



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
MECHANICAL ENGINEERING DEPARTMENT

2017

CORE COMMITTEE MEMBERS OF 2017-18

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2. Faculty Advisor : Mr D S Nagaraju
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4. Student Vice-Chairperson : Sher Nithin
5. Student General Secretary : Gouthami Vuppala
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10. Student Deputy Documentation And Membership Chair: Mikkilineni Naga Durga Dinesh



REPORT ON SAE AERODESIGN CHALLENGE 2017
REGULAR
TEAM BRUISER HEADS
TEAMID: ADC20170122



MICRO
TEAM SKYRIDERS
TEAMID: ADC20170121

List Of Members

Team Bruiser Heads

S.No	Team Member
1	Sneha Sriram
2	Subash Reddy Kolan
3	B.Hari Krishna
4	C.Srikanth
5	R,Anjali
6	K.Sri Sai

Team Sky Rider

S.No	Team Member
1	V.Manil Reddy
2	M.Raghavendra
3	Sher Nithin
4	M.Naga Sai Durga Dinesh
5	A.Sravika
6	A.Srujana
7	S.Raghu Veer



Abstract

The main objective of this competition is to design analysis and fabricate the radio controlled aircraft. That is capable of lifting as much as payload with as much as less self-weight. i.e. self-weight of aircraft which should not weigh more than 1.5 Kg. A special attention has been devoted to select the aerofoil, the wing plan form and overall weight of a aircraft. In order to have less weight with a moderate strength to the aircraft balsa wood was chosen of different thickness in different positions of the flight according to the strengths required. We have used solid works software to model the aircraft. Analysis and Xflr5 software were used to do structural analysis and to estimate the max coefficient of lift (C_l), min coefficient of drag (c_d) and angle of attack (α). This report is synopsis of the design process, analysis, manufacturing, testing of aircraft.

Introduction

Society of Automotive Engineers Indian Southern Section (SAEISS) hosts Aero Design Challenge, where engineering students are faced with the opportunity to take part in a real life challenge by designing an RC Aircraft based on requirements. During the design process there are many problems that arise with design process, time management, budget, and team dynamics all create unforeseen obstacles. In order to be successful in this competition, the design must be adapted and enhanced along the way. Based on the rules of the competition, each team is required to design a cargo airplane that will be able to complete a predetermined circuit carrying the predicted maximum payload while taking off and successfully landing within the specified parameters.

SAEISS Aero design features two classes of competition–

1. Regular Class
2. Micro Class

The competition is divided into 3 phases as follows:

- **Phase 1:** Technical report: Proposal describing the team's requirement compliance.
- **Phase 2:** Technical Presentation and Inspection.

Phase 2A – Payload Loading Demonstration (timed event during Oral Presentation).

Phase 2B – Payload Unloading Demonstration (timed event during Oral Presentation).

Phase 2C – Oral Presentation.

- **Phase 3:** Flight Competition.

Rules:-

Regular Class	Micro Class
(L+W+H) <170 inches	MCA container shall be less than 3 feet cubic box.
2 kgs< Aircraft Weight < 5kgs	MCA weight < 1.5kgs.
Designs are limited to fixed wing aircraft	Designs are limited to fixed wing aircraft
Landing gear	Hand Launch
Electric Motor propulsion should be used	Electric Motor propulsion should be used
Single motor configuration is allowed.	Multiple motor configurations are allowed.
Single propeller is allowed.	Multiple propeller can be used
Prop savers and metal propellers are prohibited.	Propeller shrouds, ducted fans are allowed. Metal propellers are prohibited.
Spinner or Rounded safety nut must be used.	Spinner or a Rounded safety nut must be used
Gyroscopic assistance is not allowed.	Gyroscopic assist and other forms of stability Augmentation is allowed.
The use of fiber reinforced plastic, lead is prohibited	The use of fiber reinforced plastic, lead is prohibited
4 cell-6 cell Li- Po battery pack	3 cell-Li-Po battery pack
2.4 GHz radio is to be used	2.4 GHz radio is to be used
A closed payload bay of 10x4x4 inches	Payload bay dimension are 5x1.5x1.5inches.

Over All Specifications

Particulars	Dimensions of Regular Class	Dimensions of Regular Class
Aerofoil	Seiling123	Eppler423
Wingspan	58inches	33inches
Plan form	Elliptical	Tapered wing
Mean aerodynamic chord	11inches	4.1732inches
Root chord	12inches	4.5669inches
Tip chord	10inches	3.7795inches
Wing area	638 sq.inch	159.65 sq.inch
Aspect ratio	5.27	6.79
Wing loading	21.76 Oz/ft ²	16.29 Oz/ft ²
Winglet inclination	30 ⁰	Not Used

Event

ADC 2017 was a 3 days event which was held at Anna University, Chennai on 8,9 and 10 June 2017.

On the day one, it was a technical presentation where we have to give description and analysis of its design, aerodynamic structures and its aerodynamic properties. Besides, to this presentation there was a question hour. The Judges enquires our aircraft design, manufacturing, properties and point out any flaws in our model.

Main event, flying was organized on the day two. Before flying, every team must undergo technical inspection. It consists inspection of overall dimensions i.e., (L+B+H<170 inches) for regular class, micro class aircraft must fit in a 3 cubic. Feet container. Inspection of material used where we can use many materials like MDF, Depron, Balsa Wood etc., and we are prohibited to use materials whose weight is less than air. Weight of the aircraft is another aspect where regular flight must weigh 2-5 kg, micro Class less than 1.5kg. If any team violates these rules, they may be expelled out of the competition. Apart from these rules, there was another category for micro class called "ASSEMBLY OF AIRCRAFT". The team will be awarded bonus points if they assemble the flight within 90 seconds. After this whole inspection, the team is allowed to fly.

On day three was award presentation. Top 3 overall performance awards were given both for regular and micro classes. Apart from them there are other awards like best design report, best technical presentation and best innovation.

Achivements

MICRO CLASS

1. Over all 3rd prize
2. 2nd Best technical presentation

REGULARCLASS: Over all 7th position.



REPORT ON MECHANO 2K17

Mechano2k17

Conducted by: SAE GRIET (TEAM BRUISER HEADS)

Event dates: 31 JAN, 1 FEB 2017

Venue –GRIET date – 31/1/2017, 1/2/2017

Mechano 2k17 was conducted by GRIET MECHANICAL ENGINEERING SAE COLLEGIATE CLUB. Under this a workshop related to ALL TERRAIN VEHICLE, RC AEROPLANE and HYBRID CYCLE was conducted. All these projects were made by students of SAE GRIET over past two years. All three projects were explained in detail from design phase to fabrication phase. A detailed explanation was given in two days about all the projects and sharing the experience with the teams that had represented these projects in national level competitions.

There was PPT presentation session, where students gave their presentations about various topics.

Non-technical events such as MOVIE MANIA, MINI MILITIA and LOGICAL QUIZ competitions were also held.

The students were pretty much excited to be a part of the fest. At the end of the workshop quiz competition was held and 10 merit students were shortlisted.

COST REPORT

TOTAL AMOUNT GENERATED WITH REGISTRATIONS IS

57800/-

EXPENDITURE (T SHIRTS -6400/-

Digital printout- 2860/-

Flexi printing -2450/-

Winning amount 1500/- etc.)

- 14690/-

Net amount

43110/-



Mr.D S Nagaraju, Dr. L Jayahari(HOD), faculty members with students in MECHANO17