

CIRCUIT IDEAS

Economiser for DC Flashlights

There are various types of solidstate AC lamp dimmers in the market these days, but what does one do while using a DC source of supply such as dry cell batteries or storage cell operated emergency lights. The conventional alternative has been a rheostat, which is undesirable as it gets hot in operation and consumes the very power we intend to conserve.

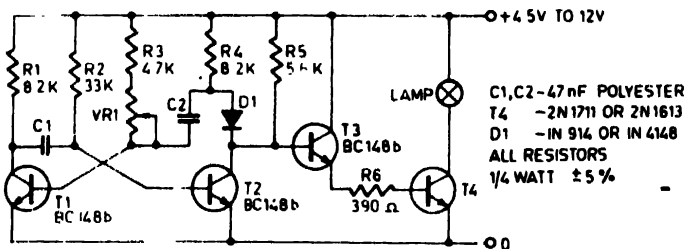


Fig. 1

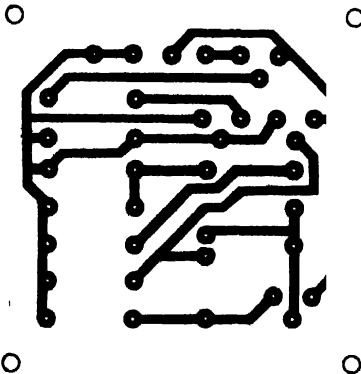


Fig. 2

To solve this problem I devised the circuit given here. This dimmer may be used with 4.5 to 12 volt batteries, keeping in mind that the maximum load that transistor T4 can take is 1 ampere. Keeping the basic principle in mind, and using suitable semiconductors, the device may be adapted for use on higher voltages and current.

Transistors T1 and T2 form an astable multivibrator

whose duty cycle can be varied by means of potentiometer VR1. The diode improves the rise time of the resultant square wave. Via T3 the multivibrator switches transistor T4, which in turn switches on the lamp. Since T4 is operating as a switch, no special cooling will be found necessary for it. With the components used, the control range is three to one, i.e. at the minimum brightness the lamp would burn at one third of its normal intensity; that means the batteries would last three times as much.

Though no special construction skill is necessary, as the circuit is very simple, yet for those who want to give beauty and neatness to their gadget a printed board layout is given. And in case you are willing to experiment with the circuit, I suggest you replace potentiometer VR1 with a suitable light-dependent resistor so that the brightness of the lamp would be inversely proportional to the ambient light where the LDR is placed.

—P.K. SOOD

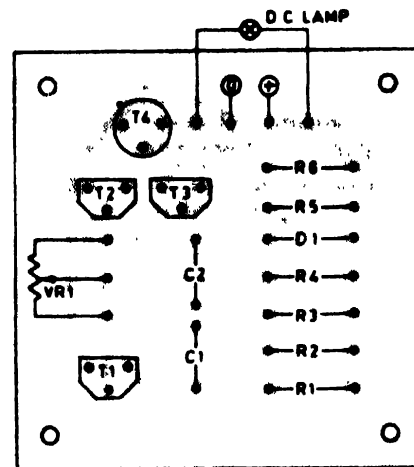


Fig 3

A Simple Overload Indicator

With power electrical appliances, the fuse may blow off often, and it may be a nuisance for you to replace it frequently. To save yourself from this trouble, you can use the following overload indicator circuit with the supply

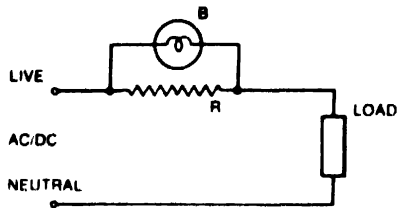


Fig. 1

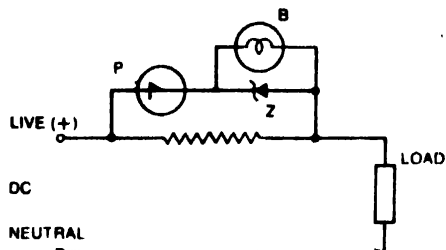


Fig. 2

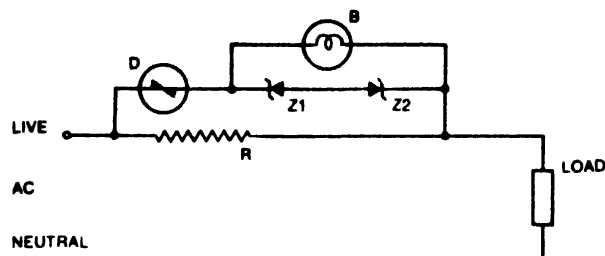


Fig. 3

this defect with the help of a pnpn diode to exclude mild glow at a low load current and a zener diode to protect the bulb, as shown in Fig. 2. For AC supply, it may be noted that the current flows through the bulb in this circuit through one half of each cycle. Hence, the value of the resistance may be doubled. However, it leads to a greater dissipation. Instead, a diac switch may be used in place of the pnpn diode and two zeners in series in place of one, as shown in Fig. 3.

—HIRANMAY GHOSE

PARTS LIST

- B — 3V, 500 mA torch bulb
- R — 0.8 ohm, 20W resistor (see text)
- D — 3V, 500mA diac switch for AC
- P — 3V, 500mA pnpn diode for DC
- Z1, Z2 — 3V zener diode for AC
- Z — 3V zener diode for DC
- Misc—Connecting wires, mounting board etc.

lines so that you may take preventive measures before the fuse blows off.

The basic circuit is shown in Fig. 1. All you have to do is to tap a small voltage from the supply line across a small resistance. The resistance should be so chosen that when the line current exceeds a certain value, the voltage drop across the resistance is sufficient to make the bulb glow brightly.

Usually, the household supply lines carry fuse wires of 5-amp rating which permit up to 1100-watt load at 220 volts (at unity power factor for AC). For a 3-volt torchbulb to glow at a current little less than 5 amp, the resistance should be 0.8 ohm with a dissipation capacity of 20 watts. A suitable length of a rejected heatercoil (about 3 cm), if you have any at your disposal, may be used as the resistance. The exact length may be easily found experimentally. The circuit is suitable for both AC and DC.

It may be noted that the bulb in this circuit starts glowing from a low value of the load current (about 2 amps) and glows brighter and brighter with increasing load current. It may be difficult to distinguish between a harmless mild glow and a bright glow denoting overload. Besides, there is risk of damage to the bulb in case of accidental short circuit or sudden heavy overload.

The circuit for the overload indicator may be freed from

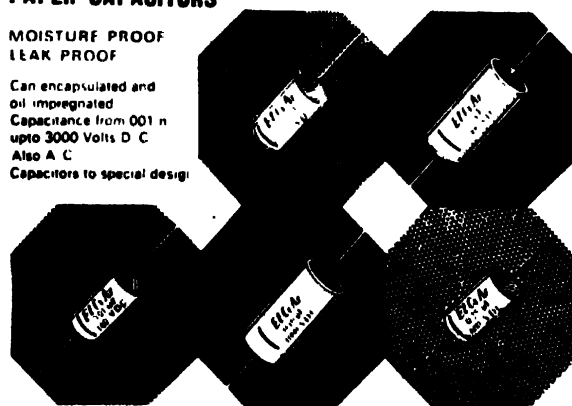
SMALL IN SIZE

BIG IN PERFORMANCE

El-Ci-Ar
PAPER CAPACITORS

MOISTURE PROOF
LEAK PROOF

Can encapsulated and
oil impregnated
Capacitance from 001 n
upto 3000 Volts D C
Also A C
Capacitors to special design



Sole Agents



NEUTRONIKS PRIVATE LIMITED

BOMBAY-400 001

PHONE: 273718 273771

DISTRIBUTORS:

PRECIOUS ELECTRONICS CORPORATION

● 3, Chingam Lane Lamington Road, BOMBAY 400 007
Phone: 267469. Gram DEEPTILAMP

● 8, Athipattan Street, Mount Road, MADRAS-600 002
Phone: 66672