

SEASPACE TERASCAN® ANTENNAS

AXYOM MODEL 50

PRODUCT OVERVIEW

AXYOM Antenna Technology

SeaSpace's AXYOM Antennas are specifically engineered to meet the rigorous tracking requirements of Low Earth Orbit (LEO) satellites with high frequency downlinks. AXYOM consists of four engineered subsystems that combine to provide high performance tracking capability that absolutely minimizes tracking dynamics and provides true full hemispherical coverage with no keyholes.

Each Model 50 subsystem was designed using state-of the art technologies to maximize performance and minimize operational risk:

- ✔ SeaSpace's unique AXYOM Pedestal using an X-Y over Azimuth geometry.
- ✔ Our 3-axis, high-performance Servo Drive System.
- ✔ The Model 50 Antenna Control Unit (ACU) based on our TeraScan® technology.
- ✔ An integrated Autotrack Receiver & Demodulator embedded within the ACU.

AXYOM Pedestal Geometry

The AXYOM pedestal was designed specifically to handle even the highest frequency links through Ka-Band and beyond. The X-Y over active Azimuth geometry results in the lowest required servo velocity, acceleration and torque, making it ideally suited for tracking NPP and other LEO satellites with high frequency downloads. AXYOM is the most cost-effective implementation of a three axis pedestal and provides X-Y and X/Az tracking capabilities in a single unit.

KEY FEATURES

- ✔ Very high pointing and tracking precision and accuracy
- ✔ True full hemispherical coverage with no keyholes above 0° elevation
- ✔ Minimal swept volume
- ✔ Minimal wear & tear, long life
- ✔ Maximized MTBF, minimized MTTR
- ✔ Low maintenance & life cycle costs
- ✔ Motor & drive redundancy
- ✔ High reliability/availability
- ✔ Azimuth mechanical stops provide increased system safety and protection



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AXYOM Antenna Specifications

AXYOM Pedestal Performance Specifications

Parameter		Units	X-Axis	Y-Axis	AZ-Axis
Travel Limits	Mechanical	deg	± 92	-7 to +110	± 275
	Electrical	deg	± 90	-2 to +105	± 270
Maximum Velocity		deg/sec	3	3	3
Maximum Acceleration		deg/sec ²	5	5	5
Stall Torque		lb-ft	1640	1110	1755
Drive Compliance		lb-ft	15,956,904	3,612,348	24,294,467
Shaft Encoder Resolution		bits	19	19	19
Overall Accuracy		Tracking: 0.02 deg		Positioning: 0.01 deg	

AXYOM Reflector & Subreflector Specifications

Parameter	Units					Notes
Reflector Diameter	m	4.0	4.5	5.0	6.1	
Reflector F/D	Ratio	0.352	0.375	0.357	0.375	
Surface Accuracy	mm	0.48	0.48	0.48	0.48	RMS, maximum
Shape	P or S	S	P	S	P	P=Parabolic, S=Shaped
Subreflector Diameter	m	0.66	-	0.66	-	

AXYOM Environmental & Operations Performance Specifications

Parameter	Units	Value	Notes
Operating Temperature Range	°C	-30 to +70	Extended available: -60 to +70
Operating Wind Speed	kph	280	Standard-higher ratings optional
Survival Wind Speed	kph	280	Standard-higher ratings optional
Total System Weight	kg	3,050	Nominal-3.0m reflector & radome
Overtum Moment	Nm	147,000	3.0m system @ 240kph winds
Operational Relative Humidity	%	100	Including condensation
Operational Rain	cm/hr	10	
Operational Snow/Ice	kg/m ²	96.9	
Voltage	VAC	110/220	50 or 60Hz
Power Consumption	amps	20/10	Maximum

AXYOM Model 50 Total RF Performance Specifications

Reflector Size (m)	Frequency (MHz)	Cassegrain Te ₂₁ SCM			Prime Focus Conscan		
		Gain (dBi)	G/T (dB/K)	3dB BW (deg)	Gain (dBi)	G/T (dB/K)	3dB BW (deg)
4.0m (shaped for x-band)	L-Band(1485.0)	-	-	-	32.8	11.4	3.5
	S-Band(2250.0)	-	-	-	36.4	15.0	2.3
	X-Band(8200.0)	49.0	27.0	0.6	48.2	26.2	0.6
4.5m (parabolic)	L-Band(1485.0)	-	-	-	34.1	12.7	3.1
	S-Band(2250.0)	-	-	-	37.7	16.3	2.1
	X-Band(8200.0)	49.6	27.6	0.6	49.5	27.5	0.6
5.0m (shaped for X-band)	L-Band(1485.0)	-	-	-	34.7	13.3	2.8
	S-Band(2250.0)	-	-	-	38.3	16.9	1.9
	X-Band(8200.0)	51.1	29.0	0.5	50.1	28.1	0.5
6.1m (parabolic)	L-Band(1485.0)	-	-	-	36.7	15.3	2.3
	S-Band(2250.0)	-	-	-	40.3	18.9	1.5
	X-Band(8200.0)	52.3	31.4	0.4	52.1	30.2	0.4

Benefits

- Reflector antennas ranging in size from 4.0 - 6.1m in diameter, parabolic and dual shaped
- Autotrack feeds supporting single or multiple frequencies at L-, S-, X-, and Ka-Band
- 3-axis, X-Y over Azimuth geometry operating in multiple tracking modes (X/AZ, Y/AZ, X-Y)
- Absolutely minimized requirements for tracking velocities (<0.7°/sec) and accelerations (<0.005/sec²) of LEO satellites at all latitudes and satellite inclination angles
- Continuous, smooth tracking at velocities from 0.005°.sec to 5°/sec
- Bias drives provide zero backlash operation
- Interchangeable drive units for all axes
- Low LRU count, easy access to all LRU's
- Minimal maintenance requirement
- Intelligent motors with integrated servos mean each drive unit can be accessed remotely for FD/FI providing AXYOM with unique "Intelligent Drive" technology
- High torsional stiffness, compliance and resonant frequency
- All steel, fully counter-balanced design
- Mechanical stops in all three axes
- Stow pins and interlocks for safety

*G/T specifications are calculated values for 5° elevation above an unobstructed horizon and clear sky, dry air conditions. Beamwidth and Gain specifications are nominal values. All values subject to change without notice.



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