

EchoStar 17/24 GHz Link Budget

Link Parameters		Clear Sky (Mexico City)	Faded D/L (Mexico City)
Link Geometry:			
Tx E/S Range to Satellite (Cheyenne)	(km)	37,590	37,590
Rx E/S Range to Satellite	(km)	36,271	36,271
Uplink:			
Carrier Frequency	(MHz)	25,000	25,000
Tx E/S Antenna Diameter	(m)	12.0	12.0
Tx E/S Power to Antenna	(W)	4.7	4.7
Tx E/S Power Density to Antenna	(dBW/MHz)	-6.5	-6.5
Tx E/S Antenna Gain	(dB)	68.2	68.2
Tx E/S EIRP per Carrier	(dBW)	74.9	74.9
Atmospheric and Other Losses	(dB)	0.5	0.5
Free Space Loss	(dB)	211.9	211.9
Satellite:			
G/T towards Tx E/S	(dB/K)	10.3	10.3
EIRP per Carrier towards Rx E/S	(dBW)	55.9	55.9
Downlink:			
Carrier Frequency	(MHz)	17,500	17,500
Atmospheric and Other Losses	(dB)	0.1	5.5
Free Space Loss	(dB)	208.5	208.5
Rx E/S Antenna Diameter	(m)	0.45	0.45
Rx E/S Antenna Gain	(dB)	36.1	36.1
Pointing Error	(dB)	0.5	0.5
Rx E/S G/T	(dB/K)	13.1	10.2
System (LNA+Sky) Noise Temperature	(K)	200	392
Total Link:			
Bandwidth	(dB-Hz)	73.20	73.20
C/N - Thermal Uplink	(dB)	28.2	28.2
C/N - Thermal Downlink	(dB)	15.3	7.0
C/I - Aggregate uplink ASI	(dB)	37.0	37.0
C/I - Aggregate downlink ASI	(dB)	16.5	16.5
C/I - Other Link Degradations	(dB)	20.0	20.0
C/(N+I) - Total, Actual	(dB)	12.0	6.3
C/(N+I) - Total, Required	(dB)	4.8	4.8
Excess Margin	(dB)	7.2	1.5
Availability	(%)	N/A	99.98
Aggregate Interference Assessment:			
(C/N) - no ASI	(dB)	13.9	6.7
Degradation due to aggregate ASI	(dB)	1.9	0.4