Q & A

READERS' QUESTIONS, EDITORS' ANSWERS

Regenerative Correction

Q *Regarding the regenerative AM radio in the July 1997 installment of "Q&A" (on page 8), shouldn't the transistor be an NPN? The diagram shows a PNP. Also, what gauge of wire should L1 be wound with, and what is the length? Would a 250-µH ferrite bar coil work? — Pete Haas, Kent, OH*

A You're right—the 2N3904 transistor is an NPN even though the PNP symbol appears in the diagram. (Your author does his own drafting and can't blame anybody else for this one.) The coil is not critical; we used 36 turns of No. 28 magnet wire close-wound on a 4-inch spool that had originally held gift-wrapping ribbon. Any high-Q coil of about 250 µH should work just as well.

Regenerative Troubleshooting

Q *I tried using an LM386 audio amplifier with the regenerative receiver presented in July, and it started "motorboating" and displayed all sorts of spurious oscillations. Could you provide a simple circuit to drive a speaker from the regenerative receiver by means of an LM386 or an MC34119P?*

And, if possible, I would like to see a schematic of a simple superregenerative receiver to receive aircraft frequencies (117–136 MHz). Thanks. — L. H., Canoga Park, CA

A Taking the easy question first, plans for a VHF superregenerative receiver are given in the *ARRL Handbook for Radio Amateurs, 1998 Edition*, together with an explanation of how it works and the special "ugly bug" construction technique required. You can get that book from the American Radio Relay League, Newington, CT 06111.

Now for the motorboating problem. As you've discovered, regenerative receivers are very sensitive to power-supply coupling. For best results, power the receiver from one battery and the audio amplifier from another. If that's not possible, you can try isolating the two circuits as shown in Fig. 1. There are two bypass capacitors on each side because large capacitors aren't efficient at high frequencies.

Also, the LM386 itself is prone to oscillation at radio frequencies, and the LM386 circuit that you sent in (shown in Fig. 2) looks like it has too much gain. Regenerative receivers themselves have tremendous gain and don't need much audio amplification after them. Try removing C2 and R2, and make sure C3, C4, C6, and R3 are as close to the chip as possible.

Because of its low-impedance input and bridged output, the MC34119P might be a better choice for this application. Figure 3 shows Motorola's recommended circuit. For best results, use a 32- or 64-ohm speaker.

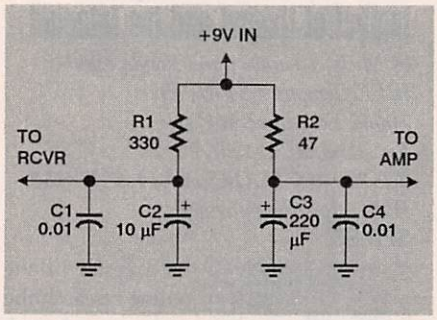

FIG. 1—HERE'S HOW TO POWER both your regenerative receiver and an audio amplifier from a single supply.

EPROMS Demystified

Q *I am new to electronics and would like to learn more about EPROMs and EEPROMs. Do they program through a language, or does the user have to plot the actual internal wiring? — G. G., Bradenton, FL*

A Let's distinguish three different devices: (1) ROMs (read-only memories); (2) microcontrollers, which are one-chip computers that include some form of ROM, together with CPU and input-output ports; and (3) programmable logic devices (PLDs), which are arrays of gates whose interconnections can be programmed by the user.

ROMs, or read-only memories, simply store information. A ROM chip has sixteen to twenty address inputs and eight data outputs. Information is repre-

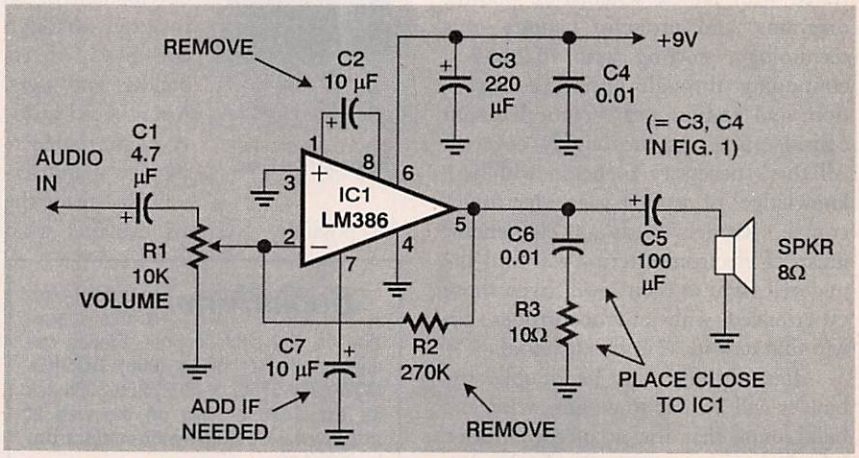

FIG. 2—FOR USE WITH A REGENERATIVE RECEIVER, the modifications shown to the reader's circuit will greatly improve stability.