



Shaping the way our world moves™

Shaping The Way Our World Moves™

- ▶ Founded in 1951 by Bill Moog
- ▶ Headquarters in East Aurora, NY
- ▶ Multi-national Company
 - Over 100 locations in 25+ Countries
- ▶ Over 13,000 Employees Worldwide
- ▶ \$3.3 Billion in Revenue (FY 2023)
- ▶ Aerospace, Defense, Industrial, Medical
- ▶ Precision Control System Provider
- ▶ Traded on the New York Stock Exchange (MOG.A and MOG.B)
- ▶ People-oriented environment with emphasis on individual responsibility



OUR VALUES

Customer Focus

- ▶ Meeting commitments
- ▶ Creating significant value for our customers
- ▶ Enhancing Operational Performance

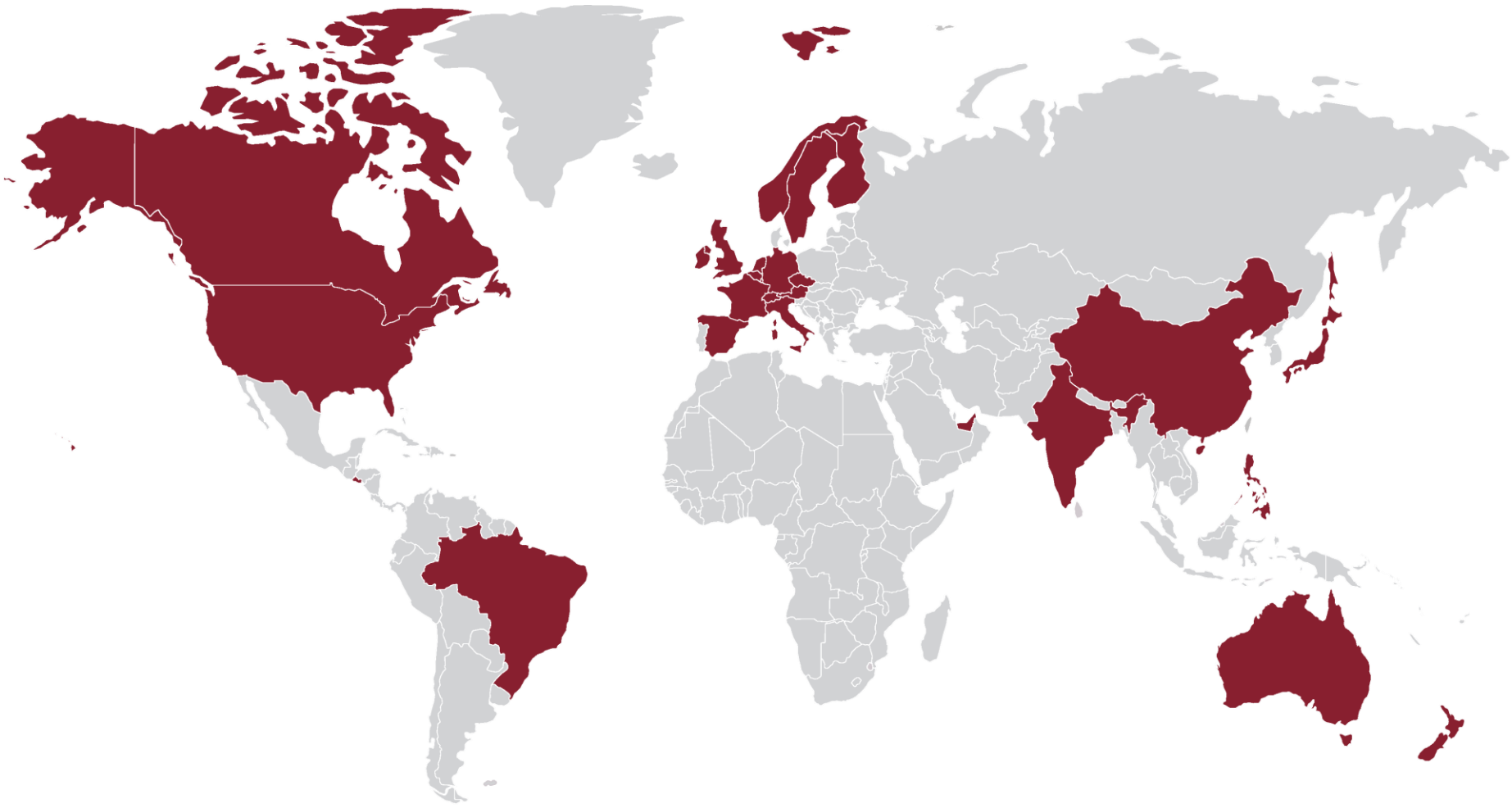
People, Community and Planet

- ▶ Maintaining strong culture
- ▶ Great place to work
- ▶ Good steward of our planet
- ▶ Driving Employee Engagement and Workforce Diversity
- ▶ Sustainability

Business Strength

- ▶ Long term sustainability of Moog's business
- ▶ Investment in key capabilities across business
- ▶ Business Simplification





FY 2023 REVENUE = \$3.3B

Commercial Aircraft

Commercial Aircraft Business
Jets
Global Support Engine Controls Avionics

\$669M/ 20%
of total revenue

Military Aircraft

Military Aircraft
Rotorcraft
Unmanned Systems
Global Support Engine Controls Avionics
Mission Systems

\$720M/ 22%
of total revenue

Space and Defense

Military Vehicles
Missiles
Naval Platforms
Air Defense
Launch Vehicles
Spacecraft
Surveillance

\$947M/ 28%
of total revenue

Industrial

Industrial Machinery
Energy
Marine
Test and Simulation
Medical Devices

\$983M/ 30%
of total revenue





1956
First flight of F-106 with Moog Servovalves



1989
First flight of B-2 with Moog Fly-By-Wire Actuation System



1985
First use of Moog fuel control valves on V2500

1972
First flight of F-15 with Moog actuators



1989
First flight of V-22 with Moog Actuation



2003
First flight of G450 with Moog Actuation



1995
First flight of F-18E/F with Moog Actuation for Leading Edge, Wing Fold, LEX and Servovalves

1994
Moog Acquires Allied Signal Actuation Mechanical Systems (Torrance CA)

2009
First flights of Gulfstream G650, G280 with Moog Flight Control Systems



2006
First flight of F-35 with Moog EHA Flight Control System



2010
First flight of X-47 Moog Primary Flight Control System



2016
First flight of Embraer E190-E2



2013
First flight of A350 Moog Actuation Control Systems

2015
First flight of Bell 525 with Moog Flight Control System

2015
First flight of KC-46 with Moog Refueling Boom Actuation

2016
First flight of Gulfstream G600/G500 Moog High Lift System



2019
SureFly Acquisition

2019
First flight of Embraer E130 / E175E2 Moog Fly-By-Wire Flight Control System



2017
First flight of COMAC C919 Moog High Lift System



2017
First flight of Bell V280 Moog Fly-By-Wire Flight Control System



2021
Divestiture of NavAids

2020
Genesys Aerosystems Acquisition
GENESYS AEROSYSTEMS
A Moog Company



2022
Teams Accessories Acquisition

2023
Teams Accessories Rebranded as Moog MRO Services
MOOG MRO SERVICES



2023
DCL Acquisition

2023
Split of Commercial / Military Aircraft

1951 Moog Valve Company Formed

1970

1980

1990

2000

2010

2020

AIRCRAFT OFFERINGS

Integrated Flight Control Systems

- ▶ Military – Rotary Wing – Commercial – Business Jets

Critical Control Applications

- ▶ Engine Controls – Active Vibration Control – Weapon Bay Door Drives – Specialty Control Actuation – Wingfold Actuation

Critical Control Products

- ▶ Flight Control Computers – Cockpit Controls
- ▶ Digital Airfield Solutions

Platform Integration

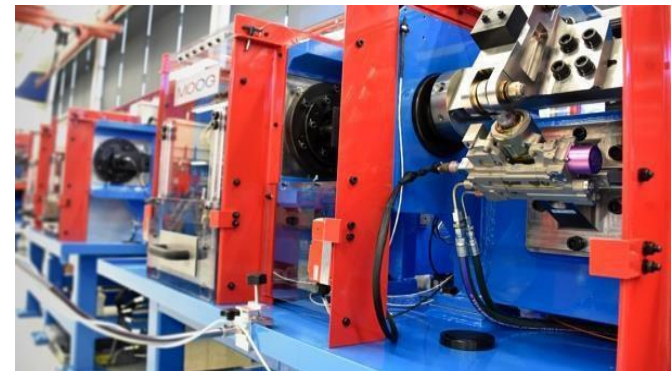
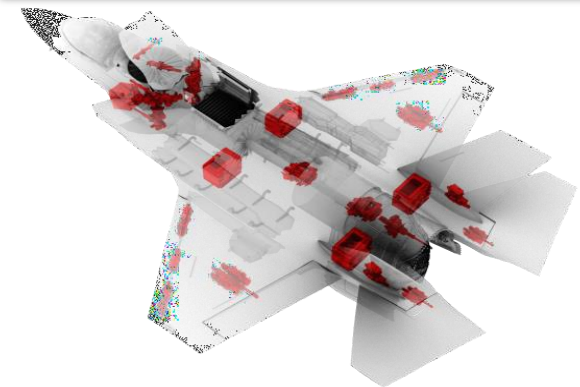
- ▶ Qualification – Certification

Manufacturing

- ▶ Global Sourcing – Worldwide Manufacturing

Aftermarket Services

- ▶ R&O – Advanced Repair Technologies – Public Private Partnerships
- Power By Hour

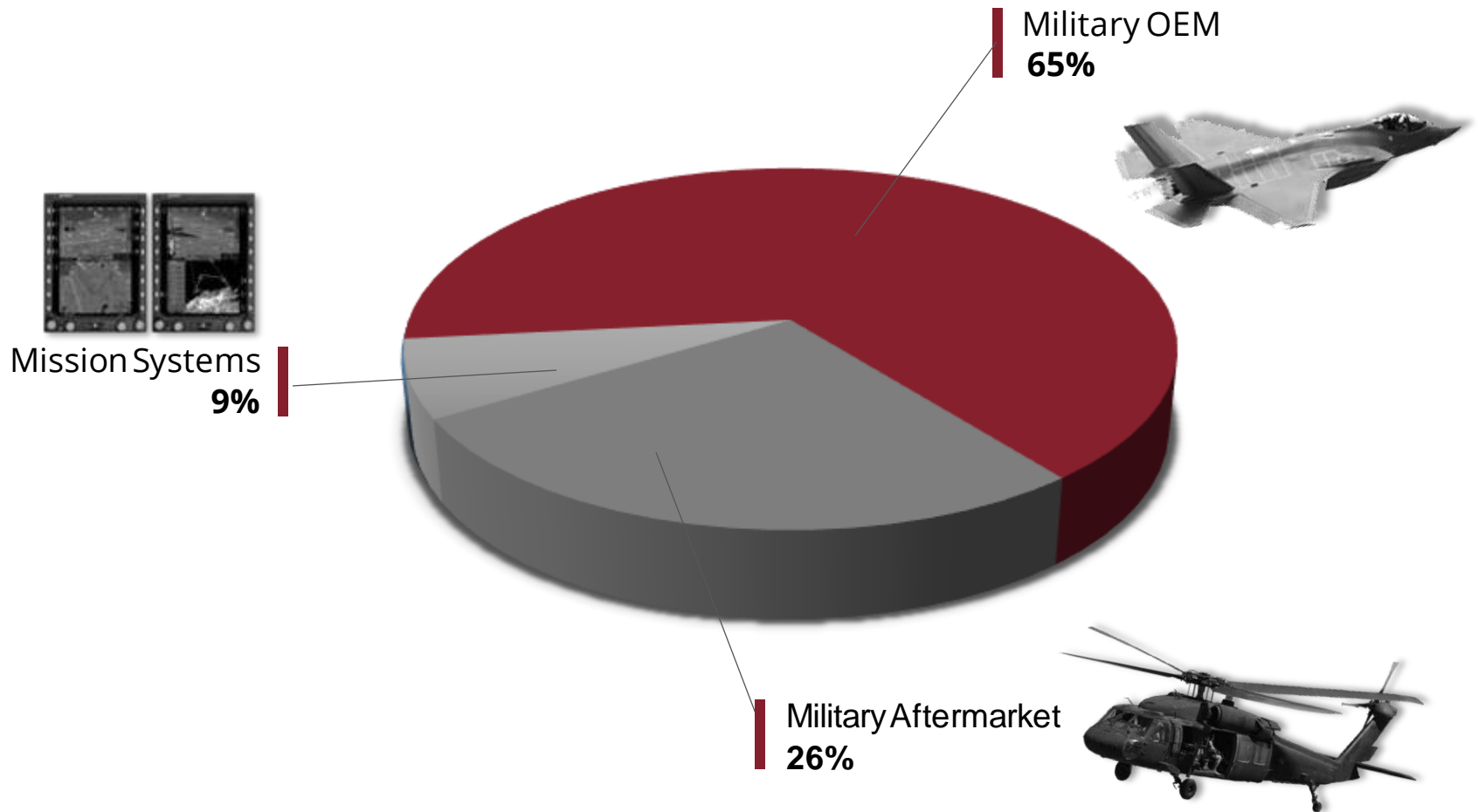


MILITARY AIRCRAFT

Leader in Flight Control Systems and Critical Control Products



2023 MAJOR MARKETS SERVED



MOOG MILITARY AIRCRAFT GROUP PRESENCE





MILITARY OE DIVISION

U.S. Air Force
Airman 1st Class Jose Miguel T. Tamondong

FLIGHT CONTROLS FOR MILITARY AIRCRAFT

F-35



V-22



F/A-18 E/F



MQ-25



B-2



F-15E



F-16



Typhoon



Tejas



T-50



KF-21



Hawk AJT



M-346



A400M



C-27



KC-46



UH-60



AW-129



AJT T-5



C-2



MILITARY AIRCRAFT

High Performance Systems

- ▶ Primary and Secondary Flight Control
- ▶ Maneuvering Leading Edge
- ▶ Weapons Bay Door Drive
- ▶ Engine Control
- ▶ Lift Fan Actuation
- ▶ Wingfold and Specialty Controls

Advanced Technology

- ▶ Actuation and Control Electronics



F-35



F/A-18E/F



Eurofighter
Typhoon



KC-46

UNMANNED AIR SYSTEMS (UAS)

Systems, Products and Components

- ▶ Primary and Secondary Flight Controls
- ▶ Maneuvering Leading Edge
- ▶ Weapons Bay Door Drive
- ▶ Wingfold, Nosewheel Steering and Utility Controls

Wide Range of Capabilities

- ▶ Fractional to Integral HPA Actuators
- ▶ Simplex and Redundant Designs
- ▶ Hydraulic, Electromechanical, and Electrohydrostatic Actuation Technology

Mix of Catalog and Semi-Custom Products for Accelerated Demonstration Programs



**Boeing
MQ-25**



**Northrup Grumman
X-47B**

ROTORCRAFT

▶ **Flight Control Solutions**

- Main and Tail Rotor Actuation
- Fly-by-Wire and Mechanical Input
- Ballistically Tolerant Designs

▶ **Flight Control Electronics and Software**

▶ **Cockpit Controls**

▶ **Active Vibration Control**

▶ **Specialty Actuation**

▶ **Blade Fold, Weapons Stabilization and Utility Actuation**

▶ **Systems, Products and Components**



V-22



FLRAA



UH-60



B-525

AIRCRAFT CONTROL COMPONENTS



ACC ENGINE CONTROLS

Wide Range of Application

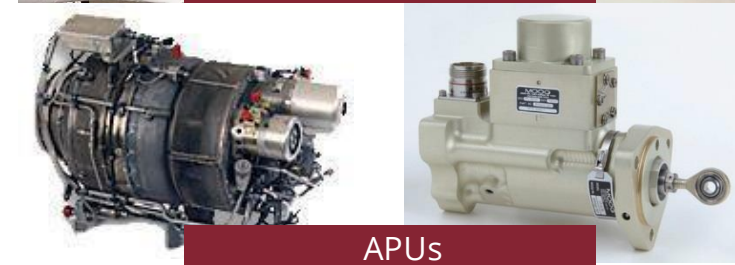
- ▶ Variable Geometry Controls
- ▶ Fuel Metering
- ▶ Thrust Vector Control
- ▶ Shut Off and Surge Control
- ▶ Anti-Icing Control

Products and Component Solutions

- ▶ Actuators
- ▶ Control Manifolds
- ▶ Servovalves
- ▶ Servo Actuators

Advanced Technologies

- ▶ High Temperature Component
- ▶ Electromechanical Actuation
- ▶ Distributed Control Architecture



ACC AIRCRAFT CONTROLS

Integrated Flight Control Systems

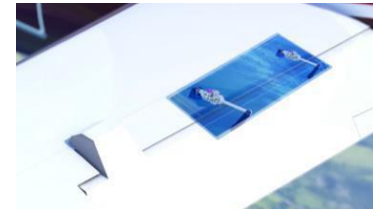
- ▶ Primary and Secondary Flight Control Systems
- ▶ Servovalves and Control Manifolds
- ▶ High Lift Systems
- ▶ Maneuvering Leading Edge Systems

Braking and Steering

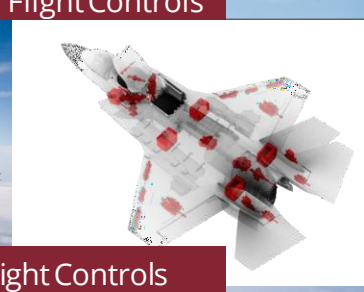
- ▶ Servovalves and Control Manifolds
 - Anti-Skid Braking Manifolds
 - Nose Wheel Steering Manifolds and Actuation

Pneumatic Inflation and Utility Systems

- ▶ Control Manifolds and Actuators
 - Helicopter Emergency Floatation
 - Gun Elevation and Pneumatic Control
 - Missile Decoy System Deployment and Inflation



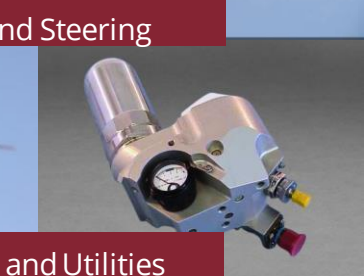
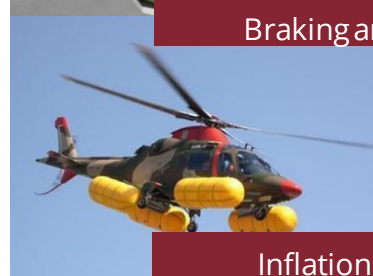
Commercial Flight Controls



Military Flight Controls



Braking and Steering



Inflation and Utilities



MILITARY GLOBAL SUSTAINMENT

Lance Cpl. Alexis Moradian

MILITARY GLOBAL SUSTAINMENT

- ▶ Repair and Overhaul Services
- ▶ Modifications and Upgrades
- ▶ Integrated Logistics Services
- ▶ Training and Technical Support
- ▶ Obsolescence Management
- ▶ Technology Insertion
- ▶ Public/Private Partnerships



F-16



UH-60



F/A-18

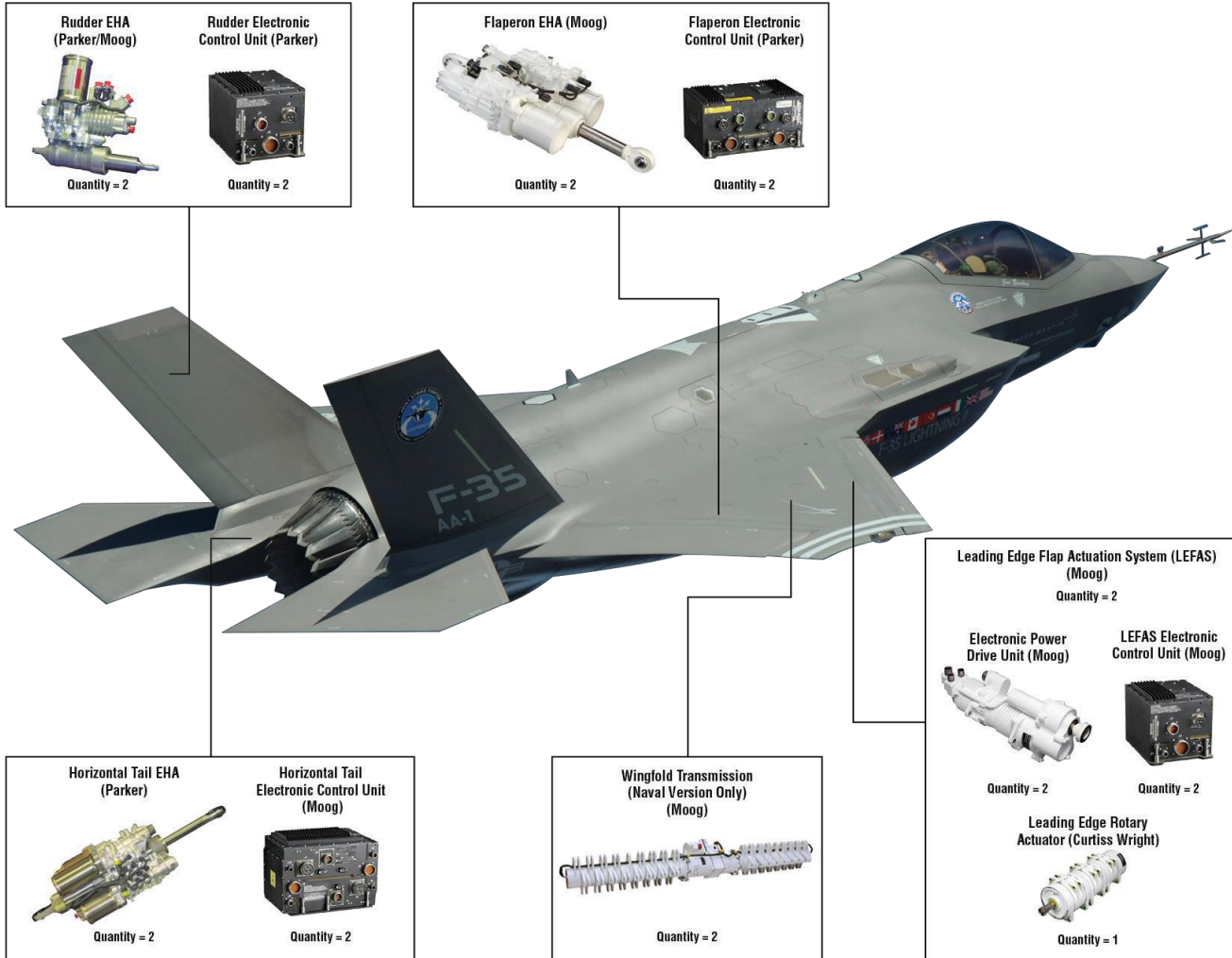


F-15

MILITARY PROGRAMS

LOCKHEED MARTIN F-35 FLIGHT CONTROLS

Primary and Secondary Flight Control System



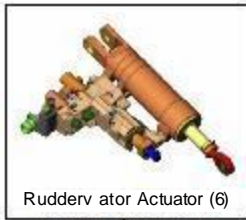
LOCKHEED MARTIN F-35B – STOVL LIFT FAN ACTUATION

Engine Lift Fan and Swivel Module Actuation Systems

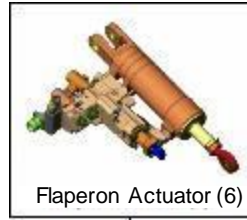


BELL FLRAA FLIGHTCONTROL SYSTEM

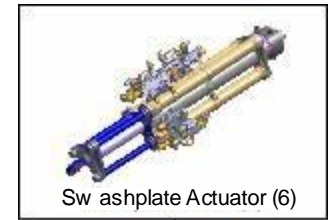
Complete Flight Control Systems



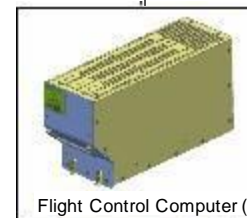
Rudderator Actuator (6)



Flaperon Actuator (6)



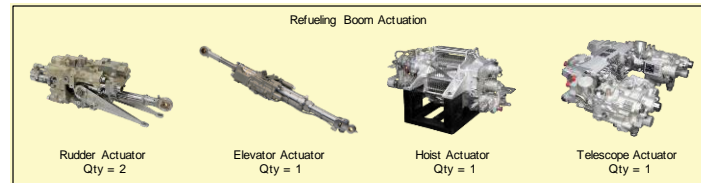
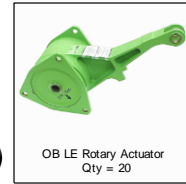
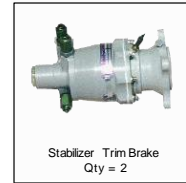
Swashplate Actuator (6)



Flight Control Computer (3)

BOEING KC-46 TANKER

Refueling Boom Actuation and Flight Control Products



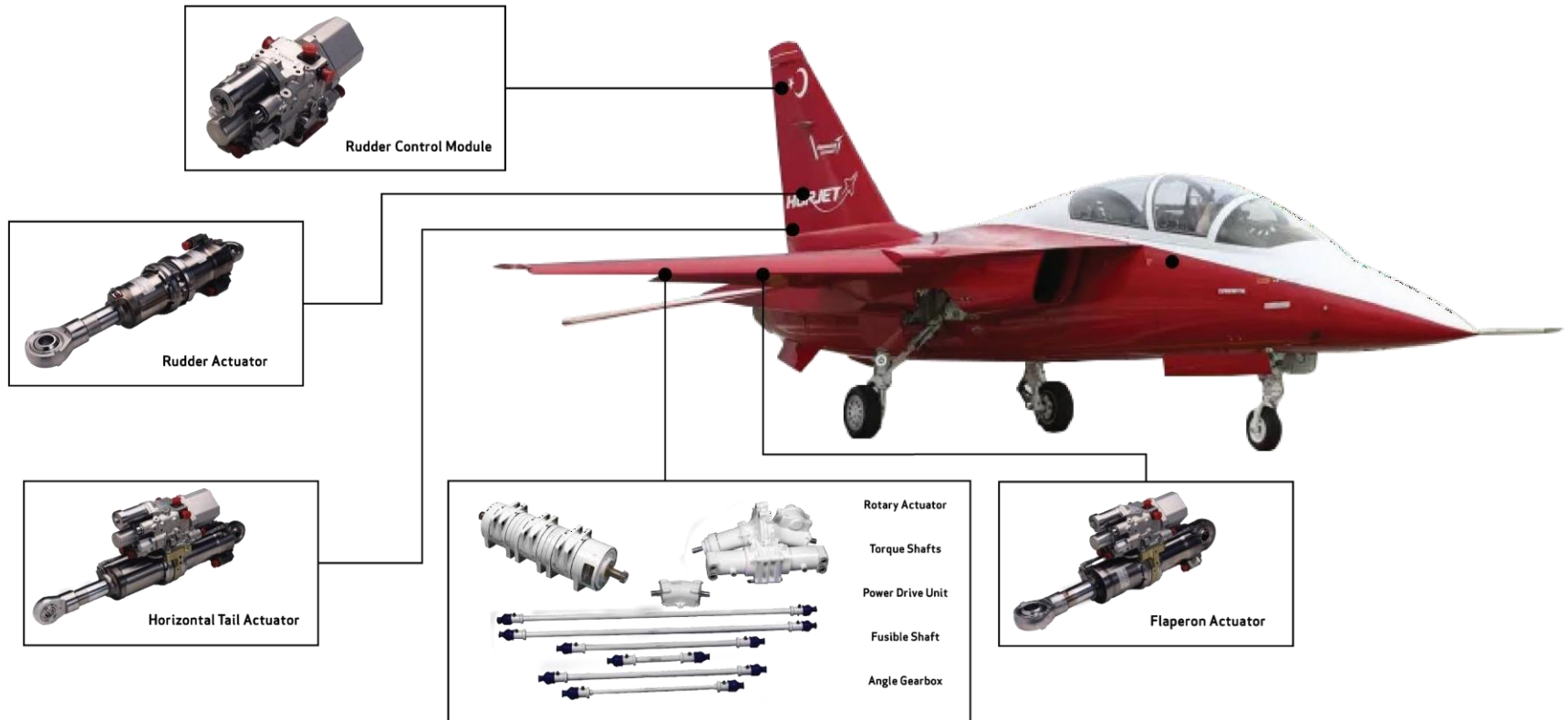
AIDC F-CK-1 FLIGHT CONTROLS

Primary and Secondary Flight Control Actuation



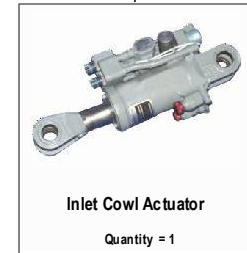
TAI HURJET FLIGHT CONTROLS

Primary and Secondary Flight Control Actuation



EUROFIGHTER TYPHOON FLIGHT CONTROLS

Flight Control Actuation and Critical Control Subsystems



LEONARDO M-346 FLIGHT CONTROLS

Primary Flight Control Actuation



AIDC T-5 FLIGHT CONTROLS

Primary and Secondary Flight Control Actuation



KAI T/FA-50 FLIGHT CONTROLS SECONDARY FLIGHT CONTROL ACTUATION

Leading Edge Flap Actuation System



Photo by Dokunaga (2007)

한국항공우주산업

KAI KF-21 FLIGHT CONTROLS

Secondary Flight Control Actuation



AIRBUS A400M FLIGHTCONTROLS

Primary Flight Control Actuation



BELL/BOEING V-22 FLIGHT CONTROLS AND VIBRATION CONTROL

Primary Flight Control Actuation and Vibration Suppression Actuation



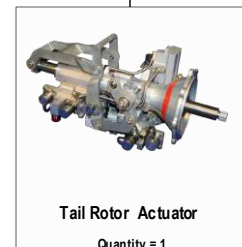
LEONARDO AW129 ATAK FLIGHT CONTROLS

Complete Primary Flight Control Actuation



LEONARDO AW159 LYNX FLIGHT CONTROLS

Primary Flight Control Actuation



Tail Rotor Actuator

Quantity = 1

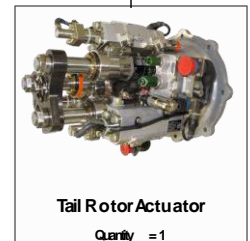
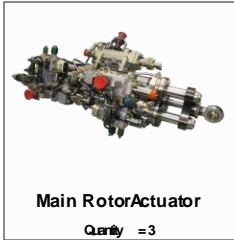
SIKORSKY H-60 FLIGHT CONTROLS AND VIBRATION CONTROL

Pitch Trim and Active Vibration Control



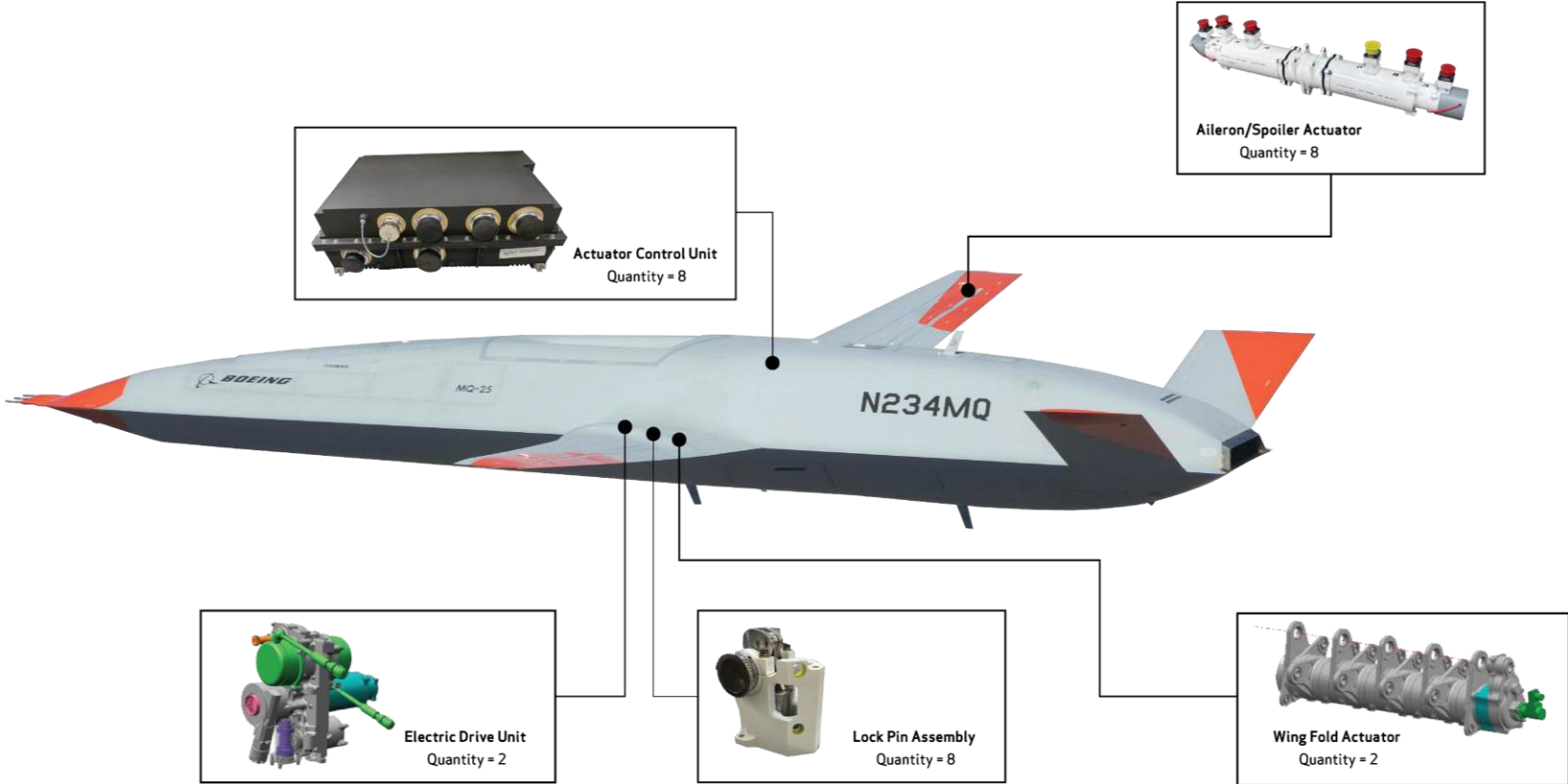
BELL 525RELENTLESS FLIGHT CONTROLS

Complete Primary Flight Control Actuation



BOEING MQ-25

Wing Actuation and Wingfold



Cleared for ExportPurposes

MISSION SYSTEMS



DIGITAL AIRFIELD SOLUTIONS



DIGITAL AIRFIELD SOLUTIONS

POWERED BY MOOG

Airfields are complex operating environments. New technologies integrated into a user-centric interface can significantly enhance situation awareness, and therefore improve safety, and reduce cost and disruption for all aviation stakeholders.

MOOG

Tarsier® Automatic Runway FOD Detection System

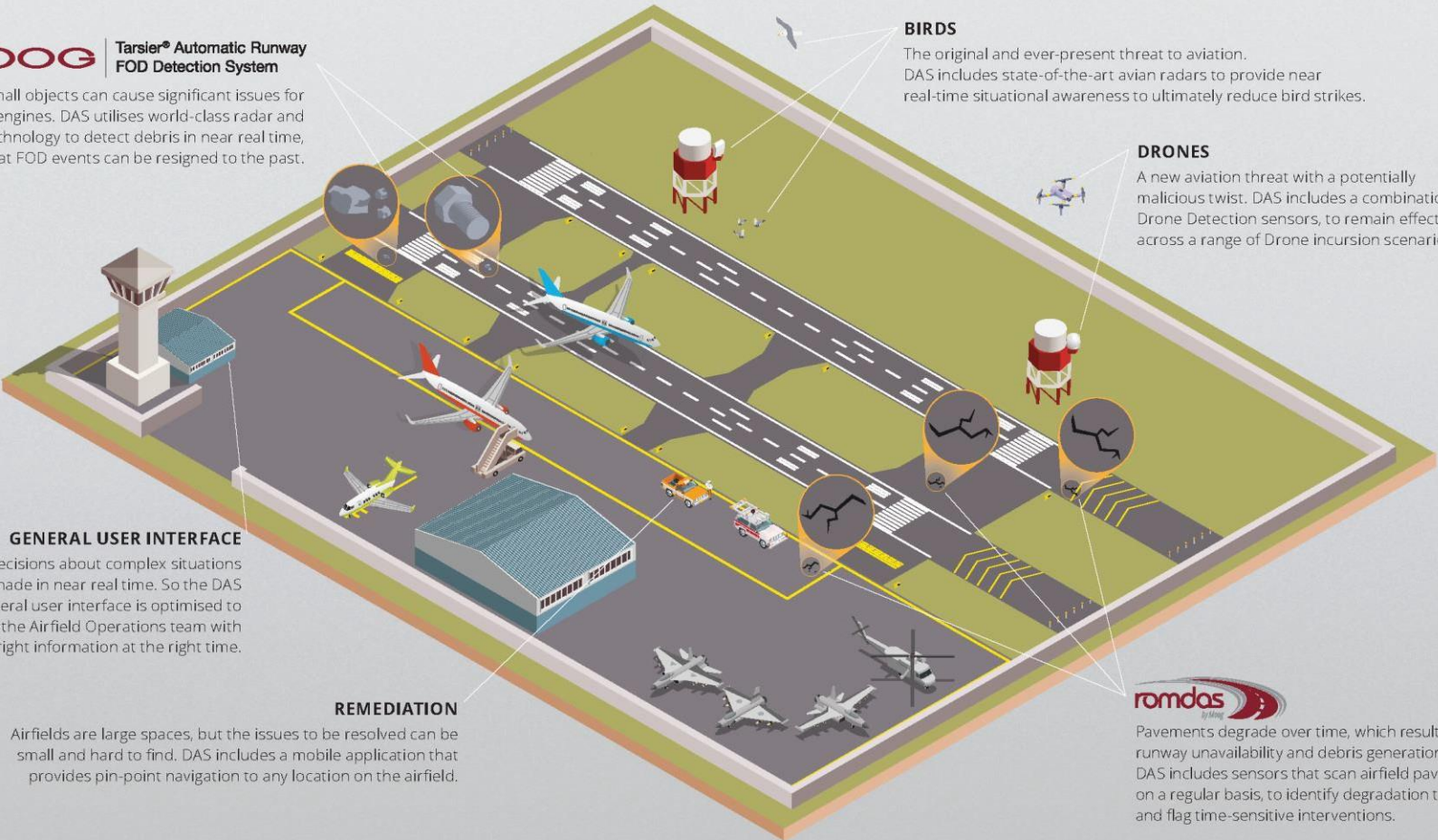
Even small objects can cause significant issues for aircraft and engines. DAS utilises world-class radar and camera technology to detect debris in near real time, so that FOD events can be resigned to the past.

BIRDS

The original and ever-present threat to aviation. DAS includes state-of-the-art avian radars to provide near real-time situational awareness to ultimately reduce bird strikes.

DRONES

A new aviation threat with a potentially malicious twist. DAS includes a combination of Drone Detection sensors, to remain effective across a range of Drone incursion scenarios.



GENERAL USER INTERFACE

Critical decisions about complex situations are made in near real time. So the DAS general user interface is optimised to provide the Airfield Operations team with the right information at the right time.

REMEDATION

Airfields are large spaces, but the issues to be resolved can be small and hard to find. DAS includes a mobile application that provides pin-point navigation to any location on the airfield.



Pavements degrade over time, which results in runway unavailability and debris generation. DAS includes sensors that scan airfield pavements on a regular basis, to identify degradation trends and flag time-sensitive interventions.

DIGITAL AIRFIELD SOLUTIONS

- ▶ Pays for itself by reducing FOD rates
- ▶ Uses world-class cutting-edge radar and camera technology
- ▶ The stepping-stone to release the full potential of Smart Airfield technologies





GENESYS AEROSYSTEMS



GENESYS AEROSYSTEMS

Founded in 1978

- ▶ Acquired by Moog in 2020
- ▶ Mineral Wells, TX
- ▶ 40+ years in business

Premier Provider of Electronic Flight Instrument System and Autopilot Solutions

- ▶ Best-in-Class Product Portfolio

Support a Global Customer Base

- ▶ Military and Commercial



Product Examples



Autopilots
(fixed wing and rotorwing)

Sensors &
Interfaces



Digital Radios

Smart Displays



This document, including all enclosed slides, consists of general capabilities information that is not defined as controlled technical data under ITAR Part 120.33 or EAR Part 772.