

**Digital C-band link budgets (Table 15 of Technical Appendix)**

|                                  | H_C                                  | I_C                                | J_C                                    | K_C                                       | L_C                       | M_C                          |
|----------------------------------|--------------------------------------|------------------------------------|--|---|---------------------------|------------------------------|
| Parameter                        | Digital TV MCPC, 40 MBPS, QPSK, ¾ RS | Digital TV SCPC, 8 MBPS, QPSK ¾ RS | Digital TV MCPC, 60 MBPS, 8PSK, 2/3 RS | Digital TV, MCPC, 110 MBPS, 16QAM, 7/8 RS | 56 Kbps, SCPC, QPSK, ¾ RS | 1.544 Mbps, SCPC, QPSK, ¾ RS |
| Carrier designation              | 36M0G7W                              | 6M95G1W                            | 36M0G7W                                | 36M0G7W                                   | 100KG1D                   | 1M60G1D                      |
| Throughput rate, Mbps            | 40                                   | 8                                  | 60                                     | 110                                       | 0.056                     | 2                            |
| Symbol rate, MHz                 | 28.8                                 | 5.8                                | 32.6                                   | 34.1                                      | 0.037                     | 1                            |
| FEC rate                         | 0.69                                 | 0.69                               | 0.61                                   | 0.81                                      | 0.75                      | 0.75                         |
| Uplinks:                         |                                      |                                    |  |   |                           |                              |
| Transmit Power (dBW)             | 17.1                                 | 9.6                                | 25.1                                   | 25.1                                      | -3.4                      | 11.8                         |
| Transmit Loss (dB)               | 0.5                                  | 0.5                                | 0.5                                    | 0.5                                       | 0.5                       | 0.5                          |
| Antenna diameter(m)              | 10                                   | 10                                 | 10                                     | 10  | 4.5                       | 4.5                          |
| Antenna Gain (dBi)               | 54.4                                 | 54.4                               | 54.4                                   | 54.4                                      | 47.4                      | 47.4                         |
| Ground Station EIRP (dBW)        | 71                                   | 63.5                               | 79                                     | 79  | 43.5                      | 58.7                         |
| Uplink Rain Loss (dB)            | 1                                    | 1                                  | 1                                      | 1   | 1                         | 1                            |
| Free Space Loss (dB)             | 200.1                                | 200.1                              | 200.1                                  | 200.1                                     | 200.1                     | 200.1                        |
| Satellite G/T (dB/K)             | 0                                    | 0                                  | 0                                      | 0   | 0                         | 0                            |
| Data Rate (dB-Hz)                | 76                                   | 69                                 | 77.8                                   | 80.4                                      | 47.5                      | 61.9                         |
| Boltzmann's Constant (dBW/K-Hz)  | 228.6                                | 228.6                              | 228.6                                  | 228.6                                     | 228.6                     | 228.6                        |
| Eb/No (dB)                       | 22.5                                 | 22                                 | 28.7                                   | 26.1                                      | 23.5                      | 24.3                         |
| Eb/Io (dB)                       | 18                                   | 18                                 | 18                                     | 18  | 18                        | 18                           |
| Total Eb/(No + Io) (dB) For 10-7 | 16.7                                 | 16.5                               | 17.6                                   | 17.4                                      | 16.9                      | 17.1                         |
| Downlinks:                       |                                      |                                    |  |   |                           |                              |
| Satellite Carrier EIRP (dBW)     | 38.0                                 | 28.0                               | 38.0                                   | 40.0                                      | 8.0                       | 25.2                         |
| Downlink Rain Loss (dB)          | 0.5                                  | 0.5                                | 0.5                                    | 0.5                                       | 0.5                       | 0.5                          |
| Free Space Loss (dB)             | 196.3                                | 196.3                              | 196.3                                  | 196.3                                     | 196.3                     | 196.3                        |
| Ground station antenna dia, m    | 3.8                                  | 6.0                                | 10.0                                   | 10.0                                      | 6.0                       | 6.0                          |
| Ground Station G/T (dB/K)        | 21.8                                 | 25.2                               | 33.2                                   | 33.2                                      | 23.0                      | 23.0                         |
| Eb/No (dB)                       | 15.6                                 | 16.0                               | 25.2                                   | 24.6                                      | 15.3                      | 18.1                         |
| C/I                              |                                      | 18.0                               |  |   | 18.0                      | 18.0                         |
| Eb/IMo(dB)                       |                                      | 16.6                               |  |   | 16.2                      | 16.2                         |
| C/I                              | 16.0                                 | 16.0                               | 20.0                                   | 22.0                                      | 16.0                      | 16.0                         |
| Eb/Io(ASI)                       | 14.6                                 | 14.6                               | 17.3                                   | 16.9                                      | 14.2                      | 14.2                         |
| Eb/Io (dB)                       | 14.6                                 | 12.5                               | 17.3                                   | 16.9                                      | 12.1                      | 12.1                         |
| Eb/(No + Io) (dB)                | 12.1                                 | 10.9                               | 16.7                                   | 16.2                                      | 10.4                      | 11.1                         |
| Total UP/DOWN C/(N+I)(dB)        | 13.5                                 | 12.3                               | 19.3                                   | 21.3                                      | 12.2                      | 12.9                         |
| Total UP/DOWN Eb/(No+Io)(dB)     | 10.8                                 | 9.8                                | 14.1                                   | 13.8                                      | 9.5                       | 10.2                         |
| Required Eb/No(dB)               | 5.4                                  | 5.4                                | 7.2                                    | 11.5                                      | 5.4                       | 5.4                          |
| Required C/N(dB)                 | 6.8                                  | 6.8                                | 9.9                                    | 16.6                                      | 7.2                       | 7.2                          |
| Margin(dB)                       | 5.4                                  | 4.4                                | 6.9                                    | 2.3                                       | 4.1                       | 4.8                          |