Christmas Lights Dimmer and Life Extender

MY SOLUTION to the perennial problem of extending the life of Christmas Lights is shown in Fig. 2. It is based on a standard diac/triac dimmer configuration which has been optimised for this application. Cheap dimmers omit R3, R4 and C2 which is why they have the irritating habit of not turning on until the control is half-way up, and then coming on comparatively brightly.

The values of resistors R1 and R5 were found empirically, and also determined the value I eventually selected for control potentiomer VR1. Resistor R2 is however optional and was only included to help discharge the capacitors quickly.

All capacitors are 250V a.c. X2 rated ***(this is very important),*** all resistors are 500V working voltage, and the triac CSR1 was chosen for its low holding current so that it would function with small loads. Note that VR1 is fitted with a double-pole mains switch for complete isolation.

Even with only one 20-lamp string plugged in (22 watts) control is very smooth with barely any trace of hysteresis. It can be built safely on a piece of matrix board, wired point-to-point, provided it is mounted in a ***completely insulated plastic case*** and that no external components (i.e. S1 and VR1) are metal. *(Do not build this circuit if you do not understand the safety requirements – Ed.)*

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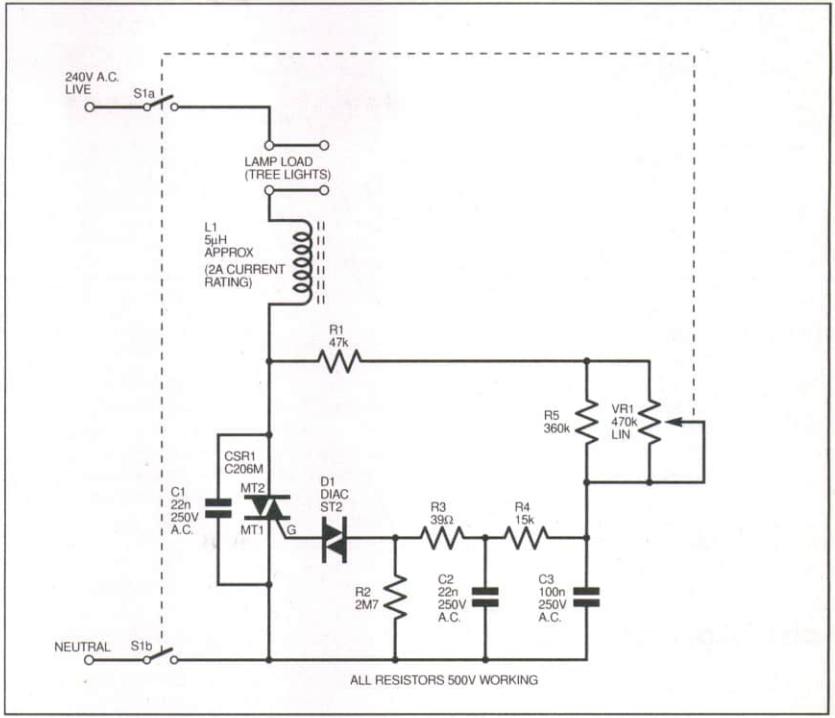

Fig. 2. Circuit diagram of the Christmas Lights Dimmer and Life Extender.