RADIO TESTING INSTRUMENTS

- TUBE TESTERS
- MULTIMETERS
- SET ANALYZERS - STATIC
- SIGNAL GENERATORS
- FREQUENCY MODULATORS
- CATHODE RAY OSCILLOSCOPES
- SET ANALYZERS - DYNAMIC
- ASSOCIATED TEST EQUIPMENT

SUPREME INSTRUMENTS CORPORATION
GREENWOOD - MISSISSIPPI - U. S. A.
SUPREME TUBE TESTER
MODEL 89-LD

TECHNICAL DATA

SUPREME INSTRUMENTS CORPORATION
GREENWOOD, MISSISSIPPI
U.S.A.

(STOCK # T145)
MODEL 80-D PICKING LIST

EFFECTIVE SEPT. 1, 1935.

ACCESSORIES INCLUDED IN ORIGINAL MODEL 80-D TUBE TESTER SHIPMENTS.

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>STOCK NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7144</td>
<td>OPERATING DATA AND &quot;TUBE&quot; LIST, ENCLOSED IN COVER WITH FORM</td>
</tr>
<tr>
<td>1</td>
<td>1417</td>
<td>THUMB SCREWS</td>
</tr>
<tr>
<td>1</td>
<td>0725</td>
<td>CARD, RETURN REGISTRATION</td>
</tr>
<tr>
<td>1</td>
<td>6298</td>
<td>CHART, SAMPLE ANALYSIS</td>
</tr>
<tr>
<td>1</td>
<td>7051</td>
<td>CONNECTOR, 15-INST UNIVERSAL TOP CLIP</td>
</tr>
<tr>
<td>1</td>
<td>6946</td>
<td>CONNECTOR, 4-FT, BLACK WITH ALL RED</td>
</tr>
<tr>
<td>1</td>
<td>6947</td>
<td>CONNECTOR, 4-FT, RED, WITH ALL BLACK</td>
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<tr>
<td>1</td>
<td>6744</td>
<td>CONNECTOR, 4-FT, BLACK TEST PROBE</td>
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<td>1</td>
<td>6745</td>
<td>CONNECTOR, 4-FT, RED TEST PROBE</td>
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<tr>
<td>1</td>
<td>7145</td>
<td>DATA, MODEL 80-D TECHNICAL</td>
</tr>
<tr>
<td>1</td>
<td>7146</td>
<td>FORM, MODEL 80-D ACCESSORIES ORDER</td>
</tr>
</tbody>
</table>

The above list of items was checked by the undersigned who is responsible for the completion of this packing.

[Signature]

The serial number of this tester is engraved (but not marked) in the center of the lower corner of the panel, and should be mentioned in all correspondence pertaining to the tester.

SUPREX INSTRUMENTS CORPORATION
GREENWOOD, MISSISSIPPI
U.S.A.
SUPREME TUBE TESTER
MODEL 80-30
TECHNICAL DATA

IMPORTANT

The guarantee policy on your tube tester is not applicable unless this paragraph is complied with.

Registration. The return registration card, which is included with each tester, should be completed with the proper information and mailed immediately after the user's receipt of the tester. It is the purpose of the return registration card (1) to apply the guarantee policy in the interests of the owner of the tester, and (2) to assure the user's receipt of any additional data which may be issued with reference to the use of the tester. The issuance of new data may not be necessary; but, if such data should be issued, the user is entitled to it and he will receive such new data if his ownership of the tester is registered by means of the return registration card. The guarantee policy is not applicable unless the tester is registered within 10 days after the receipt, and the serial number of the tester should be mentioned in all correspondence.

General. The "Operating Data" and "Tube List" card which is mounted in the carry-case of the tester outlines the general procedure which should be followed for the proper operation of the tester. The "technical data" included in this pamphlet is intended for the information of professional radio engineers who use this tester for service calls and "shop" tests of tubes when a deep technical familiarity with the tester is desired. Every professional radio engineer knows that tubes must be replaced for one or both of two reasons: namely, (1) by reason of service replacement on cathodes, or filament emission which lowers the transconductance (or mutual conductance) of tubes, or (2) by reason of inter-electron leakage or shunt-circuited conditions. It is obvious, therefore, that a practical "field" tube tester should (1) indicate the quality of a tube on the basis of "good" or "bad" transconductance emission with approximately correct working voltages and plate load resistance, and (2) should be capable of indicating any leaks or short circuits between elements, which repair the proper functioning of a radio tube. These are the objectives accomplished in the design of this new Supreme Tester. (3) Besides the normal tube testing function of this tester, the 80-30 also offers 4 ranges for measuring D.C. Volts, 6 ranges for measuring resistance, and electrolytic and an electrolytic capacitor leakage test.
"SELECT" SCALE
4- 0, 2, RANGE
4- ENGLISH READING ELECTROLYTIC CAPACITORS LEAKAGE SCALE
1- 0, RANGE 1 READING TUBE SCALE
5- RESISTANCE RANGES

"LEAKAGE INDICATION" TYPE 356 OR 24V RECTIFIER
SCALE
FOR LEAKAGE INDICATIONS WHEN TESTING TUBES OR ELECTROLYTIC CAPACITORS.

"RECTIFIER" TYPE 356 OR 24V RECTIFIER
FOR RECTIFYING A, C, OR USE IN A, C, MEASUREMENTS.

"METER RETURN SELECTOR" SWITCH
FOR CONNECTING METER RETURN TO PROPER POSITION WHEN TESTING TUBES.
P1- "RETEST" CONNECTS METER TO 5 RESISTANCE RANGES
P2- "TEST" CONNECTS METER TO TUBE TESTING Circuit FOR TUBE LEAKAGE MEASUREMENTS.
P3- "TUBE" CONNECTS METER TO QUALITY TUBE TEST CIRCUIT.
P4- "LEFT" CONNECTS "LEAKAGE INDICATION" IN CIRCUIT FOR TESTING LeAKAGE OF ELECTROLYTIC CAPACITORS OF SMALLER THAN 1 MF. CAP. AND ELECTRICAL IN CIRCUIT FOR TESTING LEAKAGE OF ELECTROLYTIC CAPACITORS AND ELECTROSTATIC CAPACITORS OVER 1 MF.
P5- "VOLTS" CONNECTS THE METER IN THE CIRCUIT FOR MEASURING D, C, VOLTS (4 RANGES)

"PRIMARY VOLTS SELECTOR" SWITCH
FOR VARYING THE CONNECTION TO THE PRIMARY OF THE TRANSFORMER AND MATCHING SCALES TO LOCAL LINE VOLTAGE.
FOR (1) USE IN LINE TESTING, (2) USE IN PRELIMINARY ADJUSTMENT OF THE METER FOR MEASURING RESISTANCE MEASUREMENTS.

"QUALITY TEST SELECTOR" SWITCH
FOR (1) USE IN TUBE TESTING, (2) USE IN PREFERENCE OF THE METER, OR USE IN PRELIMINARY ADJUSTMENT OF THE METER FOR MEASURING RESISTANCE MEASUREMENTS.

"FILM TEST" SELECTOR, ELECTROLYTIC CAPACITOR SELECTOR SWlTCH
FOR USE WHEN TESTING ELECTROLYTIC CAPACITORS (PUSH BUTTON TO LEAVE READER INDICATION.)
FOR USE WHEN TESTING 225 TUBES; OTHERWISE, LEAVE IN "NORMAL" POSITION.
FOR USE WHEN TESTING 125 TUBES; OTHERWISE, LEAVE IN "NORMAL" POSITION.
FOR USE WHEN TESTING 25 TUBES; OTHERWISE, LEAVE IN "NORMAL" POSITION.
FOR USE WHEN TESTING TUBES.

"QUALITY INDICATION" TYPE 356 OR 24V RECTIFIER
FOR PUSH BUTTONS FOR DETERMINING "LEAKAGE" & "QUALITY" OF TUBE.

"ELECTROLYTIC CAPACITORS, LEAKAGE" PIN JACKS
PIN JACK TERMINALS FOR ELECTROLYTIC CAPACITORS LEAKAGE MEASUREMENTS. OBSERVE POLARITY ON ELECTROLYTICS.

"ELECTROSTATIC CAPACITANCE LEAKAGE" PIN JACKS
PIN JACK TERMINALS FOR ELECTROSTATIC CAPACITANCE LEAKAGE MEASUREMENTS.

"IONIC, 24V, 200M" PIN JACKS
LOWER OHM RANGE OF PIN JACK TERMINALS
"REG., 2, 20" PIN JACKS
HIGHER OHM RANGE OF PIN JACK TERMINALS
"MULTI., 5, 125, 500, 1200" PIN JACKS
D, C. VOLTAGE RANGES OF PIN JACK TERMINALS

LOCATION ON PANEL
UPPER CENTER
UPPER LEFT SIDE OF PANEL
UPPER RIGHT SIDE OF PANEL
LEFT SIDE OF PANEL.
LEFT SIDE OF PANEL AND TO LEFT OF "PRIMARY VOLTS SELECTOR" SWITCH.
CENTER OF PANEL AND BELOW "METER".
RIGHT SIDE OF PANEL.
RIGHT SIDE OF PANEL, BELOW "METER".
RIGHT SIDE OF PANEL.
LEFT SIDE OF "METER".
RIGHT SIDE OF "METER".
RIGHT SIDE OF "METER".
BELOW AND TO LEFT OF "METER".
BELOW AND TO RIGHT OF "METER".
UPPER PORTION OF PANEL.
LOWER PORTION OF PANEL.
LOWER SECTION OF PANEL.
LOWER RIGHT BOTTOM EDGE OF PANEL.
LOWER LEFT BOTTOM EDGE OF PANEL.
FAR LEFT EDGE OF PANEL.
FAR RIGHT EDGE OF PANEL.
OUTSTANDING FEATURES. THE MAXIMUM OF VALUE WILL BE REALIZED IN THE USE OF THIS TESTER WHEN THE USER APPRECIATES ITS OUTSTANDING FEATURES. THE PROFESSIONAL RADIOIAN CAN ALWAYS BE IDENTIFIED BY THE WAY HE HANDLES HIS PROFESSIONAL TOOLS. CERTAIN TEST EQUIPMENT. THE SIX OUTSTANDING FEATURES OF THIS TESTER ARE LISTED AS FOLLOWS:

1. SIMPLICITY: THE TESTER HAS ONLY FIVE SOCKETS SO THERE DOES NOT EXIST THE PROBLEM OF CONFUSION, AS TO WHICH SOCKET IS WHICH. THE TESTER IS SIMPLER THAN THE ORDINARY TESTER WITH A LARGE NUMBER OF SOCKETS. A TUBE CANNOT BE PLACED IN THE WRONG SOCKET. THE SOCKET TESTS ARE REDUCED TO AN ABSOLUTE MINIMUM, THEREBY ASSURING SPECIFIC TUBE TESTING.

2. NON-LEAKAGE TEST: THIS TESTER EMPLOYS A FULL-SIZED NON-GLION LOOP IN THE COLOR-CODED, ISOLATION CIRCUIT FOR DETECTING LEAKAGES AND SUBJECTIVE 
CUTTING CONDITIONS BETWEEN ALL AND ALL TUBE ELEMENTS. BECAUSE TUBE MANUFACTURERS USE "SOLES" ON THIS TESTER, IT IS BEING USED BY OTHERS, IN SOME 
FOUR, TO ALL TUBE TESTER DESIGNS.

3. ELECTROLYTIC AND LARGE ELECTROSTATIC CAPACITORS LEAKAGE TEST: THIS TESTER EMPLOYS A SPECIAL CIRCUIT WITH 450 VOLTS D.C. APPLIED POTENTIAL ACROSS THE PROPER OUTPUT PIN JACKS TO TEST FOR LEAKAGE IN ELECTROSTATIC AND LARGE 
PAPER CAPACITORS FROM 1 WATT TO 12.5 WATTS.

4. ELECTROSTATIC CAPACITOR LEAKAGE TEST FOR PAPER CAPACITORS BELOW 1 WATT: THE TESTER INCORPORATES A SPECIAL CIRCUIT WITH AN APPLIED POTENTIAL ACROSS THE PROPER OUTPUT PIN JACKS.

5. 5 RANGES FOR RESISTANCE MEASUREMENTS: THIS TESTER ALSO INCLUDES 5 INCREMENT RANGES FOR MEASURING CONTINUITY AND VALUES OF MANY TYPES OF RESISTANCES FROM A FEW OHMS TO 20 KILO.

6. RUGGEDNESS: THE 55D-0 IS FLOOR PROOF AND CANNOT BE HARMED BY SHORT-CIRCUITED 
TUBES, OR BY IMPROPER OPERATION.

ALL 4-WAY TUBES ARE TESTED IN THE 4-WAY SOCKET; 5-WAY TUBES IN THE 5-WAY SOCKET, ETC. THE TESTER CANNOT BE HARMED BY PRESSING THE WRONG BUTTON IF THE WRONG BUTTONS ARE(DEPRESSED DURING THE "TUBE TEST" THE INDICATOR WILL EITHER NOT MOVE OR IF IT DOES IT WILL MOVE BACKWARDS SLIGHTLY. THE BUTTON WILL MOVE FORWARD ONLY WHEN THE CORRECT BUTTONS ARE DEPRESSED. THE "QUALITY TEST SELECTION" MAY BE NOTIFIED TO ITS EXCUSES OR FIELD POSITION WITHOUT OVERLOADING THE METER ENOUGH TO HARM THE TUBE ON THE TESTER DURING A TUBE TEST. AN INCORRECT SETTING OF THE "FLUORESCENT VOLTS SELECTOR" CONTROL MAY RUIN A TUBE TEST, BUT THE TESTER WILL NOT BE HARMED.

POWER SUPPLY, THE "ON/OFF" LOCATION OF THE ENTRAPMENT VOLTS SELECTOR ROTARY SWITCH ENABLES THE USER TO ENCLOSE THE TRANSFORMER PRIMARY CIRCUIT FROM THE POWER SUPPLY SYSTEM, HOWEVER IT IS DESIGNED TO DO SO. HOWEVER, THE TRANSFORMER IS SO DESIGNED THAT IT MAY BE LEFT CONNECTED INDEFINITELY TO THE POWER SUPPLY SYSTEM. WITHOUT HARM TO THE TESTER AND, WHILE THE TESTER IS SO CONNECTED, THE POWER SUPPLY SYSTEM WILL BECOME INSULATED TO THE TOUCH. IF THE TESTER IS LEFT CONNECTED DAY AND NIGHT FOR A WHOLE WINTER. IT IS ABVIOUS, THEREFORE, THAT THE ADDITION OF AN "ON/OFF" TUBE SWITCH AND A PILOT LIGHT WOULD ADD TO THE ECONOMY OR UTILITY OF THE TESTER.

POWER SUPPLY RATINGS: ABOUT ONE OF ALL TUBE TESTERS ARE USED WITH POWER SUPPLY POTENTIALS BETWEEN 200 AND 120 VOLTS, AND THIS RANGE IS LETTERED ON THE PANEL UNDER THE "NORMAL VOLTS SELECTOR" CONTROL. VOLTS. THE RATING 200 OF THE TESTERS WHICH ARE REQUIRED FOR SPECIAL POWER SUPPLY RATINGS ARE OF SPECIAL DESIGN. THE "NORMAL VOLTS SELECTOR" MARKINGS OF WHICH MAY BE INTERPRETED IN ACCORDANCE WITH THE FOLLOWING TABLE:

<table>
<thead>
<tr>
<th>PRUARY VOLTS SELECTOR</th>
<th>SPECIAL VOLTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>196</td>
</tr>
<tr>
<td>101</td>
<td>202</td>
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<td>107</td>
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<tr>
<td>123</td>
<td>244</td>
</tr>
<tr>
<td>125</td>
<td>250</td>
</tr>
</tbody>
</table>

SPECIAL FREQUENCY RATING ARE ACCOMMODATED BY THE NECESSARY CHANGES IN TRANSFORMER CORE THICKNESSES.

POWER SUPPLY, THE "NORMAL VOLTS SELECTOR" ENABLES THE RADIOIAN TO ADJUST THE TESTER FOR ANY POWER SUPPLY POTENTIAL WITHOUT ADDING TO THE USE OF THE TESTER.

SCALE MARKING. THE SCALE ON THE KETE SUPPLIED SHOWS THREE SETS OF MARKINGS.

(1) THE UPPER SCALE IS ACCOMPANY THE DRIVER AND DEMODULATOR CIRCUITS, AND IS READ DIRECTLY FOR THE 2000-MGC (2.6) RANGE, MULTIPLIED BY 10 FOR THE 20,000-MGC (20) RANGE, BY 100 FOR THE 200,000-MGC (200) RANGE, BY 1000 FOR THE 2000-MGC RANGE, AND BY 10,000 FOR THE 2000-MGC RANGE.

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(2) Weigh English resistors scales for "GOOD" and "BAD" tube testers and "GOOD" and "BAD" capacity leakage tests.

(3) Lower scale is used for all readings of D. C. voltage. Three sets of scale numbers are provided, which fit all scales read until 700V. The proper method of reading these scales will be determined by the proper location of a dot. In reading D. C. voltage, the scale may be read directly for the 250-Volt range and the 500-Volt range, and multiplied by 2 for the 1000-Volt range.

Preliminary Adjustments:

I. Connect the A.C. plug in the socket.

II. Rotate "3-1/2" circuit selector" switch to "8" position.

III. Rotate "primary volts selector" switch until needle of meter reads one-half scale deflection. This automatically sets primary tap of transformer correctly to read local line voltage.

IV. Locate in first column of the "tube list" below, the tube which is to be tested.

V. Observe the corresponding "filament volts selector" setting and do set.

VI. And the proper setting for the filament return selector" control knob which is "OFF" for glass envelope tubes, and either "ON" or "OFF" for octal tubes (depending on the type tube).

Leakage Test:

I. Set the "3-1/2" circuit selector" switch to the "8" position.

II. Place the tube in the proper socket and connect top cap terminals, if any, to the "Top cap" pin jack, and allow tube to attain normal operating temperature.

III. Demerse the switch buttons, give it a shake, do as to reveal any interelemental leakage or "shorts" by a glow of either elements of the neon lamp if more than one switch button is illuminated in the last column.

The indicated switch buttons should be depressed and released together, a necessary "Glow" or "Flashes" of one element, only, of the neon lamp. A capacity shadow has been placed on the tube defect, intermittent tube leakage may be revealed by gently turning the tube as each button is depressed. Warning: filament return selector switch must be set in the correct position; otherwise, shifting of the transformer and consequent damage of the equipment will result.

Quality Test:

I. After completing the preliminary adjustment and the leakage tests.

II. Set the "3-1/2" circuit selector" switch in the "8" position.

III. Demerse the button (or buttons) indicated in the last column after observing the meter indication of the tube condition. Short-circuit test will cause the meter pointer to veerage violently about its zero position, and if such condition is observed, the depressed switch should be released immediately.

Tube List Card: All receiving types of tubes, for which data are available, are listed in the "3-1/2" circuit selector" card which is mounted in the carrying case cover. A simplified operating procedure is outlined on the card, so that any one, without even an elementary technical knowledge of the test, can test tubes without difficulty. Group A of the "tube list" includes 10 popular types of tubes which constitute about 75% of the replacement market. It is suggested that the user of the tester understand the data of this group so that he will not have to refer to the "tube list" for these types. If the experience is unwieldy under the first, second and last column of this group, the last column represents the terminals of the electronic-emitting elements, so that he has only the third column to examine. Group B tests the balance of the "glass envelope" type of tubes, and group C, containing the new octal tubes.

Neon Leakage Test: Every tube should be subjected to the "element" test before it is subjected to the actual test. If the "element" test applied to a short-circuited tube, the meter pointer will veerage violently about its zero position, and any switch buttons which are being depressed should be released immediately. The tester is designed to withstand normal transients and overloads, but it cannot be expected to indefinitely withstand an overload imposed by deliberately keeping a switch button depressed with a short-circuit tube in one of the sockets.
A low-voltage, neon glow lamp with a standard socket base is utilized for leakage and short tests. In this type, the operating condition of the lamp is in question. The lamp may be tested by the following method. Insert an ordinary low-voltage lamp socket as a resistor of about 100 ohms, and connect the lamp to the 110-Volt source. If the lamp lights, it indicates that the insulation resistance is not sufficient to cause a short circuit. If the lamp does not light, it indicates that the insulation resistance is too high to cause a short circuit. In order to make the neon lamp responsive only to leakage potentials in the circuit, and to prevent it from responding to rectified potentials, the lamp is connected in series with a motor-operated switch, to which the test button is attached. When pressing the test button, the lamp will light if there is a leakage potential present in the circuit.

For example, a leaky or short-circuited condition involving the control grid and screen grid elements of a type 25 tube should be revealed by the alloy of both electrodes of the neon lamp. When the test button is pressed, the lamp will light if there is a leakage potential present. If the lamp does not light, it indicates that there is no leakage potential present in the circuit.

The neon lamp is shunted down so as to reduce the sensitivity of the lamp to permissive leakage of almost infinite value will not be indicated. It should be remembered that every material which is used for insulation purposes has some conductive properties, and, therefore, leakage can be detected through any insulating material. Insulating materials of any kind, if of a sufficiently sensitive nature, may be employed for detecting such leakages. In the design of a tube tester, the leakage potential between the grid and the screen grid, between the plate and the cathode, and between the cathode and the neutral elements, which do not impair the proper functioning of a radio tube, otherwise, the tube would not be safe for use.

The neon lamp is used for leakage tests because it is the most suitable tube tester ever devised for professional work. It is also used in conjunction with a normal radio circuit and allows for the detection of short circuits in the circuit. The high-voltage filament is utilized for testing the neon lamp. In order to open the neon lamp, the filament is turned off, and the filament is turned on to open the neon lamp.

In conclusion, the neon lamp is a useful tool for detecting leakage and short circuits in circuits. It is simple to use and provides accurate results when used properly.


ADJUSTER ALTERNATELY PULL THE ‘8’ 3 ‘CIRCUIT SELECTOR’ TUBE IN THE ‘TUBE’ POSITION.

IV. AS EACH BUTTON IS DEPRESSED, THE LATER POINTER SHOULD MOVEMENT FORWARD, UNLESS THE CORRESPONDING ELEMENT IS DE-CONNECTED.


VI. AS EACH BUTTON IS DEPRESSED, THE LATER POINTER SHOULD MOVEMENT FORWARD, UNLESS THE CORRESPONDING ELEMENT IS DE-CONNECTED.


45-VOLT BATTERIES WHICH TESTS 52 VOLTS WHEN NEW SO NECESSARILY BETTER THAN A BATTERY WHICH TESTS 47 VOLTS WHEN NEW, BECAUSE HE KNOWS THAT THERE IS A SINGLE ELEMENT INVOLVED; WHEN BOTH BATTERIES ARE SUBJECT TO THE SAME SEVERE OVER A PERIOD OF TIME, THE ONE WHICH ORIGINALLY TESTED 52 VOLTS DAY THEN TEST 40 VOLTS UNLESS THE OTHER WHICH ORIGINALLY TESTED 47 VOLTS DAY THEN TEST 41 VOLTS. WHENEVER A BATTERY WHICH TESTS 20 VOLTS AT 72 HOURS IS TESTED AGAINST ANOTHER WHICH EFFECTIVELY TESTS 47 VOLTS AT 72 HOURS, THE RESULT IS NOT NECESSARILY IDENTICAL WITH THE RESULT OF A SIMILAR BATTERY WHICH TESTS 47 VOLTS AT 72 HOURS AGAINST ANOTHER WHICH TESTS 20 VOLTS AT 72 HOURS.

FUTURE TUBES. THE DESIGN OF THIS TESTER IS SUCH THAT THE MANUFACTURER CAN ESTABLISH HIS OWN QUALITY TEST SELECTION SETTING FOR THE TUBES NOT LISTED IN THE "TUBES LIST" CARD FOR FILLING THE PROCEDURE OUTLINED HERETO.

1. CONNECT THE TUBER TO A CONVENIENT POWER SUPPLY OUTLETS, THEN REPLACE THE "HEATER CIRCUIT SELECTOR" SWITCH TO "HEAT", POSITION. NOTE THE "HEATER VOLTS SELECTOR" CONTROL KNOB TO A POSITION WHICH GIVES EALIY CONSUMPTION. THE SPACE BETWEEN THE TUBES, WHICH ARE SUBJECT TO THE SAME SEVERE OVER FOR A PERIOD OF THREE. THE ONE WHICH INITIALLY TESTED 52 VOLTS DAY THEN TEST 40 VOLTS UNLESS THE OTHER WHICH INITIALLY TESTED 47 VOLTS DAY THEN TEST 41 VOLTS.

2. PLACE THE TUBE IN THE PROPER SOCKET AND CONNECT THE TOP CAP TERMINAL, IF ANY, TO THE PROPER "TOP CAP PIN JACK" AND SET THE "TOP, CIRCUIT SELECTOR" SWITCH TO THE "TOP" POSITIONS.

3. DEPRESS THE PUSH BUTTON SWITCHES, ONE AT A TIME IMMEDIATELY, THE 4TH BUTTON, UNTIL A BUTTON IS DEPRESSED WHICH CAUSES THE HEATER Point TO DEPLETE TO THE RIGHT MOST, WHILE HOLDING BUTTON DOWN, CONTINUE WITH THE REMAINING BUTTONS, ONE AT A TIME, TO DETERMINE WHETHER THE DEPRESSION OF ADDITIONAL BUTTONS WILL INCREASE THE NUMBER OF THE TUBE TERMINAL SELECTATION.

4. AFTER DETERMINING THE BUTTON WHICH CAUSES THE HEATER TO DEPLETE FURTHER, RECORD THEIR ORDER IN THE LAST COLUMN OF THE "TUBES LIST" CARD.

5. ADJUST THE QUALITY TEST SELECTION SETTING SO AS TO OBTAIN A NEUTRAL READING OF 73 VOLTS. WITH THE BATTERY CONNECTED TO THE HEATER (HEATER VOLTS SELECTOR) OF THE TUBER TESTED, ADJUST THE QUALITY TEST SELECTION SETTING FOR SIX OR MORE NEW TUBES.

6. ADJUST THE QUALITY TEST SELECTION SETTING, AND OBTAIN THE AVERAGE OF THE RESULTS, THEN RECORD THE AVERAGE SETTING OF THE CONTROL TO BE RECORDED IN THE "TUBES LIST" CARD.

7. OFF THE BEARING COLUMN OF THE "TUBES LIST" CARD CAN BE FILLED IN FROM DATA PUBLISHED BY TUBE MANUFACTURERS. WHILE THE QUALITY TEST SELECTION SETTING DETERMINED BY THE ABOVE PROCEDURE MAY NOT BE ABSOLUTELY ACCURATE, IT WILL GENERALLY BE FOUND TO BE ACCURATE FOR ALL PRACTICAL PURPOSES, OR WITH NEW TUBES WHICH CAN BE OBTAINED.

THIRD-TUBE FILAMENTS. THE ORIGINAL DESIGN OF THE TUBE 99 TUBE UTILIZED A FILAMENT WIRE WITH CHERISHED CABLE CONNECTORS TO THE AVAILABLE TUBE FILAMENT SIZED SUPPLIED THOROUGH TYPE 56 TUBES FOR REPLACEMENT PURPOSES. OTHER TUBE MANUFACTURERS ARE OFFERING THE TYPE 99 TUBE WITH CODE FILAMENT WIRE OF THE TUBE CONSTRUCTION AS THAT EMPLOYED IN OTHER TYPE TUBES. A SIMILAR SITUATION EXISTS FOR THOROUGH TYPE 25 TUBES. THESE TYPES OF TUBES WHICH ARE BEING SUPPLIED BY DIFFERENT MANUFACTURERS AND WHICH ARE NOT OPERATING IN THE TUBE SELECTION ARE FOLLOWED BY THE LETTER "F" IN THE LETTER "TUBE" COLUMN OF THE "TUBES LIST" CARD. THE THOROUGH TYPES ARE FOLLOWED BY THE LETTER "T". WITH THE CHERISH TYPE FOLLOWED BY THE LETTER "C". ACCORDINGLY, IT IS ADVISABLE FOR THE TESTER USED TO DESIGNATE EACH TUBE MANUFACTURER'S OWN LETTER. THE TYPE OF FILAMENT CONSTRUCTION EMPLOYED IN THOSE TUBES WHICH ARE LISTED TWICE, AS TO BE SURE TO PROPERLY TEST THESE TUBES.


GAS-FILLED TUBES. IN THE COURSE OF THE DEVELOPMENT OF THIS TESTER, IT WAS DECIDED MORE IMPORTANT TO PROVIDE FACILITIES FOR INDICATING LEAKAGES AND SHORT-CIRCUITING CONDITIONS BETWEEN THE ELEMENTS OF ALL TUBES. THIS IS APPROVED WITH A GDI TEST FOR SIMULTANEOUSLY DEPRESSED BUTTONS. AUTOMATICALLY ON THE TESTER, TUBE BUTTONS ARE NOT SIMULTANEOUSLY DEPRESSED TO THE TEST LIMITS VARIOUS OF EACH TYPE TUBE. AUTOMATICALLY ON THE TESTER, TUBE BUTTONS ARE NOT SIMULTANEOUSLY DEPRESSED TO THE TEST LIMITS VARIOUS OF EACH TYPE TUBE. AUTOMATICALLY ON THE TESTER, TUBE BUTTONS ARE NOT SIMULTANEOUSLY DEPRESSED TO THE TEST LIMITS VARIOUS OF EACH TYPE TUBE. AUTOMATICALLY ON THE TESTER, TUBE BUTTONS ARE NOT SIMULTANEOUSLY DEPRESSED TO THE TEST LIMITS VARIOUS OF EACH TYPE TUBE.
TUBE TESTER ACCURACY. THE STANDARD PREFERRED TEST OF AMPLIFIED TYPES OF TUBES IS KNOWN AS THE MODEL TESTS WHICH PROVIDE A USEFUL INSTRUMENT IN TERMS OF ENABLING SPECIFIED D.C. POTENTIALS TO BE APPLIED TO THE TUBE. ORIGINALLY, SUCH EQUIPMENT WAS BASED FOR FULLY MODELED TUBE TESTER WHICH MEASURED THE POTENTIAL OF EACH TUBE, AND ACQUISITION OF THE PROPORTIONATE COST OF SUCH EQUIPMENT, ANY DEPARTURE FROM SUCH EQUIPMENT IS DEEMED UNNECESSARY IN ACCORDANCE FOR THE SCALE OF SIMPLIFYING Operation AND LOWER UNIT COST PER TUBE, BUT PRINCIPAL RADIO DEALERS AND THE PROFESSIONAL RADIO USER FEEL THAT AN INVESTMENT OF $200.00 WHICH PRODUCES AN ACCURACY OF 95% IS MORE PROFITABLE THAN AN INVESTMENT OF $300.00 IN A COLLECTIVE TO OBTAIN AN ACCURACY OF 99%. IN ADDITION TO THE GREATER SIMPLICITY AND CUSTOMER COMPLIANCE OF THE LOWER PRICED TUBE TESTER, THERE IS SOME INCREASED DEGREE OF ACCURACY ENABLED BY THE SURVEY TESTER OF FACT THAT THE TUBE TESTER IS USED UNDER AIVI AUTOMATICALLY TESTED BETWEEN THE TUBE TESTER INCIDENT AND THE EFFECTIVE INTERNAL RESISTANCE OF SUCH TUBE WHICH IS SUBJECT TO THE TEST, THE USER OF THIS TESTER, OR OF ANY OTHER TUBE TESTER OFFERED IN A SIMILAR PRICE CLASS, SHOULD APPRECIATE THE FACT THAT THE TESTER IS NOT A GRADUATED QUALITATIVE TESTER IN WHICH A TUBE WHICH TESTS AT A METER READING OF 20 IS Necessarily BETTER THAN A TUBE WHICH TESTS AT 30, BUT THAT THE TESTER IS USEFUL PRIMARILY AS A LEARNING TOOL SEPARATING "BAD" TUBES FROM "GOOD" TUBES. IN OTHER WORDS, A "GOOD" OR "VERY GOOD" TUBET MAY TEST ANYWHERE IN THE "GOOD" SECTOR OF THE METER SCALE, THE TUBE TESTER AS TO WHETHER A TUBE IS SATISFATORILY OPERABLE IS WHETHER OR NOT THE TUBE OPERATES SATISFATORILY IN AN OPERATIVE RADIO AND, EVEN WITH SUCH A SIMPLEMENTARY AND PROBABLY CONCLUSIVE CRITERION AS AN OPERATIVE RADIO, IT IS OPINION THAT A TUBE WHICH IS NOT COMPLETELY Satisfactorily IN ONE OPERATIVE RADIO CIRCUIT MAY BE FOUND SATISFACTORY OPERATING IN ANOTHER OPERATIVE RADIO CIRCUIT. THE FACILITIES OF THE SURVEY TESTER FOR INDICATING INTER-ELEMENT LEAKAGES AND SHORT-CIRCUIT CONDITIONS ARE UNNECESSARY TO ANY TESTER AT ANY PRICE, AND CONSTITUTE AN INVALUABLE AUXILIARY TEST FOR "SECOND OUT" SATISFACTORY TUBES; IT IS OFTEN FOUND THAT SOME TUBES OF A PARTICULAR RADIO REQUIRE REPLACEMENT BECAUSE OF INTER-ELEMENT LEAKAGES OR INTER-ELEMENT ANOMALIES OF TRANSPORTATION. THESE ARE OFTEN CAUSED BY THE DESTRUCTION OF THE ELECTRODES AND THE QUALITIES OF THE TUBE INVOLVED, THIS TESTER IS AN INVALUABLE AUXILIARY TESTER FOR THE RADIO DEALER, AS IT IS USEFUL TO THE TUBE TESTER TO DISCARD LEAKAGE OF SUCH TUBE IN A SINGLE TEST AND TO SIMPLIFY THE WORK OF THE TUBE TESTER. THIS CAUSING THE NEEDLE TO BOUNCE OFF SCALE, THIS TESTER SHOULD BE USED SIMULTANEOUSLY ON THE SIGNAL AND PICTURE TERMINALS AND THEN, WHETHER PROVIDES AN ADEQUATE RANGE SO THAT THE INTER-NEEDLE WILL NOT BE SLICKED OFF SCALE.

HIGH RESISTANCE MEASUREMENTS. A MINIATURE "POorer PATH" IS INCLUDED IN THIS TESTER FOR EXTENDING THE HIGHEST-PRECISION MEASUREMENTS PLOY TO 200,000 OMS OHMS TO 2 AND 20 MICROHMS, AND THESE HIGH RANGES MAY BE USED IN THE FOLLOWS,

1. SET THE SELECTOR ROTARY SWITCH AT THE "OHMS" POSITION.
2. CONNECT THE VOLTAGE LEAD TO THE "VOLTAGE" TERMINAL IN THE "OHMS" DEVIATION.
3. CONNECT THE VOLTAGE LEAD TO THE "VOLTAGE" TERMINAL IN THE "OHMS" DEVIATION.
4. WHILE HOLDING THE FREE CONTACT ICONS TO THE "VOLTAGE" TERMINAL IN THE "OHMS" DEVIATION, CONNECT THE "ZERO OHMS" CONTROL BLOCK TO THE "ZERO OHMS" PIN JAC.

5. "OHMS" TO "ZERO OHMS" FULL SELECTOR DEFLECTION OF ZERO OHMS.
v. The resistance value of an unknown resistor, if disconnected from the circuit, may be estimated by measuring the voltage drop across it when a known current is passed through it. This voltage drop can be calculated by dividing the known current into the voltage across the resistor. The resistance is then calculated using the formula: 

\[ R = \frac{V}{I} \]

where \( R \) is the resistance, \( V \) is the voltage, and \( I \) is the current.

Precautions when using this instrument:
- It is essential that before making any measurements that the selector switches be set to their proper positions and that the primary tap be correctly fixed for local line voltage.
- When taking D.C. voltage measurements, the test leads should be connected to the pin jacks which will provide an accurate range against overloading the meter or associated apparatus. It is always advisable to start with the highest range and work down if the actual voltage is not known.

Testing Octal Tubes:
The new metal tubes are characterized by an octal arrangements of the pins which are located in a square grid of 8 pins. Each pin is at a 90-degree angle to the adjacent ones. Therefore, it is obvious that octal tubes, regardless of the number of pins per tube, cannot be fitted into earlier types of jacks. All the tubes require one of the inlets of each pin per tube can be fitted into any octal tube, because the holes of the octal jacks are separated from each other by 90-degree angles.

The additional pin of the new octal tubes is a "grounding pin" for the metal shields. Otherwise, the octal tubes will operate in conventional circuits and will involve no new test principles other than the applicability of test equipment is concerned. Looking at the rear end of the new octal tubes, and with the locator guide ridge under the first pin clockwise from the locator guide ridge is the 1 pin, the second pin clockwise from the locator guide ridge is the 6 pin, and so on consecutively in a clockwise direction. In the type 524 octal tube, the filament terminates at the octal pins numbered 2 and 8, while the octal pins numbered 2 and 7 terminate the filament circuit in all other octal tubes. Pin position is the shield which is normally allays at ground potential.

Electrolytic Capacitor Leakage Tests with High D.C. Voltage:
- Warning: When making electrolytic capacitor leakage tests, there is an approximate potential of 4000 volts across the "plus" and "minus" pair of electrolytic capacitor leakage pin jacks. "Plus" is red and "minus" is black. Handle with care! Use insulated alligator clip test leads which are provided with each unit.

Procedure:
1. Turn "FET CIRCUIT SELECTOR" switch to "FET", position.
2. Turn "RESISTIVITY VOLTS SELECTOR" switch until meter needle rests at half-scale deflection.
3. Set "FET CIRCUIT SELECTOR" switch to "FET", position.
4. Connect electrolytic capacitor selector switch to position and reposition the outer circle which line nearly corresponds with the value of the capacitor to be tested.
5. Connect insulated alligator clip test leads to "plus" (red) and "minus" (black) pair of electrolytic capacitor leakage pin jacks.
6. Connect insulated alligator clip test ends to test leads to capacitor to be tested, reversing proper polarity (red jack to plus side of capacitor — black jack to minus side of capacitor). The capacitor must be free of any other circuit. Never touch both terminals with your fingers as they are hot.
VII. Press "PRICES FOR ELECTROLYTIC CAPACITORS" push button and observe reading on meter. If needle hesitates within the "BAD" portion, capacitor has a satisfactorily low leakage. If it hesitates within the "BAD" portion, capacitor has objectionably low leakage and should be discarded. If capacitor is shorted needle will fully deflect.

NOTE: Electrolytic & Electrolytic capacitors having lower working voltages than 400 volts should not be tested in this manner.

Testing Paper Condensers. The same procedure may be observed as that prescribed for electrolytics, with the exception that no polarity need be observed as to the connection of the condenser to the pin jack terminals.

PROCEDURE:
1. Turn "MTR CIRCUIT SELECTOR" switch to "LUG" position, and
2. Rotate "PRIMARY VOLTS SELECTOR" switch until meter needle deflects halfway scales.
3. Rotate "MTR CIRCUIT SELECTOR" switch to "ELEC." position.
4. Connect tip ends of alligator clip test leads to "ELECTROSTATIC CAPACITY LEADING" pin jack.
5. Connect insulated alligator clip end of test leads to capacitor to be tested; electrostatic condensers have no polarity, however, they must be free of any other circuit.

VI. Observe indication on "LEAD INDICATOR" glow lamp.

Open Circuit Capacitors. If an open circuit capacitor is connected between the "ELECTROSTATIC CAPACITY LEADING" pin jack terminals, the glow lamp will not glow. It is, therefore, obvious that this tester will indicate open-circuited capacitors as well as other capacitor defects. This is a feature which is not included in many other types of capacitor testing instruments.

Leaky Capacitors. If a leaky capacitor is connected between the "ELECTROSTATIC CAPACITY LEADING" pin jack terminals, one electrode, only, of the neon lamp will glow intermittently. That is, the glow will come and go, at regular intervals, as long as the capacitor remains connected. The interval of time between each glow will be determined by the capacity of the capacitor and by the amount of leakage. Short Circuit Capacitors. When a short-circuited capacitor is connected between the "ELECTROSTATIC CAPACITY LEADING" pin jack, only, will glow continuously.

Good Capacitors. When a good capacitor is connected between the "ELECTROSTATIC CAPACITY LEADING" pin jack terminals, one electrode, only, will glow intermittently.

Neon Lamp for Continuity Purposes. When using the neon lamp as a continuity tester, connect the test leads to the "ELECTROSTATIC CAPACITY LEADING" pin jack, and after preliminary adjustments are made as outlined previously the clip ends of the leads may be connected across the unit to be tested.

If the lamp has continuity, this will be indicated by a continuous glow of one element of the neon lamp.

Transportation Warnings. The office of origin of the transportation agency which accepted this vehicle for the transport shipped assured the shipper against external and concealed damages in transit. If the tester be received in a damaged condition, or if some part of the tester be damaged in transit, the user of the tester should notify the transportation agency, where delivered the tester, of such concealed damage report which should be forwarded to the factory, with the return registration card, for factory instructions as to the procedure which should be followed in the event the tester is damaged or concealed during the transit. If the transportation agency refuses to furnish concealed damage reports, that fact should be reported in a letter to the factory with the return of the registration card.

Supreme Service Stations. For the purpose of effecting prompt repair of damaged sustained by transportation injuries, or for any other reasons, the services of the supreme service stations may be utilized instead of returning damaged testers to the factory. A list of the supreme service stations may be obtained from the supreme office factories. If it should be necessary to ship a tester to the factory or to a supreme service station, the shipment should be made via express — never via parcel post — and a letter should be written and forwarded, separately, announcing the shipment and including complete instructions as to the desired handling and disposition of the merchandise; otherwise, the merchandise may be refused by the consignee. Immediate repairs or replacements can usually be expected for customers who make not unreasonable shipments. When damage is expected on express orders, a statement of the damage should be attached to the outside of the box. Damage claims may be made for a credit certificate when it is necessary to write to the factory. Credit certificates are furnished in 30 days after return receipt, and under the other provisions of the guarantee policy, the repair charges should be paid or accepted, and a copy of the invoice covering the repair should be obtained from the service station and forwarded to the factory for any refund or credit which may be properly made under the terms of the guarantee policy.
REPLACEMENT PARTS, ETC. IF SOME PART OF THE TESTER BE DAMAGED IN SERVICE, OR IF THE USER SHOULD WANT TO ORDER COMPLETE DRAWINGS, ANALYSIS CHARTS, TEST LEADS, OR OTHER ACCESSORIES, HIS ORDER SHOULD BE ACCOMPANYED BY A DEPOSIT AMOUNTING TO NOT LESS THAN FIFTY CENTS, SINCE AN ORDER AMOUNTING TO LESS THAN FIFTY CENTS CANNOT BE ASSEMBLED, PACKED AND SHIPPED WITHOUT FINANCIAL LOSS. A HANDLING CHARGE MAY BE MADE SO AS TO MAKE THE ORDER TOTAL FIFTY CENTS, INCLUDING TRANSPORTATION CHARGES. IF AN ORDER IS ACCOMPANYED BY A DEPOSIT WHICH DOES NOT COVER THE COST OF THE NEW CHASSIS AND TRANSPORTATION CHARGES, THE SHIPMENT WILL BE MADE VIA EXPRESS C. O. D., FOR THE BALANCE DUE. A LIST OF REPLACEMENT PARTS MAY BE OBTAINED UPON REQUEST.

GUARANTEES. THIS TESTER IS NOT GUARANTEED UNLESS THE OWNERSHIP THEREOF IS PROPERLY REGISTERED. WHEN THE USER Registers HIS OWNERSHIP OF THIS TESTER WITHIN 30 DAYS AFTER HE RECEIVES IT, THE TESTER WILL BE GUARANTEED TO BE FREE FROM DEFECTS IN MATERIAL OR WORKMANSHIP AND ANY SUCH DEFECTS IN MATERIAL OR WORKMANSHIP WILL BE CORRECTED, WITHOUT CHARGE, WHEN THE TESTER IS DELIVERED TO THE SUPREME INSTRUMENTS CORPORATION, GREENWOOD, MISSISSIPPI, WITHIN 90 DAYS AFTER ITS RECEIPT BY THE USER; OR, THE SUPREME INSTRUMENTS CORPORATION WILL REFUND THE REPAIR CHARGES PAID TO AN AUTHORIZED SUPREME SERVICE STATION FOR THE CORRECTION OF SUCH DEFECTS IN MATERIAL OR WORKMANSHIP UPON THE USER'S PRESENTATION, WITHIN 90 DAYS AFTER THE USER'S ORIGINAL RECEIPT OF THE TESTER, OF A PAID INVOICE FOR SUCH REPAIRS, INDICATING THE CORRECT SERIAL NUMBER OF THE TESTER AND DESCRIBING THE REPAIRS; PROVIDED THE USER ACCEPTS THE OBLIGATION OF THE PAYMENT OF ALL TRANSPORTATION COSTS INVOLVED IN ANY CORRECTIONS EFFECTED UNDER THE CONDITIONS OF THIS GUARANTEE POLICY, IN ACCORDANCE WITH THE STANDARD PRACTICES OF THE RADIO MANUFACTURERS ASSOCIATION.

SUPREME INSTRUMENTS CORPORATION
GREENWOOD, MISSISSIPPI
U.S.A.
PLEASE SHIP TO:

STREET ADDRESS:

P. O. & STATE:

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TOTAL

A DEPOSIT, AMOUNTING TO NOT LESS THAN FIFTY CENTS IS ENCLOSED HERETO AND IT IS UNDERSTOOD THIS, IF THIS ORDER A MOUNTS TO LESS THAN FIFTY CENTS INCLUDING TRANSPORTATION COSTS, A HANDLING CHARGE WILL BE MADE SO AS TO MAKE THE ORDER TOTAL FIFTY CENTS. IF THE DEPOSIT IS INSUFFICIENT TO COVER THE COST OF THE DEPOSIT MADE AS THE SHIPMENT CHARGES, YOU ARE REQUESTED TO MAKE PAYMENT VIA C.C. D.D. EXPRESS FOR THE BALANCE DUE. IT IS UNDERSTOOD THAT YOUR QUOTED PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

(100) (SHOEN)

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