

FIG. 5—IN THIS PULSE-WIDTH MODULATOR CIRCUIT, R3 is used to vary the width of the output pulses, and hence the speed of the motor.

of this column, but use a 2.5-MHz crystal and increase C5 (for a starting point, use 330 pF) until you hear signals.

The BFO is a separate circuit. You can use the oscillator shown in Fig. 6; it originally appeared in *Popular Electronics*, May 1990. Note that it does not connect directly to the radio; instead, you place the coupling wire near or around the detector diode. Once you've tuned the BFO initially, you can probably fine-tune individual stations with the radio's tuning knob without making further adjustments to the BFO.

Clock Conversion

Q I would like to convert the electronic clock-timer of an oven to operate on 50-Hz power. It uses an HD 614042 IC. — R. N. L., Curacao, Netherlands Antilles

A We assume you've solved all the other voltage problems, so the clock is working correctly but running at $\frac{1}{2}$ of normal speed. We're not familiar with the HD 614042 chip, but if you can find out where it receives its 60-Hz input, perhaps you can build the oscillator in Fig. 4 and supply the 60-Hz signal from that rather than from the line.

Motor-Speed Control

Q I would like to install an electric drive on an adult tricycle for use in a retirement community, with a solid-state "chopper" speed control. I've been advised that such a controller might be constructed using the 555 timer in PWM mode. Can you help? — R. L., Kissimmee, FL

A A motor-speed control circuit that you can probably adapt for your purposes is shown in Fig. 5. In the prototype, we used an IRF510 and a small

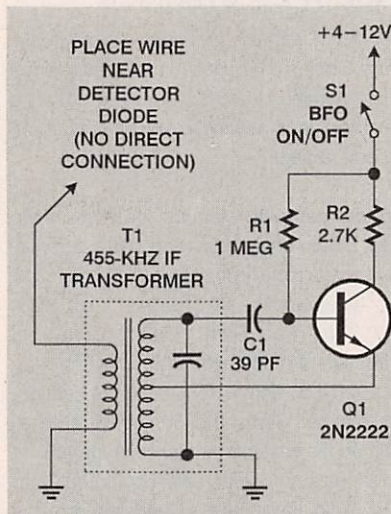


FIG. 6—YOU CAN ADD CW AND SSB reception to any radio with a 455-kHz IF using this simple BFO circuit.

tape-recorder motor; for your big motor, you'll want to use a number of MOSFETs in parallel. The 555 operates as a pulse-width modulator (PWM), producing a squarewave that is positive for an adjustable percentage of the time. Thus, the average voltage at the motor can be varied without wasting any energy in a rheostat.

Writing to Q&A

As always, we welcome your questions. Please write to Q&A, *Electronics Now Magazine*, 500 Bi-County Blvd., Farmingdale, NY 11735. The most interesting ones are answered in print. Please be sure to include plenty of background information (we'll shorten your letter for publication). If you are asking about a circuit, please include a complete diagram. Due to the volume of mail, we regret that we cannot give personal replies. **EN**