

The AVT729 is an amazing toy and eye-catching light-emitting gadget. Large, high brightness LED with diameter 5 or 10 mm are used in this gadget. A sequence of colorful lights travels round a central light spot. The sequence is randomly selected creating amazing light effects. The sequencer is an ideal toy for enhancing the user's individuality for example, at a disco or school.

### Specifications

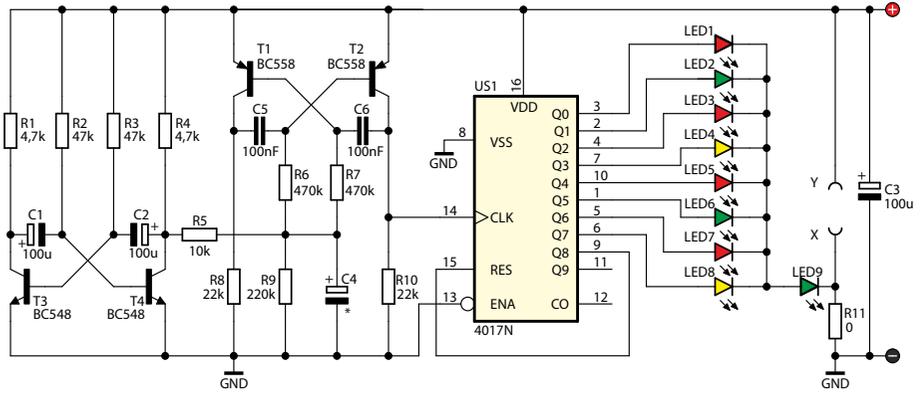
- alterable light sequence
- the travelling light spot in basic mode, the hold-on mode in option
- diodes of any colour, shape or size applicable
- power supply: 6-15V DC

### Functional description

The CMOS 4017 (U1) counter is the "heart" of the LED sequencer whose counting cycle is reduced to 8 states by connecting the Q8 output to the RST input. Each counted pulse causes each of the eight subsequent diodes to turn on. Once the circuit has been turned on, the middle D9 diode shines continuously. Pulses for the U1 counter are generated by a typical oscillator with transistors T1 and T2. The speed of the bouncing light is determined by the resistors R6, R7 and capacitors C5, C6. The generator frequency is variable. Basically, the

speed of the bouncing light is determined by the additional sub-low frequency oscillator along with transistors T3 and T4. The alteration in speed of the bouncing light is determined by the resistors R4, R5, R6, and capacitor C4. The signal on collector T4 is not purely square-waved and its shape is dependent on the R3/R4 ratio. The "modulation depth" is determined by R4 and R5 to R9 ratio. The values given by the schematic guarantee good operational results without having to use the C4 capacitor.



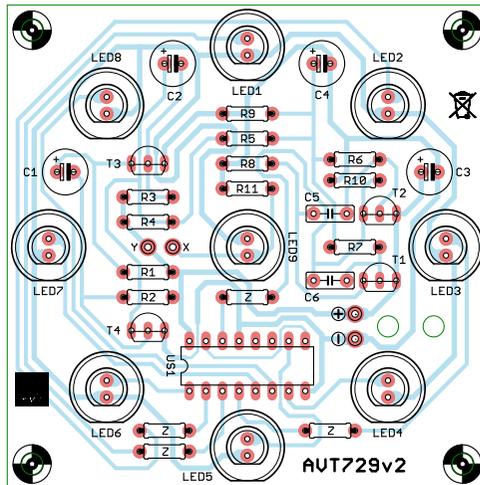


**Figure 1.** Schematic diagram

### Assembly and test

The schematic of the LED sequencer is shown in Figure 1, the PCB is shown in Figure 2. The best way to assembly the device is to follow the order of soldering given in the component list. First seven wire jumpers should be soldered in places marked as "Z". Then a single wire jumper should be soldered in place of R11 and finally larger components should follow the others. During assembly a lot of care should be taken to the polarity of the components.

The pin 1 mark in the socket and the IC must correspond to the draft on the PCB. After the circuit has been assembled the components must be checked. After checking the correctness of assembly a 9V battery or 9-15V power supply can be connected. Once properly assembled, the circuit will work instantly.



**Figure 2.** Components layout



Start off by soldering the printed circuit elements in order from smallest to largest. The unit assembled flawlessly, using the supplied components will operate immediately after switching on the power supply.

# Component list

## Resistors:

- Z: ..... 0Ω (4pcs.) (black)
- R11: ..... 0Ω (black)
- R1, R4: ..... 4,7kΩ (yellow-purple-red-gold)
- R2, R3: ..... 47kΩ (yellow-purple-orange-gold)
- R5: ..... 10kΩ (brown-black-orange-gold)
- R6, R7: ..... 470kΩ (yellow-purple-yellow-gold)
- R8, R10: ..... 22kΩ (red-red-orange-gold)
- R9: ..... 220kΩ (red-red-yellow-gold)

## Capacitors:

- C1-C3: ..... 100μF !
- C4: ..... not to be soldered
- C5, C6: ..... 100nF (also marked as 104)

## Semiconductors:

- T1-T2: ..... BC558 (BC557) !
- T3-T4: ..... BC548 (BC547) !
- U1: ..... CMOS 4017 IC with 16-pin IC socket
- D1-D9: ..... any 5-10mm LED diode !

## Others:

6F22 snap-in connector (red wire ⊕; black wire ⊖) !

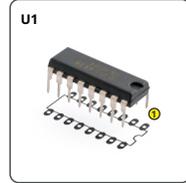
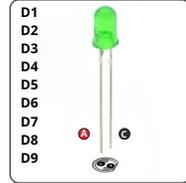


While assembling the components marked with an exclamation mark attention should be paid to their polarity. Symbols of the components on the PCB as well as photos of assembled sets may come in useful. To access high-resolution images, download the PDF file.

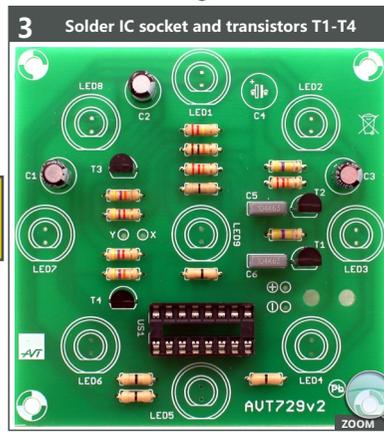
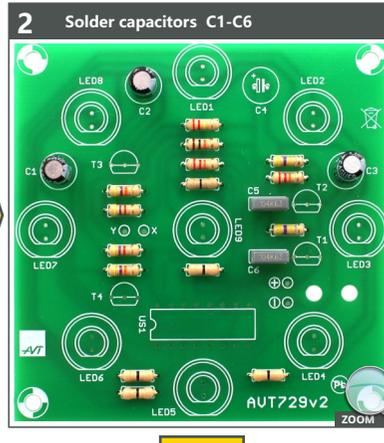
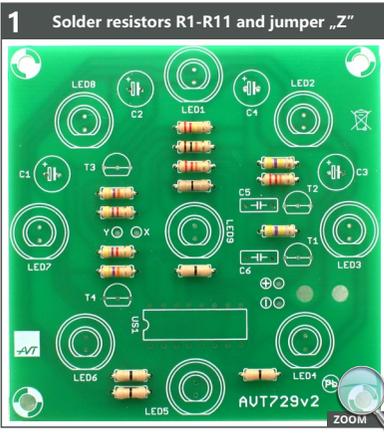
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## Assembly in 4 steps



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