

SHA Astra 2015

Fire N ICE

I've tried everything other than jumping out of a plane, but nothing gives you an adrenaline rush like racing a car.

-Nigel Mansell



This year, we are increasing the limits, breaking boundaries in the field of RC car racing. The challenges and obstacles are really interesting and challenging. Here is the problem statement.

MOTO:

Build a RC nitro powered RC car [1/8th Scale Buggy] and model it accordingly to the specifications mentioned below and race against the opponents in an off-terrain track.

CAR SPECIFICATIONS:

1. The RC buggy should fit in a box of **500x500x500mm** box.
2. The maximum allowed piston displacement is 4.6 cc, and propulsion using any other means is strictly prohibited and will lead to disqualification.
3. The teams will have to control three components of the car which are,
 - (a) Engine throttle control
 - (b) Steering control
 - (c) Braking system

Participants have to have a wireless remote that controls the RC car, it can be two remote controls of distinct frequencies or a dual frequency remote control.

4. Those parts which need to be made by the team are:

(a) **Steering mechanism:** Any suitable steering mechanism can be implemented on the car.
[Please clearly mention about the mechanism in the Team description Paper.]

(b) **Chassis:** Include what material is used in making the chassis and the pictures of chassis when there is nothing mounted on it. These should be put up on the TDP. The wheelbase should be at least of the length 350mm.

(c) **Body cover:** The body cover of the car should be manufactured by the team themselves and the material used in manufacturing should be included in the TDP, along with its price and a picture of it.

Rest all of the parts and electronics can be bought directly from the market and attached to the car. Include all the parts bought for the car and the price for it in TDP.

5. Fuel

The fuel to be is should only have these constituents: methanol, castor oil/synthetic oil, nitro methane. The percentage of nitro methane should not exceed 20% by volume in the fuel. Fuel must be brought by the participants themselves. Fuel can be bought, in case of emergency.

Utmost one filter can be used in the fuel line. Air filter play an important role as they can give out purer fuel to the engine.

6. Power supply

The machine must have an on-board power supply to provide power to any mechanism requiring electric power.

The maximum voltage across any two points in the vehicle should not exceed 12 volts.

TRACK DESCRIPTION:

This time, the track is modified in such a way that the participants get a hold of how challenging and difficult it is to maintain the speed and control of the car on the track. Width of the track is 1.2 meter.

The driver will be given a stand from which he has to operate his car,

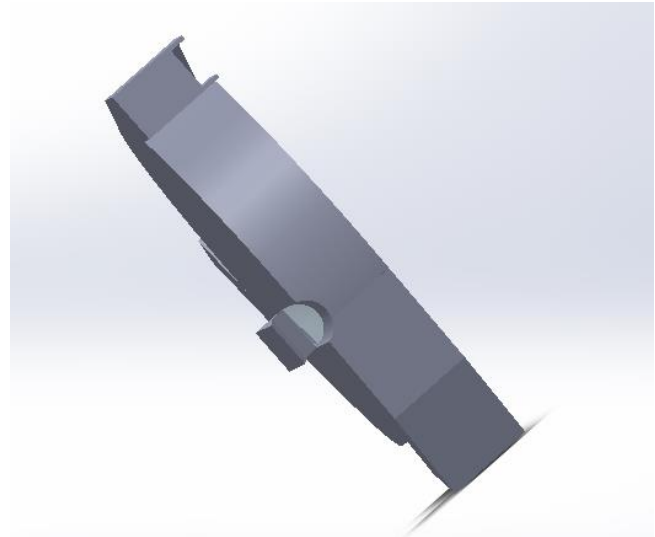
The car will have to race on an off-road track, which will have the following obstacles:

All the obstacles will be designed such that it is suitable for a 1/8th scale nitro buggy. So, there is no measurement units specified as such.

OBSTACLES

1. Death well

There will be an obstacle which looks like the figure below:

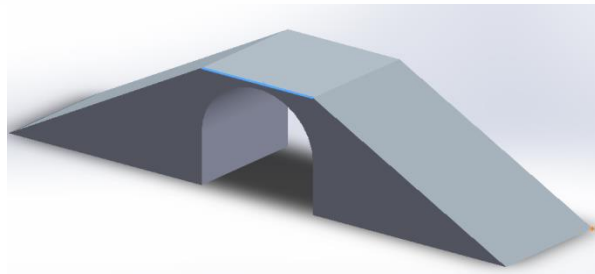


2. Textures of the track

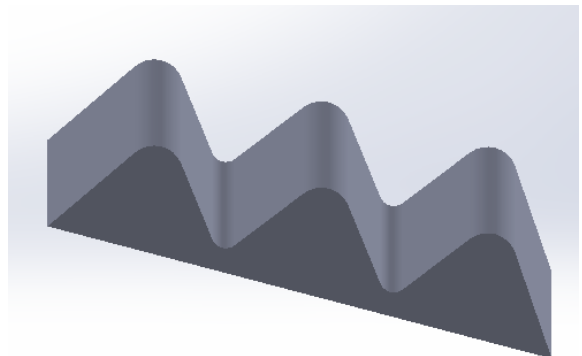
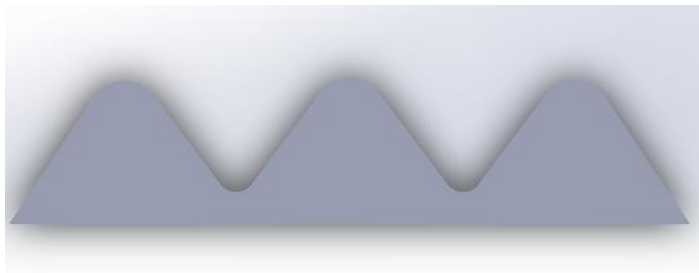
Most part of the track will be mud and dirt, but some parts will be made out of materials like carpets, wood planks and pebbles. This is to test the driver's idea of how to handle the car and how successfully he can cross over the track.

3. Bridge

There will be two high inclination angle wedges, and a connecting plank which will form a bridge. Refer to the following figure:



4. Continuous bumps, like that of the sine wave function.



There will be several checkpoints in the entire circuit, if a car topples and falls down, a member of the team is allowed to reset the car to its last crossed checkpoint. Only during this time the team member is allowed to touch the car, and not at any times once the race is started.

EVENT FORMAT

There would be a warm-up time of two and a half minutes before the actual start of the race, if the teams turn up early they can use this chance to get a glimpse of the track.

Round 1: Time trail

All the participants will be given a chance to go round the track twice and track time will be noted down, nothing else. The average of the two track times will be taken into account, and in case of discrepancies, the best track time will be considered.

Round 2: Group Stages

Some number of teams will be eliminated [the number will be notified at the event only]. The teams in the group will again have a time trail around the track, and the top team of every group will proceed to the grand finale! Again, the number of laps around the track is two, same rules as the in round 1 apply.

Round-3: The Grand Finale

The selected teams will be racing on the same track. Colliding with the opponent's car and overtaking are allowed in this round. Laps around the track will be 10. Refueling is allowed during this round. Track's width will be made sufficient enough to overtake other opponent's car.

RULES AND REGULATIONS

1. Each team can comprise of a minimum of two members and a maximum of five members. Each member must be a student with a valid ID card.
2. At the time of registration, teams will be provided with a registration number and will be allotted time for the qualifying rounds
3. Any team that is not ready at the arena at the time specified will be automatically disqualified.
- 4.. Any vehicle disintegrating during the race will be disqualified.
5. The teams must adhere to the spirit of healthy competition. The coordinators reserve the right to disqualify any team indulged in misbehavior.
6. Change in rules, if any, will be highlighted on the website and notified to the registered participants.
7. All decisions by the coordinators are final and binding.
8. No early starts are encouraged during the race, if done so, the car will be disqualified from the race.

TEAM DESCRIPTION PAPER [TDP] REQUIREMENTS:

1. Not all teams will be eligible to enter the competition, the teams which only send their TDP and follow the correct guidelines in filling it will be qualified to enter the competition during SHA Astra 2015.
2. As mentioned before, pictures, mechanisms [steering, suspensions, braking] and parts bought should be clearly mentioned in the TDP. If not, then the TDP will not be approved.
3. If there is some different mechanism implemented, please do mention in the TDP.
4. Avoid multiple submissions, only one submission per team is allowed.

Problem Statement, Rules and Scoring may change and all changes shall be reflected in the Shaastra website. And hence, the teams are responsible for keeping themselves well informed about the event. Keep visiting the website www.shaastra.org for updates regarding the event.

For any queries please mail firenice@shaastra.org with the subject as "Query: <query-topic>"