

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)	38,245	38,245
Rx E/S Range to Satellite (km)	36,767	36,767
Uplink:		
Carrier Frequency (MHz)	25,000	25,000
Tx E/S Antenna Diameter (m)	12.0	12.0
Max. Tx E/S Power to Antenna (W)	4.7	4.7
Max. Tx E/S Power Density to Antenna (dBW/MHz)	-6.9	-6.9
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)	212.1	212.1
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	3.0
Free Space Loss (dB)	208.6	208.6
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	10.9
System (LNA+Sky) Noise Temperature (K)	200	332
Total Link:		
Bandwidth (dB-Hz)	73.60	73.60
C/N - Thermal Uplink (dB)	27.6	27.6
C/N - Thermal Downlink (dB)	14.8	9.7
C/I - Aggregate uplink ASI (dB)	37.3	37.3
C/I - Aggregate downlink ASI (dB)	16.8	16.8
C/I - Other Link Degradations (dB)	20.0	20.0
C/(N+I) - Total, Actual (dB)	11.8	8.5
C/(N+I) - Total, Required (dB)	7.5	7.5
Excess Margin (dB)	4.3	1.0
Availability (%)	N/A	99.90
Aggregate Interference Assessment:		
(C/N) - no ASI (dB)	13.5	9.2
Degradation due to aggregate ASI (dB)	1.7	0.7