

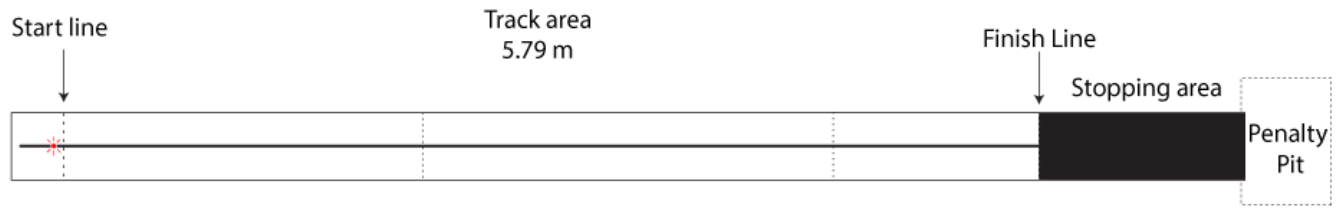
Drag Racer Autonomous (DRA)

Code: **DRA**

Control: **Autonomous**

Open to: **All up to Senior 4**

Playing Field: **A 7.3m** long, two lane straight race course. The surface is 12 mm off the ground. Each lane is 400 mm wide.



Competition Objective: **The robot's** task is to be able to detect the 940nm signal that is placed 5cm (2") behind the start line. When the IR LED is extinguished the Drag Racer will race down the track following the straight black line, pass under the finish line triggering the timer and then stop before running into the foam barrier.

Playing Field Surface: **The playing field** is made from White Foamed PVC (Sintra®), with a matt black line 19 mm wide centred each track. Both tracks are side by side with a space between of approximately 30-40cm. The total track length is 7.3m and divided into a ready area 300mm, race track 5.79m and stopping area 900mm.

There is a 940 nm infrared LED in the centre of the track, 50mm behind the start line which when turned off will signal the start of the run.

A horizontal light beam is placed at the finish line 25 mm, +/- 5 mm above the playing surface and will, when broken, detect the first drag racer to interrupt the timing beam.

The stopping zone at the end of the track is entirely black with a foam barrier at the far end.

This contest is intended to provide a new side-by-side race for Autonomous Line Follower vehicles.

Robot Specifications: **The robot must** be no more than 200mm wide and 300mm long at any time and the maximum height is 180mm. with **a maximum weight of 2Kg**. The robot shall be self-contained.

A downward facing infrared detector (IR) on the robot is to be used to start the robot's forward movement when the IR source is removed.

The robot is to be placed so that the front most part of the robot is less than 50mm from the sensor. The infrared light will be ON until the start of the race. When the IR light is ON the robot must NOT move.

The robot must also detect the black stopping zone following the finish line and come to a full stop before the foam safety barrier, 90cm.

Restrictions: **No fuel cells**, compressed gasses or other combustion processes are permitted. **If using** Lithium based batteries, (See "[MRG General Rules 2020](#)" page 3 for more information)

Maximum 24 V total battery voltage

No scratching or other damage to the playing field is permitted.

No remote control of any kind are permitted. Once released the robot must be fully autonomous.

Must be powered entirely by electricity.

Robot Identification: **The MRG** identification sticker(s) (as supplied during registration, sized 67 x 25mm) must be easily readable on the robot's body while the robot is in competition.

Game Principles: **The best** of three runs determines the winner. If a robot leaves the track it is deemed to have forfeited that run. If both robots leave the track the robot that left first is the loser of that run. If a robot fails to stop within the stopping zone and collides with the safety barrier a 5 second penalty will be added to its time.

Game Procedure: **At the start** of each run, the robots will be placed in the area behind the start line. **The robot** may be placed anywhere behind the start line as long as it detects the IR light. **When both** robots are ready the IR light will be extinguished and the robots race to cross the finish line. **A horizontal** light beam will record the instant the front of each robot reaches the finish line. **The judge** may choose between “fastest time” , or “elimination”, or other combination at the judges discretion based upon number of entrants and scheduling constraints.

MRG General Rules: **Failure** to follow the MRG General Rules may result in the following:
Warning being issued, or
Disqualification and loss of the round, or
Disqualification from competition and or event.