
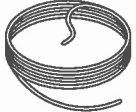



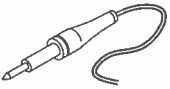
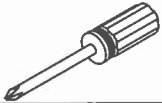
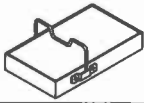


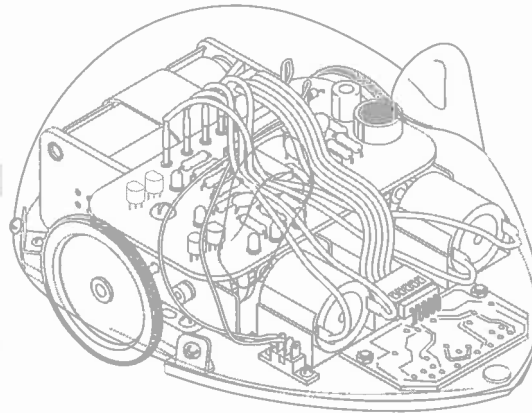
# LINE TRACKING MOUSE

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


Power Source Required:  
DC 6V -1.5V AAX4 batteries ( not included ).

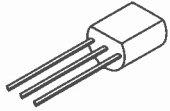


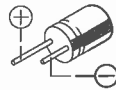
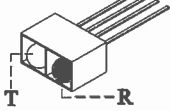
## 2. Tools Required:

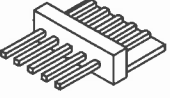
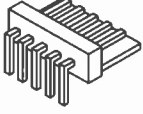
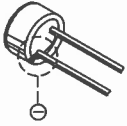
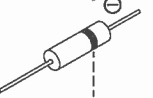
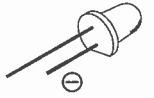
	
4 x AA Battery	Solder Wire
	
Black Plastic Electrical Tape	Diagonal Cutter
	
Long Nose Pliers	Soldering Iron
	
Screwdriver	Soldering Iron Stand With Sponge

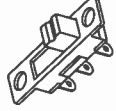



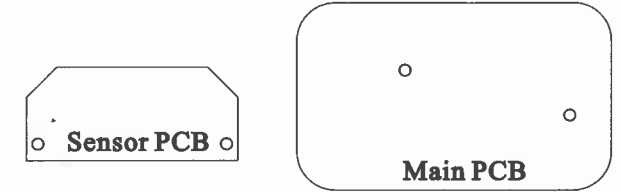
## 2. Electronic Parts List:


Resistor		
		
<input type="checkbox"/> 1/4W 220 Ω (red red brown gold)	4pcs	
<input type="checkbox"/> 1/4W 330 Ω (orange orange brown gold)	3pcs	
<input type="checkbox"/> 1/4W 3.3K (orange orange red gold)	1pc	
<input type="checkbox"/> 1/4W 10K (brown black orange gold)	1pc	
<input type="checkbox"/> 1/4W 56K (green blue orange gold)	1pc	
<input type="checkbox"/> 1/4W 100K (brown black yellow gold)	1pc	
<input type="checkbox"/> 1/4W 3.3M (orange orange green gold)	1pc	
<input type="checkbox"/> 1/4W 560 Ω (green blue brown gold)	1pc	
<input type="checkbox"/> 1/8W 220 Ω (red red brown gold)	3pcs	
<input type="checkbox"/> 1/8W 33K (orange orange orange gold)	3pcs	

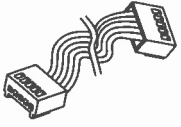
				
<input type="checkbox"/> 1815 3 pcs or(C945) <input type="checkbox"/> 8050 2 pcs	<input type="checkbox"/> EM78P156EP 1 pc	<input type="checkbox"/> 22P 1 pc <input type="checkbox"/> 104 2 pcs	<input type="checkbox"/> 100uf 1 pc	<input type="checkbox"/> LTH-1550-1 3 pcs

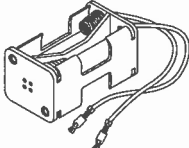
				
<input type="checkbox"/> 5 pins 180° 1 pc	<input type="checkbox"/> 5 pins 90° 1 pc	<input type="checkbox"/> Ø 10mm 1 pc	<input type="checkbox"/> IN 4004 1 pc	<input type="checkbox"/> red 3pcs <input type="checkbox"/> green 2pcs

	
<input type="checkbox"/> Slide switch 1 pc	<input type="checkbox"/> Ø 1.3mm pin 8 pcs

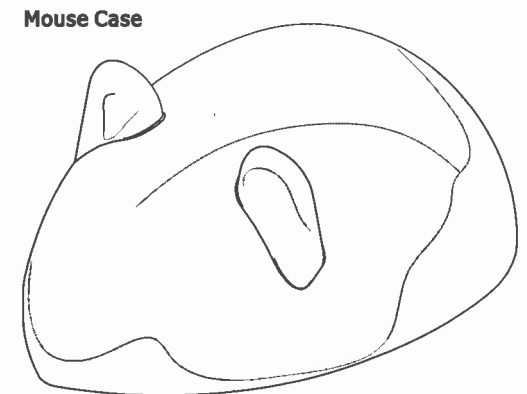
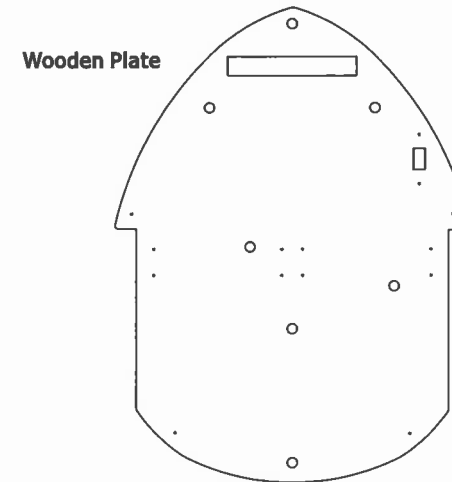


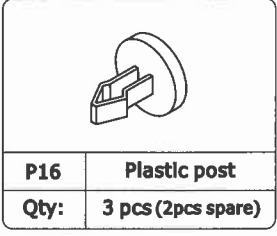
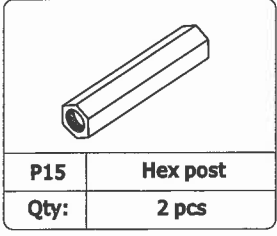
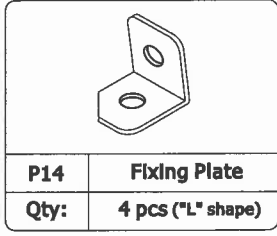
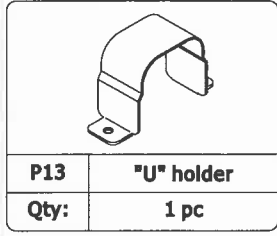
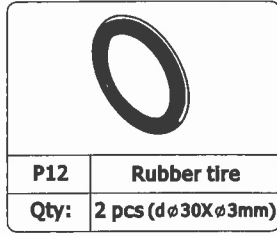
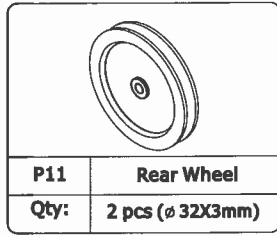
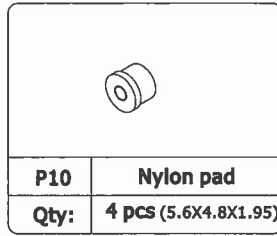
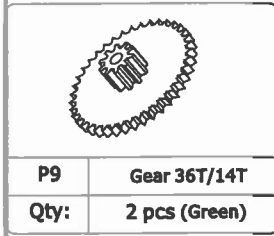
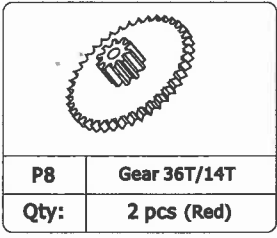
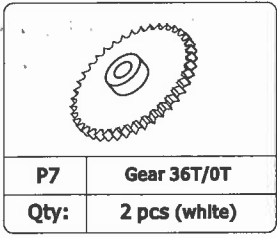
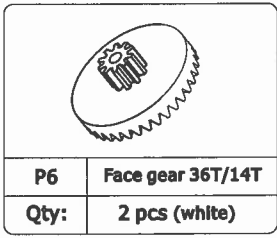
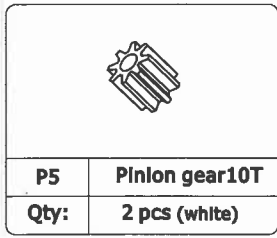
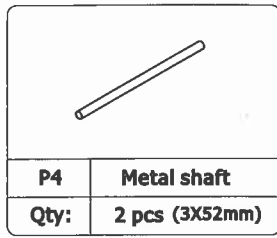
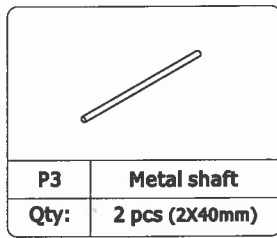
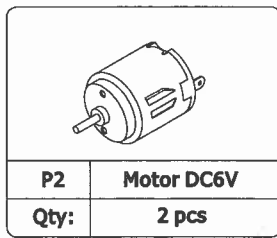
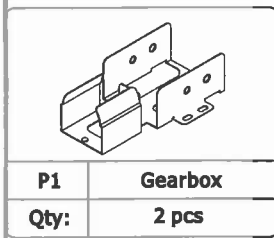
	<input type="checkbox"/> yellow 1 pc <input type="checkbox"/> blue 1 pc <input type="checkbox"/> orange 1 pc <input type="checkbox"/> green 1 pc <input type="checkbox"/> red 1 pc <input type="checkbox"/> black 1 pc
(12cm)	

	<b>Harness</b> <input type="checkbox"/> 5 pins harness 1 pc
---	---

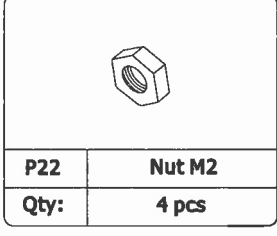
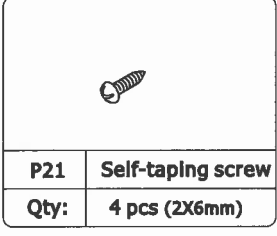
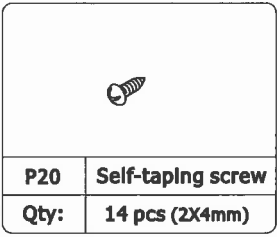
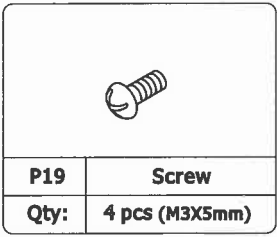
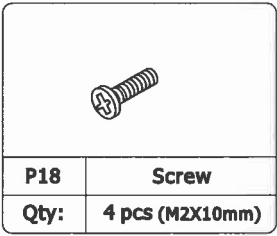
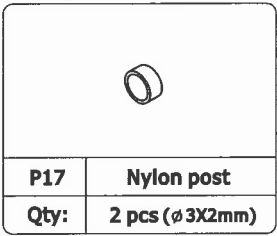
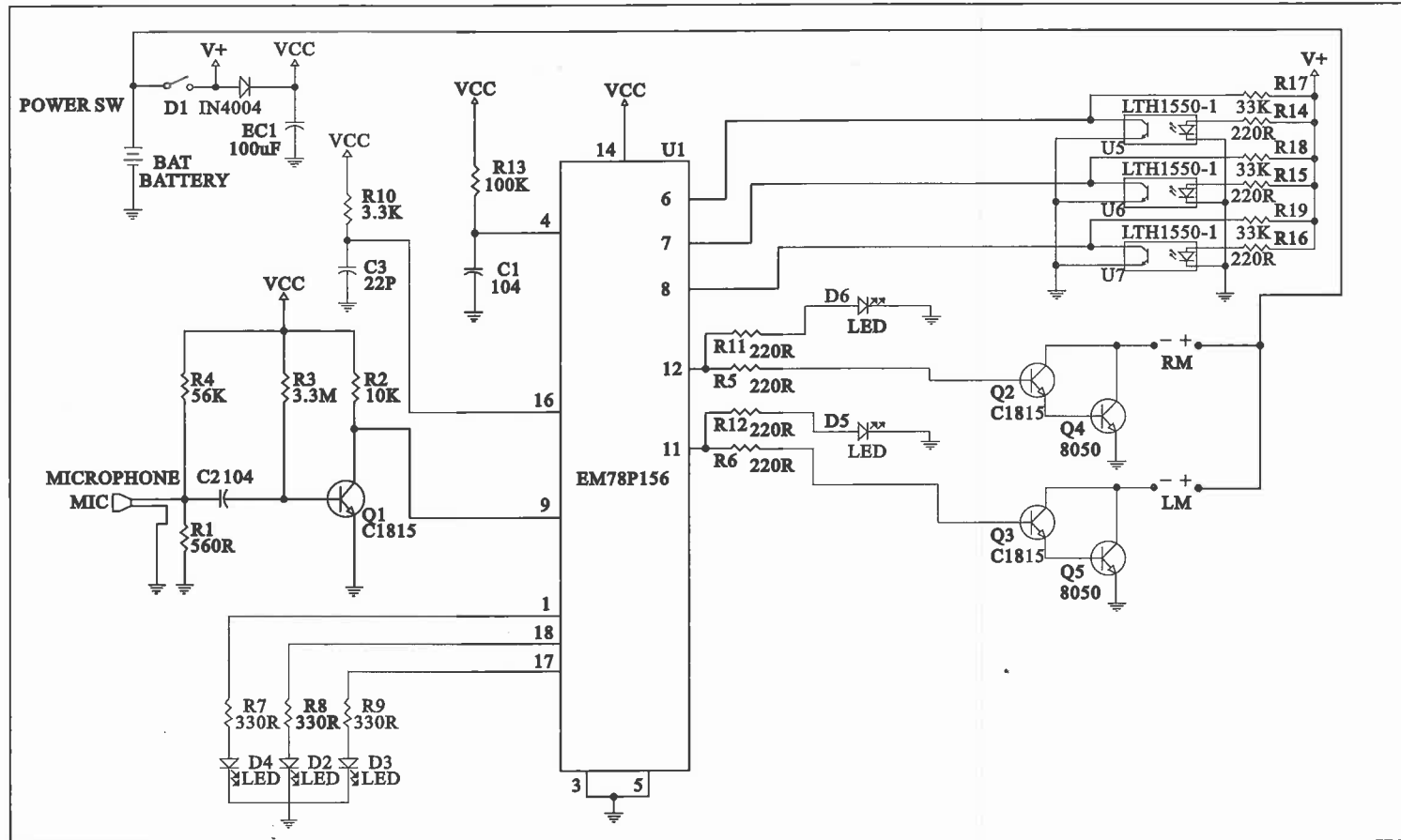
	<b>Battery Holder</b> <input type="checkbox"/> 4AA with 10cm wires 1 pc
---	---

## 3. Mechanical Parts List:





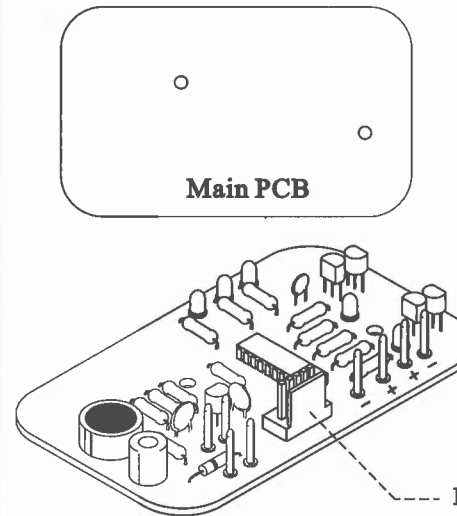
### Circuit Diagram



#### 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 PCB.


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	1/4W 100K	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.

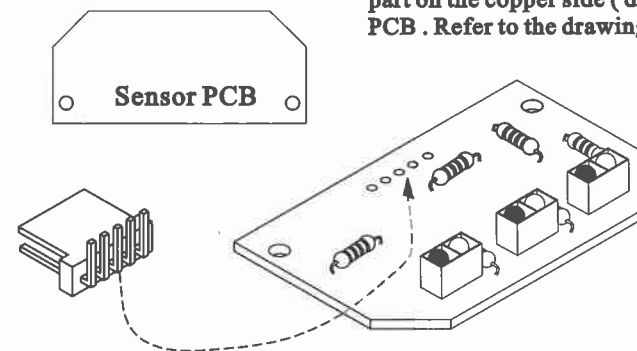
Part I.D.	Description	Qty
U1	18 pin IC	1
MIC	Microphone unit	1
C1/2	Ceramic capacitor 104P	2
C3	Ceramic capacitor 22P	1
EC1	Elec capacitor 100uf	1
Q1/2/3	Transistor 1815	3
Q4/5	Transistor 8050	2
D2/3/4	LED red	3
D5/6	LED green	2
IR	5P pin header 180°	1
L/R (+-)	 ø 1.3mm pin	8
BAT (+-)		
SW		
D1	IN 4004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

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 PCB.

This is the side of the board where you will mount parts.

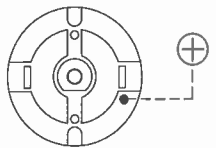
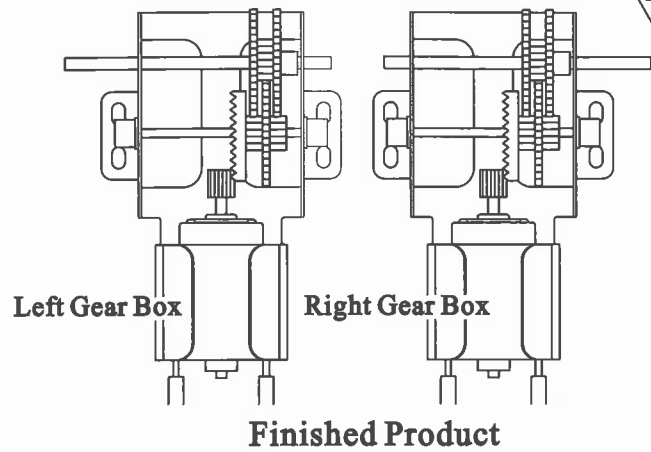


Step 1: Mount the resistors, photo interrupters:

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

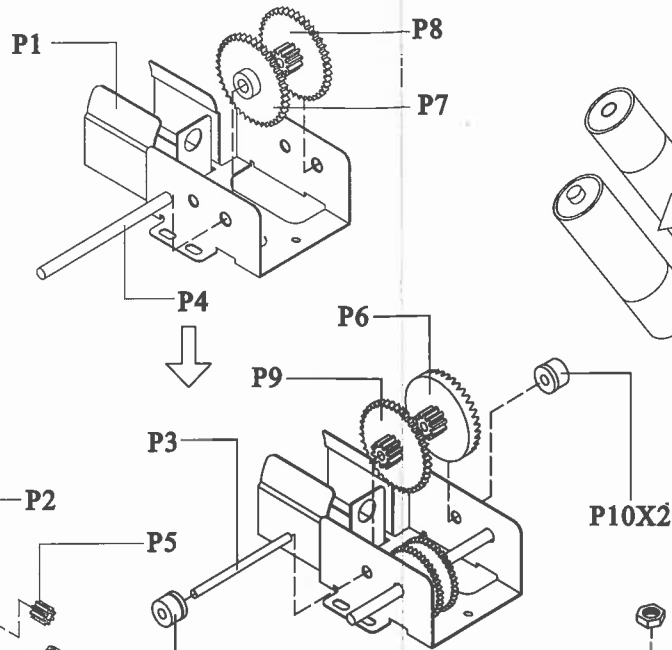
Step 2: Mount 5p 90° pin header, please note to mount this part on the copper side ( different with all other parts ) of the PCB . Refer to the drawing below .

**5. Mechanical Assembly:**



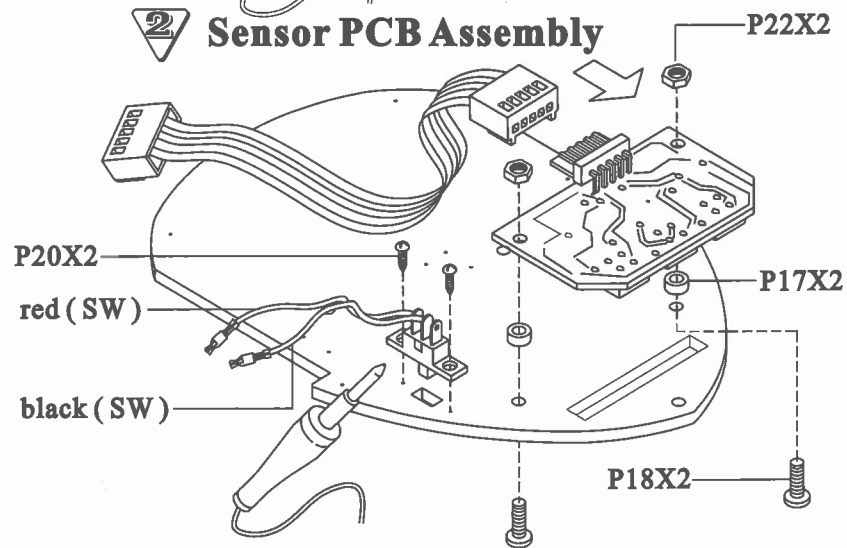
	⊕ positive of Motor	⊖ Negative of Motor
Left Gear Box	Orange wire	Blue wire
Right Gear Box	Yellow wire	Green wire

**1 Gear box Assembly**

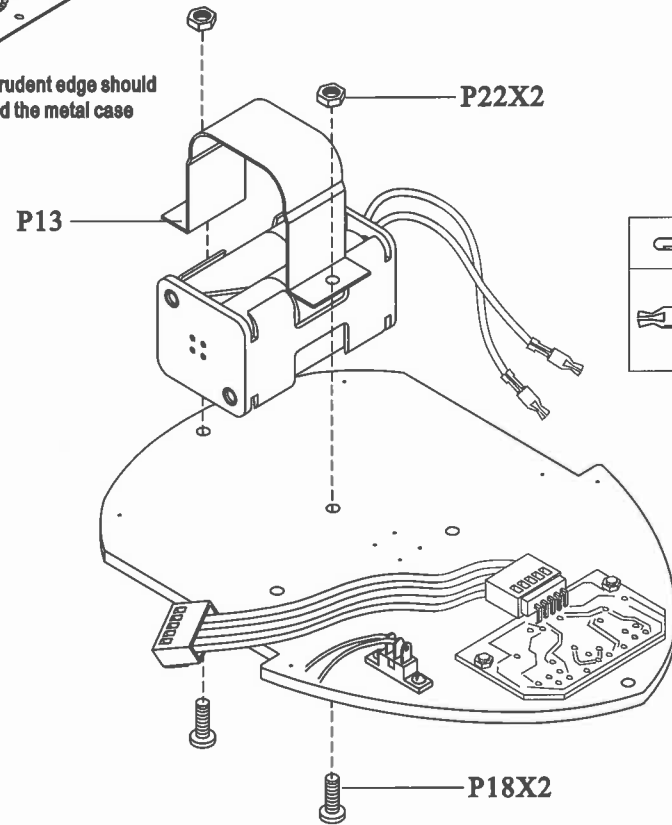


Note: The protrudent edge should be toward the metal case

**2 Sensor PCB Assembly**

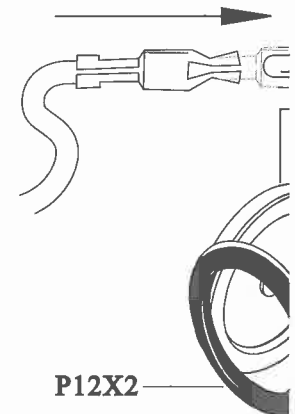
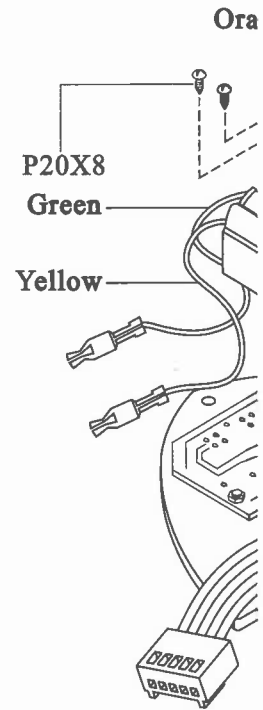
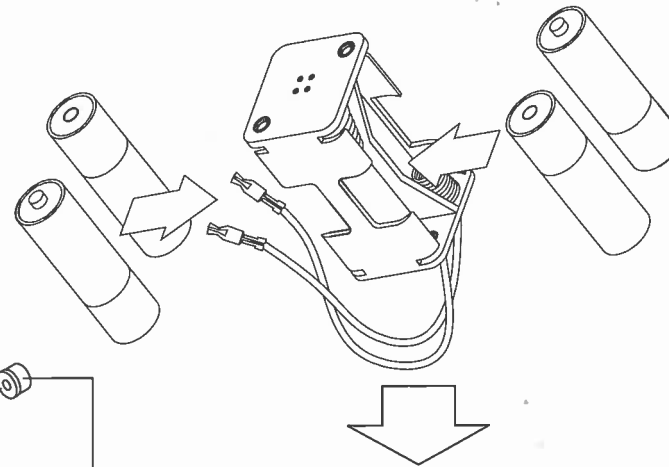


**3 Battery Holder Assembly**



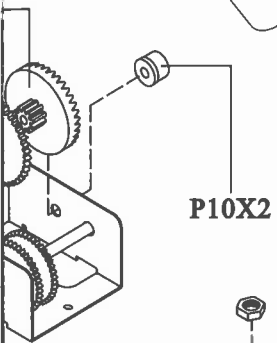
	A	B	C	D
⊖	L(-)	L(+)	R(+)	R(-)
⊕	Blue	Orange	Yellow	Green

**4 M**



P8

P7



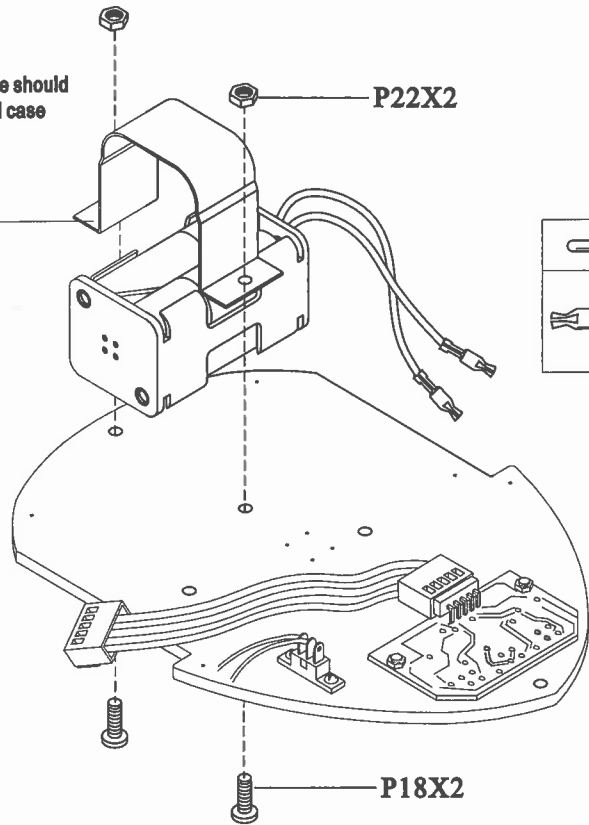
P10X2

### 3 Battery Holder Assembly

The protrudent edge should be toward the metal case

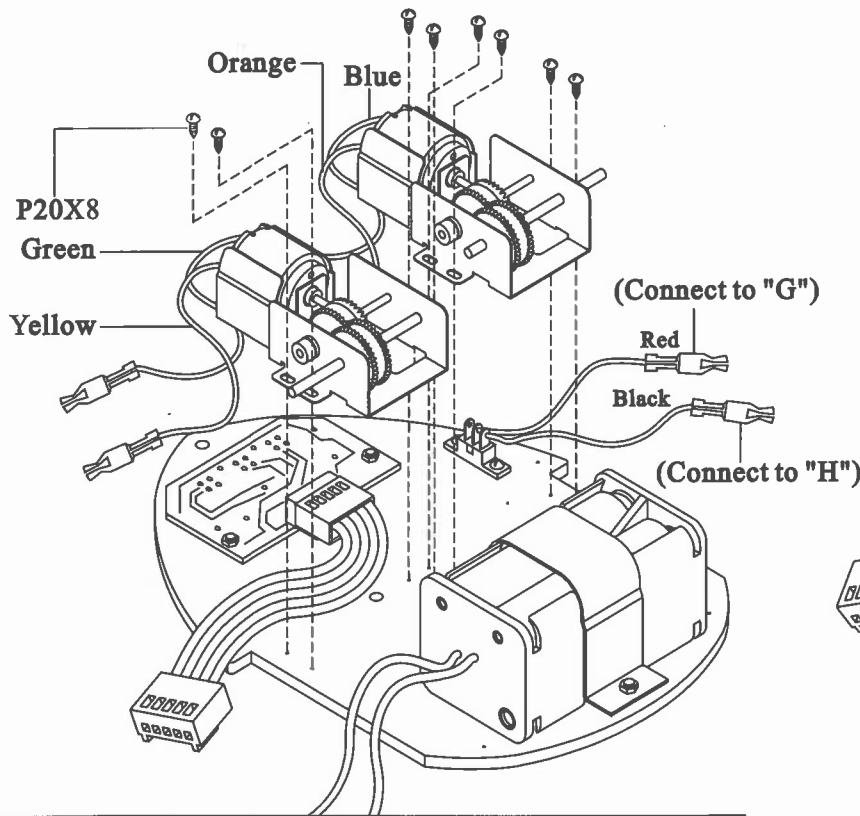
P13

P22X2

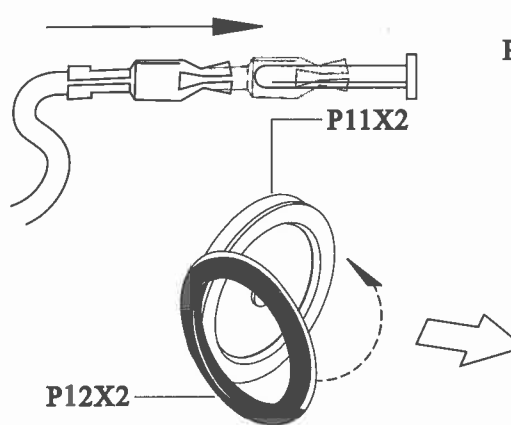


P18X2

### 4 Mounting of Gear box

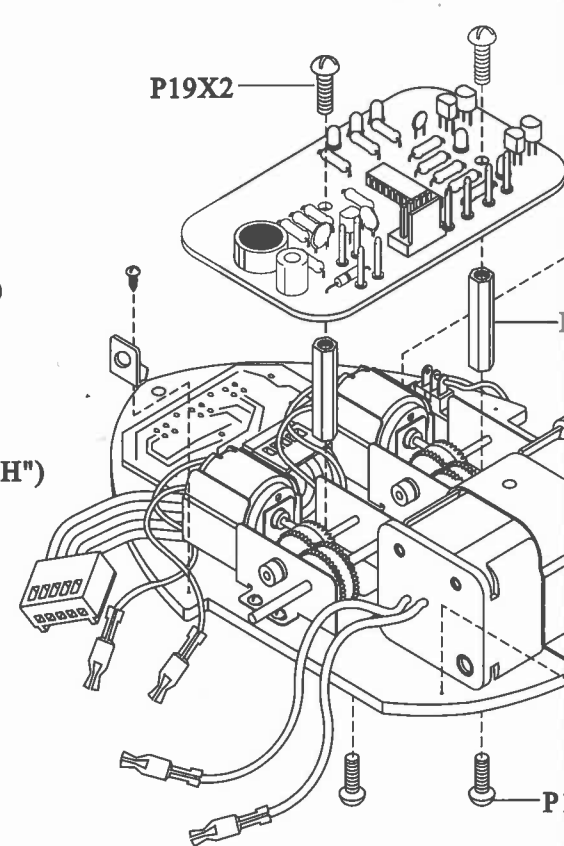


	A	B	C	D	E	F	G	H	I
	L(-)	L(+)	R(+)	R(-)	BAT (+)	BAT (-)	Red	Black	
	Blue	Orange	Yellow	Green	Red	Black	SW		IR (+-)
					Battery (6V)				5 Pins harness

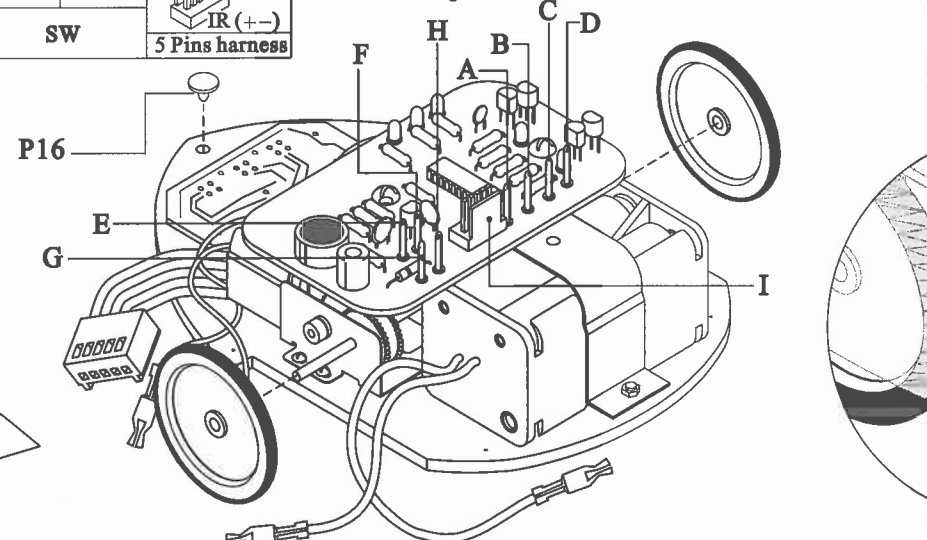


P12X2

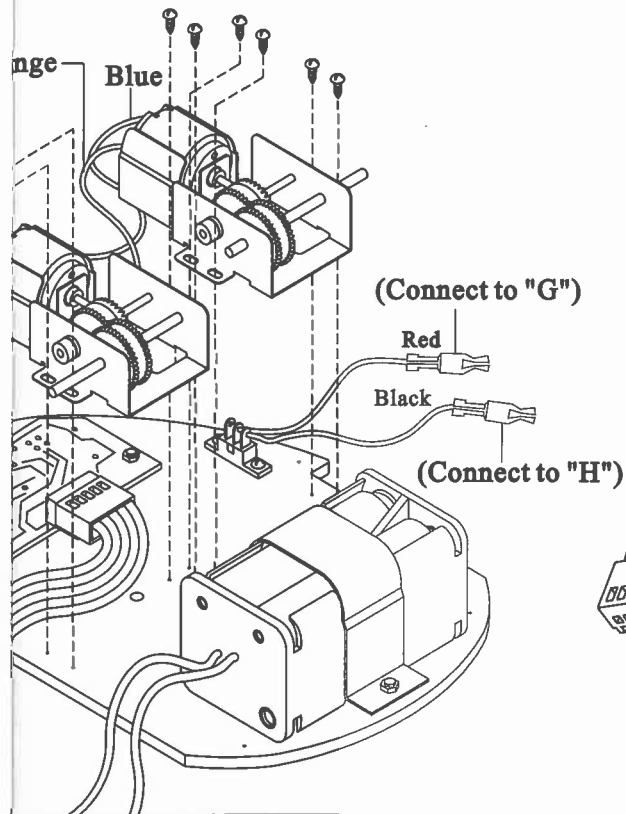
### 5 Main PCB Assem



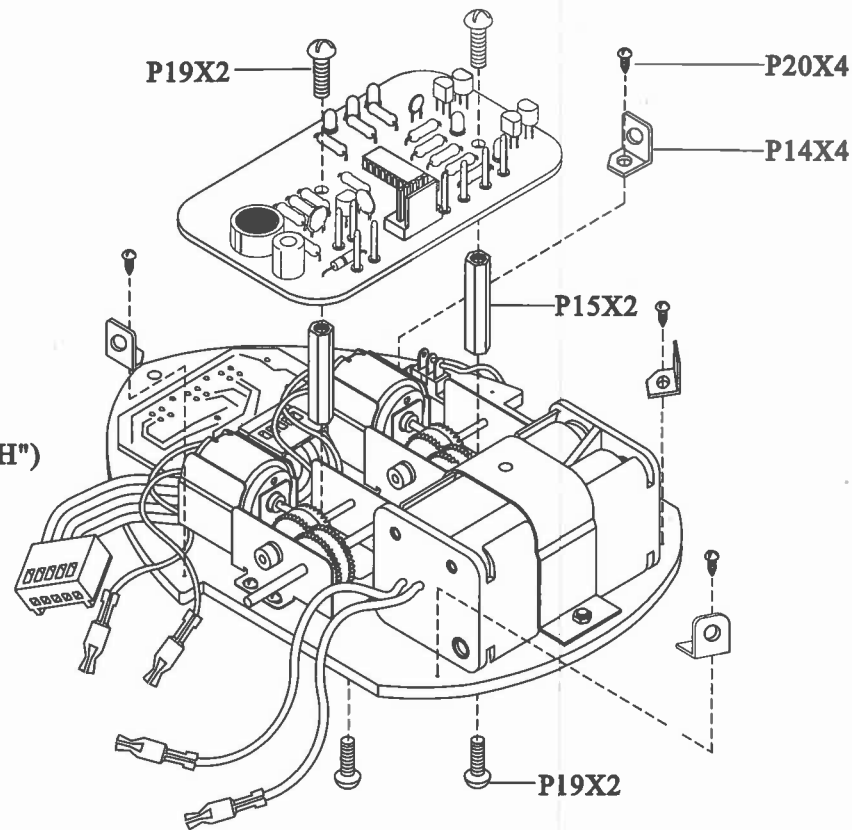
### 6 Wiring



## Mounting of Gear box

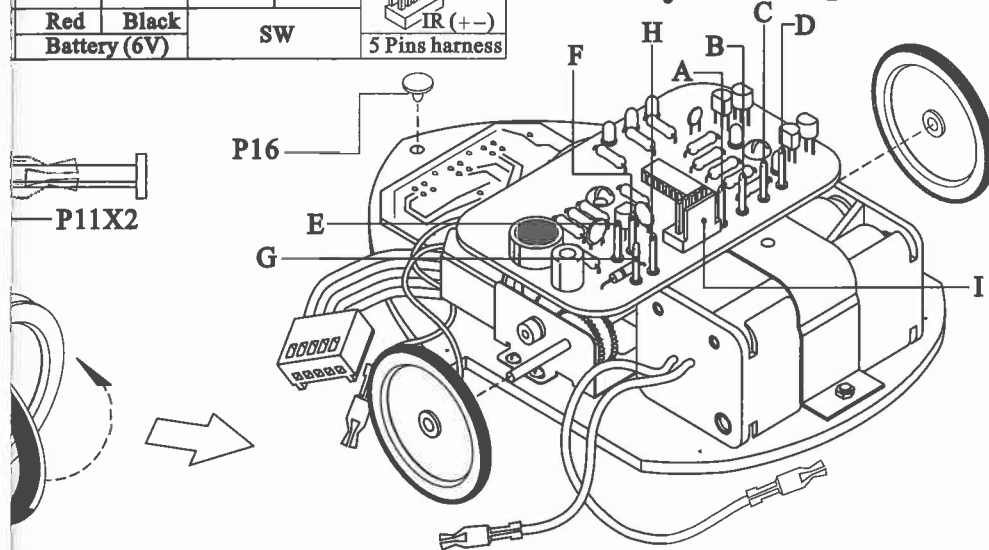


## 5 Main PCB Assembly



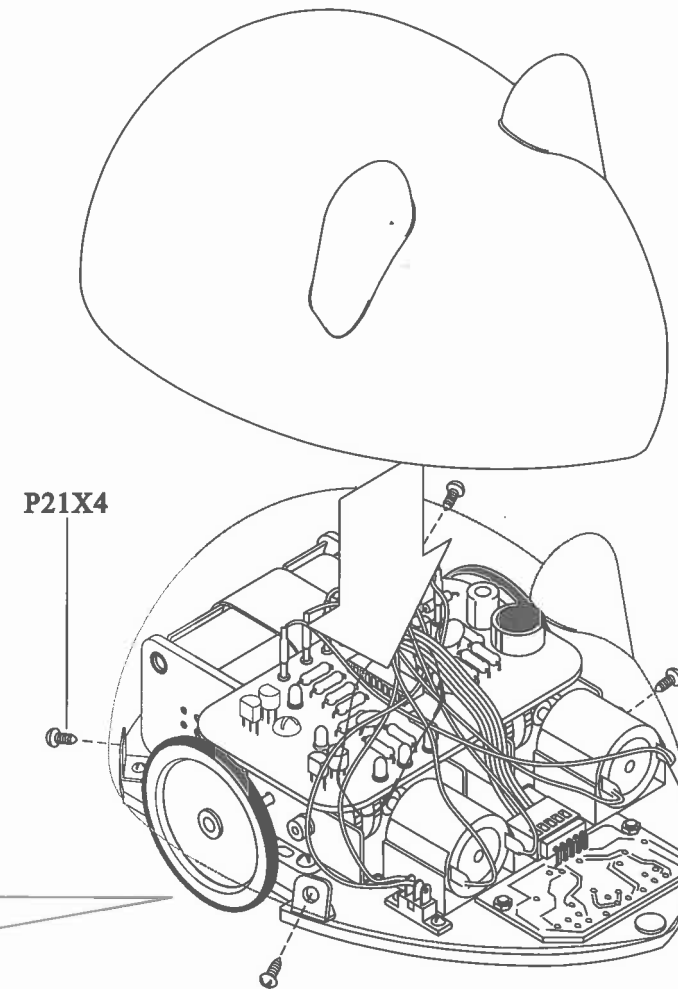
## 6 Wiring

E	F	G	H	I
BAT (+)	BAT (-)	Red	Black	
Red	Black	SW		IR (+-)
Battery (6V)		5 Pins harness		



## 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

1. U
- N
2. S
3. P
- P
4. G

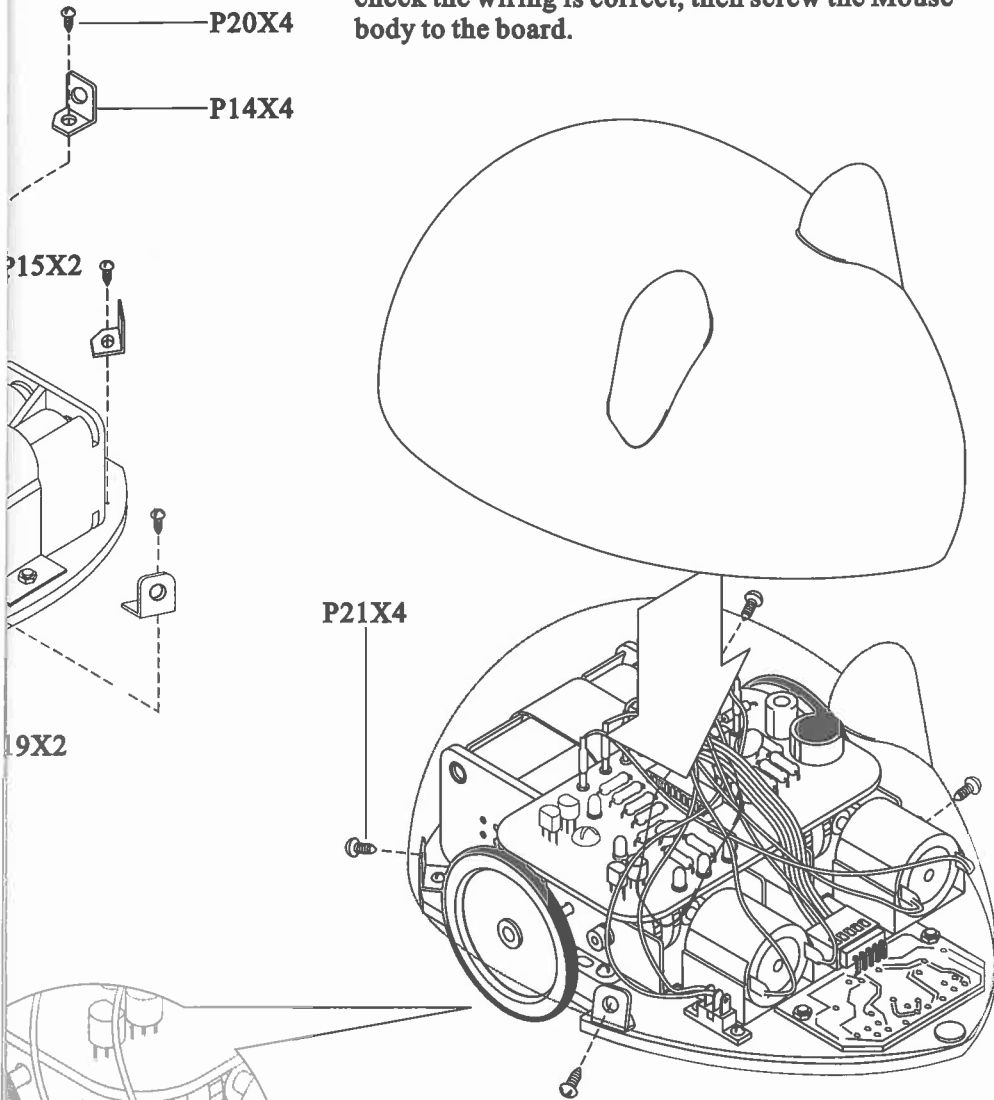
8.

1. C
2. C
3. F
4. M
- P
5. I
6. I

Assembly

## 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.

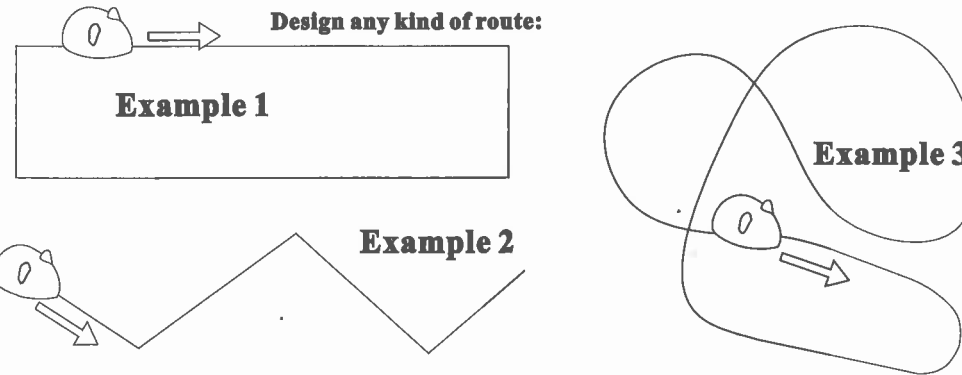


### Note:

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.

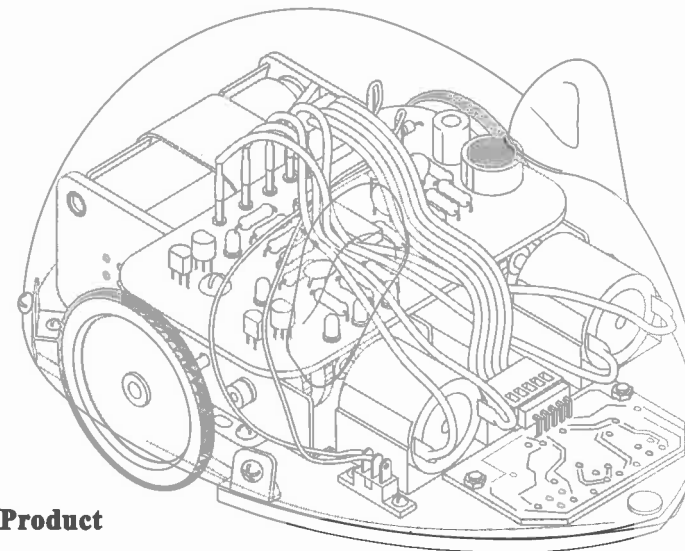


## 8. Troubleshooting:

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.



Finished Product



K12351A