

EchoStar 17 GHz RBW DBS Link Budget

| Link Parameters | | Clear Sky (New York) | Faded D/L (New York) | Faded D/L (Los Angeles) |
|--------------------------------------|--------|-------------------------|-------------------------|----------------------------|
| Link Geometry: | | | | |
| Tx E/S Range to Satellite (Cheyenne) | (km) | 37,895 | 37,895 | 37,895 |
| Rx E/S Range to Satellite | (km) | 39,464 | 39,464 | 37,045 |
| Uplink (per carrier): | | | | |
| Carrier Frequency | (MHz) | 25,000 | 25,000 | 25,000 |
| Tx E/S Antenna Diameter | (m) | 12.0 | 12.0 | 12.0 |
| Tx E/S Power to Antenna | (W) | 53.7 | 53.7 | 53.7 |
| Tx E/S Antenna Gain | (dB) | 68.2 | 68.2 | 68.2 |
| Tx E/S EIRP per Carrier | (dBW) | 85.5 | 85.5 | 85.5 |
| Atmospheric and Other Losses | (dB) | 0.5 | 0.5 | 0.5 |
| Free Space Loss | (dB) | 212.0 | 212.0 | 212.0 |
| Satellite: | | | | |
| G/T towards Tx E/S | (dB/K) | 10.3 | 10.3 | 10.3 |
| EIRP per Carrier towards Rx E/S | (dBW) | 56.3 | 56.3 | 51.9 |
| Downlink: | | | | |
| Carrier Frequency | (MHz) | 17,500 | 17,500 | 17,500 |
| Atmospheric and Other Losses | (dB) | 0.3 | 5.5 | 1.5 |
| Free Space Loss | (dB) | 209.2 | 209.2 | 208.7 |
| Rx E/S Antenna Diameter | (m) | 0.45 | 0.45 | 0.45 |
| Rx E/S Antenna Gain | (dB) | 36.1 | 36.1 | 36.1 |
| Rx E/S G/T | (dB/K) | 13.1 | 10.2 | 11.9 |
| System (LNA+Sky) Noise Temp. | (K) | 200 | 394 | 264 |
| Total Link: | | | | |
| Carrier Noise Bandwidth | (kHz) | 24,000 | 24,000 | 24,000 |
| (C/N) - Thermal Uplink | (dB) | 38.1 | 38.1 | 38.1 |
| (C/N) - Thermal Downlink | (dB) | 14.7 | 6.5 | 8.4 |
| (C/I) - Other Link Degradations | (dB) | 20.0 | 20.0 | 20.0 |
| (C/N) - Total Actual | (dB) | 13.5 | 6.3 | 8.1 |
| (C/N) - Total Required | (dB) | 4.8 | 4.8 | 4.8 |
| Excess Margin | (dB) | 8.7 | 1.5 | 3.3 |
| Availability | (%) | N/A | 99.80 | 99.80 |