TECHNICAL APPENDIX FOR SES-4

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3. Type of Authorization Requested

New Skies Satellites B.V. (doing business as "SES WORLD SKIES") hereby submits this Petition for Declaratory Ruling ("Petition") seeking U.S. market access for SES-4, as a replacement for the currently operating NSS-7 satellite at the 22.0º W.L. (338° E.L.) orbital location. Specifically, SES WORLD SKIES requests: (1) the inclusion of SES-4, with respect to its conventional C-band and Ku-band payloads, on the Permitted Space Station List ("Permitted List") for the provision of Fixed-Satellite

Service (“FSS”) to, from and within the United States; (2) a ruling permitting the use of the extended C-band and Ku-band capacity on SES-4 for the provision of international FSS and limited tracking, telemetry and command (“TT&C”) operations; and (3) authority to provide direct-to-home (“DTH”) FSS within the United States and between the United States and certain other countries.

4. General Description of Overall System Facilities, Operations and Services

SES-4 is a geostationary satellite operating in the C-band and Ku-band that will provide a range of FSS to users located in various countries in ITU Regions 1 and 2 from the 22º W.L. orbital location. The C-band portion of the communications payload consists of 36 transponders with one group of 42-for-36 Traveling Wave Tube Amplifiers ("TWTAs"), using both left hand and right hand circular polarization to achieve dual frequency re-use. The satellite features three C-band beams that can be interconnected on a transponder-by-transponder basis: (a) West Hemisphere beam (covering Eastern North America, Central America, and South America), (b) East Hemisphere beam (covering Europe, the Middle East, and Africa), and (c) a Global beam. Eight (8) C-band transponders have a bandwidth of 72 MHz, sixteen (16) transponders have a bandwidth of 54 MHz, and twelve (12) transponders have a bandwidth of 36 MHz.

The Ku-band portion of the communications payload consists of 50 transponders with one group of 58-for-50 Traveling Wave Tube Amplifiers TWTAs, using both horizontal and vertical polarization to achieve dual frequency re-use. The satellite features four Ku-band beams that can be interconnected on a transponder-by-transponder basis: (a) Europe/Middle East beam (covering Europe, Middle East, Northern Africa and part of Russia), (b) North American beam (covering North America), (c) Southern Cone beam (covering Latin America) and (c) a West Africa beam (covering Western and

Central Africa). Six (6) Ku-band transponders have a bandwidth of 62 MHz, thirty eight (38) transponders have a bandwidth of 54 MHz, and six (6) transponders have a bandwidth of 36 MHz.

SES-4 has a wide range of possible connectivities between the different beams, including the possibility to cross-connect between C-band beams and Ku-band beams.

As specified in Table 5-5 and Appendix C, the Telemetry, Tracking and Control ("TT&C") functions will be provided at the edges of the allocated conventional C-band, Ku-band, and extended Ku-band frequencies, consistent with the Commission's rules.[1] The accompanying Schedule S includes information on which antenna beams are connected or switchable to each transponder and TT&C functions.

5. Operational Characteristics

5.1 Frequency/Channelization and Polarization Plan

Details of the SES-4 frequency/channelization and polarization plan, including the TT&C frequencies, are included in the accompanying Schedule S. Typical emission designators with associated bandwidth can also be found in the Schedule S.

5.2 Communications Payload

5.2.1 Uplink Transmissions

The maximum receive antenna gain, receive system noise temperature, and beam peak G/T, SFD and cross-polarization isolation of the SES-4 satellite are all specified in the accompanying Schedule S. Note that the G/T will decrease and the SFD level will increase, dB-for-dB, from the beam peak value as the uplink location moves away from beam peak.

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[1] *See* 47 C.F.R. § 25.202(g); *see also In the Matter of EchoStar KuX Corporation Application for Authority to Construct, Launch and Operate a Geostationary Satellite Using the Extended Ku-band*
(footnote continued)

5.2.2 Downlink Transmissions

In the C-band, the SES-4 downlink will be capable of a maximum EIRP of 42.8 dBW in the East Hemi Beam, 42.1 dBW in the West Hemi Beam, and 36.4 dBW in the Global Beam. In the Ku-band, the SES-4 downlink will be capable of a maximum EIRP of 50.9 dBW in the Europe/Middle East Beam, 54.3 dBW in the North America Beam, 51.9 dBW in the Southern Cone Beam, and 51.9 dBW in the West Africa Beam. The peak transmit antenna gain, EIRP, cross-polarization, and associated contours are specified in the accompanying Schedule S.

5.2.3 Channel Filter Response

The predicted worst case channel filter response performance for each of the transponder bandwidths (72 MHz, 62 MHz, 54 MHz and 36 MHz), measured between the receive antenna reference interface point and the transmit antenna reference interface point, is shown in Table 5-1a and Table 5-1b.

Parameter	Frequency Offset from Channel Center (F_c)	Gain Relative to Channel Center Frequency
Insertion Loss Variation 36 MHz Channel	±12.6 MHz	0.3 dB_{p-p}
	±14.4 MHz	0.4 dB_{p-p}
	±16.2 MHz	0.6 dB_{p-p}
	±18.0 MHz	1.2 dB_{p-p}
Insertion Loss Variation 54 MHz Channel	±18.9 MHz	0.3 dB_{p-p}
	±21.6 MHz	0.4 dB_{p-p}
	±24.3 MHz	0.5 dB_{p-p}
	±27 MHz	1.0 dB_{p-p}
Insertion Loss Variation 72 MHz Channel	±25.2 MHz	0.3 dB_{p-p}
	±28.8 MHz	0.4 dB_{p-p}
	±32.4 MHz	0.5 dB_{p-p}
	±36 MHz	1.0 dB_{p-p}

Table 5-1a. Response Characteristics of Representative SES-4 C-band Channel Filter

Frequencies in the Fixed-Satellite Service at the 83° W.L. Orbital Location, 20 FCC Rcd 919, at ¶ 18 (Int'l Bur. 2004).

Parameter	Frequency Offset from Channel Center (F_c)	Gain Relative to Channel Center Frequency
Insertion Loss Variation 36 MHz Channel	±12.6 MHz	0.4 dB_{p-p}
	±14.4 MHz	0.6 dB_{p-p}
	±16.2 MHz	1.1 dB_{p-p}
	±18.0 MHz	2.3 dB_{p-p}
Insertion Loss Variation 54 MHz Channel	±18.9 MHz	0.4 dB_{p-p}
	±21.6 MHz	0.6 dB_{p-p}
	±24.3 MHz	0.9 dB_{p-p}
	±27 MHz	1.6 dB_{p-p}
Insertion Loss Variation 62 MHz Channel	±21.7 MHz	0.5 dB_{p-p}
	±24.8 MHz	0.6 dB_{p-p}
	±27.9 MHz	0.9 dB_{p-p}
	±31.0 MHz	1.6 dB_{p-p}

Table 5-1b. Response Characteristics of Representative SES-4 Ku-band Channel Filter

The narrow-band receive and transmit out-of-band response, and the wide-band receive out-of-band response for each of the transponder bandwidths (72 MHz, 62 MHz, 54 MHz and 36 MHz) are shown in Tables 5-2a, 5-2b, 5-3a, 5-3b and 5-4.

Parameter	Frequency Offset from Channel Center (F_c)	Gain Relative to Channel Center Frequency
Insertion Loss Variation 36 MHz Channel	> ±23 MHz	-10 dB
	> ±27 MHz	-40 dB
Insertion Loss Variation 54 MHz Channel	> ±34 MHz	-10 dB
	> ±38 MHz	-40 dB
Insertion Loss Variation 72 MHz Channel	> ±44 MHz	-10 dB
	> ±50 MHz	-40 dB
	> ±94 MHz	-40 dB

Table 5-2a. Narrow-band Receive Out-of-Band Response Characteristics of Representative SES-4 C-band Channels

Parameter	Frequency Offset from Channel Center (F_c)	Gain Relative to Channel Center Frequency
Insertion Loss Variation 36 MHz Channel	> ±23 MHz	-10 dB
	> ±27 MHz	-25 dB
	> ±30 MHz	-40 dB
Insertion Loss Variation 54 MHz Channel	> ±34 MHz	-10 dB
	> ±38 MHz	-40 dB
Insertion Loss Variation 62 MHz Channel	> ±38 MHz	-10 dB
	> ±43 MHz	-40 dB
	> ±81 MHz	-40 dB

Table 5-2b. Narrow-band Receive Out-of-Band Response Characteristics of Representative SES-4 Ku-band Channels

Parameter	Frequency Offset from Channel Center (F_c)	Gain Relative to Channel Center Frequency
Insertion Loss Variation 36 MHz Channel	> ±23 MHz	-8 (-6) dB
	> ±27 MHz	-20 (-15) dB
Insertion Loss Variation 54 MHz Channel	> ±34 MHz	-8 (-6) dB
	> ±38 MHz	-20 (-15) dB
Insertion Loss Variation 72 MHz Channel	> ±44 MHz	-8 (-6) dB
	> ±50 MHz	-20 (-15) dB
	> ±94 MHz	-20 (-15) dB

Table 5-3a. Narrow-band Transmit Out-of-Band Response Characteristics of Representative SES-4 C-band Channels (values in parentheses apply to the channel edge corresponding to the upper or lower edge of the transmit band)

Parameter	Frequency Offset from Channel Center (F_c)	Gain Relative to Channel Center Frequency
Insertion Loss Variation 36 MHz Channel	> ±23 MHz	-8 (-6) dB
	> ±27 MHz	-20 (-15) dB
Insertion Loss Variation 54 MHz Channel	> ±34 MHz	-8 (-6) dB
	> ±38 MHz	-20 (-15) dB
Insertion Loss Variation 62 MHz Channel	> ±38 MHz	-8 (-6) dB
	> ±43 MHz	-20 (-15) dB
	> ±81 MHz	-20 (-15) dB

Table 5-3b. Narrow-band Transmit Out-of-Band Response Characteristics of Representative SES-4 Ku-band Ku-band Channels (values in parentheses apply to the channel edge corresponding to the upper or lower edge of the transmit band)

Parameter	Frequency Offset from Bands Edges (F_e)	Gain Relative to Channel Center Frequency
Out of Band Rejection All Channels	±160 MHz	-20 dB
	±200 MHz	-30 dB

Table 5-4. Wide-band Receive Out-of-Band Response Characteristics of Representative SES-4 Channels

The filtered signals will have 15 dB of gain adjustment with a step size of 1 dB

dB for both the C- and Ku-band payload. The Ku-band payload also has an ALC

adjustment range of -10 to +3 dB w.r.t. saturation, with 0.5dB steps. Each active satellite transmission chain (channel amplifiers and associated TWTAs) can be individually turned on and off by ground telecommand, resulting in cessation of emissions from the satellite, as required.

5.3 TT&C Subsystem

The satellite TT&C subsystem provides redundant telemetry, tracking and command channels for the SES-4 spacecraft. The principal functions of the subsystem are:

1. Reception and amplification of the radio frequency command uplinks and demodulation for subsequent signal processing and command distribution.
2. Modulation, up-conversion, amplification, and transmission of all telemetry data.
3. Reception and retransmission of ground-station-generated ranging signals.

Normal on-station commands will be received through the earth-facing horn antenna, and on-station telemetry will be transmitted through the earth facing horn antenna, allowing the satellite to be commanded from anywhere on the Earth that is visible from its orbital location.

A beacon signal will be continuously transmitted by the satellite and used by earth station operators as a calibrated reference to compensate for rain attenuation and to adjust antenna pointing. This frequency will be transmitted through the earth facing horn antenna and will be available anywhere within the satellite's coverage area.

The TT&C frequency and polarization plans for all phases of the mission are shown in Table 5-5.

Carrier	Frequency, MHz	Polarization
Telecommand 1	14496.0	RHCP
Telecommand 2	14499.0	RHCP
Telemetry 1	11451.0	RHCP

Telemetry 2	11454.0	RHCP
Telemetry 3	12500.5	LHCP
Telemetry 4	12502.0	LHCP
Tracking Beacon	4199.75	V

Table 5-5. SES-4 TT&C Frequency and Polarization Plan

It should be noted that Telemetry frequencies 1 through 4 can also be used as tracking beacon signals. The two telemetry frequencies in the 12.5 GHz band are usable only in ITU Region 1.

The telemetry and command link performance is summarized in the link budget analysis in Appendix C. The antenna patterns for the TT&C subsystem are discussed in Section 7.3. The emission designators associated with the TT&C subsystem are 800KF9D for command, 300KF9D for telemetry and 25K0N0N for the tracking beacons. The associated allocated bandwidth is 800 kHz, 300 kHz and 25 kHz for each of these emissions, respectively.

5.6 Cross-polarization Isolation

The cross-polarization isolation performance of the SES-4 antennas are given in Schedule S. The cross-polarization isolation performance is less than the 30 dB required by Section 25.210(i) for the primary coverage areas of the satellite. The cross-polarization isolation performance for the SES-4 satellite is 28 dB for the East Hemi beam and 26.3 dB for the West Hemi beam. For the Ku-band beams, the worst-case cross-polarization isolation is in the 27 dB range. Such cross-polarization isolation performance levels will have a negligible impact on adjacent satellites. SES WORLD SKIES respectfully requests a waiver of Section 25.210(i) for SES-4. *See* Narrative, at Section III.C.2.

6. Orbital Location

SES WORLD SKIES will operate the SES-4 satellite at the 22.0° W.L. orbital location, under a license issued by and ITU network filings registered to The Netherlands. The requested orbital location is necessary to provide continuity of service to customers.

7. Predicted Spacecraft Antenna Gain Contours

7.1 Uplink Beams

The receive antenna gain contours for the SES-4 receive beams are given in GXT format in the accompanying Schedule S. The contours can also be found in Appendix B.

7.2 Downlink Beams

The peak transmit gain, and the antenna gain contours in GXT format, are given in the accompanying Schedule S. The contours can also be found in Appendix B.

7.3 TT&C Beams

The TT&C coverage for all stages of mission operation will be provided by the receive communications antenna for command and by the earth facing horn transmit communications antenna for telemetry. The receive and transmit antenna beam patterns are given in GXT format in the accompanying Schedule S (see also Sections 7.1 and 7.2 above).

8. Service Description, Link Performance Analysis, and Earth Station Parameters

8.1 Service Description

SES WORLD SKIES will use the SES-4 satellite to provide a wide range of FSS services, including voice, video and narrowband to wideband digital services, to customers throughout the Americas, Europe, the Middle East, and Africa.

8.2 Link Performance

Representative communications link budgets for the SES-4 satellite are shown in Appendix A as Tables A-1 to A-39. The TT&C link budgets are shown in Appendix C as Tables C-1 to C-4.

In the link budgets depicted in Tables A-1 to A-39 it is also indicated to which transponders they relate (under the header "Associated Txr IDs") as they are defined in the accompanying Schedule S. This information would relate to Columns "a" and "b" of Table S13 of Schedule S.

The link budgets assume two adjacent operating satellites at 2 degrees orbital separation each. For the C-band digital carrier link budgets, the uplink power density of the emissions from each of the neighboring satellites was assumed to be -42 dBW/Hz. The downlink EIRP density of the emissions of each of the adjacent satellites was assumed to be -34 dBW/Hz. At Ku-band, the uplink power density of the emissions from each of the adjacent satellites was assumed to be -50 dBW/Hz, and the maximum downlink EIRP density of the emissions from each of the hypothetical satellites was assumed to be -26 dBW/Hz.

8.3 Earth Station Parameters

Earth station characteristics are reflected in the representative link budgets shown in Appendix A as Tables A-1 to A-39 as well as the accompanying Schedule S.

9. Satellite Orbit Characteristics

The SES-4 satellite will be maintained in geosynchronous orbit at the 22º W.L. orbital location with a maximum N-S drift of ± 0.05° and a maximum E-W drift of ± 0.05°. The antenna axis attitude will be maintained within a value of ± 0.16° for pitch, ± 0.14° for roll, and 0.41° for yaw, for all modes of operation.

10. Power Flux Density

The allowable PFD levels in the C-band are defined in Section 25.208(a) of the Commission's rules for all conditions, including clear sky, and for all methods of modulation as:

(1) For angles of arrival between 0 and 5 degrees above the horizontal plane: -152 dBW/m^2 in any 4 kHz band;

(2) For angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane: -152 + (δ-5)/2 dBW/m^2 in any 4 kHz band; and

(3) For angles of arrival between 25 and 90 degrees above the horizontal plane: -142 dBW/m^2 in any 4 kHz band.

SES WORLD SKIES will operate SES-4 such that all C-band downlink transmissions will comply with these PFD limits.

The allowable PFD levels in the 10.95-11.20 GHz and 11.45-11.70 GHz bands (per 4kHz) are defined in Section 25.208(b)(1) of the Commission's rules for all conditions, including clear sky, and for all methods of modulation as:

(1) For angles of arrival between 0 and 5 degrees above the horizontal plane: -150 dBW/m^2 in any 4 kHz band;

(2) For angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane: -150 + (δ-5)/2 dBW/m^2 in any 4 kHz band; and

(3) For angles of arrival between 25 and 90 degrees above the horizontal plane: -140 dBW/m^2 in any 4 kHz band.

With respect to the 12.50-12.75 GHz band, the allowable PFD levels are defined in No. 21.16 of the ITU Radio Regulations for all conditions, including clear sky, and for all methods of modulation as:

(1) For angles of arrival between 0 and 5 degrees above the horizontal plane: -148 dBW/m^2 in any 4 kHz band;

(2) For angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane: -148 + (δ-5)/2 dBW/m^2 in any 4 kHz band; and

(3) For angles of arrival between 25 and 90 degrees above the horizontal plane: -138 dBW/m^2 in any 4 kHz band.

With respect to the frequency band 11.70-11.95 GHz, no PFD limits are specified in either the FCC rules or the ITU Radio Regulations.

The SES-4 payload will be operated such that all Ku-band downlink transmissions will comply with the applicable PFD limits referenced above.

In order to demonstrate such compliance, the carrier with the highest EIRP density in each of the possible beam connectivities, based on the link budgets set forth in Appendix A, is depicted in Table 10.1 (the worst case for digital and analog transmissions is provided separately) and analyzed below. It should be noted that in the Ku-band downlink there are also some transponders with a bandwidth of 62 MHz on-board the spacecraft. However, from the carrier design point of view, and for the maximum PFD value calculations, these transponders are the same as the 54 MHz transponders. Therefore, the below tables will not separately reflect the connectivities for 62 MHz separately.

Connectivity	Analog/Digital Carrier	EIRP density (dBW/4kHz)	Carrier Type
West Hemi/West Hemi (WH/WH 36 MHz)	Digital	1.0	36M0G7W
	Analog	13.4	36M0F3F
West Hemi/West Hemi (WH/WH 54 MHz)	Digital	0.6	54M0G7W
	Analog	13.4	36M0F3F
West Hemi/West Hemi (WH/WH 72 MHz)	Digital	-0.8	72M0G7W
	Analog	10.2	36M0F3F
East Hemi/West Hemi (EH/WH 36 MHz)	Digital	1.0	36M0G7W
	Analog	13.0	36M0F3F
East Hemi/West Hemi (EH/WH 54 MHz)	Digital	0.6	54M0G7W
	Analog	13.0	36M0F3F
East Hemi/West Hemi	Digital	-0.8	72M0G7W

Connectivity	Analog/Digital Carrier	EIRP density (dBW/4kHz)	Carrier Type
(EH/WH 72 MHz)	Analog	10.2	36M0F3F
Europe/West Hemi	Digital	0.6	54M0G7W
(EU/WH 54 MHz)	Analog	13.2	36M0F3F
West Africa/West Hemi	Digital	0.7	54M0G7W
(WA/WH 54 MHz)	Analog	13.1	36M0F3F
Global/Global	Digital	-2.2	36M0G7W
(GLB/GLB 36 MHz)	Analog	9.6	36M0F3F
West Hemi/East Hemi	Digital	1.0	36M0G7W
(WH/EH 36 MHz)	Analog	12.7	36M0F3F
West Hemi/East Hemi	Digital	1.0	54M0G7W
(WH/EH 54 MHz)	Analog	12.7	36M0F3F
West Hemi/East Hemi	Digital	-0.3	72M0G7W
(WH/EH 72 MHz)	Analog	10.7	36M0F3F
East Hemi/East Hemi	Digital	1.0	36M0G7W
(EH/EH 36 MHz)	Analog	12.6	36M0F3F
East Hemi/East Hemi	Digital	0.9	54M0G7W
(EH/EH 54 MHz)	Analog	12.6	36M0F3F
East Hemi/East Hemi	Digital	-0.3	72M0G7W
(EH/EH 72 MHz)	Analog	10.7	36M0F3F
Europe/East Hemi	Digital	0.8	54M0G7W
(EU/EH 54 MHz)	Analog	12.9	36M0F3F
West Africa/East Hemi	Digital	1.0	54M0G7W
(WA/EH 54 MHz)	Analog	12.9	36M0F3F
Europe/Europe	Digital	9.9	36M0G7W
(EU/EU 36 MHz)	Analog	14.2	36M0F3F
Europe/Europe	Digital	9.3	54M0G7W
(EU/EU 54 MHz)	Analog	14.2	36M0F3F
West Africa/Europe	Digital	9.8	36M0G7W
(WA/EU 36 MHz)	Analog	13.6	36M0F3F
West Africa/Europe	Digital	9.4	54M0G7W
(WA/EU 54 MHz)	Analog	13.6	36M0F3F

Connectivity	Analog/Digital Carrier	EIRP density (dBW/4kHz)	Carrier Type
West Hemi/Europe (WH/EU 54 MHz)	Digital	9.4	54M0G7W
	Analog	13.8	36M0F3F
East Hemi/Europe (EH/EU 54 MHz)	Digital	9.4	54M0G7W
	Analog	14.0	36M0F3F
North America/Europe (NA/EU 36 MHz)	Digital	9.7	36M0G7W
	Analog	14.2	36M0F3F
North America/Europe (NA/EU 54 MHz)	Digital	9.4	54M0G7W
	Analog	14.2	36M0F3F
Europe/West Africa (EU/WA 36 MHz)	Digital	9.8	36M0G7W
	Analog	19.9	36M0F3F
Europe/West Africa (EU/WA 54 MHz)	Digital	9.8	54M0G7W
	Analog	19.9	36M0F3F
West Africa/West Africa (WA/WA 36 MHz)	Digital	10.0	36M0G7W
	Analog	19.8	36M0F3F
West Africa/West Africa (WA/WA 54 MHz)	Digital	10.0	54M0G7W
	Analog	19.8	36M0F3F
West Hemi/West Africa (WH/WA 54 MHz)	Digital	10.0	54M0G7W
	Analog	19.7	36M0F3F
East Hemi/West Africa (EH/WA 54 MHz)	Digital	10.0	54M0G7W
	Analog	19.7	36M0F3F
N. America/West Africa (NA/WA 36 MHz)	Digital	9.9	36M0G7W
	Analog	19.3	36M0F3F
N. America/West Africa (NA/WA 54 MHz)	Digital	10.0	54M0G7W
	Analog	19.3	36M0F3F
S. Cone/S. Cone (SC/SC 54 MHz)	Digital	10.0	54M0G7W
	Analog	16.0	36M0F3F
North America/S. Cone (NA/SC 54 MHz)	Digital	10.0	54M0G7W
	Analog	16.0	36M0F3F
S. Cone /North America (SC/NA 54 MHz)	Digital	10.0	54M0G7W
	Analog	14.4	36M0F3F
N. America /N. America	Digital	9.9	54M0G7W

Connectivity	Analog/Digital Carrier	EIRP density (dBW/4kHz)	Carrier Type
(NA/NA 54 MHz)	Analog	14.1	36M0F3F
W. Africa /N. America (WA/NA 54 MHz)	Digital	9.9	54M0G7W
	Analog	13.9	36M0F3F
Europe /N. America (EU/NA 54 MHz)	Digital	10.0	54M0G7W
	Analog	14.5	36M0F3F

Table 10-1. Maximum power density levels for different connectivities

Tables 10-2 to 10-82 below show the worst case PFD levels that will occur at various angles of arrival, for the different connectivities, to demonstrate that they will comply with the requirements of Section 25.208(a) and 25.208(b).

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-164.7	12.7
5°	-152.0	-163.3	-2.2	-164.5	12.5
10°	-149.5	-163.2	-1.2	-163.4	13.9
15°	-147.0	-163.0	-1.0	-163.0	16.0
20°	-144.5	-162.9	-0.7	-162.6	18.1
25°	-142.0	-162.8	-0.2	-162.0	20.0
30° (Peak)	-142.0	-162.7	0.0	-161.7	19.7

Table 10-2. Max PFD Levels, WH/WH 36 MHz, Digital Carrier (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-152.3	0.3

5°	-152.0	-163.3	-2.2	-152.1	0.1
10°	-149.5	-163.2	-1.2	-151.0	1.5
15°	-147.0	-163.0	-1.0	-150.6	3.6
20°	-144.5	-162.9	-0.7	-150.2	5.7
25°	-142.0	-162.8	-0.2	-149.6	7.6
30° (Peak)	-142.0	-162.7	0.0	-149.3	7.3

Table 10-3. Max PFD Levels, WH/WH 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-165.1	13.1
5°	-152.0	-163.3	-2.2	-164.9	12.9
10°	-149.5	-163.2	-1.2	-163.8	14.3
15°	-147.0	-163.0	-1.0	-163.4	16.4
20°	-144.5	-162.9	-0.7	-163.0	18.5
25°	-142.0	-162.8	-0.2	-162.4	20.4
30° (Peak)	-142.0	-162.7	0.0	-162.1	20.1

Table 10-4. Max PFD Levels, WH/WH 54 MHz, Digital Carrier (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-152.3	0.3
5°	-152.0	-163.3	-2.2	-152.1	0.1
10°	-149.5	-163.2	-1.2	-151.0	1.5
15°	-147.0	-163.0	-1.0	-150.6	3.6
20°	-144.5	-162.9	-0.7	-150.2	5.7
25°	-142.0	-162.8	-0.2	-149.6	7.6

30° (Peak)	-142.0	-162.7	0.0	-149.3	7.3

Table 10-5. Max PFD Levels, WH/WH 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-166.5	14.5
5°	-152.0	-163.3	-2.2	-166.3	14.3
10°	-149.5	-163.2	-1.2	-165.2	15.7
15°	-147.0	-163.0	-1.0	-164.8	17.8
20°	-144.5	-162.9	-0.7	-164.4	19.9
25°	-142.0	-162.8	-0.2	-163.8	21.8
30° (Peak)	-142.0	-162.7	0.0	-163.5	21.5

Table 10-6. Max PFD Levels, WH/WH 72 MHz, Digital Carrier (72M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-155.5	3.5
5°	-152.0	-163.3	-2.2	-155.3	3.3
10°	-149.5	-163.2	-1.2	-154.2	4.7
15°	-147.0	-163.0	-1.0	-153.8	6.8
20°	-144.5	-162.9	-0.7	-153.4	8.9
25°	-142.0	-162.8	-0.2	-152.8	10.8
30° (Peak)	-142.0	-162.7	0.0	-152.5	10.5

Table 10-7. Max PFD Levels, WH/WH 72 MHz, Analog Carrier (36M0F3F)

Angle of	Applicable PFD Limit	Spreading Loss	Gain Contour	Worst Case PFD Level at	PFD Margin

Arrival	for Angle of Arrival (dBW/m^2/4 kHz)	(dBW/m^2)	(dB)	Angle of Arrival (dBW/m^2/4kHz)	(dB)
0°	-152.0	-163.4	-2.3	-164.7	12.7
5°	-152.0	-163.3	-2.2	-164.5	12.5
10°	-149.5	-163.2	-1.2	-163.4	13.9
15°	-147.0	-163.0	-1.0	-163.0	16.0
20°	-144.5	-162.9	-0.7	-162.6	18.1
25°	-142.0	-162.8	-0.2	-162.0	20.0
30° (Peak)	-142.0	-162.7	0.0	-161.7	19.7

Table 10-8. Max PFD Levels, EH/WH 36 MHz, Digital Carrier (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-152.7	0.7
5°	-152.0	-163.3	-2.2	-152.5	0.5
10°	-149.5	-163.2	-1.2	-151.4	1.9
15°	-147.0	-163.0	-1.0	-151.0	4.0
20°	-144.5	-162.9	-0.7	-150.6	6.1
25°	-142.0	-162.8	-0.2	-150.0	8.0
30° (Peak)	-142.0	-162.7	0.0	-149.7	7.7

Table 10-9. Max PFD Levels, EH/WH 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-165.1	13.1
5°	-152.0	-163.3	-2.2	-164.9	12.9

10°	-149.5	-163.2	-1.2	-163.8	14.3
15°	-147.0	-163.0	-1.0	-163.4	16.4
20°	-144.5	-162.9	-0.7	-163.0	18.5
25°	-142.0	-162.8	-0.2	-162.4	20.4
30° (Peak)	-142.0	-162.7	0.0	-162.1	20.1

Table 10-10. Max PFD Levels, EH/WH 54 MHz, Digital Carrier (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-152.7	0.7
5°	-152.0	-163.3	-2.2	-152.5	0.5
10°	-149.5	-163.2	-1.2	-151.4	1.9
15°	-147.0	-163.0	-1.0	-151.0	4.0
20°	-144.5	-162.9	-0.7	-150.6	6.1
25°	-142.0	-162.8	-0.2	-150.0	8.0
30° (Peak)	-142.0	-162.7	0.0	-149.7	7.7

Table 10-11. Max PFD Levels, EH/WH 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-166.5	14.5
5°	-152.0	-163.3	-2.2	-166.3	14.3
10°	-149.5	-163.2	-1.2	-165.2	15.7
15°	-147.0	-163.0	-1.0	-164.8	17.8
20°	-144.5	-162.9	-0.7	-164.4	19.9
25°	-142.0	-162.8	-0.2	-163.8	21.8
30°	-142.0	-162.7	0.0	-163.5	21.5

(Peak)					

Table 10-12. Max PFD Levels, EH/WH 72 MHz, Digital Carrier (72M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-155.5	3.5
5°	-152.0	-163.3	-2.2	-155.3	3.3
10°	-149.5	-163.2	-1.2	-154.2	4.7
15°	-147.0	-163.0	-1.0	-153.8	6.8
20°	-144.5	-162.9	-0.7	-153.4	8.9
25°	-142.0	-162.8	-0.2	-152.8	10.8
30° (Peak)	-142.0	-162.7	0.0	-152.5	10.5

Table 10-13. Max PFD Levels, EH/WH 72 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-165.1	13.1
5°	-152.0	-163.3	-2.2	-164.9	12.9
10°	-149.5	-163.2	-1.2	-163.8	14.3
15°	-147.0	-163.0	-1.0	-163.4	16.4
20°	-144.5	-162.9	-0.7	-163.0	18.5
25°	-142.0	-162.8	-0.2	-162.4	20.4
30° (Peak)	-142.0	-162.7	0.0	-162.1	20.1

Table 10-14. Max PFD Levels, EU/WH 54 MHz, Digital Carrier (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of	PFD Margin

	Arrival (dBW/m^2/4 kHz)			Arrival (dBW/m^2/4kHz)	(dB)
0°	-152.0	-163.4	-2.3	-152.5	0.5
5°	-152.0	-163.3	-2.2	-152.3	0.3
10°	-149.5	-163.2	-1.2	-151.2	1.7
15°	-147.0	-163.0	-1.0	-150.8	3.8
20°	-144.5	-162.9	-0.7	-150.4	5.9
25°	-142.0	-162.8	-0.2	-149.8	7.8
30° (Peak)	-142.0	-162.7	0.0	-149.5	7.5

Table 10-15. Max PFD Levels, EU/WH 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-165.0	13.0
5°	-152.0	-163.3	-2.2	-164.8	12.8
10°	-149.5	-163.2	-1.2	-163.7	14.2
15°	-147.0	-163.0	-1.0	-163.3	16.3
20°	-144.5	-162.9	-0.7	-162.9	18.4
25°	-142.0	-162.8	-0.2	-162.3	20.3
30° (Peak)	-142.0	-162.7	0.0	-162.0	20.0

Table 10-16. Max PFD Levels, WA/WH 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-2.3	-152.6	0.6
5°	-152.0	-163.3	-2.2	-152.4	0.4

10°	-149.5	-163.2	-1.2	-151.3	1.8
15°	-147.0	-163.0	-1.0	-150.9	3.9
20°	-144.5	-162.9	-0.7	-150.5	6.0
25°	-142.0	-162.8	-0.2	-149.9	7.9
30° (Peak)	-142.0	-162.7	0.0	-149.6	7.6

Table 10-17. Max PFD Levels, WA/WH 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-3.4	-169.0	17.0
5°	-152.0	-163.3	-3.0	-168.5	16.5
10°	-149.5	-163.2	-2.8	-168.2	18.7
15°	-147.0	-163.0	-2.7	-167.9	20.9
20°	-144.5	-162.9	-2.6	-167.7	23.2
25°	-142.0	-162.8	-2.4	-167.4	25.4
90° (Peak)	-142.0	-162.1	0.0	-164.3	22.3

Table 10-18. Max PFD Levels, GLB/GLB 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-3.4	-157.2	5.2
5°	-152.0	-163.3	-3.0	-156.7	4.7
10°	-149.5	-163.2	-2.8	-156.4	6.9
15°	-147.0	-163.0	-2.7	-156.1	9.1
20°	-144.5	-162.9	-2.6	-155.9	11.4
25°	-142.0	-162.8	-2.4	-155.6	13.6
90°	-142.0	-162.1	0.0	-152.5	10.5

(Peak)					

Table 10-19. Max PFD Levels, GLB/GLB 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-164.1	12.1
5°	-152.0	-163.3	-1.7	-164.0	12.0
10°	-149.5	-163.2	-1.7	-163.9	14.4
15°	-147.0	-163.0	-1.4	-163.4	16.4
20°	-144.5	-162.9	-1.0	-162.9	18.4
25°	-142.0	-162.8	-0.7	-162.5	20.5
60° (Peak)	-142.0	-162.2	0.0	-161.2	19.2

Table 10-20. Max PFD Levels, WH/EH 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-152.4	0.4
5°	-152.0	-163.3	-1.7	-152.3	0.3
10°	-149.5	-163.2	-1.7	-152.2	2.7
15°	-147.0	-163.0	-1.4	-151.7	4.7
20°	-144.5	-162.9	-1.0	-151.2	6.7
25°	-142.0	-162.8	-0.7	-150.8	8.8
60° (Peak)	-142.0	-162.2	0.0	-149.5	7.5

Table 10-21. Max PFD Levels, WH/EH 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival	PFD Margin (dB)

	(dBW/m^2/4 kHz)			(dBW/m^2/4kHz)	
0°	-152.0	-163.4	-1.7	-164.1	12.1
5°	-152.0	-163.3	-1.7	-164.0	12.0
10°	-149.5	-163.2	-1.7	-163.9	14.4
15°	-147.0	-163.0	-1.4	-163.4	16.4
20°	-144.5	-162.9	-1.0	-162.9	18.4
25°	-142.0	-162.8	-0.7	-162.5	20.5
60° (Peak)	-142.0	-162.2	0.0	-161.2	19.2

Table 10-22. Max PFD Levels, WH/EH 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-152.4	0.4
5°	-152.0	-163.3	-1.7	-152.3	0.3
10°	-149.5	-163.2	-1.7	-152.2	2.7
15°	-147.0	-163.0	-1.4	-151.7	4.7
20°	-144.5	-162.9	-1.0	-151.2	6.7
25°	-142.0	-162.8	-0.7	-150.8	8.8
60° (Peak)	-142.0	-162.2	0.0	-149.5	7.5

Table 10-23. Max PFD Levels, WH/EH 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-165.4	13.4
5°	-152.0	-163.3	-1.7	-165.3	13.3
10°	-149.5	-163.2	-1.7	-165.2	15.7
15°	-147.0	-163.0	-1.4	-164.7	17.7

20°	-144.5	-162.9	-1.0	-164.2	19.7
25°	-142.0	-162.8	-0.7	-163.8	21.8
60° (Peak)	-142.0	-162.2	0.0	-162.5	20.5

Table 10-24. Max PFD Levels, WH/EH 72 MHz, Digital Crx (72M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-154.4	2.4
5°	-152.0	-163.3	-1.7	-154.3	2.3
10°	-149.5	-163.2	-1.7	-154.2	4.7
15°	-147.0	-163.0	-1.4	-153.7	6.7
20°	-144.5	-162.9	-1.0	-153.2	8.7
25°	-142.0	-162.8	-0.7	-152.8	10.8
60° (Peak)	-142.0	-162.2	0.0	-151.5	9.5

Table 10-25. Max PFD Levels, WH/EH 72 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-164.1	12.1
5°	-152.0	-163.3	-1.7	-164.0	12.0
10°	-149.5	-163.2	-1.7	-163.9	14.4
15°	-147.0	-163.0	-1.4	-163.4	16.4
20°	-144.5	-162.9	-1.0	-162.9	18.4
25°	-142.0	-162.8	-0.7	-162.5	20.5
60° (Peak)	-142.0	-162.2	0.0	-161.2	19.2

Table 10-26. Max PFD Levels, EH/EH 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-152.5	0.5
5°	-152.0	-163.3	-1.7	-152.4	0.4
10°	-149.5	-163.2	-1.7	-152.3	2.8
15°	-147.0	-163.0	-1.4	-151.8	4.8
20°	-144.5	-162.9	-1.0	-151.3	6.8
25°	-142.0	-162.8	-0.7	-150.9	8.9
60° (Peak)	-142.0	-162.2	0.0	-149.6	7.6

Table 10-27. Max PFD Levels, EH/EH 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-164.2	12.2
5°	-152.0	-163.3	-1.7	-164.1	12.1
10°	-149.5	-163.2	-1.7	-164.0	14.5
15°	-147.0	-163.0	-1.4	-163.5	16.5
20°	-144.5	-162.9	-1.0	-163.0	18.5
25°	-142.0	-162.8	-0.7	-162.6	20.6
60° (Peak)	-142.0	-162.2	0.0	-161.3	19.3

Table 10-28. Max PFD Levels, EH/EH 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-152.5	0.5

5°	-152.0	-163.3	-1.7	-152.4	0.4
10°	-149.5	-163.2	-1.7	-152.3	2.8
15°	-147.0	-163.0	-1.4	-151.8	4.8
20°	-144.5	-162.9	-1.0	-151.3	6.8
25°	-142.0	-162.8	-0.7	-150.9	8.9
60° (Peak)	-142.0	-162.2	0.0	-149.6	7.6

Table 10-29. Max PFD Levels, EH/EH 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-165.4	13.4
5°	-152.0	-163.3	-1.7	-165.3	13.3
10°	-149.5	-163.2	-1.7	-165.2	15.7
15°	-147.0	-163.0	-1.4	-164.7	17.7
20°	-144.5	-162.9	-1.0	-164.2	19.7
25°	-142.0	-162.8	-0.7	-163.8	21.8
60° (Peak)	-142.0	-162.2	0.0	-162.5	20.5

Table 10-30. Max PFD Levels, EH/EH 72 MHz, Digital Crx (72M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-154.4	2.4
5°	-152.0	-163.3	-1.7	-154.3	2.3
10°	-149.5	-163.2	-1.7	-154.2	4.7
15°	-147.0	-163.0	-1.4	-153.7	6.7
20°	-144.5	-162.9	-1.0	-153.2	8.7
25°	-142.0	-162.8	-0.7	-152.8	10.8
60°	-142.0	-162.2	0.0	-151.5	9.5

(Peak)					

Table 10-31. Max PFD Levels, EH/EH 72 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-164.3	12.3
5°	-152.0	-163.3	-1.7	-164.2	12.2
10°	-149.5	-163.2	-1.7	-164.1	14.6
15°	-147.0	-163.0	-1.4	-163.6	16.6
20°	-144.5	-162.9	-1.0	-163.1	18.6
25°	-142.0	-162.8	-0.7	-162.7	20.7
60° (Peak)	-142.0	-162.2	0.0	-161.4	19.4

Table 10-32. Max PFD Levels, EU/EH 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-152.2	0.2
5°	-152.0	-163.3	-1.7	-152.1	0.1
10°	-149.5	-163.2	-1.7	-152.0	2.5
15°	-147.0	-163.0	-1.4	-151.5	4.5
20°	-144.5	-162.9	-1.0	-151.0	6.5
25°	-142.0	-162.8	-0.7	-150.6	8.6
60° (Peak)	-142.0	-162.2	0.0	-149.3	7.3

Table 10-33. Max PFD Levels, EU/EH 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival	PFD Margin (dB)

	(dBW/m^2/4 kHz)			(dBW/m^2/4kHz)	
0°	-152.0	-163.4	-1.7	-164.1	12.1
5°	-152.0	-163.3	-1.7	-164.0	12.0
10°	-149.5	-163.2	-1.7	-163.9	14.4
15°	-147.0	-163.0	-1.4	-163.4	16.4
20°	-144.5	-162.9	-1.0	-162.9	18.4
25°	-142.0	-162.8	-0.7	-162.5	20.5
60° (Peak)	-142.0	-162.2	0.0	-161.2	19.2

Table 10-34. Max PFD Levels, WA/EH 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-1.7	-152.2	0.2
5°	-152.0	-163.3	-1.7	-152.1	0.1
10°	-149.5	-163.2	-1.7	-152.0	2.5
15°	-147.0	-163.0	-1.4	-151.5	4.5
20°	-144.5	-162.9	-1.0	-151.0	6.5
25°	-142.0	-162.8	-0.7	-150.6	8.6
60° (Peak)	-142.0	-162.2	0.0	-149.3	7.3

Table 10-35. Max PFD Levels, WA/EH 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-155.0	5.0
5°	-150.0	-163.3	-1.0	-154.4	4.4
10°	-147.5	-163.2	-1.0	-154.3	6.8
15°	-145.0	-163.0	-1.0	-154.1	9.1

20°	-142.5	-162.9	-0.5	-153.5	11.0
25°	-140.0	-162.8	-0.1	-153.0	13.0
27° (Peak)	-140.0	-162.8	0.0	-152.9	12.9

Table 10-36. Max PFD Levels, EU/EU 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-150.7	0.7
5°	-150.0	-163.3	-1.0	-150.1	0.1
10°	-147.5	-163.2	-1.0	-150.0	2.5
15°	-145.0	-163.0	-1.0	-149.8	4.8
20°	-142.5	-162.9	-0.5	-149.2	6.7
25°	-140.0	-162.8	-0.1	-148.7	8.7
27° (Peak)	-140.0	-162.8	0.0	-148.6	8.6

Table 10-37. Max PFD Levels, EU/EU 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-155.6	5.6
5°	-150.0	-163.3	-1.0	-155.0	5.0
10°	-147.5	-163.2	-1.0	-154.9	7.4
15°	-145.0	-163.0	-1.0	-154.7	9.7
20°	-142.5	-162.9	-0.5	-154.1	11.6
25°	-140.0	-162.8	-0.1	-153.6	13.6
27° (Peak)	-140.0	-162.8	0.0	-153.5	13.5

Table 10-38. Max PFD Levels, EU/EU 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-150.7	0.7
5°	-150.0	-163.3	-1.0	-150.1	0.1
10°	-147.5	-163.2	-1.0	-150.0	2.5
15°	-145.0	-163.0	-1.0	-149.8	4.8
20°	-142.5	-162.9	-0.5	-149.2	6.7
25°	-140.0	-162.8	-0.1	-148.7	8.7
27° (Peak)	-140.0	-162.8	0.0	-148.6	8.6

Table 10-39. Max PFD Levels, EU/EU 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-155.1	5.1
5°	-150.0	-163.3	-1.0	-154.5	4.5
10°	-147.5	-163.2	-1.0	-154.4	6.9
15°	-145.0	-163.0	-1.0	-154.2	9.2
20°	-142.5	-162.9	-0.5	-153.6	11.1
25°	-140.0	-162.8	-0.1	-153.1	13.1
27° (Peak)	-140.0	-162.8	0.0	-153.0	13.0

Table 10-40. Max PFD Levels, WA/EU 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-151.3	1.3

5°	-150.0	-163.3	-1.0	-150.7	0.7
10°	-147.5	-163.2	-1.0	-150.6	3.1
15°	-145.0	-163.0	-1.0	-150.4	5.4
20°	-142.5	-162.9	-0.5	-149.8	7.3
25°	-140.0	-162.8	-0.1	-149.3	9.3
27° (Peak)	-140.0	-162.8	0.0	-149.2	9.2

Table 10-41. Max PFD Levels, WA/EU 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-155.5	5.5
5°	-150.0	-163.3	-1.0	-154.9	4.9
10°	-147.5	-163.2	-1.0	-154.8	7.3
15°	-145.0	-163.0	-1.0	-154.6	9.6
20°	-142.5	-162.9	-0.5	-154.0	11.5
25°	-140.0	-162.8	-0.1	-153.5	13.5
27° (Peak)	-140.0	-162.8	0.0	-153.4	13.4

Table 10-42. Max PFD Levels, WA/EU 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-151.3	1.3
5°	-150.0	-163.3	-1.0	-150.7	0.7
10°	-147.5	-163.2	-1.0	-150.6	3.1
15°	-145.0	-163.0	-1.0	-150.4	5.4
20°	-142.5	-162.9	-0.5	-149.8	7.3
25°	-140.0	-162.8	-0.1	-149.3	9.3
27°	-140.0	-162.8	0.0	-149.2	9.2

(Peak)					

Table 10-43. Max PFD Levels, WA/EU 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-155.5	5.5
5°	-150.0	-163.3	-1.0	-154.9	4.9
10°	-147.5	-163.2	-1.0	-154.8	7.3
15°	-145.0	-163.0	-1.0	-154.6	9.6
20°	-142.5	-162.9	-0.5	-154.0	11.5
25°	-140.0	-162.8	-0.1	-153.5	13.5
27° (Peak)	-140.0	-162.8	0.0	-153.4	13.4

Table 10-44. Max PFD Levels, WH/EU 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-151.1	1.1
5°	-150.0	-163.3	-1.0	-150.5	0.5
10°	-147.5	-163.2	-1.0	-150.4	2.9
15°	-145.0	-163.0	-1.0	-150.2	5.2
20°	-142.5	-162.9	-0.5	-149.6	7.1
25°	-140.0	-162.8	-0.1	-149.1	9.1
27° (Peak)	-140.0	-162.8	0.0	-149.0	9.0

Table 10-45. Max PFD Levels, WH/EU 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival	PFD Margin (dB)

	(dBW/m^2/4 kHz)			(dBW/m^2/4kHz)	
0°	-150.0	-163.4	-1.5	-155.5	5.5
5°	-150.0	-163.3	-1.0	-154.9	4.9
10°	-147.5	-163.2	-1.0	-154.8	7.3
15°	-145.0	-163.0	-1.0	-154.6	9.6
20°	-142.5	-162.9	-0.5	-154.0	11.5
25°	-140.0	-162.8	-0.1	-153.5	13.5
27° (Peak)	-140.0	-162.8	0.0	-153.4	13.4

Table 10-46. Max PFD Levels, EH/EU 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-150.9	0.9
5°	-150.0	-163.3	-1.0	-150.3	0.3
10°	-147.5	-163.2	-1.0	-150.2	2.7
15°	-145.0	-163.0	-1.0	-150.0	5.0
20°	-142.5	-162.9	-0.5	-149.4	6.9
25°	-140.0	-162.8	-0.1	-148.9	8.9
27° (Peak)	-140.0	-162.8	0.0	-148.8	8.8

Table 10-47. Max PFD Levels, EH/EU 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-155.2	5.2
5°	-150.0	-163.3	-1.0	-154.6	4.6
10°	-147.5	-163.2	-1.0	-154.5	7.0
15°	-145.0	-163.0	-1.0	-154.3	9.3

20°	-142.5	-162.9	-0.5	-153.7	11.2
25°	-140.0	-162.8	-0.1	-153.2	13.2
27° (Peak)	-140.0	-162.8	0.0	-153.1	13.1

Table 10-48. Max PFD Levels, NA/EU 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-150.7	0.7
5°	-150.0	-163.3	-1.0	-150.1	0.1
10°	-147.5	-163.2	-1.0	-150.0	2.5
15°	-145.0	-163.0	-1.0	-149.8	4.8
20°	-142.5	-162.9	-0.5	-149.2	6.7
25°	-140.0	-162.8	-0.1	-148.7	8.7
27° (Peak)	-140.0	-162.8	0.0	-148.6	8.6

Table 10-49. Max PFD Levels, NA/EU 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-155.5	5.5
5°	-150.0	-163.3	-1.0	-154.9	4.9
10°	-147.5	-163.2	-1.0	-154.8	7.3
15°	-145.0	-163.0	-1.0	-154.6	9.6
20°	-142.5	-162.9	-0.5	-154.0	11.5
25°	-140.0	-162.8	-0.1	-153.5	13.5
27° (Peak)	-140.0	-162.8	0.0	-153.4	13.4

Table 10-50. Max PFD Levels, NA/EU 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.5	-150.7	0.7
5°	-150.0	-163.3	-1.0	-150.1	0.1
10°	-147.5	-163.2	-1.0	-150.0	2.5
15°	-145.0	-163.0	-1.0	-149.8	4.8
20°	-142.5	-162.9	-0.5	-149.2	6.7
25°	-140.0	-162.8	-0.1	-148.7	8.7
27° (Peak)	-140.0	-162.8	0.0	-148.6	8.6

Table 10-51. Max PFD Levels, NA/EU 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-160.7	10.7
5°	-150.0	-163.3	-7.0	-160.5	10.5
10°	-147.5	-163.2	-6.3	-159.7	12.2
15°	-145.0	-163.0	-6.0	-159.2	14.2
20°	-142.5	-162.9	-5.1	-158.2	15.7
25°	-140.0	-162.8	-4.1	-157.1	17.1
70° (Peak)	-140.0	-162.2	0.0	-152.4	12.4

Table 10-52. Max PFD Levels, EU/WA 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-150.6	0.6

5°	-150.0	-163.3	-7.0	-150.4	0.4
10°	-147.5	-163.2	-6.3	-149.6	2.1
15°	-145.0	-163.0	-6.0	-149.1	4.1
20°	-142.5	-162.9	-5.1	-148.1	5.6
25°	-140.0	-162.8	-4.1	-147.0	7.0
70° (Peak)	-140.0	-162.2	0.0	-142.3	2.3

Table 10-53. Max PFD Levels, EU/WA 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-160.7	10.7
5°	-150.0	-163.3	-7.0	-160.5	10.5
10°	-147.5	-163.2	-6.3	-159.7	12.2
15°	-145.0	-163.0	-6.0	-159.2	14.2
20°	-142.5	-162.9	-5.1	-158.2	15.7
25°	-140.0	-162.8	-4.1	-157.1	17.1
70° (Peak)	-140.0	-162.2	0.0	-152.4	12.4

Table 10-54. Max PFD Levels, EU/WA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-150.6	0.6
5°	-150.0	-163.3	-7.0	-150.4	0.4
10°	-147.5	-163.2	-6.3	-149.6	2.1
15°	-145.0	-163.0	-6.0	-149.1	4.1
20°	-142.5	-162.9	-5.1	-148.1	5.6
25°	-140.0	-162.8	-4.1	-147.0	7.0
70°	-140.0	-162.2	0.0	-142.3	2.3

(Peak)					

Table 10-55. Max PFD Levels, EU/WA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-160.5	10.5
5°	-150.0	-163.3	-7.0	-160.3	10.3
10°	-147.5	-163.2	-6.3	-159.5	12.0
15°	-145.0	-163.0	-6.0	-159.0	14.0
20°	-142.5	-162.9	-5.1	-158.0	15.5
25°	-140.0	-162.8	-4.1	-156.9	16.9
70° (Peak)	-140.0	-162.2	0.0	-152.2	12.2

Table 10-56. Max PFD Levels, WA/WA 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-150.7	0.7
5°	-150.0	-163.3	-7.0	-150.5	0.5
10°	-147.5	-163.2	-6.3	-149.7	2.2
15°	-145.0	-163.0	-6.0	-149.2	4.2
20°	-142.5	-162.9	-5.1	-148.2	5.7
25°	-140.0	-162.8	-4.1	-147.1	7.1
70° (Peak)	-140.0	-162.2	0.0	-142.4	2.4

Table 10-57. Max PFD Levels, WA/WA 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival	PFD Margin (dB)

	(dBW/m^2/4 kHz)			(dBW/m^2/4kHz)	
0°	-150.0	-163.4	-7.1	-160.5	10.5
5°	-150.0	-163.3	-7.0	-160.3	10.3
10°	-147.5	-163.2	-6.3	-159.5	12.0
15°	-145.0	-163.0	-6.0	-159.0	14.0
20°	-142.5	-162.9	-5.1	-158.0	15.5
25°	-140.0	-162.8	-4.1	-156.9	16.9
70° (Peak)	-140.0	-162.2	0.0	-152.2	12.2

Table 10-58. Max PFD Levels, WA/WA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-150.7	0.7
5°	-150.0	-163.3	-7.0	-150.5	0.5
10°	-147.5	-163.2	-6.3	-149.7	2.2
15°	-145.0	-163.0	-6.0	-149.2	4.2
20°	-142.5	-162.9	-5.1	-148.2	5.7
25°	-140.0	-162.8	-4.1	-147.1	7.1
70° (Peak)	-140.0	-162.2	0.0	-142.4	2.4

Table 10-59. Max PFD Levels, WA/WA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-160.5	10.5
5°	-150.0	-163.3	-7.0	-160.3	10.3
10°	-147.5	-163.2	-6.3	-159.5	12.0
15°	-145.0	-163.0	-6.0	-159.0	14.0

20°	-142.5	-162.9	-5.1	-158.0	15.5
25°	-140.0	-162.8	-4.1	-156.9	16.9
70° (Peak)	-140.0	-162.2	0.0	-152.2	12.2

Table 10-60. Max PFD Levels, WH/WA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-150.8	0.8
5°	-150.0	-163.3	-7.0	-150.6	0.6
10°	-147.5	-163.2	-6.3	-149.8	2.3
15°	-145.0	-163.0	-6.0	-149.3	4.3
20°	-142.5	-162.9	-5.1	-148.3	5.8
25°	-140.0	-162.8	-4.1	-147.2	7.2
70° (Peak)	-140.0	-162.2	0.0	-142.5	2.5

Table 10-61. Max PFD Levels, WH/WA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-160.5	10.5
5°	-150.0	-163.3	-7.0	-160.3	10.3
10°	-147.5	-163.2	-6.3	-159.5	12.0
15°	-145.0	-163.0	-6.0	-159.0	14.0
20°	-142.5	-162.9	-5.1	-158.0	15.5
25°	-140.0	-162.8	-4.1	-156.9	16.9
70° (Peak)	-140.0	-162.2	0.0	-152.2	12.2

Table 10-62. Max PFD Levels, EH/WA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-150.8	0.8
5°	-150.0	-163.3	-7.0	-150.6	0.6
10°	-147.5	-163.2	-6.3	-149.8	2.3
15°	-145.0	-163.0	-6.0	-149.3	4.3
20°	-142.5	-162.9	-5.1	-148.3	5.8
25°	-140.0	-162.8	-4.1	-147.2	7.2
70° (Peak)	-140.0	-162.2	0.0	-142.5	2.5

Table 10-63. Max PFD Levels, EH/WA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-160.6	10.6
5°	-150.0	-163.3	-7.0	-160.4	10.4
10°	-147.5	-163.2	-6.3	-159.6	12.1
15°	-145.0	-163.0	-6.0	-159.1	14.1
20°	-142.5	-162.9	-5.1	-158.1	15.6
25°	-140.0	-162.8	-4.1	-157.0	17.0
70° (Peak)	-140.0	-162.2	0.0	-152.3	12.3

Table 10-64. Max PFD Levels, NA/WA 36 MHz, Digital Crx (36M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-151.2	1.2

5°	-150.0	-163.3	-7.0	-151.0	1.0
10°	-147.5	-163.2	-6.3	-150.2	2.7
15°	-145.0	-163.0	-6.0	-149.7	4.7
20°	-142.5	-162.9	-5.1	-148.7	6.2
25°	-140.0	-162.8	-4.1	-147.6	7.6
70° (Peak)	-140.0	-162.2	0.0	-142.9	2.9

Table 10-65. Max PFD Levels, NA/WA 36 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-160.5	10.5
5°	-150.0	-163.3	-7.0	-160.3	10.3
10°	-147.5	-163.2	-6.3	-159.5	12.0
15°	-145.0	-163.0	-6.0	-159.0	14.0
20°	-142.5	-162.9	-5.1	-158.0	15.5
25°	-140.0	-162.8	-4.1	-156.9	16.9
70° (Peak)	-140.0	-162.2	0.0	-152.2	12.2

Table 10-66. Max PFD Levels, NA/WA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-7.1	-151.2	1.2
5°	-150.0	-163.3	-7.0	-151.0	1.0
10°	-147.5	-163.2	-6.3	-150.2	2.7
15°	-145.0	-163.0	-6.0	-149.7	4.7
20°	-142.5	-162.9	-5.1	-148.7	6.2
25°	-140.0	-162.8	-4.1	-147.6	7.6
70°	-140.0	-162.2	0.0	-142.9	2.9

(Peak)					

Table 10-67. Max PFD Levels, NA/WA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-3.7	-157.1	7.1
5°	-150.0	-163.3	-3.2	-156.5	6.5
10°	-147.5	-163.2	-2.5	-155.7	8.2
15°	-145.0	-163.0	-1.7	-154.7	9.7
20°	-142.5	-162.9	-1.0	-153.9	11.4
25°	-140.0	-162.8	-0.7	-153.5	13.5
40° (Peak)	-140.0	-162.5	0.0	-152.5	12.5

Table 10-68. Max PFD Levels, SC/SC 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-3.7	-151.1	1.1
5°	-150.0	-163.3	-3.2	-150.5	0.5
10°	-147.5	-163.2	-2.5	-149.7	2.2
15°	-145.0	-163.0	-1.7	-148.7	3.7
20°	-142.5	-162.9	-1.0	-147.9	5.4
25°	-140.0	-162.8	-0.7	-147.5	7.5
40° (Peak)	-140.0	-162.5	0.0	-146.5	6.5

Table 10-69. Max PFD Levels, SC/SC 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival	PFD Margin (dB)

	(dBW/m^2/4 kHz)			(dBW/m^2/4kHz)	
0°	-150.0	-163.4	-3.7	-157.1	7.1
5°	-150.0	-163.3	-3.2	-156.5	6.5
10°	-147.5	-163.2	-2.5	-155.7	8.2
15°	-145.0	-163.0	-1.7	-154.7	9.7
20°	-142.5	-162.9	-1.0	-153.9	11.4
25°	-140.0	-162.8	-0.7	-153.5	13.5
40° (Peak)	-140.0	-162.5	0.0	-152.5	12.5

Table 10-70. Max PFD Levels, NA/SC 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-3.7	-151.1	1.1
5°	-150.0	-163.3	-3.2	-150.5	0.5
10°	-147.5	-163.2	-2.5	-149.7	2.2
15°	-145.0	-163.0	-1.7	-148.7	3.7
20°	-142.5	-162.9	-1.0	-147.9	5.4
25°	-140.0	-162.8	-0.7	-147.5	7.5
40° (Peak)	-140.0	-162.5	0.0	-146.5	6.5

Table 10-71. Max PFD Levels, NA/SC 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.4	-154.8	4.8
5°	-150.0	-163.3	-1.2	-154.5	4.5
10°	-147.5	-163.2	-0.9	-154.1	6.6
15°	-145.0	-163.0	-0.9	-153.9	8.9

20°	-142.5	-162.9	-0.4	-153.3	10.8
25°	-140.0	-162.8	0.0	-152.8	12.8
25° (Peak)	-140.0	-162.8	0.0	-152.8	12.8

Table 10-72. Max PFD Levels, SC/NA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.4	-150.4	0.4
5°	-150.0	-163.3	-1.2	-150.1	0.1
10°	-147.5	-163.2	-0.9	-149.7	2.2
15°	-145.0	-163.0	-0.9	-149.5	4.5
20°	-142.5	-162.9	-0.4	-148.9	6.4
25°	-140.0	-162.8	0.0	-148.4	8.4
25° (Peak)	-140.0	-162.8	0.0	-148.4	8.4

Table 10-73. Max PFD Levels, SC/NA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.4	-154.9	4.9
5°	-150.0	-163.3	-1.2	-154.6	4.6
10°	-147.5	-163.2	-0.9	-154.2	6.7
15°	-145.0	-163.0	-0.9	-154.0	9.0
20°	-142.5	-162.9	-0.4	-153.4	10.9
25°	-140.0	-162.8	0.0	-152.9	12.9
25° (Peak)	-140.0	-162.8	0.0	-152.9	12.9

Table 10-74. Max PFD Levels, NA/NA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.4	-150.7	0.7
5°	-150.0	-163.3	-1.2	-150.4	0.4
10°	-147.5	-163.2	-0.9	-150.0	2.5
15°	-145.0	-163.0	-0.9	-149.8	4.8
20°	-142.5	-162.9	-0.4	-149.2	6.7
25°	-140.0	-162.8	0.0	-148.7	8.7
25° (Peak)	-140.0	-162.8	0.0	-148.7	8.7

Table 10-75. Max PFD Levels, NA/NA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.4	-154.9	4.9
5°	-150.0	-163.3	-1.2	-154.6	4.6
10°	-147.5	-163.2	-0.9	-154.2	6.7
15°	-145.0	-163.0	-0.9	-154.0	9.0
20°	-142.5	-162.9	-0.4	-153.4	10.9
25°	-140.0	-162.8	0.0	-152.9	12.9
25° (Peak)	-140.0	-162.8	0.0	-152.9	12.9

Table 10-76. Max PFD Levels, WA/NA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.4	-150.9	0.9

5°	-150.0	-163.3	-1.2	-150.6	0.6
10°	-147.5	-163.2	-0.9	-150.2	2.7
15°	-145.0	-163.0	-0.9	-150.0	5.0
20°	-142.5	-162.9	-0.4	-149.4	6.9
25°	-140.0	-162.8	0.0	-148.9	8.9
25° (Peak)	-140.0	-162.8	0.0	-148.9	8.9

Table 10-77. Max PFD Levels, WA/NA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.4	-154.8	4.8
5°	-150.0	-163.3	-1.2	-154.5	4.5
10°	-147.5	-163.2	-0.9	-154.1	6.6
15°	-145.0	-163.0	-0.9	-153.9	8.9
20°	-142.5	-162.9	-0.4	-153.3	10.8
25°	-140.0	-162.8	0.0	-152.8	12.8
25° (Peak)	-140.0	-162.8	0.0	-152.8	12.8

Table 10-78. Max PFD Levels, EU/NA 54 MHz, Digital Crx (54M0G7W)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival ($dBW/m^2/4$ kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival ($dBW/m^2/4kHz$)	PFD Margin (dB)
0°	-150.0	-163.4	-1.4	-150.3	0.3
5°	-150.0	-163.3	-1.2	-150.0	0.0
10°	-147.5	-163.2	-0.9	-149.6	2.1
15°	-145.0	-163.0	-0.9	-149.4	4.4
20°	-142.5	-162.9	-0.4	-148.8	6.3
25°	-140.0	-162.8	0.0	-148.3	8.3
25°	-140.0	-162.8	0.0	-148.3	8.3

(Peak)					

Table 10-79. Max PFD Levels, EU/NA 54 MHz, Analog Carrier (36M0F3F)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-150.0	-163.4	-1.0	-174.2	22.2
5°	-150.0	-163.3	-1.0	-174.1	22.1
10°	-147.5	-163.2	-1.0	-174.0	24.5
15°	-145.0	-163.0	-0.9	-173.7	26.7
20°	-142.5	-162.9	-0.8	-173.5	29.0
25°	-140.0	-162.8	-0.8	-173.4	31.4
90° (Peak)	-140.0	-162.1	0.0	-171.9	29.9

Table 10-80. Max. PFD Levels, TLM beam, Telemetry (300KF9D)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival (dBW/m^2/4 kHz)	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival (dBW/m^2/4kHz)	PFD Margin (dB)
0°	-152.0	-163.4	-1.0	-166.4	14.4
5°	-152.0	-163.3	-1.0	-166.3	14.3
10°	-149.5	-163.2	-1.0	-166.2	16.7
15°	-147.0	-163.0	-0.9	-165.9	18.9
20°	-144.5	-162.9	-0.8	-165.7	21.2
25°	-142.0	-162.8	-0.8	-165.6	23.6
90° (Peak)	-142.0	-162.1	0.0	-164.1	22.1

Table 10-81. Max. PFD Levels, BNC beam, Tracking Beacon (25K0N0N)

Angle of Arrival	Applicable PFD Limit for Angle of Arrival	Spreading Loss (dBW/m^2)	Gain Contour (dB)	Worst Case PFD Level at Angle of Arrival	PFD Margin (dB)

	(dBW/m^2/4 kHz)			(dBW/m^2/4kHz)	
0°	-150.0	-163.4	-1.0	-163.4	13.4
5°	-150.0	-163.3	-1.0	-163.3	13.3
10°	-147.5	-163.2	-1.0	-163.2	15.7
15°	-145.0	-163.0	-0.9	-162.9	17.9
20°	-142.5	-162.9	-0.8	-162.7	20.2
25°	-140.0	-162.8	-0.8	-162.6	22.6
90° (Peak)	-140.0	-162.1	0.0	-161.1	21.1

Table 10-82. Max. PFD Levels, BNK beam, Tracking Beacon (25K0N0N)

11. Arrangement for Tracking, Telemetry, and Control

SES WORLD SKIES will conduct primary TT&C operations for SES-4 using antennas that are located in Betzdorf, Luxembourg. Back-up TT&C capability will also be available from Manassas, Virginia, in the United States. In addition, SES WORLD SKIES will have remote control capability from its headquarters in The Hague that will, if required by the Dutch Administration, enable satellite operations to be controlled from the territory of The Netherlands.

12. Physical Characteristics of the Space Station

SES-4 is being constructed by Space System Loral based on the Series FS1300 satellite design, a three-axis stabilized system. The spacecraft will have a launch mass of 6,170 kg, total power of 15,500 watts (end-of-life), and a design lifetime of 15 years. Additional key spacecraft characteristics for SES-4 can be found in the appropriate sections of the accompanying Schedule S.

13. Common Carrier Status

SES WORLD SKIES intends to market all of the C-band and Ku-band transponders on the SES-4 satellite on a non-common carrier basis.

14. Schedule

See Narrative, at Section IV.

15. Polarization Information

The SES-4 C-band payload operates using circular polarization and is not capable of switching polarization sense upon ground command. SES WORLD SKIES has requested waivers of Section 25.210 to account for these operational parameters. *See* Narrative, at Section II.C.2. The SES-4 Ku-band payload operates using linear polarization.

16. Public Interest Considerations

See Narrative, at Section II.C.2.

17. Interference Analysis

At present, the nearest operational C-band and/or Ku-band satellites to the proposed location for SES-4, 22.0º W.L., are NSS-5 at 20.0° W.L. and Intelsat-905 at 24.5º W.L. As demonstrated below, SES-4 largely is in compliance with the FCC's two-degree spacing policy, as explained herein, and to the extent it is not, SES-4 has been coordinated with both of these satellites and therefore a waiver of the rule is warranted.

In order to assess compliance with the Commission's two-degree spacing policy, two interference analyses are provided below, distinguishing a number of different cases, as required by the FCC's rules.[2] The first case is the assessment of interference from communication carriers of SES-4 into the communication carriers of a hypothetical

[2] *See* Public Notice, Report No. SPB-207, DA 04-1708 (June 16, 2004).

satellite at 24.0º W.L.(the "general interference analysis case"). The second case is the assessment of interference from communication carriers of SES-4 into the communication carriers of NSS-5, which operates at 20.0º W.L.(the "specific interference analysis case"). Apart from these assessments, an assessment is provided of the interference of the TT&C carriers of SES-4 into the TT&C and communication carriers of NSS-5, as well as an assessment of the SES-4 TT&C carriers into a hypothetical satellite at 24.0º W.L. having the same TT&C parameters.

17.1 General interference analysis case

For this case, SES WORLD SKIES has assumed that the transmission parameters of the SES-4 satellite are both the wanted and victim transmissions in a two-degree spacing environment (i.e. the victim satellite is assumed to be at 24.0º W.L.). This analysis is performed for digital signals in both networks, and analog TV/FM signal link calculations are provided in Appendix A to this Technical Appendix. Analog TV/FM signals are coordinated on a case-by-case basis with nearby spacecraft.

The odd numbered Tables in the range from 17-1 to 17-78 below (e.g. Tables 17-1, 17-3, 17-5, …,17-77) provide summaries of the C- and Ku-band transmission parameters derived from the SES-4 link budgets for the different connectivity options that are presented in Tables A-1 through A-39 in Appendix A and embedded in the accompanying Schedule S form. The interference calculations assume a 1 dB advantage for topocentric-to-geocentric conversion, co-polarization of all wanted and interfering carriers, and all earth station antennas conforming to a sidelobe pattern of 29-25 log(θ), as specified in section 25.209(a)(1) of the Commission's Rules.

The even numbered Tables in the range from 17-1 to 17-78 below (e.g. Tables 17-2, 17-4, 17-6, …,17-78) show the results of the C- and Ku-band interference calculations in terms of the overall C/I margins for the different possible connectivities on the SES-4

satellite. For ease of reference and analysis, these tables are provided in a format similar to the output of the commonly-used Sharp Adjacent Satellite Interference Analysis program.

Global/Global beam connectivity

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.7	53.6	13.0	42.5	18.2
2	461KG7W	0.341	47.6	57.1	16.6	43.8	21.5
3	1M84G7W	1.365	55.4	63.2	22.6	43.8	21.5
4	8M25G7W	6.111	51.7	68.3	27.8	42.5	19.1
5	36M0G7W	30.000	56.8	79.1	36.6	42.5	19.1

Table 17-1. Summary of Typical Transmission Parameters for the SES-4 Global/Global beam connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.3	0.4	1.3	2.4	0.7
	2	3.4	0.3	1.5	2.5	0.9
	3	3.4	0.3	1.5	2.5	0.9
	4	3.4	0.4	1.4	2.4	0.7
	5	5.5	2.7	3.4	4.5	2.8

Table 17-2. Summary of Overall C/I Margins for the SES-4 Global/Global beam connectivity (dB)

As shown in Table 17-2, all C/I margins are positive.

West Hemi/West Hemi beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	52.1	16.3	42.3	18.2
2	461KG7W	0.341	47.0	55.0	19.2	42.3	21.5
3	1M84G7W	1.365	54.9	61.0	25.2	42.3	21.5

4	8M25G7W	6.111	51.2	65.9	30.1	42.3	19.1
5	36M0G7W	30.000	56.3	76.5	39.7	42.3	19.1

Table 17-3. Summary of Typical Transmission Parameters for the SES-4 West Hemi/West Hemi beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	0.7	1.8	3.0	0.7
	2	1.4	-0.9	0.1	1.4	-1.0
	3	1.4	-0.9	0.1	1.4	-1.0
	4	2.3	-0.1	0.9	2.2	-0.2
	5	5.0	2.8	3.6	5.0	2.6

Table 17-4. Summary of Overall C/I Margins for the SES-4 West Hemi/West Hemi beam (36 MHz) connectivity (dB)

It can be seen in Table 17-4 that most C/I margins are positive, except for some cases, like for Interfering Carrier 2 and Interfering Carrier 5. The worst case is represented for Wanted Carrier 3 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.0dB, which is equivalent to an increase of 7.6% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

West Hemi/West Hemi beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	51.2	15.4	42.3	18.2
2	461KG7W	0.341	47.0	54.5	18.7	42.3	21.5
3	1M84G7W	1.365	54.9	59.3	23.6	43.8	21.5
4	8M25G7W	6.111	51.2	65.7	29.9	42.3	19.1
5	54M0G7W	45.000	56.3	77.9	41.1	42.3	19.1

Table 17-5. Summary of Typical Transmission Parameters for the SES-4 West Hemi/West Hemi beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5

Wanted Carriers	1	3.1	0.3	2.5	2.3	0.1
	2	1.9	-0.9	1.3	1.1	-1.1
	3	2.0	-1.1	1.5	1.2	-0.8
	4	3.0	0.1	2.4	2.2	0.0
	5	5.6	2.9	4.9	4.8	2.6

Table 17-6. Summary of Overall C/I Margins for the SES-4 West Hemi/West Hemi beam (54 MHz) connectivity (dB)

It can be seen in Table 17-6 that almost all C/I margins are positive, except for some cases, like for Interfering Carrier 2 and Interfering Carrier 5. The worst case is represented for Wanted Carrier 2 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.1dB, which is equivalent to an increase of 7.7% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

West Hemi/West Hemi beam connectivity (72 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	50.5	14.7	42.3	18.2
2	461KG7W	0.341	47.0	52.8	17.0	43.8	21.5
3	1M84G7W	1.365	54.9	58.8	23.0	43.8	21.5
4	8M25G7W	6.111	51.2	64.6	28.8	42.3	19.1
5	72M0G7W	63.330	56.3	78.0	41.1	48.0	24.9

Table 17-7. Summary of Typical Transmission Parameters for the SES-4 West Hemi/West Hemi beam (72 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	1.3	2.3	2.7	0.9
	2	2.2	0.1	1.5	1.8	0.1
	3	2.2	0.1	1.5	1.8	0.1
	4	2.6	0.7	1.8	2.2	0.4
	5	3.8	1.1	3.4	3.4	2.0

Table 17-8. Summary of Overall C/I Margins for the SES-4 West Hemi/West Hemi beam (72 MHz) connectivity (dB)

As shown in Table 17-8, all C/I margins are positive.

East Hemi/East Hemi beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	52.2	17.0	42.3	18.2
2	461KG7W	0.341	47.0	54.7	19.5	42.3	21.5
3	1M84G7W	1.365	54.9	60.7	25.5	42.3	21.5
4	8M25G7W	6.111	51.2	66.9	31.8	42.3	19.1
5	36M0G7W	30.000	56.3	76.9	39.8	42.3	19.1

Table 17-9. Summary of Typical Transmission Parameters for the SES-4 East Hemi/East Hemi beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	1.1	2.2	2.1	1.3
	2	1.0	-0.9	0.1	0.1	-0.8
	3	1.0	-0.9	0.1	0.1	-0.8
	4	3.2	1.2	2.2	2.2	1.4
	5	4.5	2.7	3.4	3.5	2.6

Table 17-10. Summary of Overall C/I Margins for the SES-4 East Hemi/East Hemi beam (36 MHz) connectivity (dB)

It can be seen in Table 17-10 that most C/I margins are positive, except for some cases, like for Interfering Carrier 2 and Interfering Carrier 5. The worst case is represented for Wanted Carrier 3 with respect to Interfering Carrier 2. The deficit with respect to the 6% C/I criterion is 0.9dB, which is equivalent to an increase of 7.5% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

East Hemi/East Hemi beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S	Uplink EIRP	Downlink EIRP	Rx E/S	C/I Criterion

			Gain (dBi)	(dBW)	(dBW	Gain (dBi)	(dB)
1	346KG7W	0.256	51.2	51.2	16.0	42.3	18.2
2	461KG7W	0.341	47.0	53.5	18.3	42.3	21.5
3	1M84G7W	1.365	54.9	59.0	23.8	43.8	21.5
4	8M25G7W	6.111	51.2	65.2	30.1	42.3	19.1
5	54M0G7W	45.000	56.3	78.6	41.4	42.3	19.1

Table 17-11. Summary of Typical Transmission Parameters for the SES-4 East Hemi/East Hemi beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	1.3	2.9	2.8	0.4
	2	0.9	-0.9	0.6	0.6	-1.8
	3	1.6	-0.4	1.5	1.4	-0.9
	4	2.5	0.7	2.2	2.2	-0.2
	5	5.3	3.8	5.0	5.1	2.6

Table 17-12. Summary of Overall C/I Margins for the SES-4 East Hemi/East Hemi beam (54 MHz) connectivity (dB)

It can be seen in Table 17-10 that most C/I margins are positive, except for some cases, like for Interfering Carrier 2 and Interfering Carrier 5. The worst case is represented for Wanted Carrier 2 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.8dB, which is equivalent to an increase of 9.2% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

East Hemi/East Hemi beam connectivity (72 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	49.9	14.8	42.3	18.2
2	461KG7W	0.341	47.0	52.4	17.2	43.8	21.5
3	1M84G7W	1.365	54.9	58.6	23.4	43.8	21.5
4	8M25G7W	6.111	51.2	64.3	29.1	42.3	19.1
5	72M0G7W	63.330	56.3	78.9	41.7	48.0	24.9

Table 17-13. Summary of Typical Transmission Parameters for the SES-4 East Hemi/East Hemi beam (72 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	1.2	2.0	2.5	0.4
	2	2.3	0.1	1.3	1.7	-0.4
	3	2.5	0.3	1.5	1.9	-0.2
	4	2.8	0.8	1.7	2.2	0.0
	5	4.5	1.9	3.7	3.9	2.0

Table 17-14. Summary of Overall C/I Margins for the SES-4 East Hemi/East Hemi beam (72 MHz) connectivity (dB)

It can be seen in Table 17-14 that most C/I margins are positive, except for Interfering Carrier 5. The worst case is represented for Wanted Carrier 2 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 0.4dB, which is equivalent to an increase of 6.5% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

East Hemi/West Hemi beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	52.3	16.6	42.3	18.2
2	461KG7W	0.341	47.0	54.9	19.2	42.3	21.5
3	1M84G7W	1.365	54.9	60.9	25.2	42.3	21.5
4	8M25G7W	6.111	51.2	67.0	31.4	42.3	19.1
5	36M0G7W	30.000	56.3	76.4	39.8	42.3	19.1

Table 17-15. Summary of Typical Transmission Parameters for the SES-4 East Hemi/West Hemi beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	1.0	2.1	2.1	1.0
	2	1.1	-0.9	0.1	0.2	-1.0
	3	1.1	-0.9	0.1	0.2	-1.0

	4	3.2	1.1	2.1	2.2	1.0
	5	4.8	2.8	3.7	3.8	2.6

Table 17-16. Summary of Overall C/I Margins for the SES-4 East Hemi/West Hemi beam (36 MHz) connectivity (dB)

It can be seen in Table 17-16 that most C/I margins are positive, except for some cases, like for Interfering Carrier 2 and Interfering Carrier 5. The worst case is represented for Wanted Carrier 3 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.0dB, which is equivalent to an increase of 7.6% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

East Hemi/West Hemi beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	51.4	15.8	42.3	18.2
2	461KG7W	0.341	47.0	54.4	18.8	42.3	21.5
3	1M84G7W	1.365	54.9	59.3	23.7	43.8	21.5
4	8M25G7W	6.111	51.2	65.4	29.8	42.3	19.1
5	54M0G7W	45.000	56.3	77.7	41.1	42.3	19.1

Table 17-17. Summary of Typical Transmission Parameters for the SES-4 East Hemi/West Hemi beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	0.6	2.8	2.9	0.6
	2	1.6	-0.9	1.3	1.3	-1.0
	3	1.7	-1.0	1.5	1.5	-0.7
	4	2.4	-0.1	2.1	2.2	-0.1
	5	5.2	2.8	4.8	4.9	2.6

Table 17-18. Summary of Overall C/I Margins for the SES-4 East Hemi/West Hemi beam (54 MHz) connectivity (dB)

It can be seen in Table 17-18 that most C/I margins are positive, except for some cases, like for Interfering Carrier 2 and Interfering Carrier 5. The worst case is represented

for Wanted Carrier 2 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.0dB, which is equivalent to an increase of 7.6% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

East Hemi/West Hemi beam connectivity (72 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	50.1	14.4	42.3	18.2
2	461KG7W	0.341	47.0	52.8	17.2	43.8	21.5
3	1M84G7W	1.365	54.9	58.8	23.2	43.8	21.5
4	8M25G7W	6.111	51.2	64.4	28.8	42.3	19.1
5	72M0G7W	63.330	56.3	77.9	41.2	48.0	24.9

Table 17-19. Summary of Typical Transmission Parameters for the SES-4 East Hemi/West Hemi beam (72 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	0.9	1.9	2.5	0.6
	2	2.6	0.1	1.5	2.1	0.2
	3	2.6	0.1	1.5	2.1	0.2
	4	2.7	0.5	1.5	2.2	0.2
	5	4.1	1.0	3.3	3.5	2.0

Table 17-20. Summary of Overall C/I Margins for the SES-4 East Hemi/West Hemi beam (72 MHz) connectivity (dB)

As shown in Table 17-20, all C/I margins are positive.

West Hemi/East Hemi beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	52.6	17.3	42.3	18.2

2	461KG7W	0.341	47.0	55.5	20.2	42.3	21.5
3	1M84G7W	1.365	54.9	61.5	26.3	42.3	21.5
4	8M25G7W	6.111	51.2	66.9	31.6	42.3	19.1
5	36M0G7W	30.000	56.3	77.0	39.7	42.3	19.1

Table 17-21. Summary of Typical Transmission Parameters for the SES-4 West Hemi/East Hemi beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	0.7	1.7	2.6	1.7
	2	1.5	-0.9	0.1	1.0	0.0
	3	1.5	-0.9	0.1	1.0	0.0
	4	2.7	0.3	1.3	2.2	1.2
	5	4.1	1.9	2.6	3.6	2.6

Table 17-22. Summary of Overall C/I Margins for the SES-4 West Hemi/East Hemi beam (36 MHz) connectivity (dB)

It can be seen in Table 17-22 that most C/I margins are positive, except for some cases, like for Interfering Carrier 2. The worst case is represented for Wanted Carrier 3 with respect to Interfering Carrier 2. The deficit with respect to the 6% C/I criterion is 0.9dB, which is equivalent to an increase of 7.5% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

West Hemi/East Hemi beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	51.6	16.3	42.3	18.2
2	461KG7W	0.341	47.0	54.2	18.9	42.3	21.5
3	1M84G7W	1.365	54.9	59.4	24.1	43.8	21.5
4	8M25G7W	6.111	51.2	65.8	30.5	42.3	19.1
5	54M0G7W	45.000	56.3	78.8	41.5	42.3	19.1

Table 17-23. Summary of Typical Transmission Parameters for the SES-4 West Hemi/East Hemi beam (54 MHz) connectivity

	Interfering Carriers

	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	1.0	2.9	2.6	0.6
	2	1.1	-0.9	0.9	0.7	-1.4
	3	1.6	-0.7	1.5	1.2	-0.8
	4	2.7	0.6	2.4	2.2	0.2
	5	5.1	3.3	4.8	4.7	2.6

Table 17-24. Summary of Overall C/I Margins for the SES-4 West Hemi/East Hemi beam (54 MHz) connectivity (dB)

It can be seen in Table 17-24 that most C/I margins are positive, except for some cases, like for Interfering Carrier 2 and Interfering Carrier 5. The worst case is represented for Wanted Carrier 2 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.4dB, which is equivalent to an increase of 8.2% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

West Hemi/East Hemi beam connectivity (72 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.2	50.2	14.9	42.3	18.2
2	461KG7W	0.341	47.0	52.4	17.1	43.8	21.5
3	1M84G7W	1.365	54.9	58.5	23.2	43.8	21.5
4	8M25G7W	6.111	51.2	64.6	29.3	42.3	19.1
5	72M0G7W	63.330	56.3	78.9	41.7	48.0	24.9

Table 17-25. Summary of Typical Transmission Parameters for the SES-4 West Hemi/East Hemi beam (72 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.1	1.4	2.4	2.5	0.5
	2	2.1	0.1	1.5	1.5	-0.4
	3	2.1	0.1	1.5	1.5	-0.4
	4	2.8	1.1	2.1	2.2	0.2
	5	4.3	1.9	4.0	3.7	2.0

Table 17-26. Summary of Overall C/I Margins for the SES-4 West Hemi/East Hemi beam (72 MHz) connectivity (dB)

It can be seen in Table 17-26 that most C/I margins are positive, except for Interfering Carrier 5. The worst case is represented for Wanted Carrier 2 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 0.4 dB, which is equivalent to an increase of 6.6% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

Europe/West Hemi beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	53.1	52.1	15.0	42.3	18.2
2	461KG7W	0.341	53.1	54.8	17.7	45.9	21.5
3	1M84G7W	1.365	53.1	60.8	23.7	45.9	21.5
4	8M25G7W	6.111	53.1	66.9	29.8	42.3	19.1
5	54M0G7W	45.000	54.6	80.3	41.2	42.3	19.1

Table 17-27. Summary of Typical Transmission Parameters for the SES-4 Europe/West Hemi beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.3	1.8	1.8	2.3	-0.5
	2	4.6	3.2	3.2	3.7	0.8
	3	4.6	3.2	3.2	3.7	0.8
	4	3.3	1.9	1.9	2.4	-0.4
	5	6.2	4.8	4.8	5.3	2.5

Table 17-28. Summary of Overall C/I Margins for the SES-4 Europe/West Hemi beam (54 MHz) connectivity (dB)

It can be seen in Table 17-28 that most C/I margins are positive, except for Interfering Carrier 5. The worst case is represented for Wanted Carrier 1 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 0.5 dB, which is equivalent to an increase of 6.8% of victim noise temperature. However, these C/I levels

reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

Europe/East Hemi beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	49.0	51.5	14.9	42.3	18.2
2	461KG7W	0.341	53.1	54.4	17.8	45.9	21.5
3	1M84G7W	1.365	53.1	60.4	23.8	45.9	21.5
4	8M25G7W	6.111	53.1	66.2	29.6	42.3	19.1
5	54M0G7W	45.000	54.6	79.9	41.3	42.3	19.1

Table 17-29. Summary of Typical Transmission Parameters for the SES-4 Europe/East Hemi beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	2.8	1.7	1.7	2.3	-0.7
	2	3.8	3.2	3.2	3.8	0.7
	3	3.8	3.2	3.2	3.8	0.7
	4	2.9	1.7	1.7	2.4	-0.6
	5	6.1	4.8	4.8	5.5	2.5

Table 17-30. Summary of Overall C/I Margins for the SES-4 Europe/East Hemi beam (54 MHz) connectivity (dB)

It can be seen in Table 17-30 that most C/I margins are positive, except for Interfering Carrier 5. The worst case is represented for Wanted Carrier 1 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 0.7 dB, which is equivalent to an increase of 7.3% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

West Africa/West Hemi beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	53.1	55.4	15.5	42.3	18.2
2	461KG7W	0.341	54.6	57.8	17.9	45.9	21.5
3	1M84G7W	1.365	54.6	63.9	24.0	45.9	21.5
4	8M25G7W	6.111	53.1	70.2	30.3	42.3	19.1
5	54M0G7W	45.000	58.7	82.1	41.2	42.3	19.1

Table 17-31. Summary of Typical Transmission Parameters for the SES-4 West Africa/West Hemi beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	3.3	2.2	2.2	2.3	0.3
	2	4.3	3.4	3.4	3.3	1.6
	3	4.3	3.4	3.4	3.3	1.6
	4	3.3	2.3	2.3	2.4	0.4
	5	5.6	4.6	4.6	4.7	2.6

Table 17-32. Summary of Overall C/I Margins for the SES-4 West Africa/West Hemi beam (54 MHz) connectivity (dB)

As shown in Table 17-32, all C/I margins are positive.

West Africa/East Hemi beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	53.1	54.8	15.4	42.3	18.2
2	461KG7W	0.341	54.6	57.3	17.9	45.9	21.5
3	1M84G7W	1.365	54.6	63.3	23.9	45.9	21.5
4	8M25G7W	6.111	54.6	69.5	30.1	42.3	19.1
5	54M0G7W	45.000	58.7	82.9	41.5	42.3	19.1

Table 17-33. Summary of Typical Transmission Parameters for the SES-4 West Africa/East Hemi beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
W a	1	3.3	2.1	2.1	2.4	-0.2

	2	4.4	3.4	3.4	3.7	1.2
	3	4.4	3.4	3.4	3.7	1.2
	4	3.3	2.2	2.2	2.5	-0.1
	5	6.2	5.0	5.0	5.3	2.6

Table 17-34. Summary of Overall C/I Margins for the SES-4 West Africa/East Hemi beam (54 MHz) connectivity (dB)

It can be seen in Table 17-34 that most C/I margins are positive, except for Interfering Carrier 5. The worst case is represented for Wanted Carrier 1 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 0.2 dB, which is equivalent to an increase of 6.3% of victim noise temperature. However, these C/I levels reasonably can be expected to be coordinated with an adjacent satellite at 2 degrees spacing.

West Hemi/Europe beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.3	51.8	24.8	47.3	18.2
2	461KG7W	0.341	47.2	53.2	26.2	51.3	21.5
3	1M84G7W	1.365	55.1	59.2	32.2	51.3	21.5
4	8M25G7W	6.111	51.3	66.5	39.5	47.3	19.1
5	54M0G7W	45.000	55.1	78.9	50.0	47.3	19.1

Table 17-35. Summary of Typical Transmission Parameters for the SES-4 West Hemi/Europe beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	7.2	5.4	7.8	6.2	4.8
	2	6.5	3.8	7.8	5.5	4.5
	3	6.5	3.8	7.8	5.5	4.5
	4	7.3	5.5	7.9	6.3	4.9
	5	9.5	8.2	9.9	8.5	7.1

Table 17-36. Summary of Overall C/I Margins for the SES-4 West Hemi/Europe beam (54 MHz) connectivity (dB)

As shown in Table 17-36, all C/I margins are positive.

East Hemi/Europe beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.3	51.6	24.8	47.3	18.2
2	461KG7W	0.341	47.2	53.1	26.3	51.3	21.5
3	1M84G7W	1.365	55.1	59.1	32.3	51.3	21.5
4	8M25G7W	6.111	51.3	66.4	39.6	47.3	19.1
5	54M0G7W	45.000	55.1	78.8	50.0	47.3	19.1

Table 17-37. Summary of Typical Transmission Parameters for the SES-4 East Hemi/Europe beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	7.2	5.4	7.7	6.2	4.9
	2	6.5	3.8	7.8	5.5	4.6
	3	6.5	3.8	7.8	5.5	4.6
	4	7.3	5.4	7.8	6.3	5.0
	5	9.5	8.1	9.8	8.5	7.1

Table 17-38. Summary of Overall C/I Margins for the SES-4 East Hemi/Europe beam (54 MHz) connectivity (dB)

As shown in Table 17-38, all C/I margins are positive.

West Hemi/West Africa beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.3	51.1	25.3	47.3	18.2
2	461KG7W	0.341	47.2	52.7	26.8	51.3	21.5
3	1M84G7W	1.365	55.1	58.7	32.8	51.3	21.5
4	8M25G7W	6.111	51.3	65.9	40.0	47.3	19.1
5	54M0G7W	45.000	55.1	78.4	50.5	47.3	19.1

Table 17-39. Summary of Typical Transmission Parameters for the SES-4 West Hemi/West Africa beam (54 MHz) connectivity

	Interfering Carriers

	Carrier ID	1	2	3	4	5
Wanted Carriers	1	7.2	5.3	7.6	6.2	4.8
	2	6.6	3.8	7.8	5.6	4.6
	3	6.6	3.8	7.8	5.6	4.6
	4	7.3	5.3	7.7	6.3	4.9
	5	9.5	8.0	9.8	8.6	7.1

Table 17-40. Summary of Overall C/I Margins for the SES-4 West Hemi/West Africa beam (54 MHz) connectivity (dB)

As shown in Table 17-40, all C/I margins are positive.

East Hemi/West Africa beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	51.3	51.1	25.3	47.3	18.2
2	461KG7W	0.341	47.2	52.7	26.9	51.3	21.5
3	1M84G7W	1.365	55.1	58.7	33.0	51.3	21.5
4	8M25G7W	6.111	51.3	65.8	40.1	47.3	19.1
5	54M0G7W	45.000	55.1	78.3	50.5	47.3	19.1

Table 17-41. Summary of Typical Transmission Parameters for the SES-4 East Hemi/West Africa beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	7.2	5.2	7.6	6.2	4.9
	2	6.7	3.8	7.8	5.7	4.7
	3	6.7	3.8	7.8	5.7	4.7
	4	7.3	5.3	7.7	6.3	5.0
	5	9.5	7.9	9.7	8.5	7.1

Table 17-42. Summary of Overall C/I Margins for the SES-4 East Hemi/West Africa beam (54 MHz) connectivity (dB)

As shown in Table 17-42, all C/I margins are positive.

Europe/Europe beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S	Uplink EIRP	Downlink EIRP	Rx E/S	C/I Criterion

			Gain (dBi)	(dBW)	(dBW	Gain (dBi)	(dB)
1	346KG7W	0.256	54.4	53.7	26.4	48.2	18.2
2	461KG7W	0.341	54.4	55.1	27.8	52.2	21.5
3	1M84G7W	1.365	56.3	61.2	33.9	52.2	21.5
4	8M25G7W	6.111	56.3	68.4	41.1	48.2	19.1
5	36M0G7W	30.000	54.4	79.0	48.7	48.2	19.1

Table 17-43. Summary of Typical Transmission Parameters for the SES-4 Europe/Europe beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	8.6	8.4	8.7	8.0	6.2
	2	8.4	8.2	8.8	8.0	5.4
	3	8.4	8.2	8.8	8.0	5.4
	4	8.6	8.4	8.8	8.0	6.3
	5	9.7	9.6	9.7	9.0	7.7

Table 17-44. Summary of Overall C/I Margins for the SES-4 Europe/Europe beam (36 MHz) connectivity (dB)

As shown in Table 17-44, all C/I margins are positive.

Europe/Europe beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	54.6	52.1	24.8	49.2	18.2
2	461KG7W	0.341	54.6	54.2	26.9	52.8	21.5
3	1M84G7W	1.365	56.5	60.2	32.9	52.8	21.5
4	8M25G7W	6.111	56.5	66.8	39.5	49.2	19.1
5	54M0G7W	45.000	54.6	79.2	50.0	47.3	19.1

Table 17-45. Summary of Typical Transmission Parameters for the SES-4 Europe/Europe beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	9.4	8.6	9.0	8.8	6.2
	2	9.5	8.6	9.3	9.2	5.9
	3	9.5	8.6	9.3	9.2	5.9
	4	9.5	8.6	9.0	8.9	6.2
	5	10.0	9.1	9.3	9.2	7.0

Table 17-46. Summary of Overall C/I Margins for the SES-4 Europe/Europe beam (54 MHz) connectivity (dB)

As shown in Table 17-46, all C/I margins are positive.

West Africa/Europe beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	54.4	55.4	26.3	48.2	18.2
2	461KG7W	0.341	54.4	56.9	27.8	52.2	21.5
3	1M84G7W	1.365	56.3	63.0	33.9	52.2	21.5
4	8M25G7W	6.111	56.3	70.1	41.0	48.2	19.1
5	36M0G7W	30.000	56.3	80.6	48.5	48.2	19.1

Table 17-47. Summary of Typical Transmission Parameters for the SES-4 West Africa/Europe beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	8.6	8.3	8.6	8.0	6.8
	2	8.5	8.2	8.8	8.2	6.5
	3	8.5	8.2	8.8	8.2	6.5
	4	8.6	8.3	8.6	8.0	6.8
	5	9.7	9.3	9.5	8.9	8.0

Table 17-48. Summary of Overall C/I Margins for the SES-4 West Africa/Europe beam (36 MHz) connectivity (dB)

As shown in Table 17-48, all C/I margins are positive.

West Africa/Europe beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	54.6	53.6	24.5	49.2	18.2
2	461KG7W	0.341	54.6	56.2	27.1	52.8	21.5
3	1M84G7W	1.365	56.5	62.3	33.2	52.8	21.5
4	8M25G7W	6.111	56.5	68.4	39.3	49.2	19.1

5	54M0G7W	45.000	56.5	81.0	50.0	47.3	19.1

Table 17-49. Summary of Typical Transmission Parameters for the SES-4 West Africa/Europe beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	9.4	8.1	8.4	8.8	6.4
	2	10.0	8.6	9.3	9.7	7.0
	3	10.0	8.6	9.3	9.7	7.0
	4	9.5	8.1	8.5	8.9	6.5
	5	10.2	8.9	9.1	9.5	7.2

Table 17-50. Summary of Overall C/I Margins for the SES-4 West Africa/Europe beam (54 MHz) connectivity (dB)

As shown in Table 17-50, all C/I margins are positive.

North America/Europe beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	54.4	53.9	26.2	50.2	18.2
2	461KG7W	0.341	54.4	56.1	28.5	53.7	21.5
3	1M84G7W	1.365	54.4	62.1	34.5	53.7	21.5
4	8M25G7W	6.111	54.4	68.6	40.9	50.2	19.1
5	36M0G7W	30.000	54.4	79.1	48.4	48.2	19.1

Table 17-51. Summary of Typical Transmission Parameters for the SES-4 North America/Europe beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	10.1	9.1	9.1	9.2	7.6
	2	10.0	9.1	9.1	9.1	6.9
	3	10.0	9.1	9.1	9.1	6.9
	4	10.2	9.2	9.2	9.2	7.6
	5	9.6	8.6	8.6	8.7	7.7

Table 17-52. Summary of Overall C/I Margins for the SES-4 North America/Europe beam (36 MHz) connectivity (dB)

As shown in Table 17-52, all C/I margins are positive.

North America/Europe beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	54.6	52.4	24.8	51.3	18.2
2	461KG7W	0.341	54.6	55.1	27.5	54.6	21.5
3	1M84G7W	1.365	54.6	61.2	33.5	54.6	21.5
4	8M25G7W	6.111	54.6	67.1	39.5	51.3	19.1
5	54M0G7W	45.000	54.6	79.6	49.9	49.2	19.1

Table 17-53. Summary of Typical Transmission Parameters for the SES-4 North America/Europe beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	11.0	9.5	9.5	10.0	7.5
	2	11.1	9.6	9.6	10.1	7.3
	3	11.1	9.6	9.6	10.1	7.3
	4	11.0	9.5	9.5	10.1	7.6
	5	11.6	10.1	10.1	10.7	8.5

Table 17-54. Summary of Overall C/I Margins for the SES-4 North America/Europe beam (54 MHz) connectivity (dB)

As shown in Table 17-54, all C/I margins are positive.

Europe/West Africa beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	54.4	52.5	26.3	48.2	18.2
2	461KG7W	0.341	54.4	55.6	29.4	50.2	21.5
3	1M84G7W	1.365	54.4	61.6	35.4	50.2	21.5
4	8M25G7W	6.111	54.4	67.2	41.0	48.2	19.1
5	36M0G7W	30.000	54.4	78.7	48.5	48.2	19.1

Table 17-55. Summary of Typical Transmission Parameters for the SES-4 Europe/West Africa beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wa	1	8.6	6.7	6.7	7.6	5.9

	2	8.7	6.8	6.8	7.8	5.7
	3	8.7	6.8	6.8	7.8	5.7
	4	8.6	6.7	6.7	7.7	6.0
	5	9.8	7.9	7.9	8.8	7.7

Table 17-56. Summary of Overall C/I Margins for the SES-4 Europe/West Africa beam (36 MHz) connectivity (dB)

As shown in Table 17-56, all C/I margins are positive.

Europe/West Africa beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	53.1	52.5	26.3	47.3	18.2
2	461KG7W	0.341	53.1	54.3	28.1	51.3	21.5
3	1M84G7W	1.365	53.1	60.3	34.1	51.3	21.5
4	8M25G7W	6.111	53.1	65.7	39.5	49.2	19.1
5	54M0G7W	45.000	53.1	79.5	50.3	47.3	19.1

Table 17-57. Summary of Typical Transmission Parameters for the SES-4 Europe/West Africa beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	7.6	7.0	7.0	8.2	5.2
	2	7.7	7.1	7.1	8.3	4.7
	3	7.7	7.1	7.1	8.3	4.7
	4	7.6	7.0	7.0	8.1	4.9
	5	8.8	8.2	8.2	9.3	6.7

Table 17-58. Summary of Overall C/I Margins for the SES-4 Europe/West Africa beam (54 MHz) connectivity (dB)

As shown in Table 17-58, all C/I margins are positive.

West Africa/West Africa beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)

1	346KG7W	0.256	54.4	56.2	28.0	45.7	18.2
2	461KG7W	0.341	54.4	57.5	29.4	50.2	21.5
3	1M84G7W	1.365	54.4	63.5	35.4	50.2	21.5
4	8M25G7W	6.111	54.4	69.1	40.9	48.2	19.1
5	36M0G7W	30.000	56.3	80.9	48.8	48.2	19.1

Table 17-59. Summary of Typical Transmission Parameters for the SES-4 West Africa/West Africa beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	6.5	6.4	6.4	7.3	6.1
	2	6.9	6.8	6.8	7.8	6.1
	3	6.9	6.8	6.8	7.8	6.1
	4	6.8	6.8	6.8	7.7	6.3
	5	8.3	8.2	8.2	9.2	8.0

Table 17-60. Summary of Overall C/I Margins for the SES-4 West Africa/West Africa beam (36 MHz) connectivity (dB)

As shown in Table 17-60, all C/I margins are positive.

West Africa/West Africa beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	54.6	54.6	26.5	47.3	18.2
2	461KG7W	0.341	54.6	56.2	28.1	51.3	21.5
3	1M84G7W	1.365	54.6	62.2	34.1	51.3	21.5
4	8M25G7W	6.111	54.6	67.8	39.6	49.2	19.1
5	54M0G7W	45.000	56.5	82.7	50.5	47.3	19.1

Table 17-61. Summary of Typical Transmission Parameters for the SES-4 West Africa/West Africa beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	7.9	7.5	7.5	8.5	5.9
	2	8.0	7.7	7.7	8.6	5.6
	3	8.0	7.7	7.7	8.6	5.6
	4	7.9	7.5	7.5	8.5	5.7
	5	9.0	8.6	8.6	9.6	7.2

Table 17-62. Summary of Overall C/I Margins for the SES-4 West Africa/West Africa beam (54 MHz) connectivity (dB)

As shown in Table 17-62, all C/I margins are positive.

North America/West Africa beam connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	54.4	54.5	27.9	48.2	18.2
2	461KG7W	0.341	54.4	55.4	28.8	53.7	21.5
3	1M84G7W	1.365	54.4	61.9	35.3	52.2	21.5
4	8M25G7W	6.111	54.4	68.4	41.8	48.2	19.1
5	36M0G7W	30.000	54.4	78.2	48.6	48.2	19.1

Table 17-63. Summary of Typical Transmission Parameters for the SES-4 North America/West Africa beam (36 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	8.6	8.9	8.4	8.4	7.8
	2	8.7	9.1	8.6	8.6	7.0
	3	8.3	8.7	8.2	8.2	6.9
	4	7.8	8.2	7.7	7.7	7.0
	5	8.2	8.5	8.0	8.0	7.7

Table 17-64. Summary of Overall C/I Margins for the SES-4 North America/West Africa beam (36 MHz) connectivity (dB)

As shown in Table 17-64, all C/I margins are positive.

North America/West Africa beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	53.1	53.0	26.5	49.2	18.2
2	461KG7W	0.341	54.6	54.5	28.0	54.6	21.5
3	1M84G7W	1.365	54.6	60.5	34.0	54.6	21.5
4	8M25G7W	6.111	53.1	66.4	39.8	51.3	19.1
5	54M0G7W	45.000	53.1	79.1	50.5	47.3	19.1

Table 17-65. Summary of Typical Transmission Parameters for the SES-4 North America/West Africa beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	9.0	9.2	9.2	9.5	6.8
	2	9.0	9.6	9.6	9.5	6.2
	3	9.0	9.6	9.6	9.5	6.2
	4	9.1	9.4	9.4	9.5	6.6
	5	8.6	8.6	8.6	9.1	6.7

Table 17-66. Summary of Overall C/I Margins for the SES-4 North America/West Africa beam (54 MHz) connectivity (dB)

As shown in Table 17-66, all C/I margins are positive.

North America/Southern Cone beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	53.1	52.4	25.5	49.6	18.2
2	461KG7W	0.341	54.6	54.2	27.2	55.0	21.5
3	1M84G7W	1.365	54.6	60.2	33.3	55.0	21.5
4	8M25G7W	6.111	53.1	65.9	38.9	51.7	19.1
5	54M0G7W	45.000	53.1	79.5	50.5	47.7	19.1

Table 17-67. Summary of Typical Transmission Parameters for the SES-4 North America/Southern Cone beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	9.3	9.2	9.2	9.7	6.0
	2	9.5	9.8	9.8	9.8	5.6
	3	9.5	9.8	9.8	9.8	5.6
	4	9.4	9.4	9.4	9.8	5.8
	5	10.0	9.7	9.7	10.3	7.0

Table 17-68. Summary of Overall C/I Margins for the SES-4 North America/Southern Cone beam (54 MHz) connectivity (dB)

As shown in Table 17-68, all C/I margins are positive.

Southern Cone/North America beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	53.1	54.1	27.1	45.2	18.2
2	461KG7W	0.341	54.6	56.4	29.3	49.6	21.5
3	1M84G7W	1.365	54.6	62.4	35.3	49.6	21.5
4	8M25G7W	6.111	53.1	68.9	41.8	45.2	19.1
5	54M0G7W	45.000	53.1	79.5	50.5	45.2	19.1

Table 17-69. Summary of Typical Transmission Parameters for the SES-4 Southern Cone/North America beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	5.9	5.1	5.1	4.9	4.6
	2	7.0	6.4	6.4	6.0	5.3
	3	7.0	6.4	6.4	6.0	5.3
	4	5.9	5.1	5.1	5.0	4.6
	5	6.1	5.3	5.3	5.2	5.0

Table 17-70. Summary of Overall C/I Margins for the SES-4 Southern Cone/North America beam (54 MHz) connectivity (dB)

As shown in Table 17-70, all C/I margins are positive.

Southern Cone/Southern Cone beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	53.1	55.1	25.3	47.7	18.2
2	461KG7W	0.341	54.6	57.4	27.7	51.7	21.5
3	1M84G7W	1.365	54.6	62.8	33.1	53.1	21.5
4	8M25G7W	6.111	53.1	69.8	40.1	47.7	19.1
5	54M0G7W	45.000	56.5	82.2	50.5	45.2	19.1

Table 17-71. Summary of Typical Transmission Parameters for the SES-4 Southern Cone/Southern Cone beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	7.9	7.1	7.7	7.0	5.5
	2	8.5	7.9	8.6	7.5	6.3
	3	8.6	8.2	8.8	7.7	6.5
	4	8.0	7.1	7.8	7.0	5.5
	5	7.9	6.9	7.5	7.0	5.3

Table 17-72. Summary of Overall C/I Margins for the SES-4 Southern Cone/Southern Cone beam (54 MHz) connectivity (dB)

As shown in Table 17-72, all C/I margins are positive.

North America/North America beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	49.1	52.1	27.0	45.2	18.2
2	461KG7W	0.341	53.1	54.2	29.1	47.6	21.5
3	1M84G7W	1.365	53.1	60.2	35.1	47.6	21.5
4	8M25G7W	6.111	49.1	66.8	41.7	45.2	19.1
5	54M0G7W	45.000	53.1	77.5	50.4	45.2	19.1

Table 17-73. Summary of Typical Transmission Parameters for the SES-4 North America/North America beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	5.0	5.0	5.0	4.1	4.6
	2	4.1	4.5	4.5	3.2	3.9
	3	4.1	4.5	4.5	3.2	3.9
	4	5.1	5.1	5.1	4.1	4.6
	5	5.6	5.3	5.3	4.7	5.0

Table 17-74. Summary of Overall C/I Margins for the SES-4 North America/North America beam (54 MHz) connectivity (dB)

As shown in Table 17-74, all C/I margins are positive.

West Africa/North America beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	49.1	53.2	27.4	45.2	18.2
2	461KG7W	0.341	53.1	55.2	29.3	49.6	21.5
3	1M84G7W	1.365	53.1	61.2	35.3	49.6	21.5
4	8M25G7W	6.111	49.1	67.6	41.8	45.2	19.1
5	54M0G7W	45.000	53.1	79.2	50.4	45.2	19.1

Table 17-75. Summary of Typical Transmission Parameters for the SES-4 West Africa/North America beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	5.0	5.2	5.2	4.4	4.8
	2	5.0	6.0	6.0	4.4	5.0
	3	5.0	6.0	6.0	4.4	5.0
	4	4.8	4.9	4.9	4.1	4.5
	5	5.4	5.2	5.2	4.7	5.0

Table 17-76. Summary of Overall C/I Margins for the SES-4 West Africa/North America beam (54 MHz) connectivity (dB)

As shown in Table 17-76, all C/I margins are positive.

Europe/North America beam connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW	Rx E/S Gain (dBi)	C/I Criterion (dB)
1	346KG7W	0.256	49.1	51.5	27.5	45.2	18.2
2	461KG7W	0.341	53.1	53.3	29.3	49.6	21.5
3	1M84G7W	1.365	53.1	59.4	35.3	49.6	21.5
4	8M25G7W	6.111	49.1	65.9	41.9	45.2	19.1
5	54M0G7W	45.000	53.1	78.5	50.5	45.2	19.1

Table 17-77. Summary of Typical Transmission Parameters for the SES-4 Europe/North America beam (54 MHz) connectivity

		Interfering Carriers				
	Carrier ID	1	2	3	4	5
Wanted Carriers	1	5.0	5.3	5.3	4.4	4.5
	2	4.9	6.0	6.0	4.3	4.4
	3	4.9	6.0	6.0	4.3	4.4
	4	4.8	5.0	5.0	4.1	4.2
	5	5.5	5.4	5.4	4.9	5.0

Table 17-78. Summary of Overall C/I Margins for the SES-4 Europe/North America beam (54 MHz) connectivity (dB)

As shown in Table 17-78, all C/I margins are positive.

17.2 Summary of results for the generic interference analysis case

The table below summarizes all the results for the studied connectivities under the generic interference analysis case. It shows the uplink beam, the downlink beam, the associated frequency bands, and the worst case observed C/I margin from the calculations.

Uplink Beam	Downlink Beam	Uplink Band	Downlink Band	Txp BW	Worst Case C/I Margin
GLB	GLB	C	C	36	0.3
WH	WH	C	C	36	-1.0
WH	WH	C	C	54	-1.1
WH	WH	C	C	72	0.1
EH	EH	C	C	36	-0.9
EH	EH	C	C	54	-1.8
EH	EH	C	C	72	-0.4
EH	WH	C	C	36	-1.0
EH	WH	C	C	54	-1.0
EH	WH	C	C	72	0.1
WH	EH	C	C	36	-0.9
WH	EH	C	C	54	-1.4
WH	EH	C	C	72	-0.4
EU	WH	Ku	C	54	-0.5
EU	EH	Ku	C	54	-0.7
WA	WH	Ku	C	54	0.3
WA	EH	Ku	C	54	-0.2
WH	EU	C	Ku	54	3.8
EH	EU	C	Ku	54	3.8
WH	WA	C	Ku	54	3.8
EH	WA	C	Ku	54	3.8
EU	EU	Ku	Ku	36	5.4
EU	EU	Ku	Ku	54	5.9
WA	EU	Ku	Ku	36	6.5
WA	EU	Ku	Ku	54	6.4
NA	EU	Ku	Ku	36	6.9
NA	EU	Ku	Ku	54	7.3
EU	WA	Ku	Ku	36	5.7
EU	WA	Ku	Ku	54	4.7
WA	WA	Ku	Ku	36	6.1
WA	WA	Ku	Ku	54	5.6
NA	WA	Ku	Ku	36	6.9
NA	WA	Ku	Ku	54	6.2
NA	SC	Ku	Ku	54	5.6
SC	NA	Ku	Ku	54	4.6
SC	SC	Ku	Ku	54	5.3
NA	NA	Ku	Ku	54	3.2
WA	NA	Ku	Ku	54	4.1
EU	NA	Ku	Ku	54	4.1

17.3 Specific interference analysis case (SES-4 with respect to NSS-5)

For this case, SES WORLD SKIES has assumed that the transmission parameters of the NSS-5 satellite are the wanted transmissions and the transmission parameters of the SES-4 satellite are the interfering transmissions.[3] This analysis is performed for digital signals only in both the SES-4 and NSS-5 networks as analog TV/FM signals are coordinated on a case-by-case basis with nearby spacecraft.

The SES-4 and NSS-5 spacecraft do not have exactly the same coverages, and therefore a number of geographic overlap scenarios are chosen. For each of the possible SES-4 connectivities and transponder bandwidths, the minimum transponder bandwidth available was chosen as this presents the maximum victim transmission parameters within a certain connectivity. Further, only the scenarios where an actual frequency overlap could occur have been studied. Table 17-79 below depicts the scenarios that are analyzed in this section.

[3] Technical information for NSS-5 is available in the technical appendices associated with File Nos. SAT-PPL-20091208-00142 and SAT-LOA-20091208-00141.

	Interfering	Wanted
Scenario	SES-4 connectivity	NSS-5 connectivity
1	GLB/GLB 36 MHz	GLB/GLB 36 MHz
2	WH/WH 36 MHz	HEMI/HEMI 72 MHz GLB/GLB 36 MHz HEMI/GLB 36 MHz GLB/HEMI 36 MHz ZONE/ZONE 72 MHz HEMI/ZONE 72 MHz ZONE/HEMI 72 MHz
3	EH/EH 36 MHz	HEMI/HEMI 72 MHz GLB/GLB 36 MHz HEMI/GLB 36 MHz GLB/HEMI 36 MHz ZONE/ZONE 72 MHz HEMI/ZONE 72 MHz ZONE/HEMI 72 MHz
4	EH/WH 36 MHz	HEMI/HEMI 72 MHz GLB/GLB 36 MHz HEMI/GLB 36 MHz GLB/HEMI 36 MHz ZONE/ZONE 72 MHz HEMI/ZONE 72 MHz ZONE/HEMI 72 MHz
5	WH/EH 36 MHz	HEMI/HEMI 72 MHz GLB/GLB 36 MHz HEMI/GLB 36 MHz GLB/HEMI 36 MHz ZONE/ZONE 72 MHz HEMI/ZONE 72 MHz ZONE/HEMI 72 MHz
6	EU/WH 54 MHz	KSPOT/GLB 36 MHz KSPOT/HEMI 72 MHz KSPOT/ZONE 72 MHz

	Interfering	Wanted
Scenario	SES-4 connectivity	NSS-5 connectivity
7	EU/EH 54 MHz	KSPOT/GLB 36 MHz KSPOT/HEMI 72 MHz KSPOT/ZONE 72 MHz
8	WA/WH 54 MHz	KSPOT/GLB 36 MHz KSPOT/HEMI 72 MHz KSPOT/ZONE 72 MHz
9	WA/EH 54 MHz	KSPOT/GLB 36 MHz KSPOT/HEMI 72 MHz KSPOT/ZONE 72 MHz
10	WH/EU 54 MHz	GLB/KSPOT 36 MHz HEMI/KSPOT 72 MHz ZONE/KSPOT 72 MHz
11	EH/EU 54 MHz	GLB/KSPOT 36 MHz HEMI/KSPOT 72 MHz ZONE/KSPOT 72 MHz
12	WH/WA 54 MHz	GLB/KSPOT 36 MHz HEMI/KSPOT 72 MHz ZONE/KSPOT 72 MHz
13	EH/WA 54 MHz	GLB/KSPOT 36 MHz HEMI/KSPOT 72 MHz ZONE/KSPOT 72 MHz
14	EU/EU 36 MHz	KSPOT/KSPOT 72 MHz
15	WA/EU 36 MHz	KSPOT/KSPOT 72 MHz
16	NA/EU 36 MHz	KSPOT/KSPOT 72 MHz
17	EU/WA 36 MHz	KSPOT/KSPOT 72 MHz
18	WA/WA 36 MHz	KSPOT/KSPOT 72 MHz
19	NA/WA 36 MHz	KSPOT/KSPOT 72 MHz
20	NA/SC 54 MHz	KSPOT/KSPOT 72 MHz
21	SC/NA 54 MHz	KSPOT/KSPOT 72 MHz
22	SC/SC 54 MHz	KSPOT/KSPOT 72 MHz
23	NA/NA 54 MHz	KSPOT/KSPOT 72 MHz
24	WA/NA 54 MHz	KSPOT/KSPOT 72 MHz
25	EU/NA 54 MHz	KSPOT/KSPOT 72 MHz

Table 17-79. Overview of interference analysis scenarios between SES-4 (interfering) and NSS-5 (wanted)

For each scenario as described in the table above, the summary of the transmission parameters for SES-4 (derived from the link budgets in Annex A) and NSS-5[4] will be given together with the results of the interference calculations in terms of the overall C/I margins. For ease of reference and analysis, these tables are provided in a format similar to the output of the commonly-used Sharp Adjacent Satellite Interference Analysis program.

[4] *See supra* note 3

The interference calculations assume a 1 dB advantage for topocentric-to-geocentric conversion, co-polarization of all wanted and interfering carriers, and all earth station antennas conforming to a sidelobe pattern of 29-25 log(θ), as specified in section 25.209(a)(1) of the Comission's Rules.

Scenario 1: SES-4 Global/Global connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	51.6	52.6	11.4	43.8	18.2	-53.1	-42.7	GLB/GLB 36 MHz
2	461KG7W	0.341	47.5	55.1	13.8	46.9	21.5	-47.7	-41.5	GLB/GLB 36 MHz
3	1M84G7W	1.365	55.3	64.4	23.2	42.5	21.5	-52.3	-38.2	GLB/GLB 36 MHz
4	8M25G7W	6.111	51.6	67.3	26.1	43.8	19.1	-52.2	-41.8	GLB/GLB 36 MHz
5	36M0G7W	30.000	56.8	80.7	33.4	42.5	19.1	-50.9	-41.4	GLB/GLB 36 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.7	53.6	13.0	42.5	18.2	-52.2	-41.0	GLB/GLB 36 MHz
2	461KG7W	0.341	47.6	57.1	16.6	43.8	21.5	-45.8	-38.8	GLB/GLB 36 MHz
3	1M84G7W	1.365	55.4	63.2	22.6	43.8	21.5	-53.6	-38.8	GLB/GLB 36 MHz
4	8M25G7W	6.111	51.7	68.3	27.8	42.5	19.1	-51.2	-40.1	GLB/GLB 36 MHz
5	36M0G7W	30.000	56.8	79.1	36.6	42.5	19.1	-52.5	-38.2	GLB/GLB 36 MHz

Table 17-80. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 1

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	2.9	-0.1	1.0	2.0	0.3
	2	3.4	-0.2	1.7	2.4	1.0
	3	3.0	0.1	1.0	2.1	0.3
	4	2.9	-0.1	1.0	2.0	0.4
	5	2.5	0.1	0.3	1.6	-0.3

Table 17-81. Summary of Overall C/I Margins for scenario 1 (dB)

It can be seen in Table 17-81 that most C/I margins are positive, except for Interfering Carriers 2 and 5. The worst case is represented for Wanted Carrier 5 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 0.3 dB, which is equivalent to an increase of 6.5% of victim noise temperature. These C/I levels

have been successfully coordinated between these two spacecraft and therefore no harmful interference will be caused.

Scenario 2: SES-4 West Hemi/West Hemi connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	47.2	49.6	14.0	42.3	18.2	-51.7	-40.1	HEMI/HEMI 72 MHz
2	461KG7W	0.341	51.3	52.2	16.6	43.8	21.5	-54.4	-38.7	HEMI/HEMI 72 MHz
3	1M84G7W	1.365	55.0	58.2	22.6	43.8	21.5	-58.2	-38.8	HEMI/HEMI 72 MHz
4	8M25G7W	6.111	47.2	63.4	27.8	42.3	19.1	-51.7	-40.1	HEMI/HEMI 72 MHz
5	72M0G7W	63.330	56.4	80.9	40.2	46.9	19.1	-53.5	-37.8	HEMI/HEMI 72 MHz
6	346KG7W	0.256	51.6	52.6	11.4	43.8	18.2	-53.1	-42.7	GLB/GLB 36 MHz
7	461KG7W	0.3413	47.5	55.1	13.8	46.9	21.5	-47.7	-41.5	GLB/GLB 36 MHz
8	1M84G7W	1.3653	55.3	64.4	23.2	42.5	21.5	-52.3	-38.2	GLB/GLB 36 MHz
9	8M25G7W	6.1113	51.6	67.3	26.1	43.8	19.1	-52.2	-41.8	GLB/GLB 36 MHz
10	36M0G7W	30	56.8	80.7	33.4	42.5	19.1	-50.9	-41.4	GLB/GLB 36 MHz
11	346KG7W	0.256	47.5	52.5	11	43.8	18.2	-49.1	-43.1	HEMI/GLB 36 MHz
12	461KG7W	0.3413	51.6	55	13.6	46.8	21.5	-51.9	-41.7	HEMI/GLB 36 MHz
13	1M84G7W	1.3653	55.3	63.6	22.1	43.8	21.5	-53.1	-39.3	HEMI/GLB 36 MHz
14	8M25G7W	6.1113	47.5	67.3	25.8	43.8	19.1	-48.1	-42.1	HEMI/GLB 36 MHz
15	36M0G7W	30.000	56.8	81.9	33.4	42.3	19.1	-49.7	-41.4	HEMI/GLB 36 MHz
16	346KG7W	0.256	47.5	49.7	15.2	42.3	18.2	-51.9	-38.9	GLB/HEMI 36 MHz
17	461KG7W	0.3413	51.6	52.7	18.3	43.8	21.5	-54.2	-37.0	GLB/HEMI 36 MHz
18	1M84G7W	1.3653	55.3	58.7	24.3	42.3	21.5	-58.0	-37.1	GLB/HEMI 36 MHz
19	8M25G7W	6.1113	47.5	64.4	30	42.3	19.1	-51.0	-37.9	GLB/HEMI 36 MHz
20	36M0G7W	30.000	56.8	77	37.6	42.3	19.1	-54.6	-37.2	GLB/HEMI 36 MHz
21	346KG7W	0.256	47.3	48.1	15.2	42.3	18.2	-53.3	-38.9	ZONE/ZONE 72 MHz
22	461KG7W	0.3413	51.4	51	18.1	43.8	21.5	-55.7	-37.2	ZONE/ZONE 72 MHz
23	1M84G7W	1.3653	55.1	57.3	24.4	43.8	21.5	-59.2	-37.0	ZONE/ZONE 72 MHz
24	8M25G7W	6.1113	47.3	62.9	29.9	42.3	19.1	-52.3	-38.0	ZONE/ZONE 72 MHz
25	72M0G7W	63.330	56.6	79	41	47.1	19.1	-55.6	-37.0	ZONE/ZONE 72 MHz
26	346KG7W	0.256	47.3	48.8	15.8	42.3	18.2	-52.6	-38.3	HEMI/ZONE 72 MHz
27	461KG7W	0.3413	51.4	52.2	19.1	43.8	21.5	-54.5	-36.2	HEMI/ZONE 72 MHz
28	1M84G7W	1.3653	55.1	58.4	25.4	43.8	21.5	-58.1	-36.0	HEMI/ZONE 72 MHz
29	8M25G7W	6.1113	47.3	63.6	30.6	42.3	19.1	-51.6	-37.3	HEMI/ZONE 72 MHz
30	72M0G7W	63.330	56.6	82.9	41.9	47.1	19.1	-51.7	-36.1	HEMI/ZONE 72 MHz
31	346KG7W	0.256	47.2	48.2	13.6	42.3	18.2	-53.1	-40.5	ZONE/HEMI 72 MHz
32	461KG7W	0.3413	51.3	50.3	15.8	43.8	21.5	-56.3	-39.5	ZONE/HEMI 72 MHz
33	1M84G7W	1.3653	55	56.4	21.8	43.8	21.5	-60.0	-39.6	ZONE/HEMI 72 MHz
34	8M25G7W	6.1113	47.2	62.3	27.7	42.3	19.1	-52.8	-40.2	ZONE/HEMI 72 MHz
35	72M0G7W	63.330	56.4	81.3	39.8	45.9	19.1	-53.1	-38.2	ZONE/HEMI 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.2	52.1	16.3	42.3	18.2	-53.2	-37.8	WH/WH 36 MHz
2	461KG7W	0.341	47.0	55.0	19.2	42.3	21.5	-47.4	-36.2	WH/WH 36 MHz
3	1M84G7W	1.365	54.9	61.0	25.2	42.3	21.5	-55.3	-36.2	WH/WH 36 MHz
4	8M25G7W	6.111	51.2	65.9	30.1	42.3	19.1	-53.2	-37.7	WH/WH 36 MHz
5	36M0G7W	30.000	56.3	76.5	39.7	42.3	19.1	-54.6	-35.1	WH/WH 36 MHz

Table 17-82. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 2

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	0.8	-1.6	-0.5	0.7	-1.6
	2	0.1	-2.5	-1.1	0.1	-2.1
	3	0.1	-2.5	-1.1	0.1	-2.2
	4	-0.1	-2.5	-1.4	-0.1	-2.5
	5	6.8	4.5	5.5	6.8	4.4
	6	0.0	-1.9	-1.5	0.0	-2.6
	7	0.8	-1.5	-0.6	0.7	-1.7
	8	0.0	-1.9	-1.5	0.0	-2.6
	9	0.1	-1.9	-1.5	0.0	-2.6
	10	-0.7	-2.4	-2.3	-0.7	-3.4
	11	-0.4	-2.3	-1.9	-0.4	-3.0
	12	0.5	-1.7	-0.9	0.4	-2.0
	13	0.2	-1.8	-1.3	0.1	-2.4
	14	-0.2	-2.2	-1.8	-0.3	-2.8
	15	-0.9	-2.6	-2.5	-0.9	-3.6
	16	1.9	-0.7	0.6	1.8	-0.5
	17	1.6	-1.2	0.5	1.6	-0.5
	18	0.4	-2.2	-0.9	0.3	-1.9
	19	2.0	-0.6	0.7	1.9	-0.4
	20	3.1	1.1	1.6	3.1	0.5
	21	1.6	-1.3	0.5	1.5	-0.6
	22	1.1	-2.1	0.2	1.0	-0.9
	23	1.4	-1.8	0.4	1.3	-0.6
	24	1.6	-1.2	0.5	1.6	-0.6
	25	7.4	4.6	6.3	7.3	5.2
	26	2.2	-0.6	1.1	2.1	0.0
	27	2.1	-1.0	1.2	2.1	0.1
	28	2.4	-0.8	1.4	2.3	0.4
	29	2.3	-0.5	1.2	2.3	0.1
	30	8.7	6.4	7.4	8.7	6.3
	31	0.3	-2.3	-1.0	0.2	-2.1
	32	-0.8	-3.7	-2.0	-0.9	-3.0
	33	-0.8	-3.7	-2.0	-0.9	-3.0
	34	-0.3	-2.9	-1.6	-0.4	-2.6
	35	5.6	3.5	4.1	5.5	3.0

Table 17-83. Summary of Overall C/I Margins for scenario 2 (dB)

It can be seen in Table 17-83 that there is a variety of positive and negative C/I margins (with respect to the criteria of 6%). The worst case is represented for Wanted Carrier 33 with respect to Interfering Carrier 2. The deficit with respect to the 6% C/I criterion is 3.7 dB, which is equivalent to an increase of 14.1% of victim noise temperature. The C/I deficit indicated will lead to an impact on the overall C/N+I of only

0.6 dB. These C/I levels have been successfully coordinated between these two spacecraft and therefore no harmful interference will be caused.

Scenario 3: SES-4 East Hemi/East Hemi connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	47.2	49.6	14.0	42.3	18.2	-51.7	-40.1	HEMI/HEMI 72 MHz
2	461KG7W	0.341	51.3	52.2	16.6	43.8	21.5	-54.4	-38.7	HEMI/HEMI 72 MHz
3	1M84G7W	1.365	55.0	58.2	22.6	43.8	21.5	-58.2	-38.8	HEMI/HEMI 72 MHz
4	8M25G7W	6.111	47.2	63.4	27.8	42.3	19.1	-51.7	-40.1	HEMI/HEMI 72 MHz
5	72M0G7W	63.330	56.4	80.9	40.2	46.9	19.1	-53.5	-37.8	HEMI/HEMI 72 MHz
6	346KG7W	0.256	51.6	52.6	11.4	43.8	18.2	-53.1	-42.7	GLB/GLB 36 MHz
7	461KG7W	0.3413	47.5	55.1	13.8	46.9	21.5	-47.7	-41.5	GLB/GLB 36 MHz
8	1M84G7W	1.3653	55.3	64.4	23.2	42.5	21.5	-52.3	-38.2	GLB/GLB 36 MHz
9	8M25G7W	6.1113	51.6	67.3	26.1	43.8	19.1	-52.2	-41.8	GLB/GLB 36 MHz
10	36M0G7W	30	56.8	80.7	33.4	42.5	19.1	-50.9	-41.4	GLB/GLB 36 MHz
11	346KG7W	0.256	47.5	52.5	11	43.8	18.2	-49.1	-43.1	HEMI/GLB 36 MHz
12	461KG7W	0.3413	51.6	55	13.6	46.8	21.5	-51.9	-41.7	HEMI/GLB 36 MHz
13	1M84G7W	1.3653	55.3	63.6	22.1	43.8	21.5	-53.1	-39.3	HEMI/GLB 36 MHz
14	8M25G7W	6.1113	47.5	67.3	25.8	43.8	19.1	-48.1	-42.1	HEMI/GLB 36 MHz
15	36M0G7W	30.000	56.8	81.9	33.4	42.3	19.1	-49.7	-41.4	HEMI/GLB 36 MHz
16	346KG7W	0.256	47.5	49.7	15.2	42.3	18.2	-51.9	-38.9	GLB/HEMI 36 MHz
17	461KG7W	0.3413	51.6	52.7	18.3	43.8	21.5	-54.2	-37.0	GLB/HEMI 36 MHz
18	1M84G7W	1.3653	55.3	58.7	24.3	42.3	21.5	-58.0	-37.1	GLB/HEMI 36 MHz
19	8M25G7W	6.1113	47.5	64.4	30	42.3	19.1	-51.0	-37.9	GLB/HEMI 36 MHz
20	36M0G7W	30.000	56.8	77	37.6	42.3	19.1	-54.6	-37.2	GLB/HEMI 36 MHz
21	346KG7W	0.256	47.3	48.1	15.2	42.3	18.2	-53.3	-38.9	ZONE/ZONE 72 MHz
22	461KG7W	0.3413	51.4	51	18.1	43.8	21.5	-55.7	-37.2	ZONE/ZONE 72 MHz
23	1M84G7W	1.3653	55.1	57.3	24.4	43.8	21.5	-59.2	-37.0	ZONE/ZONE 72 MHz
24	8M25G7W	6.1113	47.3	62.9	29.9	42.3	19.1	-52.3	-38.0	ZONE/ZONE 72 MHz
25	72M0G7W	63.330	56.6	79	41	47.1	19.1	-55.6	-37.0	ZONE/ZONE 72 MHz
26	346KG7W	0.256	47.3	48.8	15.8	42.3	18.2	-52.6	-38.3	HEMI/ZONE 72 MHz
27	461KG7W	0.3413	51.4	52.2	19.1	43.8	21.5	-54.5	-36.2	HEMI/ZONE 72 MHz
28	1M84G7W	1.3653	55.1	58.4	25.4	43.8	21.5	-58.1	-36.0	HEMI/ZONE 72 MHz
29	8M25G7W	6.1113	47.3	63.6	30.6	42.3	19.1	-51.6	-37.3	HEMI/ZONE 72 MHz
30	72M0G7W	63.330	56.6	82.9	41.9	47.1	19.1	-51.7	-36.1	HEMI/ZONE 72 MHz
31	346KG7W	0.256	47.2	48.2	13.6	42.3	18.2	-53.1	-40.5	ZONE/HEMI 72 MHz
32	461KG7W	0.3413	51.3	50.3	15.8	43.8	21.5	-56.3	-39.5	ZONE/HEMI 72 MHz
33	1M84G7W	1.3653	55	56.4	21.8	43.8	21.5	-60.0	-39.6	ZONE/HEMI 72 MHz
34	8M25G7W	6.1113	47.2	62.3	27.7	42.3	19.1	-52.8	-40.2	ZONE/HEMI 72 MHz
35	72M0G7W	63.330	56.4	81.3	39.8	45.9	19.1	-53.1	-38.2	ZONE/HEMI 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.2	52.2	17.0	42.3	18.2	-53.1	-37.1	EH/EH 36 MHz
2	461KG7W	0.341	47.0	54.7	19.5	42.3	21.5	-47.7	-35.8	EH/EH 36 MHz
3	1M84G7W	1.365	54.9	60.7	25.5	42.3	21.5	-55.6	-35.8	EH/EH 36 MHz
4	8M25G7W	6.111	51.2	66.9	31.8	42.3	19.1	-52.1	-36.1	EH/EH 36 MHz
5	36M0G7W	30.000	56.3	76.9	39.8	42.3	19.1	-54.2	-35.0	EH/EH 36 MHz

Table 17-84. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 3

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	0.1	-1.8	-0.9	-0.8	-1.7
	2	-0.5	-2.7	-1.4	-1.5	-2.3
	3	-0.5	-2.7	-1.4	-1.5	-2.3
	4	-0.8	-2.7	-1.7	-1.7	-2.6
	5	6.1	4.3	5.1	5.2	4.3
	6	-0.7	-2.2	-1.8	-1.7	-2.7
	7	0.1	-1.7	-1.0	-0.9	-1.8
	8	-0.7	-2.2	-1.9	-1.7	-2.7
	9	-0.7	-2.2	-1.8	-1.6	-2.7
	10	-1.4	-2.7	-2.7	-2.4	-3.5
	11	-1.1	-2.6	-2.2	-2.1	-3.1
	12	-0.2	-2.0	-1.3	-1.2	-2.1
	13	-0.6	-2.1	-1.7	-1.5	-2.5
	14	-1.0	-2.5	-2.1	-1.9	-3.0
	15	-1.6	-2.9	-2.8	-2.6	-3.7
	16	1.2	-0.9	0.3	0.2	-0.6
	17	1.0	-1.3	0.2	0.0	-0.7
	18	-0.3	-2.4	-1.2	-1.3	-2.1
	19	1.3	-0.8	0.4	0.3	-0.5
	20	2.4	0.8	1.3	1.4	0.4
	21	0.9	-1.4	0.2	0.0	-0.7
	22	0.5	-2.2	-0.1	-0.5	-1.0
	23	0.8	-1.9	0.2	-0.2	-0.8
	24	1.0	-1.3	0.2	0.0	-0.7
	25	6.8	4.5	6.0	5.8	5.1
	26	1.6	-0.8	0.8	0.6	-0.1
	27	1.5	-1.1	0.9	0.6	0.0
	28	1.8	-0.8	1.2	0.8	0.3
	29	1.7	-0.6	0.9	0.7	0.0
	30	8.0	6.2	7.0	7.1	6.2
	31	-0.4	-2.5	-1.3	-1.4	-2.2
	32	-1.5	-3.8	-2.3	-2.5	-3.2
	33	-1.5	-3.8	-2.3	-2.5	-3.2
	34	-1.0	-3.0	-1.9	-1.9	-2.8
	35	4.9	3.2	3.8	3.9	2.9

Table 17-85. Summary of Overall C/I Margins for scenario 3 (dB)

It can be seen in Table 17-85 that there is a variety of positive and negative C/I margins (with respect to the criteria of 6%). The worst case is represented for Wanted Carrier 32 with respect to Interfering Carrier 2. The deficit with respect to the 6% C/I criterion is 3.8 dB, which is equivalent to an increase of 14.4% of victim noise temperature. The C/I deficit indicated will lead to an impact on the overall C/N+I of only

0.6 dB. These C/I levels have been successfully coordinated between these two spacecraft and therefore no harmful interference will be caused.

Scenario 4: SES-4 East Hemi/West Hemi connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	47.2	49.6	14.0	42.3	18.2	-51.7	-40.1	HEMI/HEMI 72 MHz
2	461KG7W	0.341	51.3	52.2	16.6	43.8	21.5	-54.4	-38.7	HEMI/HEMI 72 MHz
3	1M84G7W	1.365	55.0	58.2	22.6	43.8	21.5	-58.2	-38.8	HEMI/HEMI 72 MHz
4	8M25G7W	6.111	47.2	63.4	27.8	42.3	19.1	-51.7	-40.1	HEMI/HEMI 72 MHz
5	72M0G7W	63.330	56.4	80.9	40.2	46.9	19.1	-53.5	-37.8	HEMI/HEMI 72 MHz
6	346KG7W	0.256	51.6	52.6	11.4	43.8	18.2	-53.1	-42.7	GLB/GLB 36 MHz
7	461KG7W	0.3413	47.5	55.1	13.8	46.9	21.5	-47.7	-41.5	GLB/GLB 36 MHz
8	1M84G7W	1.3653	55.3	64.4	23.2	42.5	21.5	-52.3	-38.2	GLB/GLB 36 MHz
9	8M25G7W	6.1113	51.6	67.3	26.1	43.8	19.1	-52.2	-41.8	GLB/GLB 36 MHz
10	36M0G7W	30	56.8	80.7	33.4	42.5	19.1	-50.9	-41.4	GLB/GLB 36 MHz
11	346KG7W	0.256	47.5	52.5	11	43.8	18.2	-49.1	-43.1	HEMI/GLB 36 MHz
12	461KG7W	0.3413	51.6	55	13.6	46.8	21.5	-51.9	-41.7	HEMI/GLB 36 MHz
13	1M84G7W	1.3653	55.3	63.6	22.1	43.8	21.5	-53.1	-39.3	HEMI/GLB 36 MHz
14	8M25G7W	6.1113	47.5	67.3	25.8	43.8	19.1	-48.1	-42.1	HEMI/GLB 36 MHz
15	36M0G7W	30.000	56.8	81.9	33.4	42.3	19.1	-49.7	-41.4	HEMI/GLB 36 MHz
16	346KG7W	0.256	47.5	49.7	15.2	42.3	18.2	-51.9	-38.9	GLB/HEMI 36 MHz
17	461KG7W	0.3413	51.6	52.7	18.3	43.8	21.5	-54.2	-37.0	GLB/HEMI 36 MHz
18	1M84G7W	1.3653	55.3	58.7	24.3	42.3	21.5	-58.0	-37.1	GLB/HEMI 36 MHz
19	8M25G7W	6.1113	47.5	64.4	30	42.3	19.1	-51.0	-37.9	GLB/HEMI 36 MHz
20	36M0G7W	30.000	56.8	77	37.6	42.3	19.1	-54.6	-37.2	GLB/HEMI 36 MHz
21	346KG7W	0.256	47.3	48.1	15.2	42.3	18.2	-53.3	-38.9	ZONE/ZONE 72 MHz
22	461KG7W	0.3413	51.4	51	18.1	43.8	21.5	-55.7	-37.2	ZONE/ZONE 72 MHz
23	1M84G7W	1.3653	55.1	57.3	24.4	43.8	21.5	-59.2	-37.0	ZONE/ZONE 72 MHz
24	8M25G7W	6.1113	47.3	62.9	29.9	42.3	19.1	-52.3	-38.0	ZONE/ZONE 72 MHz
25	72M0G7W	63.330	56.6	79	41	47.1	19.1	-55.6	-37.0	ZONE/ZONE 72 MHz
26	346KG7W	0.256	47.3	48.8	15.8	42.3	18.2	-52.6	-38.3	HEMI/ZONE 72 MHz
27	461KG7W	0.3413	51.4	52.2	19.1	43.8	21.5	-54.5	-36.2	HEMI/ZONE 72 MHz
28	1M84G7W	1.3653	55.1	58.4	25.4	43.8	21.5	-58.1	-36.0	HEMI/ZONE 72 MHz
29	8M25G7W	6.1113	47.3	63.6	30.6	42.3	19.1	-51.6	-37.3	HEMI/ZONE 72 MHz
30	72M0G7W	63.330	56.6	82.9	41.9	47.1	19.1	-51.7	-36.1	HEMI/ZONE 72 MHz
31	346KG7W	0.256	47.2	48.2	13.6	42.3	18.2	-53.1	-40.5	ZONE/HEMI 72 MHz
32	461KG7W	0.3413	51.3	50.3	15.8	43.8	21.5	-56.3	-39.5	ZONE/HEMI 72 MHz
33	1M84G7W	1.3653	55	56.4	21.8	43.8	21.5	-60.0	-39.6	ZONE/HEMI 72 MHz
34	8M25G7W	6.1113	47.2	62.3	27.7	42.3	19.1	-52.8	-40.2	ZONE/HEMI 72 MHz
35	72M0G7W	63.330	56.4	81.3	39.8	45.9	19.1	-53.1	-38.2	ZONE/HEMI 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.2	52.3	16.6	42.3	18.2	-53.0	-37.4	EH/WH 36 MHz
2	461KG7W	0.341	47.0	54.9	19.2	42.3	21.5	-47.5	-36.1	EH/WH 36 MHz
3	1M84G7W	1.365	54.9	60.9	25.2	42.3	21.5	-55.4	-36.1	EH/WH 36 MHz
4	8M25G7W	6.111	51.2	67.0	31.4	42.3	19.1	-52.0	-36.5	EH/WH 36 MHz
5	36M0G7W	30.000	56.3	76.4	39.8	42.3	19.1	-54.7	-35.0	EH/WH 36 MHz

Table 17-86. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 4

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	0.4	-1.6	-0.6	-0.5	-1.7
	2	-0.2	-2.5	-1.1	-1.2	-2.2
	3	-0.2	-2.5	-1.1	-1.2	-2.3
	4	-0.4	-2.5	-1.5	-1.4	-2.6
	5	6.5	4.5	5.4	5.5	4.3
	6	-0.3	-2.0	-1.5	-1.3	-2.7
	7	0.4	-1.5	-0.7	-0.6	-1.8
	8	-0.4	-1.9	-1.6	-1.3	-2.7
	9	-0.3	-2.0	-1.5	-1.3	-2.6
	10	-1.1	-2.4	-2.4	-2.0	-3.5
	11	-0.7	-2.4	-1.9	-1.7	-3.1
	12	0.1	-1.8	-1.0	-0.8	-2.1
	13	-0.2	-1.8	-1.4	-1.2	-2.5
	14	-0.6	-2.2	-1.8	-1.6	-2.9
	15	-1.2	-2.6	-2.5	-2.2	-3.7
	16	1.5	-0.7	0.6	0.5	-0.6
	17	1.3	-1.2	0.5	0.3	-0.6
	18	0.0	-2.2	-0.9	-0.9	-2.0
	19	1.6	-0.6	0.7	0.6	-0.4
	20	2.8	1.1	1.6	1.8	0.4
	21	1.2	-1.3	0.4	0.3	-0.7
	22	0.7	-2.1	0.1	-0.2	-1.0
	23	1.0	-1.8	0.4	0.1	-0.7
	24	1.3	-1.2	0.5	0.3	-0.6
	25	7.1	4.6	6.2	6.1	5.1
	26	1.9	-0.7	1.0	0.9	-0.1
	27	1.8	-1.0	1.1	0.8	0.1
	28	2.1	-0.8	1.4	1.1	0.3
	29	2.0	-0.5	1.2	1.0	0.1
	30	8.4	6.4	7.3	7.4	6.2
	31	-0.1	-2.3	-1.0	-1.0	-2.2
	32	-1.2	-3.7	-2.0	-2.2	-3.1
	33	-1.2	-3.7	-2.0	-2.2	-3.1
	34	-0.7	-2.9	-1.6	-1.6	-2.7
	35	5.2	3.4	4.1	4.3	3.0

Table 17-87. Summary of Overall C/I Margins for scenario 4 (dB)

It can be seen in Table 17-87 that there is a variety of positive and negative C/I margins (with respect to the criteria of 6%). The worst case is represented for Wanted Carrier 32 with respect to Interfering Carrier 2. The deficit with respect to the 6% C/I criterion is 3.7 dB, which is equivalent to an increase of 14.1% of victim noise temperature. The C/I deficit indicated will lead to an impact on the overall C/N+I of only

0.6 dB. These C/I levels have been successfully coordinated between these two spacecraft and therefore no harmful interference will be caused.

Scenario 5: SES-4 West Hemi/East Hemi connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	47.2	49.6	14.0	42.3	18.2	-51.7	-40.1	HEMI/HEMI 72 MHz
2	461KG7W	0.341	51.3	52.2	16.6	43.8	21.5	-54.4	-38.7	HEMI/HEMI 72 MHz
3	1M84G7W	1.365	55.0	58.2	22.6	43.8	21.5	-58.2	-38.8	HEMI/HEMI 72 MHz
4	8M25G7W	6.111	47.2	63.4	27.8	42.3	19.1	-51.7	-40.1	HEMI/HEMI 72 MHz
5	72M0G7W	63.330	56.4	80.9	40.2	46.9	19.1	-53.5	-37.8	HEMI/HEMI 72 MHz
6	346KG7W	0.256	51.6	52.6	11.4	43.8	18.2	-53.1	-42.7	GLB/GLB 36 MHz
7	461KG7W	0.3413	47.5	55.1	13.8	46.9	21.5	-47.7	-41.5	GLB/GLB 36 MHz
8	1M84G7W	1.3653	55.3	64.4	23.2	42.5	21.5	-52.3	-38.2	GLB/GLB 36 MHz
9	8M25G7W	6.1113	51.6	67.3	26.1	43.8	19.1	-52.2	-41.8	GLB/GLB 36 MHz
10	36M0G7W	30	56.8	80.7	33.4	42.5	19.1	-50.9	-41.4	GLB/GLB 36 MHz
11	346KG7W	0.256	47.5	52.5	11	43.8	18.2	-49.1	-43.1	HEMI/GLB 36 MHz
12	461KG7W	0.3413	51.6	55	13.6	46.8	21.5	-51.9	-41.7	HEMI/GLB 36 MHz
13	1M84G7W	1.3653	55.3	63.6	22.1	43.8	21.5	-53.1	-39.3	HEMI/GLB 36 MHz
14	8M25G7W	6.1113	47.5	67.3	25.8	43.8	19.1	-48.1	-42.1	HEMI/GLB 36 MHz
15	36M0G7W	30.000	56.8	81.9	33.4	42.3	19.1	-49.7	-41.4	HEMI/GLB 36 MHz
16	346KG7W	0.256	47.5	49.7	15.2	42.3	18.2	-51.9	-38.9	GLB/HEMI 36 MHz
17	461KG7W	0.3413	51.6	52.7	18.3	43.8	21.5	-54.2	-37.0	GLB/HEMI 36 MHz
18	1M84G7W	1.3653	55.3	58.7	24.3	42.3	21.5	-58.0	-37.1	GLB/HEMI 36 MHz
19	8M25G7W	6.1113	47.5	64.4	30	42.3	19.1	-51.0	-37.9	GLB/HEMI 36 MHz
20	36M0G7W	30.000	56.8	77	37.6	42.3	19.1	-54.6	-37.2	GLB/HEMI 36 MHz
21	346KG7W	0.256	47.3	48.1	15.2	42.3	18.2	-53.3	-38.9	ZONE/ZONE 72 MHz
22	461KG7W	0.3413	51.4	51	18.1	43.8	21.5	-55.7	-37.2	ZONE/ZONE 72 MHz
23	1M84G7W	1.3653	55.1	57.3	24.4	43.8	21.5	-59.2	-37.0	ZONE/ZONE 72 MHz
24	8M25G7W	6.1113	47.3	62.9	29.9	42.3	19.1	-52.3	-38.0	ZONE/ZONE 72 MHz
25	72M0G7W	63.330	56.6	79	41	47.1	19.1	-55.6	-37.0	ZONE/ZONE 72 MHz
26	346KG7W	0.256	47.3	48.8	15.8	42.3	18.2	-52.6	-38.3	HEMI/ZONE 72 MHz
27	461KG7W	0.3413	51.4	52.2	19.1	43.8	21.5	-54.5	-36.2	HEMI/ZONE 72 MHz
28	1M84G7W	1.3653	55.1	58.4	25.4	43.8	21.5	-58.1	-36.0	HEMI/ZONE 72 MHz
29	8M25G7W	6.1113	47.3	63.6	30.6	42.3	19.1	-51.6	-37.3	HEMI/ZONE 72 MHz
30	72M0G7W	63.330	56.6	82.9	41.9	47.1	19.1	-51.7	-36.1	HEMI/ZONE 72 MHz
31	346KG7W	0.256	47.2	48.2	13.6	42.3	18.2	-53.1	-40.5	ZONE/HEMI 72 MHz
32	461KG7W	0.3413	51.3	50.3	15.8	43.8	21.5	-56.3	-39.5	ZONE/HEMI 72 MHz
33	1M84G7W	1.3653	55	56.4	21.8	43.8	21.5	-60.0	-39.6	ZONE/HEMI 72 MHz
34	8M25G7W	6.1113	47.2	62.3	27.7	42.3	19.1	-52.8	-40.2	ZONE/HEMI 72 MHz
35	72M0G7W	63.330	56.4	81.3	39.8	45.9	19.1	-53.1	-38.2	ZONE/HEMI 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.2	52.6	17.3	42.3	18.2	-52.7	-36.8	WH/EH 36 MHz
2	461KG7W	0.341	47.0	55.5	20.2	42.3	21.5	-46.8	-35.1	WH/EH 36 MHz
3	1M84G7W	1.365	54.9	61.5	26.3	42.3	21.5	-54.7	-35.1	WH/EH 36 MHz
4	8M25G7W	6.111	51.2	66.9	31.6	42.3	19.1	-52.2	-36.3	WH/EH 36 MHz
5	36M0G7W	30.000	56.3	77.0	39.7	42.3	19.1	-54.1	-35.1	WH/EH 36 MHz

Table 17-88. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 5

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	-0.2	-2.5	-1.6	-0.7	-1.6
	2	-0.8	-3.4	-2.1	-1.3	-2.2
	3	-0.8	-3.4	-2.1	-1.3	-2.2
	4	-1.1	-3.4	-2.5	-1.5	-2.5
	5	5.8	3.5	4.4	5.4	4.4
	6	-1.0	-3.0	-2.5	-1.5	-2.6
	7	-0.2	-2.5	-1.7	-0.7	-1.7
	8	-1.0	-2.9	-2.6	-1.5	-2.6
	9	-1.0	-2.9	-2.5	-1.4	-2.6
	10	-1.7	-3.4	-3.4	-2.2	-3.4
	11	-1.4	-3.3	-2.9	-1.9	-3.0
	12	-0.5	-2.7	-2.0	-1.0	-2.0
	13	-0.8	-2.8	-2.4	-1.3	-2.4
	14	-1.2	-3.2	-2.8	-1.7	-2.9
	15	-1.9	-3.6	-3.6	-2.4	-3.6
	16	0.9	-1.6	-0.4	0.4	-0.5
	17	0.7	-2.1	-0.5	0.2	-0.6
	18	-0.6	-3.1	-1.9	-1.1	-2.0
	19	1.0	-1.5	-0.3	0.5	-0.4
	20	2.1	0.1	0.6	1.6	0.5
	21	0.6	-2.2	-0.6	0.2	-0.6
	22	0.2	-2.9	-0.9	-0.3	-1.0
	23	0.5	-2.7	-0.6	0.0	-0.7
	24	0.7	-2.1	-0.5	0.2	-0.6
	25	6.5	3.7	5.2	6.0	5.2
	26	1.3	-1.5	0.1	0.8	0.0
	27	1.2	-1.8	0.2	0.7	0.1
	28	1.5	-1.6	0.4	1.0	0.3
	29	1.4	-1.4	0.2	0.9	0.1
	30	7.8	5.5	6.3	7.3	6.3
	31	-0.7	-3.2	-2.0	-1.2	-2.1
	32	-1.8	-4.6	-3.0	-2.3	-3.1
	33	-1.8	-4.6	-3.0	-2.3	-3.1
	34	-1.3	-3.8	-2.6	-1.8	-2.7
	35	4.6	2.5	3.1	4.1	3.0

Table 17-89. Summary of Overall C/I Margins for scenario 5 (dB)

It can be seen in Table 17-89 that there is a variety of positive and negative C/I margins (with respect to the criteria of 6%). The worst case is represented for Wanted Carrier 32 with respect to Interfering Carrier 2. The deficit with respect to the 6% C/I criterion is 4.6 dB, which is equivalent to an increase of 17.3% of victim noise temperature. The C/I deficit indicated will lead to an impact on the overall C/N+I of only

0.7 dB. These C/I levels have been successfully coordinated between these two spacecraft and therefore no harmful interference will be caused.

Scenario 6: SES-4 Europe/West Hemi connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	49.2	52.4	8.2	48.1	18.2	-50.9	-45.9	KSPOT/GLB 36 MHz
2	461KG7W	0.3413	53.3	55.3	11.2	50	21.5	-53.3	-44.1	KSPOT/GLB 36 MHz
3	1M84G7W	1.3653	53.3	61.4	17.2	50	21.5	-53.3	-44.2	KSPOT/GLB 36 MHz
4	8M25G7W	6.1113	46.7	64	19.8	51.7	19.1	-50.6	-48.1	KSPOT/GLB 36 MHz
5	36M0G7W	30.000	49.2	73.9	26.1	51.7	19.1	-50.1	-48.7	KSPOT/GLB 36 MHz
6	346KG7W	0.256	46.5	49.6	14.6	42.3	18.2	-51.0	-39.5	KSPOT/HEMI 72 MHz
7	461KG7W	0.3413	49.1	51.1	16.2	45.8	21.5	-53.3	-39.1	KSPOT/HEMI 72 MHz
8	1M84G7W	1.3653	52.9	57.7	22.7	45.8	21.5	-56.6	-38.7	KSPOT/HEMI 72 MHz
9	8M25G7W	6.1113	49.1	63.4	28.4	43.8	19.1	-53.6	-39.5	KSPOT/HEMI 72 MHz
10	72M0G7W	63.330	56.5	80.6	38.6	50	19.1	-53.9	-39.4	KSPOT/HEMI 72 MHz
11	346KG7W	0.256	46.5	49.2	16.8	42.3	18.2	-51.4	-37.3	KSPOT/ZONE 72 MHz
12	461KG7W	0.3413	49	51	18.6	45.8	21.5	-53.3	-36.7	KSPOT/ZONE 72 MHz
13	1M84G7W	1.3653	52.8	57	24.7	45.8	21.5	-57.2	-36.7	KSPOT/ZONE 72 MHz
14	8M25G7W	6.1113	46.5	62.7	30.3	43.8	19.1	-51.7	-37.6	KSPOT/ZONE 72 MHz
15	72M0G7W	63.330	54.5	79.1	40.8	50	19.1	-53.4	-37.2	KSPOT/ZONE 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	53.1	52.1	15.0	42.3	18.2	-55.1	-39.1	EU/WH 54 MHz
2	461KG7W	0.341	53.1	54.8	17.7	45.9	21.5	-53.6	-37.6	EU/WH 54 MHz
3	1M84G7W	1.365	53.1	60.8	23.7	45.9	21.5	-53.6	-37.6	EU/WH 54 MHz
4	8M25G7W	6.111	53.1	66.9	29.8	42.3	19.1	-54.1	-38.1	EU/WH 54 MHz
5	54M0G7W	45.000	54.6	80.3	41.2	42.3	19.1	-50.8	-35.3	EU/WH 54 MHz

Table 17-90. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 6

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	2.4	0.9	0.9	1.4	-1.4
	2	2.6	1.1	1.1	1.6	-1.2
	3	2.5	1.1	1.1	1.6	-1.2
	4	2.6	1.1	1.1	1.6	-1.2
	5	2.3	0.8	0.8	1.3	-1.5
	6	2.7	1.2	1.2	1.7	-1.1
	7	2.6	1.1	1.1	1.6	-1.3
	8	3.1	1.6	1.6	2.1	-0.8
	9	3.1	1.6	1.6	2.1	-0.7
	10	9.4	8.0	8.0	8.5	5.6
	11	4.5	3.0	3.0	3.5	0.6
	12	4.3	2.8	2.8	3.3	0.3
	13	4.3	2.9	2.9	3.3	0.4
	14	4.4	3.0	3.0	3.5	0.6
	15	10.9	9.5	9.5	9.9	7.0

Table 17-91. Summary of Overall C/I Margins for scenario 6 (dB)

It can be seen in Table 17-91 that most C/I margins are positive, except for Interfering Carrier 5 (with respect to the criteria of 6%). The worst case is represented for Wanted Carrier 5 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.5 dB, which is equivalent to an increase of 8.5% of victim noise temperature. These C/I levels have been successfully coordinated between these two spacecraft, except for the 13.75-14.0 GHz band. However, the NSS-5 satellite does not operate in that band. In any event, the C/I deficit of 1.5 dB is due to the downlink portion of the link (which is in the C-band), and it is reasonably expected that the uplink in the 13.75-14.0 GHz band can be coordinated.[5]

Scenario 7: SES-4 Europe/East Hemi connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	49.2	52.4	8.2	48.1	18.2	-50.9	-45.9	KSPOT/GLB 36 MHz
2	461KG7W	0.3413	53.3	55.3	11.2	50	21.5	-53.3	-44.1	KSPOT/GLB 36 MHz
3	1M84G7W	1.3653	53.3	61.4	17.2	50	21.5	-53.3	-44.2	KSPOT/GLB 36 MHz
4	8M25G7W	6.1113	46.7	64	19.8	51.7	19.1	-50.6	-48.1	KSPOT/GLB 36 MHz
5	36M0G7W	30.000	49.2	73.9	26.1	51.7	19.1	-50.1	-48.7	KSPOT/GLB 36 MHz
6	346KG7W	0.256	46.5	49.6	14.6	42.3	18.2	-51.0	-39.5	KSPOT/HEMI 72 MHz
7	461KG7W	0.3413	49.1	51.1	16.2	45.8	21.5	-53.3	-39.1	KSPOT/HEMI 72 MHz
8	1M84G7W	1.3653	52.9	57.7	22.7	45.8	21.5	-56.6	-38.7	KSPOT/HEMI 72 MHz
9	8M25G7W	6.1113	49.1	63.4	28.4	43.8	19.1	-53.6	-39.5	KSPOT/HEMI 72 MHz
10	72M0G7W	63.330	56.5	80.6	38.6	50	19.1	-53.9	-39.4	KSPOT/HEMI 72 MHz
11	346KG7W	0.256	46.5	49.2	16.8	42.3	18.2	-51.4	-37.3	KSPOT/ZONE 72 MHz
12	461KG7W	0.3413	49	51	18.6	45.8	21.5	-53.3	-36.7	KSPOT/ZONE 72 MHz
13	1M84G7W	1.3653	52.8	57	24.7	45.8	21.5	-57.2	-36.7	KSPOT/ZONE 72 MHz
14	8M25G7W	6.1113	46.5	62.7	30.3	43.8	19.1	-51.7	-37.6	KSPOT/ZONE 72 MHz
15	72M0G7W	63.330	54.5	79.1	40.8	50	19.1	-53.4	-37.2	KSPOT/ZONE 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	49.0	51.5	14.9	42.3	18.2	-51.6	-39.2	EU/EH 54 MHz
2	461KG7W	0.341	53.1	54.4	17.8	45.9	21.5	-54.1	-37.6	EU/EH 54 MHz
3	1M84G7W	1.365	53.1	60.4	23.8	45.9	21.5	-54.1	-37.6	EU/EH 54 MHz
4	8M25G7W	6.111	53.1	66.2	29.6	42.3	19.1	-54.7	-38.2	EU/EH 54 MHz
5	54M0G7W	45.000	54.6	79.9	41.3	42.3	19.1	-51.2	-35.2	EU/EH 54 MHz

Table 17-92. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 7

[5] *See supra* Section 17.1 (providing a two-degree interference analysis for a hypothetical satellite operating under the same technical parameters). The closest satellite operating in the 13.75-14 GHz band is Telstar-12 at 15° W.L. and the calculated C/I deficit with respect to that satellite, operating at a seven-degree separation, is negligible.

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	2.1	0.9	0.9	1.5	-1.5
	2	2.2	1.1	1.1	1.7	-1.3
	3	2.2	1.1	1.1	1.7	-1.3
	4	2.0	1.1	1.1	1.8	-1.3
	5	2.1	0.8	0.8	1.4	-1.6
	6	2.2	1.2	1.2	1.9	-1.2
	7	1.5	1.2	1.2	1.9	-1.2
	8	2.1	1.7	1.7	2.4	-0.7
	9	2.4	1.7	1.7	2.3	-0.8
	10	8.8	8.0	8.0	8.6	5.6
	11	3.6	3.1	3.1	3.7	0.6
	12	2.7	2.9	2.9	3.6	0.4
	13	2.8	3.0	3.0	3.6	0.5
	14	3.3	3.1	3.1	3.7	0.6
	15	9.7	9.5	9.5	10.2	7.1

Table 17-93. Summary of Overall C/I Margins for scenario 7 (dB)

It can be seen in Table 17-93 that most C/I margins are positive, except for Interfering Carrier 5 (with respect to the criteria of 6%). The worst case is represented for Wanted Carrier 5 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.6 dB, which is equivalent to an increase of 8.7% of victim noise temperature. These C/I levels have been successfully coordinated between these two spacecraft, except for the 13.75-14.0 GHz band. However, the NSS-5 satellite does not operate in that band. In any event, the C/I deficit of 1.6 dB is due to the downlink portion of the link (which is in the C-band), and it is reasonably expected that the uplink in the 13.75-14.0 GHz band can be coordinated.[6]

[6] *See supra* Section 17.1 (providing a two-degree interference analysis for a hypothetical satellite operating under the same technical parameters).

Scenario 8: SES-4 West Africa/West Hemi connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	49.2	52.4	8.2	48.1	18.2	-50.9	-45.9	KSPOT/GLB 36 MHz
2	461KG7W	0.3413	53.3	55.3	11.2	50	21.5	-53.3	-44.1	KSPOT/GLB 36 MHz
3	1M84G7W	1.3653	53.3	61.4	17.2	50	21.5	-53.3	-44.2	KSPOT/GLB 36 MHz
4	8M25G7W	6.1113	46.7	64	19.8	51.7	19.1	-50.6	-48.1	KSPOT/GLB 36 MHz
5	36M0G7W	30.000	49.2	73.9	26.1	51.7	19.1	-50.1	-48.7	KSPOT/GLB 36 MHz
6	346KG7W	0.256	46.5	49.6	14.6	42.3	18.2	-51.0	-39.5	KSPOT/HEMI 72 MHz
7	461KG7W	0.3413	49.1	51.1	16.2	45.8	21.5	-53.3	-39.1	KSPOT/HEMI 72 MHz
8	1M84G7W	1.3653	52.9	57.7	22.7	45.8	21.5	-56.6	-38.7	KSPOT/HEMI 72 MHz
9	8M25G7W	6.1113	49.1	63.4	28.4	43.8	19.1	-53.6	-39.5	KSPOT/HEMI 72 MHz
10	72M0G7W	63.330	56.5	80.6	38.6	50	19.1	-53.9	-39.4	KSPOT/HEMI 72 MHz
11	346KG7W	0.256	46.5	49.2	16.8	42.3	18.2	-51.4	-37.3	KSPOT/ZONE 72 MHz
12	461KG7W	0.3413	49	51	18.6	45.8	21.5	-53.3	-36.7	KSPOT/ZONE 72 MHz
13	1M84G7W	1.3653	52.8	57	24.7	45.8	21.5	-57.2	-36.7	KSPOT/ZONE 72 MHz
14	8M25G7W	6.1113	46.5	62.7	30.3	43.8	19.1	-51.7	-37.6	KSPOT/ZONE 72 MHz
15	72M0G7W	63.330	54.5	79.1	40.8	50	19.1	-53.4	-37.2	KSPOT/ZONE 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	53.1	55.4	15.5	42.3	18.2	-51.7	-38.5	WA/WH 54 MHz
2	461KG7W	0.341	54.6	57.8	17.9	45.9	21.5	-52.1	-37.4	WA/WH 54 MHz
3	1M84G7W	1.365	54.6	63.9	24.0	45.9	21.5	-52.1	-37.4	WA/WH 54 MHz
4	8M25G7W	6.111	53.1	70.2	30.3	42.3	19.1	-50.8	-37.6	WA/WH 54 MHz
5	54M0G7W	45.000	58.7	82.1	41.2	42.3	19.1	-53.1	-35.3	WA/WH 54 MHz

Table 17-94. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 8

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	1.6	0.6	0.6	0.6	-1.3
	2	1.7	0.8	0.8	0.7	-1.0
	3	1.7	0.7	0.7	0.7	-1.1
	4	1.6	0.7	0.7	0.6	-1.0
	5	1.5	0.5	0.5	0.5	-1.4
	6	1.7	0.8	0.8	0.7	-0.9
	7	1.2	0.6	0.6	0.3	-0.8
	8	1.7	1.1	1.1	0.8	-0.3
	9	2.0	1.2	1.2	1.0	-0.4
	10	8.4	7.6	7.6	7.4	5.9
	11	3.2	2.5	2.5	2.2	1.0
	12	2.5	2.1	2.1	1.6	1.1
	13	2.5	2.1	2.1	1.6	1.1
	14	3.0	2.4	2.4	2.0	1.1
	15	9.4	8.8	8.8	8.5	7.6

Table 17-95. Summary of Overall C/I Margins for scenario 8 (dB)

It can be seen in Table 17-95 that most C/I margins are positive, except for Interfering Carrier 5 (with respect to the criteria of 6%). The worst case is represented for Wanted Carrier 5 with respect to Interfering Carrier 5. The deficit with respect to the 6%

C/I criterion is 1.4 dB, which is equivalent to an increase of 8.3% of victim noise temperature. These C/I levels have been successfully coordinated between these two spacecraft, except for the 13.75-14.0 GHz band. However, the NSS-5 satellite does not operate in that band. In any event, the C/I deficit of 1.4 dB is due to the downlink portion of the link (which is in the C-band), and it is reasonably expected that the uplink in the 13.75-14.0 GHz band can be coordinated.[7]

Scenario 9: SES-4 West Africa/East Hemi connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	49.2	52.4	8.2	48.1	18.2	-50.9	-45.9	KSPOT/GLB 36 MHz
2	461KG7W	0.3413	53.3	55.3	11.2	50	21.5	-53.3	-44.1	KSPOT/GLB 36 MHz
3	1M84G7W	1.3653	53.3	61.4	17.2	50	21.5	-53.3	-44.2	KSPOT/GLB 36 MHz
4	8M25G7W	6.1113	46.7	64	19.8	51.7	19.1	-50.6	-48.1	KSPOT/GLB 36 MHz
5	36M0G7W	30.000	49.2	73.9	26.1	51.7	19.1	-50.1	-48.7	KSPOT/GLB 36 MHz
6	346KG7W	0.256	46.5	49.6	14.6	42.3	18.2	-51.0	-39.5	KSPOT/HEMI 72 MHz
7	461KG7W	0.3413	49.1	51.1	16.2	45.8	21.5	-53.3	-39.1	KSPOT/HEMI 72 MHz
8	1M84G7W	1.3653	52.9	57.7	22.7	45.8	21.5	-56.6	-38.7	KSPOT/HEMI 72 MHz
9	8M25G7W	6.1113	49.1	63.4	28.4	43.8	19.1	-53.6	-39.5	KSPOT/HEMI 72 MHz
10	72M0G7W	63.330	56.5	80.6	38.6	50	19.1	-53.9	-39.4	KSPOT/HEMI 72 MHz
11	346KG7W	0.256	46.5	49.2	16.8	42.3	18.2	-51.4	-37.3	KSPOT/ZONE 72 MHz
12	461KG7W	0.3413	49	51	18.6	45.8	21.5	-53.3	-36.7	KSPOT/ZONE 72 MHz
13	1M84G7W	1.3653	52.8	57	24.7	45.8	21.5	-57.2	-36.7	KSPOT/ZONE 72 MHz
14	8M25G7W	6.1113	46.5	62.7	30.3	43.8	19.1	-51.7	-37.6	KSPOT/ZONE 72 MHz
15	72M0G7W	63.330	54.5	79.1	40.8	50	19.1	-53.4	-37.2	KSPOT/ZONE 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	53.1	54.8	15.4	42.3	18.2	-52.4	-38.7	WA/EH 54 MHz
2	461KG7W	0.341	54.6	57.3	17.9	45.9	21.5	-52.6	-37.4	WA/EH 54 MHz
3	1M84G7W	1.365	54.6	63.3	23.9	45.9	21.5	-52.6	-37.4	WA/EH 54 MHz
4	8M25G7W	6.111	54.6	69.5	30.1	42.3	19.1	-52.9	-37.7	WA/EH 54 MHz
5	54M0G7W	45.000	58.7	82.9	41.5	42.3	19.1	-52.3	-35.0	WA/EH 54 MHz

Table 17-96. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 9

[7] *See supra* Section 17.1 (providing a two-degree interference analysis for a hypothetical satellite operating under the same technical parameters).

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	1.8	0.7	0.7	1.0	-1.6
	2	1.9	0.9	0.9	1.2	-1.4
	3	1.9	0.8	0.8	1.1	-1.4
	4	1.8	0.8	0.8	1.1	-1.3
	5	1.7	0.6	0.6	0.9	-1.7
	6	2.0	0.9	0.9	1.2	-1.2
	7	1.6	0.8	0.8	1.1	-1.2
	8	2.1	1.3	1.3	1.6	-0.7
	9	2.3	1.3	1.3	1.6	-0.8
	10	8.7	7.7	7.7	8.0	5.6
	11	3.5	2.7	2.7	3.0	0.6
	12	2.9	2.3	2.3	2.6	0.6
	13	3.0	2.4	2.4	2.7	0.7
	14	3.4	2.6	2.6	2.9	0.7
	15	9.8	9.0	9.0	9.3	7.2

Table 17-97. Summary of Overall C/I Margins for scenario 9 (dB)

It can be seen in Table 17-97 that most C/I margins are positive, except for Interfering Carrier 5 (with respect to the criteria of 6%). The worst case is represented for Wanted Carrier 5 with respect to Interfering Carrier 5. The deficit with respect to the 6% C/I criterion is 1.7 dB, which is equivalent to an increase of 8.9% of victim noise temperature. These C/I levels have been successfully coordinated between these two spacecraft, except for the 13.75-14.0 GHz band. However, the NSS-5 satellite does not operate in that band. In any event, the C/I deficit of 1.7 dB is due to the downlink portion of the link (which is in the C-band), and it is reasonably expected that the uplink in the 13.75-14.0 GHz band can be coordinated.[8]

[8] *See supra* Section 17.1 (providing a two-degree interference analysis for a hypothetical satellite operating under the same technical parameters).

Scenario 10: SES-4 West Hemi/Europe connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	51.8	52.9	27.4	48.2	18.2	-53.0	-26.7	GLB/KSPOT 36 MHz
2	461KG7W	0.341	53.7	54.8	29.3	52.2	21.5	-54.2	-26.0	GLB/KSPOT 36 MHz
3	1M84G7W	1.365	53.7	60.8	35.3	52.2	21.5	-54.3	-26.1	GLB/KSPOT 36 MHz
4	8M25G7W	6.111	55.5	67.3	41.8	48.2	19.1	-56.1	-26.1	GLB/KSPOT 36 MHz
5	36M0G7W	30.000	55.5	74.3	48.8	48.3	19.1	-56.0	-26.0	GLB/KSPOT 36 MHz
6	346KG7W	0.256	45.8	50.8	25.9	48.1	18.2	-49.1	-28.2	HEMI/KSPOT 72 MHz
7	461KG7W	0.341	47.3	52.5	27.7	51.7	21.5	-50.1	-27.6	HEMI/KSPOT 72 MHz
8	1M84G7W	1.365	47.3	58.5	33.7	51.7	21.5	-50.2	-27.7	HEMI/KSPOT 72 MHz
9	8M25G7W	6.111	53.4	65.2	40.3	48.1	19.1	-56.1	-27.6	HEMI/KSPOT 72 MHz
10	72M0G7W	63.330	53.4	81.9	52.0	53.4	19.1	-49.5	-26.0	HEMI/KSPOT 72 MHz
11	346KG7W	0.256	45.7	48.9	25.2	48.1	18.2	-50.9	-28.9	ZONE/KSPOT 72 MHz
12	461KG7W	0.341	47.2	50.6	26.9	51.7	21.5	-51.9	-28.4	ZONE/KSPOT 72 MHz
13	1M84G7W	1.365	47.2	56.7	32.9	51.7	21.5	-51.9	-28.5	ZONE/KSPOT 72 MHz
14	8M25G7W	6.111	53.2	63.7	39.9	48.1	19.1	-57.4	-28.0	ZONE/KSPOT 72 MHz
15	72M0G7W	63.330	53.2	80.7	50.9	53.4	19.1	-50.5	-27.1	ZONE/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.3	51.8	24.8	47.3	18.2	-53.6	-29.3	WH/EU 54 MHz
2	461KG7W	0.341	47.2	53.2	26.2	51.3	21.5	-49.4	-29.2	WH/EU 54 MHz
3	1M84G7W	1.365	55.1	59.2	32.2	51.3	21.5	-57.3	-29.2	WH/EU 54 MHz
4	8M25G7W	6.111	51.3	66.5	39.5	47.3	19.1	-52.7	-28.3	WH/EU 54 MHz
5	54M0G7W	45.000	55.1	78.9	50.0	47.3	19.1	-52.7	-26.5	WH/EU 54 MHz

Table 17-98. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 10

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	9.9	7.6	10.9	8.9	7.8
	2	9.1	6.0	11.0	8.2	7.5
	3	9.1	6.0	11.0	8.1	7.4
	4	9.6	7.3	10.6	8.6	7.5
	5	9.8	7.4	10.8	8.8	7.7
	6	8.1	5.7	9.2	7.1	6.0
	7	6.9	3.7	8.8	5.9	5.3
	8	6.9	3.7	8.8	5.9	5.2
	9	7.8	5.4	8.9	6.8	5.7
	10	14.5	12.0	15.7	13.5	12.5
	11	6.8	4.1	8.2	5.8	4.9
	12	5.4	2.0	7.5	4.4	3.8
	13	5.4	2.1	7.5	4.4	3.9
	14	6.9	4.2	8.2	5.9	4.9
	15	13.4	10.8	14.6	12.4	11.3

Table 17-99. Summary of Overall C/I Margins for scenario 10 (dB)

As shown in Table 17-99, all C/I margins are positive.

Scenario 11: SES-4 East Hemi/Europe connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	51.8	52.9	27.4	48.2	18.2	-53.0	-26.7	GLB/KSPOT 36 MHz
2	461KG7W	0.341	53.7	54.8	29.3	52.2	21.5	-54.2	-26.0	GLB/KSPOT 36 MHz
3	1M84G7W	1.365	53.7	60.8	35.3	52.2	21.5	-54.3	-26.1	GLB/KSPOT 36 MHz
4	8M25G7W	6.111	55.5	67.3	41.8	48.2	19.1	-56.1	-26.1	GLB/KSPOT 36 MHz
5	36M0G7W	30.000	55.5	74.3	48.8	48.3	19.1	-56.0	-26.0	GLB/KSPOT 36 MHz
6	346KG7W	0.256	45.8	50.8	25.9	48.1	18.2	-49.1	-28.2	HEMI/KSPOT 72 MHz
7	461KG7W	0.341	47.3	52.5	27.7	51.7	21.5	-50.1	-27.6	HEMI/KSPOT 72 MHz
8	1M84G7W	1.365	47.3	58.5	33.7	51.7	21.5	-50.2	-27.7	HEMI/KSPOT 72 MHz
9	8M25G7W	6.111	53.4	65.2	40.3	48.1	19.1	-56.1	-27.6	HEMI/KSPOT 72 MHz
10	72M0G7W	63.330	53.4	81.9	52.0	53.4	19.1	-49.5	-26.0	HEMI/KSPOT 72 MHz
11	346KG7W	0.256	45.7	48.9	25.2	48.1	18.2	-50.9	-28.9	ZONE/KSPOT 72 MHz
12	461KG7W	0.341	47.2	50.6	26.9	51.7	21.5	-51.9	-28.4	ZONE/KSPOT 72 MHz
13	1M84G7W	1.365	47.2	56.7	32.9	51.7	21.5	-51.9	-28.5	ZONE/KSPOT 72 MHz
14	8M25G7W	6.111	53.2	63.7	39.9	48.1	19.1	-57.4	-28.0	ZONE/KSPOT 72 MHz
15	72M0G7W	63.330	53.2	80.7	50.9	53.4	19.1	-50.5	-27.1	ZONE/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.3	51.6	24.8	47.3	18.2	-53.7	-29.3	EH/EU 54 MHz
2	461KG7W	0.341	47.2	53.1	26.3	51.3	21.5	-49.4	-29.1	EH/EU 54 MHz
3	1M84G7W	1.365	55.1	59.1	32.3	51.3	21.5	-57.3	-29.1	EH/EU 54 MHz
4	8M25G7W	6.111	51.3	66.4	39.6	47.3	19.1	-52.8	-28.3	EH/EU 54 MHz
5	54M0G7W	45.000	55.1	78.8	50.0	47.3	19.1	-52.8	-26.5	EH/EU 54 MHz

Table 17-100. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 11

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	9.9	7.6	10.8	8.9	7.8
	2	9.2	6.0	11.0	8.2	7.5
	3	9.2	6.0	10.9	8.2	7.5
	4	9.6	7.3	10.6	8.6	7.5
	5	9.8	7.4	10.7	8.8	7.7
	6	8.1	5.7	9.1	7.1	6.0
	7	7.0	3.8	8.8	6.0	5.3
	8	7.0	3.7	8.8	6.0	5.3
	9	7.8	5.4	8.9	6.8	5.8
	10	14.5	12.0	15.6	13.6	12.5
	11	6.8	4.1	8.1	5.9	4.9
	12	5.4	2.0	7.5	4.5	3.9
	13	5.5	2.1	7.5	4.5	3.9
	14	6.9	4.2	8.2	5.9	5.0
	15	13.4	10.9	14.5	12.4	11.4

Table 17-101. Summary of Overall C/I Margins for scenario 11 (dB)

As shown in Table 17-101, all C/I margins are positive.

Scenario 12: SES-4 West Hemi/West Africa connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	51.8	52.9	27.4	48.2	18.2	-53.0	-26.7	GLB/KSPOT 36 MHz
2	461KG7W	0.341	53.7	54.8	29.3	52.2	21.5	-54.2	-26.0	GLB/KSPOT 36 MHz
3	1M84G7W	1.365	53.7	60.8	35.3	52.2	21.5	-54.3	-26.1	GLB/KSPOT 36 MHz
4	8M25G7W	6.111	55.5	67.3	41.8	48.2	19.1	-56.1	-26.1	GLB/KSPOT 36 MHz
5	36M0G7W	30.000	55.5	74.3	48.8	48.3	19.1	-56.0	-26.0	GLB/KSPOT 36 MHz
6	346KG7W	0.256	45.8	50.8	25.9	48.1	18.2	-49.1	-28.2	HEMI/KSPOT 72 MHz
7	461KG7W	0.341	47.3	52.5	27.7	51.7	21.5	-50.1	-27.6	HEMI/KSPOT 72 MHz
8	1M84G7W	1.365	47.3	58.5	33.7	51.7	21.5	-50.2	-27.7	HEMI/KSPOT 72 MHz
9	8M25G7W	6.111	53.4	65.2	40.3	48.1	19.1	-56.1	-27.6	HEMI/KSPOT 72 MHz
10	72M0G7W	63.330	53.4	81.9	52.0	53.4	19.1	-49.5	-26.0	HEMI/KSPOT 72 MHz
11	346KG7W	0.256	45.7	48.9	25.2	48.1	18.2	-50.9	-28.9	ZONE/KSPOT 72 MHz
12	461KG7W	0.341	47.2	50.6	26.9	51.7	21.5	-51.9	-28.4	ZONE/KSPOT 72 MHz
13	1M84G7W	1.365	47.2	56.7	32.9	51.7	21.5	-51.9	-28.5	ZONE/KSPOT 72 MHz
14	8M25G7W	6.111	53.2	63.7	39.9	48.1	19.1	-57.4	-28.0	ZONE/KSPOT 72 MHz
15	72M0G7W	63.330	53.2	80.7	50.9	53.4	19.1	-50.5	-27.1	ZONE/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.3	51.1	25.3	47.3	18.2	-54.2	-28.8	WH/WA 54 MHz
2	461KG7W	0.341	47.2	52.7	26.8	51.3	21.5	-49.8	-28.5	WH/WA 54 MHz
3	1M84G7W	1.365	55.1	58.7	32.8	51.3	21.5	-57.7	-28.5	WH/WA 54 MHz
4	8M25G7W	6.111	51.3	65.9	40.0	47.3	19.1	-53.2	-27.8	WH/WA 54 MHz
5	54M0G7W	45.000	55.1	78.4	50.5	47.3	19.1	-53.2	-26.0	WH/WA 54 MHz

Table 17-102. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 12

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	9.8	7.6	10.5	8.8	7.6
	2	9.3	6.2	10.8	8.3	7.5
	3	9.3	6.2	10.8	8.3	7.4
	4	9.5	7.3	10.2	8.5	7.3
	5	9.7	7.4	10.4	8.7	7.4
	6	8.0	5.7	8.8	7.0	5.8
	7	7.1	4.0	8.6	6.1	5.3
	8	7.1	3.9	8.6	6.1	5.2
	9	7.7	5.4	8.5	6.8	5.5
	10	14.5	12.1	15.3	13.5	12.3
	11	6.8	4.2	7.8	5.8	4.7
	12	5.6	2.3	7.4	4.6	3.9
	13	5.7	2.3	7.4	4.7	3.9
	14	6.9	4.3	7.9	5.9	4.8
	15	13.3	10.9	14.2	12.3	11.2

Table 17-103. Summary of Overall C/I Margins for scenario 12 (dB)

As shown in Table 17-103, all C/I margins are positive.

Scenario 13: SES-4 East Hemi/West Africa connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	51.8	52.9	27.4	48.2	18.2	-53.0	-26.7	GLB/KSPOT 36 MHz
2	461KG7W	0.341	53.7	54.8	29.3	52.2	21.5	-54.2	-26.0	GLB/KSPOT 36 MHz
3	1M84G7W	1.365	53.7	60.8	35.3	52.2	21.5	-54.3	-26.1	GLB/KSPOT 36 MHz
4	8M25G7W	6.111	55.5	67.3	41.8	48.2	19.1	-56.1	-26.1	GLB/KSPOT 36 MHz
5	36M0G7W	30.000	55.5	74.3	48.8	48.3	19.1	-56.0	-26.0	GLB/KSPOT 36 MHz
6	346KG7W	0.256	45.8	50.8	25.9	48.1	18.2	-49.1	-28.2	HEMI/KSPOT 72 MHz
7	461KG7W	0.341	47.3	52.5	27.7	51.7	21.5	-50.1	-27.6	HEMI/KSPOT 72 MHz
8	1M84G7W	1.365	47.3	58.5	33.7	51.7	21.5	-50.2	-27.7	HEMI/KSPOT 72 MHz
9	8M25G7W	6.111	53.4	65.2	40.3	48.1	19.1	-56.1	-27.6	HEMI/KSPOT 72 MHz
10	72M0G7W	63.330	53.4	81.9	52.0	53.4	19.1	-49.5	-26.0	HEMI/KSPOT 72 MHz
11	346KG7W	0.256	45.7	48.9	25.2	48.1	18.2	-50.9	-28.9	ZONE/KSPOT 72 MHz
12	461KG7W	0.341	47.2	50.6	26.9	51.7	21.5	-51.9	-28.4	ZONE/KSPOT 72 MHz
13	1M84G7W	1.365	47.2	56.7	32.9	51.7	21.5	-51.9	-28.5	ZONE/KSPOT 72 MHz
14	8M25G7W	6.111	53.2	63.7	39.9	48.1	19.1	-57.4	-28.0	ZONE/KSPOT 72 MHz
15	72M0G7W	63.330	53.2	80.7	50.9	53.4	19.1	-50.5	-27.1	ZONE/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	51.3	51.1	25.3	47.3	18.2	-54.3	-28.8	EH/WA 54 MHz
2	461KG7W	0.341	47.2	52.7	26.9	51.3	21.5	-49.8	-28.4	EH/WA 54 MHz
3	1M84G7W	1.365	55.1	58.7	33.0	51.3	21.5	-57.7	-28.4	EH/WA 54 MHz
4	8M25G7W	6.111	51.3	65.8	40.1	47.3	19.1	-53.3	-27.8	EH/WA 54 MHz
5	54M0G7W	45.000	55.1	78.3	50.5	47.3	19.1	-53.3	-26.0	EH/WA 54 MHz

Table 17-104. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 13

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	9.8	7.6	10.4	8.8	7.6
	2	9.3	6.2	10.7	8.4	7.5
	3	9.3	6.2	10.7	8.3	7.5
	4	9.5	7.3	10.1	8.5	7.3
	5	9.7	7.4	10.3	8.7	7.5
	6	8.0	5.7	8.7	7.0	5.8
	7	7.1	4.0	8.5	6.1	5.3
	8	7.1	3.9	8.5	6.1	5.3
	9	7.7	5.4	8.4	6.8	5.6
	10	14.5	12.1	15.2	13.5	12.3
	11	6.8	4.2	7.7	5.9	4.8
	12	5.7	2.3	7.3	4.7	4.0
	13	5.7	2.3	7.3	4.7	4.0
	14	6.9	4.3	7.8	5.9	4.8
	15	13.3	10.9	14.1	12.3	11.2

Table 17-105. Summary of Overall C/I Margins for scenario 13 (dB)

As shown in Table 17-105, all C/I margins are positive.

Scenario 14: SES-4 Europe/Europe connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	54.4	53.7	26.4	48.2	18.2	-54.8	-27.7	EU/EU 36 MHz
2	461KG7W	0.341	54.4	55.1	27.8	52.2	21.5	-54.6	-27.5	EU/EU 36 MHz
3	1M84G7W	1.365	56.3	61.2	33.9	52.2	21.5	-56.5	-27.5	EU/EU 36 MHz
4	8M25G7W	6.111	56.3	68.4	41.1	48.2	19.1	-55.7	-26.7	EU/EU 36 MHz
5	36M0G7W	30.000	54.4	79.0	48.7	48.2	19.1	-50.2	-26.1	EU/EU 36 MHz

Table 17-106. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 14

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	6.4	6.2	6.3	5.6	4.4
	2	6.6	6.4	6.6	5.8	4.4
	3	6.7	6.5	6.7	5.9	4.5
	4	6.6	6.5	6.7	5.9	4.5
	5	12.7	12.5	12.8	12.1	10.4

Table 17-107. Summary of Overall C/I Margins for scenario 14 (dB)

As shown in Table 17-107, all C/I margins are positive.

Scenario 15: SES-4 West Africa/Europe connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	54.4	55.4	26.3	48.2	18.2	-53.1	-27.8	WA/EU 36 MHz
2	461KG7W	0.341	54.4	56.9	27.8	52.2	21.5	-52.8	-27.5	WA/EU 36 MHz
3	1M84G7W	1.365	56.3	63.0	33.9	52.2	21.5	-54.7	-27.5	WA/EU 36 MHz
4	8M25G7W	6.111	56.3	70.1	41.0	48.2	19.1	-54.1	-26.9	WA/EU 36 MHz
5	36M0G7W	30.000	56.3	80.6	48.5	48.2	19.1	-50.5	-26.3	WA/EU 36 MHz

Table 17-108. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 15

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	6.4	6.0	6.2	5.6	4.7
	2	6.4	6.1	6.4	5.8	4.7
	3	6.5	6.2	6.5	5.9	4.7
	4	6.5	6.2	6.5	5.9	4.7
	5	12.5	12.1	12.5	11.9	10.6

Table 17-109. Summary of Overall C/I Margins for scenario 15 (dB)

As shown in Table 17-109, all C/I margins are positive.

Scenario 16: SES-4 North America/Europe connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	54.4	53.9	26.2	50.2	18.2	-54.6	-27.9	NA/EU 36 MHz
2	461KG7W	0.341	54.4	56.1	28.5	53.7	21.5	-53.6	-26.9	NA/EU 36 MHz
3	1M84G7W	1.365	54.4	62.1	34.5	53.7	21.5	-53.6	-26.9	NA/EU 36 MHz
4	8M25G7W	6.111	54.4	68.6	40.9	50.2	19.1	-53.7	-26.9	NA/EU 36 MHz
5	36M0G7W	30.000	54.4	79.1	48.4	48.2	19.1	-50.1	-26.4	NA/EU 36 MHz

Table 17-110. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 16

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	6.5	5.5	5.5	5.6	4.7
	2	6.7	5.7	5.7	5.8	4.6
	3	6.8	5.8	5.8	5.9	4.7
	4	6.8	5.8	5.8	5.8	4.7
	5	12.8	11.8	11.8	11.9	10.5

Table 17-111. Summary of Overall C/I Margins for scenario 16 (dB)

As shown in Table 17-111, all C/I margins are positive.

Scenario 17: SES-4 Europe/West Africa connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	54.4	52.5	26.3	48.2	18.2	-56.0	-27.8	EU/WA 36 MHz
2	461KG7W	0.341	54.4	55.6	29.4	50.2	21.5	-54.1	-25.9	EU/WA 36 MHz
3	1M84G7W	1.365	54.4	61.6	35.4	50.2	21.5	-54.1	-25.9	EU/WA 36 MHz
4	8M25G7W	6.111	54.4	67.2	41.0	48.2	19.1	-55.1	-26.9	EU/WA 36 MHz
5	36M0G7W	30.000	54.4	78.7	48.5	48.2	19.1	-50.5	-26.3	EU/WA 36 MHz

Table 17-112. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 17

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	6.6	4.7	4.7	5.7	4.7
	2	6.9	4.9	4.9	5.9	4.7
	3	6.9	5.0	5.0	6.0	4.7
	4	6.9	5.0	5.0	6.0	4.7
	5	13.0	11.1	11.1	12.1	10.6

Table 17-113. Summary of Overall C/I Margins for scenario 17 (dB)

As shown in Table 17-113, all C/I margins are positive.

Scenario 18: SES-4 West Africa/West Africa connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	54.4	56.2	28.0	45.7	18.2	-52.3	-26.1	WA/WA 36 MHz
2	461KG7W	0.341	54.4	57.5	29.4	50.2	21.5	-52.2	-26.0	WA/WA 36 MHz
3	1M84G7W	1.365	54.4	63.5	35.4	50.2	21.5	-52.2	-26.0	WA/WA 36 MHz
4	8M25G7W	6.111	54.4	69.1	40.9	48.2	19.1	-53.2	-26.9	WA/WA 36 MHz
5	36M0G7W	30.000	56.3	80.9	48.8	48.2	19.1	-50.2	-26.0	WA/WA 36 MHz

Table 17-114. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 18

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	4.7	4.6	4.6	5.5	4.4
	2	4.8	4.8	4.8	5.7	4.4
	3	4.9	4.8	4.8	5.8	4.4
	4	4.9	4.8	4.8	5.8	4.4
	5	10.9	10.8	10.8	11.8	10.3

Table 17-115. Summary of Overall C/I Margins for scenario 18 (dB)

As shown in Table 17-115, all C/I margins are positive.

Scenario 19: SES-4 North America/West Africa connectivity (36 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	54.4	54.5	27.9	48.2	18.2	-54.0	-26.2	NA/WA 36 MHz
2	461KG7W	0.341	54.4	55.4	28.8	53.7	21.5	-54.4	-26.5	NA/WA 36 MHz
3	1M84G7W	1.365	54.4	61.9	35.3	52.2	21.5	-53.9	-26.0	NA/WA 36 MHz
4	8M25G7W	6.111	54.4	68.4	41.8	48.2	19.1	-53.9	-26.0	NA/WA 36 MHz
5	36M0G7W	30.000	54.4	78.2	48.6	48.2	19.1	-51.0	-26.2	NA/WA 36 MHz

Table 17-116. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 19

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	5.0	5.3	4.8	4.8	4.6
	2	5.2	5.5	5.0	5.0	4.7
	3	5.3	5.6	5.1	5.1	4.8
	4	5.3	5.6	5.1	5.1	4.8
	5	11.4	11.7	11.2	11.2	10.7

Table 17-117. Summary of Overall C/I Margins for scenario 19 (dB)

As shown in Table 17-117, all C/I margins are positive.

Scenario 20: SES-4 North America/Southern Cone connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	53.1	52.4	25.5	49.6	18.2	-54.7	-28.6	NA/SC 54 MHz
2	461KG7W	0.341	54.6	54.2	27.2	55.0	21.5	-55.7	-28.1	NA/SC 54 MHz
3	1M84G7W	1.365	54.6	60.2	33.3	55.0	21.5	-55.7	-28.1	NA/SC 54 MHz
4	8M25G7W	6.111	53.1	65.9	38.9	51.7	19.1	-55.1	-29.0	NA/SC 54 MHz
5	54M0G7W	45.000	53.1	79.5	50.5	47.7	19.1	-50.1	-26.0	NA/SC 54 MHz

Table 17-118. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 20

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	7.2	6.8	6.8	7.6	4.4
	2	7.4	7.1	7.1	7.7	4.4
	3	7.5	7.1	7.1	7.8	4.5
	4	7.4	7.1	7.1	7.8	4.5
	5	13.5	13.2	13.2	13.8	10.3

Table 17-119. Summary of Overall C/I Margins for scenario 20 (dB)

As shown in Table 17-119, all C/I margins are positive.

Scenario 21: SES-4 Southern Cone/North America connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	53.1	54.1	27.1	45.2	18.2	-53.0	-27.0	SC/NA 54 MHz
2	461KG7W	0.341	54.6	56.4	29.3	49.6	21.5	-53.6	-26.0	SC/NA 54 MHz
3	1M84G7W	1.365	54.6	62.4	35.3	49.6	21.5	-53.6	-26.0	SC/NA 54 MHz
4	8M25G7W	6.111	53.1	68.9	41.8	45.2	19.1	-52.1	-26.0	SC/NA 54 MHz
5	54M0G7W	45.000	53.1	79.5	50.5	45.2	19.1	-50.1	-26.0	SC/NA 54 MHz

Table 17-120. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 21

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	5.6	4.7	4.7	4.6	4.4
	2	5.7	5.0	5.0	4.8	4.4
	3	5.8	5.0	5.0	4.9	4.5
	4	5.8	5.0	5.0	4.8	4.5
	5	11.8	11.1	11.1	10.9	10.3

Table 17-121. Summary of Overall C/I Margins for scenario 21 (dB)

As shown in Table 17-121, all C/I margins are positive.

Scenario 22: SES-4 Southern Cone/Southern Cone connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	53.1	55.1	25.3	47.7	18.2	-52.1	-28.7	SC/SC 54 MHz
2	461KG7W	0.341	54.6	57.4	27.7	51.7	21.5	-52.5	-27.6	SC/SC 54 MHz
3	1M84G7W	1.365	54.6	62.8	33.1	53.1	21.5	-53.1	-28.3	SC/SC 54 MHz
4	8M25G7W	6.111	53.1	69.8	40.1	47.7	19.1	-51.2	-27.8	SC/SC 54 MHz
5	54M0G7W	45.000	56.5	82.2	50.5	45.2	19.1	-50.8	-26.0	SC/SC 54 MHz

Table 17-122. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 22

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	7.0	6.1	6.7	6.1	4.5
	2	6.9	6.2	6.8	6.0	4.6
	3	7.0	6.2	6.9	6.1	4.6
	4	7.0	6.2	6.9	6.1	4.6
	5	12.8	12.2	12.8	11.9	10.5

Table 17-123. Summary of Overall C/I Margins for scenario 22 (dB)

As shown in Table 17-123, all C/I margins are positive.

Scenario 23: SES-4 North America/North America connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	49.1	52.1	27.0	45.2	18.2	-51.1	-27.1	NA/NA 54 MHz
2	461KG7W	0.341	53.1	54.2	29.1	47.6	21.5	-54.3	-26.3	NA/NA 54 MHz
3	1M84G7W	1.365	53.1	60.2	35.1	47.6	21.5	-54.3	-26.3	NA/NA 54 MHz
4	8M25G7W	6.111	49.1	66.8	41.7	45.2	19.1	-50.2	-26.2	NA/NA 54 MHz
5	54M0G7W	45.000	53.1	77.5	50.4	45.2	19.1	-52.1	-26.1	NA/NA 54 MHz

Table 17-124. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 23

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	5.5	5.0	5.0	4.5	4.7
	2	5.4	5.3	5.3	4.5	4.9
	3	5.5	5.4	5.4	4.6	4.9
	4	5.5	5.3	5.3	4.6	4.9
	5	11.4	11.5	11.5	10.4	10.9

Table 17-125. Summary of Overall C/I Margins for scenario 23 (dB)

As shown in Table 17-125, all C/I margins are positive.

Scenario 24: SES-4 West Africa/North America connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	49.1	53.2	27.4	45.2	18.2	-50.0	-26.7	WA/NA 54 MHz
2	461KG7W	0.341	53.1	55.2	29.3	49.6	21.5	-53.3	-26.0	WA/NA 54 MHz
3	1M84G7W	1.365	53.1	61.2	35.3	49.6	21.5	-53.3	-26.0	WA/NA 54 MHz
4	8M25G7W	6.111	49.1	67.6	41.8	45.2	19.1	-49.3	-26.1	WA/NA 54 MHz
5	54M0G7W	45.000	53.1	79.2	50.4	45.2	19.1	-50.4	-26.1	WA/NA 54 MHz

Table 17-126. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 24

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	4.9	4.7	4.7	4.3	4.5
	2	4.8	4.9	4.9	4.2	4.5
	3	4.9	5.0	5.0	4.3	4.6
	4	4.9	5.0	5.0	4.3	4.6
	5	10.7	11.1	11.1	10.1	10.5

Table 17-127. Summary of Overall C/I Margins for scenario 24 (dB)

As shown in Table 17-127, all C/I margins are positive.

Scenario 25: SES-4 Europe/North America connectivity (54 MHz)

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	NSS-5 Connectivity
1	346KG7W	0.256	54.5	55.5	26.5	45.3	18.2	-53.1	-27.6	KSPOT/KSPOT 72 MHz
2	461KG7W	0.341	52.8	58.0	29.0	47.8	21.5	-50.1	-26.3	KSPOT/KSPOT 72 MHz
3	1M84G7W	1.365	62.4	64.1	35.1	47.8	21.5	-59.7	-26.3	KSPOT/KSPOT 72 MHz
4	8M25G7W	6.111	54.5	68.2	39.2	47.8	19.1	-54.2	-28.7	KSPOT/KSPOT 72 MHz
5	72M0G7W	63.330	62.4	82.9	51.9	51.6	19.1	-57.5	-26.1	KSPOT/KSPOT 72 MHz

Carrier ID	Emission Designator	Bandwidth (MHz)	Tx E/S Gain (dBi)	Uplink EIRP (dBW)	Downlink EIRP (dBW)	Rx E/S Gain (dBi)	C/I Criterion	(up density)	(dn density)	SES-4 Connectivity
1	346KG7W	0.256	49.1	51.5	27.5	45.2	18.2	-51.6	-26.6	EU/NA 54 MHz
2	461KG7W	0.341	53.1	53.3	29.3	49.6	21.5	-55.1	-26.0	EU/NA 54 MHz
3	1M84G7W	1.365	53.1	59.4	35.3	49.6	21.5	-55.1	-26.0	EU/NA 54 MHz
4	8M25G7W	6.111	49.1	65.9	41.9	45.2	19.1	-51.0	-26.0	EU/NA 54 MHz
5	54M0G7W	45.000	53.1	78.5	50.5	45.2	19.1	-51.1	-26.0	EU/NA 54 MHz

Table 17-128. Summary of Typical Transmission Parameters for SES-4 and NSS-5 under scenario 25

		Interfering (SES-4 @338E)				
	Carrier ID	1	2	3	4	5
Wanted (NSS-5 @340E)	1	5.1	4.9	4.9	4.5	4.5
	2	5.2	5.1	5.1	4.5	4.6
	3	5.2	5.2	5.2	4.6	4.7
	4	5.2	5.2	5.2	4.6	4.7
	5	11.2	11.4	11.4	10.6	10.6

Table 17-129. Summary of Overall C/I Margins for scenario 25 (dB)

As shown in Table 17-129, all C/I margins are positive.

17.4 Summary of results for the specific interference analysis case

The table below summarizes all the results for the studied connectivities under the specific interference analysis case. It shows for each scenario the uplink beam and downlink beam for the wanted and interfering satellite, the associated frequency bands, and the worst case observed C/I margin from the calculations.

	Interfering	Wanted			
Scenario	SES-4 connectivity	NSS-5 connectivity	Uplink band	Downlink band	Worst Case C/I margin
1	GLB/GLB 36 MHz	GLB/GLB 36 MHz	C	C	-0.3
2	WH/WH 36 MHz	HEMI/HEMI 72 MHz GLB/GLB 36 MHz HEMI/GLB 36 MHz GLB/HEMI 36 MHz ZONE/ZONE 72 MHz HEMI/ZONE 72 MHz ZONE/HEMI 72 MHz	C	C	-3.7
3	EH/EH 36 MHz	HEMI/HEMI 72 MHz GLB/GLB 36 MHz HEMI/GLB 36 MHz GLB/HEMI 36 MHz ZONE/ZONE 72 MHz HEMI/ZONE 72 MHz ZONE/HEMI 72 MHz	C	C	-3.8
4	EH/WH 36 MHz	HEMI/HEMI 72 MHz GLB/GLB 36 MHz HEMI/GLB 36 MHz GLB/HEMI 36 MHz ZONE/ZONE 72 MHz HEMI/ZONE 72 MHz ZONE/HEMI 72 MHz	C	C	-3.7
5	WH/EH 36 MHz	HEMI/HEMI 72 MHz GLB/GLB 36 MHz HEMI/GLB 36 MHz GLB/HEMI 36 MHz ZONE/ZONE 72 MHz HEMI/ZONE 72 MHz ZONE/HEMI 72 MHz	C	C	-4.6
6	EU/WH 54 MHz	KSPOT/GLB 36 MHz KSPOT/HEMI 72 MHz KSPOT/ZONE 72 MHz	Ku	C	-1.5
7	EU/EH 54 MHz	KSPOT/GLB 36 MHz KSPOT/HEMI 72 MHz KSPOT/ZONE 72 MHz	Ku	C	-1.6
8	WA/WH 54 MHz	KSPOT/GLB 36 MHz KSPOT/HEMI 72 MHz KSPOT/ZONE 72 MHz	Ku	C	-1.7
9	WA/EH 54 MHz	KSPOT/GLB 36 MHz KSPOT/HEMI 72 MHz KSPOT/ZONE 72 MHz	Ku	C	-1.4
10	WH/EU 54 MHz	GLB/KSPOT 36 MHz HEMI/KSPOT 72 MHz ZONE/KSPOT 72 MHz	C	Ku	2.0
11	EH/EU 54 MHz	GLB/KSPOT 36 MHz HEMI/KSPOT 72 MHz ZONE/KSPOT 72 MHz	C	Ku	2.0
12	WH/WA 54 MHz	GLB/KSPOT 36 MHz HEMI/KSPOT 72 MHz ZONE/KSPOT 72 MHz	C	Ku	2.3
13	EH/WA 54 MHz	GLB/KSPOT 36 MHz HEMI/KSPOT 72 MHz ZONE/KSPOT 72 MHz	C	Ku	2.3
14	EU/EU 36 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.4
15	WA/EU 36 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.7
16	NA/EU 36 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.6
17	EU/WA 36 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.7
18	WA/WA 36 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.4
19	NA/WA 36 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.6
20	NA/SC 54 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.4
21	SC/NA 54 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.4
22	SC/SC 54 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.5
23	NA/NA 54 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.5
24	WA/NA 54 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.2
25	EU/NA 54 MHz	KSPOT/KSPOT 72 MHz	Ku	Ku	4.5

17.5 Analysis of the interference of the SES-4 TT&C carriers into the NSS-5 TT&C carriers

Table 17-130 shows the TT&C carrier frequencies of SES-4 and NSS-5 (derived from the Schedule S information). Also shown are the closest frequency separation of each NSS-5 TT&C carrier from the SES-4 TT&C carriers.

Satellite	Carrier name	Channel ID (from Sched. S)	Frequency (MHz)	Polarisation	BW (kHz)	Frequency separation from closest SES-4 TTC (MHz)
SES-4	Telecommand 1	CM1	14496.0	RHCP	800	
	Telecommand 2	CM2	14499.0	RHCP	800	
	Telemetry 1	TM1	11451.0	RHCP	300	
	Telemetry 2	TM2	11454.0	RHCP	300	
	Telemetry 3	TM3	12500.5	LHCP	300	
	Telemetry 4	TM4	12502.0	LHCP	300	
	Beacon 1	BNK1	11451.0	RHCP	25	
	Beacon 2	BNK2	11454.0	RHCP	25	
	Beacon 3	BNK3	12500.5	LHCP	25	
	Beacon 4	BNK4	12502.0	LHCP	25	
	Tracking Beacon	BNC1	4199.75	V	25	
NSS-5	Telecommand 1	CM1	6173.7	LHCP	800	8322.30
	Telecommand 2	CM2	6176.3	LHCP	800	8319.70
	Telemetry 1	TM1	3947.5	RHCP	300	252.25
	Telemetry 2	TM2	3948.0	RHCP	300	251.75
	Telemetry 3	TM3	3952.0	RHCP	300	247.75
	Telemetry 4	TM4	3952.5	RHCP	300	247.25
	Beacon 1	BCN1	3950.0	V	25	249.75
	Beacon 2	BCN2	11198.0	RHCP	25	253.00
	Beacon 3	BCN3	11452.0	RHCP	25	1.00
	Beacon 4	BCN4	11701.0	V	25	247.00
	Beacon 5	BCN5	12501.0	V	25	0.50

Table 17-130. TT&C carrier frequencies of SES-4 and NSS-5 and the closest frequency separation of each NSS-5 TT&C carrier from the SES-4 TT&C carriers

It can be seen from the Table that there are no direct frequency overlaps between any of the TT&C carriers. Nevertheless there are two cases where the frequency separation between some beacon frequencies of SES-4 (BNK1 and BNK3) are separated by 1MHz of less from some NSS-5 beacon frequencies (BCN3 and BCN5). Therefore an

C/I analysis is provided in Table 17-131 for a worse case scenario, where it is assumed that the beacon frequencies are co-frequency and operating in the same polarization. For this analysis a C/N threshold for the beacon operations was assumed to be 0 dB and the C/I protection criteria was assumed to be 14 dB (based on NSS-5 Schedule S information). Receive antenna sizes of 1.8m and 2.4 were assumed. From the Schedule S information for NSS-5 it can be derived that the downlink EIRP of the beacon signals is 6 dBW for EOC, whereas for the SES-4 beacon the downlink is 8 dBW at EOC. A difference in downlink EIRP of 2 dB is therefore assumed between these two beacons.

		Frequency (MHz)			
		11452		12501	
Rx Antenna Size	(m)	1.8	2.4	1.8	2.4
Rx Antenna Gain	(dBi)	44.8	47.3	45.6	48.1
Off-Axis gain	(dBi)	21.0	21.0	21.0	21.0
Discrimination	(dB)	23.8	26.3	24.6	27.1
Delta EIRP	(dB)	-2.0	-2.0	-2.0	-2.0
C/I	(dB)	21.8	24.3	22.6	25.1
Threshold	(dB)	14.0	14.0	14.0	14.0
Margin	**(dB)**	**7.8**	**10.3**	**8.6**	**11.1**

Table 17-131. Overview of C/I margins (dB) for SES-4 beacon interference into NSS-5 beacons in Ku-band

It can be seen from the analysis in the above table that all C/I margins are positive, and that there is therefore no interference from the SES-4 TT&C carriers at 22° W.L. into the NSS-5 TT&C carriers at 20° W.L.

17.6 Analysis of the interference of the SES-4 Communication carriers into the NSS-5 TT&C carriers

Table 17-132 shows the TT&C carrier frequencies of NSS-5 at 20° W.L. together with an assessment of whether there would be a frequency overlap, and possible interference from SES-4 communication carriers.

Satellite	Carrier name	Channel ID (from Sched. S)	Frequency (MHz)	Polarisation	BW (kHz)	Overlap with SES-4 communication carriers
NSS-5	Telecommand 1	CM1	6173.7	LHCP	800	Yes (Hemi beam up)
	Telecommand 2	CM2	6176.3	LHCP	800	Yes (Hemi beam up)
	Telemetry 1	TM1	3947.5	RHCP	300	Yes (Hemi beam down)
	Telemetry 2	TM2	3948.0	RHCP	300	Yes (Hemi beam down)
	Telemetry 3	TM3	3952.0	RHCP	300	Yes (Hemi beam down)
	Telemetry 4	TM4	3952.5	RHCP	300	Yes (Hemi beam down)
	Beacon 1	BCN1	3950.0	V	25	Yes (Hemi beam down)
	Beacon 2	BCN2	11198.0	RHCP	25	No
	Beacon 3	BCN3	11452.0	RHCP	25	No
	Beacon 4	BCN4	11701.0	V	25	No
	Beacon 5	BCN5	12501.0	V	25	No

Table 17-132. Overview of the TT&C carrier frequencies of NSS-5 at 20° W.L. together with an assessment of whether there would be a frequency overlap, and possible interference from SES-4 communication carriers at 22° W.L.

From the table it can be seen that there are a number of interference cases to study, i.e.: a) interference from SES-4 communication carriers in C-band hemi uplink into NSS-5 Telecommand carriers, b) interference from SES-4 communication carriers in C-band hemi downlink into NSS-5 Telemetry carriers, and c) interference from SES-4 communication carriers in C-band hemi downlink into NSS-5 C-band beacon carrier. For the SES-4 C-band uplink and downlink carriers in the hemi beams the worst case carriers (in terms of potential for interference in the uplink and downlink direction) will be chosen. For the uplink case, the uplink carrier parameters of the 461KG7W carrier in the WH/EH 36 MHz beam connectivity is chosen. For the downlink case, the downlink carrier parameters of the 54M0G7W carrier in the WH/EH 54 MHz beam connectivity is chosen. The carrier parameters for the NSS-5 telecommand, telemetry and beacon carriers are derived from the NSS-5 Schedule S information. Table 17-133, 17-134 and 17-135 show the (result) of the interference analyses for the NSS-5 Telecommand, Telemetry and Beacon carriers respectively.

SES-4 - 461KG7W crx		
input power density	(dBW/Hz)	-46.8
Off-axis EIRP density	(dBW/Hz)	-25.8
Off-axis EIRP over 800 kHz	(dBW)	33.2
NSS-5 - Telecommand crx		
uplink EIRP	(dBW)	75.5
Required C/N	(dB)	10.0
Required C/I	(dB)	24.0
Interference analysis		
Calculated C/I	(dB)	42.3
Margin	(dB)	**18.3**

Table 17-133. Interference assessment of SES-4 communication carrier (461KG7W) into NSS-5 Telecommand carrier

SES-4 - 54M0G7W		
downlink EIRP density (peak)	(dBW/Hz)	-35.0
downlink EIRP over 300 kHz	(dBW)	19.8
NSS-5 - Telemetry carrier		
Downlink EIRP (EOC)	(dBW)	3.0
Receive earth station size	(m)	12.0
Receive earth station gain	(dBi)	52.2
Receive earth station off-axis	(dBi)	21.0
Required C/N	(dB)	0.0
Required C/I	(dB)	14.0
Interference analysis		
Calculated C/I	(dB)	14.4
Margin	(dB)	**0.4**

Table 17-134. Interference assessment of SES-4 communication carrier (54M0G7W) into NSS-5 Telemetry carrier

SES-4 - 54M0G7W		
downlink EIRP density (peak)	(dBW/Hz)	-35.0
downlink EIRP over 25 kHz	(dBW)	9.0
NSS-5 - Beacon carrier		
Downlink EIRP (EOC)	(dBW)	4.0
Receive earth station size	(m)	3.7
Receive earth station gain	(dBi)	41.9
Receive earth station off-axis	(dBi)	21.0
Required C/N	(dB)	0.0
Required C/I	(dB)	14.0
Interference analysis		
Calculated C/I	(dB)	15.9
Margin	(dB)	**1.9**

Table 17-135. Interference assessment of SES-4 communication carrier (54M0G7W) into NSS-5 Beacon carrier

It can be seen that all the C/I margins in Tables 17-133, 17-134 and 17-135 are positive.

17.7 Analysis of the interference of the SES-4 TT&C carriers into the NSS-5 Communication carriers

Table 17-136 shows the TT&C carrier frequencies of SES-4 at 22° W.L. together with an assessment of whether there would be a frequency overlap, and possible interference into NSS-5 communication carriers.

Satellite	Carrier name	Channel ID (from Sched. S)	Frequency (MHz)	Polarisation	BW (kHz)	Overlap with NSS-5 communication carriers
SES-4	Telecommand 1	CM1	14496.0	RHCP	800	Yes
	Telecommand 2	CM2	14499.0	RHCP	800	No
	Telemetry 1	TM1	11451.0	RHCP	300	No
	Telemetry 2	TM2	11454.0	RHCP	300	No
	Telemetry 3	TM3	12500.5	LHCP	300	No
	Telemetry 4	TM4	12502.0	LHCP	300	No
	Beacon 1	BNK1	11451.0	RHCP	25	No
	Beacon 2	BNK2	11454.0	RHCP	25	No
	Beacon 3	BNK3	12500.5	LHCP	25	No
	Beacon 4	BNK4	12502.0	LHCP	25	No
	Tracking Beacon	BNC1	4199.75	V	25	No

Table 17-136. Overview of the TT&C carrier frequencies of SES-4 at 22° W.L. together with an assessment of whether there would be a frequency overlap, and possible interference into NSS-5 communication carriers at 20° W.L.

The only occurrence of frequency overlap between a SES-4 TT&C carrier and an NSS-5 communication carrier is for an overlap between the SES-4 Telecommand1 carrier at 14496 MHz (RHCP) with the NSS-5 SPOT/GLB 41MHz transponder connectivity. This is a 41 MHz transponder with center uplink in Ku-band SPOT at 14477.5 MHz (and cross-strapped into C-band GLB at 4177.5 MHz). It should be noted that the SPOT on NSS-5 is operating in linear polarization, whereas the Telecommand carrier on SES-4 is operating in circular polarization. Table 17-137 below provides the interference calculations for the SES-4 Telecommand carrier into the NSS-5 communication carrier. An advantage of 1.7dB was taken into account for the fact that both carriers operate in different polarizations. Further, the power levels for the SES-4 Telecommand carrier have been adjusted for the cases where the bandwidth of the NSS-5 communication carrier was smaller than 800 kHz.

SES-4 - Telecommand crx						
input power	(dBW)	19.0				
Off-axis EIRP	(dBW)	40.0				
NSS-5 - Communcation crx		**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**
uplink EIRP	(dBW)	52.4	55.3	61.4	64.0	73.9
Required C/I	(dB)	18.2	21.5	21.5	19.1	19.1
Interference analysis						
C/I without adjustments	(dB)	12.4	15.3	21.4	24.0	33.9
Bandwidth adjustment	(dB)	4.9	3.7	0.0	0.0	0.0
Polarisation adjustment	(dB)	1.7	1.7	1.7	1.7	1.7
C/I total	(dB)	19.1	20.7	23.1	25.7	35.6
Margin	**(dB)**	**0.9**	**-0.8**	**1.6**	**6.6**	**16.5**

Table 17-137. Interference calculations for the SES-4 Telecommand carrier (CM1) into the NSS-5 communication carrier (SPOT/GLB)

The C/I margins in Table 17-137 are all positive except for the case of NSS-5 carrier 416KG7W. In this case the C/I margin is 0.8 dB negative. This negative margin is

however negligible. Further, the coordination between the TT&C carriers of SES-4 and the communication carriers of NSS-5 has been completed.

17.8 Analysis of the interference of the SES-4 TT&C carriers into the communication and TT&C carriers of a hypothetical satellite at 24°W.L. having the same transmission parameters as the NSS-703 satellite

It is assumed that SES-4 has a hypothetical neighbor at an orbital separation of 2°, with the same TT&C transmission parameters as the SES-4 satellite. The interference between the two systems then is only in the TT&C carriers. Table 17-138 shows the interference analysis for the telecommand carriers whereas Table 17-139 shows the interference analyses for the telemetry and beacon carriers. All C/I margins in the analyses are positive.

SES-4 CM1		
input power	(dBW)	19.0
Off-axis EIRP	(dBW)	40.0
Hypothetical satellite - CM1		
uplink EIRP	(dBW)	83.0
required C/N	(dB)	10.0
Required C/I	(dB)	24.0
Interference analysis		
C/I total	(dB)	43.0
Margin	**(dB)**	**19.0**

Table 17-138. Interference calculations for the SES-4 telecommand carrier into the hypothetical satellite telecommand carrier

SES-4		TM1	BNK1	BNC1
downlink EIRP	(dBW)	8.0	8.0	5.0
Hypothetical satellite		**TM1**	**BNK1**	**BNC1**
Downlink EIRP (EOC)	(dBW)	8.0	8.0	5.0
Receive earth station size	(m)	9.0	2.4	3.7
Receive earth station gain	(dBi)	58.8	44.8	41.9
Receive earth station off-axis	(dBi)	21.0	21.0	21.0
Required C/N	(dB)	0.0	0.0	0.0
Required C/I	(dB)	14.0	14.0	14.0
Interference analysis				
Calculated C/I	(dB)	37.8	23.8	20.9
Margin	(dB)	**23.8**	**9.8**	**6.9**

Table 17-139. Interference calculations for the SES-4 telemetry and beacon carrier into the hypothetical satellite telemetry and beacon carrier

18. Orbital Debris Mitigation

SES WORLD SKIES has reviewed orbit debris mitigation for all satellites in its fleet, including the SES-4 spacecraft. SES WORLD SKIES' policy is to incorporate these objectives, as appropriate, into its test plan, including a formal analysis of orbital debris risks associated with the TT&C, propulsion, and power generation and storage systems.

Spacecraft Hardware Design

SES WORLD SKIES has assessed and limited the amount of debris released in a planned manner during normal operations. SES-4 will not be a source of debris during drift or operating mode, as SES WORLD SKIES does not intend to release debris during the planned course of operations of the satellite.

SES WORLD SKIES has also assessed and limited the possibility of SES-4 becoming a source of debris by collisions with small debris or meteoroids that could cause loss of control of the spacecraft and prevent post-mission disposal. Specifically, the SES-4 satellite has been designed and constructed in a manner that incorporates redundancy, shielding, separation of components, and other physical characteristics into the satellite's design. For example, omni-directional antennas are mounted on opposite sides of the

spacecraft, and either will be sufficient to support orbit raising. The command receivers and decoders, telemetry encoders and transmitters, and the bus control electronics are fully redundant, physically separated, and located within a shielded area to minimize the probability of the spacecraft becoming a source of debris due to a collision.

Minimizing Accidental Explosions

SES WORLD SKIES has assessed and limited the probability of accidental explosion during and after completion of mission operations. The key areas reviewed for this purpose included leakage of propellant and mixing of fuel and oxidizer as well as battery pressure vessels. The basic propulsion design (including component and functional redundancy, and the placement of fuel tanks inside a central cylinder which provides a high level of shielding), propulsion subsystem component construction, preflight verification through both proof testing and analysis, and quality standards have been designed to ensure a very low risk of propellant leakage and fuel and oxidizer mixing that can result in subsequent explosions. During the mission, batteries and various critical areas of the propulsion subsystem will be continually monitored (for both pressure and temperature) to preclude conditions that could result in the remote possibility of explosion and subsequent generation of debris.

After SES-4 reaches its final disposal orbit, all on-board sources of stored energy will be depleted, all residual fuel will be depleted, all fuel line valves will be left "open," all batteries will be left in a permanent discharge state, and all pressurized systems will be vented. The solar cells will also be slewed away from the sun to minimize power generation.

Through this process, SES WORLD SKIES has assessed and limited the possibility of accidental explosions during and after completion of mission operations and will assure that all stored energy at the end of the satellite's operation will be removed.

Safe Flight Profiles

SES WORLD SKIES has assessed and limited the probability of SES-4 becoming a source of debris by collisions with large debris or other operational space stations through detailed and conscientious mission planning. SES WORLD SKIES has reviewed the list of licensed systems and systems that are under consideration by the Commission for the nominal 22° W.L. orbital location where SES-4 will operate. In addition, in order to address non-U.S. licensed systems, SES WORLD SKIES has reviewed the list of satellite networks in the vicinity of 22° W.L. for which a request for coordination has been submitted to the ITU. Only those networks that are operating, or are planned to be operating, within ± 0.2° have been taken into account in this review.

SES WORLD SKIES has determined that no system is under consideration or has been licensed by the Commission, or is currently operating, at the nominal 22° W.L. location, except for the NSS-7 satellite. Also, with the exception of the filings made by SES WORLD SKIES, the company is not aware of any system with an overlapping station-keeping volume with SES-4, that is the subject of an ITU filing and that is either in orbit or progressing towards launch. SES WORLD SKIES therefore concludes that physical coordination of SES-4 with another operator will not be required at the present time.

With respect to the NSS-7 satellite, which is currently located at 22.0° W.L., that satellite will be moved to another location once SES-4 has arrived on station and traffic transfer is complete. At that time, SES-4 will assume the station-keeping box currently occupied by NSS-7. During the brief period in which communication traffic is being transferred from NSS-7 to SES-4, SES WORLD SKIES will take all the necessary steps, e.g., execute a "pass-in-the-night-maneuver" or temporarily offset the orbital location of

NSS-7 and/or SES-4 (with Commission authorization, where necessary), to minimize the risk of collision between the two spacecraft.

Post-Mission Disposal

At the end of the mission, SES WORLD SKIES expects to dispose of the spacecraft by moving it to a planned minimum altitude of 200 kilometers (perigee) above the geostationary arc. This is consistent with SES WORLD SKIES' obligations in its license issued under The Netherlands' Space Activities Act. Such license requires SES WORLD SKIES to ensure (among other things) that, at the end of a space object's life span, adequate fuel supply is onboard to transport the space object to a de-commissioning orbit or de-commissioning zone. While the license does not define the de-commissioning orbit or zone, the Explanatory Memorandum to the Dutch Space Activities Act does refer to a "de-commissioning zone" of "around 200 km higher than geostationary orbit."

SES WORLD SKIES has reserved 27 kilograms of fuel for post-mission disposal. Fuel gauging uncertainty (as discussed further below) has been taken into account in these calculations. Nevertheless, because there is no mechanism for precisely calculating the amount of fuel left on the spacecraft once it is in orbit, it is possible that the spacecraft will not meet the planned minimum de-orbit altitude.

In the Second Report and Order regarding the mitigation of orbital debris, the FCC declared that non-U.S.-licensed satellites seeking U.S. market access could satisfy the FCC's post-mission disposal requirements "by showing that the satellite system's debris mitigation plans are subject to direct and effective regulatory oversight by the satellite system's national licensing authority." *In the Matter of Mitigation of Orbital Debris*, 19 FCC Rcd 11567, at ¶ 95 (2004). The condition in SES WORLD SKIES' license under

The Netherlands' Space Activities Act (as discussed above) qualifies as such oversight. For these reasons, the SES-4 planned disposal orbit complies with the FCC's rules.[9]

In addition, SES WORLD SKIES provides the following information regarding the proposed disposal orbit:

1) Planned orbital eccentricity: 3.0E-04 (This is a best estimate of optimal eccentricity to match the natural eccentricity circle due to Sun and Moon perturbations after decommission)[10]

2) Planned apogee altitude: 225 km

3) Information concerning the methods that will be used to assess and provide adequate margins concerning fuel gauging uncertainty: For the SES-4 spacecraft, in addition to the nominal hold-back provided by the manufacturer, the fuel reserve takes into account the propellant uncertainty resulting from the fuel book-keeping method, including the mixture ratio uncertainty. In addition, SES WORLD SKIES performs thermal gauging near the spacecraft's end of life by inferring the remaining propellant from the thermal signature when SES WORLD SKIES applies heat to different parts of the propellant tank system. This information is considered when determining the additional hold-back and adjustments to book values to attempt to ensure sufficient propellant to achieve the planned minimum altitude. There are,

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[9] *See, e.g.*, Stamp Grant, File No. SAT-PPL-20091208-00142 (June 4, 2010) (granting Permitted List petition for NSS-5, which has the same planned disposal orbit).

[10] Because it is extremely difficult to anticipate end-of-life thruster performance and operational conditions, it is extremely difficult to achieve the planned eccentricity. SES WORLD SKIES' priority is to achieve the planned minimum perigee of 200 kilometers. In order to achieve the planned eccentricity, not only must there be sufficient propellant reserved but, in addition, individual thrusters must be fired at specific times during satellite decommissioning because the timing of thruster firing will affect eccentricity. Due to difficulties in predicting the thruster end-of-life performance, as well as earth station availability and visibility as the satellite drifts, it may not

(footnote continued)

however, many uncertainties to both methods that could lead to incorrect conclusions regarding remaining fuel.

be possible to fire the right thrusters at the optimal times. Thus, optimal eccentricity may not be achieved, which, in turn, will affect the apogee altitude.

APPENDIX A

Link Budget Analysis

		WH/WH 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.1	55.0	61.0	65.9	76.5	78.1
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	0.9	7.9	6.1	14.8	20.2	21.8
Free Space Loss	dB	200.0	200.0	200.0	200.0	200.0	200.0
G/T Satellite	dB/K	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
C/N Thermal Uplink	dB	23.4	25.1	25.1	23.5	27.2	28.0
C/I XPOL, ACI, IM, ASI	dB	16.0	17.7	17.7	16.1	19.8	20.6
C/(N+I) uplink	dB	15.3	16.9	16.9	15.4	19.1	19.9
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	13.3	16.2	22.2	27.1	36.7	37.4
Maximum e.i.r.p. density	dBW/4kHz	-1.8	-0.2	-0.2	-1.7	1.0	13.4
Free Space Loss	dB	195.7	195.7	195.7	195.7	195.7	195.7
Earth Station Diameter	m	3.8	3.8	3.8	3.8	3.8	3.8
Earth Station Gain	dBi	41.6	41.6	41.6	41.6	41.6	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	21.8	21.8	21.8	21.8	21.8
C/N Thermal Downlink	dB	13.9	15.5	15.5	13.9	16.6	16.5
C/I XPOL, ACI, IM, ASI	dB	13.8	15.5	15.5	13.9	16.6	16.4
C/(N+I) downlink	dB	10.8	12.5	12.5	10.9	13.6	13.4
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	19.0	20.7	20.7	19.1	22.8	23.6
C/I dn (single satellite)	dB	16.8	18.5	18.5	16.9	19.6	19.4
Aggregate C/I up	dB	16.0	17.7	17.7	16.1	19.8	20.6
Aggregate C/I down	dB	13.8	15.5	15.5	13.9	16.6	16.4
Overall:							
C/(N+I) overall	dB	9.5	11.2	11.2	9.6	12.5	12.6
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	3.5	1.9	1.9	2.7	5.6	2.6

Associated Txr IDs	
Start	End
43	45

TABLE A-1. LINK BUDGET, WEST HEMI/WEST HEMI, 36 MHZ TRANSPONDER

		WH/WH 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.2	54.5	59.3	65.7	77.9	78.1
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	0.0	7.5	4.5	14.6	21.6	21.8
Free Space Loss	dB	200.0	200.0	200.0	200.0	200.0	200.0
G/T Satellite	dB/K	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
C/N Thermal Uplink	dB	22.5	24.6	23.4	23.3	26.8	28.0
C/I XPOL, ACI, IM, ASI	dB	15.1	17.2	16.1	15.9	19.4	20.6
C/(N+I) uplink	dB	14.4	16.5	15.3	15.2	18.7	19.9
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	12.4	15.7	20.6	26.9	38.1	37.4
Maximum e.i.r.p. density	dBW/4kHz	-2.7	-0.6	-1.8	-1.9	0.6	13.4
Free Space Loss	dB	195.7	195.7	195.7	195.7	195.7	195.7
Earth Station Diameter	m	3.8	3.8	4.5	3.8	3.8	3.8
Earth Station Gain	dBi	41.6	41.6	43.1	41.6	41.6	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	21.8	23.3	21.8	21.8	21.8
C/N Thermal Downlink	dB	13.0	15.1	15.4	13.8	16.3	16.5
C/I XPOL, ACI, IM, ASI	dB	12.9	15.0	15.3	13.7	16.2	16.4
C/(N+I) downlink	dB	10.0	12.1	12.3	10.7	13.2	13.4
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	18.1	20.2	19.1	18.9	22.4	23.6
C/I dn (single satellite)	dB	15.9	18.0	18.3	16.7	19.2	19.4
Aggregate C/I up	dB	15.1	17.2	16.1	15.9	19.4	20.6
Aggregate C/I down	dB	12.9	15.0	15.3	13.7	16.2	16.4
Overall:							
C/(N+I) overall	dB	8.6	10.7	10.6	9.4	12.2	12.6
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	2.6	1.5	1.3	2.5	5.2	2.6

Associated Txr IDs	
Start	End
3	7
40	42

TABLE A-2. LINK BUDGET, WEST HEMI/WEST HEMI, 54 MHZ TRANSPONDER

		WH/WH 72MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**72M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	72000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	50.5	52.8	58.8	64.6	78.0	72.0
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	-0.7	5.7	3.9	13.4	21.6	15.7
Free Space Loss	dB	200.0	200.0	200.0	200.0	200.0	200.0
G/T Satellite	dB/K	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
C/N Thermal Uplink	dB	21.8	22.9	22.9	22.2	25.4	21.9
C/I XPOL, ACI, IM, ASI	dB	14.4	15.5	15.5	14.8	18.0	16.5
C/(N+I) uplink	dB	13.7	14.8	14.8	14.1	17.3	15.4
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	11.7	14.0	20.0	25.8	38.2	34.2
Maximum e.i.r.p. density	dBW/4kHz	-3.4	-2.3	-2.3	-3.0	-0.8	10.2
Free Space Loss	dB	195.7	195.7	195.7	195.7	195.7	195.7
Earth Station Diameter	m	3.8	4.5	4.5	3.8	7.2	4.5
Earth Station Gain	dBi	41.6	43.1	43.1	41.6	47.1	43.1
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	23.3	23.3	21.8	27.4	23.3
C/N Thermal Downlink	dB	12.3	14.8	14.8	12.6	20.4	14.8
C/I XPOL, ACI, IM, ASI	dB	12.2	14.8	14.8	12.6	20.4	17.7
C/(N+I) downlink	dB	9.2	11.8	11.8	9.6	17.4	13.0
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-44
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-37
C/I up (single satellite)	dB	17.4	18.5	18.5	17.8	21.0	19.5
C/I dn (single satellite)	dB	15.2	17.8	17.8	15.6	23.4	20.7
Aggregate C/I up	dB	14.4	15.5	15.5	14.8	18.0	16.5
Aggregate C/I down	dB	12.2	14.8	14.8	12.6	20.4	17.7
Overall:							
C/(N+I) overall	dB	7.9	10.0	10.0	8.3	14.3	11.0
C/(N+I) required	dB	6.0	9.3	9.3	6.9	12.7	10.0
System Margin	dB	1.9	0.7	0.7	1.4	1.6	1.0

Associated Txr IDs	
Start	End
1	2
38	39

TABLE A-3. LINK BUDGET, WEST HEMI/WEST HEMI, 72 MHZ TRANSPONDER

		EH/WH 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.3	54.9	60.9	67.0	76.4	75.7
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	1.1	7.8	6.0	15.9	20.1	19.3
Free Space Loss	dB	199.8	199.8	199.8	199.8	199.8	199.8
G/T Satellite	dB/K	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C/N Thermal Uplink	dB	22.7	24.0	24.0	23.7	26.1	24.6
C/I XPOL, ACI, IM, ASI	dB	16.3	17.6	17.6	17.2	19.7	18.2
C/(N+I) uplink	dB	15.4	16.7	16.7	16.3	18.8	17.3
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	13.6	16.2	22.2	28.4	36.8	37.0
Maximum e.i.r.p. density	dBW/4kHz	-1.4	-0.1	-0.1	-0.5	1.0	13.0
Free Space Loss	dB	195.7	195.7	195.7	195.7	195.7	195.7
Earth Station Diameter	m	3.8	3.8	3.8	3.8	3.8	3.8
Earth Station Gain	dBi	41.6	41.6	41.6	41.6	41.6	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	21.8	21.8	21.8	21.8	21.8
C/N Thermal Downlink	dB	14.3	15.6	15.6	15.2	16.7	16.2
C/I XPOL, ACI, IM, ASI	dB	14.2	15.5	15.5	15.2	16.6	16.1
C/(N+I) downlink	dB	11.2	12.5	12.5	12.2	13.6	13.1
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	19.3	20.6	20.6	20.2	22.7	21.2
C/I dn (single satellite)	dB	17.2	18.5	18.5	18.2	19.6	19.1
Aggregate C/I up	dB	16.3	17.6	17.6	17.2	19.7	18.2
Aggregate C/I down	dB	14.2	15.5	15.5	15.2	16.6	16.1
Overall:							
C/(N+I) overall	dB	9.8	11.1	11.1	10.8	12.5	11.7
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	3.8	1.9	1.9	3.9	5.6	1.7

Associated Txr IDs	
Start	End
51	53

TABLE A-4. LINK BUDGET, EAST HEMI/WEST HEMI, 36 MHZ TRANSPONDER

		EH/WH 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.4	54.4	59.3	65.4	77.7	75.7
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	0.3	7.4	4.4	14.3	21.4	19.3
Free Space Loss	dB	199.8	199.8	199.8	199.8	199.8	199.8
G/T Satellite	dB/K	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C/N Thermal Uplink	dB	21.8	23.6	22.4	22.1	25.7	24.6
C/I XPOL, ACI, IM, ASI	dB	15.4	17.2	16.0	15.6	19.3	18.2
C/(N+I) uplink	dB	14.5	16.3	15.1	14.7	18.4	17.3
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	12.8	15.8	20.7	26.8	38.1	37.0
Maximum e.i.r.p. density	dBW/4kHz	-2.3	-0.5	-1.7	-2.1	0.6	13.0
Free Space Loss	dB	195.7	195.7	195.7	195.7	195.7	195.7
Earth Station Diameter	m	3.8	3.8	4.5	3.8	3.8	3.8
Earth Station Gain	dBi	41.6	41.6	43.1	41.6	41.6	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	21.8	23.3	21.8	21.8	21.8
C/N Thermal Downlink	dB	13.4	15.2	15.5	13.6	16.3	16.2
C/I XPOL, ACI, IM, ASI	dB	13.3	15.1	15.4	13.6	16.2	16.1
C/(N+I) downlink	dB	10.4	12.1	12.4	10.6	13.2	13.1
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	18.4	20.2	19.0	18.6	22.3	21.2
C/I dn (single satellite)	dB	16.3	18.1	18.4	16.6	19.2	19.1
Aggregate C/I up	dB	15.4	17.2	16.0	15.6	19.3	18.2
Aggregate C/I down	dB	13.3	15.1	15.4	13.6	16.2	16.1
Overall:							
C/(N+I) overall	dB	9.0	10.7	10.6	9.2	12.1	11.7
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	3.0	1.5	1.3	2.3	5.2	1.7

Associated Txr IDs	
Start	End
10	14
48	50

TABLE A-5. LINK BUDGET, EAST HEMI/WEST HEMI, 54 MHZ TRANSPONDER

		EH/WH 72MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**72M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	72000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	50.1	52.8	58.8	64.4	77.9	71.9
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	-1.1	5.8	4.0	13.3	21.5	15.5
Free Space Loss	dB	199.8	199.8	199.8	199.8	199.8	199.8
G/T Satellite	dB/K	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C/N Thermal Uplink	dB	20.5	22.0	22.0	21.0	24.3	20.8
C/I XPOL, ACI, IM, ASI	dB	14.0	15.6	15.6	14.6	17.9	16.3
C/(N+I) uplink	dB	13.2	14.7	14.7	13.7	17.0	15.0
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	11.4	14.2	20.2	25.8	38.2	34.2
Maximum e.i.r.p. density	dBW/4kHz	-3.6	-2.1	-2.1	-3.1	-0.8	10.2
Free Space Loss	dB	195.7	195.7	195.7	195.7	195.7	195.7
Earth Station Diameter	m	3.8	4.5	4.5	3.8	7.2	4.5
Earth Station Gain	dBi	41.6	43.1	43.1	41.6	47.1	43.1
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	23.3	23.3	21.8	27.4	23.3
C/N Thermal Downlink	dB	12.0	15.0	15.0	12.6	20.5	14.8
C/I XPOL, ACI, IM, ASI	dB	12.0	15.0	15.0	12.5	20.4	17.8
C/(N+I) downlink	dB	9.0	12.0	12.0	9.6	17.4	13.0
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-44
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-37
C/I up (single satellite)	dB	17.0	18.6	18.6	17.6	20.9	19.3
C/I dn (single satellite)	dB	15.0	18.0	18.0	15.5	23.4	20.8
Aggregate C/I up	dB	14.0	15.6	15.6	14.6	17.9	16.3
Aggregate C/I down	dB	12.0	15.0	15.0	12.5	20.4	17.8
Overall:							
C/(N+I) overall	dB	7.6	10.1	10.1	8.1	14.2	10.9
C/(N+I) required	dB	6.0	9.3	9.3	6.9	12.7	10.0
System Margin	dB	1.6	0.8	0.8	1.2	1.5	0.9

Associated Txr IDs	
Start	End
8	9
46	47

TABLE A-6. LINK BUDGET, EAST HEMI/WEST HEMI, 72 MHZ TRANSPONDER

		EU/WH 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.161	14.161	14.161	14.161	14.161	14.161
Downlink Frequency	GHz	3.871	3.871	3.871	3.871	3.871	3.871
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.1	54.8	60.8	66.9	80.3	79.3
Earth Station Diameter	m	3.8	3.8	3.8	3.8	4.5	4.5
Earth Station Gain	dBi	53.1	53.1	53.1	53.1	54.6	54.6
Uplink Input Power per Carrier	dBW	-1.0	1.7	7.8	13.8	25.7	24.7
Free Space Loss	dB	206.8	206.8	206.8	206.8	206.8	206.8
G/T Satellite	dB/K	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6
C/N Thermal Uplink	dB	17.3	18.7	18.7	18.2	23.0	22.9
C/I XPOL, ACI, IM, ASI	dB	24.1	25.5	25.5	25.0	29.8	29.8
C/(N+I) uplink	dB	16.4	17.9	17.9	17.4	22.1	22.1
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	12.0	14.7	20.7	26.8	38.2	37.2
Maximum e.i.r.p. density	dBW/4kHz	-3.1	-1.6	-1.6	-2.1	0.6	13.2
Free Space Loss	dB	196.0	196.0	196.0	196.0	196.0	196.0
Earth Station Diameter	m	3.8	5.6	5.6	3.8	3.8	3.8
Earth Station Gain	dBi	41.9	45.2	45.2	41.9	41.9	41.9
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	22.1	25.5	25.5	22.1	22.1	22.1
C/N Thermal Downlink	dB	12.6	17.4	17.4	13.6	16.3	16.3
C/I XPOL, ACI, IM, ASI	dB	12.9	17.7	17.7	13.8	16.6	16.5
C/(N+I) downlink	dB	9.7	14.6	14.6	10.7	13.4	13.4
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	27.1	28.5	28.5	28.0	32.8	32.8
C/I dn (single satellite)	dB	15.9	20.7	20.7	16.8	19.6	19.5
Aggregate C/I up	dB	24.1	25.5	25.5	25.0	29.8	29.8
Aggregate C/I down	dB	12.9	17.7	17.7	13.8	16.6	16.5
Overall:							
C/(N+I) overall	dB	8.9	12.9	12.9	9.9	12.9	12.9
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	2.9	3.6	3.6	3.0	6.0	2.9

Associated Txr IDs	
Start	End
15	17

TABLE A-7. LINK BUDGET, EUROPE/WEST HEMI, 54 MHZ TRANSPONDER

		WA/WH 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.161	14.161	14.161	14.161	14.161	14.161
Downlink Frequency	GHz	3.871	3.871	3.871	3.871	3.871	3.871
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	55.4	57.8	63.9	70.2	82.1	81.0
Earth Station Diameter	m	3.8	4.5	4.5	3.8	7.2	7.2
Earth Station Gain	dBi	53.1	54.6	54.6	53.1	58.7	58.7
Uplink Input Power per Carrier	dBW	2.4	3.3	9.3	17.1	23.4	22.3
Free Space Loss	dB	206.8	206.8	206.8	206.8	206.8	206.8
G/T Satellite	dB/K	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
C/N Thermal Uplink	dB	20.2	21.3	21.3	21.2	24.4	24.2
C/I XPOL, ACI, IM, ASI	dB	27.4	28.6	28.6	28.4	31.6	31.5
C/(N+I) uplink	dB	19.4	20.6	20.6	20.4	23.6	23.5
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	12.5	14.9	21.0	27.3	38.2	37.1
Maximum e.i.r.p. density	dBW/4kHz	-2.5	-1.4	-1.4	-1.5	0.7	13.1
Free Space Loss	dB	196.0	196.0	196.0	196.0	196.0	196.3
Earth Station Diameter	m	3.8	5.6	5.6	3.8	3.8	3.8
Earth Station Gain	dBi	41.9	45.2	45.2	41.9	41.9	41.9
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	22.1	25.5	25.5	22.1	22.1	22.1
C/N Thermal Downlink	dB	13.2	17.7	17.7	14.1	16.3	16.0
C/I XPOL, ACI, IM, ASI	dB	13.4	17.9	17.9	14.4	16.6	16.5
C/(N+I) downlink	dB	10.3	14.8	14.8	11.2	13.4	13.2
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	30.4	31.6	31.6	31.4	34.6	34.5
C/I dn (single satellite)	dB	16.4	20.9	20.9	17.4	19.6	19.5
Aggregate C/I up	dB	27.4	28.6	28.6	28.4	31.6	31.5
Aggregate C/I down	dB	13.4	17.9	17.9	14.4	16.6	16.5
Overall:							
C/(N+I) overall	dB	9.8	13.8	13.8	10.7	13.0	12.8
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	3.8	4.5	4.5	3.8	6.1	2.8

Associated Txr IDs	
Start	End
54	56

TABLE A-8. LINK BUDGET, WEST AFRICA/WEST HEMI, 54 MHZ TRANSPONDER

		GL/GL 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	6.325	6.325	6.325	6.325	6.325	6.325
Downlink Frequency	GHz	4.100	4.100	4.100	4.100	4.100	4.100
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	53.6	57.1	63.2	68.3	79.1	80.2
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.7	47.6	55.4	51.7	56.8	56.9
Uplink Input Power per Carrier	dBW	2.0	9.6	7.8	16.7	22.3	23.3
Free Space Loss	dB	200.6	200.6	200.6	200.6	200.6	200.7
G/T Satellite	dB/K	-10.6	-10.6	-10.6	-10.6	-10.6	-10.6
C/N Thermal Uplink	dB	16.9	19.2	19.2	17.8	21.7	21.9
C/I XPOL, ACI, IM, ASI	dB	17.6	19.9	19.9	18.5	22.4	22.7
C/(N+I) uplink	dB	14.2	16.5	16.5	15.1	19.0	19.2
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	10.0	13.6	19.6	24.8	33.6	33.6
Maximum e.i.r.p. density	dBW/4kHz	-5.0	-2.8	-2.8	-4.1	-2.2	9.6
Free Space Loss	dB	196.9	196.9	196.9	196.9	196.9	197.0
Earth Station Diameter	m	3.8	4.5	4.5	3.8	3.8	4.5
Earth Station Gain	dBi	42.4	43.8	43.8	42.4	42.4	43.8
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	22.6	24.1	24.1	22.6	22.6	24.1
C/N Thermal Downlink	dB	10.3	14.0	14.0	11.2	13.1	13.7
C/I XPOL, ACI, IM, ASI	dB	11.4	15.1	15.1	12.3	14.2	14.9
C/(N+I) downlink	dB	7.8	11.5	11.5	8.7	10.6	11.3
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	20.6	22.9	22.9	21.5	25.4	25.7
C/I dn (single satellite)	dB	14.4	18.1	18.1	15.3	17.2	17.9
Aggregate C/I up	dB	17.6	19.9	19.9	18.5	22.4	22.7
Aggregate C/I down	dB	11.4	15.1	15.1	12.3	14.2	14.9
Overall:							
C/(N+I) overall	dB	6.9	10.3	10.3	7.8	10.1	10.6
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	0.9	1.1	1.1	0.9	3.1	0.6

Associated Txr IDs	
Start	End
18	20
76	78

TABLE A-9. LINK BUDGET, GLOBAL/GLOBAL, 36 MHZ TRANSPONDER

		WH/EH 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.6	55.5	61.5	66.9	77.0	75.0
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	1.4	8.5	6.7	15.7	20.7	18.6
Free Space Loss	dB	200.0	200.0	200.0	200.0	200.0	200.0
G/T Satellite	dB/K	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
C/N Thermal Uplink	dB	24.0	25.6	25.6	24.4	27.7	24.8
C/I XPOL, ACI, IM, ASI	dB	16.6	18.2	18.2	17.1	20.3	17.4
C/(N+I) uplink	dB	15.8	17.5	17.5	16.3	19.6	16.7
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	14.3	17.2	23.3	28.6	36.7	36.7
Maximum e.i.r.p. density	dBW/4kHz	-0.8	0.9	0.9	-0.3	1.0	12.7
Free Space Loss	dB	195.3	195.3	195.3	195.3	195.3	195.3
Earth Station Diameter	m	3.8	3.8	3.8	3.8	3.8	3.8
Earth Station Gain	dBi	41.6	41.6	41.6	41.6	41.6	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	21.8	21.8	21.8	21.8	21.8
C/N Thermal Downlink	dB	15.3	17.0	17.0	15.8	17.0	16.2
C/I XPOL, ACI, IM, ASI	dB	14.9	16.5	16.5	15.3	16.6	15.7
C/(N+I) downlink	dB	12.1	13.7	13.7	12.5	13.8	12.9
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	19.6	21.2	21.2	20.1	23.3	20.4
C/I dn (single satellite)	dB	17.9	19.5	19.5	18.3	19.6	18.7
Aggregate C/I up	dB	16.6	18.2	18.2	17.1	20.3	17.4
Aggregate C/I down	dB	14.9	16.5	16.5	15.3	16.6	15.7
Overall:							
C/(N+I) overall	dB	10.5	12.2	12.2	11.0	12.8	11.4
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	4.5	3.0	3.0	4.1	5.9	1.4

Associated Txr IDs	
Start	End
62	64

TABLE A-10. LINK BUDGET, WEST HEMI/EAST HEMI, 36 MHZ TRANSPONDER

		WH/EH 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.6	54.2	59.4	65.8	78.8	75.0
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	0.4	7.1	4.5	14.7	22.5	18.6
Free Space Loss	dB	200.0	200.0	200.0	200.0	200.0	200.0
G/T Satellite	dB/K	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
C/N Thermal Uplink	dB	22.9	24.3	23.5	23.4	27.7	24.8
C/I XPOL, ACI, IM, ASI	dB	15.6	16.9	16.1	16.0	20.4	17.4
C/(N+I) uplink	dB	14.8	16.2	15.4	15.3	19.6	16.7
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	13.3	15.9	21.1	27.5	38.5	36.7
Maximum e.i.r.p. density	dBW/4kHz	-1.8	-0.4	-1.2	-1.3	1.0	12.7
Free Space Loss	dB	195.3	195.3	195.3	195.3	195.3	195.3
Earth Station Diameter	m	3.8	3.8	4.5	3.8	3.8	3.8
Earth Station Gain	dBi	41.6	41.6	43.1	41.6	41.6	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	21.8	23.3	21.8	21.8	21.8
C/N Thermal Downlink	dB	14.3	15.6	16.3	14.7	17.1	16.2
C/I XPOL, ACI, IM, ASI	dB	13.9	15.2	15.9	14.3	16.6	15.7
C/(N+I) downlink	dB	11.1	12.4	13.1	11.5	13.8	12.9
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	18.6	19.9	19.1	19.0	23.4	20.4
C/I dn (single satellite)	dB	16.9	18.2	18.9	17.3	19.6	18.7
Aggregate C/I up	dB	15.6	16.9	16.1	16.0	20.4	17.4
Aggregate C/I down	dB	13.9	15.2	15.9	14.3	16.6	15.7
Overall:							
C/(N+I) overall	dB	9.5	10.9	11.1	10.0	12.8	11.4
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	3.5	1.6	1.8	3.1	5.9	1.4

Associated Txr IDs	
Start	End
23	27
59	61

TABLE A-11. LINK BUDGET, WEST HEMI/EAST HEMI, 54 MHZ TRANSPONDER

		WH/EH 72MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**72M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	72000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	50.2	52.4	58.5	64.6	78.9	72.0
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	-0.9	5.4	3.6	13.4	22.6	15.7
Free Space Loss	dB	200.0	200.0	200.0	200.0	200.0	200.0
G/T Satellite	dB/K	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
C/N Thermal Uplink	dB	21.6	22.5	22.5	22.2	26.4	21.9
C/I XPOL, ACI, IM, ASI	dB	14.2	15.2	15.2	14.8	19.0	16.5
C/(N+I) uplink	dB	13.5	14.4	14.4	14.0	18.3	15.4
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	11.9	14.1	20.2	26.3	38.7	34.7
Maximum e.i.r.p. density	dBW/4kHz	-3.1	-2.2	-2.2	-2.6	-0.3	10.7
Free Space Loss	dB	195.3	195.3	195.3	195.3	195.3	195.3
Earth Station Diameter	m	3.8	4.5	4.5	3.8	7.2	3.8
Earth Station Gain	dBi	41.6	43.1	43.1	41.6	47.1	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	23.3	23.3	21.8	27.4	21.8
C/N Thermal Downlink	dB	12.9	15.3	15.3	13.5	21.3	14.2
C/I XPOL, ACI, IM, ASI	dB	12.5	14.9	14.9	13.1	20.8	16.8
C/(N+I) downlink	dB	9.7	12.1	12.1	10.3	18.0	12.3
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-44
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-37
C/I up (single satellite)	dB	17.2	18.2	18.2	17.8	22.0	19.5
C/I dn (single satellite)	dB	15.5	17.9	17.9	16.1	23.8	19.8
Aggregate C/I up	dB	14.2	15.2	15.2	14.8	19.0	16.5
Aggregate C/I down	dB	12.5	14.9	14.9	13.1	20.8	16.8
Overall:							
C/(N+I) overall	dB	8.2	10.1	10.1	8.7	15.1	10.6
C/(N+I) required	dB	6.0	9.3	9.3	6.9	12.7	10.0
System Margin	dB	2.2	0.9	0.9	1.8	2.4	0.6

Associated Txr IDs	
Start	End
21	22
57	58

TABLE A-12. LINK BUDGET, WEST HEMI/EAST HEMI, 72 MHZ TRANSPONDER

		EH/EH 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.2	54.7	60.7	66.9	76.9	76.8
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	1.0	7.6	5.8	15.8	20.6	20.4
Free Space Loss	dB	199.8	199.8	199.8	199.8	199.8	199.8
G/T Satellite	dB/K	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C/N Thermal Uplink	dB	22.6	23.8	23.8	23.6	26.6	25.7
C/I XPOL, ACI, IM, ASI	dB	16.1	17.4	17.4	17.1	20.2	19.2
C/(N+I) uplink	dB	15.3	16.5	16.5	16.2	19.3	18.4
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	14.0	16.5	22.5	28.8	36.8	36.6
Maximum e.i.r.p. density	dBW/4kHz	-1.0	0.2	0.2	-0.1	1.0	12.6
Free Space Loss	dB	195.3	195.3	195.3	195.3	195.3	195.3
Earth Station Diameter	m	3.8	3.8	3.8	3.8	3.8	3.8
Earth Station Gain	dBi	41.6	41.6	41.6	41.6	41.6	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	21.8	21.8	21.8	21.8	21.8
C/N Thermal Downlink	dB	15.0	16.3	16.3	16.0	17.1	16.1
C/I XPOL, ACI, IM, ASI	dB	14.6	15.8	15.8	15.6	16.6	15.7
C/(N+I) downlink	dB	11.8	13.0	13.0	12.8	13.8	12.9
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	19.1	20.4	20.4	20.1	23.2	22.2
C/I dn (single satellite)	dB	17.6	18.8	18.8	18.6	19.6	18.7
Aggregate C/I up	dB	16.1	17.4	17.4	17.1	20.2	19.2
Aggregate C/I down	dB	14.6	15.8	15.8	15.6	16.6	15.7
Overall:							
C/(N+I) overall	dB	10.2	11.4	11.4	11.1	12.8	11.8
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	4.2	2.2	2.2	4.2	5.8	1.8

Associated Txr IDs	
Start	End
70	72

TABLE A-13. LINK BUDGET, EAST HEMI/EAST HEMI, 36 MHZ TRANSPONDER

		EH/EH 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.2	53.5	59.0	65.2	78.6	76.8
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	0.0	6.4	4.1	14.1	22.3	20.4
Free Space Loss	dB	199.8	199.8	199.8	199.8	199.8	199.8
G/T Satellite	dB/K	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C/N Thermal Uplink	dB	21.6	22.6	22.1	21.8	26.6	25.7
C/I XPOL, ACI, IM, ASI	dB	15.1	16.2	15.7	15.4	20.1	19.2
C/(N+I) uplink	dB	14.2	15.3	14.8	14.5	19.2	18.4
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	13.0	15.3	20.8	27.1	38.4	36.6
Maximum e.i.r.p. density	dBW/4kHz	-2.0	-1.0	-1.5	-1.8	0.9	12.6
Free Space Loss	dB	195.3	195.3	195.3	195.3	195.3	195.3
Earth Station Diameter	m	3.8	3.8	4.5	3.8	3.8	3.8
Earth Station Gain	dBi	41.6	41.6	43.1	41.6	41.6	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	21.8	23.3	21.8	21.8	21.8
C/N Thermal Downlink	dB	14.0	15.1	16.0	14.3	17.0	16.1
C/I XPOL, ACI, IM, ASI	dB	13.6	14.6	15.6	13.8	16.6	15.7
C/(N+I) downlink	dB	10.8	11.8	12.8	11.0	13.8	12.9
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	18.1	19.2	18.7	18.4	23.1	22.2
C/I dn (single satellite)	dB	16.6	17.6	18.6	16.8	19.6	18.7
Aggregate C/I up	dB	15.1	16.2	15.7	15.4	20.1	19.2
Aggregate C/I down	dB	13.6	14.6	15.6	13.8	16.6	15.7
Overall:							
C/(N+I) overall	dB	9.2	10.2	10.7	9.4	12.7	11.8
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	3.2	1.0	1.4	2.5	5.8	1.8

Associated Txr IDs	
Start	End
30	34
67	69

TABLE A-14. LINK BUDGET, EAST HEMI/EAST HEMI, 54 MHZ TRANSPONDER

		EH/EH 72MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**72M0G7W**	**36M0F3F**
Uplink Frequency	GHz	5.966	5.966	5.966	5.966	5.966	5.966
Downlink Frequency	GHz	3.741	3.741	3.741	3.741	3.741	3.741
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	72000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	49.9	52.4	58.6	64.3	78.9	73.9
Earth Station Diameter	m	7.2	4.5	11.0	7.2	13.0	13.0
Earth Station Gain	dBi	51.2	47.0	54.9	51.2	56.3	56.3
Uplink Input Power per Carrier	dBW	-1.2	5.3	3.7	13.1	22.5	17.5
Free Space Loss	dB	199.8	199.8	199.8	199.8	199.8	199.8
G/T Satellite	dB/K	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C/N Thermal Uplink	dB	20.3	21.5	21.7	20.9	25.3	22.8
C/I XPOL, ACI, IM, ASI	dB	13.9	15.1	15.3	14.5	18.9	18.4
C/(N+I) uplink	dB	13.0	14.2	14.4	13.6	18.0	17.0
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	11.8	14.2	20.4	26.1	38.7	34.7
Maximum e.i.r.p. density	dBW/4kHz	-3.3	-2.1	-1.9	-2.7	-0.3	10.7
Free Space Loss	dB	195.3	195.3	195.3	195.3	195.3	195.3
Earth Station Diameter	m	3.8	4.5	4.5	3.8	7.2	3.8
Earth Station Gain	dBi	41.6	43.1	43.1	41.6	47.1	41.6
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	21.8	23.3	23.3	21.8	27.4	21.8
C/N Thermal Downlink	dB	12.8	15.4	15.6	13.3	21.3	14.2
C/I XPOL, ACI, IM, ASI	dB	12.3	15.0	15.2	12.9	20.9	16.8
C/(N+I) downlink	dB	9.5	12.2	12.4	10.1	18.1	12.3
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-44
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-37
C/I up (single satellite)	dB	16.9	18.1	18.3	17.5	21.9	21.4
C/I dn (single satellite)	dB	15.3	18.0	18.2	15.9	23.9	19.8
Aggregate C/I up	dB	13.9	15.1	15.3	14.5	18.9	18.4
Aggregate C/I down	dB	12.3	15.0	15.2	12.9	20.9	16.8
Overall:							
C/(N+I) overall	dB	7.9	10.1	10.3	8.5	15.0	11.0
C/(N+I) required	dB	6.0	9.3	9.3	6.9	12.7	10.0
System Margin	dB	1.9	0.8	1.0	1.6	2.4	1.0

Associated Txr IDs	
Start	End
28	29
65	66

TABLE A-15. LINK BUDGET, EAST HEMI/EAST HEMI, 72 MHZ TRANSPONDER

		EU/EH 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.161	14.161	14.161	14.161	14.161	14.161
Downlink Frequency	GHz	3.871	3.871	3.871	3.871	3.871	3.871
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.5	54.4	60.4	66.2	79.9	78.9
Earth Station Diameter	m	2.4	3.8	3.8	3.8	4.5	4.5
Earth Station Gain	dBi	49.0	53.1	53.1	53.1	54.6	54.6
Uplink Input Power per Carrier	dBW	2.5	1.3	7.3	13.2	25.4	24.3
Free Space Loss	dB	206.8	206.8	206.8	206.8	206.8	206.8
G/T Satellite	dB/K	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6
C/N Thermal Uplink	dB	16.7	18.3	18.3	17.6	22.6	22.5
C/I XPOL, ACI, IM, ASI	dB	23.5	25.1	25.1	24.4	29.5	29.4
C/(N+I) uplink	dB	15.8	17.4	17.4	16.8	21.8	21.7
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	11.9	14.8	20.8	26.6	38.3	36.9
Maximum e.i.r.p. density	dBW/4kHz	-3.2	-1.5	-1.5	-2.2	0.8	12.9
Free Space Loss	dB	195.6	195.6	195.6	195.6	195.6	195.9
Earth Station Diameter	m	3.8	5.6	5.6	3.8	3.8	3.8
Earth Station Gain	dBi	41.9	45.2	45.2	41.9	41.9	41.9
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	22.1	25.5	25.5	22.1	22.1	22.1
C/N Thermal Downlink	dB	12.9	17.9	17.9	13.9	16.9	16.1
C/I XPOL, ACI, IM, ASI	dB	12.8	17.7	17.7	13.7	16.7	16.3
C/(N+I) downlink	dB	9.8	14.8	14.8	10.8	13.8	13.2
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	26.5	28.1	28.1	27.4	32.5	32.4
C/I dn (single satellite)	dB	15.8	20.7	20.7	16.7	19.7	19.3
Aggregate C/I up	dB	23.5	25.1	25.1	24.4	29.5	29.4
Aggregate C/I down	dB	12.8	17.7	17.7	13.7	16.7	16.3
Overall:							
C/(N+I) overall	dB	8.8	12.9	12.9	9.8	13.2	12.6
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	2.8	3.6	3.6	2.9	6.3	2.6

Associated Txr IDs	
Start	End
35	37

TABLE A-16. LINK BUDGET, EUROPE/EAST HEMI, 54 MHZ TRANSPONDER

		WA/EH 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.161	14.161	14.161	14.161	14.161	14.161
Downlink Frequency	GHz	3.871	3.871	3.871	3.871	3.871	3.871
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	54.8	57.3	63.3	69.5	82.9	80.7
Earth Station Diameter	m	3.8	4.5	4.5	4.5	7.2	4.5
Earth Station Gain	dBi	53.1	54.6	54.6	54.6	58.7	54.6
Uplink Input Power per Carrier	dBW	1.7	2.7	8.8	15.0	24.3	26.0
Free Space Loss	dB	206.8	206.8	206.8	206.8	206.8	206.8
G/T Satellite	dB/K	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
C/N Thermal Uplink	dB	19.5	20.8	20.8	20.5	25.2	23.9
C/I XPOL, ACI, IM, ASI	dB	26.7	28.0	28.0	27.7	32.5	31.2
C/(N+I) uplink	dB	18.8	20.0	20.0	19.7	24.5	23.1
Downlink:							
Satellite e.i.r.p. per carrier (-3dB contour)	dBW	12.4	14.9	20.9	27.1	38.5	36.9
Maximum e.i.r.p. density	dBW/4kHz	-2.7	-1.4	-1.4	-1.7	1.0	12.9
Free Space Loss	dB	195.6	195.6	195.6	195.6	195.6	195.9
Earth Station Diameter	m	3.8	5.6	5.6	3.8	3.8	3.8
Earth Station Gain	dBi	41.9	45.2	45.2	41.9	41.9	41.9
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	22.1	25.5	25.5	22.1	22.1	22.1
C/N Thermal Downlink	dB	13.4	18.0	18.0	14.3	17.1	16.1
C/I XPOL, ACI, IM, ASI	dB	13.2	17.9	17.9	14.2	17.0	16.3
C/(N+I) downlink	dB	10.3	14.9	14.9	11.2	14.0	13.2
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-34	-34	-34	-34	-34	-34
C/I up (single satellite)	dB	29.7	31.0	31.0	30.7	35.5	34.2
C/I dn (single satellite)	dB	16.2	20.9	20.9	17.2	20.0	19.3
Aggregate C/I up	dB	26.7	28.0	28.0	27.7	32.5	31.2
Aggregate C/I down	dB	13.2	17.9	17.9	14.2	17.0	16.3
Overall:							
C/(N+I) overall	dB	9.7	13.8	13.8	10.7	13.6	12.8
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	3.7	4.5	4.5	3.8	6.7	2.8

Associated Txr IDs	
Start	End
73	75

TABLE A-17. LINK BUDGET, WEST AFRICA/EAST HEMI, 54 MHZ TRANSPONDER

		EU/EU 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	13.898	13.898	13.898	13.898	13.898	13.898
Downlink Frequency	GHz	12.650	12.650	12.650	12.650	12.650	12.650
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	53.7	55.1	61.2	68.4	79.0	70.5
Earth Station Diameter	m	4.5	4.5	5.6	5.6	4.5	4.5
Earth Station Gain	dBi	54.4	54.4	56.3	56.3	54.4	54.5
Uplink Input Power per Carrier	dBW	-0.7	0.7	4.9	12.1	24.6	16.0
Free Space Loss	dB	206.6	206.6	206.6	206.6	206.6	206.7
G/T Satellite	dB/K	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6
C/N Thermal Uplink	dB	19.0	19.2	19.2	20.0	23.6	14.2
C/I XPOL, ACI, IM, ASI	dB	25.7	25.9	25.9	26.6	30.2	21.0
C/(N+I) uplink	dB	18.2	18.4	18.4	19.1	22.7	13.4
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	20.4	21.8	27.9	35.1	42.7	35.2
Maximum e.i.r.p. density	dBW/4kHz	8.3	8.5	8.5	9.3	9.9	14.2
Free Space Loss	dB	206.4	206.4	206.4	206.4	206.4	206.4
Earth Station Diameter	m	2.4	3.8	3.8	2.4	2.4	6.5
Earth Station Gain	dBi	48.2	52.2	52.2	48.2	48.2	56.8
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	28.4	32.4	32.4	28.4	28.4	37.1
C/N Thermal Downlink	dB	16.9	21.1	21.1	17.8	18.5	18.9
C/I XPOL, ACI, IM, ASI	dB	19.5	23.7	23.7	20.5	21.1	21.5
C/(N+I) downlink	dB	15.0	19.2	19.2	16.0	16.6	17.0
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	28.7	28.9	28.9	29.6	33.2	24.0
C/I dn (single satellite)	dB	22.5	26.7	26.7	23.5	24.1	24.5
Aggregate C/I up	dB	25.7	25.9	25.9	26.6	30.2	21.0
Aggregate C/I down	dB	19.5	23.7	23.7	20.5	21.1	21.5
Overall:							
C/(N+I) overall	dB	13.3	15.7	15.7	14.2	15.6	11.8
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	7.3	6.5	6.5	7.3	8.7	1.8

Associated Txr IDs	
Start	End
165	170

TABLE A-18. LINK BUDGET, EUROPE/EUROPE, 36 MHZ TRANSPONDER

		EU/EU 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.491	11.491	11.491	11.491	11.491	11.491
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.1	54.2	60.2	66.8	79.2	70.5
Earth Station Diameter	m	4.5	4.5	5.6	5.6	4.5	4.5
Earth Station Gain	dBi	54.6	54.6	56.5	56.5	54.6	54.5
Uplink Input Power per Carrier	dBW	-2.5	-0.4	3.7	10.3	24.5	16.0
Free Space Loss	dB	206.8	206.8	206.8	206.8	206.8	206.7
G/T Satellite	dB/K	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6
C/N Thermal Uplink	dB	17.2	18.0	18.0	18.1	21.8	14.2
C/I XPOL, ACI, IM, ASI	dB	24.1	24.9	24.9	25.0	28.7	21.0
C/(N+I) uplink	dB	16.4	17.2	17.2	17.3	21.0	13.4
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	18.8	20.9	26.9	33.5	43.9	35.2
Maximum e.i.r.p. density	dBW/4kHz	6.8	7.6	7.6	7.7	9.3	14.2
Free Space Loss	dB	205.6	205.6	205.6	205.6	205.6	206.4
Earth Station Diameter	m	3.0	4.5	4.5	3.0	2.4	6.5
Earth Station Gain	dBi	49.3	52.8	52.8	49.3	47.3	56.0
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	29.5	33.0	33.0	29.5	27.6	36.2
C/N Thermal Downlink	dB	17.3	21.6	21.6	18.2	17.9	18.1
C/I XPOL, ACI, IM, ASI	dB	19.1	23.4	23.4	20.0	19.7	20.7
C/(N+I) downlink	dB	15.1	19.4	19.4	16.0	15.7	16.2
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	27.1	27.9	27.9	28.0	31.7	24.0
C/I dn (single satellite)	dB	22.1	26.4	26.4	23.0	22.7	23.7
Aggregate C/I up	dB	24.1	24.9	24.9	25.0	28.7	21.0
Aggregate C/I down	dB	19.1	23.4	23.4	20.0	19.7	20.7
Overall:							
C/(N+I) overall	dB	12.7	15.2	15.2	13.6	14.6	11.5
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	6.7	5.9	5.9	6.7	7.7	1.5

Associated Txr IDs	
Start	End
79	90
107	110

TABLE A-19. LINK BUDGET, EUROPE/EUROPE, 54 MHZ TRANSPONDER

		WA/EU 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	13.898	13.898	13.898	13.898	13.898	13.898
Downlink Frequency	GHz	12.650	12.650	12.650	12.650	12.650	12.650
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	55.4	56.9	63.0	70.1	80.6	73.7
Earth Station Diameter	m	4.5	4.5	5.6	5.6	5.6	5.6
Earth Station Gain	dBi	54.4	54.4	56.3	56.3	56.3	56.4
Uplink Input Power per Carrier	dBW	1.0	2.6	6.7	13.8	24.3	17.2
Free Space Loss	dB	206.6	206.6	206.6	206.6	206.6	206.7
G/T Satellite	dB/K	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
C/N Thermal Uplink	dB	20.3	20.6	20.6	21.2	24.8	17.0
C/I XPOL, ACI, IM, ASI	dB	27.3	27.7	27.7	28.3	31.9	24.1
C/(N+I) uplink	dB	19.5	19.8	19.8	20.4	24.1	16.2
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	20.3	21.8	27.9	35.0	42.5	34.6
Maximum e.i.r.p. density	dBW/4kHz	8.2	8.5	8.5	9.1	9.8	13.6
Free Space Loss	dB	206.4	206.4	206.4	206.4	206.4	206.4
Earth Station Diameter	m	2.4	3.8	3.8	2.4	2.4	6.5
Earth Station Gain	dBi	48.2	52.2	52.2	48.2	48.2	56.8
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	28.4	32.4	32.4	28.4	28.4	37.1
C/N Thermal Downlink	dB	16.8	21.1	21.1	17.7	18.3	18.3
C/I XPOL, ACI, IM, ASI	dB	19.4	23.7	23.7	20.3	21.0	20.9
C/(N+I) downlink	dB	14.9	19.2	19.2	15.8	16.4	16.4
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	30.3	30.7	30.7	31.3	34.9	27.1
C/I dn (single satellite)	dB	22.4	26.7	26.7	23.3	24.0	23.9
Aggregate C/I up	dB	27.3	27.7	27.7	28.3	31.9	24.1
Aggregate C/I down	dB	19.4	23.7	23.7	20.3	21.0	20.9
Overall:							
C/(N+I) overall	dB	13.6	16.5	16.5	14.5	15.7	13.3
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	7.6	7.2	7.2	7.6	8.8	3.3

Associated Txr IDs	
Start	End
171	176

TABLE A-20. LINK BUDGET, WEST AFRICA/EUROPE, 36 MHZ TRANSPONDER

		WA/EU 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.491	11.491	11.491	11.491	11.491	11.491
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	53.6	56.2	62.3	68.4	81.0	73.7
Earth Station Diameter	m	4.5	4.5	5.6	5.6	5.6	5.6
Earth Station Gain	dBi	54.6	54.6	56.5	56.5	56.5	56.4
Uplink Input Power per Carrier	dBW	-1.0	1.6	5.7	11.8	24.5	17.2
Free Space Loss	dB	206.8	206.8	206.8	206.8	206.8	206.7
G/T Satellite	dB/K	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
C/N Thermal Uplink	dB	18.3	19.7	19.7	19.3	23.3	17.0
C/I XPOL, ACI, IM, ASI	dB	25.6	27.0	27.0	26.6	30.6	24.1
C/(N+I) uplink	dB	17.6	18.9	18.9	18.5	22.5	16.2
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	18.5	21.1	27.2	33.3	43.9	34.6
Maximum e.i.r.p. density	dBW/4kHz	6.5	7.8	7.8	7.4	9.4	13.6
Free Space Loss	dB	205.6	205.6	205.6	205.6	205.6	206.4
Earth Station Diameter	m	3.0	4.5	4.5	3.0	2.4	6.5
Earth Station Gain	dBi	49.3	52.8	52.8	49.3	47.3	56.0
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	29.5	33.0	33.0	29.5	27.6	36.2
C/N Thermal Downlink	dB	17.0	21.9	21.9	17.9	18.0	17.4
C/I XPOL, ACI, IM, ASI	dB	18.8	23.7	23.7	19.7	19.8	20.0
C/(N+I) downlink	dB	14.8	19.7	19.7	15.7	15.8	15.5
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	28.6	30.0	30.0	29.6	33.6	27.1
C/I dn (single satellite)	dB	21.8	26.7	26.7	22.7	22.8	23.0
Aggregate C/I up	dB	25.6	27.0	27.0	26.6	30.6	24.1
Aggregate C/I down	dB	18.8	23.7	23.7	19.7	19.8	20.0
Overall:							
C/(N+I) overall	dB	12.9	16.3	16.3	13.9	14.9	12.8
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	6.9	7.0	7.0	7.0	8.0	2.8

Associated Txr IDs	
Start	End
91	98

TABLE A-21. LINK BUDGET, WEST AFRICA/EUROPE, 54 MHZ TRANSPONDER

		WH/EU 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	6.096	6.096	6.096	6.096	6.096	6.096
Downlink Frequency	GHz	11.111	11.111	11.111	11.111	11.111	11.111
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.8	53.2	59.2	66.5	78.9	69.8
Earth Station Diameter	m	7.2	4.5	11.0	7.2	11.0	11.0
Earth Station Gain	dBi	51.3	47.2	55.1	51.3	55.1	55.1
Uplink Input Power per Carrier	dBW	0.4	5.9	4.1	15.2	23.8	14.7
Free Space Loss	dB	200.1	200.1	200.1	200.1	200.1	200.2
G/T Satellite	dB/K	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
C/N Thermal Uplink	dB	22.9	23.1	23.1	23.9	27.6	19.4
C/I XPOL, ACI, IM, ASI	dB	15.7	15.9	15.9	16.7	20.4	17.3
C/(N+I) uplink	dB	15.0	15.1	15.1	15.9	19.6	15.2
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	18.8	20.2	26.2	33.5	43.9	34.8
Maximum e.i.r.p. density	dBW/4kHz	6.7	6.9	6.9	7.7	9.4	13.8
Free Space Loss	dB	204.9	204.9	204.9	204.9	204.9	205.0
Earth Station Diameter	m	2.4	3.8	3.8	2.4	2.4	4.5
Earth Station Gain	dBi	47.0	51.0	51.0	47.0	47.0	52.5
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	27.3	31.3	31.3	27.3	27.3	32.7
C/N Thermal Downlink	dB	15.6	19.8	19.8	16.6	18.3	15.6
C/I XPOL, ACI, IM, ASI	dB	16.8	20.9	20.9	17.8	19.5	16.8
C/(N+I) downlink	dB	13.1	17.3	17.3	14.1	15.8	13.2
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-47
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	18.7	18.9	18.9	19.7	23.4	20.3
C/I dn (single satellite)	dB	19.8	23.9	23.9	20.8	22.5	19.8
Aggregate C/I up	dB	15.7	15.9	15.9	16.7	20.4	17.3
Aggregate C/I down	dB	16.8	20.9	20.9	17.8	19.5	16.8
Overall:							
C/(N+I) overall	dB	11.0	13.1	13.1	11.9	14.3	11.1
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	5.0	3.8	3.8	5.0	7.4	1.1

Associated Txr IDs	
Start	End
111	113

TABLE A-22. LINK BUDGET, WEST HEMI/EUROPE, 54 MHZ TRANSPONDER

		EH/EU 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	6.096	6.096	6.096	6.096	6.096	6.096
Downlink Frequency	GHz	11.111	11.111	11.111	11.111	11.111	11.111
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.6	53.1	59.1	66.4	78.8	69.8
Earth Station Diameter	m	7.2	4.5	11.0	7.2	11.0	11.0
Earth Station Gain	dBi	51.3	47.2	55.1	51.3	55.1	55.1
Uplink Input Power per Carrier	dBW	0.3	5.9	4.1	15.1	23.7	14.6
Free Space Loss	dB	200.0	200.0	200.0	200.0	200.0	200.1
G/T Satellite	dB/K	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C/N Thermal Uplink	dB	21.9	22.1	22.1	22.8	26.5	18.4
C/I XPOL, ACI, IM, ASI	dB	15.6	15.8	15.8	16.6	20.3	17.3
C/(N+I) uplink	dB	14.7	14.9	14.9	15.7	19.4	14.8
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	18.8	20.3	26.3	33.6	43.9	34.9
Maximum e.i.r.p. density	dBW/4kHz	6.7	6.9	6.9	7.7	9.4	14.0
Free Space Loss	dB	204.9	204.9	204.9	204.9	204.9	205.0
Earth Station Diameter	m	2.4	3.8	3.8	2.4	2.4	4.5
Earth Station Gain	dBi	47.0	51.0	51.0	47.0	47.0	52.5
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	27.3	31.3	31.3	27.3	27.3	32.7
C/N Thermal Downlink	dB	15.7	19.9	19.9	16.6	18.3	15.7
C/I XPOL, ACI, IM, ASI	dB	16.8	21.0	21.0	17.8	19.5	16.9
C/(N+I) downlink	dB	13.2	17.4	17.4	14.2	15.9	13.3
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-47
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	18.6	18.8	18.8	19.6	23.3	20.3
C/I dn (single satellite)	dB	19.8	24.0	24.0	20.8	22.5	19.9
Aggregate C/I up	dB	15.6	15.8	15.8	16.6	20.3	17.3
Aggregate C/I down	dB	16.8	21.0	21.0	17.8	19.5	16.9
Overall:							
C/(N+I) overall	dB	10.9	13.0	13.0	11.8	14.2	11.0
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	4.9	3.7	3.7	4.9	7.3	1.0

Associated Txr IDs	
Start	End
114	116

TABLE A-23. LINK BUDGET, EAST HEMI/EUROPE, 54 MHZ TRANSPONDER

		NA/EU 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	13.898	13.898	13.898	13.898	13.898	13.898
Downlink Frequency	GHz	12.650	12.650	12.650	12.650	12.650	12.650
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	53.9	56.1	62.1	68.6	79.1	72.2
Earth Station Diameter	m	4.5	4.5	4.5	4.5	4.5	5.6
Earth Station Gain	dBi	54.4	54.4	54.4	54.4	54.4	56.4
Uplink Input Power per Carrier	dBW	-0.5	1.7	7.8	14.2	24.7	15.8
Free Space Loss	dB	207.3	207.3	207.3	207.3	207.3	206.7
G/T Satellite	dB/K	3.0	3.0	3.0	3.0	3.0	3.0
C/N Thermal Uplink	dB	24.1	25.1	25.1	25.1	28.7	21.5
C/I XPOL, ACI, IM, ASI	dB	25.9	26.8	26.8	26.8	30.4	22.7
C/(N+I) uplink	dB	21.9	22.9	22.9	22.8	26.4	19.0
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	20.2	22.5	28.5	34.9	42.4	35.2
Maximum e.i.r.p. density	dBW/4kHz	8.2	9.1	9.1	9.1	9.7	14.2
Free Space Loss	dB	206.4	206.4	206.4	206.4	206.4	206.4
Earth Station Diameter	m	3.0	4.5	4.5	3.0	2.4	6.5
Earth Station Gain	dBi	50.1	53.6	53.6	50.1	48.2	56.8
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	30.3	33.9	33.9	30.3	28.4	37.1
C/N Thermal Downlink	dB	18.7	23.2	23.2	19.6	18.2	18.9
C/I XPOL, ACI, IM, ASI	dB	21.3	25.8	25.8	22.2	20.9	21.5
C/(N+I) downlink	dB	16.8	21.3	21.3	17.7	16.4	17.0
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	28.9	29.8	29.8	29.8	33.4	25.7
C/I dn (single satellite)	dB	24.3	28.8	28.8	25.2	23.9	24.5
Aggregate C/I up	dB	25.9	26.8	26.8	26.8	30.4	22.7
Aggregate C/I down	dB	21.3	25.8	25.8	22.2	20.9	21.5
Overall:							
C/(N+I) overall	dB	15.6	19.0	19.0	16.5	15.9	14.9
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	9.6	9.7	9.7	9.6	9.0	4.9

Associated Txr IDs	
Start	End
177	182

TABLE A-24. LINK BUDGET, NORTH AMERICA/EUROPE, 36 MHZ TRANSPONDER

		NA/EU 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.491	11.491	11.491	11.491	11.491	11.491
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.4	55.1	61.2	67.1	79.6	72.2
Earth Station Diameter	m	4.5	4.5	4.5	4.5	4.5	5.6
Earth Station Gain	dBi	54.6	54.6	54.6	54.6	54.6	56.4
Uplink Input Power per Carrier	dBW	-2.2	0.5	6.5	12.5	24.9	15.8
Free Space Loss	dB	207.5	207.5	207.5	207.5	207.5	206.7
G/T Satellite	dB/K	3.0	3.0	3.0	3.0	3.0	3.0
C/N Thermal Uplink	dB	22.4	23.9	23.9	23.4	27.1	21.5
C/I XPOL, ACI, IM, ASI	dB	24.4	25.9	25.9	25.3	29.1	22.7
C/(N+I) uplink	dB	20.3	21.8	21.8	21.2	25.0	19.0
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	18.8	21.5	27.5	33.5	43.9	35.2
Maximum e.i.r.p. density	dBW/4kHz	6.7	8.2	8.2	7.6	9.4	14.2
Free Space Loss	dB	205.6	205.6	205.6	205.6	205.6	206.4
Earth Station Diameter	m	3.8	5.6	5.6	3.8	3.0	6.5
Earth Station Gain	dBi	51.3	54.7	54.7	51.3	49.3	56.0
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	31.6	34.9	34.9	31.6	29.5	36.2
C/N Thermal Downlink	dB	19.2	24.1	24.1	20.2	19.9	18.1
C/I XPOL, ACI, IM, ASI	dB	21.1	25.9	25.9	22.0	21.7	20.7
C/(N+I) downlink	dB	17.0	21.9	21.9	18.0	17.7	16.2
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	27.4	28.9	28.9	28.3	32.1	25.7
C/I dn (single satellite)	dB	24.1	28.9	28.9	25.0	24.7	23.7
Aggregate C/I up	dB	24.4	25.9	25.9	25.3	29.1	22.7
Aggregate C/I down	dB	21.1	25.9	25.9	22.0	21.7	20.7
Overall:							
C/(N+I) overall	dB	15.4	18.8	18.8	16.3	17.0	14.4
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	9.4	9.5	9.5	9.4	10.0	4.4

Associated Txr IDs	
Start	End
99	106

TABLE A-25. LINK BUDGET, NORTH AMERICA/EUROPE, 54 MHZ TRANSPONDER

		EU/WA 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	13.898	13.898	13.898	13.898	13.898	13.898
Downlink Frequency	GHz	12.650	12.650	12.650	12.650	12.650	12.650
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.5	55.6	61.6	67.2	78.7	75.1
Earth Station Diameter	m	4.5	4.5	4.5	4.5	4.5	4.5
Earth Station Gain	dBi	54.4	54.4	54.4	54.4	54.4	54.7
Uplink Input Power per Carrier	dBW	-1.9	1.2	7.3	12.8	24.3	20.4
Free Space Loss	dB	206.6	206.6	206.6	206.6	206.6	206.6
G/T Satellite	dB/K	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6
C/N Thermal Uplink	dB	17.8	19.7	19.7	18.7	23.4	18.9
C/I XPOL, ACI, IM, ASI	dB	24.4	26.3	26.3	25.4	30.0	25.6
C/(N+I) uplink	dB	16.9	18.8	18.8	17.9	22.5	18.1
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	20.3	23.4	29.4	35.0	42.5	40.9
Maximum e.i.r.p. density	dBW/4kHz	8.2	10.1	10.1	9.1	9.8	19.9
Free Space Loss	dB	206.4	206.4	206.4	206.4	206.4	206.4
Earth Station Diameter	m	2.4	3.0	3.0	2.4	2.4	2.4
Earth Station Gain	dBi	48.2	50.1	50.1	48.2	48.2	48.2
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	28.4	30.3	30.3	28.4	28.4	28.4
C/N Thermal Downlink	dB	16.7	20.6	20.6	17.7	18.3	15.9
C/I XPOL, ACI, IM, ASI	dB	19.4	23.3	23.3	20.3	21.0	18.6
C/(N+I) downlink	dB	14.9	18.7	18.7	15.8	16.5	14.0
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	27.4	29.3	29.3	28.4	33.0	28.6
C/I dn (single satellite)	dB	22.4	26.3	26.3	23.3	24.0	21.6
Aggregate C/I up	dB	24.4	26.3	26.3	25.4	30.0	25.6
Aggregate C/I down	dB	19.4	23.3	23.3	20.3	21.0	18.6
Overall:							
C/(N+I) overall	dB	12.8	15.8	15.8	13.7	15.5	12.6
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	6.8	6.5	6.5	6.8	8.6	2.6

Associated Txr IDs	
Start	End
125	130

TABLE A-26. LINK BUDGET, EUROPE/WEST AFRICA, 36 MHZ TRANSPONDER

		EU/WA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.491	11.491	11.491	11.491	11.491	11.491
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.5	54.3	60.3	65.7	79.5	75.1
Earth Station Diameter	m	3.8	3.8	3.8	3.8	3.8	4.5
Earth Station Gain	dBi	53.1	53.1	53.1	53.1	53.1	54.7
Uplink Input Power per Carrier	dBW	-0.7	1.2	7.2	12.5	26.4	20.4
Free Space Loss	dB	206.8	206.8	206.8	206.8	206.8	206.9
G/T Satellite	dB/K	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6
C/N Thermal Uplink	dB	17.6	18.1	18.1	17.0	22.2	18.6
C/I XPOL, ACI, IM, ASI	dB	24.5	25.0	25.0	23.9	29.1	25.6
C/(N+I) uplink	dB	16.7	17.3	17.3	16.2	21.4	17.8
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	20.3	22.1	28.1	33.5	44.3	40.9
Maximum e.i.r.p. density	dBW/4kHz	8.2	8.8	8.8	7.7	9.8	19.9
Free Space Loss	dB	205.6	205.6	205.6	205.6	205.6	205.7
Earth Station Diameter	m	2.4	3.8	3.8	3.0	2.4	2.4
Earth Station Gain	dBi	47.3	51.3	51.3	49.3	47.3	47.3
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	27.6	31.6	31.6	29.5	27.6	27.6
C/N Thermal Downlink	dB	16.8	21.4	21.4	18.2	18.4	15.8
C/I XPOL, ACI, IM, ASI	dB	18.6	23.2	23.2	20.0	20.2	17.7
C/(N+I) downlink	dB	14.6	19.2	19.2	16.0	16.2	13.6
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	27.5	28.0	28.0	26.9	32.1	28.6
C/I dn (single satellite)	dB	21.6	26.2	26.2	23.0	23.2	20.7
Aggregate C/I up	dB	24.5	25.0	25.0	23.9	29.1	25.6
Aggregate C/I down	dB	18.6	23.2	23.2	20.0	20.2	17.7
Overall:							
C/(N+I) overall	dB	12.5	15.1	15.1	13.1	15.0	12.2
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	6.5	5.9	5.9	6.2	8.1	2.2

Associated Txr IDs	
Start	End
117	124
145	148

TABLE A-27. LINK BUDGET, EUROPE/WEST AFRICA, 54 MHZ TRANSPONDER

		WA/WA 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	13.898	13.898	13.898	13.898	13.898	13.898
Downlink Frequency	GHz	12.650	12.650	12.650	12.650	12.650	12.650
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	56.2	57.5	63.5	69.1	80.9	78.9
Earth Station Diameter	m	4.5	4.5	4.5	4.5	5.6	5.6
Earth Station Gain	dBi	54.4	54.4	54.4	54.4	56.3	56.6
Uplink Input Power per Carrier	dBW	1.8	3.1	9.1	14.7	24.6	22.3
Free Space Loss	dB	206.7	206.7	206.7	206.7	206.7	206.7
G/T Satellite	dB/K	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
C/N Thermal Uplink	dB	20.9	21.0	21.0	20.1	25.0	22.2
C/I XPOL, ACI, IM, ASI	dB	28.1	28.2	28.2	27.3	32.2	29.4
C/(N+I) uplink	dB	20.2	20.3	20.3	19.3	24.2	21.5
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	22.0	23.4	29.4	34.9	42.8	40.8
Maximum e.i.r.p. density	dBW/4kHz	10.0	10.0	10.0	9.1	10.0	19.8
Free Space Loss	dB	206.4	206.4	206.4	206.4	206.4	206.4
Earth Station Diameter	m	1.8	3.0	3.0	2.4	2.4	2.4
Earth Station Gain	dBi	45.7	50.1	50.1	48.2	48.2	48.2
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	25.9	30.3	30.3	28.4	28.4	28.4
C/N Thermal Downlink	dB	16.0	20.5	20.5	17.7	18.6	15.8
C/I XPOL, ACI, IM, ASI	dB	18.7	23.2	23.2	20.3	21.2	18.4
C/(N+I) downlink	dB	14.1	18.7	18.7	15.8	16.7	13.9
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	31.1	31.2	31.2	30.3	35.2	32.4
C/I dn (single satellite)	dB	21.7	26.2	26.2	23.3	24.2	21.4
Aggregate C/I up	dB	28.1	28.2	28.2	27.3	32.2	29.4
Aggregate C/I down	dB	18.7	23.2	23.2	20.3	21.2	18.4
Overall:							
C/(N+I) overall	dB	13.2	16.4	16.4	14.2	16.0	13.2
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	7.2	7.1	7.1	7.3	9.1	3.2

Associated Txr IDs	
Start	End
139	144

TABLE A-28. LINK BUDGET, WEST AFRICA/WEST AFRICA, 36 MHZ TRANSPONDER

		WA/WA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.491	11.491	11.491	11.491	11.491	11.491
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	54.6	56.2	62.2	67.8	82.7	78.9
Earth Station Diameter	m	4.5	4.5	4.5	4.5	5.6	5.6
Earth Station Gain	dBi	54.6	54.6	54.6	54.6	56.5	56.6
Uplink Input Power per Carrier	dBW	0.0	1.6	7.6	13.1	26.1	22.3
Free Space Loss	dB	207.0	207.0	207.0	207.0	207.0	207.1
G/T Satellite	dB/K	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
C/N Thermal Uplink	dB	19.1	19.5	19.5	18.5	24.8	21.9
C/I XPOL, ACI, IM, ASI	dB	26.6	26.9	26.9	26.0	32.2	29.4
C/(N+I) uplink	dB	18.4	18.8	18.8	17.8	24.0	21.2
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	20.5	22.1	28.1	33.6	44.5	40.8
Maximum e.i.r.p. density	dBW/4kHz	8.4	8.8	8.8	7.8	10.0	19.8
Free Space Loss	dB	205.6	205.6	205.6	205.6	205.6	205.7
Earth Station Diameter	m	2.4	3.8	3.8	3.0	2.4	2.4
Earth Station Gain	dBi	47.3	51.3	51.3	49.3	47.3	47.3
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	27.6	31.6	31.6	29.5	27.6	27.6
C/N Thermal Downlink	dB	16.9	21.3	21.3	18.3	18.6	15.7
C/I XPOL, ACI, IM, ASI	dB	18.8	23.1	23.1	20.1	20.4	17.6
C/(N+I) downlink	dB	14.8	19.1	19.1	16.1	16.4	13.5
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	29.6	29.9	29.9	29.0	35.2	32.4
C/I dn (single satellite)	dB	21.8	26.1	26.1	23.1	23.4	20.6
Aggregate C/I up	dB	26.6	26.9	26.9	26.0	32.2	29.4
Aggregate C/I down	dB	18.8	23.1	23.1	20.1	20.4	17.6
Overall:							
C/(N+I) overall	dB	13.2	15.9	15.9	13.9	15.7	12.8
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	7.2	6.7	6.7	6.9	8.8	2.8

Associated Txr IDs	
Start	End
131	138

TABLE A-29. LINK BUDGET, WEST AFRICA/WEST AFRICA, 54 MHZ TRANSPONDER

		WH/WA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	6.096	6.096	6.096	6.096	6.096	6.096
Downlink Frequency	GHz	11.111	11.111	11.111	11.111	11.111	11.111
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.1	52.7	58.7	65.9	78.4	76.6
Earth Station Diameter	m	7.2	4.5	11.0	7.2	11.0	9.3
Earth Station Gain	dBi	51.3	47.2	55.1	51.3	55.1	53.6
Uplink Input Power per Carrier	dBW	-0.2	5.5	3.7	14.6	23.3	23.0
Free Space Loss	dB	200.1	200.1	200.1	200.1	200.1	200.1
G/T Satellite	dB/K	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
C/N Thermal Uplink	dB	22.3	22.6	22.6	23.3	27.1	26.3
C/I XPOL, ACI, IM, ASI	dB	15.1	15.4	15.4	16.1	19.9	19.1
C/(N+I) uplink	dB	14.4	14.7	14.7	15.4	19.2	18.3
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	19.3	20.8	26.8	34.0	44.5	40.7
Maximum e.i.r.p. density	dBW/4kHz	7.2	7.5	7.5	8.2	10.0	19.7
Free Space Loss	dB	204.8	204.8	204.8	204.8	204.8	204.8
Earth Station Diameter	m	2.4	3.8	3.8	2.4	2.4	2.4
Earth Station Gain	dBi	47.0	51.0	51.0	47.0	47.0	47.0
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	27.3	31.3	31.3	27.3	27.3	27.3
C/N Thermal Downlink	dB	16.2	20.5	20.5	17.2	19.0	16.2
C/I XPOL, ACI, IM, ASI	dB	17.3	21.6	21.6	18.3	20.1	17.2
C/(N+I) downlink	dB	13.7	18.0	18.0	14.7	16.5	13.7
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	18.1	18.4	18.4	19.1	22.9	22.1
C/I dn (single satellite)	dB	20.3	24.6	24.6	21.3	23.1	20.2
Aggregate C/I up	dB	15.1	15.4	15.4	16.1	19.9	19.1
Aggregate C/I down	dB	17.3	21.6	21.6	18.3	20.1	17.2
Overall:							
C/(N+I) overall	dB	11.0	13.0	13.0	12.0	14.6	12.4
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	5.0	3.8	3.8	5.1	7.7	2.4

Associated Txr IDs	
Start	End
159	161

TABLE A-30. LINK BUDGET, WEST HEMI/WEST AFRICA, 54 MHZ TRANSPONDER

		EH/WA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	6.096	6.096	6.096	6.096	6.096	6.096
Downlink Frequency	GHz	11.111	11.111	11.111	11.111	11.111	11.111
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.1	52.7	58.7	65.8	78.3	76.5
Earth Station Diameter	m	7.2	4.5	11.0	7.2	11.0	9.3
Earth Station Gain	dBi	51.3	47.2	55.1	51.3	55.1	53.6
Uplink Input Power per Carrier	dBW	-0.3	5.4	3.6	14.5	23.2	22.9
Free Space Loss	dB	200.0	200.0	200.0	200.0	200.0	200.0
G/T Satellite	dB/K	-4.3	-4.3	-4.3	-4.3	-4.3	-4.3
C/N Thermal Uplink	dB	21.3	21.7	21.7	22.3	26.0	25.2
C/I XPOL, ACI, IM, ASI	dB	15.0	15.4	15.4	16.0	19.8	19.0
C/(N+I) uplink	dB	14.1	14.5	14.5	15.1	18.9	18.0
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	19.3	20.9	27.0	34.1	44.5	40.7
Maximum e.i.r.p. density	dBW/4kHz	7.2	7.6	7.6	8.2	10.0	19.7
Free Space Loss	dB	204.8	204.8	204.8	204.8	204.8	204.8
Earth Station Diameter	m	2.4	3.8	3.8	2.4	2.4	2.4
Earth Station Gain	dBi	47.0	51.0	51.0	47.0	47.0	47.0
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	27.3	31.3	31.3	27.3	27.3	27.3
C/N Thermal Downlink	dB	16.3	20.7	20.7	17.3	19.1	16.2
C/I XPOL, ACI, IM, ASI	dB	17.3	21.7	21.7	18.3	20.1	17.3
C/(N+I) downlink	dB	13.8	18.1	18.1	14.8	16.5	13.7
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-42	-42	-42	-42	-42	-42
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	18.0	18.4	18.4	19.0	22.8	22.0
C/I dn (single satellite)	dB	20.3	24.7	24.7	21.3	23.1	20.3
Aggregate C/I up	dB	15.0	15.4	15.4	16.0	19.8	19.0
Aggregate C/I down	dB	17.3	21.7	21.7	18.3	20.1	17.3
Overall:							
C/(N+I) overall	dB	10.9	12.9	12.9	11.9	14.5	12.4
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	4.9	3.7	3.7	5.0	7.6	2.4

Associated Txr IDs	
Start	End
162	164

TABLE A-31. LINK BUDGET, EAST HEMI/WEST AFRICA, 54 MHZ TRANSPONDER

		NA/WA 36MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**36M0G7W**	**36M0F3F**
Uplink Frequency	GHz	13.898	13.898	13.898	13.898	13.898	13.898
Downlink Frequency	GHz	12.650	12.650	12.650	12.650	12.650	12.650
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	36000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	54.5	55.4	61.9	68.4	78.2	76.8
Earth Station Diameter	m	4.5	4.5	4.5	4.5	4.5	5.6
Earth Station Gain	dBi	54.4	54.4	54.4	54.4	54.4	56.6
Uplink Input Power per Carrier	dBW	0.1	1.0	7.5	14.0	23.8	20.2
Free Space Loss	dB	207.3	207.3	207.3	207.3	207.3	207.3
G/T Satellite	dB/K	3.0	3.0	3.0	3.0	3.0	3.0
C/N Thermal Uplink	dB	24.7	24.4	24.9	24.8	27.7	25.6
C/I XPOL, ACI, IM, ASI	dB	26.4	26.1	26.6	26.6	29.5	27.3
C/(N+I) uplink	dB	22.5	22.1	22.6	22.6	25.5	23.4
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	21.9	22.8	29.3	35.8	42.6	40.3
Maximum e.i.r.p. density	dBW/4kHz	9.8	9.5	10.0	10.0	9.9	19.3
Free Space Loss	dB	206.4	206.4	206.4	206.4	206.4	206.4
Earth Station Diameter	m	2.4	4.5	3.8	2.4	2.4	3.8
Earth Station Gain	dBi	48.2	53.6	52.2	48.2	48.2	52.2
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	28.4	33.9	32.4	28.4	28.4	32.4
C/N Thermal Downlink	dB	18.4	23.5	22.5	18.5	18.4	19.3
C/I XPOL, ACI, IM, ASI	dB	21.0	26.2	25.2	21.2	21.1	21.9
C/(N+I) downlink	dB	16.5	21.6	20.6	16.6	16.5	17.4
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	29.4	29.1	29.6	29.6	32.5	30.3
C/I dn (single satellite)	dB	24.0	29.2	28.2	24.2	24.1	24.9
Aggregate C/I up	dB	26.4	26.1	26.6	26.6	29.5	27.3
Aggregate C/I down	dB	21.0	26.2	25.2	21.2	21.1	21.9
Overall:							
C/(N+I) overall	dB	15.5	18.9	18.5	15.7	16.0	16.4
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	9.5	9.6	9.3	8.8	9.1	6.4

Associated Txr IDs	
Start	End
153	158

TABLE A-32. LINK BUDGET, NORTH AMERICA/WEST AFRICA, 36 MHZ TRANSPONDER

		NA/WA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.491	11.491	11.491	11.491	11.491	11.491
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	53.0	54.5	60.5	66.4	79.1	76.8
Earth Station Diameter	m	3.8	4.5	4.5	3.8	3.8	5.6
Earth Station Gain	dBi	53.1	54.6	54.6	53.1	53.1	56.6
Uplink Input Power per Carrier	dBW	-0.1	-0.1	5.9	13.2	25.9	20.2
Free Space Loss	dB	207.5	207.5	207.5	207.5	207.5	207.5
G/T Satellite	dB/K	3.0	3.0	3.0	3.0	3.0	3.0
C/N Thermal Uplink	dB	23.0	23.3	23.3	22.6	26.6	25.4
C/I XPOL, ACI, IM, ASI	dB	25.0	25.3	25.3	24.6	28.6	27.3
C/(N+I) uplink	dB	20.9	21.1	21.1	20.5	24.5	23.2
Downlink:							
Satellite e.i.r.p. per carrier (-6dB contour)	dBW	20.5	22.0	28.0	33.8	44.5	40.3
Maximum e.i.r.p. density	dBW/4kHz	8.4	8.6	8.6	8.0	10.0	19.3
Free Space Loss	dB	205.6	205.6	205.6	205.6	205.6	205.6
Earth Station Diameter	m	3.0	5.6	5.6	3.8	2.4	3.8
Earth Station Gain	dBi	49.3	54.7	54.7	51.3	47.3	51.3
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	29.5	34.9	34.9	31.6	27.6	31.6
C/N Thermal Downlink	dB	18.9	24.6	24.6	20.5	18.5	19.3
C/I XPOL, ACI, IM, ASI	dB	20.7	26.4	26.4	22.3	20.4	21.1
C/(N+I) downlink	dB	16.7	22.4	22.4	18.3	16.3	17.1
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	28.0	28.3	28.3	27.6	31.6	30.3
C/I dn (single satellite)	dB	23.7	29.4	29.4	25.3	23.4	24.1
Aggregate C/I up	dB	25.0	25.3	25.3	24.6	28.6	27.3
Aggregate C/I down	dB	20.7	26.4	26.4	22.3	20.4	21.1
Overall:							
C/(N+I) overall	dB	15.3	18.7	18.7	16.2	15.7	16.1
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	9.3	9.4	9.4	9.3	8.8	6.1

Associated Txr IDs	
Start	End
149	152

TABLE A-33. LINK BUDGET, NORTH AMERICA/WEST AFRICA, 54 MHZ TRANSPONDER

		SC/SC 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.981	11.981	11.981	11.981	11.981	11.981
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	55.1	57.4	62.8	69.8	82.2	75.7
Earth Station Diameter	m	3.8	4.5	4.5	3.8	5.6	4.5
Earth Station Gain	dBi	53.1	54.6	54.6	53.1	56.5	54.6
Uplink Input Power per Carrier	dBW	1.9	2.8	8.2	16.6	25.7	21.1
Free Space Loss	dB	207.4	207.4	207.4	207.4	207.4	207.4
G/T Satellite	dB/K	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
C/N Thermal Uplink	dB	20.2	21.3	20.7	21.1	24.9	19.4
C/I XPOL, ACI, IM, ASI	dB	27.0	28.2	27.5	28.0	31.8	26.2
C/(N+I) uplink	dB	19.4	20.5	19.9	20.3	24.1	18.5
Downlink:							
Satellite e.i.r.p. per carrier (-4.7dB contour)	dBW	20.6	23.0	28.4	35.4	45.8	38.3
Maximum e.i.r.p. density	dBW/4kHz	7.3	8.4	7.8	8.2	10.0	16.0
Free Space Loss	dB	205.5	205.5	205.5	205.5	205.5	205.5
Earth Station Diameter	m	2.4	3.8	4.5	2.4	1.8	4.5
Earth Station Gain	dBi	47.7	51.7	53.2	47.7	45.2	53.2
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	27.9	31.9	33.4	27.9	25.4	33.4
C/N Thermal Downlink	dB	17.6	22.7	23.5	18.5	17.8	19.2
C/I XPOL, ACI, IM, ASI	dB	19.3	24.4	25.3	20.3	19.5	20.9
C/(N+I) downlink	dB	15.3	20.5	21.3	16.3	15.6	17.0
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	30.0	31.2	30.5	31.0	34.8	29.2
C/I dn (single satellite)	dB	22.3	27.4	28.3	23.3	22.5	23.9
Aggregate C/I up	dB	27.0	28.2	27.5	28.0	31.8	26.2
Aggregate C/I down	dB	19.3	24.4	25.3	20.3	19.5	20.9
Overall:							
C/(N+I) overall	dB	13.9	17.5	17.5	14.8	15.0	14.7
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	7.9	8.2	8.3	7.9	8.1	4.7

Associated Txr IDs	
Start	End
183	190
239	246

TABLE A-34. LINK BUDGET, SOUTHERN CONE/SOUTHERN CONE, 54 MHZ TRANSPONDER

		NA/SC 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.981	11.981	11.981	11.981	11.981	11.981
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.4	54.2	60.2	65.9	79.5	72.0
Earth Station Diameter	m	3.8	4.5	4.5	3.8	3.8	5.6
Earth Station Gain	dBi	53.1	54.6	54.6	53.1	53.1	56.5
Uplink Input Power per Carrier	dBW	-0.7	-0.4	5.6	12.7	26.4	15.5
Free Space Loss	dB	207.5	207.5	207.5	207.5	207.5	207.5
G/T Satellite	dB/K	3.0	3.0	3.0	3.0	3.0	3.0
C/N Thermal Uplink	dB	22.4	23.0	23.0	22.1	27.0	20.6
C/I XPOL, ACI, IM, ASI	dB	24.4	24.9	24.9	24.1	29.0	22.5
C/(N+I) uplink	dB	20.3	20.8	20.8	19.9	24.9	18.4
Downlink:							
Satellite e.i.r.p. per carrier (-4.7dB contour)	dBW	20.8	22.5	28.6	34.2	45.8	38.3
Maximum e.i.r.p. density	dBW/4kHz	7.4	7.9	7.9	7.0	10.0	16.0
Free Space Loss	dB	205.9	205.9	205.9	205.9	205.9	205.8
Earth Station Diameter	m	3.0	5.6	5.6	3.8	2.4	5.6
Earth Station Gain	dBi	49.6	55.1	55.1	51.7	47.7	55.1
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	29.9	35.3	35.3	31.9	27.9	35.3
C/N Thermal Downlink	dB	19.3	25.2	25.2	21.0	20.0	20.8
C/I XPOL, ACI, IM, ASI	dB	21.4	27.3	27.3	23.1	22.1	22.9
C/(N+I) downlink	dB	17.2	23.1	23.1	18.9	17.9	18.7
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	27.4	27.9	27.9	27.1	32.0	25.5
C/I dn (single satellite)	dB	24.4	30.3	30.3	26.1	25.1	25.9
Aggregate C/I up	dB	24.4	24.9	24.9	24.1	29.0	22.5
Aggregate C/I down	dB	21.4	27.3	27.3	23.1	22.1	22.9
Overall:							
C/(N+I) overall	dB	15.5	18.8	18.8	16.4	17.1	15.6
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	9.5	9.6	9.6	9.5	10.2	5.6

Associated Txr IDs	
Start	End
191	198
247	254

TABLE A-35. LINK BUDGET, NORTH AMERICA/SOUTHERN CONE, 54 MHZ TRANSPONDER

		SC/NA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.981	11.981	11.981	11.981	11.981	11.981
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	54.1	56.4	62.4	68.9	79.5	70.4
Earth Station Diameter	m	3.8	4.5	4.5	3.8	3.8	9.3
Earth Station Gain	dBi	53.1	54.6	54.6	53.1	53.1	61.0
Uplink Input Power per Carrier	dBW	1.0	1.7	7.7	15.7	26.4	9.4
Free Space Loss	dB	207.4	207.4	207.4	207.4	207.4	207.3
G/T Satellite	dB/K	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
C/N Thermal Uplink	dB	19.3	20.2	20.2	20.2	22.2	14.1
C/I XPOL, ACI, IM, ASI	dB	26.1	27.1	27.1	27.1	29.1	20.9
C/(N+I) uplink	dB	18.5	19.4	19.4	19.4	21.4	13.3
Downlink:							
Satellite e.i.r.p. per carrier (-3.4dB contour)	dBW	23.7	25.9	31.9	38.4	47.1	37.9
Maximum e.i.r.p. density	dBW/4kHz	9.1	10.0	10.0	10.0	10.0	14.4
Free Space Loss	dB	206.0	206.0	206.0	206.0	206.0	205.9
Earth Station Diameter	m	1.8	3.0	3.0	1.8	1.8	11.0
Earth Station Gain	dBi	45.2	49.6	49.6	45.2	45.2	60.9
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	25.4	29.9	29.9	25.4	25.4	41.1
C/N Thermal Downlink	dB	17.7	23.1	23.1	18.6	18.6	26.2
C/I XPOL, ACI, IM, ASI	dB	19.9	25.3	25.3	20.8	20.8	28.4
C/(N+I) downlink	dB	15.6	21.0	21.0	16.6	16.6	24.1
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	29.1	30.1	30.1	30.1	32.1	23.9
C/I dn (single satellite)	dB	22.9	28.3	28.3	23.8	23.8	31.4
Aggregate C/I up	dB	26.1	27.1	27.1	27.1	29.1	20.9
Aggregate C/I down	dB	19.9	25.3	25.3	20.8	20.8	28.4
Overall:							
C/(N+I) overall	dB	13.8	17.1	17.1	14.7	15.3	12.9
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	7.8	7.9	7.9	7.8	8.4	2.9

Associated Txr IDs	
Start	End
199	206

TABLE A-36. LINK BUDGET, SOUTHERN CONE/NORTH AMERICA, 54 MHZ TRANSPONDER

		NA/NA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.981	11.981	11.981	11.981	11.981	11.981
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	52.1	54.2	60.2	66.8	77.5	66.2
Earth Station Diameter	m	2.4	3.8	3.8	2.4	3.8	9.3
Earth Station Gain	dBi	49.1	53.1	53.1	49.1	53.1	61.0
Uplink Input Power per Carrier	dBW	3.0	1.0	7.0	17.7	24.4	5.3
Free Space Loss	dB	207.4	207.4	207.4	207.4	207.4	207.3
G/T Satellite	dB/K	3.0	3.0	3.0	3.0	3.0	3.0
C/N Thermal Uplink	dB	22.3	23.1	23.1	23.2	25.2	15.0
C/I XPOL, ACI, IM, ASI	dB	24.1	24.9	24.9	25.0	27.0	16.7
C/(N+I) uplink	dB	20.1	20.9	20.9	21.0	23.0	12.8
Downlink:							
Satellite e.i.r.p. per carrier (-3.4dB contour)	dBW	23.6	25.7	31.7	38.3	47.0	37.7
Maximum e.i.r.p. density	dBW/4kHz	8.9	9.7	9.7	9.9	9.9	14.1
Free Space Loss	dB	206.0	206.0	206.0	206.0	206.0	205.9
Earth Station Diameter	m	1.8	2.4	2.4	1.8	1.8	11.0
Earth Station Gain	dBi	45.2	47.7	47.7	45.2	45.2	60.9
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	25.4	27.9	27.9	25.4	25.4	41.1
C/N Thermal Downlink	dB	17.5	20.9	20.9	18.5	18.5	26.0
C/I XPOL, ACI, IM, ASI	dB	19.8	23.1	23.1	20.7	20.7	28.2
C/(N+I) downlink	dB	15.5	18.8	18.8	16.4	16.5	23.9
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	27.1	27.9	27.9	28.0	30.0	19.7
C/I dn (single satellite)	dB	22.8	26.1	26.1	23.7	23.7	31.2
Aggregate C/I up	dB	24.1	24.9	24.9	25.0	27.0	16.7
Aggregate C/I down	dB	19.8	23.1	23.1	20.7	20.7	28.2
Overall:							
C/(N+I) overall	dB	14.2	16.7	16.7	15.1	15.6	12.4
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	8.2	7.5	7.5	8.2	8.7	2.4

Associated Txr IDs	
Start	End
207	214

TABLE A-37. LINK BUDGET, NORTH AMERICA/NORTH AMERICA, 54 MHZ TRANSPONDER

		WA/NA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.981	11.981	11.981	11.981	11.981	11.981
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	53.2	55.2	61.2	67.6	79.2	70.7
Earth Station Diameter	m	2.4	3.8	3.8	2.4	3.8	9.3
Earth Station Gain	dBi	49.1	53.1	53.1	49.1	53.1	61.0
Uplink Input Power per Carrier	dBW	4.1	2.0	8.0	18.5	26.1	9.8
Free Space Loss	dB	207.0	207.0	207.0	207.0	207.0	206.9
G/T Satellite	dB/K	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
C/N Thermal Uplink	dB	17.7	18.4	18.4	18.4	21.3	13.8
C/I XPOL, ACI, IM, ASI	dB	25.2	25.9	25.9	25.8	28.8	21.2
C/(N+I) uplink	dB	17.0	17.7	17.7	17.7	20.6	13.1
Downlink:							
Satellite e.i.r.p. per carrier (-3.4dB contour)	dBW	24.0	25.9	31.9	38.4	47.0	37.5
Maximum e.i.r.p. density	dBW/4kHz	9.3	10.0	10.0	10.0	9.9	13.9
Free Space Loss	dB	206.0	206.0	206.0	206.0	206.0	205.9
Earth Station Diameter	m	1.8	3.0	3.0	1.8	1.8	11.0
Earth Station Gain	dBi	45.2	49.6	49.6	45.2	45.2	60.9
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	25.4	29.9	29.9	25.4	25.4	41.1
C/N Thermal Downlink	dB	17.9	23.1	23.1	18.6	18.5	25.7
C/I XPOL, ACI, IM, ASI	dB	20.1	25.3	25.3	20.8	20.7	27.9
C/(N+I) downlink	dB	15.9	21.0	21.0	16.5	16.5	23.7
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	28.2	28.9	28.9	28.8	31.8	24.2
C/I dn (single satellite)	dB	23.1	28.3	28.3	23.8	23.7	30.9
Aggregate C/I up	dB	25.2	25.9	25.9	25.8	28.8	21.2
Aggregate C/I down	dB	20.1	25.3	25.3	20.8	20.7	27.9
Overall:							
C/(N+I) overall	dB	13.4	16.1	16.1	14.1	15.0	12.7
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	7.4	6.8	6.8	7.2	8.1	2.7

Associated Txr IDs	
Start	End
215	222

TABLE A-38. LINK BUDGET, WEST AFRICA/NORTH AMERICA, 54 MHZ TRANSPONDER

		EU/NA 54MHz Transponder					
Link Parameters	**Units**	**346KG7W**	**461KG7W**	**1M84G7W**	**8M25G7W**	**54M0G7W**	**36M0F3F**
Uplink Frequency	GHz	14.281	14.281	14.281	14.281	14.281	14.281
Downlink Frequency	GHz	11.981	11.981	11.981	11.981	11.981	11.981
Carrier Allocated Bandwidth	kHz	346.0	461.0	1840.0	8250.0	54000.0	36000.0
Energy Dispersal	MHz	n/a	n/a	n/a	n/a	n/a	2.0
Uplink:							
Nominal E/S e.i.r.p. per carrier	dBW	51.5	53.3	59.4	65.9	78.5	69.5
Earth Station Diameter	m	2.4	3.8	3.8	2.4	3.8	9.3
Earth Station Gain	dBi	49.1	53.1	53.1	49.1	53.1	61.0
Uplink Input Power per Carrier	dBW	2.4	0.2	6.2	16.8	25.4	8.5
Free Space Loss	dB	207.0	207.0	207.0	207.0	207.0	206.9
G/T Satellite	dB/K	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6
C/N Thermal Uplink	dB	16.5	17.0	17.0	17.1	21.0	13.0
C/I XPOL, ACI, IM, ASI	dB	23.5	24.1	24.1	24.1	28.0	20.0
C/(N+I) uplink	dB	15.7	16.2	16.2	16.3	20.2	12.2
Downlink:							
Satellite e.i.r.p. per carrier (-3.4dB contour)	dBW	24.1	25.9	31.9	38.5	47.1	38.0
Maximum e.i.r.p. density	dBW/4kHz	9.4	10.0	10.0	10.0	10.0	14.5
Free Space Loss	dB	206.0	206.0	206.0	206.0	206.0	205.9
Earth Station Diameter	m	1.8	3.0	3.0	1.8	1.8	11.0
Earth Station Gain	dBi	45.2	49.6	49.6	45.2	45.2	60.9
Noise Temperature	kHz	95.0	95.0	95.0	95.0	95.0	95.0
Earth Station G/T	dB/K	25.4	29.9	29.9	25.4	25.4	41.1
C/N Thermal Downlink	dB	18.1	23.0	23.0	18.7	18.6	26.3
C/I XPOL, ACI, IM, ASI	dB	20.3	25.3	25.3	20.9	20.8	28.5
C/(N+I) downlink	dB	16.0	21.0	21.0	16.6	16.5	24.2
Adjacent Satellite Interference:							
Uplink Inp. Pwr. Dens. @ 2 degrees	dBW/Hz	-50	-50	-50	-50	-50	-50
Downlink e.i.r.p. Dens @ 2 degrees	dBW/Hz	-26	-26	-26	-26	-26	-26
C/I up (single satellite)	dB	26.5	27.1	27.1	27.1	31.0	23.0
C/I dn (single satellite)	dB	23.3	28.3	28.3	23.9	23.8	31.5
Aggregate C/I up	dB	23.5	24.1	24.1	24.1	28.0	20.0
Aggregate C/I down	dB	20.3	25.3	25.3	20.9	20.8	28.5
Overall:							
C/(N+I) overall	dB	12.8	15.0	15.0	13.4	15.0	11.9
C/(N+I) required	dB	6.0	9.3	9.3	6.9	6.9	10.0
System Margin	dB	6.8	5.7	5.7	6.5	8.1	1.9

Associated Txr IDs	
Start	End
223	238

TABLE A-39. LINK BUDGET, EUROPE/NORTH AMERICA, 54 MHZ TRANSPONDER

APPENDIX B

Antenna Beam Diagrams

Figure B-1.
Global Uplink Beam
Peak G/T = -7.6 dB/K
Peak Beam Gain = 20.9 dBi
Min. Saturation Flux Density = -93 dBW/m^2
Polarization LHCP and RHCP

Schedule S beam designators: GBAU and GBBU[11]

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[11] Additional gain contours, as requested in Section 25.114(d)(3), are not provided because they do not intersect with the Earth's surface. SES WORLD SKIES requests a waiver of this rule to the extent necessary.

Figure B-2.
Global Downlink Beam
Peak EIRP = 36.6 dBW
Peak Beam Gain = 20.9 dBi
Polarization RHCP and LHCP
Schedule S beam designators: GBAD and GBBD[12]

[12] Additional gain contours, as requested in Section 25.114(d)(3), are not provided because they do not intersect with the Earth's surface. SES WORLD SKIES requests a waiver of this rule to the extent necessary.

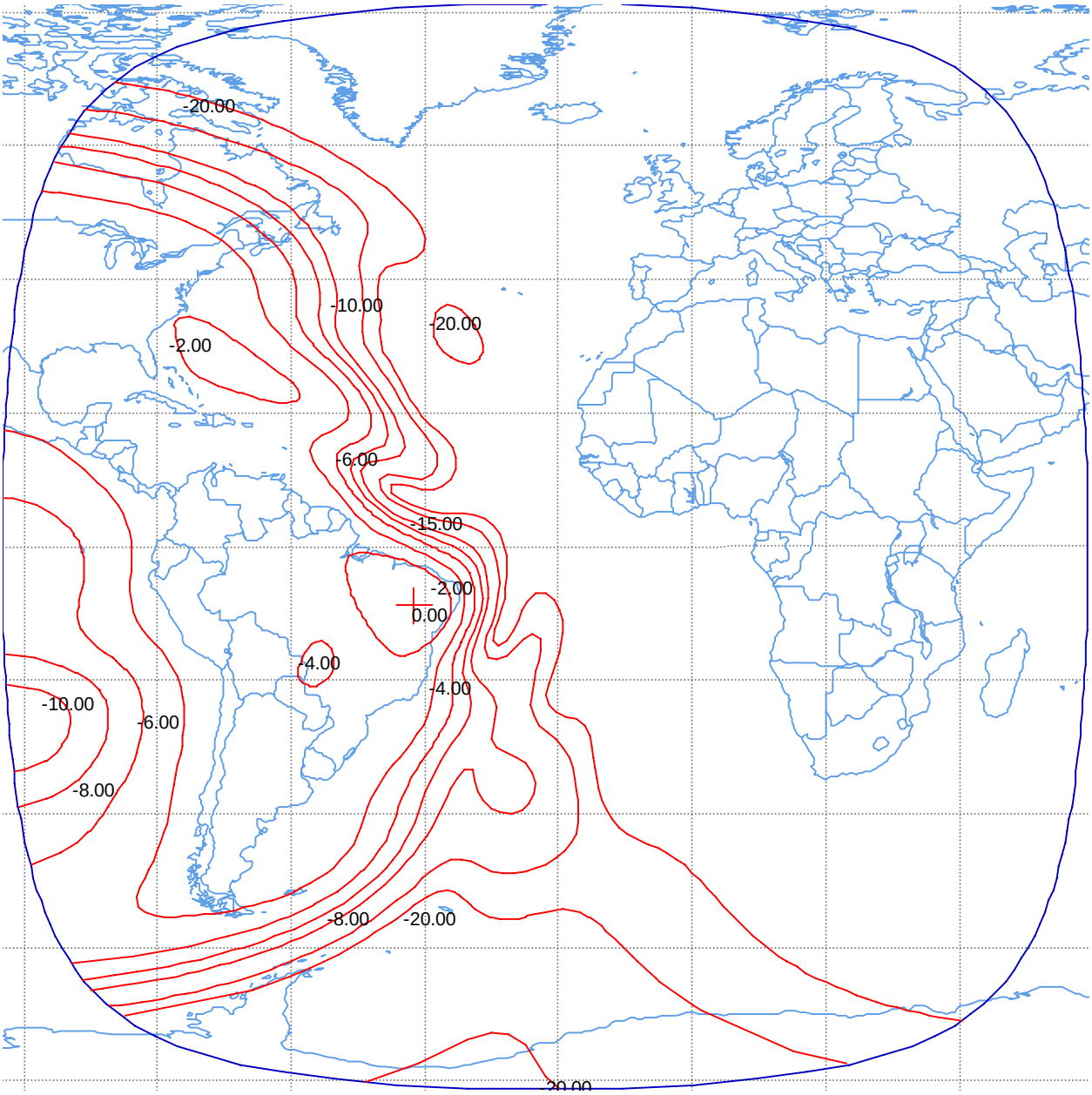

Figure B-3.
West Hemi Uplink Beam
Peak G/T = 1.4 dB/K
Peak Beam Gain = 29.4 dBi
Min. Saturation Flux Density = -96 dBW/m^2
Polarization LHCP and RHCP
Schedule S beam designator: WHAU and WHBU

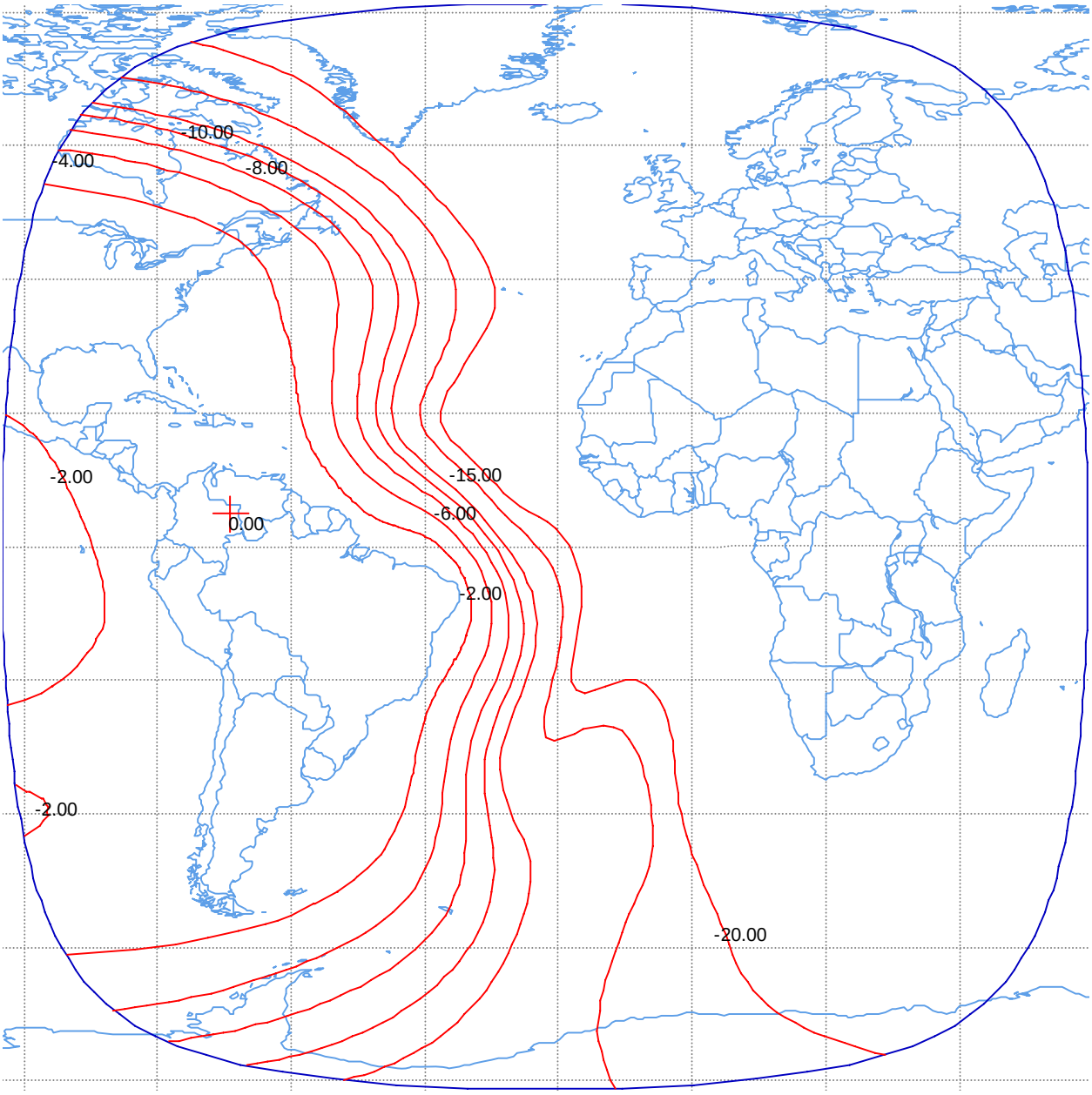

Figure B-4.
West Hemi Downlink Beam
Peak EIRP = 42.1 dBW
Peak Beam Gain = 26.8 dBi
Polarization LHCP and RHCP
Schedule S beam designator: WHAD and WHBD

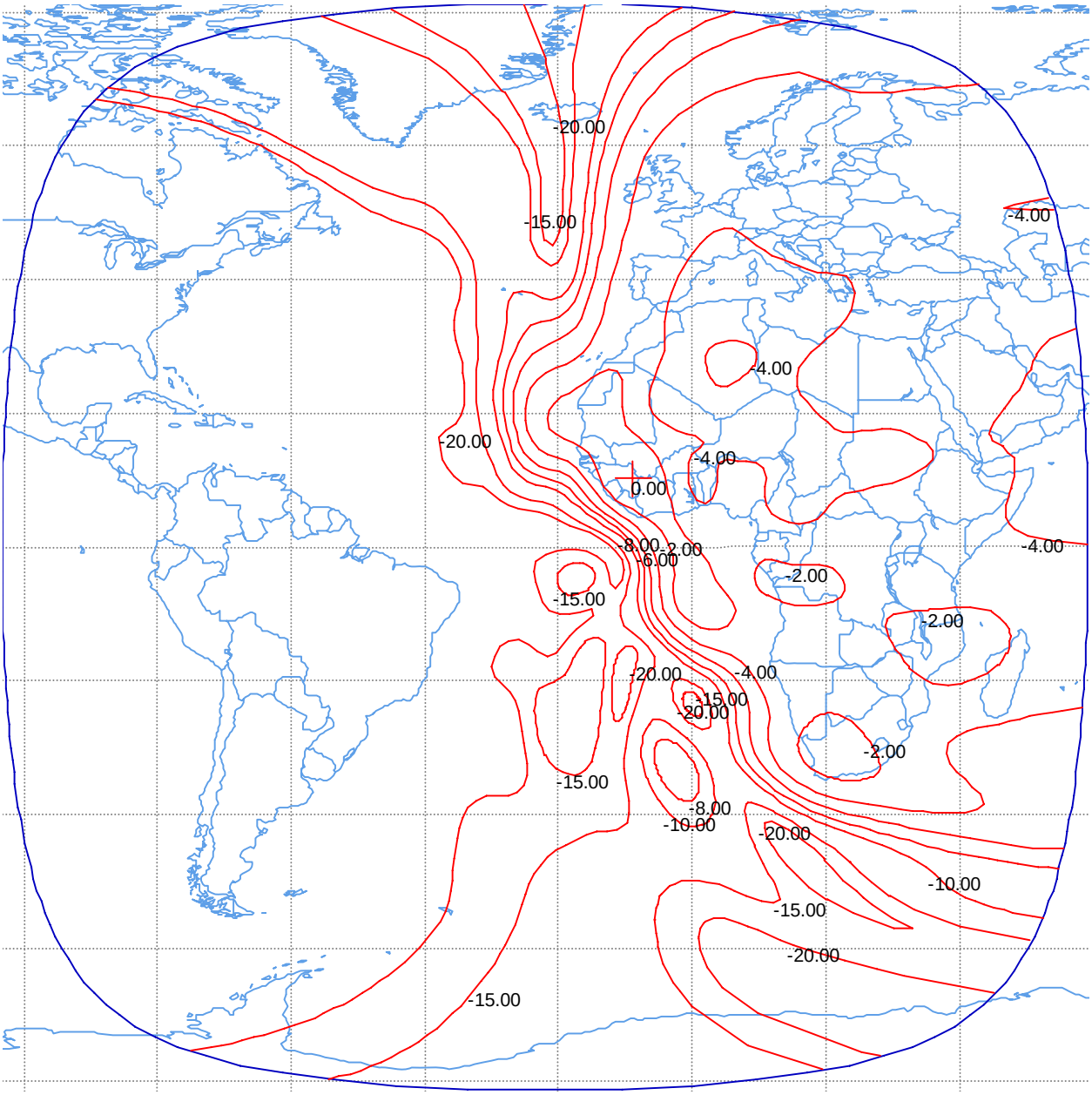

Figure B-5.
East Hemi Uplink Beam
Peak G/T = 0.4 dB/K
Peak Beam Gain = 28.2 dBi
Min. Saturation Flux Density = -96 dBW/m^2
Polarization LHCP and RHCP
Schedule S beam designator: EHAU and EHBU

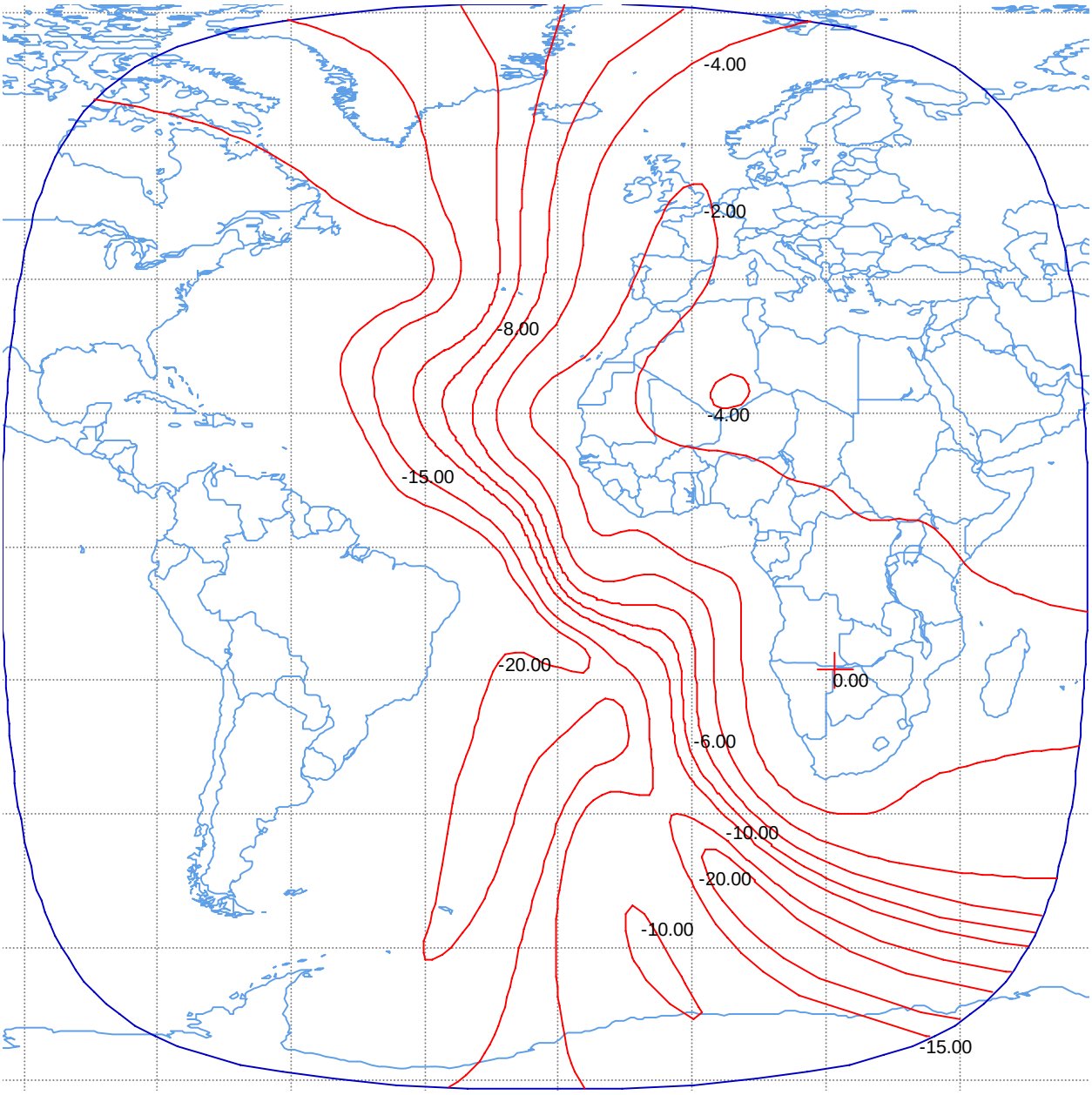

Figure B-6.
East Hemi Downlink Beam
Peak EIRP = 42.8 dBW
Peak Beam Gain = 26.5 dBi
Polarization LHCP and RHCP
Schedule S beam designator: EHAD and EHBD

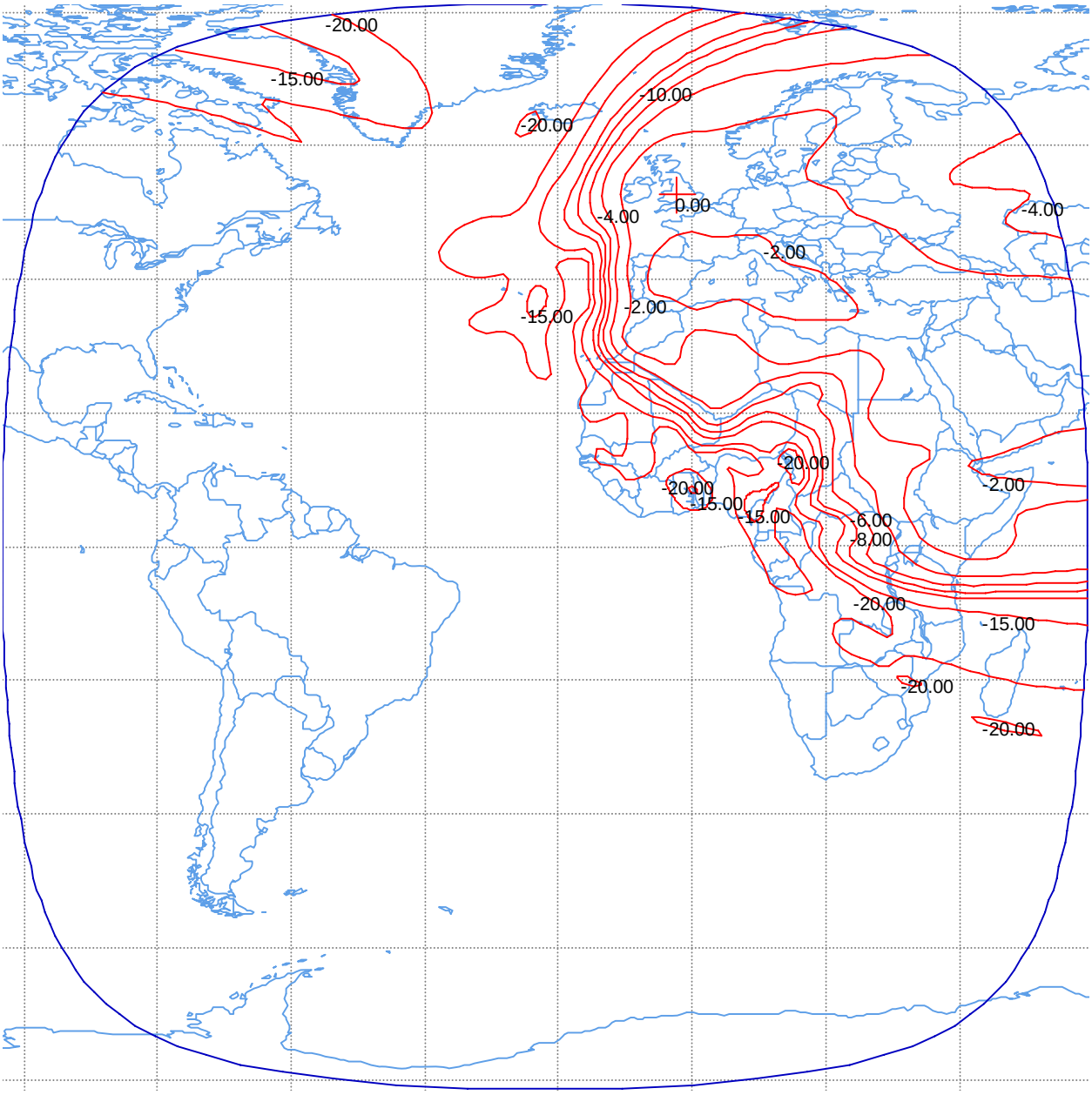

Figure B-7.
Europe Uplink Beam
Peak G/T = 4.1 dB/K
Peak Beam Gain = 32.3 dBi
Min. Saturation Flux Density = -97 dBW/m^2
Polarization Vertical and Horizontal Linear
Schedule S beam designators: EUAU and EUBU

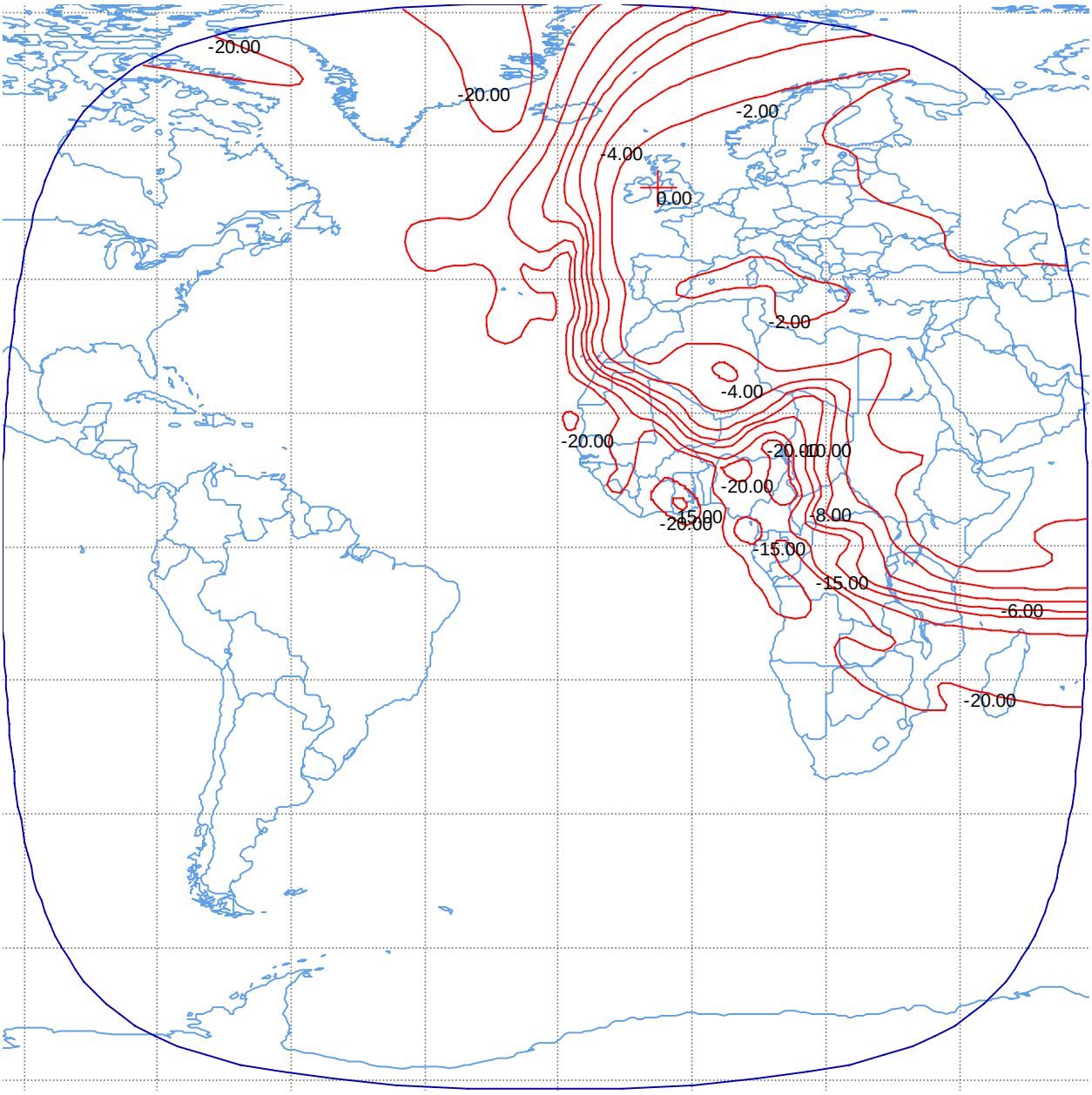

Figure B-8.
Europe Downlink Beam
Peak EIRP = 50.9 dBW
Peak Beam Gain = 31.6 dBi
Polarization Vertical and Horizontal Linear
Schedule S beam designators: EUAD and EUBD

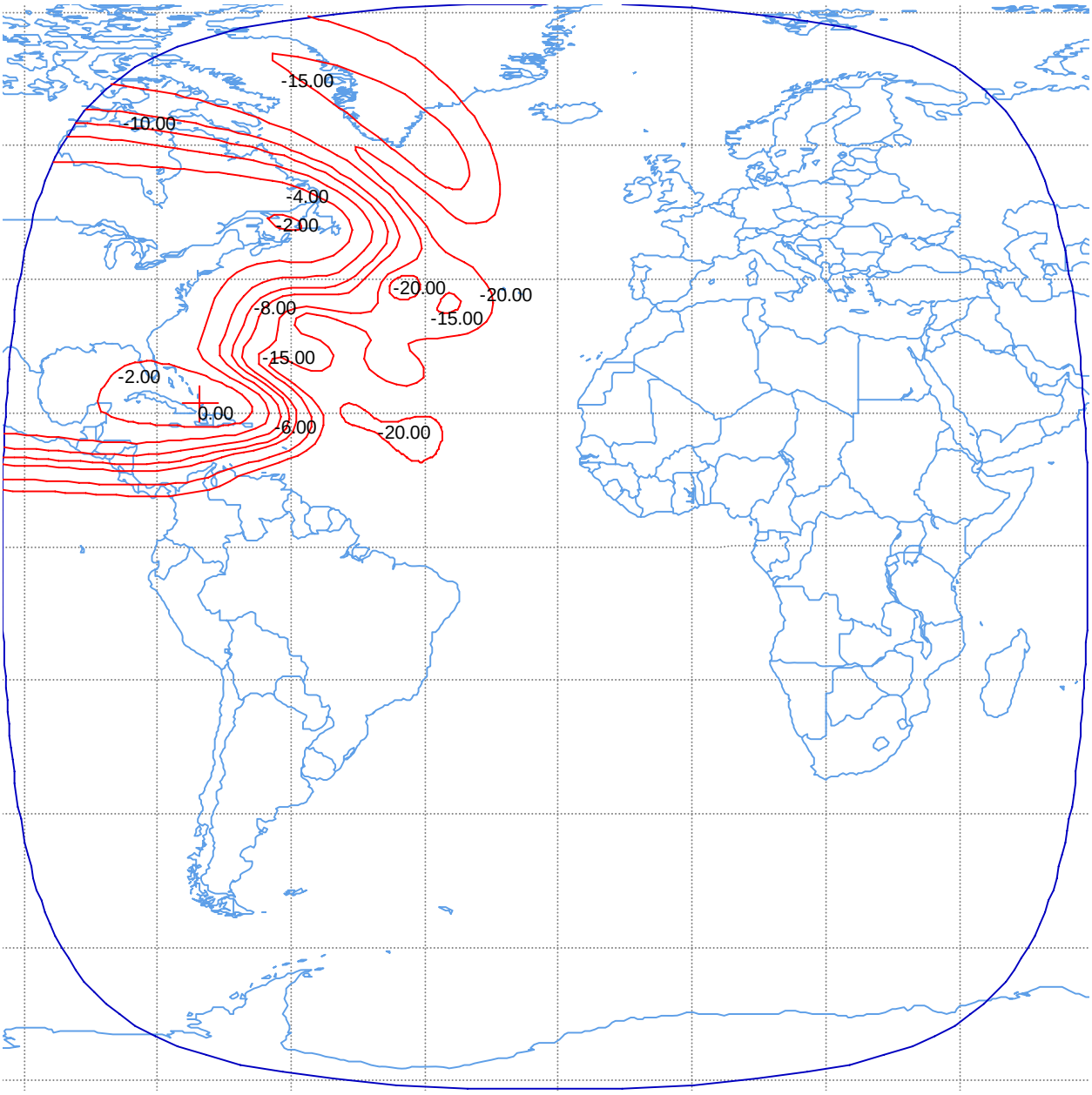

Figure B-9.
North America Uplink Beam
Peak G/T = 8.1 dB/K
Peak Beam Gain = 36.6 dBi
Min. Saturation Flux Density = -101 dBW/m^2
Polarization Vertical and Horizontal Linear
Schedule S beam designators: NAAU and NABU

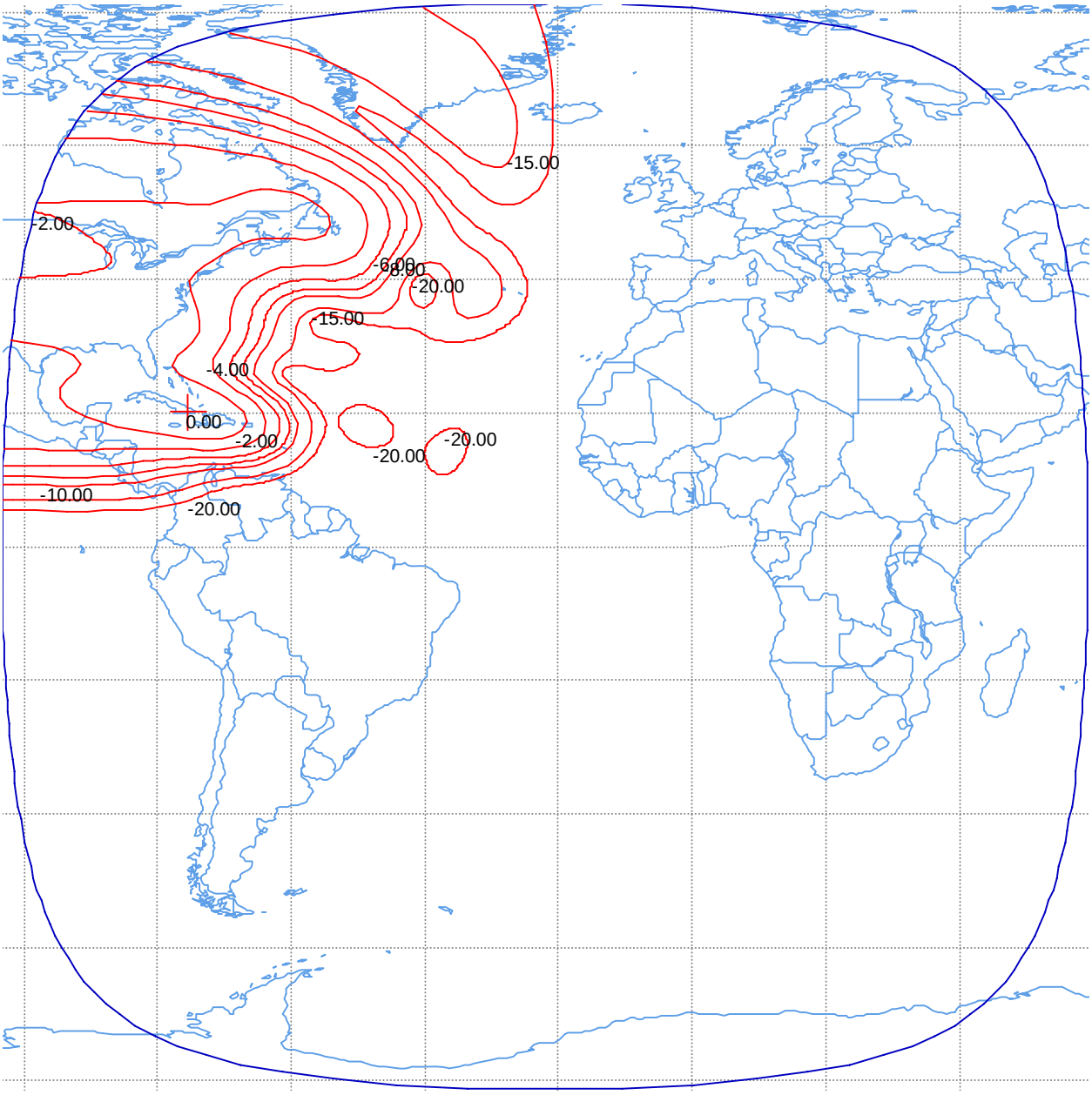

Figure B-10.
North America Downlink Beam
Peak EIRP = 54.3 dBW
Peak Beam Gain = 35.3 dBi
Polarization Horizontal Linear
Schedule S beam designators: NABD

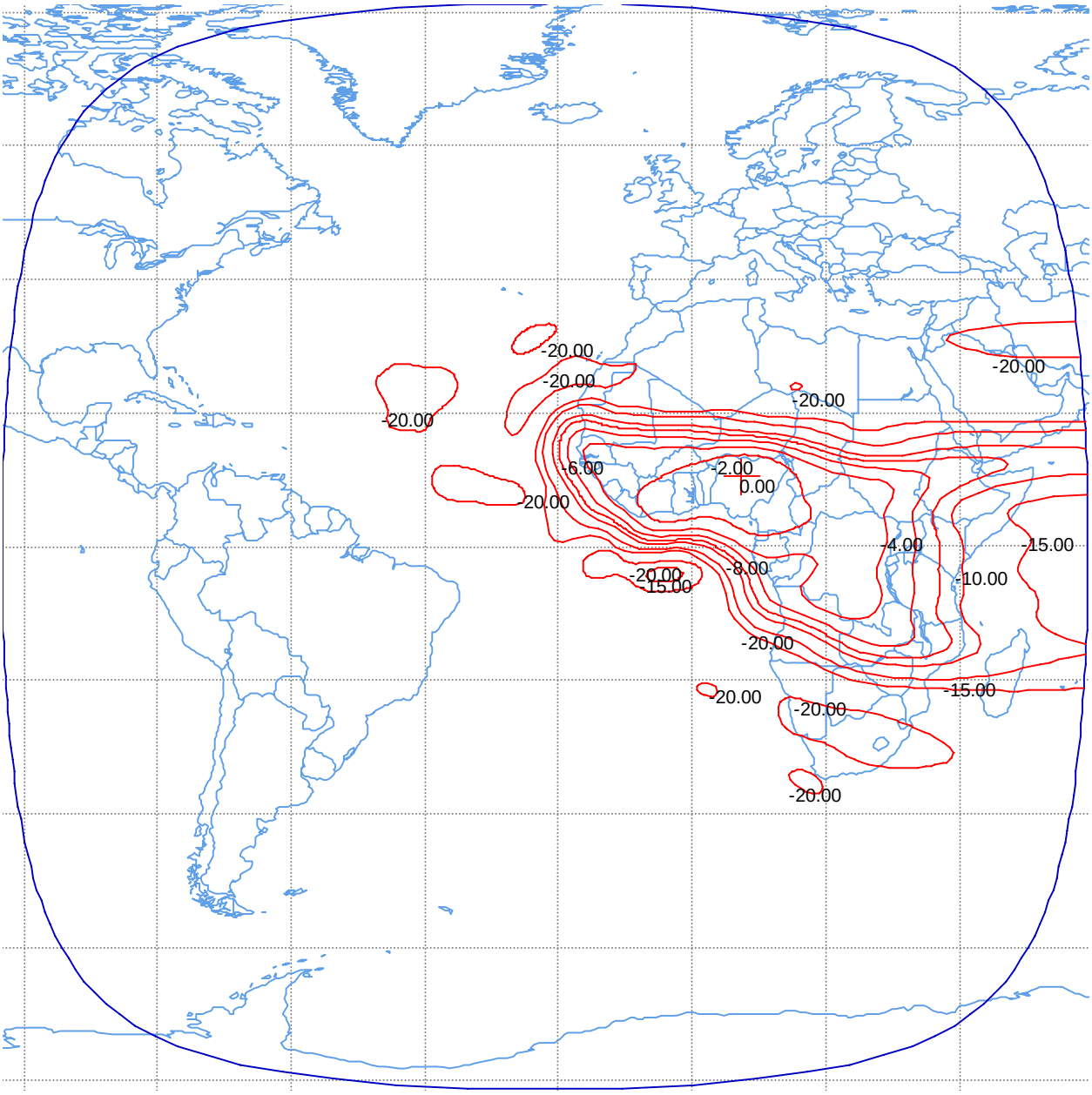

Figure B-11.
West Africa Uplink Beam
Peak G/T = 6.5 dB/K
Peak Beam Gain = 34.8 dBi
Min. Saturation Flux Density = -98 dBW/m^2
Polarization Horizontal Linear
Schedule S beam designators: WAAU

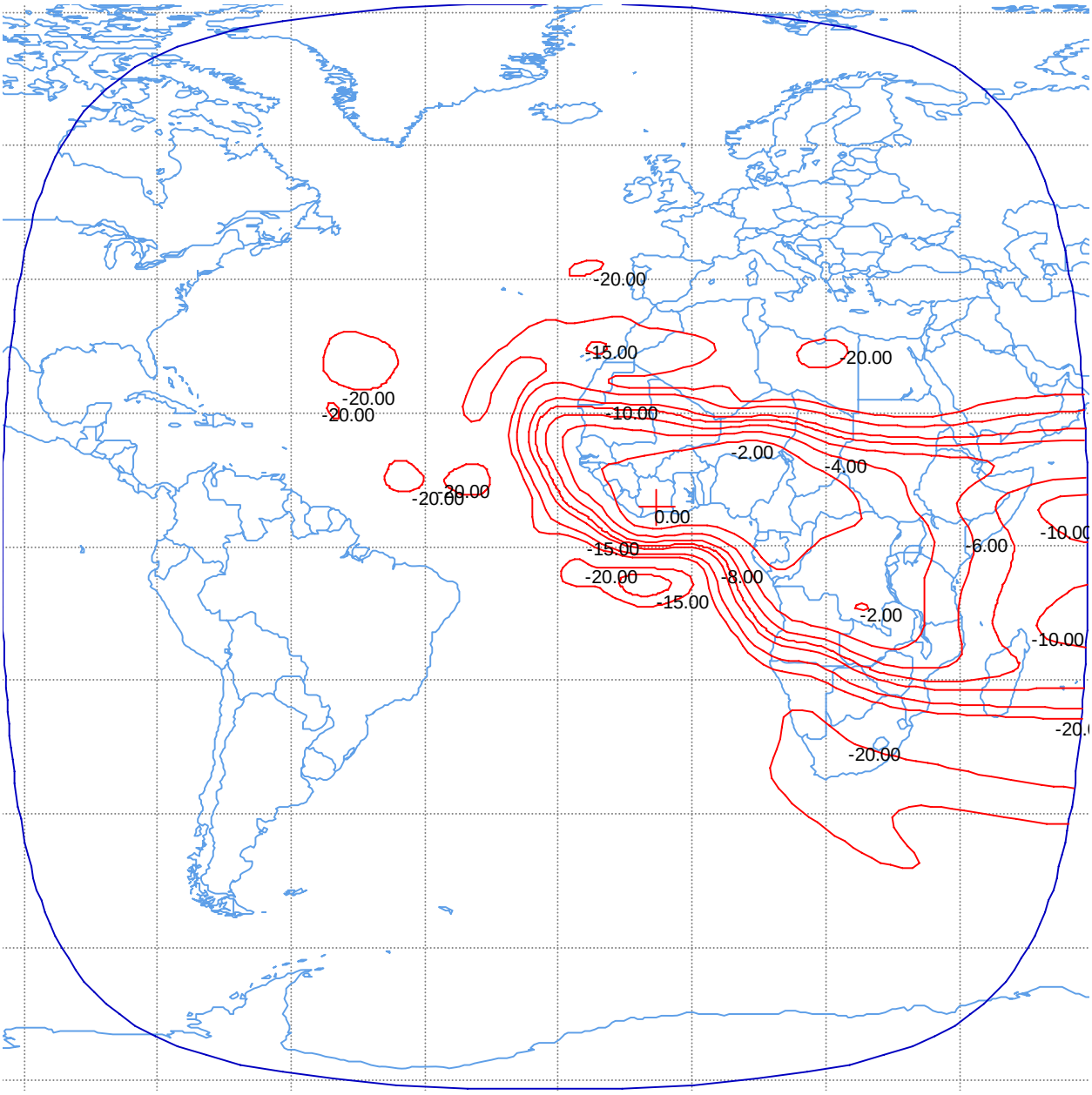

Figure B-12.
West Africa Downlink Beam
Peak EIRP = 51.9 dBW
Peak Beam Gain = 32.9 dBi
Polarization Vertical Linear
Schedule S beam designators: WAAD

Figure B-13.
Southern Cone Uplink Beam
Peak G/T = 6.1 dB/K
Peak Beam Gain = 34.2 dBi
Min. Saturation Flux Density = -98 dBW/m^2
Polarization Horizontal and Vertical Linear
Schedule S beam designators: SCAU and SCBU

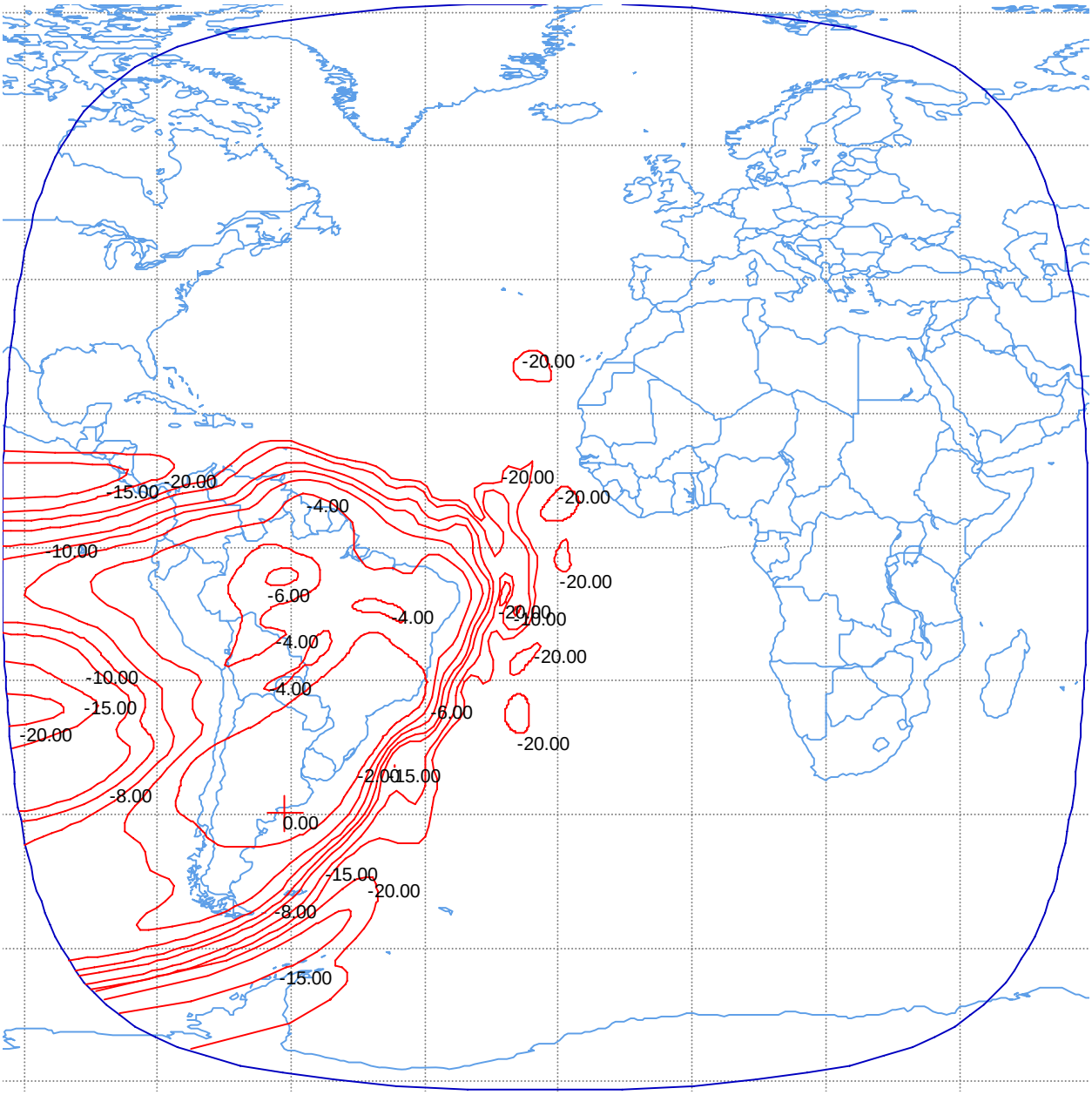

Figure B-14.
Southern Cone Downlink Beam
Peak EIRP = 51.9 dBW
Peak Beam Gain = 32.3 dBi
Polarization Horizontal and Vertical Linear
Schedule S beam designators: SCAD and SCBD

Figure B-15.
Command Carrier Earth Facing Receive Horn[13]
Maximum receive gain = 11 dBi
Command Threshold Flux Density = -90 dBW/m^2
Polarization RHCP
Schedule S beam designator: CMD

[13] Additional gain contours, as requested in Section 25.114(d)(3), are not provided because they do not intersect with the Earth's surface.

Figure B-16.
Telemetry Carrier Earth Facing Transmit Horn[14]
Maximum EIRP = 9 dBW
Maximum transmit gain = 11 dBi
Polarization LHCP and RHCP
Schedule S beam designator: TLM

[14] Additional gain contours, as requested in Section 25.114(d)(3), are not provided because they do not intersect with the Earth's surface. SES WORLD SKIES requests a waiver of this rule to the extent necessary.

Figure B-17.
C-band Tracking Beacon Earth Facing Transmit Horn[15]
Maximum EIRP = 6 dBW
Maximum transmit gain = 11 dBi
Polarization Vertical Linear
Schedule S beam designator: BNC

[15] Additional gain contours, as requested in Section 25.114(d)(3), are not provided because they do not intersect with the Earth's surface. SES WORLD SKIES requests a waiver of this rule to the extent necessary.

Figure B-18.
Ku-band Tracking Beacon Earth Facing Transmit Horn[16]
Maximum EIRP = 9 dBW
Maximum transmit gain = 11 dBi
Polarization RHCP and LHCP
Schedule S beam designator: BNK

[16] Additional gain contours, as requested in Section 25.114(d)(3), are not provided because they do not intersect with the Earth's surface. SES WORLD SKIES requests a waiver of this rule to the extent necessary.

APPENDIX C

TT&C Link Budgets

Link Parameters	Units	800KF9D
Uplink Frequency	GHz	14.496
Carrier Allocated Bandwidth	kHz	800.0
Uplink:		
Nominal E/S e.i.r.p. per carrier	dBW	83.0
Earth Station Diameter	m	13.0
Earth Station Gain	dBi	64.0
Uplink Input Power per Carrier	dBW	19.0
Spreading Loss	dB	162.8
Rain Margin	dB	5.0
Other Losses	dB	1.0
SFD at satellite	dBW/m2	-85.8
Adjustment for +/- 30° to Earth EOC	dB	4.2
SFD at satellite	dBW/m2	-81.6
CMD subsystem SFD Threshold	dBW/m2	-88.0
Margin	dB	6.4

TABLE C-1. LINK BUDGET, TELECOMMAND CARRIER, 800KF9D[17]

[17] The link budget for the telecommand carrier at frequency 14499.0 MHz would be identical and is therefore not displayed separately.

Link Parameters	Units	300KF9D
Downlink Frequency	GHz	11.451
Carrier Allocated Bandwidth	kHz	300.0
Downlink:		
Downlink e.i.r.p. (EOC)*	dBW	8.0
Free Space Loss	dB	205.4
Atmospheric and Polarization Losses	dB	1.0
Rain Fade	dB	5.0
Receive E/S Pointing Loss	dB	0.3
Receive E/S G/T	dB/K	38.4
Downlink C/No	dB	63.3
Required C/No	dB	50.0
Margin	dB	13.3

* This is the specified minimum e.i.r.p. at the edge of Earth

TABLE C-2A. LINK BUDGET, TELEMETRY CARRIER, 300KF9D (11 GHZ)[18]

Link Parameters	Units	300KF9D
Downlink Frequency	GHz	12.502
Carrier Allocated Bandwidth	kHz	300.0
Downlink:		
Downlink e.i.r.p. (EOC)*	dBW	8.0
Free Space Loss	dB	205.8
Atmospheric and Polarization Losses	dB	1.0
Rain Fade	dB	5.5
Receive E/S Pointing Loss	dB	0.3
Receive E/S G/T	dB/K	39.1
Downlink C/No	dB	63.1
Required C/No	dB	50.0
Margin	dB	13.1

TABLE C-2B. LINK BUDGET, TELEMETRY CARRIER, 300KF9D (12 GHZ)[19]

[18] The link budget for the telemetry carrier at frequency 11454.0 MHz would be identical and is therefore not displayed separately.

[19] The link budget for the telemetry carrier at frequency 12500.5 MHz would be identical and is therefore not displayed separately.

Link Parameters	Units	25K0N0N
Downlink Frequency	MHz	4199.750
Carrier Allocated Bandwidth	kHz	25.0
Downlink:		
Downlink e.i.r.p. (EOC)*	dBW	5.0
Free Space Loss	dB	197.0
Atmospheric and Polarization Losses	dB	0.4
Rain Fade	dB	0.2
Receive E/S Pointing Loss	dB	0.1
Receive E/S G/T	dB/K	27.1
Downlink C/No	dB	63.0
Required C/No	dB	47.0
Margin	dB	16.0

* This is the specified minimum e.i.r.p. at the edge of Earth

TABLE C-3. TRACKING BEACON BUDGET, BNC BEAM, 25K0N0N

Link Parameters	Units	25K0N0N
Downlink Frequency	GHz	12.501
Carrier Allocated Bandwidth	kHz	25.0
Downlink:		
Downlink e.i.r.p. (EOC)*	dBW	8.0
Free Space Loss	dB	205.7
Atmospheric and Polarization Losses	dB	1.0
Rain Fade	dB	5.0
Receive E/S Pointing Loss	dB	0.3
Receive E/S G/T	dB/K	38.4
Downlink C/No	dB	63.0
Required C/No	dB	47.0
Margin	dB	16.0

* This is the specified minimum e.i.r.p. at the edge of Earth

TABLE C-4. TRACKING BEACON BUDGET, BNK BEAM, 25K0N0N