

BUMPS JUMPS (RC Car with IC engine)

Host Department/Institute/School	ASET
About the Events	Design can radio control car with IC engine
Conditions/Rules for participants	<p>IC Engine Car Make a wireless remote controlled machine, powered only by an IC engine, which can race against other opponents on an off-road dirt track with many obstacles.</p> <p>Machine Specifications</p> <ol style="list-style-type: none"> 1. Machine should fit in a box of dimensions 700mm x 500mm x 600mm at any moment of time during the race. The external device which is used to control the machine is not included in the size constraint. 2. The machine should be controlled by a wireless remote control mechanism throughout the race. 3. The machine parts may be roughly classified into structural and functional parts: Functional parts - Gears, differential gear, engine, springs, shock absorbers, servo motors (non propulsion purposes only), batteries, wheels and wheel hub can be directly used as available in the market. Structural parts - Chassis, steering mechanism, shock towers and suspension (excluding upper suspension arm, suspension spring and shock absorbers) have to be built by the participants themselves. 4. Judging for the same will be strict and the participant will be immediately disqualified if any of the above structural components are found to be ready-made. 5. The tires must have a minimum diameter of 3 inch. You are advised to use tires of good width

for better performance on dirt tracks.

6. **Brake Mechanism:** It is compulsory to incorporate braking mechanism in the car. Participants have to fabricate the brake pad as a part of the braking mechanism. Any other part used in braking mechanism (including the brake disk) can be readymade.
7. **Wheel Hub:** Any part rigidly attached to the wheel hub will be considered as a part of it and hence can be ready-made. An example here is that of the ball stud.
8. **Steering Mechanism:** Any part which is connected to steering rod rigidly i.e. has no degrees of freedom with respect to steering rod will be considered as part of steering rod and thus has to be fabricated by participants.
9. **Suspension mechanism:** Any part rigidly connected to suspension arms or one with no degrees of freedom with respect to suspension arm will be considered as its part and has to be fabricated by the participants, except the upper suspension arm. For example both the heim joint for the upper suspension arm and the stud rigidly connected to the wheel hub can be bought from the market.
10. If there are parts used in the concerned joint which are neither rigidly connected with suspension or the hub, steering system or hub; they can be used ready-made from the market.
11. The above pictures are just sample pictures for you to understand the rules easily.

Propulsion & Steering

1. The machine must use only mechanical power generated by an internal combustion (IC) engine for propulsion. Only one IC engine should be used in the machine. Use of any other sources such as chemicals, compressed gas, rockets etc. is not allowed.

2. Any machine which uses DC Motors for propulsion will be disqualified. However DC motors and servos can be used for steering mechanisms or any other control mechanisms apart from propulsion.
3. The machine must have an on-board power supply to run any mechanism requiring electric power.
4. The maximum allowed capacity of IC engine to be used is 4.6 cc (i.e. Participants can also use 2.5 cc, 3 cc, 3.5 cc or any other IC engine lower in capacity).
5. The electric voltage anywhere in the machine should not exceed 12V at any point of time.
6. There shall be a countdown preceding the start of the race. No participant is allowed to touch the machine during the countdown period.
7. Providing a clutch mechanism between the engine and the wheel would prove useful, as it would prevent the engine from dying out at any stage of the race.
8. Participants are advised to use a proper cooling mechanism to prevent overheating of the engine.
9. Participants are advised to use sway bars for better control and stability.
10. The participants are advised to use proper air filters as dirt might cause serious problems to the engine.
11. Readymade wheels are allowed.
12. The machine will be inspected and if found to be dangerous, the team will be disqualified. This decision rests solely with the judges and the organizers.

Game Rules

1. There will be a qualifying session with each team getting 2 laps out of which the faster lap will be considered. Note that these laps will have to be taken successively.

2. The top teams from the qualifying rounds will make it to the second round.
3. After the qualifying round, there will be races between multiple cars at a time. So the participants must use a remote with frequency of band spectrum 2.4 GHz.
4. The track will have check points at regular intervals. If a machine tumbles, halts or goes off the arena at any point on the track, one of the team members is allowed to lift it up and place it at the nearest checkpoint behind that point. The time shall still be running in the meantime.
5. Team members are not permitted to touch either their machines or those of their opponents once the race begins (unless there is need to lift the machine as stated in fourth point). The penalty for doing so is disqualification.
6. In the qualification round, a maximum of two team members are allowed from a team in the racing arena while in the final round only one of the team member will be in the racing arena except the controller on the stand.
7. The machines are not allowed to leave any loose parts on any part of the arena. Any machine disintegrating during the race will be disqualified.
8. If any of the machines starts off before the flag is waved, the counter would be restarted and the machines will get a second chance. However, if any machine starts off before the waving of flag (or countdown) for a second time, it will be disqualified. No rematch will be held for the second time.
9. Teams are not allowed to purposefully damage the machine of the opponent's team. If found doing so on track (while racing), the concerned team will be disqualified. Execution of last three rules will be subjective and relies completely on judges' and organizers' discretion.

Abstract Submission

Participants have to submit a written abstract of the working model before the competition. This abstract and the video will be used to shortlist teams for the competition. Only teams which send the abstract will be eligible to participate in **bumps n jumps at ALF 2014**.

The written abstract should be prepared on the following lines:

1. The steering mechanism, suspension mechanism, braking mechanism, the chassis layout, must be explained in detail along with proper diagrams. These have to be fabricated by participants themselves (excluding shock absorbers and springs in suspension mechanism). Ready-made kits are not allowed. Picture(s) showing all the three should be attached.
2. Photographs of empty chassis have to be attached. The chassis has to be built by the participants themselves. If participants have already proceeded building their chassis, they are requested to take photographs of their machine in current state. These photographs are required for verifying that the machine has been indigenously built.
3. Description of any unique/ advantageous mechanism used.
4. The specifications of ALL the components used, including engine, suspension springs, remote controller etc. have to be mentioned.
5. This abstract can be attached as a PDF file to the video and a CD can be prepared; or the abstract can be submitted on paper.
6. In case of online submission of abstract, URL of the video you have uploaded should be sent in the same submission.
7. An email will be sent to the team leader confirming the reception of the entry.

8. Each team is allowed to make one submission only. In case of multiple submissions, the last submission before the deadline will only be used for judging purposes.

Eligibility

All students with a valid identity card of their respective educational institutes are eligible to participate in ALF 2014.

Prelim Round

YES (Abstract Submission)

Judgment Criteria

In the qualification round on the basis of individual best times for completing one lap, top teams will be selected who will get into the final round. In the finals multiple teams will race together to triumph over the others.

Approximate Duration of the event

3 Hours

Team Size

- **Maximum number of teams**
- **Maximum number of participants from each team**

No Limit

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Registration Fee

INR 300 PT

