

# robotex

International

## WATER RALLY RULES

COORDINATOR FOR THIS COMPETITION

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## Table of Contents

|                                                |   |
|------------------------------------------------|---|
| 1 Introduction .....                           | 3 |
| 2 The field .....                              | 3 |
| 3 The Robot .....                              | 4 |
| 4 The Competition .....                        | 4 |
| 5 Counting the laps .....                      | 5 |
| 6 Earning points .....                         | 5 |
| 7 Organizing .....                             | 6 |
| 8 Changes and cancellations in the rules ..... | 6 |

## 1 Introduction

The idea of the competition is to simulate the engaging nature of a boat race. The goal is to complete as many laps as possible and collect as many points as possible within the allotted time.

## 2 The field

1. The depth of the water layer covering the course surface is at least 30 cm.
2. The height of the course boundaries from the water level is at least 10 cm. The boundaries can be made of any colored or transparent material.
3. The track forms a circular trajectory.
4. The cross-section of the track can be square, round, or inclined.
5. The width of the track is at least 60 cm.
6. The course may have simple obstacles such as buoys, walls, tunnels, or track dividers. The obstacles are arranged in such a way that they make it difficult for the robot to navigate the track by moving along the walls. Touching the buoys and walls is not prohibited, and their location is not predetermined.
  - a. Buoys are attached to the bottom of the course with cables or strings.
  - b. Walls and tunnels are attached to the sides of the course, leaving at least 40 cm of free space for the robot to pass through the track. There is at least 40 cm of free space above the water level in the tunnels.

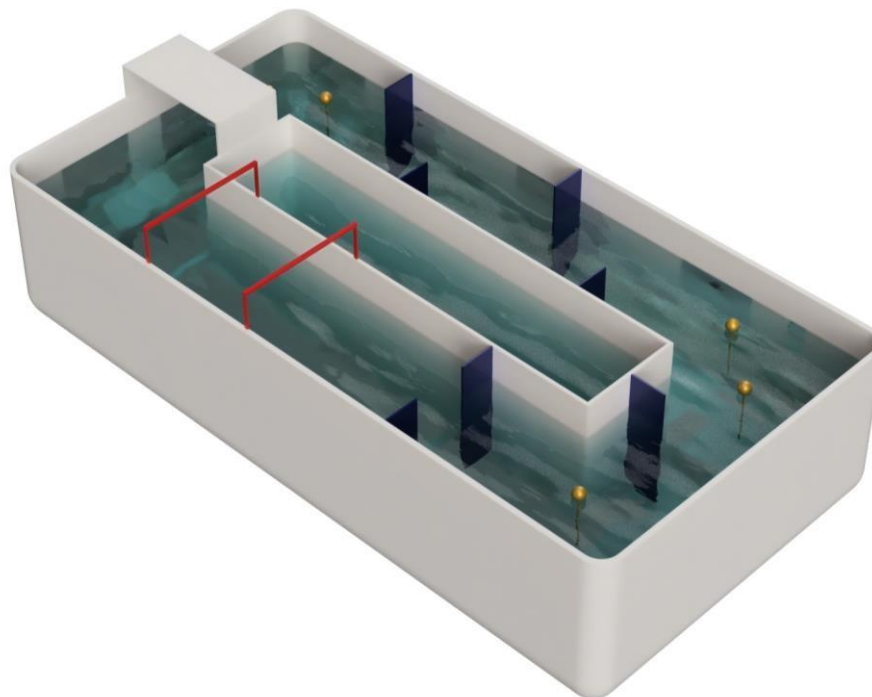


Figure 1 – Example of the field

### 3 The Robot

1. The robot must be autonomous.
2. The robot must swim or float.
3. The maximum dimensions of the robot are 35 x 25 x 35 cm (length x width x height) and it can weigh up to 2 kg.
4. The robot is allowed to dive underwater.
5. The robot is not allowed to:
  - a. Move along the bottom of the course using wheels, tracks, or other equipment for bottom movement;
  - b. Damage the course surface, splash, and/or endanger spectators (including the referee);
  - c. Emit gases, hazardous liquids, pollutants (e.g., oil), or dust;
  - d. Intentionally ram or sink other robots;
  - e. Use another robot for movement;
  - f. Intentionally consume and discharge water outside the boundaries of the course;
  - g. Extend beyond the external boundary of the course;
  - h. Leave the pool.
6. The robot must have a start and stop button or a remote control.

### 4 The Competition

1. A maximum of three robots competes in a round at a time.
2. There is a designated starting line on the track (see Figure 2), from which the direction of movement is chosen by the referee.
3. The robot that collects the most points wins the competition.
4. The duration of one competition is 5 minutes.
5. The robot may start moving 5 seconds after the referee's start signal.
6. If the robot starts moving before the designated time (see above), it is considered a false start.
7. A robot that makes a false start receives a warning. If two consecutive false starts occur, the robot's result is recorded as 0 points.
8. A robot that has finished the competition or made a false start is removed from the course by the team representative at the referee's order.
9. If the competition is halted (e.g., no robot has moved for 15 seconds), the referee has the right to order the team representative to remove the obstructing robot.
10. The obstructing robot is placed back in the same position after 10 seconds.

11. In case of rule violations, the referee may disqualify the robot and order the team representative to remove the robot from the track.
12. If the robot does not cross the starting line within two minutes, the referee may disqualify the team and remove the robot from the track.
13. Each team can have a maximum of three members.
14. If the robot capsizes or sinks during the competition but does not obstruct the movement of other robots, the team representative can decide whether the robot:
  - a. Stays in place;
  - b. Is returned to the starting line;
  - c. Is removed from the track.
15. If the robot gets stuck, the team has the right to request the robot to be returned to the starting line. With the referee's consent, a team member present in the competition area may do this without disturbing other robots. If the robot is placed on the starting line during the race for whatever reason, 3 points will be subtracted from the points earned so far.
16. If the robot is placed back at the starting line for any reason during the competition, 1 point will be deducted from its total points.
17. Only one team member is allowed in the competition area, and they are considered the team representative for the duration of the round.
18. The team representative has the right to remove the robot from the competition.
19. If the competition ends in a tie, the winner is determined by an additional round.
20. The additional round is won by the robot that earns the most points within 1 minute. The additional round takes place only between the robots that scored the same number of points.
21. Time is measured with a stopwatch.

## 5 Counting the laps

1. A full lap is defined as covering the full path of track, during which both of the checkpoint lines on the track are crossed in the right sequence which is predetermined by the referee.
2. The start of a full lap is when the robot crosses one of the start lines.
3. A full lap is completed when the robot crosses again the same start line from which the beginning of the lap was fixed.

## 6 Earning points

1. Each team starts with 0 points.
2. A team earns a point when the robot crosses the starting line after completing a full lap. If the robot crosses the same checkpoint a second time before completing a full lap, no additional point is awarded.
3. If a checkpoint is crossed in the wrong direction, 1 point is deducted from the round's score.

4. If the robot is placed back at the starting line for any reason, 1 point is deducted from the round's score.
5. A disqualified robot does not receive an official result.
6. The final ranking depends on the total points from all rounds.

## 7 Organizing

1. The robot must be registered before the competition. The registration process includes a technical inspection of the robot, marking the robot with a number sticker, and drawing lots for the participation order.
2. The technical inspection must be completed by the time specified by the organizers. If the technical inspection is not completed by the specified time, the team will be disqualified.
3. Before the competition, a qualification round must be completed. The qualification round assesses the robot's ability to navigate the track (including the 5-second start time).
4. The organizers will make every effort to allow testing of the track before the competition.
5. The current score will be displayed next to the track.
6. All questions and issues arising during the competition are resolved by the referee.
7. The final decision on all appeals is made by the referee and/or organizers. All complaints must be submitted to the referee during the match or immediately after the match ends. Later complaints will not be considered. The final decision on all disputes or discrepancies is always made by the referee.
8. The arena has at parts uneven lighting and infrared noise, which may disrupt the work of sensors during the competition. For this reason, the organizers recommend using covers or blinds for sensors, testing the sensors under intense lighting conditions or even under direct sunlight to imitate the lighting conditions of the competition arena.
9. If the winners' team has three members, next year they should have at least one new member who was not previously on this team to compete in the same category again instead of taking a year off from it. This rule is aimed at bringing new people, giving everyone a fair chance and encouraging recurring winners to try new competitions they usually do not participate in and to educate and engage new beginners in the field of robotics. \*

**\* The rule complies only with Robotex International standards and is used for Robotex International competition**

## 8 Changes and cancellations in the rules

Changes and cancellations made to the rules are adopted by the main organizer of the competition, according to the regulations of the regulatory committee of the competition.

