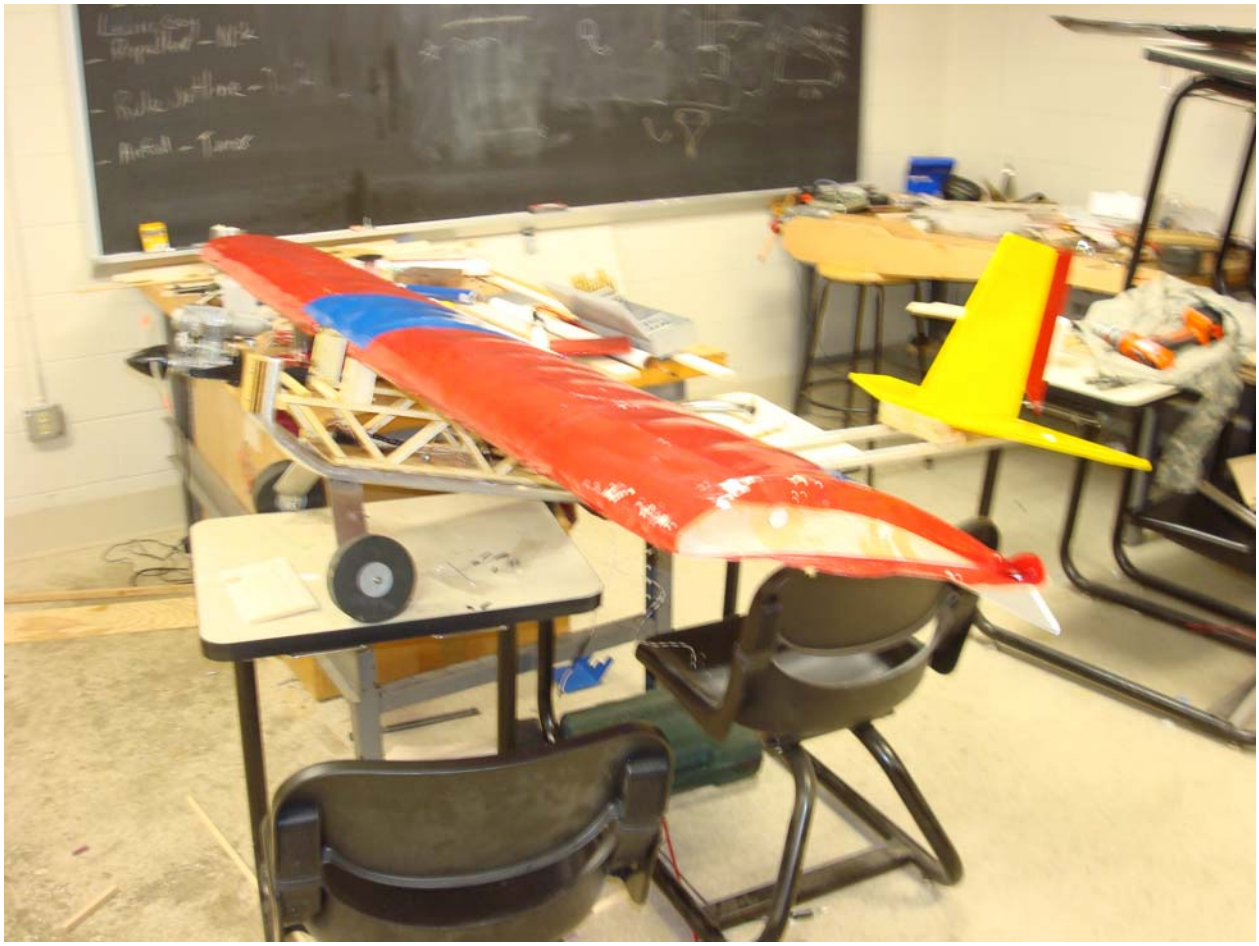
2009 SAE Aero Design Competition



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Advisor: Maj. Taylor

The objective of the project was to design, build, and fly a radio controlled airplane while complying by the rules set forth by the SAE Aero Design Competition with a primary emphasis on being able to successfully lift some defined payload in the cargo bay. An additional constraint placed by the VMI Mechanical Engineering Department was that the plane also must land and takeoff on a grass surface. Out specific tasks in relation to the overall design objective were to make a plane that was as light as possible while still being able to maintain a high

amount of lift, ensure the aircraft has good durability, stable flight characteristics, has an airfoil that could carry the maximum amount of payload possible, and to win the competition.

The first step in the design of the aircraft was the research phase. The research consisted of brainstorming within the group, reading past CEC design reports, talking to VMI faculty, consulting with the team's advisor, and using flight mechanics text books. To a small extent, R.C. aircraft forums on the internet were consulted for building and design tips. All of the different aspects of the research phase were important because whether it was a text book, a past design report, or a faculty member, each resource that was consulted gave the group a different insight about how the airplane should or should not be built. After gaining enough information, the group brainstormed how the plane should look, how it should be built, and in what order each piece would be built in order to create an airplane that would meet the objectives set forth while still staying within the rules.

As for the design itself the wing was constructed to have a relatively large surface area compared to the planes that came before us. To compensate for the large amount of lift our wing produced, the rest of the plane was made very sturdy. Therefore, the group decided to use metal pipes as the mainstay of our plane. They ran from the front of the plane to the rear, connecting every small detail together. Where most other plane wobbled and had a hard time staying together, this plane succeeded in being very sturdy. In retrospect, the design part of our project turned out to be very successful.

Although our design was flawless, the day we decided to fly turned out to be very windy. Our plane got off the ground, which was a success compared to the other groups, but it came back down pretty quickly. Our wing, being as large as it was, grabbed most of the oncoming

wind and took it back into the ground. Due to the crash landing our ailerons were removed. This plane will be in the air shortly after some re-configuration.