



## Cruise Control

*Pool Event, Open to all*

*Points: 35*

Once you've learned to fly your RC airplane confidently, it's time to step it up a notch and learn some **basic RC airplane aerobatics!** 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.

Only electrical motors are allowed which will be same for each pool.

The potential difference, between any two points on the machine, must be lower than or equal to 12.6V at any point of time during the competition.

The participants are free to use the materials of their choice. However the use of Balsa wood or 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 allowed for strengthening.

### **Team Structure:**

It is a pool event with 2 teams from each pool. The team can comprise of students irrespective of any batch. Both teams will have to design and build separate planes for two attempts.

One team will fly only single plane in both rounds of their attempt, and then other team will perform with different plane in their attempt.

**\*\*Flyers in both rounds must be from Y13 or Y14 only and same.**



### Problem Statement

#### Round1: Soaring

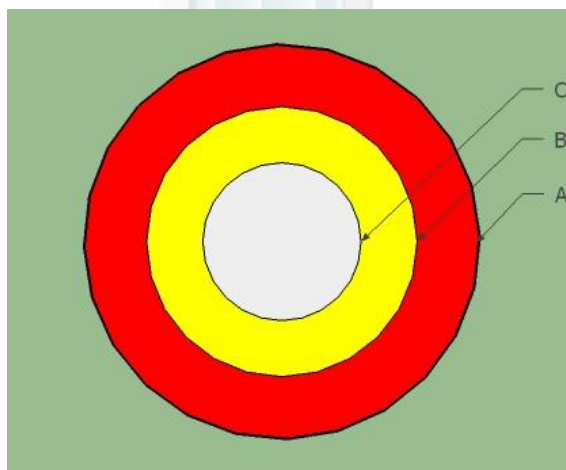
Participants will need to have good feel of gliding and ability to observe thermals in this round. The participant will also have to land in a specified zone at the end.

#### Rules and Regulations:

1. In any case after first 20 sec. if flyer anyhow uses throttle, then he will be eliminated.
2. Participants must 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.
3. Crash landing (harm to plane, electronics, and other accessories.) will attract penalty **-10 points** of score.
4. In case a team's plane crashes (in a state that it can't be flied again) in this round then that team is automatically eliminated from 2<sup>nd</sup> Round.

#### Task:

1. The participants will have to construct a plane capable of good glide, low drag and should be able to land it in a specified zone.
2. The flyer will be allowed to propel for 20sec. after takeoff, gain altitude and at 20<sup>th</sup> sec. throttle will be put to zero (kill engine) and then they need to glide for maximum time possible.
3. There will be three landing zones, outer most circle A (Helipad circle) of  $\varnothing X$  mtr., inner circle B will be  $\varnothing 0.7X$  mtr. and inner most circle C will be  $\varnothing 0.4X$  mtr.
4. Landing zone score distribution will be b/w A and B **10 points**, b/w B and C **15 points** and circle C **20 points**.



#### Scoring:

Glide time (**T1**) plus landing point (**L**) will be cumulative added for each plane in this round.



### Round2: Pylon Race

Participants will need to have good flying skills to participate. The participant will have to perform certain maneuvers in least amount of time.

### 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.
2. Crash landing (harm to plane, electronics, and other accessories.) will attract penalty **-10 points** of score.
3. Time will be measured from take-off till plane crosses the line passing through centre of pole.

### Task:

1. The participants will use the same plane used in first round to perform this task.
2. The participant needs to perform **4 Loops** around two poles 50 meters apart in the minimum amount of time.
3. Height of loops will be decided based on wind conditions on that day.
4. In case the judge feels that the loops are not perfect, then the flyer will be asked to do it again.

### Scoring:

Time taken (**T2**) to perform the task will be measured.

**\*\* If  $T2 > 250$  seconds, then that team will get 'Zero' points for this round (i.e.  $250 - T2 = 0$ ).**

Final score after both rounds for one plane will be

$$T1 + L + (250 - T2) = S1$$

Similarly final score (**S2**) for other plane will be evaluated.

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

### Note:

**\*\* 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 upto that point will be considered.**

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

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