to -77.5 dBW/m<sup>2</sup>



## **Exhibit 2-5: C-Band Pacific Downlink Beam**

[Schedule S Beam Designation: PCHD]

Beam Peak Gain: 27.2 dBi  
Beam Polarization: Horizontal  
Beam Peak EIRP: 40.4 dBW

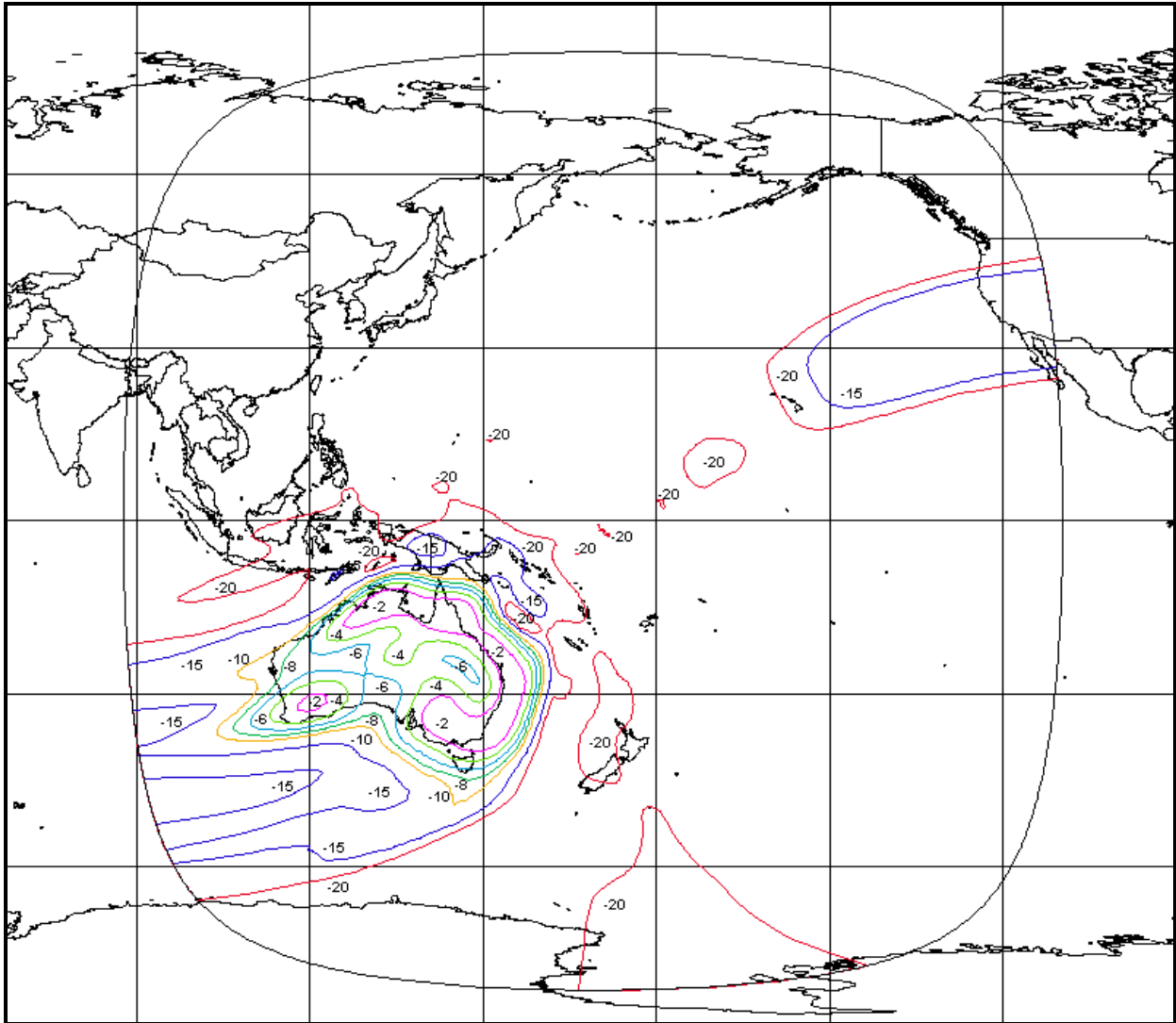




## Exhibit 2-7: Ku-Band Australia Downlink Beam

[Schedule S Beam Designation: AKHD]

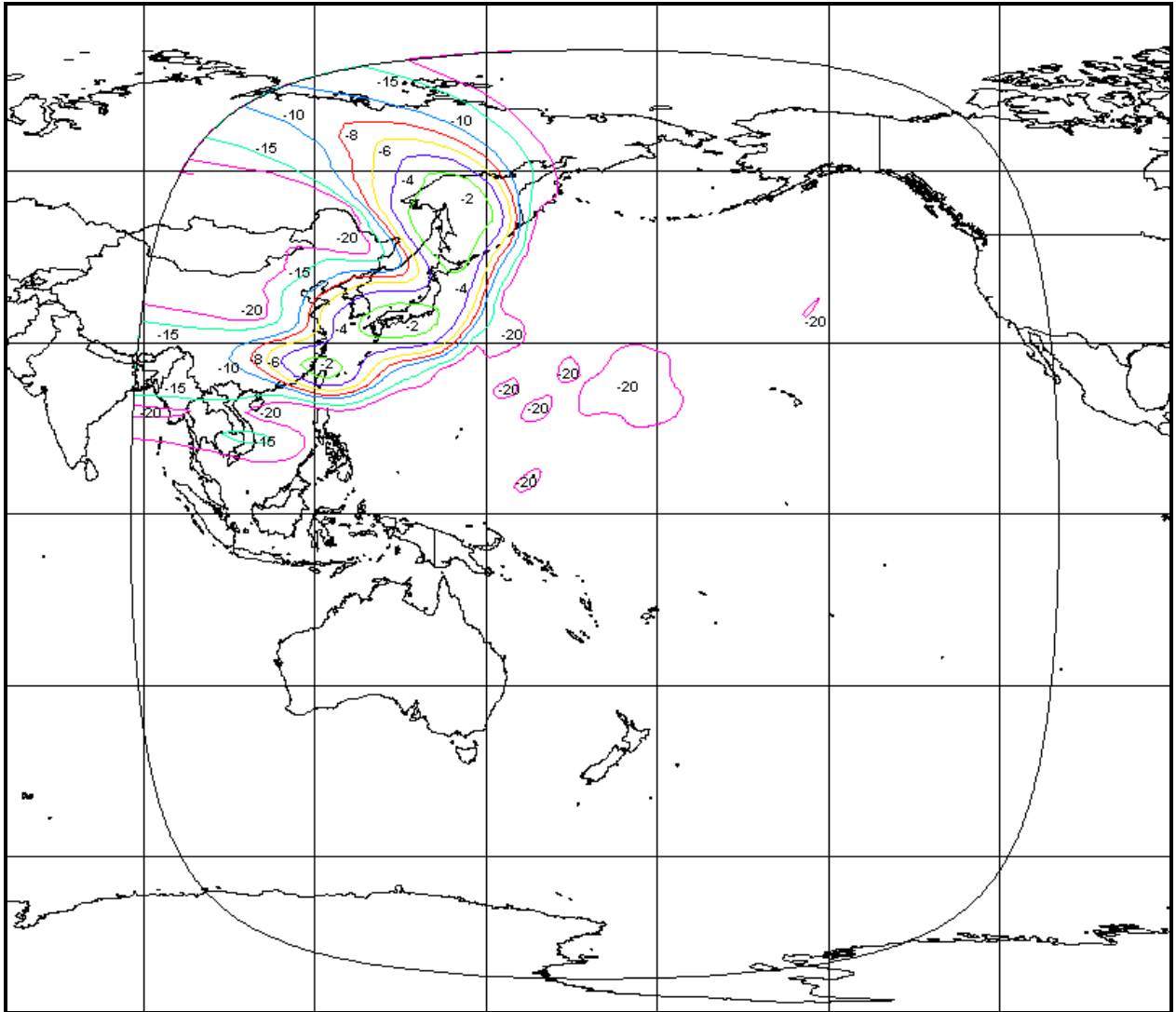
Beam Peak Gain: 34.0 dBi  
Beam Polarization: Horizontal  
Beam Peak EIRP: 52.7 dBW



**Exhibit 2-8: Ku-Band Northeast Asia Downlink Beam**

[Schedule S Beam Designation: NKHD]

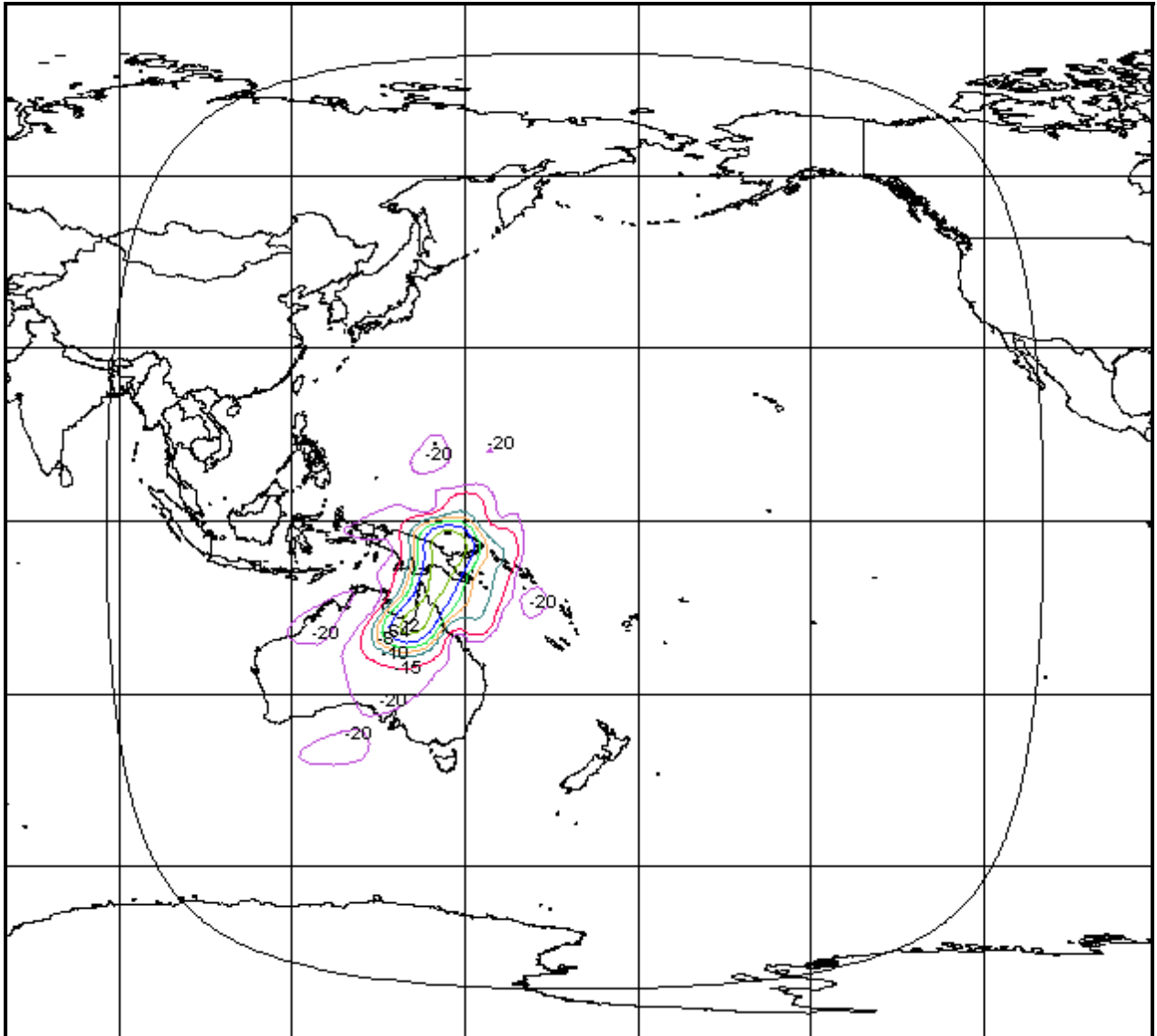
Beam Peak Gain: 37.1 dBi  
Beam Polarization: Horizontal  
Beam Peak EIRP: 56.1 dBW



**Exhibit 2-9: Ku-Band Southeast Asia Downlink Beam**

[Schedule S Beam Designation: SKVD]

Beam Peak Gain: 38.8 dBi  
Beam Polarization: Vertical  
Beam Peak EIRP: 56.7 dBW



**Exhibit 2-10: Command Uplink Beam**

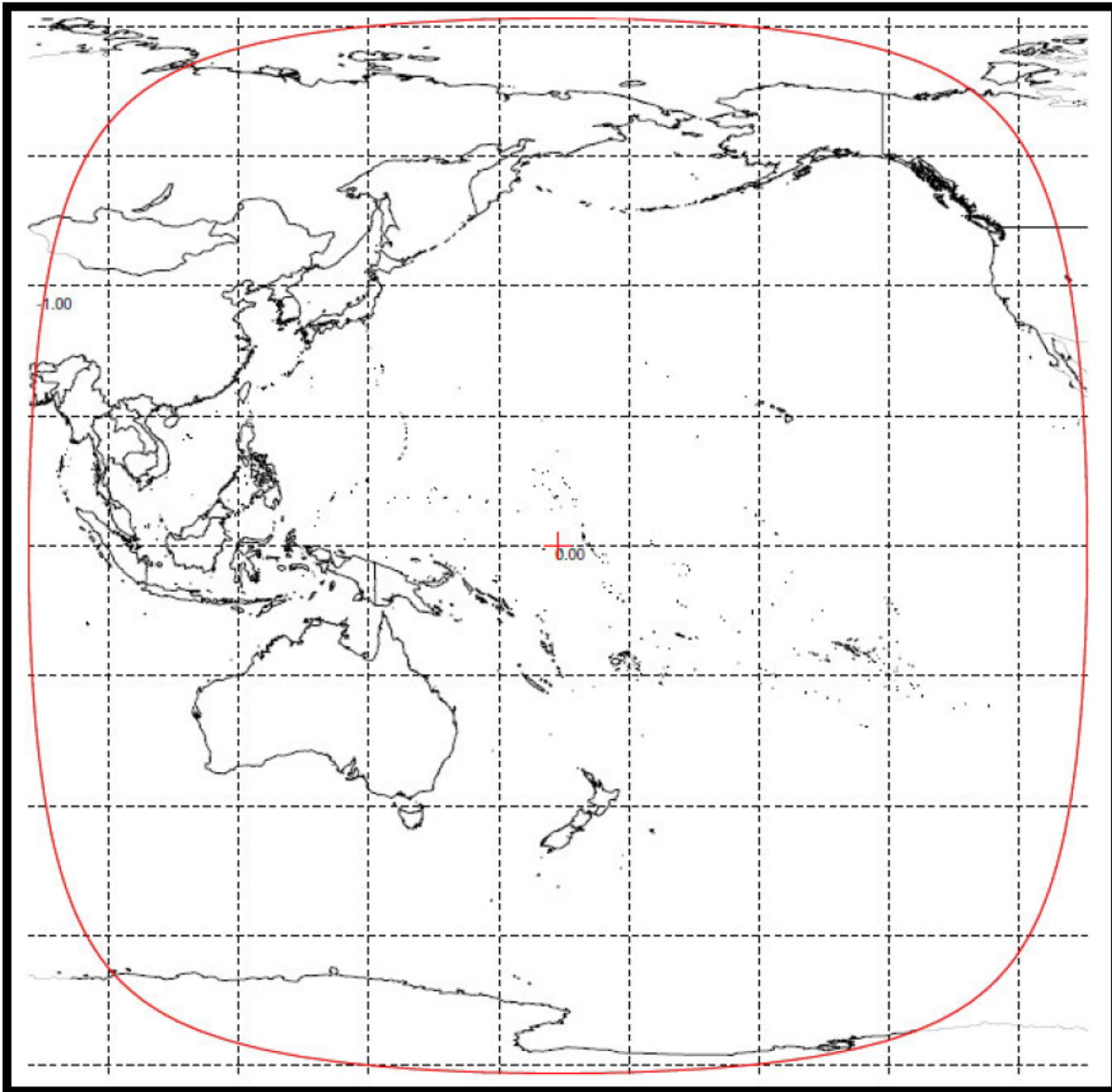
[Schedule S Beam Designation: CMD]

Peak Beam Gain: 2.0 dBi

Polarization: Right Hand Circular

Beam Peak G/T: -30.6 dB/K

Command Flux Density: -93.7 dBW/m<sup>2</sup>

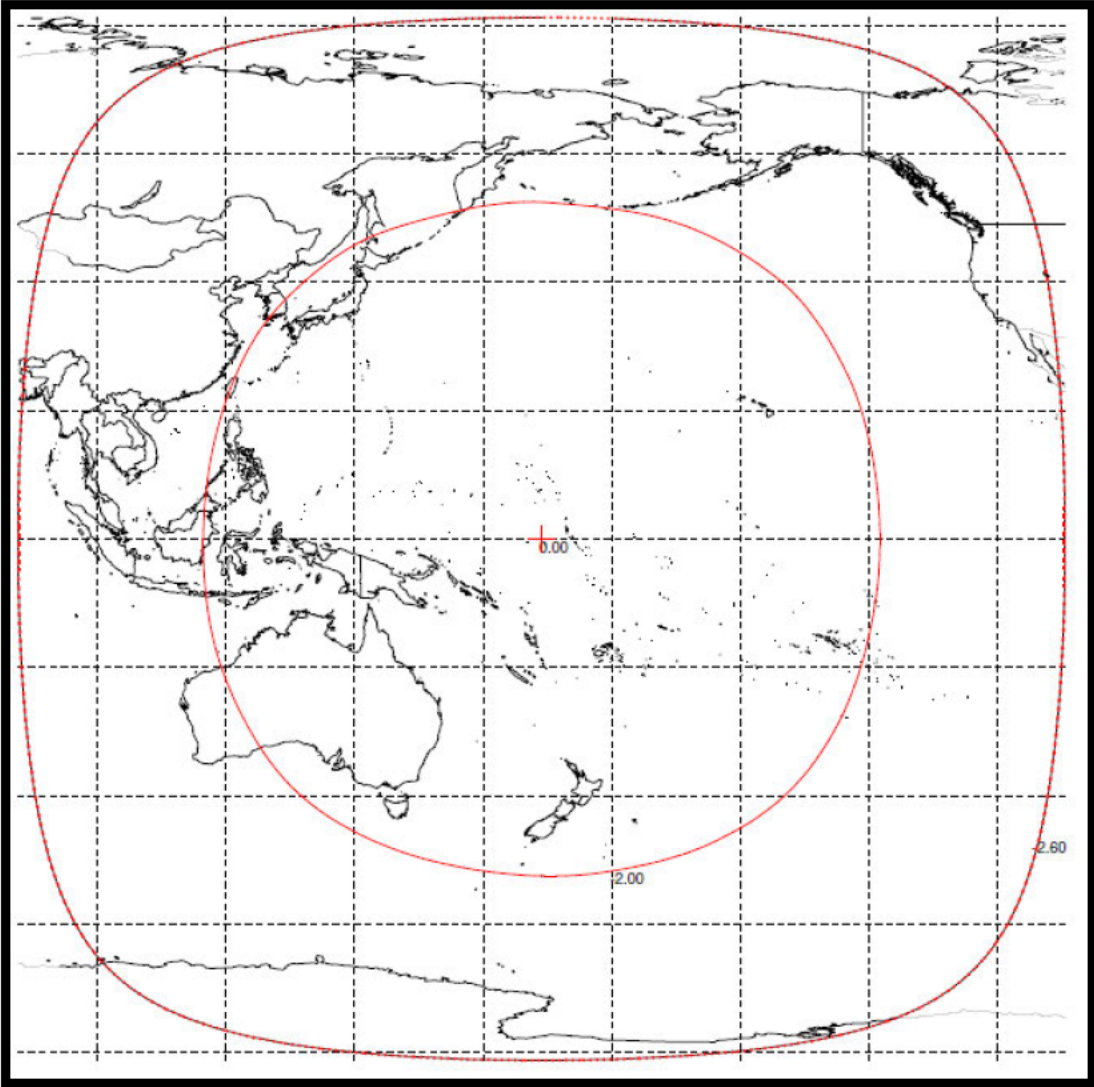




**Exhibit 2-11: Telemetry Downlink Beam [Global Horn Antenna]**

[Schedule S Beam Designation: TMGV]

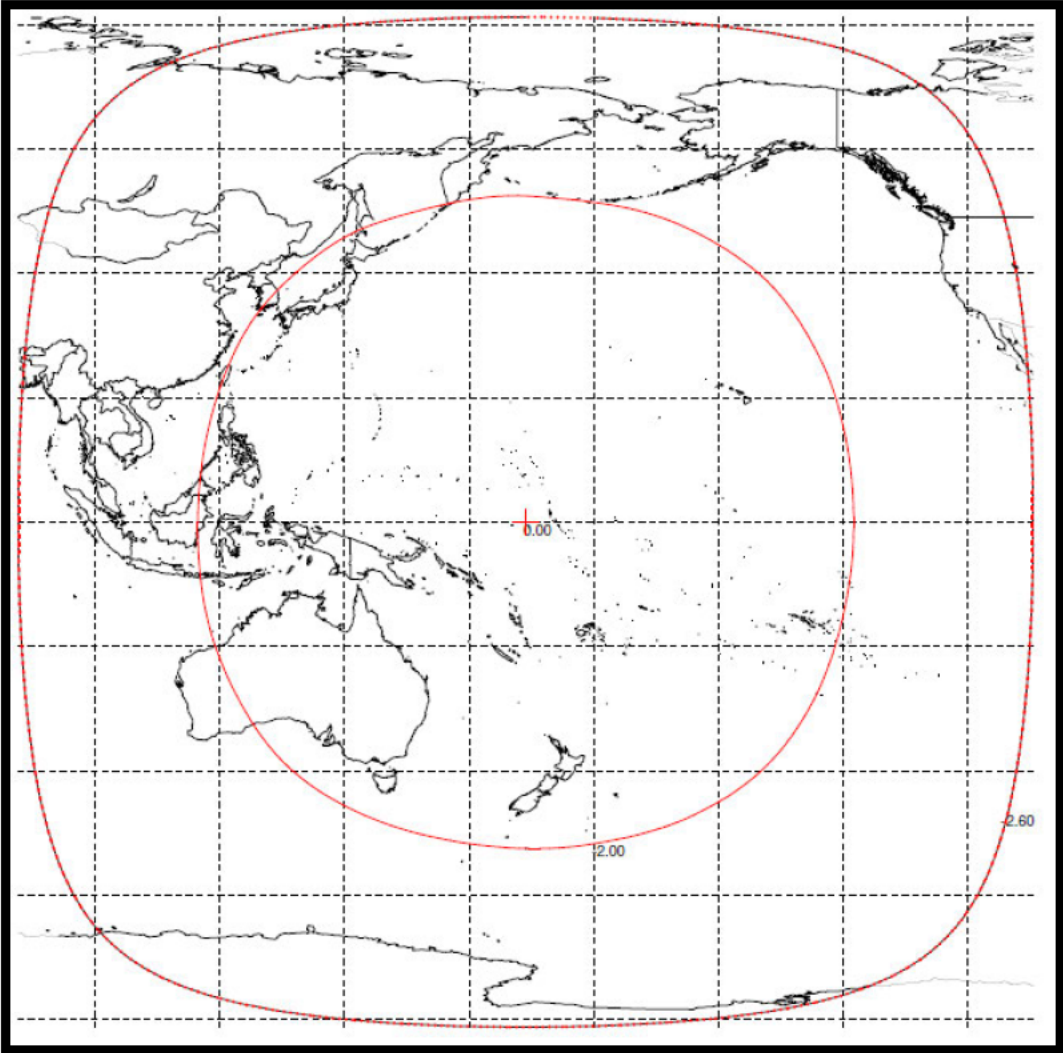
Peak Beam Gain: 22.8 dBi  
Polarization: Vertical  
Peak EIRP: 17.1 dBW



**Exhibit 2-12: Telemetry Downlink Beam [Global Horn Antenna]**

[Schedule S Beam Designation: TMGH]

Peak Beam Gain: 22.8 dBi  
Polarization: Horizontal  
Peak EIRP: 17.1 dBW



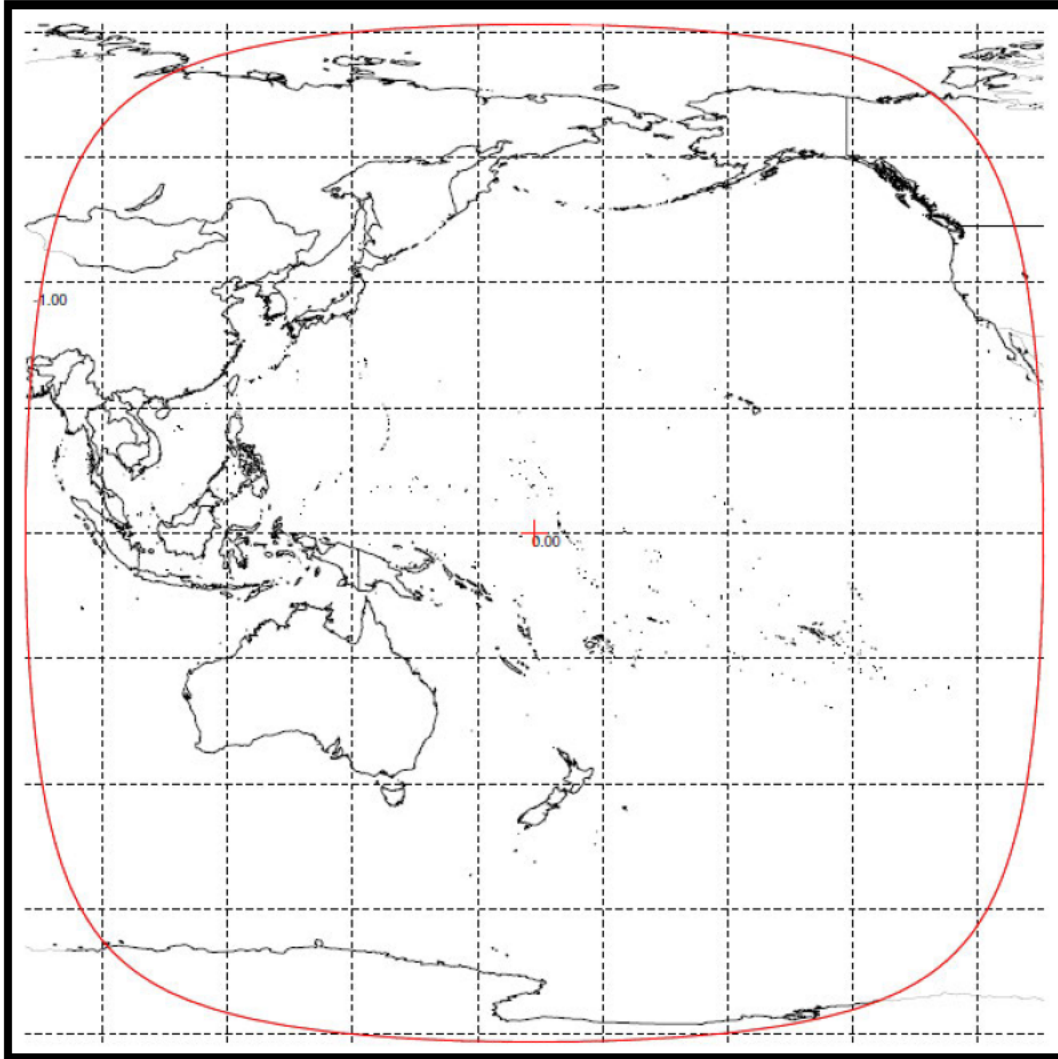
**Exhibit 2-13: Telemetry Downlink Beam [+Z / -Z Antennas]**

[Schedule S Beam Designation: TMP]

Peak Beam Gain: -2 dBi

Polarization: Left Hand Circular

Peak EIRP: 8.3 dBW



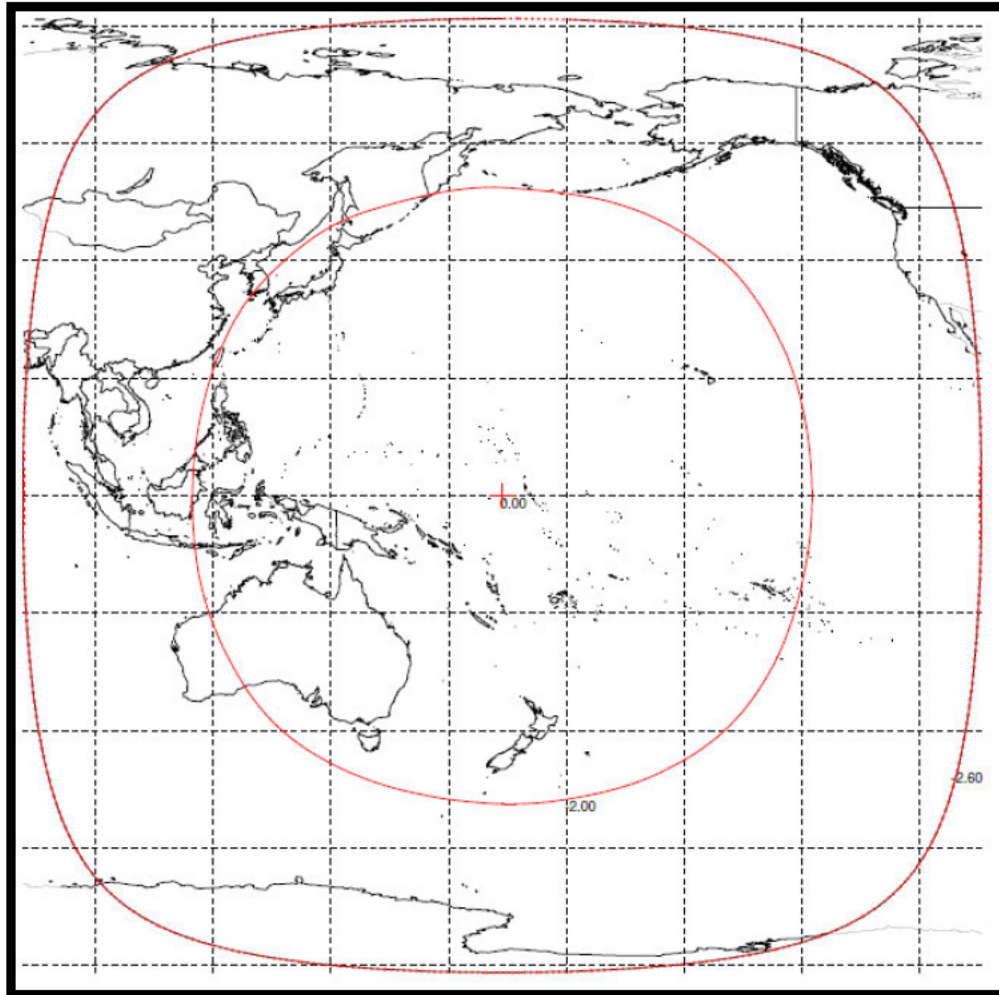
**Exhibit 2-14: Uplink Power Control Downlink Beam**

[Schedule S Beam Designation: BNC]

Peak Beam Gain: 22.8 dBi

Polarization: Horizontal

Peak EIRP: 15.5 dBW



**EXHIBIT 3: EMISSION DESIGNATORS**

<b>Signal Type</b>	<b>Emission Designator</b>	<b>Allocated Bandwidth (kHz)</b>
Analog TV/FM Carrier	36M0F3F	36000
24575 kbps Carrier	36M0G7W	36000
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>Pacific Beam (H) - 36M0F3F</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP (dBW)	40.4	40.4	40.4	40.4	40.4	40.4	40.4
Occupied Bandwidth (kHz)	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0
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	-152.6	-152.5	-152.4	-151.7
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	1.0	0.9	3.3	5.6	8.0	10.4	9.7
<b>Pacific Beam (H) - 36M0F3F</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP (dBW)	40.4	40.4	40.4	40.4	40.4	40.4	40.4
Occupied Bandwidth (kHz)	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0
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)	-161.8	-161.6	-161.5	-161.4	-161.3	-161.2	-160.4
PFD Limit (dBW/m <sup>2</sup> /4kHz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	9.8	9.6	12.0	14.4	16.8	19.2	18.4

**EXHIBIT 4: POWER FLUX DENSITY CALCULATIONS (continued)**

FREQUENCY BAND: 3.7 - 4.2 GHz							
<b>Pacific Beam (V) - 36M0F3F</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	40.4	40.4	40.4	40.4	40.4	40.4	40.4
Carrier Occupied Bandwidth (kHz)	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0
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	-152.6	-152.5	-152.4	-151.7
FCC Limit (dBW/m <sup>2</sup> /4Hz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	1.0	0.9	3.3	5.6	8.0	10.4	9.7
<b>Pacific Beam (V) - 36M0G7W</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	40.4	40.4	40.4	40.4	40.4	40.4	40.4
Carrier Occupied Bandwidth (kHz)	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0
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)	-161.8	-161.6	-161.5	-161.4	-161.3	-161.2	-160.4
FCC Limit (dBW/m <sup>2</sup> /4Hz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	9.8	9.6	12.0	14.4	16.8	19.2	18.4

**EXHIBIT 4: POWER FLUX DENSITY CALCULATIONS (continued)**

FREQUENCY BAND: 3.7 - 4.2 GHz							
ULPC Beam (H) - 25K0G7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	15.5	15.5	15.5	15.5	15.5	15.5	15.5
Carrier Occupied Bandwidth (kHz)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
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)	-155.8	-155.7	-155.6	-155.5	-155.4	-155.3	-154.5
FCC Limit (dBW/m <sup>2</sup> /4Hz)	-152.0	-152.0	-149.5	-147.0	-144.5	-142.0	-142.0
Margin (dB)	3.8	3.7	6.1	8.5	10.9	13.3	12.5



**EXHIBIT 4: POWER FLUX DENSITY CALCULATIONS (continued)**

FREQUENCY BAND: 12.25 – 12.75 GHz							
<b>Australia Beam (H) - 36M0F3F</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	45.4*	45.3*	47.7*	50.0*	52.4*	52.7	52.7
Carrier Occupied Bandwidth (kHz)	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0
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	-140.5	-140.1	-139.4
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.0	0.0	0.0	2.1	1.4
<b>Australia Beam (H) - 36M0G7W</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.7	52.7	52.7	52.7	52.7	52.7	52.7
Carrier Occupied Bandwidth (kHz)	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0
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)	-149.5	-149.3	-149.2	-149.1	-149.0	-148.9	-148.1
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	1.5	1.3	3.7	6.1	8.5	10.9	10.1

**EXHIBIT 4: POWER FLUX DENSITY CALCULATIONS (continued)**

FREQUENCY BAND: 12.25 – 12.75 GHz							
<b>Northeast Asia Beam (H) - 36M0F3F</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	45.4*	45.3*	47.7*	50.0*	52.4*	54.8*	54.1*
Carrier Occupied Bandwidth (kHz)	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0
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	-140.5	-138.0	-138.0
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Northeast Asia Beam (H) - 36M0G7W</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	54.2*	54.0*	56.1	56.1	56.1	56.1	56.1
Carrier Occupied Bandwidth (kHz)	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0
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	-145.8	-145.7	-145.6	-145.5	-144.7
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.3	2.7	5.1	7.5	6.7

**EXHIBIT 4: POWER FLUX DENSITY CALCULATIONS (continued)**

FREQUENCY BAND: 12.25 – 12.75 GHz							
<b>Southeast Asia Beam (V) - 36M0F3F</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	45.4*	45.3*	47.7*	50.0*	52.4*	54.8*	54.1*
Carrier Occupied Bandwidth (kHz)	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0	4000.0
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	-140.5	-138.0	-138.0
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Southeast Asia Beam (V) - 36M0G7W</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	54.2*	54.0*	56.4*	56.7	56.7	56.7	56.7
Carrier Occupied Bandwidth (kHz)	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0	30133.0
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	-145.1	-145.0	-144.9	-144.1
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	0.0	0.0	0.0	2.1	4.5	6.9	6.1

**EXHIBIT 4: POWER FLUX DENSITY CALCULATIONS (continued)**

FREQUENCY BAND: 12.25 – 12.75 GHz							
<b>Telemetry Beam (H) - 250KG7W [Global Horn Antenna]</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	17.1	17.1	17.1	17.1	17.1	17.1	17.1
Carrier Occupied Bandwidth (kHz)	250.0	250.0	250.0	250.0	250.0	250.0	250.0
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)	-164.2	-164.1	-164.0	-163.9	-163.8	-163.7	-162.9
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	16.2	16.1	18.5	20.9	23.3	25.7	24.9
<b>Telemetry Beam (V) - 250KG7W [Global Horn Antenna]</b>							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	17.1	17.1	17.1	17.1	17.1	17.1	17.1
Carrier Occupied Bandwidth (kHz)	250.0	250.0	250.0	250.0	250.0	250.0	250.0
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)	-164.2	-164.1	-164.0	-163.9	-163.8	-163.7	-162.9
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	16.2	16.1	18.5	20.9	23.3	25.7	24.9

**EXHIBIT 4: POWER FLUX DENSITY CALCULATIONS (continued)**

FREQUENCY BAND: 12.25 – 12.75 GHz							
Telemetry Beam (LHCP) - 25K0G7W [+Z / -Z Antennas]							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	8.3	8.3	8.3	8.3	8.3	8.3	8.3
Carrier Occupied Bandwidth (kHz)	250.0	250.0	250.0	250.0	250.0	250.0	250.0
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)	-173.0	-172.9	-172.8	-172.7	-172.6	-172.5	-171.7
ITU Limit (dBW/m <sup>2</sup> /4Hz)	-148.0	-148.0	-145.5	-143.0	-140.5	-138.0	-138.0
Margin (dB)	25.0	24.9	27.3	29.7	32.1	34.5	33.7

\* 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: Intelsat 8 (169° E.L.) Link Budgets

<b>UPLINK BEAM INFORMATION</b>				
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	6 175	6 175	6 175	6 175
Uplink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Uplink Relative Contour Level (dB)	-10 0	-10 0	-10 0	-10 0
Uplink Contour G/T (dB/K)	-8 4	-8 4	-8 4	-8 4
Uplink SFD (dBW/m2)	-78 6	-83 6	-81 6	-81 6
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>DOWNLINK BEAM INFORMATION</b>				
Downlink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Downlink Frequency (GHz)	3 95	3 95	3 95	3 95
Downlink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	32 4	32 4	32 4	32 4
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>				
Satellite 1 Orbital Location	167E	167E	167E	167E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>ADJACENT SATELLITE 2</b>				
Satellite 1 Orbital Location	171E	171E	171E	171E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>CARRIER INFORMATION</b>				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4
Allocated Bandwidth(kHz)	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79
<b>UPLINK EARTH STATION</b>				
Earth Station Diameter (meters)	18 3	11 0	6 1	6 1
Earth Station Gain (dBi)	60 2	55 4	49 4	49 4
Earth Station Elevation Angle	20	20	20	20
<b>DOWNLINK EARTH STATION</b>				
Earth Station Diameter (meters)	6 1	3 0	3 5	3 5
Earth Station Gain (dBi)	46 5	39 7	41 1	41 1
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Earth Station Elevation Angle	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>				
Uplink Earth Station EIRP (dBW)	84 3	79 3	69 4	49 0
Uplink Path Loss, Clear Sky (dB)	-200 2	-200 2	-200 2	-200 2
Uplink Rain Attenuation	0 0	0 0	0 0	0 0
Satellite G/T(dB/K)	-8 4	-8 4	-8 4	-8 4
Boltzman Constant(dBW/K-Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Uplink C/N(dB)	28 7	24 5	21 1	20 2
<b>DOWNLINK PERFORMANCE</b>				
Downlink EIRP per Carrier (dBW)	32 4	32 4	25 2	4 8
Antenna Pointing Error (dB)	- 5	- 5	- 5	- 5
Downlink Path Loss, Clear Sky (dB)	-196 3	-196 3	-196 3	-196 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Downlink C / N(dB)	14 8	8 6	9 7	8 8
<b>COMPOSITE LINK PERFORMANCE</b>				
C/N Uplink (dB)	28 7	24 5	21 1	20 2
C/N Downlink (dB)	14 8	8 6	9 7	8 8
C/I Intermodulation (dB)	N/A	N/A	20 2	19 3
C/I Uplink Co-Channel (dB)*	24 0	24 0	25 8	25 5
C/I Downlink Co-Channel (dB)*	24 0	24 0	25 8	25 5
C/I Uplink Adjacent Satellite 1 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 1 (dB)	20 9	8 8	13 2	12 3
C/I Uplink Adjacent Satellite 2 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 2 (dB)	22 7	17 5	18 0	17 1
C/(N+I) Composite (dB)	11 1	4 4	4 9	4 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	10 1	3 4	3 9	3 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0
Excess Link Margin (dB)	1	1	0 0	0 0
Number of Carriers	1	1 0	2 3	257 1
<b>CARRIER DENSITY LEVELS</b>				
Uplink Power Density (dBW/Hz)	-41 9	-50 9	-48 3	-49 2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-25 6	-34 4	-35 1	-36 0

## Exhibit 5: Intelsat 8 (169° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>				
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	6 175	6 175	6 175	6 175
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-10 0	-10 0	-10 0	-10 0
Uplink Contour G/T (dB/K)	-7 4	-7 4	-7 4	-7 4
Uplink SFD (dBW/m2)	-78 6	-83 6	-81 6	-81 6
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>DOWNLINK BEAM INFORMATION</b>				
Downlink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Downlink Frequency (GHz)	3 95	3 95	3 95	3 95
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	32 4	32 4	32 4	32 4
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>				
Satellite 1 Orbital Location	167E	167E	167E	167E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>ADJACENT SATELLITE 2</b>				
Satellite 1 Orbital Location	171E	171E	171E	171E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>CARRIER INFORMATION</b>				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4
Allocated Bandwidth(kHz)	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79
<b>UPLINK EARTH STATION</b>				
Earth Station Diameter (meters)	18 3	11 0	6 1	6 1
Earth Station Gain (dBi)	60 2	55 4	49 4	49 4
Earth Station Elevation Angle	20	20	20	20
<b>DOWNLINK EARTH STATION</b>				
Earth Station Diameter (meters)	6 1	3 0	3 5	3 5
Earth Station Gain (dBi)	46 5	39 7	41 1	41 1
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Earth Station Elevation Angle	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>				
Uplink Earth Station EIRP (dBW)	84 3	79 3	69 4	49 0
Uplink Path Loss, Clear Sky (dB)	-200 2	-200 2	-200 2	-200 2
Uplink Rain Attenuation	0 0	0 0	0 0	0 0
Satellite G/T(dB/K)	-7 4	-7 4	-7 4	-7 4
Boltzman Constant(dBW/K-Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Uplink C/N(dB)	29 7	25 5	22 1	21 2
<b>DOWNLINK PERFORMANCE</b>				
Downlink EIRP per Carrier (dBW)	32 4	32 4	25 2	4 8
Antenna Pointing Error (dB)	- 5	- 5	- 5	- 5
Downlink Path Loss, Clear Sky (dB)	-196 3	-196 3	-196 3	-196 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Downlink C / N(dB)	14 8	8 6	9 6	8 7
<b>COMPOSITE LINK PERFORMANCE</b>				
C/N Uplink (dB)	29 7	25 5	22 1	21 2
C/N Downlink (dB)	14 8	8 6	9 6	8 7
C/I Intermodulation (dB)	N/A	N/A	20 2	19 3
C/I Uplink Co-Channel (dB)*	24 0	24 0	25 7	25 4
C/I Downlink Co-Channel (dB)*	24 0	24 0	25 7	25 4
C/I Uplink Adjacent Satellite 1 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 1 (dB)	20 9	8 8	13 2	12 3
C/I Uplink Adjacent Satellite 2 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 2 (dB)	22 7	17 5	18 0	17 1
C/(N+I) Composite (dB)	11 1	4 4	4 9	4 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	10 1	3 4	3 9	3 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0
Excess Link Margin (dB)	1	1	0 0	0 0
Number of Carriers	1	1 0	2 3	258 4
<b>CARRIER DENSITY LEVELS</b>				
Uplink Power Density (dBW/Hz)	-41 9	-50 9	-48 3	-49 2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-25 6	-34 4	-35 1	-36 0

## Exhibit 5: Intelsat 8 (169° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Uplink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Uplink Contour G/T (dB/K)	-7 6	-7 6	-7 6	-7 6	-7 6	-7 6
Uplink SFD (dBW/m2)	-77 4	-69 4	-72 4	-72 4	-72 4	-72 4
Rain Rate (mm/hr)	95 0	95 0	95 0	95 0	95 0	95 0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	SE ASIA	SE ASIA	SE ASIA	SE ASIA	SE ASIA	SE ASIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	48 7	48 7	48 7	48 7	48 7	48 7
Rain Rate (mm/hr)	145	145	145	145	145	145
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	167E	167E	167E	167E	167E	167E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26 0	-26 0	-26 0	-26 0	-26 0	-26 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	171E	171E	171E	171E	171E	171E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	3	3	3	3	0	3
Downlink EIRP Density (dBW/Hz)	-26 0	-26 0	-26 0	-26 0	-26 0	-26 0
Downlink Polarization Advantage (dB)	3	3	3	3	0	3
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4	1229 0	307 0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450 0	400 0
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99	3 4	3 4
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79	2 7	2 7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11 0	6 1	6 1	6 1	6 1	4 6
Earth Station Gain (dBi)	61 7	56 9	56 9	56 9	56 9	54 7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	2 4	2 4	6 1	4 6	4 6	6 1
Earth Station Gain (dBi)	47 9	47 9	55 9	53 9	53 9	55 9
Earth Station G/T (dB/K)	25 4	25 4	33 5	31 4	31 4	33 5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	85 5	80 1	72 7	52 8	64 9	58 4
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)	-7 6	-7 6	-7 6	-7 6	-7 6	-7 6
Boltzman Constant(dBW/K-Hz)	228 6	228 6	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Uplink C/N(dB)	23 5	18 8	17 9	17 6	17 5	17 1
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	48 7	40 8	34 3	14 4	26 4	20 0
Antenna Pointing Error (dB)	- 5	- 5	- 5	- 5	- 5	- 5
Downlink Path Loss, Clear Sky (dB)	-206 3	-206 3	-206 3	-206 3	-206 3	-206 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	25 4	25 4	33 5	31 4	31 4	33 5
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Downlink C / N(dB)	20 3	13 1	21 2	18 7	18 7	20 4
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	23 5	18 8	17 9	17 6	17 5	17 1
C/N Downlink (dB)	20 3	13 1	21 2	18 7	18 7	20 4
C/I Intermodulation (dB)	N/A	N/A	11 6	11 2	11 2	10 8
C/I Uplink Co-Channel (dB)*	24 0	24 0	19 6	19 9	20 3	19 5
C/I Downlink Co-Channel (dB)*	24 0	24 0	19 6	19 9	20 3	19 5
C/I Uplink Adjacent Satellite 1 (dB)	28 9	24 3	23 4	23 0	23 0	22 5
C/I Downlink Adjacent Satellite 1 (dB)	24 8	17 6	26 0	23 6	23 6	25 2
C/I Uplink Adjacent Satellite 2 (dB)	31 9	27 3	26 4	26 0	23 0	25 5
C/I Downlink Adjacent Satellite 2 (dB)	29 2	22 1	29 7	27 4	24 3	28 8
C(N+1) Composite (dB)	15 5	10 1	9 0	8 5	8 4	8 3
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0	-1 0	-1 0
Net C/(N+1) Composite (dB)	14 5	9 1	8 0	7 5	7 4	7 3
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0	-3 4	-3 4
Excess Link Margin (dB)	4 5	5 7	4 1	4 5	4 0	3 9
Number of Carriers	1	1 0	3 5	360 0	24 8	90 0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-42 2	-51 6	-52 5	-52 9	-52 9	-51 2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-9 3	-26 0	-26 0	-26 4	-26 4	-26 9



## Exhibit 5: Intelsat 8 (169° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Uplink Contour G/T (dB/K)	-7 5	-7 5	-7 5	-7 5	-7 5	-7 5
Uplink SFD (dBW/m2)	-77 5	-72 5	-74 5	-74 5	-74 5	-74 5
Rain Rate (mm/hr)	95 0	95 0	95 0	95 0	95 0	95 0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	44 7	44 7	44 7	44 7	44 7	44 7
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	167E	167E	167E	167E	167E	167E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26 0	-26 0	-26 0	-26 0	-26 0	-26 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	171E	171E	171E	171E	171E	171E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26 0	-26 0	-26 0	-26 0	-26 0	-26 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4	1229 0	307 0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450 0	400 0
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99	3 4	3 4
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79	2 7	2 7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11 0	6 1	6 1	6 1	6 1	3 7
Earth Station Gain (dBi)	61 7	56 9	56 9	56 9	56 9	52 7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	3 0	2 4	2 4	2 4	4 6	6 1
Earth Station Gain (dBi)	49 6	47 9	47 9	47 9	53 9	55 9
Earth Station G/T (dB/K)	27 1	25 4	25 4	25 4	31 4	33 5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	85 4	81 3	74 7	54 6	63 7	57 1
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)	-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
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Uplink C/N(dB)	23 5	20 1	20 0	19 5	16 4	15 9
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	44 7	40 8	34 4	14 3	23 3	16 8
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-206 3	-206 3	-206 3	-206 3	-206 3	-206 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	27 1	25 4	25 4	25 4	31 4	33 5
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Downlink C / N(dB)	18 0	13 2	13 2	12 6	15 6	17 2
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	23 5	20 1	20 0	19 5	16 4	15 9
C/N Downlink (dB)	18 0	13 2	13 2	12 6	15 6	17 2
C/I Intermodulation (dB)	N/A	N/A	15 7	15 1	12 1	11 6
C/I Uplink Co-Channel (dB)*	24 0	24 0	23 7	23 8	21 2	20 3
C/I Downlink Co-Channel (dB)*	24 0	24 0	23 7	23 8	21 2	20 3
C/I Uplink Adjacent Satellite 1 (dB)	28 8	25 5	25 4	24 8	21 8	21 3
C/I Downlink Adjacent Satellite 1 (dB)	22 6	17 7	17 7	17 2	20 5	22 0
C/I Uplink Adjacent Satellite 2 (dB)	28 8	25 5	25 4	24 8	21 8	21 3
C/I Downlink Adjacent Satellite 2 (dB)	23 8	19 1	19 1	18 6	21 2	22 6
C/(N+I) Composite (dB)	13 9	10 0	8 9	8 4	8 0	8 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	12 9	9 0	7 9	7 4	7 0	7 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0	-3 4	-3 4
Excess Link Margin (dB)	2 9	5 6	4 0	4 4	3 6	3 6
Number of Carriers	1	1 0	3 5	360 0	24 8	90 0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-42 3	-50 4	-50 5	-51 1	-54 1	-50 4
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13 3	-26 0	-26 0	-26 5	-29 6	-30 1

## Exhibit 5: Intelsat 8 (169° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Uplink Contour G/T (dB/K)	-7 5	-7 5	-7 5	-7 5	-7 5	-7 5
Uplink SFD (dBW/m2)	-76 5	-69 5	-72 5	-72 5	-72 5	-72 5
Rain Rate (mm/hr)	95 0	95 0	95 0	95 0	95 0	95 0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	NE ASIA	NE ASIA	NE ASIA	NE ASIA	NE ASIA	NE ASIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-6 0	-6 0	-6 0	-6 0	-6 0	-6 0
Downlink Contour EIRP (dBW)	50 1	50 1	50 1	50 1	50 1	50 1
Rain Rate (mm/hr)	63 0	63 0	63 0	63 0	63 0	63 0
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	167E	167E	167E	167E	167E	167E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-24 0	-24 0	-24 0	-24 0	-24 0	-24 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	171E	171E	171E	171E	171E	171E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-24 0	-24 0	-24 0	-24 0	-24 0	-24 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4	1229 0	307 0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450 0	400 0
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99	3 4	3 4
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79	2 7	2 7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11 0	6 1	6 1	6 1	6 1	4 6
Earth Station Gain (dBi)	61 7	56 9	56 9	56 9	56 9	54 7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	1 8	1 8	3 7	3 7	4 6	6 1
Earth Station Gain (dBi)	45 2	45 2	51 5	51 5	53 9	55 9
Earth Station G/T (dB/K)	22 7	22 7	29 0	29 0	31 4	33 5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	86 4	80 6	73 0	52 8	64 2	58 0
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)	-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
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Uplink C/N(dB)	24 5	19 4	18 4	17 6	17 0	16 8
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	50 1	42 8	36 1	15 9	27 3	21 1
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-206 3	-206 3	-206 3	-206 3	-206 3	-206 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	22 7	22 7	29 0	29 0	31 4	33 5
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Downlink C / N(dB)	19 0	12 4	18 5	17 8	19 6	21 5
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	24 5	19 4	18 4	17 6	17 0	16 8
C/N Downlink (dB)	19 0	12 4	18 5	17 8	19 6	21 5
C/I Intermodulation (dB)	N/A	N/A	12 0	11 3	10 7	10 5
C/I Uplink Co-Channel (dB)*	24 0	24 0	20 1	20 0	19 8	19 2
C/I Downlink Co-Channel (dB)*	24 0	24 0	20 1	20 0	19 8	19 2
C/I Uplink Adjacent Satellite 1 (dB)	29 8	24 8	23 7	23 0	22 4	22 2
C/I Downlink Adjacent Satellite 1 (dB)	21 2	14 7	21 3	20 6	22 5	24 3
C/I Uplink Adjacent Satellite 2 (dB)	29 8	24 8	23 7	23 0	22 4	22 2
C/I Downlink Adjacent Satellite 2 (dB)	23 2	16 6	22 3	21 6	23 2	24 9
C/(N+I) Composite (dB)	14 1	8 6	8 8	8 2	8 0	7 9
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	13 1	7 6	7 8	7 2	7 0	6 9
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0	-3 4	-3 4
Excess Link Margin (dB)	3 1	4 2	3 9	4 2	3 6	3 5
Number of Carriers	1	1 0	3 5	360 0	24 8	90 0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-41 3	-51 1	-52 2	-52 9	-53 5	-51 5
Downlink EIRP Density At Beam Peak (dBW/Hz)	-9 9	-26 0	-26 2	-26 9	-27 6	-27 8

## Exhibit 6: Adjacent Satellite (167° E.L.) Link Budgets

<b>UPLINK BEAM INFORMATION</b>				
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	6 175	6 175	6 175	6 175
Uplink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Uplink Relative Contour Level (dB)	-10 0	-10 0	-10 0	-10 0
Uplink Contour G/T (dB/K)	-8 4	-8 4	-8 4	-8 4
Uplink SFD (dBW/m2)	-78 6	-83 6	-81 6	-81 6
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>DOWNLINK BEAM INFORMATION</b>				
Downlink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Downlink Frequency (GHz)	3 95	3 95	3 95	3 95
Downlink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	32 4	32 4	32 4	32 4
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>				
Satellite 1 Orbital Location	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>ADJACENT SATELLITE 2</b>				
Satellite 1 Orbital Location	165E	165E	165E	165E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>CARRIER INFORMATION</b>				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4
Allocated Bandwidth(kHz)	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79
<b>UPLINK EARTH STATION</b>				
Earth Station Diameter (meters)	18 3	11 0	6 1	6 1
Earth Station Gain (dBi)	60 2	55 4	49 4	49 4
Earth Station Elevation Angle	20	20	20	20
<b>DOWNLINK EARTH STATION</b>				
Earth Station Diameter (meters)	6 1	3 0	3 5	3 5
Earth Station Gain (dBi)	46 5	39 7	41 1	41 1
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Earth Station Elevation Angle	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>				
Uplink Earth Station EIRP (dBW)	84 3	79 3	69 4	49 0
Uplink Path Loss, Clear Sky (dB)	-200 2	-200 2	-200 2	-200 2
Uplink Rain Attenuation	0 0	0 0	0 0	0 0
Satellite G/T(dB/K)	-8 4	-8 4	-8 4	-8 4
Boltzman Constant(dBW/K-Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Uplink C/N(dB)	28 7	24 5	21 1	20 2
<b>DOWNLINK PERFORMANCE</b>				
Downlink EIRP per Carrier (dBW)	32 4	32 4	25 2	4 8
Antenna Pointing Error (dB)	- 5	- 5	- 5	- 5
Downlink Path Loss, Clear Sky (dB)	-196 3	-196 3	-196 3	-196 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Downlink C / N(dB)	14 8	8 6	9 7	8 8
<b>COMPOSITE LINK PERFORMANCE</b>				
C/N Uplink (dB)	28 7	24 5	21 1	20 2
C/N Downlink (dB)	14 8	8 6	9 7	8 8
C/I Intermodulation (dB)	N/A	N/A	20 2	19 3
C/I Uplink Co-Channel (dB)*	24 0	24 0	25 8	25 5
C/I Downlink Co-Channel (dB)*	24 0	24 0	25 8	25 5
C/I Uplink Adjacent Satellite 1 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 1 (dB)	20 9	8 8	13 2	12 3
C/I Uplink Adjacent Satellite 2 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 2 (dB)	22 7	17 5	18 0	17 1
C/(N+I) Composite (dB)	11 1	4 4	4 9	4 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	10 1	3 4	3 9	3 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0
Excess Link Margin (dB)	1	1	0 0	0 0
Number of Carriers	1	1 0	2 3	257 1
<b>CARRIER DENSITY LEVELS</b>				
Uplink Power Density (dBW/Hz)	-41 9	-50 9	-48 3	-49 2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-25 6	-34 4	-35 1	-36 0

## Exhibit 6: Adjacent Satellite (167° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>				
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	6 175	6 175	6 175	6 175
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-10 0	-10 0	-10 0	-10 0
Uplink Contour G/T (dB/K)	-7 4	-7 4	-7 4	-7 4
Uplink SFD (dBW/m2)	-78 6	-83 6	-81 6	-81 6
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>DOWNLINK BEAM INFORMATION</b>				
Downlink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Downlink Frequency (GHz)	3 95	3 95	3 95	3 95
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	32 4	32 4	32 4	32 4
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>				
Satellite 1 Orbital Location	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>ADJACENT SATELLITE 2</b>				
Satellite 1 Orbital Location	165E	165E	165E	165E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>CARRIER INFORMATION</b>				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4
Allocated Bandwidth(kHz)	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79
<b>UPLINK EARTH STATION</b>				
Earth Station Diameter (meters)	18 3	11 0	6 1	6 1
Earth Station Gain (dBi)	60 2	55 4	49 4	49 4
Earth Station Elevation Angle	20	20	20	20
<b>DOWNLINK EARTH STATION</b>				
Earth Station Diameter (meters)	6 1	3 0	3 5	3 5
Earth Station Gain (dBi)	46 5	39 7	41 1	41 1
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Earth Station Elevation Angle	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>				
Uplink Earth Station EIRP (dBW)	84 3	79 3	69 4	49 0
Uplink Path Loss, Clear Sky (dB)	-200 2	-200 2	-200 2	-200 2
Uplink Rain Attenuation	0 0	0 0	0 0	0 0
Satellite G/T(dB/K)	-7 4	-7 4	-7 4	-7 4
Boltzman Constant(dBW/K-Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Uplink C/N(dB)	29 7	25 5	22 1	21 2
<b>DOWNLINK PERFORMANCE</b>				
Downlink EIRP per Carrier (dBW)	32 4	32 4	25 2	4 8
Antenna Pointing Error (dB)	- 5	- 5	- 5	- 5
Downlink Path Loss, Clear Sky (dB)	-196 3	-196 3	-196 3	-196 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Downlink C / N(dB)	14 8	8 6	9 6	8 7
<b>COMPOSITE LINK PERFORMANCE</b>				
C/N Uplink (dB)	29 7	25 5	22 1	21 2
C/N Downlink (dB)	14 8	8 6	9 6	8 7
C/I Intermodulation (dB)	N/A	N/A	20 2	19 3
C/I Uplink Co-Channel (dB)*	24 0	24 0	25 7	25 4
C/I Downlink Co-Channel (dB)*	24 0	24 0	25 7	25 4
C/I Uplink Adjacent Satellite 1 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 1 (dB)	20 9	8 8	13 2	12 3
C/I Uplink Adjacent Satellite 2 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 2 (dB)	22 7	17 5	18 0	17 1
C/(N+I) Composite (dB)	11 1	4 4	4 9	4 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	10 1	3 4	3 9	3 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0
Excess Link Margin (dB)	1	1	0 0	0 0
Number of Carriers	1	1 0	2 3	258 4
<b>CARRIER DENSITY LEVELS</b>				
Uplink Power Density (dBW/Hz)	-41 9	-50 9	-48 3	-49 2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-25 6	-34 4	-35 1	-36 0

## Exhibit 6: Adjacent Satellite (167° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Uplink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Uplink Contour G/T (dB/K)	-7.6	-7.6	-7.6	-7.6	-7.6	-7.6
Uplink SFD (dBW/m2)	-77.4	-69.4	-72.4	-72.4	-72.4	-72.4
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	SE ASIA	SE ASIA	SE ASIA	SE ASIA	SE ASIA	SE ASIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	48.7	48.7	48.7	48.7	48.7	48.7
Rain Rate (mm/hr)	145	145	145	145	145	145
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	169E	169E	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	165E	165E	165E	165E	165E	165E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	3	3	3	3	0	3
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	3	3	3	3	0	3
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	2.7	2.7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11.0	6.1	6.1	6.1	6.1	4.6
Earth Station Gain (dBi)	61.7	56.9	56.9	56.9	56.9	54.7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	2.4	2.4	6.1	4.6	4.6	6.1
Earth Station Gain (dBi)	47.9	47.9	55.9	53.9	53.9	55.9
Earth Station G/T (dB/K)	25.4	25.4	33.5	31.4	31.4	33.5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	85.5	80.1	72.7	52.8	64.9	58.4
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)	-7.6	-7.6	-7.6	-7.6	-7.6	-7.6
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	23.5	18.8	17.9	17.6	17.5	17.1
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	48.7	40.8	34.3	14.4	26.4	20.0
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-206.3	-206.3	-206.3	-206.3	-206.3	-206.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	25.4	25.4	33.5	31.4	31.4	33.5
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	20.3	13.1	21.2	18.7	18.7	20.4
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	23.5	18.8	17.9	17.6	17.5	17.1
C/N Downlink (dB)	20.3	13.1	21.2	18.7	18.7	20.4
C/I Intermodulation (dB)	N/A	N/A	11.6	11.2	11.2	10.8
C/I Uplink Co-Channel (dB)*	24.0	24.0	19.6	19.9	20.3	19.5
C/I Downlink Co-Channel (dB)*	24.0	24.0	19.6	19.9	20.3	19.5
C/I Uplink Adjacent Satellite 1 (dB)	28.9	24.3	23.4	23.0	23.0	22.5
C/I Downlink Adjacent Satellite 1 (dB)	24.8	17.6	26.0	23.6	23.6	25.2
C/I Uplink Adjacent Satellite 2 (dB)	31.9	27.3	26.4	26.0	23.0	25.5
C/I Downlink Adjacent Satellite 2 (dB)	29.2	22.1	29.7	27.4	24.3	28.8
C(N+1) Composite (dB)	15.5	10.1	9.0	8.5	8.4	8.3
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+1) Composite (dB)	14.5	9.1	8.0	7.5	7.4	7.3
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	4.5	5.7	4.1	4.5	4.0	3.9
Number of Carriers	1	1.0	3.5	360.0	24.8	90.0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-42.2	-51.6	-52.5	-52.9	-52.9	-51.2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-9.3	-26.0	-26.0	-26.4	-26.4	-26.9

## Exhibit 6: Adjacent Satellite (167° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Uplink Contour G/T (dB/K)	-7 5	-7 5	-7 5	-7 5	-7 5	-7 5
Uplink SFD (dBW/m2)	-77 5	-72 5	-74 5	-74 5	-74 5	-74 5
Rain Rate (mm/hr)	95 0	95 0	95 0	95 0	95 0	95 0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	44 7	44 7	44 7	44 7	44 7	44 7
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	169E	169E	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26 0	-26 0	-26 0	-26 0	-26 0	-26 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	165E	165E	165E	165E	165E	165E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26 0	-26 0	-26 0	-26 0	-26 0	-26 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4	1229 0	307 0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450 0	400 0
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99	3 4	3 4
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79	2 7	2 7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11 0	6 1	6 1	6 1	6 1	3 7
Earth Station Gain (dBi)	61 7	56 9	56 9	56 9	56 9	52 7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	3 0	2 4	2 4	2 4	4 6	6 1
Earth Station Gain (dBi)	49 6	47 9	47 9	47 9	53 9	55 9
Earth Station G/T (dB/K)	27 1	25 4	25 4	25 4	31 4	33 5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	85 4	81 3	74 7	54 6	63 7	57 1
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)	-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
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Uplink C/N(dB)	23 5	20 1	20 0	19 5	16 4	15 9
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	44 7	40 8	34 4	14 3	23 3	16 8
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-206 3	-206 3	-206 3	-206 3	-206 3	-206 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	27 1	25 4	25 4	25 4	31 4	33 5
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Downlink C / N(dB)	18 0	13 2	13 2	12 6	15 6	17 2
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	23 5	20 1	20 0	19 5	16 4	15 9
C/N Downlink (dB)	18 0	13 2	13 2	12 6	15 6	17 2
C/I Intermodulation (dB)	N/A	N/A	15 7	15 1	12 1	11 6
C/I Uplink Co-Channel (dB)*	24 0	24 0	23 7	23 8	21 2	20 3
C/I Downlink Co-Channel (dB)*	24 0	24 0	23 7	23 8	21 2	20 3
C/I Uplink Adjacent Satellite 1 (dB)	28 8	25 5	25 4	24 8	21 8	21 3
C/I Downlink Adjacent Satellite 1 (dB)	22 6	17 7	17 7	17 2	20 5	22 0
C/I Uplink Adjacent Satellite 2 (dB)	28 8	25 5	25 4	24 8	21 8	21 3
C/I Downlink Adjacent Satellite 2 (dB)	23 8	19 1	19 1	18 6	21 2	22 6
C/(N+I) Composite (dB)	13 9	10 0	8 9	8 4	8 0	8 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	12 9	9 0	7 9	7 4	7 0	7 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0	-3 4	-3 4
Excess Link Margin (dB)	2 9	5 6	4 0	4 4	3 6	3 6
Number of Carriers	1	1 0	3 5	360 0	24 8	90 0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-42 3	-50 4	-50 5	-51 1	-54 1	-50 4
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13 3	-26 0	-26 0	-26 5	-29 6	-30 1

## Exhibit 6: Adjacent Satellite (167° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Uplink Contour G/T (dB/K)	-7 5	-7 5	-7 5	-7 5	-7 5	-7 5
Uplink SFD (dBW/m2)	-76 5	-69 5	-72 5	-72 5	-72 5	-72 5
Rain Rate (mm/hr)	95 0	95 0	95 0	95 0	95 0	95 0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	NE ASIA	NE ASIA	NE ASIA	NE ASIA	NE ASIA	NE ASIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-6 0	-6 0	-6 0	-6 0	-6 0	-6 0
Downlink Contour EIRP (dBW)	50 1	50 1	50 1	50 1	50 1	50 1
Rain Rate (mm/hr)	63 0	63 0	63 0	63 0	63 0	63 0
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	169E	169E	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-24 0	-24 0	-24 0	-24 0	-24 0	-24 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	165E	165E	165E	165E	165E	165E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-24 0	-24 0	-24 0	-24 0	-24 0	-24 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4	1229 0	307 0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450 0	400 0
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99	3 4	3 4
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79	2 7	2 7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11 0	6 1	6 1	6 1	6 1	4 6
Earth Station Gain (dBi)	61 7	56 9	56 9	56 9	56 9	54 7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	1 8	1 8	3 7	3 7	4 6	6 1
Earth Station Gain (dBi)	45 2	45 2	51 5	51 5	53 9	55 9
Earth Station G/T (dB/K)	22 7	22 7	29 0	29 0	31 4	33 5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	86 4	80 6	73 0	52 8	64 2	58 0
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)	-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
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Uplink C/N(dB)	24 5	19 4	18 4	17 6	17 0	16 8
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	50 1	42 8	36 1	15 9	27 3	21 1
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-206 3	-206 3	-206 3	-206 3	-206 3	-206 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	22 7	22 7	29 0	29 0	31 4	33 5
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Downlink C / N(dB)	19 0	12 4	18 5	17 8	19 6	21 5
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	24 5	19 4	18 4	17 6	17 0	16 8
C/N Downlink (dB)	19 0	12 4	18 5	17 8	19 6	21 5
C/I Intermodulation (dB)	N/A	N/A	12 0	11 3	10 7	10 5
C/I Uplink Co-Channel (dB)*	24 0	24 0	20 1	20 0	19 8	19 2
C/I Downlink Co-Channel (dB)*	24 0	24 0	20 1	20 0	19 8	19 2
C/I Uplink Adjacent Satellite 1 (dB)	29 8	24 8	23 7	23 0	22 4	22 2
C/I Downlink Adjacent Satellite 1 (dB)	21 2	14 7	21 3	20 6	22 5	24 3
C/I Uplink Adjacent Satellite 2 (dB)	29 8	24 8	23 7	23 0	22 4	22 2
C/I Downlink Adjacent Satellite 2 (dB)	23 2	16 6	22 3	21 6	23 2	24 9
C/(N+I) Composite (dB)	14 1	8 6	8 8	8 2	8 0	7 9
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	13 1	7 6	7 8	7 2	7 0	6 9
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0	-3 4	-3 4
Excess Link Margin (dB)	3 1	4 2	3 9	4 2	3 6	3 5
Number of Carriers	1	1 0	3 5	360 0	24 8	90 0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-41 3	-51 1	-52 2	-52 9	-53 5	-51 5
Downlink EIRP Density At Beam Peak (dBW/Hz)	-9 9	-26 0	-26 2	-26 9	-27 6	-27 8

## Exhibit 7: Adjacent Satellite (171° E.L.) Link Budgets

<b>UPLINK BEAM INFORMATION</b>				
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	6 175	6 175	6 175	6 175
Uplink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Uplink Relative Contour Level (dB)	-10 0	-10 0	-10 0	-10 0
Uplink Contour G/T (dB/K)	-8 4	-8 4	-8 4	-8 4
Uplink SFD (dBW/m2)	-78 6	-83 6	-81 6	-81 6
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>DOWNLINK BEAM INFORMATION</b>				
Downlink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Downlink Frequency (GHz)	3 95	3 95	3 95	3 95
Downlink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	32 4	32 4	32 4	32 4
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>				
Satellite 1 Orbital Location	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>ADJACENT SATELLITE 2</b>				
Satellite 1 Orbital Location	173E	173E	173E	173E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>CARRIER INFORMATION</b>				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4
Allocated Bandwidth(kHz)	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79
<b>UPLINK EARTH STATION</b>				
Earth Station Diameter (meters)	18 3	11 0	6 1	6 1
Earth Station Gain (dBi)	60 2	55 4	49 4	49 4
Earth Station Elevation Angle	20	20	20	20
<b>DOWNLINK EARTH STATION</b>				
Earth Station Diameter (meters)	6 1	3 0	3 5	3 5
Earth Station Gain (dBi)	46 5	39 7	41 1	41 1
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Earth Station Elevation Angle	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>				
Uplink Earth Station EIRP (dBW)	84 3	79 3	69 4	49 0
Uplink Path Loss, Clear Sky (dB)	-200 2	-200 2	-200 2	-200 2
Uplink Rain Attenuation	0 0	0 0	0 0	0 0
Satellite G/T(dB/K)	-8 4	-8 4	-8 4	-8 4
Boltzman Constant(dBW/K-Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Uplink C/N(dB)	28 7	24 5	21 1	20 2
<b>DOWNLINK PERFORMANCE</b>				
Downlink EIRP per Carrier (dBW)	32 4	32 4	25 2	4 8
Antenna Pointing Error (dB)	- 5	- 5	- 5	- 5
Downlink Path Loss, Clear Sky (dB)	-196 3	-196 3	-196 3	-196 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Downlink C / N(dB)	14 8	8 6	9 7	8 8
<b>COMPOSITE LINK PERFORMANCE</b>				
C/N Uplink (dB)	28 7	24 5	21 1	20 2
C/N Downlink (dB)	14 8	8 6	9 7	8 8
C/I Intermodulation (dB)	N/A	N/A	20 2	19 3
C/I Uplink Co-Channel (dB)*	24 0	24 0	25 8	25 5
C/I Downlink Co-Channel (dB)*	24 0	24 0	25 8	25 5
C/I Uplink Adjacent Satellite 1 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 1 (dB)	20 9	8 8	13 2	12 3
C/I Uplink Adjacent Satellite 2 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 2 (dB)	22 7	17 5	18 0	17 1
C/(N+I) Composite (dB)	11 1	4 4	4 9	4 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	10 1	3 4	3 9	3 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0
Excess Link Margin (dB)	1	1	0 0	0 0
Number of Carriers	1	1 0	2 3	257 1
<b>CARRIER DENSITY LEVELS</b>				
Uplink Power Density (dBW/Hz)	-41 9	-50 9	-48 3	-49 2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-25 6	-34 4	-35 1	-36 0



## Exhibit 7: Adjacent Satellite (171° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>				
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	6 175	6 175	6 175	6 175
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-10 0	-10 0	-10 0	-10 0
Uplink Contour G/T (dB/K)	-7 4	-7 4	-7 4	-7 4
Uplink SFD (dBW/m2)	-78 6	-83 6	-81 6	-81 6
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>DOWNLINK BEAM INFORMATION</b>				
Downlink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Downlink Frequency (GHz)	3 95	3 95	3 95	3 95
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	32 4	32 4	32 4	32 4
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>				
Satellite 1 Orbital Location	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>ADJACENT SATELLITE 2</b>				
Satellite 1 Orbital Location	173E	173E	173E	173E
Uplink Power Density (dBW/Hz)	-38 7	-38 7	-38 7	-38 7
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-40 0	-40 0	-40 0	-40 0
Downlink Polarization Advantage (dB)	0	0	0	0
<b>CARRIER INFORMATION</b>				
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4
Allocated Bandwidth(kHz)	36000	36000	10300	100
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79
<b>UPLINK EARTH STATION</b>				
Earth Station Diameter (meters)	18 3	11 0	6 1	6 1
Earth Station Gain (dBi)	60 2	55 4	49 4	49 4
Earth Station Elevation Angle	20	20	20	20
<b>DOWNLINK EARTH STATION</b>				
Earth Station Diameter (meters)	6 1	3 0	3 5	3 5
Earth Station Gain (dBi)	46 5	39 7	41 1	41 1
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Earth Station Elevation Angle	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>				
Uplink Earth Station EIRP (dBW)	84 3	79 3	69 4	49 0
Uplink Path Loss, Clear Sky (dB)	-200 2	-200 2	-200 2	-200 2
Uplink Rain Attenuation	0 0	0 0	0 0	0 0
Satellite G/T(dB/K)	-7 4	-7 4	-7 4	-7 4
Boltzman Constant(dBW/K-Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Uplink C/N(dB)	29 7	25 5	22 1	21 2
<b>DOWNLINK PERFORMANCE</b>				
Downlink EIRP per Carrier (dBW)	32 4	32 4	25 2	4 8
Antenna Pointing Error (dB)	- 5	- 5	- 5	- 5
Downlink Path Loss, Clear Sky (dB)	-196 3	-196 3	-196 3	-196 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	26 2	19 2	21 0	21 0
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8
Downlink C / N(dB)	14 8	8 6	9 6	8 7
<b>COMPOSITE LINK PERFORMANCE</b>				
C/N Uplink (dB)	29 7	25 5	22 1	21 2
C/N Downlink (dB)	14 8	8 6	9 6	8 7
C/I Intermodulation (dB)	N/A	N/A	20 2	19 3
C/I Uplink Co-Channel (dB)*	24 0	24 0	25 7	25 4
C/I Downlink Co-Channel (dB)*	24 0	24 0	25 7	25 4
C/I Uplink Adjacent Satellite 1 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 1 (dB)	20 9	8 8	13 2	12 3
C/I Uplink Adjacent Satellite 2 (dB)	19 4	15 2	11 8	10 9
C/I Downlink Adjacent Satellite 2 (dB)	22 7	17 5	18 0	17 1
C/(N+I) Composite (dB)	11 1	4 4	4 9	4 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	10 1	3 4	3 9	3 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0
Excess Link Margin (dB)	1	1	0 0	0 0
Number of Carriers	1	1 0	2 3	258 4
<b>CARRIER DENSITY LEVELS</b>				
Uplink Power Density (dBW/Hz)	-41 9	-50 9	-48 3	-49 2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-25 6	-34 4	-35 1	-36 0

## Exhibit 7: Adjacent Satellite (171° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Uplink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Uplink Contour G/T (dB/K)	-7.6	-7.6	-7.6	-7.6	-7.6	-7.6
Uplink SFD (dBW/m2)	-77.4	-69.4	-72.4	-72.4	-72.4	-72.4
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0	95.0	95.0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	SE ASIA	SE ASIA	SE ASIA	SE ASIA	SE ASIA	SE ASIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	48.7	48.7	48.7	48.7	48.7	48.7
Rain Rate (mm/hr)	145	145	145	145	145	145
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	169E	169E	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	173E	173E	173E	173E	173E	173E
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	3	3	3	3	0	3
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	3	3	3	3	0	3
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	10.0	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	10.0	3.36	3.57	2.79	2.7	2.7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11.0	6.1	6.1	6.1	6.1	4.6
Earth Station Gain (dBi)	61.7	56.9	56.9	56.9	56.9	54.7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	2.4	2.4	6.1	4.6	4.6	6.1
Earth Station Gain (dBi)	47.9	47.9	55.9	53.9	53.9	55.9
Earth Station G/T (dB/K)	25.4	25.4	33.5	31.4	31.4	33.5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	85.5	80.1	72.7	52.8	64.9	58.4
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)	-7.6	-7.6	-7.6	-7.6	-7.6	-7.6
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	23.5	18.8	17.9	17.6	17.5	17.1
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	48.7	40.8	34.3	14.4	26.4	20.0
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-206.3	-206.3	-206.3	-206.3	-206.3	-206.3
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	25.4	25.4	33.5	31.4	31.4	33.5
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	20.3	13.1	21.2	18.7	18.7	20.4
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	23.5	18.8	17.9	17.6	17.5	17.1
C/N Downlink (dB)	20.3	13.1	21.2	18.7	18.7	20.4
C/I Intermodulation (dB)	N/A	N/A	11.6	11.2	11.2	10.8
C/I Uplink Co-Channel (dB)*	24.0	24.0	19.6	19.9	20.3	19.5
C/I Downlink Co-Channel (dB)*	24.0	24.0	19.6	19.9	20.3	19.5
C/I Uplink Adjacent Satellite 1 (dB)	28.9	24.3	23.4	23.0	23.0	22.5
C/I Downlink Adjacent Satellite 1 (dB)	24.8	17.6	26.0	23.6	23.6	25.2
C/I Uplink Adjacent Satellite 2 (dB)	31.9	27.3	26.4	26.0	23.0	25.5
C/I Downlink Adjacent Satellite 2 (dB)	29.2	22.1	29.7	27.4	24.3	28.8
C(N+1) Composite (dB)	15.5	10.1	9.0	8.5	8.4	8.3
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+1) Composite (dB)	14.5	9.1	8.0	7.5	7.4	7.3
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	4.5	5.7	4.1	4.5	4.0	3.9
Number of Carriers	1	1.0	3.5	360.0	24.8	90.0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-42.2	-51.6	-52.5	-52.9	-52.9	-51.2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-9.3	-26.0	-26.0	-26.4	-26.4	-26.9

## Exhibit 7: Adjacent Satellite (171° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Uplink Contour G/T (dB/K)	-7 5	-7 5	-7 5	-7 5	-7 5	-7 5
Uplink SFD (dBW/m2)	-77 5	-72 5	-74 5	-74 5	-74 5	-74 5
Rain Rate (mm/hr)	95 0	95 0	95 0	95 0	95 0	95 0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Downlink Contour EIRP (dBW)	44 7	44 7	44 7	44 7	44 7	44 7
Rain Rate (mm/hr)	42 0	42 0	42 0	42 0	42 0	42 0
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	169E	169E	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26 0	-26 0	-26 0	-26 0	-26 0	-26 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	173E	173E	173E	173E	173E	173E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-26 0	-26 0	-26 0	-26 0	-26 0	-26 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4	1229 0	307 0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450 0	400 0
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99	3 4	3 4
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79	2 7	2 7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11 0	6 1	6 1	6 1	6 1	3 7
Earth Station Gain (dBi)	61 7	56 9	56 9	56 9	56 9	52 7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	3 0	2 4	2 4	2 4	4 6	6 1
Earth Station Gain (dBi)	49 6	47 9	47 9	47 9	53 9	55 9
Earth Station G/T (dB/K)	27 1	25 4	25 4	25 4	31 4	33 5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	85 4	81 3	74 7	54 6	63 7	57 1
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)	-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
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Uplink C/N(dB)	23 5	20 1	20 0	19 5	16 4	15 9
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	44 7	40 8	34 4	14 3	23 3	16 8
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-206 3	-206 3	-206 3	-206 3	-206 3	-206 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	27 1	25 4	25 4	25 4	31 4	33 5
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Downlink C / N(dB)	18 0	13 2	13 2	12 6	15 6	17 2
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	23 5	20 1	20 0	19 5	16 4	15 9
C/N Downlink (dB)	18 0	13 2	13 2	12 6	15 6	17 2
C/I Intermodulation (dB)	N/A	N/A	15 7	15 1	12 1	11 6
C/I Uplink Co-Channel (dB)*	24 0	24 0	23 7	23 8	21 2	20 3
C/I Downlink Co-Channel (dB)*	24 0	24 0	23 7	23 8	21 2	20 3
C/I Uplink Adjacent Satellite 1 (dB)	28 8	25 5	25 4	24 8	21 8	21 3
C/I Downlink Adjacent Satellite 1 (dB)	22 6	17 7	17 7	17 2	20 5	22 0
C/I Uplink Adjacent Satellite 2 (dB)	28 8	25 5	25 4	24 8	21 8	21 3
C/I Downlink Adjacent Satellite 2 (dB)	23 8	19 1	19 1	18 6	21 2	22 6
C/(N+I) Composite (dB)	13 9	10 0	8 9	8 4	8 0	8 0
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	12 9	9 0	7 9	7 4	7 0	7 0
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0	-3 4	-3 4
Excess Link Margin (dB)	2 9	5 6	4 0	4 4	3 6	3 6
Number of Carriers	1	1 0	3 5	360 0	24 8	90 0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-42 3	-50 4	-50 5	-51 1	-54 1	-50 4
Downlink EIRP Density At Beam Peak (dBW/Hz)	-13 3	-26 0	-26 0	-26 5	-29 6	-30 1

## Exhibit 7: Adjacent Satellite (171° E.L.) Link Budgets (continued)

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC	PACIFIC
Uplink Frequency (GHz)	14 250	14 250	14 250	14 250	14 250	14 250
Uplink Beam Polarization	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
Uplink Relative Contour Level (dB)	-8 0	-8 0	-8 0	-8 0	-8 0	-8 0
Uplink Contour G/T (dB/K)	-7 5	-7 5	-7 5	-7 5	-7 5	-7 5
Uplink SFD (dBW/m2)	-76 5	-69 5	-72 5	-72 5	-72 5	-72 5
Rain Rate (mm/hr)	95 0	95 0	95 0	95 0	95 0	95 0
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	NE ASIA	NE ASIA	NE ASIA	NE ASIA	NE ASIA	NE ASIA
Downlink Frequency (GHz)	12 500	12 500	12 500	12 500	12 500	12 500
Downlink Beam Polarization	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
Downlink Relative Contour Level (dB)	-6 0	-6 0	-6 0	-6 0	-6 0	-6 0
Downlink Contour EIRP (dBW)	50 1	50 1	50 1	50 1	50 1	50 1
Rain Rate (mm/hr)	63 0	63 0	63 0	63 0	63 0	63 0
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	169E	169E	169E	169E	169E	169E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-24 0	-24 0	-24 0	-24 0	-24 0	-24 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	173E	173E	173E	173E	173E	173E
Uplink Power Density (dBW/Hz)	-45 0	-45 0	-45 0	-45 0	-45 0	-45 0
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-24 0	-24 0	-24 0	-24 0	-24 0	-24 0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	24575	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	30133	6771 1	75 4	1229 0	307 0
Allocated Bandwidth(kHz)	36000	36000	10300	100	1450 0	400 0
Minimum C/N, Clear Sky (dB)	10 0	3 36	3 87	2 99	3 4	3 4
Minimum C/N, Rain (dB)	10 0	3 36	3 57	2 79	2 7	2 7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11 0	6 1	6 1	6 1	6 1	4 6
Earth Station Gain (dBi)	61 7	56 9	56 9	56 9	56 9	54 7
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	1 8	1 8	3 7	3 7	4 6	6 1
Earth Station Gain (dBi)	45 2	45 2	51 5	51 5	53 9	55 9
Earth Station G/T (dB/K)	22 7	22 7	29 0	29 0	31 4	33 5
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	86 4	80 6	73 0	52 8	64 2	58 0
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)	-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
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Uplink C/N(dB)	24 5	19 4	18 4	17 6	17 0	16 8
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	50 1	42 8	36 1	15 9	27 3	21 1
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-206 3	-206 3	-206 3	-206 3	-206 3	-206 3
Downlink Rain Attenuation	0 0	0 0	0 0	0 0	0 0	0 0
Earth Station G/T (dB/K)	22 7	22 7	29 0	29 0	31 4	33 5
Boltzman Constant(dBW / K - Hz)	228 6	228 6	228 6	228 6	228 6	228 6
Carrier Noise Bandwidth (dB-Hz)	-75 6	-74 8	-68 3	-48 8	-60 9	-54 9
Downlink C / N(dB)	19 0	12 4	18 5	17 8	19 6	21 5
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	24 5	19 4	18 4	17 6	17 0	16 8
C/N Downlink (dB)	19 0	12 4	18 5	17 8	19 6	21 5
C/I Intermodulation (dB)	N/A	N/A	12 0	11 3	10 7	10 5
C/I Uplink Co-Channel (dB)*	24 0	24 0	20 1	20 0	19 8	19 2
C/I Downlink Co-Channel (dB)*	24 0	24 0	20 1	20 0	19 8	19 2
C/I Uplink Adjacent Satellite 1 (dB)	29 8	24 8	23 7	23 0	22 4	22 2
C/I Downlink Adjacent Satellite 1 (dB)	21 2	14 7	21 3	20 6	22 5	24 3
C/I Uplink Adjacent Satellite 2 (dB)	29 8	24 8	23 7	23 0	22 4	22 2
C/I Downlink Adjacent Satellite 2 (dB)	23 2	16 6	22 3	21 6	23 2	24 9
C/(N+I) Composite (dB)	14 1	8 6	8 8	8 2	8 0	7 9
Required System Margin (dB)	-1 0	-1 0	-1 0	-1 0	-1 0	-1 0
Net C/(N+I) Composite (dB)	13 1	7 6	7 8	7 2	7 0	6 9
Minimum Required C/N (dB)	-10 0	-3 4	-3 9	-3 0	-3 4	-3 4
Excess Link Margin (dB)	3 1	4 2	3 9	4 2	3 6	3 5
Number of Carriers	1	1 0	3 5	360 0	24 8	90 0
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-41 3	-51 1	-52 2	-52 9	-53 5	-51 5
Downlink EIRP Density At Beam Peak (dBW/Hz)	-9 9	-26 0	-26 2	-26 9	-27 6	-27 8