



Competition Rules for Arduino Challenges

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Disclaimer

It is your responsibility to read and understand this document on a regular basis because we may update it from time to time.

If you have questions, please contact our
Arduino Team at orcarduino@gmail.com.

Team Requirements

Each team must have one team captain who is responsible for making sure their team has fully read the rules of any challenges they are register in before competition day. The team captain is also responsible for corresponding with the ORC Arduino team if they have any questions. Each team will be responsible for approaching judges for any questions and/or clarifications about the rules.

Any non-team member (team supervisor, parents, mentors, etc.) must act in an advisory role only. Otherwise, your results may be invalidated.

Teams are expected to send their robot's code before the day of the competition.

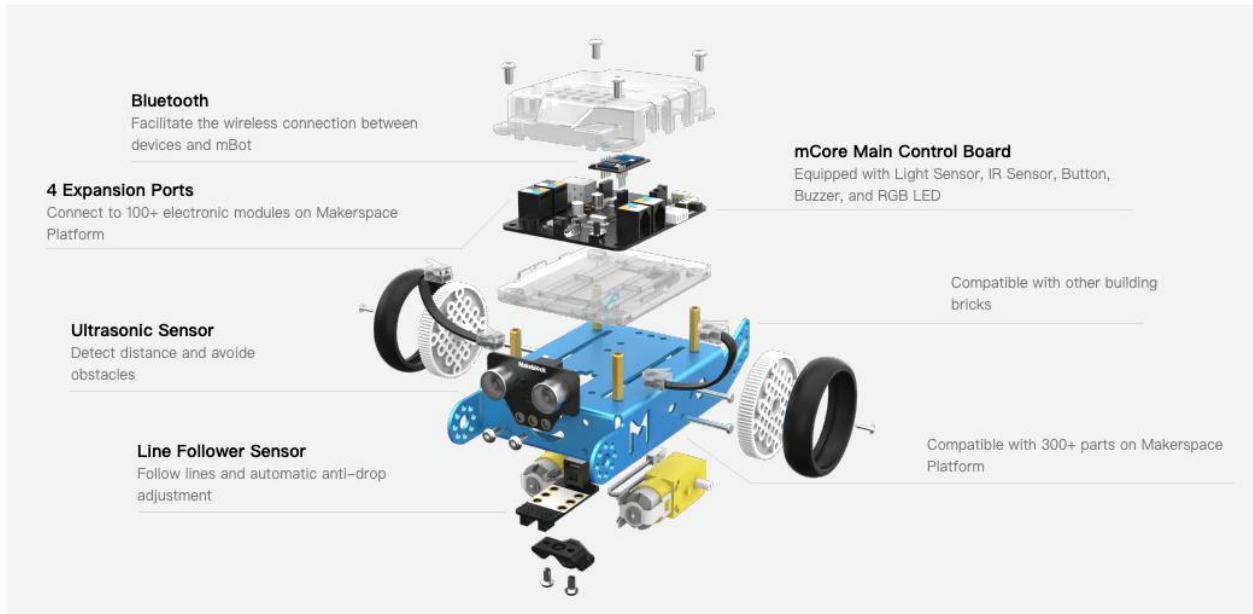
Approved Robots/Parts

As the competition is virtual this year, the robot used by all teams is limited to the Makeblock mBot.

Makeblock mBot



The Makeblock mBot that will be used has the following components:



Each team must program their robot before competition day.

LRT Detour Challenge

Many road detours are appearing in Ottawa due to the construction of a new LRT (light rail train) system, which will be featured in this year's LRT Detour Challenge. Your task is to program a self-driving robot that can navigate through road closures, sinkholes, and other detours within the City of Ottawa. All road closures will be represented by 3D printed blocks.

The number and location of road closures will change, so your self-driving robot should be able to navigate no matter what detours arise.

Challenge Rules

1. Your robot's program will be sent prior to the competition day so you would be unable to change your robot's program while competing.
2. Your robot will be placed in the START area in a specific position.
3. We will start timing your run when the ORC team member running the challenge starts the robot.
4. Locomotion can only be done on wheels.
5. Your robot will have 2 minutes to finish the maze. Your robot must follow the black lines and avoid obstacles while going through the maze.
6. There will be several different city layouts that your robot will go through. Each layout will have a different level of difficulty.
7. After your robot starts, the ORC team member will:
 - a. Restart the robot from the START area when it hits an obstacle.
 - b. Restart the robot from the START area if a judge thinks your robot has gone too far from the black lines.
8. The robot is only allowed one reset for each round. If the robot deviates from the line or hits an obstacle a second time, the round is ended, and a time of two minutes is recorded.

Bonus Objectives

In addition to the regular challenge, after the robot successfully navigates the city, it will run through it again without modification. The bonus goal being for the robot to remember the path through the city.

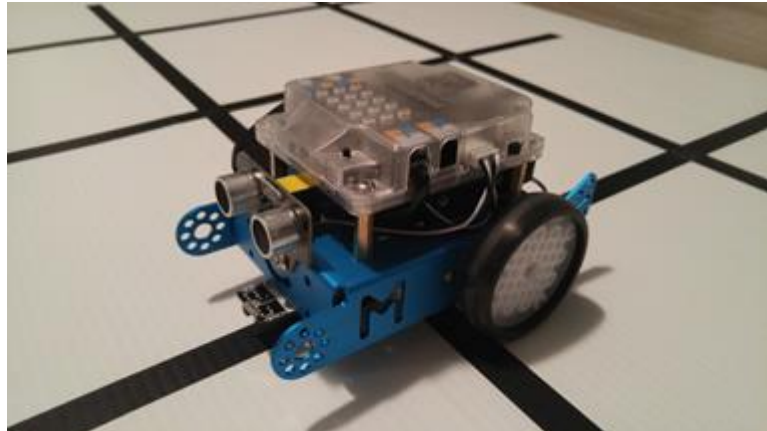
1. It is recommended that the robot has a button or a switch to set the robot into playback mode.
2. The judges will consider the robot's overall completion time as the average between its initial completion time and its bonus round completion time.
3. If the judges notice the robot simply repeats the same behavior on both runs through the city (i.e. it hasn't learned or remembered anything) you will be disqualified from the bonus objective.

Judging & Scoring

1. The runs with all the obstacles will be modified on the day of the competition. There can be up to 10 obstacles at a given time.
2. Judges will time and score your match.
3. All robots have 2 minutes to complete the maze. If the robot is unable to complete the maze within this time, a time of 2 minutes will be recorded for that particular trial.
4. The winner of the Challenge will be determined by your robot's total completion time (i.e. sum of each run's time) and the mark you receive on the [Technical Component](#). The team with the highest combined score will be the winner of the Challenge.
5. Decisions of the judges are final.

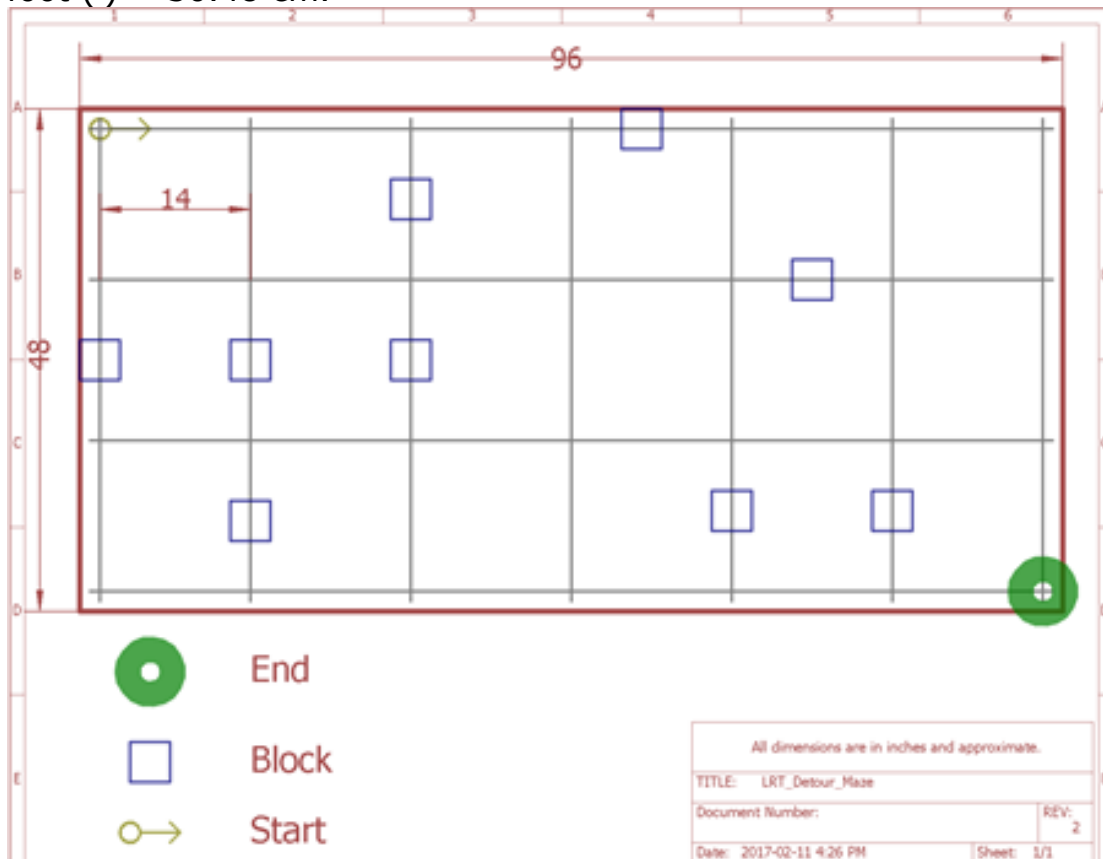
LRT Detour Challenge Starting Position

All robots will start at an intersection of the arena. The IR sensors will start after the intersection and the wheels will be behind the intersection.



LRT Detour Challenge Diagram

The dimensions of the entire challenge area are 8 ft. x 4 ft. The competition board is made out of white cardboard and the maze will be represented by [black art tape](#) (1/4 inch), arranged in a grid of 14" by 14" squares. Obstacles will have an approximate size of 4" by 4" by 4". One inch (") = 2.54 cm and one foot (') = 30.48 cm.





Please note that these diagrams represent a model of the challenge and does not reflect the exact number and location of obstacles, which are subject to change on competition day.