Event Structure

There will be 3 rounds in the competition:

Round 1: Hovering

This round will test the stability of the rotor.

The controller will be given 1.5 minutes in which he/she has to take off from a starting point and then land the rotor in the given region 8m from the starting point as given in the arena section.

There are 4 regions (i.e. regions formed between the concentric circles):

 a) **Region A -** It is the area covered by the innermost circle which will be of 50 cm in radius.

 b) **Region B -** It is the region which is enclosed by the square of side 1.5m and the circle with radius 50cm

 c) **Region C -** It is the region which is enclosed by the circles with radius 125cm and the square of side 1.5 m.

Points Distribution:

- Landing the rotor in:

        a) <u>Region A</u> will earn the team with 100 points

        b) <u>Region B</u> will earn 70 points

        c) <u>Region C</u> corresponds to 40 points

        d) <u>Landing outside this circle</u>, a team will not get any point for this round.

- In case the multirotor is landing on more than one region i.e. the line joining the radial points of contacts of the multirotor's body with the ground lies in more than 1 region, the points given to the team will be the average of the scores of the individual regions.

- Along with this, the time taken from take-off to the first point of contact on the ground after take-off will be noted(say time is t(sec)) and, (90-t) points will be added to your score in the Round 1.

Round 2: Weight Lifting

This round will be testing the power of your rotor.

2 attempts will be given to each team in which they have to lift some weight (to be decided by the team itself) up to a minimum height of 50cm and hold it air-borne for at least 30 seconds, and then make a controlled landing to the ground. The weights will be in the form of plastic bottles which will be filled with water to adjust the weight.

-The maximum of the two weights lifted followed by the controlled landing in the 2 trials will be counted as the Payload lifted and winners for this round will be decided on the basis of payload fraction.

- <u>Payload fraction</u> is the ratio of the payload to the total weight of the rotor.

For example a 1.5Kg model that can lift 3Kg would beat a 20 Kg model that can pick up 35 Kg, because the smaller one has a payload to machine weight ratio of 2.00 and the larger machine has a payload to machine weight ratio of 1.75.

- <u>Clarification</u>

a) <u>Payload Weight</u>: Payload weight is the weight that is additional to the weight of the Multirotor in its successful flight. So Payload will be extra weight attached and the weight of Batteries and motors etc. cannot be counted to as the payload. The extra weight will be in the form of bottles filled with water that will be attached through hooks/pouches prepared on the rotor. So in no way the payload will be adding strength to your model.

b) <u>Machine Weight</u>: In it the weight of batteries and motors etc. will be added to the model weight, means total weight of Multirotor will be taken into account which is lifting the payload.

- Points Calculation:
Score in Round 2 = 100 X payload fraction
*Only Half the points will be given if the minimum height criterion is not fulfilled.
The organizers reserve all rights to change any or all of the above rules. Changes will be highlighted on the website and will also be mailed to all the registered participants. However, you are **suggested to keep checking the website regularly.**

Round 3: Racing

This round will fill you with thrill and add all the more fun. It will include racing the multirotors around obstacles. The smaller the machine, better will be its manoeuvrability.
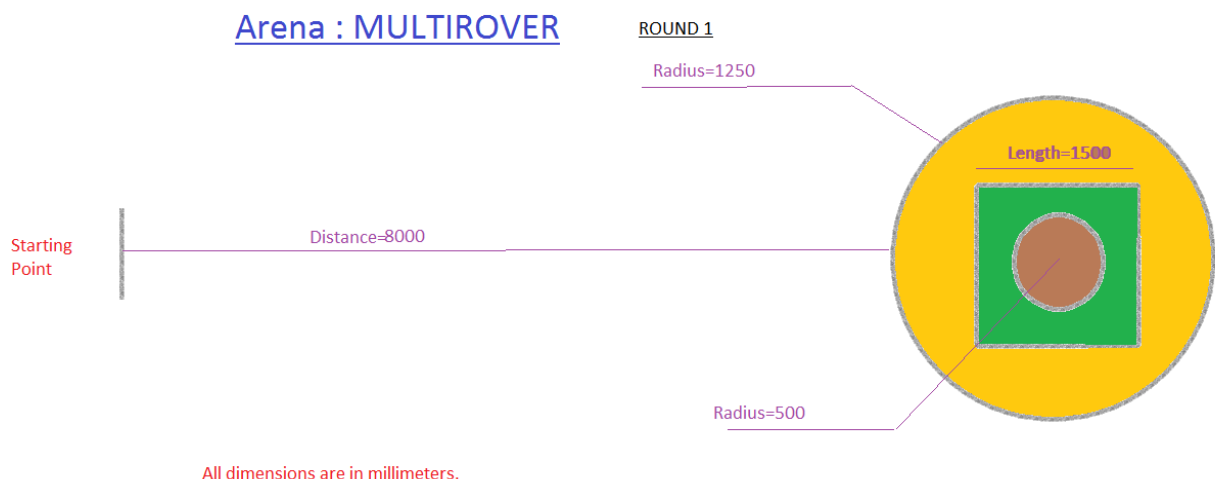
Obstacles including poles to go around and gates to pass through will be set up 2m apart in a total length of 10m along the track. The Multirotors, one at a time will line up on the start/finish line and given a chance to spool up the motor to idle condition. Once all the props are spinning and ready, the whistle will sound and the race will start. The multirotors have to cross the starting line and reach the finishing line. Time will be counted from the moment the whistle sounds until the craft touches down on the finishing line. The pilot will be allowed to walk along with their model inside and outside the course to be able to judge the clearance of each of the obstacles.

Arena

Round 1:

Spot Landing:

- Model should be landed in the inner most circle to get maximum points.

- No points will be given for landing outside the biggest circle

- Diameter of innermost circle is 1 m.
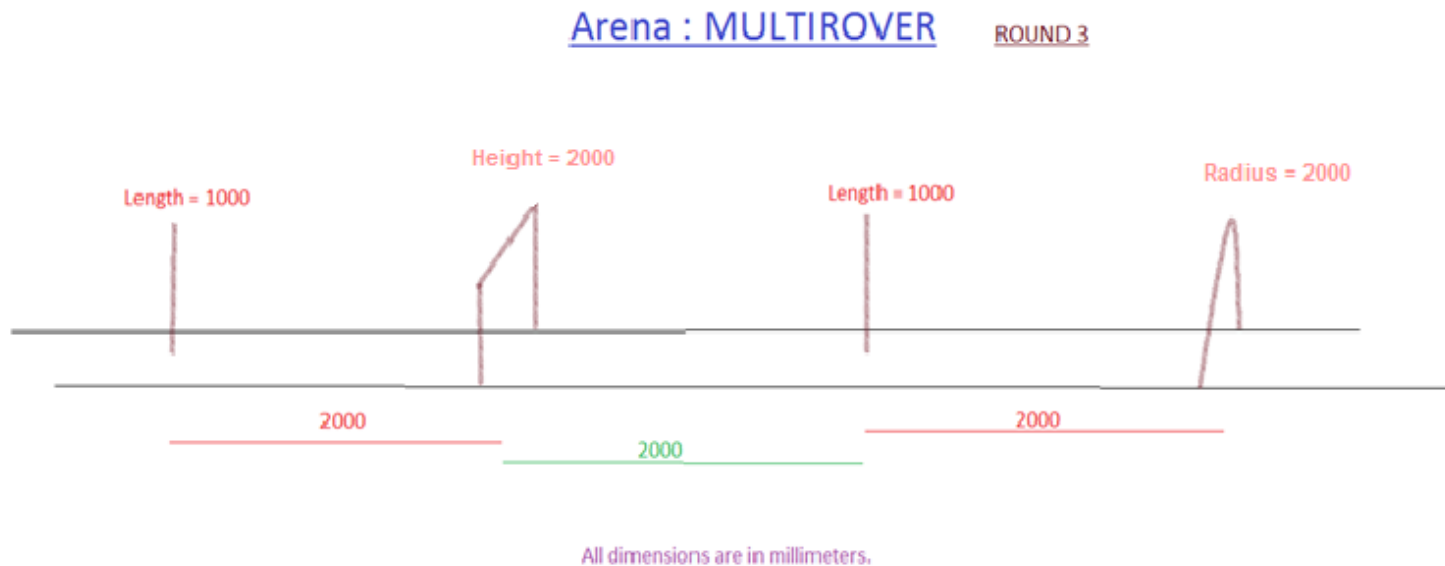
- Diameter of outer circle is 2.5m.

Arena : MULTIROVER   ROUND 1

Radius=1250

Length=1500

Distance=8000

Starting Point

Radius=500

All dimensions are in millimeters.

ROUND 3:

Maximum points will be given only if the rotor crosses over the obstacle.
Only half the points will be awarded if the rotor foes around or under the obstacle.
Width of the track will be 2m.

Arena : MULTIROVER   ROUND 3

Height = 2000

Length = 1000

Radius = 2000

Length = 1000

2000

2000

2000

All dimensions are in millimeters.

Judging Criteria
Round 1
- The arena is divided in 4 regions:

    a. Region A will earn the team with 100 points
    b. Region B will earn 70 points
    c. Region C corresponds to 40 points, and
    d. Landing outside this circle, a team will not get any point for this round.

- The first point of contact of the rotor on the ground will be considered i.e. even if the rotor has 3 of its legs in air and just one of them touches a region the points scored by the team in this round will be the points corresponding to that region.
- Points scored by a team in this round will be added to the points of Round 2.
- A stop watch will be used to measure the taken by the rotor to land. The duration shall include the time when rotor is launched to until it touches the ground in the first instance.
- Along with this, the time taken from take-off to the first point of contact on the ground after take-off will be noted(say time is t(sec)) and, (90-t) points will be added to your score in the Round 1.
- There will be extra points for stability (max. 30 points). These will be awarded by the judges.

Round 2

Points Calculation:

Score in Round 2 = 100 X payload fraction
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Round 3

Points Calculation:

- The time taken from take-off to the first point of contact on the ground after take-off will be noted(say time is t(sec)) and, (240-t) points will be added to your score in the previous rounds.

- The scores of all 3 rounds will be added.
- The top three teams will be granted certificates and prize money.
- All decisions taken by the organising team will be deemed as final.