



## «CORRIDOR RALLY» CONTEST RULES

*Version 3.1 dated November 20, 2016.*

*Based on version 2.0*

### 1. General provisions

#### 1.1. Field

- 1.1.1. The field is a track enclosed with borders from both sides.
- 1.1.2. Track color – white.
- 1.1.3. Border color – white.
- 1.1.4. Track width – 2 m max.
- 1.1.5. Border height is 20 cm min.
- 1.1.6. It is allowed protrusions and openings with depth of 10 cm max.
- 1.1.7. It is allowed obstacles on the field with height of 5 cm max. and inclination of 35° max.
- 1.1.8. It is allowed gaps in the joints between borders with width of 7 cm max.
- 1.1.9. Special obstacles may be in the field (see the list in section 1.2). 3 lines 10 cm wide are put across the route 2 m before the obstacle to warn that the robot is approaching the special zone. Such lines alternate as follows BLACK - WHITE - BLACK.
- 1.1.10. A sequence of cross stripes with the alternating colors (black and white) is put 1 m from the obstacle to determine the type of the obstacle.

#### 1.2. List of potential special obstacles in field

- 1.2.1. Stone obstacle: a platform fabricated of sheet metal max. 5 mm thick, with attached broken stones with sharp corners and elevation drops. The stone layer is 20-30 mm high on the average. The platform is max. 1500 mm long along the route. A sequence of three stripes (black - white - black) warns of approaching Stone platform.
- 1.2.2. Stop Line obstacle: a black strip 25 cm wide put across the route along its width. The robot is fully to stop at this line and then continue to move. When stopped, no projection of any parts of the robot should extend beyond the black line limit in the direction of its movement. A sequence of seven stripes warns of approaching Stop Line platform.



## 2. Requirement to the robots

### 2.1. Basic specifications

- 2.1.1. In rally four-wheel cars take part with rear- or front-wheel drive and with steering front wheel. Steering wheels shall not be installed on the same axis. The robot turns by rotating steering wheels only.
- 2.1.2. When starting robot dimensions shall be 50 x 50 cm max.
- 2.1.3. Robot height shall be 50 cm max.
- 2.1.4. During movement robot's dimensions shall remain constant and shall not exceed 50 x 50 cm.
- 2.1.5. Robot weight shall be 10 kg max.
- 2.1.6. Robot shall be fully-autonomous.
- 2.1.7. In order to minimize any damage, a protective bumper is put at the front of the robot by all means min. 1 cm thick of PU foam, foam propylene or any other shock-absorbing soft material (e.g. a plumbing insulation of the outer diameter of pipes).

## 3. Game

### 3.1. Objective of the game

- 3.1.1. Robot shall reach finish zone for the least possible time.
- 3.1.2. The total task completion time must not exceed 2 minutes.

### 3.2. Start

- 3.2.1. During the start, all parts of a robot must be located behind the start line.
- 3.2.2. Robot shall be switched on or initialized manually at the competition start on referee command, after that it is not allowed to interfere its operation. It is prohibited the remote control or command issuing for robot.
- 3.2.3. During the competition, competitors are not allowed to touch the robot's body or the polygon.

### 3.3. Finish

- 3.3.1. The task is ended upon command of a referee after a robot crosses the finish line (subject to the terms and conditions described in section 3.1.1).
- 3.3.2. By the referee decision the try can be finished in advance.

### 3.4. Task execution termination

- 3.4.1. Task execution can be interrupted and the time can be stopped in the following situations:



- 3.4.1.1. If any of team member touches the robot body;
- 3.4.1.2. If penalty points number exceeds 2 (scoring rules see in paragraph 4.2)<sup>1</sup>;
- 3.4.1.3. If the finish conditions are fulfilled (see paragraph 3.3);
- 3.4.1.4. If competition regulation is violated;
- 3.4.1.5. In case of elapse of time allotted for task execution.

## 3.5. Fines

- 3.5.1. One penalty points is charged every time the robot touches the banking boards of the route with its body.
- 3.5.2. If the robot moves in contact with the wall, one penalty point is charged for each meter of such movement.
- 3.5.3. If the robot does not stop at such special obstacle as Stop Line when the projection of its body in the field crosses Stop Line, 20 penalty seconds are charged to the robot.
- 3.5.4. 10 penalty seconds are charged to the robot if it stops at such special obstacle as Stop Line so that any part of the projection of its body in the field goes beyond the limit of Stop Line in the direction in which the robot moves.

## 4. Scoring

- 4.1.1. Competitions are conducted in two stages:
  - 4.1.1.1. the first stage – qualification;
  - 4.1.1.2. the second stage – paired heat.

### 4.2. The first stage

- 4.2.1. At the first stage it is evaluated the robot capability to execute task. Robot shall ride past the track according to these Rules.
- 4.2.2. *Moved to section 3.5.1*
- 4.2.3. *Moved to section 3.5.2*
- 4.2.4. The robots fulfilled the finish terms (see paragraph 3.3) are allowed to take part in the second stage.

### 4.3. The second stage

- 4.3.1. At the second stage robots start in pairs.
- 4.3.2. Position<sup>2</sup> is pre-defined by drawing procedure.
- 4.3.3. Robot wins if it reaches the finish zone the first.
- 4.3.4. If no robot reaches the finish during the predefined time, the winner is the robot, that locates closer to the finish zone.
- 4.3.5. Depending on the total number of competitors the competitions are conducted according to the Olympic system or competitors compete with each other.

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<sup>1</sup> Related only to the first phase. See the detailed phase description in 4.1.

<sup>2</sup> Meant from what side of the opponent's robot the competitor will start.



## 5. Change Log

### 5.1. Version 3.1

- 5.1.1. A technical correction was made to section 1.2.2.
- 5.1.2. Section 2.1.7 was added.