

# Exploration Aerial Vehicle: A Micro-Vehicle Testing Platform



INTELLIGENT SYSTEMS DIVISION  
at Ames Research Center

**Carnegie Mellon**<sup>®</sup>  
Innovations Lab



## Exploration Aerial Vehicle

Airframe: Cessna 182, Quarter Scale Model

Airframe Manufacturer: Hanger 9

Wing Span: 7.9 ft

Wing Area: 8.7 sq ft

Length: 6.4 ft

Wing Loading 32.7 oz/sq ft

Weight, Takeoff: 23.2 lbs

Avionics Weight: 4.8 lbs

Typical Cruise Altitude: 450 ft

Cruise Speed: 45 knots



# EAV-IFC System

## Athena Guidestar GS111m INS/GPS

- Full-State Feedback
- 3-Axis Magnetometers / Gyros / Accelerometers
- GPS (DGPS with Novatel/Omnistar)
- 6 Air Pressure Transducers: AOA, Sideslip, Altitude/Speed



## Batteries (Not Shown)

- CPU: Lithium Polymer, 8000mAh/11.1V, 3s4p
- Actuators: Li-Po, 4200mAh/11.1V, 3s2p

Wing Sensor: Five Hole Air Data Probe  
American Sensor Corporation

## Wireless Communications:

- 900Mhz (ISM) Telemetry/Commands
- 72MHz Safety Pilot Control
- 2.4 GHz Video

Wing Sensor: GPS Antenna

"Pisanich Super Struts"

## Airframe Manufacturer: Hanger 9

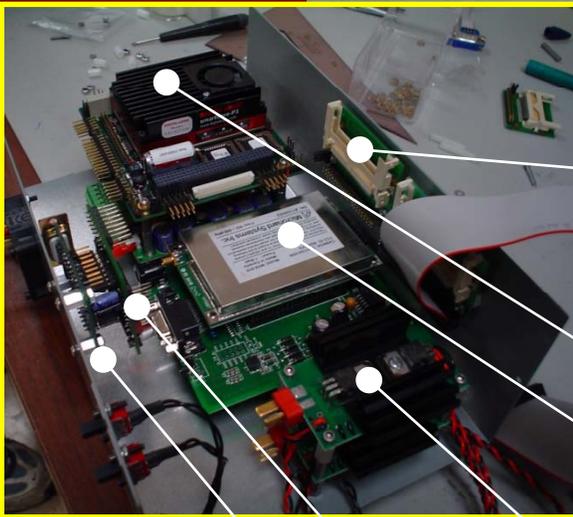
- Model: Cessna 182 Skylane, 1/4 Scale
- Actuators: Eight (8) HiTec HS-5646MG

## Engine Power Plant: Zenoah G-38

- Type: 2-Stroke, Gas/Oil Fuel Mix
- Displacement: 2.3 cu in / 38 cc
- RPM: 7300 (18x10 prop)

Pan-Tilt Camera Head

- Storage: Compact Flash, 2x512MB Cards
- PC/104 Stack:  
D.L. SmartCore P3/700Mhz/256MB]  
Diamond Jupiter MM-SIO DC/DC 80Watt)
- RF Modem: Microhard MHX910 900MHz
- Power Regulator: FMA WRL12 Power Frc  
6V, Linear Regulator (Actuator Power)
- I/O Board: New Micros USB Servopod  
Motorola DSP56F807 Microcontroller
- Servo Switch: Optically-Isolated  
Multiplexor, Custom Analog Circuit



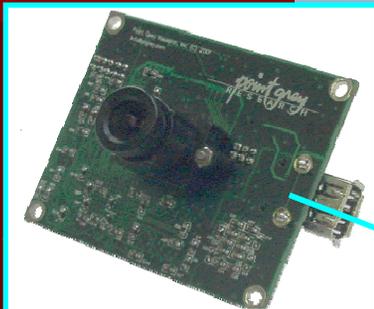
# EAV-Vision System



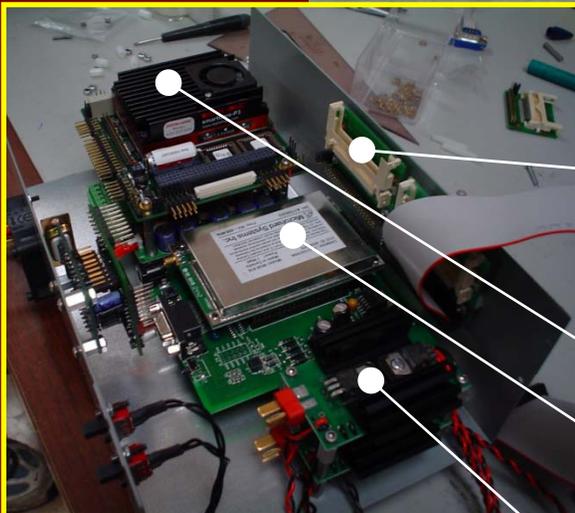
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Pan-Tilt Camera Head



Stereo Pair Digital Cameras  
Two (2x) Point Grey Research  
DragonFly IEEE-1394 Digital Cameras



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