

EXHIBIT 5 : GALAXY-9 LINK BUDGETS

UPLINK BEAM INFORMATION		
Uplink Beam Name	CONUS	CONUS
Uplink Frequency (MHz)	6185	6185
Uplink Beam Polarization	Vertical	Vertical
Uplink Relative Contour Level (dB)	6	6
Uplink Contour G/T (dB/K)	-1.3	-1.3
Uplink SFD (dBW/m ²)	-87.0	-87.0
DOWNLINK BEAM INFORMATION		
Downlink Beam Name	CONUS	CONUS
Downlink Frequency (MHz)	3960	3960
Downlink Beam Polarization	Horizontal	Horizontal
Downlink Relative Contour Level (dB)	4	4
Downlink Contour EIRP (dBW)	38.0	38.0
ADJACENT SATELLITE 1		
Satellite 1 Orbital Location	89 WL	89 WL
Uplink Power Density (dBW/Hz)	-44	-44
Uplink Polarization Advantage (dB)	0	0
Downlink EIRP Density (dBW/Hz)	-31.5	-31.5
Downlink Polarization Advantage (dB)	0	0
ADJACENT SATELLITE 2		
Satellite 2 Orbital Location	93 WL	93 WL
Uplink Power Density (dBW/Hz)	-44	-44
Uplink Polarization Advantage (dB)	0	0
Downlink EIRP Density (dBW/Hz)	-32.5	-32.5
Downlink Polarization Advantage (dB)	0	0
CARRIER INFORMATION		
Carrier ID	36M0F3F	30M1G7W
Information Rate (kbps)	n/a	36863
Carrier Modulation	TV/FM	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a
Code Rate	n/a	3/4xRS
Occupied Bandwidth (kHz)	36000	30133
Allocated Bandwidth (kHz)	36000	36000
Minimum C/N, Rain (dB)	10	6.1
UPLINK EARTH STATION		
Earth Station Diameter (meters)	8.1	8.1
Earth Station Gain (dBi)	52.8	52.8
Earth Station Elevation Angle	20	20
DOWNLINK EARTH STATION		
Earth Station Diameter (meters)	6.1	3.5
Earth Station Gain (dBi)	46.5	41.1

Earth Station G/T, Clear Sky (dB/K)	26.2	21.0
Earth Station Elevation Angle	20	20
UPLINK PERFORMANCE		
Uplink Earth Station EIRP (dBW)	75.9	75.9
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2
Satellite G/T (dB/K)	-1.3	-1.3
Boltzman Constant (dBW/K-Hz)	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8
Uplink C/N (dB)	27.4	28.2
DOWNLINK PERFORMANCE		
Downlink EIRP per Carrier (dBW)	38.0	38.0
Antenna Pointing Error (dB)	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-196.4	-196.4
Earth Station G/T, Clear Sky (dB/K)	26.2	21.0
Boltzman Constant (dBW/K-Hz)	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8
Downlink C/N (dB)	20.4	16.0
COMPOSITE LINK PERFORMANCE		
C/N Uplink (dB)	27.4	28.2
C/N Downlink (dB)	20.4	16.0
C/I Intermodulation (dB)	n/a	n/a
C/I Uplink Co-Channel (dB)*	27.0	27.0
C/I Downlink Co-Channel (dB)*	27.0	27.0
C/I Uplink Adjacent Satellite 1 (dB)	19.8	20.5
C/I Downlink Adjacent Satellite 1 (dB)	17.3	9.1
C/I Uplink Adjacent Satellite 2 (dB)	20.9	21.7
C/I Downlink Adjacent Satellite 2 (dB)	21.4	17.3
C/(N+I) Composite (dB)	12.3	7.3
Required System Margin (dB)	-1.0	-1.0
Net C/(N+I) Composite (dB)	11.3	6.3
Minimum Required C/N (dB)	-10.0	-6.1
Excess Link Margin (dB)	1.3	0.1
Carrier Density Levels		
Uplink Power Density (dBW/Hz)	-42.9	-51.7
Downlink EIRP Density At Beam Peak (dBW/Hz)	-24.0	-32.8

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

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CONUS 6185 Vertical 6 -1.3 -85.0	CONUS 6185 Vertical 6 -1.3 -85.0	CONUS 6165 Horizontal 6 -2.6 -85.7	CONUS 6165 Horizontal 6 -2.6 -85.7	CONUS 6165 Horizontal 6 -2.6 -85.7
CONUS 3960 Horizontal 4 38.0	CONUS 3960 Horizontal 4 38.0	CONUS 3940 Vertical 4 36.8	CONUS 3940 Vertical 4 36.8	CONUS 3940 Vertical 4 36.8
89 WL -44 0 -31.5 0	89 WL -44 0 -31.5 0	89 WL -44 0 -31.5 0	89 WL -44 0 -31.5 0	89 WL -44 0 -31.5 0
93 WL -44 0 -32.5 0	93 WL -44 0 -32.5 0	93 WL -44 0 -32.5 0	93 WL -44 0 -32.5 0	93 WL -44 0 -32.5 0
7M00G7W 5706 QPSK n/a 1/2xRS 6997 9000 3.4	75K4G7W 64 QPSK n/a 1/2xRS 75.4 100 3.0	36M0F3F n/a TV/FM 4 n/a 36000 36000 10	30M1G7W 36863 QPSK n/a 3/4xRS 30133 36000 6.1	7M00G7W 5706 QPSK n/a 1/2xRS 6997 9000 3.4
8.1 52.8 20	8.1 52.8 20	8.1 52.8 20	8.1 52.8 20	8.1 52.8 20
3.5 41.1	3.5 41.1	6.1 46.5	3.7 41.2	3.7 41.2

21.0	21.0	26.2	20.9	20.9
20	20	20	20	20
65.6	45.6	77.2	77.2	64.9
-200.2	-200.2	-200.2	-200.2	-200.2
-1.3	-1.3	-2.6	-2.6	-2.6
228.6	228.6	228.6	228.6	228.6
-68.4	-48.8	-75.6	-74.8	-68.4
24.2	23.9	27.4	28.2	22.3
29.1	9.0	36.8	36.8	27.9
-0.5	-0.5	-0.5	-0.5	-0.5
-196.4	-196.4	-196.3	-196.3	-196.3
21.0	21.0	26.2	20.9	20.9
228.6	228.6	228.6	228.6	228.6
-68.4	-48.8	-75.6	-74.8	-68.4
13.4	13.0	19.2	14.7	12.1
24.2	23.9	27.4	28.2	22.3
13.4	13.0	19.2	14.7	12.1
17.0	16.6	n/a	n/a	17.0
28.7	28.2	27.0	27.0	28.7
28.7	28.2	27.0	27.0	28.7
16.6	16.2	21.1	21.8	15.9
6.5	6.2	16.1	9.9	7.3
17.7	17.3	22.2	23.0	17.0
14.7	14.4	20.1	16.1	13.5
4.4	4.0	11.8	7.5	4.4
-1.0	-1.0	-1.0	-1.0	-1.0
3.4	3.0	10.8	6.5	3.4
-3.4	-3.0	-10.0	-6.1	-3.4
0.0	0.0	0.8	0.4	0.0
-55.6	-56.0	-41.6	-50.4	-56.3
-35.3	-35.8	-25.2	-34.0	-36.5

CONUS
6165
Horizontal
6
-2.6
-85.7

CONUS
3940
Vertical
4
36.8

89 WL
-44
0
-31.5
0

93 WL
-44
0
-32.5
0

75K4G7W
64
QPSK
n/a
1/2xRS
75.4
100
3.0

8.1
52.8
20

3.7
41.2

20.9
20

44.9
-200.2
-2.6
228.6
-48.8
21.9

7.8
-0.5
-196.3
20.9
228.6
-48.8
11.7

21.9
11.7
16.6
28.2
28.2
15.5
6.9
16.6
13.1

4.0
-1.0
3.0
-3.0
0.0

-56.7
-37.0