RC Glider Soaring Challenge

Aerial Design & Endurance Competition

Ingenium — IIT Indore

Competition Overview

The objective of the **RC Glider Soaring Challenge** is to design and fabricate a lightweight, electric motor-powered remote-controlled aircraft capable of achieving maximum glide time and performing a gentle landing.

The competition evaluates aerodynamic efficiency, structural integrity, piloting skill, and compliance with safety and design constraints.

Task

Teams must design, fabricate, and fly a remote-controlled aircraft that:

- Achieves sustained gliding flight for the longest possible duration
- Lands safely and gently within the designated flying zone

Specifications

- Teams may select any stable aircraft configuration suitable for the task
- Recommended materials include balsa wood, foam sheet, or plastic sheet (coroplast)
- Use of metal in the aircraft structure is strictly prohibited
- Aircraft may be launched by hand or any other approved mechanism after safety clearance
- Automatic stabilization systems, gyroscopes, or programming-based stabilization are prohibited
- Only electric motors are permitted; IC engines are not allowed
- Metal propellers are strictly forbidden
- Maximum aircraft weight: 1000 grams
- Maximum wingspan: 120 cm
- Aircraft must operate on 2.4 GHz radio frequency

General Rules

- The competition consists of three rounds
- Maximum team size: 4 members
- Teams from the same institution must have at least 50% design difference between models
- All design constraints must be satisfied; violations result in immediate disqualification
- Each team is allowed two attempts per round; the best score is considered
- Aircraft may be repaired between rounds only in case of damage
- Original design must not be altered or copied from other teams
- Exiting the flying arena or entering a no-fly zone during any flight run leads to disqualification

Round 1: Abstract Submission

Teams must submit a design and technical report of the aircraft.

Report must include:

- Technical analysis of the aircraft design
- Electrical components used
- 2D images or photographs of the aircraft under construction
- Optional cost analysis

Submission Guidelines:

- Maximum report length: 5 pages (text only)
- Each additional page results in a 5% penalty on total marks
- Photos and videos must be uploaded to Google Drive
- Drive link must be attached at the end of the report
- Design modifications are allowed only if informed before Round 2

Evaluation (30 Points):

- Creativity
- Efficiency
- Technical quality of the report

Teams satisfying all constraints advance to Round 2.

Round 2: Qualification Flight

- Aircraft must achieve a minimum flight duration of 30 seconds
- Timing starts once the aircraft reaches 1 meter above ground level
- Aircraft must land before 3 minutes of total flight time
- If flight exceeds 3 minutes, one additional attempt is permitted
- Failure in the second attempt results in disqualification
- Only one pilot is allowed per attempt
- Pilot may be changed between attempts
- A safety pilot may intervene if the aircraft exits the flying zone or becomes uncontrollable
- Safety pilot is not responsible for any damage during takeover

No points are awarded in this round; it is strictly for qualification.

Round 3: Final Glide Round

- Aircraft must take off and reach maximum attainable height within 60 seconds
- No climbing is allowed after the first 60 seconds
- Pilot must stabilize the aircraft and turn off propellers within 10 seconds
- Aircraft must glide with propellers OFF for the remainder of the flight
- Gliding must remain within the designated flying zone
- Landing must be as gentle as possible

Scoring & Penalties

Scoring Basis:

- Points are awarded based on gliding time achieved in Round 3

20-Point Penalty Applied For:

- Nose-first crash
- Wings separating from the fuselage during landing
- Tail breaking or detaching
- Permanent deformation or structural twisting

- Fire, battery burst, or motor fire after landing

Total Points Formula:

$$\text{TOTAL POINTS} = (\text{Round 1 Points}) + [(\text{Gliding Time in Round 3 (s)} \times 2) - \text{Penalties}]$$

The organising committee's decision is final and binding. No appeals or complaints will be entertained.

Eligibility

- All participants must carry a valid ID card
- Multiple teams from the same institution are allowed, subject to design constraints
- Inter-college teams are permitted