

## «AIR RACE» CONTEST RULES

Version 2.1 dated August 11, 2014.

### 1. General provisions

#### 1.1. Field

- 1.1.1. Field length is 10 m, width is 5 m; height is 3 m. The field is covered with a protective net. Two orange-colored poles are positioned in the field, at a distance of 5 m. The poles are 3 m high with diameter equal to. A 2 m free space is ensured around the poles.
- 1.1.2. By way of navigation aid, the field has a dark dashed line on a bright background. Line width is 5 cm; length of each dash 30 cm; distance between dashes is 10 cm. The line circumscribes an eight curve round the poles (Fig. 1).

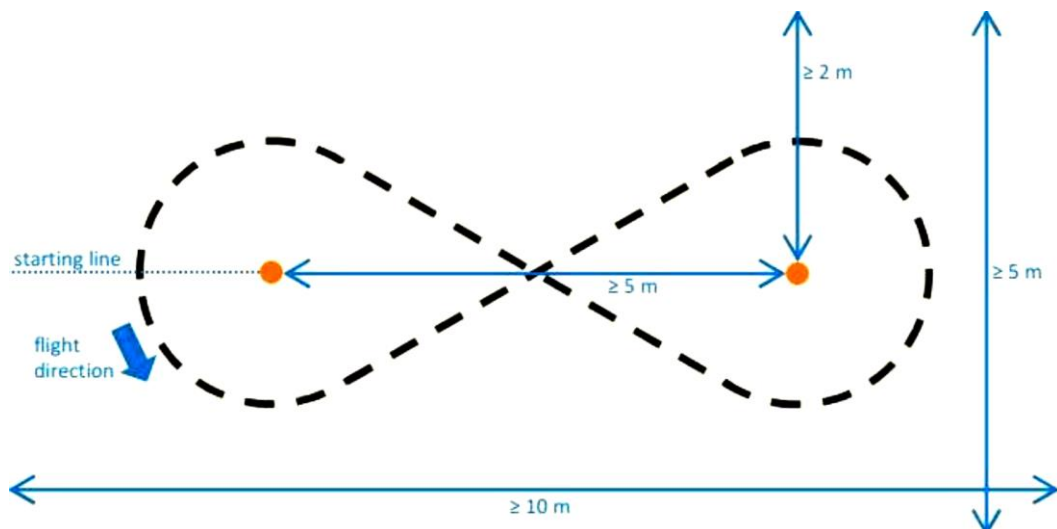


Fig. 1. The field scheme

### 2. Requirement to Robots

#### 2.1. Main specifications

- 2.1.1. The robot must be a flying vehicle capable of flying at a height of 1-2 m.
- 2.1.2. Flying vehicles include planes, propeller-driven machines (helicopters and multi-copters), ornithopters and zeppelins.
- 2.1.3. The weight of planes must not be in excess of 500 g, weight of propeller-driven machines– 1 kg, the weight of any other construct– 2 kg.
- 2.1.4. Maximum speed limit is 10 m/s. 2.1.5. Zeppelins must fit in a 1x1x2 m parallelepiped. Any other constructs must fit in a cube with side equal to 1 m.



## 2.2. Self-sustained nature

- 2.2.1. The robot must be fully self-sustained. Any control means failing to interact with a human are allowed.
- 2.2.2. Additional navigation aid is allowed. This may be represented by the dashed line on the field, active or passive beacons or marks on the floor.
- 2.2.3. Active beacons must be powered from batteries; usage of electric mains is prohibited.
- 2.2.4. The beacons must be installed during the preparation time.
- 2.2.5. The beacons must be fully removed from the table within 2 minutes after the flight.

## 2.3. Safety

- 2.3.1. Failure to comply with safety requirements entails disqualification.
- 2.3.2. Only electric motors are allowed.
- 2.3.3. Each robot may participate in the contest only once.
- 2.3.4. The robot must have no potential hazardous parts except for the propellers.
- 2.3.5. Only incombustible gas may be used in zeppelins.
- 2.3.6. The pilot must be able to take control of the robot at any moment of time.
- 2.3.7. Only one member of the participant team is allowed to enter the flight zone.
- 2.3.8. The teams must fulfill the referees' requirements.
- 2.3.9. The referee may interrupt any flight.

## 2.4. Check

- 2.4.1. The robot may participate in the contest only having passed the check. The check is for the requirements to the robot that are listed below.
- 2.4.2. The robot must display its ability to stay at a height of 1-2 m without interference of a human.
- 2.4.3. The pilot must prove his/her ability to control the robot in the manual mode.
- 2.4.4. The robot must satisfy all the safety requirements.

## 3. Game

### 3.1. Objective of game

- 3.1.1. The robot must circumscribe eight curves round the poles as many times as possible within 10 minutes.
- 3.1.2. During the flight, the robot must be at a height of 1-2 m above the ground.

### 3.2. Start

- 3.2.1. Each team is allowed 5 minutes for preparation. During preparation, one member of the team is allowed to enter the flight zone.
- 3.2.2. Upon preparation completion or upon expiry of 5 minutes, the referee commences taking the 10 minutes long flight time meanwhile the pilot may launch the robot.



- 3.2.3. Launch must be performed from the start line.
- 3.2.4. During the flight, there must be no people in the flight area.

### 3.3. Re-launch

- 3.3.1. The flight is terminated when the robot has touched the ground or the safety net or when the pilot has decided to interrupt the flight.
- 3.3.2. Restarts are allowed. To re-launch the robot, the pilot may (by the referee's permission) enter the flight zone.
- 3.3.3. In case of restart, the referee's stopwatch is not stopped.

### 3.4. Finish

- 3.4.1. The attempt is over upon expiry of 10 minutes of flying time or by the referee's command.

## 4. Points tally

- 4.1.1. The robot must circumscribe an eight curve in the correct direction as shown in the figure.
- 4.1.2. The robot scores 1 point for each correctly circumscribed eight circle.
- 4.1.3. All points scored during a launch are summed up.
- 4.1.4. In case there were multiple launches, each of them is tallied separately with the start having yielded maximum points counting.