

# NEW IDEAS

## Air-motion detector

A WIND DETECTOR AND INDICATOR could be put to good use by many hobbyists. For example, those with radio-controlled model boats or planes could use such a device to help make go/no-go flight decisions; a ham radio operator could use one to warn him that his antenna system was in danger of crashing down around him; a kite flyer could use such an indicator to announce good kite-flying days. I'm sure that by the time you have read this far, you've already come up with your own application for a wind sensor.

The sensing circuit can be built to detect either steady or fluctuating air flows. The heart of the circuit (shown in Fig. 1) is a Radio Shack piezo buzzer (part number 273-060) and an LM324 quad op-amp. Note that the red wire from the piezo element should be connected to capacitor C1, and the black wire to ground.

When a current of air hits the piezo element, a small signal is generated and is fed through C1 and R1 to the inverting input (pin 2) of one section of the LM324. That causes the output (pin 1) to go high. Resistor R3 is used to adjust the sensitivity of the detector. The circuit can be made sensitive enough to detect the wave of a hand or the sensitivity can be set so

low that blowing on the element as hard as you can will produce no output. Resistor R2 is used to adjust the level of the output voltage at pin 1.

The detector circuit can be used in various control applications. For example, an SCR can be used to control 117-volt AC loads as shown in Fig. 2-a. Also, an NPN transistor, such as a TIP29, can be used to control loads as shown in Fig. 2-b. I have driven such loads as incandescent lamps, solenoids, and relays with the setups shown.

The control circuits discussed above work well when there is a constant air flow. However, in situations where the air flow fluctuates—because the output will fluctuate with the wind source—a latch-type circuit may be necessary. One such circuit is shown in Fig. 3. The fluctuating output of the NPN transistor activates the 555 timer, and allows the load to be driven for a certain length of time—as determined by the setting of potentiometer R2—without an input.

There are a great number of possible applications for the air detector circuit and it also makes a great building block for more complex circuits. For example, a solid-state weather vane could be con-

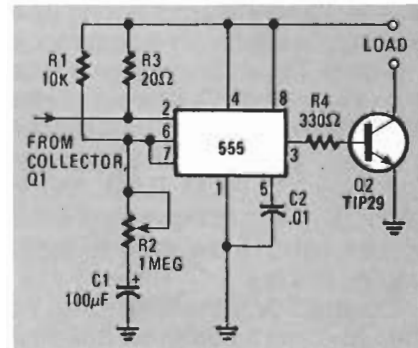


FIG. 3

structed using a group of sensors—each facing a different direction—to turn on direction-indicating lights or LED's. A digital wind-speed indicator could also be built.—Chris Mabry

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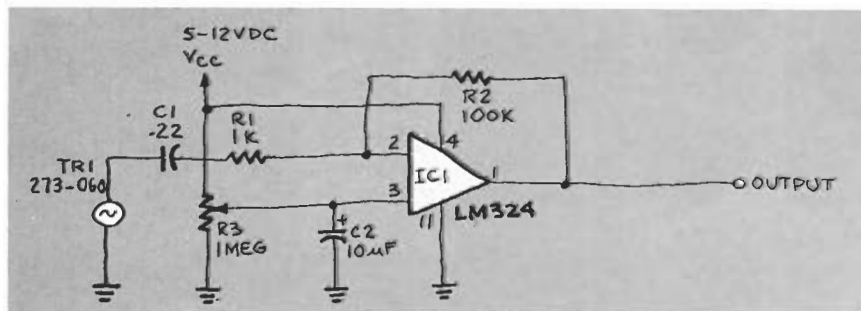


FIG. 1

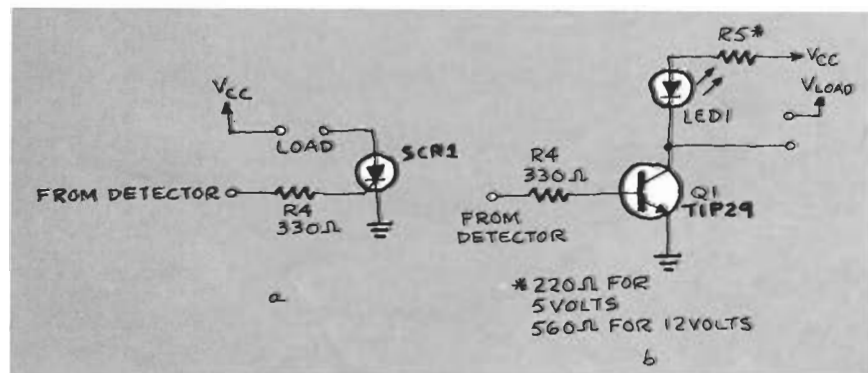


FIG. 2