

Radio Maintenance is presenting a number of short articles describing various pieces of commercially available equipment. All of the units described will be put through their paces on the bench before being presented. It is hoped that the information given will prove helpful when choosing from the great variety of instruments available.

TEST SPEAKER

by J. R. James

THE "FERRET" test speaker is a commercial version of the test speaker idea presented recently in RADIO MAINTENANCE. This unit is useful after the serviceman has completed tracing operations, and one or more particular components are suspected of causing the trouble. In a big percentage of cases, ohmmeter checks are not conclusive, and it becomes necessary to substitute a part which is known to be in good condition. This test speaker, manufactured by Coastwise Electronics of Los Angeles, provides a variety of substitute parts in a compact form. Connections, which are made by means of test leads, are from the front panel. Because the components themselves are never handled, deterioration is negligible and the parts are always available. That this is a definite advantage will be understood when we remember that extra resistor or condenser which we have been using for substitution and whose leads are broken and full of solder.

As can be seen in the photograph, tip jacks on the panel provide the choice of the *type* of component we

want; the *value* of this component can be adjusted by means of the four selector switches. Now let us survey the methods of use for various types of repair jobs.

Speaker Voice Coil

Suppose we suspect the voice coil of the speaker in a set of being open or shorted. First, the leads from the output transformer to this voice coil are disconnected. Then, test leads are plugged into the two tip jacks marked "Voice Coil" on the panel of the test speaker. The other ends of these test leads are connected to the wires from the output transformer. If the trouble is in the voice coil of the receiver's speaker, then the set will play properly through the test speaker.

Output Transformer

Perhaps, in our example, the voice coil is okay but the output transformer is suspected. If our first test draws a blank, go to work on the primary of the receiver's output transformer. Unsolder the two primary leads (three for P.P. outputs). Then use the test leads

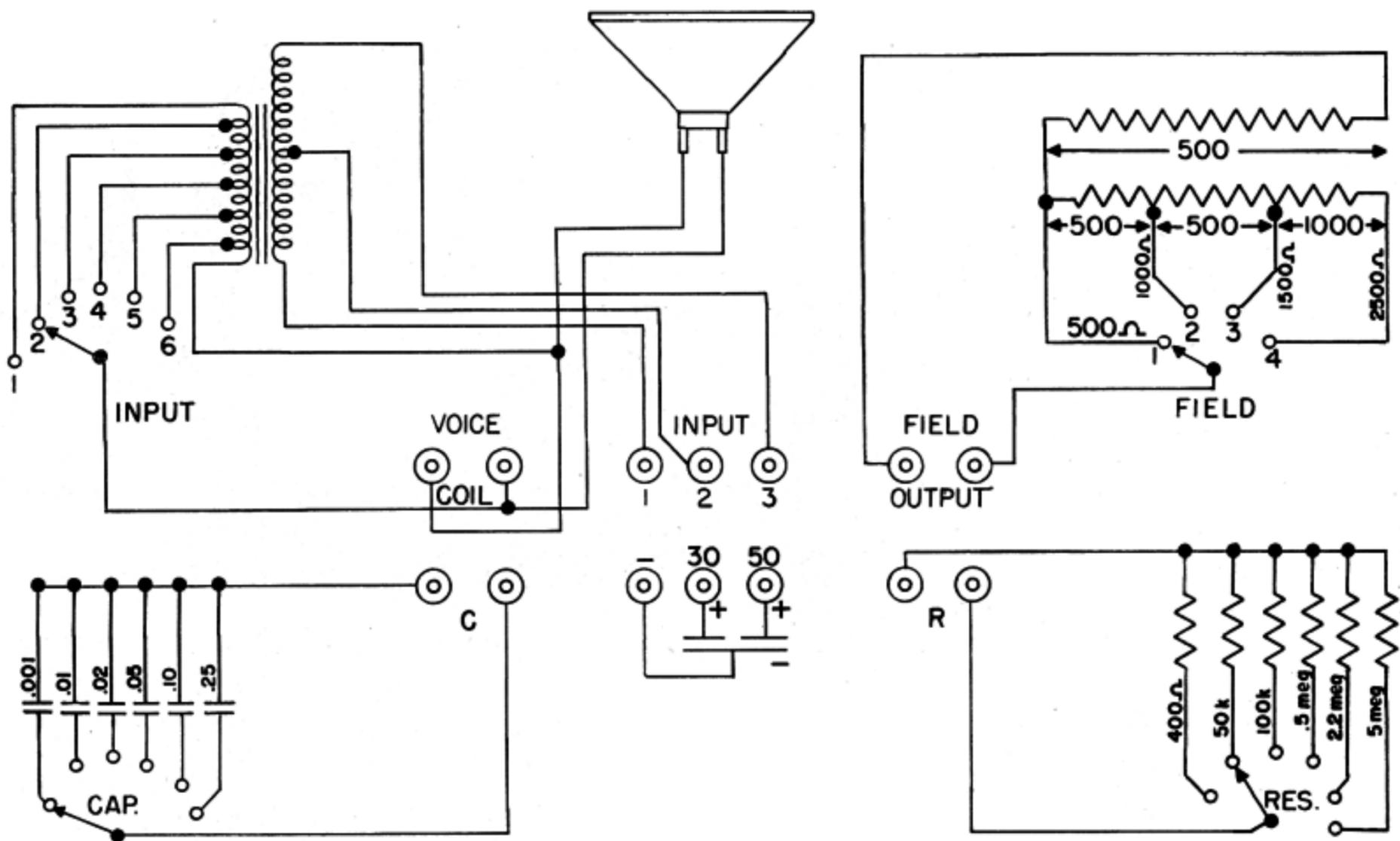
to connect the plate(s) of the output tube(s) and B plus to the terminals marked "Input" on the panel of the test speaker unit. The tip jacks are marked 1, 2 and 3. The choice of which ones are used in each case depends on the output tube type and whether the output stage is single-ended or push-pull.

The proper arrangement for almost any type of output tube is given in the table printed right in the upper left hand corner of the panel. Choice of the correct impedance match is made by using the proper position for the test leads and by adjustment of the selector switch marked INPUT. In this manner, we choose from a number of taps on the primary of the output transformer in the unit.

Field Coil

Similar substitution for field coils which are suspected of failure is provided by means of the two jacks marked FIELD OUTPUT. The selector switch labeled FIELD allows a choice of any of four field resistance values from 500 through

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Schematic diagram of the Ferret test speaker.

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2500 ohms. The table in the upper right corner of the panel is a guide for this selection.

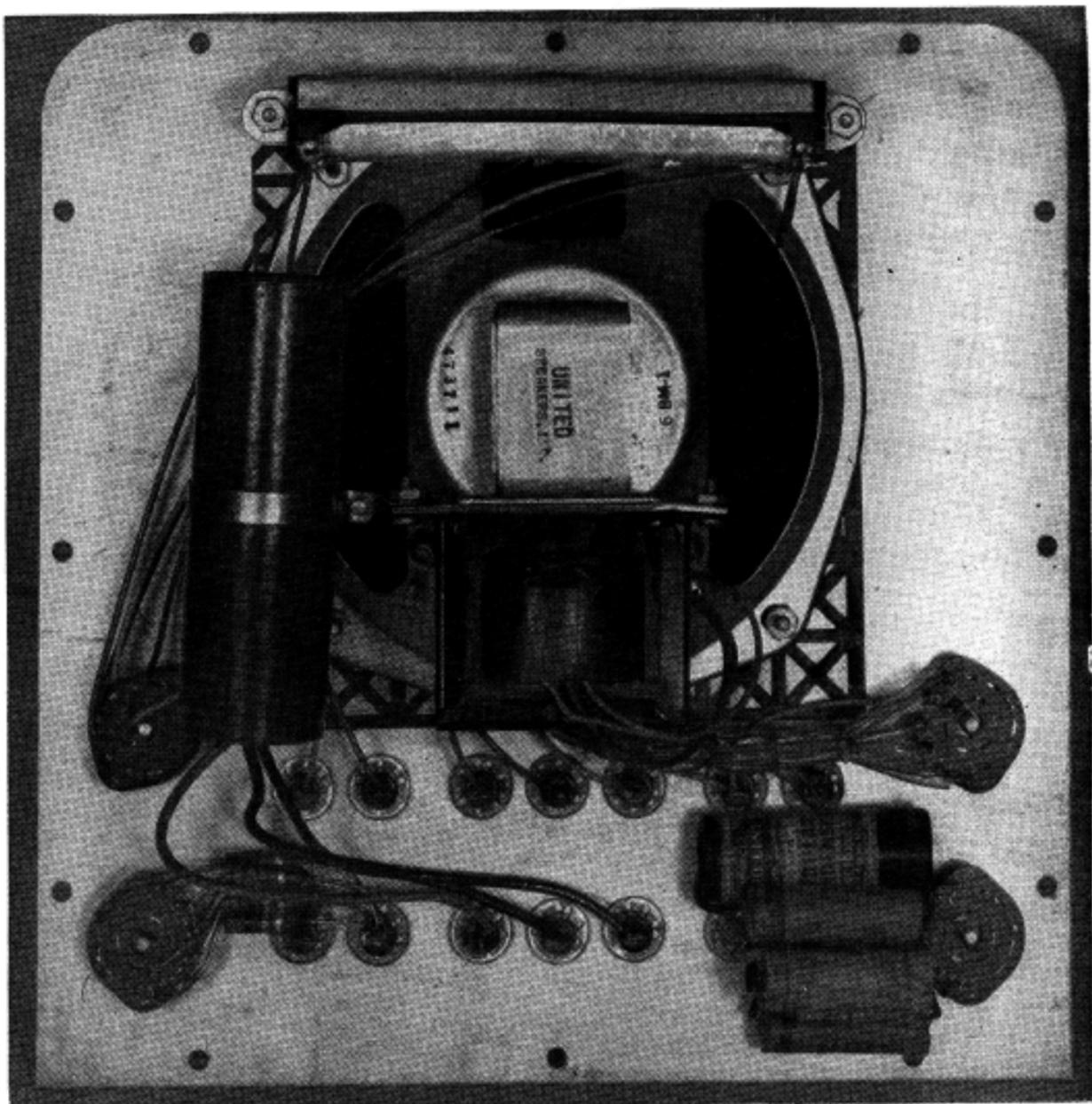
Condensers

In the bottom row, we have the jacks for use in substituting condensers. At the left end, marked C, are the leads from the paper condensers. Six different values are made available by settings on the switch marked CAP. These values are from .001 through .25. The three jacks marked ELECTROLYTICS provide two values of electrolytic condensers, 30 and 50 ufd. The paper condensers have a rating of 600 volts, the electrolytics 450 volts.

Resistors

At the right hand end of the bottom row are the two jacks for resistors. These are used in conjunction with the selector switch RES, located just to the right. Values are available from 400 to 5000 ohms.

As can be seen in the photograph, the whole unit is enclosed in a compact cabinet and weighs only about five pounds. The internal view and schematic diagram show how the instrument is wired. ✓ ✓ ✓



View of the test speaker chassis after removal from the cabinet. In the center are the speaker and output transformer. Just to the left is the electrolytic condenser and at the top are mounted the resistors for the field coil connections.

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