light dimmer

ALTHOUGH commercially made light dimmers have fallen considerably in price recently, they still usually command about £4.00 (though we have seen them advertised a bit cheaper). In addition to giving control over the brightness of a bulb, modern circuits using a Triac actually save electricity and will eventually pay for themselves though we do not advocate them for this reason.

The circuit for a light dimmer is not complex, as will be seen from Fig. 1, nor are the components all that expensive. Including everything, we reckon the cost of this project at about £2.50. The circuit overcomes a drawback in many of the commercial models: the Triac is protected against mains transients. Many versions do not come on until the control is rotated over half way, yet current is still being drawn; in our circuit the light comes on almost at minimum setting.

An unusual facility is also incorporated in the design which some readers might wish to take advantage of. A light dimmer is perfect for use with a TV set as neither viewing in full light or complete darkness is very pleasant. The circuit is so arranged that the switch can also handle a load which is not controlled by the dimmer circuitry. Thus, the TV can be switched on using the unit, but only the light will be controlled. The same arrangement also makes it possible to control only one light, leaving others unaffected.

The unit will handle 500W as shown, but with some modifications can easily be adapted to control 1kW.

CONSTRUCTION

Use of a printed circuit board (the pattern as shown in Fig. 2) is recommended. Veroboard can be used but mains voltages are present and many people will consider that the track spacing is a bit close.

First mount the terminals A–D. These are taken from a small terminal connecting block. Each terminal is fitted to the component side of the board being held in place with a screw which can then be soldered to the copper track.

The choke L1 is made up from a piece of ferrite rod, ¼" diameter and 1¼" long, wound with 55 turns of 28 s.w.g. enamelled copper wire, wound tightly and secured at each end by a strip of adhesive tape. Tin the ends of the wire and attach the choke to the p.c.b.. Now mix up some quick setting epoxy resin (Devcon etc.) and smear this over the windings, making sure that some will anchor the choke to the board. If there is any epoxy left over, smear this over the soldered terminals as this will help with rigidity.

The other components can now be mounted, the Triac should be fitted as close to the board as possible. The switch contacts of the pot must fit through the p.c.b. and should be fitted so that the back of the switch

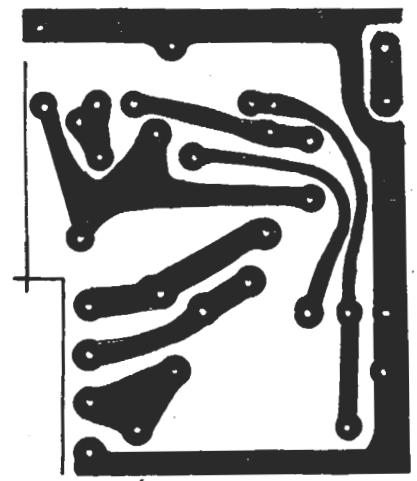


Fig. 2. The p.c.b. pattern.

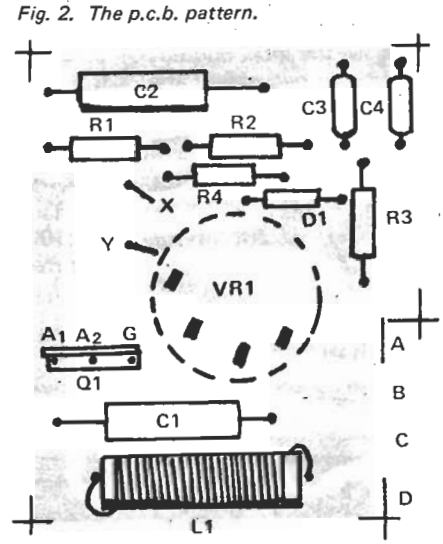
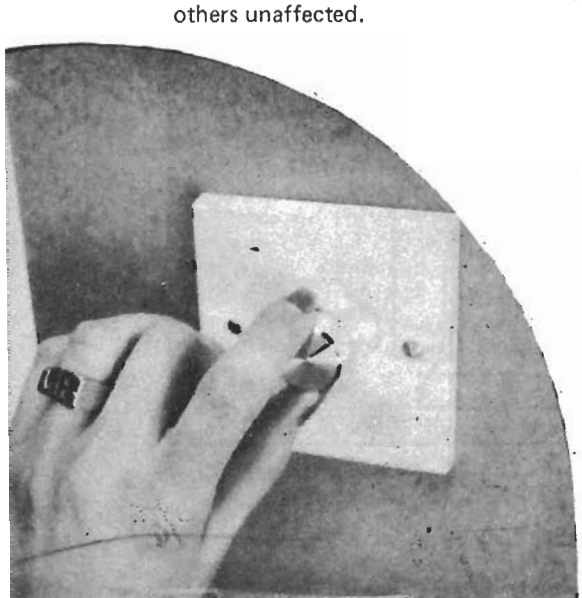


Fig. 3. Components layout, seen from the front of the p.c.b.



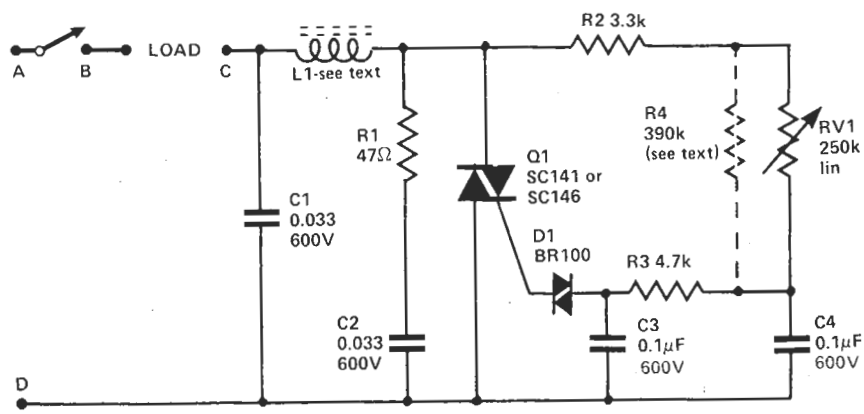


Fig. 1. The circuit of the dimmer.