

Table 15-1: Normal Mode Link Budget

EchoStar-5 DBS Link Budget				
(Normal Mode)				
Link Parameters		Clear Sky (Los Angeles)	Faded D/L (Los Angeles)	Faded D/L (Chicago)
Link Geometry:				
Tx E/S Range to Satellite (Cheyenne)	(km)	38,068	38,068	38,068
Rx E/S Range to Satellite	(km)	37,148	37,148	38,719
Uplink (per carrier):				
Carrier Frequency	(MHz)	17,500	17,500	17,500
Tx E/S Antenna Diameter	(m)	13.2	13.2	13.2
Tx E/S Power to Antenna	(dBW)	15.0	15.0	15.0
Tx E/S Antenna Gain	(dB)	65.0	65.0	65.0
Tx E/S EIRP per Carrier	(dBW)	80.0	80.0	80.0
Atmospheric and Other Losses	(dB)	0.4	0.4	0.4
Free Space Loss	(dB)	208.9	208.9	208.9
Satellite:				
G/T towards Tx E/S	(dB/K)	3.1	3.1	3.1
Sat'd EIRP	(dBW)	52.1	52.1	52.1
EIRP towards Rx E/S	(dBW)	47.0	47.0	50.3
Downlink (per carrier):				
Carrier Frequency	(MHz)	12,500	12,500	12,500
Atmospheric and Rain Losses	(dB)	0.1	1.1	2.7
Free Space Loss	(dB)	205.8	205.8	206.1
Rx E/S Antenna Diameter	(m)	0.45	0.45	0.45
Antenna Mis-pointing Error	(dB)	0.30	0.30	0.30
Rx E/S Antenna Gain	(dB)	34.0	34.0	34.0
Rx E/S G/T	(dB/K)	12.7	11.4	9.9
System (LNA+Sky) Noise Temp.	(K)	133	181	253
Total Link:				
Noise Bandwidth	(dB-Hz)	73.2	73.2	73.2
(C/N) - Thermal Uplink	(dB)	29.2	29.2	29.2
(C/N) - Thermal Downlink	(dB)	9.0	6.6	6.5
(C/I) - Adjacent Satellite Interference	(dB)	18.2	18.2	21.1
(C/I) - Other Link Degradations	(dB)	22.9	22.9	22.9
(C/N) - Total Actual	(dB)	8.3	6.2	6.2
(C/N) - Total Required	(dB)	6.1	6.1	6.1
Excess Margin	(dB)	2.2	0.1	0.1
Availability	(%)	N/A	99.92	99.86