

RADIO TUBE TESTER

Stock No. 156: Portable Type
Stock No. 156-A: Counter Type

SPECIFICATIONS

Power Supply Requirements:

Line Rating100-125 volts, 50/60 cycles
Power Consumption25 watts

Tube Complement:

Rectifier1 RCA-6J5-G

Mechanical Specifications:

Dimensions13 $\frac{1}{2}$ " long, 8" wide, 5 $\frac{3}{4}$ " high
Weight (net)14 pounds
FinishBlue-gray wrinkle lacquer with light metal trim

DESCRIPTION

This radio tube tester is a highly-efficient and sturdy instrument featuring unusual simplicity of operation. By using a new interlocking design, the push buttons are retained or released automatically as required for testing purposes. An easy-reading roll chart affords ready reference to the active buttons and

control settings for each type of tube. Connecting guide lines are marked on the panel from the controls to the corresponding columns of the chart. To insure greater precision, the line voltage is indicated continuously for adjustment except during actual measurement.

APPLICATION

Practically every standard type of receiving tube as well as special types including the regulator, ballast, tuning indicator (Magic Eye) and certain cathode-ray oscillograph tubes can be tested for acceptability with this instrument. The standard RMA emission test is applied to all receiving and similar tubes whereas the regulator tubes, which are gaseous in type, are tested for breakdown voltage. Ballast tubes may be checked for open circuit, and "noisy" welds can be detected readily by means of a pair of phones. In tuning indi-

cators, the visible control range (opening and closing of the "eye") may be noted in addition to emission.

Although the emission of a tube normally is an excellent criterion of performance, sometimes it is not the definite limiting factor. Thus, a tube which tests "poor" may, in rare instances, be perfectly satisfactory for a given application, or the reverse may equally well be true. A knowledge of the operating conditions, therefore, is highly desirable.

INSTALLATION

Upon unpacking this instrument, remove the panel assembly from the case. The panel assembly may be disengaged readily by prying with a screwdriver or similar tool inserted through the two slots at the front and the two holes at the rear after withdrawing the screw located near the center of the back. Remove the cardboard cover from the rectifier tube and make certain that the tube is properly seated and undamaged. Also, inspect the internal connections of the tester in a general manner.

Replace the instrument case and connect the power cord to an electrical outlet supplying 100 to 125 volts at 50 or 60 cycles. Throw the "POWER" switch to the "ON" position and observe the meter deflection which, after a short interval (approx. 15 seconds), will be indicative of the line voltage. Adjust this voltage by means of the "LINE VOLTS" control until the meter reads at the "LINE CHECK" (mid-scale) position.

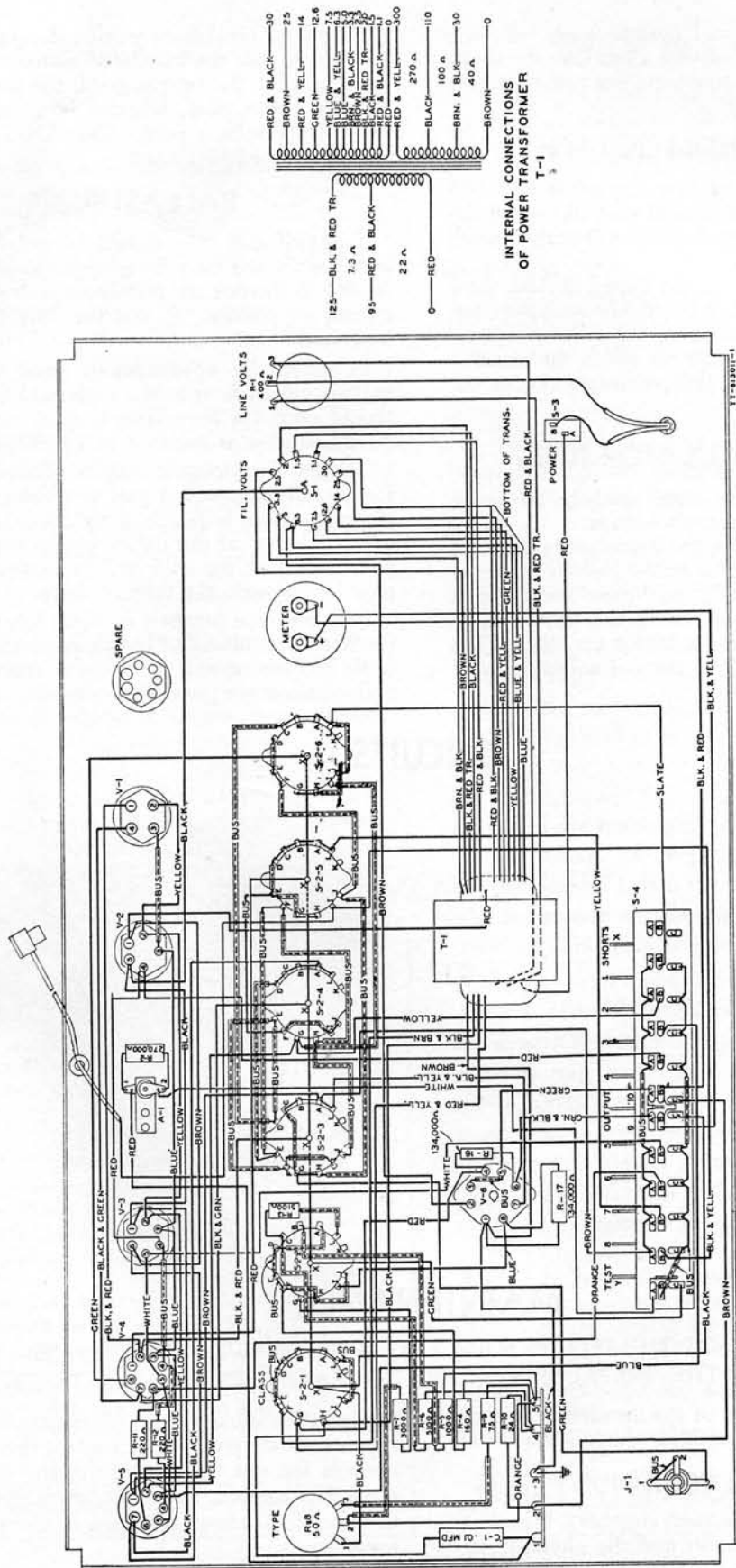


Figure 4—Connection Diagram

TT-8130(1)-1

lighted. The "eye" should operate upon following the instructions printed on the chart directly above the "OUTPUT" button, the latter not being used for this test.

CATHODE-RAY OSCILLOGRAPH TUBES

As shown on the chart, the Types-902 and -913 cathode-ray tubes can be checked with this tester. Its use in testing other tubes of this variety is not recommended.

In testing the Type-902 or the Type-913 tube, allow at least two minutes preheat before checking the emission. The testing procedure is the same as for receiving tubes, rejecting those on which the emission is not sufficient to cause the pointer to rise to the "DIODES O. K." mark.

GASEOUS REGULATOR TUBES

These tubes should be tested initially for short-circuit and then for breakdown voltage.

For the short-circuit test, the procedure is the same as for receiving tubes. Due to the gaseous nature of these tubes, the neon lamp may glow faintly upon pressing button 1 or 3 in testing the Type-874, or upon pressing button 1 or 5 in testing the others. The tube, however, should not be rejected unless the glow is brilliant.

To test for breakdown voltage, depress the "TEST" button and then the numbered button indicated upon the chart. If the tube is good, the meter deflection will rise appreciably, whereas little or no rise will occur if the tube is poor. The "OUTPUT" button is not employed in this test.

BALLAST TUBES

Tubes of this type should be tested initially for open circuit and then for incipient noise due to poor welds. Both tests are performed with the "CLASS" control on position "I" and the "SHORTS" button depressed.

In testing for open circuits, press the numbered buttons indicated upon the chart which in each case should cause the neon lamp to glow. Failure to observe this glow is evidence of a defective tube.

The test for incipient noise is effected by listening for "crackle" through a pair of phones plugged into the jack located in the front right-hand corner of the panel. Defects of this nature usually are the result of poor welds and the noise will be exaggerated by tapping lightly upon the tube envelope.

Common type numbers of these tubes are listed in the left-hand column of the chart in numerical order, while the corresponding Clarostat (tentative RMA) type numbers are given in the right-hand column.

CIRCUITS

The circuits used in this instrument are shown on the schematic diagram of Figure 3. As may be observed from this diagram, the design is comparatively simple, consisting fundamentally of the circuit elements described by RMA for standard emission tests.

Adjustment for different plate loads and voltages as required is provided by the "CLASS" control. This control also shifts the filament connections for the octal-base tubes and is equipped with an extra set of switch contacts to avoid obsolescence of the tester in the event of forthcoming new tube types. The "TYPE" control is simply a meter shunt or calibrating potentiometer, while the remaining knobs and buttons are self-explanatory in function.

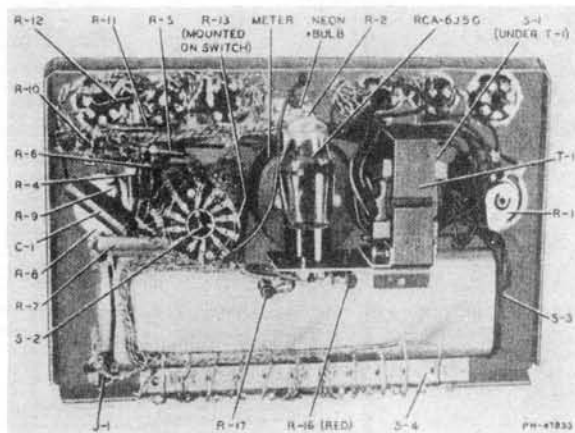


Figure 5—Bottom View of Panel

MAINTENANCE

CAUTION—DISCONNECT THE POWER SUPPLY BY WITHDRAWING THE POWER CORD PLUG BEFORE REMOVING THE INSTRUMENT CASE TO MAKE SERVICE ADJUSTMENTS.

Instructions for removal of the instrument case are given under the section entitled "Installation."

RESISTANCE AND CONTINUITY TESTS

The instrument connection diagram, Figure 4, shows the wiring color codes and the physical rela-

tions of the various parts. All resistance and capacitance values are given in addition to the identification symbols for ease of reference to the schematic diagram, photographs, and replacement parts list. The transformer windings are rated in terms of their d-c resistances.

VOLTAGE MEASUREMENTS

The normal operating voltages of the equipment are represented diagrammatically in Figure 6. These values should be observed within $\pm 10\%$ when measured with the line voltage adjusted so that the

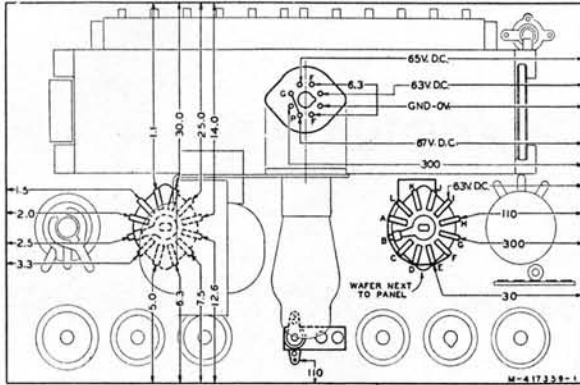


Figure 6—Voltage Diagram

meter reads at the "LINE CHECK" (mid-scale) position. A voltmeter of high internal resistance (at least 1,000 ohms per volt) should be employed. All voltages are a.c. (r-m-s) except in the one instance noted as "d.c."

CHART REPLACEMENT

In the event that replacement of the roll chart is required, proceed as follows:

1. Remove the instrument case (see "Installation").
2. Pull off the push buttons, then loosen the switch by taking out the two mounting screws, and swing it clear of the chart.
3. Rotate the chart to the *finish* end and remove the wood screw securing this end to the front spool.
4. Pull out the chart and detach the other end from the rear spool in the same manner.

To insert the new chart:

1. Pass the *start* end of the chart between the front spool and the panel, and attach that end to the rear spool using one of the two wood screws formerly removed.
2. Rotate the thumb-wheel until the entire length of the chart is snugly wound on the rear spool.
3. Attach the *finish* end of the chart to the front spool, leaving about four inches of slack.

Should any binding occur in operation, rewind the chart on the rear spool, remove the *finish* end from the front spool and reattach it allowing more slack.

REPLACEMENT PARTS

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
32118	Bolt—Suitcase bolt	32549	Resistor—Matched pair of 134,000-ohm, $\frac{1}{2}$ -watt resistors (R-16 R-17). Sum = 268,000 ohms $\pm 2\%$
32120	Button—Push-button (black)	30651	Resistor—270,000 ohms, $\frac{1}{2}$ watt (R-2)
32121	Button—Push-button (red)	31251	Socket—Tube socket (octal, for rectifier)
32117	Cap—Dual contact cap	32129	Socket—Tube socket (octal)
4839	Capacitor—0.1 mfd. (C-1)	32125	Socket—Tube socket (4-prong)
32180	Chart—Roll chart (tube data)	32126	Socket—Tube socket (5-prong)
30925	Handle—Carrying handle	32127	Socket—Tube socket (6-prong)
7903	Jack—Phone jack (J-1)	32128	Socket—Tube socket (7-prong)
32116	Knob—Control knob	32115	Socket—Neon lamp socket
23153	Lamp—Neon glow lamp	32132	Spring—Spring for panel contact
32079	Meter	32124	Switch—1-gang, 1-pole, 12-position (S-1)
32133	Panel—Control panel	32123	Switch—6-gang, 6-pole, 12-position (S-2)
32130	Potentiometer—50 ohms (R-8)	32119	Switch—Single-pole, single-throw (S-3)
32131	Potentiometer—400 ohms (R-1)	32080	Switch—Push-button switch (S-4)
32182	Resistor—24 ohms, $\frac{1}{4}$ watt (R-10)	32183	Transformer—Power transformer XT-2970 (T-1)
32181	Resistor—75 ohms, $\frac{1}{4}$ watt (R-9)		
32179	Resistor—160 ohms, 1 watt (R-4)		
5201	Resistor—220 ohms, $\frac{1}{2}$ watt (R-11, R-12)		
30152	Resistor—1,000 ohms, 1 watt (R-5)		
32122	Resistor—3,000 ohms, 10 watts (R-7)		
3413	Resistor—5,100 ohms, $\frac{1}{2}$ watt (R-6, R-13)		