

THE WRIGHT DESIGN

1. INTRODUCTION



Its late 15th century...

In Southern Europe, there existed a friendly alliance between two mighty kingdoms, Rome and Florence. The House of Medici was a banking family and the political dynasty of Florence. In search of power, Rome betrays Florence. The Medicis are furious. They have waged war against the mighty Rome.

In Florence, there lived a great man named Leonardo Da Vinci. He was an inventor, an engineer, a painter and many more. He had made many contraptions, but he is most famous for his glider. You are Da Vinci. You are summoned by Lorenzo il Magnifico, King of Florence, to be Florence's War Engineer. You are given the task to build a glider to launch an unexpected aerial attack on Rome and leave them bewildered. Can you do it? Do you have it in you to overcome Rome's might?

2. EVENT FORMAT

2.1. SUBMISSION OF WRITE-UP

2.1.1. Every team is required to produce a write-up describing the basic idea employed in designing and building the glider.

2.1.2. All methods employed in controlling the aircraft pitch, yaw and roll must be explained in detail.

2.1.3. Approximate aircraft parameters must be mentioned.

Note: Originality in the design will be the basis for selection of teams for the event. Deadlines for submission will be updated soon on the website.

2.2. PRESENTATION

2.2.1. Selected teams will participate at Shaastra. Every team must give a power point presentation (ppt) before a panel of judges.

2.2.2. The presentation should incorporate the idea, aircraft parameters and uniqueness of the design.

2.2.3. The presentation must also explain how exactly you arrived at the design, and the design parameters chosen. In a nutshell your presentations must be informative and prove your worthiness.

2.2.4. The final points for this part will be given only after a keen assessment of the design by the judges.

2.2.5. A .pptx template will be available on the website soon.

2.3. FLIGHT TESTING

2.3.1. The glider should consist of features mentioned during the presentation, failing which the teams will be disqualified.

2.3.2. Each team will be given TWO chances for each Module 1 and Module 2 of flight testing.
(**Note:** Module 1 & 2 are explained in detail in Section-4)

2.3.3. Teams should note that the place where flight testing is done is an open area; hence changes in wind direction may occur. Teams should keep this in mind while designing the glider.

3. PROBLEM STATEMENT

3.1. Design and build an **unpowered glider*** which

3.1.1. Must be able to manoeuvre and take a smooth turn

3.1.2. Must drop off a payload at a particular zone

*Terms	Description
Unpowered	Use of IC-engines, motors or any other mechanism to provide thrust are prohibited. The catapult provided must be the only means to give thrust.
Glider	A glider is defined as an object that has exactly 3 forces of flight, namely lift, drag and weight (due to gravity). Here by default, it refers to the heavier-than-air gliders .

3.2. Glider Specifications

3.2.1. Wingspan should not exceed 1 metre and the weight of the glider (excluding payload and battery provided by co-ordinators) should not exceed 600 grams.

3.2.2. The glider should not contain more than three on-board servos for controls. For each module, only two of the servos should be connected to channel of the receiver. **Use of one servo for pitch control is mandatory.**

(Note: Module 1 & 2 are explained in detail in Section-4)

3.2.3. The only electronic equipment on the glider must be 3 servos (at max.), 1 RF-receiver and 1 battery (Li-Po, Ni-Cd, Ni-mH or Li ion or any other battery generally used).

(Note: RF-transmitter & receiver module and battery will be provided by the co-ordinators.)

3.2.4. The glider should be launched using a sling-shot type launcher provided during the event & hence must have a hook to enable launching.

3.3. Package Specifications

The package dimensions will be within 10cm x 10cm x 10cm, not weighing more than 100 grams.

3.4. Launcher Specifications

The launcher uses sling-shot mechanism. The launcher design will be similar to the one in the [video](#). The exact dimensions of the launcher will be intimated soon.

4. FLIGHT TESTING

The glider flight testing consists of two modules. The glider will be launched using catapult mechanism provided by the coordinators.

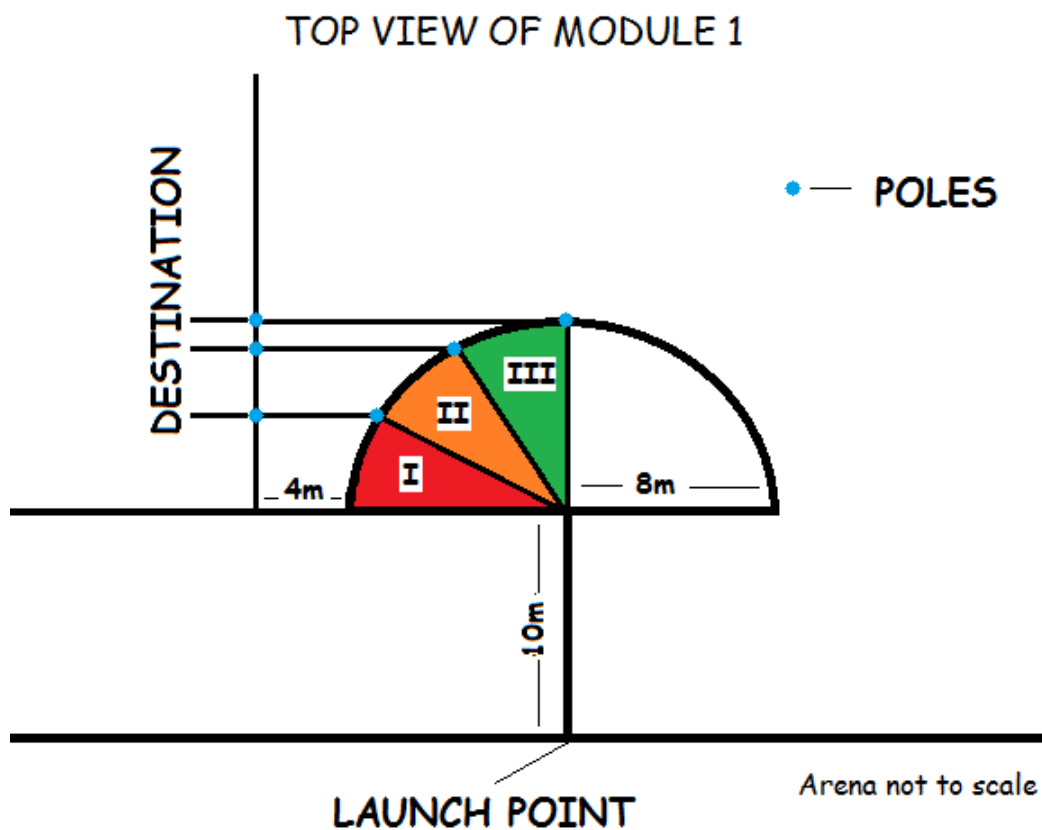
4.1. Module 1: Manoeuvring and Safe landing

4.1.1. The arena is the marked region.

4.1.2. In this module, you are required to manoeuvre the glider and reach the target zone (marked as destination)

4.1.3. Depending on the where the glider exits the semicircle and where it lands, points will be awarded.

4.1.4. Poles will be used to determine the path followed



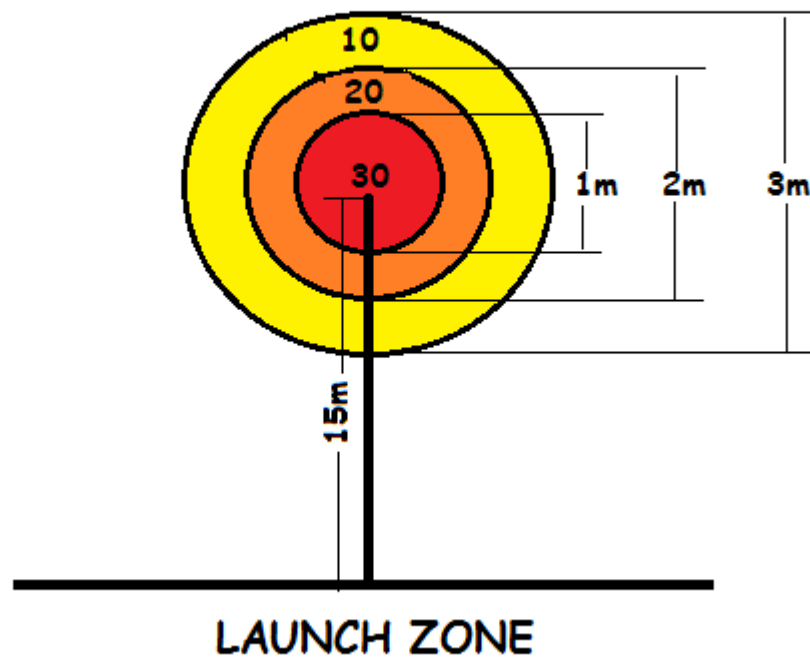


4.2. Module 2: Dropping a package

4.2.1. In this module, you are required to drop a cubical package in the coloured zones.

4.2.2. Points will be rewarded depending on where the package touches the ground first after it has been dropped.

TOP VIEW OF MODULE 2



Arena not to scale

5. SCORING

Teams will be scored against a maximum score of 100 points. The split is as given below-

5.1. Design (based on presentation) – 40 points

Unconventional designs would attract good scores if they can fly well (in such cases, extra points will be given only for this criterion after the flight test scores).

5.2. For manoeuvring and safe landing (Module 1 of Mission) – 30 points

5.2.1. Each team will be given **two trials** and an average of both trials would be taken for this module's weightage of points.

5.2.2. For exiting the semi-circle via zone I and *landing perfectly** at the destination, the team would be awarded 10 points

5.2.3. For exiting the semi-circle via zone II and *landing perfectly** at the destination, the team would be awarded 20 points.

5.2.4. For exiting the semi-circle via zone III and *landing perfectly** at the destination, the team would be awarded 30 points.

5.2.5. 5 points will be awarded just for gliding and safe landing.

5.2.6. In case the glider doesn't land at the proper place, only half of the points allotted would be awarded.

**landing perfectly*- Landing in between the respective parallel lines extended from the circumference of the semi-circle.

5.3. For dropping the package (Module 2 of Mission) – 30 points

5.3.1. Each team will be given **two trials** and an average of both trials would be taken for this module's weightage of points

5.3.2. **Zone wise point's weightage:**

Red Zone	30 points
Orange Zone	20 points
Yellow Zone	10 points

Note:

1. In case of a tie, verdict will be given based on the time of flight of the glider.
2. Scoring pattern is subject to change.
3. The final scoring pattern for the flight testing round will be explained during the presentation round.

6. RULES

- 6.1. Each team can have a maximum of 4 students, from any branch and any college.
- 6.2. No entry shall be accepted if the write-up has not been submitted on time.
- 6.3. In case of any changes in design after the write-up submission, they must be communicated to the event coordinators well in advance.
- 6.4. Any glider which doesn't meet the weight and size requirements will be disqualified.
- 6.5. The gliders can be built with any materials except metals or any other sharp materials that may pose a threat to the safety of audience.
- 6.6. Any team which has copied a design or changed the design (after write up submission) without informing the organizing team will be disqualified.
- 6.7. The coordinators shall only provide a launcher and will not be responsible for launching the glider. However, assistance shall be provided, if needed.
- 6.8. Teams are advised to fly their gliders themselves. The co-ordinators will not be responsible for the performance of the flyer.
- 6.9. Participants must make all parts of the gliders themselves. Usage of Ready-to-Fly (RTF) and Almost-Ready-to-Fly (ARF) kits are strictly prohibited.
- 6.10. The receiver should be the only powered component on the glider during flight. The servos should take power from the receiver.
- 6.11. The organisers reserve the right to mark the landing point and no objections from the participating teams will be entertained.
- 6.12. Problem Statement, Rules and Scoring may change and all changes shall be reflected in the Shaastra website. And hence, the teams are responsible for keeping themselves well informed about the event.

THE COORDINATOR'S DECISION WIL BE FINAL AND BINDING TO ALL THE TEAMS

Keep visiting the website www.shaastra.org for updates regarding the event.
For any queries please mail wrightdesign@shaastra.org with the subject as "Query || 'Query-Topic' "