

# Line Follower

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The robot follows black line on the track as fast as possible

## 1. Contest description

After being started, the robot has to run over the course and follow black line, overcoming all obstacles. The ranking is determined by the time the robot needed to go from the start to the finish line. The time is measured between the start / finish line passes. If the race time exceeds 3 minutes or if the robot leaves the playing field, the referee terminates the race.

To homologate, the robot must successfully run along the whole homologation playing field and trustworthily demonstrate it detects an object laying on the track (see below).

The races are organized in several rounds. During the qualifications, robots proceed to next round if they successfully pass all obstacles and finish the run within the time limit. Robots with the best time in the last qualification round qualify for the finales (its number will be set based on event schedule). In the finale part, the races will be held on a knock-out basis.

If time allows, the robots may repeat a run in qualification rounds and improve their time (with priority for robots with less attempts in that round).

## 2. Robot

The robot is fully autonomous and must not be dangerous or excessively annoying.

Throughout the race (including the start) no external connection is allowed. The robot must not be touched or interfered with in any way since the player starts it until the referee allows so. On its top side, an emergency switch must be located. By pressing it all actuation must be switched off. The switch must be big enough and well distinct so that it can be easily recognized. It must be also easy to be reached and intuitively used.

A 10x7 cm space for sticker marking must be reserved on the robot's top side.

Maximum size of the robot is 32(w)x32(h) cm, there is no limit on its length. As the time measurement gate is located 4 cm above the ground, it is advisable to make the robot taller than that.

If the robot loses the line, it must return to the line so that it does not shorten its way thanks to the line loss.

**Standard Category:** The robot may be constructed from arbitrarily chosen components.

**Construction Kits Category:** The robot may be built fully using only a pre-approved Construction Kit. For details, see Construction Kits specific rules.

## 3. Playing field

Playing field ground is white. The track is marked by a black line, approx. 1.5 cm wide. The line does not cross itself; however, it may split and re-join (in such case, the robot may take any of them; the paths can be however of different length). The line may even end with a loop which reverts the robot back towards the start. Starting and finishing lines are marked by two perpendicular marks 3.5 cm off the track. Minimal distance between the line and playing field border is 15 cm. Minimal curve diameter is 10 cm. There is a space of at least 8.5 cm between lines and between an obstacle and another line.

There may be some obstacles on the track:

- a) An object: There could be an object laid on the track (at a random place). Its size is at least 6(w)x8(h)x2(l) cm, weight at least 100 g. The robot may touch it but it must not move it.
- b) Line cut-off: The line may be discontinued at any place for max. 20 cm. After the gap, the line may continue anywhere within  $\pm 30^\circ$  from the original direction. The playing field border is at least that far so that at both extremal angles the line could continue and the safety distance mentioned above is met.

After passing the obstacle, the robot must continue to follow the line at latest at 30 cm from its end.

There are no obstacles in the first qualification round. In every consecutive round, there may be one or more obstacles on the track. The obstacles may be placed anywhere on the track. For a successful run, the robot must pass all obstacles it meets.

The robot should be that autonomous so that it can successfully pass any track described earlier without a need for configuration changes.