

[Print Page](#)

POWERED FLIGHT

[Link to Chatroom](#)

The competition plane:

The Delta Dart is a rubber band powered model airplane. The propeller provides the thrust from the potential energy stored in the twisted rubber band while the wings provide the lift. No other sources of thrust or lift are authorized.

Each team will field one airplane for the competition. You may use the model provided for the competition or an identical clone based on the original kit. Each plane entered will be evaluated against the specifications for the Delta Dart during the Preflight phase of the competition. Penalty points will be assessed against planes which deviate significantly from the specifications.

Specifications:

Wingspan: 29.0 cm (23.5 cm - 34.5 cm)

Wing Area: 225 cm² (no variance)

Fuselage length: 29.5 cm (23.5 - 35.5 cm)

Propellor Diameter: 14 cm (no variance)

Weight: 12 grams including the rubber band (8.0 g - 16 g)

Motor: 50-52 cm rubber band tied into a closed loop 23 - 25 cm. The cross section of the rubber band is 1.0 mm thick x 3.2 mm width. Only one rubber band may be used on the airplane during the competition. A second rubber band is provided as a replacement.

Modifications to the plane

1. accepted wing patterns a) dihedral, b) wing tip dihedral c) polyhedral
2. adjustment of the angle of attack of the wings.
3. Any modification of the wing shape must comply with the wing span and area

Restrictions/Limitations

1. the plane may not be tethered during the flight phase
2. no electronic or remote control devices are authorized.

Flight Arena

The flight arena will consist of an area approximately 27 m x 30 m (two HS basketball courts) with a ceiling of 6 meters. The baskets are in

the lowered position extending 1.3 m inside the court boundary and are considered a flight hazard.

Flight Performance

When the plane is launched (by hand), the judge will time the flight from release to landing. The ideal flight will consist of a circling/orbiting pattern with a radius of 10-12 m staying within the court boundaries.

Preflight

Each team will pick up a score sheet for their plane. Then bring the sheet with the plane to the judges position to be certified for measurement and weight.

Launch Procedures

1. Five to ten minutes prior to the launch the team will prepare the airplane for launch. A special winder will be provided to assist in the winding procedure (not required) .
2. When the team is called, one member will proceed to the launch area with the plane. Located midcourt (jump circle) of one of the basket ball courts.
3. The team member will then receive a short count by the judge and will then hand launch the plane into the air. The judge will start the official timer.
4. The clock will continue for a maximum of two minutes. The timer will be stopped before the two minute limit if one of the following conditions exists/occurs: the plane lands/crashes, or the plane hits an obstruction [basket, ceiling, wall, human]. Note all observers will remain outside the court boundary.

Penalties

- 1 A one time penalty (4 pt) will be assessed to a team that is not ready when called..
- 2 An 8 pt penalty for being outside either the weight or dimensional specifications listed above.

Disqualification

Any team member who interferes with a flight, be it their own or another teams, willfully damages another teams plane before or during the competition, or makes changes to their airplane after it has been certified, will be disqualified from the competition.

Scoring

- 1) non flying Plane 5 pt (a non repairable airplane);
- 2) flying plane 10 pt;
- 3) Each block of three seconds of flight time is worth one pt. Maximum score for flight is 40 pt.

Each score will be ranked and adjusted to a 50 point scale, IAW the NSSL constitution. Tie scores will be an average between the positions. For example: three first place airplanes will receive an average score of 49 based on the top three positions of the scale, 48, 49, and 50.

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<< BACK