OVERVIEW

Moog produces mechanisms for spacecraft motion control with design and flight heritage expanding over 45 years. With origins from historic programs such as Apollo and Pioneer to present-day satellite programs, Moog brings heritage-based solutions to spacecraft mechanisms technology. The spacecraft mechanisms facility in Chatsworth, California includes a fully-integrated engineering/design, manufacturing and test capability. Moog spacecraft products are flexible to meet customer requirements for a wide breadth of applications ranging from commercial to government flight programs.

MANUFACTURING CAPABILITIES

• Class 100 certified laminar flow work stations
• Class 1,000 Clean Room for Bearing Processing
• Class 10,000 Optical Assembly Clean Room
• Class 100,000 General Assembly
• Extensive machining capacity, over 900 square meters of floor space

TESTING CAPABILITIES

• Vibration Test Facility
• 14 Thermal-Vacuum Chambers
• 8 Thermal-Cycle Chambers
• Automated Acceptance Testing and Data Acquisition (Labview)
• Cryogenic Test Capability
SPACRAFT MECHANISM PRODUCTS

ROTARY ACTUATORS
The family of Rotary Actuators is based on heritage design with a wide range of step sizes available. Options include:
• Stepper or Brushless DC Motor
• Direct Drive or Gear Transmission
• Several options for position feedback such as optical encoders, resolvers, potentiometers, and hall effect sensors

LINEAR ACTUATORS
The family of Linear Actuators includes the following options:
• Range of Travel
• Position Feedback
• Fine Position/Nanometer Incremental Motion
• Integrated Ball Screw or Lead Screw

SOLAR ARRAY DRIVES
Moog Solar Array Drives offer a large selection of heritage solutions to customers. Options include:
• Single or Dual Axis
• Stepper or Brushless DC
• Slip Ring, Twist Capsule or Cable Management
• Resolver, Potentiometer, or Feedback Options

SPECIAL APPLICATIONS
Custom mechanisms for unique applications:
• ISS payloads, science instruments, gimbal and latch devices
• Optimized solutions for specialized requirements
• Integrated structures and mechanisms
SPACECRAFT MECHANISM PRODUCTS

ELECTRIC PROPULSION POSITIONING GIMBALS
Flight qualified electric propulsion gimbals provide vector pointing capabilities for various propulsion thruster configurations, including Xenon and Arc-Jet. Options include:
• Dual axis with wide angular range
• High resolution
• Stepper motors
• Harmonic drive transmission
• Potentiometer
• Propellant lines with heaters/thermistors and MLI blankets

ANTENNA POSITIONER MECHANISMS
APMs are available in several configurations. Either azimuth over elevation or X/Y (crossed axis) geometry are available. Options include:
• Rotary or Linear Actuators
• Stepper or Brushless DC Motors
• Encoders, Potentiometers or Resolvers
• RF & Cable Management
• Launch Locks

ELECTRONIC CONTROL UNIT
The Moog ECU is comprised of hybrid stepper motor controllers, EMI filters and analog pass-throughs for telemetry. The ECU is available in 1, 2 or 4 channel configurations.

INSTRUMENTS AND SYSTEMS
Moog Mechanisms are used on a wide variety of spacecraft instruments. These include:
• Opto-mechanical applications
• Multi-axis payload gimbals
• Precision mechanical instruments