

ECHOSTAR-2 Link Budgets

| Link Parameters | | | |
|---|--|--|--|
| | 1 | 2 | 3 |
| | 13 meter Feeder Link E/S Nominal Feeder Link Site | 13 meter Feeder Link E/S Nominal Feeder Link Site | 13 meter Feeder Link E/S Nominal Feeder Link Site |
| | to 45 cm Receive-Only | to 45 cm Receive-Only | to 50 cm Receive-Only |
| Modulation Parameters: | | | |
| Information Bit Rate per Carrier (kbps) | 27,647 | 27,647 | 27,647 |
| FEC Rate | 3/4 | 3/4 | 3/4 |
| Reed-Solomon Ratio (188/204, None) | 188/204 | 188/204 | 188/204 |
| Overall Coding Overhead (%) | 44.7% | 44.7% | 44.7% |
| Modulation Type (BPSK/QPSK/8PSK/16QAM) | QPSK | QPSK | QPSK |
| Filter Roll-off Factor ("alpha") (%) | 20 | 20 | 20 |
| Link Geometry: | | | |
| Satellite Longitude (°East) | -77.15 | -77.15 | -77.15 |
| Tx E/S City Location (name) | Gilbert | Gilbert | Gilbert |
| Tx E/S Longitude (°East) | -111.8 | -111.8 | -111.8 |
| Tx E/S Latitude (°North) | 33.4 | 33.4 | 33.4 |
| Tx E/S Range to Satellite (Km) | 38,066 | 38,066 | 38,066 |
| Tx E/S Elevation to Satellite (°) | 36.4 | 36.4 | 36.4 |
| Tx E/S Altitude (m) | 300.0 | 300.0 | 300.0 |
| Rx E/S City Location (name) | Miami | Houston | Denver |
| Rx E/S Longitude (°East) | -80.3 | -95.3 | -105.0 |
| Rx E/S Latitude (°North) | 25.9 | 29.8 | 39.8 |
| Rx E/S Range to Satellite (km) | 36,541 | 37,084 | 38,116 |
| Rx E/S Elevation to Satellite (°) | 59.6 | 49.9 | 35.8 |
| Rx E/S Altitude (m) | 1.0 | 10.0 | 1631.0 |
| Link (per carrier): | | | |
| Carrier Frequency (MHz) | 17,550 | 17,550 | 17,550 |
| HPA Power Level (to give required PFD at satellite) (W) | 31.9 | 32.1 | 32.1 |
| HPA Power in dBW (dBW) | 15.0 | 15.1 | 15.1 |
| Post-HPA Losses (dB) | 2.0 | 2.0 | 2.0 |
| Tx E/S Power to Antenna in dBW (dBW) | 13.0 | 13.1 | 13.1 |
| Tx E/S Antenna Diameter (m) | 13.0 | 13.0 | 13.0 |
| Antenna Efficiency (%) | 55 | 55 | 55 |
| Tx E/S Antenna Gain (dB) | 65.0 | 65.0 | 65.0 |
| Tx E/S EIRP (dBW) | 78.0 | 78.0 | 78.0 |
| E/S Pointing Loss (dB) | 0.1 | 0.1 | 0.1 |
| Atmospheric Loss (dB) | 0.41 | 0.41 | 0.41 |
| Availability up (%) | 99.9 | 99.9 | 99.9 |
| Rain attenuation (ITU-R Rec. P.618-8) (dB) | 2.7 | 2.7 | 2.7 |