

EXHIBIT 5: LINK BUDGETS

| UPLINK BEAM INFORMATION | | | | |
|--|-------------|-------------|-------------|-------------|
| Uplink Beam Name | CONUS | CONUS | CONUS | CONUS |
| Uplink Frequency (MHz) | 5925 - 6425 | 5925 - 6425 | 5925 - 6425 | 5925 - 6425 |
| Uplink Beam Polarization | Horizontal | Horizontal | Horizontal | Horizontal |
| Uplink Relative Contour Level (dB) | -4 | -4 | -4 | -4 |
| Uplink Contour G/T (dB/K) | 0.2 | 0.2 | 0.2 | 0.2 |
| Uplink SFD (dBW/m ²) | -90.2 | -90.2 | -86.2 | -86.2 |
| DOWNLINK BEAM INFORMATION | | | | |
| Downlink Beam Name | CONUS | CONUS | CONUS | CONUS |
| Downlink Frequency (MHz) | 3700 - 4200 | 3700 - 4200 | 3700 - 4200 | 3700 - 4200 |
| Downlink Beam Polarization | Vertical | Vertical | Vertical | Vertical |
| Downlink Relative Contour Level (dB) | -4 | -4 | -4 | -4 |
| Downlink Contour EIRP (dBW) | 36.2 | 36.2 | 36.2 | 36.2 |
| ADJACENT SATELLITE 1 | | | | |
| Satellite 1 Orbital Location | 83 WL | 83 WL | 83 WL | 83 WL |
| Uplink Power Density (dBW/Hz) | -53.3 | -53.3 | -53.3 | -53.3 |
| Uplink Polarization Advantage (dB) | 0 | 0 | 0 | 0 |
| Downlink EIRP Density (dBW/Hz) | -33.8 | -33.8 | -33.8 | -33.8 |
| Downlink Polarization Advantage (dB) | 0 | 0 | 0 | 0 |
| ADJACENT SATELLITE 2 | | | | |
| Satellite 2 Orbital Location | 87 WL | 87 WL | 87 WL | 87 WL |
| Uplink Power Density (dBW/Hz) | -38.7 | -38.7 | -38.7 | -38.7 |
| Uplink Polarization Advantage (dB) | 0 | 0 | 0 | 0 |
| Downlink EIRP Density (dBW/Hz) | -33.8 | -33.8 | -33.8 | -33.8 |
| Downlink Polarization Advantage (dB) | 0 | 0 | 0 | 0 |
| CARRIER INFORMATION | | | | |
| Carrier ID | 1 | 2 | 3 | 4 |
| Emission Designation | 36M0F3F | 36M0G7W | 10M3G7W | 100K67W |
| Information Rate (kbps) | n/a | 36863 | 6000 | 64 |
| Carrier Modulation | TV/FM | QPSK | QPSK | QPSK |
| Peak to Peak Bandwidth of EDS (MHz) | 4 | n/a | n/a | n/a |
| Code Rate | n/a | 3/4xRS | 1/2xRS | 1/2xRS |
| Occupied Bandwidth (kHz) | 36000 | 30133 | 6771.1 | 75.4 |
| Allocated Bandwidth (kHz) | 36000 | 36000 | 10300 | 100 |
| Minimum C/N (dB) | 10 | 6.1 | 3.9 | 3.0 |
| UPLINK EARTH STATION | | | | |
| Earth Station Diameter (meters) | 8.1 | 6.1 | 6.1 | 6.1 |
| Earth Station Gain (dBi) | 52.8 | 49.4 | 49.4 | 49.4 |
| Earth Station Elevation Angle | 20 | 20 | 20 | 20 |
| DOWNLINK EARTH STATION | | | | |
| Earth Station Diameter (meters) | 7.0 | 3.5 | 3.0 | 3.0 |
| Earth Station Gain (dBi) | 47.5 | 41.1 | 39.7 | 39.7 |
| Earth Station G/T, Clear Sky (dB/K) | 26.6 | 21.0 | 19.2 | 19.2 |
| Earth Station Elevation Angle | 20 | 20 | 20 | 20 |
| UPLINK PERFORMANCE | | | | |
| Uplink Earth Station EIRP (dBW) | 72.7 | 72.7 | 69.2 | 48.8 |
| Uplink Path Loss, Clear Sky (dB) | -200.2 | -200.2 | -200.2 | -200.2 |
| Satellite G/T (dB/K) | 0.2 | 0.2 | 0.2 | 0.2 |
| Boltzman Constant (dBW/K-Hz) | 228.6 | 228.6 | 228.6 | 228.6 |
| Carrier Noise Bandwidth (dB-Hz) | -75.6 | -74.8 | -68.3 | -48.8 |
| Uplink C/N (dB) | 25.8 | 26.5 | 29.5 | 28.7 |
| DOWNLINK PERFORMANCE | | | | |
| Downlink EIRP per Carrier (dBW) | 36.2 | 36.2 | 29.0 | 8.6 |
| Antenna Pointing Error (dB) | -0.5 | -0.5 | -0.5 | -0.5 |
| Downlink Path Loss, Clear Sky (dB) | -196.3 | -196.3 | -196.3 | -196.3 |
| Earth Station G/T, Clear Sky (dB/K) | 26.6 | 21.0 | 19.2 | 19.2 |
| Boltzman Constant (dBW/K-Hz) | 228.6 | 228.6 | 228.6 | 228.6 |
| Carrier Noise Bandwidth (dB-Hz) | -75.6 | -74.8 | -68.3 | -48.8 |
| Downlink C/N (dB) | 19.0 | 14.2 | 11.7 | 10.8 |
| COMPOSITE LINK PERFORMANCE | | | | |
| C/N Uplink (dB) | 25.8 | 26.5 | 29.5 | 28.7 |
| C/N Downlink (dB) | 19.0 | 14.2 | 11.7 | 10.8 |
| C/I Intermodulation (dB) | n/a | n/a | 20.3 | 19.4 |
| C/I Uplink Co-Channel (dB)* | 27.0 | 27.0 | 28.8 | 28.5 |
| C/I Downlink Co-Channel (dB)* | 27.0 | 27.0 | 28.8 | 28.5 |
| C/I Uplink Adjacent Satellite 1 (dB) | 27.9 | 28.6 | 31.6 | 30.8 |
| C/I Downlink Adjacent Satellite 1 (dB) | 20.6 | 15.8 | 14.0 | 13.1 |
| C/I Uplink Adjacent Satellite 2 (dB) | 14.4 | 15.2 | 18.2 | 17.3 |
| C/I Downlink Adjacent Satellite 2 (dB) | 20.2 | 13.7 | 7.2 | 6.4 |
| C/(N+I) Composite (dB) | 11.2 | 8.4 | 4.9 | 4.0 |
| Required System Margin (dB) | -1.0 | -1.0 | -1.0 | -1.0 |
| Net C/(N+I) Composite (dB) | 10.2 | 7.4 | 3.9 | 3.0 |
| Minimum Required C/N (dB) | -10.0 | -6.1 | -3.9 | -3.0 |
| Excess Link Margin (dB) | 0.2 | 1.2 | 0.0 | 0.0 |
| Carrier Density Levels | | | | |
| Uplink Power Density (dBW/Hz) | -46.1 | -51.5 | -48.5 | -49.4 |
| Downlink EIRP Density At Beam Peak | -25.8 | -34.6 | -35.3 | -36.2 |
| Number of Carriers | 1 | 1 | 2.3 | 256.4 |

* Note: The C/I level is adjusted depending on the signal level and transponder mode of operation.

EXHIBIT 5: LINK BUDGETS (continued)

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|--|-------------|-------------|-------------|-------------|
| UPLINK BEAM INFORMATION | | | | |
| Uplink Beam Name | CONUS | CONUS | CONUS | CONUS |
| Uplink Frequency (MHz) | 5925 - 6425 | 5925 - 6425 | 5925 - 6425 | 5925 - 6425 |
| Uplink Beam Polarization | Vertical | Vertical | Vertical | Vertical |
| Uplink Relative Contour Level (dB) | -4 | -4 | -4 | -4 |
| Uplink Contour G/T (dB/K) | -1.5 | -1.5 | -1.5 | -1.5 |
| Uplink SFD (dBW/m ²) | -90.0 | -90.0 | -84.0 | -84.0 |
| DOWNLINK BEAM INFORMATION | | | | |
| Downlink Beam Name | CONUS | CONUS | CONUS | CONUS |
| Downlink Frequency (MHz) | 3700 - 4200 | 3700 - 4200 | 3700 - 4200 | 3700 - 4200 |
| Downlink Beam Polarization | Horizontal | Horizontal | Horizontal | Horizontal |
| Downlink Relative Contour Level (dB) | -4 | -4 | -4 | -4 |
| Downlink Contour EIRP (dBW) | 36.1 | 36.1 | 36.1 | 36.1 |
| ADJACENT SATELLITE 1 | | | | |
| Satellite 1 Orbital Location | 83 WL | 83 WL | 83 WL | 83 WL |
| Uplink Power Density (dBW/Hz) | -53.3 | -53.3 | -53.3 | -53.3 |
| Uplink Polarization Advantage (dB) | 0 | 0 | 0 | 0 |
| Downlink EIRP Density (dBW/Hz) | -33.8 | -33.8 | -33.8 | -33.8 |
| Downlink Polarization Advantage (dB) | 0 | 0 | 0 | 0 |
| ADJACENT SATELLITE 2 | | | | |
| Satellite 2 Orbital Location | 87 WL | 87 WL | 87 WL | 87 WL |
| Uplink Power Density (dBW/Hz) | -38.7 | -38.7 | -38.7 | -38.7 |
| Uplink Polarization Advantage (dB) | 0 | 0 | 0 | 0 |
| Downlink EIRP Density (dBW/Hz) | -33.8 | -33.8 | -33.8 | -33.8 |
| Downlink Polarization Advantage (dB) | 0 | 0 | 0 | 0 |
| CARRIER INFORMATION | | | | |
| Carrier ID | 1 | 2 | 3 | 4 |
| Emission Designation | 36M0F3F | 36M0G7W | 10M3G7W | 100KG7W |
| Information Rate (kbps) | n/a | 36863 | 6000 | 64 |
| Carrier Modulation | TV/FM | QPSK | QPSK | QPSK |
| Peak to Peak Bandwidth of EDS (MHz) | 4 | n/a | n/a | n/a |
| Code Rate | n/a | 3/4xRS | 1/2xRS | 1/2xRS |
| Occupied Bandwidth (kHz) | 36000 | 30133 | 6771.1 | 75.4 |
| Allocated Bandwidth (kHz) | 36000 | 36000 | 10300 | 100 |
| Minimum C/N (dB) | 10 | 6.1 | 3.9 | 3.0 |
| UPLINK EARTH STATION | | | | |
| Earth Station Diameter (meters) | 8.1 | 6.1 | 6.1 | 6.1 |
| Earth Station Gain (dBi) | 52.8 | 49.4 | 49.4 | 49.4 |
| Earth Station Elevation Angle | 20 | 20 | 20 | 20 |
| DOWNLINK EARTH STATION | | | | |
| Earth Station Diameter (meters) | 7.0 | 3.5 | 3.0 | 3.0 |
| Earth Station Gain (dBi) | 47.5 | 41.1 | 39.7 | 39.7 |
| Earth Station G/T, Clear Sky (dB/K) | 26.6 | 21.0 | 19.2 | 19.2 |
| Earth Station Elevation Angle | 20 | 20 | 20 | 20 |
| UPLINK PERFORMANCE | | | | |
| Uplink Earth Station EIRP (dBW) | 72.9 | 72.9 | 71.5 | 51.0 |
| Uplink Path Loss, Clear Sky (dB) | -200.2 | -200.2 | -200.2 | -200.2 |
| Satellite G/T (dB/K) | -1.5 | -1.5 | -1.5 | -1.5 |
| Boltzman Constant (dBW/K-Hz) | 228.6 | 228.6 | 228.6 | 228.6 |
| Carrier Noise Bandwidth (dB-Hz) | -75.6 | -74.8 | -68.3 | -48.8 |
| Uplink C/N (dB) | 24.2 | 25.0 | 30.0 | 29.1 |
| DOWNLINK PERFORMANCE | | | | |
| Downlink EIRP per Carrier (dBW) | 36.1 | 36.1 | 28.9 | 8.5 |
| Antenna Pointing Error (dB) | -0.5 | -0.5 | -0.5 | -0.5 |
| Downlink Path Loss, Clear Sky (dB) | -196.3 | -196.3 | -196.3 | -196.3 |
| Earth Station G/T, Clear Sky (dB/K) | 26.6 | 21.0 | 19.2 | 19.2 |
| Boltzman Constant (dBW/K-Hz) | 228.6 | 228.6 | 228.6 | 228.6 |
| Carrier Noise Bandwidth (dB-Hz) | -75.6 | -74.8 | -68.3 | -48.8 |
| Downlink C/N (dB) | 18.9 | 14.1 | 11.6 | 10.7 |
| COMPOSITE LINK PERFORMANCE | | | | |
| C/N Uplink (dB) | 24.2 | 25.0 | 30.0 | 29.1 |
| C/N Downlink (dB) | 18.9 | 14.1 | 11.6 | 10.7 |
| C/I Intermodulation (dB) | n/a | n/a | 20.3 | 19.4 |
| C/I Uplink Co-Channel (dB)* | 27.0 | 27.0 | 28.8 | 28.5 |
| C/I Downlink Co-Channel (dB)* | 27.0 | 27.0 | 28.8 | 28.5 |
| C/I Uplink Adjacent Satellite 1 (dB) | 28.1 | 28.9 | 33.9 | 33.0 |
| C/I Downlink Adjacent Satellite 1 (dB) | 20.5 | 15.7 | 13.9 | 13.0 |
| C/I Uplink Adjacent Satellite 2 (dB) | 14.6 | 15.4 | 20.4 | 19.5 |
| C/I Downlink Adjacent Satellite 2 (dB) | 20.1 | 13.6 | 7.1 | 6.3 |
| C/(N+I) Composite (dB) | 11.2 | 8.3 | 4.9 | 4.0 |
| Required System Margin (dB) | -1.0 | -1.0 | -1.0 | -1.0 |
| Net C/(N+I) Composite (dB) | 10.2 | 7.3 | 3.9 | 3.0 |
| Minimum Required C/N (dB) | -10.0 | -6.1 | -3.9 | -3.0 |
| Excess Link Margin (dB) | 0.2 | 1.2 | 0.0 | 0.0 |
| Carrier Density Levels | | | | |
| Uplink Power Density (dBW/Hz) | -45.9 | -51.3 | -46.3 | -47.1 |
| Downlink EIRP Density At Beam Peak | -25.9 | -34.7 | -35.4 | -36.3 |
| Number of Carriers | 1 | 1 | 2.3 | 257.2 |

* Note: The C/I level is adjusted depending on the signal level and transponder mode of operation.