KITS EDUCATIONAL ELECTRONIC

AVT 720

Blue and white flashing light

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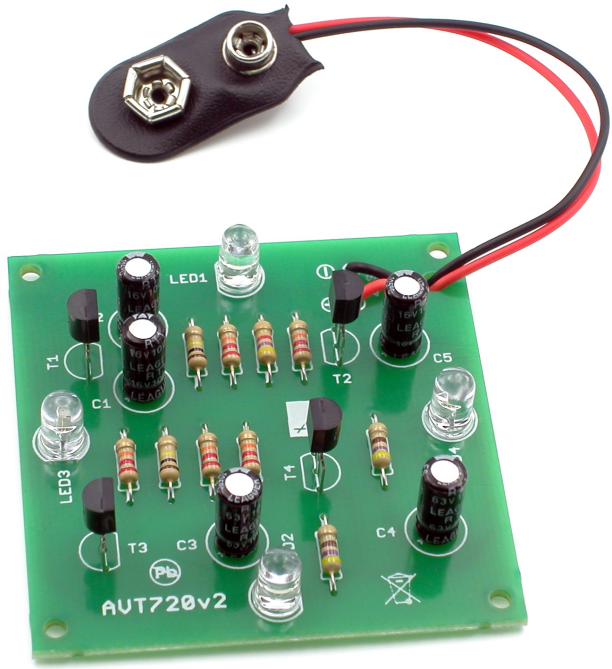

The module generates an interesting light effect with two pairs of LEDs that alternately blink at variable speed. The using of ultra bright LEDs ensures visibility of the lights from a distance – in the dark even up to several hundred meters.

Specifications

- 4 LEDs: 2 white, 2 blue
- adjustable flash frequency
- current consumption: 9mA at 9V
- supply voltage: 9-15V DC

Functional description

Kit can be powered from batteries, then it is perfect for everyone, who wants to emphasize their personality for example in a disco. It can also be connected to a car battery, then the vehicle will be recognized for its originality.
Blinker is built using a typical astable generator consisting of transistors T3 and T4. The transistors alternately turning blue or white LEDs on or off. Operation frequency is determined by resistors R8, R9 and capacitors C3, C4.
Resistors R8, R9 are not connected (as in a typical circuit) to a positive power pole, only to the connection point R5 and R6. This transforms the astable generator into a voltage-controlled generator (VFO). The frequency of the flickering of the LEDs also depends on the voltage at the point of connection of the resistors R5, R6, and the voltage changes to the rhythm of the second astable generator composed of transistors T1 and T2. Due to the high capacitance of capacitors C1 and C2, its operating frequency is much lower than the frequency of the flickering of the diodes. The difference in resistances R2, R3 causes that the control waveform is unbalanced, and the approximate R1-R4 resistances cause the waveform of the transistors to differ substantially from the rectangular ones. As a result, the frequency of the astable generator is small, the waveform is unbalanced, and the voltage at the T2 collector drops gently – as a result, it modulates the frequency of the flicker in a specific way, giving an interesting light effect.

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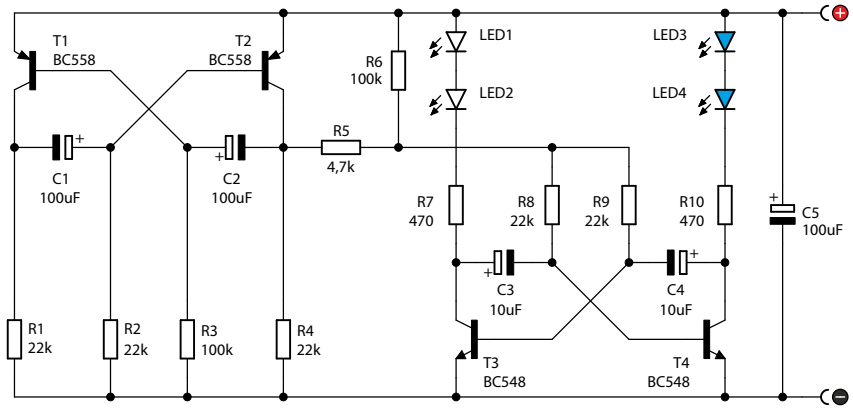

Figure 1. Schematic diagram

Assembly and test

Figure 2 shows the location of the components on the PCB. Assembly is typical. It starts with the smallest components and ends up with the biggest ones. After assembling, check that the components have not been soldered in the wrong direction or in the wrong place, and that no short circuit has occurred. After this attach a 9 V battery or a stabilized power supply. Enjoy!

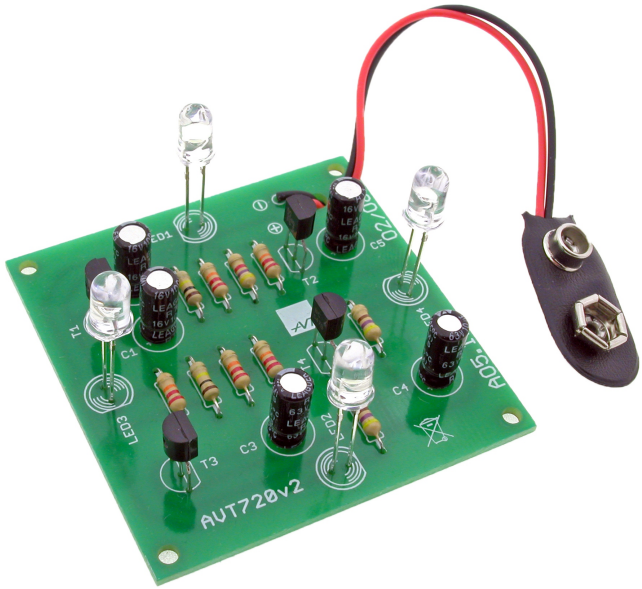

Figure 2. Components layout

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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:
R1-R2, R4, R8-R9:.. 22kΩ (red-red-orange-gold)
R5: .....4,7kΩ (yellow-purple-red-gold)
R3, R6:.....100kΩ (brown-black-yellow-gold)
R7, R10:.....470Ω (yellow-purple-brown-gold)
Capacitors:
C3, C4:.....10µF !
C1, C2, C5: .....100µF !
Semiconductors:
T1,T2:.....BC558 (BC557) !
T3,T4:.....BC548 (BC547) !
D1, D2:.....5mm WHITE LED diode !
D3, D4:.....5mm BLUE 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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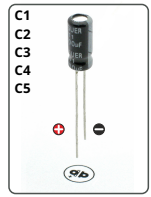
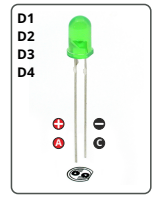
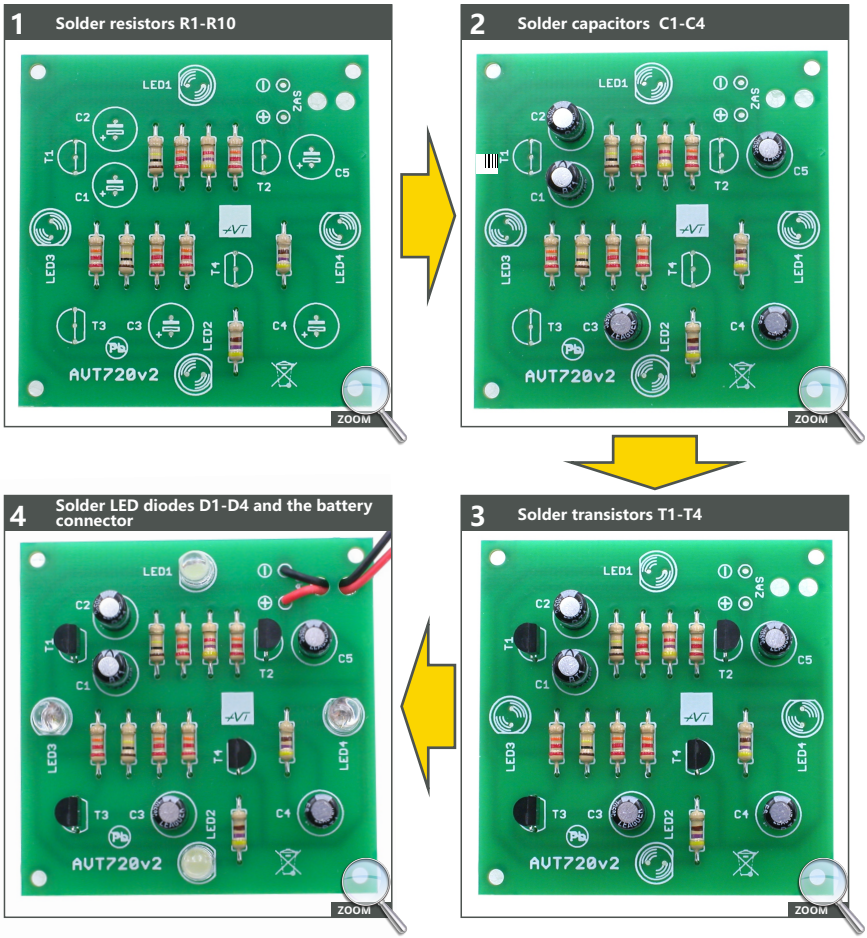




Assembly in 4 steps



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Notes

Thank you for purchasing AVT product. Please take your time to read carefully the important information below concering use of this product.

Educational Electronics Kits are intended for educational and demonstration purposes only. They are not intended for use in commercial applications. If they are used in such applications the purchaser assumes all responsibility for ensuring compliance with all local laws. In addition, they cannot be used as a part of life support systems, or systems that for use as or as a part of life support systems, or systems that might create a hazardous situation of any kind.

• Battery or wall-adaptor are safe devices. They do not require special attention unless main voltage is connected to an output e.g. a relay.
• If the kit is used to switch currents greater than 24V it is necessary to have the installation and performed by a trained professional authorized for such work. The kit may only be used in such application if it was installed in a safe to touch enclosure.
• Never exceed the limits or ratings listed in the 'Specifications' section at the this user guide.
• If the kit is used in schools or educational facilities or similar institutions the operation must be supervised by trained and authorized staff.
• The product itself and all parts thereof (including packing material) are not suitable toys for childern! (choking hazard, risk of electric shock, ...)

Failures in modern electronic component are very rare as 95% of non-working kits are due to poor soldering or components placed in the wrong location or orientation so please check your work carefully.

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