



**MOOG INC.- AGILE PRIME**  
BLACKHAWK WEAPONIZATION & AIRCRAFT  
SERVICES  
WEAPONS MANAGEMENT SYSTEMS READINESS FOR  
PRECISION GUIDED MUNITIONS & FLEX FIRE SOLUTIONS

GLOBAL DEFENSE HELICOPTER 2024, WARSAW  
ITAR-FREE PRESENTATION



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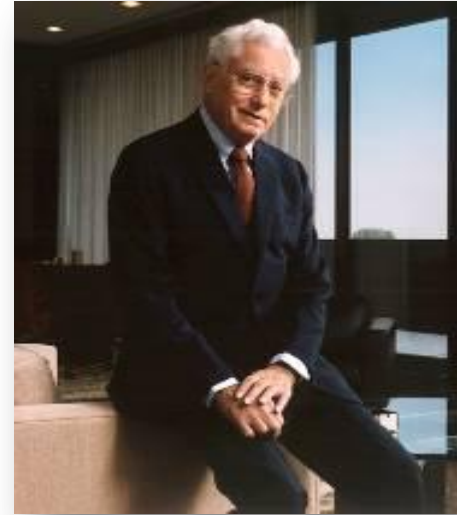
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# Snapshot of Moog

- Founded in 1951 by Bill Moog
- Headquarters in East Aurora, NY
  - ✓ 360+ Acre Facility /1,000,000+ Square Feet
- Global Company
  - ✓ 52 locations in 27 countries
  - ✓ Over 14,000 employees worldwide
- \$3 Billion in Annual Sales (FY 23)
- Worldwide designer, manufacturer, and integrator of precision control components and systems
- Moog's high-performance systems control military and commercial aircraft, satellites and space vehicles, launch vehicles, missiles, automated industrial machinery, wind energy, marine and medical equipment



Bill Moog

# Global Locations



•Moog Germany – Böblingen



Moog – Salt Lake City, UT



Moog - East Aurora, NY



Moog Japan



Moog Plant 20 – Space & Defense  
East Aurora, NY

## 52 Locations in 27 Countries – 14,000 Employees

- |                       |                            |                         |
|-----------------------|----------------------------|-------------------------|
| 1. <b>Argentina</b>   | 10. <b>Germany (3)</b>     | 19. <b>Philippines</b>  |
| 2. <b>Australia</b>   | 11. <b>Hong Kong</b>       | 20. <b>Singapore</b>    |
| 3. <b>Austria</b>     | 12. <b>India (2)</b>       | 21. <b>South Africa</b> |
| 4. <b>Brazil</b>      | 13. <b>Ireland</b>         | 22. <b>South Korea</b>  |
| 5. <b>Canada</b>      | 14. <b>Italy (4)</b>       | 23. <b>Spain</b>        |
| 6. <b>China (3)</b>   | 15. <b>Japan (2)</b>       | 24. <b>Sweden</b>       |
| 7. <b>England (2)</b> | 16. <b>Luxembourg</b>      | 25. <b>Switzerland</b>  |
| 8. <b>Finland</b>     | 17. <b>Netherlands (2)</b> | 26. <b>USA (15)</b>     |
| 9. <b>France</b>      | 18. <b>Norway</b>          | 27. <b>Other</b>        |

Key: **Sales** **Manufacturing** **Sales & Manufacturing**

# Unmatched High-Performance Solutions for Defense

We provide innovative components, sub-systems, and full weapon systems to the global defense market

## AIR



Valves



Control Electronics



Actuators



Gun Turret  
Motion Control Systems



Missile  
Steering Controls



Weaponized Bell 407  
Stores Management Systems (SMS)



## LAND



Gun  
Control Units



Multi-axis Motor Controllers



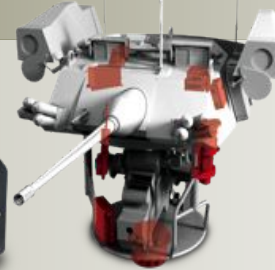
Slip Rings



Thermal/  
High Definition  
Cameras



Driver Vision Enhancer



Turret Controls



Pedestal Missile Launcher

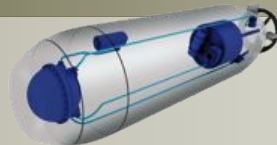
## SEA



Quiet  
Valve Actuators



Torpedo  
Fin Actuators



Large AUV  
Motion Control Systems

Naval Gun Turret Controls and  
Actuation



Weapon SMS with  
HELLFIRE Longbow Integration



# Aircraft Group



- **Integrated Flight Control Systems**
  - Primary Flight Control Systems
  - High Lift Systems
  - Maneuvering Leading Edge Systems
- **Critical Control Applications**
  - Engine Controls
  - Active Vibration Controls
  - Navigation
  - Weapons Bay Door Drive
  - Braking and Steering
  - Specialty Actuation
- **Critical Control Products**
  - Flight Control Computers & Software
  - Control Electronics & Power Drives
  - Cockpit Controls
  - Actuators – All Technologies
  - Related Components
- **Aftermarket Services & Support**
  - Repair & Overhaul at Moog
  - Global Depots
  - Upgrades & Technology Insertion
  - Obsolescence Management



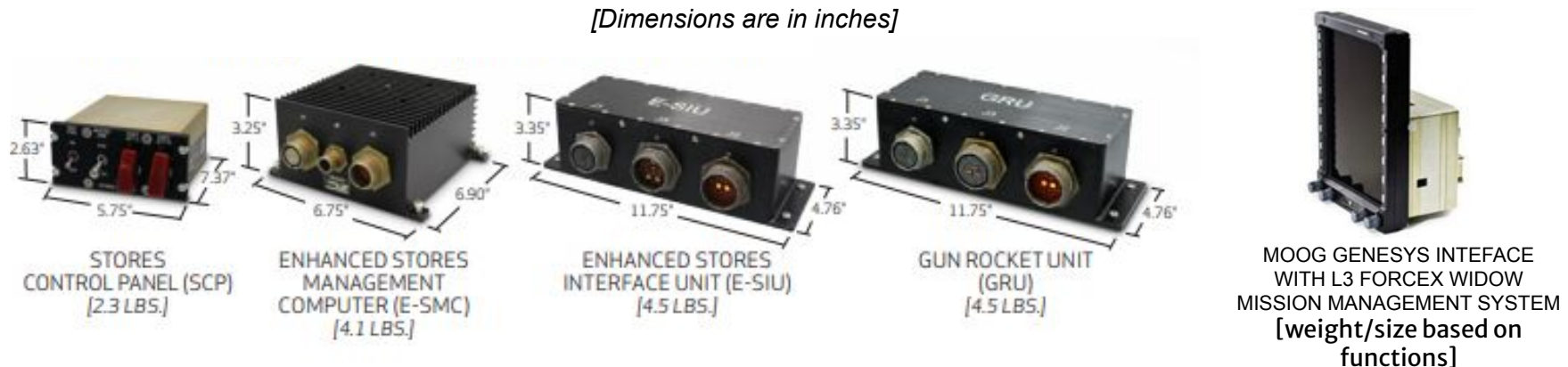


# Moog Gen3 Weapon Stores Management System (SMS)

- The Moog Gen3 Stores Management System (SMS) is a modular, MOSA compliant, best-in-class SWaP, rugged and affordable solution to weapon stores management for air, land, and sea platforms. Nothing compares to what we can do to rapidly maximize platform weapons interoperability and mission capabilities.
- The Gen3 SMS leverages Moog's experience in system integration, software development, and weapons / fire control solutions, enabling fast delivery and rapid integration through its flexible design, and an established ecosystem of unique relationships with government, primes and key component suppliers.
- The Moog Gen3 SMS is capable of future upgrades, allowing for the integration of additional sensors, avionics, protective systems, and weapons.
- Multiple US Army & US Air Force AWR certifications.

## Example Configuration For Any Rotary Wing Platform

[Dimensions are in inches]



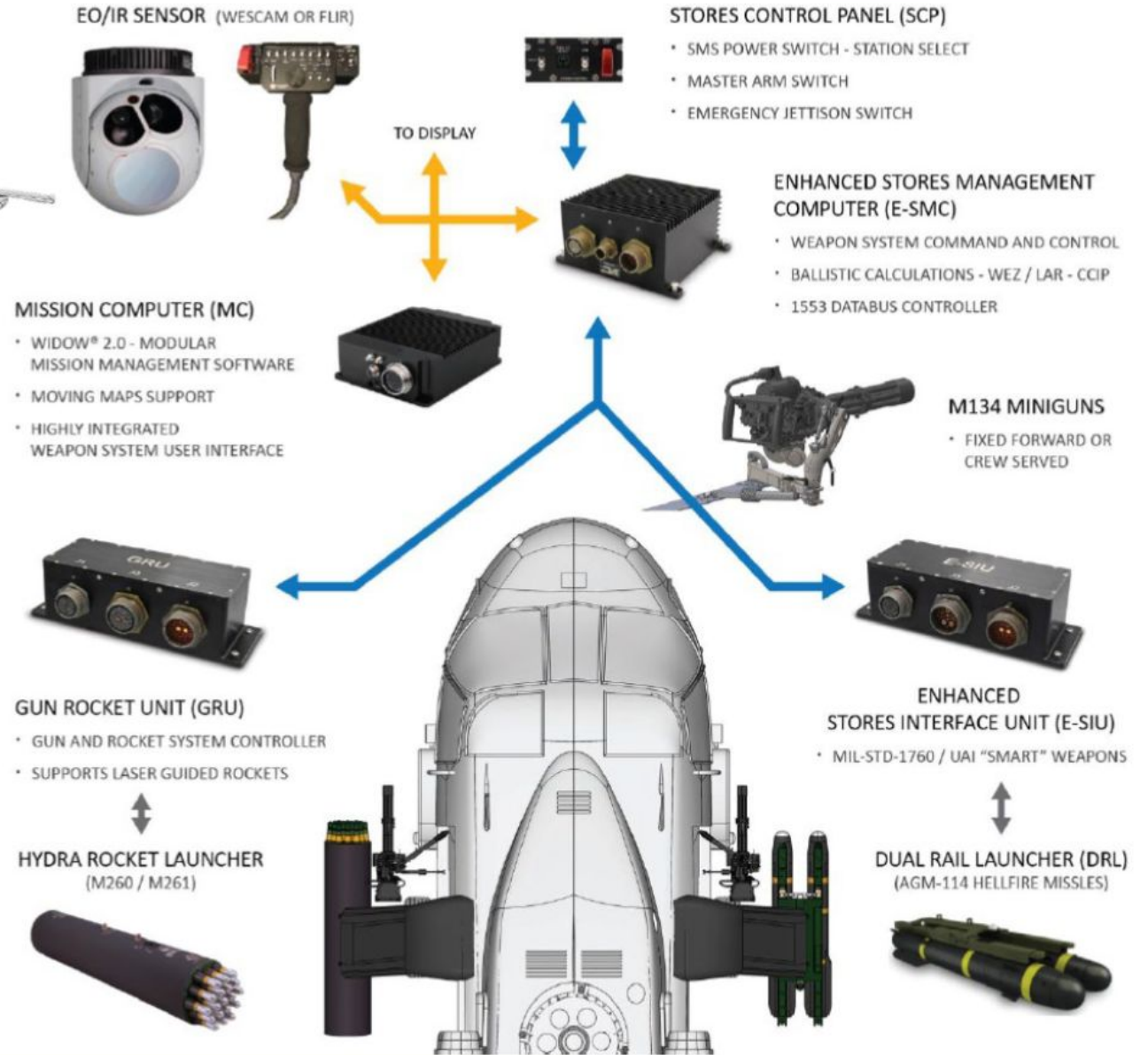


## Moog's Black Hawk Core Upgrades

**RAPID WEAPONIZATION & TRAINING** From time of platform availability we can have the first aircraft ready for combat in < 6 months along with partner training.

**COMBAT PROVEN SOLUTIONS** The Moog Weapon Stores Management System (SMS) has received an Air Worthiness Release (AWR) for use on the UH-60 Black Hawk from both the US Army SRD and the US Air Force Seek Eagle certification authorities. The SMS is a Modular Open System Approach (MOSA) compliant, COTS weapons control system that seamlessly integrates with aircraft sensors and mission management systems to provide the crew with a superior fire-control solution.

**WEAPONS** AGM-114 Hellfire, any variant (significant inventory + consider deploying soon to be de-milled DoD stock assets for cost savings), 70mm Rockets, APKWS LGR, M134 Miniguns or 50cal.

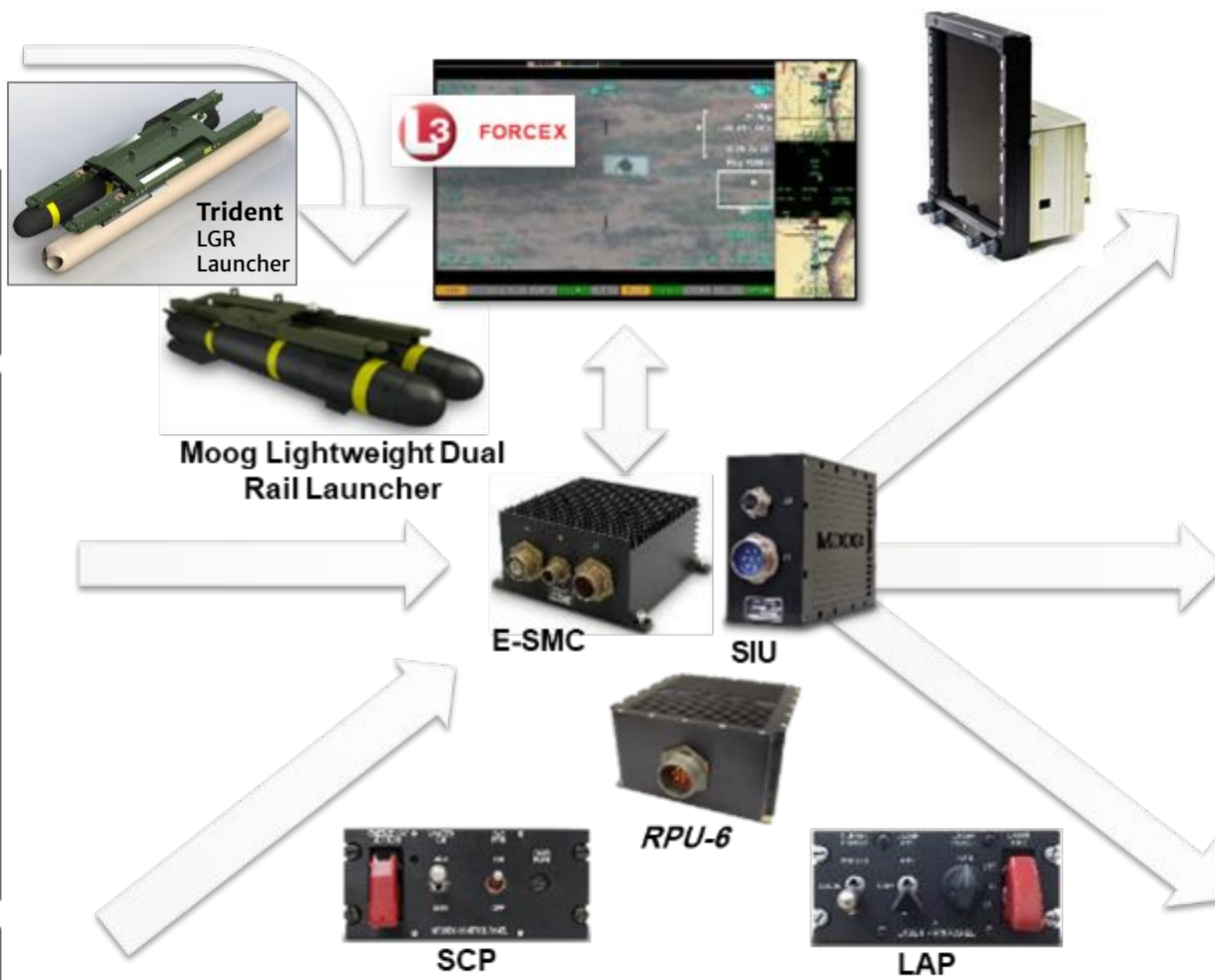


# Gen3 SMS Solutions - A MOSA Compliant Flexible Modular System

## PAYLOADS



3<sup>rd</sup> Party Interface for Next Generation Functionality  
with Latest Mission Execution Software



## PLATFORMS

Air



Land



Sea



We are at the core of successful integrations

# The Payloads - Moog Weapons Integration Experience

- HELLFIRE Missile (including Full Romeo)
- HELLFIRE – Longbow
- JAGM/JAGM-MR (In-process)
- 2.75"/70mm Unguided Hydra-70 Rockets
- 2.75"/70mm Laser Guided Rockets (LGRs)-  
APKWS, Talon
- FN Herstal .50 cal./12.7mm gun pods-  
Analog & digital HMP and RMP
- Dillon M134 mini-gun
- Fulcrum GAU-19B and GP-19 Gun Pod
- Hatchet
- LCAM
- Griffin and SGM – (in process)
- Lightweight HELLFIRE Launcher – DRL
- Arnold Defense M260/M261, LAU 131/131AA,  
Trident LGR-3 & Fletcher LGR-4 Launchers



# Proven Integrated Platforms – Air, Land and Sea

## Rotary Wing Platforms



## Fixed Wing Platforms



## Non-Standard Platforms

## Ground / Sea Platforms



# Moog Genesys Aerosystems

*Precise Performance.  
Proven Experience.  
Personalized Attention.*

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# Genesys Cockpit Display & MMS Product Lines

## Smart Displays

11.5 lbs.

- ✓ Display
- ✓ FMS
- ✓ TAWS
- ✓ ADAHRS
- ✓ Radio/Audio Mgt.



Open-Architecture System Integration

Symbology

Autopilots (4-Axis Rotor Wing, in STC for H-60)



## Radios (qualified fixed & rotary wing)



## Audio/Intercom System



## Sensors & Interfaces



GPS (non-ITAR)  
Data Acquisition Unit  
Analog Interface Unit  
AHRS Synchro Converter

Air Data, Attitude and Heading Reference Systems

# Platform Examples: Proven / Certified Fully Integrated Avionics Systems

## TH-73 US Navy Trainer



## Aero L-39CW and L-39NG



## UH-60 Black Hawk



Equipped and Serviced to Meet our Customers' Demanding Mission Requirements

# Platform Examples: Proven / Certified Fully Integrated Avionics Systems

## Airbus EC145



## Leonardo A109 (GrandNew/Trekker)



## Bell 412



Equipped and Serviced to Meet our Customers' Demanding Mission Requirements



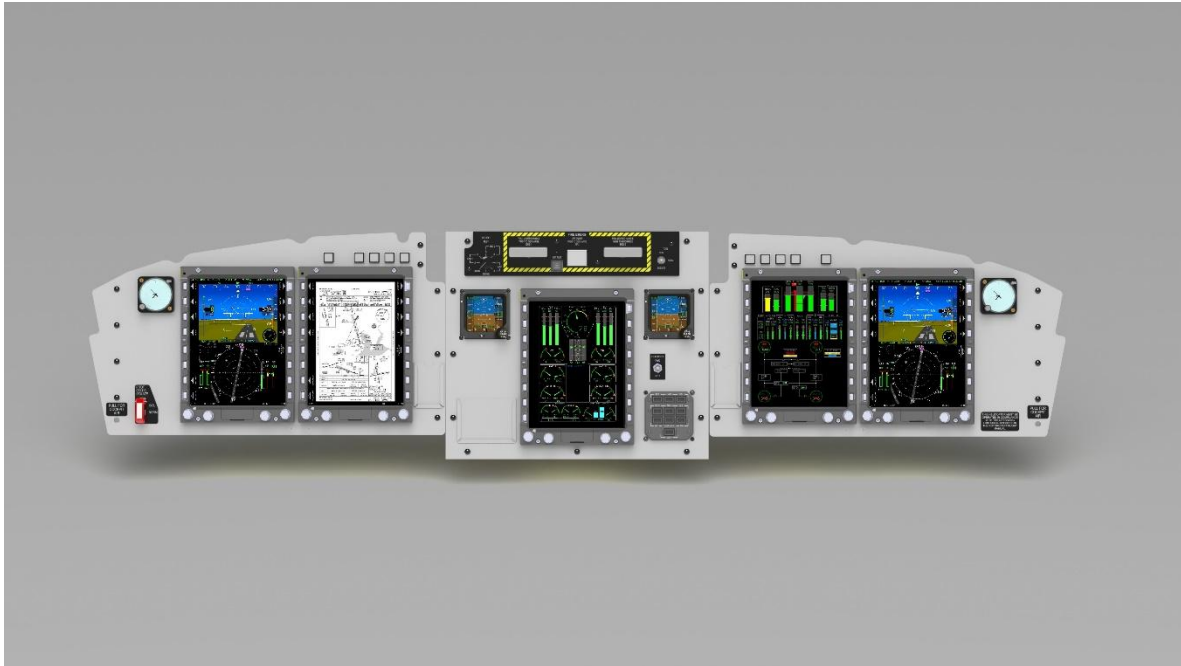
# H-60 Black Hawk (and variants)

- PFD and MFD EFIS NVG compatible Glass Cockpit with Synthetic Vision and 'Highway in the Sky' navigation
- HTAWS Helicopter Terrain Alerting & Warning System
- Full EICAS display capability
- **Industries only aftermarket IFR 4-axis Autopilot solution\*** (Alpha and Lima models, in FAA certification at time of presentation)
- Digital ADAHRS replacement for unreliable/obsolete gyro attitude source
- MIL-STD qualified



# Columbia Model 234 (CH-47) Chinook (and variants)

- State-of-the-art IFR capable digital cockpit upgrade for Model 234 Chinook and variants
- PFD and MFD EFIS NVG compatible Glass Cockpit with Synthetic Vision and 'Highway in the Sky' navigation
- HTAWS Helicopter Terrain Alerting & Warning System
- Full EICAS display capability
- MIL-STD qualified





# Defense Sustainment Capabilities

# Moog Total Support Defense Sustainment Offerings / Capabilities

## OEM Product Support

- Spares
- Repair and overhaul
- Software support
  - Revision changes, etc.
- Parts and kits
- Logistics

## OEM Modernization and Upgrades

- Upgrades
  - Software, mechanical, structural, electronics
- Obsolescence management
- Additive manufacturing
  - 3-D printing

## Training

- Maintenance
  - Preventive maintenance checks and services (PMCS), tools and test equipment
- Operators / operations
- Simulation
  - Computer-based training, embedded system training
- Subsystem integration
- Theory of operation
- Test equipment
- Training support
  - Virtual or onsite

## Engineered Solutions

- Reverse engineering
- Repair and overhaul of Non-Moog hardware
- Tech insertion
- Additive manufacturing

## Service and Support

- Public-Private Partnerships (P3)
  - Onsite depot start up and support, test equipment and engineering services
- Field Service Reps (FSR)
- Joint venture experience
- Licensing
- Data – technical information, drawings
- Documentation
  - Repair, operator, test equipment manuals

# Field Service Reps (FSRs)

- Moog's Field Service Team supports testing, fielding, training, live-fire operations, and sustainment for multiple systems within Moog's product portfolio, including but not limited to:
  - RIwP® Turreted Weapon Systems
    - XM914 30mm x 113mm
    - M240 7.62mm x 51mm
  - Fire Control Systems (Airborne, Land, & Maritime)
    - HELLFIRE Missiles (all variants)
    - 2.75" Unguided & Laser Guided Hydra-70 Rockets (FFAR & APKWS)
  - Sustainment/Depot Operations
    - Inspections/Troubleshooting
    - Test Equipment Stand-up,
    - Maintenance, Repair, Overhaul (MRO)
    - Retrofits



# Summary



- We appreciate the opportunity to brief our products & services under Moog Agile Prime
- We look forward to understanding your mission needs, and aligning program objectives that will rapidly and affordably meet your most urgent mission requirements

**COMMITTED TO OUR CUSTOMERS,  
PARTNERS AND EMPLOYEES**

***“EQUIPPING THOSE WHO DEFEND FREEDOM”***

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