3.0TSXS1-3.7m S-X Band TT&C Antenna System
Complete front end for interface with a customer provided satellite telemetry modem

The 3.0TSXS1-3.7m S-X Band Telemetry Tracking and Control System Antenna is a complete front end for connection to a satellite communications telemetry modem and a high rate demodulator. This multi-band antenna transmits and receives on S-Band, and receives on X-Band to enable reception of both control communications, and high-data rate satellite payload data. The Orbital Systems antenna systems are designed and built to provide high reliability while withstanding severe environmental conditions. Superior engineering, precision manufacturing and strict quality control standards result in near maintenance-free operation making the system the optimal choice for service in remote locations and hostile climates.

System Features
This antenna system includes the antenna positioner, 3.7m dual-band antenna, tracking controller, upconverter, HPA and downconverter to cover the standard satellite uplink and downlink bands. Standard equipment includes the positioner, feed mounting poles, antenna control unit, uncomplicated and easy to understand operation and maintenance manuals, and functional tool kit. The positioner provides standard options for AC or DC power and 100BASE-T Ethernet within the elevation arm-mounted electronics enclosure. Reception loss caused by what is sometimes called a “keyhole effect” is eliminated by the high speed of azimuth rotation in Orbital Systems’ two axis products. When tracking a near overhead pass the antenna uses a predictive motion with a peak azimuth velocity of 60 degrees/sec, and acceleration at up to 60 degrees/sec². These very high speeds completely eliminate loss of signals on a worst case near overhead pass in X Band and below.

System Components
- Antenna positioner with 3.7m solid aluminum reflector (3.0AEBP-3.7m)
  - Antenna Control Unit with built-in GNSS receiver (ACU-2) inside antenna
  - Comprehensive maintenance tool kit
  - Dehydrator for system pressurization
- Concentric X and S-Band feed, polarity selectable X-band and S-band
- Integrated X-Band block downconverter to IF of 1250 MHz
- Integrated S-band Master Converter module containing an upconverter, downconverter and loopback test converter to 70 MHz IF interfaces
- Integrated 50W HPA for S-Band with remote
- System cable up to 100m including coax and fiber cables
- Includes 3-day on-site installation and setup for prepared site

System Features
- Complete TT&C antenna front end for interface at IF with a customer provided TT&C modem
- Outstanding RF performance with X-band G/T of approximately 27.6 dB/K and S-band G/T approximately 13.1 dB/K and a typical S-Band EIRP of 45.1 dBw (P1dB)
- Uses Orbital Systems proven high reliability pressurization technology to protect all electronics and mechanical systems
- All components built into antenna system; eliminates need for indoor rack space
- Uses the powerful Orbital Data Bus (ODB) and the ACU-2 Ethernet antenna controller that is readily controlled by customer supplied M&C software based on JSON file transfers
- Control the transmit frequency, output power level and frequency, and manage the HPA control with simple JSON formatted commands
- Comprehensive web interface to facilitate status monitoring and human control of the antenna system
- ACU-2 integrates the antenna positioner tracking control with the HPA control for maximum safety and ease of control. The HPA is managed automatically with a built in configurable transmit mask and numerous safety interlocks
- ACU-2 uses precise TLE tracking by closing the tracking loop over 200 times per second
- Track difficult first orbit passes using the built in time offset capability
- Antenna system is CE marked and independently laboratory tested for compliance with CE Safety, Emissions and Machinery Directives
- Quick delivery: typical time from purchase to shipment is 4 months
- Optional satellite modem and high rate demodulator available
- RF customization is available
3.0TSXS1-3.7m S-X Band TT&C Antenna Specifications

### Antenna and Feed
Feed ........................................................................................................................................ X band prime focus with on axis S band section
RX Sensitivity ................................................................................................................................ X band G/T at 8200 MHz approximately 27.5 dB/K and S-band at 2250 MHz approximately 13 dB/K
Axial Ratio ....................................................................................................................................... Better than 1.5 dB
Reflector ........................................................................................................................................ 3.7-meter spun aluminum, .360 f/D

### X-band Downconverter
Frequency ........................................................................................................................................... Input 8000 to 8400 MHz
IF Output ........................................................................................................................................ Block converted to 1250 MHz +/- 200 MHz; optional tunable to 720 MHz

### S-band Master Converter Module
Upconverter IF Input .................................................................................................................. 70 MHz, nominal -10 dBm, BW = 10 MHz
Upconverter Output Frequency ........................................................................................................ Tunable from 2025 to 2120 MHz in 2 Hz steps
Upconverter Level Control ................................................................................................................ Integrated switchable 31 dB attenuator, switchable in 0.25 dB steps
Downconverter Input Frequency ..................................................................................................... 2200 to 2300 MHz in 2 Hz steps
Downconverter output ....................................................................................................................... 70 MHz

### HPA
Type ................................................................................................................................................ Solid-state, instant-on, nominal 50W unit
System Power .................................................................................................................................. Produces an EIRP of 45.1 dBw at P1dB

### Antenna Positioner and Integrated ACU-2
Type ............................................................................................................................................... Orbital 3.0AEBP elevation-over-azimuth bus-controlled positioner
Motors ............................................................................................................................................. Brushless servomotors
Corrosion Protection .................................................................................................................... Protected with pressurized dry air system, aluminum and stainless steel construction, powder coated
ACU ............................................................................................................................................... Orbital ACU-2 with internal GNSS receiver, TLE tracking multi-mode fiber interface
Timing ............................................................................................................................................... GPS, or IEEE1588 and PTP
Protocols ........................................................................................................................................ Web, OACP

### Power and Environmental
Mains ............................................................................................................................................... 208 to 240 VAC, 50/60 Hz, 16A maximum
Weight ......................................................................................................................................... 658 kg (1450 lbs)
Temperature ................................................................................................................................... -40°C to +55°C; optional blanket kit available for extreme cold

### Electrical Cabinet and External Controls
The electrical cabinet is equipped with the following safety devices:
- Emergency stop switch
- Audible warning annunciator
- Visual warning indicator
- Padlocks to lock the left and right sides of the electrical cabinet

3.0AEBP antenna positioners are compliant with CE Machinery Directive IEC 60204-1

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