Boeing & IITs present

National Aero-Modeling Competition

Introduction

Boeing in collaboration with the Technical Festivals of various IITs is organizing a first of its kind Pan India Aero-modeling Competition. The vision for the competition is to provide a unified national platform for students interested in aerospace and related engineering disciplines and to demonstrate their aero-modeling expertise.

This would be a two-staged pan India Competition – a) Zonal and b) National. The Zonals would be held in conjunction with the Technical Festivals of the IITs listed in the four Zones listed below. The First three teams from each of the Zonal competitions, a total of 12 teams from the Zonal competitions, will participate in a National level competition. Total Prizes worth Rs 5.4 Lakhs are up for grabs at the competition.

Venue & Timelines

Zone	Nodal IIT	Technical Festival	Date of Competition
South Zone	IIT Madras	Shaastra	**4th and 5th Jan 2014**
East Zone	IIT Kharagpur	Kshitij	**1st to 3rd Feb 2014**
West Zone	IIT Bombay	Zephyr	**9th Feb 2014**
North Zone	IIT Kanpur	TechKriti	**6th to 9th March 2014**
National	IIT Delhi	Tryst	**TBD**

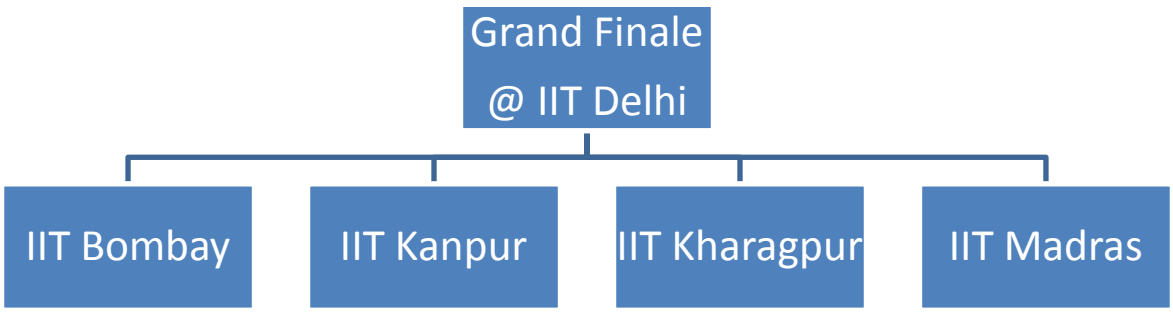
Scope

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

The competition criteria for the Finals will be declared soon.

Prizes

- **National Competition:**
  1st prize - Rs. 100,000 **2nd prize - Rs. 50,000** **3rd prize - Rs.30,000**
- **At each Zonal Competition:**
  1st prize – Rs. 50,000 **2nd prize - Rs. 25,000** **3rd prize - Rs. 15,000**



Aeromodelling workshops

Along with the competition, Boeing will also be sponsoring aero-modeling workshops to be conducted by the respective IITs. This will act as an additional platform where students who are interested in designing and building RC gliders, can get hands on experience in designing and building them. The dates for the workshops will be announced separately.

Problem Statement

Rules on Team structure

1. Maximum of 4 members in a team
2. Members of a team may be from same college or different (UG or PG)
3. Any number of teams can participate from one college
4. Professionals are not allowed

Design Constraints

1. The RC plane should measure a maximum of 1.0 m along any direction
2. **T/W =0.75** (if excess thrust is found, it will be neutralized by adding weight below the plane at center of gravity)
3. The use of IC engines is prohibited. Only electrical motors are allowed
4. The maximum voltage between any two points on the plane should be 12V at any point of time
5. Use of gyroscopes (gyros) is prohibited
6. One of the team members should fly the aircraft and another should call the stunts as they are performed (just before)
7. No Design change will be allowed after the Qualifier round at the zonal competition.

Abstract Submission

1. All the participants need to submit an abstract on their aircraft, which would be a **no longer than 2 pages** long with standard formatting. The Abstract would document the basic design of the aircraft (dimensions, wing areas, velocity, etc.) and would also explain how their design is suitable for given problem
2. Participants have to also send a zip file containing at-least 5 and no more than 10 photographs of plane while it's being built along with the Abstract
3. The Abstract has to be submitted to the respective Zonal competition 20 days in advance of the Zonal.

Zone	Nodal IIT	Technical Festival	Date of Competition	Final Date for Abstract submission
South Zone	IIT Madras	Shaastra	**4th and 5th Jan 2014**	**13th Dec 2013**
East Zone	IIT Kharagpur	Kshitij	**1st to 3rd Feb 2014**	**10th Jan 2014**
West Zone	IIT Bombay	Zephyr	**9th Feb 2014**	**18th Jan 2014**
North Zone	IIT Kanpur	TechKriti	**6th to 9th March 2014**	**3rd Feb 2014**

Format of the Competition

The competition requires the participants to design a RC plane (no Readymade Planes are allowed) and perform a set of maneuvers. The event will be conducted at the grounds of the respective IITs and participants will need to bring their aircraft and all necessary equipment to this venue. The arena will be an open ground. There will be two rounds of the competition.

A. Qualifier Round

B. Maneuver Round

A. Qualifier Round

The best measure of the design of an aircraft can be done by climb and gliding time. To examine this, participants have to climb for 30 seconds. After this, they need to perform a dead stick flight (throttle=0 or Gliding). The plane however can be maneuvered while its gliding.

The teams will be graded based on

a) Smooth Climb (35%)

b) Glide Time (65%)

Top 30 teams from the qualifier round will get a reimbursement of INR 5000 per team towards material costs for their models.

<u>Top 20 teams from the qualifier round will compete in the Maneuver Round.</u>

B. Maneuver Round

The Arena consists of 2 vertical poles separated by a distance of 25 meters and 2 horizontal bars/gates at heights of 3 meters-"entry gate" and 6 meters - "exit gate" separated by a distance of 10 meters (for better understanding of the arena- look into the arena diagram). Each gate would have enough space for planes to pass through, yet the skills of pilot could only guarantee a swift maneuver. The Arena will be at around 30 meters from Take Off zone to Landing Zone.

The participants get the scoring as below

a	A horizontal eight loop around the 2 vertical poles	**25 points** per loop (none for incomplete loop)
b	Fly-in through the entry gate and fly-out from below the exit gate	**25 points**
c	Fly-in through the entry gate and fly-out from above the exit gate	**35 points**
d	A horizontal eight loop around vertical poles immediately followed by Fly-in through the entry gate and fly-out from above the exit gate	**65 points**
e	- Safe landing before completion of 4 mins in the landing zone	**10 points** (no points for landing before the landing zone or a crash landing anywhere in the field)

Teams will have to perform all the above maneuvers (excluding landing) at least once. After they have completed the mandatory maneuvers, the teams can perform additional maneuvers in any extra time they have remaining before landing for extra points.

A maximum time of 4 minutes will be given to take off, complete the maneuver-set and land. Taking as many laps are allowed within 4 minutes but, the option has to be called before performance. Any further instructions would be given before the competition, on the spot. As soon as the timer crosses given time, only the points gathered by the aircraft till that moment are considered.

If there is a tie, winner will be decided based on a separate round in which time taken to complete one eight loop will be considered. Judges' decisions would be considered final in all cases.

Rules

1. Each team would be given 2 chances for each of the rounds and the best score is considered as per the scoring procedure mentioned above for each round
2. The timer will start from the moment the aircraft is in the air for both the rounds.

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 before the event takes place.

General Information

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. Metal propellers are not allowed.
4. The models can have powered take-off with a landing gear or can be launched manually by a person standing at ground level.
5. Plane should be built from scratch and not purchased models
6. Winners (Top 3 teams) from one zonal level are not allowed to participate in other zones, but others teams can participate again in other zonal competitions.
7. Teams who have claimed reimbursement in one Zonal cannot claim it in other Zonal.
8. A team member can't be a part of more than one team at any one given competition.
9. Bring your college/student I-Card at the time of competition.
10. Travelling allowance for grand finale will be given to the successful teams.
11. Any of the above mentioned rules, if found violated, teams would not be allowed to participate in the competition.

Award Policy

1. For zonal level winners

   Winner- Rs. 50,000 ; 1st Runner-Up- Rs. 25,000 ; 2nd Runner-Up- Rs. 15,000
2. For national level winners

   Winner- Rs. 1,00,000 ; 1st Runner-Up- Rs. 50,000 ; 2nd Runner-Up- Rs. 25,000
3. Every qualifying participant will be given a certificate of participation signed by Boeing and the Organizing Committee of the competition.
4. Winners will get certificate indicating their positions at different levels of the competition.

Contact Information

Zone	Nodal IIT	Technical Festival	Contact Information & Website
South Zone	IIT Madras	Shaastra	**Sooraj S :** boeing_aero@shaastra.org **Sidharth Ganesh:** ganesh@shaastra.org http://www.shaastra.org/2014/main/#boeing_national_aeromodelling_competition
East Zone	IIT Kharagpur	Kshitij	**Raviteja Verma:** raviteja.varma@ktj.in http://ktj.in/events/lawsofmotion
West Zone	IIT Bombay	Zephyr	**Nishant Khanduja:** nishantkhanduja@gmail.com **Vishal Insan :** vrinsan@gmail.com http://zephyr.aea-iitb.org/register.php
North Zone	IIT Kanpur	TechKriti	**Tigmanshu Goyal:** tgoyal@iitk.ac.in **Suraj Bhamare:** surajab@iitk.ac.in http://www.iitk.ac.in/dord/boeing/beia/boeinguniversityrelations/
National	IIT Delhi	Tryst	**TBD**

Aerotrix is the overall coordinator for the events across India. Participants can also contact Aerotrix for any issues they have. Their contact information is:

Phone	Email	Website
080-28531277	info@aerotrix.com	http://www.aerotrix.com/boeingcompetition

Arena Information