RC PLANE

Team Size: Each team can have a maximum of 5 members and also all members may not be of the same college.

- A participant can't be in 2 or more teams.

Synopsis: A team must design, fabricate and demonstrate a fixed-wing aircraft system that can perform tasks mentioned in following rounds with given constraints.

Event Description/Gameplay:

The event consists of two rounds.

Round 1(preferably on day one): Aircraft is supposed to complete the arena and land safely in the landing zone. *Top ⅔ rd teams will be promoted to the next round of the competition. Rest of the teams will be eliminated.*

Round 2(preferably on day two): In this round participants are given freedom to choose their own manoeuvre which is awarded different points depending on their complexity.

There are some manoeuvres available for the participants.

The timer will start from the moment the aircraft is in the air.

ARENA:

The arena will be approximate of the size of Institute football pitch(100m x 40m).

ROUND DETAILS:

ROUND 1:

Aircraft are supposed to complete the arena and land safely in the landing zone.

The landing zone and the corresponding points awarded will be as follows :

a)	The innermost diameter of 1.5 m	100 points
b)	The second circle of 3 m	70 points
c)	The third circle of diameter 5 m	50 points
d)	The fourth circle of diameter 7m	40 points
e)	Outside fourth diameter of 7m	30 points

Round2 – Aerobatics:

1) This round will consist of hurdles such as :
   a) The RC plane need to pass through the Ring placed at the borders of the arena 30 points will be awarded on one through the pass of the ring
   b) Limbo Round (if required) - barriers will be placed at a height of approx 5t 50 points will be awarded for one successful completion of crossing barrier.

2)►In this round, the participant will have to perform the manoeuvers that are listed below and the number of points awarded against the total will be based on the smoothness and accuracy of the manoeuvers.

► Partial points can be awarded. No discussion will be entertained on the points are given.

►To toughen the challenge further the participants will have to do spot landing i.e. land the plane in a defined area after completing the manoeuvers.

►The Maximum time given to each participant (i.e. take-off, manoeuvering and spot landing) is 7 minutes.

►Points will be deducted for crossing this limit and manoeuvers performed after 7 minutes will not be judged.

►Points deduction rate will be 0.5 Points/sec or 10 points, whichever is minimum.

►However spot landing will be considered even after 10 minutes but not after 12 minutes.

►Extra 10 points will be given for completing round before 6 minutes.

►Flyer have to perform at least 5 manoeuvers and landing (no spot landing needed) to get an extra point.

►Manoeuvers can be repeated to improve your score in that particular manoeuver.

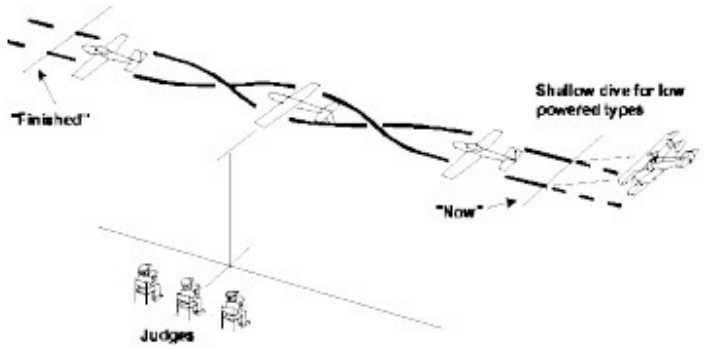
Manoeuver:

►You have to call the manoeuver name before performing it.

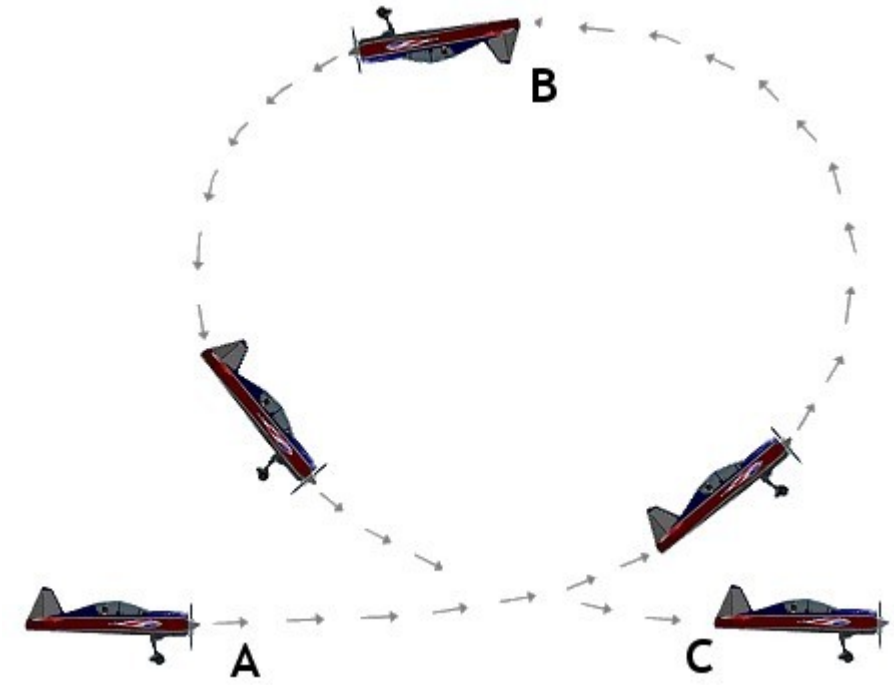
►Maneuvers can be performed in any sequence.
►The manoeuvers need to be performed are as follows:

S.No	Manoeuver	Max Points
1	Roll	10
2	Inside Loop	10
3	Inverted loop	15
4	Split S	20
5	Hammerhead	20
6	Square loop	20
7	Humpty-Bump	25
8	4 point roll	25
9	Reverse Cuban Eight	30
10	Flat Spin	35
11	Rolling Harrier	40

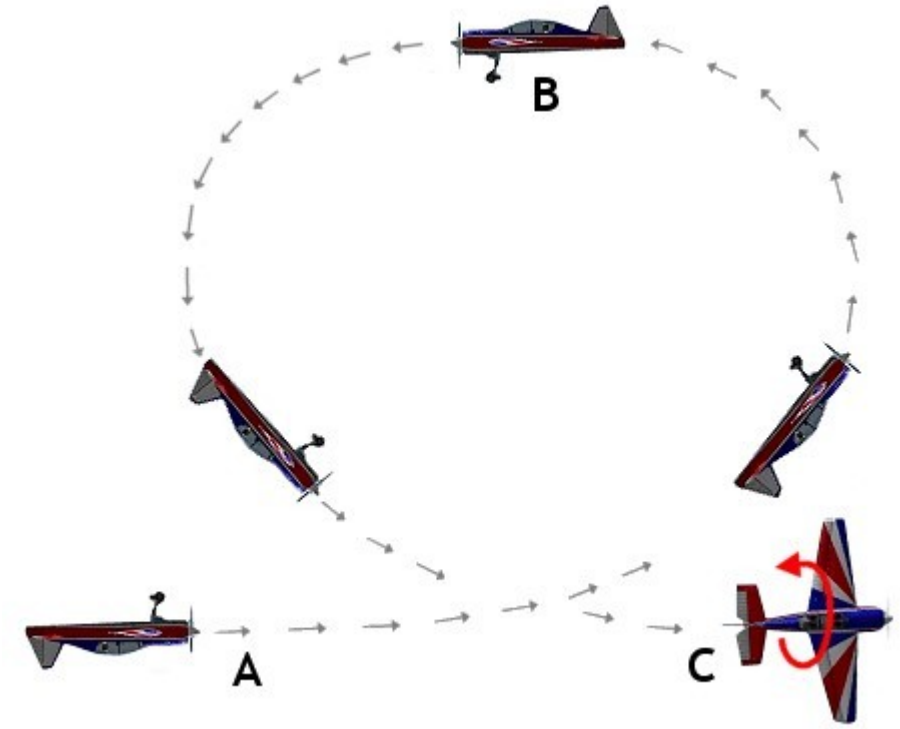
► **Roll:** Rolls have to be flown normally on a straight line (exception is the avalanche). The roll rate has to be constant and the longitudinal axis of the plane has to go straight. This requires constantly changing rudder and elevator control inputs throughout the roll.



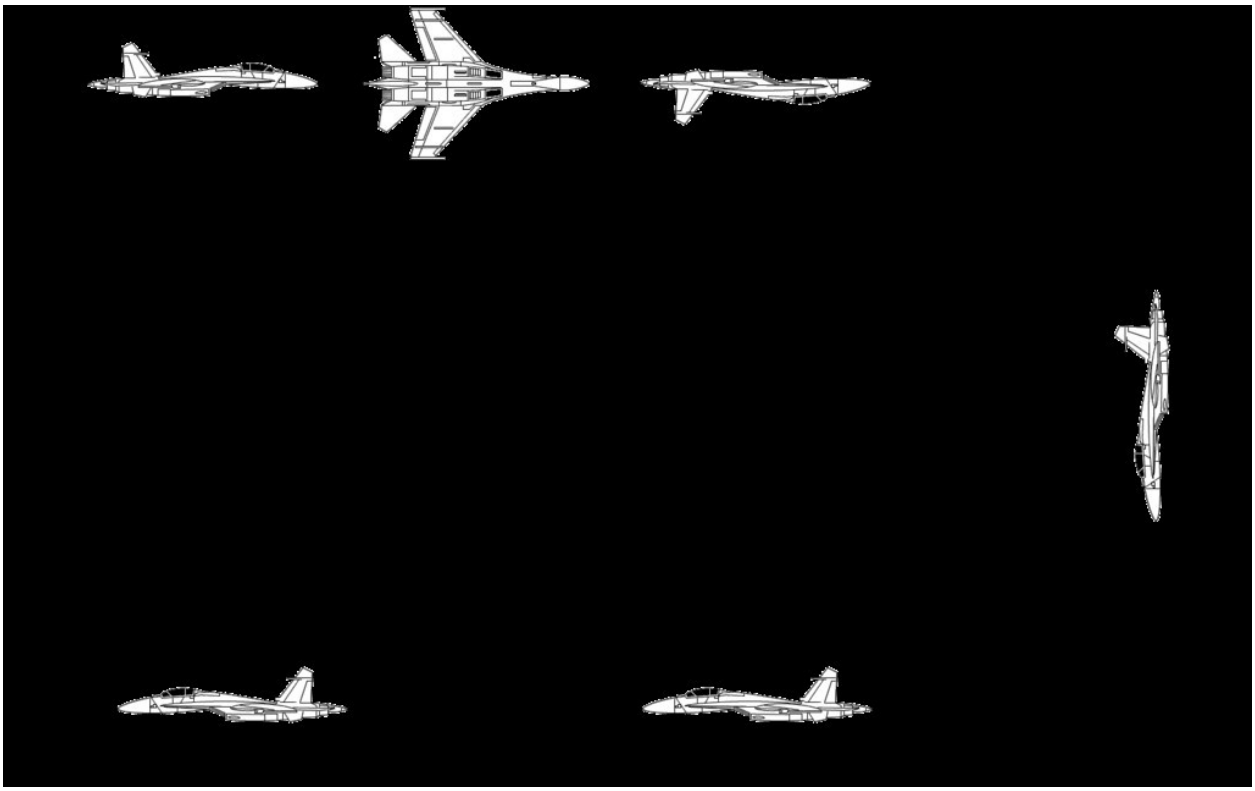
► **Inside Loop:** A vertical circle entered from straight and erect level flight. A positive pitching movement is used at all points in the loop to draw the circle so that the aeroplane canopy is pointing inwards.



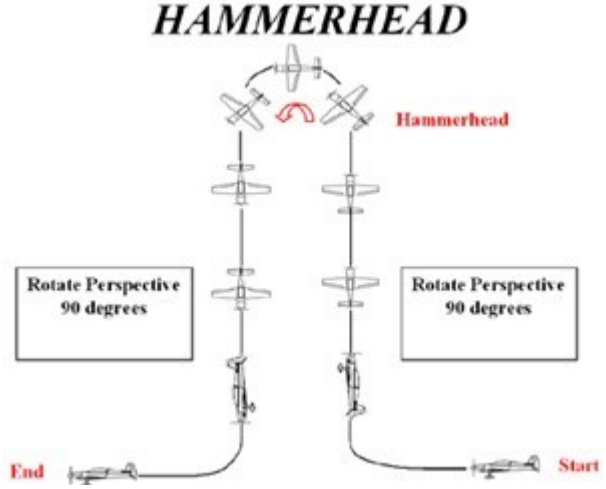
► **Inverted Loop:** Vertical loop in which plane remains inverted at start and end of the loop.



► **Split-S:** The figure starts with a half roll to inverted followed by the second half of a loop downward. This is another manoeuver to reverse direction. This does not preserve speed and altitude. In this case, it trades altitude for speed.

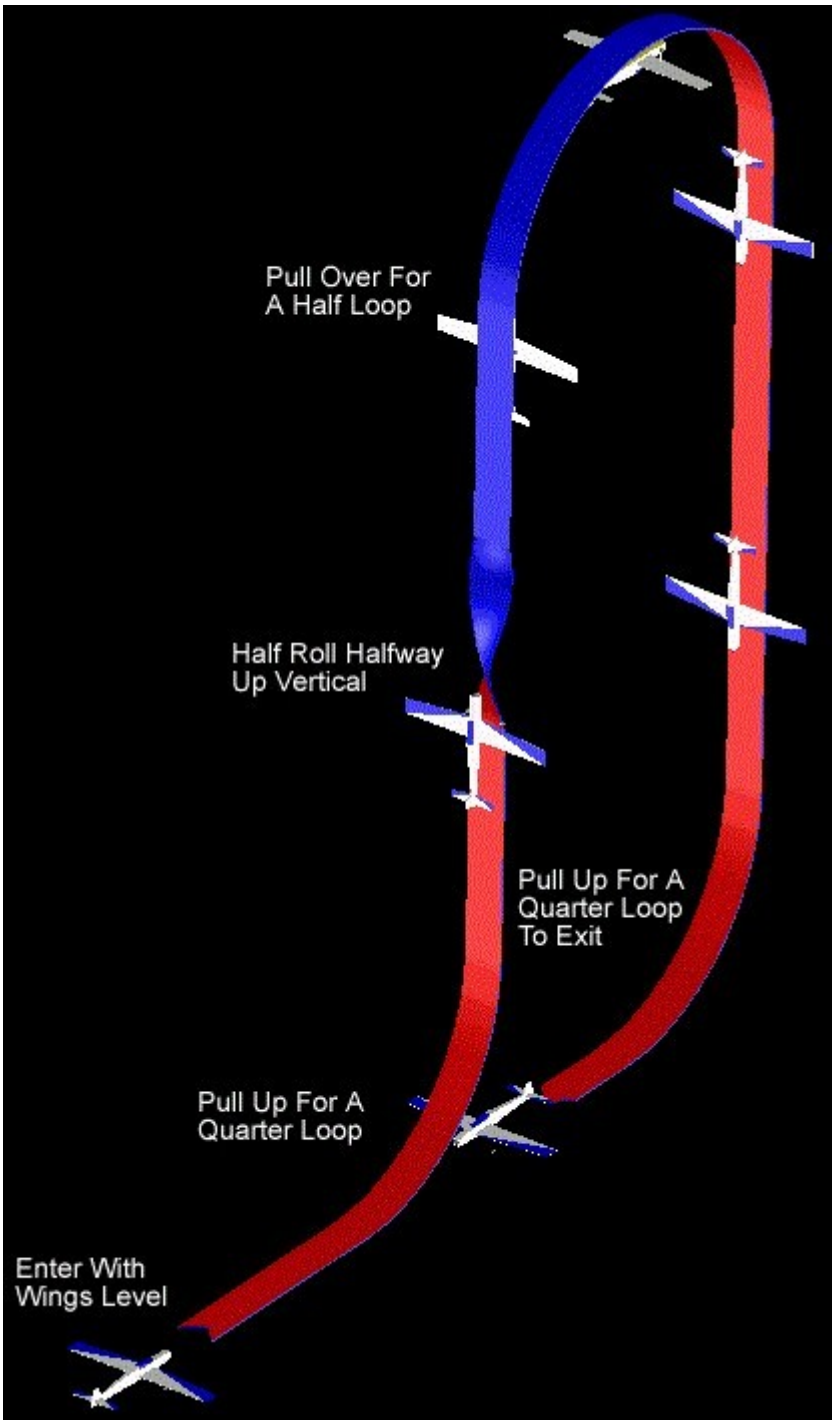


► **Hammerhead:** 1/4 loop (pull or push) to vertical, as momentum/airspeed decreases, the rudder is applied and the aircraft rotates around its yaw axis, the nose falls through the horizon and points towards the ground, a momentary pause is made to draw the vertical downline, and 1/4 loop to level flight. This figure is sometimes called a stall turn which is a misnomer because of the aircraft never actually stalls.

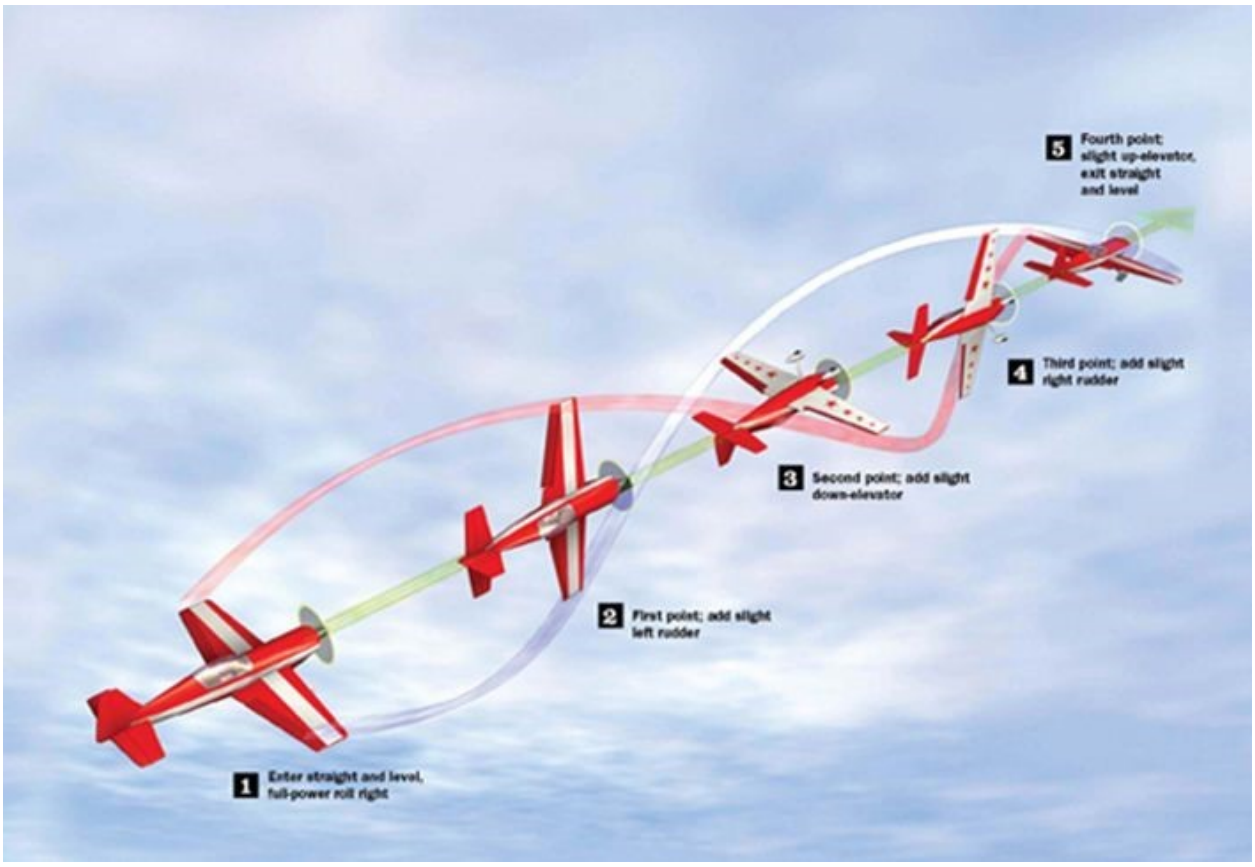


► **Square loop:** This is a variation of the basic loop. The two vertical lines and the horizontal line on top have to be of the same length. The exit line at the bottom has to be at least as long as the other three sides. The quarter loops that connect the four sides have to have the same radius at each corner.

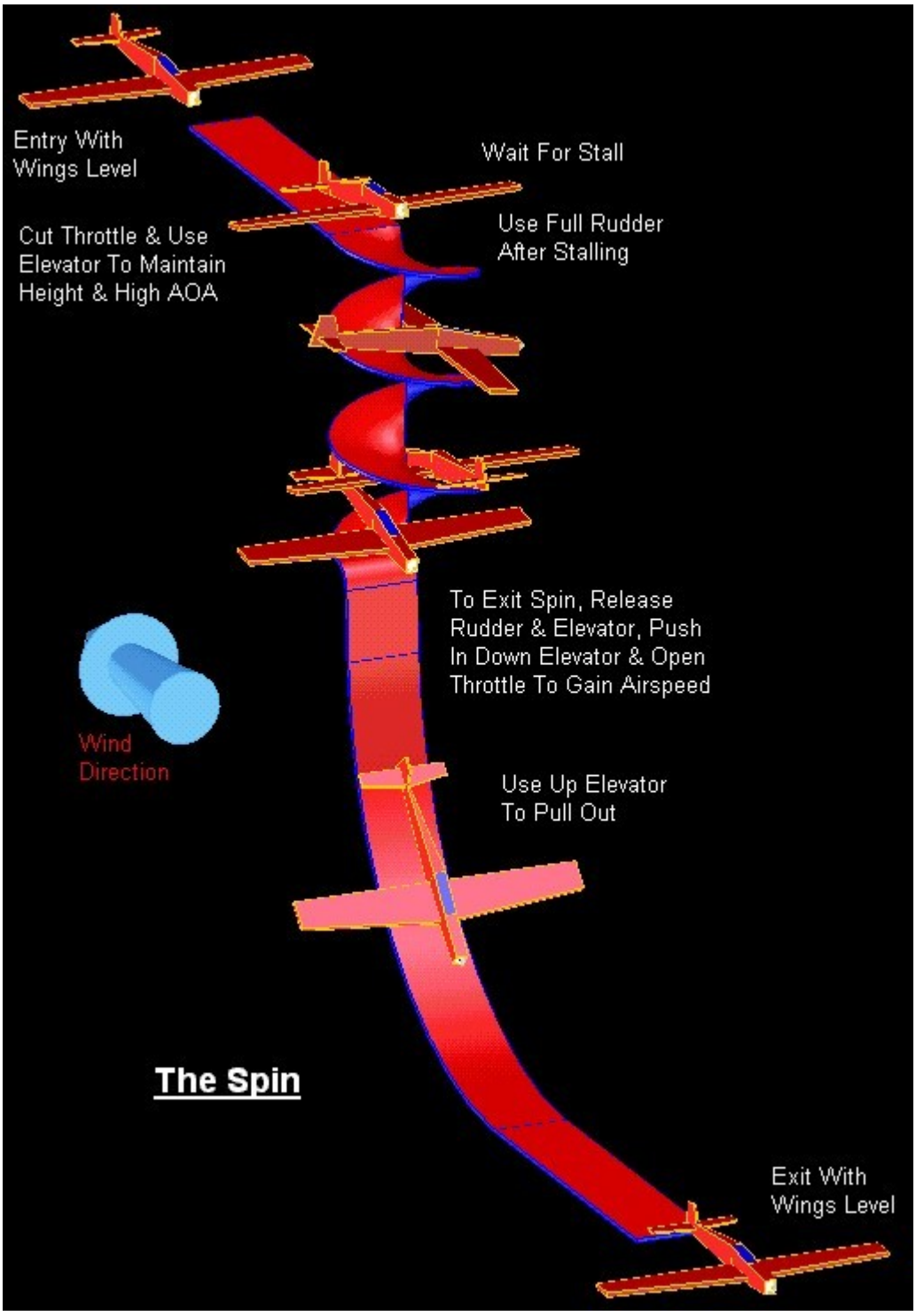
► **Humpty-Bump:** This starts with a quarter loop followed by a half roll to a vertical climb. A half loop then results in a vertical down-line. The manoeuvre completes with another quarter loop to horizontal flight.



► **4 Point Roll:** The four-point roll (hesitation roll) is a horizontal roll with a brief hesitation at 90, 180 and 270 degrees. You should be able to do a roll without any altitude loss or heading deviation.



► **Flat Spin:** During spin entry, the plane has to show a stall break, followed by the auto-rotation. The rotation has to stop exactly after the specified number of turns. Once the rotation has stopped, a vertical downline has to be established.



SPOT LANDING:

►After completing the manoeuvres proceed for spot landing. The landing zone will be marked on the airstrip. The plane is to touch down precisely in the arena. The better the touchdown greater the marks obtained.

►In case of crash landing, no points will be given for landing. Damage to the propeller will not be considered as a crash landing.

MACHINE SPECIFICATIONS:

An aircraft is defined as an object that has the four forces of flight, namely lift, drag, weight (gravity) and thrust.

1. The wingspan of the aircraft should be anything less than or equal to 60 inches.
2. The voltage of the battery should not exceed 12 V or that of 3 cell Li-Po battery or equivalent
3. The weight of the aircraft should be minimum as judging will be done based on the weight also
4. The use of launching mechanisms is prohibited. The aircraft should be hand launched.
5. The use of IC engines is prohibited. Only electrical motors are allowed.
6. The participants are free to use the materials of their choice. However, the use of Balsa wood or foam (sun board) or sun pack is advisable. Balsa wood is light, easy to handle and fabricate the Aircraft making it the best choice.
7. 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. However, the kit comprising of unassembled cut-pieces of Balsa wood is allowed. Also, the use of readymade actuators/motors, remote controls and propellers are allowed.

Use of gyroscopes (gyros) is prohibited.

If anyone found not following above rules will be disqualified.

General Rules:

- A team is liable for disqualification in any of the following situations:
  1. If the plane does not follow the specifications.

  2. If the team not following the instructions.

- The transmitters of all the teams will have to be deposited with the coordinators to prevent frequency clashes. Your cooperation is required for a healthy and better competition.

- The coordinators cannot assume responsibility for any problems arising due to the weather. However, necessary steps will be taken to ensure a fair competition.

- **The organizers' reserve all rights to change any or all of the above rules as they deem fit. Change in any rule, if any, will be highlighted on the website.**
- **Organizers decision will be the final decision.**
- The rounds are conducted in given specified time if any team could not make in time inform beforehand. We request you to be on time .so rounds can be conducted in front of all the teams. no disputes occur further.
- Certificates will be issued after completion of the event only if a certain amount of points are cleared which will be decided by judges.

JUDGING CRITERIA:

It will be based on:

- Design
- Time Taken
- Safe Landing
- Manoeuver

In case of a tie: The team which has obtained more points in the manoeuvre round will be ranked higher.

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Materials and services provided:

► Electric Sockets (220-230V) will be provided for charging the batteries, radio set etc., in case you need more, you have to inform us well before the event.
► But, you are strongly suggested to bring all the materials you require to repair your model. We cannot assure you of the materials we provide.

Contact: