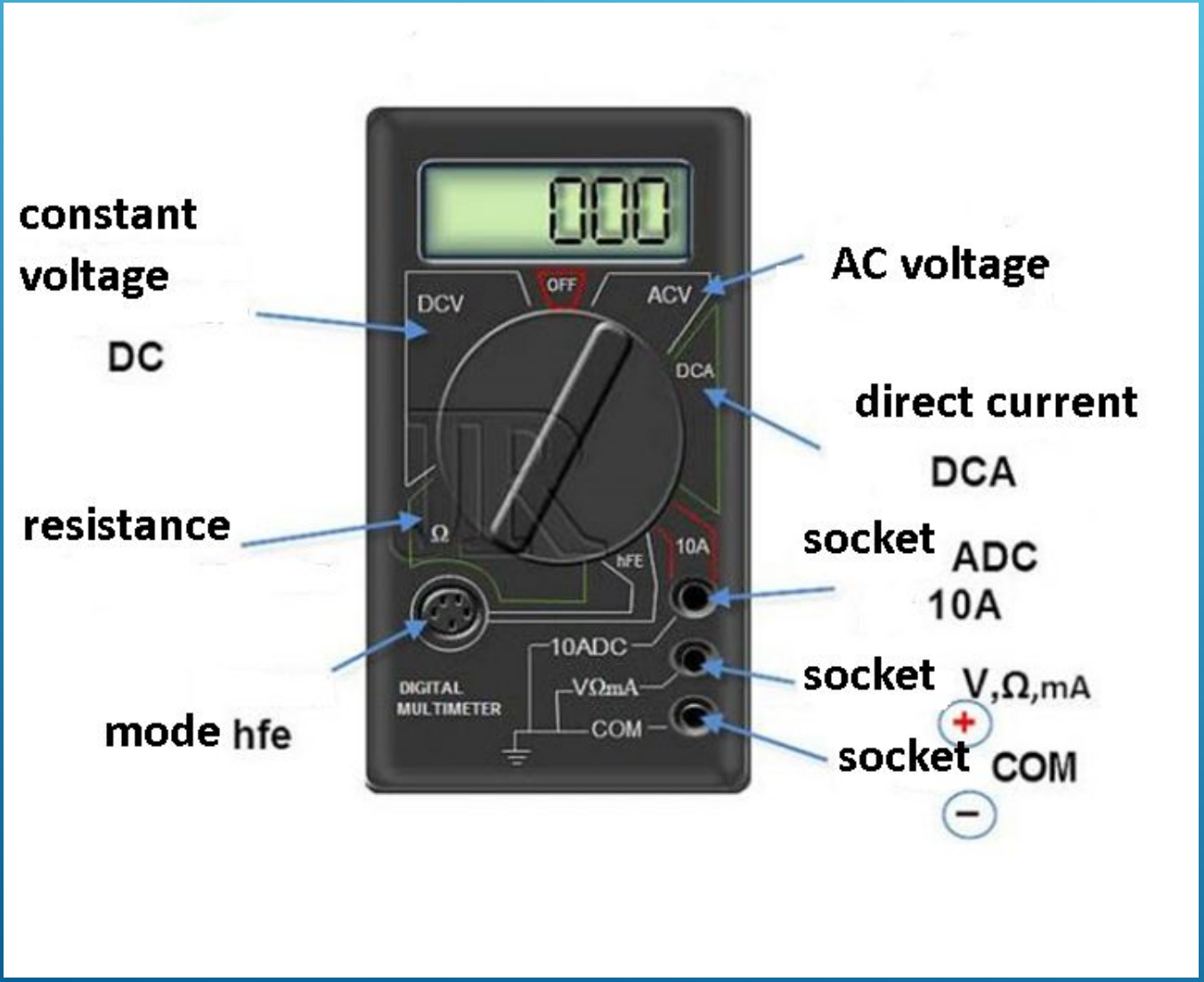
MULTIMETER

Работу выполнили:
Студенты группы 18-Э-2
Злобин Михаил,
Ефимов Кирилл.

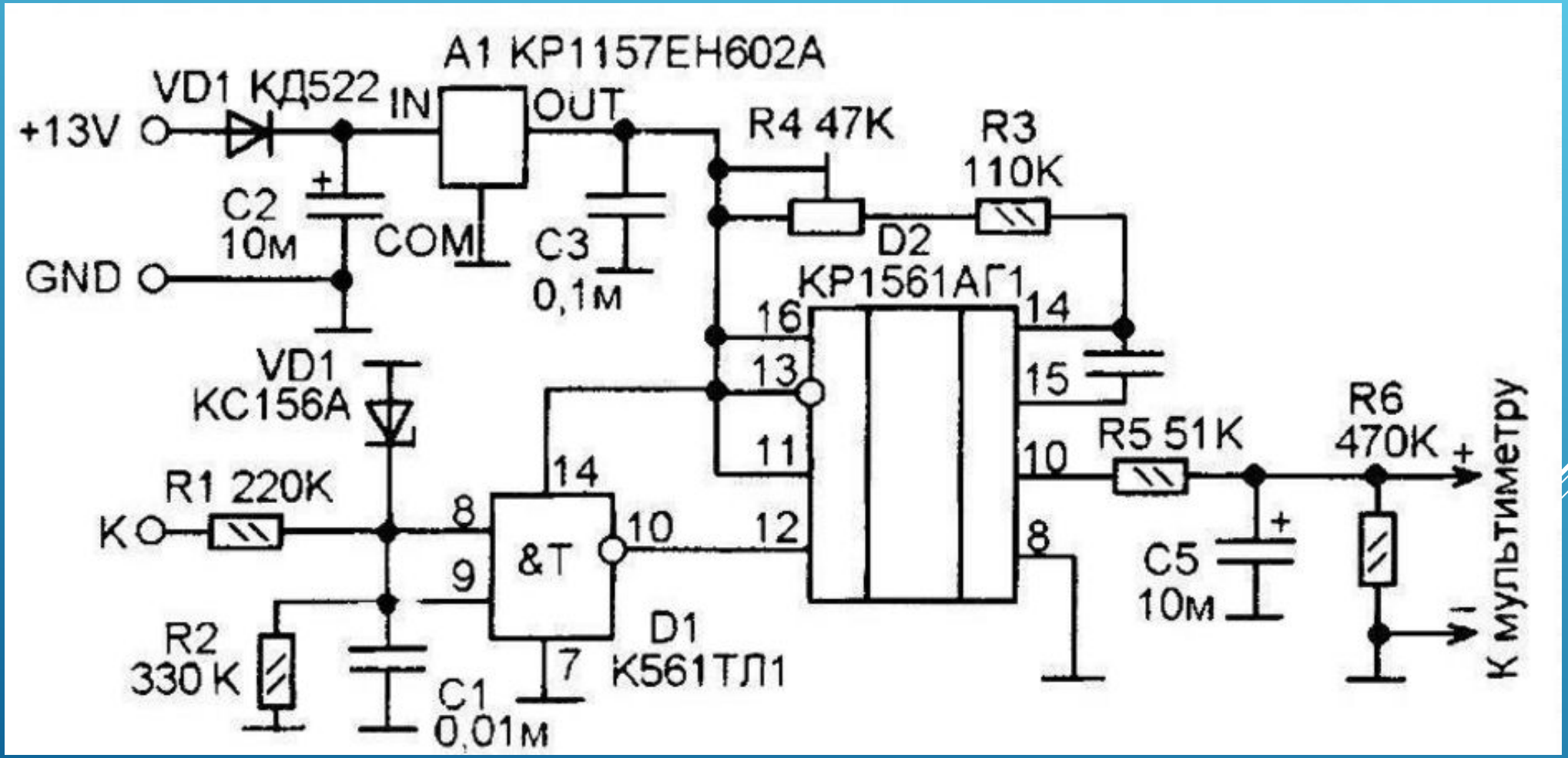
DEFINITION

A multimeter is a digital multi-function measuring instrument, also called a universal tester. With it, you can learn the values of resistance, voltage and current on the circuit. In addition, you can check the integrity of the electrical circuit and many radio components, such as transistors or diodes. Functionally, the multimeter replaces several measuring devices: voltmeter, ammeter, ohmmeter.

MAIN WORKING AREAS OF THE MULTIMETER



ELECTRICAL CIRCUIT OF THE MULTIMETER



PRINCIPLE OF OPERATION OF DIGITAL MULTIMETER

At the heart of the digital multimeter is a dual-integration ADC-analog-to-digital Converter, in which the input signal is compared with the reference. In order for the meter to show the value of the electrical parameter, the meter must be electrically connected to the circuit or its component. These connections are made by a set of wires. Black wire is usually called common or negative, red — positive. At one end of each wire is a plug that plugs into the meter's socket. The other end of each wire is used to make contact with the circuit or its component to be measured. To measure direct current, the meter must be connected in series with the circuit in which the measurements are made. If a device that is configured to measure current is accidentally turned on in parallel with a voltage source, the voltage may cause excess current to flow through the meter and damage it. To measure the voltage, the meter must be connected in parallel with the voltage source. Since the voltage is the same in all branches of the parallel circuit, the voltage to be measured will be on the meter as well, causing the meter to show the voltage level. Resistance measurements should be carried out on de-energized circuits. Resistance measurements use a small internal battery to power the meter circuit and the resistance to be measured.

TYPES

-Analog

-Digital

DISADVANTAGES

The LCD display depends on the battery or external power supply. When the battery is low, the display will be dim. In case of hesitation, it can fix the error. Heating of the counter during use of the device may change its properties, which leads to errors in the measurements. There is a voltage limitation. The digital nature makes it unsuitable for adjusting the setting of contours or the peak of customizable responses. They are expensive because of the high cost of production.

PRICE

Prices for multimeters in the store can vary from 300 to 90,000 rubles.

CONCLUSION

Multimeters do not have high accuracy of measurements, but are quite reliable in operation. Therefore, digital and analog multimeters are gaining popularity and are widely used.