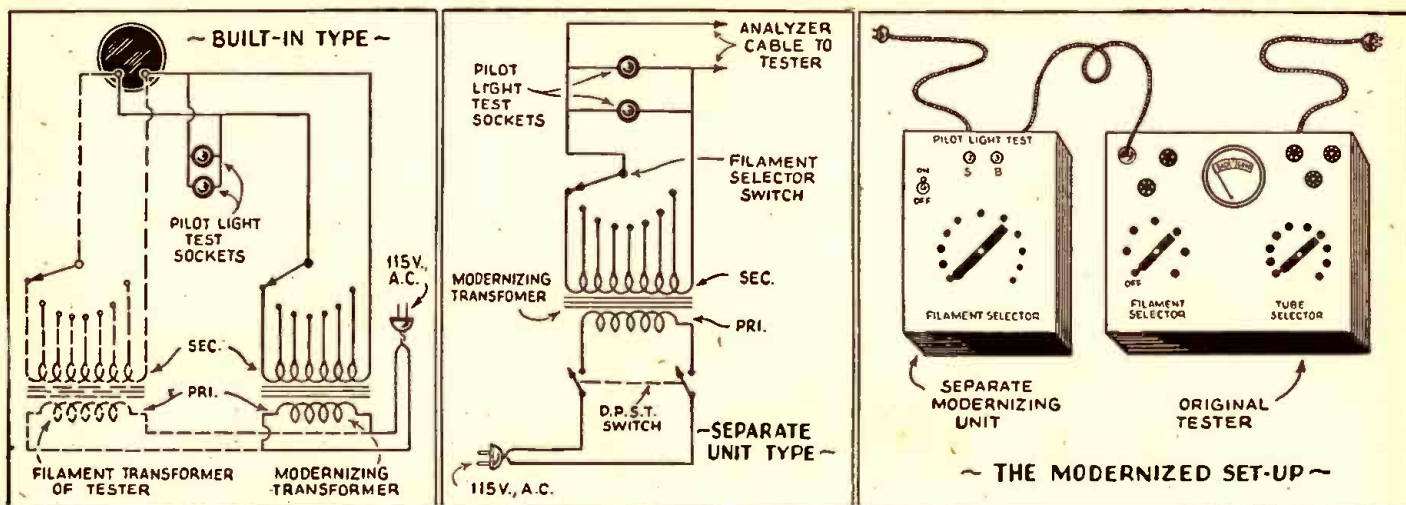




If there's no room to build-in the new transformer and switch (Fig. 1, left), in your test unit's case, try using a separate unit (Figs. 2 and 3, center and right).

MODERNIZE YOUR TESTER

To Check High-Voltage-Heater Tubes

A new filament transformer, a new filament selector switch, and presto!, you are ready with your old tester to test even 117-volt-filament tubes. Read this article and learn how easy it is to do a face-lifting job on otherwise outmoded tube testers.

D. J. FOARD, E.E.

IT WASN'T so very long ago that I purchased a tube and set tester that would accommodate only 4- and 5-prong tubes, this because those were the only tubes in use at the time. But shortly thereafter it became necessary for me to trade this instrument in for instruments that would accommodate 6- and 7-prong tubes. Then along came metal tubes and I had to purchase testers with provision for octal-base tubes. Not long ago some technician invented localt bases and the modernity of my test equipment was once again subjected to considerable question. Then came "bantams" and other types of midjet tubes and I began to wonder if it wouldn't be wiser to rent test equipment!

To cap the climax, so to speak, tube manufacturers introduced the new high-voltage-heater tubes. Though they are unquestionably a forward stride in improving the efficiency and life of A.C.-D.C. receivers, they do present still another problem for those of us who must service the receivers in which they are used.

At the present time, there are a great many fine tube testers and combination testers which are modern, or which have been rendered modern through the use of adapters, except that there is no provision for the high-voltage-heater tubes. Though we do not encounter these tubes as yet with alarming frequency, practically all of the new A.C.-D.C. sets employ them and it will not be long until they will be coming in every day. As many of us have had to change test equipment all too frequently in the last few years, most of us dislike to again have to purchase new equipment. At the present time, modernization of the equipment of most shops requires only provision for the high-voltage-heater tubes. Fortunately, most Servicemen can do such modernization themselves, easily and inexpensively.

BUILT-IN MODERNIZATION

Most radio transformer manufacturers now manufacture tube tester filament transformers, with secondaries of from 1 to 117 volts. These transformers can be purchased for \$2 or \$3 from any large radio supply house. Most tube testers, as well as most combination testers, have sufficient spare room in which to mount the modernizing transformer and, as most of these transformers are quite small, installing them in the tester should present no great difficulty. See Fig. 1.

A new filament voltage selector switch is, of course, necessary and one must use a switch with a position for each of the secondary taps of the modernizing transformer. These switches, together with a suitable filament selector switch plate, can be obtained from any large radio supply house.

PROCEDURE

As soon as the modernizing transformer has been mounted in the tester, the primary is wired in parallel with the primary of the original transformer, and the filament supply leads of the original transformer are cut-off at the transformer. The old filament selector switch is then removed from the tester and the new switch installed in its place. The secondary leads of the modernizing transformer are then wired, in proper order, to the various lugs of the new filament selector switch.

The lead which ran from the original transformer's secondary directly to the tube socket is, of course, wired onto the modernizing transformer. Too, the lead from the tube sockets to the arm of the filament selector switch is wired onto the arm of the new filament selector switch. This will complete the modernization and the tester will now deliver all of the higher filament voltages,

as well as the lower voltages, through the new transformer and filament selector switch.

INDEPENDENT MODERNIZATION

If it is not possible, or desired, to install a built-in modernization, as described above, a separate unit can very easily be built which will operate well on any tester having the filaments of the various tube sockets wired in parallel. The separate unit can be housed in almost any type of case and has a separate power cord and an "on-off" switch. See Fig. 2.

The modernizing transformer is installed in the case, the "on-off" switch and filament selector switch then mounted on the panel. The "on-off" switch is then wired in the power cord input to the primary of the modernizing transformer. One wire from the secondary of the modernizing transformer, and a lead from the arm of the filament selector switch are then wired to a 2-wire analyzer cable. The cable should terminate in a 4-prong analyzer plug with the 2 wires soldered to the 2 filament prongs of the plug. The secondary taps of the modernizing transformer should then be wired, in proper order, to the various lugs of the new filament selector switch.

The Separate Unit Modernizer will then be complete and, after testing, be ready for use. To use this unit, the tester's filament selector switch is placed (and left) in the "off" position, and the Modernizer cable is plugged into the tester's 4-prong socket. Then all adjustments are made as before, except that the filament selector switch on the Modernizer is used instead of the filament selector on the tester itself. See Fig. 3.

If the tester has no provision for localt or bantam-base tubes, these can easily be installed at this time. All one need do is to obtain the proper sockets and to mount them on the tester panel. Then simply wire the new sockets in parallel with sockets, originally in the tester, having the same number of terminals.

A very handy feature too is a pilot-light tester. They require very little room and are easily installed. Simply obtain 1 screw-base socket and 1 bayonet-base socket for flush panel mounting and mount them on the tester panel. Wire them together in parallel and then wire the 2 leads in parallel with the filament terminals of the nearest tube socket. Different voltages will then be applied to each of the pilot-light sockets by the tester's filament selector switch. This tester will, of course, also test flashlight and Xmas-tree lights.

Any competent Serviceman should be able

to modernize almost any tester in an evening or two—and at a cost of about \$5.

NOTES

BUILT-IN TYPE

(1) Note instructions and diagram which come with the modernizing transformer.

(2) Follow original wiring through the Filament Return selector switch (if the tester has one).

(3) Make sure the filaments of the tester are wired in parallel.

(4) If the tester uses a separate filament transformer, disconnect and remove this transformer, replacing it with the modernizing transformer.

(5) If the tester does not have a separate filament transformer, cut the filament secondary taps. Wire the secondary tap leads of the modernizing transformer to the new filament selector switch, then wire the new switch to the original wiring of the tester. Connect the primaries of the 2 transformers in parallel.

SEPARATE UNIT TYPE

(1) Note instructions and diagram which come with the modernizing transformer.

(2) Follow the original wiring through the Filament Return selector switch (if the tester has one).

(3) The filament selector switch on the tester must be left in the Off position whenever the modernizer is in use.

(4) Do not alter or disturb the wiring of the tester.

ILLEGAL RADIO SEIZED AT RACETRACK

A MONTH'S search by the Federal Communications Commission for unlicensed radio equipment which broadcast "sure tips" to favored bettors while horse races were still being run was climaxed last month by the arrest of 2 men and the seizure of illegal apparatus at the Charles Town, W. Va., racetrack!

In early December Commission field men discovered that 2 portable transmitters were surreptitiously being put to such use. One transmitter concealed under the coat was employed by one of the men in the grandstand to communicate progress of the race to an accomplice in a rented tourist cabin near the track. The latter utilized the 2nd set to flash the expected result to conspirators listening-in at outside receiving stations. Under this system, some persons were able to make advantageous bets before the results of the race were generally known.

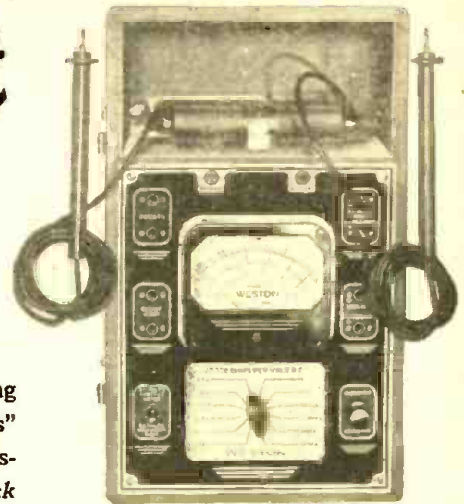
The method of operation, as determined by Commission inspectors listening-in, was this:

At the start of the race a person could be heard whistling on a certain radio frequency, followed by the words "Oh Johnny" repeated several times, and then a few bars from such songs as "Beer Barrel Polka" or "Maryland, My Maryland" would be sung. As the race neared the finish the voice would suddenly cut in with a number, repeated until the race was completed. Immediately after this number was spoken, a stronger signal on another frequency was observed to repeat the same number perhaps 10 or 15 times, followed by such commonplace expressions as "testing" or "testing for modulation," and finally the words, "that is all." On checking the race results it was obvious that the number in question referred to the number of the winning horse.

By the use of highly specialized equipment and technique, the party in the grand-

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sensitivity 20,000 ohms per volt.
AC—2.5/10/250/1000... sensitivity
1000 ohms per volt.
Current... DC—.1/1/10/50/250 milli-
amperes 1/10 amperes
Ohms... 0-3000; 0-30,000 ohms . . .
0-3 megohms; 0-30 megohms
Decibels... -14 +2/-2 +14/+12 +
28/+26 +42/+38 +54

WESTON Radio Instruments

stand operating the transmitter concealed on his person was finally located. This transmitter was adjusted to an ultra-high frequency and the microphone extended down into the sleeve of the overcoat worn by the operator. To speak into the microphone, he merely raised his hand to the back of his neck and appeared to be conversing with his look-out companion, or shouting for his favorite horse to win. To allay suspicion, he carried a program and consulted it between races.

The grandstand tip-off man had a clear view of the tourist camp in which the high-powered transmitter was located, and received acknowledgements of the reception of his transmission by light signals flashed by the operator at the tourist cabin. On one occasion, the operator in the grandstand remarked on the air that a clothesline obstructed his view of the light. This announcement enabled the inspectors to verify the exact cabin in the group where the presence of the high-powered radio transmitter had been previously located by a radio direction finder, even though the antenna was concealed. This transmitter was built into a trunk and when the lid was closed gave no semblance of a radio apparatus.

Arrests were made in cooperation with the West Virginia State Police and United States District Commissioner at Martinsburg, after evidence had been presented by members of the Commission's field operations section personnel—Charles Ellert, Supervisor of the Central Atlantic Monitoring Area; Assistant Monitoring Officer Earl M. Johnson, and Radio Operator Kenneth B. Menear.

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