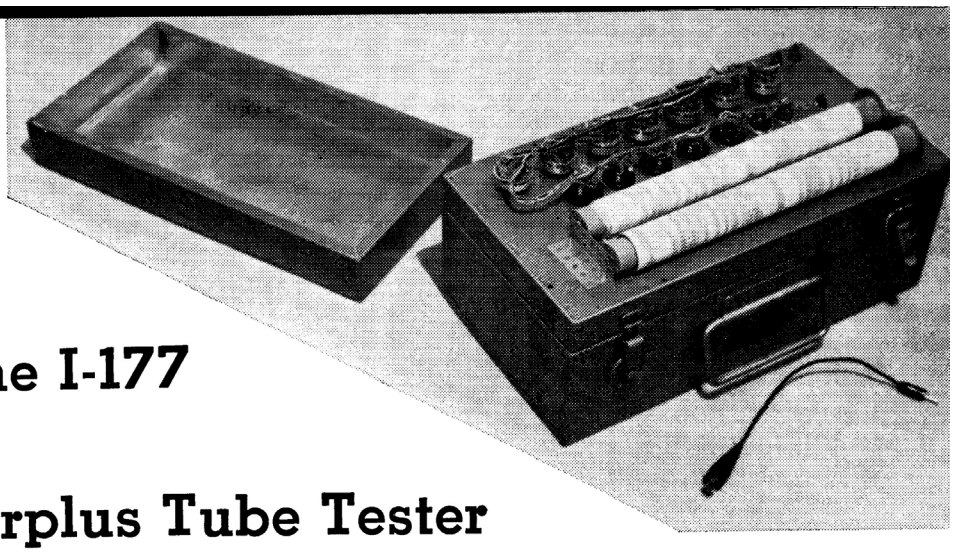

Updating the I-177

Surplus Tube Tester

A Modern Checker at Low Cost

BY W. T. BRADLEY,* K4YPY

It is estimated that about 40,000 of the I-177 tube testers were produced. Many of these were furnished to amateurs through MARS channels. If you have one of these units, or can locate one in surplus, the modification described here will provide an up-to-date tube tester at minimum cost.

THE I-177 (ABC) surplus tube tester is of the dynamic type, and one comparable on the market today will run from $200 up. Its drawback is that it will not handle tubes developed since the last World War (it doesn't even have a 9-pin socket); therefore, it is practically useless as it stands.

There have been several articles published describing an adapter that was issued by the armed forces to supplement the tester. These adapters will work, but it is necessary that you look up the circuit diagram of each new tube to be tested, set up the adapter connections to match the diagram, test a *new* tube to determine the settings of dials L and R for a good reading, then record these readings for future use. Over a period of time, a log of L and R settings for the more popular tubes will be developed. This is slow, expensive and tiresome, and we gave up after logging about a half dozen tubes.

Not wanting to discard this valuable tester, we began comparing circuit diagrams of modern dynamic testers with that of the I-177. Basically, they were about the same, so we decided to select a tube chart from a good tester and work backwards to adapt the I-177 to the chart.[1]

Most companies that manufacture tube testers sell adapters that will update any tube tester, but all of the old sockets will have to be added in updating the very obsolete I-177. These sockets can be added in a Minibox attached to the adapter and connected, pin for pin, to the sockets in the adapter. For those wishing to construct their own adapter, it can be built into the lid of the tube tester, as shown in the photos, or as a separate unit. There are about 2400 tubes listed on the tube chart roll selected. Our I-177 will now test all of these except those showing "press button B." There are very few such tubes listed, and we leave this problem with you.

This adapter for the I-177 tube tester is built into the cover of the unit. A new cover is made by cutting a standard 8 × 17 × 2-inch aluminum chassis down to a length of 15½ inches, and attaching it to the original cover with long bolts. The two rollers carry the new test chart.

Construction

1) Close the lid of the I-177 and mark holes as shown in Fig. 1A. Remove the lid from the tester, drill and punch all holes, and make the hacksaw cuts.

2) Mount all sockets. You may mount any sockets desired, keeping in mind that no socket on the original tester is to be used again.

3) By observation, make sure that the rotating arm of all seven switches (Fig. 2) rests beneath the common connection. (They usually come from the factory this way.) Mount all switches so that the common connection will be at 6 o'clock.

4) Mount the 6-pin tie point TB_1, Fig. 2.

5) With but two exceptions, connect all similarly-numbered switch terminals (see Fig. 2) and similarly-numbered tube-socket terminals (where such exist) together. In the first exception, the No. 12 terminal of S_6 is connected to Terminal 12 of the Compactron socket; no connection is made to any of the remaining No. 12 switch terminals. The second exception refers to the Nuvistor socket whose Terminal 10 connects to the No. 1 terminal line, and whose Terminal 12 connects to the No. 3 terminal line. Terminals 2, 4 and 8 of this socket connect to similarly-numbered lines. The banana jack, J_1, connects to the No. 10 terminal line.

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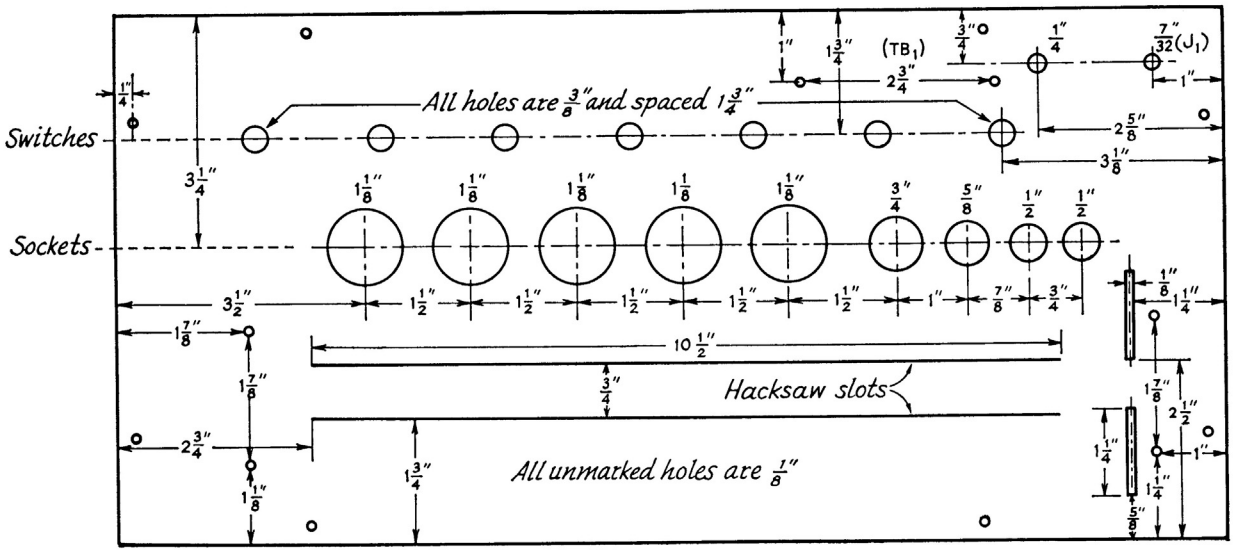
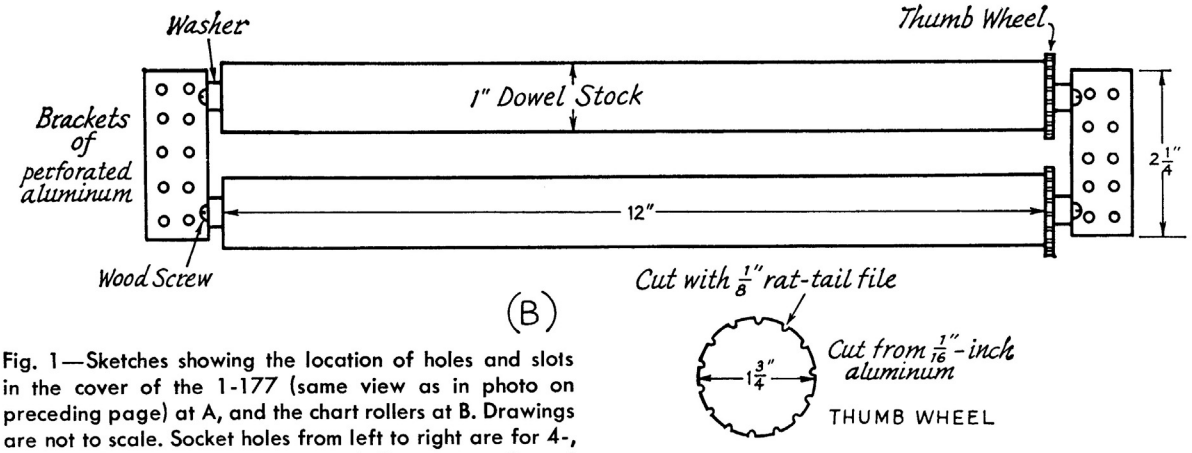
[1] The chart used is one supplied with the Hickok tester type 6005, and is obtainable from Hickok Electrical Instrument Co., 10514 DuPont Ave., Cleveland 8, Ohio, at a cost of $2.00 plus 15c postage.

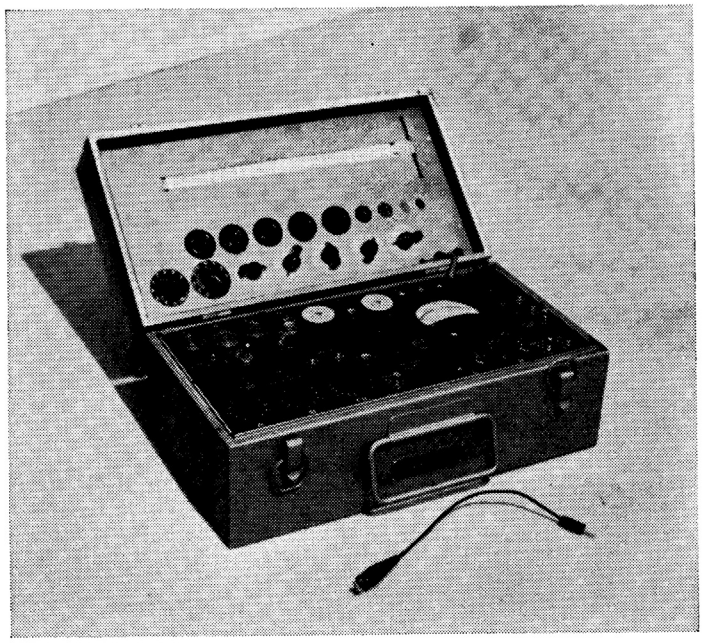


(A)



(B)

Fig. 1—Sketches showing the location of holes and slots in the cover of the 1-177 (same view as in photo on preceding page) at A, and the chart rollers at B. Drawings are not to scale. Socket holes from left to right are for 4-, 5-, 6- and 7-pin large sockets, octal, Compactron, 9- and 7-pin miniature, and Nuvistor sockets. Switches are mounted in the order shown in Fig. 3, with the orientation described in the text. The long hacksaw cuts are started by drilling a series of very small holes at one end filed into a slot.



The completed adapter for the 1-177 tube tester. The paper chart is fed through slots cut in the cover with a hacksaw. The plug-and-clip lead in the foreground is for use with tubes having cap connections.

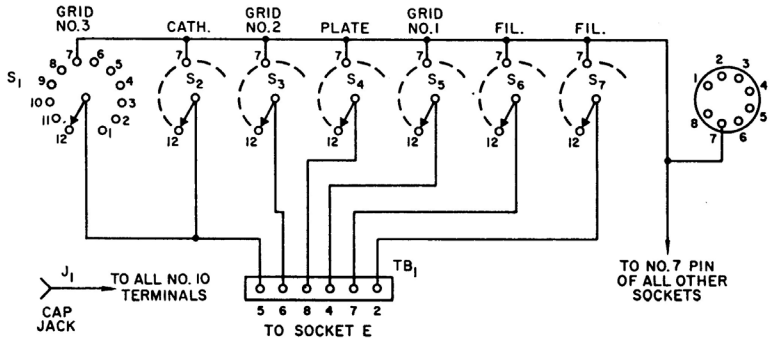


Fig. 2—Diagram showing connections to switch arms, as viewed from the rear of the switches. Switch contacts are connected as described in the text. Terminal 7 connections are shown as an illustration. Switches are single-pole 12-position rotary (Mallory 32112J). J_1 is a banana jack, and TB_1 is a 6-terminal tie-point strip. This strip connects to socket E in the 1-177 tester.

6) Connect the arms of the seven switches as shown in Fig. 2.

7) Connect a 6-conductor cable from TB_1 to similarly-numbered terminals of socket E in the tube tester. If a separate adapter is constructed, this cable should terminate in an octal plug inserted in socket E of the tester.

8) Dial plates for the seven selector switches can be made from disks cut from thin Bristol board or cardboard, labeled as shown in Fig. 3, covered with thinned dope or shellac, and mounted under the switch-mounting nuts. New dials for L and R are constructed in the same fashion and calibrated to read zero to 100, instead of zero to 80 as originally. There are several such commercial dials on the market, if preferred.

At this point, we must admit that we have not determined what press button B actually is. Again, we leave this to your ingenuity.

Operation

1) Place the pointer of dial A to 4, and the pointer of dial B to 2. These pointers are to remain in these positions. So as not to turn them accidentally, we removed the pointers and replaced them with small, ½-inch knobs for the sake of appearance.

2) Tests as outlined in the pamphlet accompanying I-177 tester should be made, using the chart for settings and micromho readings.

3) The micromho reading as shown on the chart is the minimum reading for a good tube,

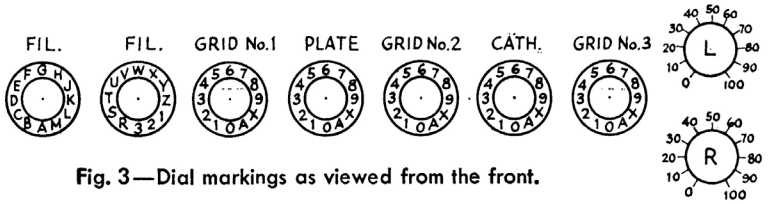


Fig. 3—Dial markings as viewed from the front.

9) Attach pointers to all switch shafts, pointing to 6 o'clock.

10) Turn the shaft of the potentiometer R fully counterclockwise and adjust the pointer to zero.

11) Turn the shaft of potentiometer L fully counterclockwise and adjust the pointer to 10. This pointer would normally be set to zero, but the calibration we made gave readings that were too low and, by checking the same tube on an expensive Hickok tester and on the I-177, it was learned that the setting should be as described above. This potentiometer is the meter shunt, and a little experimenting may be required.

12) Instead of making a chart roller (see Fig. 1B), you may wish to cut the chart up into pages, mount the pages on heavier stock, punch holes and use in a loose-leaf binder. Regardless of which method you use, the tube-chart columns should be labeled as follows:

TYPE, FILAMENT, SELECTORS, R, L, PRESS, MICROMHOS.

(Note that L and R are purposely reversed.)

13) Label the press buttons on the tester as follows:

Amplifier Test — A
Diode — C
Rectifier Std. — D

and might be compared with the lower end of a green space in the red-and-green general test Many tubes will show a micromho reading of 1½ to 2 times that shown on the chart; this condition is normal. A tube that shows a reading under the minimum might be entirely satisfactory for low-frequency and audio use, but is not recommended for v.h.f. use. An r.f. amplifier that would not operate satisfactorily at 144 Mc. might perform for many months as a 50-Mc. (or lower) amplifier; and one that will not perform even as high as 30 Mc. might still be satisfactory for use in an audio circuit. QST

Strays

Contest Corrections

In the July report on the January V.H.F. SS, K8BGZ should be noted as the Michigan section leader as well as winner of the Central Michigan Amateur Radio Club club award. In the Sept. report of the June V.H.F. QSO Party, the section heading "South Texas" was inadvertently dropped. It should precede the calls of K5s PTK and DRF and WA5ABG. K3YFD of E. Penna. turned up as K3YFZ, *sorry fellas!*

The October *CD Bulletin* should show the 76,500 point Ohio c.w. score along with K8RXD's call.