

Table A.13-1 – Representative Link Budget

EchoStar Extended Ku-Band Link Budget (DTH Link)				
Link Parameters		Clear Sky (New York)	Faded D/L (New York)	Faded D/L (Los Angeles)
Link Geometry:				
Tx E/S Range to Satellite	(km)	37,810	37,810	37,810
Rx E/S Range to Satellite	(km)	39,251	39,251	37,056
Uplink (per carrier):				
Carrier Frequency	(MHz)	13,900	13,900	13,900
Tx E/S Antenna Diameter	(m)	11.0	11.0	11.0
Tx E/S Power to Antenna	(dBW)	13	13	13
Tx E/S Antenna Gain	(dB)	62.2	62.2	62.2
Tx E/S EIRP per Carrier	(dBW)	75.2	75.2	75.2
Atmospheric and Other Losses	(dB)	0.3	0.3	0.3
Free Space Loss	(dB)	206.9	206.9	206.9
Satellite:				
Gain Attenuation	(dB)	10.0	10.0	10.0
Equivalent G/T towards Tx E/S	(dB/K)	6.4	6.4	6.4
Sat'd EIRP	(dBW)	50.3	50.3	50.3
EIRP towards Rx E/S	(dBW)	48.3	48.3	48.3
Downlink (per carrier):				
Carrier Frequency	(MHz)	11,000	11,000	11,000
Atmospheric and Other Losses	(dB)	0.1	3.8	2.1
Free Space Loss	(dB)	205.1	205.1	204.6
Rx E/S Antenna Diameter	(m)	0.90	0.90	0.90
Antenna Mis-pointing Error	(dB)	0.50	0.50	0.50
Rx E/S Antenna Gain	(dB)	38.4	38.4	38.4
Rx E/S G/T	(dB/K)	17.4	13.9	14.9
System (LNA+Sky) Noise Temp.	(K)	128	285	227
Total Link:				
Carrier Noise Bandwidth	(kHz)	27,000	27,000	27,000
(C/N) - Thermal Uplink	(dB)	28.8	28.8	28.8
(C/N) - Thermal Downlink	(dB)	14.2	7.0	10.2
(C/I) - Adjacent Satellite Interference	(dB)	14.0	14.0	14.0
(C/I) - Other Link Degradations	(dB)	22.0	22.0	22.0
(C/N) - Total Actual	(dB)	10.7	6.1	8.5
(C/N) - Total Required	(dB)	6.0	6.0	6.0
Excess Margin	(dB)	4.7	0.1	2.5
Availability	(%)	N/A	99.95	99.99