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

Representative Return Link Budget		
UT Type		Handheld Terminal
Carrier Type		FDMA
General Parameters	**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
Uplink		
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	dBi	43.0
Satellite receive system noise temperature	dB-K	26.0
Effective satellite antenna G/T	dB/K	17.0
Uplink C/N_o	dBHz	43.1
Uplink $C/I_{o\ \text{Intra-system}}$	dBHz	48.2
Uplink $C/I_{o\ \text{ext}}$	dBHz	53.1
Aggregate uplink C/I_o	dBHz	47.0
Downlink		
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_o	dBHz	64.7
Downlink $C/I_{o\ \text{Intra-system}}$	dBHz	60.5
Downlink $C/I_{o\ \text{ASI}}$	dBHz	63.7
Aggregate downlink C/I_o	dBHz	58.8
End-to-End Performance		
End-to-end C/N_o	dBHz	42.9
End-to-end aggregate C/I_o	dBHz	46.7
End-to-end C/IM_o	dBHz	64.7
Total aggregate $C/(N_o+I_o+IM_o)$	dBHz	41.4
Total aggregate C/(N+I+IM)	dB	2.3
Required C/N	dB	2.3
System Margin	dB	0.0