

## Pulsating doorbell

CONVENTIONAL DOORBELLS CAN often fail to get your attention. That can happen when you are in a remote part of your house, such as your basement or attic, or when there are other loud noises, such as when you are working with power tools. While it is possible to replace your doorbell with a loud, pulsating buzzer, such buzzers will pulsate only as long as the doorbell button is pressed. In addition, they can be rather expensive. However, as we'll see, there is a better solution.

Figure 1 shows a simple doorbell circuit that, when activated, will emit a loud, pulsating sound. The circuit is easy to build and uses readily available parts. Unlike other doorbells, this one will continue to sound for about 1½ minutes before it automatically turns off. An additional feature of the circuit is that it will automatically shut off if the door is opened before the 1½ minutes is up.

### How it works

The operation of the circuit is centered around transistor Q1 (a 2N3819 general-purpose FET) and IC1 (a 555 timer configured as an astable multivibrator). The door-

bell circuit is powered by two power supplies, 12- and 18-volts DC, made from several batteries. If you don't like the idea of using batteries, you can, of course, use a DC power supply.

Capacitor C1 determines the on-time for the buzzer, while D1 provides a discharge path for that capacitor. When S1 (the doorbell button) is closed, C1 charges to the supply rail and a voltage is applied to the gate of transistor Q1, turning it on. Turning on Q1 provides a ground path for the rest of the circuit. With Q1 on, current flows and a trigger pulse is developed at the junction of C2 and R1. That trigger pulse is applied to pin 2 of IC1, causing it to begin the timing operation.

The output of IC1 (at pin 3) is used to turn relay RY2 on and off. Here, the output is used to sink current. When that output is low, current flows through the coil; when it is high, no current flows. As the output of the 555 is changing states rapidly, the relay contacts open and close repeatedly. The relay, of course, controls the sounding of the buzzer, so that it is continually being turned on and off, causing the pulsing effect.

When C1 has discharged (timed out), the gate voltage is removed and Q1 turns off, effectively opening the signal path and turning off the buzzer. But, as stated earlier, if the door is opened before that time, the buzzer automatically shuts off. That action is caused by S2. When the door is opened, S2 closes and shorts the charge on C1 to ground. That removes the Q1 gate-voltage and turns the transistor off, cutting off the path to ground. Switch S2 (Radio Shack 49-496, or equivalent) is a magnet-

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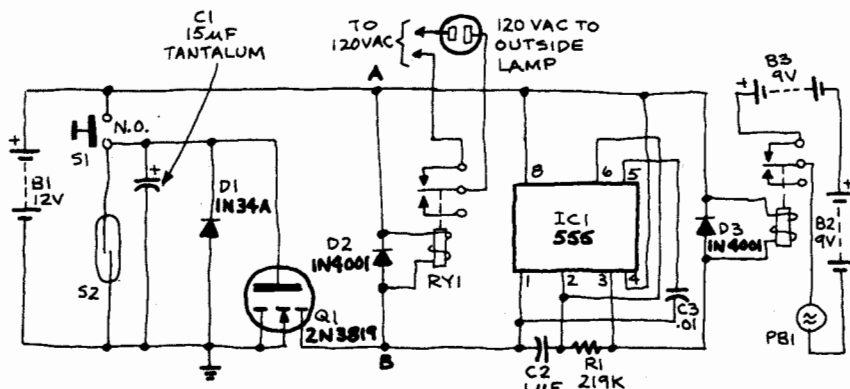


FIG. 1

### NEW IDEAS

This column is devoted to new ideas, circuits, device applications, construction techniques, helpful hints, etc.

All published entries, upon publication, will earn \$25. In addition, for U.S. residents only, Panavise will donate their model 333—The Rapid Assembly Circuit Board Holder, having a retail price of \$39.95. It features an eight-position rotating adjustment, indexing at 45-degree increments, and six positive lock positions in the vertical plane, giving you a full ten-inch height adjustment for comfortable working.

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## NEW IDEAS

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ic burglar-alarm type switch with normally open contacts (the type that's mounted recessed in the door frame).

Relay RY1 is optional; it's used to turn on an outside lamp so that you can see the person that's at the door.

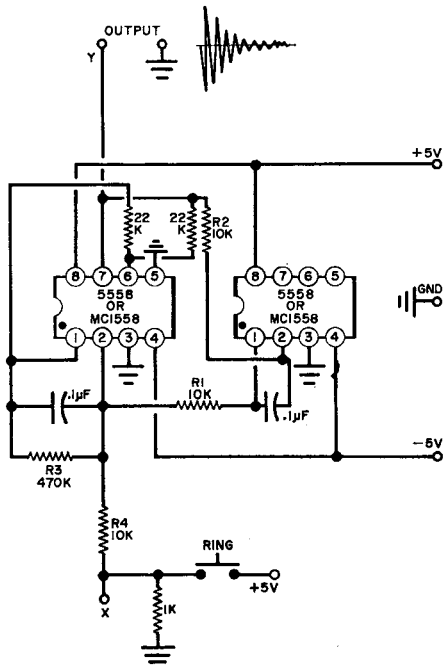
Relay RY1 is a SPDT 12-volt coil relay with 125-volt, 3-amp contacts (if you wish, Radio-Shack sells a *DPDT* relay, 275-206, that is rated appropriately and can be used here; with that relay, one set of contacts is simply not used) and RY2 is a mini SPDT relay with a 6-9-volt coil and contacts rated at 1-amp at 125 volts (Radio Shack 275-004). To make RY2 operate properly, it is necessary to strip off 4 or 5 turns of wire from the coil tension spring to increase its tension. Transistor Q1 and diode D1 are general-purpose devices. The buzzer is a 2-20-volt piezo type (Radio Shack 273-060).—*Fred Jellison, Jr.*

## AN ELECTRONIC BELL

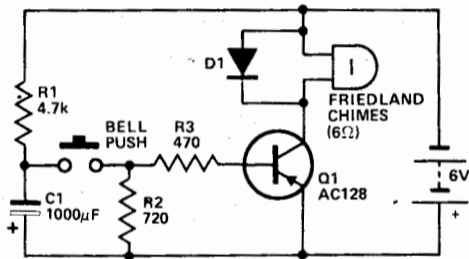
Traditional twin-T and bridged-T bell circuits suffer from stability problems and are difficult to design. Here we show a better way of doing things. Push the RING button and the bell sounds.

Coarse frequency is controlled by the capacitors which must be kept nearly identical to each other in value for best results. Fine tuning is accomplished with  $R1$  and  $R2$ . The decay time is controlled by  $R3$ .

This same circuit is useful as a high-Q filter. Send the signal in at point X and take it out at point Y. The response is bandpass, and the Q is controlled by  $R3$ . Gain is controlled by  $R4$ . Unlike practically all other active filters, none of the parameters in this circuit interact. The Q, frequency, and gain are pretty much independent of each other and are simple factors in the design.



## DOORCHIMES DELAY



will permit one operation every 10 seconds or so. Capacitor C1 charges through R1 when the button is released. Making R1 larger will increase the delay.

Ever get tired of people who repeatedly press your doorbell?

With values shown, this simple circuit

ETI DOORBELL

