EXHIBIT 12: GALAXY KA LINK BUDGETS

Satellite Information	Clear Sky	Up Fade	Dn Fade
Satellite Longitude (degrees)	-89.1	-89.1	-89.1
G/T (EOC, dB/K)	2.5	2.5	2.5
Attenuation setting (dB)	17.0	17.0	17.0
SFD (EOC, dBW/m2)	-77.2	-77.2	-77.2
Downlink EIRP (Beam Peak, dBW)	61.2	61.2	61.2
Carrier Information			
Emission Designation	110MG7W	110MG7W	110MG7W
Bits/Symbol	2	2	2
Info Rate + Overhead (Mblt/s)	86.27	86.27	86.27
Codec:	0.50	0.50	0.50
RS:	0.92	0.92	0.92
Noise Bandwidth (MHz)	93.616	93.616	93.616
C/N required (dB)	3.1	3.1	3.1
Transmit Earth Station	0		0
Antenna Diameter (m)	6.0	6.0	6.0
Rain Rate (mm/hr)	95.0	95.0	95.0
Peak Antenna Gain (dBl)	63.6	63.6	63.6
S/C Relative Gain from Peak towards E/S (dB) Receive Earth Station	~4.0	-4.0	-4.0
Antenna Diameter (m)	0.73	0.73	0.73 95.0
Rain Rate (mm/hr)	95.0	95.0	
Peak Antenna Gain (dBi)	41.8	41.8	41.8
D/Lamda	48.6	48.6	48.6
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA_Sky) Noise Temp	150.0	150.0	150.0
Temperature due to rain fade and gases	37.4	37.4	223.6
G/T of ES (dB/K)	19.1	19.1	16.1
C/N Uplink Per Carrier			
Uplink EIRP per carrier (EOC, dBW)	85.1	95.1	85.1
Pathloss at uplink frequency (dB)	213.2	213.2	213.2
Uplink gazeous attienuation (dB)	0.5	0.5	0.5
Uplink rain attenuation (dB)	0.0	12.8	0.0
Uplink control correction (dB)	0.0	10.0	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier input back-off (dB)	0.0	0.0	0.0
C/N uplink, thermal (EOC, dB)	22.7	20.0	22.7
C/N Downlink Per Carrier			
Transponder BP saturation EIRP (dBW)	61.2	61.2	61.2
Per carrier output back-off (dB)	0.0	0.0	0.0
Per carrier EIRP (EOC, dBW)	57.2	57.2	57.2
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathioss at downlink frequency (dB)	209.7	209.7	209.7
Downlink gazeous attenuation (dB)	0.6	0.6	0.6
Downlink rain attenuation (dB)	0.0	0.0	5.8
ES G/T (dB/K)	19.1	19.1	16.1
C/N downlink, thermal (EOC, dB)	14.4	14.4	5.6
C/I Other links (re-use, IM)	30.0	30.0	30.0
INTERFERING SATELLITE #1		00.0	00.0
Orbital Separation (degrees)	1.80	1.80	1.80
G (AP-7) (dBl)	22.7	22.7	22.7
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-30.5	-36.5	-36.5
C/I ASI uplink (dB)	40.4	50.4	40.4
		12.5	
C/LASI downlink (dB) INTERFERING SATELLITE #2	12.5	12.5	12.5
Orbital Separation (degrees)	1.91	1.91	1.91
G (AP-7) (dBl)	21.2	21.2	21.2
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	40.4	50.4	40.4
C/I ASI downlink (dB)	14.0	14.0	14.0
Total C/N			
C/N available per carrier (dB)	8.6	8.4	4.2
Margin for other losses (dB)	1.1	1.1	1.1
C/N total (clear-sky, dB)	7.5	7.3	3.1
PSD (EOC, dBW/Hz)	-58.2	-48.2	-58.2
ESD at beam peak (dBW/Hz)	-18.5	-18.5	-18.5

- 1) Carrier modulation is QPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
- The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).

			
Satellite Information	Clear Sky	Up Fade	Dn Fade
Satellite Longitude (degrees)	-89.1	-89.1	-89.1
G/T (EOC, dB/K)	2.5	2.5	2.5
Attenuation setting (dB)	15.0	15.0	15.0
SFD (EOC, dBW/m2) Downlink EIRP (Beam Peak, dBW)	-79.2	-79.2 61.2	-79.2 61.2
	61.2	01.2	01.2
Carrier Information Emission Designation	10M3G7W	10M3G7W	10M3G7W
Bits/Symbol	2	2	2
Info Rate + Overhead (Mblt/s)	6.24	6.24	6.24
Codec:	0.50	0.50	0.50
RS:	0.92	0.92	0.92
Noise Bandwidth (MHz)	6.771	6.771	6.771
C/N required (dB)	3.9	3.6	3.6
Transmit Earth Station	0.5	0.0	0.0
Antenna Dlameter (m)	6.0	6.0	6.0
Rain Rate (mm/hr)	95.0	95.0	95.0
Peak Antenna Gain (dBi)	63.6	63.6	63.6
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
Receive Earth Station			
Antenna Dlameter (m)	0.67	0.67	0.67
Rain Rate (mm/hr)	95.0	95.0	95.0
Peak Antenna Gain (dBi)	41.0	41.0	41.0
D/Lamda	44.4	44.4	44.4
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA_Sky) Noise Temp	150.0	150.0	150.0
Temperature due to rain fade and gases	37.4	37.4	223.6
G/T of ES (dB/K)	18.3	18.3	15.3
C/N Uplink Per Carrier			
Uplink EIRP per carrier (EOC, dBW)	69.2	79.2	69.2
Pathloss at uplink frequency (dB)	213.2	213.2	213.2
Uplink gazeous attenuation (dB)	0.5	0.5	0.5
Uplink rain attenuation (dB)	0.0	12.8	0.0
Uplink control correction (dB)	0.0	10.0	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier input back-off (dB)	-13.9	-13.9	-13.9
C/N uplink, thermal (EOC, dB)	18.3	15.5	18.3
C/N Downlink Per Carrier			
Transponder BP saturation EIRP (dBW)	61.2	61.2	61.2
Per carrier output back-off (dB)	-8.8	-8.8	-8.8
Per carrier EIRP (EOC, dBW)	48.4	48.4	48.4
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathloss at downlink frequency (dB)	209.7	209.7 0.6	209.7 0.6
Downlink gazeous attenuation (dB)	0.6	0.0	5.8
Downlink rain attenuation (dB) ES G/T (dB/K)	18.3	18.3	15.3
C/N downlink, thermal (EOC, dB)	16.2	16.2	7.4
C/I Other links (re-use, IM)	16.0	16.0	16.0
INTERFERING SATELLITE #1	10.0	10.0	10.0
Orbital Separation (degrees)	1.77	1.77	1.77
G (AP-7) (dBl)	25.5	25.5	25.5
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	35.9	45.9	35.9
C/I ASI downlink (dB)	11.5	11.5	11.5
INTERFERING SATELLITE #2			
Orbital Separation (degrees)	1.88	1.88	1.88
G (AP-7) (dBl)	23.6	23.6	23.6
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	35.9	45.9	35.9
C/I ASI downlink (dB)	13.5	13.5	13.5
Total C/N			
C/N available per carrier (dB)	7.4	7.1	4.7
Margin for other losses (dB)	1.1	1.1	1.1
C/N total (clear-sky, dB)	6.3	6.0	3.6
PSD (EOC, dBW/Hz)	-62.7	-52.7	-62.7
ESD at beam peak (dBW/Hz)	-15.9	-15.9	-15.9
# of carriers	7	7	7

- 1) Carrier modulation is QPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
- 3) The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).

Satellite Information Satellite Longitude (degrees) G/T (EOC, dB/K) Attenuation setting (dB) SFD (EOC, dBW/m2) Downlink EIRP (Beam Peak, dBW) Carrier Information Emission Designation Bits/Symbol Info Rate + Overhead (Mbit/s) Codec: RS: Noise Bandwidth (MHz) C/N required (dB) Transmit Ende Atolicon	Clear Sky -89.1 2.5 15.0 -79.2 61.2 100KG7W 2 0.07 0.50 0.93	Up Fade -89.1 2.5 15.0 -79.2 61.2 100KG7W 2 0.07	Dn Fade -89.1 2.5 15.0 -79.2 61.2 100KG7W 2
G/T (EOC, dB/K) Attenuation setting (dB) SFD (EOC, dBW/m2) Downlink EIRP (Beam Peak, dB/W) Carrier Information Emission Designation Bits/Symbol Info Rate + Overhead (Mbit/s) Codec: RS: Noise Bandwidth (MHz) C/N required (dB)	15.0 -79.2 61.2 100KG7W 2 0.07 0.50	15.0 -79.2 61.2 100KG7W 2	15.0 -79.2 61.2 100KG7W
Attenuation setting (dB) SFD (EOC, dBW/m2) Downlink EIRP (Beam Peak, dBW) Carrier Information Emission Designation Bits/Symbol Info Rate + Overhead (MbIt/s) Codec: RS: Noise Bandwidth (MHz) C/N required (dB)	-79.2 61.2 100KG7W 2 0.07 0.50	-79.2 61.2 100KG7W 2	-79.2 61.2 100KG7W
Downlink EIRP (Beam Peak, dBW) Carrier Information Emission Designation Bits/Symbol Info Rate + Overhead (Mbibs) Codec: RS: Noise Bandwidth (MHz) C/N required (dB)	61.2 100KG7W 2 0.07 0.50	61.2 100KG7W 2	61.2 100KG7W
Carrier Information Emission Designation Bits/Symbol Info Rate + Overhead (Mbil/s) Codec: RS: Noise Bandwidth (MHz) C/N required (dB)	100KG7W 2 0.07 0.50	100KG7W 2	100KG7W
Emission Designation Bits/Symbol Info Rate + Overhead (Mbil/s) Codec: RS: Noise Bandwidth (MHz) C/N required (dB)	2 0.07 0.50	2	
Bits/Symbol Info Rate + Overhead (Mbl/is) Codec: RS: Noise Bandwidth (MHz) C/N required (dB)	2 0.07 0.50	2	
Info Rate + Overhead (Mbit/s) Codec: RS: Noise Bandwidth (MHz) C/N required (dB)	0.07 0.50	_	2
Codec: RS: Noise Bandwidth (MHz) C/N required (dB)	0.50	0.07	-
RS: Noise Bandwidth (MHz) C/N required (dB)			0.07
Noise Bandwidth (MHz) C/N required (dB)	0.93	0.50	0.50
C/N required (dB)		0.93	0.93
	0.075	0.075	0.075
Transmit Earth Station	3.0	2.8	2.8
Transmit Earth Station			
Antenna Diameter (m)	6.0	6.0	6.0
Rain Rate (mm/hr)	95.0	95.0	95.0
Peak Antenna Gain (dBi)	63.6	63.6	63.6
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
Receive Earth Station			
Antenna Diameter (m)	0.64	0.64	0.64
Rain Rate (mm/hr)	95.0	95.0	95.0
Peak Antenna Gain (dBi)	40.6	40.6	40.6
D/Lamda	42.5	42.5	42.5
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA_Sky) Noise Temp	150.0	150.0	150.0
Temperature due to rain fade and gases	37.4	37.4	223.6
G/T of ES (dB/K) C/N Uplink Per Carrier	17.9	17.9	14.9
Uplink EIRP per carrier (EOC, dBW)	49.6	59.6	49.6
Pathloss at uplink frequency (dB)	213.2	213.2	213.2
Uplink gazeous attenuation (dB)	0.5	0.5	0.5
Uplink rain attenuation (dB)	0.0	12.8	0.0
Uplink control correction (dB)	0.0	10.0	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier input back-off (dB)	-33.4	-33.4	-33.4
C/N uplink, thermal (EOC, dB)	18.3	15.5	18.3
C/N Downlink Per Carrier			
Transponder BP saturation EIRP (dBW)	61.2	61.2	61.2
Per carrier output back-off (dB)	-28.3	-28.3	-28.3
Per carrier EIRP (EOC, dBW)	28.9	28.9	28.9
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathloss at downlink frequency (dB)	209.7	209.7	209.7
Downlink gazeous attenuation (dB)	0.6	0.6	0.6
Downlink rain attenuation (dB)	0.0	0.0	5.8
ES G/T (dB/K)	17.9	17.9	14.9
C/N downlink, thermal (EOC, dB)	15.8	15.8	7.0
C/I Other links (re-use, IM) INTERFERING SATELLITE #1	16.0	16.0	16.0
Orbital Separation (degrees)	1.76	1.76	1.76
	26.7	26.7	26.7
G (AP-7) (dBl) Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-30.5	-36.5	-36.5
	35.9	45.9	35.9
Dell Gen MULTER INCO	10.0	10.0	10.0
C/LASI uplink (dB) C/LASI downlink (dB)		10.0	
C/I ASI upink (db) C/I ASI downlink (db) INTERFERING SATELLITE #2			1.87
C/I ASI downlink (dB) INTERFERING SATELLITE #2	1.87	1.87	
C/I ASI downlink (dB)	1.87 24.9	1.87 24.9	24.9
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees)			24.9 -56.5
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI)	24.9	24.9	
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz)	24.9 -56.5	24.9 -56.5	-56.5
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering U/L elrp density (dBW/Hz)	24.9 -56.5 -15.9	24.9 -56.5 -15.9	-56.5 -15.9
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L elip density (dBW/Hz) C/I ASI uplink (dB)	24.9 -56.5 -15.9 35.9	24.9 -56.5 -15.9 45.9	-56.5 -15.9 35.9
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBi) Interfering Uplink power density (dBW/Hz) Interfering D/L elip density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB)	24.9 -56.5 -15.9 35.9	24.9 -56.5 -15.9 45.9	-56.5 -15.9 35.9
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L elip density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N	24.9 -56.5 -15.9 35.9 11.8	24.9 -56.5 -15.9 45.9 11.8	-56.5 -15.9 35.9 11.8
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L elip density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB)	24.9 -56.5 -15.9 35.9 11.8 6.3	24.9 -56.5 -15.9 45.9 11.8 6.1	-56.5 -15.9 35.9 11.8 3.9
Cil ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBi) Interfering Uplink power density (dBW/Hz) Interfering D/L elrp density (dBW/Hz) Cil ASI uplink (dB) Cil ASI downlink (dB) Total C/N C/N available per carrier (dB) Margin for other losses (dB) C/N total (dear-sky, dB) PSD (EOC, dBW/Hz)	24.9 -55.5 -15.9 35.9 11.8 6.3 1.1 5.2 -62.7	24.9 -56.5 -15.9 45.9 11.8 6.1 1.1 5.0 -52.7	-56.5 -15.9 35.9 11.8 3.9 1.1 2.8 -62.7
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB) Margin for other losses (dB) C/N total (clear-sky, dB)	24.9 -56.5 -15.9 35.9 11.8 6.3 1.1 5.2	24.9 -56.5 -15.9 45.9 11.8 6.1 1.1 5.0	-56.5 -15.9 35.9 11.8 3.9 1.1 2.8

- 1) Carrier modulation is QPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
- The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).

Cort (EOC, dB(x)) 2.5 2.5 2.5 Abtenuation setting (dB) 15.0 15.0 15.0 SPD (EOC, dB(W)) 61.2 61.2 61.2 Carrier Information 11445G7W 11445G7W 11445G7W Bits@ymbol 1 1 1 1 Into Rate + Overhead (Mbit/s) 0.61 0.61 0.61 0.61 Codes: 0.50 0.50 0.50 0.50 0.50 Noise Bandwidth (MHz) 1.229 1.229 1.229 1.229 1.229 Codes: 0.50 95.0 95.0 95.0 95.0 95.0 Coh required (dB) 3.4 2.7 2.7 7 7 Tranemit Earth Station - - - - Antenna Cain (dB) 63.0 95.0 95.0 95.0 95.0 95.0 Pask Antenna Cain (dB) 42.6 42.6 42.6 42.6 42.6 42.6 42.6 42.6 42.6 42.6 42.6	Satellite Information	Clear Sky	Up Fade	Dn Fade
Attenuitoria setting (dB) 15.0 15.0 15.0 -79.2	Satellite Longitude (degrees)	-89.1	-89.1	-89.1
SFD (EC), dBVI/m2) -79.2 -79.2 61.2<	G/T (EOC, dB/K)	2.5	2.5	2.5
Downlink EIRP. (Beam Peak, dBW) 61.2 61.2 61.2 Carrier Information IM45G7W IM45G7W IM45G7W Bits/Symbol 1 1 1 Info Rate - Overnead (Mbit/s) 0.61 0.61 0.61 Coles: 0.50 0.53 0.50 Rol: 1.00 1.000 1.000 Noise Bandwidth (MHz) 1.229 1.229 1.229 Tanamit Earth Station - - - Arterna Diameter (m) 6.0 6.0 6.0 Rol: Rate (mmitr) 95.0 95.0 95.0 SiC Relative Gain from Peak towards E/G (dB) 4.0 -4.0 Reserve Earth Station - - - Anterna Diameter (m) 0.80 95.0 95.0 95.0 Peak Anterna Gain (dBi) 42.6 42.6 42.6 42.6 Namada Rate (mmitr) 95.0 95.0 95.0 95.0 95.0 System (UAStry) Noise Temp 150.0 150.0 150.0 150.0 <td>Attenuation setting (dB)</td> <td>15.0</td> <td>15.0</td> <td>15.0</td>	Attenuation setting (dB)	15.0	15.0	15.0
Carrier Information IM45G7W IM45G7W IM45G7W Emission Designation 1 1 1 1 Info Rate + Overnead (Mbit/Is) 0.61 0.61 0.61 0.61 Codes: 0.50 0.53 0.50 0.55 RS: 1.00 1.00 1.00 1.00 Noise Bandwidth (MHz) 1.229 1.229 1.229 CIN required (dB) 3.4 2.7 2.7 Transmit Earth Station - - - Antenna Cain (dB) 63.6 63.5 63.6 SiC Relative Gain from Peak towards E/G (dB) 4.0 -4.0 -4.0 Antenna Cain (dB) 42.6 42.6 42.6 142.6 C Relative Gain from Peak towards E/G (dB) 4.0 -4.0 -4.0 System (UAA_SX) Note Temp 150.0 150.0 150.0 Temperature due to rain fade and gases 37.4 37.4 223.5 Of X O E (dBA) 0.9 50.9 50.9 50.9 On T IT Z (dBA)	SFD (EOC, dBW/m2)	-79.2	-79.2	-79.2
Emission Designation 11M45G7W 11M45G7W 11M45G7W 11M45G7W Bits/Symbol 0.51 0.51 0.51 0.51 Codec: 0.50 0.50 0.50 0.50 RS: 1.00 1.00 1.00 Noise Bandwidth (MHz) 1.229 1.229 1.229 Tamamit Edmits Station - - - Anterna Diaméter (m) 6.0 6.0 6.0 Rain Rate (mnihr) 95.0 95.0 95.0 SC Relative Gain from Peak towards E/G (dB) -4.0 -4.0 Receive Earth Station - - - Anterna Diaméter (m) 0.80 0.80 95.0 95.0 Peak Antenna Gain (dB) 2.2 3.2 33.2 23.2 23.2 SC Relative Gain from Peak towards E/G (dB) -4.0 -4.0 -4.0 Temperature due to rain fade and gases 37.4 37.4 223.6 Gr T E S (dB/K) 19.9 19.9 19.9 19.9 Uplink RatreqCarter	Downlink EIRP (Beam Peak, dBW)	61.2	61.2	61.2
Bits/Symbol 1 1 1 1 Info Rate + Overhead (Mbit/s) 0.51 0.61 0.61 0.61 Code: 0.50 0.50 0.50 0.50 RS: 1.00 1.00 1.00 1.00 CN required (dB) 3.4 2.77 2.7 Transmit Earth Station - - - Antenna Diameter (m) 6.0 6.0 6.0 Rain Rate (mm/hr) 95.0 95.0 95.0 Peak Antenna Gain (dB) 6.0 0.80 0.80 SiC Relative Gain from Peak towards E/S (dB) 4.0 -4.0 Preparature Gain (dB) 0.40 0.40 -4.0 SiC Relative Gain from Peak towards E/S (dB) 4.0 -4.0 -4.0 System (LNA_GNY) Noise Temp 150.0 150.0 150.0 150.0 CR Bit Noise Temp 150.0 150.0 150.0 150.9 2.15.2 213.2 213.2 213.2 213.2 213.2 213.2 213.2 213.2 213.2	Carrier Information			
Info Filter + Overhead (Mol/Is) 0.51 0.50 0.50 Codec: 0.50 0.50 0.50 Noise Bandwidth (MHz) 1.229 1.229 1.229 Con required (dB) 3.4 2.7 2.7 Transmitt Earth Station	Emission Designation	1M45G7W	1M45G7W	1M45G7W
Codec: 0.50 0.50 0.50 RS: 1.00 1.00 1.00 1.00 CAN required (dB) 3.4 2.7 2.7 Transmit Earth Station - - - Artenna Diameter (m) 6.0 6.0 6.0 6.0 Rain Rate (mmhr) 95.0 95.0 95.0 95.0 Peak Antenna Gain (dB) 6.0 4.0 -4.0 -4.0 Antenna Gain (dB) 0.80 0.80 0.80 0.80 Rain Rate (mmhr) 0.80 0.80 0.80 95.0 Peak Antenna Gain (dB) 42.6 42.6 42.6 1.00 SiC Relative Gain from Peak towards E/S (dB) 4.0 -4.0 50.0 150.0 System (LNA_Sky) Noise Temp 150.0 150.0 150.0 150.0 150.0 Temperature due to rain fade and gases 37.4 37.4 223.2 213.2 213.2 213.2 213.2 213.2 213.2 213.2 213.2 213.2 213.2	Bits/Symbol	1	1	1
RS: 1.00 1.00 1.00 1.00 Noise Bandwidth (MHz) 1.229 1.229 1.229 1.229 CAN required (dB) 3.4 2.7 2.7 Transmitt Earth Station	Info Rate + Overhead (Mblt/s)	0.61	0.61	0.61
Noise Bandwidth (MHz) 1 229 1 229 1 229 1 229 C/N required (dB) 3.4 2.7 2.7 Chr required (dB) 3.4 2.7 2.7 Antenna Diameter (m) 6.0 6.0 6.0 Bain Rate (mm/hr) 95.0 95.0 95.0 Peak Antenna Gain (dB) 6.3.6 63.6 63.6 SiC Relative Gain from Peak towards E/S (dB) 4.0 -4.0 -4.0 Antenna Diameter (m) 0.80 0.80 0.80 0.80 Paain Rate (mm/hr) 95.0 95.0 95.0 95.0 Peak Antenna Gain (dB) 42.6 42.6 42.6 D'Iamda 53.2 53.2 53.2 C Relative Gain from Peak towards E/S (dB) 4.0 -4.0 -4.0 System (LNA_Sky) Noise Temp 150.0 150.0 150.0 150.0 C R Uplink IPer Garrier	Codec:	0.50	0.50	0.50
CN required (dB) 3.4 2.7 2.7 Transmit Earth Station	RS:	1.00	1.00	1.00
CN required (dB) 3.4 2.7 2.7 Transmit Earth Station	Noise Bandwidth (MHz)	1		1
Transmit Earth Station 6.0 6.0 6.0 6.0 Antenna Diameter (m) 65.0 65.0 65.0 65.0 Peak Antenna Gain (dBI) 65.6 65.6 63.6 63.6 63.6 SIC Relative Gain from Peak towards E/S (dB) 4.0 -4.0 -4.0 Antenna Diameter (m) 0.80 0.80 0.80 0.80 Peak Antenna Gain (dBI) 42.6 42.6 42.6 42.6 DLamda 53.2 53		1		
Antenna Diameter (m) 6.0 6.0 6.0 6.0 Rain Rate (mm/hr) 95.0 95.0 95.0 95.0 Peak Antenna Gain (dBI) 6.3.6 7.4 7.4 7.4 2.2.5 5.1 7.4 1.5.0 150.0 150.0 150.0 150.0 150.0 150.0 150.0 1.0.0 0.0 1.0.0 0.0 1.0.0 0.0 1.0.0 0.0 1.0.0 0.0 1.0.0 0.0 1.0.0 0.0 1.0.0 0.0 1.0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0				
Rain Rate (mm/hr) 95.0 <td></td> <td>6.0</td> <td>6.0</td> <td>6.0</td>		6.0	6.0	6.0
Peak Antenna Gain (dB) 63.6 63.				
SIC Relative Gain from Peak towards E/S (dB) -4.0 -4.0 -4.0 Receive Earth Station		1		
Receive Earth Station 0.80 0.80 0.80 Antenna Diameter (m) 0.80 95.0 95.0 95.0 Rain Rate (mm)hr) 95.0 95.0 95.0 95.0 Peak Antenna Gain (dBI) 42.6 42.6 42.6 42.6 D/Lamda 53.2 53.2 53.2 53.2 53.2 SIC Relative Gain from Peak towards E/S (dB) -4.0 -4.0 -4.0 System (LNA_Sky) Noise Temp 150.0 150.0 150.0 150.0 Temperature due to rain fade and gases 37.4 37.4 37.4 223.5 GAT OES (dB/K) 19.9 16.9 16.9 150.0 150.0 150.0 CIN Uplink Per Carrier				
Antenna Diameter (m) 0.80 0.80 0.80 0.80 Rain Rate (mm/hr) 95.0 95.0 95.0 95.0 Peak Antenna Gain (dB) 42.6 42.6 42.6 42.6 D'Lamda 53.2 53.2 53.2 53.2 53.2 SIC Relative Gain from Peak towards E/S (dB) -4.0 -4.0 -4.0 System (LXA, Sky) Noise Temp 150.0 150.0 150.0 Temperature due to rain fade and gases 37.4 37.4 223.5 CN Uplink Per Carrier			-4.5	-4.5
Rain Rate (mminr) 95.0 95.0 95.0 95.0 95.0 Peak Antenna Gain (dBi) 42.6 42.6 42.6 42.6 DiLamda 53.2 53.5 56.5 58.5		0.80	0.80	0.90
Peak Antenna Gain (dBI) 42.6 42.6 42.6 42.6 DLamida 53.2 53.2 53.2 53.2 SIC Relative Gain from Peak towards E/S (dB) 4.0 4.0 4.0 System (LNA_Sky) Noise Temp 150.0 150.0 150.0 Temperature due to rain fade and gases 37.4 37.4 223.6 G/T OES (dB/k) 19.9 19.9 19.9 19.9 C/N Uplink Per Carrier	. ,			
D/Lamda 53.2 53.2 53.2 SIC Relative Gain trom Peak towards E/S (dB) 4.0 4.0 4.0 System (LAA_Sky) Noise Temp 150.0 150.0 150.0 CR Metable Gain trade and gases 37.4 37.4 223.5 GAT of ES (dB/K) 19.9 19.9 19.9 16.9 CAN Uplink Per Carrier Uplink ERP per carrier (EOC, dBW) 58.5 68.5 58.5 pathoss at uplink frequency (dB) 0.5 0.5 0.5 0.5 Uplink Ratemuation (dB) 0.0 10.0 0.0 10.0 0.0 Gain of 1 m2 antenna (dB) 50.9 50.9 50.9 50.9 50.9 Per carrier inpub back-off (dB) -19.4 -19.4 -19.4 -19.4 Per carrier inpub back-off (dB) -19.4 -19.4 -19.4 -19.4 Per carrier inpub back-off (dB) 0.5 -0.5 -0.5 -0.5 Per carrier output back-off (dB) 0.6 0.6 0.6 0.6 Downlink ran attenuation (dB) 0.0				
Si/C Relative Gain from Peak lowards E/S (dB) -4.0 -4.0 -4.0 -4.0 -4.0 -4.0 System (LNA_Sixy) Noise Temp 150.0 160.0		1		1
System (LNA_Sky) Noise Temp 150.0 150.0 150.0 150.0 Temperature due to rain fade and gases 37.4 37.4 37.4 223.6 GYT OES (dB/K) 19.9 19.9 16.9 CN Uplink Per Carrier				
Temperature due to rain fade and gases 37.4 37.4 223.6 GNT of ES (dB/K) 19.9 19.9 19.9 19.9 CN Uplink ERP per carrier (EOC, dBW) 58.5 68.5 58.5 pathoss at uplink frequency (dB) 213.2 213.2 213.2 Uplink site frequency (dB) 0.5 0.5 0.5 Uplink rain attenuation (dB) 0.0 10.0 0.0 GAI of 1 m2 anterna (dB) 50.9 50.9 50.9 Per carrier input back-off (dB) -24.5 -24.5 -24.5 C/N uplink, thermal (EOC, dB) 15.0 12.3 15.0 C/N uplink thermal (EOC, dBW) 61.2 61.2 61.2 Per carrier output back-off (dB) -0.5 -0.5 -0.5 Per carrier output back-off (dB) 0.0 0.0 5.8 209.7 209.7 Downlink ran attenuation (dB) 0.0 0.0 5.8 5.7 CH obwnlink frequency (dB) 2.0.7 209.7 Downlink gazeous attenuation (dB) 0.0 0.0 5.8 5.7				
G/T of ES (dB/K) 19.9 19.9 16.9 CN Uplink Per Carrier				
C/N Uplink Per Carrier 58.5 68.5 58.5 Uplink graduation (dB) 213.2 213.2 213.2 213.2 Uplink graduation (dB) 0.5 0.5 0.5 0.5 Uplink graduation (dB) 0.0 12.8 0.0				
Uplink EIRP per carrier (EOC, dBW) 58.5 68.5 58.5 Pathloss at uplink frequency (dB) 213.2 213.2 213.2 Uplink gazeous attenuation (dB) 0.5 0.5 0.5 Uplink rain attenuation (dB) 0.0 10.0 0.0 Gain of 1 m2 antenna (dB) 50.9 50.9 50.9 Per carrier input back-off (dB) -24.5 -24.5 -24.5 C/N uplink, thermal (EOC, dB) 15.0 12.3 15.0 C/N bownlink Per Carrier 15.0 12.3 15.0 Per camer output back-off (dB) -19.4 -19.4 -19.4 Per carrier CB saturation EIRP (dBW) 61.2 61.2 61.2 Per carrier EIRP (EOC, dBW) 37.8 37.8 37.8 Pointing Error (dB) -0.5 -0.5 -0.5 Downlink rain attenuation (dB) 0.6 0.6 0.6 Downlink ink rain attenuation (dB) 0.6 16.0 16.0 Interfering NG SATELLITE #1 0 0 16.0 16.0 Interfering NL einp dens	```````````````````````````````	19.9	19.9	16.9
Pathloss at uplink frequency (dB) 213.2				
Uplink gazeous attenuation (dB) 0.5 0.5 0.5 0.5 Uplink control correction (dB) 0.0 10.0 0.0 0.0 Gain of 1 m2 antenna (dB) 50.9 50.9 50.9 50.9 Per carrier input back-off (dB) -24.5 -24.5 -24.5 -24.5 C/N Downlink Per Carrier - - - - Transponder BP saturation EIRP (dBW) 61.2 <td></td> <td></td> <td></td> <td></td>				
Uplink rain attenuation (dB) 0.0 12.8 0.0 Uplink control correction (dB) 0.0 10.0 0.0 Gain of 1 m2 antenna (dB) 50.9 50.9 50.9 Per carrier input back-off (dB) -24.5 -24.5 -24.5 CIN uplink, thermal (EOC, dB) 15.0 12.3 15.0 CIN Downlink Per Carrier		1		
Uplink control correction (dB) 0.0 10.0 0.0 Gain of 1 m2 antenna (dB) 50.9 50.9 50.9 50.9 Per carrier input back-off (dB) -24.5 -24.5 -24.5 -24.5 C/N Downlink Per Carrier		1		
Gain of 1 m2 antenna (dB) 50.9 50.9 50.9 50.9 Per carrier input back-off (dB) -24.5 -24.5 -24.5 -24.5 C/N Downlink Per Carrier Its.0 12.3 15.0 Transponder BP saturation EIRP (dBW) 61.2 61.2 61.2 Per carrier output back-off (dB) -19.4 -19.4 -19.4 Per carrier EIRP (EOC, dBW) 37.8 37.8 37.8 Pointing Error (dB) -0.5 -0.5 -0.5 Downlink requency (dB) 209.7 209.7 209.7 Downlink gazeous attenuation (dB) 0.6 0.6 0.6 Downlink gazeous attenuation (dB) 0.0 0.0 5.8 ES G/T (dB/K) 19.9 19.9 16.0 INTERFERING SATELLITE #1 0 16.0 16.0 INTERFERING SATELLITE #1 0 18.2 1.82 1.82 Orbital Separation (degrees) 1.82 1.82 1.82 1.82 Orbital Separation (degrees) 1.93 1.93 1.93 1.93				
Per carrier input back-off (dB) -24.5 -24.5 -24.5 C/N uplink, thermai (EOC, dB) 15.0 12.3 15.0 C/N Downlink Per Carrier		1		
C/N uplink, thermal (EOC, dB) 15.0 12.3 15.0 CN Downlink Per Carrier	. ,			
C/N Downlink Per Carrier 61.2 61.5 60.5 60.5 60.5 60.5 60.5 60.5 60.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 70.5 7				
Transponder BP saturation EIRP (dBW) 61.2 19.4 -19.7 20.97 20.97	· · · · · · · · · · · · · · · · ·	15.0	12.3	15.0
Per carrier output back-off (dB) -19.4 -19.4 -19.4 -19.4 Per carrier EIRP (EOC, dBW) 37.8 37.8 37.8 37.8 Pointing Error (dB) -0.5 -0.5 -0.5 -0.5 Pathioss at downlink frequency (dB) 209.7 209.7 209.7 Downlink gazeous attenuation (dB) 0.6 0.6 0.6 Downlink gazeous attenuation (dB) 0.0 0.0 5.8 ES G/T (dB/K) 19.9 19.9 16.9 C/N downlink, thermal (EOC, dB) 14.5 14.5 5.7 C/I Other links (re-use, IM) 16.0 16.0 16.0 Interfering SATELLITE #1 Interfering Uplink power density (dBW/Hz) -15.9 -15.9 Orbital Separation (degrees) 1.82 1.82 1.82 1.82 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.2 13.2 13.2 Interfering D/L elrp density (dBW/Hz) -56.5 -56.5 -56.5 -56.5 Interfering Uplink power density (dBW/Hz) -15.9 <td></td> <td></td> <td></td> <td></td>				
Per carrier EIRP (EOC, dBW) 37.8 <t< td=""><td></td><td>1</td><td></td><td></td></t<>		1		
Pointing Error (dB) -0.5 -0.5 -0.5 -0.5 Pathloss at downlink frequency (dB) 209.7 209.7 209.7 209.7 Downlink gazeous attenuation (dB) 0.6 0.6 0.6 0.6 Downlink rain attenuation (dB) 0.0 0.0 5.8 5.7 209.7 209.7 209.7 CN downlink, thermal (EOC, dB) 14.5 14.5 5.7 5.7 C/I Other links (re-use, IM) 16.0 16.0 16.0 16.0 INTERFERING SATELLITE #1 Orbital Separation (degrees) 1.82 1.82 1.82 1.82 G (AP-7) (dBI) 22.1		1		
Pathloss at downlink frequency (dB) 209.7 209.7 209.7 Downlink gazeous attenuation (dB) 0.6 0.6 0.6 Downlink rain attenuation (dB) 0.0 0.0 5.8 SG/T (dB/K) 19.9 19.9 16.9 C/N downlink, thermal (EOC, dB) 14.5 14.5 5.7 C/I Other links (re-use, IM) 16.0 16.0 16.0 INTERFERING SATELLITE #1 0 0 1.82 1.82 Orbital Separation (degrees) 1.82 1.82 1.82 1.82 G (AP-7) (dBl) 22.1 22.1 22.1 1.59 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering Uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.2 13.2 13.2 INTERFERING SATELLITE #2 0 0 0 Orbital Separation (degrees) 1.93 1.93 1.93 G (AP-7) (dBl) 21.8 21.8 21.8 Interfering D/L einp density (dBW/Hz)				
Downlink gazeous attenuation (dB) 0.6 0.6 0.6 Downlink rain attenuation (dB) 0.0 0.0 5.8 ES G/T (dB/K) 19.9 19.9 16.9 C/N downlink, thermal (EOC, dB) 14.5 14.5 5.7 C/N downlink, thermal (EOC, dB) 14.5 14.5 5.7 C/N downlink, thermal (EOC, dB) 14.5 14.5 5.7 C/I Other links (re-use, IM) 16.0 16.0 16.0 INTERFERING SATELLITE #1		1		
Downlink rain attenuation (dB) 0.0 0.0 5.8 ES G/T (dB/K) 19.9 19.9 16.9 C/N downlink, thermal (EOC, dB) 14.5 14.5 5.7 C/I Other links (re-use, IM) 16.0 16.0 16.0 INTERFERING SATELLITE #1 1.82 1.82 1.82 Orbital Separation (degrees) 1.82 1.82 1.82 1.82 1.82 G (AP-7) (dBI) 22.1 22.1 22.1 22.1 22.1 22.1 15.9 -15.9				
ES G/T (dB/K) 19.9 19.9 19.9 16.9 C/N downlink, thermal (EOC, dB) 14.5 14.5 5.7 C/I Other links (re-use, IM) 16.0 16.0 16.0 INTERFERING SATELLITE #1 Orbital Separation (degrees) 1.82 1.82 1.82 1.82 G (AP-7) (dBI) 22.1 22.1 22.1 22.1 22.1 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 -56.5 Orbital Separation (degrees) 13.2 13.2 13.2 13.2 C/I ASI downlink (dB) 13.2 1.93 1.93 1.93 Orbital Separation (degrees) 1.93 1.93 1.93 1.93 G (AP-7) (dBI) 21.8 21.8 21.8 21.8 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering Uplink power density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI downlink (dB) 13.5 13.5 13.5 13.5		0.6	0.6	0.6
C/N downlink, thermal (EOC, dB) 14.5 14.5 5.7 C/I Other links (re-use, IM) 16.0 16.0 16.0 INTERFERING SATELLITE #1 Orbital Separation (degrees) 1.82 1.82 1.82 G (AP-7) (dBl) 22.1 22.1 22.1 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Orbital Separation (degrees) 32.7 42.7 32.7 C/I ASI uplink (dB) 13.2 13.2 13.2 Orbital Separation (degrees) 1.93 1.93 1.93 G (AP-7) (dBl) 21.8 21.8 21.8 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 INTERFERING SATELLITE #2 Orbital Separation (degrees) 1.93 1.93 1.93 1.93 G (AP-7) (dBl) 21.8 21.8 21.8 Orbital Separation (degrees) 1.93 1.93 1.93		0.0		1
C/I Other links (re-use, IM) 16.0 16.0 16.0 INTERFERING \$ATELLITE #1	ES G/T (dB/K)	19.9	19.9	16.9
INTERFERING \$ATELLITE #1 1.82 1.83 1.93 1	C/N downlink, thermal (EOC, dB)	14.5	14.5	5.7
Orbital Separation (degrees) 1.82 1.82 1.82 G (AP-7) (dBI) 22.1 22.1 22.1 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering Uplink power density (dBW/Hz) -15.9 -15.9 -15.9 Interfering Uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.2 13.2 13.2 INTERFERING SATELLITE #2 Orbital Separation (degrees) 1.93 1.93 1.93 G (AP-7) (dBI) 21.8 21.8 21.8 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering Uplink power density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.5 13.5 13.5 C/I ASI downlink (dB) 13.5 13.5 13.5 C/N available per carrier (dB) 7.3 6.7 3.8 Margin for other losses (dB) 1.1 1.1 <td>C/I Other links (re-use, IM)</td> <td>16.0</td> <td>16.0</td> <td>16.0</td>	C/I Other links (re-use, IM)	16.0	16.0	16.0
G (AP-7) (dBl) 22.1 22.1 22.1 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering D/L elip density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI uplink (dB) 13.2 13.2 13.2 INTERFERING SATELLITE #2 0rbital Separation (degrees) 1.93 1.93 1.93 G (AP-7) (dBI) 21.8 21.8 21.8 21.8 21.8 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 -56.5 Interfering Uplink (dB) 32.7 42.7 32.7 22.7 32.7 C/I ASI downlink (dB) 13.5 13.5 13.5 13.5 13.5 C/I ASI downlink (dB) 13.5 13.5 13.5 13.5 13.5 C/I ASI downlink (dB) 7.3 6.7 3.8 Margin for other losses (dB) 1.1 1.1 1.1 C/N available per carrier (dB) 65.2 5.6 2.7 7 7	INTERFERING SATELLITE #1			
interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering D/L eirp density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.2 13.2 13.2 INTERFERING \$ATELLITE #2	Orbital Separation (degrees)	1.82	1.82	1.82
Interfering D/L eing density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI uplink (dB) 13.2 13.2 13.2 INTERFERING SATELLITE #2 0 0 0 Orbital Separation (degrees) 1.93 1.93 1.93 G (AP-7) (dBI) 21.8 21.8 21.8 Interfering U/L eing density (dBW/Hz) -56.5 -56.5 -56.5 Orl ASI uplink (dB) 32.7 42.7 32.7 C/I ASI uplink (dB) 21.8 21.8 21.8 Interfering D/L eing density (dBW/Hz) -56.5 -56.5 -56.5 C/I ASI uplink (dB) 33.5 13.5 13.5 13.5 Total C/N 0 0 0.7 3.6.7 3.8 Margin for other losses (dB) 1.1 1.1 1.1 1.1 C/N total (clear-sky, dB) 65.2 5.6 2.7 PSD (EOC, dBW/Hz) -65.9 -55.9 -65.9 ESD at beam peak (dBW/Hz) -19.1<	G (AP-7) (dBl)	22.1	22.1	22.1
C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.2 13.2 13.2 INTERFERING SATELLITE #2	Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
C/I ASI downlink (dB) 13.2 13.2 13.2 INTERFERING SATELLITE #2	Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
INTERFERING SATELLITE #2 1.93 1.93 1.93 Orbital Separation (degrees) 1.93 1.93 1.93 G (AP-7) (dBl) 21.8 21.8 21.8 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering UPL elip density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.5 13.5 13.5 Total C/N 0 0 0 C/N available per carrier (dB) 7.3 6.7 3.8 Margin for other losses (dB) 1.1 1.1 1.1 C/N total (clear-sky, dB) 6.2 5.6 2.7 PSD (EOC, dBW/Hz) -65.9 -55.9 -65.9 ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1	C/LASLuplink (dB)	32.7	42.7	32.7
INTERFERING SATELLITE #2 1.93 1.93 1.93 Orbital Separation (degrees) 1.93 1.93 1.93 G (AP-7) (dBl) 21.8 21.8 21.8 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering UPL elip density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.5 13.5 13.5 Total C/N 0 0 0 C/N available per carrier (dB) 7.3 6.7 3.8 Margin for other losses (dB) 1.1 1.1 1.1 C/N total (clear-sky, dB) 6.2 5.6 2.7 PSD (EOC, dBW/Hz) -65.9 -55.9 -65.9 ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1	C/I ASI downlink (dB)	13.2	13.2	13.2
G (AP-7) (dBl) 21.8 21.8 21.8 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering D/L elip density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.5 13.5 13.5 Total C/N	INTERFERING SATELLITE #2			
G (AP-7) (dBl) 21.8 21.8 21.8 Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering D/L elip density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.5 13.5 13.5 Total C/N	Orbital Separation (degrees)	1.93	1.93	1.93
Interfering Uplink power density (dBW/Hz) -56.5 -56.5 -56.5 Interfering D/L ettp density (dBW/Hz) -15.9 -15.9 -15.9 C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.5 13.5 13.5 Total C/N	G (AP-7) (dBl)	1		1
Interfering D/L elip density (dBW/Hz) -15.9 C/// 32.7 33.6 33.5 33.6 33.5 33.6 33.7 33.6 33.7 33.6 33.7 33.6	Interfering Uplink power density (dBW/Hz)	1		
C/I ASI uplink (dB) 32.7 42.7 32.7 C/I ASI downlink (dB) 13.5 13.5 13.5 13.5 Total C/N C/I available per carrier (dB) 7.3 6.7 3.8 Margin for other losses (dB) 1.1 1.1 1.1 1.1 C/N total (clear-sky, dB) 6.2 5.6 2.7 PSD (EOC, dBW/Hz) -65.9 -55.9 -65.9 ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1	2			
C/I ASI downlink (dB) 13.5 13.5 13.5 Total C/N		1		1
Total C/N 7.3 6.7 3.8 C/N available per carrier (dB) 7.3 6.7 3.8 Margin for other losses (dB) 1.1 1.1 1.1 C/N total (clear-sky, dB) 6.2 5.6 2.7 PSD (EOC, dBW/Hz) -65.9 -55.9 -55.9 ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1		1		
C/N available per carrier (dB) 7.3 6.7 3.8 Margin for other losses (dB) 1.1 1.1 1.1 C/N total (clear-sky, dB) 6.2 5.6 2.7 PSD (EOC, dBW/Hz) -65.9 -55.9 -65.9 ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1				
Margin for other losses (dB) 1.1 1.1 1.1 C/N total (clear-sky, dB) 6.2 5.6 2.7 PSD (EOC, dBW/Hz) -65.9 -55.9 -65.9 ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1		7.3	67	3.8
C/N total (clear-sky, dB) 6.2 5.6 2.7 PSD (EOC, dBW/Hz) -65.9 -55.9 -65.9 ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1	•	1		1
PSD (EOC, dBW/Hz) -65.9 -55.9 -65.9 ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1		1		1
ESD at beam peak (dBW/Hz) -19.1 -19.1 -19.1				
		1		1
	# of carriers	-19.1	-19.1	-19.1

- 1) Carrier modulation is BPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
- 3) The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).

Satellite Information	Clear Sky -89.1	Up Fade	Dn Fade -89.1
Satellite Longitude (degrees)		-89.1	
G/T (EOC, dB/K)	2.5 15.0	2.5 15.0	2.5 15.0
Attenuation setting (dB)			
SFD (EOC, dBW/m2)	-79.2 61.2	-79.2 61.2	-79.2
Downlink EIRP (Beam Peak, dBW)	61.2	61.2	61.2
Carrier Information	100000000		
Emission Designation	400KG7W	400KG7W	400KG7W
Bits/Symbol	1	1	-
Info Rate + Overhead (Mbit/s)	0.15	0.15	0.15
Codec:		0.50	
RS: Noise Bandwidth (MHz)	1.00	1.00	1.00
	0.307	0.307	0.307
C/N required (dB)	3.4	2.7	2.7
Transmit Earth Station			
Antenna Diameter (m)	0.8	0.8	0.8
Rain Rate (mm/hr)	95.0	95.0	95.0
Peak Antenna Gain (dBi)	46.1	46.1	46.1
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
Receive Earth Station			
Antenna Diameter (m)	6.00	6.00	6.00
Rain Rate (mm/hr)	95.0	95.0	95.0
Peak Antenna Gain (dBi)	60.1	60.1	60.1
D/Lamda	399.0	399.0	399.0
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA_Sky) Noise Temp	150.0	150.0	150.0
Temperature due to rain fade and gases	37.4	37.4	223.6
G/T of ES (dB/K)	37.4	37.4	34.4
C/N Uplink Per Carrier			
Uplink EIRP per carrier (EOC, dBW)	44.4	54.4	44.4
Pathloss at uplink frequency (dB)	213.2	213.2	213.2
Uplink gazeous attenuation (dB)	0.5	0.5	0.5
Uplink rain attenuation (dB)	0.0	12.8	0.0
Uplink control correction (dB)	0.0	10.0	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier input back-off (dB)	-38.6	-38.6	-38.6
C/N uplink, thermal (EOC, dB)	7.0	4.2	7.0
C/N Downlink Per Carrier			
Transponder BP saturation EIRP (dBW)	61.2	61.2	61.2
Per carrier output back-off (dB)	-33.5	-33.5	-33.5
Per carrier EIRP (EOC, dBW)	23.7	23.7	23.7
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathloss at downlink frequency (dB)	209.7	209.7	209.7
Downlink gazeous attenuation (dB)	0.6	0.6	0.6
Downlink rain attenuation (dB)	0.0	0.0	5.8
ES G/T (dB/K)	37.4	37.4	34.4
C/N downlink, thermal (EOC, dB)	24.0	24.0	15.2
C/I Other links (re-use, IM)	16.0	16.0	16.0
INTERFERING SATELLITE #1			
Orbital Separation (degrees)	2.05	2.05	2.05
G (AP-7) (dBl)	21.2	21.2	21.2
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	24.6	34.6	24.6
C/I ASI downlink (dB)	23.6	23.6	23.6
INTERFERING SATELLITE #2			
Orbital Separation (degrees)	2.16	2.16	2.16
G (AP-7) (dBl)	20.6	20.6	20.6
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	24.6	34.6	24.6
C/I ASI downlink (dB)	24.2	24.2	24.2
Total C/N			5.6
Total C/N C/N available per carrier (dB)	6.1	3.8	3.0
	6.1 1.1	3.8 1.1	1.1
C/N available per carrier (dB)			
C/N available per carrier (dB) Margin for other losses (dB)	1.1	1.1	1.1
C/N available per carrier (dB) Margin for other losses (dB) C/N total (clear-sky, dB)	1.1 5.0	1.1 2.7	1.1 4.5

- 1) Carrier modulation is BPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
- 3) The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).

Satellite Information	Clear Sky	Up Fade	Dn Fade
Satellite Longitude (degrees)	-89.1	-89.1	-89.1
G/T (EOC, dB/K)	2.5	2.5	2.5
Attenuation setting (dB)	17.0	17.0	17.0
SFD (EOC, dBW/m2)	-77.2	-77.2	-77.2
Downlink EIRP (Beam Peak, dBW)	61.2	61.2	61.2
Carrier Information	110MG7W	110MG7W	110MG7W
Emission Designation Bits/Symbol	2	2	2
Info Rate + Overhead (Mbit/s)	86.27	85.27	86.27
Codec:	0.50	0.50	0.50
RS:	0.92	0.92	0.92
Noise Bandwidth (MHz)	93.616	93.616	93.616
C/N regulared (dB)	3.1	3.1	3.1
Transmit Earth Station			
Antenna Diameter (m)	6.0	6.0	6.0
Rain Rate (mm/hr)	41.9	41.9	41.9
Peak Antenna Gain (dBl)	63.6	63.6	63.6
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
Receive Earth Station			
Antenna Diameter (m)	0.66	0.66	0.66
Rain Rate (mm/hr)	41.9	41.9	41.9
Peak Antenna Gain (dBl)	40.9	40.9	40.9
D/Lamda	43.9	43.9	43.9
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA_Sky) Noise Temp	150.0	150.0	150.0
Temperature due to rain fade and gases	20.7	20.7	151.6
G/T of ES (dB/K)	18.6	18.6	16.1
C/N Uplink Per Carrier Uplink EIRP per carrier (EOC, dBW)	85.3	91.5	85.3
Pathloss at uplink frequency (dB)	213.4	213.4	213.4
Uplink gazeous attenuation (dB)	0.3	0.3	0.3
Uplink rain attenuation (dB)	0.0	6.3	0.0
Uplink control correction (dB)	0.0	6.2	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier Input back-off (dB)	0.0	0.0	0.0
C/N uplink, thermal (EOC, dB)	22.9	22.9	22.9
C/N Downlink Per Carrier			
Transponder BP saturation EIRP (dBW)	61.2	61.2	61.2
Per carrier output back-off (dB)	0.0	0.0	0.0
Per carrier EIRP (EOC, dBW)	57.2	57.2	57.2
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathloss at downlink frequency (dB)	210.0	210.0	210.0
Downlink gazeous attenuation (dB)	0.3	0.3	0.3
Downlink rain attenuation (dB)	0.0	0.0	2.9
ES G/T (dB/K)	18.6	18.6	16.1
C/N downlink, thermal (EOC, dB)	13.9	13.9	8.5
C/I Other links (re-use, IM) INTERFERING SATELLITE #1	30.0	30.0	30.0
Orbital Separation (degrees)	1.77	1.77	1.77
G (AP-7) (dBl)	25.9	25.9	25.9
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	40.6	46.8	40.6
C/I ASI downlink (dB)	8.5	8.5	8.5
INTERFERING SATELLITE #2			
Orbital Separation (degrees)	1.88	1.88	1.88
G (AP-7) (dBl)	23.9	23.9	23.9
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interlering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	40.6	46.8	40.6
C/I ASI downlink (dB)	10.4	10.4	10.4
Total C/N			
C/N available per carrier (dB)	5.5	5.5	4.2
Margin for other losses (dB)	1.1	1.1	1.1
C/N total (clear-sky, dB)	4.4	4.4	3.1
PSD (EOC, dBW/Hz)	-58.0	-51.8	-58.0
ESD at beam peak (dBW/Hz)	-18.5	-18.5	-18.5
# of carriers	1	1	1

- 1) Carrier modulation is QPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
- 3) The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).

Satellite Information	Clear Sky	Up Fade	Dn Fade
Satellite Longitude (degrees)	-89.1	-89.1	-89.1
G/T (EOC, dB/K)	2.5	2.5	2.5
Attenuation setting (dB)	15.0	15.0	15.0
SFD (EOC, dBW/m2)	-79.2	-79.2	-79.2
Downlink EIRP (Beam Peak, dBW)	61.2	61.2	61.2
Carrier Information			
Emission Designation	10M3G7W	10M3G7W	10M3G7W
Bits/Symbol	2	2	2
Info Rate + Overhead (Mbit/s)	6.24	6.24	6.24
Codec:	0.50	0.50	0.50
RS:	0.92	0.92	0.92
Noise Bandwidth (MHz)	6.771	6.771	6.771
C/N required (dB)	3.9	3.6	3.6
Transmit Earth Station			
Antenna Diameter (m)	6.0	6.0	6.0
Rain Rate (mm/hr)	41.9	41.9	41.9
Peak Antenna Gain (dBi)	63.6	63.6	63.6
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
Receive Earth Station	0.00	0.00	0.00
Antenna Diameter (m) Rain Rate (mm/hr)	0.62	0.62 41.9	0.62 41.9
	41.9	41.9	41.9
Peak Antenna Gain (dBl) D/Lamda	40.4	40.4	40.4
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA, Sky) Noise Temp	-4.0	-4.U 150.0	-4.0
Temperature due to rain fade and gases	20.7	20.7	151.6
G/T of ES (dB/K)	18.1	18.1	15.6
C/N Uplink Per Carrier	10.1	10.1	10.0
Uplink EIRP per carrier (EOC, dBW)	69,4	75.6	69.4
Pathloss at uplink frequency (dB)	213.4	213.4	213.4
Uplink gazeous attienuation (dB)	0.3	0.3	0.3
Uplink rain attenuation (dB)	0.0	6.3	0.0
Uplink control correction (dB)	0.0	6.2	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier input back-off (dB)	-13.9	-13.9	-13.9
C/N uplink, thermal (EOC, dB)	18.4	18.4	18.4
C/N Downlink Per Carrier			
Transponder BP saturation EIRP (dBW)	61.2	61.2	61.2
Per carrier output back-off (dB)	-8.8	-8.8	-8.8
Per carrier EIRP (EOC, dBW)	48.4	48.4	48.4
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathloss at downlink frequency (dB)	210.0	210.0	210.0
Downlink gazeous attenuation (dB)	0.3	0.3	0.3
Downlink rain attenuation (dB)	0.0	0.0	2.9
ES G/T (dB/K)	18.1	18.1	15.6
C/N downlink, thermal (EOC, dB) C/I Other links (re-use, IM)	16.0 16.0	16.0 16.0	10.6
INTERFERING SATELLITE #1	10.0	16.0	10.0
Orbital Separation (degrees)	1.75	1.75	1.75
			27.4
G (AP-7) (dBl)	27.4	27.4	
G (AP-7) (dBl) Interfering Uplink power density (dBW/Hz)	27.4	27.4 -56.5	-56.5
G (AP-7) (dBl) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz)			
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz)	-56.5 -15.9	-56.5 -15.9	-56.5 -15.9
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB)	-56.5 -15.9 36.1	-56.5 -15.9 42.3	-56.5 -15.9 36.1
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB)	-56.5 -15.9 36.1	-56.5 -15.9 42.3	-56.5 -15.9 36.1
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING SATELLITE #2	-56.5 -15.9 36.1 9.0	-56.5 -15.9 42.3 9.0	-56.5 -15.9 36.1 9.0
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz)	-56.5 -15.9 36.1 9.0 1.86	-56.5 -15.9 42.3 9.0	-56.5 -15.9 36.1 9.0 1.86
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz)	-56.5 -15.9 36.1 9.0 1.86 25.7	-56.5 -15.9 42.3 9.0 1.86 25.7	-56.5 -15.9 36.1 9.0 1.86 25.7
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB)	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1	-56.5 -15.9 42.3 9.0 1.86 25.7 -56.5 -15.9 42.3	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB)	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9	-56.5 -15.9 42.3 9.0 1.86 25.7 -56.5 -15.9	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7	-56.5 -15.9 42.3 9.0 1.86 25.7 -56.5 -15.9 42.3 10.7	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBi) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) C/I ASI downlink (dB) C/N available per carrier (dB)	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 5.6	-56.5 -15.9 42.3 9.0 1.85 25.7 -56.5 -15.9 42.3 10.7 5.6	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI downlink (dB) C/I ASI downlink (dB) Total C/N C/I asilable per carrier (dB) Margin for other losses (dB)	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 5.6 1.1	-56.5 -15.9 42.3 9.0 1.86 25.7 -56.5 -15.9 42.3 10.7 5.6 1.1	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 4.7 1.1
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB) Margin for other losses (dB) C/N total (clear-sky, dB)	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 	-56.5 -15.9 42.3 9.0 1.86 25.7 -56.5 -15.9 42.3 10.7 5.6 1.1 4.5	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 4.7 1.1 3.6
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB) Margin for other losses (dB) C/N total (clear-sky, dB) PSD (EOC, dBW/Hz)	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 5.6 1.1 4.5 -62.5	-56.5 -15.9 42.3 9.0 1.86 25.7 -56.5 -15.9 42.3 10.7 5.6 1.1 4.5 -56.3	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 4.7 1.1 3.6 -62.5
Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L eirp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB) Margin for other losses (dB) C/N total (clear-sky, dB)	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 	-56.5 -15.9 42.3 9.0 1.86 25.7 -56.5 -15.9 42.3 10.7 5.6 1.1 4.5	-56.5 -15.9 36.1 9.0 1.86 25.7 -56.5 -15.9 36.1 10.7 4.7 1.1 3.6

- 1) Carrier modulation is QPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
- The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).

Satellite Information	Clear Sky	Up Fade	Dn Fade
Satellite Longitude (degrees)	-89.1	-89.1	-89.1
G/T (EOC, dB/K)	2.5	2.5	2.5
Attenuation setting (dB)	15.0	15.0	15.0
SFD (EOC, dBW/m2)	-79.2	-79.2	-79.2
Downlink EIRP (Beam Peak, dBW)	61.2	61.2	61.2
Carrier Information			
Emission Designation	100KG7W	100KG7W	100KG7W
Bits/Symbol	2	2	2
Info Rate + Overhead (Mblt/s)	0.07	0.07	0.07
Codec:	0.50	0.50	0.50
RS:	0.93	0.93	0.93
Noise Bandwidth (MHz)	0.075	0.075	0.075
C/N required (dB)	3.0	2.8	2.8
Transmit Earth Station			
Antenna Diameter (m)	6.0	6.0	6.0
Rain Rate (mm/hr)	41.9	41.9	41.9
Peak Antenna Gain (dBl)	63.6	63.6	63.6
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
Receive Earth Station	~4.0	-4.0	~4.0
	0.60	0.60	0.60
Antenna Diameter (m) Rain Rate (mmibr)	41.9	0.6D 41.9	41.9
Rain Rate (mm/hr)		41.9	
Peak Antenna Gain (dBl) D/Lamda	40.1	40.1 39.9	40.1
	39.9		39.9
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA_Sky) Noise Temp	150.0	150.0	150.0
Temperature due to rain fade and gases	20.7	20.7	151.6
G/T of ES (dB/K)	17.8	17.8	15.3
C/N Uplink Per Carrier			
Uplink EIRP per carrier (EOC, dBW)	49.8	56.0	49.8
Pathloss at uplink frequency (dB)	213.4	213.4	213.4
Uplink gazeous atttenuation (dB)	0.3	0.3	0.3
Uplink rain attenuation (dB)	0.0	6.3	0.0
Uplink control correction (dB)	0.0	6.2	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier input back-off (dB)	-33.5	-33.5	-33.5
C/N uplink, thermal (EOC, dB)	18.4	18.3	18.4
C/N Downlink Per Carrier			
Transponder BP saturation EIRP (dBW)	61.2	61.2	61.2
Per carrier output back-off (dB)	-28.4	-28.4	-28.4
Per carrier EIRP (EOC, dBW)	28.8	28.8	28.8
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathloss at downlink frequency (dB)	210.0	210.0	210.0
Downlink gazeous attenuation (dB)	0.3	0.3	0.3
Downlink rain attenuation (dB)	0.0	0.0	2.9
ES G/T (dB/K)	17.8	17.8	15.3
C/N downlink, thermal (EOC, dB)	15.6	15.6	10.3
C/I Other links (re-use, IM)	16.0	16.0	16.0
INTERFERING SATELLITE #1			
Orbital Separation (degrees)	1.74	1.74	1.74
G (AP-7) (dBl)	28.1	28.1	28.1
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-30.5	-30.5	-36.5
2 · · · ·	36.1	42.3	36.1
C/I ASI uplink (dB)			1
C/I ASI downlink (dB)	7.9	7.9	7.9
INTERFERING SATELLITE #2			
Orbital Separation (degrees)	1.85	1.85	1.85
G (AP-7) (dBl)	26.5	26.5	26.5
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	36.1	42.3	36.1
C/I ASI downlink (dB)	9.5	9.5	9.5
Total C/N			
C/N available per carrier (dB)	4.7	4.7	3.9
Margin for other losses (dB)	1.1	1.1	1.1
C/N total (clear-sky, dB)	3.6	3.6	2.8
PSD (EOC, dBW/Hz)	-62.5	-56.3	-62.5
ESD at beam peak (dBW/Hz)	-16.0	-16.0	-16.0

- 1) Carrier modulation is QPSK
- Carrier inodulation is Q15K
 Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
 The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).

Satellite information	Clear Sky	Up Fade	Dn Fade
Satellite Longitude (degrees)	-89.1	-89.1	-89.1
G/T (EOC, dB/K)	2.5	2.5	2.5
Attenuation setting (dB)	15.0	15.0	15.0
SFD (EOC, dBW/m2)	-79.2	-79.2	-79.2
Downlink EIRP (Beam Peak, dBW)	61.2	61.2	61.2
Carrier Information			
Emission Designation	1M45G7W	1M45G7W	1M45G7W
Bits/Symbol	1	1	1
Info Rate + Overhead (Mbit/s)	0.61	0.61	0.61
Codec:	0.50	0.50	0.50
RS:	1.00	1.00	1.00
Noise Bandwidth (MHz)	1.229	1.229	1.229
C/N required (dB)	3.4	2.7	2.7
Transmit Earth Station			
Antenna Diameter (m)	6.0	6.0	6.0
Rain Rate (mm/hr)	41.9	41.9	41.9
Peak Antenna Gain (dBi)	63.6	63.6	63.6
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
Receive Earth Station			
Antenna Diameter (m)	0.66	0.66	0.66
Rain Rate (mm/hr)	41.9	41.9	41.9
Peak Antenna Gain (dBi)	40.9	40.9	40.9
D/Lamda	43.9	43.9	43.9
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA_Sky) Noise Temp	150.0	150.0	150.0 151.6
Temperature due to rain fade and gases	20.7	20.7	
G/T of ES (dB/K) C/N Uplink Per Carrier	18.6	18.6	16.1
	59.5	65.7	59.5
Uplink EIRP per carrier (EOC, dBW) Pathloss at uplink frequency (dB)	213.4	213.4	213.4
Uplink gazeous attenuation (dB)	0.3	0.3	0.3
Uplink rain attenuation (dB)	0.0	6.3	0.0
Uplink control correction (dB)	0.0	6.2	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier input back-off (dB)	-23.8	-23.8	-23.8
C/N uplink, thermal (EOC, dB)	15.9	15.9	15.9
C/N Downlink Per Carrier	13.5	10.9	13.5
Transponder BP saturation EIRP (dBW)	61.2	61.2	61.2
Per carrier output back-off (dB)	-18.7	-18.7	-18.7
Per carrier EIRP (EOC, dBW)	38.5	38.5	38.5
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathioss at downlink frequency (dB)	210.0	210.0	210.0
Downlink gazeous attenuation (dB)	0.3	0.3	0.3
Downlink rain attenuation (dB)	0.0	0.0	2.9
ES G/T (dB/K)	18.6	18.6	16.1
C/N downlink, thermal (EOC, dB)	14.0	14.0	8.7
C/I Other links (re-use, IM)	16.0	16.0	16.0
INTERFERING SATELLITE #1			
Orbital Separation (degrees)	1.77	1.77	1.77
G (AP-7) (dBi)	25.9	25.9	25.9
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interlering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	33.6	39.8	33.6
C/I ASI downlink (dB)	8.6	8.6	8.6
INTERFERING SATELLITE #2			
Orbital Separation (degrees)	1.88	1.88	1.88
G (AP-7) (dBl)	23.9	23.9	23.9
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
C/I ASI uplink (dB)	33.6	39.8	33.6
C/I ASI downlink (dB)	10.5	10.5	10.5
Total C/N			
	4.9	4.9	3.8
C/N available per carrier (dB)			
Margin for other losses (dB)	1.1	1.1	1.1
Margin for other losses (dB) C/N total (clear-sky, dB)	1.1 3.8	3.8	2.7
Margin for other losses (dB) C/N total (clear-sky, dB) PSD (EOC, dBW/Hz)	1.1 3.8 -65.0	3.8 -58.8	2.7 -65.0
Margin for other losses (dB) C/N total (clear-sky, dB)	1.1 3.8	3.8	2.7

- 1) Carrier modulation is BPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
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Satellite Information	Clear Sky	Up Fade	Dn Fade
Satellite Longitude (degrees)	-89.1	-89.1	-89.1
G/T (EOC, dB/K)	2.5	2.5	2.5
Attenuation setting (dB)	15.0	15.0	15.0
SFD (EOC, dBW/m2)	-79.2	-79.2	-79.2
Downlink EIRP (Beam Peak, dBW)	61.2	61.2	61.2
Carrier Information			
Emission Designation	400KG7W	400KG7W	400KG7W
Bits/Symbol	1	1	1
Info Rate + Overhead (Mbit/s)	0.15	0.15	0.15
Codec:	0.50	0.50	0.50
RS: Noise Bandwidth (MHz)	1.00	1.00	1.00
()	0.307		0.307
C/N required (dB) Transmit Earth Station	3.4	2.7	2.7
Antenna Diameter (m)	0.7	0.7	0.7
Rain Rate (mm/hr)	41.9	41.9	41.9
Peak Antenna Gain (dBl)	44.4	41.9	44.4
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
Receive Earth Station	-4.0	4.5	4.5
Antenna Diameter (m)	6.00	6.00	6.00
Rain Rate (mm/hr)	41.9	41.9	41.9
Peak Antenna Gain (dBl)	60.1	60.1	60.1
D/Lamda	399.0	399.0	399.0
S/C Relative Gain from Peak towards E/S (dB)	-4.0	-4.0	-4.0
System (LNA_Sky) Noise Temp	150.0	150.0	150.0
Temperature due to rain fade and gases	20.7	20.7	151.6
G/T of ES (dB/K)	37.8	37.8	35.3
C/N Uplink Per Carrier			
Uplink EIRP per carrier (EOC, dBW)	42.8	49.0	42.8
Pathloss at uplink frequency (dB)	213.4	213.4	213.4
Uplink gazeous attenuation (dB)	0.3	0.3	0.3
Uplink rain attenuation (dB)	0.0	6.3	0.0
Uplink control correction (dB)	0.0	6.2	0.0
Gain of 1 m2 antenna (dB)	50.9	50.9	50.9
Per carrier input back-off (dB)	-40.6	-40.6	-40.6
C/N uplink, thermal (EOC, dB)	5.2	5.1	5.2
C/N Downlink Per Carrier			
Transponder BP saturation EIRP (dBW) Per carrier output back-off (dB)	61.2 -35.5	61.2 -35.5	61.2 -35.5
Per carrier EIRP (EOC, dBW)	21.7	-35.5	-35.5
Pointing Error (dB)	-0.5	-0.5	-0.5
Pathloss at downlink frequency (dB)	210.0	210.0	210.0
Downlink gazeous attenuation (dB)	0.3	0.3	0.3
Downlink rain attenuation (dB)	0.0	0.0	2.9
ES G/T (dB/K)	37.8	37.8	35.3
C/N downlink, thermal (EOC, dB)	22.5	22.5	17.1
C/I Other links (re-use, IM)	16.0	16.0	16.0
INTERFERING SATELLITE #1			
Orbital Separation (degrees)	2.05	2.05	2.05
G (AP-7) (dBi)	21.2	21.2	21.2
Interfering Uplink power density (dBW/Hz)	-56.5	-56.5	-56.5
Interfering D/L eirp density (dBW/Hz)	-15.9	-15.9	-15.9
Off A Office Park (AD)	22.9	29.1	22.9
C/I ASI uplink (dB)			
C/I ASI downlink (dB)	21.7	21.7	21.7
C/I ASI downlink (dB) INTERFERING SATELLITE #2		21.7	21.7
C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees)	21.7	2.16	2.16
C/I ASI downlink (dB) INTERFERING \$ATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI)	21.7 2.16 20.6	2.16 20.6	2.16 20.6
C/I ASI downlink (d5) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz)	21.7 2.16 20.6 -56.5	2.16 20.6 -56.5	2.16 20.6 -56.5
C/I ASI downlink (d5) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L elip density (dBW/Hz)	21.7 2.16 20.6 -56.5 -15.9	2.16 20.6 -56.5 -15.9	2.16 20.6 -56.5 -15.9
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBi) Interfering Uplink power density (dBW/Hz) Interfering D/L einp density (dBW/Hz) C/I ASI uplink (dB)	21.7 2.16 20.6 -56.5 -15.9 22.9	2.16 20.6 -56.5 -15.9 29.1	2.16 20.6 -56.5 -15.9 22.9
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBi) Interfering Uplink power density (dBW/Hz) Interfering D/L etrp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB)	21.7 2.16 20.6 -56.5 -15.9	2.16 20.6 -56.5 -15.9	2.16 20.6 -56.5 -15.9
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBi) Interfering Uplink power density (dBW/Hz) Interfering D/L einp density (dBW/Hz) C/I ASI downlink (dB) C/I ASI downlink (dB) Total C/N	21.7 2.16 20.6 -56.5 -15.9 22.9 22.3	2.16 20.6 -56.5 -15.9 29.1 22.3	2.16 20.6 -56.5 -15.9 22.9 22.3
C/I ASI downlink (d5) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L einp density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB)	21.7 2.16 20.6 -56.5 -15.9 22.9 22.3 4.5	2.16 20.6 -56.5 -15.9 29.1 22.3 4.5	2.16 20.6 -56.5 -15.9 22.9 22.3 4.3
C/I ASI downlink (d5) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L elip density (dBW/Hz) C/I ASI uplink (dB) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB) Margin for other losses (dB)	21.7 2.16 20.6 -66.5 -15.9 22.9 22.3 4.5 1.1	2.16 20.6 -56.5 -15.9 29.1 22.3 4.5 1.1	2.16 20.6 -56.5 -15.9 22.9 22.3 4.3 1.1
C/I ASI downlink (dB) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L elip density (dBW/Hz) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB) Margin for other losses (dB) C/N total (clear-sky, dB)	21.7 2.16 20.6 -56.5 -15.9 22.9 22.3 4.5 1.1 3.4	2.16 20.6 -56.5 -15.9 29.1 22.3 4.5 1.1 3.4	2.16 20.6 -56.5 -15.9 22.9 22.3 4.3 1.1 3.2
C/I ASI downlink (d5) INTERFERING SATELLITE #2 Orbital Separation (degrees) G (AP-7) (dBI) Interfering Uplink power density (dBW/Hz) Interfering D/L elip density (dBW/Hz) C/I ASI uplink (dB) C/I ASI uplink (dB) C/I ASI downlink (dB) Total C/N C/N available per carrier (dB) Margin for other losses (dB)	21.7 2.16 20.6 -66.5 -15.9 22.9 22.3 4.5 1.1	2.16 20.6 -56.5 -15.9 29.1 22.3 4.5 1.1	2.16 20.6 -56.5 -15.9 22.9 22.3 4.3 1.1

- 1) Carrier modulation is BPSK
- 2) Link calculations apply to all combinations of the Conus and South America uplink and downlink beams.
- 3) The orbital location listed for each adjacent satellite corresponds to the topocentric location corresponding to a 2 degree geocentric separation with respect to Galaxy Ka and incorporating 0.05 degrees of stationkeeping accuracy as well as 0.05 degrees of receive antenna mispointing towards one of the adjacent satellites (and 0.05 degree of mispointing away from the other adjacent satellite).