

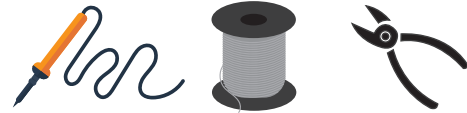
## ① Material List

Motor \* 2  
Tire \* 2  
Battery box \* 1  
Motor fixing pieces \* 2  
T shape pieces \* 2  
M5 philips screws \* 1  
M3 philips screws \* 4  
M2.5 thumb head screw \* 2  
M5 Cap Nuts \* 1  
M3 Nuts \* 4  
M2.5 Nuts \* 2

Cross screwdriver \* 1  
PCB board \* 1  
Resistance \* 10R \* 8 / 1K \* 9 / 1.5K \* 2  
potentiometer \* 10K \* 2  
Power port \* 3  
Push switch \* 2  
IR Transceiver \* 4  
LM339 IC \* 1  
Red LED \* 3  
PNP Triode \* 2

## ② Tools Required

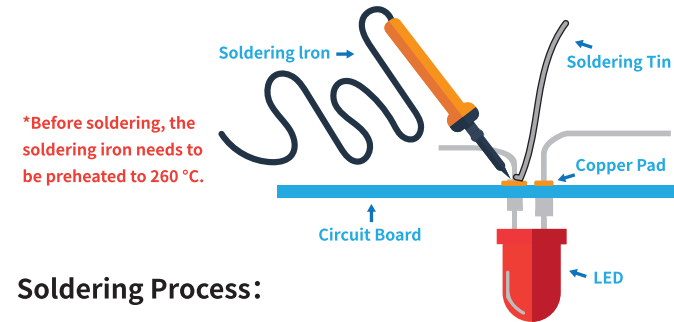
Soldering iron  
Diagonal cutters  
Soldering tin



## ③ Basic Soldering Techniques

### Soldering preparation:

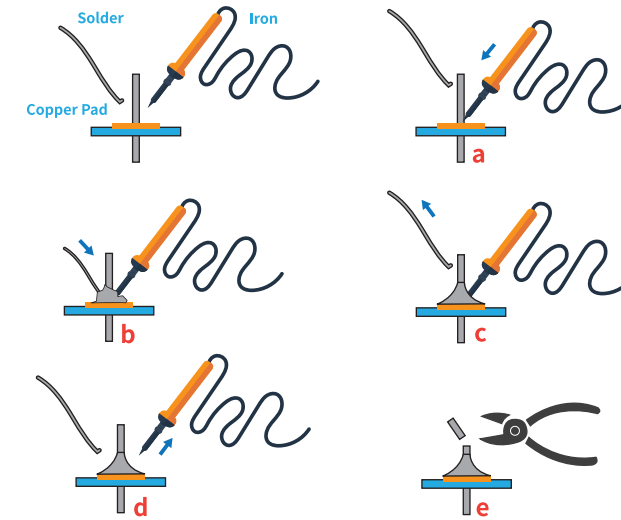
Pass the leads of the component through the holes, turning over the PCB to solder on the other side, Ensure most parts are on tight against the board unless otherwise specified.



### Soldering Process:

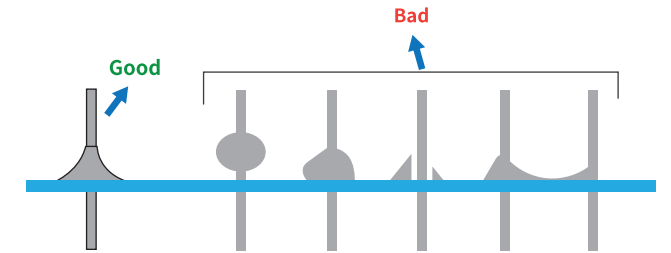
- Place iron on copper pad to preheat it.
- Apply soldering tin to the bonding pad along the iron.
- Make the soldering tin completely coat the connection, then remove the solder wire.

- Hold the iron on the solder joint for no more than 1 second to ensure the solder has fully melt, then remove the solder iron.
- Wait the solder to cool off, then use diagonal cutters to remove excess leads.



### Soldering Bond Inspection:

- After soldering, the shape of the good solder joint should be like a “mini volcano” or “cone”.
- However, if the shape of the solder joint is as shown in the figure below, it should be re-soldered because bad joints can cause poor contact.



## ④ Special Component Soldering

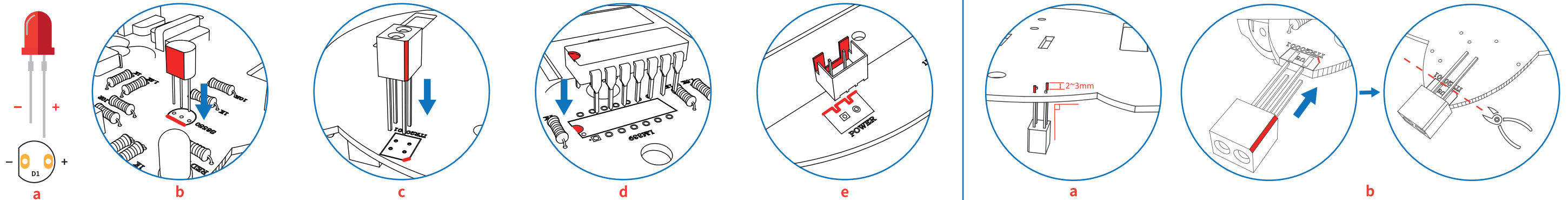
### Pay attention to the soldering direction of below components

- LED** - The longer lead of the LED is positive, and the LED needs to be installed according to the silk screen.
- Triode** - The direction of the triode should be consistent with the silkscreen contour.

- Infrared Transceiver** - The infrared transceiver has a chamfer on one of the corners. The orientation of the chamfer should be consistent with the silkscreen contour.
- LM339 Motor Driver** - LM339 is a DIP packaged chip, before soldering, we need to confirm that the U-shaped groove on the chip is in the same direction as the silk screen.
- Power port** - The notched side of the power port should be in the same direction as the two grooves of the silk screen

### Special soldering requirements:

- Line tracking Infrared Transceiver**
  - Start soldering after the longer pins pass through the PCB for 2~3mm.
  - The infrared transceiver should be perpendicular to the PCB.
- Obstacle avoidance Infrared Transceiver**
  - The obstacle avoidance infrared transceiver tube is soldered to the front of the PCB, and the soldering direction is also related to the chamfering
  - Cut off the excess pins before soldering



## ⑤ Soldering BOM List

Designator	Comment
R1, R2, R12, R14, R8, R15, R16, R18, R19	1K Resister
R3, R4, R7, R11, R13, R17, R20, R21	10R Resister
R9, R10	1.5K Resister
D1, D2, D3	RED LED
P1, P2, P3	Power Port
U1, U2, U3, U5	ITR20001 IR Transceiver
S1, S2	Self-locking Push Switch
R5, R6	10K Potentiometer
Q1, Q2	S8550 Triode
U4	LM339 Comparator

## ⑥ Installation

After the soldering is completed, we need to install the power components on the car.

- Step1:** Bolting the motor to the wooden motor fixing piece with M3 philips screws.
- Step2:** Install the M5 cap bolt at the marked position as shown in the picture.
- Step3:** Fix the motor fixing pieces on the top of the car with two wooden T-shape pieces.
- Step4:** Install the battery case onto the top of the car with tow M2.5 screws, and install two batteries in the case.

## ⑦ Working Modes

Finally, after finishing all these steps, we can make the car move now. The Soldering Car has two working modes, we can switch them through the MODE-Switch on the car.

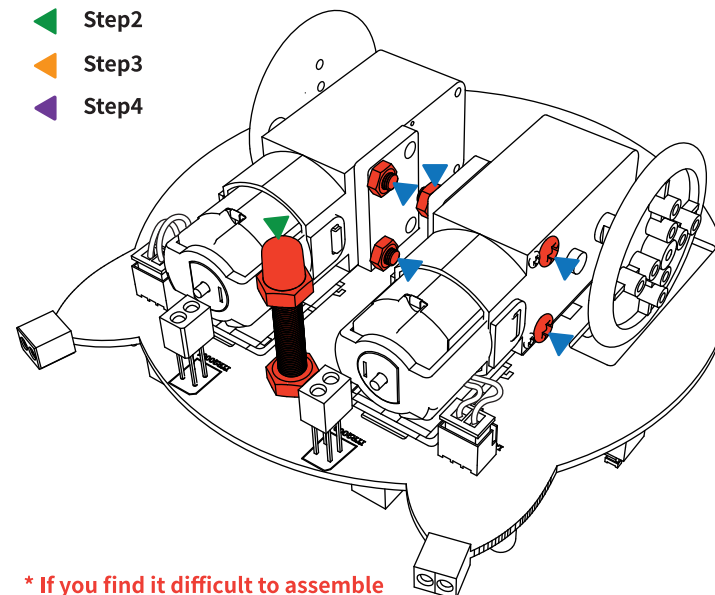
### 1) Line tracking mode 1

The two IR transceiver at the bottom of the car could recognize the black track, so the car can move along the black line by itself.

### 2) Obstacle avoidance mode 2

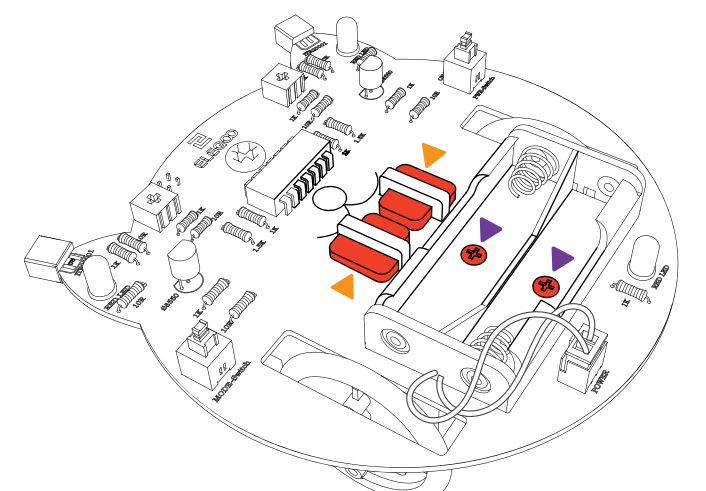
There are two infrared distance sensors on both sides of the front of the car. The car can detect obstacles on the way and avoid them.

- Step1
- Step2
- Step3
- Step4



\* If you find it difficult to assemble the soldering car, please check the assembling video from [www.elegoo.com](http://www.elegoo.com)

\*If the car runs out of track or circle in the tracking mode, you can adjust the sensitivity of the infrared transceiver through the two potentiometers on the front of the car.



\*If you have any questions during assembling or testing please feel free to contact us at [service@elegoo.com](mailto:service@elegoo.com).

Elegoo Team  
[www.elegoo.com](http://www.elegoo.com)