

# **Satellite and Space Related**

## ***Frequently Asked Questions***

### ***Has Empire ever supplied motors for space?***

Yes, Empire Magnetics, Inc. has supplied motors, gearboxes, resolvers, brakes, rotor nut motors and other motors and assemblies for satellite applications.

### **Some examples:**

Wake Shield Satellite: Empire Magnetics, Inc. supplied a stepper motor, gearbox and resolver assembly. This assembly was used to position the solar arrays in orbit. The satellite has made two trips into orbit aboard the space shuttle. The project engineer is pleased with the results.

Long Wave X-ray Telescope: This space based telescope is being assembled by the Smithsonian Observatory. Several motors, gearboxes and brakes have been supplied by Empire Magnetics, Inc. to support this project.

Space station air locks: Boeing at Marshal Space Flight Center is using several Empire Magnetics, Inc. brushless servos to control the air locks on the new space station.

European Space Agency: Empire Magnetics, Inc. motors are being used to scan a calibration source over the face of a scintillator in a satellite. The satellite was built by Alania of Italy, the scintillators by Bicron Technologies in Pennsylvania, USA.

CTA Space Systems: has used several Empire Magnetics, Inc. motors in various satellites including a rotor nut assembly to compensate an inertial guidance system.

Ground support of satellite development programs is a very common use of Empire Magnetics, Inc. products. Customers include: Hughes, Boeing, Lockheed, UC Berkeley Space Sciences Lab, Space Industries, ITT Aerospace, Ford Aerospace, Grumman and most of the National Labs.

George Cinti, Vice President of Engineering at Empire Magnetics Inc. has many years experience in the Saturn Apollo programs. He designed and built electric motors that were included in the Lunar Lander. However, due to his unique experience, his time is in great demand, as such we must be selective about the projects that are accepted.

### ***What is the cost of a space rated motor?***

Each project has been a custom engineering task, Non Recurring Engineering charges have ranged from \$20,000 to \$150,000 depending on the project. Hardware items are in addition to NRE.