

12V BATTERY CHECKER 8 LED
CODE 939 **LEVEL 1**

A battery voltage checker circuit that used for measuring the voltage of a 12V. battery. 8 LEDs are used for showing voltage of a particular measuring region. Whenever battery is connected to electrical fan, solar cell lamp, light bulb etc. and being used, its voltage will be decreased and used up. In such a case, it will shorten the battery life. This circuit will indicate the battery voltage status throughout.

Technical specifications:

- Power supply : Not required.
- Consumption : 56mA max.
- Having 8 LEDs for showing voltage at each measuring region.
- Having damage protector for short circuit.
- Having a trimmer potentiometer for adjusting the voltage at each measuring region.
- PCB dimensions : 3.79 x 2.47 in.
- Recommended housing : Future Box (FB13).

How to work:

When measure the battery voltage, the voltage will feed the circuit and diode D1 will act as a short circuit protector. When passing through IC3, incoming voltage will be reduced to 5 volts before feeding all circuits.

IC1 and IC2 are connected to be a voltage comparative circuit and each IC will be connected in the same manner. R2 and R5 will control a constant voltage of IC1/1 at pin 13 (minus pin) and pin 12 (positive pin) will be connected to a voltage comparative set by having VR1 to be a voltage adjuster. When voltage at pin 12 is more than voltage at pin 13, there will have voltage coming out from pin 14 and TR1 will work and LED RED 10.5 is lit. But if voltage at pin 12 is less than voltage at pin 13, there will no voltage coming out from pin 14 and TR1 will not work and LED RED 10.5 is not lit.

Circuit assembling:

External connecting and fitting of components are shown in figure 3. It is recommended to assemble the circuit starting with a less height component i.e. diodes, resistor, electrolite capacitors and transistors etc. Be careful while assembling and check for the matching of PCB poles and components before soldering as shown in Figure 1. Use a

max. 40W. solder and soldering lead with a tin and lead ratio of 60/40 together with a joint solution inside. Recheck the assembled circuit for your own confidence. Better using a lead sucker or a lead wire absorber in case of misplacing component to protect PCB damage.

Voltage adjustment:

Adjust VR1-VR8 to the extreme left hand side and notice the typed numbers at LED. The shown number will indicate voltage levels at that measuring region, starting from 10.5 to 13.8 volts. Then connect digital voltmeter to measure over points +12V and G.

Supply an adjust voltage of 15 volts to points +12V and G, LED RED 10.5 and 11.0 are lit while the rest are off. Gently adjust power supply down to 10.5 volts, all LEDs will be off. Adjust VR1 to the right until LED RED 10.5 is lit and adjust power supply to 11 volts. Adjust VR2 to the right until LED RED 11 is lit. Repeat the same process for all VRs. To adjust power supply, do notice the typed circuit which having fixed number for each LED. The shown number will be the voltage level to be adjusted.

Application:

Connect the positive pole of the 12V. battery to point +12V and negative pole to point G. The shown LED at each measuring region will tell the voltage level status.

Voltage less than 11V. will show that the battery is low and not recommended to be used.

Voltage between 11-12V. shows that the battery is nearly low but still workable and recharge is recommended.

Voltage over 12V. shows that the battery is full, recommended to be used.

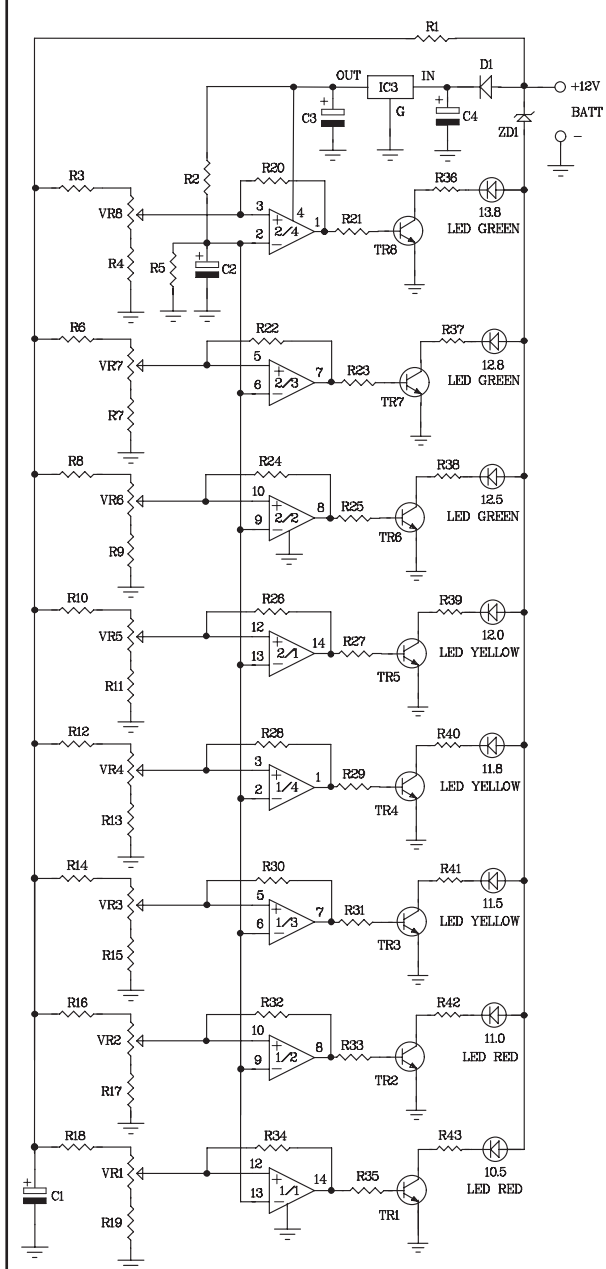
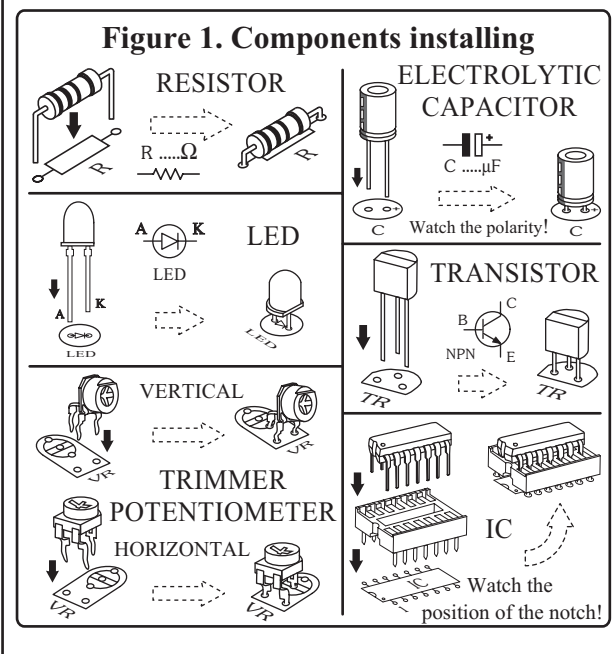
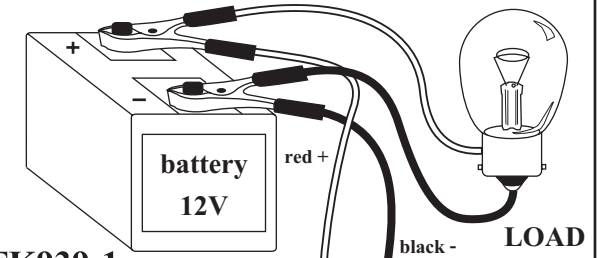


Figure 2.
12V battery checker 8 LED circuit

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.



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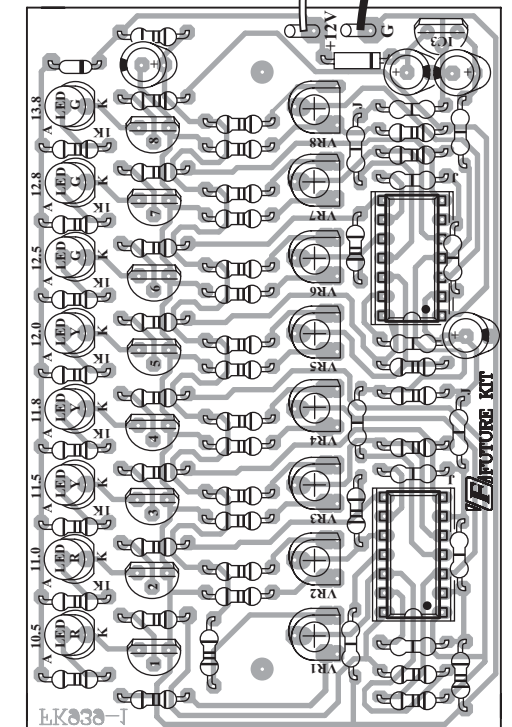
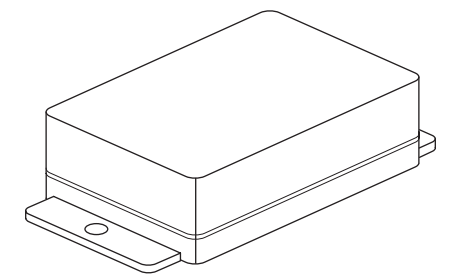


Figure 3. Circuit assembling



NOTE:

FUTURE BOX FB13 is suitable for this kit.