

GLIDE-X

COMPETITION GUIDELINES

This document is the official rulebook for GLIDEX. Any and all teams that participate in the event are required to read, understand, and comply with these guidelines.

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Introduction

GLIDE-X is an Undergraduate level Glider Design, build and Fly competition that encourages students to apply the fundamentals of aerodynamics, flight stability, and aircraft dynamics to create a glider that uses these phenomena to execute a straight flight and landing.

The competition will allow students to create more efficient wings, better stability, which in the real world translate to aerodynamic optimization for specific conditions, etc.

By doing this, the competition places emphasis on design efficiency, aerodynamic performance, stability, and innovation.

Problem Statement

Competitors are to design, build, and optimize a passively aerodynamically stable, non-RC glider that achieves maximum flight performance in terms of flight time, distance, and straightness of trajectory, while complying with the specified design constraints.

The event challenges teams to apply aerodynamics, flight mechanics, and aircraft stability principles to optimize their designs for maximum flight time and distance while maintaining a straight and stable flight path.

Complying to the Rules

- The competition organizing body reserves the right to change the schedule of the competition and/or interpret or modify the competition rules at any time and in any manner for the event to operate smoothly.
- The competition organizing body reserves the right to modify the points and penalties in the event, so that the constraints of space, do not prohibit the event to operate smoothly.

- By entering GLIDE-X, all team members, advisors, and other personnel agree to comply with these rules, along with all interpretations or procedures issued or announced by Aeronyx and other organizing bodies, which is considered final.
- All team members, faculty advisors, and other university representatives are required to cooperate with and follow all instructions from competition organizers, officials, and judges
- Teams are responsible for reading and understanding the rules in their entirety. Section and paragraph headings are provided to facilitate reading; they do not affect the paragraph contents.
- The violation of the intent of a rule will be considered a violation of the rule itself. Questions about intent or meaning may be addressed to the GLIDE-X Organisers:
 - o Siddharth P [+91 7022395629]
 - o B S Mokshada [+91 9353824957]

Glider Similarity Conditions

- Universities may enter multiple teams. However, each entry must be a unique design, significantly different from any other entry from the same university.
- If the aircraft is not considered significantly different in the opinion of the organizer, the university will be permitted only a single entry.
 - o For example, having 2 gliders with the same wing but different positioning (like high-wing/low-wing/mid-wing); along with different empennage structures with the same wing, will be considered extremely similar, and only one team will be allowed to fly.

Professional Conduct

- In the event of unsportsmanlike conduct by any team member or Faculty Advisor, the team will receive a formal warning from a Competition Official. A second violation will result in expulsion from the competition and forfeiture of all points earned.
- Arguments with or disobedience toward any competition official may result in the team being eliminated from the competition.

- The Organizer reserves the exclusive right to revise the schedule of the competition and/or to interpret the competition rules at any time and in any manner required for the efficient operation of the event.

Glider Design Constraints

The following list gives the constraints for the glider that is to be used in the competition:

- All gliders are to have a distinct Wing, empennage, that houses Tail configurations such as standard, T-tail, V-Tail, Twin-Tail, etc. wing designs may include Rectangular, tapered, swept, delta configurations. Only Single winged gliders are allowed in the competition.
- Weight Range:
 - o Minimum Glider weight: 15g
 - o Maximum Glider weight: 50g
- Wingspan Range:
 - o Minimum span: 200mm
 - o Maximum span: 500mm
- Materials:
 - o The materials that can be used to construct the glider are Balsa and Depron only
 - o Use of composites and other materials is strictly prohibited.
- Glider Aspect Ratio:
 - o The Glider aspect ratio as interpreted by the competition is given as:

$$AR_G = \frac{Wingspan}{Glider\ Length}$$

- o The value for the Glider's Aspect Ratio should not go below 1.

Event Progression and Runway Constraints

To ensure the smooth flow of the event, all competitors are to know the event procedure and constraints before the launch itself.

Team Ordering

- Once the event officially commences, all teams will be assigned numbers based on a randomizer.
- Once the team numbers are finalized, all teams will be called individually to the runway.

Qualification Round

- Gliders undergo a basic performance check. The glider must achieve an initial landing Point of Contact (POC) of at least 5 meters from the launch line to qualify for the final round.
- Each team is allocated a 30 second time slot on the runway.
- The team may choose the exact launch moment within this window to adapt to prevailing wind conditions, after mentioning a 3 second countdown for the judges to start the stopwatch.
- Failure to launch in the given runway time will result in immediate termination of the launch.

Runway and Launch Window

- Each team is allocated a 1-minute time slot on the runway.
- The team may choose the exact launch moment within this window to adapt to prevailing wind conditions, after mentioning a 3 second countdown for the judges to start the stopwatch.

- Failure to launch in the given runway time will result in immediate termination of the launch.
- All teams are provided one (1) attempt on the runway to score the most points they can.
- During the Launch, all other teams are to clear from the flying area. Any interference by any team during a flight will result in a penalty to the interfering team.

Post Landing – Glider Performance Analysis

- After the landing, Performance parameters for the glider such as distance travelled, time of flight, and path straightness are taken as readings by the organisers and officials.
- The team is then escorted out of the runway, after the measurements are complete, to give space for the next team's launch to commence.

Scoring

Scoring of the points accumulated by each team are given as follows:

Measurement Criteria

- Post launch, the ground team will be tasked with taking measurements of flight:
 - o Distance Travelled:
 - Distance is measured to the Point of Contact –the exact spot where the glider first touches the ground upon landing, not its final resting position after sliding or rolling.
 - One representative per team is allowed to observe the distance measurement.

- Time of Flight:
 - Time of flight is measured using a stopwatch. The start time is taken from when the glider is launched, till first contact of the ground.
 - One representative per team is allowed to observe the official stopwatch time.
- Path Straightness:
 - Relative path straightness, is determined by the Jury.
 - Points decrease as the path of the glider begins to deviate from a straight line.

Points Distribution

Points are distributed according to the following list:

- Distance:
 - 2m = 1 POINT
 - Note: This distance is taken in the final round and not the distance flown in the qualifying round.
- Time:
 - 2s = 1 POINT
 - Note: This distance is taken in the final round and not the distance flown in the qualifying round.
- Path Straightness:
 - Path straightness is determined by taking the average score of the points awarded to the team given by the Judges.
 - The Additional points that teams can score with path straightness ranges from 0-5 POINTS

Conclusion

This Concludes the official Event Guidelines for GLIDE-X.

All the best to all participants.

May your wings send you high, and your winds be low.