

**TRAIN'S WHISTLE SOUND**  
CODE 235 **LEVEL1**

This circuit is a sound generator. The sound of this circuit is the same a train's whistle. It is suitable for studying, easy application. It can be connected with playing train toy.

**Technical specifications:**

- power supply: 9VDC.
- consumption: 55mA max.
- dimensions: 1.98 x 1.05 inches

**How to works:**

IC1 is configured as a sound generator with the frequency is depending on R5, R6 and C4. Pin 3 of IC1 is connected capacitor C5 for coupling the sound signal to loudspeaker. IC1 has a reset pin (pin 4) when this pin has the voltage to be lower than 0.4 volt, causing IC1 is not working. Pin 4 is control the train's whistle sound by multi-vibrator circuit (TR1, TR2).

Multi-vibrator (TR1 and TR2) is configured as frequency generator. TR1 and TR2 will alternately one by one. If TR1 works, the collector at TR2 has the voltage, causing IC1 is not working. But if TR2 works, IC1 will be working. Operation of multi-vibrator is depending on R2, R3, C2 and C3.

**PCB assembly:**

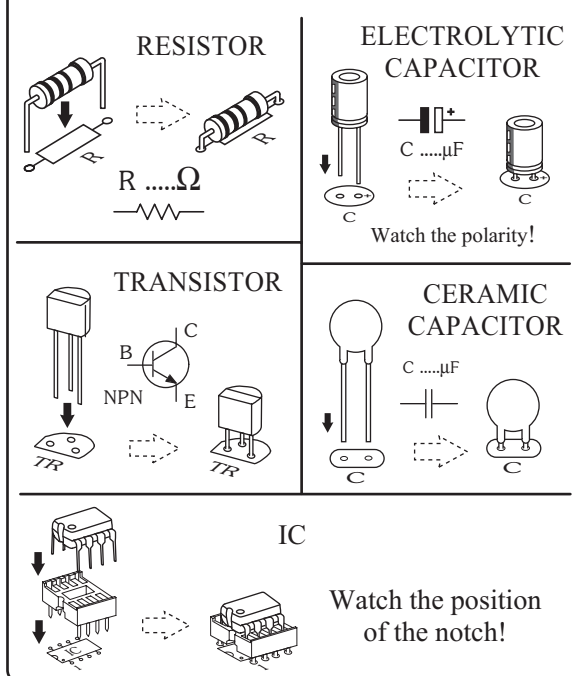
Shown in Figure 3 is the assembled PCB. Starting with the lowest height components first, taking care not to short any tracks or touch the edge connector with solder. Some tracks run under components, and care should be taken not to short out these tracks. If the pins will not enter the holes with ease, use a small drill to slightly enlarge the opening. 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. Some components are particularly sensitive to heat ( ie: Transistors, IC's, diodes etc.) extra care must be taken to only apply the iron for as little time as possible, using a pair of pliers to grip the leads will help conduct heat away. Trim components leads with wire cutters to prevent excess lengths causing a short circuit. Now check that you really did mount them all the right way round!

**Testing:**

This kit has an operating voltage range of 9 VDC. Apply power supply. You will hear the train's whistle sound from a loudspeaker.

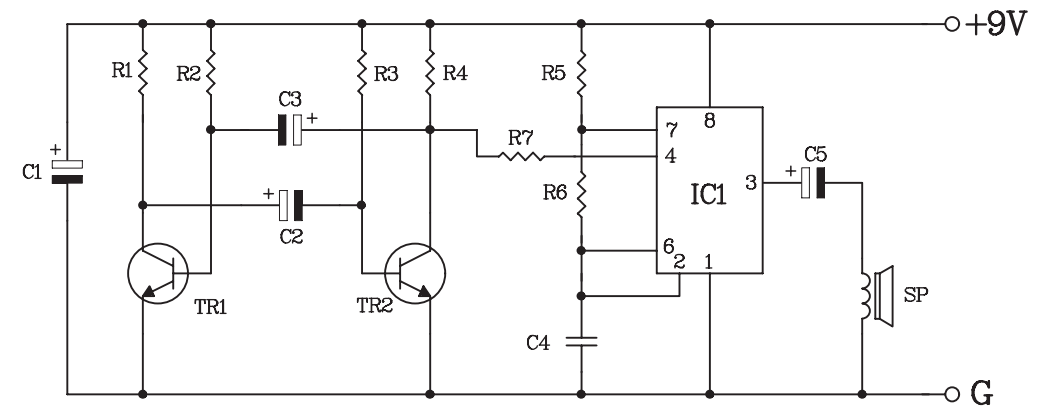
**Figure 1. Installing the components**



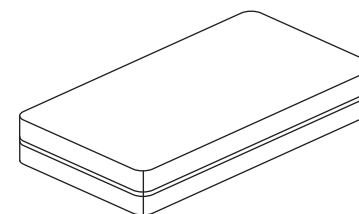
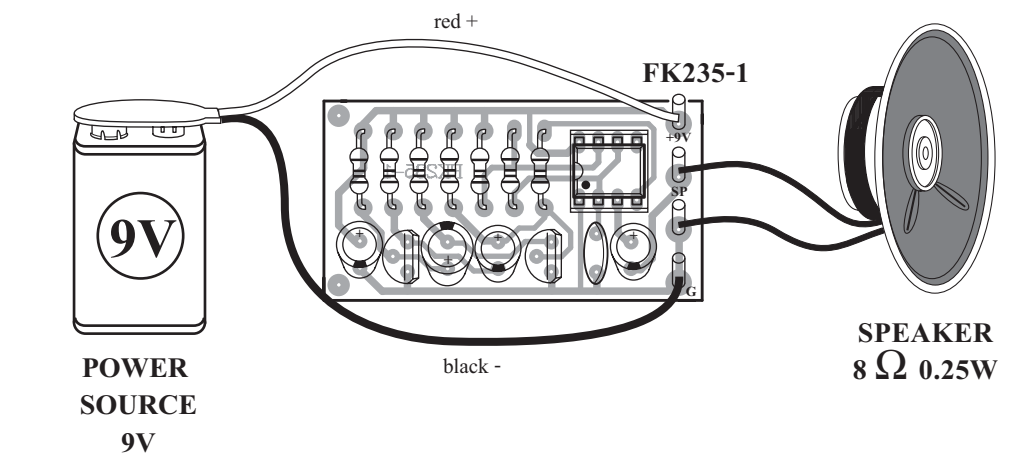
**Troubleshooting:**

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. The train's whistle sound circuit**



**Figure 3. Connections**



**NOTE:**

**FUTURE BOX FB17 is suitable for this kit.**

**NEW KIT SET**

CODE FK	DESCRIPTION	POWER
168	NO SMOKING FLASHER 46 LED	9-12VDC.
169	DANCING ROBOT FLASHER 33 LED	9-12VDC.
170	DANGER FLASHER 42 LED	9-12VDC.
171	TWO LAMP FLASHER	3VDC.
172	THREE STEP FLASHER 19 LED	9-12VDC.
173	HALLOWEEN PUMPKIN FLASHER 23 LED	9-12VDC.
174	ANIMATED LED SIGNBOARD (5x7 DOT MATRIX)	3-5VDC.
816	VARIABLE REGULATOR 0-50V. 3A.	50VDC.
817	TRANSFORMERLESS POWER SUPPLY 6-9-12V 50mA	220-240VAC.