

Table 6 Link budgets for 7 typical C-band carriers

	H_C	I_C
Parameter	Digital TV MCPC, 40 MBPS, QPSK, $\frac{3}{4}$ RS	Digital TV SCPC, 8 MBPS, QPSK $\frac{3}{4}$ RS
Carrier designation	36M0G7W	6M95G1W
Throughput rate, Mbps	40	8
Symbol rate, MHz	28.8	5.8
FEC rate	0.69	0.69
Uplinks:		
Transmit Power (dBW)	17.1	9.6
Transmit Loss (dB)	0.5	0.5
Antenna diameter(m)	10	10
Antenna Gain (dBi)	54.4	54.4
Ground Station EIRP (dBW)	71	63.5
Uplink Rain Loss (dB)	1	1
Free Space Loss (dB)	200.1	200.1
Satellite G/T (dB/K)	0	0
Data Rate (dB-Hz)	76	69
Boltzmann's Constant (dBW/K-Hz)	228.6	228.6
Eb/No (dB)	22.5	22
Eb/Io (dB)	18	18
Total Eb/(No + Io) (dB) For 10 ⁻⁷	16.7	16.5
Downlinks:		
Satellite Carrier EIRP (dBW)	38	28
Downlink Rain Loss (dB)	0.5	0.5
Free Space Loss (dB)	196.3	196.3
Ground station antenna dia, m	3.8	6
Ground Station G/T (dB/K)	21.8	25.2
Eb/No (dB)	15.6	16
C/IM		18
Eb/IMo(dB)		16.6
C/I	16	16
Eb/Io(ASI)	14.6	14.6
Eb/Io (dB)	14.6	12.5
Eb/(No + Io) (dB)	12.1	10.9
Total UP/DOWN C/(N+I)(dB)	13.5	12.3
Total UP/DOWN Eb/(No+Io)(dB)	10.8	9.8
Required Eb/No(dB)	5.4	5.4
Required C/N(dB)	6.8	6.8

Margin(dB)	5.4	4.4
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Table 7. Link budgets for TV/FM in C-band

Parameter	Typical TV/FM link
Carrier designation	36M0F3F
Noise bandwidth (MHz)	36
Uplinks:	
Transmit Power (dBW)	20.7
Transmit Loss (dB)	0.5
Antenna diameter	6.1
Antenna Gain (dBi)	49.8
Ground Station EIRP (dBW)	70
Uplink Rain Loss (dB)	1
Free Space Loss (dB)	200.1
Satellite G/T (dB/K)	0
Boltzmann's Constant (dBW/K-Hz)	228.6
C/N(dB)	21.9
C/I ASI (dB)	22
C/(N+I), dB	19
Downlinks:	
Satellite Carrier EIRP (dBW)	38
Downlink Rain Loss (dB)	0.5
Free Space Loss (dB)	196.3
Ground station antenna dia (m)	6
Ground Station G/T (dB/K)	23
C/N(dB)	17.2
C/I(dB)	18
C/(N+I) (dB)	14.6
C/(N+I), Up & DL, dB	13.2
C/(N+I) required(dB)	11
Margin(dB)	2.2
Satellite Carrier EIRP, max (dBW)	42

J_C	K_C	L_C	M_C
Digital TV MCPC, 60 MBPS, 8PSK, 2/3 RS	Digital TV, MCPC, 110 MBPS, 16QAM, 7/8 RS	56 Kbps, SCPC, QPSK, 3/4 RS	1.544 Mbps, SCPC, QPSK, 3/4 RS
36M0G7W	36M0G7W	100KG1D	1M60G1D
60	110	0.056	2
32.6	34.1	0.037	1
0.61	0.81	0.75	0.75
25.1	25.1	-3.4	11.8
0.5	0.5	0.5	0.5
10	10	4.5	4.5
54.4	54.4	47.4	47.4
79	79	43.5	58.7
1	1	1	1
200.1	200.1	200.1	200.1
0	0	0	0
77.8	80.4	47.5	61.9
228.6	228.6	228.6	228.6
28.7	26.1	23.5	24.3
18	18	18	18
17.6	17.4	16.9	17.1
38	40	8	25.2
0.5	0.5	0.5	0.5
196.3	196.3	196.3	196.3
10	10	6	6
33.2	33.2	23	23
25.2	24.6	15.3	18.1
		18	18
		16.2	16.2
20	22	16	16
17.3	16.9	14.2	14.2
17.3	16.9	12.1	12.1
16.7	16.2	10.4	11.1
19.3	21.3	12.2	12.9
14.1	13.8	9.5	10.2
7.2	11.5	5.4	5.4
9.9	16.6	7.2	7.2

