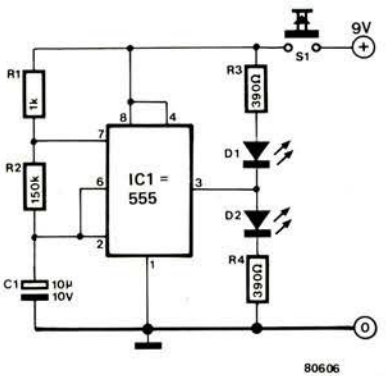
42 simple 555 tester

The versatile 555 timer IC has the habit of turning up in wide variety of circuits. As it is such a useful little device it has become very popular over recent years. Although the 555 is generally very reliable, there are occasions when malfunction does occur. The circuit shown here will provide a simple and effective method of testing suspect devices.

The timer to be tested, IC1, is connected as an astable (free-running) multivibrator. When the 'push to test' button (S1) is closed capacitor C1 will start to charge up via resistors R1 and R2. As soon as the voltage level on this capacitor reaches the trigger point of the timer the internal flip-flop is activated and pin 7 is taken low to discharge C1. The flip-flop is reset when the voltage on C1 reaches the threshold level of the IC. This takes pin 7 high and the charge cycle starts once more.

The output of the timer (pin 3) is connected to a pair of light-emitting diodes. When the output is high LED D2 will be on and D1 will be off.



Conversely, when the output is low D1 will be on and D2 will be off. The LEDs will flash on and off alternately — provided, of course, that the IC under test is a good one.

For readers who may have other applications for the circuit and who wish to alter the frequency, the rate at which the LEDs flash is determined by the values of R1, R2 and C1. The frequency of oscillation can be calculated from the formula

$$f = \frac{1.44}{(R1 + 2R2) \times C1}$$

If, as in this case, the value of R2 is much greater than the value of R1, the frequency can be approximated from the following:

$$f \approx \frac{0.72}{R2 \times C1}$$

For the values shown in the circuit diagram the frequency works out to be around 0.5 Hz.

The tester can be made very compact by soldering all the components directly to the IC test socket, which is first mounted through a hole in the upper surface of the box or container to be used. Alternatively, the components can be mounted on a small piece of Vero-board or similar. Current consumption is minimal and the unit can be powered from a single 9 V battery.