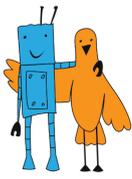


## «CORRIDOR RALLY» CONTEST RULES

*Version 5.0 dated August 23, 2019*

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## 1. General Provisions

One team plays one robot.

### 1.1. Task Description

The distance must be completed along the specified trajectory for a minimum amount of time.

## 2. Requirements for the Robot

The robot must be fully autonomous.

Additional Requirements for the Robot:

- length - not more than 500 mm;
- width - not more than 500 mm;
- height - not more than 500 mm;
- weight - not more than 10 kg;

The robot must be designed as a four-wheeled car with rear-, front- or all-wheel drive and steered front wheels. The steering wheels must not be mounted on the same kinematic axle. The robot's direction of travel must only be changed by turning the steering wheels around their vertical axis.

A minimum of 10 mm thick protective bumper made of shock-absorbing soft material (foam, polyurethane foam, porous rubber, etc.; inelastic plastic is not allowed) is required on the front of the robot.

## 3. Specifications of the Field

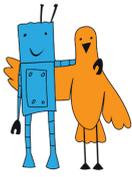
### 3.1. Track

The field is a track formed on both sides by boards. At the discretion of the organizers, there may be some obstacles on the track. In front of the obstacles there are signs warning about approaching an obstacle.

The start-finish line is a 50 mm wide line; the line color is white.

Track Specifications:

- width - 1500 +/- 500 mm;
- surface color - white;
- surface material - arbitrary (optimally - banner fabric);



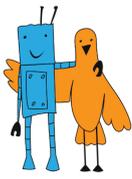
- surface relief - there may be some irregularities with a height of 50 mm max and an angle of slope of 35 ° max;
- angle between adjacent sections - more than 100 °.

#### Board Specifications:

- construction - sections composed one after another fixed and stable along the track in the form of an arbitrarily broken line in plan view (view from above);
- material - rigid (wood, plastic, chipboard, etc.)
- height - not less than 200 mm;
- gaps - not more than 100 mm between sections.

#### Warning Signs Specifications :

- type of sign - group of lines;
- line color - black;
- color of the interval between the lines is white;
- line width - 50 mm;
- interval in the group of lines is 50 mm in the light;
- line orientation - parallel to each other and perpendicular to the trace axis.



## 3.2. Obstacles

The "stones" obstacle (see the "General Contest Rules") is a zone along the width of the track. The height is 25+/-10 mm. The length along the track is 1000+/-500 mm. Warning sign about approaching the obstacle - sequence of 2 groups of lines. The first group of 2 lines with an interval of 1 m before the obstacle along the longitudinal axis, the second group of 2 lines - 2 meters before the obstacle (see Fig. 1).

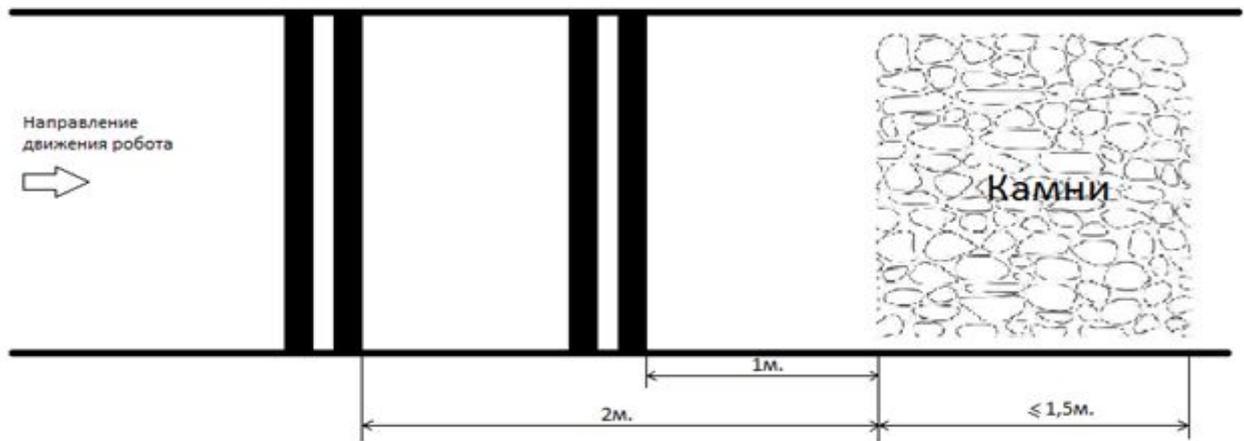
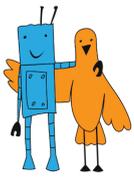


Figure 1. "Stones" obstacle



The "Track Discontinuity" is a gap between the board sections with the displacement of the axes of the track sections. The gap length is  $2000 \pm 500$  mm. The surface of the obstacle is formed of white banner material with parallel black lines 50 mm wide. The distance between the lines is 200 mm in the axes. The axis displacement of the sections is  $1500 \pm 500$  mm. Warning sign about approaching the obstacle - a sequence of 2 groups of lines. The first group of 3 lines is placed with an interval of 1 m before the obstacle along the longitudinal axis, the second group of 2 lines - 2 meters before the obstacle (see Fig. 2).

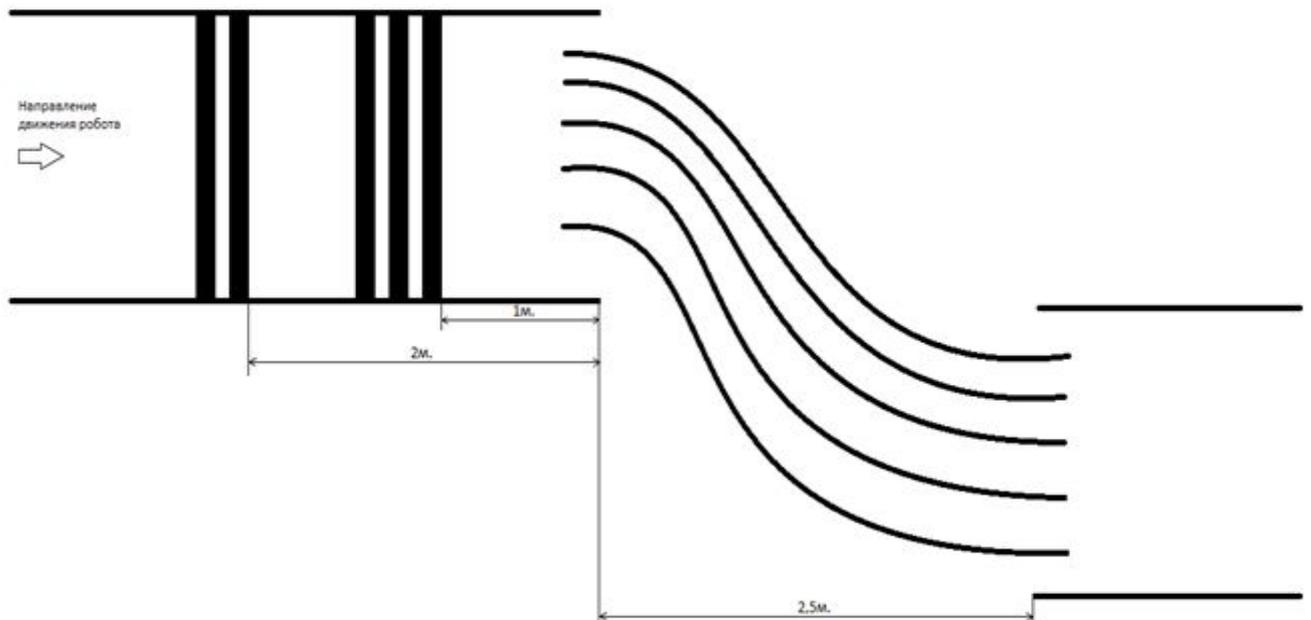
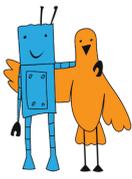


Figure 2. "Track Discontinuity" obstacle



The "Stop Line" obstacle is a 250 mm wide black line across the track. The robot must stop completely at this line and only then continue moving. When the robot stopped its projection must not go beyond the black line in the direction of travel. Warning sign about approaching the obstacle is a sequence of 2 groups of lines. The first group of 4 lines is placed at intervals of 1 m before the obstacle along the longitudinal axis, the second group of 2 lines is 2 m before the obstacle (see Fig. 3).

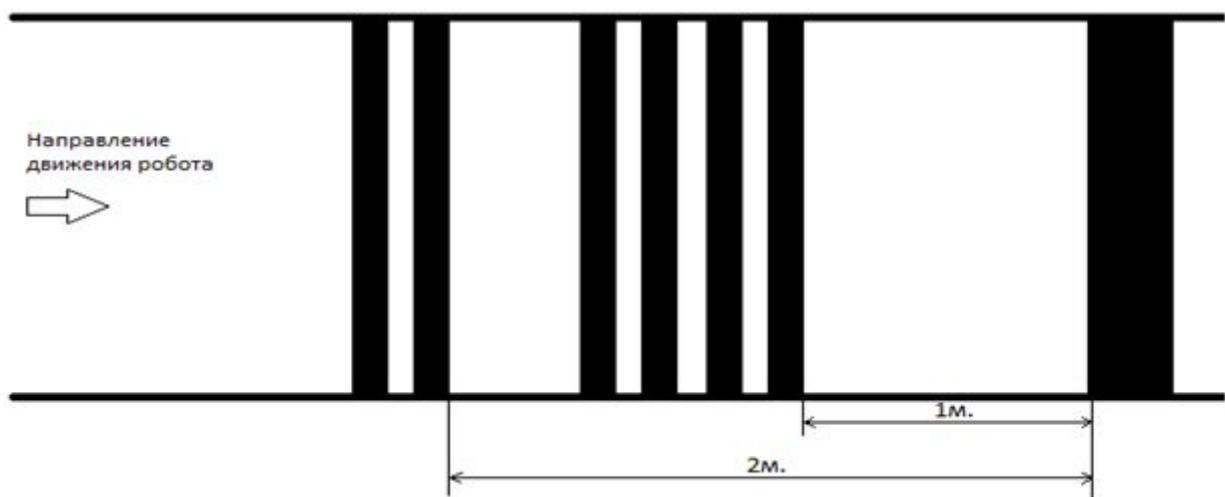


Figure 3. "Stop Line" obstacle

## 4. Contest Procedure

Robot starts by crossing the start-finish line.

Robot finishes after crossing the start-finish line.

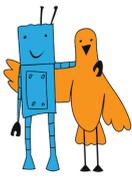
The time taken to complete the task plus the accumulated penalty time are counted.

The track line is configured by the organizers on the day of the competition.

If the robot is unable to overcome an obstacle (an element of the field), the participant may verbally announce to the judge that the task has not been completed by saying so: "Stop!", and with the permission of the judge to place the robot on the center of the track line just behind this obstacle (at the meeting point with the element of the field). The run time is not interrupted.

The competitions are held in two rounds:

first round is the qualification round;



second round is the final round.

## 4.1 Qualification Round

The robots start one by one, performing qualifying runs.

The duration of the run is 2 minutes.

Robots that have crossed the track within 2 minutes, taking into account the penalty time, are considered to have passed the qualification and are admitted to the next final round.

## 4.2 Final Round

Robots compete in pairs according to the Olympic or all-play-all systems.

The starting position of the robots in a pair (left or right in the direction of travel) is determined by the Judge by the draw method.

If it is not possible to determine the winner of the run (taking into account the penalty time), a replay is scheduled.

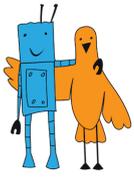
In case of collision of robots and impossibility to continue movement, time stops, robots are separated by participants and started from the same place at the command of the judge, and the countdown of time resumes. The robots' relative positions remain the starting positions.

## 5. Disqualification and penalty

### 5.1 Penalty

Penalty seconds are charged for the following violations:

- the robot has touched the board of the track - 10 penalty seconds;
- the robot is moving touching the boards - 10 penalty seconds for each meter;
- the robot has not stopped at the "Stop Line" obstacle (the projection of the robot has completely gone beyond the "Stop Line") - 20 penalty seconds;
- the robot has crossed the "Stop Line" obstacle (the robot has stopped at the obstacle and its projection has partially gone beyond the "Stop Line" in the direction of the robot's travel) - 10 penalty seconds;
- the robot cannot overcome the obstacle (an element of the field) - 30 penalty seconds.



## 5.2. Disqualification

In the following cases the attempt will be disqualified:

- the robot is non-autonomous (external control of the robot);
- during the attempt the participant has touched the field or the robot;

## 6. Scoring

N/A

## 7. Procedure for Determining the Winner

The winner of the run is the robot that has spent the least time to overcome the track (taking into account the penalty time),

The winner of the competition is the robot that took first place in the tournament.