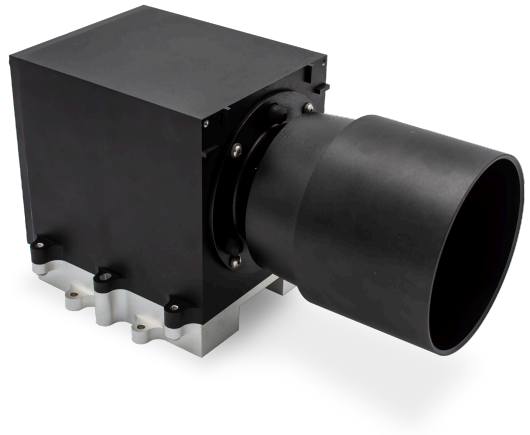
Lodestar

Star Tracker
Built in the USA for commercial space



Product Brief

Second Order Effects (SOE) Lodestar is a star tracker design for proliferated LEO and GEO missions. Using new space practices, we are optimizing how the commercial space industry engages with suppliers by reducing costs and securing domestic supply of GNC components using proven commercial technologies.

Design Philosophy

- Utilize proven sensing methodologies with modern compute and control architectures
- Right-size performative design for high volume, constellation customers
- Simple, robust interfaces for ease of integration

Product Specifications	
RMS Cross Boresight Accuracy	< 7 arcsec
RMS About Boresight Accuracy	< 70 arcsec
Max Update Rate	10 Hz
Field of View	20×20°
Baffle Sun Rejection Angle	35°
Communication Interface	Ethernet
Factory Calibration	Yes
Target Environment	5 years LEO
Volume	2,000 cm^3
Mass	400 g

Product Roadmap

Q3 to Q4 2025: Prototype Lodestar
Q1 to Q2 2026: First flight
Q3 to Q4 2026: High volume Lodestar
Q1 to Q2 2027: Advanced Lodestar

Highlights

- Dual-use camera functionality
- Technology roadmap to expand envelope and features
- Bare metal algorithm for high performance and customization
- Ethernet interface for robust comms and simple integration
- Full model characterization correlated to design for optimization

About Second Order Effects

Who we are

Founded in 2016, SOE specializes in electrical, electro-mechanical and embedded solutions for space applications, delivering high-reliability systems tailored to the demands of orbital and deep-space missions. With expertise spanning radiation-hardened designs, energy-efficient converters, and software, we provide custom architectures that ensure mission-critical performance and longevity in harsh space environments.

Flight heritage

SOE has built avionics across a range of aerospace vehicle subsystems. Our hardware has flown in space and even successfully reentered Earth's atmosphere, including:

- RF and propulsion power converters
- Battery and thermal controllers
- Flight computers and cameras
- Motor controllers

SOEFFECTS.COM CONNECT@SOEFFECTS.COM