# Fastbot

## Goal

Design, build, and program a line following robot that can follow a black line on a white background around a closed looped race track a set number of laps per your teams divisional requirements. Middle School and higher divisions may include intersections.

Eligible: ES, MS, HS, UP

Event Offer: Physical

FastBot (FBT_23.007)

## Fastbot Challenge Rules

## Who Can Play

Teams entering this challenge compete in:

1) Elementary School (ES)

2) Middle School (MS)

3) High School (HS) 4) University / Professional (UP)

Note: If fewer than 5 teams register in either division, the Event Director has the option to combine divisions.

## Requirements

Autonomous robot, any platform, ≤ USD 1,500, and meets the following design constraints, which will be verified during Check-in

Check-In:

1) An IR sensor is REQUIRED to be coded for tracking the line throughout the challenge

2) The robot can demonstrate that it is running a line-following code on a test track.

3) The volume of the robot must ≤ 65030 cm3. Click Here for the Video!

4) Has and is using IR sensors to track the line throughout the challenge

## General Rules

1) The Event Director will establish the number of official races allowed and the number of those official races that will be counted for the aggregate score used to determine the Top 8 teams that will compete in the tournament.

2) Divisions may compete on the same track with an increasing number of laps to complete, or they may compete on different tracks with increasing levels of difficulty about the track design, i.e., width of line, number of intersections, etc.

3) The score for each race is the elapsed time in seconds to the hundredths of seconds (ex. 3.52 seconds)

4) The robot has 3.00 minutes to complete the Race. Any robot exceeding three minutes will be assigned a maximum time score of 180.00 s for that race, leaving zero (0) seconds for bonus points. A line following program must control your robot's motion at all times that incorporates an Infrared (IR) sensor. REQUIRED

5) Only players can operate and manipulate the robot during the heat. Remember, “Players Play, Coaches Coach, Parents Cheer”.

6) Touching the robot at any time ends the race and requires the entry of a Maximum Time Score (180 seconds).

## Challenge Specific Rules Track:

1) Tracks are typically printed on durable paper or a PVC vinyl background

2) Elementary Division - No intersections, 1.25 cm wide black line

3) Middle School Division – May have up to one intersection, 1.25 cm wide black line

4) High School Division – May have up to two intersections, 0.75 cm wide black line

5) University/Professional Division - May have 2 or more intersections of different style, 0.75 cm wide black line or thinner, line may be solid, dashed, or different color

a) Or use the HS track with increased lap requirement,

b) Or create a UP track with higher difficulty elements that may include dashed lines, multiple colors, round-about turns, varying line widths, varying line ink saturation

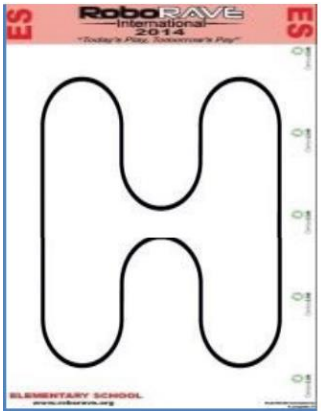
6) The line will be no closer than 10 cm from the edge of the track or any other line

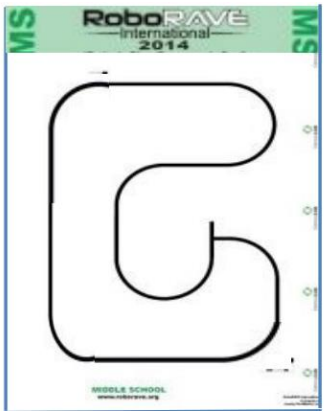
7) Advertisement, or printed instructions, can be placed anywhere on the track surface but must be a minimum of 10 cm from any line

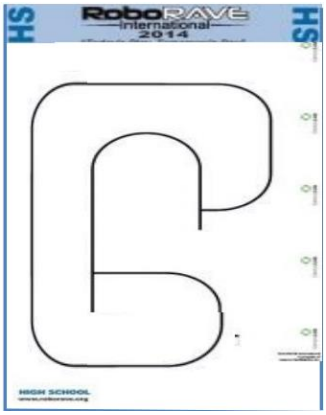
8) Curves can have different/changing radii on any division track

9) UP track is the same as the HS track BUT may contain a variety of intersections and line colors and types (dotted, dashed, thickness)

10) for Physical events: the challenge may be held in areas with natural light on your tracks which may change the lighting conditions of the track. Teams should be prepared to engineer around this natural condition.




## Scoring

The score for each race is determined by measuring the time from start to finish in seconds and hundredths of seconds (000.00).

1) A max score of 180.00 (full 3 minutes in seconds) will be entered for any race not finished within the three-minute (3.00 min) limit

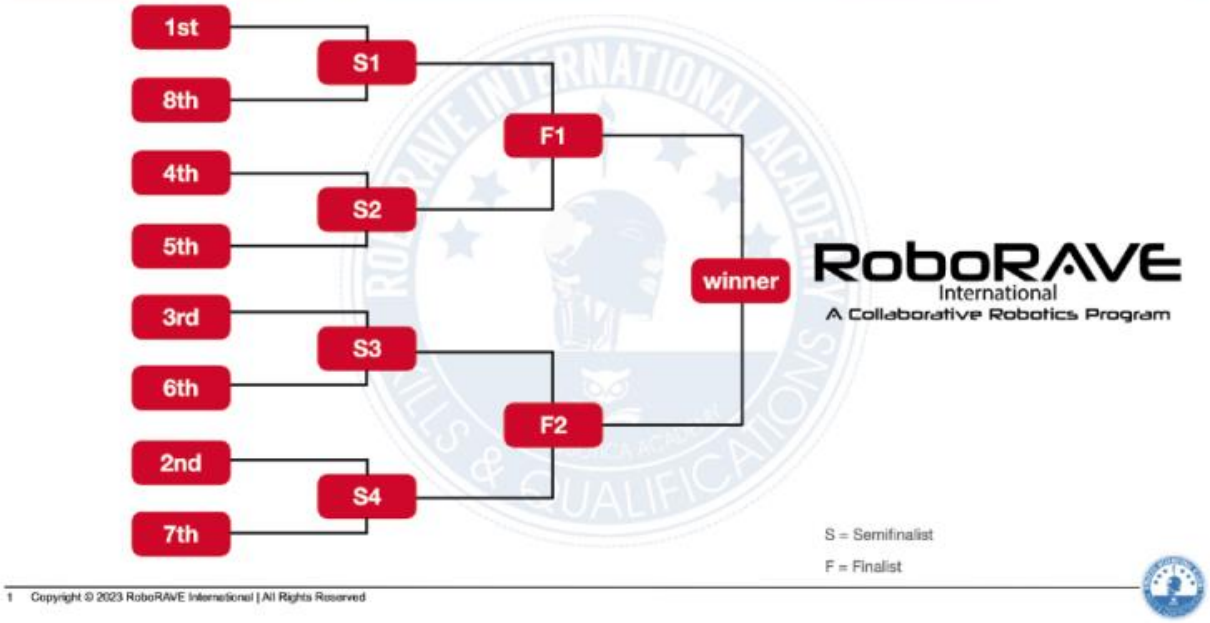
2) A max score of 180.00 (full 3 minutes in seconds) will also be entered if the robot is touched by any team member during the challenge

## Tournament Scoring:

1) The top eight teams from each division will compete in the final tournament.

2) Advancing teams will be seeded into the tournament bracket according to their aggregate score (see bracket below).

3) The runner-up is used to determine 3rd place based on the outcome of the semi-finals.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