

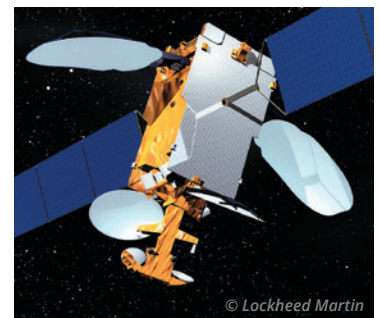
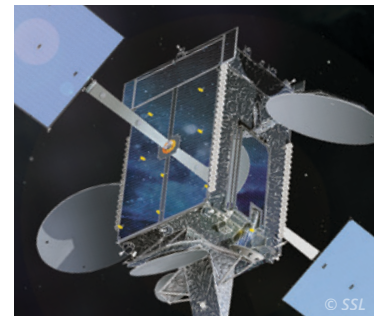
BIAXIAL GIMBALS FAMILY



Moog's biaxial gimbal and antenna pointing assembly family provides a scalable range of two axis mechanisms designed to support and position spacecraft antennas and payloads from small communication apertures to larger mission critical instruments. These assemblies are built on Moog's proven rotary incremental actuator platforms, including the Type 1, Type 2, Type 3 and Type 5 actuator families, allowing configurations that range

from compact antenna positioners to robust biaxial systems capable of handling higher mass payloads. All units provide precise azimuth elevation or X Y axis positioning and can be tailored to meet mission specific mechanical and electrical interface requirements.

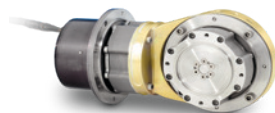
Hard stops can be incorporated for range defined motion. Cable management options include flex loop routing, cable wrap drums, and twist capsule based solutions. A full suite of position feedback devices, potentiometers, optical encoders, and sine cosine resolvers can be integrated depending on system needs. Modular construction allows substitution of actuator sizes, mixing of actuator types in orthogonal configurations, and the integration of RF rotary joints or launch latching mechanisms. Many configurations are already qualified, offering cost and schedule advantages, and all units can be driven by the standard Moog Electronic Control Unit or customer supplied electronics. Together, the family provides a flexible, flight proven solution for precise two axis antenna and payload positioning.



BIAXIAL GIMBALS FAMILY

SPECIFICATIONS

Parameter



**Type11
Biaxial Gimbal**



**Type22 Antenna
Pointing Gimbal**



**Type33 Biaxial
Gimbal Assembly**



**Type55 Biaxial
Gimbal Assembly**

Physical Characteristics				
Dimensions (inches/mm)	6.75 x 3.85 x 3.10 (171.2 x 98 x 79)	14.1 x 6.8 x 6.8 358 x 173 x 173	8.81 x 4.75 x 4.75 224 x 121 x 121	7.15 x 11.36 x 5.90 182 x 289 x 150
Total Mass (Lbm/Kg)	2.9/1.32	11.0/5.0	9.75/4.43	16.5/7.5
Mechanical				
Motor Step Size (Degrees)	3.75	2.0	1.5	1.5
Output Step Size (degrees)	0.0375	0.02	0.009375	0.0075
Slew Rate (deg/sec)	9.375	8	3	1.5
Max. Output Step rate (pulses/sec)	250	400	320	200
Range of Travel (degrees)	Customized Range	Customized Range	Customized Range	Customized Range
Unpowered Holding Torque, minimum (lb-in/Nm)	20/2.26	130/15	240/27	486/55
Output Torque (lb-in/Nm)	70/8	160/18	360/40.7	450/50
Torsional Stiffness (lb-in/rad/Nm/rad)	20,000/2,260	41,600/4,700	110,000/12,428	240,000/27,115
Moment Stiffness in Az-EL Plane (lb-in/rad/Nm/rad)	30,000/3,390	125,000/14,120	150,000/16,950	277,800/31,386
Electrical				
Motor Type	3-Phase Stepper	3-Phase Stepper	3-Phase Stepper	3-Phase Stepper
Operating Voltage, Nominal (VDC)	28	27 - 34	37	28 - 34
Motor Winding Phase Resistance @ 23C (Ohms)	37.5	60	39	32.5
Power, Nominal per Axis (Watts)	5.0	15	20	20
Position Sensor / Accuracy	Potentiometer ±1.0° Max.	Potentiometer ±1.5° Linearity	Potentiometer ± 0.016°	Potentiometer ± 1.5° Linearity
Environmental				
Operating Temperature Range	-50°C to +80°C	-50°C to +70°C	-35°C to +75°C	-35°C to +55°C

MOOG

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