

555

741 TESTER

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AMONGST the most common i.c.s used by hobbyists must be the humble 555 and 741. Many books have been written on how to use these versatile devices, but what if they go wrong? There is no easy way of telling if an i.c. has ceased to function by looking at it unless it quite literally does go up in smoke, so the author decided to build a very simple little tester. This unit gives a functional check to each device and whilst it doesn't claim to check many of the parameters, it should help to sort out the good from the bad. It uses the case given free by PE some time ago and which is available from the editorial offices at Poole (50p inclusive). It is very cheap to build, and even easier to use. Two wire-wrap sockets stand proud of the p.c.b. and project through the top panel of the case to enable suspect devices to be inserted quickly.

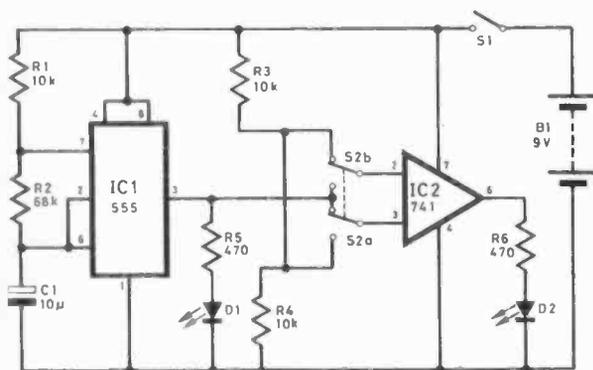
HOW IT WORKS

The circuit diagram for the Tester is shown in Fig. 1. The test 555 is connected as an astable multivibrator whose frequency is determined by R1, C1 and R2, and with the component values stated it should oscillate at approximately 1Hz. The output (pin 3) drives D1, current limited by R5, and is also connected via S2a to one of the inputs of the test 741. The other input is connected via S2b to the potential divider formed by R3 and R4, biasing the pin at approximately half supply voltage. The effect of S2 is to alter the 741 from being an inverter to a buffer and vice-versa. The

output of the 741 drives D2, current limited by R6 which will flash either in phase, with the 741 as a buffer, or out of phase, with the 741 as an inverter.

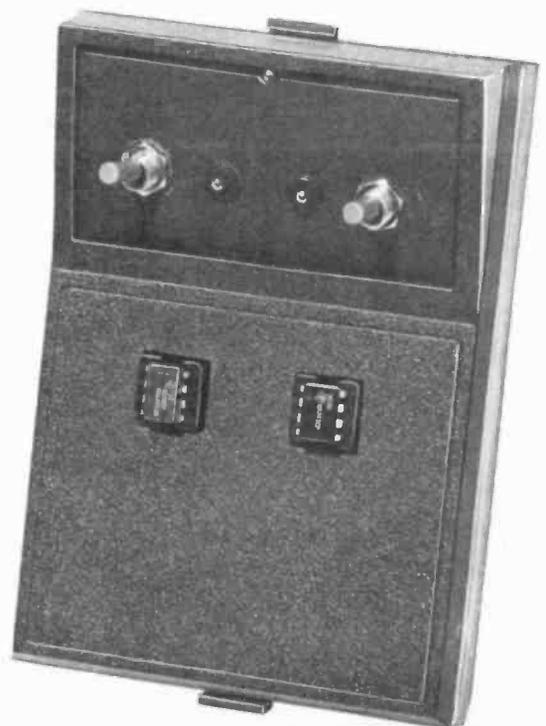
CONSTRUCTION

This can be either on Veroboard or a p.c.b., a suggested design for a p.c.b. is given in Fig. 2 with the component layout shown in Fig. 3. Mount the components, including the wire-wrap sockets which are soldered with a space of 10mm above the p.c.b. Cut a piece of black plastic to fit behind the case aperture, and mount the two switches and l.e.d.s in the panel before gluing it into position. Care must be taken to choose miniature toggle switches, otherwise they might foul the p.c.b. Two holes need to be cut in the top panel to allow the sockets to project through. Mount the p.c.b. using self-tapping screws, connect the battery and after the usual search for solder joins across tracks, track breaks etc, insert two working devices and check that the



EG1216

Fig. 1. Circuit diagram



COMPONENTS . . .

Resistors

R1, R3, R4	10k (3 off)
R2	68k
R5, R6	470 (2 off)
All resistors $\frac{1}{4}$ W 5% carbon	

Capacitors

C1	10 μ 16V tant.
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Diodes

D1, D2	min red l.e.d. (2 off)
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Switches

S1	S.p.s.t. toggle switch
S2	D.p.d.t. toggle switch

Miscellaneous

P.c.b.	
2 wire-wrap 8-pin d.i.l. sockets	
Case	
Battery connector	

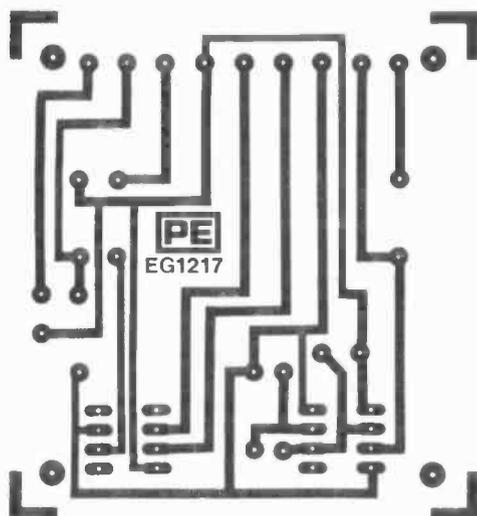
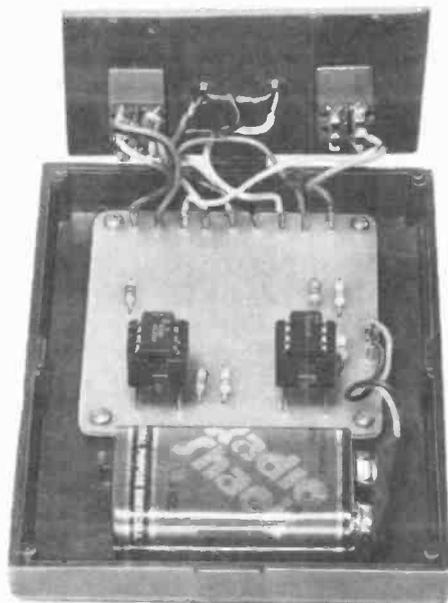


Fig. 2. P.c.b. design



Internal view

unit functions properly. It is likely that l.e.d. D2 will glow slightly. This is normal and can be ignored, it also serves to show that the unit has been left on.

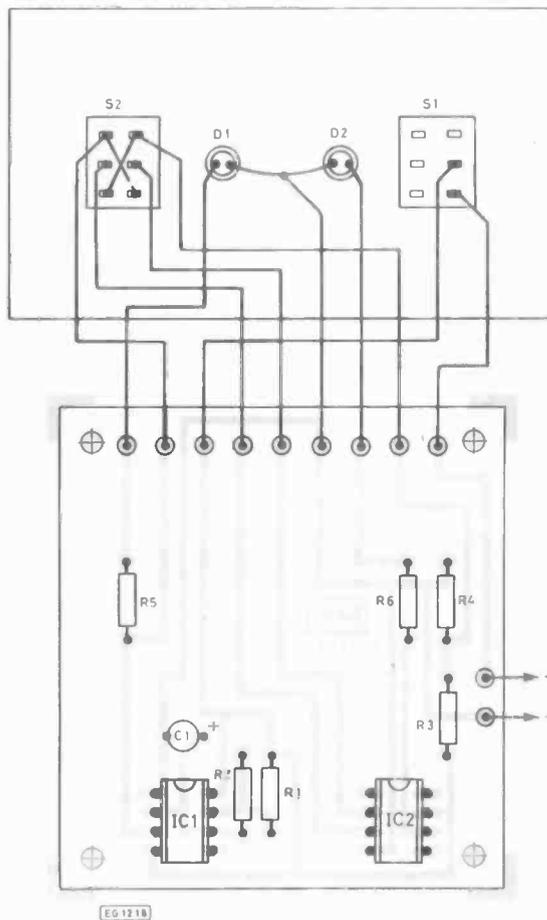


Fig. 3. Component layout

In use, two working devices are kept in the sockets, and then replaced with a suspect device for testing as and when necessary. There is no reason why other op-amps . . . e.g. CA3140, cannot be tested in the same way, providing the pin-out is the same. ★

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