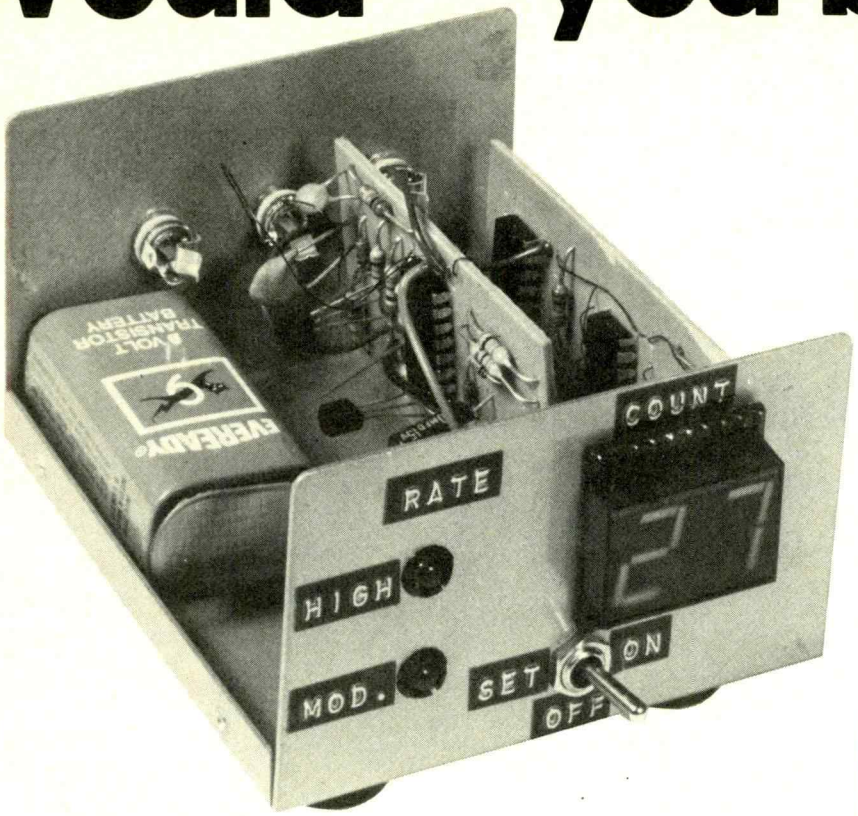
Would you believe

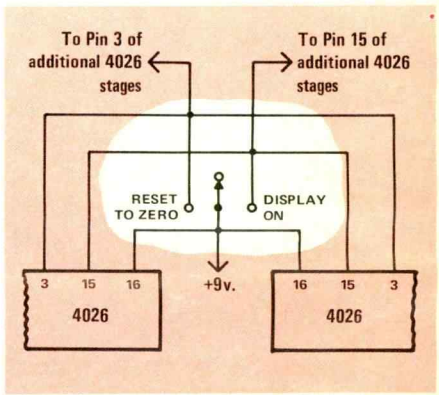


Have you ever awakened on a bright, sunny morning wondering if it had rained during the night? Was the rainfall light, moderate, or heavy? Had more rain fallen than during a downpour a week before? Here's a low-cost weekend project that lets you know if it rained, relatively how much rain fell, and at what rate.

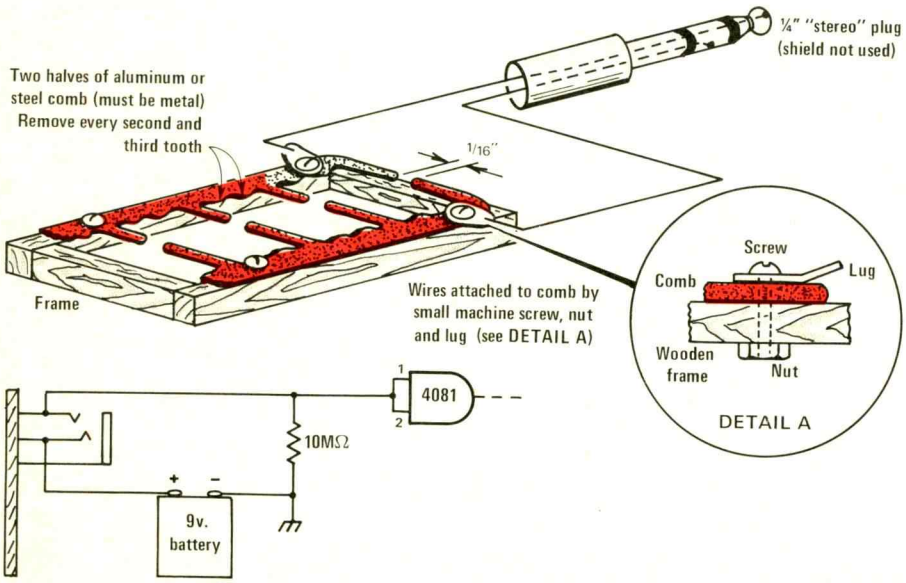
The circuit consists of a raindrop detector probe, an audio alarm circuit, two rate detectors, and a digital counter. The raindrop detector, which is fashioned from a metal comb, can be located anywhere. The rest of the circuit is contained in a small box that can be left on your bookcase, end table, or desk. The box used here is a Radio Shack two-piece cabinet 270-251, but any box will do.

All electronics are contained on two printed circuit boards mounted in the box. If you chose a larger cabinet, you can combine the two boards into one larger board. If you're not yet into making your own printed circuit boards, you can use perfboard and push-in terminals, such as Radio Shack 276-1394/5/6 and 270-1392.

The raindrop detector probe is a specialized version of the touchplate described in Clinic circuits in this issue. Instead of bridging a gap with a finger, the gap is bridged by the falling raindrop. Each time a raindrop strikes one of the gaps on the probe, a specially shaped pulse is generated in the counter circuitry. This pulse is fed into a pair of rate detectors, each preset to start at moderate and high rates by built-in variable resistors.



You can use separate display *on* and *reset* switches, as shown in the projct diagram, or a single pole, *center off*, double throw switch as shown above.



The raindrop detector probe is made from a metal comb fastened to a wooden frame with machine screws and nuts. Connections to the probe is made by wires soldered to lugs, as shown. The probe can be wired directly to the electronics box, or you can use a three-circuit stereo plug and jack.

Measure the rate

If the rate at which raindrops strike the gaps in the detector probe is relatively low—less than the preset levels—neither LED lights. When the rate increases beyond the lower preset level, the first LED lights indicating a moderate rate of rainfall. When the rate increases beyond the second preset level, both LEDs light, indicating a relatively heavy rainfall.

The rate detectors are equipped with *latch* switches. When these switches are

a raindrop counter?

by Jeffrey A. Sandler
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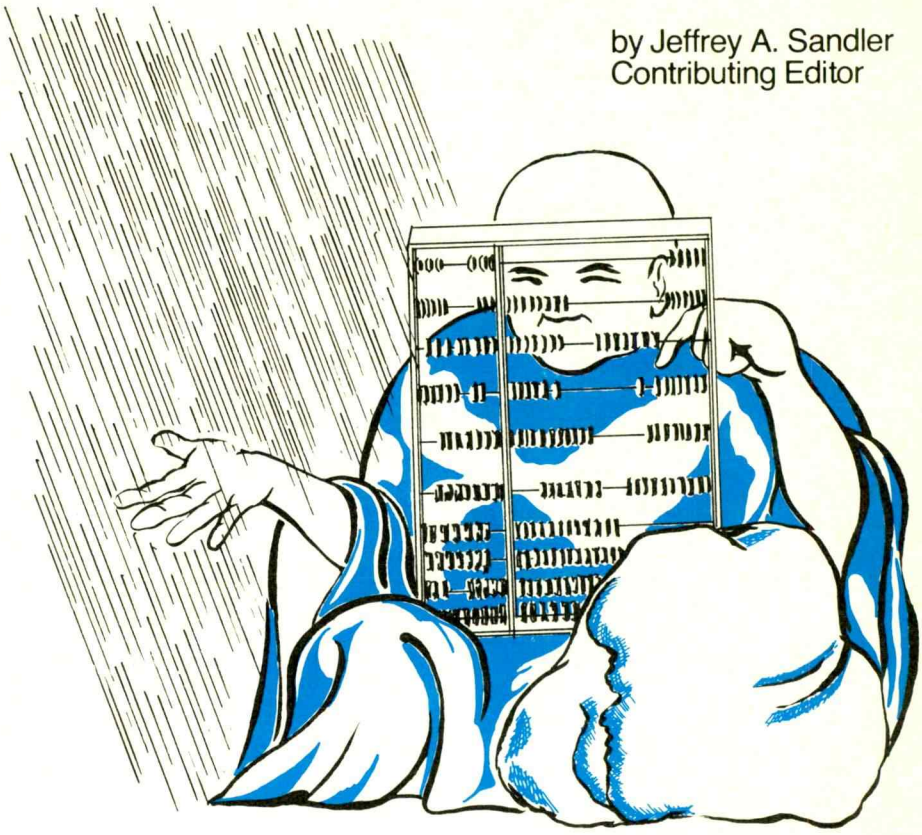


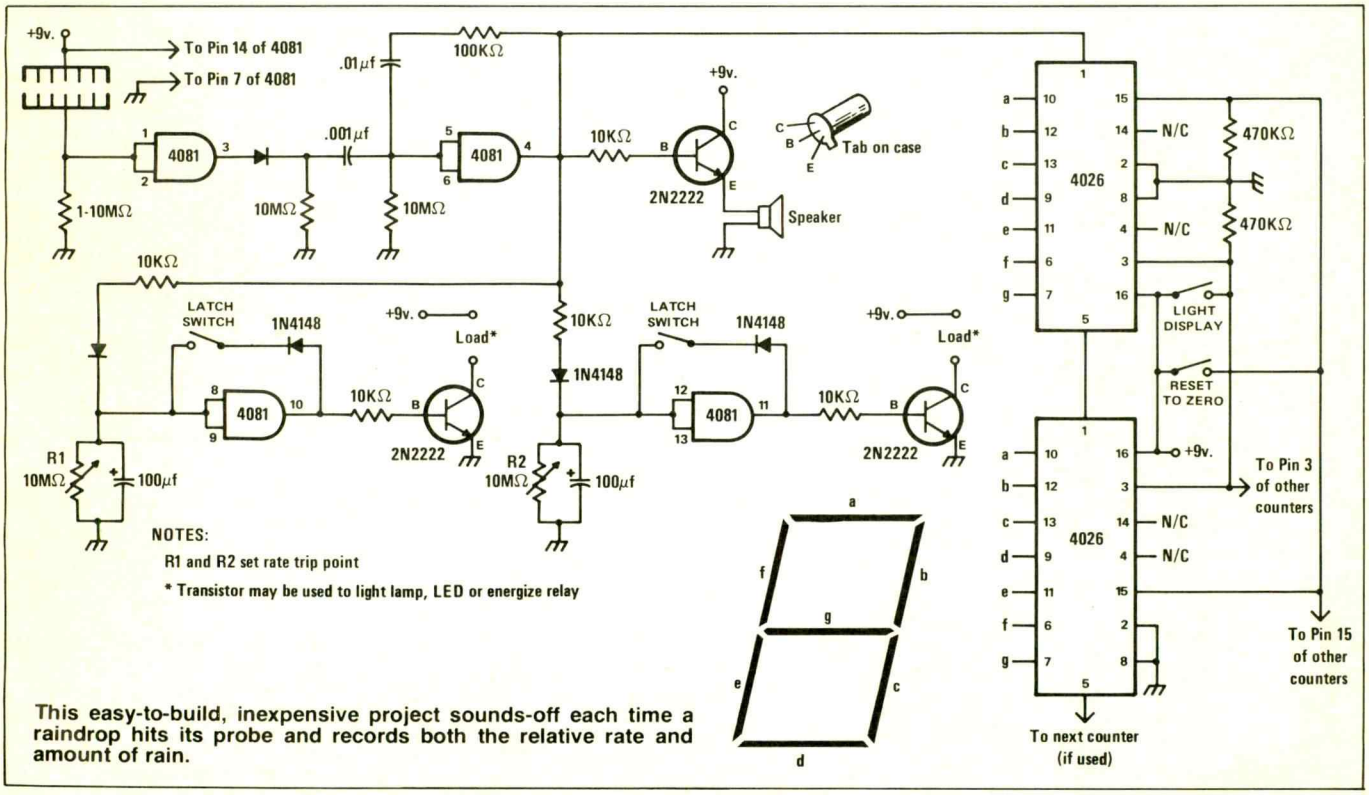
closed, the LEDs stay on until the switches are opened. So, the unit can be used to record rainfall rates during the night, or during periods when you're out of town. However, if the switches are left open, the LEDs provide an instantaneous indication of relative rainfall rates.

Counting the drops

The actual number of raindrops striking the gaps on the detector probe is provided by a two-digit counter and LED readout. You can expand the counter to as many digits as you wish by adding additional IC counters and LED readouts.

The counters used in this version of the unit are 4026 CMOS ICs, which directly drive most 0.1 and 0.2-inch displays, and even a few larger displays. However, if you'd like to use very large displays, you'll have to add transistor drivers between the 4026 and the LED readouts. 2N2222 work well.

In addition to providing a visual display, your raindrop counter also provides a click sound each time a raindrop strikes the gaps in the detector probe—much like the sound made by a Geiger counter. The speaker can be mounted in the same cabinet as the electronics, or at some other convenient location. In this version, the speaker is remote and connected to the electronics by a cable using a miniature phone connector (Radio Shack 274-286).



This easy-to-build, inexpensive project sounds-off each time a raindrop hits its probe and records both the relative rate and amount of rain.