

## INM-KA RETURN LINK BUDGET (COMMS. HCP )

<b>General</b>		Unit
User terminal type	-	Typ-100cm-1
Carrier designator	-	2M45G7W
Data rate (kbps)	(kbps)	2636
Coding rate	-	3/4
Modulation	-	QPSK
Occupied bandwidth	(kHz)	2041.7
Allocated bandwidth	(kHz)	2450.1
<b>Uplink</b>		
Beam		User-Spot (HCP)
Frequency	(GHz)	29.25
User Terminal EIRP	(dBW)	52.5
Antenna tx gain	dBi	47.9
Uplink power	(dBW)	4.6
<i>Uplink p.s.d.</i>	<i>(dBW/Hz)</i>	<i>-58.5</i>
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)	69.8
Up-path C/N	(dB)	6.7
<b>Downlink</b>		
Beam		Feeder
Frequency	(GHz)	18
<i>Max pfd per crx @ earth surface (beam peak)</i>	<i>(dBW/m2/1MHz)</i>	<i>-134.4</i>
Beam Peak to Edge of Coverage	(dB)	3.0
<i>Max pfd per crx @ earth surface (EOC)</i>	<i>(dBW/m2/1MHz)</i>	<i>-137.4</i>
Satellite EIRP (EOC)	(dBW)	27.7
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)	86.1
Down-path C/No	(dBHz)	79.1
Down-path C/N	(dB)	16.0
<b>Total</b>		
Mean satellite C/Imo	(dBHz)	84.7
Mean Overall C/No	(dBHz)	69.2
Total C/I (adjacent satellite interference)	(dB)	20.6
Mean Overall C/N (incl. a.s.i)	(dB)	6.0
<b>Margin</b>		
C/N required	(dB)	5.6
C/N margin	(dB)	0.4

## 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 $X-25\log(t)$		29.0
Tx Sidelobe gain at 2 deg sep	dBi	21.0
Inm-Ka C/I up1	<i>dB</i>	21.4

### **Downlink C/I**

Interferor 1		
Max. ground PFD	(dBW/m <sup>2</sup> /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	28.4
<b>Total C/I (adjacent satellite interference)</b>	<b>dB</b>	<b>20.6</b>