

ECHOSTAR-2 Link Budgets

Link Parameters	
	13 meter Feeder Link E/S Nominal Feeder Link Site
	to 45 cm Receive-Only

Modulation Parameters:	
Information Bit Rate per Carrier (kbps)	30,719
FEC Rate	5/6
Reed-Solomon Ratio (188/204, None)	188/204
Overall Coding Overhead (%)	30.2%
Modulation Type (BPSK/QPSK/8PSK/16QAM)	QPSK
Filter Roll-off Factor ("alpha") (%)	20
Link Geometry:	
Satellite Longitude (°East)	-77.0
Tx E/S City Location (name)	Gilbert
Tx E/S Longitude (°East)	-111.8
Tx E/S Latitude (°North)	33.4
Tx E/S Range to Satellite (Km)	38,075
Tx E/S Elevation to Satellite (°)	36.3
Tx E/S Altitude (m)	300.0
Rx E/S City Location (name)	Mexico City
Rx E/S Longitude (°East)	-99.2
Rx E/S Latitude (°North)	19.4
Rx E/S Range to Satellite (km)	36,725
Rx E/S Elevation to Satellite (°)	56.0
Rx E/S Altitude (m)	2240.0
Link (per carrier):	
Carrier Frequency (MHz)	17,550
HPA Power Level (to give required PFD at satellite) (W)	31.4
HPA Power in dBW (dBW)	15.0
Post-HPA Losses (dB)	2.0
Tx E/S Power to Antenna in dBW (dBW)	13.0
Tx E/S Antenna Diameter (m)	13.0
Antenna Efficiency (%)	55
Tx E/S Antenna Gain (dB)	65.0
Tx E/S EIRP (dBW)	77.9
E/S Pointing Loss (dB)	0.1
Atmospheric Loss (dB)	0.34
Availability up (%)	99.9
Rain attenuation (dB)	2.7