## ICStation Line Following Tracking Smart Car (Stepper Motor) Kit

# Instruction Manual

### ICStation Line Following Tracking Smart Car (Stepper Motor) Kit

Model: B07P57N347

## 1. Introduction

This instruction manual provides detailed guidance for assembling and operating your ICStation Line Following Tracking Smart Car (Stepper Motor) Kit. This educational kit is designed to enhance intellectual development, hands-on ability, and understanding of basic electronics and robotics principles. It is suitable for students and beginners interested in STEM learning and soldering practice.
The smart tracking car operates based on the principle of light reflectivity difference. A photoresistance sensor on the board detects red LED light reflected from the ground to determine if it is following a black line.

## 2. Safety Information

Please read all instructions carefully before beginning assembly. This kit involves soldering, which requires caution. Always work in a well-ventilated area and wear appropriate safety gear, such as safety glasses. Keep small components away from young children to prevent choking hazards. Adult supervision is recommended for users under 13 years of age.

## 3. Package Contents

Verify that all components listed below are present in your kit:

- Printed Circuit Board (PCB)
- Metal film resistors
- DIP-8P IC socket
- Self-Locking switch
- Potentiometers
- S8550 transistors
- Capacitors
- Red LEDs
- White LEDs
- Mecanum wheels

- Caster support bolts and nuts
- Photoresistors
- Battery case (for 2 AA batteries, batteries not included)
- Gaskets
- Steel shafts
- Three-way sleeves
- Gears
- Motors
- LM393 IC
- Various screws and fasteners

Figure 3.1: All components included in the kit.

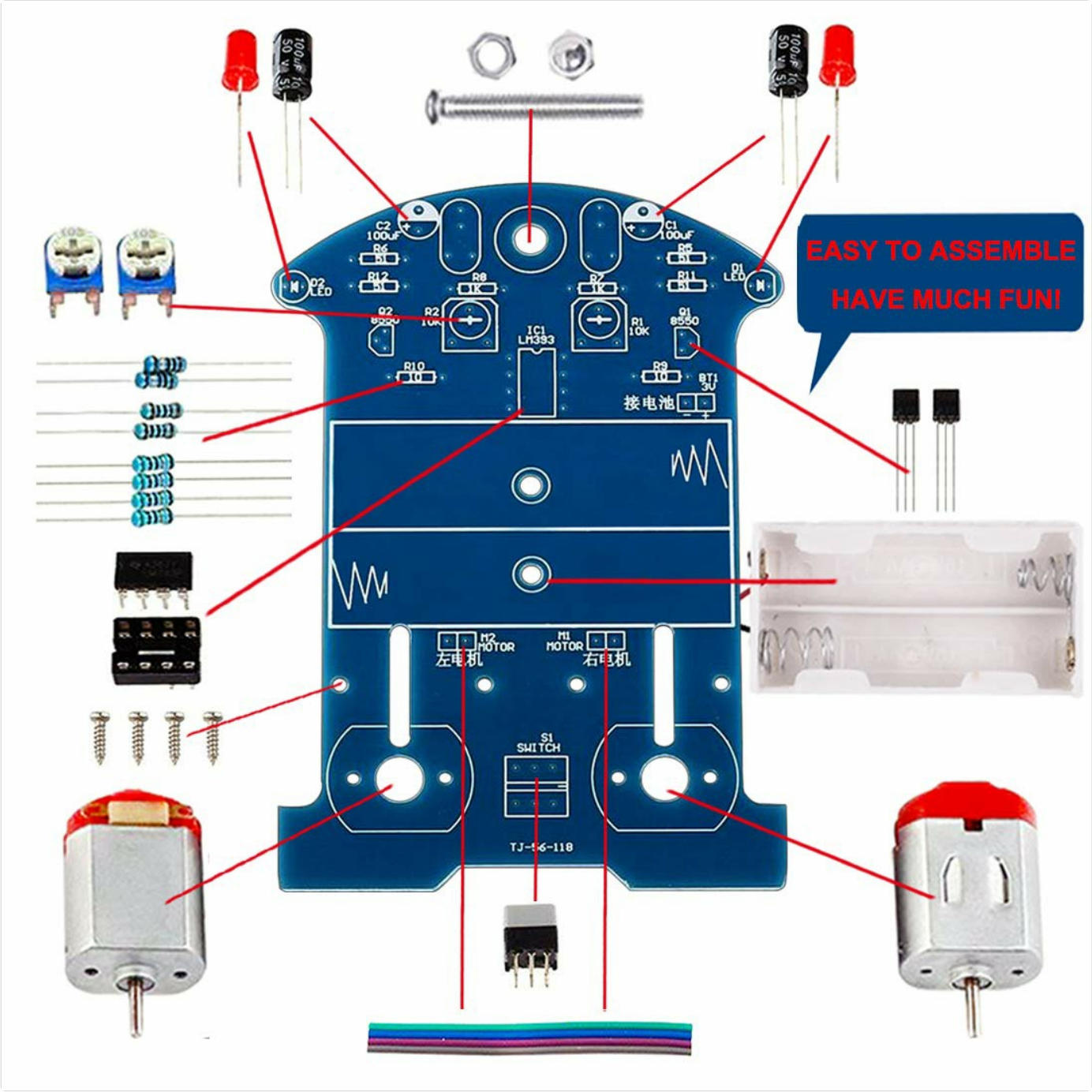


Figure 3.2: Detailed view of the PCB with component placement labels.

## 4. Assembly Instructions

### 4.1. Circuit Installation

1. Install metal film resistors, DIP-8P IC socket, Self-Locking switch, Potentiometer, S8550, Capacitors, and Red LEDs onto the PCB according to the markings on the board.
2. Install Mecanum wheels. Insert the support bolts of the caster into the hole, tighten the nuts screwed into the caster, and finally fit the caster and tighten.
3. Install photoresistors and white LEDs on the reverse side of the PCB.
4. Install the battery case.
5. **Initial Testing:** Install two AA batteries (not included). Press the switch. If both white LEDs turn ON, the circuit installation is successful. If the LEDs remain off, please recheck all soldering connections.

### 4.2. Mechanical Parts Installation

1. Install the four gaskets onto the circuit board.
2. Insert a steel shaft through the center hole of each wheel. Ensure the direction is inserted from the side with the raised sleeve of the wheel. It is best to insert the steel shaft parallel to the smooth side of the wheel.
3. Place a three-way sleeve onto the steel shaft, close to the wheel, followed by a gasket onto the steel shaft, close to the three-way sleeve. Ensure they are installed in place and the three-way sleeve can toggle flexibly.
4. Place a gear onto the steel shaft in the center.
5. Put a three-axis sleeve onto the end of the steel shaft to complete the wheel assembly for the car side.
6. Install the motors.

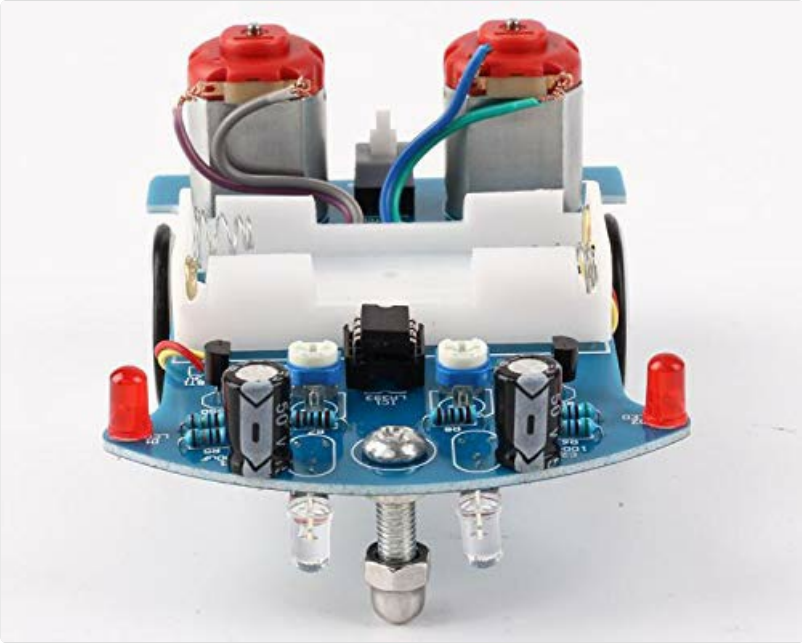

Figure 4.1: Close-up view of the assembled circuit board and components.

## 5. Operating Instructions

Once assembled, the smart car is ready for operation. You can design an interesting and winding route using a 1.5-2.0 cm wide black electrical tape on a flat surface. The car will then follow this black line.

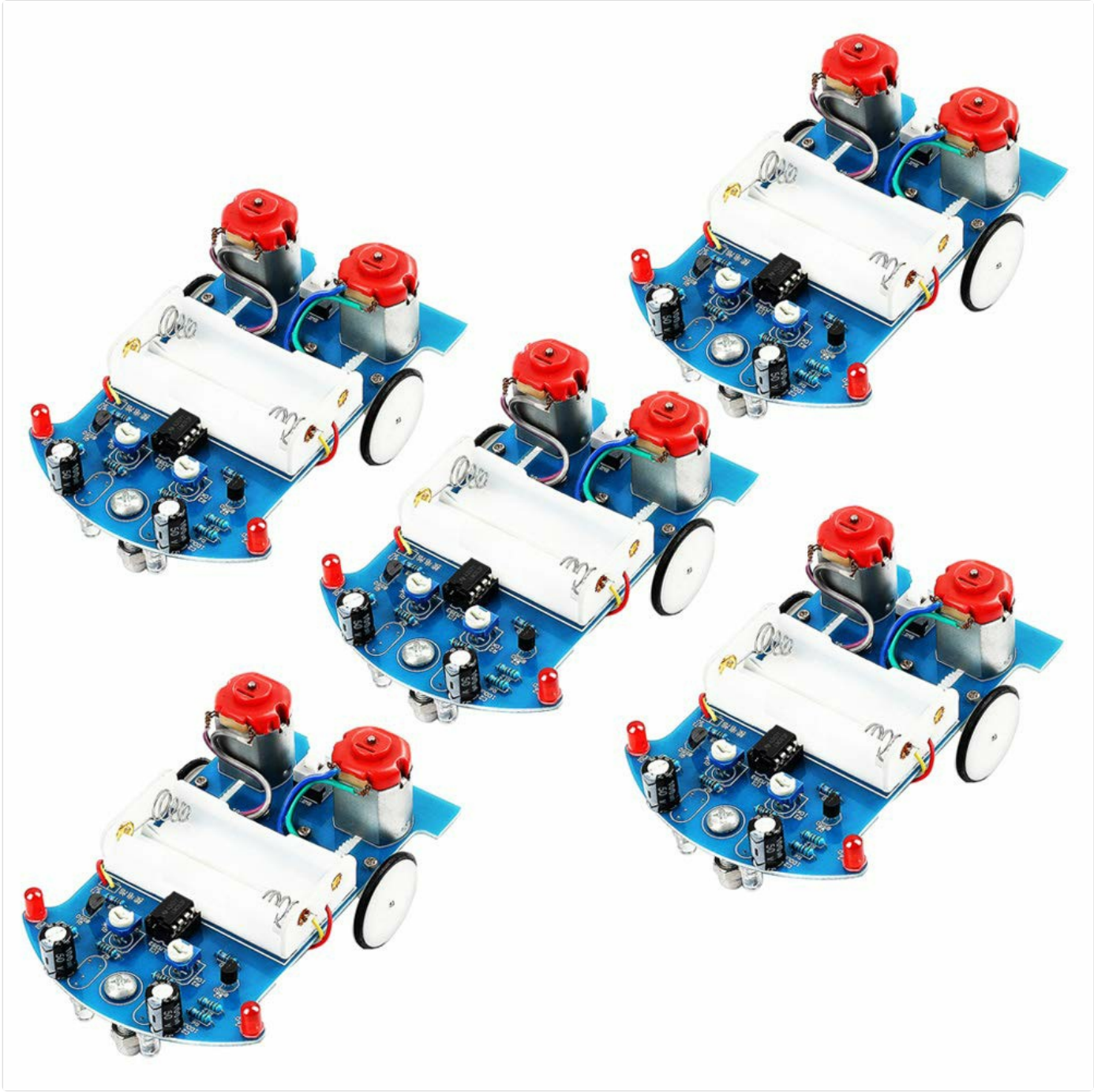

Figure 5.1: Multiple assembled smart cars.


Figure 5.2: Example of smart cars following a black line in a competition setting.

### 5.1. Demonstration Video

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Video 5.1: A demonstration of the robot car following a line. This video shows the car in action on a black line track, demonstrating its line-following capabilities.

## 6. Maintenance

To ensure the longevity and optimal performance of your smart car kit, keep it clean and free from dust and debris. Store components in a dry environment. Regularly check soldered connections for integrity. If the car's performance degrades, ensure the batteries are fresh and connections are secure.

## 7. Troubleshooting

### 7.1. Common Issues and Solutions

- **Car does not move after power on:**
  - Check the S8550 transistors.
  - Check the 10-ohm resistors.
  - Ensure batteries are correctly installed and charged.
  - Verify all soldered connections are solid and there are no short circuits.
- **Car does not follow the line correctly:**
  - Ensure the photoresistors and white LEDs are installed correctly on the reverse side of the PCB.
  - Verify the LM393 IC is installed with the correct orientation.
  - Check the black line's width (recommended 1.5-2.0 cm) and contrast against the surface.
  - Ensure the environment has adequate lighting, but avoid direct strong light that might interfere with the sensors.

- **Intermittent operation:**
  - Check for loose wires or components.
  - Ensure the battery case connections are secure.

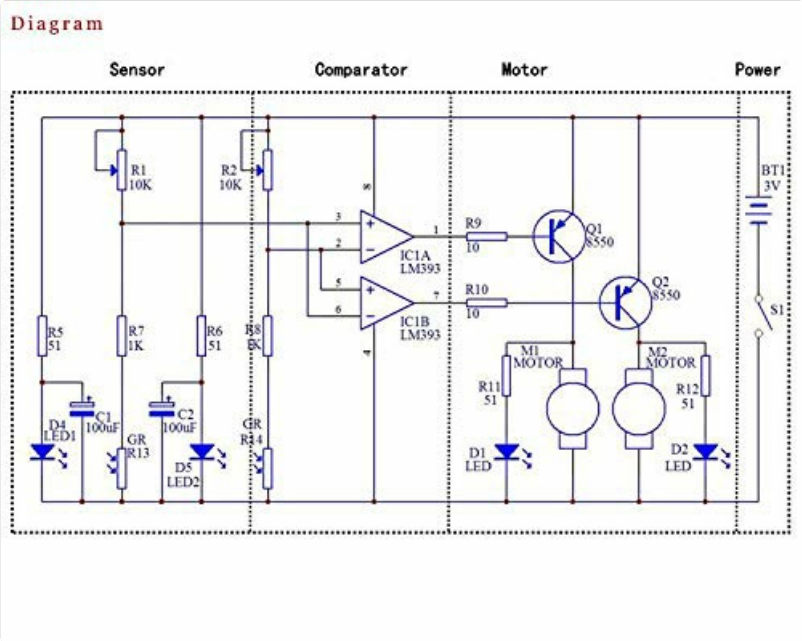


Figure 7.1: Circuit diagram for reference during troubleshooting.

## 8. Specifications

| Feature | Detail |
|---|---|
| Product Dimensions | 4.5 x 3.4 x 0.4 inches |
| Item Weight | 12.35 ounces |
| Recommended Age | 13 years and up |
| Manufacturer | ICStation |
| ASIN | B07P57N347 |
| Power Source | 2 x AA Batteries (not included) |

## 9. Warranty and Support

For any questions, technical assistance, or support regarding your ICStation product, please contact the manufacturer directly. ICStation is committed to providing professional help and support for product-related issues. Please refer to the product's original packaging or the seller's information on the purchase platform for specific warranty details and contact information.
You can also visit the official ICStation store for more information:ICStation Store on Amazon.

Figure 9.1: ICStation Brand Logo.

## Related Documents - Line Following Tracking Smart Car (Stepper Motor) Kit

| | |
|---|---|
|  | HU-064 High Voltage Electromagnetic Transmitter DIY Kit \| Educational Science Project<br>Learn about electromagnetism and electronics with the HU-064 High Voltage Electromagnetic Transmitter DIY Kit. This educational kit allows users to build a functional device, practice soldering, and understand high-voltage principles. |
|  | RDA5807 FM Radio Receiver LCD1602 DIY Kit Assembly Guide<br>Comprehensive guide for assembling the RDA5807 FM Radio Receiver LCD1602 DIY Kit. Includes detailed steps, component lists, and installation tips for building your own FM radio. |
|  | CTR-30C RGB LED Auto Flash Christmas Tree DIY Kit Assembly Guide<br>Comprehensive assembly guide for the CTR-30C RGB LED Auto Flash Christmas Tree DIY Kit. Learn how to build your own festive electronic Christmas tree with detailed instructions, component lists, and tips. |
|  | HE009 Flashing LED Rotating Astronaut Electronic Soldering DIY Kit - Assembly Guide<br>Comprehensive guide to assembling the HE009 Flashing LED Rotating Astronaut Electronic Soldering DIY Kit. Learn soldering skills with this engaging electronic project. |
|  | 6Bit Digital Electronic Clock DIY Kit - Installation and Operation Guide<br>Comprehensive guide for the 6Bit Digital Electronic Clock DIY Kit, covering features, parameters, component listing, installation steps, and operation. Ideal for electronics hobbyists and beginners. |

FM Radio Kit with Rechargeable Battery

1.Introduction:
It uses 76.0MHz-108.0MHz Wireless FM Radio Receiver DIY Kit with Rechargeable 18650 Lithium Battery. It has a built-in high-definition display LCD screen, which can display the frequency and the receiving frequency band of six short-wave stations, which is convenient for users to operate.

2.Feature:
1> LCD display LCD display screen
2> Support storage of 32 radio stations
3> Automatic search for radio stations
4> Built-in 2W level digital volume adjustment
5> Automatic memory function after power off
6> Support 76Hz-108MHz receiver frequency
7> Built-in 3W power amplifier
8> Support TF card and U disk play
9> Power saving mode with backlight off for 20 seconds
10> Support speaker and earphone audio output

3.Parameter:
1> Work Voltage: DC 3.0V-5.0V
2> Receive frequency: 76-108
3> Output power: 3W
4> Response frequency: 76Hz-18KHz
5> Output channel Main for speaker and Dual channel for earphone
6> Frequency: 87.5MHz-108.0MHz Module Category Manufacturing Brand
7> Receive frequency: 76.0MHz-108.0MHz Module Category Manufacturing Brand
8> Signal-to-noise: >=30dB
9> Work Temperature: -40℃-85℃
10> Work Humidity: 5%-95%RH
11> Size:Included: 11.5*9.5*2.5

4.Use Methods:
1> Short press switch to turn ON/OFF work voltage
2> Long press ATTO button to automatically search and store FM radio stations that exist in the area
3> Short press switch to ATTO button to turn ON/OFF store function
4> Short 9# and 8# to switch saved FM stations
5> Press 5# and 6# to adjust volume from 0Hz to 9Hz
6> Switch Category Manufacturing Band: Crazy press 2# and 1#, before press 1# and then press 2# work, press switch. It means Switch Category Manufacturing Band if display 87.5, use 1#2#. It means switch Category Manufacturing Band, if display 87.5

[Icstation FM Radio Kit with Rechargeable Battery - DIY Electronics Project Guide]

Build your own FM radio with the Icstation DIY kit. This guide provides a comprehensive overview of the FM radio receiver, including features, parameters, component listing, detailed installation steps, and usage instructions.