

D2-1 Patrol Car project

Aim of the project is for student to understand the most basic form of feedback control.

A: Circuit Assembly

- Solder all components on to the PCB. Note the polarity of IC, E capacitor, LED, and Transistor. They cannot be wrongly inserted.
- Solder the battery holder leads. Red is positive.
- Assemble and screw-in the front wheel.
- Assemble the LED and light sensitive varistor on the back side of PCB. They should be about 5mm away from the front steering wheel.
- Assemble the batteries into the kit, and test out the kit.

B: Mechanical Assembly

- Assemble the wheels
- Attach the wheels to the reduction gear unit
- Prepare the conducting wires
- Attach the motor wires to the PCB points

C: Tuning

- Turn on the e-mouse, make sure all LEDs are working, and motor polarity is correct.
- Turn off, and insert the LM393 IC, adjust the variable resistor, so that the mouse can follow the black track smoothly.

Warning: use the test track to test out the e-mouse. If the mouse does not follow the track, you must adjust the two 10K variable resistor, to make it run property.

D: Component List

LM393 IC	(IC1)	Transistor 8550	(Q1, Q2)
IC socket	(IC1)	Self-locking switch	(S1)
e-cap 100 μ F	(C1C2)	Motor Gear Mechanics	(M1, M2)
Resistor 3.3K	(R3, R4)	LED red	(D1, D2)
Resistor 51 Ω	(R5, R6, R11, R12)	LED transparent	(D3, D4)
Resistor 1K	(R7, R8)	Light sensitive varistor	(R13, R14)
Resistor 10 Ω	(R9, R10)	10K variable resistor	(R1,R2)

Circuit Diagram

