About the World Champion Unmanned Aerial Vehicle Team

The Unmanned Aerial Vehicle team, established in 2002, has the mission of producing unmanned airplane systems to compete in the annual AUVSI (Autonomous Unmanned Vehicle Systems International) student competition. Competing aircraft must take off, fly and land autonomously; in flight they must meet such challenges as navigating waypoints, patrolling areas, and identifying targets.

We are a group of undergraduate Engineering students who research airframe design and control techniques, computer science problems such as vision processing, and systems engineering and hardware integration problems.

CUUAV and You!

Our team relies heavily on the generosity of sponsors like you. Each year, we require funds and parts to upgrade our airframe, our electronics systems, and software packages.

- Any contribution to the team is **tax deductible.** Many personal donations to the team also qualify for matching corporate donations.

- As a corporate sponsor, our team recognizes your commitment to education and research. Some of the finest engineering students in the world will have had firsthand experience working with your components and equipment, and will remember the products they had success with once they are working in industry in a few years.

- Sponsors of the Cornell Unmanned Aerial Vehicle team will enjoy local and international exposure. Corporate logos are attached to our airplane; the size of these logos is proportional to the degree of sponsorship. Our airplane looks professional and catches eyes with its colorful design. This year, we were featured on Slashdot.org, a tech news website, as well as several other prominent internet forums. In addition, corporate logos are also featured on our team webpage, www.cuuav.org.

- Sponsors become part of the team by directly contributing to our continued success. You will receive periodic progress updates about our team's challenges, successes, and hopefully our victory this June!

Contacting CUUAV

If you wish to sponsor the team, please fill out the enclosed sponsorship form. For more information, visit our website at www.cuuav.org, email us (krs43@cornell.edu), or do not hesitate to call us at (925) 200-3408.

The Technology

In 2003 and 2004 we built a modified SIG Rascal 6200 airframe, with a 110" wingspan and a 30cc gas engine.

The 2003 airplane

We incorporated in this plane a PC-104 based computer with an 800 MHz Crusoe processor running custom autopilot software we developed. The computer was connected to several devices such as a GPS receiver, a gyro, and a radio modem. The radio modem allowed two-way contact with the ground to constantly monitor the plane's position using custom ground station software package we developed.

A CCD camera and a 430 MHz HAM TV transmitter broadcast a live feed of the "plane's eye view" back to our ground station so we could see below the plane.

Our custom software approach allowed us to flight-test our system in Microsoft Flight Simulator 2004™ to reduce risk and costly failures before we moved to the field.

In 2003 our plane ran a Micropilot™ based autopilot system which carried us to a 1st place victory. Due to a fire in 2004 that destroyed most of our equipment the day before the competition, we were unable to compete last year. But this year's team is reenergized and now doubly committed to reclaiming our title as champions.

Looking to the Future

Our focus this year revolves around simpler and more reliable designs. A custom cut foam delta wing configuration will rely on a Micropilot to handle attitude control, combined with a custom software package running on a Windows CE platform to handle more advanced mission management.

In addition, this year's design will feature a pan-tilt camera that can track objects on the ground, as well as automated takeoff and parachute recovery/landing.

Other design goals include computer-based vision processing and target recognition.

The 84" delta wing airframe for 2005

Team Profile

Our team is an all-undergraduate effort. We work to meet both the engineering demands of the AUVSI competition, as well as produce research in computer science, systems engineering, and electrical engineering. Our team presented papers on economical approaches to autopilot development at two AIAA conferences, including the "Unmanned Unlimited" in Chicago in September 2004.

Our computer science division also entered the control software in Microsoft's Imagine Cup for innovative uses of their new programming language, C#.

Ron Hose, Brian Rogan, Andy Abramson, and Karl Schulze pose with a display of the software at the East Coast Imagine Cup Finals, in March '04, where we placed 4th.

Brian Rogan, Jonathan Kron, Andy Abramson, Karl Schulze, and Aaron Kimball prepare the plane for a test run in May '04

We Need Your Help!

Cornell University Unmanned Aerial Vehicle Team

Our team needs funding and supplies in several areas. Any way in which you donate or help will prove useful and appreciated.

Specific areas we need donations in:

- Desktop computers (for software and ground station development)
- Embedded computers (for airplane in-flight management)
- EE Tools and supplies (multimeters, oscilloscopes, power supplies, and embedded microprocessor development platforms)
- Mechanical engineering tools and hardware (servos, stepper motors, power connectors, micrometers)
- Cash, or the ability to purchase the above at discounted rates is always appreciated!

If you have any questions, contact Karl Schulze at krs43@cornell.edu or call him at (925) 200-3408.

Previous year's sponsors:

CUUAV Sponsorship Form

If you are interested in sponsoring CUUAV, please fill out the form below and return to:

Karl Schulze
krs43@cornell.edu
(925) 200-3408
225 Phillips Hall
Ithaca, NY 14853

Name: _____

Corporation: _____

Telephone: (_____) _____ - _____

Email address: _____

Address: _____

City: _____ State: ____ ZIP: _____

Please check all that apply:

[ ] My company can provide a product or services to CUUAV. (Please describe)

[ ] My company is interested in making a financial contribution to the team.

[ ] I am interested in making a personal contribution to the team.

[ ] I am interested in discussing sponsorship opportunities with you, and want to discuss this further.

We will call you promptly to discuss any questions or concerns you have, as well as to make the mechanics of your contributions go smoothly.

Thank you for your support!

Sincerely,
-- CUUAV '04-'05