

EchoStar 17/24 GHz Link Budget

Link Parameters		Clear Sky (New York)	Faded D/L (New York)	Clear Sky (Los Angeles)	Faded D/L (Los Angeles)
Link Geometry:					
Tx E/S Range to Satellite (Cheyenne)	(km)	37,590	37,590	37,590	37,590
Rx E/S Range to Satellite	(km)	38,421	38,421	37,155	37,155
Uplink:					
Carrier Frequency	(MHz)	25,000	25,000	25,000	25,000
Tx E/S Antenna Diameter	(m)	12.0	12.0	12.0	12.0
Max. Tx E/S Power to Antenna	(W)	4.7	4.7	4.7	4.7
Max. Tx E/S Power Density to Antenna	(dBW/MHz)	-6.9	-6.9	-6.9	-6.9
Tx E/S Antenna Gain	(dB)	68.2	68.2	68.2	68.2
Tx E/S EIRP per Carrier	(dBW)	74.9	74.9	74.9	74.9
Atmospheric and Other Losses	(dB)	0.5	0.5	0.5	0.5
Free Space Loss	(dB)	211.9	211.9	211.9	211.9
Satellite:					
G/T towards Tx E/S	(dB/K)	10.3	10.3	10.3	10.3
EIRP per Carrier towards Rx E/S	(dBW)	54.6	54.6	53.4	53.4
Downlink:					
Carrier Frequency	(MHz)	17,500	17,500	17,500	17,500
Atmospheric and Other Losses	(dB)	0.2	2.7	0.1	1.8
Free Space Loss	(dB)	209.0	209.0	208.7	208.7
Rx E/S Antenna Diameter	(m)	0.45	0.45	0.45	0.45
Rx E/S Antenna Gain	(dB)	36.1	36.1	36.1	36.1
Pointing Error	(dB)	0.5	0.5	0.5	0.5
Rx E/S G/T	(dB/K)	13.1	11.0	13.1	11.6
System (LNA+Sky) Noise Temperature	(K)	200	323	200	284
Total Link:					
Bandwidth	(dB-Hz)	73.60	73.60	73.60	73.60
C/N - Thermal Uplink	(dB)	27.8	27.8	27.8	27.8
C/N - Thermal Downlink	(dB)	13.0	8.4	12.2	9.0
C/I - Aggregate uplink ASI	(dB)	36.6	36.6	36.6	36.6
C/I - Aggregate downlink ASI	(dB)	17.3	17.3	19.4	19.4
C/I - Other Link Degradations	(dB)	20.0	20.0	20.0	20.0
C/(N+I) - Total, Actual	(dB)	10.9	7.6	10.8	8.2
C/(N+I) - Total, Required	(dB)	7.5	7.5	7.5	7.5
Excess Margin	(dB)	3.4	0.1	3.3	0.7
Availability	(%)	N/A	99.55	N/A	99.75
Aggregate Interference Assessment:					
(C/N) - no ASI	(dB)	12.1	8.1	11.4	8.6
Degradation due to aggregate ASI	(dB)	1.2	0.5	0.7	0.4