Antenna Development Corporation, Inc.
151 S. Walnut Street. Suite B-6, Las Cruces, NM 88001

S-Band Quad-Helix Array Antenna

*Ant*enna *Dev*elopment *Co*rporation, Inc. (*AntDevCo*) offers a quad-helix array antenna. This medium-gain antenna (MGA) is capable of supporting high data rates and up to 10 Watts of transmitted power. This antenna design is very broadband with low VSWR and acceptable patterns over the entire band.

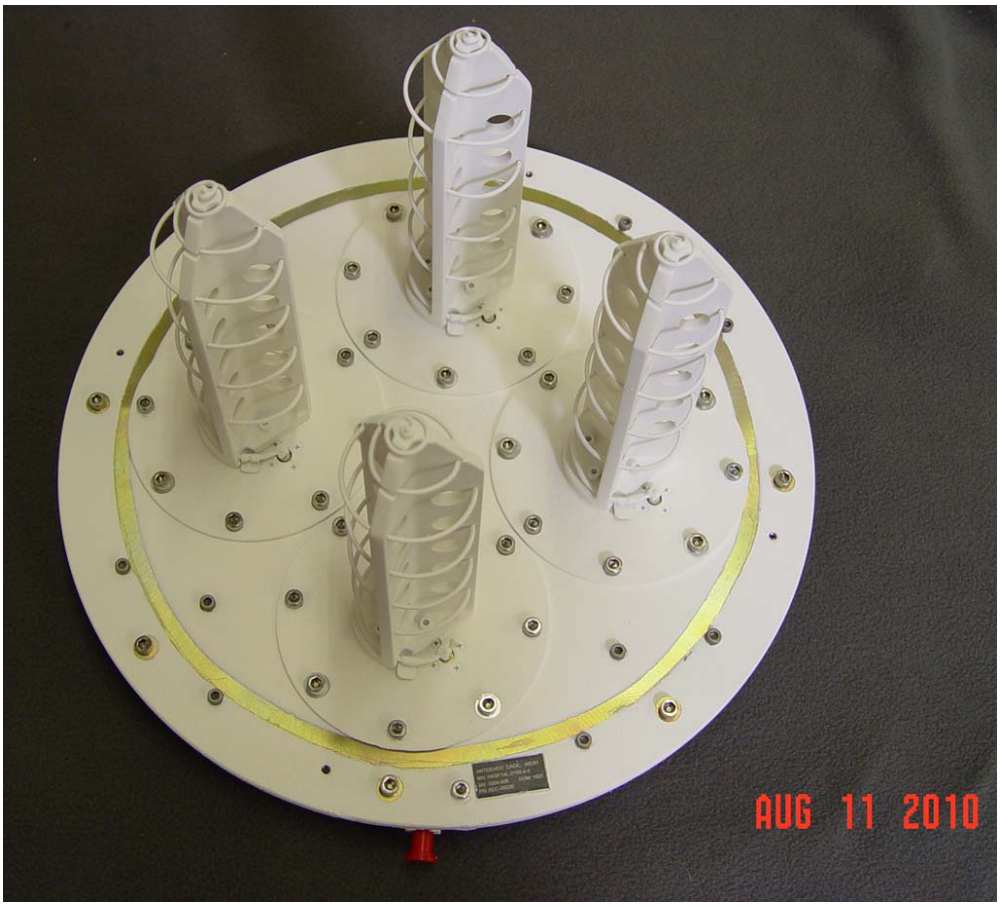


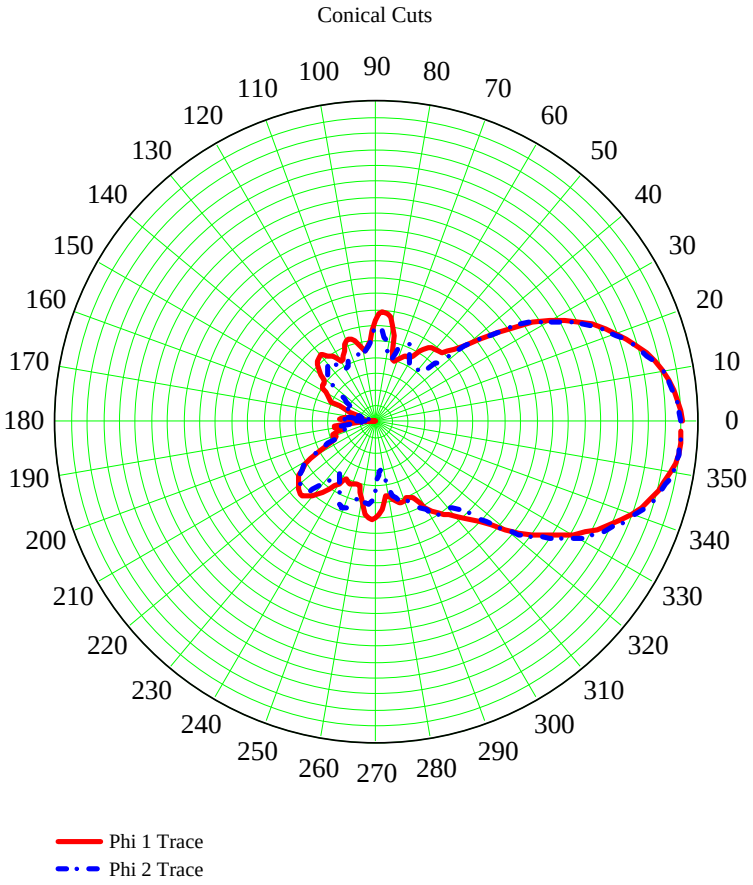
Figure 1. Quad-Helix Array Antenna

All AntDevCo antennas are supplied with extensive test data including principal plane radiation pattern plots, gain bounds plots, and coverage statistics. The expected performance of the antenna on your spacecraft can also be computer simulated or measured using full-scale mockups.

The plots below show the antenna performance at near the low and high ends of the frequency bandwidth. The Z-axis is aligned with the mechanical axis of the antenna. The theta and phi angles are from the Z axis and from the X axis, in the usual way. Note that the current antenna is manufactured for left-hand-circular polarization (LHCP) but can easily be supplied with right-hand-circular polarization (RHCP).

AUT Left Hand Circular Polarization Gain

$\phi 1 := 0$ $\phi 2 := 90$ degrees

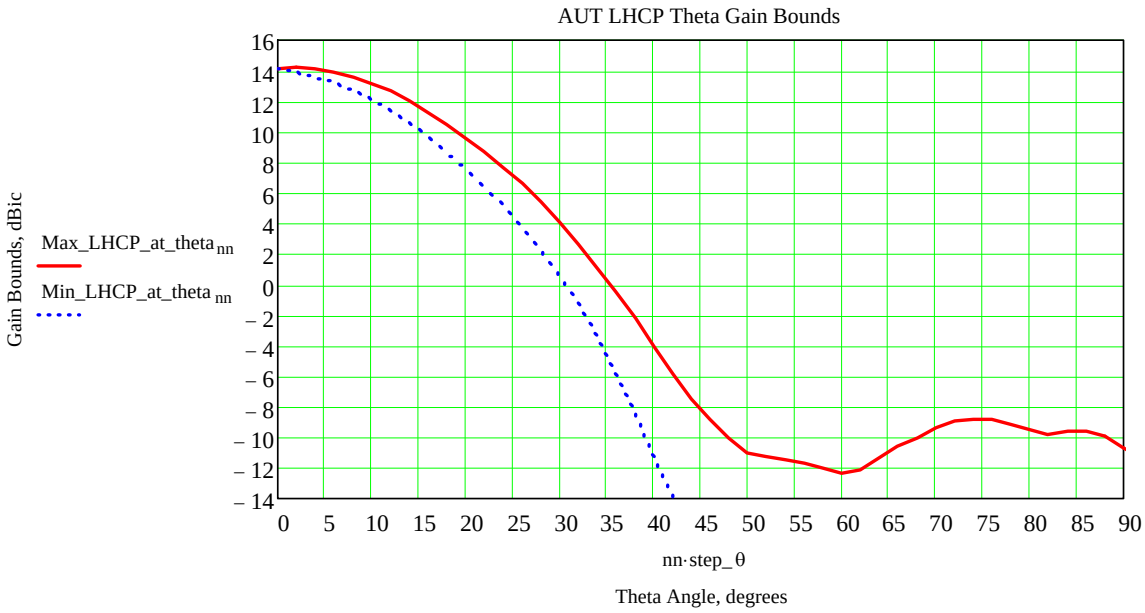


Test_date = "08/30/10"
Analysis_date = "08/31/10"
f = 2072.5 MHz

serial = "SN 1004-008 2072 MHz"
test_range = "Anechoic Chamber"

dB_per_div = 2 dB
LHCP_max= 14.3 dB
Plot_max = 16 dB max
precal_data = "AC_10H3001a.dat"
rdp_data = "AC_10H3001b.dat"
post_cal_data = "AC_10H3001a.dat"

Figure 2. Antenna gain at 2072 MHz for theta = 0 to 360 deg at phi = 0 and 90 deg.



Test_date = "08/30/10"
Analysis_date = "08/31/10"
f = 2072.5 MHz

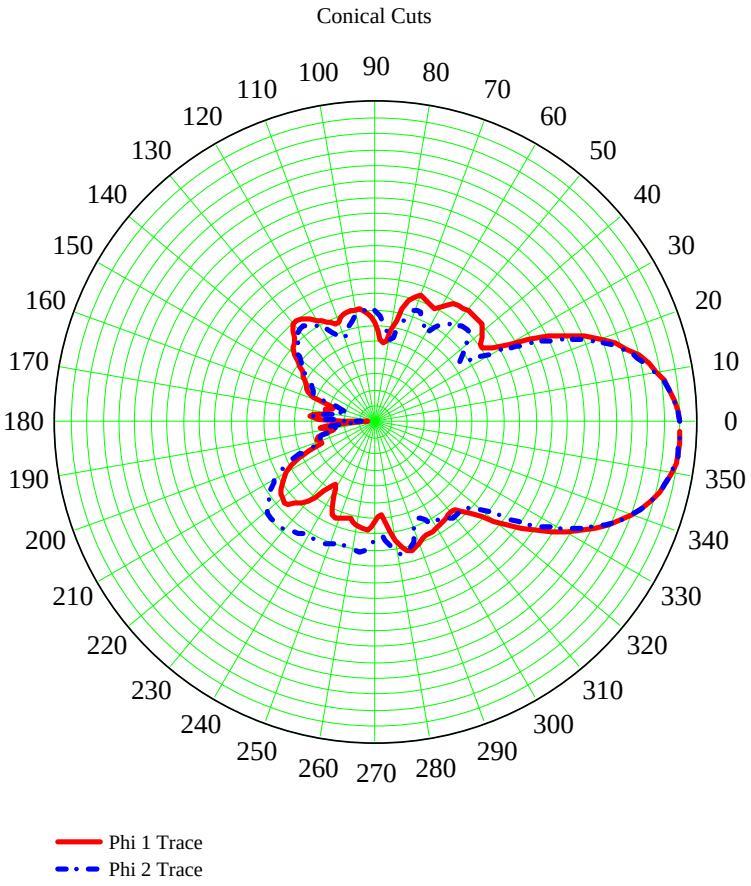
LHCP_max= 14.3 dB
precal_data = "AC_10H3001a.dat"
serial = "SN 1004-008 2072 MHz"
rdp_data = "AC_10H3001b.dat"
test_range = "Anechoic Chamber"
post_cal_data = "AC_10H3001a.dat"

Figure 3. Antenna gain bounds at 2072 MHz for theta = 0 to 90 deg over all phi angles.

The gain bounds plot shows the entire radiation pattern performance in a single simple graph. At each theta angle, phi is varied from 0 to 360 degrees and the maximum and minimum gains are determined and plotted. This plot is intended to show the degree of cylindrical symmetry present in the antenna pattern.

AUT Left Hand Circular Polarization Gain

$\phi 1 := 0$ $\phi 2 := 90$ degrees

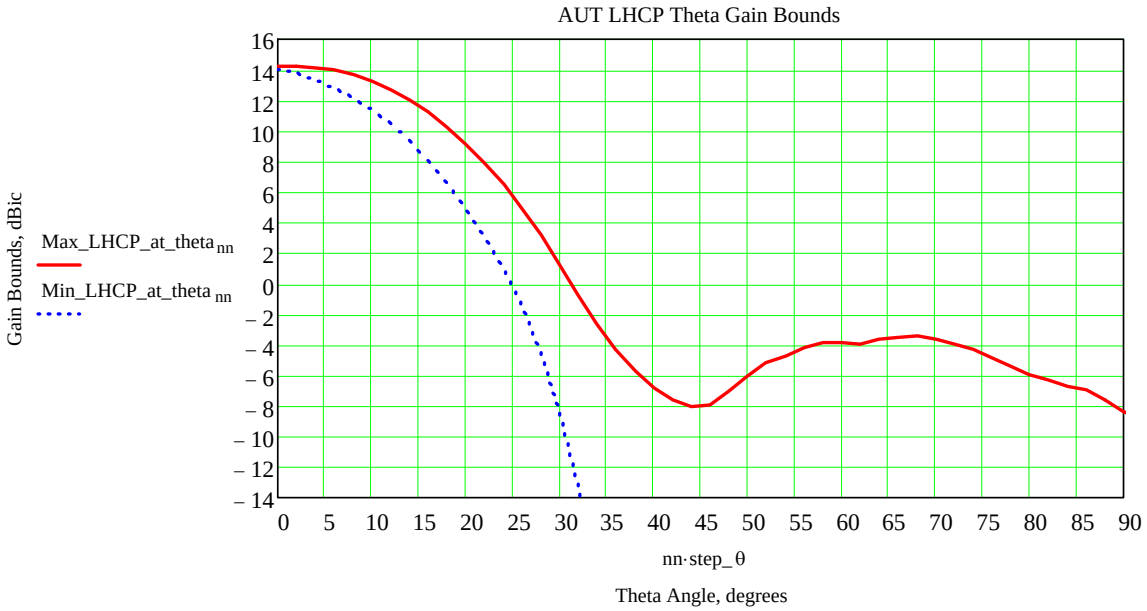


Test_date = "08/30/10"
Analysis_date = "09/01/10"
f = 2250 MHz

serial = "SN 1004-008 2250 MHz"
test_range = "Anechoic Chamber"

dB_per_div = 2 dB
LHCP_max= 14.3 dB
Plot_max = 16 dB max
precal_data = "AC_10H3004a.dat"
rdp_data = "AC_10H3004b.dat"
post_cal_data = "AC_10H3004a.dat"

Figure 4. Antenna gain at 2250 MHz for theta = 0 to 360 deg at phi = 0 and 90 deg.



Test_date = "08/30/10"
Analysis_date = "09/01/10"
f = 2250 MHz

LHCP_max= 14.3 dB
precal_data = "AC_10H3004a.dat"

serial = "SN 1004-008 2250 MHz"
test_range = "Anechoic Chamber"

rdp_data = "AC_10H3004b.dat"
post_cal_data = "AC_10H3004a.dat"

Figure 5. Antenna gain bounds at 2250 MHz for theta = 0 to 90 deg over all phi angles.

The gain bounds plot shows the entire radiation pattern performance in a single simple graph. At each theta angle, phi is varied from 0 to 360 degrees and the maximum and minimum gains are determined and plotted. This plot is intended to show the degree of cylindrical symmetry present in the antenna pattern.

Nominal S-Band Specifications

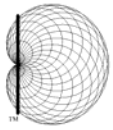
- Gain: 13 dB min on boresight (symmetrical about phi)
- Frequency: 2150 MHz (center frequencies)
- Bandwidth: > 300 MHz
- Impedance: 50 Ohms
- Polarization: Circular
- VSWR: < 1.5:1 Entire Band
- Connector: SMA Female
- Dimensions: 12” diameter, ~8” tall
- Mass: 1,260 grams
- Temperature: -85 C to +90 C
- Power: Up to 10 Watts CW (estimated, actual may have more capability)

Alternate antenna designs with modified radiation patterns and gain performance are available. This antenna is presented as an example of our capabilities.

More details are available on request.

A matching antenna hat is available for this unit.

***Ant*enna *Dev*elopment Corporation.** *AntDevCo* is ISO 9001:2008 certified.



www.AntDevCo.com (575) 541-9319
BBlevins@AntDevCo.com (575) 635-3528
TGreenling@AntDevCo.com (575) 644-1527

Come to us for expert help with your satellite antenna needs.