

**Raytheon Missile Systems GPS Re-radiation Application**  
**Attachment A to Exhibit 1 - Locations**

|                            |                  |                               |         |
|----------------------------|------------------|-------------------------------|---------|
| <b><u>Manufacturer</u></b> | Antenna          | GPS Networking                | HNRRKIT |
|                            | amplifier        | GPS Networking                | HNRRKIT |
|                            | transmit antenna | GPS Networking                | HNRRKIT |
| <b><u>Installation</u></b> | height           | all installations are indoors |         |

| <b><u>Location Number</u></b> | <b><u>Location: name</u></b> | <b><u>Address*</u></b>  |  |  | <b><u>Latitude**</u></b> | <b><u>Longitude**</u></b> | <b><u>Percent use as re-radiating system ***</u></b> | <b><u>L1 &amp; L2 Link Budgets attached</u></b> |
|-------------------------------|------------------------------|-------------------------|--|--|--------------------------|---------------------------|------------------------------------------------------|-------------------------------------------------|
| 1                             |                              | hq                      |  |  | 32-06-24N                | 110-56-16W                | 100                                                  | yes                                             |
| 2                             |                              | hq                      |  |  | 32-06-33N                | 110-56-39W                | 100                                                  | yes                                             |
| 3                             |                              | Rita Rd.                |  |  | 32-05-31N                | 110-48-24W                | 100                                                  | yes                                             |
| 4                             |                              | 3350 E. Hemisphere Loop |  |  | 32-08-18N                | 110-55-17W                | 100                                                  | yes                                             |
| 5                             |                              | 6880 S. Tucson Blvd.    |  |  | 32-07-39N                | 110-56-07W                | 100                                                  | yes                                             |
| 6                             |                              | Farmington, NM          |  |  | 36-39-24N                | 108-13-36W                | 100                                                  | yes                                             |
| 7                             |                              | East Camden, AR         |  |  | 33-37-09N                | 92-45-33W                 | 100                                                  | yes                                             |
| 8                             | Bldg 845E                    | hq                      |  |  | 32 06 14.92N             | 110 56 17.28W             | 100                                                  | yes                                             |
| 9                             | Building 805                 | hq                      |  |  | 32 06 26.32N             | 110 56 39.76W             | 7                                                    | yes                                             |
| 10                            | Building 9020E               | 9000 S. Rita Rd.        |  |  | 32 05 39.96N             | 110 48 27.70W             | 10                                                   | yes                                             |
| 11                            | Building MO9                 | 3350 e. hemisphere loop |  |  | 32 08 17.62N             | 110 55 13.56W             | 10                                                   | yes                                             |
| 12                            | Building 907B                | 6880 S. Tucson Blvd.    |  |  | 32 07 38.55N             | 110 56 06.84W             | 10                                                   | yes                                             |
| 13                            | Building 801C                | hq                      |  |  | 32 06 07.73N             | 110 56 26.39W             | 10                                                   | yes                                             |
| 14                            | Building 801NE               | hq                      |  |  | 32 06 11.13N             | 110 56 23.01W             | 1                                                    | yes                                             |
| 15                            | Building 801NW               | hq                      |  |  | 32 06 11.29N             | 110 56 29.11W             | 1                                                    | yes                                             |
| 16                            | Bldg 801W                    | hq                      |  |  | 32 06 07.43N             | 110 56 29.28W             | 1                                                    | yes                                             |
| 17                            | Bldg 803                     | hq                      |  |  | 32 06 21.82N             | 110 56 34.93W             | 100                                                  | yes                                             |
| 18                            | Bldg 804                     | hq                      |  |  | 32 06 21.66N             | 110 56 36.50W             | 1                                                    | yes                                             |

|    |            |                         |  |  |              |               |                        |  |     |
|----|------------|-------------------------|--|--|--------------|---------------|------------------------|--|-----|
| 19 | Bldg 809E  | hq                      |  |  | 32 06 13.85N | 110 56 22.24W | chambers & hoods       |  | yes |
| 20 | Bldg 810   | hq                      |  |  | 32 06 09.71N | 110 56 19.49W | 5                      |  | yes |
| 21 | Bldg 811   | hq                      |  |  | 32 06 14.55N | 110 56 13.90W | 1                      |  | yes |
| 22 | Bldg 840E  | hq                      |  |  | 32 06 23.06N | 110 56 45.30W | 40                     |  | yes |
| 23 | Bldg 840W  | hq                      |  |  | 32 06 23.06N | 110 56 49.58W | 40                     |  | yes |
| 24 | Bldg 842E1 | hq                      |  |  | 32 06 20.07N | 110 56 52.00W | EMI Chamber            |  | yes |
| 25 | Bldg 842E2 | hq                      |  |  | 32 06 20.06N | 110 56 52.18W | EMI Chamber            |  | yes |
| 26 | Bldg 842E3 | hq                      |  |  | 32 06 20.07N | 110 56 52.46W | EMI Chamber            |  | yes |
| 27 | Bldg 842S  | hq                      |  |  | 32 06 19.91N | 110 56 55.23W | 25                     |  | yes |
| 28 | Bldg 842N  | hq                      |  |  | 32 06 21.84N | 110 56 54.50W | 5                      |  | yes |
| 29 | Bldg 842W  | hq                      |  |  | 32 06 21.13N | 110 56 57.40W | 5                      |  | yes |
| 30 | Bldg 843N  | hq                      |  |  | 32 06 27.26N | 110 56 44.86W | chamber & hardline     |  | yes |
| 31 | Bldg 843S  | hq                      |  |  | 32 06 25.92N | 110 56 43.58W | chamber & hardline     |  | yes |
| 32 | Bldg 845C  | hq                      |  |  | 32 06 24.95N | 110 56 17.35W | 100                    |  | yes |
| 33 | Bldg 845   | hq                      |  |  | 32 06 26.67N | 110 56 18.86W | 100                    |  | yes |
| 34 | Bldg 847E  | hq                      |  |  | 32 06 22.34N | 110 57 14.19W | 10                     |  | yes |
| 35 | Bldg 847W  | hq                      |  |  | 32 06 22.36N | 110 57 19.22W | chamber & hardline     |  | yes |
| 36 | Bldg 848S  | hq                      |  |  | 32 06 25.21N | 110 57 18.18W | chamber & hardline     |  | yes |
| 37 | Bldg 849   | hq                      |  |  | 32 06 15.92N | 110 57 12.26W | 10                     |  | yes |
| 38 | Bldg 852   | hq                      |  |  | 32 05 38.47N | 110 56 03.79W | 100                    |  | yes |
| 39 | bldg 864   | hq                      |  |  | 32 05 40.08N | 110 55 36.72W | 100                    |  | yes |
| 40 | bldg 907A  | 6840 S. Tucson Blvd     |  |  | 32 07 39.63N | 110 56 07.19W | rerad/hardline & hoods |  | yes |
| 41 | bldg 907C  | 2424 E. Aragon Road     |  |  | 32 07 41.99N | 110 56 06.31W | rerad/hardline & hoods |  | yes |
| 42 | Bldg 908   | hq                      |  |  | 32 05 46.35N | 110 56 47.39W | 10                     |  | yes |
| 43 | Bldg 909   | hq                      |  |  | 32 05 46.29N | 110 57 06.67W | 10                     |  | yes |
| 44 | Bldg 910   | hq                      |  |  | 32 05 30.02N | 110 56 47.16W | 10                     |  | yes |
| 45 | Bldg M01   | hq                      |  |  | 32 06 29.46N | 110 56 46.35W | 30                     |  | yes |
| 46 | Bldg M10   | 3360 E. Hemisphere Loop |  |  | 32 08 12.77N | 110 55 13.90W | 20                     |  | yes |

|           |                           |                                                                                                                                                                                            |  |  |  |                                                                                                                                            |               |                                                                                             |     |
|-----------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------|-----|
| <b>47</b> | Bldg M11                  | 6223 S. Palo Verde Rd.                                                                                                                                                                     |  |  |  | 32 08 23.01N                                                                                                                               | 110 54 57.81W | 20                                                                                          | yes |
| <b>48</b> | Bldg 9020N                | 9000 S. Rita Rd.                                                                                                                                                                           |  |  |  | 32 05 40.21N                                                                                                                               | 110 48 28.90W | chamber & hardline                                                                          | yes |
| <b>49</b> | Bldg 9022W                | 9000 S. Rita Rd.                                                                                                                                                                           |  |  |  | 32 05 38.58N                                                                                                                               | 110 48 41.65W | chamber & hardline                                                                          | yes |
| <b>50</b> | Bldg 9022C                | 9000 S. Rita Rd.                                                                                                                                                                           |  |  |  | 32 05 38.99N                                                                                                                               | 110 48 40.00W | chamber & hardline                                                                          | yes |
| <b>51</b> | Camden, Arkansas Facility | Camden, AR                                                                                                                                                                                 |  |  |  | 33 39 02.00N                                                                                                                               | 92 39 06.12W  | 50                                                                                          | yes |
|           |                           | <p>* All locations are in Arizona, except 6, 7, &amp; 51. HQ refers to Raytheon Missile Systems headquarters plant at 1151 E. Hermans Road, Tucson, AZ where there are many buildings.</p> |  |  |  | <p>** All Latitude and Longitude information is provided according to WGS84, which is used both in standard GPS units and Google earth</p> |               | <p>*** For explanations regarding hard-line or hooded use, please see item 6, Exhibit 1</p> |     |
|           |                           |                                                                                                                                                                                            |  |  |  |                                                                                                                                            |               |                                                                                             |     |
|           |                           |                                                                                                                                                                                            |  |  |  |                                                                                                                                            |               |                                                                                             |     |
|           |                           |                                                                                                                                                                                            |  |  |  |                                                                                                                                            |               |                                                                                             |     |
|           |                           |                                                                                                                                                                                            |  |  |  |                                                                                                                                            |               |                                                                                             |     |

**Location Number: 1, Latitude 32-06-24 N Longitude 110-56-16 W**

Use: Re-radiation system used 100% for testing installed antennas

installed: indoors

Manufacturer: all components are part of GPS Networking HNRRKIT

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 7.8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 4.8E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8.4E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5.1E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1.3E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 7.8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1.4E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8.4E-20 | 8.43E-08  |

**Location Number: 2, Latitude 32-06-33 N Longitude 110-56-39 W**

Use: Re-radiation system used 100% for testing installed antennas

installed: indoors

Manufacturer: all components are part of GPS Networking HNRRKIT

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 7.8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 4.8E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8.4E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5.1E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1.3E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 7.8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1.4E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8.4E-20 | 8.43E-08  |

Location Number: 3, Latitude 32-05-31 N Longitude 110-48-24 W

Use: Re-radiation system used 100% for testing installed antennas

installed: indoors

Manufacturer: all components are part of GPS Networking HNRRKIT

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 7.8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 4.8E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8.4E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5.1E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1.3E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 7.8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1.4E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8.4E-20 | 8.43E-08  |

**Location Number: 4, Latitude 32-08-18 N Longitude 110-55-17 W**

Use: Re-radiation system used 100% for testing installed antennas

installed: indoors

Manufacturer: all components are part of GPS Networking HNRRKIT

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 7.8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 4.8E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8.4E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5.1E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1.3E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 7.8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1.4E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8.4E-20 | 8.43E-08  |

**Location Number: 5, Latitude 32-07-39 N Longitude 110-56-07 W**

Use: Re-radiation system used 100% for testing installed antennas

installed: indoors

Manufacturer: all components are part of GPS Networking HNRRKIT

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 7.8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 4.8E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8.4E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5.1E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1.3E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 7.8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1.4E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8.4E-20 | 8.43E-08  |



**Location Number: 6, Latitude 36-39-24 N Longitude 108-13-36 W**

Use: Re-radiation system used 100% for testing installed antennas

installed: indoors

Manufacturer: all components are part of GPS Networking HNRRKIT

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 7.8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 4.8E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8.4E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5.1E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1.3E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 7.8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1.4E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8.4E-20 | 8.43E-08  |

**Location Number: 7, Latitude 33-37-09 N Longitude 92-45-33 W**

Use: Re-radiation system used 100% for testing installed antennas

installed: indoors

Manufacturer: all components are part of GPS Networking HNRRKIT

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 7.8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 4.8E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8.4E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5.1E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |         |           |
|---------------------------------------------|--------------|--------|--------------|---------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |         |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts   | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16   | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6.3E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1.3E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 7.9E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |         |           |
| Coax Length                                 | 100          | feet   |              |         |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 1.7E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3.4E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |         |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |         |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1.3E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 7.8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |         |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |         |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1.4E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8.4E-20 | 8.43E-08  |

**Location Number: 8, Latitude 32-06-14.92 N Longitude 110-56-17.28 W**

Use: Re-radiation system used 100% for testing installed antennas

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 9, Latitude 32-06-26.32 N Longitude 110-56-39.76 W

Use: Re-radiation system used 7% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 10, Latitude 32-06-26.32 N Longitude 110-56-39.76 W**

Use: Re-radiation system used 7% for testing installed antennas, hard-wired otherwise

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 11, Latitude 32-08-17.62 N Longitude 110-55-13.56 W

Use: Re-radiation system used 10% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 12, Latitude 32-07-38.55 N Longitude 110-56-06.84 W

Use: Re-radiation system used 10% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 13, Latitude 32-06-07.73 N Longitude 110-56-26.39 W

Use: Re-radiation system used 10% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |



**Location Number: 14, Latitude 32-06-11.13 N Longitude 110-56-23.01 W**

Use: Re-radiation system used 1% for testing installed antennas, hard-wired otherwise

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 15, Latitude 32-06-11.29 N Longitude 110-56-29.11 W**

Use: Re-radiation system used 1% for testing installed antennas, hard-wired otherwise

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 16, Latitude 32-06-07.43 N Longitude 110-56-29.28 W**

Use: Re-radiation system used 1% for testing installed antennas, hard-wired otherwise

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 17, Latitude 32-06-21.82 N Longitude 110-56-34.93 W

Use: Re-radiation system used 100% for testing installed antennas

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 18, Latitude 32-06-21.66 N Longitude 110-56-36.50 W**

Use: Re-radiation system used 1% for testing installed antennas, hard-wired otherwise

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 19, Latitude 32-06-13.85 N Longitude 110-56-22.24 W**

Use: Re-radiation system used in anechoic chamber or under a hood for testing installed antennas

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 20, Latitude 32-06-09.71 N Longitude 110-56-19.49 W

Use: Re-radiation system used 5% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 21, Latitude 32-06-14.55 N Longitude 110-56-13.90 W**

Use: Re-radiation system used 1% for testing installed antennas, hard-wired otherwise

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |



Location Number: 22, Latitude 32-06-23.06 N Longitude 110-56-45.30 W

Use: Re-radiation system used 40% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 23, Latitude 32-06-23.06 N Longitude 110-56-49.58 W

Use: Re-radiation system used 40% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 24, Latitude 32-06-20.07 N Longitude 110-56-52.00 W**

Use: Re-radiation system used in anechoic chamber 100% for testing installed antennas

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 25, Latitude 32-06-20.06 N Longitude 110-56-52.18 W**

Use: Re-radiation system used in anechoic chamber 100% for testing installed antennas

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 26, Latitude 32-06-20.07 N Longitude 110-56-52.46 W**

Use: Re-radiation system used in anechoic chamber 100% for testing installed antennas

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 27, Latitude 32-06-19.91 N Longitude 110-56-55.23 W

Use: Re-radiation system used 25% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 28, Latitude 32-06-21.84 N Longitude 110-56-54.50 W**

Use: Re-radiation system used 5% for testing installed antennas, hard-wired otherwise

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 29, Latitude 32-06-21.13 N Longitude 110-56-57.40W

Use: Re-radiation system used 5% for testing installed antennas, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |



Location Number: 30, Latitude 32-06-27.26 N Longitude 110-56-44.86W

Use: Re-radiation system used in anechoic chamber, hard-wired otherwise

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 31, Latitude 32-06-25.92 N Longitude 110-56-43.58W

Use: Re-radiation system used in anechoic chamber, hard-wired otherwise

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 32, Latitude 32-06-24.95 N Longitude 110-56-17.35W

Use: Re-radiation system used 100% of time.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 33, Latitude 32-06-26.67 N Longitude 110-56-18.86W

Use: Re-radiation system used 100% of time.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 34, Latitude 32-06-22.34 N Longitude 110-57-14.19W**

Use: Re-radiation system used 10% of time; hard-wired otherwise.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 35, Latitude 32-06-22.36 N Longitude 110-57-19.22W**

Use: Re-radiation system used in anechoic chamber; hard-wired otherwise.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 36, Latitude 32-06-25.21 N Longitude 110-57-18.18W**

Use: Re-radiation system used in anechoic chamber; hard-wired otherwise.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 37, Latitude 32-06-15.92 N Longitude 110-57-12.26 W**

Use: Re-radiation system used 10% for testing installed antennas; hard-wired otherwise.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |



Location Number: 38, Latitude 32-05-38.47 N Longitude 110-56-03.79 W

Use: Re-radiation system used 100% for testing installed antennas.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 39, Latitude 32-05-40.08 N Longitude 110-55-36.72 W

Use: Re-radiation system used 100% for testing installed antennas.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 40, Latitude 32-07-39.63 N Longitude 110-56-07.19 W**

Use: Re-radiation system used for testing installed antennas either hooded or hard-wired.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 41, Latitude 32-07-41.99 N Longitude 110-56-06.31 W

Use: Re-radiation system used for testing installed antennas either hooded or hard-wired.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 42, Latitude 32-05-46.35 N Longitude 110-56-47.39 W

Use: Re-radiation system used 10% for testing installed antennas; otherwise hard-wired.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 43, Latitude 32-05-46.29 N Longitude 110-57-06.67 W**

Use: Re-radiation system used 10% for testing installed antennas; otherwise hard-wired.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 44, Latitude 32-05-30.02 N Longitude 110-56-47.16 W**

Use: Re-radiation system used 10% for testing installed antennas; otherwise hard-wired.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

**Location Number: 45, Latitude 32-06-29.46 N Longitude 110-56-46.35 W**

Use: Re-radiation system used 30% for testing installed antennas; otherwise hard-wired.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |



**Location Number: 46, Latitude 32-08-12.77 N Longitude 110-55-13.90 W**

Use: Re-radiation system used 20% for testing installed antennas; otherwise hard-wired.

**GPS Signal Analysis - L1 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

**GPS Signal Analysis - L2 Link Budget**

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 47, Latitude 32-08-23.01 N Longitude 110-54-57.81 W

Use: Re-radiation system used 20% for testing installed antennas; otherwise hard-wired.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 48, Latitude 32-05-40.21 N Longitude 110-48-28.90 W

Use: Re-radiation system used in anechoic chamber; otherwise hard-wired.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 49, Latitude 32-05-38.58 N Longitude 110-48-41.65 W

Use: Re-radiation system used in anechoic chamber; otherwise hard-wired.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 50, Latitude 32-05-38.99 N Longitude 110-48-40.00 W

Use: Re-radiation system used in anechoic chamber; otherwise hard-wired.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |

Location Number: 51, Latitude 33-39-02.00 N Longitude 92-39-06.12 W

Use: Re-radiation system used 50% for testing installed antennas.

#### GPS Signal Analysis - L1 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1575.42      | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.19042541   | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -36.38969194 | dB     | -131.1       | 8E-17 | 7.78E-05  |
| Signal level at unit under test EIRP to ERP |              |        | -133.2       | 5E-17 | 4.75E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -66.06999119 | dB     | -160.8       | 8E-20 | 8.38E-08  |
| Signal level at 100 ft ERP                  |              |        | -162.9       | 5E-20 | 5.12E-08  |

#### GPS Signal Analysis - L2 Link Budget

|                                             |              |        |              |       |           |
|---------------------------------------------|--------------|--------|--------------|-------|-----------|
| Frequency                                   | 1227.6       | MHz    | Signal Level |       |           |
| Wavelength                                  | 0.244379277  | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                      | -130         | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain          | 38           | dB     | -92          | 6E-13 | 0.63      |
| GPS RF Amplifier gain                       | 23           | dB     | -69          | 1E-10 | 125.89    |
| GPS RF Attenuator                           | -22          | dB     | -91          | 8E-13 | 0.79      |
| LMR400 Coax loss per foot                   | -0.067       | dB     |              |       |           |
| Coax Length                                 | 100          | feet   |              |       |           |
| Total Coax Loss                             | -6.7         | dB     | -97.7        | 2E-13 | 0.170     |
| GPS Transmitting Antenna Gain               | 3            | dB     | -94.7        | 3E-13 | 0.339     |
| Distance from transmit antenna              | 1            | meters |              |       |           |
| Distance from transmit antenna              | 3.2808399    | feet   |              |       |           |
| Pathloss to unit under test                 | -34.22290244 | dB     | -128.9       | 1E-16 | 0.000128  |
| Signal level at unit under test EIRP to ERP |              |        | -131.1       | 8E-17 | 7.83E-05  |
| Distance from transmit antenna              | 30.48        | meters |              |       |           |
| Distance from transmit antenna              | 100.0000002  | feet   |              |       |           |
| Pathloss to 100 ft                          | -63.9032017  | dB     | -158.6       | 1E-19 | 1.38E-07  |
| Signal level at 100 ft ERP                  |              |        | -160.7       | 8E-20 | 8.43E-08  |