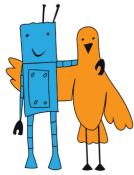


## «RELAY RACE» CONTEST RULES

*Version 4.0 dated August 11, 2019*

1. General Provisions	2
1.1. Task Description	2
2. Requirements for the Robot	2
3. Specifications of the field	2
4. Contest Procedure	4
5. Disqualification	5
6. Scoring	5
7. Procedure for Determining the Winner	5



## 1. General Provisions

The run is held by each team independently. One team plays two robots.

### 1.1. Task Description

During the race two robots of the same team must drive one after the other (first one robot drives a full lap, then the other robot does) the maximum number of laps with a relay baton passing it every time in the exchange area.

## 2. Requirements for the Robot

The robot must be fully autonomous.

The robot must have mechanisms to pass the relay baton.

Requirements for the robot at the start:

- length - not more than 300 mm;
- width - not more than 300 mm;
- height - not limited;
- weight - not more than 3 kg.

After the start, the robot's dimensions may vary, but must not exceed:

- length - not more than 500 mm;
- width - not more than 500 mm.

## 3. Specifications of the field

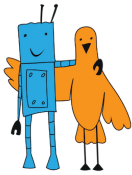
The field is a flat rectangular white surface made of no particular material with a black line on it.

Line Specifications:

- width - 50 mm;
- minimum radius of curvature - 300 mm.

The exchange area is limited by 300 mm long starting and finish lines oriented perpendicularly to the track line and symmetrical in relation to it (see Fig. 1); the shape of the line section inside the exchange area is rectilinear:

- the distance between the starting and finish lines is 600 mm in the light;
- the thickness of the lines is 30 mm;
- the lines are in black.



Obstacles placed on the track:

- Slide:
  - width (b) - 300 mm;
  - length (l) - 300 mm;
  - height (h) - 40 mm.
- Curb:
  - quantity - 2;
  - the distance between (in the light) - 50 mm;
  - the thickness - from 5 to 10 mm.

Obstacles are fixed on straight sections of the track no closer than 300 mm from the beginning of the curvature of the line.

The trajectory of the track line may vary at the discretion of the Organizers.

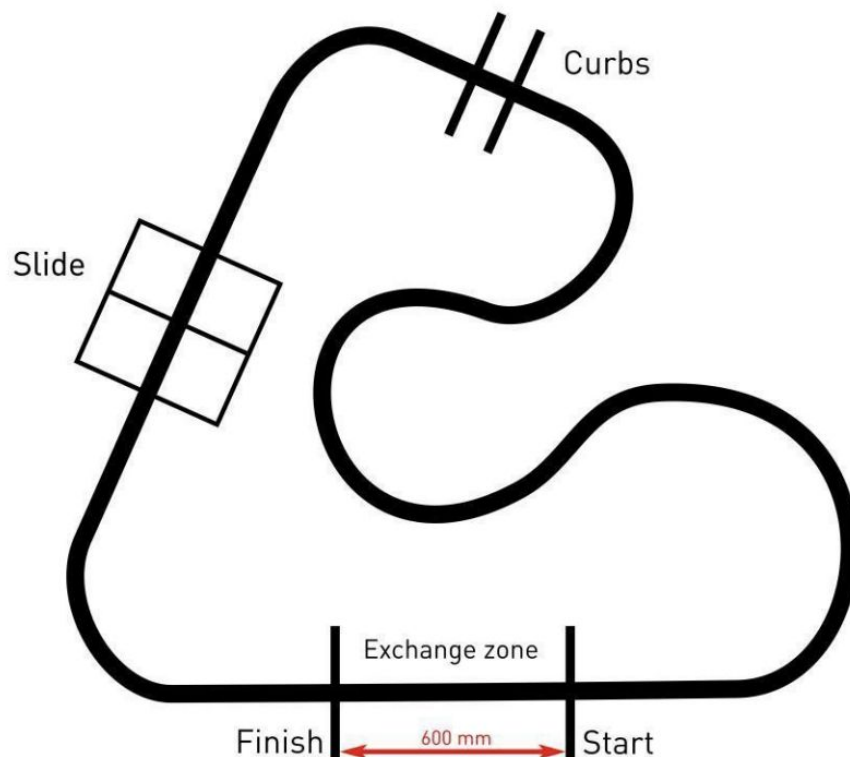
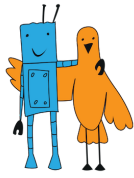


Figure 1. Field

A white cylinder is used as a relay baton:

- the base diameter -  $60 \pm 5$  mm;
- height -  $120 \pm 20$  mm;



- material - wood, plastic and/or thick paper;
- weight - 75+/-25 g.

## 4. Contest Procedure

Robots are given 5 minutes to complete the task.

Before the start of the race, both robots are placed in the exchange area along the line one after the other. The Operator places the baton on the starting line.

After starting, the robot must drive a full lap along the track and pass the baton to another robot in the exchange area.

Relay baton exchange is permitted only in the exchange area. During the exchange the baton must touch the surface of the field.

During the baton exchange, both robots must be at least partially in the exchange area.

The relay baton may stay in the exchange area as long as needed within the allotted race time.

The robot that passed the baton must remain completely in the exchange area after another robot has fully entered the track. Within the exchange area the robot can move in any way.

The track driving is interrupted, the time does not stop, the robots return to their original position in the exchange area and restart in the following cases:

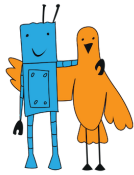
- the robot lost the baton;
- the robot left the exchange area without the baton;
- the Operator touched the robot or the baton while the robots were moving;
- the robot left the line for more than 5 seconds;
- the robot that passed the baton left the exchange area.

To leave the exchange area - the projection of the robot has left the exchange area.

To leave the line - the projection of the robot is not above the track line.

To lose the relay baton - outside the exchange area, the baton detaches (loses contact) from the robot for more than 5 seconds.

The race ends when the race time expires.



## 5. Disqualification

In the following cases the robot will be disqualified:

- the robot is non-autonomous (external control of the robot).

## 6. Scoring

The team will receive 1 point for each relay baton exchange during the whole race.

The exchange is considered to have been made if the actions are performed in the specified sequence:

- holding the baton, the first robot completely left the exchange area to the track;
- following the line of the track the robot made a full lap;
- passed the baton to the second robot;
- holding the baton, the second robot completely left the exchange area to the track.

The attempt with the highest score is counted. If the points are equal, an attempt with the minimum number of restarts is counted. If the points and the number of restarts are equal, the attempt with the minimum time of the first-performed baton exchange is counted.

## 7. Procedure for Determining the Winner

The winner is the team with the highest score.

If the points are equal, the team with the minimum number of restarts gets the advantage. If the points and the number of restarts are equal, the team with the minimum flying time of the first-performed baton exchange gets the advantage.