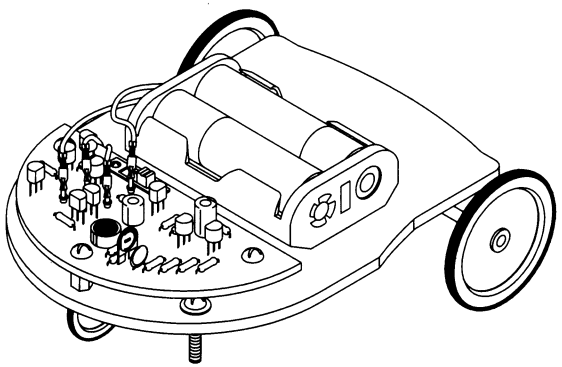
SOUND REVERSING CAR

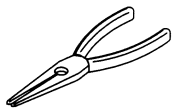
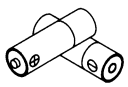
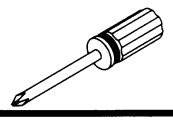
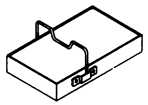
1. Product Introduction:



You will find it is fun to learn electronics and mechanism by building this Sound Reversing Car. It is a simple voice control robot car by using microphone as its detector. It moves forward normally unless the microphone receives signal like clap or physical contact. The car will move forward when you switch on the unit, when the microphone detects noise it will turn back and left side for few seconds then keep forward moving again until the next signal are received by microphone.

Power source required:
Voltage / Electronical / Mechanical parts: DC3V 1.5V "AA"X2 batteries (not included)

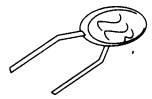
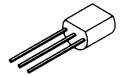
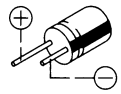
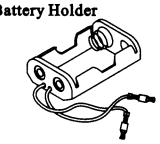
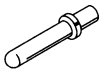
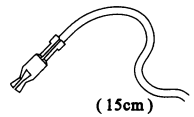
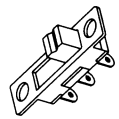
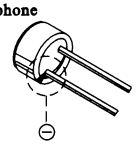
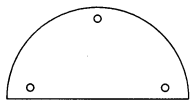
2. Tools You May Need:

			
Long Nose Pliers	Soldering Iron	AA Battery 2pcs	Solder Wire
			
Screwdriver	Soldering Iron Stand With Sponge	Diagonal Cutter	

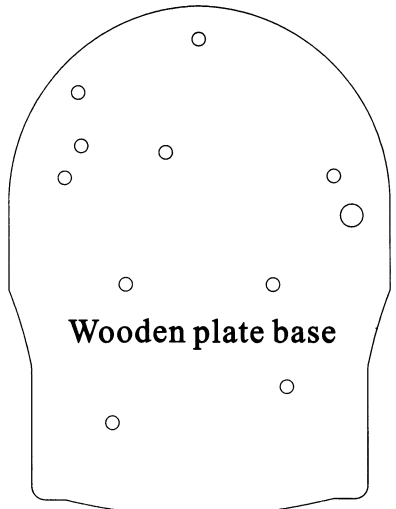
3. Electronic Parts List:

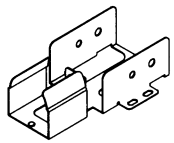
Resistor 

□220Ω	(red red brn gold) 2 pc	□22K	(red red ora gold) 1 pc
□15Ω	(brn grn blk gold) 2 pcs	□47K	(yel vio ora gold) 1 pc
□2.2K	(red red red gold) 1 pc	□100K	(brn blk yel gold) 1 pc
□1K	(brn blk red gold) 1 pc	□1M	(brn blk grn gold) 1 pc
□3.3K	(ora ora red gold) 2 pcs	□2.7M	(red vio grn gold) 1 pc

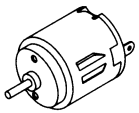
Ceramic Capacitor 	□ 223 1 pc	**Transistor** 	□ 8050 2 pcs □ 8550 2 pcs □ C945 (C1815) 5pcs
Variable Resistor 	□ 100K 1 pc	**Electrolytic Capacitor** 	□ 47uf 1 pc □ 1uf 1 pc
Battery Holder 	□ Holder with 8cm wires 1 pc		□ ø1.3mm pin 4 pcs
Connector with wire  (15cm)	□ yellow 1 pc □ green 1 pc		□ Slide Switch 1 pc
Microphone 	□ mic 1 pc		□ Printed Circuit Board 1 pc

4. Mechanical Parts List:

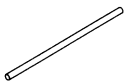




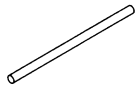
No.P1	Gearbox
Qty:	1 pc



No.P2	Motor DC3V
Qty:	1 pc



No.P3	Metal shaft
Qty:	1 pc (2X40mm)



No.P4	Metal shaft
Qty:	1 pc (3X90mm)

No.P5	Pinion gear10T
Qty:	1 pc (white)

No.P6	Face gear 36T/14T
Qty:	1 pc (white)

No.P7	Gear 36T/0T
Qty:	1 pc (white)

No.P8	Gear 36T/14T
Qty:	1 pc (Red)

No.P9	Gear 36T/14T
Qty:	1 pc (Green)

No.P10	Nylon pad
Qty:	2 pcs (5.6X4.8X1.95)

No.P11	Rubber ring
Qty:	2 pcs (⌀30X3mm)

No.P12	Rubber ring
Qty:	1 pc (⌀15X2.5mm)

No.P13	Front Wheel
Qty:	1 pc (⌀20mm)

No.P14	Rear Wheel
Qty:	2 pcs (⌀32mm)

No.P15	Spring
Qty:	1 pc

No.P16	Front Wheel Bracket
Qty:	1 pc

No.P17	Nylon nut
Qty:	2 pcs

No.P18	Round Post
Qty:	1 pc (⌀3X2mm)

No.P19	Washer
Qty:	2pcs (2.6X6X0.5mm)

No.P20	Washer
Qty:	2pcs(3.2X10X0.5mm)

No.P21	Screw
Qty:	4 pcs (2X10mm)

No.P22	Screw
Qty:	6 pcs (3X5mm)

No.P23	Screw
Qty:	3 pcs(3X18mm)

No.P24	Screw
Qty:	1 pc (3X20mm)

No.P25	M2 Nut
Qty:	4 pcs

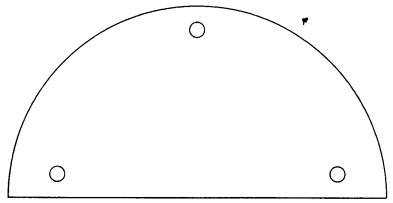
No.P26	M3 Nut
Qty:	4 pcs

No.P27	Hex Post
Qty:	3 pcs(M3X10mm)

No.P28	Round Post
Qty:	1 pc (⌀3X6mm)

5. PCB Assembly:

The parts I.D.(identification) for each component have been printed on the PCB.



step 1: Suggest you start from the low-key components first such as the resistors.

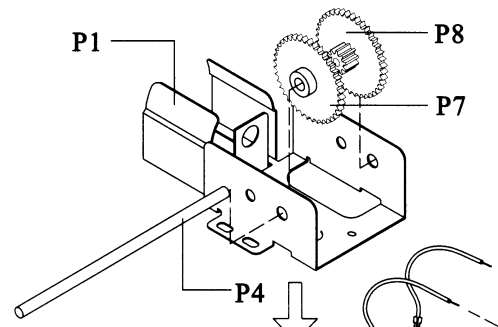
Part I.D.	Description	Color Code	Qty
R10/11	15Ω	(brn grn blk gold)	2
R8/9	220Ω	(red red brn gold)	2
R1	1K	(brn blk red gold)	1
R2	2.2K	(red red red gold)	1
R5/12	3.3K	(ora ora red gold)	2
R6	22K	(red red ora gold)	1
R4	47K	(yel vio ora gold)	1
R13	100K	(brn blk yel gold)	1
R7	1M	(brn blk grn gold)	1
R3	2.7M	(red vio grn gold)	1

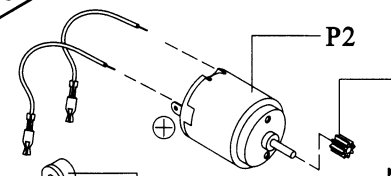
6. Mechanical Assembly:

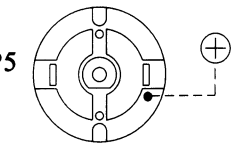
step 2: Mount Capacitors, Transistor, VR, Mic, Slide Switch,Pins.

Part I.D.	Description	Qty
C1	223 ceramic capacitor	1
C2	47uf electrolytic capacitor	1
C3	1uf electrolytic capacitor	1
TR4/8	transistor 8050	2
TR3/7	transistor 8550	2
TR1/2/5/6/9	transistor C945 or (1815)	5
VR	VR 100K	1
MIC	Microphone	1
SW	Slide Switch	1
M+	⌀1.3mm Pin 	4
M−		
+		
−		

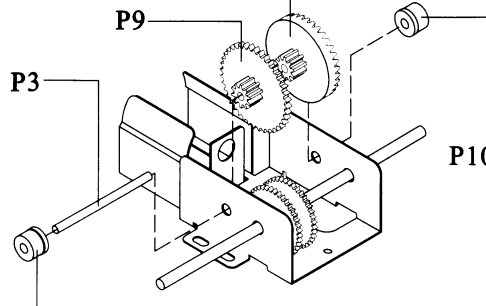
1 Gear box Assembly

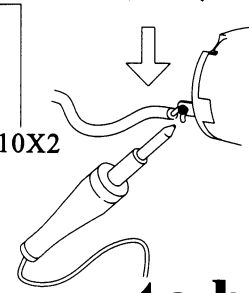






Note: The positive end (+) marked with "•"



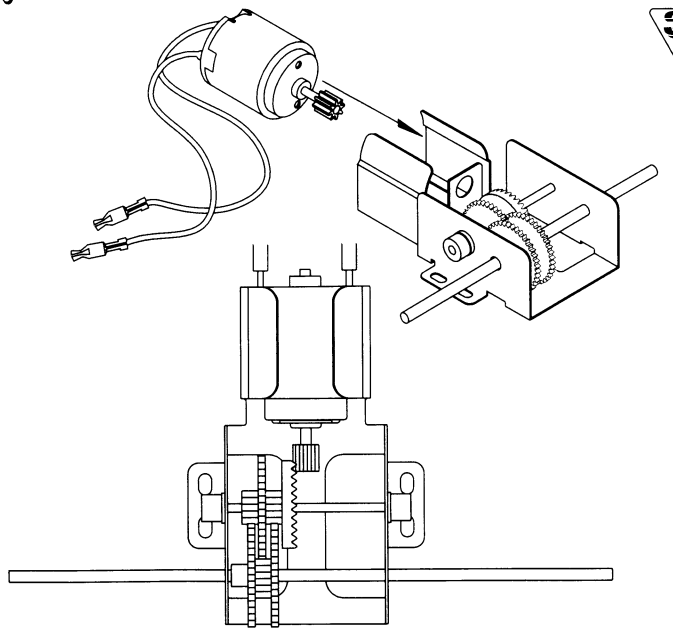


⊕positive of Motor	⊖Negative of Motor
Yellow wire	Green wire

Note: The protrudent edge should be toward the metal case

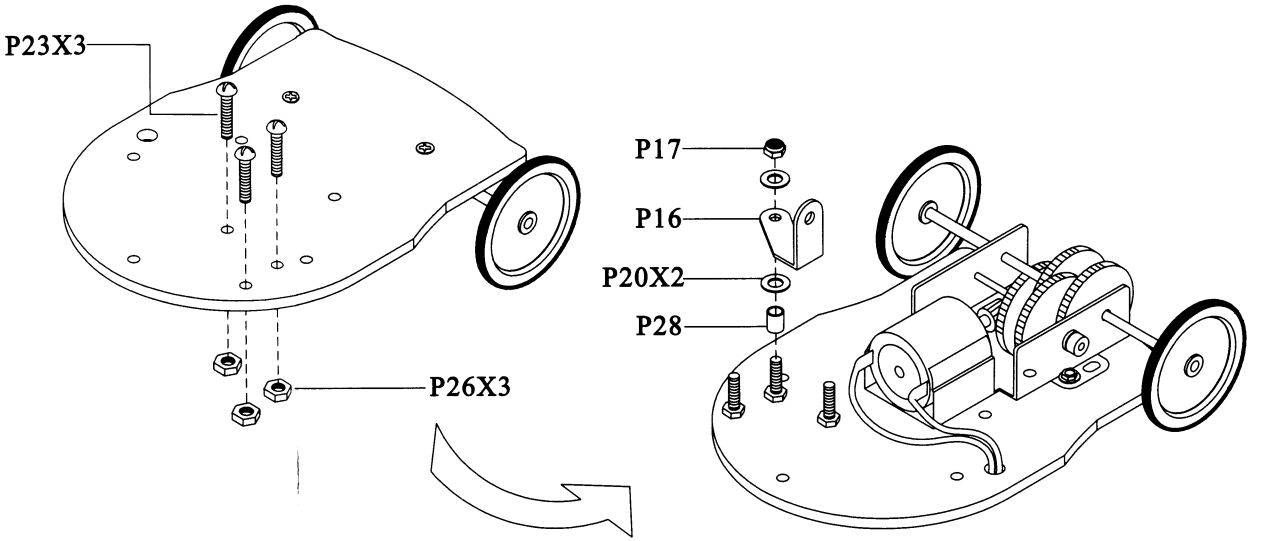
to be continued

1 Gear box Assembly

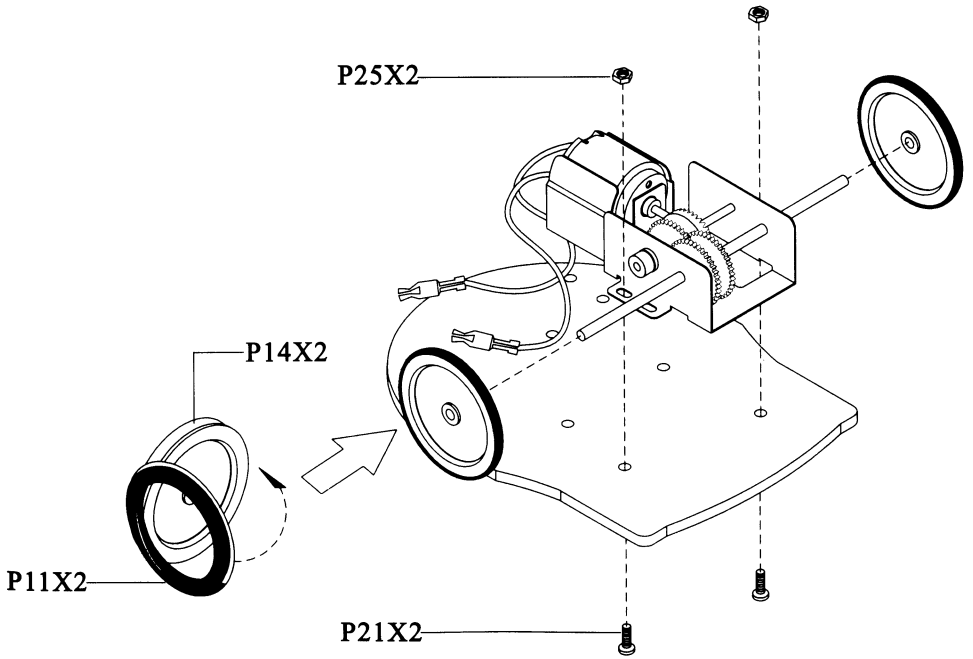


Finished Product

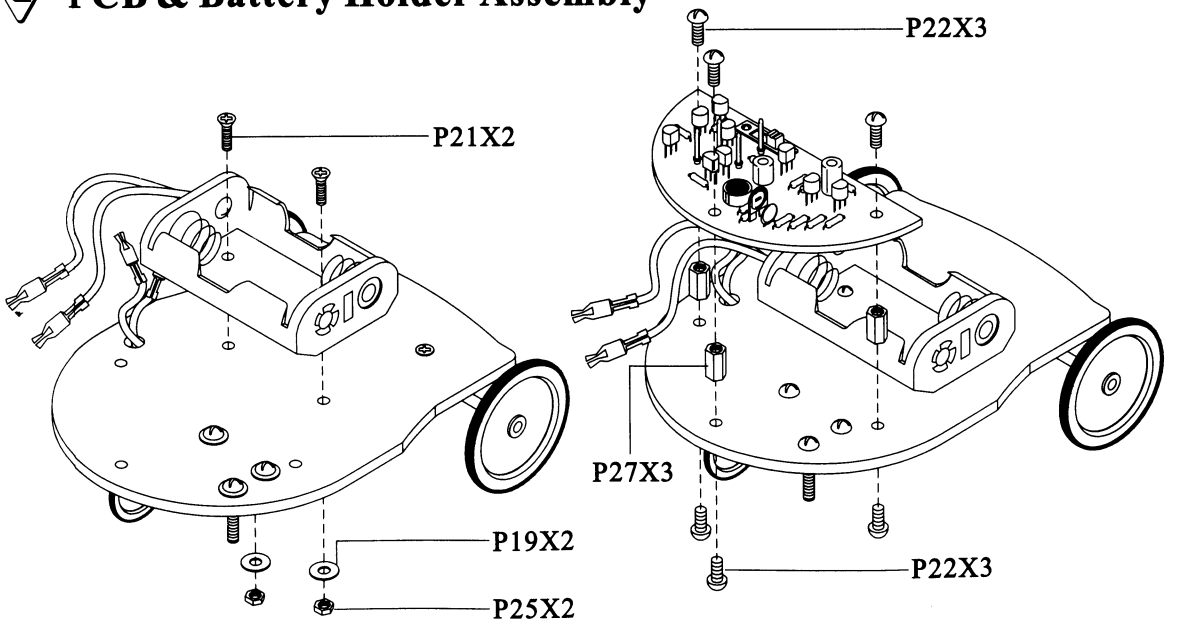
3 Bracket of Front Wheel Assembly



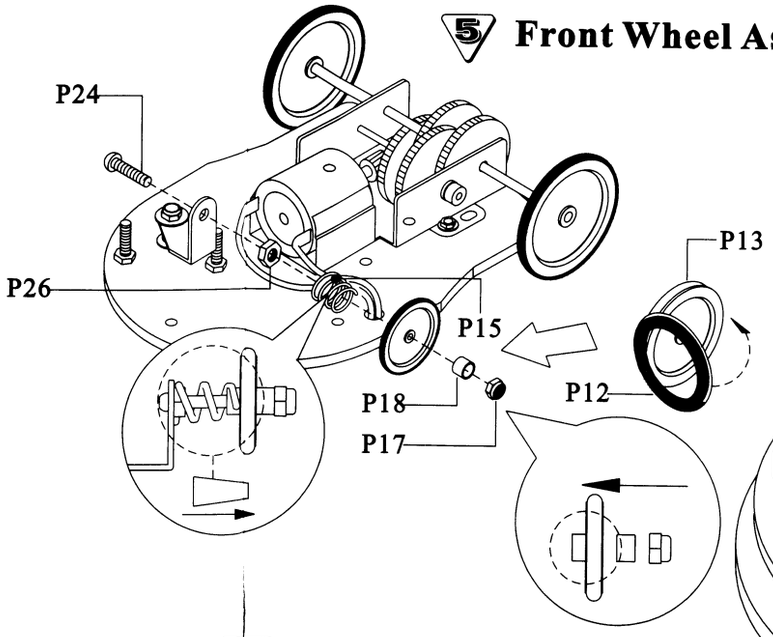
2 Mount Gear Box & Rear Wheels



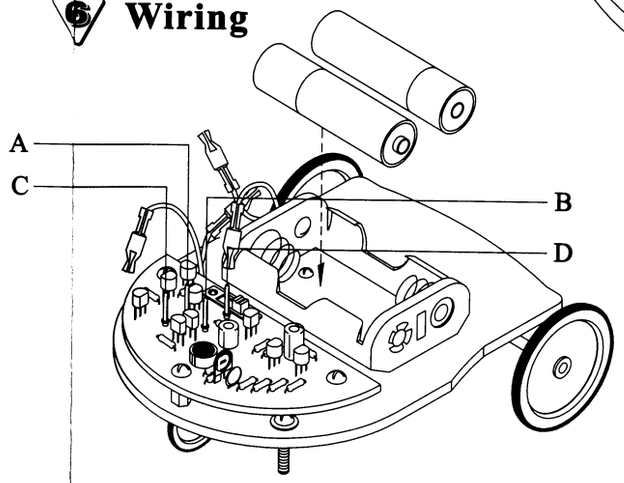
4 PCB & Battery Holder Assembly

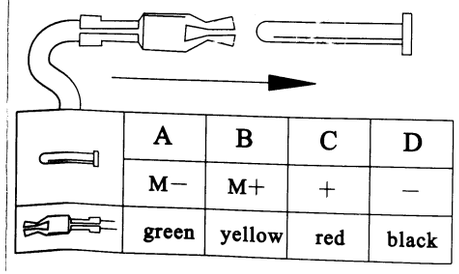


5 Front Wheel Assembly

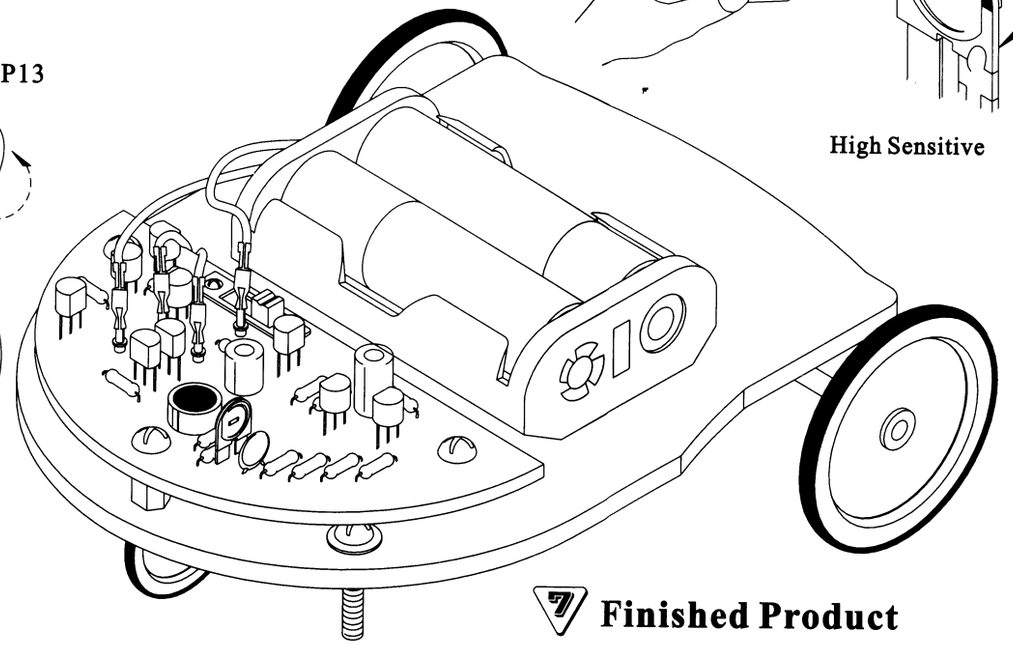


6 Wiring

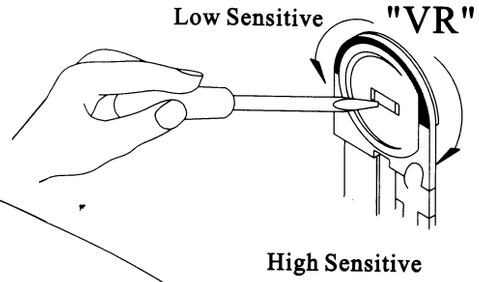




	A	B	C	D
	M−	M+	+	−
	green	yellow	red	black



7 Finished Product



7. How it works:

1. Switch the unit to "ON" position.
2. Put it on to ground and see if it goes forward smoothly
3. Clap your hand and see if it turns back and left side, then go forward again.
4. Adjust "VR" to change microphone's sensitivity.

8. Troubleshooting:

1. Make sure all components on PCB are on right position especially note the polarity of Microphone, Transistors, Capacitors are in correct position.
2. Check all wiring are same as wiring diagram.
3. If the car keeps going left, please try to adjust nut (P17) on front wheel (P13) to push spring to be tighter till it can go forward smoothly.
4. Noise from gearbox may interfere the microphone to receive signal, put few grease between face gear (P6) and 2mm shaft (P3) will reduce the noise.
5. Note**NOT** to put any grease between 3mm shaft (P4) and gears (P7&P8).

9. Circuit Diagram :