

**Table 7 – Link Budget for Voice-Rate Return Link from
Handheld User Terminal using FDMA**

Representative Return Link Budget		
UT Type		Handheld Terminal
Carrier Type		FDMA
<u>General Parameters</u>	Unit	
E/S elevation angle	deg	28.0
Minimum user elevation angle	deg	20.0
Uplink range	km	39554
Downlink range	km	38792
Uplink frequency	GHz	2.020
Downlink frequency	GHz	19.700
Bandwidth/carrier	kHz	8.0
<u>Uplink</u>		
Uplink EIRP	dBW	0.0
Free space loss	dB	190.5
Atmospheric loss	dB	0.1
Uplink propagation margin	dB	11.9
Effective satellite antenna gain	dB _i	43.0
Satellite receive system noise temperature	dB-K	26.0
Effective satellite antenna G/T	dB/K	17.0
Uplink C/N ₀	dBHz	43.1
Uplink C/I ₀ Intra-system	dBHz	48.2
Uplink C/I _{0 ext}	dBHz	53.1
Aggregate uplink C/I ₀	dBHz	47.0
<u>Downlink</u>		
Satellite EIRP	dBW	8.5
Free space loss	dB	210.1
Atmospheric attenuation	dB	0.5
Rain attenuation	dB	8.1
E/S antenna gain	dB	64.5
E/S antenna pointing error	dB	0.3
Nominal system noise temperature	dB-K	23.9
Nominal E/S G/T	dB/K	40.3
System noise temperature degradation in rain	dB	2.6
Rain-degraded system noise temperature	dB-K	26.5
Rain-degraded E/S G/T	dB/K	37.7
Downlink C/No	dBHz	56.1
Downlink C/IM ₀	dBHz	64.7
Downlink C/I ₀ Intra-system	dBHz	60.5
Downlink C/I _{0 ASI}	dBHz	62.7
Aggregate downlink C/I ₀	dBHz	58.4
<u>End-to-End Performance</u>		
End-to-end C/N ₀	dBHz	42.9
End-to-end aggregate C/I ₀	dBHz	46.7
End-to-end C/IM ₀	dBHz	64.7
Total aggregate C/(N ₀ +I ₀ +IM ₀)	dBHz	41.4
Total aggregate C/(N+I+IM)	dB	2.3
Required C/N	dB	2.3
System Margin	dB	0.0