

OPERATING INSTRUCTIONS

FOR

***PHILCO Model 9200***

TUBE TESTER



PHILCO CORPORATION

PHILA., PA., U.S.A.

PHILCO MODEL 9200  
®  
TUBE TESTER

The Philco Model 9200 Tube Tester is a modern, lever operated, emission type tube checking instrument. Its test parameters have been designed in accordance with time proven emission testing principles evolved through practical testing of radio and television tubes.

MODEL 9200 FEATURES AND SPECIFICATIONS

ACCOMMODATES ALL SERIES STRING AND OTHER UP-TO-DATE TYPES:- 17 individual filament voltages from .75 to 110 volts. Tests button 9 pin tubes, loktals, single-ended (TV and FM amplifiers), regular octals, miniature 7 pin types, etc.

OPEN ELEMENT TESTS:- This special test facility supplements the primary Emission Test.

LEVER ELEMENT SELECTOR-DISTRIBUTION SYSTEM:- This important PHILCO feature provides complete flexibility and anti-obsolescence assurance due to changing and new tube basing terminations.

TRIPLE-WINDOW, HIGH SPEED, GEAR-OPERATED ROLLER TUBE CHART.

INDEPENDENT FILAMENT TERMINAL SELECTION:- Locates terminals of all filaments (single, double, center-tapped) regardless of rotating pin positions.

VISIBLE FILAMENT CONTINUITY TESTS:- Rapidly shows up open filaments including open sections of tapped filaments.

TESTS SPECIAL TUBES:- Tests special-purpose tubes and gas rectifier types such as OY4, OZ3, OZ4, and remote control gaseous types such as OA4.

TESTS MULTI-SECTION TUBES:- Individual tests for each section of multi-section tubes,(where required). Visible "eye" tests of cathode ray indicator tubes.

HOT CATHODE LEAKAGE TESTS:- Reliable, sensitive neon method quickly shows up poor cathode structure in accordance with leakage specifications of tube manufacturers.

INTER-ELEMENT SHORT TESTS:- Made universally simple through the use of the PHILCO master-lever distribution system.

PILOT LIGHT TESTS:- All miniature screw-base and bayonet type lamps.

METER:- Large, easy-to-read, clear-plastic cased meter. Accurately balanced and factory-calibrated to within  $\pm 2$  percent. Rugged, double-jeweled D'Arsonval type.

MICRO-LINE ADJUSTMENT:- Read directly on meter. Continuously variable, heavy-duty line-voltage control.

TEST CIRCUITS COMPLETELY TRANSFORMER-ISOLATED FROM POWER LINE:- Assures utmost safety to operator and instrument.

DEEP ETCHED, SATIN FINISHED ALUMINUM PANEL FOR LIFETIME LEGIBILITY.

DESCRIPTION AND FUNCTIONS OF PANEL CONTROLS AND SWITCHES

1. "Adjust Line" Control - This control compensates for variations in power line voltage from 105 volts to 125 volts. The use of this control also compensates the test circuits for regulation effects produced by the test of heavy drain filaments. The "Line-Off" position of this control functions as the "On-Off" Switch for this instrument.
2. Switch "A" - This 4 position switch selects predetermined plate potentials and loads for the wide variety of tubes to be tested.
3. Switch "B" - Filament Selector Switch - 17 filament positions from .75 to 110 volts are selected through the use of Switch "B".
4. Master Lever Switch Assembly - Any lever thrown from the "Normal" up to Position "C" connects the corresponding numbered tube element to its proper filament return termination. If, for example, the filament terminations of the tube are pins 3 and 4, either lever 3 or 4 will be thrown to the "C" position, thereby connecting that filament termination to a proper filament voltage as selected by Switch "B". Any lever thrown to the "Test" position performs either or both of the two following functions:-
  - a) With the "Read Meter" Button undepressed, any lever thrown to the "Test" position will throw its corresponding tube element into the "Shorts" or "Leakage" test circuit. The element corresponding to the numbered lever is thereby being tested for Short or Leakage against any or all of the remaining tube elements.
  - b) With the "Read Meter" Button depressed, any numbered lever thrown to the "Test" position connects its corresponding tube element to the meter indicating circuit for Emission Test. Under these conditions, any lever thrown to the "Test" position becomes a "Plate" element. (In an Emission Test circuit, all elements other than cathode and/or filament are thrown into the "Test" position for the Quality Test.)
5. Control "D" - This control is meter sensitivity potentiometer which shunts the indicating meter to provide the proper meter range for each type of tube being tested. With this "D" Control set to zero for example, maximum Emission Current will be flowing through the tube under test for a particular meter reading. With the control set in the region of 45 to 50 for example, Emission Current through the tube is much less for the same meter indication as in the previous example.
6. "Read Meter" Button - With this button in the undepressed position, the instrument when energized will be automatically set up to indicate line voltage at the "Adjust Line" indication on the Line Meter. In the same undepressed position, this switch sets up the instrument for Short, Leakage and Continuity tests to be performed by the Master Lever Switch. With this switch depressed, the circuits of the instrument are converted to permit a final Emission Test of tubes as will be set up by the Master Lever Switches.
7. Model 9200 Meter - The three color scale of the 9200 Meter directly indicates Emission Quality of tubes being tested. In addition, the 0 - 100 linear scale can be used as supplementary indication to compare Emission readings of similar or identical types of tubes. The "Adjust Line" indication is used to compensate for the variations in power line voltage and regulation effects caused by the load presented to the instrument by high current filaments.
8. The pin straighteners in the upper right area of the panel are used to straighten the pins of 7-pin and 9-pin miniature tubes before inserting these tubes in their respective sockets.

### OPERATING INSTRUCTIONS

A variety of tests may be performed with your PHILCO Tube Tester, and these are outlined below. Use these steps as a guide when setting up the instrument for tube testing.

#### (A) TUBE TEST INSTRUCTIONS

1. Connect power cord to 110-125 volt, 50-60 cycle source.
2. Rotate the three-window roll chart to the listing of the tube to be tested.
3. Refer to the chart, and set switches "A" and "B" to the positions indicated under the "A" and "B" headings.
4. Throw the lever switch indicated under the "C" heading to the "C" row. All other lever switches remain in the "NORMAL" row at this time.
5. Set Control "D" to the position indicated under the "D" heading.
6. Rotate the "ADJUST LINE" control to turn the instrument ON. Set the "ADJUST LINE" control so that the pointer lines up with the "ADJUST LINE" marking on the meter.
7. Insert the tube in the proper socket and allow to heat.

NOTE: Filament continuity may be checked at this point as follows:

Move the lever switch, which was previously set to the "C" row, down to the "TEST" row, and then back to "C". The neon lamp (marked SHORTS, FIL., CONT., AND LEAKAGE) should glow when the lever is in the "TEST" position. If no glow is observed, reject the tube without further test. Disregard any momentary neon lamp flashes as the levers are moved. These flashes are merely due to the discharge of the blocking capacitor in the short check circuit.

8. Reset the "ADJUST LINE" control, if necessary, to align the pointer over the ADJUST LINE marking on the meter.

NOTE: Variations in line voltage due to other electrical equipment may make occasional re-adjustments of this control necessary.

9. Throw all lever buttons indicated under the "CATH SHORTS" heading (usually one Button) simultaneously to the "TEST" row and then back to the "NORMAL" row. The neon lamp should not glow when these levers are in the "TEST" position. If glow is obtained, a cathode short exists and the tube should be rejected. (The tube should be lightly tapped during this test to expose any intermittent shorted conditions.)
10. If there are elements to be continuity-tested (indicated by a note under the row of test data), throw whatever levers are indicated one at a time to the "TEST" row and then back to the "NORMAL" row. The neon lamp should glow when each lever is in the "TEST" position.
11. Throw each lever switch listed under the "TEST" heading up to the "TEST" row, one by one, in the order listed on the roll chart. Observe the neon lamp as each lever is thrown. It should not glow, unless otherwise indicated on the roll chart. If the lamp does glow, a shorted condition is indicated and the tube should be rejected. (The tube should be lightly tapped during this test to expose intermittent shorts.)

12. When all indicated levers are in the "TEST" position, press the "READ METER" button and observe tube quality on the meter.

**NOTE:** Should an open condition exist with one or more elements in the tube, a REPLACE indication will usually be obtained during the quality test. However, it is possible that certain elements in some tubes could be open-circuited and a GOOD indication still be obtained on the meter. In any event, open conditions may be readily ascertained during the quality test by holding the "READ METER" button down and throwing each of the levers in the "TEST" position one by one down to the "NORMAL" position and then back to the "TEST" position. Elements that are satisfactory (properly connected to their pins) will be indicated by a slight decrease in the meter reading when their corresponding levers are thrown to the "NORMAL" position. If an element is open-circuited, NO change whatsoever in the meter reading will be noted as the corresponding lever is actuated. **IMPORTANT NOTE:** On tubes which have an "Ignore Glow" note, each lever mentioned in the note must be thrown to "Normal" simultaneously with the next succeeding number listed in the "Test" Column. For example: For tube type 6T4, the roll chart reads:

					CATH	
	A	B	C	D	SHORTS	TEST
	2	8	3	22	5	●1726
	●(6T4 - Ignore glow on 12)					
	(6T4 - Cont. test - 1267)					

In this case, rather than throwing 1726 to "NORMAL" individually, Lever 1 must be thrown simultaneously with Lever 7, and 2 with 6.

(B) SPECIAL TUBE TEST NOTES

1. "EYE TESTS" (Electron ray type indicator tubes)

**NOTE:** For a complete short test on "EYE" tubes, watch for neon lamp glow when the indicated levers are thrown to the "TEST" position, same as is done for all other tubes.

- (a) Single Target Type. This type is typified by types 6E5 and 6G5. For example, the roll chart data for the "EYE" section of type 6E5 appears as follows:

					CATH	
TUBE	A	B	C	D	SHORTS	TEST
6E5	EYE	4	8	1	0	2-4

The following test procedure must be employed:

- Set all switches and controls as indicated on the roll chart for "EYE".
  - Depress the "READ METER" button and observe the circular fluorescent screen which should illuminate completely. Disregard meter indications.
  - Throw the first of the two levers indicated under the "TEST" heading (lever 2 in this example) to the "NORMAL" position. A good tube will now exhibit a typical angular shadow. Return the same first lever to its original "TEST" position and observe closure of the shadow.
- (b) Double Target Type. This type is typified by types 6AD6 and 6AF6. For example, the roll chart data for type 6AD6 appears as follows:

					CATH	
TUBE	A	B	C	D	SHORTS	TEST
6AD6	EYE	4	8	2	0	8
						3-4-5

Test procedure is as follows:

- Set "A", "B", "C" and "D" as indicated on the roll chart.
- Perform cathode short test by throwing lever 8 to the "TEST" position and back to "NORMAL" position, observing neon bulb for short indication while lever is in "TEST" position.
- Set levers 3, 4, and 5 to the "TEST" position and observe neon bulb for short indications.
- Depress the "READ METER" button and observe the circular fluorescent screen which should illuminate completely. Disregard meter indications.

5. Throw the first of the three levers under the "TEST" heading (lever 3 in this example) to the "NORMAL" position. A good tube will now exhibit a typical angular shadow.
6. Throw the second of the three levers under the "TEST" heading (lever 4 in this example) to the "NORMAL" position. A good tube will now exhibit another angular shadow, opposite the position occupied by the first shadow.
7. Return levers 3 and 4 to the "TEST" position and note closure of the shadows.

- (c) FM/AM Tuning Indicator Tubes. An example of this type electron ray tube is type 6AL7, the roll chart data for which appears as follows:

TUBE		A	B	C	D	CATH SHORTS	TEST
6AL7	EYE	4	8	*2	0	8	1-3-4-5-6

\*(6AL7 - Also throw 1-4-5-6 to "C")

Test procedure is as follows:

1. Set "A", "B", "C", and "D" as indicated on the roll chart.
2. Perform cathode short test.
3. Set levers 1, 3, 4, 5, and 6 to the TEST position and observe neon bulb for short indications.
4. Throw levers 1, 4, 5, and 6 to the "C" position.
5. Depress the "READ METER" button, and note the two rectangular fluorescent patterns on the screen of the tube. Disregard meter indications.
6. With the "READ METER" button depressed, throw the second lever listed in the parenthesis note (lever 4 in this example) from its "C" position down to "NORMAL" position. One rectangular pattern should become shorter in length.
7. With the "READ METER" button still depressed, throw the fourth lever listed in the parenthesis note (lever 6 in this example) from the "C" position down to the "NORMAL" position. The other rectangular pattern should then become shorter in length.
8. Throw the third lever listed in the parenthesis note (lever 5 in this example) from the "C" position down to "NORMAL" position. Both patterns should then become shorter in length from the ends opposite to those previously affected. Observe the ends closely as the movement may be slight.

## 2. SPECIAL RECTIFIER TEST (Types 7OA7, 117N7, and 117P7)

Because of unusual internal connections (one side of the filament connects to the plate), the rectifier sections of types 7OA7, 117N7, and 117P7 require special test procedures. Caution must be exercised in performing these tests to minimize the possibility of filament burn-out.

### (a) 7OA7 - Rectifier Section.

1. Set "A", "B", "C", and "D" as indicated on the roll chart.
2. Perform cathode short tests.

3. After the tube has heated sufficiently, throw levers 2, 6, and 7 RAPIDLY to the "TEST" position, and QUICKLY depress the "READ METER" button. The first meter indication obtained is the significant one, since the pointer will quickly recede as the tube filament cools. Make absolutely certain all three levers (2, 6, and 7) are in the "TEST" position before the "READ METER" button is depressed.

(b) 117N7 and 117P7 - Rectifier Section.

1. Set "A", "B", "C" and "D" as indicated on the roll chart.
2. Perform cathode short test.
3. After the tube has heated sufficiently, throw levers 2 and 7 RAPIDLY to the "TEST" position, and QUICKLY depress the "READ METER" button. The first meter indication obtained is the significant one, since the pointer will quickly recede as the tube filament cools. Make absolutely certain both levers (2 and 7) are in the "TEST" position before the "READ METER" button is depressed.

### 3. GAS TYPE RECTIFIERS

When testing gas rectifier types such as OY4, OZ3, and OZ4, it will be noted that the meter pointer will remain in the REPLACE sector for a brief period and then deflect quickly into the GOOD sector. This condition is normal for a good gas rectifier. Should the pointer remain in the REPLACE sector after several seconds have elapsed, then the tube should be rejected.

### 4. PILOT LAMP TESTS

The universal pilot lamp test socket, located in the center of the large seven prong tube socket, will accommodate all miniature screw and bayonet type pilot lamps, Christmas tree bulbs, etc.

Test procedure is as follows:

- (a) Select proper filament voltage by setting switch "B" to one of the following positions:

"B" SWITCH POSITION	VOLTS	"B" SWITCH POSITION	VOLTS
1	.75	10	10.0
2	1.5	11	12.6
3	2.0	12	20.0
4	2.5	13	25.0
5	3.3	14	32.0
6	4.2	15	50.0
7	5.0	16	70.0
8	6.3	17	110.0
9	7.5		

- (b) Leave all levers in the "NORMAL" position. Turn the instrument on, adjust for "LINE", and insert bulb in test socket.

(C) TUBE-BRAND VARIATIONS

In determining the tube test limits for this instrument, considerable time has been spent checking thousands of tubes from production runs. From the information so gathered, the data on the roll chart accompanying this instrument have been compiled.

Due to the fact that extensive research is constantly being made in the television and radio tube industry to improve and stabilize tube characteristics, it is not uncommon for a manufacturer to make a change in the specifications of a particular tube. This change, though perhaps not readily noticeable in set performance, may become apparent when the tube is tested on your PHILCO Model 9200 and necessitate a new test limit for that particular type.

Therefore, should a particular type be found to vary consistently from the assigned average roll chart limits, simply determine the new average setting for Control "D" which will produce a reading of approximately 70 on the 0-100 scale directly below the three color "quality" scale.

Keep in mind that consistently high or low readings for any particular manufacturer's tubes of a certain type are not necessarily indicative of a poorer or better run of tubes nor as a defect in your tube tester.

MAINTENANCE NOTES

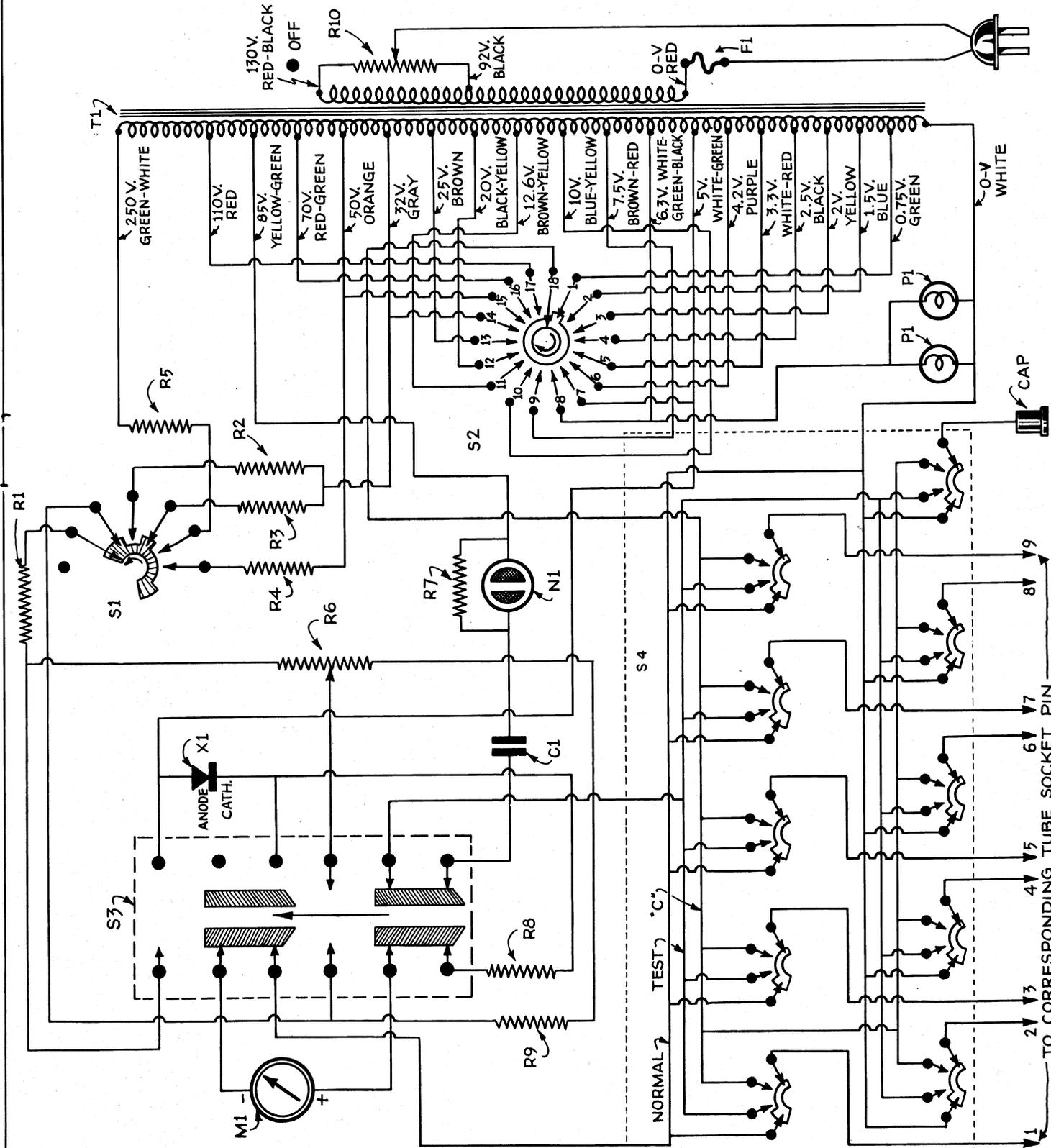
If the instrument does not operate properly, we suggest that the following check procedure be used:-

1. If a meter does not indicate when the "Read Meter" Button is in the undepressed position and the "Adjust Line" function cannot be performed (but indicates NORMAL when the "Read Meter" Button is depressed for tube testing), check the germanium rectifier, the 4000 ohm resistor and all switch contacts involved on this circuit.
2. Check the continuity between lever switch rotor contacts and the various tube socket pins to make sure that all connections are proper.
3. Should failure of the meter movement coil be suspected, the continuity may be checked with an ohmmeter if a limiting resistor of approximately 10K ohms is first connected in series with the ohmmeter test leads. NEVER test meter coil continuity directly with an ohmmeter. Excessive current from the ohmmeter battery will invariably ruin the meter coil and will definitely result in an open condition. DO NOT attempt repair of the meter movement coil at any time. This will automatically void our standard warranty coverage of the meter movement.
4. The clear plastic meter cover may occasionally, through repeated polishing or cleaning, accumulate charges of static electricity. This will cause the pointer to deflect erratically regardless of whether the instrument is turned on or off. These static charges may easily be removed by using one of the commercially available anti-static solutions, or a solution of any good liquid detergent (of the type used for washing dishes) and water. Simply dip a clean, soft cloth in the solution and wipe the surface of the meter cover. The cover need not be removed for this operation.

\* \* \* \* \*

R1	40-Ω
R2	1000-Ω-2W.
R3	200-Ω-2W.
R4	5100-Ω
R5	2000-Ω-7.5W
R6	300-Ω CONTROL "D"
R7	680K-Ω
R8	4000-Ω
R9	22-Ω
R10	300-Ω-2.5W "LINE ADJUST CONTROL"
C1	.047MFD.
F1	1 AMP FUSE
M1	1 MA. METER
N1	NE 51-NEON SHORT INDICATOR
P1	№47 PILOT LAMP
T1	POWER TRANSFORMER
X1	CRYSTAL DIODE
S1	SWITCH "A" SHOWN IN POSITION #1 SWITCH SEQUENCE 1,2,3,4.
S2	SWITCH "B" SHOWN IN POSITION #1 SWITCH SEQUENCE IS AS NUMBERED
S3	READ METER SWITCH
S4	10 SECTION LEVER SWITCH

WIRING DIAGRAM  
PHILCO MODEL 9200  
TUBE TESTER



1 2 3 4 5 6 7 8 9  
TO CORRESPONDING TUBE SOCKET PIN

REPLACEMENT PARTS LIST

Reference Symbol	Description	Service Part Number
C1	Condenser, Tubular - .047 uf, 200 V	30-4650-45
F1	Fuse - 3AG, 1 A	4540
M1	Meter - 1 MA	328-0155
N1	Lamp, Neon (NE-51)	34-2482-1
P1	Lamp, Pilot (#47)	34-2068
R1	Resistor, Film - 40 ohm, 1/2 W, 1%	327-0005-18
R2	Resistor, Wirewound - 1K ohm, 2 W, 5%	327-0005-20
R3	Resistor, Wirewound - 200 ohm, 2 W, 5%	327-0005-19
R4	Resistor, Carbon - 5.1K ohm, 1/2 W, 5%	66-2518240
R5	Resistor, Power - 2K ohm, 7.5 W, 10%	327-0005-21
R6	Potentiometer - 300 ohm, 3 W, 5% ("D" Panel Control)	327-0005-15
R7	Resistor, Carbon - 680K ohm, 1/2 W, 10%	66-4688340
R8	Resistor, Film - 4K ohm, 1/2 W, 1%	327-0005-22
R9	Resistor, Wirewound - 22 ohm, 1/2 W, 10%	327-0005-17
R10	Potentiometer - 300 ohm, 25 W, 20% (Adjust Line Panel Control)	327-0005-16
S1	Switch "A"	327-0005-27
S2	Switch "B"	327-0005-28
S3	Switch, "Read Meter"	327-0005-31
S4	Switch "C" (10-section Lever)	327-0005-29
--	Switch (Single Section of Switch "C")	327-0005-30
T1	Transformer, Power	327-0005-32
X1	Diode, Crystal	327-0005-3

\* \* \* \* \*

MISCELLANEOUS PARTS

Description	Service Part Number
Bracket and Roller Assembly, Roll Chart	327-0005-1
Case and Cover Assembly	327-0005-2
Grommet, Rubber (AC Cord)	327-0005-4
Grommet, Rubber (Short Test Lamp)	327-0005-5
Handle, Case	327-0005-6
Hasp, Case	327-0005-7
Hinge, Case	327-0005-8
Holder, Fuse	327-0005-9
Knob, Controls "A", "B", and "D"	327-0005-10
Knob, Line Adjust	327-0005-11
Knob, Lever Switch	327-0005-12
Knob, "Read Meter"	327-0005-13
Lead and Cap Assembly	327-0005-14
Panel, Front	228-0116
Roll Chart	329-0349
Supplement, Roll Chart (Domestic Tubes)	329-0350
Supplement, Roll Chart (Foreign Tubes)	329-0353
Socket, 4-pin	45-3244
Socket, 5-pin	45-3244-1
Socket, 6-pin	45-3244-2
Socket, 7-pin and Lamp	45-3251
Socket, Octal	45-3244-3
Socket, Loktal	45-3244-4
Socket, 7-pin Miniature	27-6203
Socket, 9-pin Miniature	27-6203-6
Socket Assembly, Short Indicator	327-0005-24
Socket Assembly, Pilot Light	327-0005-23
Straightener, 7-pin Miniature	327-0005-25
Straightener, 9-pin Miniature	327-0005-26
Window, Roll Chart	227-0051
Window and Screw Assembly, Meter	327-0005-33
Instructions	329-0351

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**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 the repair or, at our option, the replacement of any part or parts thereof which shall, within one (1) year 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 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.

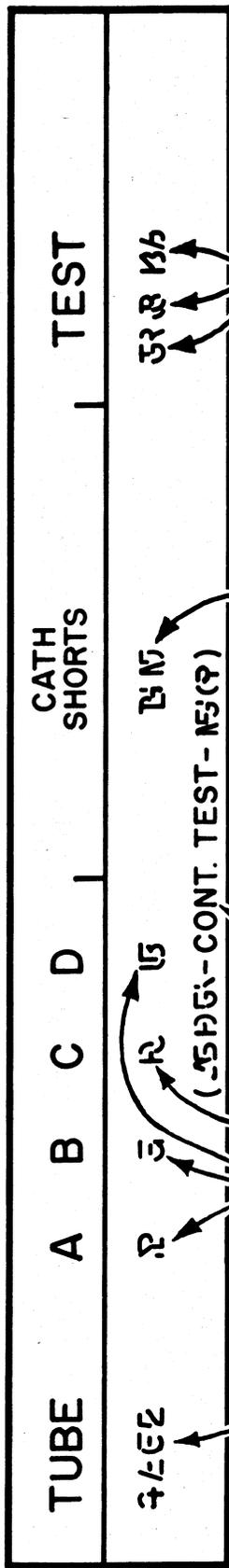
"In order to receive the benefit of the above one (1) year warranty it is required that the product be registered with Philco Corporation. The Warranty Registration Card must be completed and returned to Philco Corporation.

"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, Pennsylvania

CONDENSED TUBE TEST INSTRUCTIONS  
For PHILCO® MODEL 9200



1. TURN ROLL CHART TO TUBE BEING TESTED.

2. SET CONTROLS A, B & D TO NUMBERS SHOWN.

3. SET LEVER LISTED IN "C" COLUMN TO "C" ROW.

4. NOW INSERT TUBE, TURN INSTRUMENT ON, AND ADJUST "ADJ. LINE" CONTROL.

5. TO CHECK FOR FILAMENT CONTINUITY, THROW THE "C" LEVER DOWN TO "TEST" ROW. NEON SHOULD GLOW IF THE FILAMENT IS CONTINUOUS (NOT OPEN CIRCUITED).  
THROW LEVER BACK UP TO "C" ROW.

6. THROW LEVERS IN "CATH SHORT" COLUMN SIMULTANEOUSLY UP TO "TEST" ROW. NEON SHOULD NOT GLOW. (DISREGARD MOMENTARY NEON FLASH).  
THROW LEVERS BACK TO "NORMAL".

7. IF THE DATA INCLUDES A "CONT. TEST" NOTE, THROW EACH LEVER LISTED INDIVIDUALLY UP TO "TEST" ROW, AND THEN BACK TO NORMAL- NEON SHOULD GLOW.  
DON'T FORGET TO THROW EACH LEVER BACK TO "NORMAL" ROW BEFORE CONTINUING TO STEP 8.

8. THROW EACH LEVER LISTED IN "TEST" COLUMN UP TO "TEST" ROW, ONE BY ONE IN THE ORDER LISTED ON THE CHART AND WATCH THE NEON LAMP AS EACH LEVER IS THROWN TO THE "TEST" ROW. NEON SHOULD NOT GLOW (UNLESS OTHERWISE INDICATED ON THE ROLL CHART).  
DISREGARD MOMENTARY NEON FLASHES  
IF A GLOW IS OBTAINED, A SHORTED ELEMENT IS INDICATED AND THE TUBE SHOULD BE REJECTED.

9. WHEN ALL INDICATED LEVERS ARE UP IN THE "TEST" ROW, PRESS THE "READ METER" BUTTON AND READ TUBE QUALITY ON THE METER.

NOTE: ALWAYS RETURN ALL LEVERS BACK TO "NORMAL" ROW AFTER A TUBE TEST HAS BEEN COMPLETED.