Engineering Statement

1) Introduction

Intelsat License LLC ("Intelsat") seeks authority in this application to launch and operate a new satellite designated as Intelsat 32e. This spacecraft will operate from 43.1° W.L and will replace Intelsat 9, which is currently located at 43.1° W.L., and operate in conjunction with Intelsat 11, which is located at 43.0° W.L.

The characteristics of the Intelsat 32e spacecraft, as well as its compliance with the various provisions of Part 25 of the Commission's rules, with the exception of those specified in the Public Notice Document DA 14-90, are provided in the remainder of this Engineering Statement.

2) Spacecraft Overview

Intelsat 32e is an Astrium model Eurostar 3000 X spacecraft that operates on the Ku-band frequencies of 12750 – 13250 MHz, 13750 – 14500 MHz, 10700 – 12200 MHz; and Ka-band frequencies of 28650 – 30000 MHz and 18850 – 20200 MHz. At Ku-band, the spacecraft provides coverage of Brazil, United States, the Caribbean, Europe and the northern Atlantic Ocean region. At Ka-band, the spacecraft provides coverage of South America.[1]

2.1) Spacecraft Characteristics

Intelsat 32e is a three-axis stabilized type spacecraft that has a rectangular outer body structure. Intelsat 32e utilizes two deployable solar array wings and a number of deployable and non-deployable antennas.

The Intelsat 32e spacecraft is composed of the following subsystems:

1) Thermal
2) Power
3) Attitude Control
4) Propulsion
5) Telemetry, Command and Ranging ("TC&R")
6) Uplink Power Control ("ULPC")
7) Communication

[1] The technical characteristics associated with the Ka-band hosted payload on Intelsat 32e are provided for informational purposes only. Intelsat is not seeking FCC authority to operate the Ka-band band payload on Intelsat 32e.

These subsystems maintain the correct position and attitude of the spacecraft, ensure that all internal units are maintained within the required temperature range, and that the spacecraft can be commanded and controlled with a high level of reliability from launch to the end of its useful life. The spacecraft design incorporates redundancy in each of the various subsystems in order to avoid single point failures.

The structural design of Intelsat 32e provides mechanical support for all subsystems. The structure externally supports the communication antennas, solar arrays, and the thrusters. It also provides a stable platform for preserving the alignment of critical elements of the spacecraft.

A summary of the basic spacecraft characteristics is provided in Exhibit 1.

2.2) Communication Subsystem

Intelsat 32e provides 80 active communication channels in the downlink at Ku-band frequencies and 1 active channel at Ka-band frequencies. The Ku-band payload employs channels having bandwidths of 12, 14, 27, 28, 36, 50, 56, 104, 108, 112, 243.7 and 260.8 MHz. The Ka-band payload can employ either a 480 or 1330 MHz wide channel.

The Intelsat 32e frequency and polarization plan is provided in the Schedule S and represents the beam switching that Intelsat envisions implementing, at the outset, at 43.1° W.L.

The coverage beams of the Intelsat 32e antennas are provided in the Schedule S in the format prescribed in Section 25.114(d)(3) of the Commission's rules. The performance characteristics for each beam are also provided in Exhibit 2 and to the extent possible in the Schedule S.

For the uplink beams, the SFD at any G/T contour may be determined using the following formula:

$$SFD_D = SFD_P + [(G/T)_P - (G/T)_D] + A$$

where

SFD_D: SFD at desired G/T level (dBW/m^2)
SFD_P: Minimum SFD at peak G/T (dBW/m^2)
$(G/T)_D$: Desired G/T level (dB/K)
$(G/T)_P$: Peak G/T (dB/K)

A = Transponder attenuator setting (dB)

Section 25.210(i)(1) of the Commission's rules specifies that space station antennas in the Fixed Satellite Service, other than in the 17/24 GHz BSS, must be designed to provide a cross-polarization isolation such that the ratio of the on axis co-polar gain to cross-polar gain of the antenna in the assigned frequency band shall be at least 30 dB within its primary coverage area. In this regard, the Intelsat 32e communication beams are still being optimized, but Intelsat expects that all the beams will be compliant with Section 25.210(i)(1).

Section 25.202(e) of the rules requires that the carrier frequency of each space station transmitter be maintained within 0.002% of the reference frequency. Intelsat 32e is designed to be compliant with the provisions of this rule.

Intelsat 32e employs full frequency reuse through the use of orthogonal polarization within the same beam and/or through the use of spatially isolated beams. Accordingly, Intelsat 32e is compliant with Section 25.210 (f) of the Commission's rules.

Section 25.210(c) of the rules requires that all space stations in the Fixed Satellite Service have the minimum capability to change transponder saturation densities by ground command in 4 dB steps over a range of 12 dB. Intelsat 32e is compliant with the provisions of this rule.

With respect to the use of the 10700 – 11700 MHz band in the space-to-earth direction, footnote NG 52 of the United States Table of Frequency Allocations, as contained in Section 2.106 of the Commission's rules, permits the use of this band by non-federal fixed satellite service for international systems only.

Intelsat 32e utilizes the 10700 – 11450 MHz band, in the space-to-Earth direction, to provide international service.

Intelsat 32e utilizes the 11450 – 11700 MHz band, in the space-to-Earth direction, to provide both international and domestic service. In those cases where the associated downlink serves non-U.S. territory, Intelsat 32e would be compliant with the provisions of footnote NG 52. However, In those cases in the 11450 – 11700 MHz band where the link is domestic, Intelsat requests a waiver of the provisions of footnote NG 52 of the United States Table of Frequency Allocations contained in Section 2.106 of the

Commission's rules, as appropriate, to operate in these bands domestically on a non-interference, non-protected basis with respect to any domestic terrestrial station that is authorized to operate in the 11450 – 11700 MHz band. It is noted that the space-to-Earth transmissions of Intelsat 32e are compliant with the power flux density limits of Section 25.208 of the Commission's rules, and would not cause harmful interference into any authorized terrestrial system.

With respect to the 11700 – 12200 MHz frequency band, Intelsat 32e employs a number of beams that provide service to portions of ITU Region 1. Under the ITU Radio Regulations, this frequency band is allocated for use by the BSS ("Broadcast Satellite Service") and operations therein are governed by the provisions contained in Appendix 30 of the ITU Radio Regulations. Intelsat 32e operation in the BSS Plan frequency band 11700 – 12200 MHz in ITU Region 1 will be conducted on a non-interference-non-protected basis in view of the limitations contained in Annex 7 of Appendix 30 of the ITU Radio Regulations.

With respect to the use of the 12750 – 13250 MHz band, footnote NG 52 of the United States Table of Frequency Allocations, as contained in Section 2.106 of the Commission's rules, permits the use of this band by non-federal fixed satellite service for international systems only. Intelsat 32e utilizes the 12750 – 13250 MHz band in communication links which may originate within U.S. territory or outside of U.S. territory to provide downlink service to U.S. territory or outside of U.S. territory.

In those cases where the associated downlink serves non-U.S. territory, Intelsat 32e would be compliant with the provisions of footnote NG 52. However, with respect to the cases where the link is domestic, Intelsat requests a waiver of footnote NG 52 of the United States Table of Frequency Allocations contained in Section 2.106 of the Commission's rules, to operate in these bands on a non-interference, non-protected basis with respect to any terrestrial service that is authorized to operate in the 12750 – 13250 MHz band.

2.3) Telemetry, Command and Ranging Subsystem

The telemetry, command and ranging ("TC&R") subsystem provides the following functions:

1) Acquisition, processing and transmission of spacecraft telemetry data;

2) Reception and retransmission of ground station generated ranging signals; and

3) Reception, processing and distribution of telecommands.

Intelsat 32e can be commanded through the use of one (or both) of two available command channels centered at the frequencies 13249.5 MHz, and 14498 MHz. The spacecraft telemetry may be transmitted through one (or more) of four available telemetry channels centered at the frequencies 11443 MHz, 11443.5 MHz, 11446.5 MHz and 11447 MHz.

The Intelsat 32e command and telemetry subsystem performance is summarized in Exhibits 2 and 3 and in the Schedule S.

The coverage patterns of the telemetry and command antennas are not provided, in accordance with the Commission's Public Notice document DA14-90, whereby applicants can omit the contours of beams whose contours at the 8 dB below peak level fall entirely beyond the edge of the visible Earth. In this regard, the Intelsat 32e command and telemetry -8 dB relative gain contour falls beyond the edge of the visible Earth. Accordingly, no beam contours are provided for the telemetry and command beams.

Section 25.202(e) of the rules requires that the carrier frequency of each space station transmitter be maintained within 0.002% of the reference frequency. Intelsat 32e is designed to be compliant with the provisions of this rule as it pertains to the transmissions of the telemetry channels.

Section 25.202(g) of the rules states that the telemetry, tracking and telecommand for U.S. domestic satellites shall be conducted at either or both edges of the allocated band(s). Intelsat 32e is compliant with this rule.

2.4) Uplink Power Control Subsystem ("ULPC")

Intelsat 32e utilizes one Ku-band ULPC channel. The Ku-band ULPC channel center frequency is 11444.5 MHz.

The coverage pattern of the ULPC antenna is not provided in accordance with the Commission's Public Notice document DA14-90, whereby applicants can omit the contours of beams whose contours at the 8 dB below peak level fall entirely beyond the edge of the visible Earth. In this regard, the Intelsat 32e ULPC beam's -8 dB relative gain contour falls beyond the

edge of the visible Earth. Accordingly, no beam contours are provided for the ULPC beam.

The performance characteristics the ULPC beam is provided in Exhibit 2 and in the Schedule S.

Section 25.202(e) of the rules requires that the carrier frequency of each space station transmitter be maintained within 0.002% of the reference frequency. Intelsat 32e is designed to be compliant with the provisions of this rule as it pertains to the transmissions in the uplink power control channels.

Section 25.202(g) of the rules states that the telemetry, tracking and telecommand for U.S. domestic satellites shall be conducted at either or both edges of the allocated band(s). Intelsat 32e is compliant with this rule.

2.5) Satellite Station-Keeping

The spacecraft will be maintained within 0.05° of its nominal longitudinal position in the east-west and north-south direction. Accordingly, it is in compliance with Section 25.210(j) of the Commission's rules.

The attitude of the spacecraft will be maintained with accuracy consistent with the achievement of the specified communications performance, after taking into account all error sources (i.e., attitude perturbations, thermal distortions, misalignments, orbital tolerances and thruster perturbations, etc.).

2.6) Satellite Useful Lifetime

The minimum design lifetime of the satellite in orbit is 15 years. This has been determined by a conservative evaluation of the effect of the synchronous orbit environment on the solar array, the amount of fuel aboard the spacecraft, the effect of the charge-discharge cycling on the life of the battery, and the wear-out of the amplifiers and other active units. The mass allocation of propellant for spacecraft station keeping is 15 years. To enhance the probability of survival, equipment/unit redundancy is incorporated into the spacecraft design where possible. Materials and processes have been selected so that aging or wearing effects will not adversely affect spacecraft performance over the estimated life.

2.7) Spacecraft Reliability

Intelsat 32e is designed for an operational and mission life of at least 15 years. Life and reliability are maximized by incorporating flight proven or flight qualified units and designs to the greatest extent possible. All subsystems and units have a minimum design life of 15 years. Redundancy concepts are applied to all critical components. All avoidable single-point failure modes have been eliminated.

In Public Notice document DA14-90, the estimated reliability factors for the spacecraft, its payload and bus systems are no longer required. Accordingly, in accordance with this Public Notice, this information has not been provided for Intelsat 32e.

3.0) Services and Emission Designators

Intelsat 32e is to be a general purpose communications satellite and has been designed to support various services offered within the Intelsat satellite system. Depending upon the needs of the users, the transponders on Intelsat 32e can accommodate television, radio, voice and data communications. Typical communication services to be offered include:

a) Compressed digital video

b) High speed digital data

c) Digital single channel per carrier ("SCPC") data channels

d) Digital SCPC with 64 kbps and T1 data rates

Emission designators and allocated bandwidths for representative communication carriers are provided in Exhibit 4.

4.0) Power Flux Density ("PFD")

The power flux density ("PFD") limits for space stations operating in the 10950 – 11200 MHz and 11450 – 11700 MHz bands are contained in Section 25.208 of the Commission's rules. With respect to the frequency bands 10700 – 10950 MHz and 11200 – 11450 MHz, there are PFD limits specified in No. 21.16 of the ITU Radio Regulations. Neither the Commission's rules nor the ITU Radio Regulations specify any PFD limits for the 11700 – 12200 MHz band applicable to geostationary satellites operating in the fixed satellite service.

The maximum PFD levels for the Intelsat 32e transmissions were calculated for a number of digital carriers listed in Exhibit 4 operating in the 10700 – 11700 MHz band. These carriers were chosen because they generally produce high PFD levels on the Earth's surface. The PFD levels were also calculated for the Intelsat 32e telemetry and ULPC carriers. The results are provided in Exhibit 5 and show that the downlink power flux density levels of the Intelsat 32e carriers do not exceed the limits specified in Section 25.208 of the Commission's rules, as appropriate; nor the limits specified in No. 21.16 of the ITU Radio Regulations.

5.0) Emission Limitations

Intelsat will comply with the provisions of Section 25.202(f) of the Commission's rules with regard to Intelsat 32e emissions.

In Public Notice document DA14-90, the predicted spacecraft receiver and transmitter filter characteristics are no longer required. Accordingly, this information is not provided for Intelsat 32e.

6.0) Service Area

At Ku-band, Intelsat 32e provides service to Brazil, United States, the Caribbean, Europe and the northern Atlantic Ocean region.

7.0) Orbital Location

Intelsat requests that it be assigned the 43.1° W.L. orbital location for Intelsat 32e. The 43.1° W.L. location satisfies Intelsat 32e requirements for optimizing coverage, elevation angles and service availability and ensures that maximum operational, economic and public interest benefits will be derived.

As previously indicated, Intelsat 32e will replace Intelsat 9 at 43.1° W.L. These two satellites will be nominally collocated during transfer of traffic and Intelsat will ensure that sufficient spatial separation is achieved between these two satellites through the use of orbit eccentricity and inclination offsets.

8.0) Orbital Arc Limitations

Intelsat 32e is intended to provide video, audio and data services to satellite users within its coverage area. The 43.1° W.L. position affords reasonable

earth station elevation angles to the region. The attractiveness of Intelsat 32e to this market would be severely diminished if service to this area is not possible.

9.0) Intelsat 32e Link Budgets and Interference Analysis

Link analysis for Intelsat 32e was conducted for a number of representative carriers at non-planned Ku-band frequencies. For the analysis it was assumed that an adjacent satellite operated at 41.1° W.L. and 45° W.L. At 41.1° W.L. the satellite was assumed to be a hypothetical satellite having the same operational characteristics as Intelsat 32e. At 45° W.L. the adjacent satellite was assumed to be either a hypothetical satellite having the same operational characteristics as Intelsat 32e, or Intelsat 14, depending on the specific frequency band and coverage area to be analyzed.[2]

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) or (a)(2) of the FCC rules, depending on the specific Ku-band frequency under consideration.
b) All transmitting and receiving earth stations have a cross-polarization isolation value of at least 30 dB within their main beam lobe.
c) At Ku-band frequencies rain attenuation predictions are derived using Recommendation ITU-R P.618.
d) At Ku-band frequencies, increase in noise temperature of the receiving earth station due to rain is taken into account.
e) For the cases where the transponder operates in a multi-carrier mode, the effects due to intermodulation interference are taken into account.

As listed in the Schedule S, the Intelsat 32e beam connectivities are extensive. In order to keep the number of Intelsat 32e link calculations to a manageable number, worst-case performance values were assumed for each beam type that operated in non-planned Ku-band frequencies. The worst-case beam parameters were derived from the beam parameters listed in the Schedule S and chosen in such a manner that would make carrier links utilizing any specific uplink/downlink beam combination as sensitive to adjacent satellite interference as possible. This would ensure that the link

[2] Intelsat 14 is licensed to Intelsat and provides service to U.S, Europe and Africa in the 14000 – 14250 MHz and 11450 – 11700 MHz band frequency bands; and service to the Americas in the 14250 – 14500 MHz and 11700 – 11950 MHz bands (see FCC File Number: SAT-RPL-20090123-0007).

performance objectives would be achieved for all possible Intelsat 32e uplink/downlink beam combinations. The worst-case beam performance for each Intelsat 32e beam type is provided below:

(Schedule S) Beam Name	**Aggregate Beam Designation**	**Worst-Case Beam Peak G/T (dB/K)**	**Worst-Case Beam SFD Range @ Peak G/T (dBW/m^2)**	**Worst-Case Beam Peak EIRP (dBW)**
All Brazil coverage uplink beams operating in the frequency band 13.75 – 14.5 GHz	Brazil	14.2	-98.0 to -79.0	n/a
All Brazil downlink beams operating in the frequency bands 10.95 – 11.2 GHz 11.45 – 12.2 GHz Excluding beams NLHD, NLVD, NEHD and NEVD	Brazil Spot	n/a	n/a	54.0
NLHD, NLVD, NEHD and NEVD beams operating in the frequency bands 10.95 – 11.2 GHz 11.45 – 12.2 GHz	Brazil	n/a	n/a	54.0
All beams operating in the frequency bands 11.45 – 12.2 GHz 13.75 – 14.00 GHz Excluding the Brazil coverage beams and the WBHU and WBVD beams	Trans Atlantic	15.0	-107.4 to -83.4	60.5
Beams WBHU and WBVD	Widebeam	1.9	-102.3 to -78.3	47.4

As listed in the Schedule S, Intelsat 32e employs channels having varying bandwidths. In an effort to keep the number of link calculations to a manageable level, link calculations were not performed for each channel size, but rather for only one channel size. The channel size chosen for each beam was based upon the level of adjacent satellite downlink interference. As an example, if a channel having a bandwidth of 112 MHz and a channel having a bandwidth of 27 MHz have the same associated adjacent satellite downlink interfering EIRP density, then link budgets were performed only for emissions that were transmitted through the 112 MHz channel, since

power density levels would typically be smaller (uplink and downlink) in comparison to those which would be transmitted through the 27 MHz channel; and thus the impact of the adjacent satellite interference would be greater on the former. As a second example, if the level of downlink interfering EIRP density to which the 27 MHz channel was subjected was larger than that for the 112 MHz channel, and if this additional level of interference was larger than ten times the logarithmic ratio of the two channel bandwidths (i.e., 10log[112/27]), then link calculations were performed only for the emissions of the 27 MHz channel, since the impact of adjacent satellite interference is greater on emissions of this channel (in comparison to those being transmitted through the 112 MHz channel).

The results of the Ku-band analyses are shown in Exhibit 6 and demonstrate that operation of the Intelsat 32e satellite from 43.1° W.L. would permit the intended services to achieve their respective performance objectives while maintaining sufficient link margin. Additionally, the EIRP density levels of the carriers listed in Exhibit 6 comply with the FCC limits contained in Section 25.212(c) of the Commission's rules.

With respect to the operation of Intelsat 32e at the FSS Plan frequencies of 12750 – 13250 MHz, 10700 – 10950 MHz and 11200 – 11450 MHz, Intelsat will operate in accordance with the provisions of Appendix 30B of the ITU Radio Regulations.[3]

10.0) Adjacent Satellite Link Analysis

At non-planned Ku-bands, the impact of the proposed Intelsat 32e emissions on the transmissions of adjacent satellites located at 45° W.L. and 41.1º W.L. was analyzed.

At the 41.1° W.L. orbital location, it was assumed that a hypothetical satellite having the same operating characteristics as Intelsat 32e operated at that orbital location.

At the 45° W.L. orbital location, the interference analysis was conducted with respect to Intelsat 14. This spacecraft is licensed to Intelsat and provides service to U.S, Europe and Africa in the 14000 – 14250 MHz and 11450 – 11700 MHz frequency bands; and service to the Americas in the

[3] At the nominal orbital location of 43° W.L., Intelsat has the necessary filings at the ITU for the operation of a space network in accordance with the provisions of Appendix 30B of the ITU Radio Regulations.

14250 – 14500 MHz and 11700 – 11950 MHz bands (see FCC File Number: SAT-RPL-20090123-0007).

Additionally, it was assumed that a hypothetical satellite having the same characteristics as Intelsat 32e in the 13750 – 14500 MHz and 11950 – 12200 MHz bands and serving the northern hemisphere operated at 45° W.L. Moreover, it was assumed that this hypothetical satellite (with the same operational characteristics as Intelsat 32e) also provided service to Brazil in the 13750 – 14500 MHz, 10950 – 11200 MHz, 11450 – 11700 MHz and 11700 – 12200 MHz bands.

For the satellite located at 41.1º W.L., it was assumed that the adjacent satellites were Intelsat 32e, located at 43.1º W.L, and a hypothetical satellite having the same operating characteristics as Intelsat 32e located at 39.1º W.L.[4]

For the satellite located at 45º W.L, it was assumed that the adjacent satellites were Intelsat 32e, located at 43.1º W.L.; and at 47° W.L. a hypothetical satellite having the same operational characteristics as Intelsat 14 or Intelsat 32e, depending on the specific frequency band and coverage area to be analyzed.

The assumptions made in section 9.0 pertaining to earth station off-axis gain performance, earth station cross-polarization performance and rain attenuation were also applied in this analysis.

Additionally, for the hypothetical (Intelsat 32e) satellites located at 41.1° W.L. and 45° W.L., the same simplifying (space station) assumptions described in section 9.0 for Intelsat 32e relating to (worst case) beam performance and channel size were also applied.

The results of the analysis are given in Exhibits 7 and 8. The Intelsat 32e transmissions will be limited to those levels contained in Sections 25.212 (d) of the Commission's rules, as applicable, unless higher levels are coordinated with affected adjacent satellite operators. In any case, pursuant to the results in Exhibits 7 and 8, the uplink power density of the Intelsat 32e digital carriers (into the transmitting earth station antenna) will not exceed -

[4] SES 6 operates at 40.5° W.L. The orbital separation between a hypothetical (Intelsat 32e) satellite located at 41.1° W.L. and SES 6 is 0.6 degrees and would be inconsistent with a two degree orbital separation environment. For the purposes of the interference analysis, the interference impact due to SES 6 was not considered.

45 dBW/Hz in the frequency band 13750 – 14500 MHz; and the downlink EIRP density of Intelsat 32e digital carriers will not exceed the levels specified below:

a) 10950 – 11200 MHz: -18.9 dBW/Hz
b) 11450 – 11700 MHz: -20.8 dBW/Hz
c) 11700 – 12200 MHz: -12.8 dBW/Hz

With respect to the operation of Intelsat 32e at the FSS Plan frequencies of 12750 – 13250 MHz, 10700 – 10950 MHz and 11200 – 11450 MHz, Intelsat shall operate in accordance with the provisions of Appendix 30B of the ITU Radio Regulations.[5]

11.0) Schedule S Submission

Intelsat is providing with its application a Schedule S for the operations of Intelsat 32e from 43.1º W.L. In the preparation of the Schedule S, the data parameters no longer required by the Commission as specified in the FCC Public Notice document DA 14-90 were not included.

Concerning the data items in columns q and r of Table S7 and column b of Table S10, consistent with the instructions provided in footnote 6 of the aforementioned Public Notice, a value of "1" has been entered. In this regard, the entries in these data fields are outside the scope of the certification concerning the accuracy of information provided in this application, in reliance on the waiver that is sought from the Commission pursuant to the interim waiver policy announced in aforementioned Public Notice (DA 14-90) and pursuant to the instructions set forth in footnote 6 of this Public Notice.

With regard to the beam gain contour .gxt files, these have been provided in a GIMS container file that is included with this application.

12.0) 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.

[5] At the nominal orbital location of 43° W.L., Intelsat has the necessary filings at the ITU for the operation of a space network in accordance with the provisions of Appendix 30B of the ITU Radio Regulations. The frequency assignments in these filings are already in the AP30B List and hence no additional interference analysis is required for these frequency bands.

12.1) 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.

12.2) 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 by leaving the batteries in a permanent discharge state.

12.3) 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 9 during the transition of traffic period, Intelsat 32e 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 9, Intelsat will take all the necessary steps, e.g., “pass-in-the-night maneuver” or slight relocation of Intelsat 9 and/or Intelsat 32e, to minimize the risk of collision between Intelsat 9 and Intelsat 32e.

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 32e. Intelsat is also not aware of any system with an overlapping station-keeping volume with Intelsat 32e that is

the subject of an ITU filing and that is either in orbit or progressing towards launch.

12.4) Post Mission Disposal

At the end of the mission, Intelsat will dispose of the spacecraft by moving it to a minimum altitude of 300 kilometers above the geostationary arc, which is above the altitude established by the IADC formula. Intelsat has reserved a minimum of 38.2 kilograms of fuel for this purpose. The reserved fuel figure was determined by the spacecraft manufacturer and provided for in the propellant budget. To calculate this figure, the "rocket equation" was used, taking into account the expected mass of the satellite at the end of life and the required delta-velocity to achieve the desired orbit. The fuel gauging uncertainty has been taken into account in these calculations.

In calculating the disposal orbit, Intelsat has used simplifying assumptions as permitted under the Commission's Orbital Debris Report and Order. For reference, the effective area to mass ratio (Cr*A/M) of the Intelsat 32e spacecraft is 0.045 m^2/kg, resulting in a minimum perigee disposal altitude under the IADC formula of at most 284.5kilometers above the geostationary arc. Accordingly, the Intelsat 32e planned disposal orbit complies with the FCC's rules.

13) TC&R Control Earth Stations

Intelsat will conduct TC&R operations through one or more of the following earth stations: Atlanta, Georgia or Castle Rock, Colorado. Additionally, Intelsat is capable of remotely controlling Intelsat 32e from its facilities 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.

/s/ Roya Shambayati	February 20, 2014
Roya Shambayati	Date
Intelsat	
Director, Spectrum Strategy	

EXHIBIT 1: SUMMARY OF SPACECRAFT CHARACTERISTICS

GENERAL	
Spacecraft Name	Intelsat 32e
Orbital Location	43.1° W.L.
Spacecraft Manufacturer	Astrium
Spacecraft Model	Eurostar 3000 LX
Spacecraft Type	3-axis stabilized
Spacecraft Expected Lifetime	≥15 years
Eclipse Capability	100%
Station-keeping	
North-South	±0.05°
East-West	±0.05°
Antenna Pointing Accuracy	
North-South, East-West, Rotational	0.1°, 0.1º, 0.1º
Propulsion Type	Liquid Propulsion and Electric Propulsion
Ranging Accuracy	≤ 30 m

EXHIBIT 2: INTELSAT 32e Beam Performance

Beam ID	Frequency Band (MHz)	Beam Maximum EIRP (dBW)	Beam Maximum G/T (dB/K)	Beam Minimum Saturated Flux Density (dBW/m^2)	Beam Maximum Saturated Flux Density (dBW/m^2)
RHUL	13750 – 14500	n/a	8.1	-98	-79
RVUL	13750 – 14500	n/a	8.1	-98	-79
B1HU	14000 – 14500	n/a	8.5	-98	-79
B8HU	14000 – 14500	n/a	14.2	-98	-79
BGHU	12750 – 13250	n/a	12.8	-98	-79
BGVU	12750 – 13250	n/a	12.8	-98	-79
U1VU	14000 – 14250	n/a	14	-106.4	-82.4
U2HU	14000 – 14250	n/a	13.9	-106.3	-82.3
U3VU	14000 – 14250	n/a	14.2	-106.6	-82.6
U4HU	14000 – 14250	n/a	13.9	-106.3	-82.3
U5HU	14000 – 14250	n/a	14	-106.4	-82.4
U6VU	14000 – 14250	n/a	14.4	-106.8	-82.8
U7HU	14000 – 14250	n/a	13.4	-105.8	-81.8
U9VU	14000 – 14250	n/a	13.6	-106	-82
UAVU	14000 – 14250	n/a	13.6	-106	-82
UBHU	14000 – 14250	n/a	13.7	-106.1	-82.1
UCVU	14000 – 14250	n/a	13.4	-105.8	-81.8
UDHU	14000 – 14250	n/a	13.5	-105.9	-81.9
UEVU	14000 – 14250	n/a	14.1	-106.5	-82.5
UFHU	14000 – 14500	n/a	13.5	-105.9	-81.9
UGVU	14000 – 14500	n/a	14	-106.4	-82.4
G9HU	12750 – 13250 13750 – 14500	n/a	14.6	-107	-83
G9VU	12750 – 13250 13750 – 14500	n/a	14.6	-107	-83
GBHU	12750 – 13250 13750 – 14500	n/a	14.9	-107.3	-83.3
GBVU	12750 – 13250 13750 – 14500	n/a	15	-107.4	-83.4
WBHU	14450 – 14500	n/a	1.9	-102.3	-78.3
NLHD	10700 - 11450	55.9	n/a	n/a	n/a
NLVD	10700 - 11450	55.9	n/a	n/a	n/a
NEHD	11450 – 11700 11950 – 12200	54	n/a	n/a	n/a
NEVD	11450 – 11700 11950 – 12200	54	n/a	n/a	n/a

EXHIBIT 2: INTELSAT 32e Beam Performance (continued)

Beam ID	Frequency Band (MHz)	Beam Maximum EIRP (dBW)	Beam Maximum G/T (dB/K)	Beam Minimum Saturated Flux Density (dBW/m^2)	Beam Maximum Saturated Flux Density (dBW/m^2)
B1VD	11950 – 12200	54	n/a	n/a	n/a
B2HD	11450 – 11700	54	n/a	n/a	n/a
B2VD	11450 – 11700	54	n/a	n/a	n/a
B3HD	11450 – 11700	54	n/a	n/a	n/a
B3VD	11450 – 11700	54	n/a	n/a	n/a
B4HD	11450 – 11950	54	n/a	n/a	n/a
B4VD	11450 – 11700 11950 – 12200	54	n/a	n/a	n/a
B5HD	11450 – 11700	54	n/a	n/a	n/a
B5VD	11450 – 11700	54	n/a	n/a	n/a
B6HD	11450 – 11700	54	n/a	n/a	n/a
B6VD	11450 – 11700	54	n/a	n/a	n/a
B7HD	11450 – 11700	54	n/a	n/a	n/a
B7VD	11450 – 11700	54	n/a	n/a	n/a
B8VD	11950 – 12200	54	n/a	n/a	n/a
B9HD	11700 – 11950	54	n/a	n/a	n/a
B9VD	11950 – 12200	54	n/a	n/a	n/a
BAHD	11450 – 11700	54	n/a	n/a	n/a
BAVD	11950 – 12200	54	n/a	n/a	n/a
BBHD	11700 – 11950	54	n/a	n/a	n/a
BBVD	11950 – 12200	54	n/a	n/a	n/a
BCHD	11450 – 11700	54	n/a	n/a	n/a
BCVD	11450 – 11700	54	n/a	n/a	n/a
BDHD	11450 – 11700	54	n/a	n/a	n/a
BDVD	11450 – 11700	54	n/a	n/a	n/a
BEHD	11450 – 11700	54	n/a	n/a	n/a
BEVD	11450 – 11700	54	n/a	n/a	n/a
BFHD	11700 – 11950	54	n/a	n/a	n/a
BFVD	11950 – 12200	54	n/a	n/a	n/a
BGHD	11450 – 11950	54	n/a	n/a	n/a
BGVD	11450 – 11700 11950 – 12200	54	n/a	n/a	n/a
BHHD	11450 – 11700	54	n/a	n/a	n/a
BHVD	11450 – 11700	54	n/a	n/a	n/a
BIHD	11700 – 11950	54	n/a	n/a	n/a
BIVD	11950 – 12200	54	n/a	n/a	n/a

EXHIBIT 2: INTELSAT 32e Beam Performance (continued)

Beam ID	Frequency Band (MHz)	Beam Maximum EIRP (dBW)	Beam Maximum G/T (dB/K)	Beam Minimum Saturated Flux Density (dBW/m^2)	Beam Maximum Saturated Flux Density (dBW/m^2)
BJHD	11450 – 11950	54	n/a	n/a	n/a
BJVD	11950 – 12200	54	n/a	n/a	n/a
BKHD	11700 – 11950	54	n/a	n/a	n/a
BKVD	11950 – 12200	54	n/a	n/a	n/a
U1HD	11700 – 11950	61.1	n/a	n/a	n/a
U2VD	11950 – 12200	61.6	n/a	n/a	n/a
U3HD	11950 – 12200	61.3	n/a	n/a	n/a
U4VD	11950 – 12200	61.3	n/a	n/a	n/a
U5VD	11700 – 11950	61.1	n/a	n/a	n/a
U6HD	11950 – 12200	61.4	n/a	n/a	n/a
U7VD	11950 – 12200	61.2	n/a	n/a	n/a
U9HD	11700 – 11950	61.1	n/a	n/a	n/a
UAHD	11950 – 12200	61.1	n/a	n/a	n/a
UBVD	11950 – 12200	61	n/a	n/a	n/a
UCHD	11700 – 11950	61.1	n/a	n/a	n/a
UDVD	11700 – 11950	60.6	n/a	n/a	n/a
UEHD	11950 – 12200	61	n/a	n/a	n/a
UFVD	11700 – 11950	61.3	n/a	n/a	n/a
UGHD	11950 – 12200	61.2	n/a	n/a	n/a
G9HD	11450 – 11950	61	n/a	n/a	n/a
G9VD	11450 – 11700	60.7	n/a	n/a	n/a
	11700 – 11950	60.7	n/a	n/a	n/a
GBHD	11450 – 11950	60.7	n/a	n/a	n/a
GBVD	11450 – 11700	60.5	n/a	n/a	n/a
	11700 – 11950	60.5	n/a	n/a	n/a
WBVD	11800 – 11950	47.4	n/a	n/a	n/a
CGHU	13249 – 13250 14497.5 – 14498.5	n/a	-13.2	-113.7	n/a
CGVU	13249 – 13250 14497.5 – 14498.5	n/a	-13.2	-113.7	n/a
CNRU	13249 – 13250 14497.5 – 14498.5	n/a	-21.8	-98.4	n/a
CNLU	13249 – 13250 14497.5 – 14498.5	n/a	-21.8	-98.4	n/a
CARU	13249 – 13250 14497.5 – 14498.5	n/a	-20.8	-99	n/a

EXHIBIT 2: INTELSAT 32e Beam Performance (continued)

Beam ID	Frequency Band (MHz)	Beam Maximum EIRP (dBW)	Beam Maximum G/T (dB/K)	Beam Minimum Saturated Flux Density (dBW/m^2)	Beam Maximum Saturated Flux Density (dBW/m^2)
CALU	13249 – 13250 14497.5 – 14498.5	n/a	-20.8	-99	n/a
TGVD	11442.75 – 11443.25 11443.25 – 11443.75 11446.25 – 11446.75 11446.75 – 11447.25	14.8	n/a	n/a	n/a
TNRD	11442.75 – 11443.25 11443.25 – 11443.75 11446.25 – 11446.75 11446.75 – 11447.25	19.3	n/a	n/a	n/a
TNLD	11442.75 – 11443.25 11443.25 – 11443.75 11446.25 – 11446.75 11446.75 – 11447.25	19.3	n/a	n/a	n/a
TARD	11442.75 – 11443.25 11443.25 – 11443.75 11446.25 – 11446.75 11446.75 – 11447.25	20.2	n/a	n/a	n/a
TALD	11442.75 – 11443.25 11443.25 – 11443.75 11446.25 – 11446.75 11446.75 – 11447.25	20.2	n/a	n/a	n/a
UHD	11444.4875 – 11444.5125	18	n/a	n/a	n/a
KARU	28650 – 30000	n/a	-0.5	-90	-67
KALU	28650 – 30000	n/a	-0.5	-90	-67
KARD	18850 – 20200	46.9	n/a	n/a	n/a
KARU	18850 – 20200	46.9	n/a	n/a	n/a

EXHIBIT 3: TC&R SUBSYSTEM CHARACTERISTICS

	Global	+Z	-Z
Command Frequency (MHz) / Polarization (see note)			
Transfer Orbit / Emergency	n/a	13249.5 (LHCP) 14498.0 (RHCP)	13249.5 (RHCP) 14498.0 (LHCP)
On-Station	13249.5 (V) 14498.0 (H)	n/a	n/a
Command Modulation	FM	FM	FM
Bandwidth of Command Carrier (kHz)			
Occupied Bandwidth	900	900	900
Allocated Bandwidth	1000	1000	1000
Command Threshold (dBW/m^2)			
Beam Peak	-113.7	-98.4	-99.0
Edge of Coverage	-104.3	-78.1	-79.1
Command G/T (dB/K)			
Beam Peak	-13.2	-21.8	-20.8
Edge of Coverage	-20.3	-42.1	-41.1
-			
Telemetry Frequency (MHz) / Polarization (see note)			
Transfer Orbit / Emergency	n/a	11443.0 (RHCP) 11443.5 (RHCP) 11446.5 (LHCP) 11447.0 (LHCP)	11443.0 (LHCP) 11443.5 (LHCP) 11446.5 (RHCP) 11447.0 (RHCP)
On-Station	11443.0 (V) 11443.5 (V) 11446.5 (V) 11447.0 (V)	n/a	n/a
Telemetry Modulation	PM	PM	PM
Bandwidth of Telemetry Carrier (kHz)			
Occupied	300	300	300
Allocated	500	500	500
Telemetry EIRP			
Beam Peak	14.8	19.3	20.2
Edge of Coverage	9.0	-0.2	0.7
Power Into Telemetry Antenna (dBW / Watts)	-8.6 dBW / 0.1 W	10.2 dBW / 10.5 W	11.1 dBW / 12.9 W
On-Station Ranging Accuracy (meters)	≤ 30	≤ 30	≤ 30

Note:

H: Linear Horizontal Polarization
V: Linear Vertical Polarization
RHCP: Right Hand Circular Polarization
LHCP: Left Hand Circular Polarization

EXHIBIT 4: EMISSION DESIGNATORS

Signal Type	Emission Designator	Allocated Bandwidth (kHz)
64 kbps Carrier	100KG7W	100
6000 kbps carrier	10M3G7W	10300
18431 kbps carrier	27M0G7W	27000
24575 kbps carrier	36M0G7W	36000
38228 kbps carrier	56M0G7W	56000
70994 kbps carrier	104MG7W	104000
73725 kbps carrier	108MG7W	108000
76455 kbps carrier	112MG7W	112000
166358 kbps carrier	244MG7W	243700
178031 kbps carrier	261MG7W	260800
327665 kbps carrier	480MG7W	480300
907906 kbps carrier	1G33G7W	1330000

EXHIBIT 5: POWER FLUX DENSITY CALCULATIONS#

FREQUENCY BAND : 10950 - 11200 MHz and 11450 - 11700 MHz							
Beam G9HD (H) - 261MG7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	60.8*	60.6*	61.0	61.0	61.0	61.0	61.0
Carrier Occupied Bandwidth (kHz)	218300.0	218300.0	218300.0	218300.0	218300.0	218300.0	218300.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-149.5	-149.4	-149.3	-149.2	-148.4
FCC Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	2.0	4.4	6.8	9.2	8.4
Beam G9VD (V) - 244MG7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	60.5*	60.4*	60.7	60.7	60.7	60.7	60.7
Carrier Occupied Bandwidth (kHz)	204000.0	204000.0	204000.0	204000.0	204000.0	204000.0	204000.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-149.5	-149.4	-149.3	-149.2	-148.4
FCC Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	2.0	4.4	6.8	9.2	8.4

EXHIBIT 5: POWER FLUX DENSITY CALCULATIONS (continued)

FREQUENCY BAND : 10950 - 11200 MHz and 11450 - 11700 MHz							
Beam NLHD (H) - 36M0G7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.2*	52.0*	54.4*	55.9	55.9	55.9	55.9
Carrier Occupied Bandwidth (kHz)	30133.0	30134.0	30139.0	30144.0	30145.0	30146.0	30147.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-147.5	-145.9	-145.8	-145.7	-144.9
FCC Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.9	3.3	5.7	4.9
Beam NLVD (V) - 36M0G7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.2*	52.0*	54.4*	55.9	55.9	55.9	55.9
Carrier Occupied Bandwidth (kHz)	30133.0	30134.0	30139.0	30144.0	30145.0	30146.0	30147.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-147.5	-145.9	-145.8	-145.7	-144.9
FCC Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.9	3.3	5.7	4.9

EXHIBIT 5: POWER FLUX DENSITY CALCULATIONS (continued)

FREQUENCY BAND : 10950 - 11200 MHz and 11450 - 11700 MHz							
Beam NEHD (H) - 36M0G7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.2*	52.0*	54.0	54.0	54.0	54.0	54.0
Carrier Occupied Bandwidth (kHz)	30133.0	30134.0	30139.0	30144.0	30145.0	30146.0	30147.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-147.9	-147.8	-147.7	-147.6	-146.8
FCC Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.4	2.8	5.2	7.6	6.8
Beam NEVD (V) - 36M0G7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.2*	52.0*	54.0	54.0	54.0	54.0	54.0
Carrier Occupied Bandwidth (kHz)	30133.0	30134.0	30139.0	30144.0	30145.0	30146.0	30147.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-147.9	-147.8	-147.7	-147.6	-146.8
FCC Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.4	2.8	5.2	7.6	6.8

EXHIBIT 5: POWER FLUX DENSITY CALCULATIONS (continued)

FREQUENCY BAND : 10950 - 11200 MHz and 11450 - 11700 MHz							
Beams (H): B2HD, B3HD, B4HD, B5HD, B6HD, B7HD, BAHD, BCHD, BEHD, BGHD, BHHD, BJHD **36M0G7W**							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.2*	52.0*	54.0	54.0	54.0	54.0	54.0
Carrier Occupied Bandwidth (kHz)	30133.0	30134.0	30139.0	30144.0	30145.0	30146.0	30147.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-147.9	-147.8	-147.7	-147.6	-146.8
FCC Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.4	2.8	5.2	7.6	6.8
Beams (V): B2VD, B3VD, B4VD, B5VD, B6VD, B7VD, BCVD, BDVD, BEVD, BGVD, BHVD **36M0G7W**							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.2*	52.0*	54.0	54.0	54.0	54.0	54.0
Carrier Occupied Bandwidth (kHz)	30133.0	30134.0	30139.0	30144.0	30145.0	30146.0	30147.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-147.9	-147.8	-147.7	-147.6	-146.8
FCC Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.4	2.8	5.2	7.6	6.8

EXHIBIT 5: POWER FLUX DENSITY CALCULATIONS (continued)

FREQUENCY BAND : 10700 - 10950 MHz and 11200 - 11450 MHz							
Beam TGVD (V) - 2M40G8D							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	14.8	14.8	14.8	14.8	14.8	14.8	14.8
Carrier Occupied Bandwidth (kHz)	900.0	900.0	900.0	900.0	900.0	900.0	900.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-172.1	-172.0	-171.9	-171.8	-171.7	-171.6	-170.8
ITU Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	22.1	22.0	24.4	26.8	29.2	31.6	30.8
Beam TNRD (RHCP) - 2M40G8D							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	19.3	19.3	19.3	19.3	19.3	19.3	19.3
Carrier Occupied Bandwidth (kHz)	900.0	900.0	900.0	900.0	900.0	900.0	900.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-167.6	-167.5	-167.4	-167.3	-167.2	-167.1	-166.3
ITU Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	17.6	17.5	19.9	22.3	24.7	27.1	26.3

EXHIBIT 5: POWER FLUX DENSITY CALCULATIONS (continued)

FREQUENCY BAND : 10700 - 10950 MHz and 11200 - 11450 MHz							
Beam TNLD (LHCP) - 2M40G8D							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	19.3	19.3	19.3	19.3	19.3	19.3	19.3
Carrier Occupied Bandwidth (kHz)	900.0	900.0	900.0	900.0	900.0	900.0	900.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-167.6	-167.5	-167.4	-167.3	-167.2	-167.1	-166.3
ITU Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	17.6	17.5	19.9	22.3	24.7	27.1	26.3
Beam TARD (RHCP) - 2M40G8D							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	20.2	20.2	20.2	20.2	20.2	20.2	20.2
Carrier Occupied Bandwidth (kHz)	900.0	900.0	900.0	900.0	900.0	900.0	900.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-166.7	-166.6	-166.5	-166.4	-166.3	-166.2	-165.4
ITU Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	16.7	16.6	19.0	21.4	23.8	26.2	25.4

EXHIBIT 5: POWER FLUX DENSITY CALCULATIONS (continued)

FREQUENCY BAND : 10700 - 10950 MHz and 11200 - 11450 MHz							
Beam TALD (LHCP) - 2M40G8D							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	20.2	20.2	20.2	20.2	20.2	20.2	20.2
Carrier Occupied Bandwidth (kHz)	900.0	900.0	900.0	900.0	900.0	900.0	900.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-166.7	-166.6	-166.5	-166.4	-166.3	-166.2	-165.4
ITU Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	16.7	16.6	19.0	21.4	23.8	26.2	25.4
Beam UHD (H) - 25K0G7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Carrier Occupied Bandwidth (kHz)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-153.3	-153.2	-153.1	-153.0	-152.9	-152.8	-152.0
ITU Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	3.3	3.2	5.6	8.0	10.4	12.8	12.0

EXHIBIT 5: POWER FLUX DENSITY CALCULATIONS (continued)

FREQUENCY BAND : 10700 - 10950 MHz and 11200 - 11450 MHz							
Beam NLHD (H) - 36M0G7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.2*	52.0*	54.4*	55.9	55.9	55.9	55.9
Carrier Occupied Bandwidth (kHz)	30133.0	30134.0	30139.0	30144.0	30145.0	30146.0	30147.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-147.5	-145.9	-145.8	-145.7	-144.9
ITU Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.9	3.3	5.7	4.9
Beam NLVD (V) - 36M0G7W							
Elevation Angle (degrees)	0.0	5.0	10.0	15.0	20.0	25.0	90.0
Assumed EIRP	52.2*	52.0*	54.4*	55.9	55.9	55.9	55.9
Carrier Occupied Bandwidth (kHz)	30133.0	30134.0	30139.0	30144.0	30145.0	30146.0	30147.0
Spreading Loss (dB/m^2)	163.4	163.3	163.2	163.0	162.9	162.8	162.1
Maximum EIRP Spectral Density (dBW/m^2/4kHz)	-150.0	-150.0	-147.5	-145.9	-145.8	-145.7	-144.9
ITU Limit (dBW/m^2/4Hz)	-150.0	-150.0	-147.5	-145.0	-142.5	-140.0	-140.0
Margin (dB)	0.0	0.0	0.0	0.9	3.3	5.7	4.9

* This is the maximum allowable EIRP level at the specified elevation angle. The actual EIRP level of the carrier 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.

Beam designations correspond to the Schedule S beam designations.

EXHIBIT 6: INTELSAT 32e (43.1º W.L) LINK BUDGETS

UPLINK BEAM INFORMATION			
Uplink Beam Name	WIDEBEAM	WIDEBEAM	WIDEBEAM
Uplink Frequency (GHz)	14.477	14.477	14.477
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	-2.1	-2.1	-2.1
Uplink SFD (dBW/m2)	-74.3	-76.3	-76.3
Rain Rate (mm/hr)	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION			
Downlink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Downlink Frequency (GHz)	11.927	11.927	11.927
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	56.5	56.5	56.5
Rain Rate (mm/hr)	42.0	42.0	42.0
ADJACENT SATELLITE 1			
Satellite 1 Orbital Location	41.1W	41.1W	41.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-12.8	-12.8	-12.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0
ADJACENT SATELLITE 2			
Satellite 1 Orbital Location	45.0W	45.0W	45.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-25.4	-25.4	-25.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0
CARRIER INFORMATION			
Carrier ID	27M0G7W	10M3G7W	100KG7W
Carrier Modulation	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A
Information Rate(kbps)	18432	6000	64
Code Rate	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	22600	6771.1	75.4
Allocated Bandwidth(kHz)	27000	10300	100
Minimum C/N, Clear Sky (dB)	3.36	3.87	2.99
Minimum C/N, Rain (dB)	3.36	3.57	2.79
UPLINK EARTH STATION			
Earth Station Diameter (meters)	6.1	6.1	6.1
Earth Station Gain (dBi)	57.0	57.0	57.0
Earth Station Elevation Angle	20	20	20
DOWNLINK EARTH STATION			
Earth Station Diameter (meters)	3.0	2.4	2.4
Earth Station Gain (dBi)	49.2	47.5	47.5
Earth Station G/T (dB/K)	26.7	25.0	25.0
Earth Station Elevation Angle	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE			
Uplink Earth Station EIRP (dBW)	69.8	65.2	44.9
Uplink Path Loss, Clear Sky (dB)	-207.6	-207.6	-207.6
Uplink Rain Attenuation	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.1	-2.1	-2.1
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.5	-68.3	-48.8
Uplink C/N(dB)	15.1	15.8	15.0
DOWNLINK PERFORMANCE			
Downlink EIRP per Carrier (dBW)	43.6	38.2	17.9
Antenna Pointing Error (dB)	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0
Earth Station G/T (dB/K)	26.7	25.0	25.0
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-73.5	-68.3	-48.8
Downlink C / N(dB)	18.9	17.1	16.2
COMPOSITE LINK PERFORMANCE			
C/N Uplink (dB)	15.1	15.8	15.0
C/N Downlink (dB)	18.9	17.1	16.2
C/I Intermodulation (dB)	N/A	15.9	15.1
C/I Uplink Co-Channel (dB)*	27.0	18.0	17.8
C/I Downlink Co-Channel (dB)*	27.0	18.0	17.8
C/I Uplink Adjacent Satellite 1 (dB)	19.3	19.9	19.1
C/I Downlink Adjacent Satellite 1 (dB)	9.9	9.5	8.6
C/I Uplink Adjacent Satellite 2 (dB)	18.7	19.3	18.5
C/I Downlink Adjacent Satellite 2 (dB)	23.2	19.9	19.0
C/(N+I) Composite (dB)	7.4	6.1	5.3
Required System Margin (dB)	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	6.4	5.1	4.3
Minimum Required C/N (dB)	-3.4	-3.9	-3.0
Excess Link Margin (dB)	3.1	1.2	1.3
Number of Carriers	1.0	2.6	270.0
CARRIER DENSITY LEVELS			
Uplink Power Density (dBW/Hz)	-60.8	-60.1	-60.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.1	-26.9

EXHIBIT 6: INTELSAT 32e (43.1º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION					
Uplink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Uplink Frequency (GHz)	14.400	14.400	14.400	14.400	14.400
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	11.0	11.0	11.0	11.0	11.0
Uplink SFD (dBW/m2)	-82.4	-91.4	-91.4	-91.4	-91.4
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION					
Downlink Beam Name	WIDEBEAM	WIDEBEAM	WIDEBEAM	WIDEBEAM	WIDEBEAM
Downlink Frequency (GHz)	11.850	11.850	11.850	11.850	11.850
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-2.0	-2.0	-2.0	-2.0	-2.0
Downlink Contour EIRP (dBW)	45.4	45.4	45.4	45.4	45.4
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1					
Satellite 1 Orbital Location	41.1W	41.1W	41.1W	41.1W	41.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2					
Satellite 1 Orbital Location	45.0W	45.0W	45.0W	45.0W	45.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-25.4	-25.4	-25.4	-25.4	-25.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION					
Carrier ID	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	24575	6000	64	512	128
Code Rate	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	30133	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	36000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	3.36	3.57	2.79	2.7	2.7
UPLINK EARTH STATION					
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	57.0	57.0	57.0	57.0	46.5
Earth Station Elevation Angle	20	20	20	20	20
DOWNLINK EARTH STATION					
Earth Station Diameter (meters)	1.2	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	41.2	44.7	44.7	44.7	55.4
Earth Station G/T (dB/K)	18.7	22.2	22.2	22.2	33.0
Earth Station Elevation Angle	20	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE					
Uplink Earth Station EIRP (dBW)	80.5	59.0	38.8	50.8	42.0
Uplink Path Loss, Clear Sky (dB)	-207.6	-207.6	-207.6	-207.6	-207.6
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	11.0	11.0	11.0	11.0	11.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	37.7	22.7	22.0	21.9	19.1
DOWNLINK PERFORMANCE					
Downlink EIRP per Carrier (dBW)	45.4	36.0	15.8	27.8	19.0
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	18.7	22.2	22.2	22.2	33.0
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	11.5	12.1	11.4	11.3	19.4
COMPOSITE LINK PERFORMANCE					
C/N Uplink (dB)	37.7	22.7	22.0	21.9	19.1
C/N Downlink (dB)	11.5	12.1	11.4	11.3	19.4
C/I Intermodulation (dB)	N/A	26.1	25.4	25.3	22.5
C/I Uplink Co-Channel (dB)*	27.0	28.1	28.0	28.4	25.2
C/I Downlink Co-Channel (dB)*	27.0	28.1	28.0	28.4	25.2
C/I Uplink Adjacent Satellite 1 (dB)	28.7	13.7	13.0	12.9	10.1
C/I Downlink Adjacent Satellite 1 (dB)	14.1	15.8	15.1	15.0	23.7
C/I Uplink Adjacent Satellite 2 (dB)	28.1	13.1	12.4	12.3	9.5
C/I Downlink Adjacent Satellite 2 (dB)	16.7	16.8	16.1	16.0	23.2
C/(N+I) Composite (dB)	8.6	6.7	6.1	6.0	6.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	7.6	5.7	5.1	5.0	5.0
Minimum Required C/N (dB)	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	4.3	1.9	2.1	1.6	1.6
Number of Carriers	1.0	2.7	284.3	17.9	90.0
CARRIER DENSITY LEVELS					
Uplink Power Density (dBW/Hz)	-51.3	-66.3	-67.0	-67.1	-59.4
Downlink EIRP Density At Beam Peak (dBW/Hz)	-27.4	-30.3	-31.0	-31.1	-33.9

EXHIBIT 6: INTELSAT 32e (43.1º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION					
Uplink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	11.0	11.0	11.0	11.0	11.0
Uplink SFD (dBW/m2)	-79.4	-83.4	-83.4	-83.4	-83.4
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION					
Downlink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Downlink Frequency (GHz)	11.575	11.575	11.575	11.575	11.575
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	56.5	56.5	56.5	56.5	56.5
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1					
Satellite 1 Orbital Location	41.1W	41.1W	41.1W	41.1W	41.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2					
Satellite 1 Orbital Location	45.0W	45.0W	45.0W	45.0W	45.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-20.9	-20.9	-20.9	-20.9	-20.9
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION					
Carrier ID	261MG7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	178031	6000	64	512	128
Code Rate	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	218297	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	260800	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	3.36	3.57	2.79	2.7	2.7
UPLINK EARTH STATION					
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9	46.4
Earth Station Elevation Angle	20	20	20	20	20
DOWNLINK EARTH STATION					
Earth Station Diameter (meters)	1.8	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	44.5	44.5	44.5	44.5	55.2
Earth Station G/T (dB/K)	22.0	22.0	22.0	22.0	32.8
Earth Station Elevation Angle	20	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE					
Uplink Earth Station EIRP (dBW)	74.6	58.0	37.7	49.7	41.8
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	11.0	11.0	11.0	11.0	11.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-83.4	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	23.3	21.8	21.0	20.9	19.0
DOWNLINK PERFORMANCE					
Downlink EIRP per Carrier (dBW)	53.4	38.1	17.8	29.8	21.9
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.7	-205.7	-205.7	-205.7	-205.7
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	22.0	22.0	22.0	22.0	32.8
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-83.4	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	14.4	14.2	13.5	13.4	22.3
COMPOSITE LINK PERFORMANCE					
C/N Uplink (dB)	23.3	21.8	21.0	20.9	19.0
C/N Downlink (dB)	14.4	14.2	13.5	13.4	22.3
C/I Intermodulation (dB)	N/A	25.7	24.9	24.8	22.9
C/I Uplink Co-Channel (dB)*	27.0	27.7	27.5	28.0	25.6
C/I Downlink Co-Channel (dB)*	27.0	27.7	27.5	28.0	25.6
C/I Uplink Adjacent Satellite 1 (dB)	14.2	12.7	11.9	11.8	9.9
C/I Downlink Adjacent Satellite 1 (dB)	17.9	17.7	16.9	16.8	26.4
C/I Uplink Adjacent Satellite 2 (dB)	13.6	12.1	11.3	11.2	9.3
C/I Downlink Adjacent Satellite 2 (dB)	14.4	14.2	13.4	13.3	21.4
C/(N+I) Composite (dB)	7.5	6.6	5.8	5.7	5.9
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	6.5	5.6	4.8	4.7	4.9
Minimum Required C/N (dB)	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	3.1	1.7	1.8	1.3	1.5
Number of Carriers	1.0	21.4	2300.3	144.3	652.0
CARRIER DENSITY LEVELS					
Uplink Power Density (dBW/Hz)	-65.7	-67.2	-68.0	-68.1	-59.5
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.2	-27.0	-27.1	-29.0

EXHIBIT 6: INTELSAT 32e (43.1º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION					
Uplink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Uplink Frequency (GHz)	14.000	14.000	14.000	14.000	14.000
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	11.0	11.0	11.0	11.0	11.0
Uplink SFD (dBW/m2)	-79.4	-81.4	-81.4	-81.4	-81.4
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION					
Downlink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Downlink Frequency (GHz)	11.950	11.950	11.950	11.950	11.950
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	56.5	56.5	56.5	56.5	56.5
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1					
Satellite 1 Orbital Location	41.1W	41.1W	41.1W	41.1W	41.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-16.8	-16.8	-16.8	-16.8	-16.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2					
Satellite 1 Orbital Location	45.0W	45.0W	45.0W	45.0W	45.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-25.4	-25.4	-25.4	-25.4	-25.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION					
Carrier ID	112MG7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	76455	6000	64	512	128
Code Rate	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	93747	6771.1	75.4	1229.0	307.0
Allocated Bandwidth(kHz)	112000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	3.36	3.57	2.79	2.7	2.7
UPLINK EARTH STATION					
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1	1.8
Earth Station Gain (dBi)	56.7	56.7	56.7	56.7	46.2
Earth Station Elevation Angle	20	20	20	20	20
DOWNLINK EARTH STATION					
Earth Station Diameter (meters)	2.4	1.8	1.8	1.8	6.1
Earth Station Gain (dBi)	47.5	44.8	44.8	44.8	55.5
Earth Station G/T (dB/K)	25.0	22.3	22.3	22.3	33.1
Earth Station Elevation Angle	20	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE					
Uplink Earth Station EIRP (dBW)	70.8	59.9	39.6	51.6	42.3
Uplink Path Loss, Clear Sky (dB)	-207.3	-207.3	-207.3	-207.3	-207.3
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	11.0	11.0	11.0	11.0	11.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-79.7	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	23.4	23.9	23.1	23.0	19.7
DOWNLINK PERFORMANCE					
Downlink EIRP per Carrier (dBW)	49.7	38.0	17.7	29.7	20.4
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	25.0	22.3	22.3	22.3	33.1
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-79.7	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	17.1	14.1	13.4	13.3	20.8
COMPOSITE LINK PERFORMANCE					
C/N Uplink (dB)	23.4	23.9	23.1	23.0	19.7
C/N Downlink (dB)	17.1	14.1	13.4	13.3	20.8
C/I Intermodulation (dB)	N/A	21.9	21.1	21.0	17.8
C/I Uplink Co-Channel (dB)*	27.0	24.0	23.8	24.2	20.5
C/I Downlink Co-Channel (dB)*	27.0	24.0	23.8	24.2	20.5
C/I Uplink Adjacent Satellite 1 (dB)	14.1	14.6	13.8	13.7	10.5
C/I Downlink Adjacent Satellite 1 (dB)	13.5	10.8	10.0	9.9	16.7
C/I Uplink Adjacent Satellite 2 (dB)	13.5	14.0	13.2	13.1	9.9
C/I Downlink Adjacent Satellite 2 (dB)	19.9	16.7	15.9	15.8	24.0
C/(N+I) Composite (dB)	7.8	6.3	5.5	5.4	5.6
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	6.8	5.3	4.5	4.4	4.6
Minimum Required C/N (dB)	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	3.4	1.4	1.5	1.0	1.2
Number of Carriers	1.0	10.9	1120.0	77.2	280.0
CARRIER DENSITY LEVELS					
Uplink Power Density (dBW/Hz)	-65.7	-65.1	-65.9	-66.0	-58.8
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.3	-27.1	-27.2	-30.4

EXHIBIT 6: INTELSAT 32e (43.1º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	BRAZIL	BRAZIL	BRAZIL	BRAZIL
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	10.2	10.2	10.2	10.2
Uplink SFD (dBW/m2)	-73	-73	-73	-73
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	BRAZIL	BRAZIL	BRAZIL_SPOT	BRAZIL_SPOT
Downlink Frequency (GHz)	11.700	11.700	11.700	11.700
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	50.0	50.0	50.0	50.0
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	41.1W	41.1W	41.1W	41.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-20.8	-20.8	-20.8	-20.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	45.0W	45.0W	45.0W	45.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-20.8	-20.8	-20.8	-20.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	100KG7W	36M0G7W	100KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A
Information Rate(kbps)	24575	64	24575	64
Code Rate	1/2x188/204	1/2x239/256	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	30133	75.4	30133	75.4
Allocated Bandwidth(kHz)	36000	100	36000	100
Minimum C/N, Clear Sky (dB)	3.36	2.99	3.36	2.99
Minimum C/N, Rain (dB)	3.36	2.79	3.36	2.79
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	2.4	1.8	2.4
Earth Station Gain (dBi)	44.6	47.3	44.6	47.3
Earth Station G/T (dB/K)	22.1	24.8	22.1	24.8
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	78.8	52.6	78.8	52.6
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	10.2	10.2	10.2	10.2
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-48.8	-74.8	-48.8
Uplink C/N(dB)	35.3	35.1	35.3	35.1
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	44.8	17.3	44.8	17.3
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.8	-205.8	-205.8	-205.8
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	22.1	24.8	22.1	24.8
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-48.8	-74.8	-48.8
Downlink C / N(dB)	14.4	15.7	14.4	15.7
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	35.3	35.1	35.3	35.1
C/N Downlink (dB)	14.4	15.7	14.4	15.7
C/I Intermodulation (dB)	N/A	14.3	N/A	14.3
C/I Uplink Co-Channel (dB)*	27.0	23.4	27.0	23.4
C/I Downlink Co-Channel (dB)*	27.0	23.4	27.0	23.4
C/I Uplink Adjacent Satellite 1 (dB)	27.0	26.8	27.0	26.8
C/I Downlink Adjacent Satellite 1 (dB)	12.8	14.4	12.8	14.4
C/I Uplink Adjacent Satellite 2 (dB)	26.4	26.2	26.4	26.2
C/I Downlink Adjacent Satellite 2 (dB)	14.4	15.4	14.4	15.4
C/(N+I) Composite (dB)	8.8	8.4	8.8	8.4
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	7.8	7.4	7.8	7.4
Minimum Required C/N (dB)	-3.4	-3.0	-3.4	-3.0
Excess Link Margin (dB)	4.4	4.4	4.4	4.4
Number of Carriers	1.0	360.0	1.0	360.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-52.9	-53.1	-52.9	-53.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-27.4	-26.0	-27.4

EXHIBIT 7: ADJACENT SATELLITE (41.1º W.L) LINK BUDGETS

UPLINK BEAM INFORMATION				
Uplink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Uplink Frequency (GHz)	14.250	14.250	14.000	14.000
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	11.0	11.0	11.0	11.0
Uplink SFD (dBW/m2)	-79.4	-83.4	-79.4	-81.4
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Downlink Frequency (GHz)	11.575	11.575	11.950	11.950
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	56.5	56.5	56.5	56.5
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-22.4	-22.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	39.1W	39.1W	39.1W	39.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-22.4	-22.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
Carrier ID	261MG7W	100KG7W	112MG7W	100KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A
Information Rate(kbps)	178031	64	76455	64
Code Rate	1/2x188/204	1/2x239/256	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	218297	75.4	93747	75.4
Allocated Bandwidth(kHz)	260800	100	112000	100
Minimum C/N, Clear Sky (dB)	3.36	2.99	3.36	2.99
Minimum C/N, Rain (dB)	3.36	2.79	3.36	2.79
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.1	1.2	6.1	6.1
Earth Station Gain (dBi)	56.9	42.9	56.7	56.7
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	6.1	1.8	1.8
Earth Station Gain (dBi)	44.5	55.2	44.8	44.8
Earth Station G/T (dB/K)	22.0	32.8	22.3	22.3
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	74.6	37.0	70.8	39.1
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.3	-207.3
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	11.0	11.0	11.0	11.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-83.4	-48.8	-79.7	-48.8
Uplink C/N(dB)	23.3	20.3	23.4	22.6
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	53.4	18.7	49.7	18.8
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.7	-205.7	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	22.0	32.8	22.3	22.3
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-83.4	-48.8	-79.7	-48.8
Downlink C / N(dB)	14.4	25.1	14.4	14.4
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	23.3	20.3	23.4	22.6
C/N Downlink (dB)	14.4	25.1	14.4	14.4
C/I Intermodulation (dB)	N/A	17.7	N/A	14.1
C/I Uplink Co-Channel (dB)*	27.0	26.8	27.0	23.3
C/I Downlink Co-Channel (dB)*	27.0	26.8	27.0	23.3
C/I Uplink Adjacent Satellite 1 (dB)	14.2	11.2	14.1	13.3
C/I Downlink Adjacent Satellite 1 (dB)	17.9	29.3	14.6	14.6
C/I Uplink Adjacent Satellite 2 (dB)	14.2	11.2	14.1	13.3
C/I Downlink Adjacent Satellite 2 (dB)	20.0	29.9	16.7	16.7
C/(N+I) Composite (dB)	8.3	7.3	7.5	6.2
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	7.3	6.3	6.5	5.2
Minimum Required C/N (dB)	-3.4	-3.0	-3.4	-3.0
Excess Link Margin (dB)	3.9	3.3	3.1	2.2
Number of Carriers	1.0	2608.0	1.0	1120.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-65.7	-54.7	-65.7	-66.4
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.1	-26.0	-26.0

EXHIBIT 7: ADJACENT SATELLITE (41.1º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC	TRANSATLANTIC
Uplink Frequency (GHz)	14.250	14.250	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	11.0	11.0	11.0	11.0
Uplink SFD (dBW/m2)	-82.4	-82.4	-86.4	-86.4
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	WIDEBEAM	WIDEBEAM	WIDEBEAM	WIDEBEAM
Downlink Frequency (GHz)	11.85	11.85	11.85	11.85
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-2.0	-2.0	-2.0	-2.0
Downlink Contour EIRP (dBW)	45.4	45.4	45.4	45.4
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	39.1W	39.1W	39.1W	39.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
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
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1
Earth Station Gain (dBi)	56.9	56.9	56.9	56.9
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	2.4	1.2	1.2	1.2
Earth Station Gain (dBi)	47.4	41.2	41.2	41.2
Earth Station G/T (dB/K)	24.9	18.7	18.7	18.7
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	80.5	80.5	64.6	44.6
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	11.0	11.0	11.0	11.0
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
Uplink C/N(dB)	37.1	37.8	28.4	27.9
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	45.4	45.4	38.2	18.1
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	24.9	18.7	18.7	18.7
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)	17.0	11.5	10.8	10.3
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	37.1	37.8	28.4	27.9
C/N Downlink (dB)	17.0	11.5	10.8	10.3
C/I Intermodulation (dB)	N/A	N/A	20.2	19.7
C/I Uplink Co-Channel (dB)*	27.0	27.0	28.8	28.8
C/I Downlink Co-Channel (dB)*	27.0	27.0	28.8	28.8
C/I Uplink Adjacent Satellite 1 (dB)	27.9	28.7	19.3	18.8
C/I Downlink Adjacent Satellite 1 (dB)	21.0	14.1	13.4	12.9
C/I Uplink Adjacent Satellite 2 (dB)	27.9	28.7	19.3	18.8
C/I Downlink Adjacent Satellite 2 (dB)	22.5	17.8	17.1	16.6
C/(N+I) Composite (dB)	13.9	8.8	7.3	6.8
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.9	7.8	6.3	5.8
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	2.9	4.4	2.5	2.8
Number of Carriers	1	1.0	2.3	236.4
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-42.4	-51.2	-60.6	-61.1
Downlink EIRP Density At Beam Peak (dBW/Hz)	-18.6	-27.4	-28.1	-28.6

EXHIBIT 7: ADJACENT SATELLITE (41.1º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	TRANSATLANTIC	TRANSATLANTIC	WIDEBEAM	WIDEBEAM
Uplink Frequency (GHz)	14.250	14.250	14.477	14.477
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	11.0	11.0	-2.1	-2.1
Uplink SFD (dBW/m2)	-86.4	-86.4	-74.3	-74.3
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	WIDEBEAM	WIDEBEAM	TRANSATLANTIC	TRANSATLANTIC
Downlink Frequency (GHz)	11.85	11.85	11.927	11.927
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-2.0	-2.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	45.4	45.4	56.5	56.5
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-12.8	-12.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	39.1W	39.1W	39.1W	39.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-12.8	-12.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
Carrier ID	1M45G7W	400KG7W	27M0G7W	100KG7W
Carrier Modulation	BPSK	BPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A
Information Rate(kbps)	512	128	18432	64
Code Rate	R1/2	R1/2	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	1229.0	307.0	22600	75.4
Allocated Bandwidth(kHz)	1450.0	400.0	27000	100
Minimum C/N, Clear Sky (dB)	3.4	3.4	3.36	2.99
Minimum C/N, Rain (dB)	2.7	2.7	3.36	2.79
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.1	1.8	6.1	6.1
Earth Station Gain (dBi)	56.9	46.4	57.0	57.0
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	6.1	2.4	4.6
Earth Station Gain (dBi)	44.7	55.4	47.5	53.5
Earth Station G/T (dB/K)	22.2	33.0	25.0	31.0
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	53.7	43.5	69.8	45.9
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.6	-207.6
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	11.0	11.0	-2.1	-2.1
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-54.9	-73.5	-48.8
Uplink C/N(dB)	25.0	20.7	15.1	16.0
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	27.3	17.1	43.6	18.8
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	22.2	33.0	25.0	31.0
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-54.9	-73.5	-48.8
Downlink C / N(dB)	10.8	17.5	17.2	23.2
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	25.0	20.7	15.1	16.0
C/N Downlink (dB)	10.8	17.5	17.2	23.2
C/I Intermodulation (dB)	16.7	12.5	N/A	10.2
C/I Uplink Co-Channel (dB)*	26.4	21.7	27.0	17.6
C/I Downlink Co-Channel (dB)*	26.4	21.7	27.0	17.6
C/I Uplink Adjacent Satellite 1 (dB)	15.8	11.6	19.3	20.2
C/I Downlink Adjacent Satellite 1 (dB)	14.6	21.8	7.9	14.4
C/I Uplink Adjacent Satellite 2 (dB)	15.8	11.6	19.3	20.2
C/I Downlink Adjacent Satellite 2 (dB)	16.6	22.4	9.5	15.2
C/(N+I) Composite (dB)	6.6	6.1	4.6	6.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	5.6	5.1	3.6	5.1
Minimum Required C/N (dB)	-3.4	-3.4	-3.4	-3.0
Excess Link Margin (dB)	2.2	1.7	.2	2.1
Number of Carriers	24.8	90.0	1.0	270.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-64.1	-57.8	-60.8	-59.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-31.6	-35.8	-26.0	-26.0

EXHIBIT 7: ADJACENT SATELLITE (41.1º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	BRAZIL	BRAZIL	BRAZIL	BRAZIL
Uplink Frequency (GHz)	14.250	14.250	14.125	14.125
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	8.2	8.2	8.2	8.2
Uplink SFD (dBW/m2)	-73.0	-82.0	-73	-73
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	BRAZIL_SPOT	BRAZIL_SPOT	BRAZIL	BRAZIL
Downlink Frequency (GHz)	11.700	11.700	11.700	11.700
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4.0	-4.0	-10.0	-10.0
Downlink Contour EIRP (dBW)	50.0	50.0	44.0	44.0
Rain Rate (mm/hr)	95.0	95.0	95.0	95.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-20.8	-20.8	-20.8	-20.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	39.1W	39.1W	39.1W	39.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-20.8	-20.8	-20.8	-20.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	100KG7W	36M0G7W	100KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A
Information Rate(kbps)	24575	64	24575	64
Code Rate	1/2x188/204	1/2x239/256	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	30133	75.4	30133	75.4
Allocated Bandwidth(kHz)	36000	100	36000	100
Minimum C/N, Clear Sky (dB)	3.36	2.99	3.36	2.99
Minimum C/N, Rain (dB)	3.36	2.79	3.36	2.79
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1
Earth Station Gain (dBi)	56.9	56.9	56.8	56.8
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	1.8	2.4	3.7	3.7
Earth Station Gain (dBi)	44.6	47.3	50.9	50.9
Earth Station G/T (dB/K)	22.1	24.8	28.4	28.4
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	78.8	44.7	78.8	53.9
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	8.2	8.2	8.2	8.2
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-48.8	-74.8	-48.8
Uplink C/N(dB)	33.3	25.3	33.4	34.6
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	44.8	18.5	38.8	12.7
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.8	-205.8	-205.8	-205.8
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	22.1	24.8	28.4	28.4
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-48.8	-74.8	-48.8
Downlink C / N(dB)	14.4	16.9	14.7	14.7
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	33.3	25.3	33.4	34.6
C/N Downlink (dB)	14.4	16.9	14.7	14.7
C/I Intermodulation (dB)	N/A	15.4	N/A	15.7
C/I Uplink Co-Channel (dB)*	27.0	24.6	27.0	24.8
C/I Downlink Co-Channel (dB)*	27.0	24.6	27.0	24.8
C/I Uplink Adjacent Satellite 1 (dB)	25.0	16.9	25.0	26.2
C/I Downlink Adjacent Satellite 1 (dB)	12.8	15.5	13.7	13.6
C/I Uplink Adjacent Satellite 2 (dB)	25.0	16.9	25.0	26.2
C/I Downlink Adjacent Satellite 2 (dB)	14.9	17.1	14.7	14.7
C/(N+I) Composite (dB)	8.8	8.3	9.2	8.2
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	7.8	7.3	8.2	7.2
Minimum Required C/N (dB)	-3.4	-3.0	-3.4	-3.0
Excess Link Margin (dB)	4.5	4.3	4.8	4.2
Number of Carriers	1.0	360.0	1.0	360.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-52.9	-61.0	-52.8	-51.7
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.3	-26.0	-26.0

EXHIBIT 8: ADJACENT SATELLITE (45º W.L) LINK BUDGETS

UPLINK BEAM INFORMATION				
Uplink Beam Name	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA
Uplink Frequency (GHz)	14.125	14.125	14.125	14.125
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-10.0	-10.0	-10.0	-10.0
Uplink Contour G/T (dB/K)	-2.4	-2.4	-2.4	-2.4
Uplink SFD (dBW/m2)	-80	-72	-77	-77
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA
Downlink Frequency (GHz)	11.575	11.575	11.575	11.575
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	45.9	45.9	45.9	45.9
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-22.4	-22.4	-22.4	-22.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	47.0W	47.0W	47.0W	47.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
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	27769.6	6240	70.4
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	36000	30133	6771	75
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
UPLINK EARTH STATION				
Earth Station Diameter (meters)	7.0	6.0	6.0	6.0
Earth Station Gain (dBi)	58.0	57.1	57.1	57.1
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	2.4	2.4	2.4	2.4
Earth Station Gain (dBi)	47.2	47.2	47.2	47.2
Earth Station G/T (dB/K)	24.7	24.7	24.7	24.7
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	82.9	79.9	69.5	49.3
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.4	-2.4	-2.4	-2.4
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)	26.1	23.9	20.0	19.3
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	45.9	40.8	34.2	13.9
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.7	-205.7	-205.7	-205.7
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	24.7	24.7	24.7	24.7
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)	17.5	13.1	13.0	12.3
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	26.1	23.9	20.0	19.3
C/N Downlink (dB)	17.5	13.1	13.0	12.3
C/I Intermodulation (dB)	N/A	N/A	15.7	15.0
C/I Uplink Co-Channel (dB)*	27.0	27.0	24.2	24.1
C/I Downlink Co-Channel (dB)*	27.0	27.0	24.2	24.1
C/I Uplink Adjacent Satellite 1 (dB)	23.8	21.5	17.6	16.9
C/I Downlink Adjacent Satellite 1 (dB)	17.0	12.7	12.5	11.9
C/I Uplink Adjacent Satellite 2 (dB)	24.3	22.1	18.2	17.5
C/I Downlink Adjacent Satellite 2 (dB)	22.8	18.5	18.3	17.7
C/(N+I) Composite (dB)	12.4	8.6	7.0	6.4
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.4	7.6	6.0	5.4
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	1.4	4.2	2.2	2.4
Number of Carriers	1	1.0	3.5	360.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-41.1	-52.0	-55.9	-56.6
Downlink EIRP Density At Beam Peak (dBW/Hz)	-12.1	-26.0	-26.1	-26.8

EXHIBIT 8: ADJACENT SATELLITE (45º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA
Uplink Frequency (GHz)	14.125	14.125	14.125	14.125
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-10.0	-10.0	-10.0	-10.0
Uplink Contour G/T (dB/K)	-2.4	-2.4	-2.4	-2.4
Uplink SFD (dBW/m2)	-77	-77	-79	-75
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA
Downlink Frequency (GHz)	11.575	11.575	11.575	11.575
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	45.9	45.9	45.9	45.9
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-22.4	-22.4	-22.4	-22.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	47.0W	47.0W	47.0W	47.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
Carrier ID	1M45G7W	400KG7W	36M0F3F	72M0G7W
Carrier Modulation	BPSK	BPSK	TV/FM	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	4	N/A
Information Rate(kbps)	614.5	153.5	N/A	55539.3
Code Rate	R1/2	R1/2	N/A	1/2x188/204
Occupied Bandwidth(kHz)	1229.0	307.0	36000	60266
Allocated Bandwidth(kHz)	1450.0	400.0	36000	72000
Minimum C/N, Clear Sky (dB)	3.4	3.4	10.0	3.36
Minimum C/N, Rain (dB)	2.7	2.7	10.0	3.36
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.0	2.4	6.0	6.0
Earth Station Gain (dBi)	57.1	48.9	57.0	57.0
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	2.4	6.0	4.6	2.4
Earth Station Gain (dBi)	47.2	55.3	53.2	47.2
Earth Station G/T (dB/K)	24.7	32.9	30.7	24.7
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	61.3	51.8	80.9	80.2
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.4	-2.4	-2.4	-2.4
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-54.9	-75.6	-77.8
Uplink C/N(dB)	19.2	15.8	24.1	21.2
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	26.0	16.5	41.7	43.8
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.7	-205.7	-205.7	-205.7
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	24.7	32.9	30.7	24.7
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-54.9	-75.6	-77.8
Downlink C / N(dB)	12.2	17.0	19.3	13.1
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	19.2	15.8	24.1	21.2
C/N Downlink (dB)	12.2	17.0	19.3	13.1
C/I Intermodulation (dB)	14.9	11.4	N/A	N/A
C/I Uplink Co-Channel (dB)*	24.5	20.7	27.0	27.0
C/I Downlink Co-Channel (dB)*	24.5	20.7	27.0	27.0
C/I Uplink Adjacent Satellite 1 (dB)	16.8	13.4	21.7	18.8
C/I Downlink Adjacent Satellite 1 (dB)	11.7	16.9	19.2	12.6
C/I Uplink Adjacent Satellite 2 (dB)	17.4	14.0	22.3	19.4
C/I Downlink Adjacent Satellite 2 (dB)	17.5	21.7	24.3	18.4
C/(N+I) Composite (dB)	6.3	6.0	13.2	8.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	5.3	5.0	12.2	7.1
Minimum Required C/N (dB)	-3.4	-3.4	-10.0	-3.4
Excess Link Margin (dB)	1.9	1.6	2.2	3.8
Number of Carriers	24.8	90.0	2	1.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-56.7	-52.0	-42.1	-54.6
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.9	-30.4	-16.3	-26.0

EXHIBIT 8: ADJACENT SATELLITE (45º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION					
Uplink Beam Name	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA
Uplink Frequency (GHz)	14.125	14.125	14.125	14.125	14.125
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-10.0	-10.0	-10.0	-10.0	-10.0
Uplink Contour G/T (dB/K)	-2.4	-2.4	-2.4	-2.4	-2.4
Uplink SFD (dBW/m2)	-73	-79	-79	-79	-79
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION					
Downlink Beam Name	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA	EUROPE_AFRICA
Downlink Frequency (GHz)	11.575	11.575	11.575	11.575	11.575
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0	-8.0
Downlink Contour EIRP (dBW)	45.9	45.9	45.9	45.9	45.9
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1					
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-22.4	-22.4	-22.4	-22.4	-22.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2					
Satellite 1 Orbital Location	47.0W	47.0W	47.0W	47.0W	47.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION					
Carrier ID	36M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	22769.6	6240	70.4	614.5	153.5
Code Rate	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	30133	6771	75	1229.0	307.0
Allocated Bandwidth(kHz)	36000	10300	100	1450.0	400.0
Minimum C/N, Clear Sky (dB)	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	3.36	3.57	2.79	2.7	2.7
UPLINK EARTH STATION					
Earth Station Diameter (meters)	6.0	6.0	6.0	6.0	2.4
Earth Station Gain (dBi)	57.0	57.0	57.0	57.0	48.9
Earth Station Elevation Angle	20	20	20	20	20
DOWNLINK EARTH STATION					
Earth Station Diameter (meters)	2.4	2.4	2.4	2.4	6.0
Earth Station Gain (dBi)	47.2	47.2	47.2	47.2	55.4
Earth Station G/T (dB/K)	24.7	24.7	24.7	24.7	33.0
Earth Station Elevation Angle	20	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE					
Uplink Earth Station EIRP (dBW)	80.9	67.7	47.4	59.4	50.2
Uplink Path Loss, Clear Sky (dB)	-207.4	-207.4	-207.4	-207.4	-207.4
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-2.4	-2.4	-2.4	-2.4	-2.4
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	24.9	18.2	17.5	17.4	14.1
DOWNLINK PERFORMANCE					
Downlink EIRP per Carrier (dBW)	40.8	34.3	14.1	26.1	16.8
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.7	-205.7	-205.7	-205.7	-205.7
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	24.7	24.7	24.7	24.7	33.0
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	13.1	13.2	12.5	12.4	17.4
COMPOSITE LINK PERFORMANCE					
C/N Uplink (dB)	24.9	18.2	17.5	17.4	14.1
C/N Downlink (dB)	13.1	13.2	12.5	12.4	17.4
C/I Intermodulation (dB)	N/A	18.9	18.2	18.0	14.8
C/I Uplink Co-Channel (dB)*	27.0	27.4	27.3	27.7	24.0
C/I Downlink Co-Channel (dB)*	27.0	27.4	27.3	27.7	24.0
C/I Uplink Adjacent Satellite 1 (dB)	22.5	15.8	15.1	15.0	11.7
C/I Downlink Adjacent Satellite 1 (dB)	12.7	12.7	12.0	11.9	17.3
C/I Uplink Adjacent Satellite 2 (dB)	23.1	16.4	15.7	15.6	12.3
C/I Downlink Adjacent Satellite 2 (dB)	18.5	18.5	17.8	17.7	22.2
C/(N+I) Composite (dB)	8.7	7.0	6.4	6.3	6.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	7.7	6.0	5.4	5.3	5.0
Minimum Required C/N (dB)	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	4.4	2.2	2.4	1.9	1.6
Number of Carriers	2.0	6.4	673.7	42.2	180.0
CARRIER DENSITY LEVELS					
Uplink Power Density (dBW/Hz)	-50.9	-57.7	-58.4	-58.5	-53.6
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.0	-26.7	-26.8	-30.0

EXHIBIT 8: ADJACENT SATELLITE (45º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	AMERICAS	AMERICAS	AMERICAS	AMERICAS
Uplink Frequency (GHz)	14.375	14.375	14.375	14.375
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0
Uplink Contour G/T (dB/K)	-5.2	-5.2	-5.2	-5.2
Uplink SFD (dBW/m2)	-81.2	-77.2	-78.2	-78.2
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	AMERICAS	AMERICAS	AMERICAS	AMERICAS
Downlink Frequency (GHz)	11.825	11.825	11.825	11.825
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-6.0	-6.0	-6.0	-6.0
Downlink Contour EIRP (dBW)	43.3	43.3	43.3	43.3
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-12.8	-12.8	-12.8	-12.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	47.0W	47.0W	47.0W	47.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-26.0	-26.0
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
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	22769.6	6240	70.4
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	36000	30133	6771	75
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
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.0	6.0	6.0	6.0
Earth Station Gain (dBi)	57.2	57.2	57.2	57.2
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	6.1	2.4	3.0	3.0
Earth Station Gain (dBi)	55.4	47.4	49.1	49.1
Earth Station G/T (dB/K)	33.0	24.9	26.6	26.6
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	81.7	81.0	72.8	52.8
Uplink Path Loss, Clear Sky (dB)	-207.6	-207.6	-207.6	-207.6
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-5.2	-5.2	-5.2	-5.2
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Uplink C/N(dB)	22.0	22.1	20.3	19.9
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	43.3	42.8	36.0	16.0
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	33.0	24.9	26.6	26.6
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)	23.0	15.2	16.6	16.1
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	22.0	22.1	20.3	19.9
C/N Downlink (dB)	23.0	15.2	16.6	16.1
C/I Intermodulation (dB)	N/A	N/A	20.1	19.7
C/I Uplink Co-Channel (dB)*	27.0	27.0	28.7	28.8
C/I Downlink Co-Channel (dB)*	27.0	27.0	28.7	28.8
C/I Uplink Adjacent Satellite 1 (dB)	24.6	24.6	22.9	22.4
C/I Downlink Adjacent Satellite 1 (dB)	14.2	6.9	8.2	7.7
C/I Uplink Adjacent Satellite 2 (dB)	25.1	25.2	23.5	23.0
C/I Downlink Adjacent Satellite 2 (dB)	27.3	19.1	20.7	20.3
C/(N+I) Composite (dB)	12.1	5.8	6.7	6.3
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.1	4.8	5.7	5.3
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0
Excess Link Margin (dB)	1.1	1.5	1.8	2.3
Number of Carriers	1	1.0	2.4	236.8
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-41.5	-51.0	-52.8	-53.2
Downlink EIRP Density At Beam Peak (dBW/Hz)	-16.7	-26.0	-26.3	-26.7

EXHIBIT 8: ADJACENT SATELLITE (45º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	AMERICAS	AMERICAS	BRAZIL	BRAZIL
Uplink Frequency (GHz)	14.375	14.375	14.250	14.250
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-8.0	-8.0	-6.0	-6.0
Uplink Contour G/T (dB/K)	-5.2	-5.2	8.2	8.2
Uplink SFD (dBW/m2)	-78.2	-78.2	-73	-82
Rain Rate (mm/hr)	42.0	42.0	95.0	95.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	AMERICAS	AMERICAS	BRAZIL_SPOT	BRAZIL_SPOT
Downlink Frequency (GHz)	11.825	11.825	11.700	11.700
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-6.0	-6.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	43.3	43.3	50.0	50.0
Rain Rate (mm/hr)	42.0	42.0	95.0	95.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-12.8	-12.8	-20.8	-20.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	47.0W	47.0W	47.0W	47.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-26.0	-26.0	-20.8	-20.8
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
Carrier ID	1M45G7W	400KG7W	36M0G7W	100KG7W
Carrier Modulation	BPSK	BPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A
Information Rate(kbps)	614.5	153.5	24575	64
Code Rate	R1/2	R1/2	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	1229.0	307.0	30133	75.4
Allocated Bandwidth(kHz)	1450.0	400.0	36000	100
Minimum C/N, Clear Sky (dB)	3.4	3.4	3.36	2.99
Minimum C/N, Rain (dB)	2.7	2.7	3.36	2.79
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.0	3.7	6.1	6.1
Earth Station Gain (dBi)	57.2	52.8	56.9	56.9
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	3.7	6.0	2.4	2.4
Earth Station Gain (dBi)	51.0	55.5	47.3	47.3
Earth Station G/T (dB/K)	28.5	33.1	24.8	24.8
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	63.2	54.2	78.8	44.9
Uplink Path Loss, Clear Sky (dB)	-207.6	-207.6	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-5.2	-5.2	8.2	8.2
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-54.9	-74.8	-48.8
Uplink C/N(dB)	18.2	15.2	33.3	25.5
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	26.5	17.5	44.8	18.7
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.8	-205.8
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	28.5	33.1	24.8	24.8
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-60.9	-54.9	-74.8	-48.8
Downlink C / N(dB)	16.4	18.0	17.1	17.0
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	18.2	15.2	33.3	25.5
C/N Downlink (dB)	16.4	18.0	17.1	17.0
C/I Intermodulation (dB)	18.0	15.0	N/A	15.6
C/I Uplink Co-Channel (dB)*	27.7	24.2	27.0	24.8
C/I Downlink Co-Channel (dB)*	27.7	24.2	27.0	24.8
C/I Uplink Adjacent Satellite 1 (dB)	20.8	17.7	24.4	16.6
C/I Downlink Adjacent Satellite 1 (dB)	7.9	9.2	15.2	15.1
C/I Uplink Adjacent Satellite 2 (dB)	21.4	18.3	25.0	17.1
C/I Downlink Adjacent Satellite 2 (dB)	20.6	22.3	17.4	17.3
C/(N+I) Composite (dB)	6.1	6.1	11.0	8.3
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	5.1	5.1	10.0	7.3
Minimum Required C/N (dB)	-3.4	-3.4	-3.4	-3.0
Excess Link Margin (dB)	1.7	1.7	6.7	4.3
Number of Carriers	21.1	90.0	1.0	360.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-54.8	-53.4	-52.9	-60.8
Downlink EIRP Density At Beam Peak (dBW/Hz)	-28.4	-31.4	-26.0	-26.1

EXHIBIT 8: ADJACENT SATELLITE (45º W.L) LINK BUDGETS (continued)

UPLINK BEAM INFORMATION				
Uplink Beam Name	BRAZIL	BRAZIL	TRANS_ATLANTIC	TRANS_ATLANTIC
Uplink Frequency (GHz)	14.250	14.250	13.875	13.875
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-6.0	-6.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	8.2	8.2	11.0	11.0
Uplink SFD (dBW/m2)	-73	-73	-79.4	-81.4
Rain Rate (mm/hr)	95.0	95.0	42.0	42.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	BRAZIL	BRAZIL	TRANS_ATLANTIC	TRANS_ATLANTIC
Downlink Frequency (GHz)	11.700	11.700	12.075	12.075
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-10.0	-10.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	44.0	44.0	56.5	56.5
Rain Rate (mm/hr)	95.0	95.0	42.0	42.0
ADJACENT SATELLITE 1				
Satellite 1 Orbital Location	43.1W	43.1W	43.1W	43.1W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-20.8	-20.8	-19.6	-19.6
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2				
Satellite 1 Orbital Location	47.0W	47.0W	47.0W	47.0W
Uplink Power Density (dBW/Hz)	-45.0	-45.0	-45.0	-45.0
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-20.8	-20.8	-19.6	-19.6
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	100KG7W	112MG7W	100KG7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A
Information Rate(kbps)	24575	64	76455	64
Code Rate	1/2x188/204	1/2x239/256	1/2x188/204	1/2x239/256
Occupied Bandwidth(kHz)	30133	75.4	93747	75.4
Allocated Bandwidth(kHz)	36000	100	112000	100
Minimum C/N, Clear Sky (dB)	3.36	2.99	3.36	2.99
Minimum C/N, Rain (dB)	3.36	2.79	3.36	2.79
UPLINK EARTH STATION				
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1
Earth Station Gain (dBi)	56.9	56.9	56.7	56.7
Earth Station Elevation Angle	20	20	20	20
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	3.7	3.7	2.4	2.4
Earth Station Gain (dBi)	50.9	50.9	47.6	47.6
Earth Station G/T (dB/K)	28.4	28.4	25.1	25.1
Earth Station Elevation Angle	20	20	20	20
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE				
Uplink Earth Station EIRP (dBW)	78.8	54.0	70.8	38.8
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.2	-207.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	8.2	8.2	11.0	11.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-48.8	-79.7	-48.8
Uplink C/N(dB)	33.3	34.5	23.4	22.4
DOWNLINK PERFORMANCE				
Downlink EIRP per Carrier (dBW)	38.8	12.8	49.7	18.5
Antenna Pointing Error (dB)	-.5	-.5	-.5	-.5
Downlink Path Loss, Clear Sky (dB)	-205.8	-205.8	-206.0	-206.0
Downlink Rain Attenuation	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	28.4	28.4	25.1	25.1
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-74.8	-48.8	-79.7	-48.8
Downlink C / N(dB)	14.7	14.7	17.1	16.9
COMPOSITE LINK PERFORMANCE				
C/N Uplink (dB)	33.3	34.5	23.4	22.4
C/N Downlink (dB)	14.7	14.7	17.1	16.9
C/I Intermodulation (dB)	N/A	15.7	N/A	13.9
C/I Uplink Co-Channel (dB)*	27.0	24.8	27.0	23.0
C/I Downlink Co-Channel (dB)*	27.0	24.8	27.0	23.0
C/I Uplink Adjacent Satellite 1 (dB)	24.4	25.6	13.5	12.5
C/I Downlink Adjacent Satellite 1 (dB)	13.1	13.1	14.2	14.0
C/I Uplink Adjacent Satellite 2 (dB)	25.0	26.2	14.1	13.1
C/I Downlink Adjacent Satellite 2 (dB)	14.7	14.7	16.4	16.2
C/(N+I) Composite (dB)	8.9	8.1	7.6	6.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	7.9	7.1	6.6	5.1
Minimum Required C/N (dB)	-3.4	-3.0	-3.4	-3.0
Excess Link Margin (dB)	4.6	4.1	3.3	2.1
Number of Carriers	1.0	360.0	1.0	1120.0
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-52.9	-51.7	-65.6	-66.6
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.0	-26.0	-26.0	-26.3