Portfolio

- Embedded Systems
- Advanced Embedded Software
- Sense and Control Systems
- State estimation firmware
- Mechatronics
- Robotics
- Ruggedized Systems
- UAV flight stabilization

Swope Designs, Inc.
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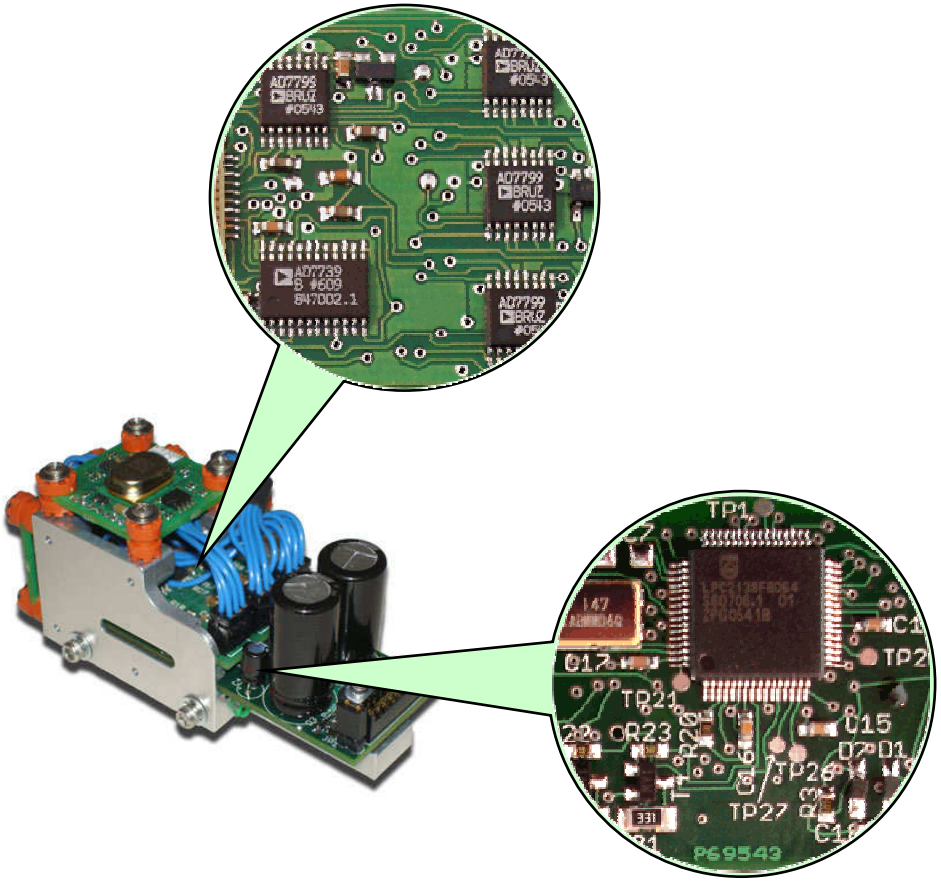
swope designs

Swope Designs, Inc (SDI) provides innovative and technically advanced consulting services primarily through the multidisciplinary expertise of its founder, John Swope. John is able to provide electronic design, firmware, and mechanical support for many projects. This eliminates costly team management overhead to provide outstanding value for small and medium sized businesses.

The following pages offer a sampling of projects that demonstrate breadth and depth of expertise. Both the hardware and software portions of these projects were developed in-house by John.

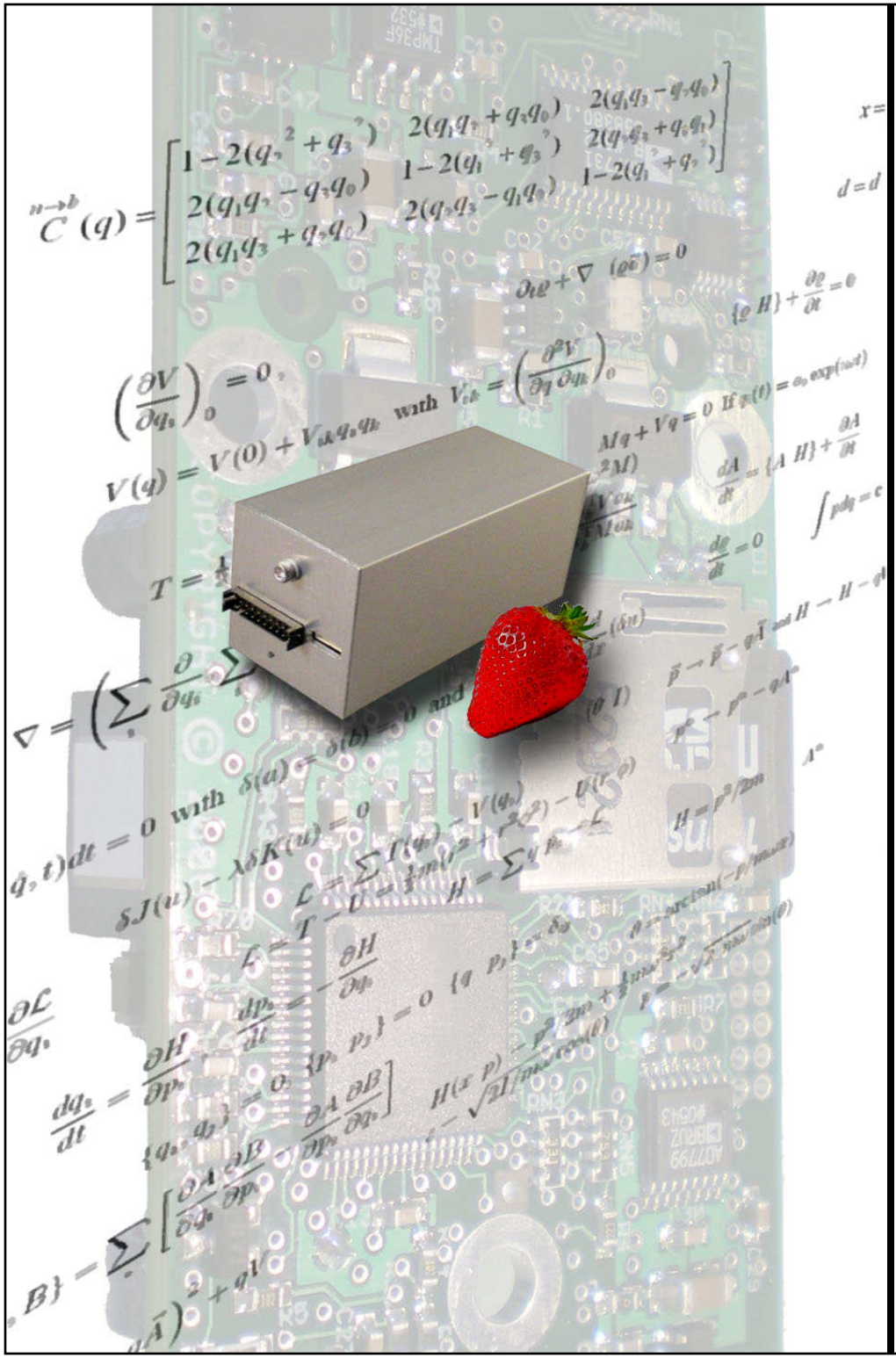


Product

Strapdown Vertical Gyro developed for a leading motion stabilization company.

SDI Key Roles

- Advise client of various solutions to problem.
- Turnkey product development from statement of problem to delivery of solution.
- Electrical engineering
  - Embedded real-time system
  - High-resolution analog sensor circuitry
- Firmware
  - Sensor fusion and optimal state estimation algorithms
- Chassis design
- In-house CNC machining of prototype chassis
- Supported contract manufacture of Printed Circuit Boards (PCBs)
- Performed environmental and margin testing
- Delivered working prototypes and full documentation to support manufacturing



Product

Stability system and autopilot for Vertical Take-off and Landing (VTOL) Unmanned Aerial Vehicles (UAVs) for Department of Defense (DoD) applications.

SDI Key Roles

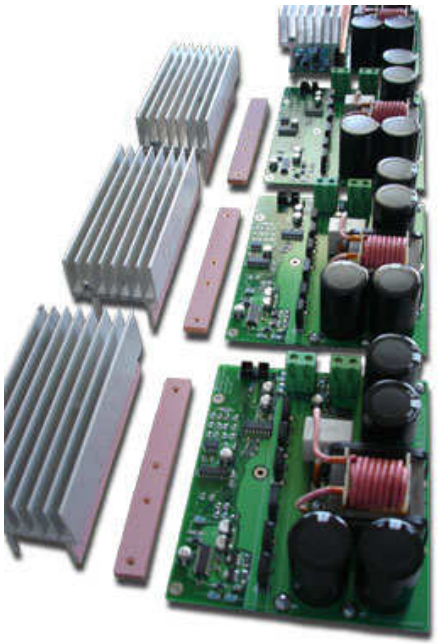
- Electrical engineering
- Advanced Firmware
  - Quaternion based Integrated Inertial Measurement Unit (IMU)
  - Extended Kalman Filter in addition to other digital filters provided optimal state estimation
  - Advanced non-linear control algorithms were developed which resulted in best-in-class UAV control.
  - Advanced non-traditional sensors integrated in an innovative way to provide product differentiation
- Enclosure Design
- In-house CNC machining of prototype enclosures

Product

Autonomously balancing robot platform. This product was developed and marketed as an educational tool for universities and high schools.

SDI Key Roles

- Turnkey development from concept to production
- Electrical engineering
  - Embedded system
  - Clever engineering allowed use of low-cost sensors in place of traditional high-cost sensors.
- Mechanical engineering
  - Sheet-metal design
  - Plastic injection molded parts design
  - Laser cut components design
- Software engineering
  - Balance control algorithm
  - Human-machine interface
  - Closed-loop motor control
- Documentation for contract manufacturing



Product

Ground Control Station (GCS) to control unmanned aerial vehicles, developed for Department of Defense (DoD) and homeland security applications. This ruggedized system is fully self-contained and provides a highly

Product

1 kilowatt power converter for high-reliability application.

SDI Key Roles

- Turnkey development from concept to delivery of prototypes and supporting documentation
- Electrical engineering of Buck converter
- Assembly and delivery of prototype units
- Delivery of documentation to support production through Contract Manufacturers (CMs)

data and instruments.

- Documentation for manufacturing

Product

Custom Carbon Fiber propeller.

SDI Key Roles

- 3D Solid modeling CAD Design
- 2D Drawing
- Generated CNC toolpaths
- Produced female mold on in-house CNC milling machine
- Supported 3rd party carbon fiber layup of prototypes