

Avanz Avion

Team Future-Innovators

Team Number 96

OUR TEAM



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Avanz Avion = Advanced Plane in Spanish

0.1 Introduction

The world today is going towards the dawn of modern sciences and technology. Now-a-days everyone are trying to reduce their working nature and are looking for their own comforts of their life.

Everyone in their daily life go to work in cars or an automobile vehicle and during the start they also dream to travel in airplane once in their lifetime. So we had an idea of making a automobile vehicle which could move on any surface and also which can fly. That's the basic idea of our project which we wanted to do.

0.2 Motivation

As stated above, our dream of this project was to build a RC-vehicle which could move on any surfaces like grass, plain road, concrete surface, water, ice, etc. and also can fly in the air like a plane if time permits.

Initially we thought of combining the concepts of hovercraft and Quadcopter but after going through the concept of other we thought that the hydrofoam would suit our project statement for the best of anyone.

. The main motivation we got through the video link below:-
<https://www.youtube.com/watch?v=CfGD9se32MI>

These are the sites which we refereed for knowing the ways to create the Avanz-Avion :-

1. Wikipedia
2. RC-groups
3. Parkjets
4. Watt-Flyer Forums
5. usc-aero-77
6. You-tube videos on hydrofoam



0.3 Requirements

1. **Skeleton, Rudders and Elevators** - Styrofoam Board (0.5mm thick)
2. **skidding** - Carbon Plates (1.0 mm thick)
3. **Motor Fixing** - Carbon Tube (8.0 mm diameter)
4. **Rudder and Elevator Fixing** - Carbon Rods (1.0mm diameter)
5. **Strengthening Base** - Carbon Tubes (3.0mm diameter)
6. **Sticking Two Skeletal Parts** - Bond Tite
7. **Coloring**) - **Acrylic Paints**

The above items are the basic items needed for the design of the project.

The items which we need for the hardware and functioning of the vehicle are:-

1. One, 8x4 propeller
2. One, 1300kv Brushless Motor
3. One, 10 amp E.S.C.
4. One, 1.5Ah 25C Li-poly Battery
5. Three, Analog Mini-Servo motor
6. One, Sender and Receiver device
7. Aluminum Rods (For connecting servos and rudders & elevators)
8. Fevi-quick (For joining the carbon rod and the motor frame with a small part of wood attached inside the motor plate)

0.4 Demonstration

The principle involved in this system is very simple. The air moving with high velocity is passed from above the big base part and the ends are flexibly movable so that the air can be shaped up, down, left or rightwards.

If the rudders are moved towards the right(/left) side, the air hits the rudders normal to the left(/right) direction creating the back side of the part to move towards the left side, then the whole RC-vehicle will tend to move towards the right(/left) side,

If the elevators are moved downward(/upwards), the air hits the elevators in the upwards(/downwards) which makes the back part to gain ore force in the downward(/upward) making the front part to go up(/down) which in-turn makes the RC-vehicle to lift off(/land on)

Initially it is connected to the receiver so that all the servos would restore to their normal length. Then we would keep it on the surface so that only the carbon plates touch the ground but not Depron(/Styrofoam) then the speed is slowly raised up and when a sufficient good speed is attained by the RC-vehicle then the elevators are moved down so that the bot could attain the lift-off condition.

The RC-vehicle once attains a good height in air, could be able to do the stunts with the help of rudder and dual-elevator system. We could fly if in air and when the battery needs to be recharged or when we want to end the ride the the elevators are pushed upwards, same as the method of the airplane so that the land on condition takes place perfectly without any rotten results.

The speeding and slowing down of the RC-vehicle depends on the transmitter which gives the information to ESC about controlling the speed of the propeller-motor.



0.5 Roles of Members

The project work was divided among the members with all the members opinion in mind. Though the work was divided everyone would work for one system if the other system job's done. The major contributes of the work system are written below:-

1. Skeleton Making System Members - Puneeth & Sreeram
2. Electrical System Members - Sushant
3. Purchasing System Members - Sushant & Sreeram
4. Minor-Work System Members - Sivaji

Though this list shows a max of two members in one system all the four have worked in each and every system making them complete perfectly well with good ease.

0.6 Cost of Components

The cost of the parts which are needed from the on-line would be around 5,500 rupees and the stationery equipment needed for the project utility would be around 2,000 rupees.

Hence the total cost of the project would be around 7,000-9,000 rupees.

0.7 Work-Schedule

Days	Dates	Target
1 to 4	5/5 to 9/5	To study about the Hovercraft
5 to 10	10/5 to 15/5	To create a design fit for the project (also to order the things)
11 to 15	16/5 to 20/5	To purchase the things needed for the project
16 to 22	21/5 to 27/5	To build the base for the project
23 to 26	28/5 to 31/5	To rebuild the remaining part of the project
27 to 29	1/6 to 3/6	To start it's test run and to check it's defects
30 to 34	4/6 to 8/6	To improvise the project
35 to 41	9/6 to 15/6	To develop the project
42	16/6/2015	Testing the project
43 and 44	17/6 and 18/6	Making finishing touches and making necessary changes
45	19/6/2015	Testing it finally and submitting it

0.8 Learning

By building this project, we come to know about the air-drift concept and relative wind concept due to rudders and elevators.

We also know about the pressure concept while building the project.

We also come to learn about the matters of the motors, propellers, E.S.Cs and much more of mechanical, electrical and electronics stuff associated with this project.

0.9 Conclusions

We sincerely thank S.T.A.B. for letting us to do the project with the idea we came front. I also thank all my mentors and other related members of I.T.S.P. for understanding our idea and we all hope that it would be a great success by completing and presenting the project and hope that other team in the mere future would develop it and take it to an higher level.

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