BUILD AN

AC Power Line Monitor

Don't risk losses due to power outages

BY GARY McCLELLAN

IN THESE times of fuel shortages and increasing electric power demands, power outages have become common occurrences. At the very least, an outage can be a nuisance. The outage becomes serious when it lasts several hours and you have a freezer full of food. To play it safe, you should equip your home with an ac line monitor that will alert you in the event of an outage so that you can take corrective measures.

An ac power line monitor need not be expensive. The one shown schematically below will cost about $8 for all new parts. Once assembled, it will monitor your power line on a continuous 24-hour basis, remaining passive until an outage occurs. Then when power is interrupted, a loud buzzer sounds and a panel light comes on. The panel lamp serves as an alert system for those times when power is interrupted and you are away from home. Even if power is restored before you return home, the lamp remains on until the system is manually reset.

The circuit consists of three basic parts. Its power supply is comprised of *T1, D1, C1,* and *R1.* This is followed by controlling relay *K1.* Finally, there is a dual alarm system, with the buzzer independently powered by *B1* providing an audible alarm and *I1* providing a visual alarm in the event power was interrupted and restored.

In operation, the incoming ac is rectified by *D1* and dropped to about 75 volts by *R1.* Capacitor *C1* filters the rectified ac to prevent relay chatter and provides about 5 seconds of delay after power goes off, thus preventing false alarms.

When the line cord is first plugged into an ac receptacle, *K1* does not immediately energize. Instead, *I1* lights up. For *K1* to energize, *S1* must be momentarily depressed to bypass the *I1* circuit. Once *S1* is depressed and returned to its operating position, *K1* will remain energized for as long as ac power is supplied to the circuit.

Now, if power is interrupted for longer than 5 seconds, *K1* deenergizes, making its upper contacts. This completes the B1/buzzer circuit and sounds the audible alarm. The buzzer will continue to sound until *S1* is set to RESET or the battery runs down.

In the event that power is restored, *I1* comes on and remains on until *S1* is set to its RESET position, at which time the relay pulls in and *I1* extinguishes.

There is nothing critical about assembling the alarm system. If you build it into a metal utility box, make certain that no ac portion of the circuit contacts the box itself.

Periodically check out the condition of *B1* to make sure it is capable of sounding the buzzer. To do this, simply unplug and reinsert the line cord in an ac outlet. If the buzzer does not sound or puts out a weak buzz, replace the battery. If you wish, you can substitute a nickel-cadmium battery for *B1* and periodically recharge it. This way you will not have to worry about running out of batteries on a weekend. ◈