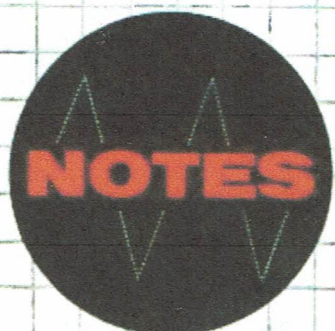




NOTES on test equipment

by Les Deane

informative reports from the lab

New Radio Troubleshooter

Keeping pace with the ever-expanding electronic servicing field, Hickok Electrical Instrument Co. of Cleveland has recently introduced a new bench instrument specifically for troubleshooting transistor radios. Doing one of the jobs it was designed for in Fig. 1, the Model 810 Transistor-Radio Tester is actually a signal generator, an AM receiver substitute, and a transistor checker all rolled into one neat package.

Applications of the tester are not necessarily limited to transistor radios, however, and it may also be used in servicing tube-type receivers as well as auto radios.

Specifications and features are:

1. Power Requirements—105/125 volts, 50/70 cps; power consumption approximately 25 watts.
2. RF Output—audio modulated or unmodulated frequency ranges of 200 to

600 kc and 500 to 1600 kc; output impedance 180 ohms.

3. Radio Substitute—tuned receiver covering an IF band of 500 to 1600 kc; and an RF band of 500 to 1600 kc; cathode-follower probe provided; input impedance 5 megohms shunted by approximately 4 mmf; sensitivity 200 uv.
4. Audio Output — 600-cycle sawtooth, variable from 0 to 2 volts p-p across 180-ohm load; modulation switch provided on panel.
5. Audio Substitute—AF amplifier with cathode-follower input and built-in speaker; input probe resistance 5 megohms.
6. Transistor Test — checks both p-n-p and n-p-n transistors for leakage and relative gain when used with low-range milliammeter.
7. Size and Weight—9" x 11¼" x 7", 11¼ lbs.

One can probably visualize many uses for the Model 810 from the specifications alone, but to really become acquainted with a new instrument of this type, you should

understand its operating principles. When I first examined this piece of equipment and took a look at the function selector, I immediately wanted to find out how it worked.

Although the tester is basically a service instrument for transistorized equipment, its circuitry employs four vacuum tubes — one 6AB4, two 6AU8's, and a 6X4 power rectifier. This complement represents six separate stages; however, certain stages are used for more than one application, depending on the setting of the function selector.

The function switch has six positions. In one, labeled 500-1600 KC REC., the instrument operates as a complete AM radio, covering the standard broadcast band and reproducing sound on a built-in 4" speaker. Stages involved in this arrangement are shown in the block diagram of Fig. 2A.

The input to this substitute receiver consists of a cathode-follower triode stage housed in a probe at the end of the input cable. The probe may be connected to the RF circuits of a radio under test or, with the use of a 3' length of wire, used as an antenna itself. A gain control is also found in the output of this first stage.

The two RF amplifiers (V2A and V3A) are plate-tuned over a range from 500 kc to 1600 kc by varying the tuning dial on the front panel. Since an intermediate frequency is not used, the circuit operates as a simple TRF receiver.

Audio detection is accomplished by a 1N34 crystal diode which, in turn, supplies a grid signal to the AF amplifier V3B. In the final stage, an attenuator control located on the front panel varies the output signal to the tester's built-in speaker. For this function, the modulation switch is placed in its off position, automatically connecting the speaker across the output circuit.

Turning the function switch to the position marked 200-600 KC REC., the instrument is again operated as a TRF receiver, except that the plate circuits of V2A and V3A (Fig. 2A) are tuned to a range covering the two common IF radio frequencies of 262 kc and 455 kc. Incidentally, with the tester operating in this manner, you can also pick up aircraft weather signals, which are transmitted in this frequency band.

Selecting another function of the

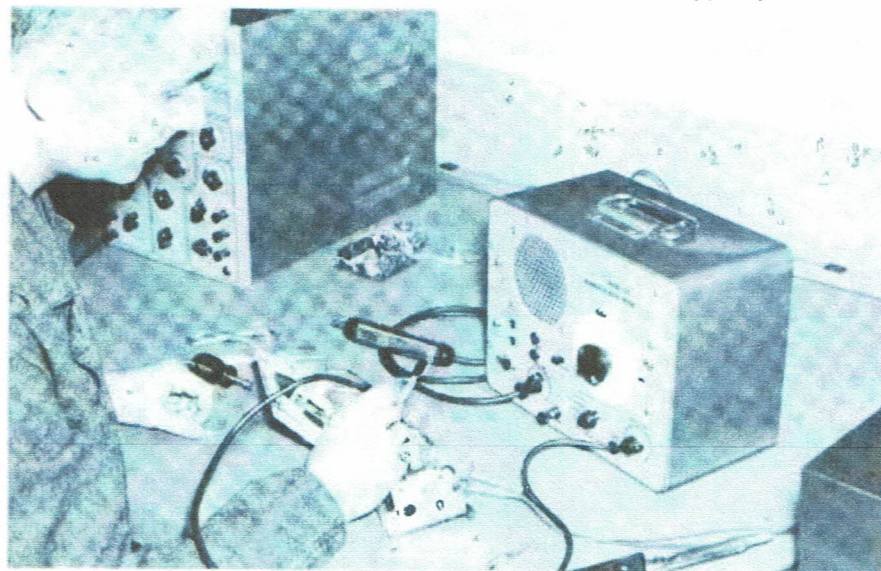


Fig. 1. Signal-tracing, substitution, and alignment of transistor radios is easy with Hickok's Model 810, which also features a test circuit for transistors.