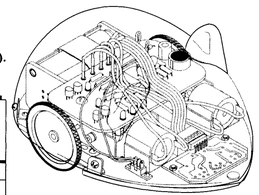
LINE TRACKING MOUSE

This intelligent robotic mouse tracks a black line using three photo interrupters its eyes.

Power Source Required:
DC 6V -1.5V AA x 4 batteries (not included).



1. Required Tools

4 x AA Battery	Solder Wire
Black Plastic Electrical Tape	Diagonal Cutter
Long Nose Pliers	Soldering Iron
Screwdriver	Soldering Iron Stand With Sponge

2. Electronic Parts List:

Resistor	
□1/4W 220Ω (red red brown gold)	4 pcs
□1/4W 330Ω (orange orange brown gold)	3 pcs
□1/4W 3.3K (orange orange red gold)	1 pc
□1/4W 10K (brown black orange gold)	1 pc
□1/4W 56K (green blue orange gold)	1 pc
□1/4W 100K (brown black yellow gold)	1 pc
□1/4W 3.3M (orange orange green gold)	1 pc
□1/4W 560Ω (green blue brown gold)	1 pc
□1/8W 220Ω (red red brown gold)	3 pcs
□1/8W 33K (orange orange orange gold)	3 pcs

Transistor	IC	Ceramic Capacitor	Electrolytic Capacitor	Photo Interrupter
□ 1815 3 pcs or(C945) □ 8050 2 pcs	□EM78P156EP 1 pc	□22P 1 pc □104 2 pcs	□ 100uf 1 pc	□LTH-1550-1 3 pcs

Pin header	Pin header	microphone	Diode	∅3mm LED
□ 5 pins 180° 1 pc	□ 5 pins 90° 1 pc	□ ∅10mm 1 pc	ID mark □ IN 4004 1 pc	□ red 3 pcs □ green 2 pcs

Slide switch	
□Slide switch 1 pc	□∅1.3mm pin 8 pcs

Sensor PCB

Main PCB

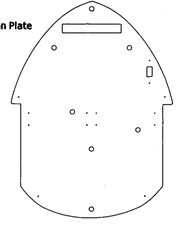
Connector with wire	
(12cm)	□ yellow 1 pc
	□ blue 1 pc
	□ orange 1 pc
	□ green 1 pc
	□ red 1 pc
	□ black 1 pc

Harness	
	□ 5 pins harness 1 pc

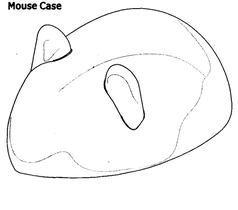
Battery Holder	
	□4AA with 10cm wires 1 pc

3. Mechanical Parts List:

Wooden Plate



Mouse Case



P1	Gearbox	P2	Motor DC6V	P3	Metal shaft	P4	Metal shaft
Qty:	2 pcs	Qty:	2 pcs	Qty:	2 pcs (2X40mm)	Qty:	2 pcs (3X52mm)

P5	Pinion gear10T	P6	Face gear 36T/14T	P7	Gear 36T/0T	P8	Gear 36T/14T
Qty:	2 pcs (white)	Qty:	2 pcs (white)	Qty:	2 pcs (white)	Qty:	2 pcs (Red)

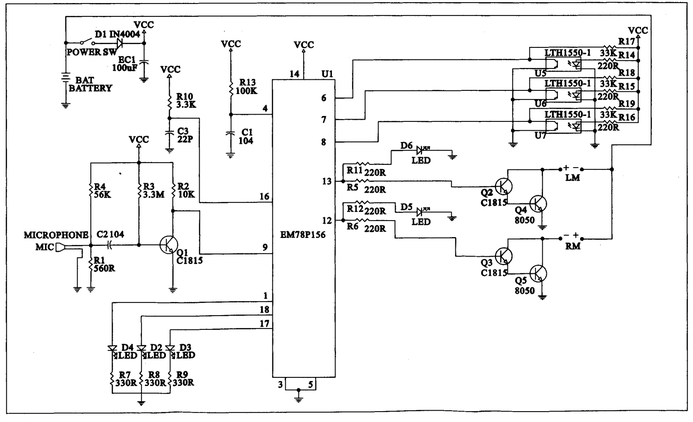
P9	Gear 36T/14T	P10	Nylon pad	P11	Rear Wheel	P12	Rear tire
Qty:	2 pcs (Green)	Qty:	4 pcs (5.6X4.8X1.95)	Qty:	2 pcs (∅32X3mm)	Qty:	2 pcs (∅30X∅3mm)

P13	"U" holder	P14	Fixing Plate	P15	Hex post	P16	Plastic post
Qty:	1 pc	Qty:	4 pcs ("L" shape)	Qty:	2 pcs	Qty:	3 pcs(2pcs spare)

P17	Nylon post	P18	Screw	P19	Screw	P20	Self-taping screw
Qty:	2 pcs (∅3X2mm)	Qty:	4 pcs(M2X10mm)	Qty:	4 pcs (M3X5mm)	Qty:	14 pcs(2X4mm)

P21	Self-taping screw	P22	Nut M2
Qty:	4 pcs (2X6mm)	Qty:	4 pcs

Circuit Diagram



4. PCB Assembly

Refer to components view of the main PCB as below drawing , the parts identification for each component has been printed on the PC B .
This is the side of the board where you will mount parts .

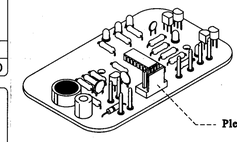
Step 1:Start from the low-key components first such as the resistors.

Part I.D.	Description	Color Code	Qty
R5/6/11/12	1/4W 220Ω	red red brown gold	4
R7/8/9	1/4W 330Ω	orange orange brown gold	3
R10	1/4W 3.3K	orange orange red gold	1
R2	1/4W 10K	brown black orange gold	1
R4	1/4W 56K	green blue orange gold	1
R13	1/4W100K	brown black yellow gold	1
R3	1/4W 3.3M	orange orange green gold	1
R1	1/4W 560Ω	green blue brown gold	1

Step 2: Mount other components as below.

Part I.D.	Description	Qty
U1	18 pin IC	1
MIC	Microphone unit	1
C1/2	Ceramic capacitor 104P	2
C3	Ceramic capacitor 22P	1
EC1	Elec capacitor 100uf	1
Q1/2/3	Transistor 1815	3
Q4/5	Transistor 8050	2
D2/3/4	LED red	3
D5/6	LED green	2
IR	5P pin header 180°	1
L/R (+ —) BAT (+ —)	∅1.3mm pin	8
SW		1
D1	IN 4004	1

Main PCB



Please note the direction of 5 pins header must be as drawing.

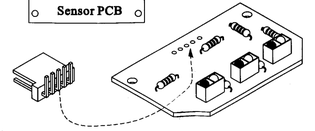
Sensor PC Board Assembly :
Refer to the components view of the sensor PCB as below drawing , the parts identification for each component has been printed on the PC B .
This is the side of the board where you will mount parts .

Step 1: Mount the resistors, photo interrupters:

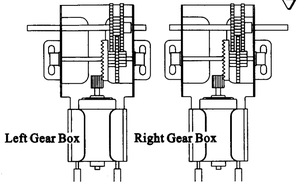
Part I.D.	Description	Color Code	Qty
R17/18/19	1/8W 33K	orange orange orange gold	3
R14/15/16	1/8W 220Ω	red red brown gold	3
U5/6/7	Photo interrupter		3

Step 2: Mount 5p 90° pin header, please note to mount this part on the copper side (different with all other parts) of the PC B . Refer to the drawing below.

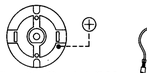
Sensor PCB



5. Mechanical Assembly

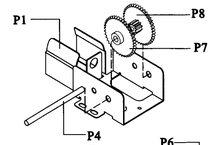


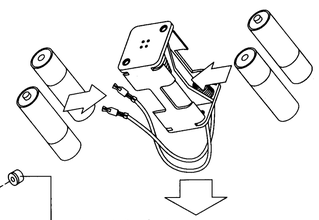
Finished Product



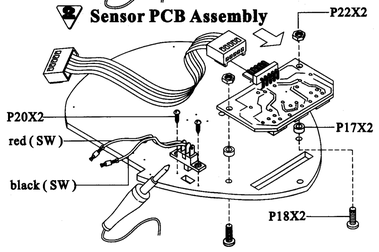
	⊕ positive of Motor	⊖ Negative of Motor
Left Gear Box	Orange wire	Blue wire
Right Gear Box	Yellow wire	Green wire

1 Gear box Assembly

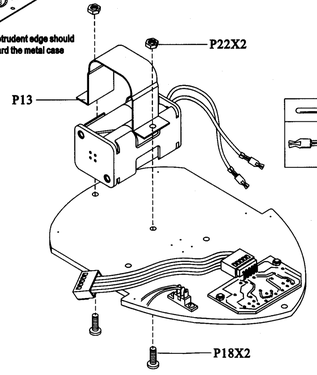




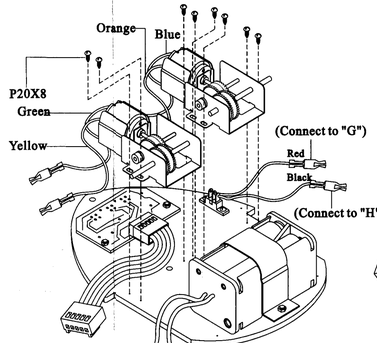
2 Sensor PCB Assembly



3 Battery Holder Assembly

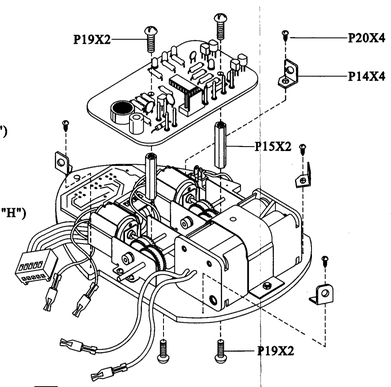


4 Mounting of Gear box

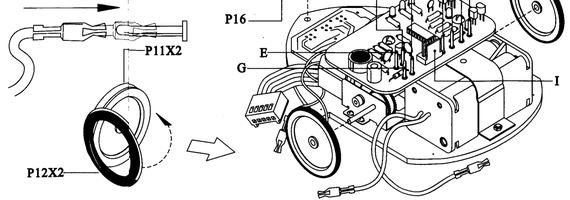


	A	B	C	D	E	F	G	H	I
	L(+)	L(–)	R(+)	R(–)	BAT (+)	BAT (–)	Red	Black	IR (+–)
	Blue	Orange	Yellow	Green	Red	Black	SW		5 Pins harness
					Battery (6V)				

5 Main PCB Assembly

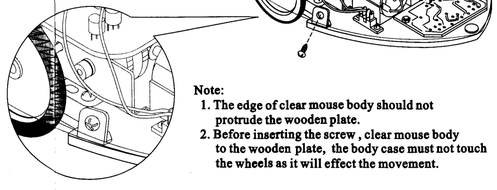


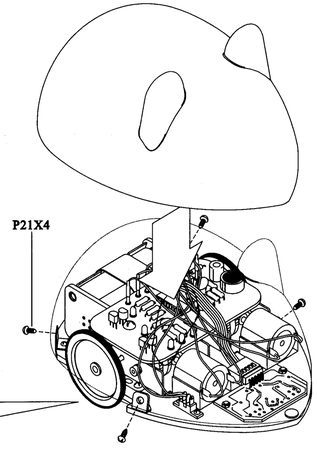
6 Wiring



7 Mounting Body Case

Before mounting the Mouse body to the board, check the wiring is correct, then screw the Mouse body to the board.

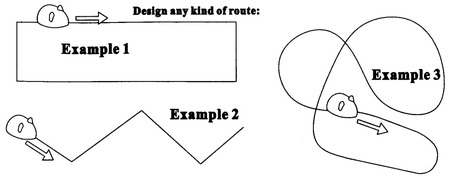




Note:
1. The edge of clear mouse body should not protrude the wooden plate.
2. Before inserting the screw , clear mouse body to the wooden plate, the body case must not touch the wheels as it will effect the movement.

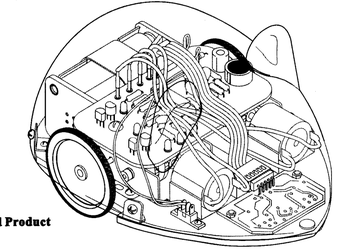
6. How It Works

1. Using black electrical tape or thick black texter to create a twisting and turning route for your Mouse.
2. Switch power to "ON" .
3. Put Mouse on the route you have designed. The black line should be within the 3 photo interrupters detecting range.
4. Gently move the mouse body to start running.



7. Troubleshooting:

1. Check the batteries are inserted with correct polarity.
2. Check the polarity of Microphone, IC, Capacitors are all in correct position.
3. Ensure wiring is correct.
4. Noise from gearbox may interfere the microphone to receive signal, put grease between face gear (P6) and 2mm shaft (no.P3) will reduce the noise.
5. DO **NOT** put grease between 3mm shaft (P4) and gears (P7&P8).
6. If mouse reverses, check if two motors wiring are reverse.



8 Finished Product