



## The VCU Engineering Schools Wins Awards With An Electric Powered Helicopter

By Mark Sternheimer, VAHS Board Member

In June I attended the contest sponsored by the Association for Unmanned Vehicle Systems International (AUVIS) at Webster Field, Maryland, which is part of the Patuxent River Naval Air Station. This contest has been going on for a number of years and pits the best engineering schools in the country against each other to produce an unmanned aerial vehicle which could possibly have military significance. In previous years Dr. Klenke and his students from the VCU Engineering School won a first place and a second place at this event. This year they really outdid themselves with their significant technical achievement. The previous awards used a small radio control model aircraft but this year they decided to use an electrically powered helicopter which in itself was much more difficult to fly and control than a model aircraft. No other school used a helicopter. Some of their extraordinary achievements were:



VCU's helicopter being prepared for the competition

1. Lifting more than twice its own empty weight. It weighed 8 lbs. empty and more than 18 lbs. fully loaded.
2. Flying in wind that varied from 20 mph to 30 mph which kept a number of participants on the ground and forced VCU to fly before they had been told they should fly because the other contestants were unable to fly.



The helicopter preparing to take off

3. Having a completely autonomous auto pilot and navigation control system designed by the VCU students.
4. Having a camera system which could be remotely controlled from the ground in azimuth and elevation. This system took video as well as still pictures.
5. The system used four different transmitters and receivers to downlink and uplink signals from the ground.



The helicopter in flight during competition

Even though they lost more than ½ of their allocated flight time because some other school was transmitting on their frequency they still managed to complete the required course. They were able to identify the 10 way points on their course as well as a pop up target whose coordinates were given to them only after the helicopter was in the air. After their flying event, several Navy engineers who are involved in this type of work showed a great deal of interest in the VCU system. The Navy has spent millions of dollars working on a similar system and to see a small engineering school accomplish

this feat is really a tour de force. They received a first place for technical presentation and a second place for actual flying.

*Photos courtesy of Mark Sternheimer*

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