

BOEING National Aeromodelling Competition

This competition is launched with the vision to provide a unified national platform for students interested in aerospace and related engineering disciplines - to demonstrate their aero-modelling expertise.

AIM:

A team must design, fabricate and demonstrate a fixed wing aircraft system that can perform tasks mentioned in following rounds with given constraints.

Design Constraints:

1. T/W ≤ 0.75 without payload (If excess thrust is measured, it will be neutralized by adding weight below the aircraft at centre of gravity)
2. Propeller diameter should not be greater than 13 inches
3. Total wingspan should be a maximum of 1.2 m
4. Only electrical motors are allowed. The use of IC engines or any other means of providing thrust is prohibited.
5. Use of gyroscopes (gyros) and programming assistance in receivers is prohibited

Abstract Submission:

1. All the participants need to submit an abstract to boeing@techfest.org on their aircraft, with **standard formatting** given in point 4. The Abstract must document the basic design of the aircraft (dimensions, wing areas, velocity, etc.) and should also explain how their design is suitable for given problem.
2. Along with the abstract, Participants also have to send a zip file containing at-least 5 and no more than 10 photographs of the aircraft while it is being built.
3. **The Abstract and the zip file has to be submitted by 20th November 2018** containing the photographs for teams participating in IIT-Bombay Zonal round have to be sent by email to boeing@techfest.org with the team details clearly mentioned in the email. The Team ID should be explicitly mentioned in the email subject as well as the filename for both Abstract and zip file.
4. Link for Abstract Format- <http://www.ps.techfest.org/BoeingAbstract.docx>

Registration Deadline: 20th November 2018

Scope:

Evaluation will be carried out in two rounds for the Zonals; a qualifier round and a competitive round. The evaluation criteria and the constraints are listed in the Problem statement. Teams qualifying to the competitive round in the Zonals will be reimbursed a limited amount for the costs incurred towards the expenses for procuring materials for their models.

Format of the Competition:

The competition requires participants to design and fabricate an RC Aircraft (no readymade aircraft like RTF, ARF, and BNF etc. are permitted) and perform a set of tasks. Propellers, Motors, ESC, Servos, Receiver and Transmitter are allowed as off-the-shelf items.

The zonal events will be conducted in 4 IITs (East Zone: IIT Kharagpur, West Zone – IIT Bombay, North Zone – IIT Kanpur and South Zone – IIT Madras). Participants can register at any of the four zonal competitions and bring their aircraft and all necessary equipment to participate. The arena will be an open ground. There will be two rounds in the competition:

A. Qualifier Round**B. Competitive Round****A. Qualifier Round**

A good measure of the design of an aircraft is in rate of climb and gliding time. In this round, participants are required to make their aircraft (without payload) to climb for 20 seconds. After this, they need to perform a dead stick flight (throttle=0 or Gliding). The aircraft however can be maneuvered while it is gliding.

The teams will be graded based on the glide time of the aircraft as mentioned below.

Scoring for Qualifier Round: 10* (glide time in seconds)

A maximum of up to 30 teams, based on the score, will qualify to Competitive Round from the Qualifier Round.

Along with qualification to next round, qualifying teams will get a reimbursement of INR 5000 per team towards material costs for their models.

B. Competitive Round

In this round, the design w.r.t. to the payload handling capability of the aircraft is put to test.

The aircraft should carry one or more than one payloads (*golf balls of weight - 45g, diameter - 43mm-* will be supplied by the organizers during the competition) and drop them in a circular drop zone of 20m diameter. All the payloads in/on the aircraft should be released in a single drop. The payloads should fall as independent objects and should not be put together as one bigger payload (sticking them together or putting payloads into a single box etc. are not allowed). The drop zone is at a distance of 40m from the take-off and landing zone. (For a better understanding of the arena, refer to the illustrations).

The scoring for the Competitive round will be carried out based on the following formula.

Scoring Details: (Number of Payloads dropped in the drop zone)² *100

As is evident from the scoring, high advantage is given to Aircraft that are designed to be capable of carrying and dropping multiple payloads in a single drop within the zone. No points for payloads that fall outside the dropping zone.

A maximum time of 4 minutes will be given between the first take off and the final landing. The maneuver can be performed multiple times within the time limit for additional points.

Entire payload should be released using only one channel in the transmitter.

So, it is important to design the aircraft for quick loading (for multiple attempts) and quick releasing of payloads (to ensure they drop within the zone when released) in addition to the payload carrying capacity.

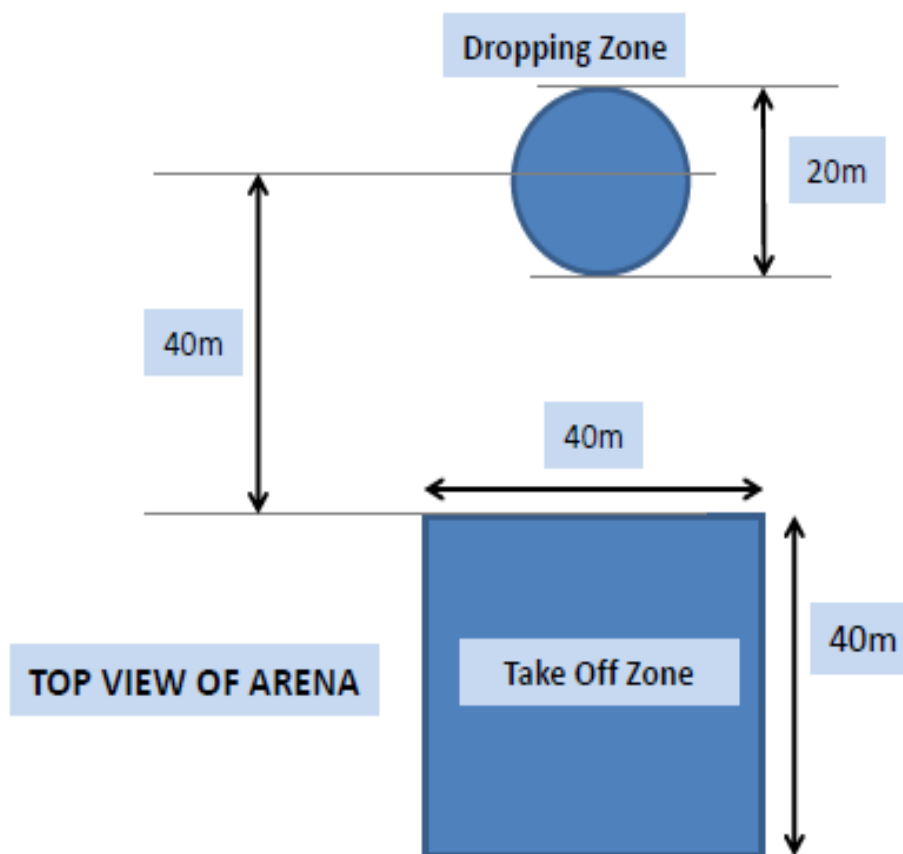
Partial dropping of payloads consecutively without reloading is not allowed. All payloads in the aircraft should be either released while dropping or removed from the aircraft or loaded again for next attempt.

Final Score:

Final Score = **Score from Qualifier round + Score from Competitive round**

If there is a tie, winner will be decided by a separate round framed by the Judges on the spot. Judges' decisions would be considered final in all cases.

Arena Information:



Rules:

1. Each team would be given **one attempt** in Qualifier round and **two attempts** in Competitive Round and the best score is considered as per the scoring procedure mentioned above for each round.
 - a. If the aircraft does not take off in first attempt during qualifier round due to uncontrollable/ natural causes like sudden gusts of wind etc., they will be given second attempt then and there itself. This will be applicable only if the cause happens within the first 3 seconds of flight.
2. The timer will start the moment the participating team enters the take-off zone with the aircraft or within 30 seconds of previous team completing their attempt, whichever is earlier. The participants need to be prepared in time and launch without delay after entering the take-off zone.

Rules on Team structure:

1. Maximum of 4 members in a team.
2. Members of a team may be from same college/school or different (School/UG/PG).
3. Any number of teams can participate from one college/school
4. Professionals are not allowed. Only students can participate.
5. Participants are required to get a bona fide certificate signed by the respective HoD/Dean/Principal in addition to their school/college ID Card.

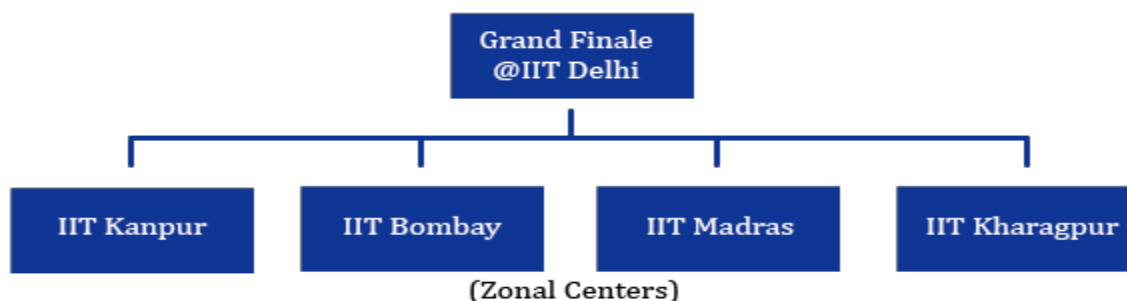
Revisions:

Any revisions to the Scope of the Competition would be intimated to all the participants via registered email and on the websites of the respective festivals at-least 45 days before the event takes place.

General Guidelines:

1. The use of 2.4 GHz radio is required for all aircraft competing in the competition. If the participants want to use any other frequency, they will have to inform the organizers in advance.

2. A limited number of 2.4 GHz radios will be available with the organizers for use by the teams. Teams who do not have access to radios can inform the organizers in advance to request use of these radios.
3. Receivers installed in the aircraft must be in 'receiver mode only'.
4. All the systems (Servos, motor, etc.) will be checked by organizers for functionality before the competition. If found not working, teams will be dismissed from the competition.
5. Pilot can position himself at any point in the arena to fly the aircraft during the rounds.
6. In view of stringent safety requirements, if a pilot flies out of the designated flying zone which includes overhead of the event organizing and control section, as mentioned at the venue, he/ she is disqualified and has to immediately turn back and land at any cost.
7. Teams are suggested to carry additional components (motors, batteries, propellers etc.) as needed to avoid last minute surprises at the venue. You will lose time/ attempt if you are not ready at the time of your turn.
- 8. Metal propellers are not allowed.**
9. The models can have powered take-off with a landing gear or can be launched manually by a person standing at ground level.
10. Aircraft should be built from scratch by the participants of the team and should not be a purchased model.
11. A team member can't be a part of more than one team.
12. Teams can participate in more than one zonal event if they are not qualified for the finals already.
13. Teams that claimed reimbursement in one zonal event cannot claim in any other zonal event in case they are participating in more than one zonal event.
14. New members cannot be added to the teams who have been selected at Zonals to reach the Final Round.
15. Bring your college/student I-Card at the time of competition.
16. Any of the above-mentioned rules, if found violated, teams would not be allowed to participate in the competition.
17. Each team is advised to bring all components for their aircraft although they are coming from same college. Any delay due to sharing of components might result in your team losing the time available for your attempt or lose the entire attempt itself.
- 18. Decision Taken by Judges and Organizers will be final and binding for all.**

**This would be a two-staged pan India Competition:**

- Zonal Level: The Zonals would be held in conjunction with the Technical Festivals of IIT Bombay, IIT Kanpur, IIT Kharagpur and IIT Madras. The First three teams from each of the Zonal competitions, a total of 12 teams from the Zonal competitions, will participate in the National level.
- National Level: The National Level Competition will be held at IIT Delhi for all the toppers from the Zonal Round to decide the champion.

Certificate Policy:

- Top three teams in the grand finale will be awarded Certificate of Excellence.
- E-Certificate of participation will be given to the teams scoring more than the critical marks which will be decided later.

Prizes:

The Prize money will be awarded to Winners via NEFT and will be processed within 20 working days after the receiving the Prize Money from Sponsors.

The Winner have to mail the following information (immediately after announcement of results) to rohan@techfest.org.

Subject: Boeing Aeromodelling Competition, team id- your position (example- Boeing Aeromodelling Competition, BO1003- 3rd Position) Body of mail-

1. Account Holder's Name
2. Account Number
3. Bank name and Branch name.
4. IFSC Code