

# Maze Solving Rules

**Name of Event:** Maze Solving

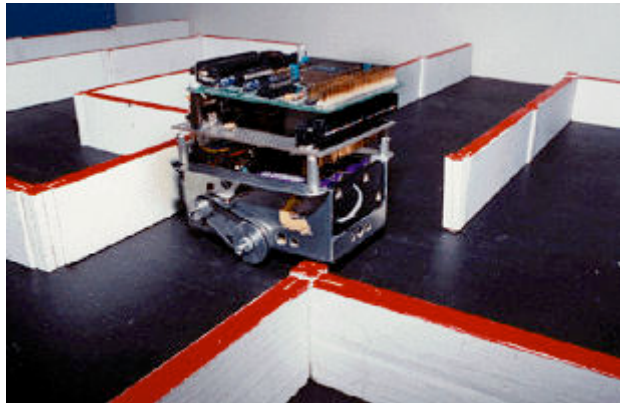
**Number of Robots per Event:** One

**Length of Event:** 10 minutes maximum across all runs

**Robot Weight Range:** Any

**Robot Dimensions:** 16 cm x 16 cm

**Arena Specifications:** 2.88m x 2.88m



**Robot Control Specifications:** Autonomous

The following rules were adapted from 1986 official rules for North American Micromouse Contest, but have been modified to reflect the changes in technology since 1986.

## A. OBJECTIVE

1. In this contest the contestant or team of contestants design and build small self-contained robots (micromice) to negotiate a maze in the shortest possible time.

## B. RULES FOR THE MicroMouse

1. A MicroMouse shall be self-contained (no remote controls). A MicroMouse shall not use an energy source employing a combustion process.
2. A MicroMouse shall not leave any part of its body behind while negotiating the maze.
3. A MicroMouse shall not jump over, fly over, climb, scratch, cut, burn, mark, damage, or destroy the walls of the maze.
4. A MicroMouse shall not be larger either in length or in width, than 16 centimeters. The dimensions of a MicroMouse that changes its geometry during a run shall not be greater than 16 cm x 16 cm.
5. Any violation of these rules will constitute immediate disqualification from the contest and ineligibility for the associated prizes.

## C. RULES FOR THE MAZE

1. The maze is composed of multiples of an 18 cm x 18 cm unit square. The walls of the maze are 5 cm high and 1.2 cm thick (**assume 5% tolerance for mazes**). Thus, the internal navigable area within a square is 16.8cm, not 18cm. The maze comprises up to 16 x 16 unit squares, for a total maze size of up to 2.88m square. The outside wall encloses the entire maze.
2. The sides of the maze walls are white, the tops of the walls are red, and the floor is black. The maze is made of wood, finished with non-gloss paint.  
**WARNING:** Do not assume the walls are consistently white, or that the tops of the walls are consistently red, or that the floor is consistently black. Fading may occur; parts from different mazes may be used. Do not assume the floor provides a given amount of friction. It is simply painted plywood and may be quite slick. There may be a seam between the two sheets on which any low-hanging parts of a mouse may snag.
3. The start of the maze is located at one of the four corners. The start square is bounded on three sides by walls. The start line is located between the first and its second squares. That is, as the mouse exits the corner square, the time starts. The destination goal is the four cells at the center of the maze. The destination square has only one entrance.
4. Small square zones (posts), each 1.2 cm x 1.2 cm, at the four corners of each unit square are called *lattice points*. The maze is so constituted that there is at least one wall at each lattice point.
5. Multiple paths to the destination square are allowed and are to be expected. The destination square will be positioned so that a wall-hugging mouse will NOT be able to find it.

## D. RULES FOR THE CONTEST

1. Each contesting MicroMouse is **not** allocated any time to access the maze prior to their first run. Any time used to adjust a mouse between runs is included in the 10 minutes. Each run (from the start cell to the center zone) in which a mouse successfully reaches the destination square is given a run time. The minimum run time shall be the mouse's

official time. First prize goes to the mouse with the shortest official time. Second prize to the next shortest, and so on.

**NOTE**, again, that the 10-minute timer continues even between runs. Mice that do not enter the center square will be ranked by the maximum number of cells they consecutively transverse without being touched. All mice who enter the center square within their 10 minute allotment are ranked higher than those who do not enter the center square.

2. Each run shall be made from a random one of the four possible starting squares. The operator may abort a run at any time. If an operator touches the MicroMouse during a run, it is deemed aborted, and the mouse must be removed from the maze. If a mouse has already crossed the finish line, it may be removed at any time without affecting the run time of that run. If a mouse is placed back in the maze for another run, a one-time penalty of **30 seconds** will be added to the mouse's best time.
3. After the maze is disclosed, the operator shall not feed information on the maze into the MicroMouse however, switch positions may be changed.
4. The illumination, temperature, and humidity of the room shall be those of an ambient environment. (40 to 120 degrees F, 0% to 95% humidity, non-condensing).  
**BEWARE:** Do not make any assumptions about the amount of sunlight, incandescent light, or fluorescent light that may be present at the contest site.
5. The run timer will start when front edge of the mouse crosses the start line and stops when the front edge of the mouse crosses the finish line. The start line is at the boundary between the starting unit square and the next unit square clockwise. The finish line is at the entrance to the destination square.
6. Every time the mouse leaves the start square, a new run begins. If the mouse has not entered the destination square, the previous run is aborted. For example, if a mouse re-enters the start square (before entering the destination square) on a run, that run is aborted, and a new run will be deemed begun, with a new time that starts when the starting square is exited.
7. The mouse may, after reaching the destination square, continue to navigate the maze, for as long as their total maze time allows.
8. If a mouse continues to navigate the maze after reaching the destination square, the time taken will not count toward any run. Of course, the 10-minute timer continues to run. When the mouse next leaves the start square, a new run will start. Thus, a mouse may and should make several runs without being touched by the operator. It should make its own way back to the beginning to do so.
9. The judges reserve the right to ask the operator for an explanation of the MicroMouse. The judges also reserve the right to stop a run, declare disqualification, or give instructions as appropriate (e.g., if the structure of the maze is jeopardized by continuing operation of the mouse).
10. A contestant may not feed information on the maze to the MicroMouse. Therefore, changing ROMs or downloading programs is NOT allowed once the maze is revealed.  
**However, contestants are allowed to:**
  1. Change switch settings (e.g. to select algorithms)
  2. Replace batteries between runs
  3. Adjust sensors
  4. Change speed settings
  5. Make repairs
11. However, a contestant may not alter a mouse in a manner that alters its weight (e.g. removal of a bulky sensor array or switching to lighter batteries to get better speed after mapping the maze is not allowed). The judges shall arbitrate.
12. All mice, whether or not they have competed in previous contests, compete on an equal basis. All mice must be presented to the judges by the original design team, which must meet all other qualifications. First prize will go to that mouse which travels from the start square to the destination square in the least amount of time. Second and third prizes will be awarded to the second and third fastest respectively. As stated above, mice that do not enter the center square will be ranked by the maximum number of cells they consecutively transverse without being touched.
13. Gold, silver, and bronze medals are awarded to first, second, and third place robots.
14. If requested, a break will be provided for a mouse after any run if another mouse is waiting to compete. The 10-minute timer will stop. When the mouse is re-entered, the 10-minute timer will continue. The judges shall arbitrate on the granting of such breaks.