SATELLITE EARTH STATION
FREQUENCY COORDINATION
Run Options
05/2/2003

| | |
|---|---|
| User name | kryan |
| Site name | KAUAI |
| Calculations | Y |
| Horizon elevation | N |
| Coord. Distance | N |
| Horizon gain | N |
| Great circle | Y |
| Frequencies | Y |
| Frequencies Low | N |
| Frequencies High | N |
| Profile Type | 1 |
| Precipitation Scatter | N |
| Generate Owner/Plots | Y |
| Generate Transponder | N |
| Possible interference paths | 16 |
| Margins | 1 |
| LST file name | kauai54368.lst |

Coordination run

SATELLITE EARTH STATION
FREQUENCY COORDINATION DATA
05/2/2003

| | | |
|---|---|---|
| Company | SKYTOWER, INC | |
| Earth Station Name, State | | KAUAI, HI |
| Latitude (DMS) (NAD83) | | 22 2 2.5 N |
| Longitude (DMS) (NAD83) | | 159 47 21.7 W |
| Ground Elevation AMSL (Ft/m) | | 40.00 / 12.19 |
| Antenna Centerline AGL (Ft/m) | | 10.00 / 3.05 |
| Transmit Antenna Type: | FCC32 | FCC Reference 32-25LOG(THETA) |
| 2.0 GHz Gain (dBi) / Diameter (m) | | 13.0 / 0.3 |
| 3 dB / 15 dB Half Beamwidth | | 10.00 / 20.00 |
| Operating Mode | | TRANSMIT ONLY |
| Modulation | | DIGITAL |
| Emission / Transmit Band (MHz) | | 6M76G7W / 1987.5 |
| | | 60K0G7W/ 2005.5,2005.7 |
| | | 1M00G7W/ 2002.5 |
| Max. Available RF Power | (dBW)/4 kHz) | -20.00 |
| | (dBW)/MHz) | 4.00 |
| Max. EIRP | (dBW)/4 kHz) | -7.00 |
| | (dBW)/MHz) | 17.00 |
| | (dBW) | 7.40 |
| Max permissible Interference Power | | |
| 2.0 GHz, 20% (dBW/4 kHz) | | -154.0 |
| 2.0 GHz, 0.0025% (dBW/4 kHz) | | -131.0 |
| Low Earth Orbit Satellite | | |
| Azimuth Range (Min/Max) Degrees | | 0.0 / 360.0 |
| Minimum Elevation Angle Degrees | | 10.0 |
| Radio Climate | | C |
| Rain Zone | | 4 |
| Max Great Circle Coordination Distance (Mi/Km) | | |
| 2.0 GHz | | 186.4 / 300.0 |
| Precipitation Scatter Contour Radius (Mi/Km) | | |
| 2.0 GHz | | 62.1 / 100.0 |

Note: Horizon is less than 0.2 degrees at all azimuths

Table of Earth Station Coordination Values
05/2/2003

Earth Station Name KAUAI HI
Owner SKYTOWER, INC
Latitude (DMS) (NAD83) 22 2 2.5 N
Longitude (DMS) (NAD83)159 47 21.7 W
Ground Elevation (Ft/m) 40.00 / 12.19 AMSL
Antenna Centerline (Ft/m) 10.00 / 3.05 AGL
Antenna Model FCC Reference 32-25LOG(THETA)
Objectives: Transmit -154.0 (dBW /4 kHz) TX Power -20.0 (dBW/4 kHz)

| Azimuth (Deg) | Horizon Elevation Angle (Deg) | Antenna Disc. Angle (Deg) | Antenna Gain (dBi) | 2.0 GHz Coordination Distance (Km) |
|---|---|---|---|---|
| 0 | 0.00 | 71.92 | -14.00 | 300.0 |
| 5 | 0.00 | 70.38 | -14.00 | 300.0 |
| 10 | 0.00 | 68.99 | -14.00 | 300.0 |
| 15 | 0.00 | 67.75 | -14.00 | 300.0 |
| 20 | 0.00 | 66.68 | -14.00 | 300.0 |
| 25 | 0.00 | 65.79 | -14.00 | 300.0 |
| 30 | 0.00 | 65.09 | -14.00 | 300.0 |
| 35 | 0.00 | 64.59 | -14.00 | 300.0 |
| 40 | 0.00 | 64.30 | -14.00 | 300.0 |
| 45 | 0.00 | 64.22 | -14.00 | 300.0 |
| 50 | 0.00 | 64.35 | -14.00 | 300.0 |
| 55 | 0.00 | 64.68 | -14.00 | 300.0 |
| 60 | 0.00 | 65.23 | -14.00 | 300.0 |
| 65 | 0.00 | 65.96 | -14.00 | 300.0 |
| 70 | 0.00 | 66.89 | -14.00 | 300.0 |
| 75 | 0.00 | 68.00 | -14.00 | 300.0 |
| 80 | 0.00 | 69.27 | -14.00 | 300.0 |
| 85 | 0.00 | 70.70 | -14.00 | 300.0 |
| 90 | 0.00 | 72.26 | -14.00 | 300.0 |
| 95 | 0.00 | 73.95 | -14.00 | 300.0 |
| 100 | 0.00 | 75.75 | -14.00 | 300.0 |
| 105 | 0.00 | 77.65 | -14.00 | 300.0 |
| 110 | 0.00 | 79.62 | -14.00 | 300.0 |
| 115 | 0.00 | 81.67 | -14.00 | 300.0 |
| 120 | 0.00 | 83.76 | -14.00 | 300.0 |
| 125 | 0.00 | 85.90 | -14.00 | 300.0 |
| 130 | 0.00 | 88.06 | -14.00 | 300.0 |
| 135 | 0.00 | 90.23 | -14.00 | 300.0 |
| 140 | 0.00 | 92.40 | -14.00 | 300.0 |
| 145 | 0.00 | 94.56 | -14.00 | 300.0 |
| 150 | 0.00 | 96.69 | -14.00 | 300.0 |
| 155 | 0.00 | 98.78 | -14.00 | 300.0 |
| 160 | 0.00 | 100.81 | -14.00 | 300.0 |
| 165 | 0.00 | 102.77 | -14.00 | 300.0 |
| 170 | 0.00 | 104.64 | -14.00 | 300.0 |
| 175 | 0.00 | 106.42 | -14.00 | 300.0 |
| 180 | 0.00 | 108.08 | -14.00 | 300.0 |

Table of Earth Station Coordination Values
05/2/2003

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Owner SKYTOWER, INC
Latitude (DMS) (NAD83) 22 2 2.5 N
Longitude (DMS) (NAD83)159 47 21.7 W
Ground Elevation (Ft/m) 40.00 / 12.19 AMSL
Antenna Centerline (Ft/m) 10.00 / 3.05 AGL
Antenna Model FCC Reference 32-25LOG(THETA)
Objectives: Transmit -154.0 (dBW /4 kHz) TX Power -20.0 (dBW/4 kHz)

| Azimuth (Deg) | Horizon Elevation Angle (Deg) | Antenna Disc. Angle (Deg) | Antenna Gain (dBi) | 2.0 GHz Coordination Distance (Km) |
|---|---|---|---|---|
| 185 | 0.00 | 109.62 | -14.00 | 300.0 |
| 190 | 0.00 | 111.01 | -14.00 | 300.0 |
| 195 | 0.00 | 112.25 | -14.00 | 300.0 |
| 200 | 0.00 | 113.32 | -14.00 | 300.0 |
| 205 | 0.00 | 114.21 | -14.00 | 300.0 |
| 210 | 0.00 | 114.91 | -14.00 | 300.0 |
| 215 | 0.00 | 115.41 | -14.00 | 300.0 |
| 220 | 0.00 | 115.70 | -14.00 | 300.0 |
| 225 | 0.00 | 115.78 | -14.00 | 300.0 |
| 230 | 0.00 | 115.65 | -14.00 | 300.0 |
| 235 | 0.00 | 115.32 | -14.00 | 300.0 |
| 240 | 0.00 | 114.77 | -14.00 | 300.0 |
| 245 | 0.00 | 114.04 | -14.00 | 300.0 |
| 250 | 0.00 | 113.11 | -14.00 | 300.0 |
| 255 | 0.00 | 112.00 | -14.00 | 300.0 |
| 260 | 0.00 | 110.73 | -14.00 | 300.0 |
| 265 | 0.00 | 109.30 | -14.00 | 300.0 |
| 270 | 0.00 | 107.74 | -14.00 | 300.0 |
| 275 | 0.00 | 106.05 | -14.00 | 300.0 |
| 280 | 0.00 | 104.25 | -14.00 | 300.0 |
| 285 | 0.00 | 102.35 | -14.00 | 300.0 |
| 290 | 0.00 | 100.38 | -14.00 | 300.0 |
| 295 | 0.00 | 98.33 | -14.00 | 300.0 |
| 300 | 0.00 | 96.24 | -14.00 | 300.0 |
| 305 | 0.00 | 94.10 | -14.00 | 300.0 |
| 310 | 0.00 | 91.94 | -14.00 | 300.0 |
| 315 | 0.00 | 89.77 | -14.00 | 300.0 |
| 320 | 0.00 | 87.60 | -14.00 | 300.0 |
| 325 | 0.00 | 85.44 | -14.00 | 300.0 |
| 330 | 0.00 | 83.31 | -14.00 | 300.0 |
| 335 | 0.00 | 81.22 | -14.00 | 300.0 |
| 340 | 0.00 | 79.19 | -14.00 | 300.0 |
| 345 | 0.00 | 77.23 | -14.00 | 300.0 |
| 350 | 0.00 | 75.36 | -14.00 | 300.0 |
| 355 | 0.00 | 73.58 | -14.00 | 300.0 |

# DESCRIPTION OF GREAT CIRCLE INTERFERENCE CASE HEADINGS

| | |
|---|---|
| TERRESTRIAL PATH: | SITE NAME AND STATE; THE FIRST SITE LISTED IS THE TERRESTRIAL STATION INVOLVED IN THE INTERFERENCE CONFLICT. |
| LAT: | LATITUDE OF THE INVOLVED TERRESTRIAL STATION |
| LON: | LONGITUDE OF THE INVOLVED TERRESTRIAL STATION |
| CALL: | FCC CALL SIGN OF THE INVOLVED TERRESTRIAL STATION |
| OWNER: | OWNER OF THE TERRESTRIAL PATH |
| GND: | GROUND ELEVATION (AMSL) OF THE INVOLVED TERRESTRIAL STATION |
| ACL: | ANTENNA CENTERLINE (AGL) OF THE INVOLVED TERRESTRIAL STATION |
| EDISCT: | EARTH STATION DISCRIMINATION ANGLE , IN DEGREES, TOWARDS THE INVOLVED TERRESTRIAL STATION |
| TDISCT: | INVOLVED TERRESTRIAL STATION DISCRIMINATION ANGLE, IN DEGREES, TOWARDS THE EARTH STATION |
| GES: | GAIN OF THE EARTH STATION IN dBi AT THE CALCULATED EDISCT |
| GTS: | GAIN OF THE INVOLVED TERRESTRIAL STATION IN DBI AT THE CALCULATED TDISCT |
| FSLOSS: | FREE SPACE PROPAGATION LOSS IN dB DUE TO THE DISTANCE BETWEEN THE EARTH STATION AND THE INVOLVED TERRESTRIAL STATION AT THE INTERFERENCE FREQUENCY |
| TANT: | INVOLVED TERRESTRIAL STATION ANTENNA CODE AND TYPE |
| DIST: | DISTANCE BETWEEN THE EARTH STATION AND THE INVOLVED TERRESTRIAL STATION IN KILOMETERS |
| AZ: | AZIMUTH IN DEGREES FROM TRUE NORTH FROM THE EARTH STATION TO THE INVOLVED TERRESTRIAL STATION |
| PR: | CALCULATED POWER RECEIVED IN dBW.<br>PR = GES + GTS + (TPWR - 30) - FSLOSS - LL for RECEIVE<br>PR = GES + GTS + TX POWER - FSLOSS - LL - TX_LOSS for TRANSMIT |
| TX POWER: | POWER OF EARTH STATION IN dBW/4kHz |
| MARGIN: | MARGIN IN DB TO THE INTERFERENCE OBJECTIVE. THIS VALUE IS THE DIFFERENCE BETWEEN THE OBJECTIVE AND THE PR |
| TPWR: | TRANSMIT POWER IN dBM OF THE TRANSMIT STATION IN THE INTERFERENCE CONFLICT |

| | |
|---|---|
| LL: | LINE LOSS OF THE INVOLVED TERRESTRIAL STATION |
| TX_LOSS: | TRANSMIT LINE LOSS |
| LOADING: | TRAFFIC LOADING OF THE INVOLVED TERRESTRIAL STATION |
| FREQ POL: | FREQUENCIES AND POLARIZATIONS OF THE INVOLVED TERRESTRIAL STATION |

# Great Circle Interference Conflicts
05/2/2003

Earth Station Name KAUAI HI
Owner SKYTOWER, INC
Latitude (DMS) (NAD83) 22 2 2.5 N
Longitude (DMS) (NAD83)159 47 21.7 W
Ground Elevation (Ft/m) 40.00 / 12.19 AMSL
Antenna Centerline (Ft/m) 10.00 / 3.05 AGL
Antenna Model FCC Reference 32-25LOG(THETA)
Objectives: Transmit -154.0 (dBW /4 kHz) TX Power -20.0 (dBW/4 kHz)

| | Terrestrial Path | | Gnd ACL | EDISCT TDISCT | GES GTS | FSLoss TANT | Dist Az | PR Margin | TPWR LL | Plan |
|---|---|---|---|---|---|---|---|---|---|---|
| | Latitude | Longitude | | | | | | | | |
| | Owner | | | | | Loading | | | | |
| | Freq/Pol | | | | | | | | | |
| 1 | KOGG TV | HI2005 KALIA HI | 2954.12 | 80.1 | -14.0 | 145.8 | 232.1 | -154.2 | 0.0 | BS |
| | 21 15 58 | 157 42 9 | RXONLY | 3.66 | 14.4 | 25.6 | *25000 | 111.1 | -0.2 | 0.0 |
| | LESBRO: LESEA BROADCASTING CORPORATION | | | | 1 CH | | FMV RCN: | | | |
| | 2042.0000V | | | | | | | | | |
| | Status: X | | | Equipment: AB0011 | | | Emission: 17M0F8W | | | |
| | OH LOSS 20% / 0.0025%: | | 61.80/ | 28.20 | | | | | | |

***** END OF GREAT CIRCLE CASES REPORT ****

# Earth Station Preliminary Analysis Report
05/2/2003

Earth Station Name KAUAI HI
Owner SKYTOWER, INC
Latitude (DMS) (NAD83) 22 2 2.5 N
Longitude (DMS) (NAD83) 159 47 21.7 W
Ground Elevation (Ft/m) 40.00 / 12.19 AMSL
Antenna Centerline (Ft/m) 10.00 / 3.05 AGL
Antenna Model FCC Reference 32-25LOG(THETA)
Objectives: Transmit -154.0 (dBW /4 kHz) TX Power -20.0 (dBW/4 kHz)

| | Path | Band (GHz) | Azimuth (Deg) | Dist (Km) | Margin dB | EST OH Loss dB | EST Margin dB |
|---|---|---|---|---|---|---|---|
| 1. | KOGG TV -FROM-2005 KALIA | 2 | 111.1 | 232.1 | -0.2 | 41.95 | -42.1 |

## Pathloss Calculation

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Path data for case # 1 | KAUAI | | | KOGG TV | | | |
| Latitude | 22 2 2.5 | | | 21 15 58.6 | | | |
| Longitude | 159 47 21.7 | | | 157 42 9.1 | | | |
| Antenna Center Agl ..... | 10.01 ft. | 3.05 m. | | 12.01 ft. | 3.66 m. | | |
| Site Elevation Amsl .... | 40.00 ft. | 12.19 m. | | 9692.47 ft. | 2954.12 m. | | |
| Antenna Center Amsl .... | 50.00 ft. | 15.24 m. | | 9704.48 ft. | 2957.78 m. | | |
| Effective Antenna Ht ... | 10.01 ft. | 3.05 m. | | 9570.34 ft. | 2916.90 m. | | |
| Horizon Distance ..... | 4.21 mi. | 6.77 km. | | 127.12 mi. | 204.53 km. | | |
| Horizon Elevation Amsl . | 941.81 ft. | 287.05 m. | | 1261.87 ft. | 384.60 m. | | |
| Ray Crossover Angle .... | 42.49 mr. | | | | | | |
| Terrain Delta Ht ..... | 783.22 ft. | 238.71 m. | | | | | |
| Effective Distance ..... | 74.04 mi. | 119.13 km. | | | | | |
| Pathlength ..... | 144.28 mi. | 232.14 km. | | | | | |
| Azimuth ..... | 111.10 deg. | | | 291.87 deg. | | | |
| Frequency ..... | 2000 MHz | | | | | | |
| K Factor ..... | 1.33 (K) | | | | | | |

Radio Climate Phrase ... Maritime Temperate Climate Over Sea
Type of Path ..... Irregular Terrain
Free Space Path Loss ... 145.7 dB Atmospheric Loss ... 1.398 dB
Diff. Loss .... 129.7 dB (275.4 dB) Tropo. Loss ... 73.9 dB (219.6 dB)
Terrain data type ..... 1.0 ARC Second

| Losses | L-Fspl | Sigma | Controlling Propagation Mode | |
|---|---|---|---|---|
| 207.5 dB | 61.8 dB | 4.0 dB | 20. % | Troposcattering |
| 191.9 dB | 46.1 dB | 6.8 dB | 1. % | Troposcattering |
| 182.8 dB | 37.1 dB | 8.6 dB | 0.1 % | Troposcattering |
| 175.6 dB | 29.8 dB | 10.1 dB | 0.01 % | Troposcattering |
| 174.0 dB | 28.2 dB | 10.5 dB | 0.0025% | Troposcattering |

The OH loss calculations considered a terrain profile of 448 points.
The list below shows the highest point in each fiftieth of the path length.

| Dist. (km.) | Elev. (m.) | Obstr. (m.) | K=Inf. Clrnce. (m.) | K= 1.33 Clrnce. (m.) | Dist. (km.) | Elev. (m.) | Obstr. (m.) | K=Inf. Clrnce. (m.) | K= 1.33 Clrnce. (m.) |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 12.2 | 3.0 | 0.0 | 0.0 | 116.27 | 0.0 | 0.0 | 1489.0 | 694.6 |
| 4.17 | 51.0 | 0.0 | 17.1 | -38.9 | 120.97 | 0.0 | 0.0 | 1548.6 | 755.5 |
| 6.77 | 287.0 | -0.0 | -185.9 | -275.9 | 125.67 | 0.0 | 0.0 | 1608.2 | 819.1 |
| 7.81 | 304.6 | 0.0 | -190.3 | -293.7 | 130.37 | 0.0 | 0.0 | 1667.7 | 885.3 |
| 13.02 | 365.9 | 0.0 | -185.6 | -353.8 | 135.07 | 0.0 | 0.0 | 1727.3 | 954.1 |
| 17.19 | 234.9 | 0.0 | -1.7 | -219.6 | 139.77 | 0.0 | 0.0 | 1786.9 | 1025.5 |
| 22.92 | 300.8 | 0.0 | 4.9 | -277.8 | 143.94 | 0.0 | 0.0 | 1839.8 | 1091.2 |
| 27.61 | 384.6 | 0.0 | -19.4 | -352.4 | 148.65 | 0.0 | 0.0 | 1899.4 | 1167.5 |
| 28.13 | 383.3 | 0.0 | -11.5 | -350.0 | 153.35 | 0.0 | 0.0 | 1959.0 | 1246.5 |
| 32.82 | 168.1 | 0.0 | 263.1 | -122.6 | 158.05 | 0.0 | 0.0 | 2018.6 | 1328.0 |
| 39.60 | 104.4 | 0.0 | 412.8 | -36.8 | 162.75 | 0.0 | 0.0 | 2078.2 | 1412.2 |
| 42.20 | 5.1 | 0.0 | 545.1 | 72.4 | 167.45 | 0.0 | 0.0 | 2137.8 | 1499.0 |
| 46.89 | 0.0 | 0.0 | 609.6 | 97.4 | 172.16 | 0.0 | 0.0 | 2197.4 | 1588.4 |
| 51.58 | 0.0 | 0.0 | 669.1 | 119.9 | 178.95 | 32.6 | 0.0 | 2250.9 | 1689.6 |
| 55.76 | 0.0 | 0.0 | 722.0 | 142.0 | 185.22 | 144.4 | 0.0 | 2218.7 | 1706.2 |
| 60.45 | 0.0 | 0.0 | 781.5 | 169.4 | 187.83 | 853.0 | 0.0 | 1543.2 | 1052.4 |
| 65.14 | 0.0 | 0.0 | 840.9 | 199.4 | 190.45 | 304.8 | 0.0 | 2124.5 | 1656.2 |
| 69.83 | 0.0 | 0.0 | 900.4 | 232.0 | 195.15 | 83.9 | 0.0 | 2405.1 | 1979.4 |
| 74.53 | 0.0 | 0.0 | 959.9 | 267.2 | 199.86 | 1.8 | 0.0 | 2546.8 | 2166.3 |
| 79.22 | 0.0 | 0.0 | 1019.4 | 305.0 | 208.23 | 59.8 | 0.0 | 2594.8 | 2301.2 |
| 83.92 | 0.0 | 0.0 | 1078.9 | 345.4 | 210.32 | 29.2 | 0.0 | 2651.9 | 2381.3 |
| 88.61 | 0.0 | 0.0 | 1138.5 | 388.4 | 217.64 | 136.0 | 0.0 | 2638.0 | 2451.9 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 93.31 | 0.0 | 0.0 | 1198.0 | 434.1 | 221.30 | 258.1 | 0.0 | 2562.2 | 2420.7 |
| 98.00 | 0.0 | 0.0 | 1257.5 | 482.3 | 222.87 | 299.7 | 0.0 | 2540.5 | 2418.7 |
| 102.18 | 0.0 | 0.0 | 1310.4 | 527.3 | 231.76 | 36.6 | 0.0 | 2916.4 | 2911.2 |
| 106.88 | 0.0 | 0.0 | 1370.0 | 580.5 | 232.14 | 2954.1 | 3.7 | 0.0 | 0.0 |
| 111.57 | 0.0 | 0.0 | 1429.5 | 636.2 | | | | | |