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RV College of Engineering®

Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi

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THE AERONAUTICAL SOCIETY OF INDIA

Promoting Excellence in Aeronautical and Aerospace Profession

AEROMANIA

AERIAL ENDEVOUR

organized by PROJECT JATAYU

RULE BOOK

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Problem statement

Design and build a dropping mechanism that will be attached to a drone and has the capability to house an egg and safely drop it from an altitude of 10 meters.

Requirements

Max volume of the payload dropping mechanism	15 cm * 15 cm * 10 cm
Max mass of the payload-dropping mechanism with the egg	500 grams
Mass of egg	55 ±5 cm
Size of egg	Length - 5±0.5 cm Breadth - 4± 0.5 cm

Rules

*Team size – 6
*The electronics present in the payload-dropping mechanism should be powered by a source inside the payload-dropping mechanism(No power supply will be given from the drone).
*The payload dropping mechanism has to be remotely actuated since it will be attached to the drone and will be dropped from an altitude of 10 meters, 2 RC channels will be provided from the drone's receiver, and arrangement for actuation signal can also be done by the participating teams.
*The egg will be provided during the first day of the competition.
*The dropping mechanism will be mounted at the bottom of the drone, The mounting plate dimension is given in the further sections.

Timeline

Day 1 – 04/01/2023 – Presentation and ground testing of the dropping mechanism
Day 2 – 5/01/2023 - Drop test using drone

Drop Test

*Attachment of the dropping mechanism developed by the students to the bottom plate of the drone.
*Drone will hover at an altitude of 10 metres above the ground and enter the drop zone.
*Payload will be dropped/released from an altitude of 10 metres.

Points distribution

Day 1 - Presentation	
Category	**Points**
Introduction of the team,presentation	5
Design of payload dropping mechanism (Conceptual design – sketches, Calculations, CAD model)	5
Manufacturing of the prototype – Material chosen, manufacturing method with photos or videos	5
prototype testing – pictures, videos	5
Innovation	10
Q and A session	5
Day 1 – Ground testing	
Volume of payload <=(15*15*10)	5
Mass of the mechanism with egg <=500 grams	5
The ability of the mechanism to drop payload when the mechanism is tilted by 10 and 15 degree	5
Repeatability of mechanism – 5 consecutive drops	5
Day 2 – Drop test	
Successful recovery of the egg – (no cracks)	45
Total points	**100**

Mounting arrangement

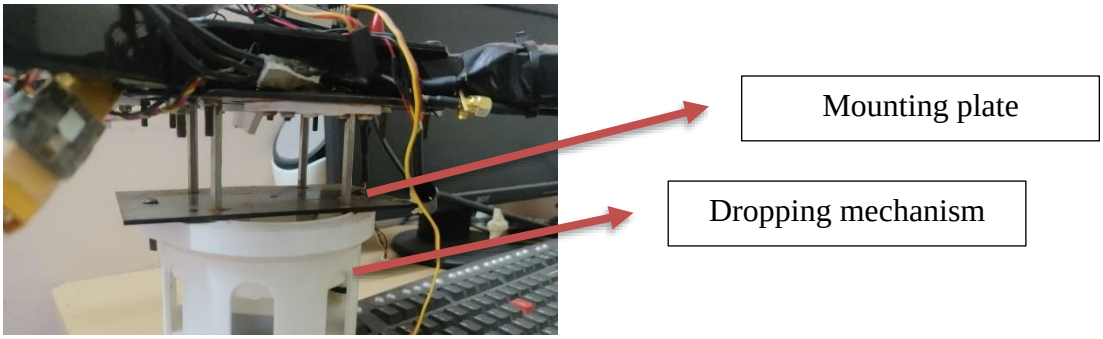
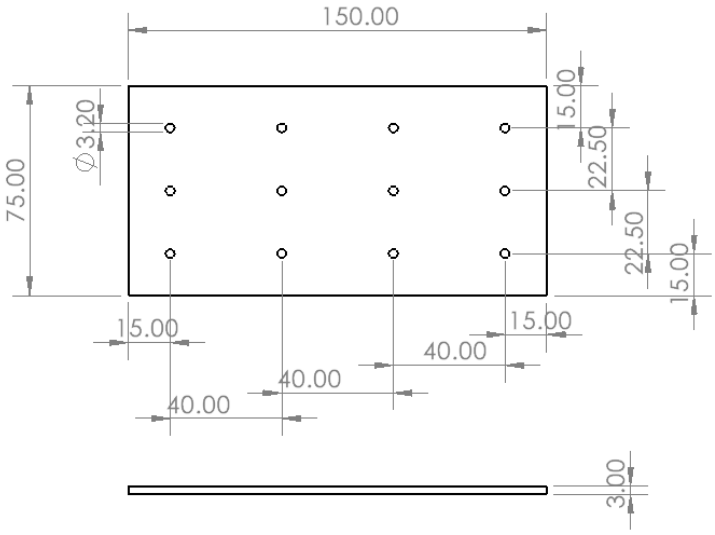


Fig 1 Mounting plate arrangement

Fig 2 Mounting plate

*CAD model of the actual mounting plate, all the holes are available for the mounting of the payload dropping mechanism(Fig 2).



*Mounting hole dimension and position is as shown in the above drawing(all dimensions are in mm), Bolt head should sit on top of the plate (as shown in fig 1).

Reference video

*Reference videos to get more understanding of the competition.

Any doubts, please contact

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