

ECHOSTAR-6 Link Budgets

| Link Parameters | | High Power Mode | | |
|---|----------|--------------------------|--------------------------|--------------------------|
| | | 1 | 2 | 3 |
| | | 13 meter Feeder Link E/S | 13 meter Feeder Link E/S | 13 meter Feeder Link E/S |
| | | Nominal Feeder Link Site | Nominal Feeder Link Site | Nominal Feeder Link Site |
| | | to | to | to |
| | | 45 cm Receive-Only | 45 cm Receive-Only | 45 cm Receive-Only |
| Modulation Parameters: | | | | |
| Information Bit Rate per Carrier | (kbps) | 41,200 | 41,200 | 41,200 |
| FEC Rate | | 2/3 | 2/3 | 2/3 |
| Overall Coding Overhead | (%) | 56.5% | 56.5% | 56.5% |
| Modulation Type (BPSK/QPSK/8PSK/16QAM) | | 8PSK | 8PSK | 8PSK |
| Filter Roll-off Factor ("alpha") | (%) | 20 | 20 | 20 |
| Link Geometry: | | | | |
| Satellite Longitude | (°East) | -77.0 | -77.0 | -77.0 |
| Tx E/S City Location | (name) | Cheyenne | Cheyenne | Cheyenne |
| Tx E/S Longitude | (°East) | -104.7 | -104.7 | -104.7 |
| Tx E/S Latitude | (°North) | 41.1 | 41.1 | 41.1 |
| Tx E/S Range to Satellite | (Km) | 38,209 | 38,209 | 38,209 |
| Tx E/S Elevation to Satellite | (°) | 34.7 | 34.7 | 34.7 |
| Tx E/S Altitude | (m) | 1876.0 | 1876.0 | 1876.0 |
| Rx E/S City Location | (name) | Miami | New York | Los Angeles |
| Rx E/S Longitude | (°East) | -80.3 | -74.0 | -118.2 |
| Rx E/S Latitude | (°North) | 25.9 | 40.8 | 34.0 |
| Rx E/S Range to Satellite | (km) | 36,542 | 37,571 | 38,507 |
| Rx E/S Elevation to Satellite | (°) | 59.5 | 42.8 | 31.2 |
| Rx E/S Altitude | (m) | 1.0 | 15.0 | 33.0 |
| Link (per carrier): | | | | |
| Carrier Frequency | (MHz) | 17,550 | 17,550 | 17,550 |
| HPA Power Level (to give required PFD at satellite) | (W) | 26.8 | 26.8 | 26.8 |
| HPA Power in dBW | (dBW) | 14.3 | 14.3 | 14.3 |
| Post-HPA Losses | (dB) | 2.0 | 2.0 | 2.0 |
| Tx E/S Power to Antenna in dBW | (dBW) | 12.3 | 12.3 | 12.3 |
| Tx E/S Antenna Diameter | (m) | 13.0 | 13.0 | 13.0 |
| Antenna Efficiency | (%) | 65 | 65 | 65 |
| Tx E/S Antenna Gain | (dB) | 65.7 | 65.7 | 65.7 |
| 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) | 0.34 | 0.34 | 0.34 |
| Availability up | (%) | 99.9 | 99.9 | 99.9 |
| Rain attenuation | (dB) | 2.7 | 2.7 | 2.7 |
| Free Space Loss | (dB) | 209.0 | 209.0 | 209.0 |
| Satellite: | | | | |