

Aircraft Project for Notre Dame University Students

1. Background to the project

When the semester started in 1996, there were two final year students who had very strong interest in aircrafts. One of them also had obtained a Commercial Pilot's License. They were seeking a project that can enhance their interest in aviation. However, at that time, there were no projects of that nature in our School of Mechanical Engineering.

So these two students set about investigating the possibility of initiating an aircraft construction project. After much researching, they settled on the building of an RV-6A aircraft which was and still is a popular class of light aircraft in U.S.A.



CAD of the internal structure of the aircraft (by A. Scott-Murphy – Honours student, 1997)

The aircraft being constructed is a high performance two seater, side by side, aircraft. It is expected to achieve a top speed of 170 kts with the cruising speed of 165 kts at 75 % power at 8000 ft. It has a short takeoff distance of about 300 ft. and landing distance of 500 ft. It has two fuel tanks, one on each wing, capable of supporting a range of about 900 miles. A certified Lycoming engine of 160 horsepower will be installed as the power plant. At this stage, instrumentation, lighting and navigation systems are only intended for VFR(visual flight rating) conditions

Since the inception of this project in 1996, about 50 students have participated in both theoretical analyses and hands-on construction of the RV-6A aircraft during their third / final year in the School of Mechanical Engineering. They undertook this project due to their particular interest and fascination in aircrafts

Each year, we have a new team of students working on this project. Most of them had no prior experience with aircraft construction techniques. However, after training period and having

worked on this project, they gained experience and confidence in the hands-on aspect of aircraft construction.

At this stage, the tail section, two wings and most of the fuselage, engine monitoring instruments, flight instruments for VFR (day light flying) and communication systems have been completed. Due to the lack of space on campus, the final phase of construction was moved to the hangar in the Aviation Centre, Victoria Park where the students in the special aviation programme in the Kent St. S.H.S. will also participate in the construction.

Students working on the fitting the tail section to the fuselage



Students working on the fuselage construction

2. Fieldwork Contents

This would include two parts :

Part 1 : Knowledge of flying

If the students are not already pilots, they will be given a few lectures on flying so they will appreciate what and why they are making those aircraft parts / assemblies.

Each student will also be given an opportunity to fly in a similar aircraft as the one they are building so they will gain first hand knowledge on flying.

Part 2 : Construction

Initial training will be given on the usage of aircraft tools and construction techniques. Then students are divided into pairs and work on a part of the plane that can be the control mechanisms, hydraulic braking systems and complete the fuselage.

Students will be expected to have 12 – 13 sessions on the actual construction. Each session will be of 4 hour duration.

At the completion of the fieldwork, students will be expected to write up a technical report on what they have achieved and what are the unfinished tasks so future students can continue from where they have stopped.