

Your new Philco Mutual Conductance Tube Tester, Model 9100, is one of the most versatile, accurate instruments of its type available to the service industry today. You will find this unit precision designed to accomplish a great variety of tube tests, quickly and accurately. By carefully following the operating instructions below, you can look forward to years of reliable performance and increased service efficiency from it.

FEATURES

- **WIDE APPLICATION**

All types of tubes normally used in radio, television, and similar phases of electronics may be tested by this unit. Panel sockets accommodate 4, 5, 6, and 7-pin tubes, octal and Loktal types, 7 and 9-pin miniatures, acorns, hearing-aid types, and subminiatures. In addition to testing the high-vacuum type of tube this instrument will also test many other types such as cold-cathode and mercury-vapor rectifiers, thyratrons, ballast tubes, etc. Provision is also made for testing all miniature types of bayonet and screw-base pilot lamps requiring voltages up to 12.6 volts.

- **DYNAMIC MUTUAL CONDUCTANCE TEST**

Because the Model 9100 tube tester is of the dynamic mutual conductance type, tubes are tested under conditions which closely simulate the conditions which exist in actual operation, thus providing the best and most trustworthy indication of the tube's condition. This instrument will detect faulty tubes which in many cases will give a normal indication on other types of testers.

- **BOTH MICROMHO AND REPLACE (?) GOOD INDICATIONS**

The Model 9100 tube tester indicates tube operating quality either directly in micromho values, for the technician, or in terms of REPLACE (?) GOOD readings for easy interpretation by the customer. Mutual conductance values can be measured in three ranges: 0-3000, 0-6000, and 0-15,000 micromhos.

- **LINE ADJUSTMENT**

The Model 9100 tube tester operates from a 105 to 125-volt, 60-cycle a-c power line. A LINE ADJUST control is incorporated in the instrument to compensate for variations in line voltage and thereby maintain standard test voltages on the tube elements.

● RAPID TESTING

A smooth, positive, free-running roll chart built into the instrument, makes control setting information quickly available. In addition, the control settings given on the roll chart are keyed to the particular controls involved by means of red guide lines, thereby further increasing the speed and simplicity of the testing procedure.

● LIFE TEST

The life test, which permits the remaining life expectancy of a tube to be ascertained, is another special feature which has been incorporated into the tester. By means of this test it is possible to determine whether a tube is likely soon to fall below standard specifications for its type, and to replace it before such a substandard condition is reached. This feature also has considerable value for the accurate matching of tubes and similar applications.

● SENSITIVE GAS TEST

Even a very small amount of gas in a tube may result in unsatisfactory circuit operation and possible damage to other components. This is particularly true when the tube is to be used in critical circuits, such as those used, for example, in the modern television receiver. A highly sensitive method of checking tubes for gas content is therefore a necessity, and is incorporated into the Model 9100 tube tester.

● SHORT, LEAKAGE, AND NOISE TESTS

The SHORT check incorporated into the Model 9100 tube tester provides indication of direct short circuits or leakages between the elements in the tube being tested. Also included in this tester are provisions for making noise tests. NOISE TEST jacks on the front panel of the instrument permit connections to be made to the input of any radio receiver. Intermittent disturbances caused by loose elements, etc., which are too brief to be registered on the indicator lamp will be reproduced in the loud speaker when the tube is tapped.

● FUSE-LAMP PROTECTION

A fuse-lamp, easily accessible from the front panel, is employed to provide over-all protection for the tester. Under normal conditions of operation this fuse-lamp will glow (to a greater or lesser degree, depending upon the type of tube being tested), but this will in no way affect the instrument indication. In case of overload, however, the lamp will open and thereby disconnect the tester from the power source. Additional protection for the tester is provided by another fuse-lamp, also accessible from the front panel, which is connected in the portion of the power supply which furnishes grid-bias voltages. This bias fuse-lamp does not glow in normal operation, but will open in case of bias-circuit overload. The use of fuse-lamps for overload protection provides the operator of the tester with an immediate and highly visible indication if an overload should occur.

● CONTINUITY TESTER

Still another feature which adds to the versatility of the Model 9100 tube tester is its application as a continuity checker through circuits which may have resistances as high as 200,000 ohms.

● PILOT LAMP TESTS

All miniature screw-base and bayonet-base pilot lamps requiring up to 12.6 volts for operation can be tested by means of a receptacle provided on the front panel of the instrument.

● CATHODE-RAY-TUBE TESTING

All commonly used picture tubes may be checked with the Model 9100 Dynamic Mutual Conductance Tube Tester by using the CRT Adapter Cable Kit, Philco Part No. 425-0001. Complete operating instructions and tube data are included in the kit.

OPERATION

The instrument is placed in operation by connecting it to a source of 105 to 125-volt, 60-cycle, a-c power, and setting the POWER switch to the ON position.

● PRELIMINARY

First set all controls in accordance with the data given on the roll chart for the type of tube to be tested; then insert the tube into its proper socket.

Two jacks, located in the upper-center of the con-

trol panel, and marked GRID and PLATE, are used for making connections to tubes which have leads brought out through top caps. The notation CAP=G or CAP=P appears in the roll chart information for such types. CAP=G indicates that the top cap is to be connected to the GRID jack, and CAP=P indicates that the top cap should be connected to the PLATE jack.

NOTE: Improved versions of tubes are occasionally brought out after the original design, and are usually identified by adding a letter

(such as A, B, etc.) after the original type designation. Unless specifically listed on the roll chart, these tubes should be tested in accordance with the data given for the original type.

● LINE-VOLTAGE ADJUSTMENT

Press the LINE ADJ switch, P7, which will cause the indicating meter pointer to move up-scale. Keeping the switch depressed, set the LINE ADJUST knob to bring the meter pointer exactly over the mark LINE TEST at 1500 on the meter scale; then release the LINE ADJ switch. This procedure serves to establish standard test voltages on the tube elements.

● SHORT TEST

This test should *always* be made first, before proceeding to other tests.

Turn the SHORT TEST switch successively through positions 1, 2, 3, 4, and 5. This connects the various tube elements, in turn, across the test voltage. Tubes having shorts or leakages between elements will cause the neon SHORT lamp to glow continuously. *A tube showing a short or leakage between elements should be discarded without further test.* The SHORT TEST switch must be reset to the TUBE TEST position at the conclusion of the test.

A momentary flash of the indicator lamp as the SHORT TEST switch is turned from one position to another should be disregarded.

● DYNAMIC MUTUAL CONDUCTANCE TESTS

To determine the dynamic mutual conductance of a tube directly in micromhos, the MICROMHO switch is set to the range (0-3000, 0-6000, or 0-15,000) covering the value given in the roll chart, and the GM switch, P4, is pressed to obtain the meter indication. The micromho values given on the roll chart are the low-limit values for good tubes. A reading less than the value given indicates a weak tube, which should be discarded.

The GM values shown on the roll chart may differ from those shown in tube manuals. There are two reasons for this. First, tube-manual data indicates average values, whereas the roll chart gives low-limit values to facilitate the determination of a tube's condition. Second, the operating conditions in the tester may differ from those conditions specified in the tube manual. This has been taken into account in the roll-chart readings, and need cause no concern.

When it is desired to test the tube in terms of REPLACE (?) GOOD, the MICROMHO switch is set to the R-G position. The R-G control is then set to the figure given under the R-G heading on the roll chart, and the GM switch, P4, is pressed. Good

tubes will read in the GOOD sector of the meter scale, and poor tubes will read in the REPLACE sector. Those tubes which read in the sector marked (?) may still have some useful life, but are soon likely to need replacement.

The REPLACE (?) GOOD meter scale, which also indicates dynamic mutual conductance, is designed to make tubes read at the left edge of the GOOD sector when they are 25 percent below average for amplifier tubes, and 35 percent below average for power tubes.

CAUTION: Before applying voltages to subminiature tubes, care must be taken to see that none of the tube leads are shorted to each other. In the round subminiature tubes, leads are numbered in a clockwise direction (looking from the bottom) lead No. 1 being identified by an arrow on the side of the tube.

In the rectangular subminiature tubes, lead No. 1 is identified by a red dot.

● GAS TEST

In some cases a tube will develop gas after the tube has been heated for a period of time. It is therefore advisable to permit a suspected tube to become thoroughly warmed up before making this test.

With the MICROMHO switch set to the 0-3000 range, the GAS 1 switch (P5) is depressed and the BIAS control is adjusted to make the meter pointer indicate 100 micromhos.

With the GAS 1 (P5) switch still depressed, the GAS 2 (P6) switch is then pressed. If the tube contains gas, the meter pointer will move up-scale. If the pointer movement is not more than one scale division, the gas content may be considered satisfactory.

With some tubes, such as the type 45, it may not be possible to bring the micromhos reading down to 100 by adjusting the BIAS control. In such cases, set the BIAS control to 100 and proceed with the remainder of the test.

● RECTIFIER TESTS

Switches P1, P2, and P3 are used for testing the various types of tube rectifiers. The MICROMHO switch must be in the R-G position for testing these types.

Switch P1 is used for testing detector diodes. When this switch is depressed, it applies a low voltage which will not injure the delicate cathode. Good diodes will cause the meter pointer to read above the DIODES OK mark.

Switch P2 is used when testing cold-cathode rectifiers such as the type OZ4. When this switch is pressed it applies a voltage sufficient to ionize the tube and start conduction. Good tubes will read in the GOOD sector of the meter scale.

Switch P3 is used for testing regular rectifier tubes such as the 5Y3. When this switch is pressed it applies a medium value of voltage which is best adapted to reveal defects in tubes of this type. Good tubes will read in the GOOD sector of the meter scale.

NOTE: Directly below the indicating meter is a switch marked REVERSE-NORMAL. With this switch set to NORMAL, certain tubes such as the 117N7 will cause the meter pointer to deflect backwards (to the left) when switch P3 is pressed. In such instances, setting the NORMAL-REVERSE switch to REVERSE will permit the meter to read up-scale. The switch should always be reset to NORMAL after the test has been made.

● LIFE TEST

Before this test is performed it is advisable first to check for dynamic mutual conductance in the normal manner, to make certain that the tube is capable of satisfactory operation.

In making the life test, the MICROMHO switch is first set to the R-G position; then switch P4 is depressed and the R-G control is adjusted to make the meter pointer read at 2000 in the GOOD sector of the scale.

With switch P4 still depressed, the NORMAL-LIFE TEST switch is thrown to the LIFE TEST position. This serves to reduce the cathode temperature. If the meter pointer is still within the GOOD sector of the scale, the tube has a large life reserve and will probably perform satisfactorily for an extended period.

Since rectifiers have no mutual conductance, a different procedure is required for making the life test on such types. For such types the tube is first checked in the normal manner, as given under RECTIFIER TESTS, and the meter reading is carefully noted. The twenty-position FILAMENT switch

is then reduced by one position and the meter reading is again noted. The drop in reading should not exceed 25 percent.

● PILOT-LAMP TEST

A receptacle in the center of the seven-pin socket is used for testing all miniature types of bayonet and screw-base pilot lamps. Voltages up to 12.6 are available for such tests, and are controlled by the twenty-position FILAMENT switch. No other switch settings are required.

● FILAMENT AND HEATER CONTINUITY

For this test the controls are first set in accordance with the data given on the roll chart, except that the twenty-position FILAMENT switch is set to BLST instead of the voltage indicated on the chart. Certain tubes which have tapped filaments, such as the 35Z5, 50Z7, etc., have special continuity test settings. These are given on the roll chart.

The SHORT TEST switch is set to position 1 and the tube is then inserted into its proper socket. If the neon lamp does not glow, the filament is open.

● CONTINUITY TEST

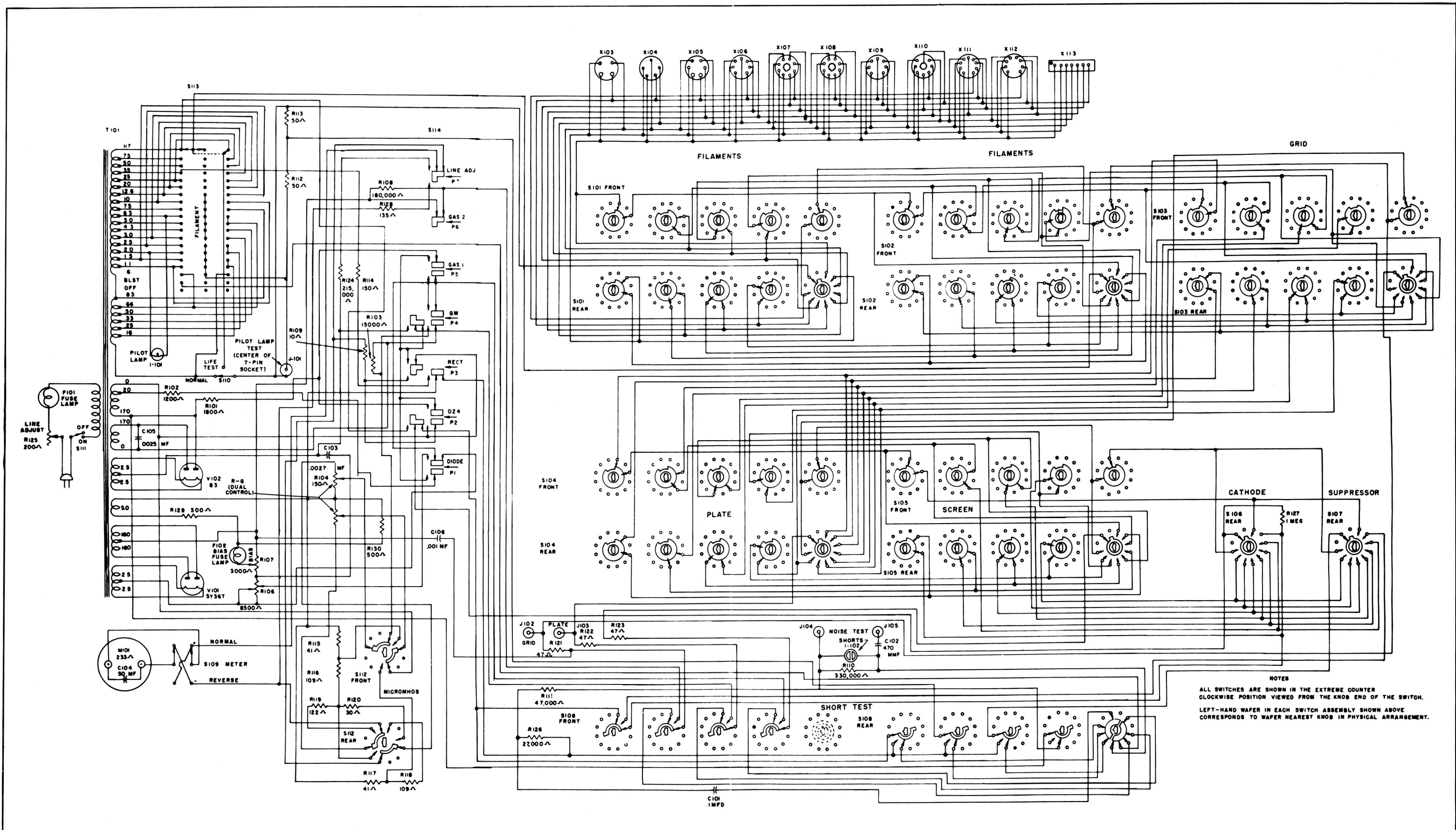
The Model 9100 tube tester can be used in the following manner to test for continuity through circuits having resistances up to 200,000 ohms.

The SHORT TEST switch is first set to position 4. Two leads having prods and pin tips are then connected to the panel jacks marked PLATE and GRID. If the prods are then touched to the terminals of the circuit to be checked, the neon lamp will glow if the circuit is continuous.

● ADDITIONAL SHORT TEST INFORMATION

The following table gives the positions of the SHORT TEST switch in which the indicator will glow when a short or leakage exists between particular tube elements.

Location of Short	Switch Positions				
FILAMENT—CATHODE			3		
FILAMENT—GRID	1	2			5
FILAMENT—PLATE	1	2		4	5
FILAMENT—SCREEN	1		3	4	5
FILAMENT—SUPPR.		2			
GRID—CATHODE	1	2	3		5
GRID—PLATE				4	
GRID—SCREEN		2	3	4	
GRID—SUPPR.	1				5
PLATE—SCREEN		2	3		
PLATE—SUPPR.				4	5
SCREEN—SUPPR.	1	2	3	4	5



NOTES
 ALL SWITCHES ARE SHOWN IN THE EXTREME COUNTER
 CLOCKWISE POSITION VIEWED FROM THE KNOB END OF THE SWITCH.
 LEFT-HAND WAFER IN EACH SWITCH ASSEMBLY SHOWN ABOVE
 CORRESPONDS TO WAFER NEAREST KNOB IN PHYSICAL ARRANGEMENT.

Philco Dynamic Mutual Conductance Tube Tester Model 9100, Schematic Diagram

MAINTENANCE

The Philco Model 9100 Dynamic Mutual Conductance Tube Tester has been engineered to make it outstanding, not only in electrical performance, but also in mechanical ruggedness. In addition, the use of quality components further assists in reducing the possibility of trouble. However, if the instrument should at any time become inoperative, the condition of the rectifier tubes in the power supply should first be checked. If the trouble persists, a visual inspection of parts, wiring, and connections is next in order. In general, the source of trouble will be easy to locate and to correct. Should it ever become necessary to replace voltage-divider resistor R106, however, the following procedure should be used after the replacement resistor has been installed.

1. Apply power to the tester, press P7, and then adjust the LINE ADJUST control to make the meter needle coincide with the LINE TEST indication.

2. Connect a VTVM (or a 20,000-ohms-per-volt voltmeter) across the outside terminals of the BIAS potentiometer, with negative (—) meter lead connected to the terminal nearest the outside edge of the front panel.

3. Resistor R106, mounted on the fiber terminal strip near the power transformer, has two adjustable contactor clamps. The adjustable contactor clamp having the short bus-wire jumper attached to it should be adjusted until the VTVM reads 40 volts \pm 1 volt. The clamp should then be tightened.

The other adjustable clamp should be kept tight during this adjustment.

4. Disconnect the positive (+) lead of the VTVM from the BIAS potentiometer, and connect it to the adjustable clamp on R106 which is farthest from the power transformer. Adjust this sliding clamp to obtain a reading of 55 volts on the VTVM, and then tighten the clamp.

5. Reconnect the positive (+) lead of the VTVM to the BIAS potentiometer terminal. The reading obtained should be 40 volts \pm 1 volt. If the reading obtained is not within this tolerance, the complete procedure should be repeated to bring the reading within the tolerance limits.

After either R106 or the BIAS potentiometer, R107, has been replaced, the panel calibration of the BIAS control should be checked as follows:

1. Set the panel controls to the following settings:

Fil	Fil	Grid	Plate	Screen	Cath	Suppr	RG	Bias
J	R	3	5	6	2	0	65	24

2. Insert the negative lead of the VTVM (or 20,000-ohms-per-volt voltmeter) into pin 3 of the octal socket, and the positive lead into pin 1. A reading of 4.3 volts should be obtained, and should coincide with a BIAS control setting of 24. If a reading of 4.3 volts is not obtained, adjust the potentiometer slightly until the meter indicates this value; then loosen the BIAS control knob, set it to 24, and tighten.

REPLACEMENT PARTS LIST

REFERENCE SYMBOL	DESCRIPTION	SERVICE PART NO.
C101	Condenser, paper, .1 mfd, 400v	30-4650-47
C102	Condenser, mica, 470 mmfd	60-10475017
C103	Condenser, mica, .0027 mfd	60-20275404
C104	Condenser, electrolytic, 500 mfd, 10v working	30-2417-31
C105	Condenser, mica, .0027 mfd	60-20275404
C106	Condenser, mica, .001 mfd	60-20105411
F101	Fuse, line (lamp, type 81)	AD-2807
F102	Fuse, bias (lamp, type 47)	34-2068
I101	Lamp, pilot (type 47)	34-2068
I102	Lamp, short test (neon, type NE45)	34-2482
J102	Jack, grid, pin, black	27-6299-1
J103	Jack, plate, pin, red	27-6299
J104	Jack, noise test, pin, black	27-6299-1
J105	Jack, noise test, pin, black	27-6299-1
M101	Meter, 500 ua	45-1916-4
R101	Resistor, 1800 ohms, 10 w	33-1336-61
R102	Resistor, 1200 ohms, 1 w	66-2124240
R103	Resistor, 15,000 ohms, 1 w	66-3154240
R104 and R105	Potentiometer, dual, 150 ohms	45-3263
R106	Resistor, slide ohms, 2 taps, 8500 ohms, 10 w	45-3245
R107	Potentiometer, 3000 ohms	45-3261
R108	Resistor, 180,000 ohms, 1/2 w	66-4188340
R109	Resistor, deposited carbon, 10 ohms	33-1346-38
R110	Resistor, 270,000 ohms, 1/2 w	66-4278340
R111	Resistor, 47,000 ohms, 1/2 w	66-3478240
R112 and R113	Resistor, center-tapped, 100 ohms, 10 w	45-3245-1
R114	Resistor, deposited carbon, 150 ohms	33-1346-43
R115	Resistor, deposited carbon, 41 ohms	33-1346-40
R116	Resistor, deposited carbon, 109 ohms	33-1346-41
R117	Resistor, deposited carbon, 41 ohms	33-1346-40
R118	Resistor, deposited carbon, 109 ohms	33-1346-41
R119	Resistor, deposited carbon, 122 ohms	33-1346-42
R120	Resistor, deposited carbon, 30 ohms	33-1346-39
R121	Resistor, 47 ohms $\pm 10\%$, 1/2 w	66-0478340
R122	Resistor, 47 ohms $\pm 10\%$, 1/2 w	66-0478340
R123	Resistor, 47 ohms $\pm 10\%$, 1/2 w	66-0478340
R124	Resistor, 215,000 ohms	33-1346-36
R125	Potentiometer, 200 ohms	45-3262
R126	Resistor, 27,000 ohms $\pm 5\%$, 1/2 w	66-3278240
R127	Resistor, 1 megohm $\pm 10\%$, 1/2 w	66-5108340
R128	Resistor, deposited carbon, 135 ohms	33-1346-44
R129	Resistor, 500 ohms	33-1346-37
R130	Resistor, 500 ohms	33-1346-37
S101	Switch, filament	45-3252
S102	Switch, filament	45-3252
S103	Switch, grid	45-3252
S104	Switch, plate	45-3252

REPLACEMENT PARTS LIST

REFERENCE SYMBOL	DESCRIPTION	SERVICE PART NO.
S105	Switch, screen	45-3252
S106	Switch, cathode	45-3254
S107	Switch, suppressor	45-3254
S108	Switch, short test	45-3255
S109	Switch, meter reverse, slide	42-1795-1
S110	Switch, life test	45-3243
S111	Switch, power	45-3243-1
S112	Switch, microphone	45-3257
S113	Switch, filament, 20-position	45-3256
S114	Switch, pushbutton	45-3258
T101	Transformer, power	45-3266
VI01	Tube, rectifier, type 5Y3GT	
VI02	Tube, rectifier, type 83	
X101	Socket, octal (5Y3GT rectifier)	45-3248-1
X102	Socket, 4-pin (83 rectifier)	45-3248
X103	Socket, 4-pin	45-3244
X104	Socket, 5-pin	45-3244-1
X105	Socket, 6-pin	45-3244-2
X106	Socket, 7-pin and lamp	45-3251
X107	Socket, octal	45-3244-3
X108	Socket, Loktal	45-3244-4
X109	Socket, 7-pin miniature	27-6203-1
X110	Socket, acorn	45-3250
X111	Socket, 9-pin miniature	27-6203-6
X112	Socket, sub-miniature, round	45-3246
X113	Socket, sub-miniature, rectangular	45-3247

MISCELLANEOUS

DESCRIPTION	SERVICE PART NO.
Case, complete	11058
Clip-lead assembly	45-3260
Instructions	78-1767
Jewel, pilot light	45-3242
Knob	54-4281
Knob, push-button, black	45-3273
Knob, push-button, red	45-3273-1
Line cord	41-3821-20
Roll chart	45-3109-1
Window, roll chart	54-5207
Socket assy., pilot lamp	45-3241
Socket assy., bias fuse	45-3241
Socket assy., neon lamp	27-6210
Socket assy., line fuse	45-3259



STANDARD WARRANTY

"We warrant Philco Test Equipment to be free from defects in material and workmanship under normal use and service, our obligation under this warranty being limited to making good any part or parts thereof which shall, within ninety (90) days after delivery of such product to the original purchaser, be returned to us through our distributor with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied, and of all other obligations or liabilities on our part, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of our products.

"In order to receive the benefit of the above ninety (90) day warranty it is required that the product be registered with Philco Corporation. The Registration Card, postage prepaid, attached to this booklet, must be completed and returned to Philco Corporation.

"We reserve the right to make changes in design or to make additions to or improvements upon this product, without incurring any obligation to modify such previously manufactured product.

"This warranty shall not apply to any product which shall have been repaired or altered in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor which has had the serial number altered, effaced or removed. Neither shall this warranty apply to any product which has been connected otherwise than in accordance with the instructions furnished by us."

PHILCO CORPORATION

ACCESSORY DIVISION

PHILADELPHIA 34, PA.

SUPPLEMENTARY TUBE DATA FOR SELDOM ENCOUNTERED TYPES FOR PHILCO DYNAMIC MUTUAL CONDUCTANCE TUBE TESTERS—MODELS 7052 AND 9100

Tube Type	Filament	R-G	Bias	Filament	Filament	Grid	Plate	Screen	Cathode	Suppressor	Press	GM	Notes	Tube Type	Filament	R-G	Bias	Filament	Filament	Grid	Plate	Screen	Cathode	Suppressor	Press	GM	Notes	
0A2	....	50	0	K	P	0	5	0	2	0	P5	....		7W7	6.3	80	0	J	R	6	2	3	7	5	P4	2200	
0D3/VR150	....	62	0	J	P	0	5	0	1	0	P5	....		7X6	6.3	55	0	J	R	0	6	0	7	0	P3	....	Plate No. 1
0Z4	1.1	70	0	J	R	0	5	0	7	0	P2	....	Plate No. 1	7X6	6.3	55	0	J	R	0	3	0	2	0	P3	....	Plate No. 2
0Z4	1.1	70	0	J	R	0	3	0	7	0	P2	....	Plate No. 2	7X7/XXFM	6.3	42	6	J	R	3	2	0	4	0	P4	720	Triode Sect.
1A5	1.5	35	38	J	R	5	3	4	0	0	P4	640		7X7/XXFM	6.3	77	0	J	R	0	5	0	4	0	P1	....	Diode No. 1
1AX2	1.5	15	0	B	S	0	0	0	0	0	P5	....	Cap=P	7X7/XXFM	6.3	77	0	J	R	0	6	0	7	0	P1	....	Diode No. 2
1DN5	1.5	10	33	D	X	6	2	1	0	0	P4	450	Pentode Sect.	7Y4	6.3	33	0	J	R	0	6	0	7	0	P3	....	Plate No. 1
1DN5	1.5	10	0	H	T	6	8	1	0	0	P1	....	Diode Sect.	7Y4	6.3	33	0	J	R	0	3	0	7	0	P3	....	Plate No. 2
1L6	1.5	35	0	D	X	6	2	5	1	8	P1 with P4	640	Pent. Sect.	7Z4	6.3	24	0	J	R	0	6	0	7	0	P3	....	Plate No. 1
1L6	1.5	0	0	D	X	8	1	5	2	6	P1 with P4	400	Osc. Sect.	7Z4	6.3	24	0	J	R	0	3	0	7	0	P3	....	Plate No. 2
1LA6	1.5	48	0	J	R	6	2	5	3	4	P1 with P4	800	Pent. Sect.	8BA8	10.0	83	28	E	V	2	3	0	1	0	P4	2300	Triode Sect.	
1LA6	1.5	0	14	J	R	4	3	5	2	6	P1 with P4	400	Osc. Sect.	8BA8	10.0	87	18	E	V	7	9	8	6	0	P4	3000	Pentode Sect.	
1LB4	1.5	44	46	J	R	6	2	3	0	0	P4	740		8BH8	7.5	81	30	E	V	2	3	0	1	0	P4	2400	Triode Sect.	
1LD5	1.5	33	0	J	R	6	2	3	0	0	P1 with P4	620	Pent. Sect.	8BH8	7.5	84	17	E	V	7	9	8	6	0	P4	2350	Pentode Sect.	
1LD5	1.5	0	0	J	R	0	4	0	0	0	P1	....	Diode Sect.	8BN8	7.5	89	8	E	V	8	7	0	9	0	P4	3700	Triode Sect.
1LG5	1.5	50	15	J	R	6	2	3	4	0	P4	840		8BN8	7.5	79	0	E	V	0	6	0	3	0	P1	....	Diode No. 1
1LN5	1.5	31	11	J	R	6	2	3	4	0	P4	600		8BN8	7.5	79	0	E	V	0	1	0	2	0	P1	....	Diode No. 2
1N5	1.5	31	11	J	R	0	3	4	0	0	P4	600	Cap=G	8CN7	7.5	80	0	E	V	0	2	0	3	0	P1	....	Diode No. 1
2B3	2.0	80	0	J	R	0	0	0	0	0	P5	....	Cap=P. May short on 3.	8CN7	7.5	80	0	E	V	0	1	0	3	0	P1	....	Diode No. 2
2C5 1	6.3	88	20	K	R	7	6	0	8	0	P4	4000	Triode No. 1	8CN7	7.5	56	11	E	V	7	8	0	6	0	P4	960	Triode Sect.	
2C5 1	6.3	88	20	K	R	3	4	0	2	0	P4	4000	Triode No. 2	8SN7	7.5	79	23	J	X	4	5	0	6	1	P4	2080	Triode No. 1	
2E22	6.3	75	40	J	R	3	0	2	4	0	P4	1760	Cap=P	8SN7	7.5	79	23	J	X	2	1	0	3	5	P4	2080	Triode No. 2	
2E26	6.3	84	37	J	R	5	0	3	2	7	P4	2800	Cap=P	9C8	10.0	83	25	E	V	1	2	0	3	0	P4	2125	Triode Sect.	
2T4	2.5	86	40	J	R	2	3	0	5	0	P4	3200		9C8	10.0	74	17	E	V	9	6	7	8	0	P4	1700	Tetrode Sect.	
3A4	2.5	67	36	D	X	8	2	1	0	0	P4	1280		9U8	10.0	80	7	E	V	2	6	3	7	0	P4	2240	Pentode Sect.	
3B2	3.0	68	0	J	R	0	0	0	0	0	P5	....	Short on 3. Cap=P	9U8	10.0	90	12	E	V	9	1	0	8	0	P4	4960	Triode Sect.
3LF4	2.5	67	27	J	R	6	2	3	0	0	P4	1280		10C8	10.0	81	12	E	V	2	1	0	3	0	P4	2100	Triode Sect.	
3Q4	3.0	75	15	H	T	1	2	8	0	0	P4	1720		10C8	10.0	81	12	E	V	8	6	7	9	0	P4	2300	Pentode Sect.	
3Q5	2.5	70	34	J	R	5	3	4	0	0	P4	1440		12A4	12.6	92	25	E	V	2	9	0	1	0	P4	6240		
5AW4	5.0	35	0	H	R	0	6	0	0	0	P3	....	Plate No. 1	12AC6	12.6	34	38	J	R	3	5	6	7	2	P4	575	
5AW4	5.0	30	0	H	R	0	4	0	0	0	P3	....	Plate No. 2	12AE7	12.6	40	19	E	V	7	6	0	8	0	P1	700	Triode No. 1
5AZ4	5.0	17	0	J	S	0	4	0	0	6	P3	....	Plate No. 1	12AE7	12.6	75	0	E	V	2	1	0	3	0	P1	2000	Triode No. 2
5Z4	5.0	22	0	J	S	0	6	0	0	4	P3	....	Plate No. 2	12AF3	Cannot be tested. Top cap is cathode.												
5R4	5.0	40	0	H	R	0	6	0	0	0	P3	....	Plate No. 1	12AJ6	12.6	37	17	J	R	3	7	0	2	0	P4	650	Triode Sect.
5R4	5.0	40	0	H	R	0	4	0	0	0	P3	....	Plate No. 2	12AJ6	12.6	42	0	J	R	3	6	0	2	0	P1	....	Diode No. 1
5Y4	5.0	16	0	J	X	0	5	0	0	0	P3	....	Plate No. 1	12AJ6	12.6	42	0	J	R	3	5	0	2	0	P1	....	Diode No. 2
5Y4	5.0	12	0	J	X	0	3	0	0	0	P3	....	Plate No. 2	12AL5	12.6	78	0	J	R	0	7	0	3	0	P1	....	Diode No. 1
6AF3	Cannot be tested. Top cap is cathode.														12AL5	12.6	78	0	J	R	0	2	0	5	0	P1	Diode No. 2
6AJ5	6.3	80	10	J	R	3	5	6	2	0	P1 with P4	2200		12AL8	12.6	48	33	E	V	8	1	0	9	0	P4	750	Triode Sect.	
6AK4	6.3	72	34	D	W	1	8	0	5	7	P4	1520		12AL8	12.6	42	45	E	V	3	6	2	7	0	P4	500	Tetrode Sect.	
6AK6	6.3	74	20	J	R	3	5	6	7	2	P4	1680		12AT6	12.6	60	10	J	R	3	7	0	2	0	P4	1040	Triode Sect.	
6AN4	6.3	81	22	J	R	2	3	0	5	0	P4	2400		12AT6	12.6	26	0	J	R	3	6	0	2	0	P1	....	Diode No. 1
6AN5	6.3	85	13	J	R	3	5	6	7	0	P1 with P4	3200		12AT6	12.6	26	0	J	R	3	5	0	2	0	P1	....	Diode No. 2
6AQ6	6.3	55	6	J	R	3	7	0	2	0	P4	920	Triode Sect.	12AW6	12.6	81	10	J	R	3	5	6	2	7	P4	2400		
6AQ6	6.3	26	0	J	R	0	6	0	2	0	P1	....	Diode No. 1	12BA7	12.6	31	0	E	V	7	9	1	3	2	P1 with P4	600	Ampl. Sect.
6AQ6	6.3	26	0	J	R	0	5	0	2	0	P1	....	Diode No. 2	12BA7	12.6	31	0	E	V	2	9	1	3	7	P4	600	Osc. Sect.
6AR5	6.3	77	0	J	R	3	5	6	2	0	P4	1920		12BK6	12.6	58	0	J	R	3	7	0	2	5	P4	1000	Triode Sect.	
6AS6	6.3	70	0	J	R	3	5	6	2	7	P4	1440		12BK6	12.6	57	0	J	R	0	6	0	2	5	P1	....	Diode No. 1
6AV5	6.3	85	40	J	R	2	5	7	3	0	P4	3120		12BK6	12.6	57	0	J	R	0	5	0	2	7	P1	....	Diode No. 2
6BC7	6.3	80	0	E	V	0	8	0	9	0	P1	....	Diode No. 1	12BN6	12.6	27	6	J	R	2	7	5	3	6	P4	560	Limiter Grid
6BC7	6.3	80	0	E	V	0	6	0	7	0	P1	....	Diode No. 2	12BN6	12.6	27	0	J	R	6	7	5	3	2	P4	560	Quadrature Grid
6BC7	6.3	80	0	E	V	0	2	0	1	0	P1	....	Diode No. 3	12BW4	12.6	95	0	E	V	0	7	0	9	0	P5	....	Diode No. 1
6BJ7	6.3	82	0	E	V	0	8	0	9	0	P1	....	Diode No. 1	12BW4	12.6	95	0	E	V	0	1	0	9	0	P5	....	Diode No. 2
6BJ7	6.3	82	0	E	V	0	6	0	7	0	P1	....	Diode No. 2	12DK7	12.6	63	69	E	V	1	7	3	2	0	P4	1150	Tetrode Sect.
6BJ7	6.3	82	0	E	V	0	2	0	1	0	P1	....	Diode No. 3	12DK7	12.6	45	0	E	V	0	6	0	2	0	P1	....	Diode No. 1
6BL4	6.3	55	0	J	R	0	2	0	3	0	P3	....		12DK7	12.6	45	0										

BALLAST TUBE TEST INFORMATION FOR PHILCO DYNAMIC MUTUAL CONDUCTANCE TUBE TESTER – MODEL 9100

TO TEST BALLAST TUBES

1. Turn Tester on.
2. Set filament switch to BLST.
3. Set SHORT TEST switch on 1.
4. Set first selector switch (lettered A to K) to letter shown in column marked (first selector switch). Set all numbered selectors on zero.
5. ROTATE second selector switch (lettered P to Z) from P. to Z. NEON LAMP SHOULD LIGHT IN POSITIONS NOTED.

TUBE TYPE	FIRST SELEC-TOR	SECOND SELECTOR				
		NEON LAMP SHOULD LIGHT IN THESE POSITIONS				
1A1, 1B1, 1C1, 1E1, 1F1, 1G1, 1J1, 1K1, 1L1, 1N1, 1P1, 1Q1, 1R1G, 1S1G, 1T1G, 1U1G, 1V1, 1Y1, 1Z1, 2	J	R				
2UR224	J		T			X
2LR212	H	R	S		U	
3	J	R				
O3G	J		T			
4, 5	J	R				
6, 133	J		T			
6, 6AA	J	R				
7, 8, 9	J	R				
10A, 10AG	J		T			
10AB	J		T			X
K17B, M17C, BM17C	J		T			X
M17HG, M17H	J					
	D	R	S			X
K23B, K23C, KX23B, KX30C	J		T			X
M30H	J					
	D	R	S			X
30A, K30A	J		T			
K30D	J	R	T			X
33A, 33AG	J		T			
K34B	J		T			X
36A	J		T			
K36B, BK36B, L36C, KX36C	J		T			X
KX36A	J		T			X
36D, L36D	J	R	T			X
L36DJ	J	R	T	U		X
K36H, M36HG	J					
	D	R	S			X
L40S1, L40S2	J	R	T		V	
42A	J		T			
42A1	H			U		
42A2, 42B2	H		S	U		
K42B, L42B, M42B, KX42B, LX42B, L42BX, K42C, L42C, M42C	J		T			X
KB42D, K42D, L42D	J	R	T			X
LX42D, L42DX	J	R	S	T		

TUBE TYPE	FIRST SELEC-TOR	SECOND SELECTOR				
		NEON LAMP SHOULD LIGHT IN THESE POSITIONS				
K42E, L42E	J		T			X
L42F	J					
	D	R				X
42HA, K42HJ, M42H, M42HG	J					
	E	R	S	T		X
LX42C	J		T			X
L42S1	J	R	T		V	
49A, 49AJ, K49AJ	J		T			
KX49A	J		T			X
49A1	H			U		
49A2, 49B2	H		S	U		
K49B, L49B, M49B, BM49B, K49C, M49C, BM49C, BK49C, K49E, L49E	J		T			X
K49D, BK49D	J		T			X
L49F	J					
	D	R				X
M49H, M49HG	J					
	D	R	S			X
KZ49B, KZ49C	J	R			V	
K49BJ, L49BJ	J		T	U		X
L49S2	J	R	T		V	
49AJ, K49AJ	J		T			
KX49B, LX49C	J		T			X
L49DJ	J	R	T	U		X
L49S3	J	R	T		V	
50A2	J	R	T			
50A2MF, 50B2	J	R			V	
50X3	J	R				
K52H, M52H	J					
	D	R	S			X
K54B	J		T			X
55A, K55A	J		T			
55A1	H			U		
KX55A	J	R				
55B, K55B, M55B, BM55B, L55BG, LX55B	J		T			X
55A2, 55B2	H		S	U		
K55C, L55C, KX55C	J		T			X
K55CP	J		T		V	X
K55D, L55D	J	R	T			X
L55E, M55E	J		T			X
L55F, M55F, BL55F	J					
	D	R				X
K55H, M55H, M55HG	J					
	D	R	S			X
L55S1, L55S2	J	R	T		V	X
60R30G	J	R	T			
64.23	J		T			

TUBE TYPE	FIRST SELEC-TOR	SECOND SELECTOR			
		NEON LAMP SHOULD LIGHT IN THESE POSITIONS			
67A	J	T			
K67B, L67B	J	T			X
L73B, K74B, L74B, CX74C	J	T			X
80A	J	T			
K79B, K80B, M80B, K80C, KX80B, L80B	J	T			
K80F	J				
	D	R			X
KX87B, LX87B, L90B	J	T			X
K90F, M90F, K92F, M92F	J				
	D	R			X
92A	J	T			
L92B, 95K2	J	T			X
L99D	J	R	T		X
100R8	J	T			X
120R	J	R			
120RS, 135K1	J	T			X
135K1A	J	T	U		X
140L4, 140L8, 140R4, 140R8	J	R	T		
140R	J	R			
140L44, 140R44	J	R	S	T	
165L4, 165R4, 165R8	J	R	T		
165R	J	R			
165L44, 165R44	J	R	S	T	
185L4, 185L8, 185R4, 185R8	J	R	T		
185R	J	R			
185L44, 185R44	J	R	S	T	
200R, 250R	J	R			
250R8, 290L4	J	T			X
300R4, 320R4	J	T			X
340	J	R			
808, 1	J	T	U		X
E14980, W43357, W4588, 3613	J	T			X
3334, 3334A	J	R	T		X

TUBE TYPE	FIRST SELEC-TOR	SECOND SELECTOR				
		NEON LAMP SHOULD LIGHT IN THESE POSITIONS				
8593, 8598, 8601, 8664	J	T				X
3ER248	J	R	T	U		X
3CR241	J	R	T			X
B9M15822	B	T				
	E				V	
	G					X Y
B9M16067	J	R	T	V	W	X
B9M16275	B	T	U	V	W	X Y
B9M16534	J	R	T	V	W	X
B9M17571	H	R	T			
	J			U	V	X
B9M18941	B	S	T			
	E				V	
	G					X Y
17A470303	J	R	S		V	
	D			U		
	G					X
17A485459	J	R	S		W	
	D			U		
TBR102D	B	S	T	U	V	
	G					X Y
TBR103D	B	S		U	V	
	G					X Y
TBR104D	B	S	T	U	V	
	G					X Y
397021	B	S	T			
397022	E				V	W
397023	J					X
397036	C				V	
407100	J	R	S		V	
408100	J	R	S		V	
	D			U		
SW507300	J	R	T		V	W X
571606	B	S	T			
	E				V	W
	J					X



PHILCO CIRCUIT MASTER
Model M-8100



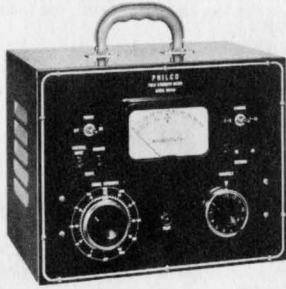
PHILCO CIRCUIT TESTER
Model M-8102



PHILCO 3" OSCILLOSCOPE
Model S-8200



PHILCO 5" HIGH GAIN OSCILLOSCOPE
Model S-8202



PHILCO FIELD STRENGTH METER
Model M-8104



Philco UHF Matching Transformer
Model T-1000



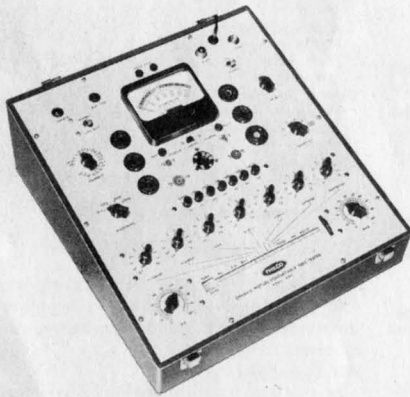
Philco UHF Variable Attenuator
Model A-1000



PHILCO UHF SWEEP SIGNAL GENERATOR
Model G-8002



PHILCO SIGNAL GENERATOR ADAPTER
Model G-8000C



PHILCO MUTUAL CONDUCTANCE TUBE CHECKER
Model 9100



PHILCO ALIGNMENT GENERATOR
Model 7008



PHILCO TELEVISION PATTERN GENERATOR
Model G-8005

PHILCO TEST EQUIPMENT—Applications and Specifications

Model M-8100

This rugged metal-cased vacuum tube voltmeter is one of the finest in its price class. It is designed to meet rigid engineering specifications.

AVC, Bias Measurements

This type of unit is unexcelled for making measurements in AVC, bias, oscillator, and other high impedance circuits where test instrument loading effect must be kept to a minimum.

Discriminator Alignment

The galvanometer center mark (zero center) is useful for discriminator alignment in FM and TV receivers where plus and minus indications are required.

RF and IF Measurements

May be used with high frequency probe Philco part No. 45-1752-1 to extend its frequency range for measuring RF and IF circuits.

High Voltage Measurements

May be used with high voltage probe

Philco part No. 45-1753-1 to measure voltages up to 22.5 KV.

SPECIFICATIONS

Operating Voltage—105-125 volts: 60 cycles.

Basic Circuit—Balanced difference amplifier. Miniature double triode.

Voltage Ranges (DC)—1.5, 15, 150, 450, 1500 volts.

Voltage Ranges (AC)—1.5, 15, 150, 450, 1500 volts. 1.5, 15, 150 volts AC RMS and peak—compensated to same frequency response.

Circuit Switch Positions—Off, + DC volts, — RMS volts, peak volts, ohms.

Ohms Ranges—Full Scale, 100 times center. RX1—10 ohm center. RX100—100 ohm center. RX1000—10,000 ohm center. RX-10,000—100,000 ohm center. RX1 meg.—10 megohm center.

Decibels—20 to +65 on AC peak. Reference level 1 milliwatt, 600 ohms—Zero level.

Internal Resistance—AC volts (RMS and peak), 5 megohms. DC volts, 10 megohms.

External Adjustments—Zero adjust and ohms adjust.

Tube Compl.—1-12AU7.

Weight—4 lbs., Shipping Weight—4½ lbs.

Part No. 45-1902

Suggested Dealer Net \$64.95

Model M-8104

This unit provides direct readings of signal strength in microvolts. The novel calibration of the instrument permits the checking of either fringe or strong signal areas.

Probing for Signal

It can be used to check or probe an area for maximum signal.

Sensitivity Checks

RF units, such as boosters, may be accurately checked for relative sensitivity.

Scope Provisions

The 'scope monitor provision makes possible location of r-f interference which can be seen on the picture signal as well as observation of any signal being measured.

SPECIFICATIONS

Tuner

Semi-incremental wafer-switch type.

Tubes Used

Code 121 (Tuner No. 76-7070-4)

1—12AV7

1—6BZ7

Code 122 (Tuner No. 76-7070)

1—12AV7

1—6BZ7

Code 122 (Tuner No. 76-6777-2)

1—12AV7

1—6BQ7

Code 123 (Tuner No. 76-5747)

1—12AV7

1—6CB6

Code 124 (Tuner No. 76-7664-2)

1—12AZ7

1—6BZ7

All Codes

1-6CB6 1 ST IF

1-6CB6 2 nd IF

1N34 Crystal Diode

Meter

50 microamp. 4½" Type.

PHILCO TEST EQUIPMENT—Applications and Specifications

Power Supply
Voltage Rating—105-125 V a.c.
Freq. Rating—50-60 CPS
Power Consump.—65 watts

Dimensions
Depth 8 1/2", Height 10", Width 13"
Weight—16 1/2 lbs.,
Shipping Weight—19 lbs.
Part No. 45-1907
Suggested Dealer Net \$109.95

Model 9100

By means of actual transconductance checks, the true dynamic characteristics of all type of tubes can be accurately checked with this unit.

Checking Shorts

Shorts on tube elements can be determined.

Tube Life

The tube-life can be accurately predicted with this unit.

Gain

Gain characteristics can be measured.

SPECIFICATIONS

Types of Tubes Checked
All Receiving Tubes
Low Powered Acorn Transmitting Tubes
Miniature Hearing Aid Type Tubes

Type of Case

Gray Leatherette on Wood—Cover included

Power Supply

Voltage Rating—110 to 120 V a.c.
Frequency Rating—60 CPS
Power Consumption—60 watts

Tube Compl.

1—83 1—5Y3

Weight—21 1/2 lbs.,
Shipping Weight—24 lbs.
Part No. 45-3211

Model M-8102

This metal-cased unit fulfills the need of the average serviceman for a reliable, general purpose voltohmmeter.

Accuracy

The use of precision 1% resistors throughout insures good accuracy.

AC and Audio Ranges

The highly versatile AC voltage ranges allow for accurate testing of audio and high impedance AC circuit where a vacuum tube voltmeter might normally be required.

High Impedance Input

The high internal impedance allows for direct measurement of low voltage, high impedance circuits, even on the low voltage ranges.

SPECIFICATIONS

Voltage Ranges DC—(20,000 ohms per volt) 2, 5, 10, 50, 250, 1000, 5000 volts.
Voltage Ranges AC—(1000 ohms per volt) 2, 5, 10, 50, 1000, 5000 volts.
A.F. Output—2, 5, 10, 50, 250, 1000.
Volume Level—12 to +55 db (5 steps).
Resistance—RX1—12 ohms center—2000 full scale. RX100-1200 ohms center—200,000 full scale. RX10,000-120,000 ohms center—20 megs. full scale.
Current—100 microamperes; 10, 100, 500 milliamperes; 10 amperes.
Weight—3 lbs., Shipping Weight—3 1/2 lbs.
Part No. 45-1903
Suggested Dealer Net \$49.95

Model G-8002

The high output level of the Model G-8002 makes possible testing and alignment of low gain units such as UHF tuners, boosters, converters, etc.

Level

The output is controllable and the leakage is negligible making possible overall trouble-shooting of UHF TV receivers, from the antenna terminals to the output of the video detector. The Philco UHF Variable Attenuator, Model A-1000, Part Number 45-1984, may be used for additional external attenuation.

Alignment

It may be used with any test oscilloscope for sweep alignment purposes. The Philco UHF Matching Transformer, Model T-1000, Part Number 45-1983 may be used for accurate matching to a 300 ohm input.

Sensitivity

It may be used for checking the relative sensitivity of any kind of UHF device, by taking advantage of the exclusive built-in monitoring system.

SPECIFICATIONS

Output
Minimum of 1V Peak to Peak (Blanked)
Flatness of Sweep
±1DB over Entire Range (470-890MC) due to exclusive electronic leveling circuit.

Frequency Coverage
470—890MC on Fundamentals.

Output Impedance
72 Ohm Unbalanced.

Power Supply
Voltage Rating—110-120 V AC.
Frequency Rating—50 to 60 CPS.
Power Consumption—30 watts.

Monitoring
Built-in monitor circuit gives rectified output of UHF generator.

Sweep Width
Continuously Variable.
Minimum of 25 MC at low end, 50 MC at high end.

Blanking
Adjustable, can be turned off by switch.

Phasing
Adjustable 0 to 140°.

Tube Compl.
1—12AV7 1—6X4
1—12AT7 1—6AQ5
1—6AF4

Part No. 45-1956
T-1000—Part No. 45-1983
Suggested Dealer Net \$14.95
A-1000—Part No. 45-1984
Suggested Dealer Net \$20.00
G-8002—Part No. 45-1956
Suggested Dealer Net \$289.50

Model 7008

An outstandingly accurate visual generator that meets servicing alignment and calibration needs by "Combining in one economical instrument," functions that ordinarily must be approached with cumbersome costly conventional devices. No special scope connections are required with this unit for alignment use.

RF and IF Trouble-shooting

The scope sensitivity is high enough to allow for RF and IF circuit trouble-shooting.

Low Level Devices

The extremely high RF output allows for direct alignment of such low level amplifying devices as boosters, RF amplifiers, tuners, etc.

One Output Lead

The one output lead feature allows for simple connections for r-f and i-f alignment work where both marker and sweep signals are required.

SPECIFICATIONS

AM-Marker Generator—3.2 to 250 MC
FM Generator—4 to 120MC, 145-260MC
Sweep Width—0 to 15MC
Output Voltage—App. .5 Volts
Flatness of Sweep—0.2 DB/MC
Vert. Scope Sens.
25 Millivolts/inch XTAL Cal. for Marker

Power Supply
Voltage Rating—110-120 V PUC
Freq. Rating—60 CPS
Power Consumption—70 watts

Tube Compl.
1—5Z4 2—6AK5
2—6X4 2—7F7
4—6C4 1—3MP1
1—6J6

Weight 35 lbs.
Shipping Weight—40 lbs.
Part No. 43-4922
Suggested Dealer Net \$466.00

Model S-8200

The Philco Model S-8200 Oscilloscope is a portable unit adaptable to either bench use or field servicing. It is a high sensitivity instrument with wide response, ideal for TV.

TV Sync Circuits

The excellent frequency response makes this unit ideal for sync circuit trouble-shooting.

TV Sweep Circuits

The preset frequencies at vertical and horizontal rates takes the guesswork out of trouble-shooting sweep circuit.

Video Circuit

The DC coupled amplifier circuits make

video circuit trouble-shooting realistic by using Auxiliary probes.

Alignment Work

The scope may be used for an external indicator for sweep generator work, due to the incorporated phasing control.

DC & AC Voltage Measurements

The use of a UC amplifier and built-in voltage calibrator permits the use of the unit as a high sensitivity vacuum tube voltmeter.

SPECIFICATIONS

Vertical Amplifier
Sensitivity—Direct Cable—0.05V rms/inch
Low Capacity Probe—0.5V rms/inch
Frequency Response—0.750 KC within 2DB, 0-1 mc/s within 6DB.
Input Resistance and Capacity, without cables; 1 megohm shunted by 25 uuf low capacity probe, 1 megohm shunted by 10 uuf.

Power Supply
Voltage Rating—105-125 V a.c.
Frequency Rating—50-60 cps
Power Consumption—50 watts

Dimensions
6" W x 12" L x 7" H

Horizontal Amplifier
Sensitivity—0.5 V rms/inch
Frequency Response 20 cps to 80 KC/s within 2DB, 10 cps to 125 KC/s within 6DB.
Input Resistance and Capacity 0.5 megohm shunted by 35 uuf.

Sweep Circuit Frequency
Variable—15 to 30,000 cps
Preset—VTV, 30 cps. HTV, 7,875 cps.

Tube Compl.
1—12AV7 1—6X4
2—12AT7 1—1V2
1—12AX7 1—3RP1
1—6J6

Weight—12 1/2 lbs.,
Shipping Weight—15 lbs.
Part No. 45-1919
Suggested Dealer Net \$149.50

Model G-8000C

The Model G-8000C is an adapter unit for changing the output of any VHF TV servicing test equipment to UHF. The adapter unit can be used as a converter to change UHF signals to VHF signals to operate a VHF TV receiver.

UHF Transmission

The unit can be modulated by incoming VHF at 60 MC to produce a UHF signal on any UHF station, which contains the original modulation of the VHF signal.

High Output

The relatively high output permits alignment of low level equipment such as tuners and converters.

Relative Sensitivity

Relative sensitivity checks can be made for UHF devices with this unit.

UHF Field Strength Tests

Any VHF field strength meter can be adapted for UHF with this unit.

SPECIFICATIONS

Freq. Range
470 to 890 MC/s. Chan. 14 to 83

Conversion Range
Converts VHF Signal Generator from 60 MC to any UHF Channel or any UHF Channel down to VHF.

Dial Calibration

Individually calibrated for an accuracy at the video carrier of each channel of ±1/2% with 60MC at input.

Tubes

1—6AF4 UHF osc.
1—6X4 Full wave rect.
1—CP-1 Special UHF Mixer Crystal

Connectors

72 ohm (input)
300 ohm dual
Binding Post (output)

Bandwidth

App. 15MC

Channel Dial

Combination Vernier and Pointer Dial

Power Supply

Voltage Rating—110 to 120 V AC.
Freq. Rating—60 CPS.
Power Consumption—20W.

Part No. 45-1920
Suggested Dealer Net \$169.50

Model G-8005

This unit has very efficient circuits which allow extreme stability and high output at low cost.

Linearity & Width

Adjustment of all linearity, height and width controls is made easy.

Beam Bender

Adjustment of the beam bender or ion trap is made easy.

Deflection Yoke

Adjustment of the deflection yoke is accomplished by checking "levelness" of horizontal lines.

Centering

Picture centering is also simple to perform.

Focusing

The white dot on black background pattern allows for the simplest system for focusing the TV set.

Sync Circuits

The model G-8005 provides pulses which can be used for sync circuit trouble-shooting.

High Output

The extremely high RF output allows for RF trouble-shooting. Video output is supplied for checking video circuits.

SPECIFICATIONS

Freq. Range
Chan. 2 through 6.
Other channels by use of harmonics.

RF Output
200,000 Microvolts Maximum

Hor. Lines
App. Range from 3 to 15

Ver. Lines or Vert. Dot Rows
App. Range from 10 to 20 by adj. of rear control, which is normally set for 12 vert. lines.

RF Output Connector
75 ohms

Synchronization

Built-in Sync Circuit.
Ext. sync for more accurate Synchronization.

Power Supply

Voltage Rating—100 to 125 V a.c.
Freq. Rating—60 CPS
Power Consumption—10 watts.

Tube Compl.
1—12AU7 2—XTAL 1N34
Part No. 45-3204
Suggested Dealer Net \$99.50

Model S-8202

This general purpose scope performs the job of providing a highly sensitive instrument with good frequency response.

TV Sync Circuits

The unit has excellent sensitivity and frequency response which will allow for trouble-shooting difficult sync troubles.

TV Sweep Circuits

The unit has wide sweep ranges (up to 100KC) allowing for extreme flexibility in sweep circuit trouble-shooting.

RF Circuits

In conjunction with a high frequency probe, the high sensitivity of .01V (RMS) per inch deflection allows for trouble-shooting of RF and IF systems and low level amplifying devices.

Alignment Work

A built-in phasing control allows for 60CPS phasing of sweep generator presentations.

SPECIFICATIONS

Vertical Amplifier

Sensitivity .01V (RMS) per inch of deflection.
Freq. Response—10 CPS to 1 MC within 6DB.

Horizontal Amplifier

Sensitivity—.3V (RMS) per inch of deflection.
Freq. Response—10 CPS to 300KC.

Size

Cabinet—16" deep, louvered.

Tube Compl.

2—6J5 2—5Y3GT
1—6C4 1—5CP1 (Code 121)
4—12AT7 1—5BP1 (Code 122)

Part No. 45-1905
Suggested Dealer Net \$159.95

For further detailed information see your PHILCO Distributor