

# SKYDANCER

## POOL EVENT

POINTS 20

Design and make a wireless remote-controlled aircraft, which can perform the following specified task.

## PROBLEM STATEMENT

The competition requires the participants to design and build an RC plane and complete the specified tasks from the given pockets and then land the plane safely in the specified landing zone.

### Pocket 1

- Takeoff from a specified launch zone
- Horizontal - 8 trajectory

### Pocket 2

- Inside Loops
- Inverted Flight
- Roll

### Pocket 3

- Inverted Loop
- Cuban 8
- Knife Edge
- 4 Point Roll

## TEAM STRUCTURE

It is a pool event with a **single team from each pool**. The pilot has to be from Y18 UG Batch.

## RULES AND REGULATIONS

- Order of attempt will be decided by lottery.
- Each pool will get 20 seconds for a flight test. A second chance for the flight test may be given in case the coordinators/judges feel it is necessary.
- Aircraft has to land after completing the second pocket. The third pocket will be attempted afterwards in a separate flight after a battery check.
- Only one battery will be given per pool.
- Safe landing and spot landing points will be given for both the flights (Pocket 1,2 and Pocket 3). If the aircraft crash-lands in the first flight, pocket 3 attempts will not be given.
- First, a maneuver has to be called and then attempted. Attempt without calling will not be considered for judging.

- Maneuvers of pocket 1 are to be attempted first followed by pocket 2 and 3. Maneuvers of next pocket may be attempted only after successful completion of all the maneuvers of the previous pocket. Attempting the next pocket without completing the first will fetch 0 points. Maneuvers within a single pocket may be attempted in any order.
- Each maneuver may be attempted any number of time but MUST be called before a new attempt. The best score of all individual maneuvers in a single flight will be considered.
- Each pool will be given two chances for flight other than the test flight. Best overall score among the two attempts will be considered for final judging.
- If anytime the judges or coordinators feel that the plane is out of control of the pilot, the transmitter may be taken away from his/her hands immediately and the pool may be given another attempt later.
- If the pilot fails to control the plane in the second attempt as well, the pool will not be given any more chances.
- If the coordinators do not consider a particular person capable of flying, he/she will not be allowed to fly.
- Each pool must be present at the scheduled time of the event with aircraft ready to fly, failing which the penalty will be applied in the following manner:
  - For every late minute, 5 points will be deducted till 10 minutes.
  - After 10 minutes, 10 points will be deducted per minute.
  - After 15 minutes, 15 points will be deducted per minute.
  - After 20 minutes, the pool will not be allowed to participate.
  - Extension of even a second will be counted in a new minute for the above rules. (Eg: 61 seconds will be penalized for 2 minutes)
- Any kind of disturbance caused to the pilot during flight by other pool members will fetch a penalty of 50 points. Any kind of cheering is strictly prohibited.
- In case of disputes, the decision of coordinators and judges will be final. MODEL

## **SPECIFICATIONS**

- An aircraft is a machine capable of flying
- The aero model must be hand-made.
- Size of the plane should not exceed 1.5m in any direction.
- 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. Use of CF rod is allowed for strengthening.
- Participants must make all parts of the aircraft themselves. Usage of Ready-to-Fly (RTF) and Almost Ready-to-Fly (ARF) kits are strictly prohibited.
- Use of readymade actuators/motors, remote controls and propellers are allowed.
- Use of gyroscopes is strictly prohibited.
- If anyone is found not following the above rules, they will be disqualified.

## MANEUVER DESCRIPTION AND SCORING

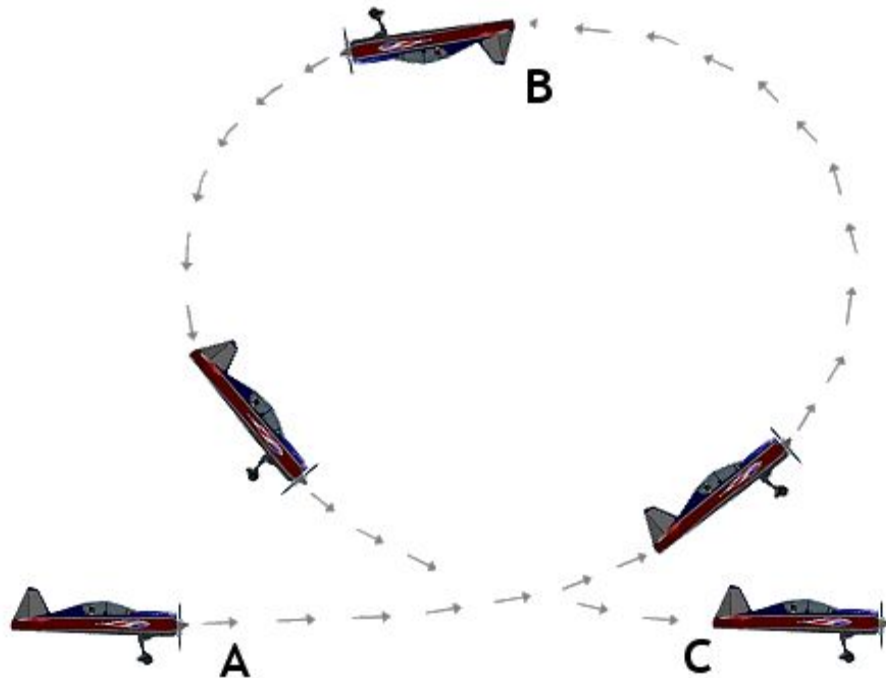
### Pocket 1

- The aircraft must be hand-launched from the specified zone. There are no points for this task.
- The aircraft has to complete a trajectory forming 8 in the horizontal plane. Successfully completing each quadrant of the '8' will earn 25 points.
- One may start with any quadrant depending on the direction of air.
- Judging of completion will be on the discretion of the judges.

### Pocket 2

- Inside loop :

One has to perform inside loop 3 times. Each successful loop will be given 20 points. Performing the loop more than 3 times will fetch neither points nor penalty. Refer the image for a description of the inside loop. The canopy of the plane MUST point to the centre of the circle throughout the maneuver.



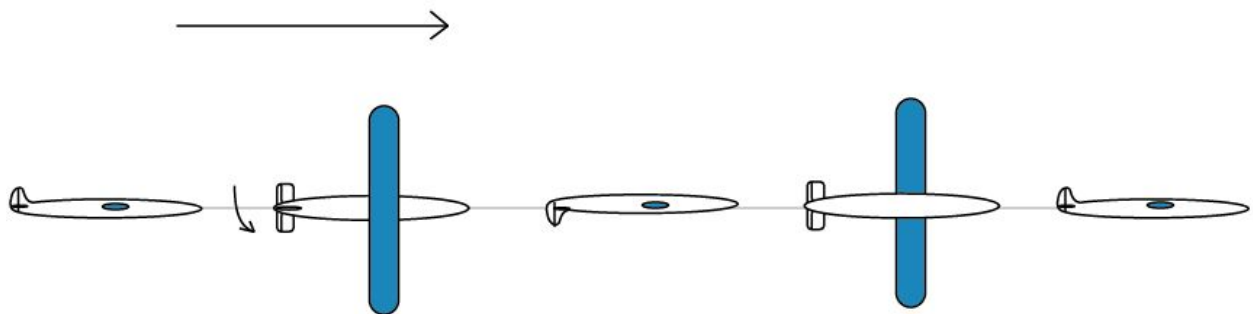
- Inverted Flight :

Aircraft has to be flown inverted for 5 seconds. Each second will earn 4 points. The maximum points given in the task will be 20. The top of the aircraft will be specified at the time of takeoff and the reference will be made for inverted flight.



- Roll :

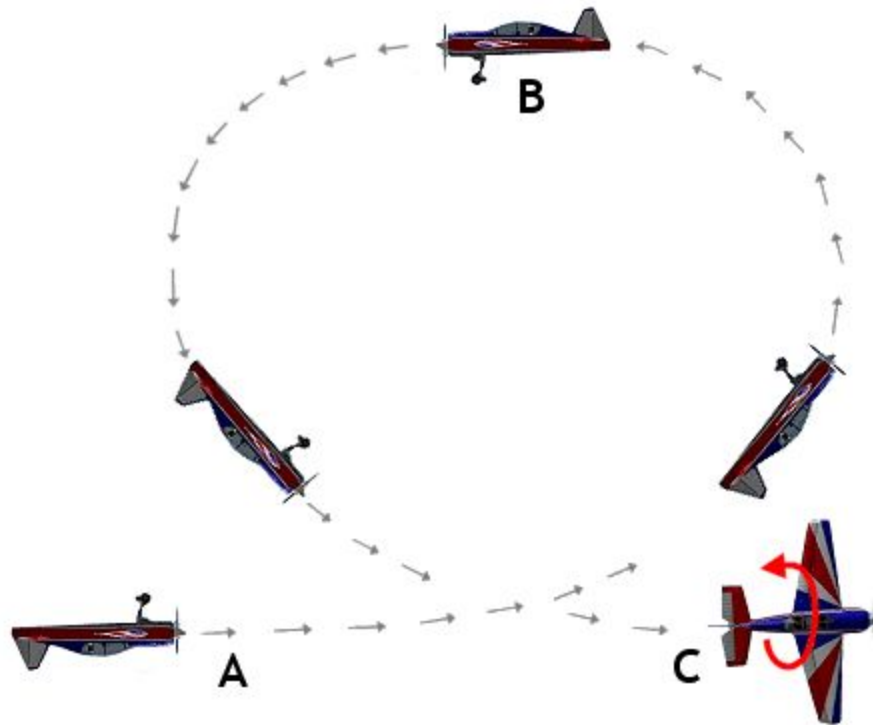
One has to perform a complete 360-degree rotation of the aircraft in the rolling plane, ie, about the axis along the fuselage. One has to perform the rotation twice. Each roll will gain 30 points with a maximum of 60 points. The fuselage of the plane should be in the approximate horizontal plane during the maneuver, failing which the maneuver won't be considered.



### Pocket 3

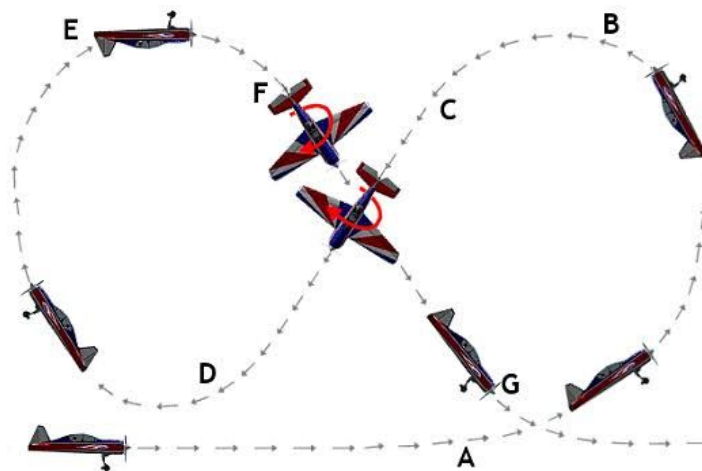
- Inverted Loop :

One has to perform 2 inverted loops. Each loop will gain 30 points with a maximum of 60 points. The bottom of the airplane MUST always point towards the centre of the circle during the maneuver. The loop may be above or below the level altitude of flight.



- Cuban-8 :

One has to perform Cuban eight once. Successful completion of the maneuver will earn 100 points without any partial marks.



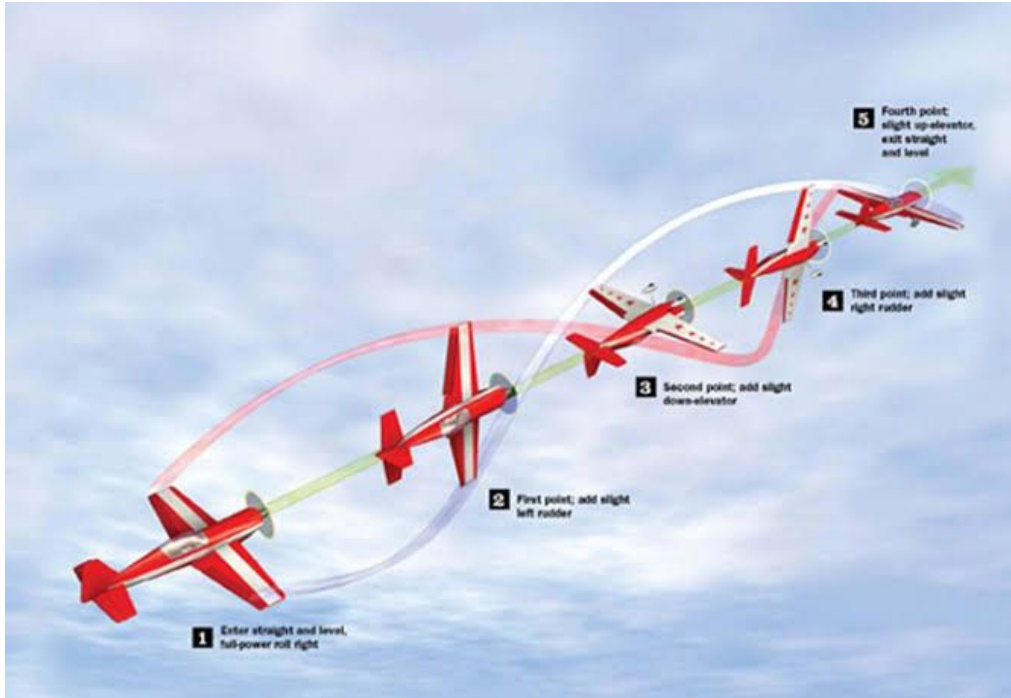
- Knife Edge :

Aircraft has to be in knife-edge flight for 5 seconds. Each second will gain 10 points with a maximum of 50 points. Knife-edge flight has to be such that the wings of the aircraft are completely in the vertical plane while the fuselage is horizontal.



- 4 Point Roll :

Aircraft has to perform 4 point roll. For successful completion of the maneuver 100 points will be awarded. If the task is not complete but first 3/5 of it is completed successfully, 50 points will be awarded. No points will be given in any other condition. The five parts of the flight are given below in the image



## LANDING

- The safe landing will be considered if no component of the plane other than the propeller is broken. In such a case, 50 points will be awarded to the team, else 0. There will be no penalty for crash landing but the above mentioned 50 points will not be awarded partially or completely.
- Spot landing will be considered if the plane touches down in the specified landing zone. Spot landing will only be considered if the landing is safe according to the above-mentioned point. Spot landing will earn another 50 points. There will not be any partial scoring for landing.

## TOTAL SCORE

Total score = Score of maneuvers + Safe Landing + Spot Landing

## IN CASE OF TIE

In case of a tie, an on-spot problem statement will be given to the pools.

**In case of any problem, feel free to contact.**

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