

Table A.13-2 –Link Budget for 72 MHz carrier. (72M0G7W)

Representative Link Budget			
Link Parameters		Clear Sky	Faded D/L
Carrier:			
Uncoded Data Rate	(kbps)	82942.0	82942.0
Modulation		QPSK	QPSK
FEC		0.691	0.691
Carrier Bandwidth	(MHz)	72.0	72.0
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)	4.5	4.5
Tx E/S Power to Antenna	(dBW)	19.0	19.0
Tx E/S Antenna Gain	(dB)	61.0	61.0
Tx E/S EIRP per Carrier	(dBW)	80.0	80.0
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)	50.6	50.6
Downlink (per carrier):			
Carrier Frequency	(MHz)	18,400	18,400
Atmospheric and Rain Losses	(dB)	0.2	6.7
Free Space Loss	(dB)	209.1	209.1
Rx E/S Antenna Diameter	(m)	1.80	1.80
Antenna Mis-pointing Error	(dB)	0.50	0.50
Rx E/S Antenna Gain	(dB)	48.9	48.9
Rx E/S G/T	(dB/K)	25.9	22.8
System (LNA+Sky) Noise Temperature	(K)	200	414
Total Link:			
(C/N) - Thermal Uplink	(dB)	19.7	19.7
(C/N) - Thermal Downlink	(dB)	16.7	7.1
(C/I) - Intra-system	(dB)	20.0	20.0
(C/I) up - Adjacent Satellite Interference	(dB)	33.9	33.9
(C/I) dn - Adjacent Satellite Interference	(dB)	15.0	15.0
(C/N) - Total Actual	(dB)	11.3	6.1
(C/N) - Total Required	(dB)	6.1	6.1
Excess Margin	(dB)	5.2	0.0
Availability	(%)	N/A	99.96