

Q & A

READERS' QUESTIONS, EDITORS' ANSWERS

Blast From The Past

Q Around 1960-1962 your magazine, then called *Radio-Electronics*, had a column called "Noteworthy Circuits" in which a regenerative broadcast receiver was published. It worked surprisingly well, but I've lost track of it. Could you please print it again in "Q&A"? I'm sure others would be interested too. — R. G., Gig Harbor, WA

A You have a good memory—the receiver was in our January 1962 issue, which credited it to the British magazine *Wireless World*. Figure 1 here shows the circuit, slightly reworked to use currently available parts. You can connect high-impedance headphones in place of R3.

A regenerative receiver is an oscillator that is biased so that it doesn't quite oscillate. It then operates as an amplifier with tremendous gain at the frequency to which it is tuned, and good rejection of all other frequencies. It also clips in such a way as to demodulate AM signals. This was an old-fashioned circuit even in 1962, but it produces a remarkably sensitive and selective radio with just one transistor or tube.

Using R4, you adjust the bias so that the gain is high but the receiver doesn't oscillate; that adjustment has to be tweaked every time you tune in a station, since the best setting depends on the strength of the incoming signal. When we breadboarded it, we heard AM stations 1000 miles away using just a 4-foot antenna; local stations came in loud and clear with no antenna.

You'll note that C3 is a 365-pF tuning capacitor. Those are not quite as easy to find as they used to be, but you can salvage one from an old, non-working radio or order one from Antique Electronic Supply, 6221 S. Maple Ave., Tempe, AZ 85283 (Tel: 602-820-5411). You could also substitute a 125-pF capacitor from a newer transistor radio, but you'll need to wind twice as many turns on L1.

And if you like simple radios, take a

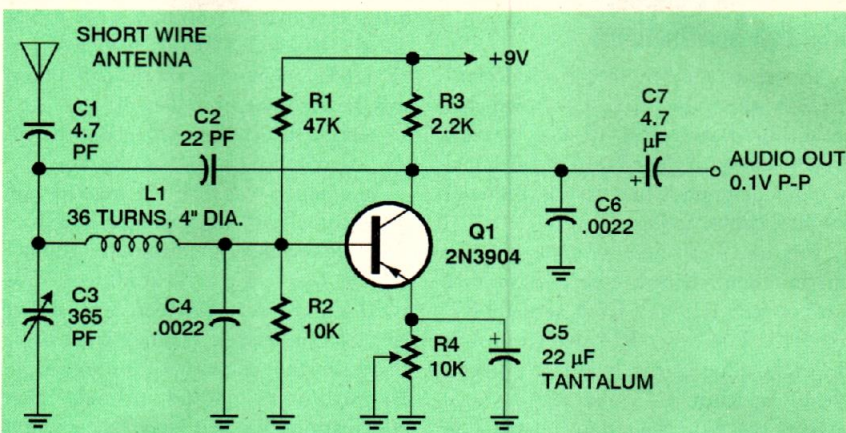


FIG. 1—AN OLD DESIGN THAT WORKS WELL, this regenerative AM receiver has been updated to use parts that are commonly available today.

look at our December 1995 column, which featured an 8-component TRF radio built with the Ferranti ZN414 IC.

Old Tube Needed

Q I have a Philco portable radio that needs a new 3LF4, 3LE4, or 3V4 tube. I have not been able to find one. Is it possible to make changes in the wiring to use some type of transistor? — J. C. J., Denver, CO

A You can get the 3LF4 and 3V4 from Antique Electronic Supply at the address given earlier in this column. It would be a pity to transistorize such an interesting and potentially valuable antique radio.

Audio Notch Filter

Q I want to design a transistorized version of the distortion meter in the Gernsback book *High Fidelity*, published in the 1960s. I need to know the design specifics of the bridged-T network used as a null audio filter. Can you help? — J. S., Lakewood, NJ

A To test an amplifier for distortion, you need a notch filter that eliminates one frequency from the signal. What

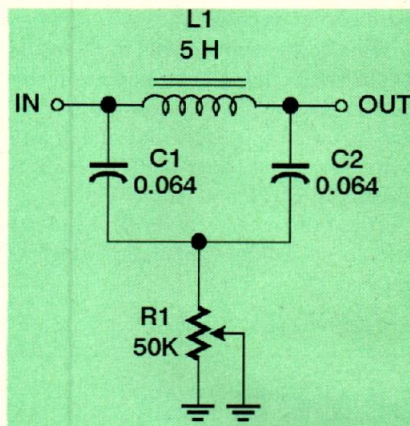


FIG. 2—AN OLD DESIGN THAT DOES NOT work well, coil L1 would be extremely hard to find these days, and the results produced by this circuit would not be worth the effort or the cost.

you do, then, is apply a pure sinewave to the input, measure the output level, and then insert the notch filter to eliminate the original sinewave. What's left is total harmonic distortion plus noise.

The circuit that you describe uses a bridged-T filter as shown in Fig. 2, with a special, high-Q, 5-henry choke. That choke was hard to find 30 years ago, and is probably completely unavailable now. If you can find one, it might cost \$50 or more. And even then, it won't give an