AMC-14 DBS Link Budget

Link Parameters		(Normal Mode) Clear Sky (New York)	(Normal Mode) Faded D/L (New York)	(Normal Mode) Faded D/L (Miami)	(High-Powered Mode) Clear Sky (New York)	(High-Powered Mode) Faded D/L (New York)	(High-Powered Mode) Faded D/L (Miami)
Link Geometry:							
Tx E/S Range to Satellite (Cheyenne)	(km)	39,033	39,033	39,033	39,033	39,033	39,033
Rx E/S Range to Satellite	(km)	37,686	37,686	36,882	37,686	37,686	36,882
Uplink (per carrier):							
Carrier Frequency	(MHz)	17,500	17,500	17,500	17,500	17,500	17,500
Tx E/S Antenna Diameter	(m)	13.2	13.2	13.2	13.2	13.2	13.2
Tx E/S Power to Antenna	(dBW)	9.2	9.2	9.2	9.2	9.2	9.2
Tx E/S Antenna Gain	(dB)	65.8	65.8	65.8	65.8	65.8	65.8
Tx E/S EIRP per Carrier	(dBW)	75.0	75.0	75.0	75.0	75.0	75.0
Atmospheric and Other Losses	(dB)	0.3	0.3	0.3	0.3	0.3	0.3
Free Space Loss	(dB)	209.1	209.1	209.1	209.1	209.1	209.1
Satellite:							
G/T towards Tx E/S	(dB/K)	7.6	7.6	7.6	7.6	7.6	7.6
Sat'd EIRP	(dBW)	55.7	55.7	55.7	58.4	58.4	58.4
EIRP towards Rx E/S	(dBW)	53.1	53.1	53.7	55.8	55.8	56.4
Downlink (per carrier):							
Carrier Frequency	(MHz)	12,500	12,500	12,500	12,500	12,500	12,500
Atmospheric and Rain Losses	(dB)	0.1	4.2	5.1	0.1	5.8	7.1
Free Space Loss	(dB)	205.9	205.9	205.7	205.9	205.9	205.7
Rx E/S Antenna Diameter	(m)	0.45	0.45	0.45	0.45	0.45	0.45
Antenna Mis-pointing Error	(dB)	0.50	0.50	0.50	0.50	0.50	0.50
Rx E/S Antenna Gain	(dB)	34.0	34.0	34.0	34.0	34.0	34.0
Rx E/S G/T	(dB/K)	13.2	9.4	9.1	13.2	8.9	8.7
System (LNA+Sky) Noise Temp.	(K)	120	288	307	120	321	339
Total Link:							
Noise Bandwidth	(dB-Hz)	73.2	73.2	73.2	73.2	73.2	73.2
(C/N) - Thermal Uplink	(dB)	28.6	28.6	28.6	28.6	28.6	28.6
(C/N) - Thermal Downlink	(dB)	15.2	7.3	6.9	17.9	7.9	7.2
(C/I) - Adjacent Satellite Interference	(dB)	24.0	24.0	24.8	26.7	26.7	27.5
(C/I) - Other Link Degradations	(dB)	22.9	22.9	22.9	22.9	22.9	22.9
(C/N) - Total Actual	(dB)	13.9	7.0	6.7	16.0	7.7	7.0
(C/N) - Total Required	(dB)	6.6	6.6	6.6	6.6	6.6	6.6
Excess Margin	(dB)	7.3	0.4	0.1	9.4	1.1	0.4
Availability	(%)	N/A	99.96	99.90	N/A	99.98	99.95