SKY-DIVE

Aerophilia '26 · RC Aircraft Design & Flight Competition

Team Challengers · Sahyadri College of Engineering and Management, Mangalore

Rulebook v1.0 · Latest version at aerophilia.in
Please cite the rule number in any query (e.g. “clarification on 3.3.2”).

1. Event Description

Design, build and fly an unmanned, electric, radio-controlled aircraft across two missions: a **stunt round** and a **gate course with precision landing**. The event rewards a balanced design — good handling and affordable manufacturing.

Total score: 100 points — Mission 1 (50) + Mission 2 (50).

Prize pool ₹80,000 — Champion · 1st Runner-up · 2nd Runner-up.

2. Eligibility, Team & Registration

2.1 **Open to everyone**. No age limit, no requirement to be a student. Teams may be from a college, a school, a makerspace, a flying club, or simply a group of friends.

2.2 Participants under 18 must submit a **guardian consent form.**

2.3 Every participant carries **a valid photo ID** and produces it at reporting. No ID, no flight line access.

2.4 Maximum **5 members** per team. An individual may be in only one team.

2.5 Each team may nominate a **Captain** (sole point of contact, and the only person who may raise a protest), a **Pilot**, and **a Spotter.**

2.6 **The nominated Pilot is the only person who may fly for that team.** The Pilot may be changed only before technical inspection, with the Chief Judge's approval. Guest, borrowed and external pilots are not permitted.

2.7 **Registration**: **Fee ₹1,800 per team**, paid along with the abstract. Participation is confirmed only when both are received, and the fee is non-refundable thereafter.

3. Abstract

Every team must submit a short technical abstract. It is **mandatory and judged pass/fail** — it carries no marks, but a team that does not submit one does not compete.

3.1 Submit by email to challengers@sahyadri.edu.in by 1st NOVEMBER 2026.

3.2 The abstract must contain:

- **Team name**, and institution or group name
- **Every team member with their role**, clearly identifying the **Pilot** — this is the roster checked at the flight line.
- A brief description of the aircraft: configuration, dimensions, materials.
- The **component list** — motor, ESC, propeller, battery, servos.
- The **declared static thrust**, **take-off weight and thrust-to-weight ratio.**

3.3 Photographs of the aircraft are not required.

3.4 Format: PDF, maximum 3 pages, maximum 5 MB. File named Aerophilia26_Skydive_[TeamName]_ABSTRACT.pdf.

3.5 All content must be the team's original work. Plagiarism is grounds for disqualification.

3.6 The aircraft presented at inspection must match the abstract. Substantial undeclared deviation is grounds for disqualification.

3.7 An acknowledgement email follows within 48 hours. If you do not receive one, follow up — an unacknowledged submission is not a submission.

4. Aircraft Requirements

These are hard limits. Failing any one of them means the aircraft does not fly.

4.1 Airframe

Parameter	Limit
Maximum wingspan	1200 mm
Maximum overall length	1200 mm
Maximum take-off weight	2000 g, including battery
Configuration	Fixed-wing only
Ballast bay	Internal, minimum 110 x 40 x 40 mm clear, securely mounted

4.1.1 The airframe must be **fabricated by the team**. RTF and ARF aircraft and commercial airframe kits are not permitted. Commercial electronics, hardware and raw materials are expected and entirely acceptable.

4.1.2 The aircraft must take off from the ground under its own power (Hand launch is acceptable). **No bungee or catapult**.

4.1.3 The **underside must be smooth** and free of protruding metal, screws or exposed spars. A reinforced belly skid is recommended.

4.1.4 **No stabilisation of any kind is permitted**. The aircraft must be flown on direct manual control.

4.2 Propulsion

4.2.1 **Electric only.** No IC engines, turbines, rockets or pyrotechnics. Maximum two powered propellers.

4.2.2 **No metal propellers.** Propellers must be free of chips and cracks; the inspector may reject any propeller.

4.2.3 A working **arming mechanism** — safety plug, transmitter arm switch, or the battery connector — is mandatory. The motor must not be able to spin in the pits.

4.2.4 **Maximum static thrust-to-weight ratio: 1.2**, where T/W = static thrust (g) ÷ take-off weight (g). Take-off weight is the weight recorded at inspection, including battery and ballast. An aircraft above 1.2 does not fly.

4.2.5 Thrust is measured at inspection on the organisers' thrust stand, at full throttle, with a charged pack and the propeller the team intends to fly. The figure recorded is the highest sustained for 3 continuous seconds. A **+5% tolerance is applied in the team's favour**.

4.2.6 Teams declare their calculated static thrust, take-off weight and T/W in the abstract.

4.2.7 The **motor, propeller and battery combination measured at inspection is the combination that must be flown.** Changing any of the three requires re-measurement; flying an unmeasured combination is grounds for disqualification.

4.3 Battery

4.3.1 **Maximum 4S** (16.8 V fully charged), **maximum 2200 mAh**, **one flight pack** per aircraft. Packs may not be combined to exceed this.

4.3.2 Cell count and capacity must be legibly labelled; unlabelled packs are rejected. Voltage is checked at inspection and may be re-checked before any flight. A pack above 16.8 V means disqualification from that mission.

4.3.3 Swollen or damaged packs will be confiscated for safe disposal.

5. Safety

Safety rules are not scored — they are gating. Breaking one costs points; breaking one dangerously ends your event.

5.1 Maximum **three people** per team on the flight line: Pilot, Spotter and one other.

5.2 **The Flight Marshal may call a throttle cut at any time.** The pilot cuts immediately, without argument. Failure to do so is instant disqualification.

5.3 The organisers may pause or stop flying for weather or any safety concern. Weather stoppages are not grounds for protest.

6. Technical Inspection

6.0.1 **A mission ends at first landing.** Once the aircraft has touched down, the mission is over — whether the landing was intended or not. The team may not take off again to improve its score, complete unflown manoeuvres, or attempt a gate it has missed. A go-around does not count as a landing; contact with the ground does.

6.0.2 **A crash ends the team's event.** An aircraft that crashes is out of the competition from that moment. There is no repair window, no re-inspection and no second flight. Any mission not yet flown scores **zero**.

6.1 Every aircraft is inspected before its first scoring flight: dimensions, weight with ballast, battery, propeller, static thrust and T/W (4.2.5), arming mechanism, failsafe, ballast bay, belly condition, control surfaces, and correspondence with the abstract.

6.2 Bring the aircraft **flight-ready with a charged pack** — the thrust measurement cannot be taken otherwise.

6.3 A failed aircraft (in inspection) may be re-presented **once**, after rectification in the pits.

6.4 **The inspector's decisions are final.**

7. Missions

7.0 Rules common to both missions

- **One scoring attempt per mission.** A re-flight is granted only if the Chief Judge rules the failure was the organisers' fault.
- **Take-off:** Launch from the marked launch box. A take-off is **clean** if the aircraft is airborne and under control with no wingtip or propeller strike.
- **Landing:** Landing on grass field. A landing is **successful** if the aircraft arrives on the marked field under control, with the wing attached and the fuselage unbroken. **Propeller damage on landing is not a failure.**

- **Throttle must be cut to zero before ground contact.** A powered belly landing is penalised.
- **No successful landing, no score** — the mission is zero.
- **Go-arounds are unlimited** within the flight window; only the final landing is scored.
- The clock starts at take-off and stops when the aircraft comes to rest.
- Course orientation is set on the day for prevailing wind. The nominal course is published in advance and may vary.

7.1 Mission 1 — Stunt Round · 50 points

The task: take off, fly a 2-minute aerobatic display, land safely. Ballast may be carried for bonus points.

How it works

- The pilot may move freely within the pilot zone.
- **Each manoeuvre scores once only** — repeats earn nothing. Fly the variety, not the reps.
- Call each manoeuvre before flying it. Uncalled manoeuvres are scored at the judges' discretion.
- Each manoeuvre is judged **full, half or zero** — full: cleanly executed; half: recognisable but with significant deviation; zero: unrecognisable, or controlled flight is lost.
- Manoeuvres must be flown downrange at a safe altitude.

Ballast

- Ballast is **supplied by the organisers** in 50 g units. Team-supplied ballast is not accepted.
- It is declared before the flight, loaded and weighed at the flight line, and **re-weighed after landing**.

• It is carried inside the ballast bay and **may not be jettisoned**. Losing it in flight scores **zero for the mission**.

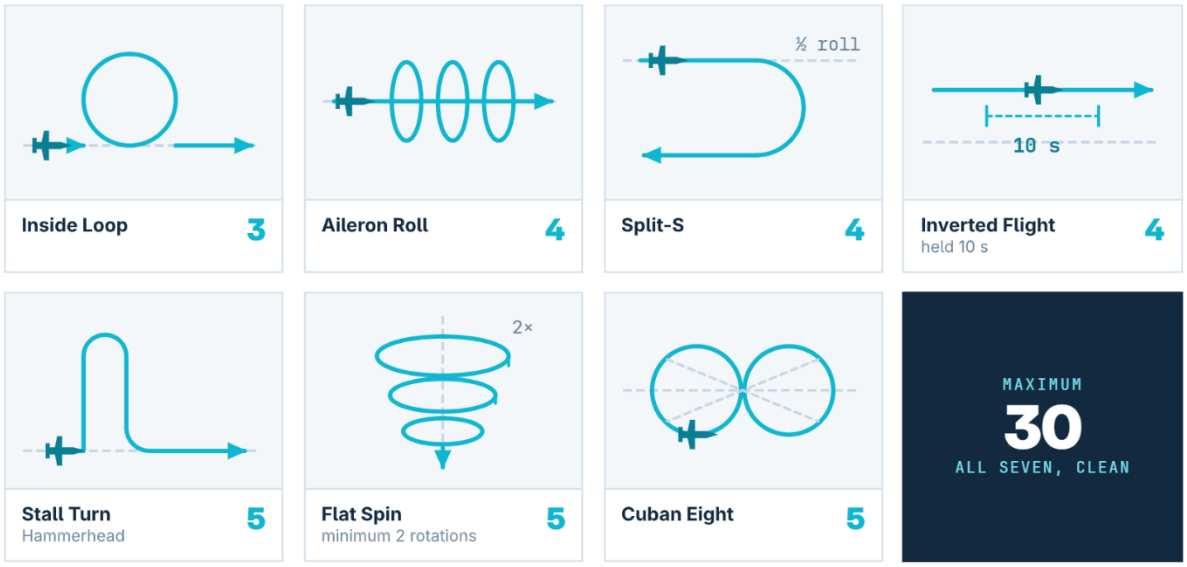
• Ballast counts toward the 2000 g weight limit and the T/W measurement. Teams are measured in their heaviest declared configuration.

Scoring

Manoeuvre	**Points**
Inside Loop	3
Aileron Roll	4
Split-S	4
Inverted Flight, held 10 s	4
Stall Turn (Hammerhead)	5
Flat Spin, minimum 2 rotations	5
Cuban Eight	5
Maximum	**30**

Ballast carried	**Bonus points**
100–199 g	4
200–299 g	7
300 g and above	10

Element	**Points**
Clean take-off	5
Manoeuvres	30
Ballast bonus	10
Successful landing	5
Mission 1 total	**50**



A manoeuvre not defined above is not scored.

7.2 Mission 2 — Gate Course & Precision Landing · 50 points

The task: take off, clear three gates, then land as accurately as possible in the marked landing zone — all within 5 minutes. **No ballast is carried.**

How it works

· A gate is **cleared** when the whole aircraft passes through it in the marked direction without touching it. Contact, or passing over or outside, does not count.

· **Each gate scores once only.** Teams may fly extra laps to attempt a gate they have missed, but no gate scores twice.

· **The pilot stays within a fixed marked area.**

· Once the aircraft has landed and come to rest, the mission is over — no re-launching for further laps.

How the landing is scored

· The landing zone is a set of **bands marked across the strip**, perpendicular to the approach.

• The aircraft must come to a **complete stop** — motionless for 3 seconds, as called by the judge.

• The band touched by the **nose of the aircraft**, meaning its forwardmost point, is the band scored. Where it first touched down and where it skidded are not scored.

• **Nobody may touch the aircraft** until the judge marks its position. Touching it first scores the minimum -2 points.

• A nose resting **on a line** scores the higher band. A nose **off the ground** is projected vertically down and scored there.

• An unsuccessful landing scores **zero for the mission**, wherever the aircraft stops.

Scoring

Element	Points
Clean take-off	5
Gates cleared — 7 points each, 3 gates maximum	21
Precision landing band	24
Mission 2 total	**50**

Landing band — nose position at rest	Width	Points
Outer, short	10 m	7
Inner, short	5 m	14
Target	5 m	**24**
Inner, long	5 m	14
Outer, long	10 m	7
Elsewhere on the field	—	2

Landing scores are exclusive — the target band scores 24, not 24 + 14 + 7.

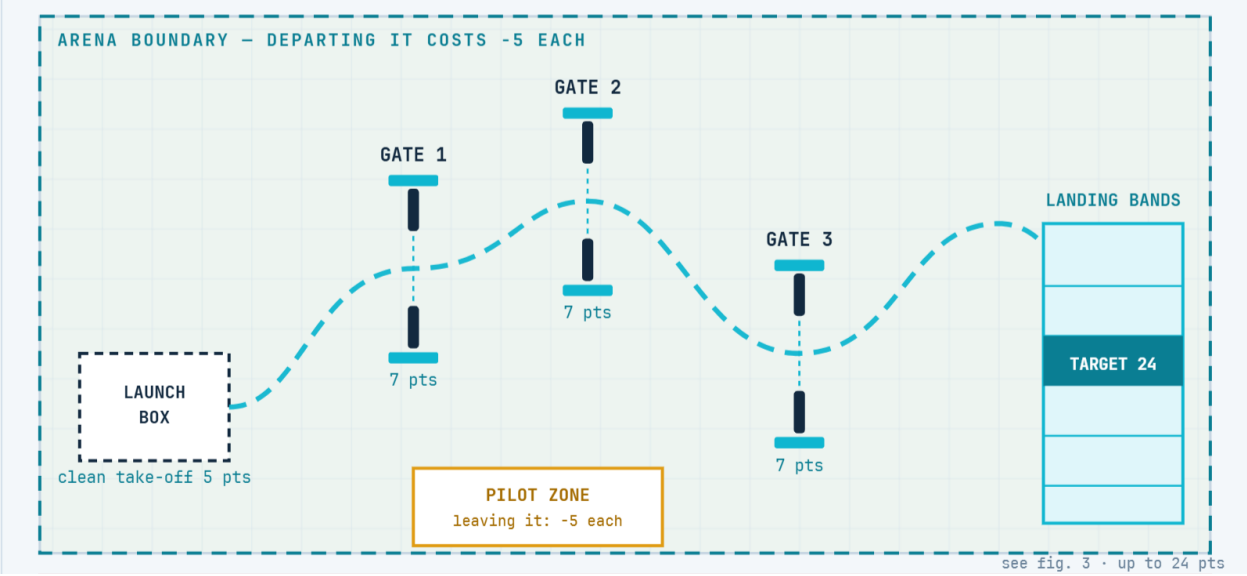


Image shown is for illustration purposes only. Final Arena will vary.

9. Conduct & Contact

9.1 Treat judges, marshals, volunteers and rival teams with respect. Leave the venue clean. The organisers may remove anyone for unsafe or abusive behaviour.

9.2 Teams are responsible for their own equipment, transport and insurance. Participation grants the organisers permission to photograph and film aircraft and teams for publicity.

9.3 Rule queries: **challengers@sahyadri.edu.in**, subject line SKYDIVE QUERY — [rule number]. Answers of general interest are published in the official Q&A.

Rules are subject to change. All updates are posted at aerophilia.in

CONTACT INFORMATION

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