



Capabilities and Aerospace Experience

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Capabilities and Aerospace Experience

- Who we are:
 - Full service product development firm
 - Capable of bringing aerospace products through qualification
 - Design and build custom test stands
 - Provide advanced engineering services
 - Develop and sell patented technology and products



Capabilities and Aerospace Experience

- **Founder & President – Robert Kennedy**
 - Corporate experience
 - Hamilton Sundstrand – 10 years
 - » Main Engine Fuel Control Design
 - » Pump Design
 - » Engine Accessory Gearbox Design
 - Goodrich (Chandler Evans) – 8 years
 - » Pump Design (Centrifugal, Vane & Gear)
 - » Gearbox Design
 - Rolls Royce – 1 year (Engine cost reduction)
 - Jet Propulsion Laboratory- 1 year (propulsion group design & structural analysis)
 - Have designed components for many military aerospace programs including the F-22, Joint Strike Fighter, B-2 Bomber, P-8A Poseidon



Capabilities and Aerospace Experience

- Our facility consists of:
 - Engineering office
 - Development lab
 - Test and assembly room
 - Fabrication model shop



Capabilities and Aerospace Experience

- Company Awards and Achievements
 - Working with NASA developed novel planetary gearbox.
 - <http://www.techbriefs.com/component/content/article/1814>
 - Out come – aerospace qualified, limited units sold
 - Awarded SBIR Phase II from Air Force to develop micro fuel pump technology for UAVs
 - <http://www.wpafb.af.mil/news/story.asp?id=123322954>
 - Developed and patented new technology
 - Out come – 75+ prototype units evaluated by potential customers, Technology in process of being transferred to aerospace manufacturer



Capabilities and Aerospace Experience

- Company Awards and Achievements
 - Awarded SBIR Phase II from Air Force to develop thermally efficient main engine positive displacement fuel pump
 - http://www.dodsbir.net/sitis/archives_display_topic.asp?Bookmark=39732
 - Outcome – developed new technology that behaves like an electronic continuously variable transmission, tested with 20 GPM fuel pump with turndown ratios up to 2.3 achieved from baseline operating point
 - Awarded SBIR Phase II from NAVAIR to develop flow on demand positive displacement lubrication and scavenge pump for F135 engine
 - http://www.navysbir.com/n11_2/N112-096.htm .
 - Outcome – Outcome – ongoing, tested with F-35 Lube pump

Capabilities and Aerospace Experience

- Company Awards and Achievements
 - One of twelve small businesses selected by Rolls-Royce to participate in 2016 Commercialization Readiness Program Technology Interchange Meeting
 - Outcome – Variable Speed Drive Technology received 1st Place Judges Vote for most innovative technology



- In process of developing high power density linear motor actuator technology



Programs that we provided advanced engineering services for:

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Honda Jet

Aileron, Rudder and Elevator Trim Actuators

F 35 – Joint Strike Fighter
Main Engine Fuel & Actuator Pump,
Electric Actuation Systems



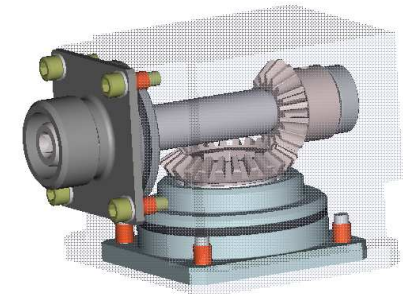
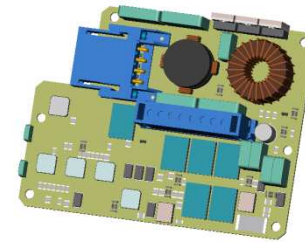
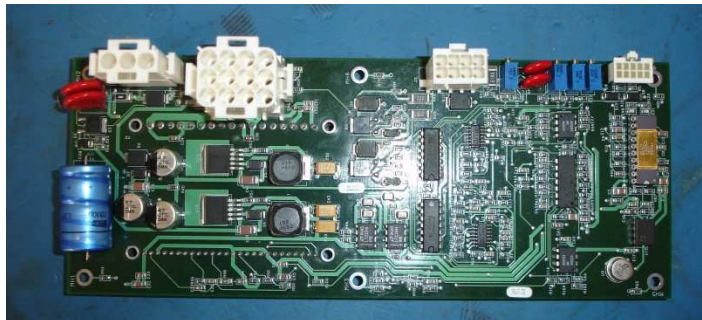


Programs that we provided advanced engineering services for:

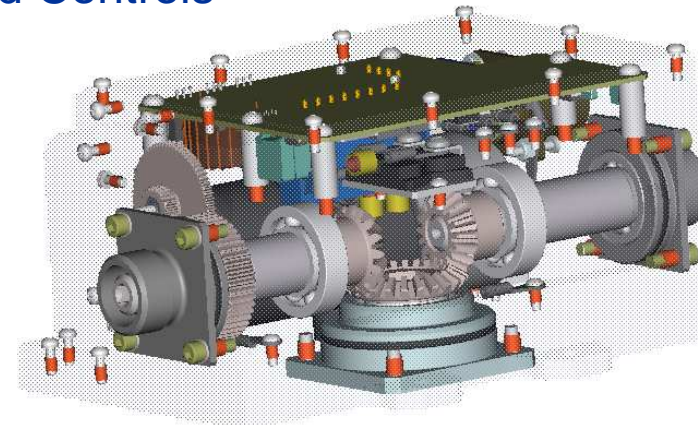
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BLDC Speed Controller for door actuator



P8-A-737 Actuator System With DC Motor and Controls





Programs that we provided advanced engineering services for:

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Cirrus Jet -Flap Actuator
DC Brushless Motor
Controller

Diamond Jet – D-Jet
Aileron Actuator
Brushed Motor Controller





Programs that we provided advanced engineering services for:

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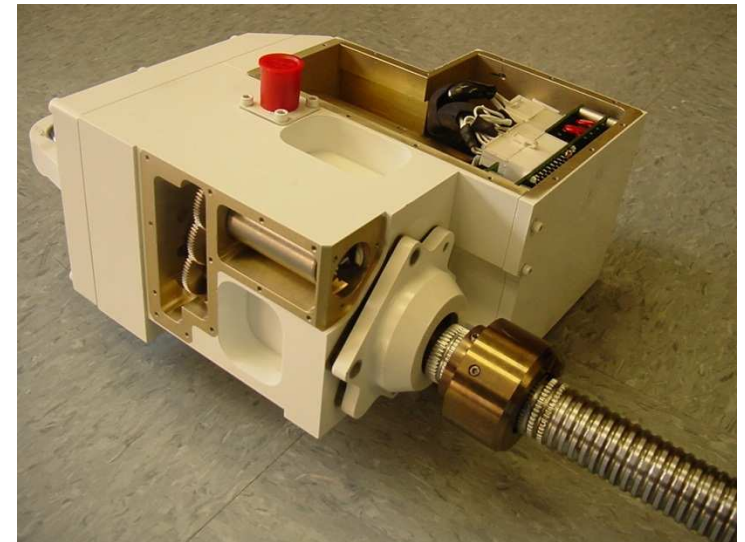
Efficient Small Scale Propulsion Program

High Speed/High Power Main Gearbox



E10A

Synchronized door actuator capable of +/- 8,000 lbs





Programs that we provided advanced engineering services for:

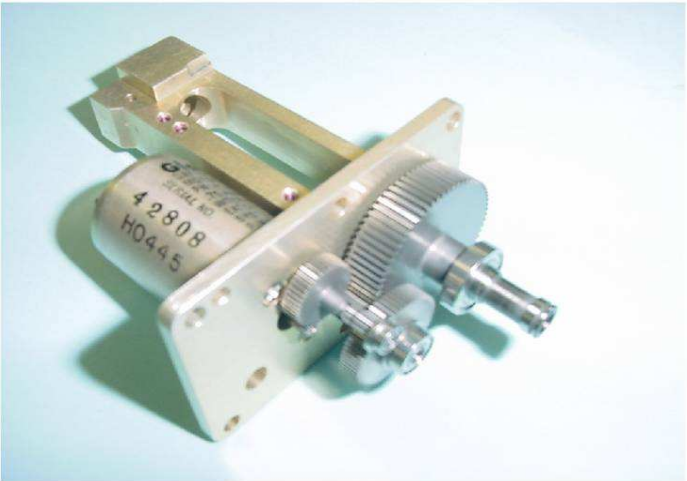
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Rotary Actuator Test Stand



Hydraulic Actuators

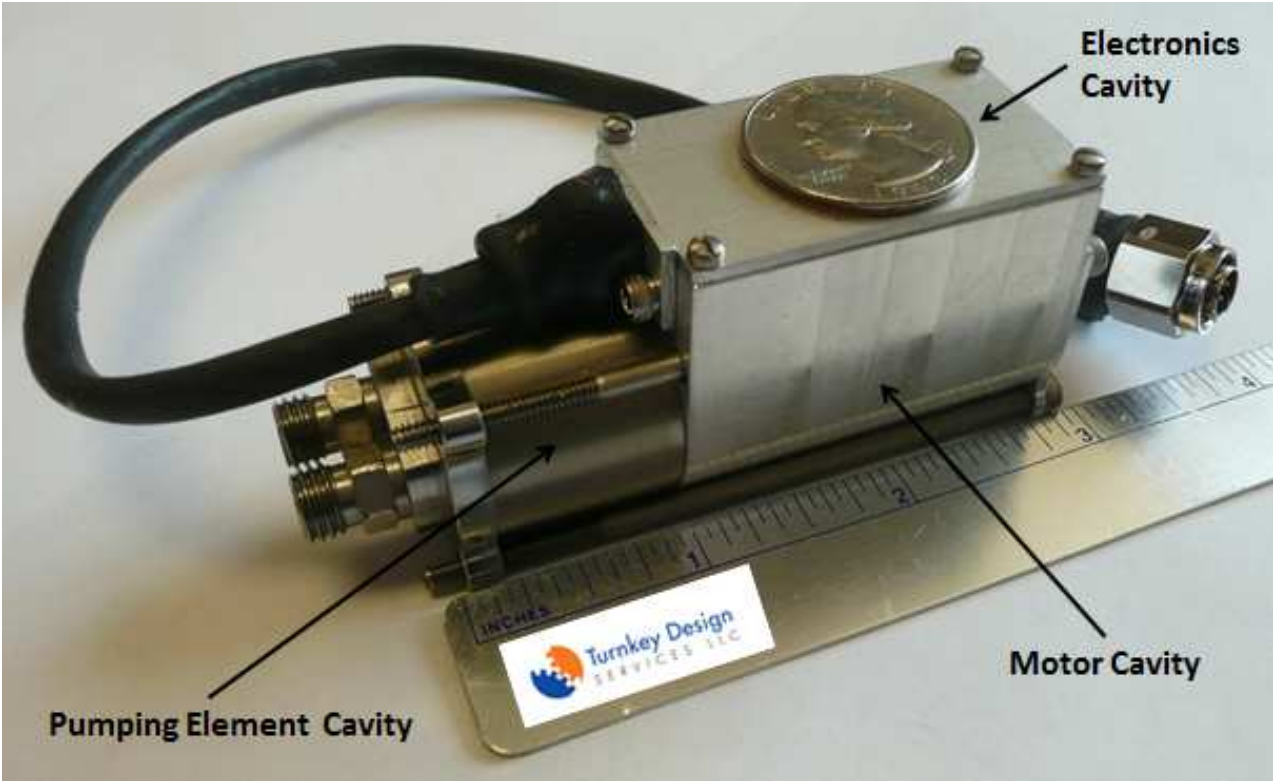


September 2016



Miniature Fuel/Lubrication Pump

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Turnkey Design Services MFP30-1 Pump
Weight: 7.8 OZ

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Tested with F35 Lube Pump

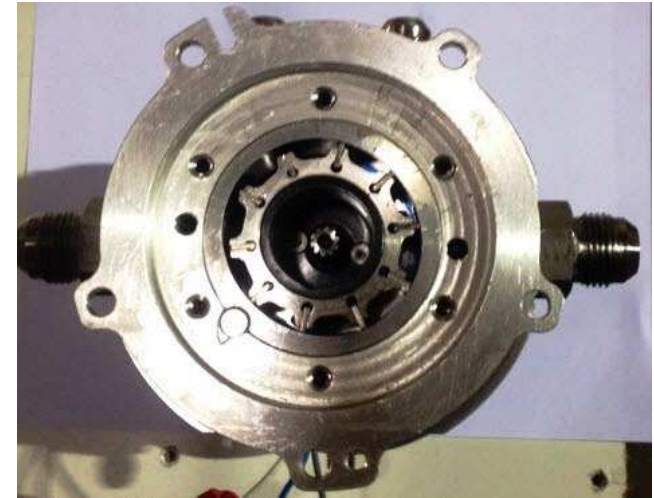
Received Rolls-Royce 1st Place Judges Vote –
For 2016 Small Business most innovative technology



- Behaves like a electronically controlled continuous variable transmission
 - Self powering
 - Capable of setting a particular speed ratio via an input signal
 - Can either increase or decrease speed ratio on demand
 - Can be used to provide vehicle power or charge battery

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20 GPM Pump
Installed height = 10.8"
Outside diameter = 5.1"
Able to achieve flow reduction
Up to 42%



Capabilities and Aerospace Experience

- Electro-Mechanical Actuation System Design
 - Gear train, Motor, Motor Controller
- Hydro-Mechanical Design
 - Pumps – Gear, Vane, Centrifugal, Rotary Piston
 - Valves – metering, regulating, check
 - Actuator
- Rotary Equipment & Gearbox Design
 - High horsepower
 - High Speed
- Electro-Hydraulic/Pneumatic Design
 - Solenoid
 - Torque/Stepper Motor
 - High Temperature Valves

Capabilities and Aerospace Experience

- Power electronics/EMI
 - AC/DC power
 - Noise filtering/prevention
- Custom BLDC Motor Design
- Motor control
 - BLDC motor controls
 - Closed loop velocity control
 - Closed loop position control
- Digital system controllers
 - Speed, temperature & pressure sensing
 - Health monitoring
- Embedded Systems
- Logic Design
 - FPGA-Xilinx/Altera
 - PLD
 - Verilog, VHDL
- PCB Design and layout
- Prototype assembly and test