Engineering Statement

1 Introduction

Intelsat License LLC ("Intelsat") seeks authority in this application to launch and operate a new satellite designated as Intelsat 36. This spacecraft will operate from 68.5° E.L. co-located with the Intelsat 20 spacecraft currently operating at that location.

The characteristics of the Intelsat 36 spacecraft, as well as its compliance with the various provisions of Part 25 of the Federal Communication Commission's ("FCC or "Commission") rules, are provided in the remainder of this Engineering Statement.

2 Spacecraft Overview

Intelsat 36 is a Space Systems Loral model SS/L-1300 spacecraft that is capable of operating in C-band and Ku-band frequencies listed in the table below.

C-band:	Uplink:	5925 – 6725MHz
	Downlink:	3650 – 4200 MHz
Ku-band:	Uplink:	13000 – 13250 MHz
		17300 – 18100 MHz
	Downlink:	11200 – 11450 MHz
		11700 – 12500 MHz

The spacecraft provides the following coverage:

Band	**Beam**	**Coverage**
C-band	Landmass	Europe, Asia, Middle East, and Africa
Ku-band	Southern Africa	Southern Africa

2.1 Spacecraft Characteristics

Intelsat 36 is a three-axis stabilized type spacecraft that has a rectangular outer body structure. Intelsat 36 utilizes two deployable solar array wings and a number of deployable and non-deployable antennas.

The Intelsat 36 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) Communications

These subsystems maintain the correct position and attitude of the spacecraft, ensure that all internal units are maintained within the required temperature range, and ensure 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 36 provides mechanical support for all subsystems. The structure supports the communication antennas, solar arrays, and 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 36 provides active communication channels at C-band and Ku-band frequencies. The C-band payload employs channels having a bandwidth of 27 MHz, 36 MHz, 54 MHz, 57 MHz, and 60 MHz. The Ku-band payload employs channels having bandwidths of 36 MHz, 54 MHz, 72 MHz, and 82 MHz. The Intelsat 36 frequency and polarization plan as well as the coverage contours for the C-band and Ku-band beams are provided in Schedule S.

The level of isolation of the Intelsat 36 beams is equal to or greater than 27 dB. This level was the best that the satellite manufacturer could achieve without causing excessive degradation in the performance of the beam and/or in the size of the beams' coverage area. Intelsat has taken this level of isolation into account in its planned operations. Section 25.210(i)(1) requires antenna-cross-polarization isolation such that the ratio of the on-axis co-polar gain to the on-axis cross-polar gain of the antenna in the assigned frequency band shall be at least 30 dB within its primary coverage area Therefore, to the extent necessary, Intelsat requests a waiver of Section 25.210(i)(1).

Exhibits 2 and 3 provide the beam parameters for the Intelsat 36 uplink and downlink beams, respectively.

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 36 can be commanded through the use of two available command channels centered at the frequencies 6722.0 MHz and 6724.5 MHz. The spacecraft telemetry is received through two of four telemetry channels centered at the frequencies 3652.0 MHz, 3652.5 MHz, 3653.5 MHz, and 3654.0 MHz.

The coverage patterns of the on-station command and telemetry beams as well as the wide-angle beams used for orbital maneuvers and on-station emergencies have gain contours that vary by less than 8 dB across the surface of the Earth, and accordingly the gain at 8 dB below the peak falls beyond the edge of the Earth. Therefore, pursuant to Section 25.114(c)(4)(vi)(A) of the FCC's rules, contours for these beams are not required to be provided and the associated GXT files have not been included in Schedule S. The Intelsat 36 command and telemetry subsystem performance is summarized in Exhibit 4.

2.4 Uplink Power Control Subsystem

Intelsat 36 utilizes one C-band and two Ku-band ULPC channels. The C-band ULPC channel center frequency is 3650.5 MHz. The Ku-band ULPC channel center frequencies are 11200.5 MHz and 12496.0 MHz.

The coverage patterns of the C-band and Ku-band beams have gain contours that vary by less than 8 dB across the surface of the Earth, and accordingly the gain at 8 dB below the peak falls beyond the edge of the Earth. Therefore, pursuant to Section 25.114(c)(4)(vi)(A) of the FCC's rules, contours for these beams are not required to be provided and the associated GXT files have not been included in Schedule S. The Intelsat 36 ULPC subsystem performance is summarized in Exhibit 4.

2.5 Satellite Station-Keeping

The spacecraft will be maintained within 0.05° of its nominal longitudinal position in the east-west 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.).

3 Services and Emission Designators

Intelsat 36 is to be a general purpose communications satellite and has been designed to support various services offered within the Intelsat's satellite system. Depending upon the needs of the users, the transponders on Intelsat 36 can accommodate television, radio, voice, and data communications. Typical communication services include:

a) Compressed digital video

b) High speed digital data

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

Emission designators and allocated bandwidths for representative communication carriers are provided in Schedule S.

4 Power Flux Density ("PFD")

The power flux density ("PFD") limits for space stations operating in the 3650– 4200 MHz band are contained in Section 25.208 of the Commission's rules. With respect to the frequency band 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 – 12500 MHz band applicable to geostationary satellites operating in the fixed satellite service in ITU Region 1.

The maximum PFD levels for the Intelsat 36 transmissions were calculated for the 3650 – 4200 MHz, 11200 – 11450 MHz, and 11700 – 12500 MHz bands. The PFD levels were also calculated for the Intelsat 36 telemetry and ULPC carriers. The results are provided in Schedule S and show that the downlink power flux density levels of the Intelsat 36 carriers do not exceed the limits specified in Section 25.208 of the Commission's rules or the limits specified in No. 21.16 of the ITU Radio Regulations.

5 Emission Compliance

Section 25.202(e) of the FCC's rules requires that the carrier frequency of each space station transmitter be maintained within 0.002% of the reference frequency. Intelsat 36 is designed to be compliant with the provisions of this rule.

Intelsat will comply with the provisions of Section 25.202(f) of the Commission's rules with regard to Intelsat 36 emissions.

6 Orbital Location

Intelsat requests that it be assigned the 68.5° E.L. orbital location for Intelsat 36. The 68.5° E.L. location satisfies Intelsat 36 requirements for optimizing coverage, elevation angles, and service availability. Additionally, the location also ensures that the maximum operational, economic, and public interest benefits will be derived.

As previously indicated, Intelsat 36 will be co-located with Intelsat 20 at 68.5° E.L. Intelsat will use the well-documented eccentricity and inclination collocation strategy for orbit control. With this procedure, two spacecraft can be controlled with the same station-keeping limits of ±0.05 degrees in both latitude and longitude and still maintain a minimum close approach of greater than 5 km.

7 Interference Analysis

The impact of the proposed Intelsat 36 emissions on the transmissions of adjacent satellites located at 66.5° E.L.[1] and 70.5º E.L.[2] was analyzed. Interference analysis was conducted for a number of representative carriers at non-planned C-band and Ku-band frequencies. It was assumed that there was a hypothetical satellite having the same operating characteristics as Intelsat 36 at the 66.5° E.L. orbital location and another such satellite at 70.5° E.L.

For the satellite located at 66.5° E.L. it was assumed that the adjacent satellites were Intelsat 36, located at 68.5º E.L., and a hypothetical satellite having the same operating characteristics as Intelsat 36 located at 64.5º E.L.

For the satellite located at 70.5º E.L., it was assumed that the adjacent satellites were Intelsat 36, located at 68.5º E.L., and a hypothetical satellite having the same operating characteristics as Intelsat 36 located at 72.5º E.L. [3]

Other assumptions made for the interference analysis were as follows:

a) In the plane of the geostationary satellite orbit, all transmitting and receiving earth station antennas have off-axis co-polar gains that are compliant with the limits specified in section 25.209(a)(1) of the FCC's rules.
b) All transmitting and receiving earth stations have a cross-polarization isolation value of at least 30 dB within their main beam lobe.
c) At C-band frequencies, degradation due to rain is not considered, given that rain (attenuation) effects are insignificant at C-band.
d) At Ku-band frequencies, rain attenuation predictions are derived using Recommendation ITU-R P.618.
e) At Ku-band frequencies, increase in noise temperature of the receiving earth station due to rain is taken into account.
f) For the cases where the transponder operates in a multi-carrier mode, the effects due to intermodulation interference are taken into account.

All assumptions and the results of the analysis are documented in Exhibits 5 and 6. The Intelsat 36 transmissions will be limited to those levels contained in Sections 25.212(c) and (d) and Section 25.138 of the Commission's rules, as applicable, unless higher levels

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[1] At the time of submission of this application, no satellites are located at or near two degrees from 68.5°E.L. in the vicinity of 66.5°E.L.

[2] Eutelsat 70B is located at 70.5°E.L., but it is not licensed by the United States. The inclusion of the satellite in the interference analysis would therefore be inconsistent with a two-degree orbital separation environment and policy.

[3] At the time of submission of this application, no satellites licensed by the United Stated are located at or near either 64.5° E.L. or 72.5° E.L.

are coordinated with affected adjacent satellite operators. In any case, pursuant to the results in Exhibits 5 and 6, the uplink power density of the Intelsat 36 digital carriers will not exceed the levels specified below:

a) 5925 – 6725 MHz: -38.7 dBW/Hz
b) 13000 – 13250 MHz: -50.0 dBW/Hz
c) 17300 – 18100 MHz: -50.0 dBW/Hz

The downlink EIRP density of Intelsat 36 digital carriers will not exceed the levels specified below:

a) 3650 – 4200 MHz: -32.0 dBW/Hz
b) 11200 – 11450 MHz: -20.0 dBW/Hz
c) 11700 – 12500 MHz: -19.5 dBW/Hz

8 Orbital Debris Mitigation Plan

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

8.1 Spacecraft Hardware Design

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

8.2 Minimizing Accidental Explosions

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

8.3 Safe Flight Profiles

Intelsat has assessed and limited the probability of the space station becoming a source of debris as a result of collisions with large debris or other operational space stations. With the exception of Intelsat 20, Intelsat 36 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.

With the exception of Intelsat 20, 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 36. Intelsat is also not aware of any system with an overlapping station-keeping volume with Intelsat 36, with the exception of Intelsat 20, that is the subject of an ITU filing and that is either in orbit or progressing towards launch.

To safely maintain Intelsat 36 and Intelsat 20 at 68.5° E.L., Intelsat will use the well-documented eccentricity and inclination collocation strategy for orbit control. With this procedure, two spacecraft can be controlled with the same station-keeping limits of ±0.05 degrees in both latitude and longitude and still maintain a minimum close approach of greater than 5 km.

8.4 Post-Mission Disposal

At the end of the mission, Intelsat intends to dispose of the spacecraft by moving it to a minimum altitude above the altitude established by the IADC formula. Intelsat has reserved 1.6 kilograms of xenon 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.[4] For reference, the effective area to mass ratio (Cr*A/M) of the Intelsat 36 spacecraft is 0.041 m^2/kg, resulting in a minimum perigee disposal altitude under the IADC formula of at most 300 kilometers above the geostationary arc. Accordingly, the Intelsat 36 planned disposal orbit complies with the FCC's rules.

9 ITU Filing

Intelsat 36's operations in the 3650– 4200 MHz and 5925 – 6725 MHz bands have been coordinated under the Administration of the United States International Telecommunication Union ("ITU") filings USASAT-14I, USASAT-14I-3, and USASAT-60C.

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[4] *Mitigation of Orbital Debris*, Second Report and Order, IB Docket No. 02-54, FCC 04-130 (rel. June 21, 2004).

Intelsat 36's operations in the 11200 – 11450 MHz and 13000 – 13250 MHz bands have been coordinated under the Administration of Germany International Telecommunication Union ("ITU") filing, Odyssey FSS-68.5E.

Intelsat currently has no United States ITU filing with for a satellite network that specifies operation in the frequency bands 11200 – 11450 MHz, 13000 – 13250 MHz, 11700 – 12500 MHz and 17300 – 18100 MHz at the nominal orbital location of 68.5° E.L. Intelsat will submit to the Commission Appendix 4 information for a new satellite network that utilizes these frequency bands at the nominal orbital of 68.5° E.L., to be forwarded to the ITU.

10 TC&R Control Earth Stations

Intelsat will conduct TC&R operations through one or more of the following earth stations: Mingenew, Australia; Kumsan, South Korea; or Fucino, Italy. Additionally, Intelsat is capable of remotely controlling Intelsat 36 from its facilities in McLean, VA or in Long Beach, CA.

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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	December 28, 2015
Roya Shambayati Intelsat Director, Spectrum Strategy	Date

EXHIBIT 1

SUMMARY OF SPACECRAFT CHARACTERISTICS

General Spacecraft Characteristics	
Spacecraft Name	Intelsat 36
Orbital Location	68.5° E.L.
Spacecraft Manufacturer	Space Systems Loral
Spacecraft Model	SS/L-1300
Spacecraft Type	3-axis stabilized
Spacecraft Expected Lifetime	15 years
Eclipse Capability	100%
Station-keeping	
North-South	±0.05°
East-West	±0.05°
Propulsion Type	Xenon ion

EXHIBIT 2

COMMUNICATION SUBSYSTEM UPLINK BEAM PARAMETERS

Beam Name	C-Band Linear	C-Band Linear	Ku-Band Linear	Ku-Band Linear
Schedule S Beam ID	CWHU	CWVU	KUHU	KUVU
Frequency Band (MHz)	5925 - 6725	5925 - 6725	13000 – 13250 17300 - 18100	13000 – 13250 17300 - 18100
Polarization	Horizontal	Vertical	Horizontal	Vertical
Beam Peak Gain (dBi)	26.7	26.8	37.5	37.6
G/T (dB/K)	0.8	1.2	11.3	11.3
Minimum SFD-- (dBW/m^2)	-79.4	-79.8	-83.7	-83.7
Maximum SFD-- (dBW/m^2)	-103.4	-103.8	-104.7	-104.7

EXHIBIT 3

COMMUNICATION SUBSYSTEM DOWNLINK BEAM PARAMETERS

Beam Name	C-Band Linear	C-Band Linear	Ku-Band Linear	Ku-Band Linear
Schedule S Beam ID	CWHD	CWVD	KUHD	KUVD
Frequency Band (MHz)	3650 - 4200	3650 - 4200	11200 – 11450 11700 - 12500	11200 – 11450 11700 - 12500
Polarization	Horizontal	Vertical	Horizontal	Vertical
Peak Antenna Gain (dBi)	28.0	28.0	37.4	37.5
EIRP (dBW)	44.6	44.6	56.4	56.7

EXHIBIT 4

TC&R and ULPC SUBSYSTEM CHARACTERISTICS

Beam Name	Command - Global	Command – Omni
Schedule S Beam ID	CGRU	CZRU
Frequencies (MHz)	6722.0, 6724.5	6722.0, 6724.5
Polarization	RHCP	RHCP
Peak Antenna Gain (dBi)	19.0	6.0

Beam Name	Telemetry - Global	Telemetry – Omni	ULPC	ULPC
Schedule S Beam ID	TGLD	TZLD	CLRD	KLRD
Frequencies (MHz)	3652.0, 3652.5, 3653.5, 3654.0	3652.0, 3652.5, 3653.5, 3654.0	3650.5	11200.5, 12496.0
Polarization	LHCP	LHCP	RHCP	RHCP
Peak Antenna Gain (dBi)	18.1	6.0	27.2	27.5
Maximum Channel EIRP (dBW)	9.4	13.0	20.0	18.0

Note: *RHCP: Right Hand Circular Polarization, LHCP: Left Hand Circular Polarization*

EXHIBIT 5
Hypothetical 66.5°E INTERFERENCE ANALYSIS

UPLINK BEAM INFORMATION				
Uplink Beam Name	**CWHU / CWVU**	**CWHU / CWVU**	**CWHU / CWVU**	**CWHU / CWVU**
Uplink Frequency (MHz)	**6015**	**6015**	**6015**	**6015**
Uplink Beam Polarization	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**
Uplink Beam Peak G/T (dB/K)	**0.8**	**0.8**	**0.8**	**0.8**
Uplink Beam Peak SFD (dBW/m2)	**-79.8**	**-79.8**	**-79.8**	**-79.8**
Uplink Relative Contour Level (dB)	**-8.0**	**-8.0**	**-8.0**	**-8.0**
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	**CWHD / CWVD**	**CWHD / CWVD**	**CWHD / CWVD**	**CWHD / CWVD**
Downlink Frequency (MHz)	**3790**	**3790**	**3790**	**3790**
Downlink Beam Polarization	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**
Downlink Beam Peak EIRP (dBW)	**44.6**	**44.6**	**44.6**	**44.6**
Downlink Relative Contour Level (dB)	**-8.5**	**-8.5**	**-8.5**	**-8.5**
ADJACENT SATELLITE 1				
Satellite Name	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**
Orbital Location	**68.5E**	**68.5E**	**68.5E**	**68.5E**
Uplink Power Density (dBW/Hz)	**-38.7**	**-38.7**	**-38.7**	**-38.7**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-32.0**	**-32.0**	**-32.0**	**-32.0**
ADJACENT SATELLITE 2				
Satellite Name	**Hypothetical 64.5E**	**Hypothetical 64.5E**	**Hypothetical 64.5E**	**Hypothetical 64.5E**
Orbital Location	**64.5E**	**64.5E**	**64.5E**	**64.5E**
Uplink Power Density (dBW/Hz)	**-38.7**	**-38.7**	**-38.7**	**-38.7**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-32.0**	**-32.0**	**-32.0**	**-32.0**
CARRIER INFORMATION				
Carrier ID	**36M0G7W**	**8M25G7W**	**1M74G7W**	**861KG7W**
Carrier Modulation	**QPSK**	**QPSK**	**QPSK**	**BPSK**
Information Rate(kbps)	**36860**	**8448**	**1024**	**272**
Code Rate	**3/4x188/204**	**3/4**	**1/2**	**0.431**
Occupied Bandwidth(kHz)	**26664.7**	**6111.3**	**1284**	**717.1**
Allocated Bandwidth(kHz)	**36000**	**8250.5**	**1733**	**861**
Minimum C/N, Rain (dB)	**7.3**	**7.3**	**1.8**	**0.8**
UPLINK EARTH STATION				
Earth Station Diameter (meters)	**10.0**	**5.0**	**3.7**	**3.7**
Earth Station Gain (dBi)	**53.7**	**47.7**	**45.1**	**45.1**
Earth Station Elevation Angle	**6.4**	**6.4**	**6.4**	**6.4**
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	**7.5**	**7.5**	**3.7**	**3.7**
Earth Station Gain (dBi)	**48.1**	**48.1**	**41.9**	**41.9**
Earth Station G/T (dB/K)	**29.0**	**29.0**	**22.7**	**22.7**
Earth Station Elevation Angle	**6.4**	**6.4**	**6.4**	**6.4**
COMPOSITE LINK PERFORMANCE				
C/N Thermal Uplink (dB)	**25.8**	**26.3**	**26.4**	**25.9**
Uplink Interference C/I (dB)	**28.6**	**29.1**	**19.4**	**31.9**
Uplink Adjacent Satellite C/I (dB)	**13.2**	**13.7**	**13.9**	**13.3**
Intermodulation C/IM (dB)	**35.3**	**21.8**	**21.3**	**21.8**
Downlink Thermal C/N (dB)	**15.0**	**15.0**	**8.8**	**8.2**
Downlink Interference C/I (dB)	**24.1**	**21.7**	**20.5**	**23.5**
Downlink Adjacent Satellite C/I (dB)	**15.4**	**15.4**	**6.0**	**5.4**
Subtotal C/N (dB)	**9.3**	**9.2**	**3.4**	**3.0**
Antenna Mispointing and Other Losses (dB)	**1.5**	**1.5**	**1.5**	**1.5**
Total C/N (dB)	**7.8**	**7.7**	**1.9**	**1.5**
Minimum Required C/N (dB)	**7.3**	**7.3**	**1.8**	**0.8**
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	**-47.8**	**-41.3**	**-39.3**	**-39.0**
Downlink EIRP Density At Beam Peak (dBW/Hz)	**-37.1**	**-37.1**	**-41.9**	**-37.6**

UPLINK BEAM INFORMATION				
Uplink Beam Name	**CWHU/CWVU**	**CWHU/CWVU**	**CWHU/CWVU**	**CWHU/CWVU**
Uplink Frequency (MHz)	**6610**	**6610**	**6610**	**6610**
Uplink Beam Polarization	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**
Uplink Beam Peak G/T (dB/K)	**0.8**	**0.8**	**0.8**	**0.8**
Uplink Beam Peak SFD (dBW/m2)	**-79.8**	**-79.8**	**-79.8**	**-79.8**
Uplink Relative Contour Level (dB)	**-8.0**	**-8.0**	**-8.0**	**-8.0**
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	**KUVD/KUHD**	**KUVD/KUHD**	**KUVD/KUHD**	**KUVD/KUHD**
Downlink Frequency (MHz)	**11888**	**11888**	**11888**	**11888**
Downlink Beam Polarization	**Vertical/Horizontal**	**Vertical/Horizontal**	**Vertical/Horizontal**	**Vertical/Horizontal**
Downlink Beam Peak EIRP (dBW)	**56.7**	**56.7**	**56.7**	**56.7**
Downlink Relative Contour Level (dB)	**-7.9**	**-7.9**	**-7.9**	**-7.9**
ADJACENT SATELLITE 1				
Satellite Name	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**
Orbital Location	**68.5E**	**68.5E**	**68.5E**	**68.5E**
Uplink Power Density (dBW/Hz)	**-38.7**	**-38.7**	**-38.7**	**-38.7**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-19.5**	**-19.5**	**-19.5**	**-19.5**
ADJACENT SATELLITE 2				
Satellite Name	**Hypothetical 64.5E**	**Hypothetical 64.5E**	**Hypothetical 64.5E**	**Hypothetical 64.5E**
Orbital Location	**64.5E**	**64.5E**	**64.5E**	**64.5E**
Uplink Power Density (dBW/Hz)	**-38.7**	**-38.7**	**-38.7**	**-38.7**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-20.0**	**-20.0**	**-20.0**	**-20.0**
CARRIER INFORMATION				
Carrier ID	**36M0G7W**	**8M25G7W**	**1M74G7W**	**861KG7W**
Carrier Modulation	**QPSK**	**QPSK**	**QPSK**	**BPSK**
Information Rate(kbps)	**36860**	**8448**	**1024**	**272**
Code Rate	**3/4x188/204**	**3/4**	**1/2**	**0.431**
Occupied Bandwidth(kHz)	**26664.7**	**6111.3**	**1284**	**717.1**
Allocated Bandwidth(kHz)	**36000**	**8250.5**	**1733**	**861**
Minimum C/N, Rain (dB)	**7.3**	**7.3**	**1.8**	**0.8**
UPLINK EARTH STATION				
Earth Station Diameter (meters)	**10.0**	**3.7**	**3.7**	**3.7**
Earth Station Gain (dBi)	**53.7**	**45.1**	**45.1**	**45.1**
Earth Station Elevation Angle	**6.4**	**6.4**	**6.4**	**6.4**
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	**6.5**	**6.5**	**2.4**	**1.8**
Earth Station Gain (dBi)	**55.6**	**55.6**	**47.0**	**44.5**
Earth Station G/T (dB/K)	**34.0**	**34.0**	**25.0**	**23.3**
Earth Station Elevation Angle	**25.2**	**25.2**	**25.2**	**25.2**
COMPOSITE LINK PERFORMANCE				
C/N Thermal Uplink (dB)	**24.0**	**24.0**	**23.3**	**23.8**
Uplink Interference C/I (dB)	**36.3**	**36.2**	**35.5**	**39.8**
Uplink Adjacent Satellite C/I (dB)	**11.6**	**11.6**	**10.9**	**11.4**
Intermodulation C/IM (dB)	**999.0**	**44.5**	**43.6**	**45.6**
Downlink Thermal C/N (dB)	**22.7**	**21.8**	**12.1**	**10.9**
Downlink Interference C/I (dB)	**28.1**	**24.7**	**23.2**	**23.6**
Downlink Adjacent Satellite C/I (dB)	**16.3**	**15.9**	**6.5**	**4.4**
Subtotal C/N (dB)	**9.8**	**9.6**	**4.2**	**2.8**
Antenna Mispointing and Other Losses (dB)	**1.5**	**1.5**	**1.5**	**1.5**
Total C/N (dB)	**8.3**	**8.1**	**2.7**	**1.3**
Minimum Required C/N (dB)	**7.3**	**7.3**	**1.8**	**0.8**
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	**-50.2**	**-45.2**	**-41.2**	**-41.9**
Downlink EIRP Density At Beam Peak (dBW/Hz)	**-26.3**	**-26.4**	**-27.1**	**-26.6**

UPLINK BEAM INFORMATION				
Uplink Beam Name	**KUHU / KUVU**	**KUHU / KUVU**	**KUHU / KUVU**	**KUHU / KUVU**
Uplink Frequency (MHz)	**13068**	**13068**	**13068**	**13068**
Uplink Beam Polarization	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**
Uplink Beam Peak G/T (dB/K)	**11.3**	**11.3**	**11.3**	**11.3**
Uplink Beam Peak SFD (dBW/m2)	**-81.2**	**-81.2**	**-81.2**	**-81.2**
Uplink Relative Contour Level (dB)	**--8.5**	**-8.5**	**-8.5**	**-8.5**
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	**KUVD / KUHD**	**KUVD / KUHD**	**KUVD / KUHD**	**KUVD / KUHD**
Downlink Frequency (MHz)	**11268**	**11268**	**11268**	**11268**
Downlink Beam Polarization	**Vertical/Horizontal**	**Vertical/Horizontal**	**Vertical/Horizontal**	**Vertical/Horizontal**
Downlink Beam Peak EIRP (dBW)	**56.7**	**56.7**	**56.7**	**56.7**
Downlink Relative Contour Level (dB)	**-7.9**	**-7.9**	**-7.9**	**-7.9**
ADJACENT SATELLITE 1				
Satellite Name	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**
Orbital Location	**68.5E**	**68.5E**	**68.5E**	**68.5E**
Uplink Power Density (dBW/Hz)	**-50**	**-50**	**-50.0**	**-50.0**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-19.5**	**-19.5**	**-19.5**	**-19.5**
ADJACENT SATELLITE 2				
Satellite Name	**Hypothetical 64.5E**	**Hypothetical 64.5E**	**Hypothetical 64.5E**	**Hypothetical 64.5E**
Orbital Location	**64.5E**	**64.5E**	**64.5E**	**64.5E**
Uplink Power Density (dBW/Hz)	**-50**	**-50**	**-50.0**	**-50.0**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-20.0**	**-20.0**	**-20.0**	**-20.0**
CARRIER INFORMATION				
Carrier ID	**36M0G7W**	**8M25G7W**	**1M74G7W**	**861KG7W**
Carrier Modulation	**QPSK**	**QPSK**	**QPSK**	**BPSK**
Information Rate(kbps)	**36860**	**8448**	**1024**	**272**
Code Rate	**3/4x188/204**	**3/4**	**1/2**	**0.431**
Occupied Bandwidth(kHz)	**26664.7**	**6111.3**	**1284**	**717.1**
Allocated Bandwidth(kHz)	**36000**	**8250.5**	**1733**	**861**
Minimum C/N, Rain (dB)	**7.3**	**7.3**	**1.8**	**0.8**
UPLINK EARTH STATION				
Earth Station Diameter (meters)	**6.5**	**2.4**	**1.8**	**1.8**
Earth Station Gain (dBi)	**57.4**	**48.7**	**46.2**	**46.2**
Earth Station Elevation Angle	**25.2**	**25.2**	**25.2**	**25.2**
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	**6.5**	**6.5**	**2.4**	**1.8**
Earth Station Gain (dBi)	**55.6**	**55.6**	**47.0**	**44.5**
Earth Station G/T (dB/K)	**34.0**	**34.0**	**25.0**	**23.3**
Earth Station Elevation Angle	**25.2**	**25.2**	**25.2**	**25.2**
COMPOSITE LINK PERFORMANCE				
C/N Thermal Uplink (dB)	**19.9**	**19.9**	**19.1**	**19.7**
Uplink Interference C/I (dB)	**28.1**	**27.6**	**26.9**	**32.6**
Uplink Adjacent Satellite C/I (dB)	**14.0**	**13.9**	**13.2**	**13.7**
Intermodulation C/IM (dB)	**999.0**	**43.0**	**42.3**	**44.3**
Downlink Thermal C/N (dB)	**23.8**	**22.9**	**13.2**	**12.0**
Downlink Interference C/I (dB)	**28.4**	**24.8**	**23.3**	**24.0**
Downlink Adjacent Satellite C/I (dB)	**17.3**	**17.2**	**7.7**	**5.6**
Subtotal C/N (dB)	**11.2**	**11.0**	**5.5**	**4.0**
Antenna Mispointing and Other Losses (dB)	**1.5**	**1.5**	**1.5**	**1.5**
Total C/N (dB)	**9.7**	**9.5**	**4.0**	**2.5**
Minimum Required C/N (dB)	**7.3**	**7.3**	**1.8**	**0.8**
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	**-61.5**	**-52.9**	**-51.1**	**-50.6**
Downlink EIRP Density At Beam Peak (dBW/Hz)	**-26.3**	**-26.4**	**-27.1**	**-26.6**

EXHIBIT 6
HYPOTHETICAL 70.5°E SATELLITE INTERFERENCE ANALYSIS

UPLINK BEAM INFORMATION				
Uplink Beam Name	**CWHU / CWVU**	**CWHU / CWVU**	**CWHU / CWVU**	**CWHU / CWVU**
Uplink Frequency (MHz)	**6015**	**6015**	**6015**	**6015**
Uplink Beam Polarization	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**
Uplink Beam Peak G/T (dB/K)	**0.8**	**0.8**	**0.8**	**0.8**
Uplink Beam Peak SFD (dBW/m2)	**-79.8**	**-79.8**	**-79.8**	**-79.8**
Uplink Relative Contour Level (dB)	**-8.0**	**-8.0**	**-8.0**	**-8.0**
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	**CWHD / CWVD**	**CWHD / CWVD**	**CWHD / CWVD**	**CWHD / CWVD**
Downlink Frequency (MHz)	**3790**	**3790**	**3790**	**3790**
Downlink Beam Polarization	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**
Downlink Beam Peak EIRP (dBW)	**44.6**	**44.6**	**44.6**	**44.6**
Downlink Relative Contour Level (dB)	**-8.5**	**-8.5**	**-8.5**	**-8.5**
ADJACENT SATELLITE 1				
Satellite Name	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**
Orbital Location	**68.5E**	**68.5E**	**68.5E**	**68.5E**
Uplink Power Density (dBW/Hz)	**-38.7**	**-38.7**	**-38.7**	**-38.7**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-32.0**	**-32.0**	**-32.0**	**-32.0**
ADJACENT SATELLITE 2				
Satellite Name	**Hypothetical 72.5E**	**Hypothetical 72.5E**	**Hypothetical 72.5E**	**Hypothetical 72.5E**
Orbital Location	**72.5E**	**72.5E**	**72.5E**	**72.5E**
Uplink Power Density (dBW/Hz)	**-38.7**	**-38.7**	**-38.7**	**-38.7**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-32.0**	**-32.0**	**-32.0**	**-32.0**
CARRIER INFORMATION				
Carrier ID	**36M0G7W**	**8M25G7W**	**1M74G7W**	**861KG7W**
Carrier Modulation	**QPSK**	**QPSK**	**QPSK**	**BPSK**
Information Rate(kbps)	**36860**	**8448**	**1024**	**272**
Code Rate	**3/4x188/204**	**3/4**	**1/2**	**0.431**
Occupied Bandwidth(kHz)	**26664.7**	**6111.3**	**1284**	**717.1**
Allocated Bandwidth(kHz)	**36000**	**8250.5**	**1733**	**861**
Minimum C/N, Rain (dB)	**7.3**	**7.3**	**1.8**	**0.8**
UPLINK EARTH STATION				
Earth Station Diameter (meters)	**10.0**	**5.0**	**3.7**	**3.7**
Earth Station Gain (dBi)	**53.7**	**47.7**	**45.1**	**45.1**
Earth Station Elevation Angle	**6.4**	**6.4**	**6.4**	**6.4**
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	**7.5**	**7.5**	**3.7**	**3.7**
Earth Station Gain (dBi)	**48.1**	**48.1**	**41.9**	**41.9**
Earth Station G/T (dB/K)	**29.0**	**29.0**	**22.7**	**22.7**
Earth Station Elevation Angle	**6.4**	**6.4**	**6.4**	**6.4**
COMPOSITE LINK PERFORMANCE				
C/N Thermal Uplink (dB)	**25.8**	**26.3**	**26.4**	**25.9**
Uplink Interference C/I (dB)	**28.6**	**29.1**	**19.4**	**31.9**
Uplink Adjacent Satellite C/I (dB)	**13.2**	**13.7**	**13.9**	**13.3**
Intermodulation C/IM (dB)	**35.3**	**21.8**	**21.3**	**21.8**
Downlink Thermal C/N (dB)	**15.0**	**15.0**	**8.8**	**8.2**
Downlink Interference C/I (dB)	**24.1**	**21.7**	**20.5**	**23.5**
Downlink Adjacent Satellite C/I (dB)	**15.4**	**15.4**	**6.0**	**5.4**
Subtotal C/N (dB)	**9.3**	**9.2**	**3.4**	**3.0**
Antenna Mispointing and Other Losses (dB)	**1.5**	**1.5**	**1.5**	**1.5**
Total C/N (dB)	**7.8**	**7.7**	**1.9**	**1.5**
Minimum Required C/N (dB)	**7.3**	**7.3**	**1.8**	**0.8**
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	**-47.8**	**-41.3**	**-39.3**	**-39.0**
Downlink EIRP Density At Beam Peak (dBW/Hz)	**-37.1**	**-37.1**	**-41.9**	**-37.6**

UPLINK BEAM INFORMATION				
Uplink Beam Name	CWHU/CWVU	CWHU/CWVU	CWHU/CWVU	CWHU/CWVU
Uplink Frequency (MHz)	6610	6610	6610	6610
Uplink Beam Polarization	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Uplink Beam Peak G/T (dB/K)	0.8	0.8	0.8	0.8
Uplink Beam Peak SFD (dBW/m2)	-79.8	-79.8	-79.8	-79.8
Uplink Relative Contour Level (dB)	-8.0	-8.0	-8.0	-8.0
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	KUVD/KUHD	KUVD/KUHD	KUVD/KUHD	KUVD/KUHD
Downlink Frequency (MHz)	11888	11888	11888	11888
Downlink Beam Polarization	Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
Downlink Beam Peak EIRP (dBW)	56.7	56.7	56.7	56.7
Downlink Relative Contour Level (dB)	-7.9	-7.9	-7.9	-7.9
ADJACENT SATELLITE 1				
Satellite Name	Intelsat 36	Intelsat 36	Intelsat 36	Intelsat 36
Orbital Location	68.5E	68.5E	68.5E	68.5E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Beam Peak Downlink EIRP Density (dBW/Hz)	-19.5	-19.5	-19.5	-19.5
ADJACENT SATELLITE 2				
Satellite Name	Hypothetical 72.5E	Hypothetical 72.5E	Hypothetical 72.5E	Hypothetical 72.5E
Orbital Location	72.5E	72.5E	72.5E	72.5E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7
Beam Peak Downlink EIRP Density (dBW/Hz)	-20.0	-20.0	-20.0	-20.0
CARRIER INFORMATION				
Carrier ID	36M0G7W	8M25G7W	1M74G7W	861KG7W
Carrier Modulation	QPSK	QPSK	QPSK	BPSK
Information Rate(kbps)	36860	8448	1024	272
Code Rate	3/4x188/204	3/4	1/2	0.431
Occupied Bandwidth(kHz)	26664.7	6111.3	1284	717.1
Allocated Bandwidth(kHz)	36000	8250.5	1733	861
Minimum C/N, Rain (dB)	7.3	7.3	1.8	0.8
UPLINK EARTH STATION				
Earth Station Diameter (meters)	10.0	3.7	3.7	3.7
Earth Station Gain (dBi)	53.7	45.1	45.1	45.1
Earth Station Elevation Angle	6.4	6.4	6.4	6.4
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	6.5	6.5	2.4	1.8
Earth Station Gain (dBi)	55.6	55.6	47.0	44.5
Earth Station G/T (dB/K)	34.0	34.0	25.0	23.3
Earth Station Elevation Angle	25.2	25.2	25.2	25.2
COMPOSITE LINK PERFORMANCE				
C/N Thermal Uplink (dB)	24.0	24.0	23.3	23.8
Uplink Interference C/I (dB)	36.3	36.2	35.5	39.8
Uplink Adjacent Satellite C/I (dB)	11.6	11.6	10.9	11.4
Intermodulation C/IM (dB)	999.0	44.5	43.6	45.6
Downlink Thermal C/N (dB)	22.7	21.8	12.1	10.9
Downlink Interference C/I (dB)	28.1	24.7	23.2	23.6
Downlink Adjacent Satellite C/I (dB)	16.3	15.9	6.5	4.4
Subtotal C/N (dB)	9.8	9.6	4.2	2.8
Antenna Mispointing and Other Losses (dB)	1.5	1.5	1.5	1.5
Total C/N (dB)	8.3	8.1	2.7	1.3
Minimum Required C/N (dB)	7.3	7.3	1.8	0.8
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	-50.2	-45.2	-41.2	-41.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-26.3	-26.4	-27.1	-26.6

UPLINK BEAM INFORMATION				
Uplink Beam Name	**KUHU / KUVU**	**KUHU / KUVU**	**KUHU / KUVU**	**KUHU / KUVU**
Uplink Frequency (MHz)	**13068**	**13068**	**13068**	**13068**
Uplink Beam Polarization	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**	**Horizontal/Vertical**
Uplink Beam Peak G/T (dB/K)	**11.3**	**11.3**	**11.3**	**11.3**
Uplink Beam Peak SFD (dBW/m2)	**-81.2**	**-81.2**	**-81.2**	**-81.2**
Uplink Relative Contour Level (dB)	**--8.5**	**-8.5**	**-8.5**	**-8.5**
DOWNLINK BEAM INFORMATION				
Downlink Beam Name	**KUVD / KUHD**	**KUVD / KUHD**	**KUVD / KUHD**	**KUVD / KUHD**
Downlink Frequency (MHz)	**11268**	**11268**	**11268**	**11268**
Downlink Beam Polarization	**Vertical/Horizontal**	**Vertical/Horizontal**	**Vertical/Horizontal**	**Vertical/Horizontal**
Downlink Beam Peak EIRP (dBW)	**56.7**	**56.7**	**56.7**	**56.7**
Downlink Relative Contour Level (dB)	**-7.9**	**-7.9**	**-7.9**	**-7.9**
ADJACENT SATELLITE 1				
Satellite Name	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**	**Intelsat 36**
Orbital Location	**68.5E**	**68.5E**	**68.5E**	**68.5E**
Uplink Power Density (dBW/Hz)	**-50.0**	**-50.0**	**-50.0**	**-50.0**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-19.5**	**-19.5**	**-19.5**	**-19.5**
ADJACENT SATELLITE 2				
Satellite Name	**Hypothetical 72.5E**	**Hypothetical 72.5E**	**Hypothetical 72.5E**	**Hypothetical 72.5E**
Orbital Location	**72.5E**	**72.5E**	**72.5E**	**72.5E**
Uplink Power Density (dBW/Hz)	**-50.0**	**-50.0**	**-50.0**	**-50.0**
Beam Peak Downlink EIRP Density (dBW/Hz)	**-20.0**	**-20.0**	**-20.0**	**-20.0**
CARRIER INFORMATION				
Carrier ID	**36M0G7W**	**8M25G7W**	**1M74G7W**	**861KG7W**
Carrier Modulation	**QPSK**	**QPSK**	**QPSK**	**BPSK**
Information Rate(kbps)	**36860**	**8448**	**1024**	**272**
Code Rate	**3/4x188/204**	**3/4**	**1/2**	**0.431**
Occupied Bandwidth(kHz)	**26664.7**	**6111.3**	**1284**	**717.1**
Allocated Bandwidth(kHz)	**36000**	**8250.5**	**1733**	**861**
Minimum C/N, Rain (dB)	**7.3**	**7.3**	**1.8**	**0.8**
UPLINK EARTH STATION				
Earth Station Diameter (meters)	**6.5**	**2.4**	**1.8**	**1.8**
Earth Station Gain (dBi)	**57.4**	**48.7**	**46.2**	**46.2**
Earth Station Elevation Angle	**25.2**	**25.2**	**25.2**	**25.2**
DOWNLINK EARTH STATION				
Earth Station Diameter (meters)	**6.5**	**6.5**	**2.4**	**1.8**
Earth Station Gain (dBi)	**55.6**	**55.6**	**47.0**	**44.5**
Earth Station G/T (dB/K)	**34.0**	**34.0**	**25.0**	**23.3**
Earth Station Elevation Angle	**25.2**	**25.2**	**25.2**	**25.2**
COMPOSITE LINK PERFORMANCE				
C/N Thermal Uplink (dB)	**19.9**	**19.9**	**19.1**	**19.7**
Uplink Interference C/I (dB)	**28.1**	**27.6**	**26.9**	**32.6**
Uplink Adjacent Satellite C/I (dB)	**14.0**	**13.9**	**13.2**	**13.7**
Intermodulation C/IM (dB)	**999.0**	**43.0**	**42.3**	**44.3**
Downlink Thermal C/N (dB)	**23.8**	**22.9**	**13.2**	**12.0**
Downlink Interference C/I (dB)	**28.4**	**24.8**	**23.3**	**24.0**
Downlink Adjacent Satellite C/I (dB)	**17.3**	**17.2**	**7.7**	**5.6**
Subtotal C/N (dB)	**11.2**	**11.0**	**5.5**	**4.0**
Antenna Mispointing and Other Losses (dB)	**1.5**	**1.5**	**1.5**	**1.5**
Total C/N (dB)	**9.7**	**9.5**	**4.0**	**2.5**
Minimum Required C/N (dB)	**7.3**	**7.3**	**1.8**	**0.8**
CARRIER DENSITY LEVELS				
Uplink Power Density (dBW/Hz)	**-61.5**	**-52.9**	**-51.1**	**-50.6**
Downlink EIRP Density At Beam Peak (dBW/Hz)	**-26.3**	**-26.4**	**-27.1**	**-26.6**