

# NEW IDEAS

## Outdoor light controller

MOST AUTOMATIC YARD LIGHTS ARE controlled using just a simple photocell. However, since the ambient light levels at dawn and dusk change rather slowly, that approach usually results in some flickering just before the light fully locks on or off, which can significantly shorten bulb life. That can be avoided by using the controller shown in Fig. 1. That circuit *snaps* the light on or off, depending on whether ambient light levels are rising or falling.

### How it works

The key to the circuit's operation is an optocoupler made up of a

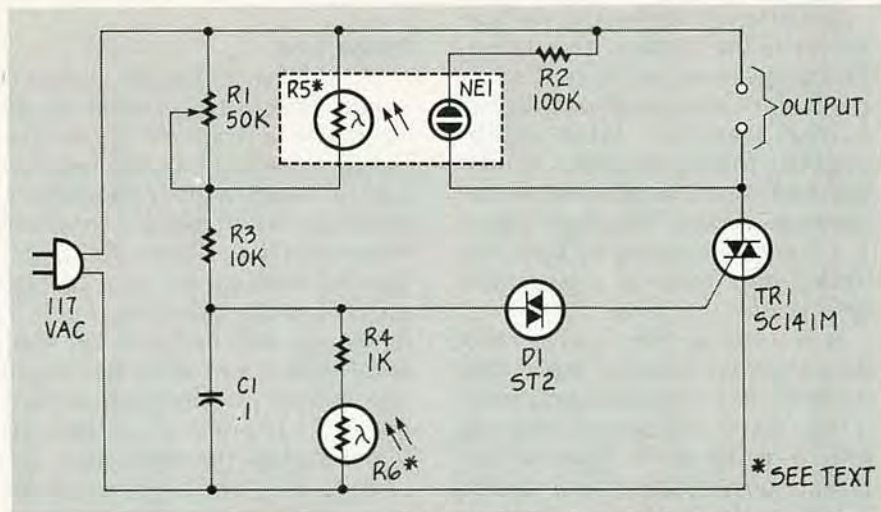


FIG. 1

neon bulb (NE2 type) and a CdS photocell whose resistance varies inversely with light from 10K to 100K; those components are enclosed in a light-tight housing. A Diac/Triac combination is used to provide the snap-switch effect. A second CdS photocell acts as the main sensor.

As evening approaches the resistance of R6 begins to increase. When it reaches a threshold level, which is set by adjusting R1, the Diac triggers the Triac and causes the neon bulb to light. Even a momentary flicker of the bulb is sufficient to reduce the resistance of R5, causing the Diac to trigger the Triac, which lights the neon bulb, and so on.

As morning approaches, the process is reversed. The resistance of R6 begins to decrease until it drops below the threshold level. That causes the Diac to cease triggering the Triac, which extinguishes the bulb, which causes the resistance of R5 to increase, and so on.

Most of the components can be mounted on a piece of perforated

construction board and placed within a small experimenters box. Parts placement is not at all critical. All resistors, except the potentiometer and the photocells are 1/2-watt units. Once the threshold level for the circuit has been established, the potentiometer can be replaced by a fixed resistor of the appropriate value. Before mounting R5 and NE1, place them in a light-tight enclosure. For my unit, the two were simply wrapped together using some black electrical tape.

Mount R6 so that it can be illuminated by the ambient light. However, take care to shield it from any artificial lighting. In my installation, the unit was mounted inside the lamp post, with the sensor looking out through a conveniently placed plastic lens.

To set up the unit, simply adjust the setting of R1 at dusk until the Triac is triggered. Remember that you are working with line voltages in this circuit, so take the appropriate precautions to protect yourself and others from potentially dangerous shocks.—*E.J. Holtke*