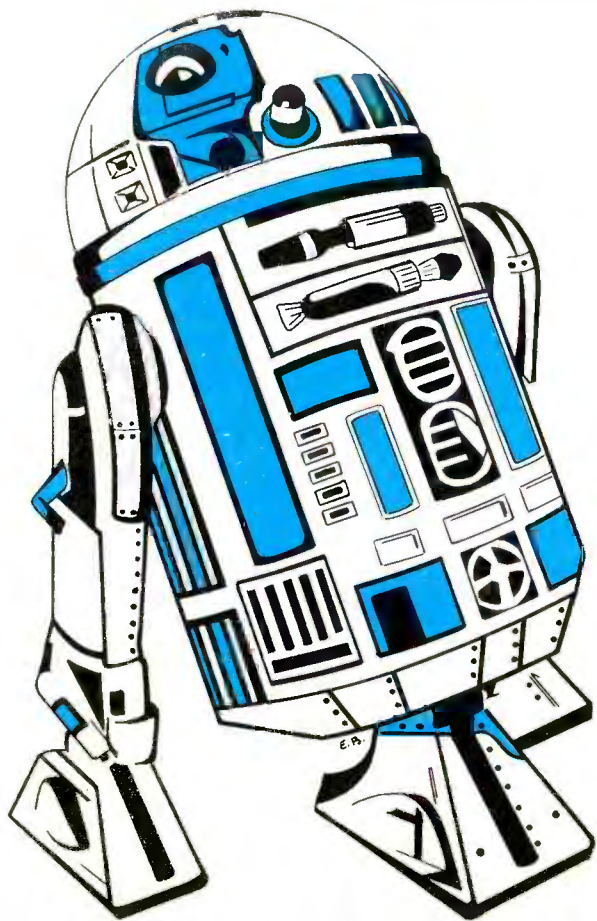# Make your own R2-D2 robot sound effects

by David L. Heiserman

Slowly the Imperial cruiser closed with the smaller ship, energy beams now scoring direct hits. Deep within the damaged vessel a golden hued human-like robot and his short, stubby cylindri-cal companion bounced from wall to wall.

"This is madness. This time we'll be destroyed for sure," See Threepio said slowly shaking his head.

"Beep chirp, beep beep whistle chirp beep," Artoo Detoo responded.

And so began what has become the most successful movie ever made, *Star Wars*. Although the story revolves around Luke Skywalker, Ben Kenobi, Han Solo, Princess Leia, and of course, Darth Vader, it is little Artoo Detoo who has captured the viewer's imagination.
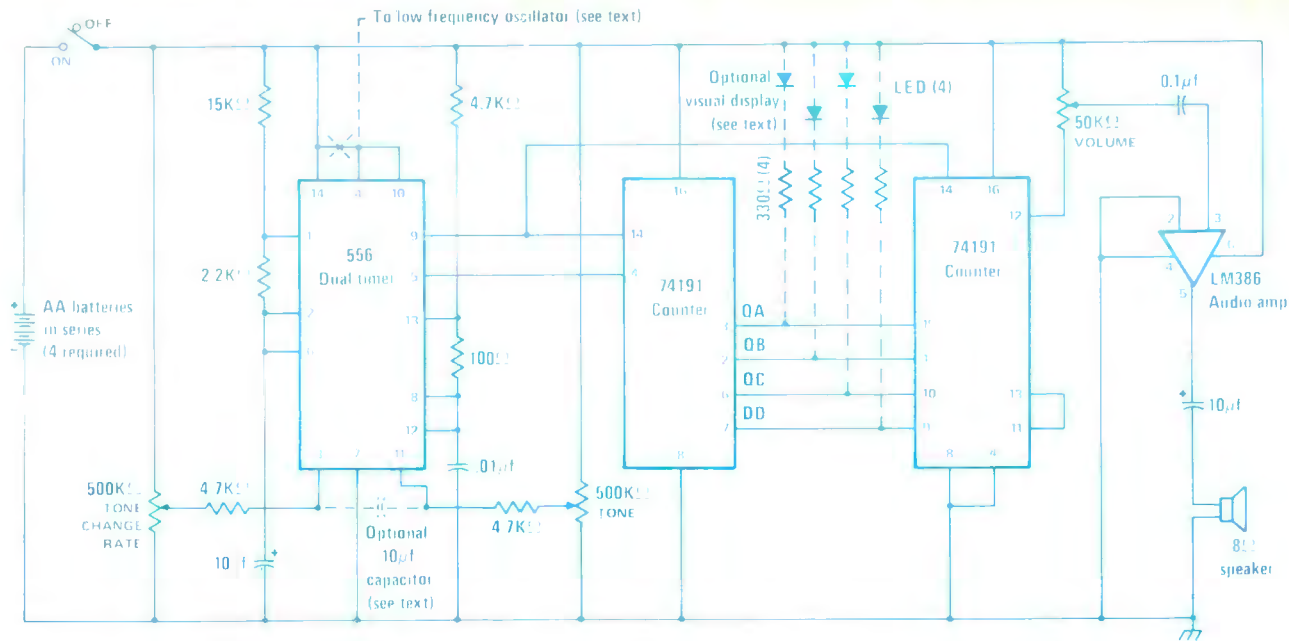
A large part of Artoo's charm is the delightful bleeping and chirping that makes up its vocabulary. Well, here's an inexpensive, easy-to-build beeper-chirper you can use to add life to your Artoo Detoo model, or your version of the *Modern Electronics* MEL robot. Its unique sound effect makes the beeper-chirper ideal for use in alarm systems too.

Beep beep

The ME Beeper-Chirper produces 16 different tones in either random or pro-grammed sequence. The entire circuit can be built on a small printed circuit board, or can be hand wired on per-forated board such as Radio Shack cata-log number 276-1395.

The beeper-chirper shown in this arti-cle produces an output during the period of time the on-off switch is held in the *on* position. But, if you're into cir-cuit design, you can also build it with a voice actuated switch and delay that gives you a response to your questions.

You also can customize your beeper-chirper to produce a series of rapid, high-pitched tones that gradually change to a lower pitch range, changing at a slower rate. This is done by connect-

ing a 10 uF capacitor between pins 3 and 11 of the 556 timer IC.

Customize your own

If you have a 555 timer IC handy, you can add an interesting babbling effect. Just build a very-low frequency oscillator around the 555, and connect the output to pins 4 and 10 of the 556 timer IC.

You also can add a striking visual effect by connecting an LED through a 330 resistor to each of the four Q outputs of the first 74191 counter IC. This will produce a four-LED display that twinkles in patterns that follow the sounds you're hearing.

Construction is straightforward; parts layout is not critical. You'd be wise, however, to breadboard your beeper-chirper before constructing the final unit. This will allow you to work out any

problems, and to experiment with custom modifications.

The circuit provided has both a variable tone and a variable rate control. If by chance you set the two controls so that the frequency and rate are directly related, you'll get a relatively short tone-change pattern that repeats itself over and over. All you have to do to correct this is change the setting of either control.