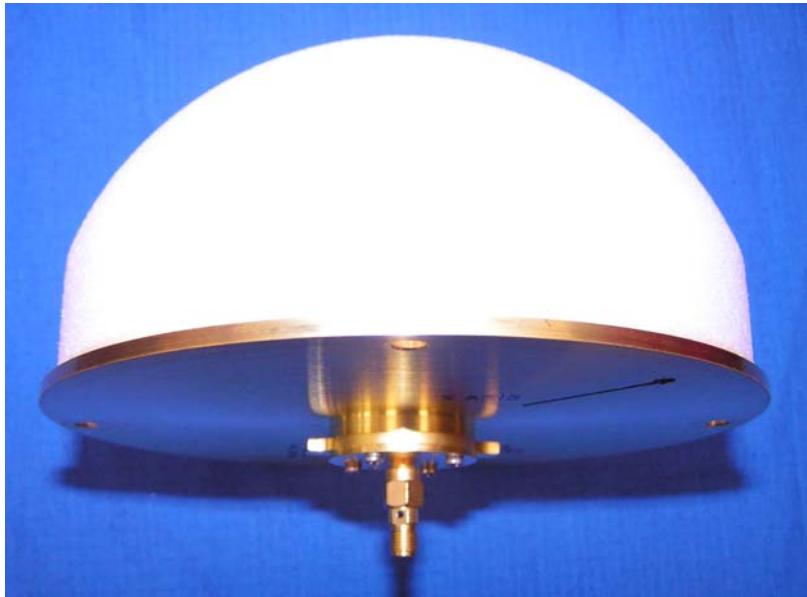


***Antenna Development Corporation, Inc.***  
***151 S. Walnut Street. Suite B-6, Las Cruces, NM 88001***

***Evolved X-Band Spacecraft Antennas***

Antenna Development Corporation, Inc. (*AntDevCo*) employees integrated the evolved antenna designed by NASA Ames for the ST-5 spacecraft. These antennas are capable of supporting high data rates and up to 10 Watts of transmitted power (depending on the antenna frequency). This antenna design is very broadband (optimized for 7209 and 8470 MHz and operational with low VSWR and acceptable patterns over the entire band.



All antennas are supplied with extensive testing data including principal plane radiation pattern plots, gain bounds plots, and coverage statistics. Simulations of the expected performance on your satellite can also be supplied. The designs were developed by the Physical Science Laboratory at New Mexico State University. As a spin off from the University, *AntDevCo* continues the quality and attention to detail efforts characteristic of the laboratory.

In summary, the antennas and services are:

- Space Qualified
- Low mass
- High Performance
- Custom antenna radiation patterns available

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**Nominal X-Band Specifications**

- Gain: > -2 dB for all angles where  $0^\circ < \theta < 60^\circ$
- Frequency: 7209 and 8470 MHz (center frequencies)
- Bandwidth: > 100 MHz at each center frequencies (measured VSWR performance > 2 GHz)
- Impedance: 50 Ohms
- Polarization: Circular
- VSWR: < 1.5 Transmit Band (8470 MHz), < 2.0 Receive Band (7209 MHz)
- Connector: SMA Female
- Dimensions: 2" diameter, 2" tall<sup>1</sup>
- Mass: ~ 120 grams (see footnote 1)
- Temperature: -100 C to +100 C (flight requirement, not ultimate limit)
- Power: Up to 10 Watts CW

***Evolved S-Band Spacecraft Antennas***

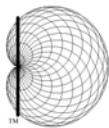
The X-band unit designed for the ST-5 spacecraft can be scaled to operate at S-band frequencies. We expect the antenna characteristics to be:

**Nominal S-Band Specifications**

- Gain: > -2 dB for all angles where  $0^\circ < \theta < 60^\circ$
- Frequency: 2000 MHz
- Bandwidth: > 25 MHz
- Impedance: 50 Ohms
- Polarization: Circular
- VSWR: < 1.5
- Connector: SMA Female
- Dimensions: 6" diameter, 3" tall<sup>2</sup>
- Mass: ~ 120 grams (TBC)
- Temperature: -100 C to +100 C (typical, not ultimate limit)
- Power: Up to 10 Watts CW (estimated, TBC)

More details are available on request. Please note that the device is covered under the patent 5719794. We work with the inventor, Dr. Derek Linden for optimization of these devices.

**Antenna Development Corporation.** *AntDevCo* is ISO 9001:2000 certified.



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

<sup>1</sup> The ST-5 antenna had dimensions of 6" diameter and 3.125" tall to match the dimensions of a quadrifilar helix also flown on the spacecraft. The dimensions shown above are the minimum dimensions to accommodate the evolved antenna. The mass has also been reduced to the minimum required for the evolved radiator.

<sup>2</sup> Directly scaled dimensions from the X-band version. The antenna dimensions may require alteration depending on the exact specifications desired and the results of the evolutionary design. The mass is an estimate.