“*Ask any racer, any real racer. It doesn't matter if you win by an inch or a mile; winning's winning.”*
—The Fast and The Furious

Got thirst for speed? Then speed is what you’ll get. This March every limit shall be breached, every hurdle conquered, every tyre burned down, every drop of fuel guzzled as these speed demons blaze through the vicious turns and tantalizing straights of the booby trap riddled track that awaits; you know you just can’t sit back in awe. Fabricate a wirelessly controlled car powered by an IC engine and be a part of the frenzy.
Rev up the engines. Glory awaits this March, at Nitro Blaze.

The Task: Fabricate radio controlled car powered by an internal combustion engine not exceeding 4.6cc in displacement. The car must be capable of competing against other cars in an off road race involving many obstacles.

*Submitting the abstract is not mandatory, it will only be used for awarding points and judging the innovation of the participants.

The Arena:

One track shall be an all-terrain track consisting of sharp turns, undulations, rough and smooth patches and the following obstacles:

- Small bumps of 3 inch diameters and of height 1.5 inches.
- Multiple bumps and depressions of 2 inches diameter and 1 inch height/depth.
- Ramps of length 60cm height 25cm.
- Bridge of height 2 feet and total length of 15 feet.
- Width of the track for most of the part will be around 6 feet (shortcuts will be of lesser width)

1. The other track shall be a long, smooth and obstacle free straight meant to test the top speed and acceleration of the car. It will be used only in the qualification rounds.

2. A control stand will be provided along the track for the driver to position himself to control his vehicle during the run. The height of the stand will be around 5 to 6 feet. The controlling of the machine has to be done from this site only.
3. Any changes in the obstacles will be duly updated on the main website and promptly communicated to the registered teams. The participants are advised to check the website regularly for updates.
4. Despite organizers' efforts to keep the track quality intact, the track is subjected to undergo wear and tear as machines run over it. The machine is expected to be able to perform on such a weakened track.
5. Multiple machines will race on a single lane track at a time.

Machine Specifications:

1. Machine dimensions shouldn't exceed 800mm*600mm*600mm at any moment of time during the race (dimension constraint doesn't include the external device used to control the machine.).
2. Machine should be controlled by a wireless remote control mechanism throughout the race.
3. Following is a rough classification of the parts of the machines:

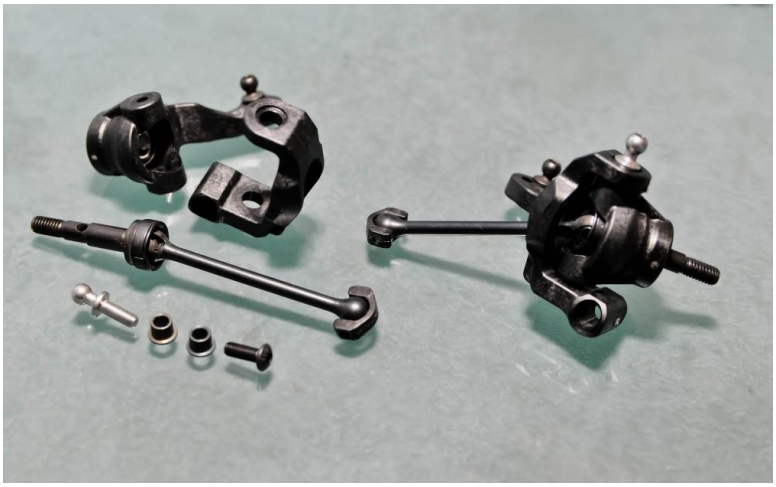
   Functional parts - Gears, differential gear, engine, springs, shock absorbers, servo motors (non-propulsion purposes only), batteries, wheels, wheel hub are allowed to be used as available in the market.

   Structural parts - Chassis, steering mechanism, brake mechanism (brake pads and brake disk) shock towers and suspension (including upper and lower suspension arms, suspension spring and shock absorbers). Teams shall be awarded points for every structural part that they fabricate as per the following scheme:

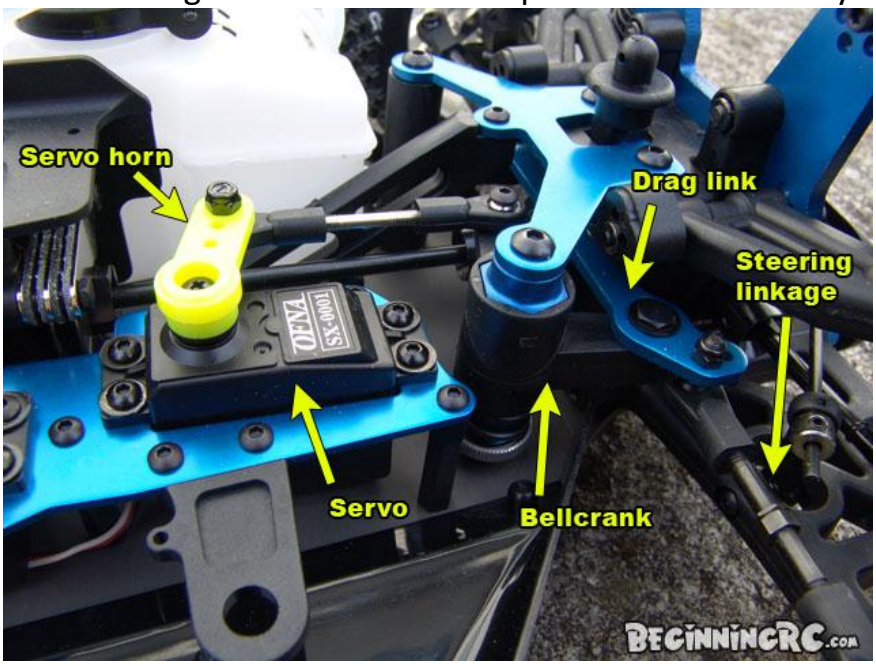
   - Chassis – 50 points
   - Steering tie rods – 10 points per tie rod
   - Other parts of the steering mechanism – 15 points for each part
   - Shock towers – 5 points

- Upper suspension arms – 10 for each part
- Lower Suspension arms – 5 for each part
- Brake pad and disk – 5 for each part

4. **Tyres:** The tyres used must have a minimum diameter of 3 inch. You are advised to use tyres of good width for better performance on dirt tracks.
5. **Wheel Hub**: Any part rigidly attached to the wheel hub will be considered as a part of it and hence can be ready-made.

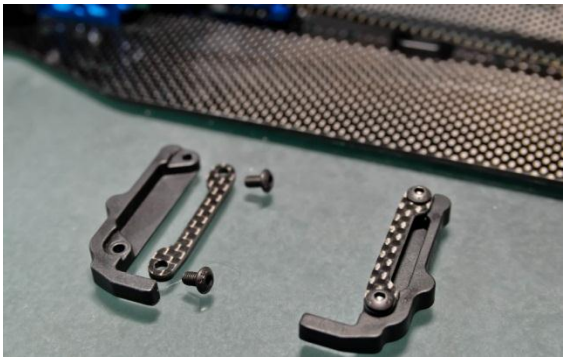


6. **Steering Mechanism:** Any part which is connected to steering rod rigidly i.e. has no degrees of freedom with respect to steering rod will be considered as part of steering rod and thus carries points if fabricated by the participants.

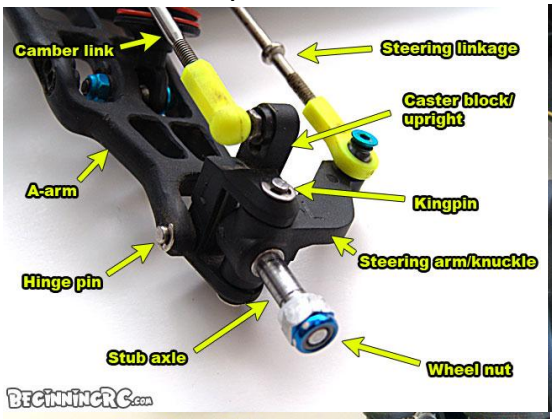


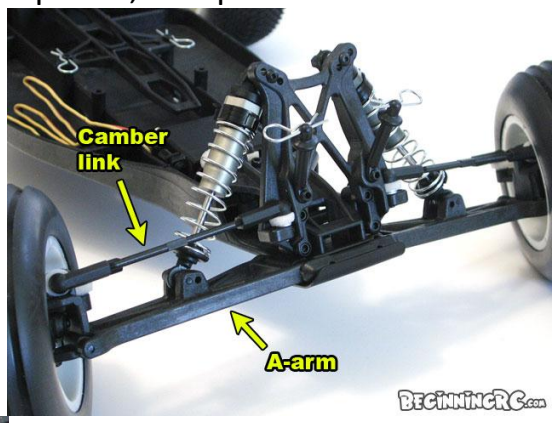
(Courtesy: http://www.beginningrc.com)

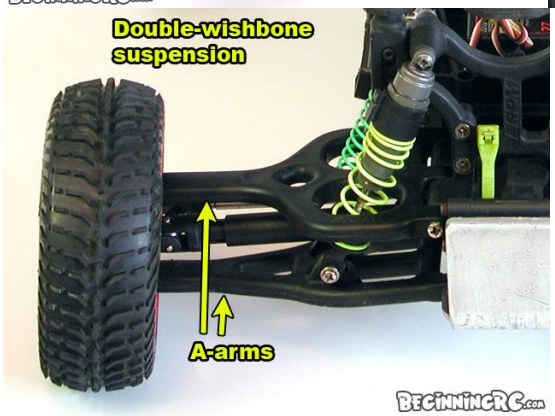
7. **Braking Mechanism:** Having a braking mechanism in the car is mandatory. Points shall be awarded for fabricating the brake pads and brake disc.


(Brake pads which grip the brake disc)

8. **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 hence carries points, except the shockers.







(Courtesy: http://www.beginningrc.com)

9. Any other part used can be procured readymade.

Propulsion and steering:

1. The machine must only use the mechanical power generated by an Internal Combustion (IC) engine for propulsion. Only one IC engine should be used. Use of other sources like rockets, chemicals, compressed gases etc. is not allowed.
2. DC motors can be used for controlling steering mechanism and/or any other 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. Teams are advised to use a clutch mechanism between the engine and transmission, cooling systems to prevent overheating, air filters for the engine and sway bars for better control and stability.

Event structure:

The event will consist of a total of 3 rounds:

1. Qualification round: First each team's car will be inspected for safety and points will be awarded for fabrication of parts as per the above scheme. Please note that if any car is deemed to be unsafe then it shall be disqualified and the decision of the organizers shall be final and binding. Each team will then run their machine for two successive complete laps of two different tracks. On each track, only the faster lap time shall be considered. Points will be awarded as per the following rule:

Points scored = 1000 – (t/2) + points for fabrication of parts,

where 't' is the combined time in seconds clocked on the two tracks. Top 18 teams in the points tally will be selected for the next round.

2. Quarterfinal round: 3 machines at a time will race on the track out of which only the winner will qualify for the next round.
3. Semifinal round: Again 3 machines will race at a time and the winner lone will qualify for the final round. However for the 3rd contender of the final race, there will be a race between the machines that stood 2nd in each of the two semi final races.
4. Final round: The three machines will then race for the ultimate glory.

Game Rules:

1. The track will have check points at regular intervals. If a machine tumbles, or 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.
2. 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.
3. There will be a maximum of only 1 member allowed inside the racing arena to lift the machine if required during the race.
4. 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.
5. If any of the machines starts off before the countdown, the counter would be restarted and the machines will get a second chance. However, if any machine starts off before the countdown for a second time, it will be disqualified. No re- match will be held for the second time.
6. 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.

Control Rules:

1. Participants are required to use a remote control of frequency of band spectrum **2.4 GHz.**
2. The above rule is to ensure that there is no frequency clash during the competition and participants are not allowed to use any other remotes with frequency other than **2.4 GHz.**

General Rules:

1. The teams must report on time for their slots failing which they shall be immediately disqualified.
2. Only two members of the teams will be allowed to handle and operate the machine.
3. Stepping onto the arena without the consent of the organizers is strictly prohibited, failing which might lead to disqualification.
4. The teams must pass a security check of the robots prior to a match; use of flammables, explosive, combustive or otherwise hazardous processes is not allowed.
5. Participants are not allowed to keep anything inside the arena other than their robot.
6. Use of radio jammers or anything that disrupts the control of other robots is strictly prohibited.
7. Only the points and time recorded by the organizers shall be considered and their decision shall be final and binding in case of any disputes.
8. The organizers reserve the right to change any or all of the above rules without prior intimation, however any change shall be reflected over here and promptly communicated to all registered participants.

Team Composition and Registration:

1. A team must not have more than 5 members.
2. Each team member must produce a valid ID card of his/her respective educational institute at the venue.
3. A team may comprise of members from different educational institutes.
4. A team once registered cannot register again, even with a different name.

Certificate Policy:

Top 3 teams shall be awarded Certificates of Excellence while the rest shall be awarded Certificates of Participation. The team having the best design as per the judges shall be awarded a Certificate of Excellence.

Abstract Submission:

Teams are required to submit an abstract of the working model to be eligible to participate in Nitro Blaze. Participants must **download** the abstract form from the website and submit it before the mentioned deadline. A confirmation of the entry shall be sent to the team leader once we receive the abstract. Please note that only one entry is allowed per team and in case of multiple entries only the latest entry before the deadline shall be considered.

Important Note: Exodia takes the responsibility of keeping the information contained in the abstract confidential. The abstract is meant to help us assess the efforts put in by the participants and the seriousness of the entries, so if you are not able to meet the requirements or complete the abstract we encourage you to submit it as per the current state of your machine before the deadline. This means that even if your machine is incomplete you should **still** send in your entry along with the abstract complete to the best of your knowledge, instead of not sending it at all or asking for extensions. The abstract shall be useful everywhere in future as an evidence of your hard work, so please pay adequate attention to it.