

# 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)	41,200
FEC Rate		2/3
Overall Coding Overhead	(%)	56.5%
Modulation Type (BPSK/QPSK/8PSK/16QAM)		8PSK
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
Free Space Loss	(dB)	208.9