

## EXHIBIT 4: GALAXY 12 LINK BUDGETS

<b>UPLINK BEAM INFORMATION</b>				
Uplink Beam Name	CONUS	CONUS	CONUS	CONUS
Uplink Frequency (MHz)	5925 - 6425	5925 - 6425	5925 - 6425	5925 - 6425
Uplink Beam Polarization	Vertical / Horizontal	Vertical / Horizontal	Vertical / Horizontal	Vertical / Horizontal
Uplink Relative Contour Level (dB)	-4	-4	-4	-4
Uplink Contour G/T (dB/K)	-0.5	-0.5	-0.5	-0.5
Uplink SFD (dBW/m <sup>2</sup> )	-89.5	-89.5	-93.5	-93.5
<b>DOWNLINK BEAM INFORMATION</b>				
Downlink Beam Name	CONUS	CONUS	CONUS	CONUS
Downlink Frequency (MHz)	3700 - 4200	3700 - 4200	3700 - 4200	3700 - 4200
Downlink Beam Polarization	Horizontal / Vertical	Horizontal / Vertical	Horizontal / Vertical	Horizontal / Vertical
Downlink Relative Contour Level (dB)	-4	-4	-4	-4
Downlink Contour EIRP (dBW)	39.4	40.2	40.2	40.2
<b>ADJACENT SATELLITE 1</b>				
Satellite 1 Orbital Location	125 WL	125 WL	125 WL	125 WL
Uplink Power Density (dBW/Hz)	-47.5	-47.5	-47.5	-47.5
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-31.4	-31.4	-31.4	-31.4
Downlink Polarization Advantage (dB)	0	0	0	0
<b>ADJACENT SATELLITE 2</b>				
Satellite 2 Orbital Location	121 WL	121 WL	121 WL	121 WL
Uplink Power Density (dBW/Hz)	-44.2	-44.2	-44.2	-44.2
Uplink Polarization Advantage (dB)	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-32.5	-32.5	-32.5	-32.5
Downlink Polarization Advantage (dB)	0	0	0	0
<b>CARRIER INFORMATION</b>				
Carrier ID	36M0F3F	30M1G7W	6M77G7W	75K4G7W
Information Rate (kbps)	n/a	32767	6000	64
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	n/a	n/a	n/a
Code Rate	n/a	1/2xRS	1/2xRS	1/2xRS
Occupied Bandwidth (kHz)	36000	30133	6771.1	75.4
Allocated Bandwidth (kHz)	36000	36000	10300	100
Minimum C/N, Rain (dB)	10	5.1	3.9	3.0
<b>UPLINK EARTH STATION</b>				
Earth Station Diameter (meters)	6.1	6.1	6.1	6.1
Earth Station Gain (dBi)	49.4	49.4	49.4	49.4
Earth Station Elevation Angle	20	20	20	20
<b>DOWNLINK EARTH STATION</b>				
Earth Station Diameter (meters)	4.5	3.0	3.0	3.0
Earth Station Gain (dBi)	43.9	39.7	39.7	39.7
Earth Station G/T, Clear Sky (dB/K)	23.6	19.2	19.2	19.2
Earth Station Elevation Angle	20	20	20	20
<b>UPLINK PERFORMANCE</b>				
Uplink Earth Station EIRP (dBW)	73.4	73.4	60.7	40.3
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2
Satellite G/T (dB/K)	-0.5	-0.5	-0.5	-0.5
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Uplink C/N (dB)	25.7	26.5	20.3	19.4
<b>DOWNLINK PERFORMANCE</b>				
Downlink EIRP per Carrier (dBW)	39.4	40.2	33.0	12.6
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3
Earth Station G/T, Clear Sky (dB/K)	23.6	19.2	19.2	19.2
Boltzman Constant (dBW/K-Hz)	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-74.8	-68.3	-48.8
Downlink C/N (dB)	19.2	16.4	15.7	14.8
<b>COMPOSITE LINK PERFORMANCE</b>				
C/N Uplink (dB)	25.7	26.5	20.3	19.4
C/N Downlink (dB)	19.2	16.4	15.7	14.8
C/I Intermodulation (dB)	n/a	n/a	20.8	19.9
C/I Uplink Co-Channel (dB)*	24.0	24.0	25.8	25.5
C/I Downlink Co-Channel (dB)*	24.0	24.0	25.8	25.5
C/I Uplink Adjacent Satellite 1 (dB)	23.9	24.7	18.5	17.6
C/I Downlink Adjacent Satellite 1 (dB)	19.3	17.2	16.5	15.7
C/I Uplink Adjacent Satellite 2 (dB)	19.5	20.2	14.0	13.2
C/I Downlink Adjacent Satellite 2 (dB)	16.7	7.7	7.0	6.1
C/(N+I) Composite (dB)	11.5	6.3	4.9	4.0
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	10.5	5.3	3.9	3.0
Minimum Required C/N (dB)	-10.0	-5.1	-3.9	-3.0
Excess Link Margin (dB)	0.5	0.2	0.0	0.0
<b>Carrier Density Levels</b>				
Number of Carriers	1.0	1.0	2.3	256.0
Uplink Power Density (dBW/Hz)	-42.0	-50.8	-57.0	-57.9
Downlink EIRP Density At Beam Peak (dBW/Hz)	-22.6	-30.6	-31.3	-32.2

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