

**Table A.13-7 – Link Budget for Voice-Rate Return Link from  
Handheld User Terminal using FDMA**

<b>Representative Return Link Budget</b>		
UT Type		Handheld Terminal
Carrier Type		FDMA
<b><u>General Parameters</u></b>	<b>Unit</b>	
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
<b><u>Uplink</u></b>		
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 <sub>i</sub>	43.0
Satellite receive system noise temperature	dB-K	26.0
Effective satellite antenna G/T	dB/K	17.0
Uplink C/N <sub>o</sub>	dBHz	43.1
Uplink C/I <sub>o</sub> Intra-system	dBHz	48.2
Uplink C/I <sub>o</sub> ext	dBHz	53.1
Aggregate uplink C/I <sub>o</sub>	dBHz	47.0
<b><u>Downlink</u></b>		
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/N <sub>o</sub>	dBHz	56.1
Downlink C/IM <sub>o</sub>	dBHz	64.7
Downlink C/I <sub>o</sub> Intra-system	dBHz	60.5
Downlink C/I <sub>o</sub> ASI	dBHz	63.7
Aggregate downlink C/I <sub>o</sub>	dBHz	58.8
<b><u>End-to-End Performance</u></b>		
End-to-end C/N <sub>o</sub>	dBHz	42.9
End-to-end aggregate C/I <sub>o</sub>	dBHz	46.7
End-to-end C/IM <sub>o</sub>	dBHz	64.7
Total aggregate C/(N <sub>o</sub> +I <sub>o</sub> +IM <sub>o</sub> )	dBHz	41.4
Total aggregate C/(N+I+IM)	dB	2.3
Required C/N	dB	2.3
System Margin	dB	0.0