JACKSON *Electronic Test Equipment*

DYNAMIC* PLATE CONDUCTANCE TUBE TESTER

MODEL 648

OPERATING INSTRUCTIONS

THE JACKSON ELECTRICAL INSTRUMENT CO.
DAYTON, OHIO, U. S. A.

Litho in U.S.A.

* TM Reg. U. S. Pat. Off.

DYNAMIC PLATE CONDUCTANCE TUBE TESTER MODEL 648

INSTRUCTIONS FOR TUBE TESTING

This Dynamic Plate Conductance Tube Tester incorporates the most advanced features of design and accuracy. The test method is a new advancement in the Jackson dynamic plate conductance circuit which has established an excellent reputation over many years for accuracy. The control arrangement is greatly simplified by a new switching method for connecting the proper voltage to the proper pins on the socket without regard to where the tube elements are connected to the base pins of the tube to be tested. This flexible circuit permits easy and rapid testing of tubes now used in receivers or tubes to be announced in the future. With this instrument or any other fine piece of equipment it is always advisable to thoroughly understand its operation before attempting to put the instrument to use. *Please read the following instructions carefully.*

PURPOSE OF CONTROLS

OFF-ON SWITCH: This switch is used to turn power source on or off.

LINE CONTROL: This control is used to set the input voltage to establish accurate voltages to the elements of the tube to be tested.

FILAMENT: This control permits the correct selection of filament voltage to the tube being tested. Before inserting any tube in the tester make sure that the filament control is correctly set per listing given on tube chart.

CIRCUIT: This control consists of push buttons divided into two rows of 12 buttons each. The top row is marked CIRCUIT D and the bottom row marked CIRCUIT E. These buttons are used to connect the proper voltages to the proper pins of the sockets. The correct buttons to be pressed are given on the chart under Circuit for the tube type to be tested. These buttons are lock down type and should be left in the down position while making shorts and quality test (See release).

SHORTS TEST: This switch is used for making shorts and leakage tests. This is a new low voltage type shorts or leakage test that will show leakage up to approximately ½ megohms. The markings on this switch are Test, K, P, G_2 and G_1. When the shorts neon lamp located above this switch glows the position will indicate which elements of tube are shorted or leaky. The switch must be reset to Test position before making quality test.

PLATE: This control adjusts the meter sensitivity to the proper condition for the tube type to be tested. The number listed on chart under plate test should correspond to this control setting for the tube type.

TEST BUTTONS: It is the purpose of these buttons to connect the proper loads and voltages for the type to be tested, to remove the line control reading from the meter and to secure a meter reading on the quality worth of the tube. These buttons are non-lock down type and are listed by letter on chart under Plate Test. For tube types where two letters are shown on the chart, both buttons should be pressed simultaneously.

RELEASE: The instrument is equipped with two (2) release buttons located to the right of the test buttons, one in the top row for releasing buttons under Circuit D, one in the bottom row for releasing buttons under Circuit E. Both sections can be released simultaneously. The two (2) release buttons are provided for your convenience when testing dual types with common heater and cathode connections. These types are shown on the chart with a Filament and Circuit D setting on the first section only. For testing second section, the Filament and Circuit D settings remain the same. Therefore only Circuit E Section need be changed. By pressing bottom release button and resetting Circuit E as given on the chart, the second section can then be tested. For types with three sections, the same procedure as for second test applies. For types where heater and cathode connections are not common, both Circuits D and E must be released and reset as shown on chart.

LIFE LINE INDICATOR: This is a spring return type switch located below the circuit buttons in the center of the panel. This switch reduces the filament or heater voltage (all other voltages remaining normal). The reduction of the heater voltage on tubes with sufficient cathode emission will have no appreciable change on the meter reading. If the meter reading falls substantially lower after the switch is depressed, it is an indication that the tube is approaching the end of its useful life. Judgment on the part of tester operator must be used in replacing tubes on this test. If the tube being tested is subject to hard service or if used in devices that operate on low line voltage, it would be advisable to make replacement if meter reading is substantially lower after this switch is pressed. Depress this switch while holding down test button or buttons as listed on chart for type to be tested.

NOISE TEST: This test essentially duplicates the shorts and leakage test and is performed in the same manner. The indication is audible instead of visual. It is valuable in that it goes beyond the capabilities of the shorts and leakage test in catching intermittently "open" tube elements. A shorted tube will produce a 60 cycle hum in the phones. An intermittent short or open will produce noise clicks when the tube is tapped.

SOCKETS: This tester is equipped with a 4, 5, 6, 7 combination. Octal 8, Loctal 8, Noval 9, Miniature 7, Sub-miniature 7 Pin, Sub-Miniature 8 Pin, and Acorn sockets. There is one blank for future use. An index dot is shown on right side of 7 Pin sub-miniature socket. This should correspond with index dot on tube. For 5 and 6-pin sub-miniature tubes, insert with open pins on left or all pins toward the index dot.

TUBE CHART

This is a three (3) column, free-running roll chart for speed of operation. The markings on the panel are self-explanatory for setting the tester for various tube types. (See paragraph under "General Information" at end). The extra clip lead is used in place of the regular top cap connector for those tube types so indicated on the chart setting.

METER DIAL

The meter is equipped with a GOOD BAD scale. Tubes on which the meter pointer falls in the RED position of the dial are classified by the tester as defective. It will be noted that a tube which delivers an ultra high deflection is classified as questionable by red area (extreme right of dial). Such tubes may be questionable in performance because of possibility of a gassy condition or the defect might be misplaced elements or damaged connections in base of tube. The dial is also marked in percentage with 70 percent being the end point or position between Good and Bad on Red and Green sections.

SEQUENCE OF OPERATION

1. LINE VOLTAGE OPERATION: Turn OFF and ON switch to ON position. Turn Line Control in a clockwise direction until meter pointer reads to "Line". This control is graduated in 2.5 volt steps and gives an indication of the AC line voltage when the meter is reading "Line" (center scale). This is a useful feature as many radio and TV troubles can be traced to low input line voltages.
2. FILAMENT: From the tube chart set filament control as given for type to be tested.
3. CIRCUIT: Press buttons indicated on chart for Circuits D and E. Insert tube in proper socket and allow time to heat.
4. SHORTS TEST: Turn shorts test control to all positions tapping tube at each position and watching neon indicator. If lamp flashes or glows steadily, the tube is shorted or leaky and is not satisfactory. If lamp glows in only one position, tube is shorted from that element to filament. If it glows in two positions, it is shorted between given elements. Reset to test position after shorts tests are made.
5. TEST: Recheck line control setting. Set plate control as per chart and press test buttons. Meter pointer will indicate quality of tube being tested.
6. DUAL TEST: For tubes of the dual section type several settings are given on the chart. When testing a tube of this type, repeat the above

procedure for each testing setting given on chart. Only the setting changes for dual types are given. If no setting in filament or Circuit D, column is given, these settings remain same as for first test and only "Circuit E" Plate and Test button are changed. (See Release under Purpose of Controls). Shorts tests should be made between each test of dual type tubes.

7. TARGET TEST: The target sections of tuning indicator tubes are tested by setting the controls as shown under VIS and Visual Test on the chart. Press the correct TEST button and watch target element of the tube for glow.

8. DIAL LIGHTS, ETC. are tested in the center receptacle of 7-prong socket. Set filament switch for voltage rating of lamp to be tested.

GENERAL INFORMATION

Mail the Registration Card for your tester promptly, giving correct name and address, so that additional technical bulletins from our factory will be properly delivered. Notify us of a change of address, listing model number and serial number of your tester in the notice.

Information on new tubes will be sent promptly at regular intervals from our factory. New chart service will be continued for a period of one year after purchase date and will entitle the tester owner to receive tube testing information as the occasion warrants. (Nominal charge thereafter).

REPAIRS AND ADJUSTMENTS

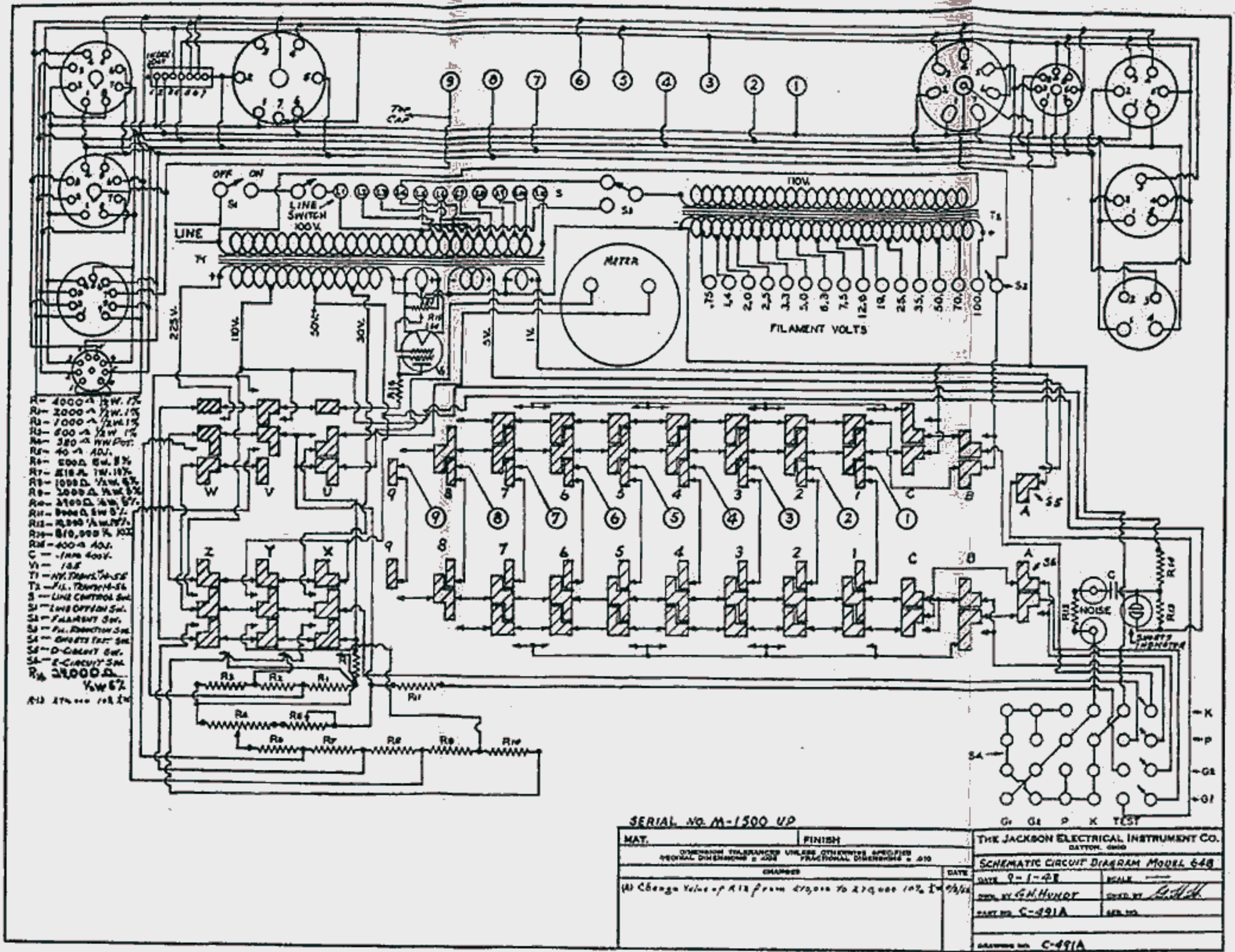
Repairs and adjustments will be made under the terms and conditions stated in the guarantee furnished with this tester. The tester should not be returned to our factory except where we authorize such return to be advisable. When corresponding concerning this instrument always mention model number and serial number. Be certain to describe fully and accurately the information desired.

Manufactured by

THE JACKSON ELECTRICAL INSTRUMENT COMPANY

DAYTON, OHIO U.S.A.

Inst. Form 648/A Printed in U.S.A. No. 32-32/853



SERIAL NO. M-1500 UP

MAT.	FINISH
DIMENSION TOLERANCED UNLESS OTHERWISE SPECIFIED DECIMAL DIMENSIONS ± .005 FRACTIONAL DIMENSIONS ± .010	
CHANGES	DATE
(A) Change Value of R13 from 470,000 to 270,000 10% 1W	9/1/48

THE JACKSON ELECTRICAL INSTRUMENT CO.
DAYTON, OHIO

SCHEMATIC CIRCUIT DIAGRAM MODEL 648

DATE 9-1-48	SCALE
DRN. BY G.H. HUNDT	CHKD BY
PART NO. C-491A	SER. NO.
DRAWING NO. C-491A	

K4XL's  BAMA

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