

FACON SOUND FOLLOW ROBOT
CODE 1103 **LEVEL 2**

This robot will start moving whenever a condenser microphone detects sound. The running manner will be moving ahead and automatically stop.

Technical Specifications:

- Power supply : 2 rechargeable AA batteries (not included).
- Consumption : 150mA.
- Sound detecting speed : controllable.
- PCB dimensions : 2.18 x 2.63 in.

(1) ROBOT CONTROL CIRCUIT

How To Work:

This circuit is showing in Fig. 1. When condenser microphone detects sound, transistor TR7 is amplified the sound signal (first step) and this signal is fed to TR6 for amplified again by VR1 controls the gain of TR6. The voltage from TR6 is passed through the base of TR5. When TR5 works, the voltage from the emitter of TR5 will charge capacitor C5 which C5 acts as a delayed timer for the circuit. Then the voltage will feed to the base of TR4, causing TR4 and TR1 to work and force motor M1 and M2 to rotate. Moreover, this voltage will feed the light flashing part to work as well.

When the light flashing part received voltage from TR1, causing the light flashing set to work. TR2 and TR3 will be assembled as a multivibrator circuit and work alternatively. When TR2 works, it will light up LED2 and LED3. And when TR3 works, LED1 will be lit up. The flashing speed

will be depended upon R14, R15, C6 and C7. R13 and R16 will reduce the current for LED1-LED3.

Circuit Assembling:

The PCB will be divided into two boards, FK1103-1 for circuit controlling and BR001-1 for motor, wheel and battery container assembling.

The FK1103-1 circuit assembling has been shown in Fig 2. It is recommended to assemble the circuit starting with a less height component i.e. diodes, resistor, electrolytic capacitors and transistors etc. Be careful while assembling and check for the matching of PCB poles and components before soldering as shown in Fig 3. For IDE port, press the pin of IDE port to be level with the black plastic before soldering as shown in Fig 4. Use a max. 40W solder and soldering tin with a tin and lead ratio of 60/40 together with a joint solution inside. Recheck the assembled circuit for your own confidence. Better use a lead sucker or a lead wire absorber in case of component misplacing to protect PCB from damage.

The BR001-1 circuit is to be assembled as shown in the next page.

Testing:

When the two circuit boards have been completely assembled, insert two AA batteries into the battery holder. Then adjust VR1 to the most right hand side and slide switch SW to "on" position.

Lay down the assembled robot on the ground level and clapping 1 time. The robot will run straight and stop automatically. But if there is more clapping, the robot will run straight and stop automatically again.

VR1 will act as a sound detecting speed controller of the condenser microphone. Adjust VR1 to the right hand side for increasing speed and to the left hand side for decreasing speed.

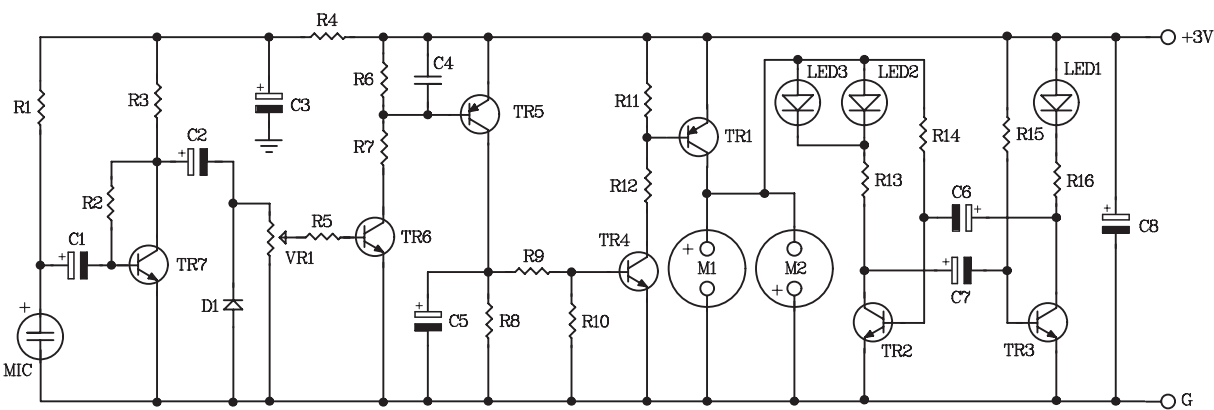
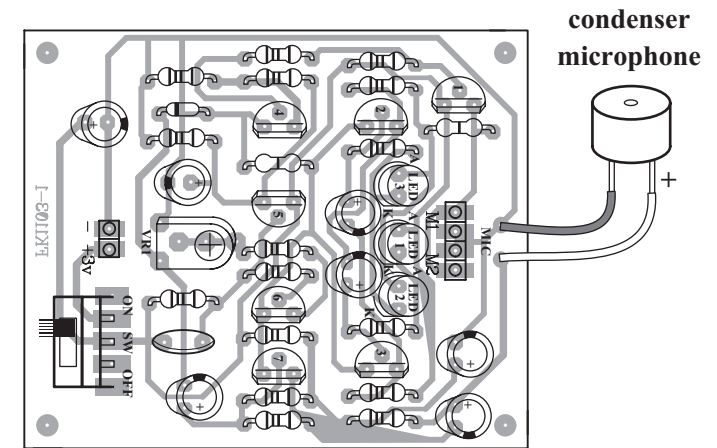


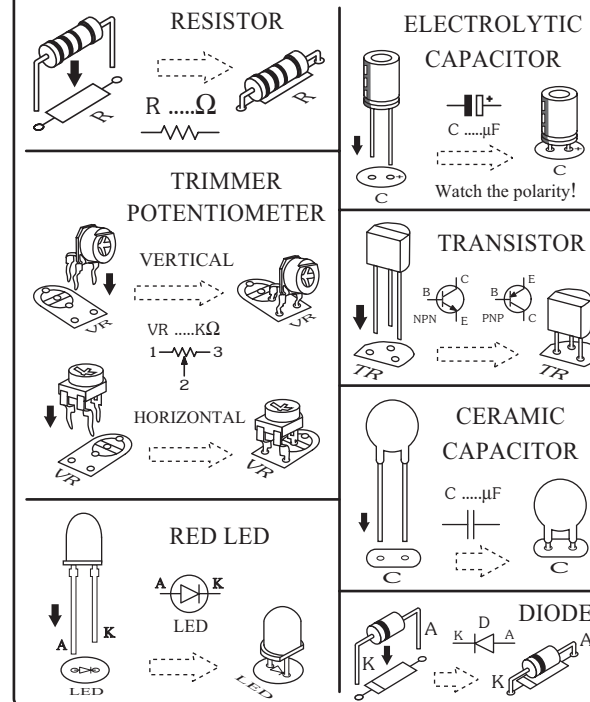
Figure 2. FACON Sound Follow Robot Circuit

Figure 2. FK1103-1 Circuit Board Assembling



FK1103-1

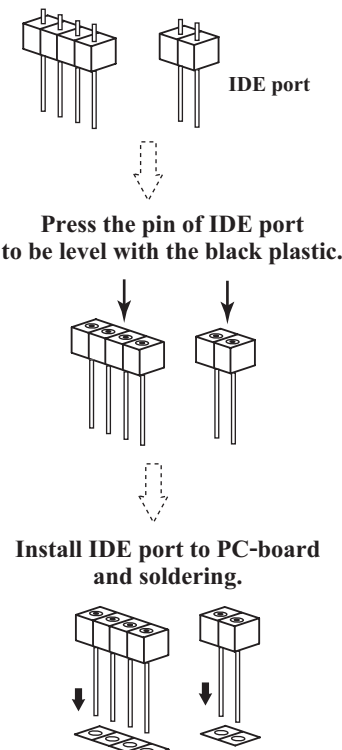
Figure 3. Components Installing



Troubleshooting:

As the circuit has only a few components, the main cause of troubles will come from component misplacing and defaulted soldering. When found out that the circuit does not work, check for the proper component placings and various soldering points.

Figure 4. IDE Port Assembling To The FK1103-1 Circuit Board.



(2) ROBOT BODY

Assembling Steps of the BR001-1 Circuit.

1. Fix a mini caster wheel set to the BR001-1 board with using a 12 mm. bolt as a holder as shown in Fig. 5.
2. Insert both motors into the rectangular slots by keeping them an inclined positions before soldering. Make sure that the positive motor pole marked with silver point being matched with the provided right positions of the BR001-1 board. After having soldered both motor poles to the PCB, try to lay down the robot. The PCB should be in a parallel position to the floor. If not so, incline the PCB to be parallel to the floor and then solder motor bodies to the PCB, as shown in Fig. 6.
3. Fix the battery holder to the circuit board with using two 6 mm. flat bolts as holders. Make sure that the wiring side facing the right connecting point, as shown in Fig. 7.
4. Insert IDE port to the slot provided on the upper side of the PCB and solder it, as shown in Fig. 8.
5. The last step, assemble FK1103-1 board to the BR001-1 board one, as shown in Fig. 9.

