SUPERIOR MOTION CONTROL, INC.
Engineering & Manufacturing Affordable Solutions

Certifications
• AS9100
• ITAR

Small Business
Cage Code 66344

E-MAIL: SALES@SUPERIOR-NY.COM, PHONE: 516-420-2821
Quality Policy:

To consistently provide a quality service and distribute products that meet or exceed all our customer requirements. To further provide these products in a timely fashion and maintain our leadership in product quality and on-time performance.
In House Capabilities

- **Electro-Mechanical Design, Development & Integration**
  - Linear & Rotary Actuators, Gears, Motors, Drives, and Systems using SolidWorks

- **Mechanical Design Analysis**
  - COSMOS for Finite Element Analysis, MathCAD for Gear Analysis

- **Electrical Design**
  - Engineering Control Units (ECU), Digital & Analog Communication, AC/DC Brush/Brushless Motors, using Matlab Simulink

- **Qualification Testing**
  - ATP, Environmental and Electrical

- **Reliability Analysis / Documentation**
  - FMEA, Maintainability, Fault Tree, Finite Element & Gear Analysis

- **Build to Print**
  - Gear Cutting, CNC Milling, CNC Turning, Broaching, Grinding & Honing

- **Product Development / Testing / Field Support**

- **Test Stand Development & Construction**

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Facility

25,000 Square Foot Facility – Farmingdale, NY
Applications

- Aircraft & Unmanned Vehicles
- Shipboard
- Torpedoes
- Missile & Drones
- Radar
- Military Ground Vehicles

Superior’s Business for over 30 years has been in support of the Military
Customers:

Raytheon

BAE Systems

Lockheed Martin

General Dynamics

Boeing

United Technologies

L3 Communications

ITT

Northrop Grumman

Penn State

Department of the Navy

U.S. Air Force

U.S. Army
Programs:

- DDG-1000 Zumwalt - HAU
- MK-41 VLS
- M1A1 Tank
- AQM-37 Target Drone
- AGS - Advanced Gun System
- Crusader
- V-22 Osprey
- C-17

- Patriot
- MK-57 AVLS
- MK-30 Target Torpedo
- MK-50 Torpedo
- Harm Missile
- AQS 20 Mine Hunter
- OASIS
- F-22
- LMRS
MK 41-Vertical Launch System (VLS)

Ticonderoga Class: USS Shiloh firing a Tomahawk Cruise Missile
MK 41-VLS

• Designed in House
• 20 years in production
• 15,000 units delivered
• US Navy Ships:
  All Ticonderoga Class (CG)
  All Arleigh Burke Class (DDG)
  Some Spruance Class (DD)
• Choice of 8 other International Navies

USS San Jacinto AFT VLS
**MK 41-VLS**

**FEATURES:**

- Open & Close 150 lb. Missile Hatches in under 1.5 second
- Anti-backdrive feature
- Combat Tested Reliability
- Zero Field Failures
MK 41-VLS Components

- Housing & Links
- Worm Gearing
- Crank Shafts
- Splined Shafts
- Splined Hubs
- Trunnion
- Hinge Bracket

Parts made out of Inconel, 17-4, Forgings and castings.

VLS Housing and Gear Components
DDG1000 MK-57 (HAU)
Hatch Actuator Unit

Zumwalt Class Destroyer
DDG1000 MK-57
Hatch Actuator Unit

• Designed and developed to control the open and close operation of a 250 lb. missile hatch door on Zumwalt Class Destroyer in less than 1 second.
• This system will be used on future surface combat ships.
• 120 HAU’s per ship.
DDG1000 MK-57
Hatch Actuator Unit

Specifications

**Mechanical**
- Travel Range: 160 Degrees
- Accuracy: ± 0.2 Degrees
- Torque: 15,000 in-lbs
- Size: 16” x 23 ” x 10”
- Operation: Open or Close in <1 Second

**Electrical**
- Supply Voltage: 28 VDC Controller
- Supply Voltage: 375 VDC Drive
- Max Current: 60 Amps
- Bandwidth: 0.5 Hertz
- Com: Optoisolated RS-422, 115 KBPS
Rotary Actuators

- MK 30 Fin
- MK 50 Fin
- MIT Fin
- LMRS Fin
- Custom Sub-Assy
- SMTD/CCAT Fin
AQS 20 Fin Control Actuator

Specifications

**Mechanical**
- Travel Range: + 25 Degrees
- Accuracy: ± 0.35 Degrees
- Force: 600 in-lbs
- Size: 7.5 “ x 2.5 ” x 3.3 “

**Electrical**
- Supply Voltage: 28VDC
- Max Current: 6 Amps
- Bandwidth: 10 Hertz
- Communication: Analog

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MK-30 Fin Actuator

Specifications

**Mechanical**
- Travel Range: + 35 Degrees
- Accuracy: + 0.5 Degrees
- Torque: 200 in-lbs
- Size: 7” x 5” x 4”

**Electrical**
- Supply Voltage: 24 - 32 VDC
- Max Current: 5.4 Amps
- Bandwidth: 4 Hertz
- Com: Optoisolated RS-485, 38.4 kbaud serial Discrete Enabled
LMRS Fin Actuator

Long Term Mine Reconnaissance System

Specifications

Mechanical
Travel Range: 360 Degrees
Force: 50 in-lbs
Size: 8.5 " x 1.7 " x 2.7 "
Speed: 20 Degrees / Second

Electrical
Supply Voltage: 28 VDC
Communication: Analog
MK-50 Fin Actuator

SMTD / CCAT Actuator
Non Line of Sight (NLOS) Elevation

Single Planetary Gear Reduction Gear Box with Service/Manual Drive

Mechanical Specifications
- Efficiency: 86%
- Nom Torque: 2600 lb in
- Power: 22.7 HP (17 kw)
- Size: 7” x 5.25 ” x 12”
- Weight: 39 lbs
- Ratio: 9:1
Non Line of Sight (NLOS) Traverse

Mechanical Specifications
Efficiency: 70%
Nominal Torque: 7525 lb in
Power: 10 HP (7.4 kw)
Size: 16” x 9.5 ” x 9”
Ratio: 60.3:1

Double Planetary Gear Reduction Gear Box with Service/Manual Drive & Bevel Gear Input
Patriot Antenna Elevation Drive

Mechanical Specifications
Travel Range: 360 Degrees
Output Torque per Shaft: 63.5 in-lbs
Output Speed per Shaft: 1630 rpm
Size: 10” x 6.75” x 6”
Manual Drive
Dual Output Shafts
Future Combat Systems (FCS)
Mounted Combat System (MCS)

Turret Basket Magazine (TBM)
Index Drive Planetary Gearbox

Mechanical Specifications
Backlash: < 5 arc min
Peak Torque: 1700 N-m
Size: 9.7” x 5.5” x 5.5”
Ratio: 28:1
Linear Actuators

Submersible

FLIR Pod Deployment

C-17

Patriot Radar

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“Black Program” SUBMERSIBLE Actuator

Specifications

**Mechanical**
- Travel Range: 5.2 in
- Accuracy: 0.020 in
- Force: 120 lbs
- Size: 2.5 “ x 2.5 ” x 10 “
- Speed: 2 in / second

**Electrical**
- Supply Voltage: 75 to 120 VDC
- Max Current: 3.5 Amps
- Bandwidth: 0.2 Hertz
- Communication: RS485, 115 KBPS

Submerge to: 1000 ft
Cargo Ramp Lock (CRLA) Actuator C-17

Specifications

Mechanical
Travel Range: 1 in  
Force: 700 lbs  
Size: 2.5" x 5" x 12"  
Operating Temperature: -54°C to 74°C  
Operating Altitude: to 50,000 ft

Electrical
Supply Voltage: 19.5 – 29 VDC  
Max Current: 5 Amps
FLIR Pod Deployment Actuator

Specifications

**Mechanical**
- Travel Range: 7 in
- Force: 3,254 lbs
- Size: 2” x 4.3” x 16”
- Output Velocity: 0.3 inches / second

**Electrical**
- Supply Voltage: 22 – 32 VDC
- Max Current: 9.5 Amps

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FLIR Pod Deployment Actuator

Specifications

Mechanical
- Travel Range: 5.2 in
- Force: 3,254 lbs
- Size: 2” x 5.2” x 16”
- Output Velocity: 0.3 inches / second
- Manual Drive

Electrical
- Supply Voltage: 22 – 32 VDC
- Max Current: 9.5 Amps
Superior Motion Control, Inc.

Engineering & Manufacturing Affordable Solutions

Patriot Antenna Elevation Drive

Mechanical Specifications

Travel Range: 12 inches
Max Force: 15,000 lbs
Max Speed: 16 inches / minute
Size: 35” x 5” x 10.5”
Aircraft Fin Actuator

Specifications

**Mechanical**
- Travel Range: 1.5 in
- Accuracy: 0.020 in
- Force: 400 lbs
- Size: 1.6 “ x 3.3 ” x 7.4 “

**Electrical**
- Supply Voltage: 28VDC
- Max Current: 6 Amps
- Bandwidth: 10 Hertz
- Communication: Analog

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V-22 Osprey - DC to DC Power Supply

Size: 5” x 3” x 1”
Build-To-Print

Application: This assembly was built to a print as a part of the Towed Vehicle Capstan Drive in support of the OASIS (Organic Airborne and Surface Influence Sweep) program.
DDG1000 MK-57
Vertical Launch System (VLS)
Build-To-Print Cost Savings

Saved over $1 Million Dollars

• Superior engineering suggested changing material from 17-4 PH to a 4340 forging.
• Cost saving in material and machine time for initial requirement.
• Future savings to be realized.
Build-To-Print

These parts are used on the AGS (Advanced Gun System) that is on the DDG-1000, Zumwalt Class Destroyer
Machine Capabilities

- **CNC Horizontal Mills**
  - OKK MCH600
  - OKK HM4
  - Leblond Makino MC85

- **CNC Vertical Mills**
  - OKK HM4
  - Mazak V-7.5
  - Mazak V550
  - Wintek MV-40
  - Dahlih MCV-1450
  - (2) Leadwell MCV-1300P
  - Trak DPM

- **CNC Lathes**
  - Wintek TC-35C
  - Ikegai TU-26
  - Wintek TC-15

- **Gear Cutting**
  - Fellows
  - Barber-Colman
  - Mikron
  - Gleason Coniflex
  - Phauter
Facility
Assembly
Clean Room Assembly (PCB)
Testing
Call Superior for an Affordable, Innovative Solution for your **Design** requirements or **Build-To-Print**

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