

ELECTRONIC SANDGLASS 22 LED
CODE 154 **LEVEL 1**

This circuit is the running light circuit. The shape is the same to sandglass. This circuit is consist of 22 LEDs. Adjustable running speed with potentiometer. Idea as light shows for model construction etc.

Technical specifications:

- power supply: 9-12VDC.
- consumption: 20-50mA max.
- chasing speed : adjustable
- dimensions of PCB : 4.27 x 2.64 in.

How to works:

The circuit diagram shown in figure 2 can be divided into two parts. The simplest part is the frequency generator (IC1) with R1, R2, C2, C3 and VR100K that controls the speed of the frequency. The output of this oscillator is used to clock a decade counter (IC2). This counter has ten outputs but used to six outputs only. The output of this counter (pin 3, 2, 4, 7 and 10 of IC2) are connected to the driver transistors (TR1 to TR7) and the output (pin 1 of IC2) is connected to the switch reset (SW1) for reset IC2. The driver transistors are connected to LEDs. The outputs representing each end of the decade count (pin 1 of IC2) is used to reset IC2 automatic. But if you jump the jumper (J1), when the decade counter of IC2 is counting to pin 10, IC2 will hold the decade counter untill has push the reset switch (SW1) the circuit is working again.

PCB assembly:

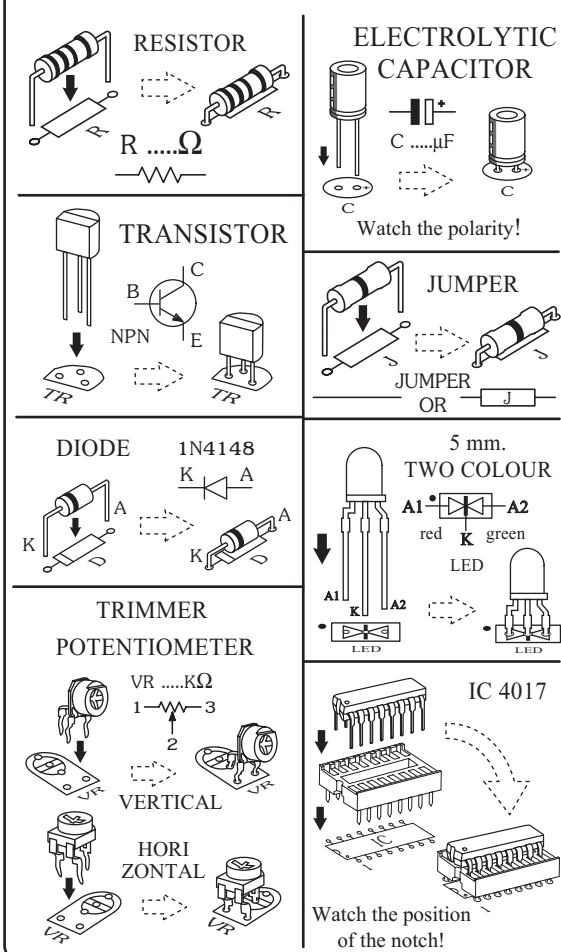
Shown in Figure 3 is the assembled PCB. Starting with the lowest height components first, taking care not to short any tracks or touch the edge connector with solder. Some tracks run under components, and care should be taken not to short out these tracks. All components with axial leads should be carefully bent to fit the position on the PCB and then soldered into place. Make sure that the electrolytic capacitors are inserted the correct way around. The LED has a flat spot on the body which lines up with the line on the overlay. Now check that you really did mount them all the right way round!

Testing:

Connect 9-volt battery to circuit. With the position

pole is connected to "+" point and the negative pole is connected to "-" point. LEDs will light on. If you want to adjust the speed of LEDs can be adjusted by VR1. The characteristic of circuit is chasing light on from upper column to lower column and the circuit will reset automatic. But if you jump the jumper (J1), the circuit will hold when LEDs of all lower column is light on untill you push the reset switch, the circuit will restart again. If you want to use a long time, you can used to the power supply 9 to 12VDC/300mA. instead of the battery 9-volt.

Figure 1. Installing the components



Troubleshooting:

The most problem like the fault soldering. Check all the soldering joint suspicious. If you discover the short track or the short soldering joint, re-solder at that point and check other the soldering joint. Check the position of all component on the PCB. See that there are no components missing or inserted in the wrong places. Make sure that all the polarised components have been soldered the right way round.

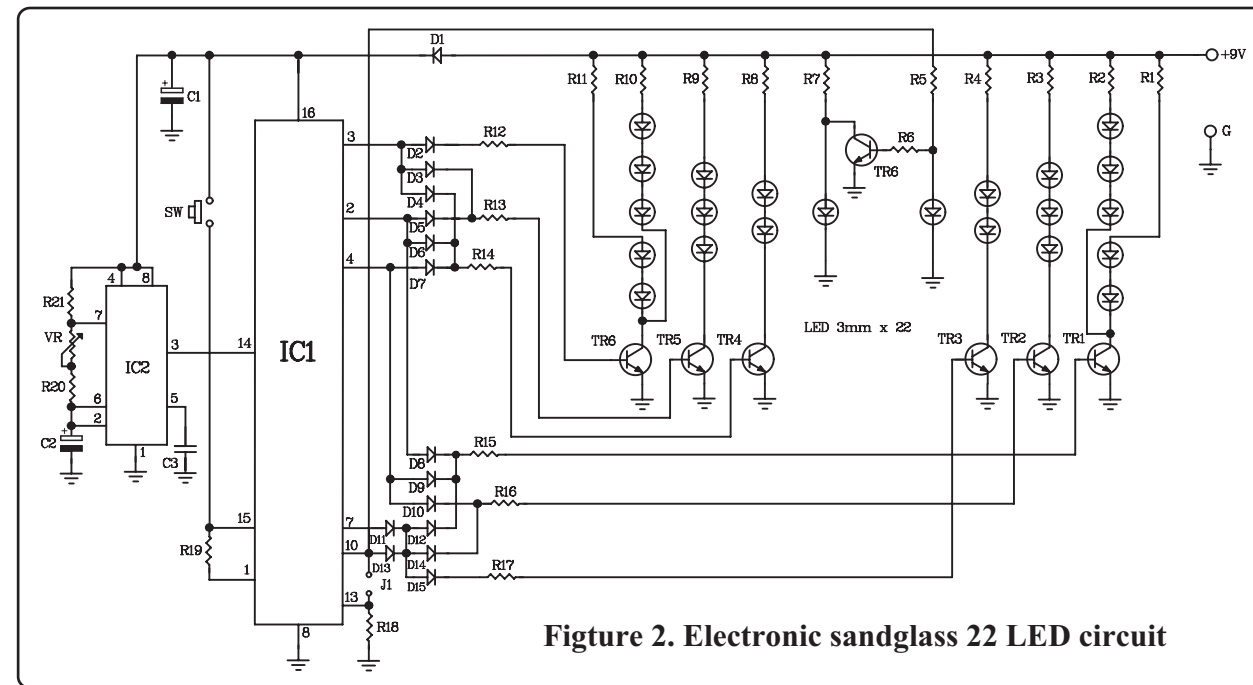


Figure 2. Electronic sandglass 22 LED circuit

