



*Image Courtesy of Boeing*

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

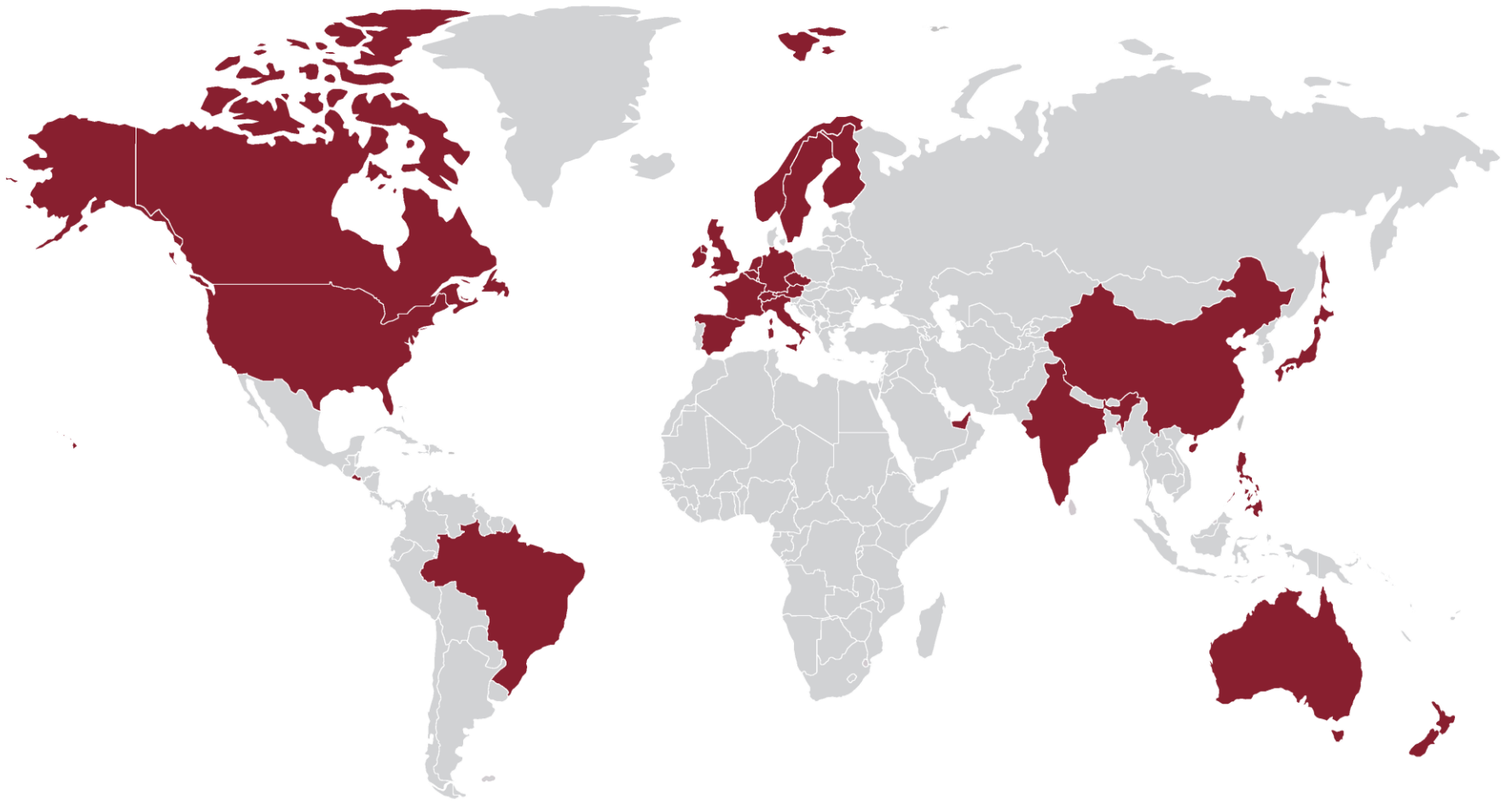
## People, Community and Planet

- ▶ 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



**1985**  
First use of Moog fuel control valves on V2500

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



**1989**  
First flight of V-22 with Moog Actuation



**1972**  
First flight of F-15 with Moog actuators

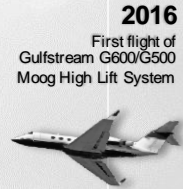


**1994**  
Moog Acquires Allied Signal Actuation Mechanical Systems (Torrance CA)

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



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



**2003**  
First flight of G450 with Moog Actuation

**2009**  
Moog Acquires GE Aviation Systems (Wolverhampton UK)

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



**2015**  
First flight of Bell 525 with Moog Flight Control System

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

**2013**  
First flight of A350 Moog Actuation Control Systems



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

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



**2019**  
SureFly Acquisition

**2019**  
First flight of Embraer E190 / E175 E2 Moog Fly-By-Wire Flight Control System



**2020**  
Genesys Aerosystems Acquisition

**2021**  
Divestiture of NavAids

**2022**  
Teams Accessories Acquisition

**2023**  
Teams Accessories Rebranded as Moog MRO Services

**2023**  
Split of Commercial / Military Aircraft

**2023**  
DCL Acquisition

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

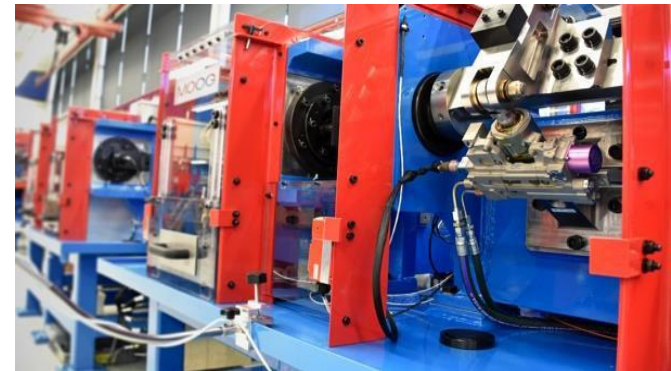
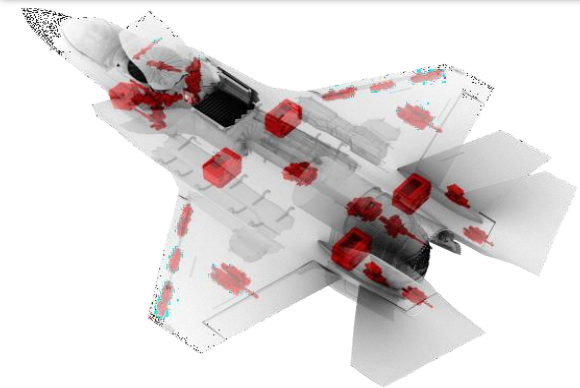
- ▶ Qualification – Certification

## Manufacturing

- ▶ Global Sourcing – Worldwide Manufacturing

## Aftermarket Services

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



# COMMERCIAL AIRCRAFT

Leader in Flight Control Systems and Critical Control Products



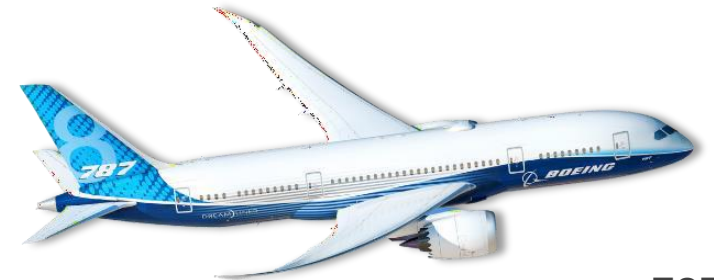


# COMMERCIAL AIRCRAFT STRATEGY

**Systems Integrator experience, customer relationships gained through supplying equipment on premier Aircraft platforms covering:**

- ▶ Flight Controls, Electronics, and Software
- ▶ Primary and Secondary Actuation
- ▶ Hydraulic, EM and EHA Technology
- ▶ Cockpit Controls
- ▶ Design, Qualify, and Certify

Ability to provide technology-agnostic solutions to solve our customer's flight control problems.



787



A350



E190-E2

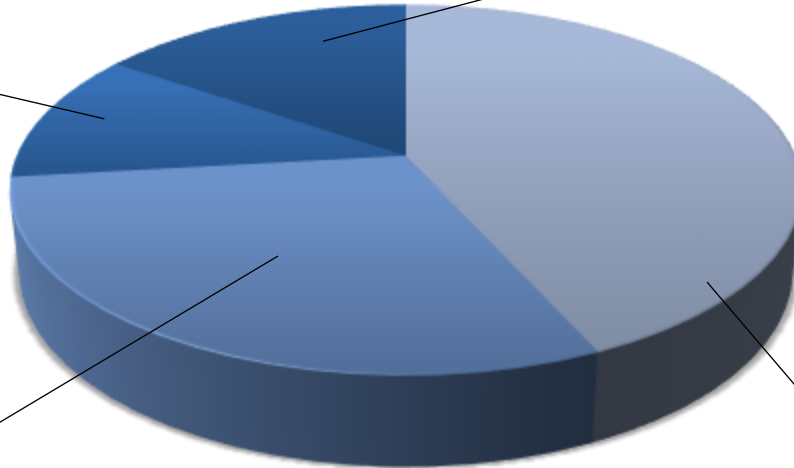
# 2023 MAJOR MARKETS SERVED



Business Jets  
**12%**



Engine Controls & Aircraft  
Components  
**15%**



Commercial Aftermarket  
**30%**



Commercial OEM  
**43%**



# COMMERCIAL AIRCRAFT GROUP PRESENCE



East Aurora, NY



Torrance, CA



Wolverhampton, UK



Tewkesbury, UK



Baguio City, PH



Bengaluru, IN



Dublin, IE



Seattle, WA



Singapore



Toulouse, FR

# COMMERCIAL OE DIVISION



# FLIGHT CONTROLS FOR COMMERCIAL AIRCRAFT



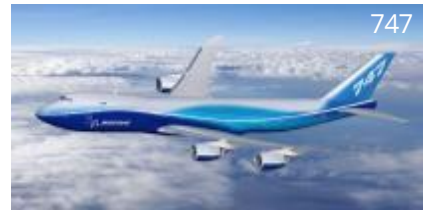
787



777



767



747



737



A380



A350



A330



A320



A319



E190E2



C919



G280



G450



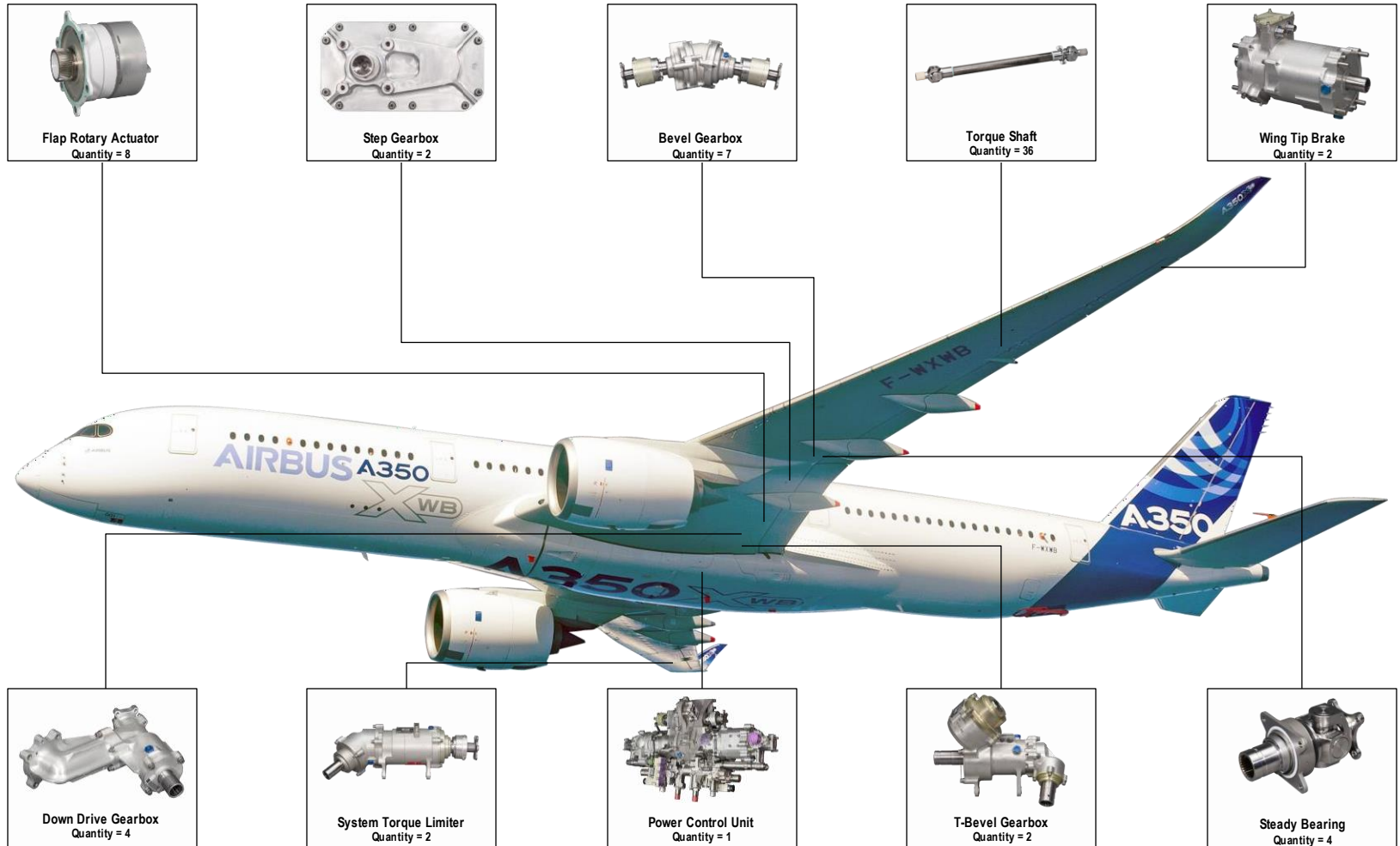
G600



G650

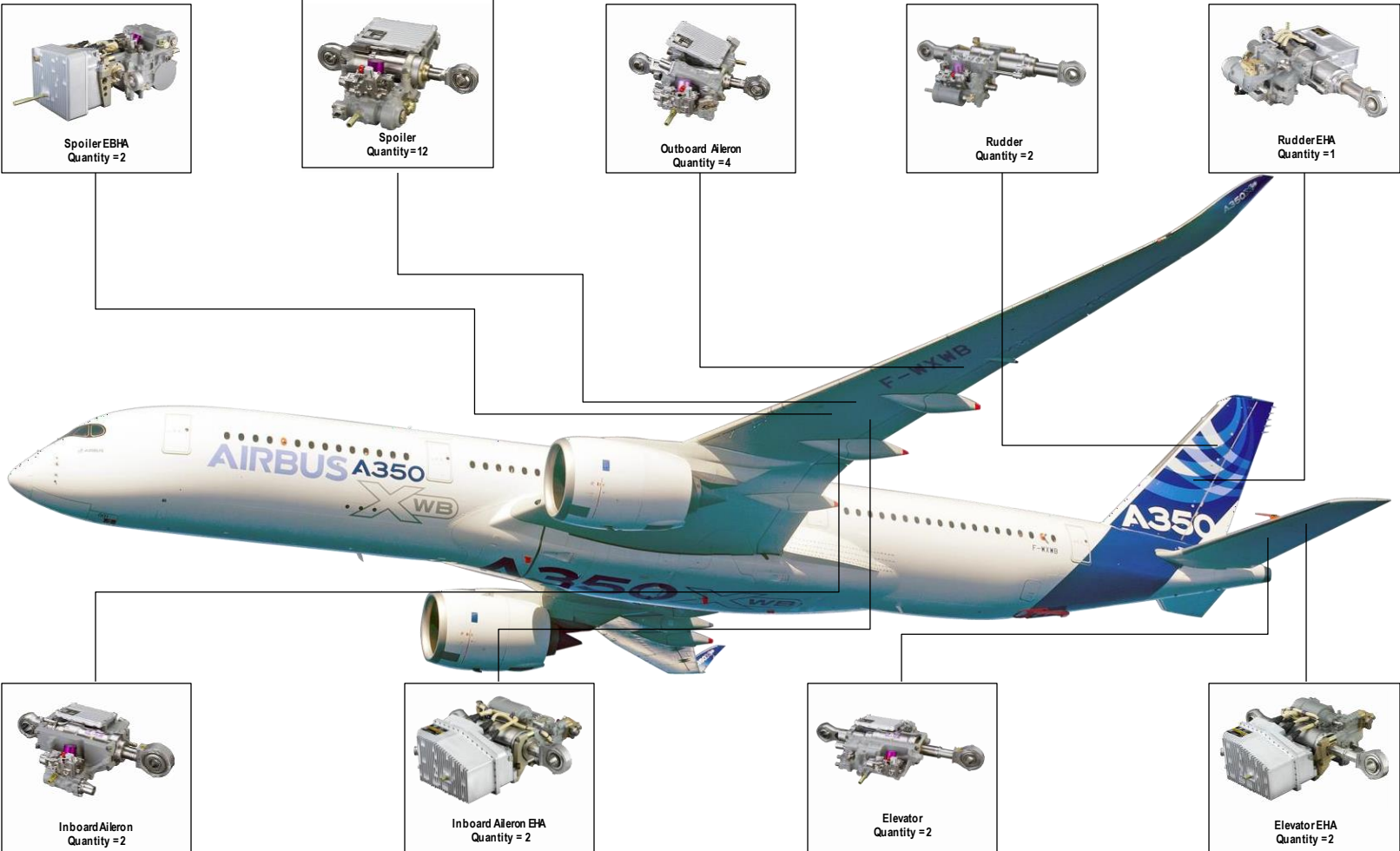
# AIRBUS A350XWB HIGH LIFT ACTUATION

## Trailing Edge Flap Actuation



# AIRBUS A350XWB PRIMARY FLIGHT CONTROLS

## Primary Flight Control Actuation



# BOEING 787 PRIMARY FLIGHT CONTROLS

## Complete Primary Flight Control Actuation System





# BOEING 787 HIGH LIFT ACTUATION SYSTEM

## Complete Slat and Flap Actuation Systems

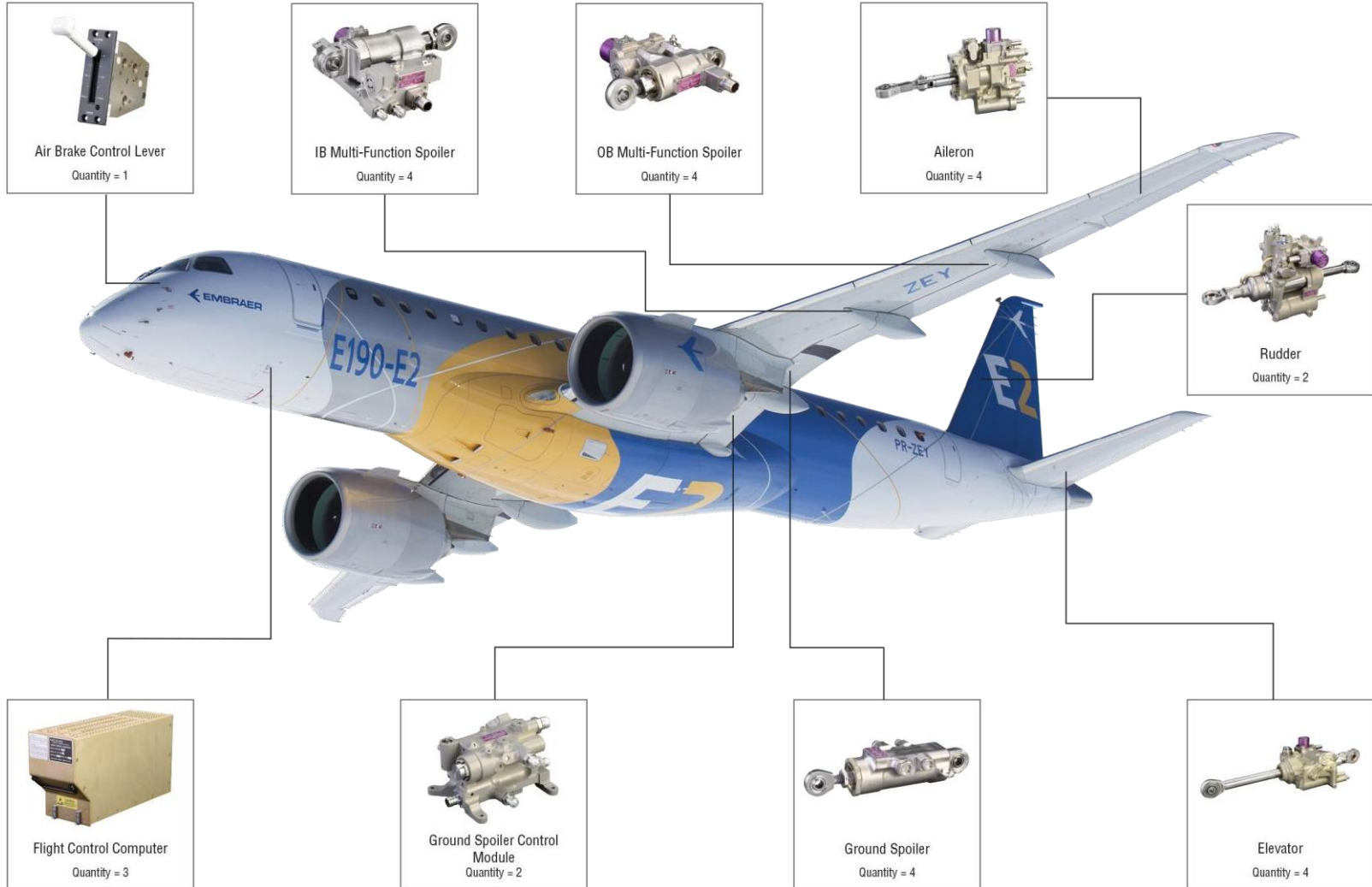


400+ Products per shipset



# EMBRAER 2ND GENERATION E-JETS FLIGHT CONTROL SYSTEM

## Complete Primary Flight Control Actuation System



# COMAC C919 HIGH LIFT SYSTEM

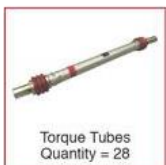
## Leading Edge



## Common



## Trailing Edge



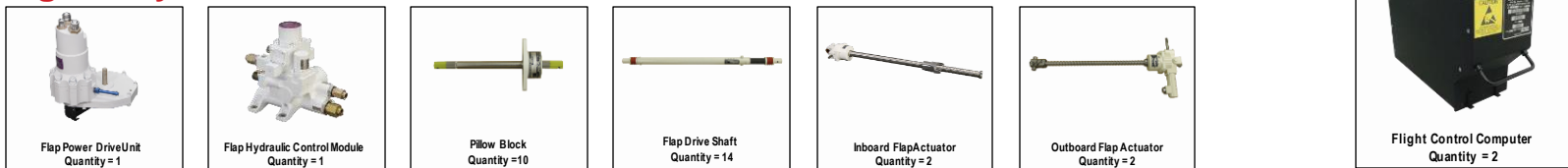
# GULFSTREAM G280 INTEGRATED FLIGHT CONTROL SYSTEMS

## Complete Primary and High Lift Flight Control Systems

### Primary Flight Control System

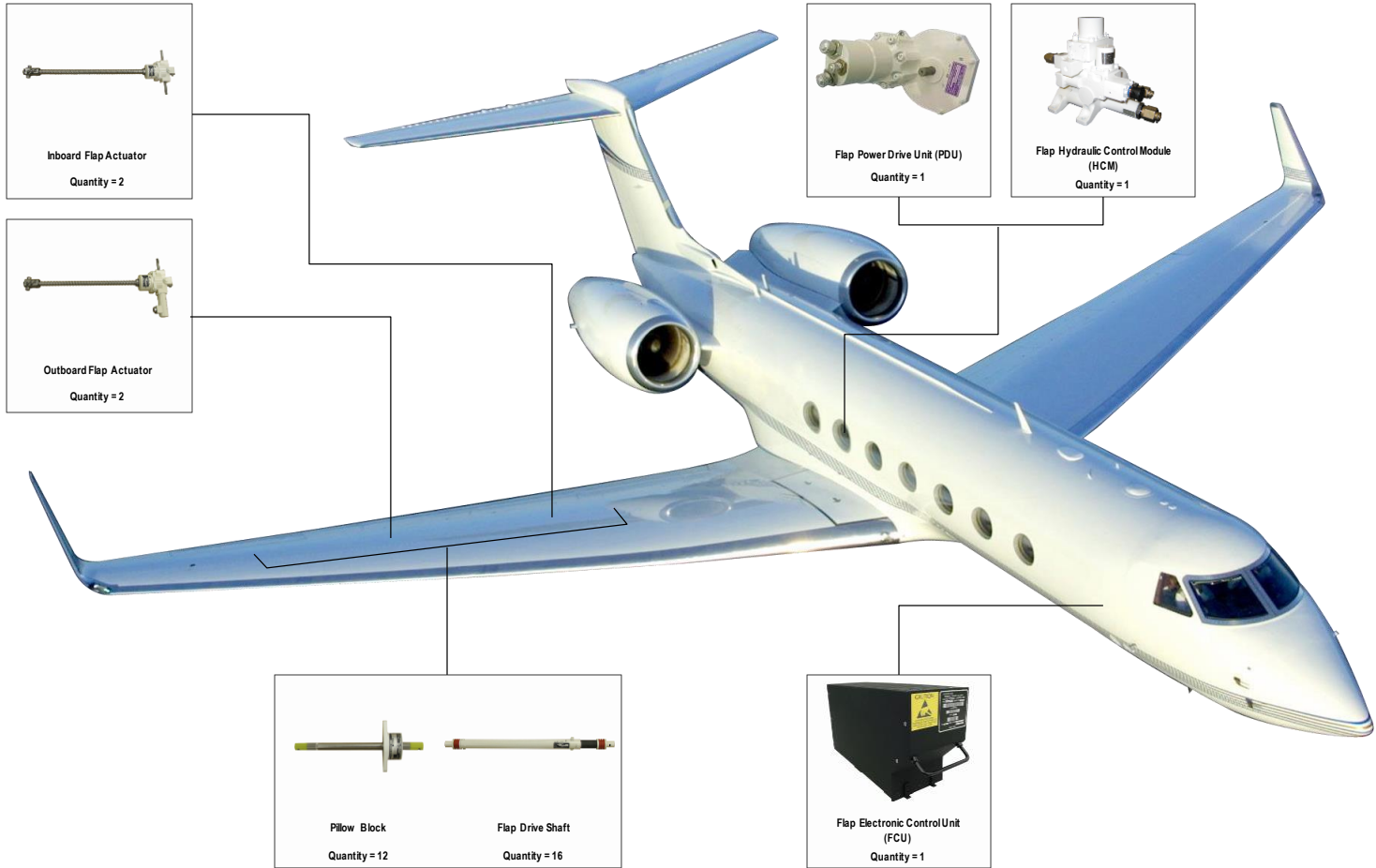


### High Lift System



# GULFSTREAM G650 HIGH LIFT ACTUATION SYSTEM

## Complete Flap Actuation System





# COMMERCIAL AFTERMARKET DIVISION

# COMMERCIAL AFTERMARKET

## MOOG TOTAL SUPPORT

- ▶ Integrated Flight Hour Pooling and MRO
- ▶ Commercial and Performance Guarantees
- ▶ OEM Technical Support and Training
- ▶ Reliability Focused

## MOOG MRO SERVICES

- ▶ Engine Component MRO Supporting Commercial and Cargo Aviation
- ▶ Specialization in Fuel, Oil, Hydraulic and Electrical Components
- ▶ Extensive Repair Development Capabilities

## MOOG ASSET SOLUTIONS

- ▶ Sale of New or Used Material
- ▶ Purchase of Customer Assets
- ▶ Exchange, Lease and Loan Options
- ▶ OEM Renowned Quality and Reliability
- ▶ Extended Warranties
- ▶ Inventory Available for Immediate Dispatch

# MOOG TOTAL SUPPORT INCLUDES:

## OEM Product Support

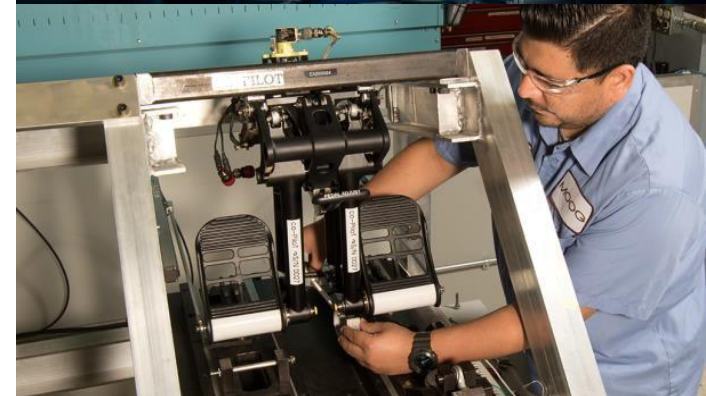
- ▶ Spares, repair and overhaul
- ▶ Software Support
- ▶ Parts and kits
- ▶ Logistics

## OEM Modernization and Upgrades

- ▶ Upgrades
- ▶ Obsolescence management
- ▶ Additive manufacturing
- ▶ 3-D printing

## Service and Support

- ▶ Public-Private Partnerships
- ▶ Moog Field Service Reps
- ▶ Joint venture experience
- ▶ Licensing
- ▶ Data
- ▶ Documentation





# MOOG MRO SERVICES - ENGINES

## Established in 1995

- ▶ Acquired by Moog in 2022
- ▶ Dublin, Ireland

## MRO shop supporting commercial and cargo aviation

- ▶ Specializing in Fuel, Oil, Hydraulic, and Electrical components.
- ▶ Supporting a global customer base.
- ▶ FAA, EASA, CAAC, TCCA, ISO certified.



# AIRCRAFT CONTROLS COMPONENTS



# ACC ENGINE CONTROLS

## Wide Range of Application

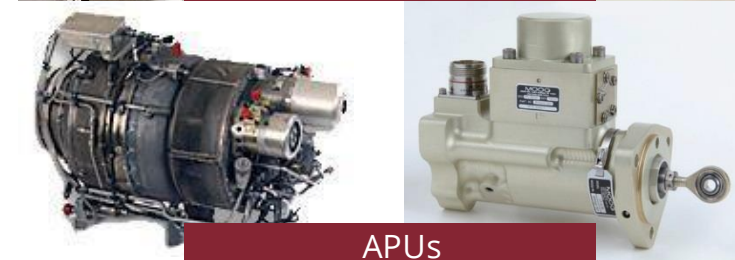
- ▶ Variable Geometry Controls
- ▶ Fuel Metering
- ▶ Thrust Vector Control
- ▶ Shut Off and Surge Control
- ▶ Anti-Icing Control

## 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



*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.*