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Design and fabrication of the RC Aircraft Model

Dharmaraj P¹, Arunainathan D², Kishore S³, Manohar H⁴, Naveen Kumar. S⁵

^{1, 2, 3, 4, 5} Aeronautical Department, Dhanalakshmi Srinivasan College Of Engineering And Technology, Chennai-603104, India

Abstract: A radio-controlled (model) aircraft (often called RC aircraft or RC plane) is controlled remotely by a hand-held transmitter and a receiver within the craft. The RC aircraft has been made up of various high temperatures light weight composite materials like nickel based alloys & titanium alloy. The design of the RC aircraft is done by using CATIA software. And the designed RC model is fabricated by using light weighted foam material. At flying condition the receiver controls the corresponding servos that move the control surfaces based on the position of joysticks on the transmitter, which in turn affect the orientation of the plane. The paper shows that all the motion of the fabricated flying RC aircraft model is done by using elevator. And the vertical stabilizer is only for stability.

I. INTRODUCTION

This certainly must be one of the most exciting and enjoyable hobbies in existence, encompassing so many different interests. The first thing one must realize about a radio control model aircraft is that it is not a toy. The model is a real aircraft which flies and operates by the same principle as its full scale counterpart. The only difference is size and weight. And require a learned skill to be controlled properly and it's not simply a matter of pushing a button to take off, another landing, etc. Perhaps the most realistic form of aero modeling, in its main purpose to replicate full-scale aircraft designs from aviation history, for testing of future aviation designs, or even to realize never-built "proposed" aircraft, is that of radio-control scale aero modeling, as the most practical way to re-create "vintage" full-scale aircraft designs for flight once more, from long ago. RC Scale model aircraft can be of any type of steerable airship lighter-than-air (LTA) aviation craft, or more normally, of the heavier-than-air fixed wing glider/sailplane, fixed-wing single or multi-engine aircraft, or rotary-wing aircraft such as autogyros or helicopters. Builders of RC Scale aircraft can enjoy the challenge of creating a controllable, miniature aircraft that merely looks like the full scale original in the air with no fine details. I prefer gliders; that's where I started. The 2m (6 foot wingspan) class is a good size large enough to be easy to fly but small enough for easy transport. Beginner gliders are lighter, fly slower and are more acceptable to the non-flying community than powered planes no noise or mess. Gliders are also cheaper (at least the trainers are) than powered planes no fuel, batteries, starter etc. to worry about. Electric Flight is silent and clean so finds greater acceptance from neighbours etc. at the flying field, although some people feel that electrics are not robust/easy enough for beginners. There is a little more paraphernalia - you may need spare battery packs, but you can fly from smaller fields. Power (with engines that use a fuel) will let you fly longer, and your model doesn't need to be as light as with electric (so it's likely to be easier to build); however, you may have to go to a field far from populated areas. Whatever you pick, stay away from those sleek fast scale jobs! They look nice and fly hard, and those are the last things you want in your first plane. Stick to the trainers - they might not look as glamorous, but they will make you a much better pilot. And the most important point - no matter what else, try to find an instructor! This is the one thing that may make the difference between a rewarding experience and endless frustration. R/C pilots are friendly, and most will gladly teach you for free.

II. LITERATURE SURVAY:

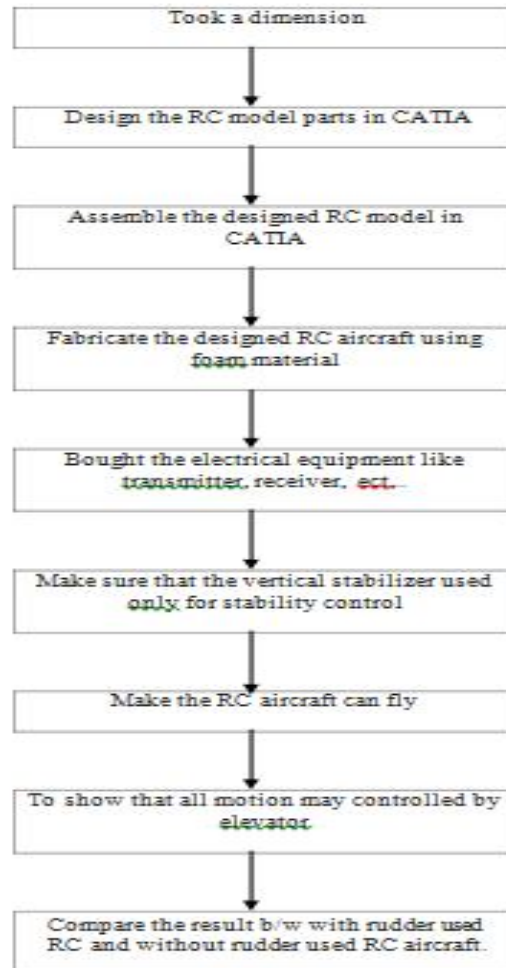
A. Design Of A Low Cost

1) Poweredr Ccombat

- a) *Airplane And Manufacturing PLAN* by JONATHAN N. BAILEY – They concluded that The aerodynamic design proves its capability of flight, and the survivability of the plane through violent impacts is better than expected. And These goals were accomplished and verified with a flying prototype and an economic analysis including all determined manufacturing terms and conditions.
- b) *CFD Analysis Of An Rc Aircraft Wing* By Shreyas Krishnamurthy-They: Concluded that the analysis played a significant role in improving the wing design of the VTOL/Hybrid Aircraft. And The analysis of the wing helped in significantly predicting a better performance and reduced power consumption of the aircraft due to reduced drag and increased lift forces.
- c) *Design and Analysis of Solar Powered RC Aircraft* by RAKESH C.SUNIL KUMAR N – They concluded that Analysis of the main wing has been carried out using Nastran and Patran software where von mises stress, maximum principal stress, maximum shear stress and deflection of the spars, skin and ribs of the main wing are calculated by considering skin and ribs are PU foam materials and the spars are Aluminium materials.

d) *Design Of A Rc Aircraft Presented By* ROOPAL RAJ, SANDEEP KR.MISHRA, SHREYA SRIVASTAVA-they concluded that the project did not concentrated on electronics components as the components used are readily available in markets and need not be programmed by the users. The project concentrated on designing the mechanical part of the model. It was the step wise execution of procedure to synthesize the glider. And they show the proper steps of the designed RC aircraft.

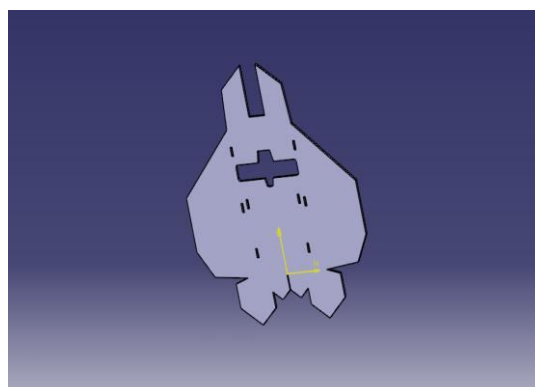
2) Work Plan



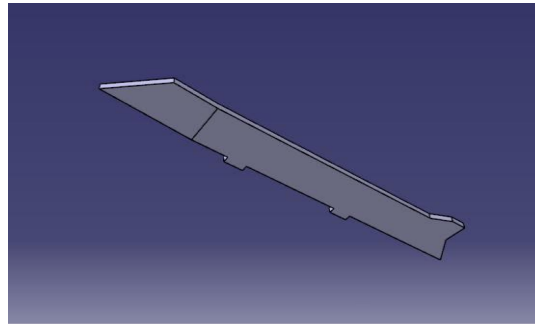
B. Design Of Rc Aircraft

The RC aircraft design is done by using CATIA software. First the parts of the RC aircraft is done.

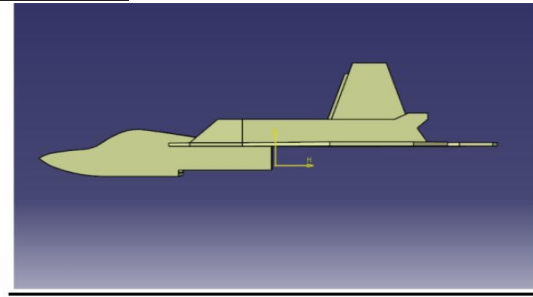
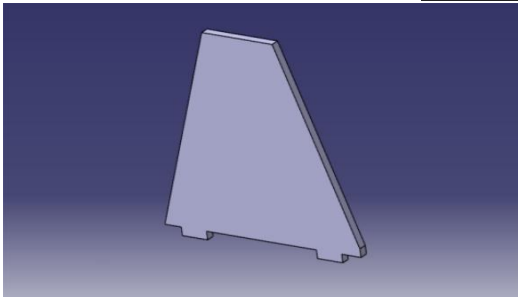
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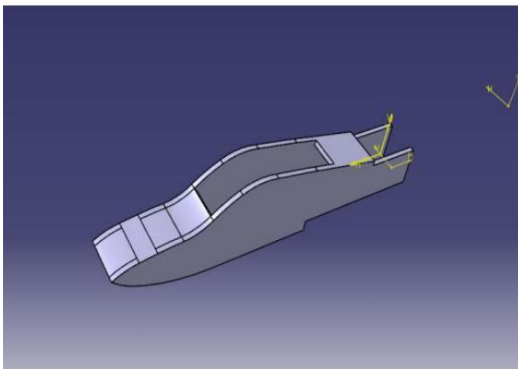
SUBPART



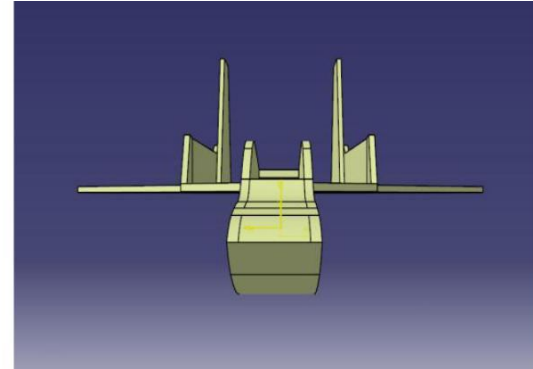
VERTICAL STABILIZER



NOSE

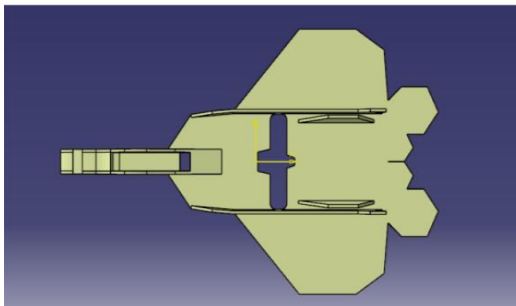


FRONT VIEW

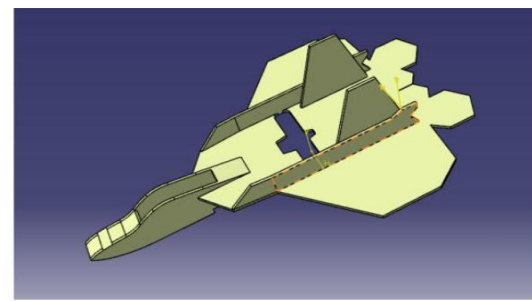


The above parts had been assembled by using the CATIA software. The views of the RC aircraft model is shown in below

TOP VIEW



ISOMETRIC VIEW

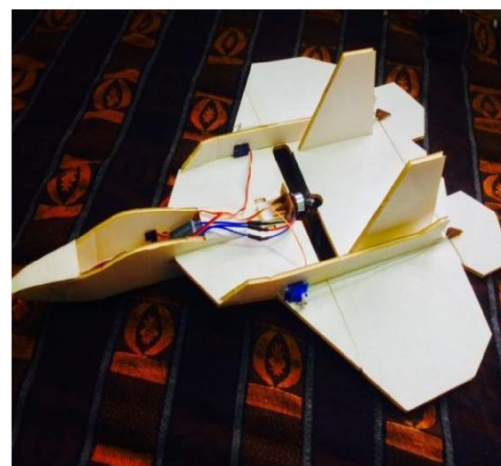
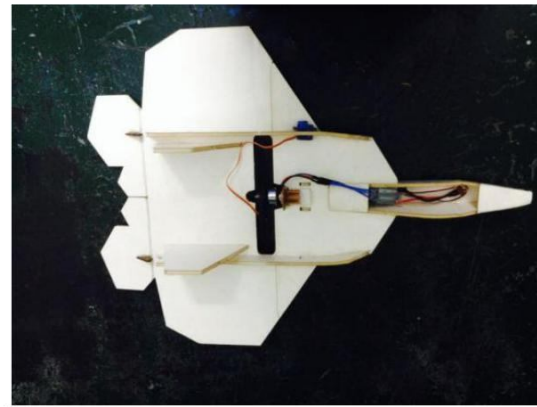


SIDE VIEW

C. Fabrication

The assembled RC aircraft model is fabricated by using the light weighted foam material. In the fabrication, the laser cutting is done for the designed RC aircraft. Then the laser cutting parts had been assembled by using the glue gun. Then the electrical equipment had bought for make the RC aircraft model fly. The assembled fabricated RC aircraft parts and assembled model is shown below.

FABRICATE ASSEMBLED RC AIRCRAFT MODEL



ASSEMBLE THE RC WITH A

ELECTRICAL EQUIPMENT



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45.98



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