

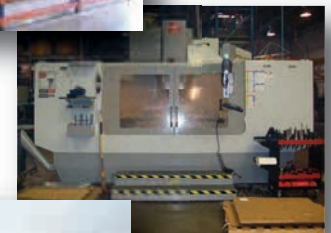
Orbital Systems, Ltd founded in 2004, designs and manufactures satellite antenna systems and components in their Irving Texas facility. Orbital Systems has over 160 antenna systems installed all over the world and supplies products to end users and systems integrators for a variety of tracking applications.

Company Profile

- Over twelve years experience installing antenna systems and components
- Co-located with innovative industry leader RF sister company, Quorum Communications (founded in 1988)
- Defense and Commercial Markets
- Certified Resellers and Systems Integrator Partners

Design, Engineering, Manufacturing and Testing Facility

- Average system design to delivery is four months
- 19,000 ft² (1800m²) engineering and manufacturing facility
- Manufactures most metal parts used in positioners and systems in-house
- 1 Acre (4050m²) antenna system yard for Factory Acceptance Test (FAT), performed on every positioner and antenna system



Installation and Maintenance

- Superior engineering, precision manufacturing and strict quality control standards result in maintenance free operation
- Field statistics show greater than 10 years Mean Time Between Failure (MTBF) and Low Mean Time to Repair (MTTR)
- Fast professional installation; typical installation time-frame is 2 or 4 days
- Worldwide professional installation and maintenance support
- Remote diagnostics and maintenance
- Extended maintenance available after warranty expiration



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Products and Systems

Reliable, affordable and innovative elevation-over-azimuth satellite positioners and antenna systems are available in the size class of 5m and smaller.

Antenna Positioners

- Designed for high reliability and minimal maintenance, first major maintenance recommended at ten years
- Pressurized with dehydrated air to eliminate internal condensing humidity and to keep out dust. Internal temperature and humidity sensors control built in automatic purging system
- High accuracy axis feedback suitable for precision tracking from vectors and TLEs
- Uses the Orbital Data Bus technology to integrate the positioners mechanical system with the RF payload to provide an integrated control interface that uses less internal cables and connections
- Designed for operation in extreme temperature ranges with typical operating temperature from -40°C to $+55^{\circ}\text{C}$. Built in automatic heaters for operation in uncommonly cold climates
- Unlimited rotation in azimuth axis
- RF cables are carried internally on a flex system rated for the life of the system
- Electronics are mounted on the elevation arm with options to provide A/C or DC power, 100bT or 1000bT Ethernet, fiber, data pairs and RF channels through the positioners base
- Heavy duty spun aluminum reflectors for operation up to 18 GHz
- Two year warranty; typical mean time between failure (MTBF) is over 10 years
- Comprehensive toolkit included
- Compliant with CE Electrical Safety, Emissions and Machinery Directive standards



X, S and L Band Feeds

- High efficiency feeds for RX and TX/RX applications with integrated downconverter options
- Multi-band feeds and optional polarity selection depending on application
- Built in filtering options to reject strong out of band interference
- Built in high isolation diplexers for TX/RX applications
- Feed and associated components are enclosed in machined and pressurized housing
- Feeds are integrated to the antenna controller over ODB and contain purge valve for pressurization

Upconverters and Downconverters

- Downconverters for various applications built into feed, or electronics enclosure on positioner arm
- Combination upconverter/downconverter/loopback test converter for TT&C applications
- Custom up and downconverters

Low-rate and High-rate Demodulators

- Versatile 1U rack EOS DB digital receivers for X, S, and L-Band LEO and GEO satellites
- Processing of standard EOS-DB satellites in fixed modes
- Optional TT&C satellite modems and high rate general purpose demodulators through partner programs

Control Software

- EOS Front End Server for EOS DB applications to schedule acquisition and control ingest of satellites
- Mission Commander software for basic M&C operations for TT&C antenna systems
- Mission Commander Free for TT&C systems to demo control protocols
- Established partnerships for M&C and C2 software to support Orbital Systems products



Orbital Systems satellite ground station antenna positioners and complete front end systems are built to meet the high performance and accuracy requirements of demanding satellite tracking applications, including Telemetry, Tracking and Control (TT&C), Earth Observation Satellites (EOS) Direct Broadcast (DB), Radar, Search and Rescue (SARSAT), UAV/RPV Tracking, and other custom antenna applications.

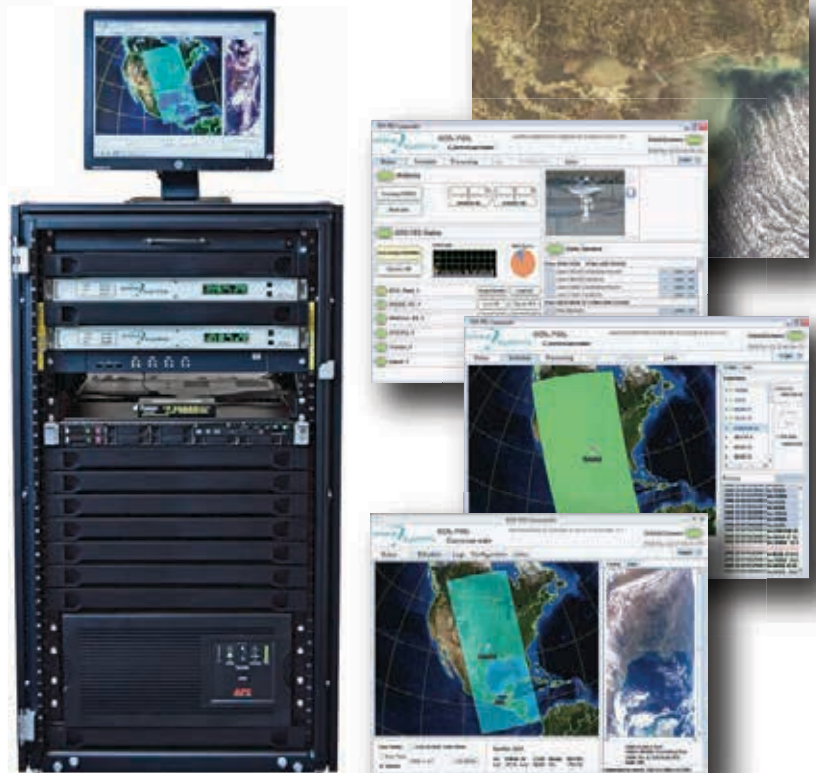
Positioners and TT&C Systems

- TT&C antenna systems from 1.5m to 5m
 - Completely integrates RF components with the antenna positioner
 - X and S and Feeds
 - Downconverters
 - Upconverters
 - Loopback test converter
 - 50W or 100W HPA
 - Control through one convenient interface
 - Extensive monitoring capabilities
 - Automatic safety features prevent damage to expensive components
 - Tracking
 - TLE tracking
 - Offsets to TLEs for first orbit applications (time, az/el)
 - Location vector and pointing vector tracking
 - Mission Commander Free software is included with TT&C antenna systems
 - OACP control protocol makes software interface development easy



EOS Data Capture and Processing

- Pre-configured solution for reception and processing to level 0 files on disk for common X and L-Band EOS-DB satellites; the choice of leading meteorological and science research organizations worldwide
 - 2.4XLC EOS-DB Integrated System Bundle
 - Positioner in 2.4m or 3.0m sizes
 - Concentric X-L Dual Band Feed
 - Built in LNA/LNB and Downconverters
 - Low-rate Demodulator
 - High-rate Demodulator
 - Front End Server (EOS-FES)
 - Server Hardware and Software License
 - Dehydrator
 - Professional installation
 - Standard two year warranty
 - Extended maintenance available after warranty



*Optional Rack Enclosure Half Height Rack

Additional Applications

Orbital Systems is a leading manufacturer of antenna positioners and components used for a variety of tracking applications.

Radar Positioners

- Radar Positioners for Systems Integrators
 - Meteorological and Public Safety
 - Precision scanning
 - High speed slewing



Search and Rescue (SARSAT)

- Search and Rescue reception of LEO and MEO satellites in S-L Bands
 - Special S-L Band SARSAT optimized feeds and filters
 - SARSAT optimized downconverters



UAV/RPV Tracking

- Unmanned Aerial Vehicles
- Remotely Piloted Vehicles



Custom Antenna Applications for System Integrators

- Custom Built Antenna Applications for Systems Integrators
 - Positioners only
 - Custom RF components
 - Assembly and mounting

