

Solid-State Night Light

If you still have little tykes living at home that don't like to sleep without having a light on, take a gander at the unusual *Solid-State Night Light* circuit shown in Fig. 2. The Solid-State Night Light doesn't put out a blinding beam, but it does emit enough light to chase away the "bosogy-man."

To keep the kids interested and to add that special touch, the LEDs can be of different colors and arranged in some special design. Also additional LED strings can be added in parallel with the one shown, as indicated by the second string of LEDs connected to the circuit by a dashed line, to form circles, spirals, stars, etc.

The circuit's operation is very simple. Power for the circuit is provided by a 12-volt transformer, T1. The AC output of the transformer is rectified by D1 and the SCR to supply DC to the LEDs and the control circuitry. A light-dependent resistor, R5, in conjunction with transistor Q1 (which is in series with the gate of SCR1) is used to control the operation of the circuit. Resistor R1 sets the turn on/off sensitivity to the ambient-light level.

Ambient light striking R5 causes its resistance to be low, allowing current to pass through D1 and R5 to the base of Q1, biasing it on. With Q1 conducting, current through R2 is shunted (away from the gate of SCR1) to ground. That keeps SCR1 turned off. But as the ambient light decreases below the sensitivity setting, R5's resistance increases, delivering less and less base bias to Q1, until that transistor eventually turns off. With Q1 turned off, current through R2 biases SCR1 on, supplying power to the LEDs. The Night Light remains on until the sun comes up, or another light is turned on.

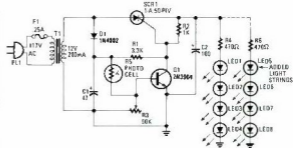


Fig. 2—Power for the Solid-State Night Light circuit is derived from a 12-volt transformer, with its output rectified by D1 and SCR1.

PARTS LIST FOR THE SOLID-STATE NIGHT LIGHT

- Q1—2N3904 general-purpose NPN transistor
- D1—1N4002 100-PIV, 1-A silicon rectifier diode
- LED1-LED4—Light-emitting diode
- R1—33,000-ohm, ¼-watt, 5% resistor
- R2—1000-ohm, ¼-watt, 5% resistor
- R3—50,000-ohm potentiometer
- R4—470-ohm, ¼-watt, 5% resistor
- R5—Light-dependent resistor
- C1—47-µF, 25-WVDC electrolytic capacitor
- C2—100-µF, 25-WVDC electrolytic capacitor
- T1—117-volt primary, 12-volt, 200-mA secondary step-down transformer
- F1—0.25-A 3AG fuse
- PL1—117-VAC molded plug and line cord

Printed circuit or perfboard materials, enclosure, IC sockets, wire, solder, hardware, etc.