

Table A-1: CDMA Return Link Data Budget

Table A-1: CDMA Return Link Data Budget		
Satellite and Earth Station Information		
Downlink name	Las Vegas (6.3 m)	Las Vegas (9.3 m)
Satellite longitude (degrees) (- = West)	-111.1	-111.1
Uplink elevation angle (degrees)	36.1001407	36.1001407
Carrier Information		
Frequency reuse pattern	4	4
Beam pitch (deg)	0.25	0.25
Number of CDMA carriers per beam	1	1
Number of traffic channels per CDMA carrier	1	1
CDMA carrier bandwidth (MHz)	1.25	1.25
Information rate (kbps) plus overhead	64	64
Pilot signal (dB below traffic channel)	3.75	3.75
Modulation	QPSK	QPSK
FEC code rate	0.2	0.2
Required total C/N with margin (dB)	-2.98	-2.98
Uplink		
Uplink frequency (GHz)	2.01	2.01
Uplink EIRP (not including pilot) (dBW)	-7.55	-7.55
Uplink atmospheric loss (dB)	0.06	0.06
Fade + head loss (dB)	3	3
Uplink free space pathloss (dB)	190.12	190.12
Transponder G/T (dBi/K)	21.50	21.50
Polarization loss (dB)	0	0
Uplink C/N (dB)	-2.37	-2.62
C/I inband ATC (dB)	100	100
C/I inter-beam (dB)	14.05	14.05
C/I self Interference (Intra-beam) (dB)	100	100
C/I adj-channel (dB)	26.91	26.91
Composite uplink C/I (dB)	13.83	13.83
Satellite Transponder		
C/I ATC affecting amplifier backoff (dB)	-42.55	-42.55
Power control tolerance (dB)	1	1
Per carrier output backoff (dB)	48.55	48.55
Expected C/IM in digital carrier bandwidth at satellite (dB)	19	19
Downlink		
Downlink frequency (GHz)	11	11
Satellite EIRP per carrier (dBW)	6.95	6.95
Downlink free space pathloss (dB)	204.69	204.69
Downlink atmospheric loss (dB)	0.09	0.09
Rain availability (%)	99.99	99.99

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Downlink rain fade (dB)	2.2	2.2
Pointing + line losses (dB)	1	1
Earth station on-axis G/T (dBi/K)	31.36	34.46
Downlink C/N (dB)	6.89	10.00
Expected composite downlink C/I (dB)	28.93	28.93
Overall Performance Summary		
Computed uplink or system margin (dB)	0.00	0.01
Downlink margin (dB)	0.04	0.18

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Table A-2: CDMA Return Link Voice Budget		
Satellite and Earth Station Information		
Downlink name	Las Vegas (6.3 m)	Las Vegas (9.3 m)
Satellite longitude (degrees) (- = West)	-111.1	-111.1
Uplink elevation angle (degrees)	36.10	36.10
Carrier Information		
Frequency reuse pattern	4	4
Beam pitch (deg)	0.25	0.25
Number of beams	280	280
Number of CDMA carriers per beam	2	2
Number of traffic channels per CDMA carrier	129	135
CDMA carrier bandwidth (MHz)	1.25	1.25
Information rate (kbps) plus overhead	5.64	5.64
Voice activity factor		
Number of voice channels per beam		
Pilot signal (dB below traffic channel)	3.75	3.75
Modulation	QPSK	QPSK
FEC code rate	0.2	0.2
Required total C/N with margin (dB)	-2.98	-2.98
Uplink		
Uplink frequency (GHz)	2.01	2.01
Uplink EIRP (not including pilot) (dBW)	-7.55	-7.55
Uplink atmospheric loss (dB)	0.06	0.06
Fade + head loss (dB)	9.00	9.00
Uplink free space pathloss (dB)	190.12	190.12
Transponder G/T dBi/K	21.50	21.50
Polarization loss (dB)	0.00	0.00
Uplink C/N (dB)	1.88	1.88
C/I inband ATC (dB)	100.00	100.00
C/I inter-beam (dB)	3.49	3.30
C/I self Interference (Intra-beam) (dB)	1.38	1.19
C/I adj-channel (dB)	16.35	16.15

Composite uplink C/I (dB)	-0.78	-0.98
Satellite Transponder		
C/I ATC affecting amplifier backoff(dB)	-42.55	-42.55
Power control tolerance (dB)	1.00	1.00
Per carrier output backoff (dB)	56.82	56.99
Expected C/IM in digital carrier bandwidth at satellite (dB)	19	19
Downlink		
Downlink frequency (GHz)	11	11
Satellite EIRP per carrier (dBW)	-1.32	-1.49
Downlink free space pathloss (dB)	204.69	204.69
Downlink atmospheric loss (dB)	0.09	0.09
Rain availability (%)	99.99	99.99
Downlink rain fade (dB)	2.20	2.20
Pointing + line losses (dB)	1.00	1.00
Earth station on-axis G/T (dBi/K)	31.36	34.46
Downlink C/N (dB)	9.17	12.11
Expected composite downlink C/I (dB)	28.93	28.93
Overall Performance Summary		
Computed uplink or system margin (dB)	0.01	0.02
Downlink margin (dB)	0.18	0.57