

**LICON LIGHT FOLLOW ROBOT**  
CODE 1101

LEVEL 2

This robot will start moving whenever any sensor detects light. The running manner whether ahead or aside depends upon the light volume received by the sensor.

**Technical Specifications:**

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

**(1) ROBOT CONTROL CIRCUIT**

**How To Work:**

The circuit is composed of 2 major parts, light detecting and light flashing, as shown in Fig. 1.

The light detecting part is composed of 2 alike circuits that will work in the same manner. Each circuit will start working when the photo received light, causing voltage being passed through. The more reflected light will lessen the internal resistance and give bigger passing through voltage. Less reflected light will enlarge the internal resistance and give less passing through voltage.

When there is voltage being passed through the photo, it will cause TR2 and TR1 to work and force motor M1 to rotate. Moreover, this voltage will feed the light flashing part to work as well. Therefore, if any photo receives more light volume, the robot will move to the direction of that photo position. The VR1 and VR2 will work as a light detecting speed controller of each photo.

When the light flashing part received voltage, TR5 will start

working and cause the light flashing set to work. TR6 and TR7 will be assembled as a multivibrator circuit and work alternatively. When TR6 works, it will light up LED1. And when TR7 works, LED2 will be lit up. The flashing speed will be depended upon R6, R7, C1 and C2. R5 and R8 will reduce the current for LED1 and LED2.

**Circuit Assembling:**

The PCB will be divided into two boards, FK1101-1 for circuit controlling and BR001-1 for motor, wheel and battery container assembling.

The FK1101-1 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.

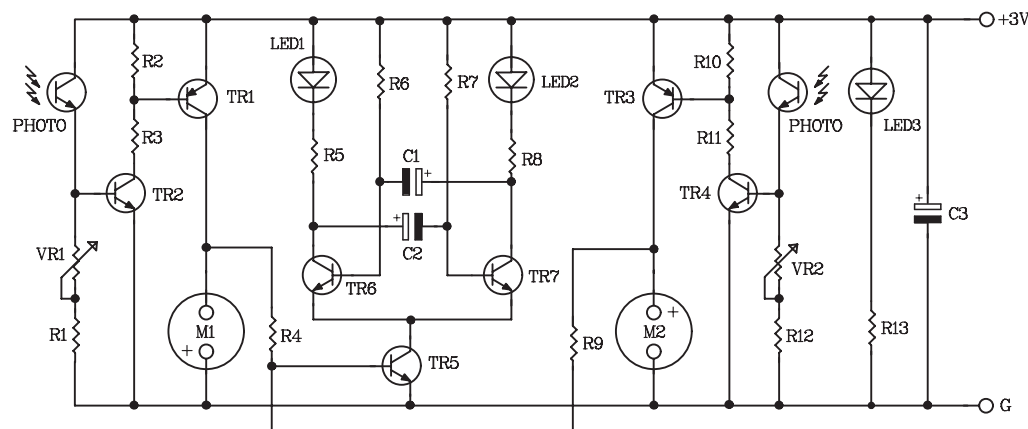
The BR001-1 circuit is to be assembled as shown in the next page.

**Testing:**

When the two circuit boards have been completely assembled, insert two AA batteries into the battery holder. Then adjust VR1 and VR2 to the most right hand side and slide switch SW to "on" position.

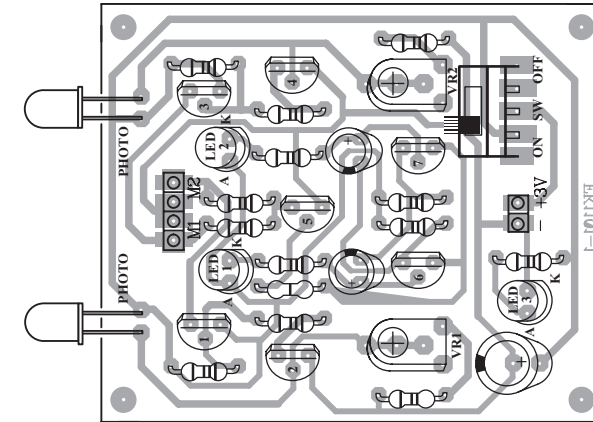
Lay down the assembled robot on the least light area and shine on the photos with flashlight. The robot will move to the photo side that shone with bigger light volume. However, the robot will run straight when being shone in between.

VR1 and VR2 will act as a light detecting speed controller of the photos. Adjust VR1 and VR2 to the right hand side for decreasing speed and to the left hand side for increasing speed.



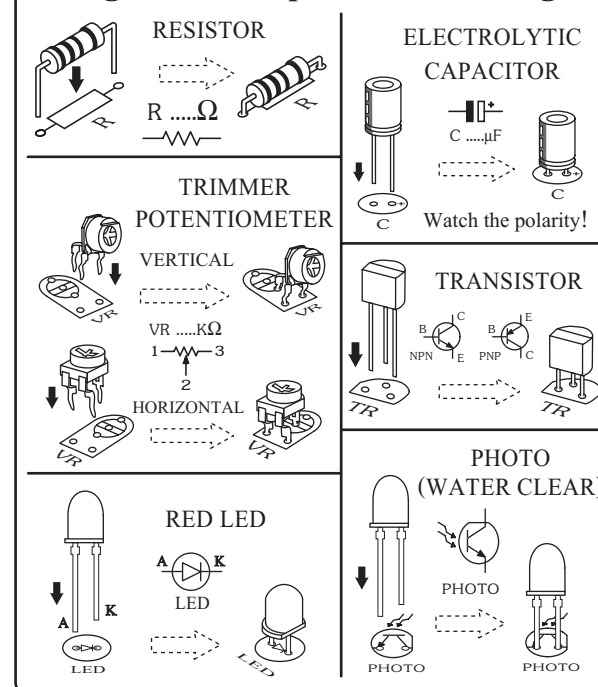
**Figure 1. LICON Light Follow Robot Circuit**

**Figure 2. FK1101-1 Circuit Board Assembling**



**FK1101-1**

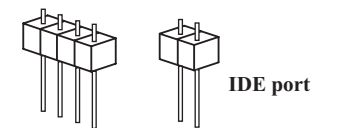
**Figure 3. Components Installing**



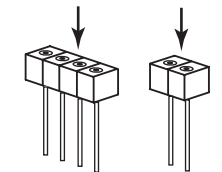
**Troubleshooting:**

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.

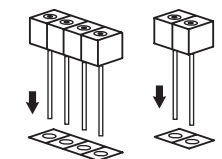
**Figure 4. IDE Port Assembling To The FK1101-1 Circuit Board.**



Press the pin of IDE port to be level with the black plastic.



Install IDE port to PC-board and soldering.



## (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 FK1101-1 board to the BR001-1 board one, as shown in Fig. 9.

