Georgia Tech

Research News

Georgia Institute of Technology
Research Communications Office
Atlanta, Georgia 30332-0800
404•894•3444

*For Immediate Release*
*June 23, 1992*

# IF AT FIRST YOU DON'T SUCCEED... FLYING ROBOTS GROW IN NUMBER; IMPROVE PERFORMANCE -- BUT STILL FALL SHORT

For sponsors of the International Aerial Robotics Competition, the 1992 contest -- held June 19 on the campus of the Georgia Institute of Technology -- brought both good news and bad news.

The good news was that teams from eight colleges entered machines in the competition, more than twice as many as joined the first event in 1991. Four of the machines were able to fly at least briefly under their own computer control, and only one crashed.

The bad news was that the task of finding, retrieving and flying metal disks across a three-foot barrier was still too difficult for the student-built craft, which were designed to fly without a human operator. But even that ultimately turned out to be good news for the college students, who began making plans for the 1993 contest even as they were packing up for the return trip home.

*San Diego State University students display their robotic blimp, which was unable to compete in the Aerial Robotics Competition because of control system problems. (Color/B&W Avail)*

"We had more vehicles flying this year, and we had more vehicles flying autonomously for at least a portion of their flights," said Rob Michelson, vice-president of the Association for Unmanned Vehicle Systems (AUVS), the event's sponsor. "They are moving toward longer and longer flights in which the vehicles are using their own sensing and intelligence to fly by themselves."

The armada of amazing air vehicles assembled in Georgia Tech's Bobby Dodd

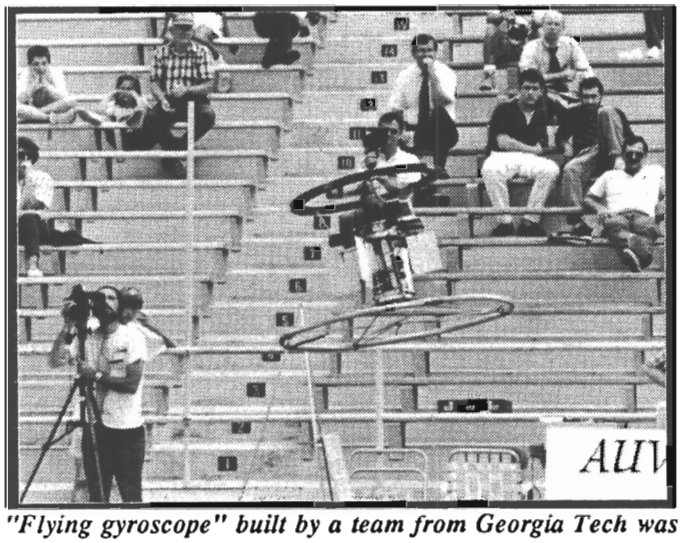
- OVER -

*FOR MORE INFORMATION:*

*ASSISTANCE/PHOTO: John Toon or Lea McLees, (404) 894-3444*
*RESEARCHER: Rob Michelson, (404) 528-7568*
*WRITER: John Toon*

Stadium included several helicopters, a billowing gray blimp, a "tailsitter" aircraft and the top-scoring vehicle: a "flying gyroscope" based on a toy-store hula-hoop and built for $700.

After nine hours of flying and attempting to fly under the blistering sun, a panel of judges awarded prizes to three hometown teams: $5,000 to the Georgia Tech builders of the "flying gyroscope," $3,000 to the student builders of a helicopter from the Southern College of Technology in Marietta, and $2,000 to a second Georgia Tech team also fielding a helicopter.




***"Flying gyroscope" built by a team from Georgia Tech was awarded top honors at the Aerial Robotics Competition. (Color/B&W Avail.)***

"This is quite an impressive performance," said Jerry Lane, a spokesman for the contest judges and chief of robotics for the U.S. Army's Tank Automotive Command in Michigan. "What we have seen here today shows a tremendous commitment from the teams."

Also participating were student teams from the University of Texas at Arlington, San Diego State University, the University of Dayton, the U.S. Naval Academy, Ecole Polytechnique Federale de Lausanne (Switzerland) and a joint team from Purdue University and the Massachusetts Institute of Technology.

Michelson was not discouraged by the results of the competition, and believes the task will eventually be completed.

"It's not beyond the state of the art to accomplish this," he said. "But it is difficult to reduce the state of the art to practice. If we can't fly around and pick things up without human control, then how can we expect to do the more complex tasks required of autonomous deep-sea and space probes."

The task sounds relatively simple, but to accomplish it, the autonomous aerial robots must sense their environment, locate the disks, acquire them one at a time, navigate to a drop-off bin while avoiding obstacles, and stay within the boundaries of the designated arena area -- all while maintaining stable flight. They may use a variety of sensing mechanisms and computer intelligence.

"Once the vehicle is started, each robot must travel on its own, using its machine vision to perceive the environment and its own intelligence to find a disk, acquire it, and navigate across the barrier to drop it," explained Michelson. "It's a real technical challenge."

Michelson, who is Manager for Battlefield Robotics and Unmanned Systems for the Georgia Tech Research Institute, expects to see a greater variety of vehicles for the 1993 competition. He also believes the teams learned a great deal from their frustrations which will help them in their future engineering careers.

"The teams learned that when you do a real engineering project, you must integrate all of your systems together," he said. "People always seem to put that off to the end, thinking that since their systems work individually, they will also work correctly together. That's not so."

The teams also learned that the simpler solutions often work better than complex ones, and that many problems can arise between the drawing board and the competition field. The AUVS hopes these lessons will help students be better engineers -- and equip them with skills that will advance knowledge about autonomous aerial vehicles, Michelson noted.

Because the work is also interdisciplinary, requiring skills in mechanical, aerospace, electrical and materials engineering, along with computer science and software development, the students learn to bring different expertise together.

Autonomous aerial vehicles would be useful for both the military and commercial sectors. Military agencies already use remotely-piloted vehicles to fly behind enemy lines to obtain information about positions and activities without jeopardizing humans. Commercial uses could include "dull, dirty or dangerous" jobs such as pipeline inspections or timber monitoring.

**EDITOR'S NOTE: Color slides and black-and-white photos of these and other aerial robots are available.**