

Table D4.2

C-band Digital

Wanted System Orbital Location -77 deg
 Interfering System Orbital Location -79 deg and 74W(FCC allocation)
 Minimum Orbital Separation (Geo-centric) 1.90 deg ; Note: the calculations take topocentric advantage into account

| | | | | | | |
|--------|----------|-------|-------|------|-------|-----|
| Uplink | I, psd | -37.3 | dBwhz | Tx F | 6.000 | GHz |
| Dnlink | I, eirpd | -31.7 | dBwhz | Rx F | 4.000 | GHz |

| Carrier Type | 64K, 8PSK, R2/3 RS | | | | | | 64K, QPSK, R1/2 RS | | | | | |
|--------------------------------------------------|--------------------|---------|---------|---------|---------|---------|--------------------|---------|---------|---------|---------|---------|
| | CONUS | CONUS | Mexico | Mexico | Conus | Conus | CONUS | CONUS | Mexico | Mexico | Conus | Conus |
| Transmit ES Location | CONUS | CONUS | Mexico | Mexico | Conus | Conus | CONUS | CONUS | Mexico | Mexico | Conus | Conus |
| Receive ES Location | CONUS | CONUS | Conus | Conus | Mexico | Mexico | CONUS | CONUS | Conus | Conus | Mexico | Mexico |
| Tx ES Size at SA | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Transmit ES Peak gain | 46.8 | 46.8 | 46.8 | 46.8 | 46.8 | 46.8 | 46.8 | 46.8 | 46.8 | 46.8 | 46.8 | 46.8 |
| RX ES Size | 3.8 | 16.0 | 3.8 | 16.0 | 4.5 | 16.0 | 2.4 | 16.0 | 3.0 | 16.0 | 3.8 | 16.0 |
| Receive ES Gain | 41.8 | 54.3 | 41.8 | 54.3 | 43.3 | 54.3 | 37.8 | 54.3 | 39.8 | 54.3 | 41.8 | 54.3 |
| Receive ES G/T (Temp=83K) | 22.6 | 35.1 | 22.6 | 35.1 | 24.1 | 35.1 | 18.6 | 35.1 | 20.6 | 35.1 | 22.6 | 35.1 |
| Carrier Type | 64KR2/3 | 64KR2/3 | 64KR2/3 | 64KR2/3 | 64KR2/3 | 64KR2/3 | 64KR1/2 | 64KR1/2 | 64KR1/2 | 64KR1/2 | 64KR1/2 | 64KR1/2 |
| Occupied bandwidth per carrier (kHz) | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 69.7 | 69.7 | 69.7 | 69.7 | 69.7 | 69.7 |
| Allocated bandwidth per carrier (kHz) | 47.1 | 47.1 | 47.1 | 47.1 | 47.1 | 47.1 | 94.1 | 94.1 | 94.1 | 94.1 | 94.1 | 94.1 |
| C/N Threshold | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| System Margin | 1.0 | 1.0 | 0.8 | 1.0 | 0.3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Other losses(terrestrial, OBE, etc..) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Clear Sky C/N | 12.5 | 12.5 | 12.3 | 12.5 | 11.8 | 12.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| C/N, Threshold + margin | 11.5 | 11.5 | 11.3 | 11.5 | 10.8 | 11.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| Nominal e/s e.i.r.p. per carrier @ES(dBW) | 49.2 | 47.4 | 53.5 | 52.1 | 53.5 | 48.2 | 48.5 | 43.5 | 49.4 | 48.2 | 45.4 | 43.6 |
| TX ES PSD @ ES | -43.0 | -44.8 | -38.7 | -40.1 | -38.7 | -44.0 | -46.7 | -51.7 | -45.8 | -47.0 | -49.8 | -51.6 |
| ES eirp @ bp- minimum (dBW) | 45.3 | 43.5 | 44.5 | 43.1 | 49.6 | 44.3 | 44.6 | 39.6 | 40.4 | 39.2 | 41.5 | 39.7 |
| ES Power @ bp dBW, min | -1.5 | -3.3 | -2.3 | -3.7 | 2.8 | -2.5 | -2.2 | -7.2 | -6.4 | -7.6 | -5.3 | -7.1 |
| ES Power @ site dBW, max | 2.4 | 0.6 | 6.7 | 5.3 | 6.7 | 1.4 | 1.7 | -3.3 | 2.6 | 1.4 | -1.4 | -3.2 |
| Sat G/T at bp | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| Sat G/T at e/s | -1.3 | -1.3 | -6.4 | -6.4 | -1.3 | -1.3 | -1.3 | -1.3 | -6.4 | -6.4 | -1.3 | -1.3 |
| Free space path loss (dB) | 199.6 | 199.6 | 199.3 | 199.3 | 199.6 | 199.6 | 199.6 | 199.6 | 199.3 | 199.3 | 199.6 | 199.6 |
| Input back off, dB | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Output back off dB | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| C/N uplink (dB) | 31.5 | 29.7 | 31.0 | 29.6 | 35.8 | 30.5 | 27.8 | 22.8 | 23.9 | 22.7 | 24.7 | 22.9 |
| X-pol interf.C/I -uplink (dB)-wanted system | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| X-pol interf.C/I -uplink (dB)-interfering ES | 24.5 | 22.7 | 28.8 | 27.4 | 28.8 | 23.5 | 20.8 | 15.8 | 21.7 | 20.5 | 17.7 | 15.9 |
| C/I - copol asi uplink (dB) | 16.2 | 14.4 | 15.4 | 14.0 | 20.5 | 15.2 | 12.5 | 7.5 | 8.3 | 7.1 | 9.4 | 7.6 |
| HPA IM at 10 deg el angle(limit: 21,c;10,Ku) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 |
| Satellite TWTA IM per carrier @bp | -21.0 | -21.0 | -21.0 | -21.0 | -21.0 | -21.0 | -21.0 | -21.0 | -21.0 | -21.0 | -21.0 | -21.0 |
| C/N+others, uplink | 14.8 | 12.7 | 14.5 | 12.7 | 18.1 | 13.4 | 11.5 | 6.6 | 7.9 | 6.6 | 8.6 | 6.7 |
| Downlink e.i.r.p. -bp (dBW) | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 |
| Downlink BP-BE difference | 6.7 | 6.7 | 6.7 | 6.7 | 6.7 | 6.7 | 6.7 | 6.7 | 6.7 | 6.7 | 6.7 | 6.7 |
| DL ES Pattern Advantage | 4.5 | 4.5 | 4.5 | 4.5 | 0 | 0 | 4.5 | 4.5 | 4.5 | 4.5 | 0 | 0 |
| Satellite e.i.r.p.d. per carrier (dBW)-tow es | -35.2 | -39.2 | -35.2 | -39.2 | -39.7 | -43.7 | -35.2 | -39.2 | -35.2 | -39.2 | -39.7 | -43.7 |
| Satellite e.i.r.p.d. per carrier (dBW)-bp | -33.0 | -37.0 | -33.0 | -37.0 | -33.0 | -37.0 | -33.0 | -37.0 | -33.0 | -37.0 | -33.0 | -37.0 |
| Satellite e.i.r.p. per carrier (dBW)-at es | 10.2 | 6.3 | 10.2 | 6.3 | 5.7 | 1.8 | 13.3 | 9.3 | 13.3 | 9.3 | 8.8 | 4.8 |
| Satellite e.i.r.p. per carrier (dBW)-bp | 12.4 | 8.5 | 12.4 | 8.5 | 12.4 | 8.5 | 15.5 | 11.5 | 15.5 | 11.5 | 15.5 | 11.5 |
| Free space path loss (dB) | 196.1 | 196.1 | 195.8 | 195.8 | 196.1 | 196.1 | 196.1 | 196.1 | 195.8 | 195.8 | 196.1 | 196.1 |
| Earth station pointing loss (dB) | 0.30 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.30 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| C/N downlink towards BP (dB) | 26.3 | 34.9 | 26.6 | 35.1 | 23.3 | 30.4 | 22.4 | 34.9 | 24.6 | 35.1 | 21.9 | 30.4 |
| C/N downlink towards ES (dB) | 24.1 | 32.7 | 24.4 | 32.9 | 16.6 | 23.7 | 20.2 | 32.7 | 22.4 | 32.9 | 15.2 | 23.7 |
| C/N-thermal-total | 23.4 | 27.9 | 23.6 | 27.9 | 16.6 | 22.9 | 19.5 | 22.4 | 20.1 | 22.3 | 14.7 | 20.3 |
| Interference & Margins: | | | | | | | | | | | | |
| C/I Co-polar downlink interference d/I(dB) | 23.1 | 31.9 | 23.1 | 31.9 | 19.7 | 27.4 | 10.7 | 31.9 | 16.1 | 31.9 | 18.6 | 27.4 |
| C/I X-polar external interference d/I (dB) | 18.6 | 29.7 | 18.6 | 29.7 | 17.6 | 25.2 | 12.6 | 29.7 | 15.5 | 29.7 | 14.1 | 25.2 |
| Downlink C/(Nth +I+others) composite with ASI dn | 16.4 | 26.5 | 16.5 | 26.5 | 13.0 | 20.4 | 8.2 | 26.5 | 12.3 | 26.5 | 10.8 | 20.4 |
| Total C/(Nth +I) composite with ASI tot | 12.5 | 12.6 | 12.4 | 12.6 | 11.8 | 12.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.5 | 6.5 |
| Total C/(Nth +others) w/o ASI | 20.2 | 19.0 | 20.3 | 19.0 | 15.7 | 17.9 | 17.8 | 17.7 | 18.2 | 17.7 | 14.1 | 16.9 |
| C/N Margin | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |