

EXHIBIT 4: Galaxy 9 Link Budgets

UPLINK BEAM INFORMATION					
Uplink Beam Name	Argentina	Argentina	Argentina	Argentina	Argentina
Uplink Frequency (MHz)	5925 – 6425	5925 – 6425	5925 – 6425	5925 – 6425	5925 – 6425
Uplink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical
Uplink Relative Contour Level (dB)	-6	-6	-6	-6	-6
Uplink Contour G/T (dB/K)	-2.6	-2.6	-2.6	-2.6	-2.6
Uplink SED (dBW/m ²)	-85.7	-85.7	-83.7	-85.7	85.7
DOWNLINK BEAM INFORMATION					
Downlink Beam Name	Argentina	Argentina	Argentina	Argentina	Argentina
Downlink Frequency (MHz)	3700 – 4200	3700 – 4200	3700 – 4200	3700 – 4200	3700 – 4200
Downlink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	-4	-4	-4	-4	-4
Downlink Contour EIRP (dBW)	36.8	36.8	36.8	36.8	36.8
ADJACENT SATELLITE 1					
Satellite 1 Orbital Location	79 WL	79 WL	79 WL	79 WL	79 WL
Uplink Power Density (dBW/Hz)	-45	-45	-45	-45	-45
Uplink Polarization Advantage (dB)	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-34	-34	-34	-34	-34
Downlink Polarization Advantage (dB)	0	0	0	0	0
ADJACENT SATELLITE 2					
Satellite 2 Orbital Location	83 WL	83 WL	83 WL	83 WL	83 WL
Uplink Power Density (dBW/Hz)	-45	-45	-45	-45	-45
Uplink Polarization Advantage (dB)	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-34	-34	-34	-34	-34
Downlink Polarization Advantage (dB)	0	0	0	0	0
CARRIER INFORMATION					
Carrier ID	36M0E3F	30M1G7W	6M7G7W	1M82G7W	75K4G7W
Information Rate (kbps)	N/A	36863	6000	1544	64
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a	n/a
Code Rate	N/A	3/4 - RS	1/2 - RS	1/2 - RS	1/2 - RS
Occupied Bandwidth (kHz)	36000	30133	6771.1	1819.2	75.4
Allocated Bandwidth (kHz)	36000	36000	10300	2325	100
Minimum C/N _{min} (dB)	10.0	6.1	3.9	3.0	3.0
UPLINK EARTH STATION					
Earth Station Diameter (meters)	8.1	8.1	8.1	8.1	8.1
Earth Station Gain (dBi)	52.8	52.8	52.8	52.8	52.8
Earth Station Elevation Angle	20	20	20	20	20
DOWNLINK EARTH STATION					
Earth Station Diameter (meters)	4.5	3.5	3.5	3.5	3.5
Earth Station Gain (dBi)	43.9	41.1	41.1	41.1	41.1
Earth Station G/T _{clear sky} (dB/K)	23.6	21.0	21.0	21.0	21.0
Earth Station Elevation Angle	20	20	20	20	20
UPLINK PERFORMANCE					
Uplink Earth Station EIRP (dBW)	77.2	77.2	63.9	57.3	43.5
Uplink Path Loss _{clear sky} (dB)	-200.2	-200.2	-200.2	-200.2	-200.2
Satellite G/T (dB/K)	-2.6	-2.6	-2.6	-2.6	-2.6
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-62.6	-48.8
Uplink C/N (dB)	27.4	28.2	21.4	20.5	20.5
DOWNLINK PERFORMANCE					
Downlink EIRP per Carrier (dBW)	36.8	36.8	26.9	20.3	6.4
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss _{clear sky} (dB)	-196.3	-196.3	-196.3	-196.3	-196.3
Earth Station G/T (dB/K)	23.6	21.0	21.0	21.0	21.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-62.6	-48.8
Downlink C/N (dB)	16.6	14.8	11.3	10.4	10.4
COMPOSITE LINK PERFORMANCE					
C/N Uplink (dB)	27.4	28.2	21.4	20.5	20.5
C/N Downlink (dB)	16.6	14.8	11.3	10.4	10.4
C/I Intermodulation (dB)	n/a	n/a	16.1	15.2	15.2
C/I Uplink Co-Channel (dB)*	27.0	27.0	27.1	27.0	26.8
C/I Downlink Co-Channel (dB)*	27.0	27.0	27.1	27.0	26.8
C/I Uplink Adjacent Satellite 1 (dB)	22.6	23.4	16.6	15.7	15.7
C/I Downlink Adjacent Satellite 1 (dB)	16.3	10.2	8.9	8.0	8.0
C/I Uplink Adjacent Satellite 2 (dB)	22.6	23.4	16.6	15.7	15.7
C/I Downlink Adjacent Satellite 2 (dB)	18.8	16.7	13.7	12.8	12.8
C/(N+I) Composite (dB)	11.3	8.0	4.9	4.0	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.3	7.0	3.9	3.0	3.0
Minimum Required C/N (dB)	-10.0	-6.1	-3.9	-3.0	-3.0
Excess Link Margin (dB)	0.3	0.8	0.0	0.0	0.0
CARRIER DENSITY LEVELS					
Uplink Power Density (dBW/Hz)	-41.6	-50.4	-57.2	-58.1	-58.1
Downlink EIRP Density At Beam Peak	-25.2	-34.0	-37.4	-38.3	-38.3
Number of Carriers	1.0	1.0	3.4	15.5	360.0

*The C/I level is adjusted depending on the signal level and transponder mode of operation

EXHIBIT 4: Galaxy 9 Link Budgets (continued)

UPLINK BEAM INFORMATION					
Uplink Beam Name	Argentina	Argentina	Argentina	Argentina	Argentina
Uplink Frequency (MHz)	5925 - 6425	5925 - 6425	5925 - 6425	5925 - 6425	5925 - 6425
Uplink Beam Polarization	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Uplink Relative Contour Level (dB)	-6	-6	-6	-6	-6
Uplink Contour G/T (dB/K)	-1.3	-1.3	-1.3	-1.3	-1.3
Uplink SED (dBW/m ²)	-87.0	-87.0	-87.0	-87.0	-87.0
DOWNLINK BEAM INFORMATION					
Downlink Beam Name	Argentina	Argentina	Argentina	Argentina	Argentina
Downlink Frequency (MHz)	3700 - 4200	3700 - 4200	3700 - 4200	3700 - 4200	3700 - 4200
Downlink Beam Polarization	Vertical	Vertical	Vertical	Vertical	Vertical
Downlink Relative Contour Level (dB)	-4	-4	-4	-4	-4
Downlink Contour EIRP (dBW)	38.0	38.0	38.0	38.0	38.0
ADJACENT SATELLITE 1					
Satellite 1 Orbital Location	79 WL	79 WL	79 WL	79 WL	79 WL
Uplink Power Density (dBW/Hz)	-45	-45	-45	-45	-45
Uplink Polarization Advantage (dB)	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-32.8	-32.8	-32.8	-32.8	-32.8
Downlink Polarization Advantage (dB)	0	0	0	0	0
ADJACENT SATELLITE 2					
Satellite 2 Orbital Location	83 WL	83 WL	83 WL	83 WL	83 WL
Uplink Power Density (dBW/Hz)	-45	-45	-45	-45	-45
Uplink Polarization Advantage (dB)	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-32.8	-32.8	-32.8	-32.8	-32.8
Downlink Polarization Advantage (dB)	0	0	0	0	0
CARRIER INFORMATION					
Carrier ID	36M0F3F	30M1G7W	6M77G7W	1M82G7W	75K4G7W
Information Rate (kbps)	N/A	36863	6000	1544	64
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a	n/a
Code Rate	N/A	3/4 - RS	1/2 - RS	1/2 - RS	1/2 - RS
Occupied Bandwidth (kHz)	36000	30133	6771.1	1819.2	75.4
Allocated Bandwidth (kHz)	36000	36000	10300	2325	100
Minimum C/N _{min} (dB)	10.0	6.1	3.9	3.0	3.0
UPLINK EARTH STATION					
Earth Station Diameter (meters)	8.1	8.1	8.1	8.1	8.1
Earth Station Gain (dBi)	52.8	52.8	52.8	52.8	52.8
Earth Station Elevation Angle	20	20	20	20	20
DOWNLINK EARTH STATION					
Earth Station Diameter (meters)	4.5	3.5	3.5	3.5	3.5
Earth Station Gain (dBi)	43.9	41.1	41.1	41.1	41.1
Earth Station G/T (dB/K)	23.6	21.0	21.0	21.0	21.0
Earth Station Elevation Angle	20	20	20	20	20
UPLINK PERFORMANCE					
Uplink Earth Station EIRP (dBW)	75.9	75.9	62.5	55.9	42.1
Uplink Path Loss, Clear Skv (dB)	-200.2	-200.2	-200.2	-200.2	-200.2
Satellite G/T (dB/K)	-1.3	-1.3	-1.3	-1.3	-1.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-62.6	-48.8
Uplink C/N (dB)	27.4	28.2	23.0	20.4	20.4
DOWNLINK PERFORMANCE					
Downlink EIRP per Carrier (dBW)	38.0	38.0	28.0	21.4	7.6
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Skv (dB)	-196.3	-196.3	-196.3	-196.3	-196.3
Earth Station G/T (dB/K)	23.6	21.0	21.0	21.0	21.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-62.6	-48.8
Downlink C/N (dB)	17.8	16.0	12.5	11.6	11.6
COMPOSITE LINK PERFORMANCE					
C/N Unlink (dB)	27.4	28.2	21.3	20.4	20.4
C/N Downlink (dB)	17.8	16.0	12.5	11.6	11.6
C/I Intermodulation (dB)	n/a	n/a	16.1	15.2	15.2
C/I Unlink Co-Channel (dB)*	27.0	27.0	27.1	26.9	26.8
C/I Downlink Co-Channel (dB)*	27.0	27.0	27.1	26.9	26.8
C/I Unlink Adjacent Satellite 1 (dB)	21.3	22.1	15.2	14.4	14.4
C/I Downlink Adjacent Satellite 1 (dB)	16.3	12.3	8.9	8.0	8.0
C/I Unlink Adjacent Satellite 2 (dB)	21.3	22.1	15.2	14.4	14.4
C/I Downlink Adjacent Satellite 2 (dB)	18.8	17.1	13.6	12.7	12.7
C/(N+I) Composite (dB)	11.3	9.2	4.9	4.0	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.3	8.2	3.9	3.0	3.0
Minimum Required C/N (dB)	-10.0	-6.1	-3.9	-3.0	-3.0
Excess Link Margin (dB)	0.9	2.3	0.0	0.0	0.0
CARRIER DENSITY LEVELS					
Uplink Power Density (dBW/Hz)	-42.9	-51.7	-58.6	-59.5	-59.5
Downlink EIRP Density At Beam Peak	-24.0	-32.8	-36.3	-37.2	-37.2
Number of Carriers	1.0	1.0	3.4	15.5	360

*The C/I level is adjusted depending on the signal level and transponder mode of operation