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Assembling a line follower robot

Pedro Ney Stroski

([Https://Www.Electricalelibrary.Com/En/Author/Pedroneystroski/](https://www.electricallibrary.com/en/author/pedroneystroski/)) / 2 de March de 2019

With infrared (IR) sensors, can build a line follower robot. The construction and operation of this type is the post's subject.

Clicking in the button below will open the post about IR sensors.

[IR sensors](#)

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[\(https://www.electricallibrary.com/en/2019/01/16/infrared-sensors/\)](https://www.electricallibrary.com/en/2019/01/16/infrared-sensors/)

Line follower with transistors

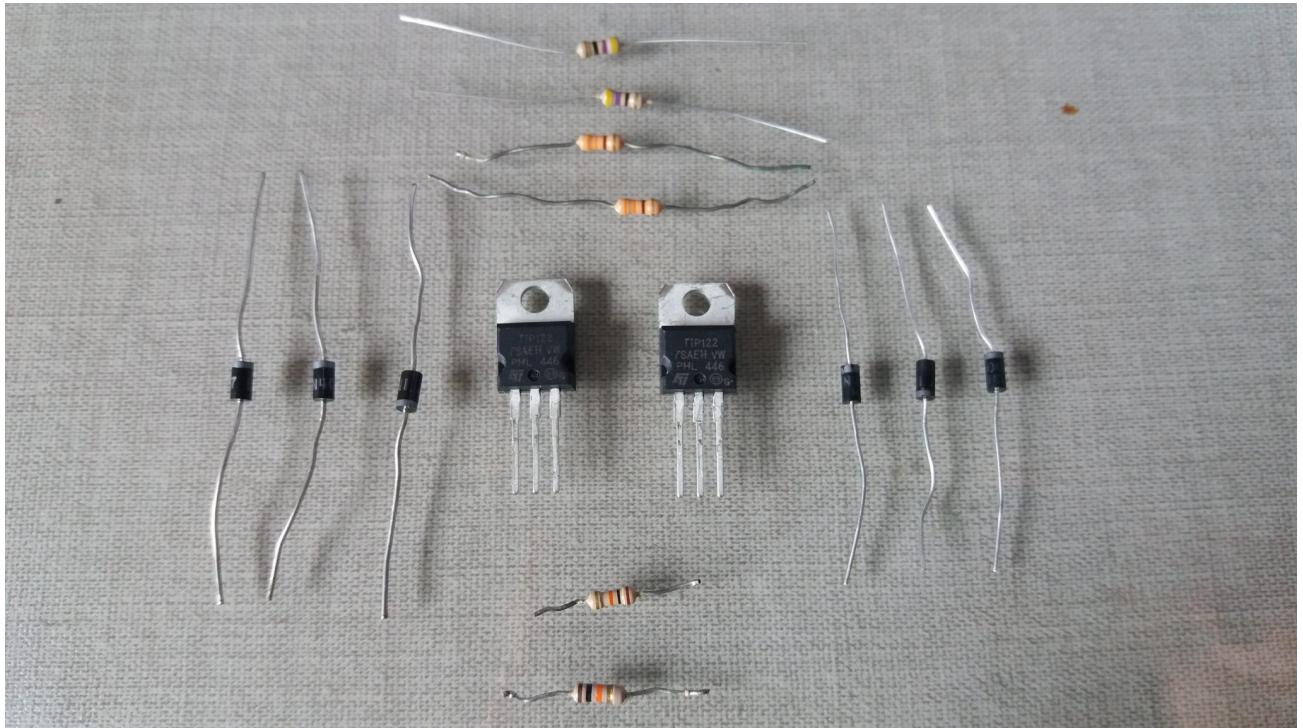
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It is possible to build a line follower robot with only 2 BJT transistors

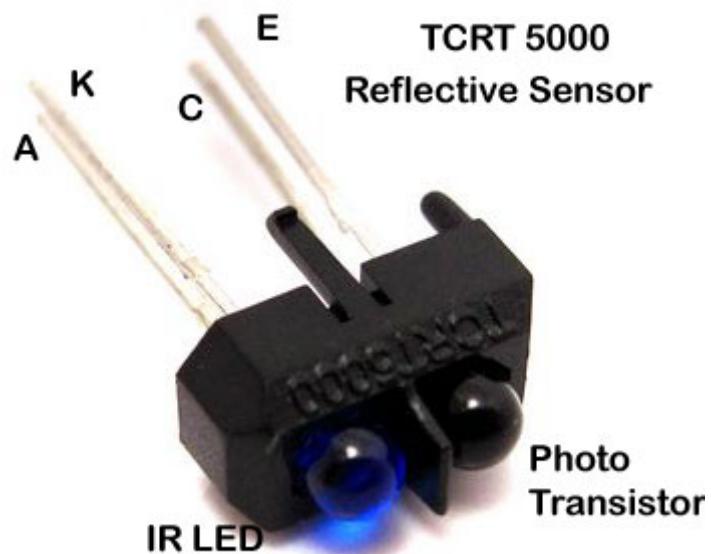
(<https://www.electricallibrary.com/en/2017/10/15/how-bit-transistor-works/>). The necessary materials are:

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- 2 TIP122 transistors;
- 6 resistors: 2 of 47Ω , 2 of $330\ \Omega$ and 2 of $10\ k\Omega$;
- 6 1N4007 diodes;



- 2 TCRT5000 IR sensors;



- 2 wheels and 2 DC motors (<https://www.electricallibrary.com/en/2017/10/08/how-dc-motors-work/>) with reduction;

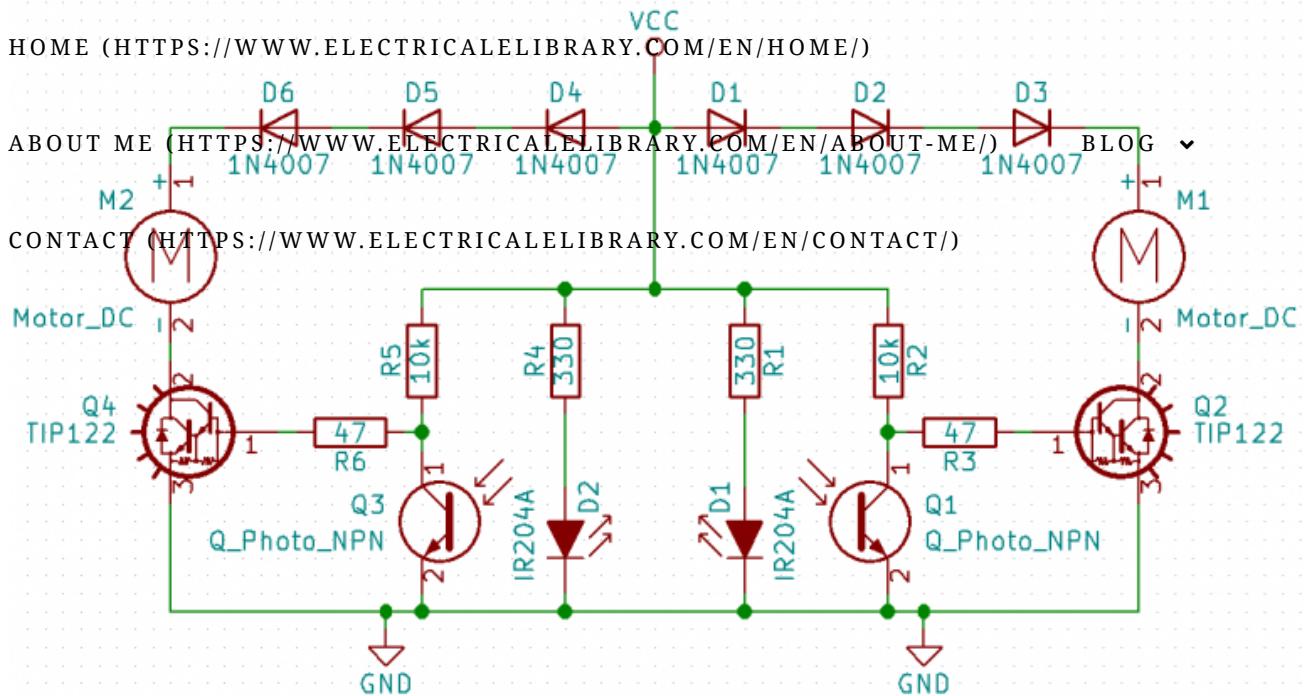
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- 4 AA batteries and support for 4 batteries;



This is the schematic circuit of electronic part. When the phototransistor receives the reflected light from IR led, the TIP122 transistor is in cut mode and motor stops moving. The $47\ \Omega$ resistor serves to avoid TIP122 from heating up. The diodes serve to reduce motor's speed. If robot goes too fast, it won't be able to make curves.





This button opens the post about how to make printed circuit board.

How to make board?

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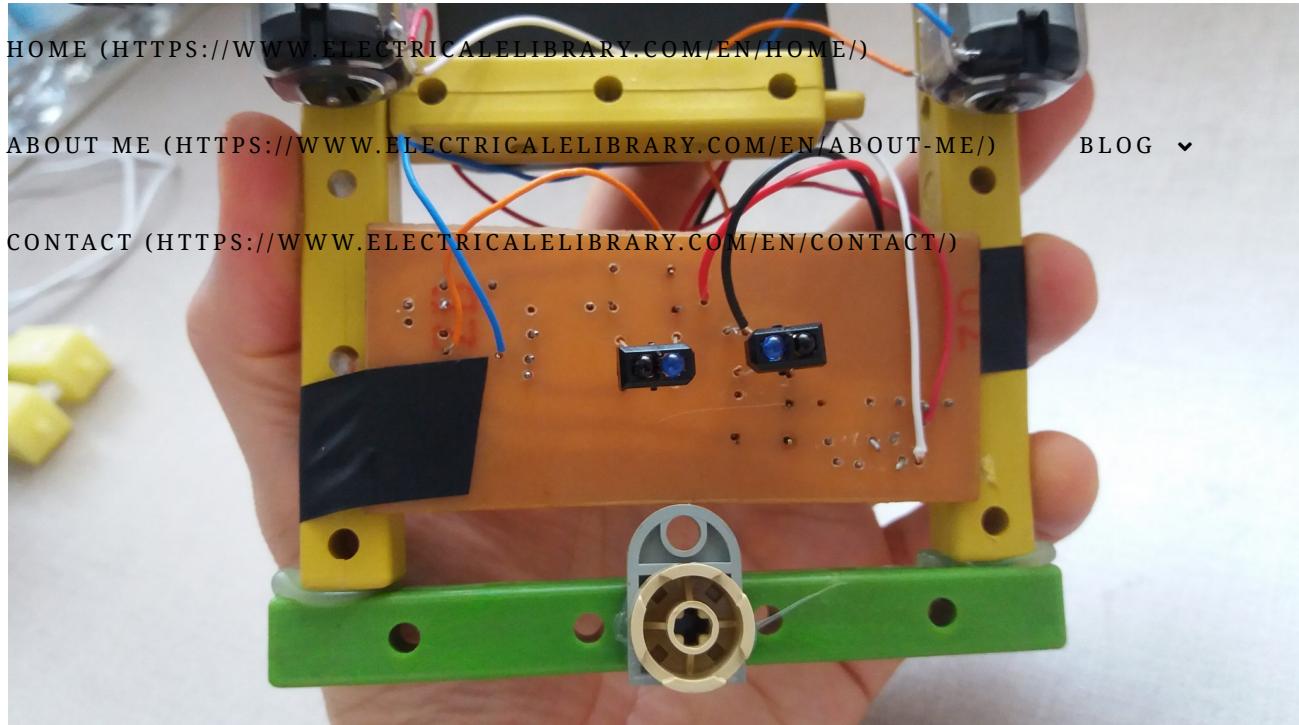
(<https://www.electicalelibrary.com/en/2017/06/23/how-to-make-printed-circuit-board-2/>)

The board after the processes of drawing, corrosion and piercing.

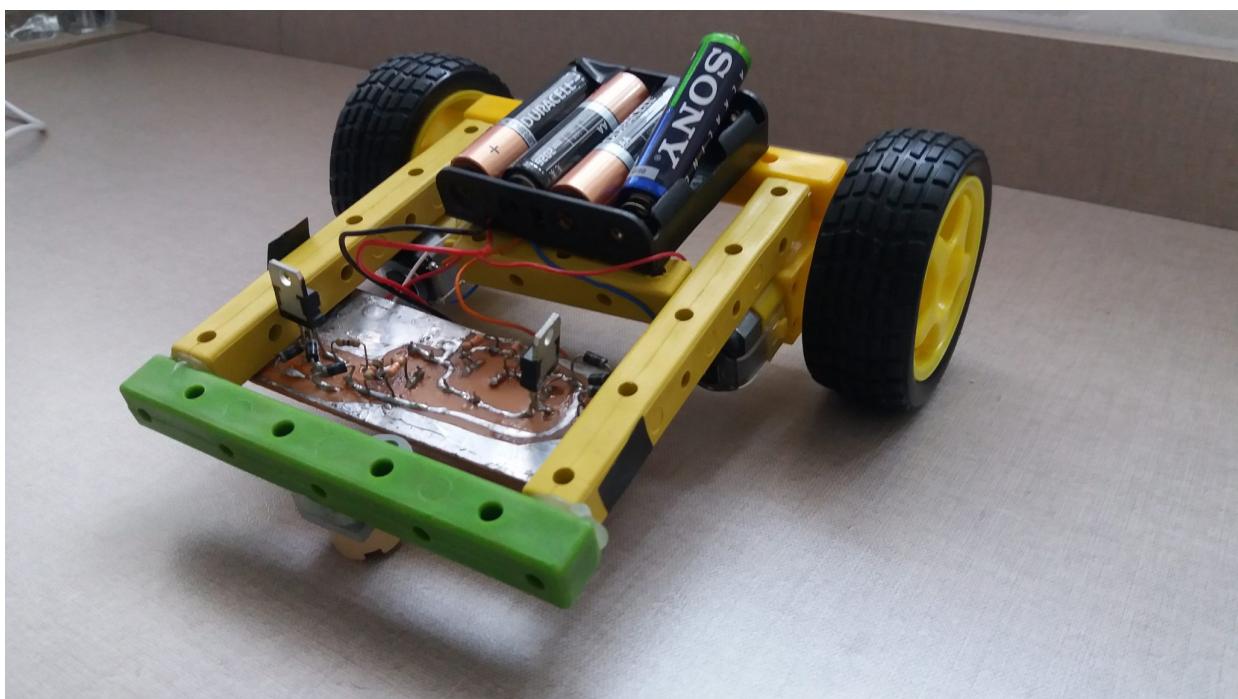


All components, with the exception of TCRT5000 were welded in the trails side.





The line follower robot ready. Follows a dark line in a light surface.

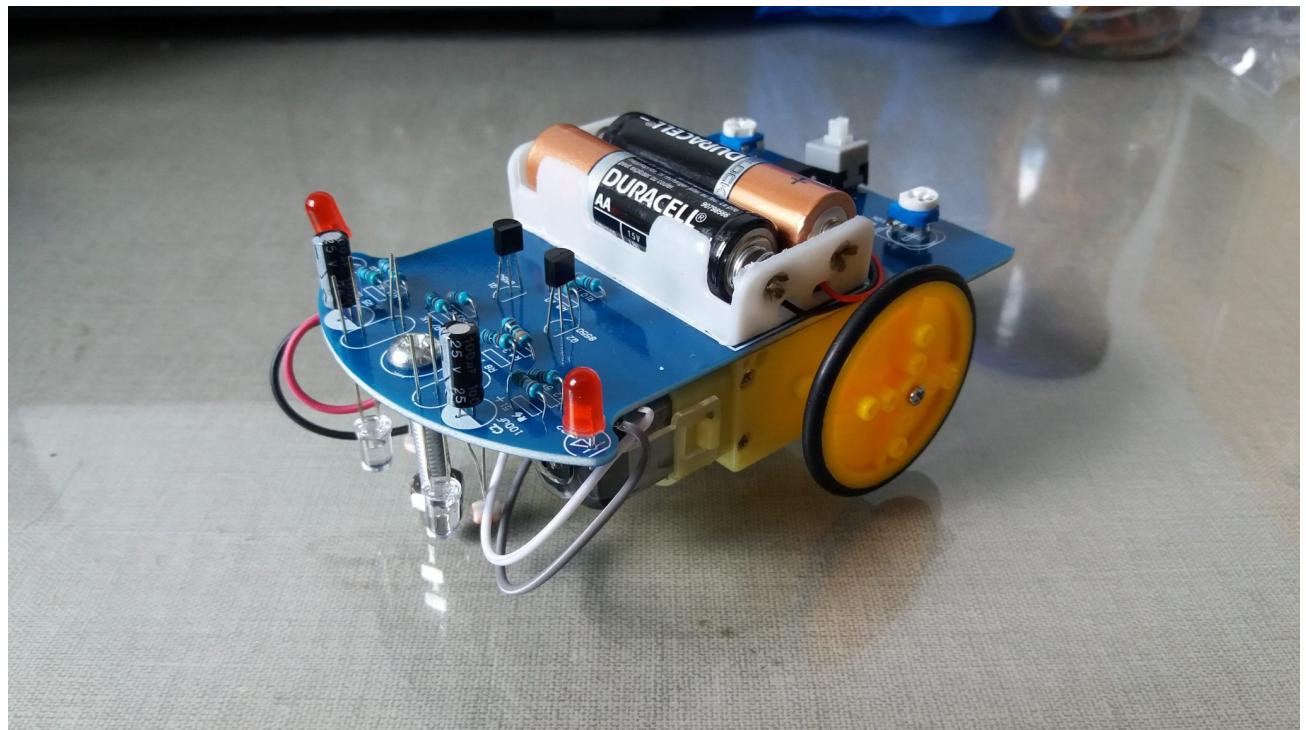


This is the test track, has 4.8 cm width.



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Line follower robot kit

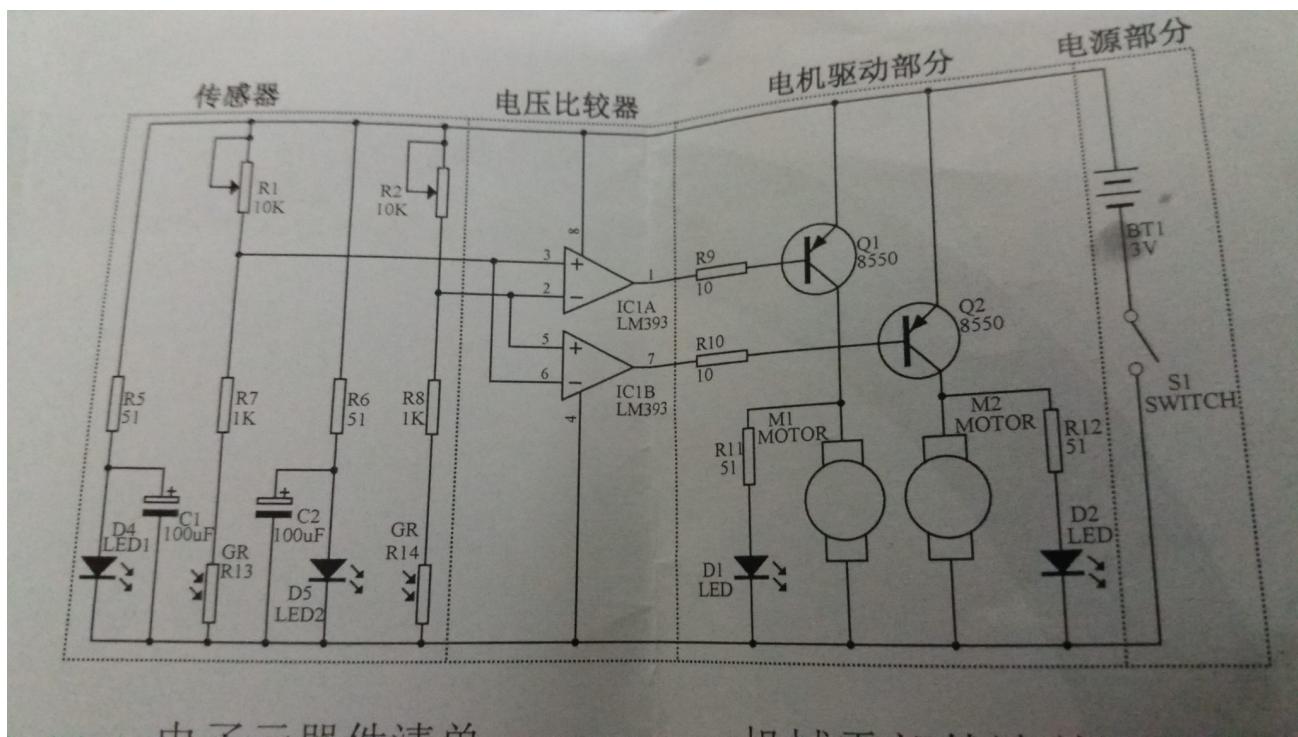


This is a D2-1 kit imported from China. These are all components, the board is the chassis.





Instruction manual shows the schematic.



This robot uses 2 LDRs (<https://www.electricalelibrary.com/en/2017/08/04/ldr-2/>) and 2 red LEDs as sensors. The potentiometers have the function to regulate response of sensors. The sensors output go to LM393 chip, which is a double voltage comparator, has two operacional amplifiers, the operation of this component will be subject to other post. LM393 controls the 8550 transistors as switches and the latter controls DC motors, the D1 and D2 LEDs serve to indicate that the motor is on. This is the track test in opposite side of schematic.



This video shows the follower line robots in operation.

Robôs seguidores de linha/Follow line robots



This other video shows the assemble process.



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**PEDRO NEY STROSKI**

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