# LEGO Robot Competition
# Regulation

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## 1   Aim

This competition is to contest how to move speedily and accurately a robot made by "LEGO Mindstorm."

## 2   Field

The field has some lines which width is 20 mm. The lines are set at intervals of 200 mm. The lines make squares, and there are 10 lines for the X axis, and 5 lines for the Y axis (see Fig. 1).
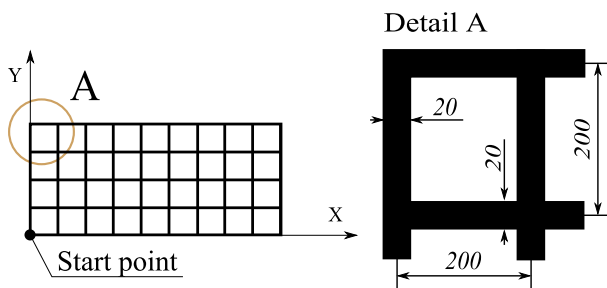


Fig. 1: Field

## 3   Robot

The robot is made from LEGO parts. The robot can use the following motors and sensors.

* Three motors
* One touch sensor
* One light sensor
* Two rotation sensors (encoders)

The robot's size is free. The robot must have an arm to get the object.

## 4   Programing

The programming language is free. In the robot program, a timer witch measures the time from the beginning till the end, should be included. The programs is exposed after the competition.

## 5   Object

The object is made from LEGO parts. The dimension is 55 : 40 : 75 mm (Width : Height : Depth) Fig. 2 (a) shows the layout, (b) shows the dimensions.
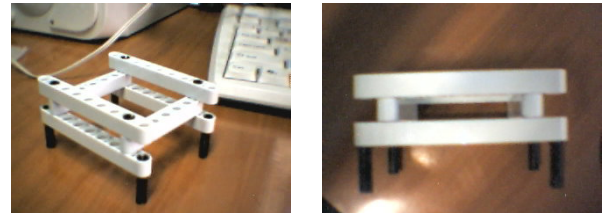


(a)                              (b)

Fig. 2: Object

## 6   How to contest

Aim is to move speedily and accurately from the start point to the goal point with your robot. Also, the robot has to carry an object to the goal point.

## 7   Before start / Prepare to start

Decide three points.

* Start point (0,0)
* Gripping point $(Xg, Yg)$
* Goal point $(x[\text{mm}], y[\text{mm}])$

Download these data to your robot. Put the robot on the start point. Also, the object is placed somewhere around the gripping point, where the robot can grip it after arriving at the gripping point.
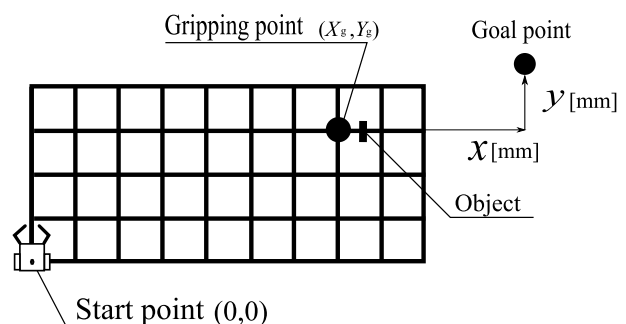


Fig. 3: Target

## 8   Start and competition

After start, the robot and the object cannot be touched.

After completing the preparation, a special sign is given to start. Also, the timer program should start.

The robot picks up the object near the gripping

point.

The robot releases the object at the goal point. After finishing the program, the robot shouldn't be touched until the measurement ends.

## 9   Measurement

First, measure the distance from the goal point to the center of the robot Then, check the timer. Fig. 4 shows the distance.
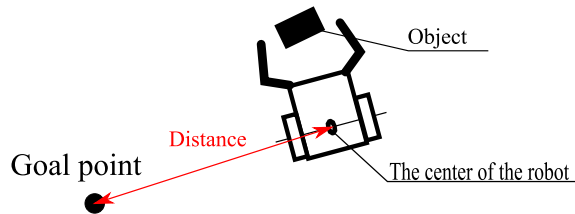


Fig. 4: Measure

## 10   Result

If the robot carried the object to the goal point, the team gets 1 point. The team whose robot was the fastest gets 1 point. The team whose robot was the most accurate gets 1 point.

The team that got most points is the winner.

## 11   Cancellation

In the following cases, the results will be ignored.

* Somebody touches the robot or the object before the measurement ends.
* The time for the competition become over five minutes.