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Credit: U.S. Army



Credit: U.S. Air Force/Giancarlo Casem



Credit: U.S. Air Force

MISSILE SYSTEMS

EQUIPPING THOSE
WHO DEFEND FREEDOM

HYPERSONIC MISSILE SYSTEMS

For over seven decades, Moog has been at the forefront of designing and delivering state-of-the-art steering controls and propulsion systems, essential for guiding missiles at hypersonic velocities. Leveraging a wealth of experience, Moog is assisting the United States Department of Defense in ensuring mission success across their portfolio of new, highly innovative hypersonic applications.

MOOG CAPABILITIES

- Actuation, control electronics, and battery integration
 - Thrust vector control
 - Linear and rotary actuation for fin control
- Sensor gimbal motors, resolvers, and slip rings
- Integrated propulsion systems and fluid control systems
- Avionics, inertial navigation sensors, and integrated solutions
- Structures and shock/vibration isolation solutions



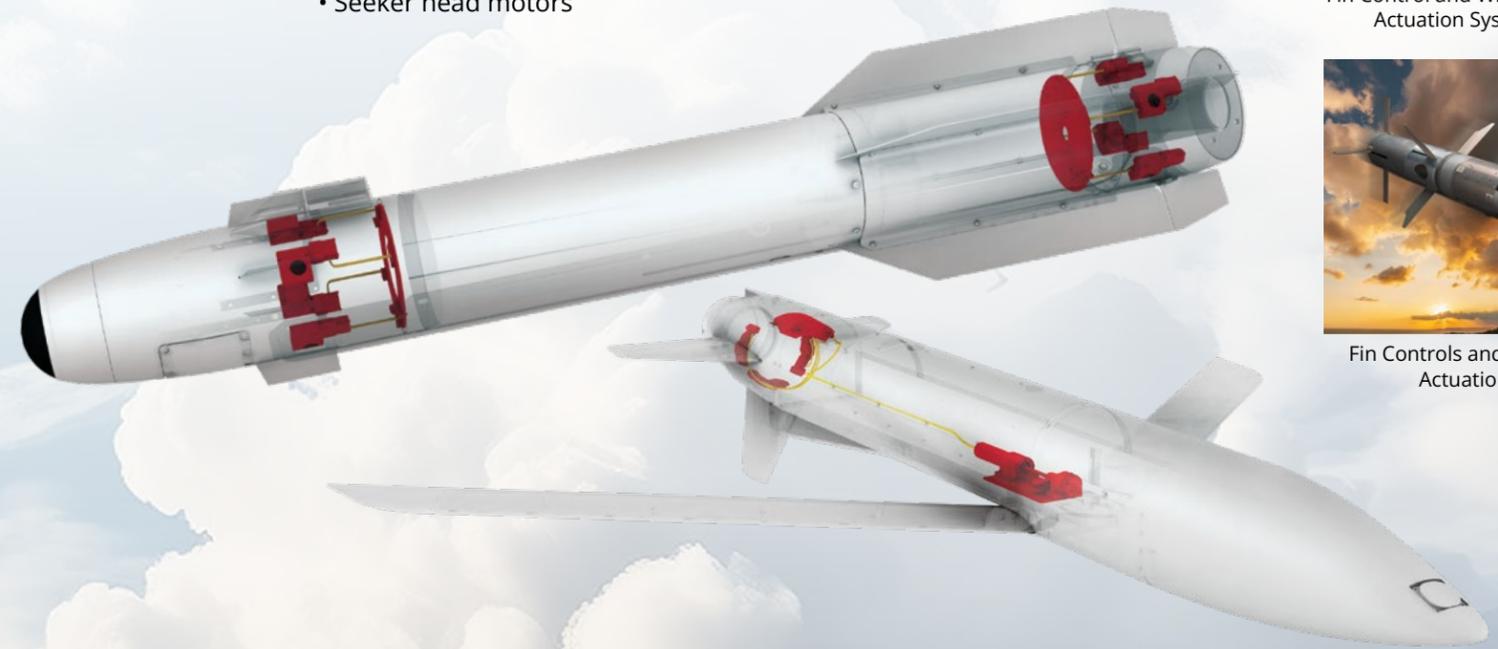
TACTICAL AND STRIKE SYSTEMS

Moog designs and integrates highly-innovative steering solutions that enable the precise accuracy of the world's most effective tactical missiles, guided projectiles, and launch platforms.

With a legacy of delivering more than a million systems for a multitude of high-profile platforms, Moog's dedication to operational excellence is unwavering—ensuring impeccable quality and on-time delivery.

MOOG CAPABILITIES

- Actuation, control electronics, and battery integration
 - Fin control
 - Wing deploy mechanisms
 - Fin lock and deploy solutions
- Integrated, control section structures
- Power distribution and management
- Seeker head motors



Fin Control Actuation Systems



Fin Control and Wing Deploy Actuation Systems



Fin Controls and Shutter Actuation



ROTARY CONTROL ACTUATION SYSTEM



LINEAR CONTROL ACTUATION SYSTEM



ROLL AND ATTITUDE PROPULSION



SUPersonic CONTROL ACTUATION SYSTEM



FIN CONTROL ACTUATION SYSTEM



LONG RANGE FIN AND WING ACTUATION SYSTEM

LONG RANGE BALLISTIC MISSILES

For more than 70 years, Moog has been a key player in aerospace control systems, producing a wide range of thrust vector control (TVC) actuators and servo valves for strategic missiles, with capabilities ranging from fractional up to 70+ horsepower. Beginning in the late 1950s, Moog's TVC actuators incorporated Bill Moog's innovative electrohydraulic servo valve, revolutionizing precision flight control systems for ballistic missiles like Jupiter, Titan, and Atlas. Moog's legacy continues with its hydraulic and electric TVC solutions, which have been integral to the Minuteman III, Peacekeeper, Small ICBM, Titan, Sentinel, and Trident I and II programs, with some products proving their reliability over 30+ years of service.

MOOG CAPABILITIES

- Actuation, control electronics, and battery integration
 - Thrust vector control
 - Fin control
- Sensor gimbal motors, resolvers, and slip rings
- Servo valves
- Liquid and cold gas propulsion
- Avionics, inertial navigation sensors, and integrated solutions
- Structures and shock/vibration isolation solutions



Thrust Vector Controls

AIR AND MISSILE DEFENSE

Since its inception, Moog has supported the United States Missile Defense Agency (MDA) through the application of mission critical solutions in support of a layered defense system that keeps our warfighters, homeland, and the homeland of our allies free from harm.

MOOG CAPABILITIES

- Actuation, control electronics, and battery integration
 - Thrust vector control
 - Fin control
 - Solid rocket pintle control
- Kill vehicle and booster propulsion components
- Avionics, inertial navigation sensors, and integrated solutions
- Structures and shock/vibration isolation solutions
- Seeker head motors
- Servo valves



Thruster Valves



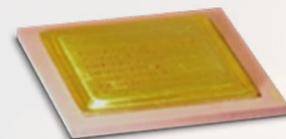
Servo Valves



SENSOR GIMBAL



DIVERT AND ATTITUDE CONTROL SYSTEMS



BRE440™ MICROPROCESSOR SYSTEM-ON-A-CHIP (SOC)



AVIONICS AND CONTROL ELECTRONICS



ACTUATION



PROPULSION MODULES



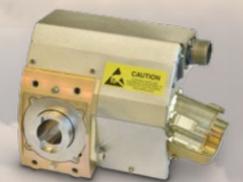
ROCKET ENGINES AND SYSTEMS



JET TAB ACTUATOR ASSEMBLY



REGULATORS



INTEGRATED ACTUATOR/CONTROLLER

THE MOOG ADVANTAGE

HERITAGE

- First missile servo control provided by Moog in 1951
- Electrohydraulic (EH), electropneumatic (EP), electromechanical (EM), and electrohydrostatic actuation (EHA) system architectures
- Moog continues to invest in critical missile control technologies

OPERATIONS CENTERS OF EXCELLENCE

- Preferred supplier status at major primes
- Lean manufacturing and integration
- Clean rooms for assembly and test
- Secure manufacturing
- Salt Lake City, UT facility: high and mixed volume production of missile control systems
- East Aurora, NY facility: actuation system and navigation sensors design development and low rate production
- Niagara Falls, NY facility: propulsion design, assembly, and hot fire test capabilities
- Gilbert, AZ facility: avionics capabilities
- Mountain View, CA facility: structures and shock/vibration isolation
- Blacksburg, VA facility: motors, resolvers, slip rings, twist capsules, and safe arm switches
- Cork, Ireland facility: electronics manufacture capabilities
- Melbourne, Australia facility: future missile control systems production capabilities

HUMAN CAPITAL

- Strong corporate culture based on trust that fosters innovation and embraces change
- Very low turnover rates
- We recruit, develop, and retain top talent

CAPABILITIES

- In house vibration and environmental test facilities
- High volume production
- Low volume rapid prototyping
- Build-to-print services
- Focused, dedicated supply chain
- Medium volume/medium mix production
- Multi-axis rate tables
- Secure or classified manufacturing

KEY COMPONENT EXPERTISE THAT ENABLES INTEGRATED GN&C SOLUTIONS WITH LOWER SWaP-C

- Trusted partner with flawless execution in flight
- Proven systems and digital engineering capabilities
- Tightly coupled designs for optimized volume, performance and lower mass
- Radiation hardened solutions for the most severe environments

LOCATIONS

Argentina
Australia
Austria
Brazil
Canada
Finland
France
Germany

India
Ireland
Italy
Japan
Luxembourg
The Netherlands
Norway
Philippines
Singapore

South Africa
South Korea
Spain
Sweden
Switzerland
United Arab Emirates
United Kingdom
United States

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Moog Space and Defense



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