INM-KA RETURN LINK BUDGET (COMMS. HCP)

General		Unit	
	User terminal type	-	Test return carrier GW-GW (HCP)
	Carrier designator	-	4M78G7W (TEST-R6)
	Data rate (kbps)	(kbps)	6366
	Coding rate	-	2/3
	Modulation	-	8PSK
	Occupied bandwidth	(kHz)	3981.1
	Allocated bandwidth	(kHz)	4777.3
Uplink			
	Beam		User-Spot (HCP)
	Frequency	(GHz)	29.25
	EIRP	(dBW)	59.5
	Antenna tx gain	dBi	*69.1*
	Uplink power	(dBW)	-9.6
	Uplink p.s.d.	*(dBW/Hz)*	*-75.6*
	Path loss	(dB)	213.5
	Rain loss	(dB)	7.0
	Mean Atmospheric loss	(dB)	1.7
	Satellite G/T (EOC)	(dB/K)	11.0
	Up-path C/No	(dBHz)	76.7
	Up-path C/N	(dB)	10.7
Downlink			
	Beam		Feeder
	Frequency	(GHz)	18
	Max pfd per crx @ earth surface(beam peak)	*(dBW/m2/1MHz)*	*-135.9*
	Beam Peak to Edge of Coverage	(dB)	3.0
	Max pfd per crx @ earth surface(EOC)	*(dBW/m2/1MHz)*	*-138.9*
	Satellite EIRP (EOC)	(dBW)	29.1
	Path loss	(dB)	209.3
	Rain loss	(dB)	5.6
	Mean Atmospheric loss	(dB)	0.7
	Earth Station G/T	(dB/K)	42.0
	G/T degradation due to rain	(dB)	2.6
	Rx terminal Pointing loss	(dB)	0.1
	Co-Channel / adj . beam interf. (dn)	(dBHz)	89.0
	Down-path C/No	(dBHz)	80.8
	Down-path C/N	(dB)	14.8
Total			
	Mean satellite C/Imo	(dBHz)	86.1
	Mean Overall C/No	(dBHz)	74.9
	Total C/I (adjacent satellite interference)	(dB)	23.1
	Mean Overall C/N (incl. a.s.i)	(dB)	8.7
Margin			
	C/N required	(dB)	8.2

C/N margin	(dB)	0.5

C/I calculations

Orbital separation (interferor 1)	degree	2.0
Worst case topocentric angle (1)	degree	2.09
Uplink C/I		
Interferor 1		
Max. uplink p.s.d	(dBW/Hz)	-56.0
Other's sidelobe at 2 deg. sep X-25log(t)		29.0
Tx Sidelobe gain at 2 deg sep	dBi	21.0
Inm-Ka C/I up1	*dB*	*25.5*
Downlink C/I		
Interferor 1		
Max. ground PFD	(dBW/m2/MHz)	-121.1
Max. downlink EIRP s.d	(dBW/Hz)	-19.0
Inm Rx sidelobe gain at 2 deg sep	dBi	21.0
Inm-Ka C/I dn1	dB	26.9
Total C/I (adjacent satellite interference)	**dB**	**23.1**