

Table A.13-1 – Link Budget for 24 MHz carrier. (24M0G7W)

Representative Link Budget			
Link Parameters		Clear Sky	Faded D/L
Carrier:			
Uncoded Data Rate	(kbps)	27647.0	27647.0
Modulation		QPSK	QPSK
FEC		0.691	0.691
Carrier Bandwidth	(MHz)	24.0	24.0
Link Geometry:			
Tx E/S Range to Satellite (Honolulu beam)	(km)	37,646	37,646
Rx E/S Range to Satellite (Phoenix beam)	(km)	37,078	37,078
Uplink (per carrier):			
Carrier Frequency	(MHz)	29,400	29,400
Tx E/S Antenna Diameter	(m)	2.4	2.4
Tx E/S Power to Antenna	(dBW)	17.0	17.0
Tx E/S Antenna Gain	(dB)	55.5	55.5
Tx E/S EIRP per Carrier	(dBW)	72.5	72.5
Atmospheric and Other Losses	(dB)	0.3	0.3
Free Space Loss	(dB)	213.3	213.3
Satellite:			
G/T towards Tx E/S	(dB/K)	3.3	3.3
Satellite EIRP (-3 dB Contour)	(dBW)	44.6	44.6
Downlink (per carrier):			
Carrier Frequency	(MHz)	18,400	18,400
Atmospheric and Rain Losses	(dB)	0.2	7.6
Free Space Loss	(dB)	209.1	209.1
Rx E/S Antenna Diameter	(m)	2.40	2.40
Antenna Mis-pointing Error	(dB)	0.50	0.50
Rx E/S Antenna Gain	(dB)	51.4	51.4
Rx E/S G/T	(dB/K)	28.4	25.1
System (LNA+Sky) Noise Temperature	(K)	200	426
Total Link:			
(C/N) - Thermal Uplink	(dB)	17.0	17.0
(C/N) - Thermal Downlink	(dB)	18.0	7.3
(C/I) - Intra-system	(dB)	18.0	18.0
(C/I) up - Adjacent Satellite Interference	(dB)	31.2	31.2
(C/I) dn - Adjacent Satellite Interference	(dB)	16.3	16.3
(C/N) - Total Actual	(dB)	11.2	6.1
(C/N) - Total Required	(dB)	6.1	6.1
Excess Margin	(dB)	5.1	0.0
Availability	(%)	N/A	99.97