



## **GIMBAL SOLUTIONS**

FOR AEROSPACE AND DEFENSE  
APPLICATIONS

# INTEGRATED MOTION CONTROL POSITIONING

From our beginnings as a precision components supplier to our ever-expanding portfolio of integrated systems, Moog has been a leader in motion control and positioning for more than 70 years. As the largest manufacturer of slip rings in the world and a leading supplier of high precision motion control products for the aerospace and defense industries, Moog has a diverse product portfolio to pull from allowing for truly integrated motion control and positioning solutions. Being the designer and manufacturer of most of the sub-assemblies used in a gimbal system, allows Moog to optimize size, weight, power, and cost to provide the highest value solution for our customers.

## HIGHEST PERFORMANCE, HIGHEST VALUE

As the designer and manufacturer of both the major subsystems and the complete system, Moog has an unparalleled ability to meet our customers cutting edge demands.

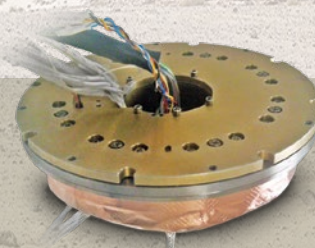
We understand that performance is critical, and an optimized design is the only way to achieve it.

- Single and multi-axis rotary position solutions that are optimized for minimal size, weight and high reliability
- Mechanically integrated assemblies that are designed to support the customer's payloads
- Ideal integration of slip ring, motor, and position feedback devices into gimbal assemblies that significantly reduces customer risk and lifetime program costs
- In-house design of servo drive and power electronics allows the platform to be tailored to the motor and feedback device and expertly tuned to optimize performance
- System and component level testing ensures every specification is met or exceeded
- Commitment to continuous improvement in lean product development while facilitating customer collaboration

Customer driven solutions are our standard -- we work with our customers to solve the most challenging applications.



**SINGLE-AXIS GROUND-BASED  
GIMBAL STAGE**



**ELEVATION AND AZIMUTH  
AIRBORNE GIMBAL STAGE**

# CAPABILITIES

Moog manufactures precision motion control components for a wide variety of applications. We leverage our expertise in the design and manufacturing of components to a new level by offering gimbal assemblies that integrate motion and power/data transmission across a rotary interface. Partnering with us allows you the flexibility and time needed to focus on your core business: the overall system solution.

We manufacture military and aerospace slip rings, direct drive DC motors, precision resolvers, fiber optic rotary joints and electromechanical actuators for a wide array of applications from EO/IR to directed energy platforms. With Moog supplying the gimbal assembly, we take on the responsibility of integrating the rotary components in a housing and ensuring proper operation in support of your payload.

## Typical Applications

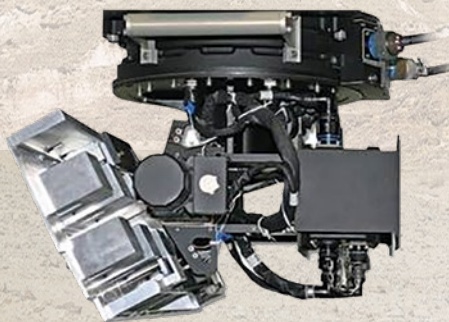
- EO/IR sensors
- Single and multi-axis aerial radar positioners
- Ground-based and airborne LIDAR systems
- Aerial and shipboard celestial navigation systems
- Infrared countermeasure systems
- High power directed energy platforms

## Key Design Elements

- Low profile assemblies
- 2 - 60 arcsec pointing accuracy
- -55° to +85° C temperature range
- Slip rings that transfer electrical power and data rates up to 10 Gbps
- Closed-loop position and stabilization servo control
- Highly accurate position feedback devices: resolvers or absolute encoders
- High-performance DC motors
- Other components that can be integrated: RF rotary joints, fluid rotary unions and fiber optic rotary joints



**TWO-AXIS DIRECT DRIVE GIMBAL WITH INTEGRAL SERVO ELECTRONICS**



**TWO-AXIS AIRBORNE GIMBAL WITH INTEGRAL SERVO ELECTRONICS**

**MOOG** | Shaping the way our world moves™

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