

BURGLAR-ALARM UPGRADE

I was pleasantly surprised to see my burglar alarm mentioned in your column. I designed it to work in my old apartment; I have moved now and brought the alarm with me. It has been ganged together with two more circuits of newer design. The three circuits form a modular security system, with each responsible for a particular zone. I have included a drawing of the new version (Fig. 8). It has the same features as the

older one, but the design is "cleaner" and the parts are easier to find.

The alarm sensors should be the normally-closed types, connected in series to the terminals labeled LOOP. With switch S1 closed, the alarm is disabled. The low that the switch provides to pin 13 on U1 keeps pin 11 high. Diode D1 passes current to C2, keeping it charged. That applies a high to the inputs of a NAND gate connected as an inverter. The low output of the NAND-gate inverter cuts Q1

compares the inputs at pins 1 and 2; if pin 2 is high (*i.e.* S1 is closed) the buzzer, BZ1, and LED1 remain off, but if the input at pin 2 is low (*i.e.* the door is opened) U2's output goes high, it sets the R-S latch, the buzzer sounds, and the LED glows. To reset the circuit, momentarily close switch S2.

The circuit has an interesting advantage: since it is wired for normally-closed operation, you need not protect the sensor wires by running them through a conduit. If a thief tries to break the wire the alarm will sound. However, the circuit and wires should be hidden or camouflaged to provide the element of surprise.

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As a matter of personal preference, I would still place the wires in a protective conduit. It's all too easy for a smart, skilled burglar to short the sensor wires, completing the circuit before opening the door. They've been known to use a razor (like the kind used to cut carpet) to cut out a section of luan doors to allow them to disable interior sensors. There's nothing to keep them from doing the same thing with a window, provided they have a glass cutter.