CRUISE CONTROL

Pool Event **Points: 40**

Once you've learned to fly your RC airplane confidently, it's time to step it up a notch and learn some basic designing and gliding skills! This event will test your nerves, ability to withstand difficult flying conditions and your flying skills.

Design, fabricate and fly a wireless remote controlled aircraft (using electric motors only), which has all three degrees of freedom including roll, pitch and yaw and that can satisfy this specified task.

Model Specifications:

An aircraft is defined as an object that has the four forces of flight, namely lift, drag, weight (gravity) and thrust due to propeller acting on it at any point of time.
*The aero model must be hand-made.
*There is no limitation on the size of the plane.
*The Aero model must weigh less than 1 kg.
*The model must be hand launched.
*Use of landing gear is prohibited.

The participants are free to use the materials of their choice. However the use of foam (sun board) or sun pack (coroplast) or thermocole is advisable. Foam is light, easy to handle and fabricate the aircraft making it the best choice.
Participants must make all parts of the aircraft themselves. Usage of Ready-to-Fly (RTF) and Almost Ready-to-Fly (ARF) kits is strictly prohibited. Use of readymade actuators/motors, remote controls and propellers is allowed.
Use of gyroscopes (gyros) is prohibited.
If anyone is found not following above rules, they will be disqualified. Use of CF rods are allowed for strengthening.

Team Structure:

It is a pool event with only one team from each pool. The team should comprise of students from Y14 and Y15 batch only.

****Flyers in both rounds must be from Y14 or Y15 only.**

Problem Statement

The competition requires the participants to design a RC plane and achieve maximum glide time. The event consist of two parts:

A. Design Report Submission
B. Flying Event

Round1: Design Report Submission

Participants must have a good knowledge of designing and analysis of an aeroplane. The participants will have to submit the design report in order to qualify for **flying event**.

- Copying of any other pools design report will lead to disqualification.
- The report must consist the following details along with XFLR file.
    - Spar calculation and bending moment.
    - Descent Rate
    - Cl/Cd wrt alpha
    - Tip stall
    - HTV and VTV coefficient ratios
    - Lateral and longitudinal stability analysis.
    - Static margins.

Round2: Flying Event

The best measure of the design of a glider can be done by climb and gliding time. To examine this, participants have to climb for 20 seconds. After this, they need to perform a dead stick flight (throttle=0 or Gliding). The plane however can be maneuvered while it's gliding.

- The flyer will get two attempts for flying.
- The team will get a trial chance for testing and checking the proper working of the plane.
- In any case after first 20 sec. If flyer anyhow uses throttle after the first 20 sec then the time only up to that point will be considered.
- The best score out of the two rounds will be considered for scoring.
- Crash landing (harm to plane, electronics, and other accessories.) will attract penalty -20 sec from the total time.

Point distribution

Round-1

S1:= The total score for design report is 70

Bending moment	10
Descent Rate	10
Cl/Cd w.r.t alpha	10
Tip stall	10
HTV and VTV coefficient ratios	10
Lateral and longitudinal stability analysis	10
Static margins	10

Note: You have to demonstrate your design and show the analysis. Failure to give a valid reason for your design won't fetch you points.

Round-2

S2:= Glide time (T1) in seconds

Rules and Regulations

1. Participants should not disturb the flyer in any case otherwise it will attract a penalty of -5 points of total score evaluated for that team in this round.

Then pool ranking will be based on [S1+S2].

Note:

**The actual plane should be of the same specification mentioned in the design. Error of 10% will be considered.

** If, at any point of time coordinators feel that the aircraft is going out of control or out of the field then the transmitter will be immediately taken from the flyer and clock will be stopped. The time only up to that point will be considered.

**If coordinator or judges feel the flyer is not capable enough to fly then he won't be allowed to fly.

** In case of any disputes, the decision of the coordinators and judges would be final and binding to all.

**It is your responsibility to handle the electronics with care. No other electronics will be provided in case of any damage or failure.

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