

**IA-9 Link Budget**

Beam **NAC-C**

Wanted System Orbital Location

-97 deg

Interfering System Orbital Location

-99 deg and -95 (FCC allocation)

Minimum Orbital Separation (Geo-centric)

1.90 deg ; Note: the calculations take topocentric advantage into account

UP Freq	6.000	GHz
DN Freq	4.000	GHz

Carrier Type	SINGLE TV/FM PER TXPR						TWO TV/FM PER TXPR		
	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-32.0	-32.0
Interfering downlink e.i.r.p. density(bp)	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-32.0	-32.0
Interfering uplink power density	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7	-41.0	-41.0
Transmit ES Locatio	CONUS	CONUS	Mexico	Mexico	Conus	Conus	CONUS	Mexico	Conus
Receive ES Location	CONUS	CONUS	Conus	Conus	Mexico	Mexico	CONUS	Conus	Mexico
TX ES Size at BE	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Transmit ES Peak gain	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8
ES Size at beam peak	13.16	13.16	8.30	8.30	13.16	13.16	13.16	8.30	13.16
Rx ES Size	6.0	4.5	7.5	6.0	12.0	9.0	6.0	6.0	12.0
Receive ES Gain	45.8	43.3	47.7	45.8	51.8	49.3	45.8	45.8	51.8
Receive ES G/T (Temp=83K)	26.6	24.1	28.5	26.6	32.6	30.1	26.6	26.6	32.6
Carrier Type	1 TV/xpr	1 TV/xpr	1 TV/xpr	1 TV/xpr	1 TV/xpr	1 TV/xpr	2TV/xpr	2TV/xpr	2TV/xpr
Energy Dispersal BW	2000	2000	2000	2000	2000	2000	2000	2000	2000
Occupied bandwidth per carrier (kHz)	30000.0	20000.0	30000.0	20000.0	30000.0	20000.0	18000.0	18000.0	18000.0
Allocated bandwidth per carrier (kHz)	36000.0	36000.0	36000.0	36000.0	36000.0	36000.0	20000.0	20000.0	20000.0
C/N Threshold	17.20	17.2	17.2	17.2	17.2	17.2	15.5	15.5	15.5
System Margin	1.00	1.00	0.70	1.00	1.00	1.00	1.00	1.00	1.00
C/N, Threshold + margin	18.20	18.20	17.90	18.20	18.20	18.20	16.50	16.50	17.50
Nominal e/s e.i.r.p. per carrier (dBW)	83.3	84.3	84.3	83.4	82.8	82.3	84.3	80.6	80.8
ES Power	25.5	26.5	26.5	25.6	25.0	24.5	26.5	22.8	23.0
TX ES PSD	-37.5	-36.5	-36.5	-37.4	-38.0	-38.5	-36.5	-40.2	-40.0
Sat G/T at bp	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
sat G/T at e/s	0.1	0.1	-3.9	-3.9	0.1	0.1	0.1	-3.9	0.1
Free space path loss (dB)	199.5	199.5	199.2	199.2	199.5	199.5	199.5	199.2	199.5
C/N uplink (dB)	37.8	40.5	35.0	35.9	37.3	38.5	41.0	33.6	37.5
X-pol interf:C/I -uplink (dB)-wanted system	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
X-pol interf:C/I -uplink (dB)-interfering ES	36.3	39.0	37.3	38.1	35.8	37.0	39.5	38.1	38.3
C/I - copol asi uplink (dB)	24.6	27.3	21.6	22.4	24.1	25.3	27.8	22.4	26.6
C/N++others, uplink	23.1	25.1	20.7	21.5	22.7	23.7	25.4	21.3	24.5
Downlink e.i.r.p. -bp (dBW)	42.2	42.2	42.2	42.2	42.2	42.2	42.2	42.2	42.2
Downlink BP-BE difference	6	6	6	6	6	6	6	6	6
DL ES Pattern Advantage	4.7	4.7	4.7	4.7	0	0	4.7	4.7	0
Satellite Txpr e.i.r.p. -ES (dBW)	40.9	40.9	40.9	40.9	36.2	36.2	40.9	40.9	36.2
Output back-off	0	0	0	0	0	0	5.5	5.5	5.5
Satellite e.i.r.p. per carrier (dBW)-ES	40.9	40.9	40.9	40.9	36.2	36.2	35.4	35.4	30.7
Free space path loss (dB)	196.0	196.0	195.7	195.7	196.0	196.0	196.0	195.7	196.0
Earth station pointing loss (dB)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
C/N downlink towards BP (dB)	31.0	30.3	33.3	33.1	32.4	31.6	27.8	28.0	29.1
C/N downlink towards ES (dB)	29.7	29.0	32.0	31.8	26.4	25.6	26.5	26.7	23.1
C/N-thermal-total	29.1	28.7	30.2	30.4	26.0	25.4	26.3	25.9	22.9
C/I Co-polar downlink interference d/I(dB)	25.9	24.9	28.0	27.6	27.6	26.7	22.6	24.6	26.3
C/I X-polar external interference d/I (dB)	24.4	23.5	26.5	26.2	26.0	25.2	21.1	23.1	24.8
Downlink C/(Nth ++others) composite with ASI dn	21.4	20.5	23.5	23.2	21.8	21.0	18.1	19.8	19.7
Total C/(Nth ++others) composite with ASI tot	19.2	19.2	18.9	19.2	19.2	19.2	17.4	17.5	18.5
Total C/(Nth ++others) w/o ASI	28.3	21.6	23.6	23.5	22.0	21.5	19.5	20.7	20.2
Other losses(terrestrial, OBE, etc.,)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Available C/N	18.2	18.2	17.9	18.2	18.2	18.2	16.4	16.5	17.5
C/N Margin	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0