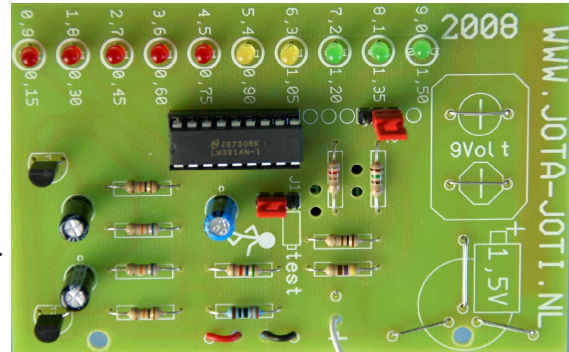


BOUNCING LIGHT & BATTERY TESTER

What do you want: a bouncing light or a battery tester?

This combi-kit can test 1.5 and 9Volt batteries.
Nothing to test? Than you have a bouncing light.

You change functionality with a jumper. With another jumper you can change the LED display mode.



Battery-tester / bouncing light, with 5 red, 2 yellow and 3 green LEDs.

JUMPER1		JUMPER2	
“test”	“running man”	“O”	“O O O”
Battery test	Bouncing light	Dot display	Bar display

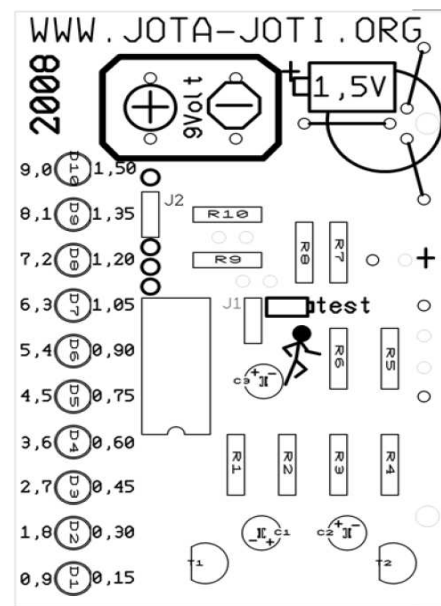
- R1, R4 = 10k Ohm brown-black-orange-gold
- R2, R3 = 68k Ohm blue-grey-orange-gold
- R5 = 3,3k Ohm orange-orange-black-black *
- R6 = 5,6k Ohm green-blue-red-gold
- R7 = 470 Ohm yellow-purple-brown-gold
- R8 = 100 Ohm brown-black-brown-gold
- R9 = 820 Ohm grey-red-brown-gold
- R10 = 150 Ohm brown-green-brown-gold
- C1, C2 = 10uF
- C3 = 22uF
- T1, T2 = BC547
- D1, 2, 3, 4, 5 = LED red
- D6, 7 = LED yellow
- D8, 9, 10 = LED green
- IC = LM3914, to be put in IC-socket
- J1, J2 = 3 pin header + jumper

18 pins IC-socket

9V battery clip

15 cm wire (test wire)

Solder-ring to be used a test pen



* supplied resistor R3 has blue background color

BUILDING INSTRUCTION

Attention: the IC is sensitive to static electricity. Put the IC as last component on the board.

Start with the 10 resistors. Pay attention to the values and the color coding! Left over pieces of wire can be used for the battery test points.

Put the IC socket on the printed circuit board (PCB). Make sure all pins are in a hole. The notch in the socket should be on the same side as the PCB print.

Place the "headers". This is a strip of 6 pins. Break it in half, in 2 strips of 3 pins. The short ends of the pens you solder on the PCB (not the other way around). Start soldering 1 pin, check if the pin is standing right up. If not, heat the solder and try again. **WARNING:** pins become hot! When the pins are straight up, solder the other two pins.

Capacitors C1, C2 and C3. Please notice the value and the side for "+" and "-".

Transistors T1 and T2. Look at the flat side of the transistors.

LED, Light Emitting Diode. A LED has two legs: a Anode (+) and a Cathode (-). If you solder the LED the other way around, it will not work. Pay attention that the long leg (Anode) is closest to the edge of the PCB.

9Volt battery clip. Bring the wires, bottom to top, through the holes in the PCB. Put the metal ends in the holes in the PCB and solder them. The red wire is connected to "+" (see bottom PCB), the black wire to "-".

The test wire. Use a piece of wire. Remove the ends of the wire (about 3 mm). Put the wire through the hole with the "+" on the component side of the PCB. Solder the metal end in the smaller hole. On the other side you solder the small eye.



Now you can put the jumpers on the headers. Near the headers you will find two holes in the PCB. You can put a piece of rope through these holes and connect them to the jumpers. So you won't lose your jumpers.

De LED

Finally you put the IC in the socket. Have a close look at the notch on the IC, as well as the socket and the PCB. The notch on the IC and the PCB should point in the same direction.

If you want, you can solder a safety pin (not included) on the large area on the top of the print. This way you can wear the bouncing light on your uniform. And you have always a battery tester at hand. :-)

As a first test put the jumper in the "running man" position. The other jumper can be in the "O" or "O O O" position. If you did all well, your bouncing light will now work!

Time to look for old batteries and give them a test.

MANUAL

The circuit itself runs on a 9Volt battery (even an almost empty one!).

Testing of a 9Volt battery is done by pushing the battery in the right manner on the PCB (see print on the PCB).

Testing of a 1.5Volt battery is done by pushing the flat site of the battery on the PCB (in the circle with the 3 wires). The other side of the battery (the "+", with the cap) you touch with the test wire.

Only red LEDs: battery is (almost) empty

Yellow LEDs: doubt, depending on your application you can still use them for a while

Green LEDs: battery is full

Next to the LEDs numbers are printed. This is the voltage. The numbers on the left are for a 9Volt battery, the numbers on the right for a 1.5Volt battery.

You can also notice the difference between alkaline and rechargeable batteries (NiCad or NiMH). Rechargeable batteries produce, even if they are full, a lower voltage (about 1.2 Volt) than a non rechargeable battery.

