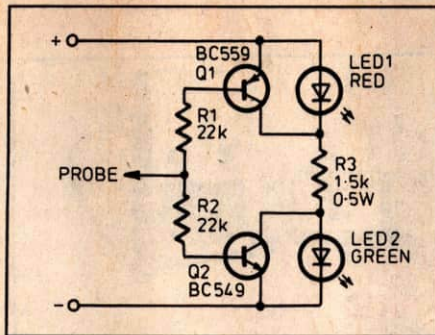


Compact logic probe

I wanted a very compact +/- indicator, so I built this circuit into the empty casing of a ball-point pen. In order to get it to fit into the casing, I did not use a PCB, but assembled the components as shown. They fitted — with a bit of poking and pulling! Two 3mm LEDs were used, with the red LED indicating positive polarity and the green one negative.

The wires to the LEDs should be insulated, and the other components simply have their leads soldered to each other. I used bits of insulation tape wherever there was any risk of leads touching. By pulling the probe wire, and pushing down the circuit with a small screwdriver, the whole assembly was worked down the casing until the LEDs lined up with their holes.

A Pentel pen was chosen, because of its soft case which made it easier to work with. It was dismantled and washed, and two 3mm holes were drilled for the LEDs near the top of the casing, but far enough



down to leave room for the cap to be replaced. Another hole was drilled in the cap for the power leads. To make the actual probe, I pushed out the ball of the nib,

and inserted a pin which was soldered to the probe wire. The nib was then placed back in the plastic casing.

The probe works by simply biasing on one of the two transistors Q1 and Q2, which lights the appropriate LED (green for positive and red for negative). The tester works well on a voltage range of 3 - 24V; though if you intend to use it mostly at one end of the range, you may like to increase or decrease the value of resistor R3. I found it very handy with alarm systems and for automotive use. It is rugged enough to be kept in the tool box.

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\$40

