

Line Following Challenge Official Rules (RoboRAVE Kaga Japan 2017)

● **Goal:** To design, build, and program a line following robot that can follow a black line on a white background to a tower and deliver balls and then return to its starting point. The faster you can complete these tasks the more balls you can deliver for 1 point/ball, which is your overall score.

● **Who Can Play:**

Teams of 2 to 4 players in separate divisions for:

- Elementary School
- Middle School
- High School

● **Required Materials:**

• Autonomous robot (any platform, costing \$ 1,500 USD or less, and meets the following design constraints, which will be verified during check-in:

- **Volume of the robot must NOT exceed 65,030 cubic cm.** Click [HERE](#) for video.
- Multiple sensors and processors are allowed.

● **Challenge Track Specifications:**

- Elementary School Division – No intersections, 1/2" black line, white tarpaulin background.
- Middle School Division – One intersection, 1/2" black line, white tarpaulin background.
- High School Division – Two intersections, 3/10" black line, white tarpaulin background.
- The Tower: All divisions use the same – approximately 8" tall, 4" wide, and 14" long with a 4" x 4" opening at the top and an open back to allow the balls to roll out during delivery. The tower is held firm to the track by a strip of gummed tape.
- The competition Tower and Tracks cannot be modified for any reason.

● **General Rules of Play during a Line Following Heat:**

1. A line following program must control your robot's motion.
2. The robot has 3 minutes to complete tasks.
3. Only Players can operate and manipulate the robot during the heat (Players play, Coaches coach.)
4. **The TOWER cannot be touched by any person during the delivery.**
5. Touching the robot at any time requires it to be picked up and returned to HOME.
6. During the qualifying period there is no seeding, simply go to any open track to compete.
7. Official tracks will be available to practice on, you may run as much as you wish on the practice tracks.
8. You will only get 10 official runs this year during the qualification period (your 5 highest qualifying scores, determine who gets into the tournament).

● **Scoring:**

- There is NO Before Event Points.
- The overall score is a combination of points earned during the first trip to the tower, delivering at least one

ball, and then returning back home; and the number of bonus points earned before the three minutes runs out.

- See the Line Following score card for your division below for details on the score assigned during your first trip to the tower and back.

- The top 5 scores that a team posts will be utilized to determine the top eight (8) teams that will advance to the Line Following Tournaments (on November 12nd).

●Scoring Matrix:

| | Leaves Home | Turns @ 1st "T" | Turns @ 2nd "T" | Stops @ Tower | Delivers a Ball | Starts Back Home | Turns @ 1st "T" | Turns @ 2nd "T" | Returns Home | Total |
|----|-------------|-----------------|-----------------|---------------|-----------------|------------------|-----------------|-----------------|--------------|-------|
| ES | 50 | NA | NA | 100 | 100 | 50 | NA | NA | 100 | 400 |
| MS | 25 | 25 | NA | 100 | 100 | 25 | 25 | NA | 100 | 400 |
| HS | 25 | 25 | 25 | 50 | 100 | 25 | 25 | 25 | 100 | 400 |

Bonus Balls: For all divisions, Bonus Balls are worth 1 point each

●Tournament Scoring:

- The top eight teams from each division will compete in the final tournament.
- Advancing teams will be seeded into the tournament bracket according to their aggregate score (see bracket below).

"RoboRAVE Kaga Japan 2017" 8 Team Tournament Bracket

Tournament Placing

- The losing teams from Round 1 will place 5th through 8th in accordance with their aggregate score coming into the tournament.
- The losing teams from Round 2 will face each other in Round 3 to determine the 3rd and 4th place winners respectively.
- The winning teams from Round 2 will face each other in the Championship Round (which may be run at the same time as Round 3) to determine the 2nd place winner, and the Tournament Champion.

