

# Lego NXT Robot Relay Race CONTEST RULES

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## 1. General Provisions

The run is held by each team independently. One team plays 3 robots.

### 1.1. Task Description

During the race 3 robots of the same team must drive one after the other; each robot runs its leg of the oval track. The 2<sup>nd</sup> robot begins when its tail bumper sensor is hit by the 1<sup>st</sup> robot. The 3<sup>rd</sup> robot begins when its tail bumper sensor is hit by the 2<sup>nd</sup> robot. The total completion time ends when the 3<sup>rd</sup> robot crosses its finish line.

## 2. Requirements for the Robot

- The robot must be fully autonomous and made only from Lego parts. The parts can be from the course-issued NXT Mindstorms kit, or from other Lego sources e.g. Bricklink, Lego Store, etc.
- The 2<sup>nd</sup> and 3<sup>rd</sup> robot must have a tail bumper sensor; they can only commence their line-following run when their sensor is activated. length - not more than 300 mm
- Each robot must fit inside the issued shoebox (12" x 9" x 5"). For robot's that can change size (e.g. extend a mechanical arm or have a collapsible bumper), the robot in its starting position must fit in the shoebox

## 3. Specifications of the field

The field is a flat rectangular white surface made of no particular material with a black line on it. The track is oval. There are 3 tracks so that 3 teams can compete at the same time.

- Width - XX mm;
- Minimum radius of curvature - XX mm.

The exchange area is limited by XX 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:

- Distance between the starting and finish lines is X mm in the light;
- Thickness of the lines is X mm;
- Lines are in black.

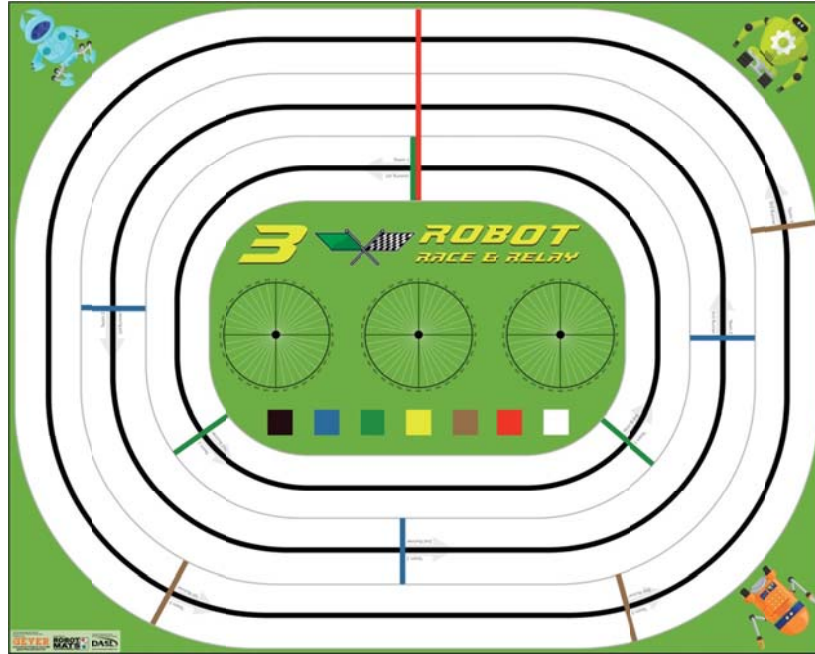


Figure1. Field

#### 4. Contest Procedure

- Robots are given 5 minutes to complete the task.
- Before the start of the race, all 3 robots are placed in the exchange area along the line one after the other.
- After starting, the robot must drive its lap along the track and touch the tail bumper sensor of the next robot in the exchange area.
- During the tail bumper contact, both robots may be partially in the exchange area.
- The robot that pushed the next robot's bumper sensor must stop in the exchange area
- 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's tail bumper fails to start the robot;
  - the robot left the exchange area without its tail bumper sensor being activated by the first robot;
  - the Operator touched a robot while it was moving;
  - the robot left the line for more than 5 seconds;
  - the robot that passed the baton left the exchange area.
- 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).
- Uses any non-Lego parts including tape, glue, screws etc

## **6. Scoring**

The team with the fastest completion time wins.

## **7. Procedure for Determining the Winner**

The winner is the team with the fastest time.