HOBBY CORNER

Battery backup for digital clocks

EARL "DOC" SAVAGE, K4SDS, HOBBY EDITOR

A while back, L. V. Clifford asked for some help in making a back-up, short-term, power supply for his AC-operated digital clock (see the May, 1982 issue of **Radio-Electronics**). He wanted to avoid the problem of having to reset his clock when the AC power just flickers.

Many readers advised putting a larger-valued capacitor on the low-voltage power-supply line. The larger value will maintain the voltage a bit longer when the AC fails.

Budd Webb (Santa Maria, CA), and others, suggested the approach shown in Fig. 1. It uses a battery and diode to keep the clock running if the AC power should fail. If the battery voltage is just a bit lower than the clock's operating voltage (as it should be under normal conditions), the battery is, in effect, disconnected from the circuit. When the AC power fails, the clock's operating voltage drops below the battery's voltage. Thus, the bias on the diode is reversed and power is supplied to the clock. Battery life should equal its shelf life unless it is called upon to run the clock frequently.

Wayne Ingram of Marietta, GA was the first of several who suggested an improvement on that circuit. As shown in Fig. 2, a second diode is added so that the battery power is not "wasted" in running anything but the clock module itself. Note
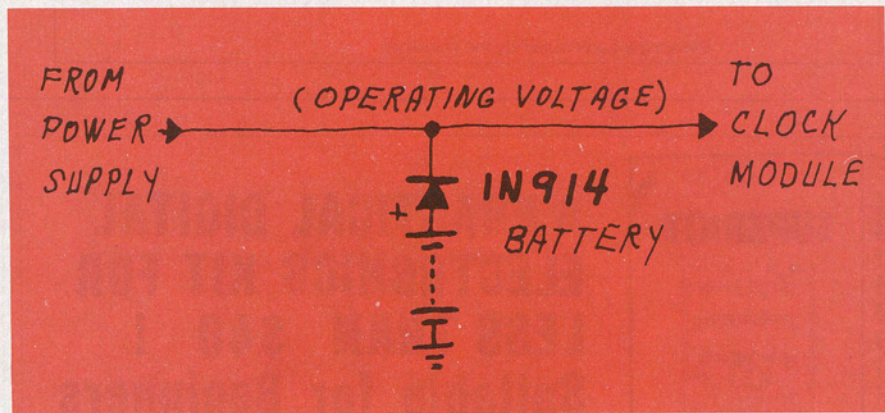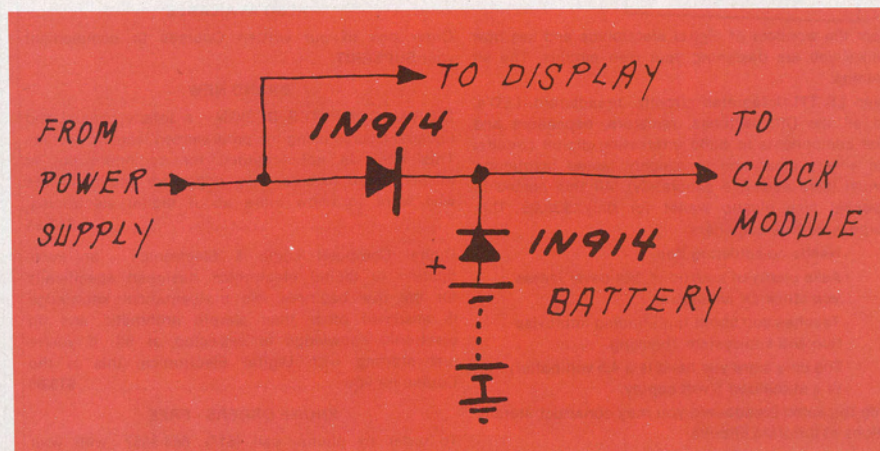

FIG. 1

FIG. 2

that the power for the display, which requires much more current than the module, is taken off the line ahead of the second diode. The clock module runs on battery power but you cannot read the time because that second diode keeps the display off.

Other readers sent more complex circuits that also provide a 60-Hz pulse in case the clock depends on the AC line for timing pulses. Robert Otis (Cincinnati, OH) sent one using a 555 oscillator and William Otto, Jr. (Jupiter, FL) uses the gates of a CD4001 to form an oscillator. If there is space later, I'll pass along those circuits.

Thanks to those readers, and all the rest of you that responded to L.V.'s call for help. I hope you will continue to be as cooperative in the future.   **R-E**