



# INSTRUCTIONS FOR OPERATING MODEL 1503 MULTIPURPOSE TESTER

## SEE SEPARATE INSTRUCTIONS FOR TUBE TESTING

### GENERAL

Complete satisfaction of any instrument can only be obtained when the radio circuit with its component parts, and the function the parts perform in the radio circuit are thoroughly understood. Take ordinary care of your testing equipment; do not overload the meter; do not drop the tester and be certain that all controls are in the OFF position before starting the tests. This will tend to form the habit of making adjustments before proceeding with the test and will prevent many burn outs. It will give protection on D. C. measurements only.

To protect the meter in the 1503 Tester the LOAD 1 control may be rotated to 100 before using meter. Then after connections are made, rotate back to the ZERO position. If the tester circuit is overloaded this will prevent the meter from burning out. The amount of current passing through the meter can be controlled in this way.

To replace the shadow meter bulb it is necessary to remove tester from case. See instructions for removing from case. Use a 6.3 volt type 46 lamp. The 25Z5 tube should be replaced only when tests show it has depreciated approximately 30%, or when the tube no longer tests good in the tube tester portion of the instrument.

### TUBE AND RANGE SELECTOR

The control marked TUBE and RANGE SELECTOR is used for:

- (1) Making the proper selection for tube testing;
- (2) Selecting the instrument range according to measurements to be made.

### LOAD 1

The dual control marked LOAD 1 is used:

- (1) To control the pulsating voltage applied to the control grid of the tube under power output test;
- (2) To shunt the meter to the range necessary for the electrolytic condenser under test.

This control must be set at zero position for all measurements except electrolytic condenser and tube tests. At this position the shunt circuit is open. Note GENERAL instructions.

### LOAD 2

The dual control marked LOAD 2, OHMS ZERO ADJUST—is used:

- (1) To adjust the ohmmeter to ZERO position;
- (2) To supply proper negative bias to the tube under power output test. The approximate ohmmeter adjustments are marked on panel. These settings being approximate, the final adjustments are made as described under heading—OHMS TEST.

### VALUE BUTTON

The button marked VALUE—A. C. V., is pressed when testing a. c. volts, decibels, paper condensers, and power output tube test.

### TOGGLE SWITCHES

The two toggle switches marked DB—AMPL—ACV—PAPER—RECT—DCV—MA—ELECT—OHMS are used to select the proper circuit for the test desired. Have both switches in the same position.

### NEON LAMP

The Neon lamp is used for tube short tests as explained under that heading.

### FILAMENT VOLTS

The FILAMENT VOLTS selector switch is used to supply proper potential to the filaments of the tube under test.

### LINE CONTROL

The LINE VOLTS CONTROL switch must be in the OFF position when measuring decibels, volts and milliamperes. Adjust from the OFF position in a clockwise rotation until the shadow in the meter marked—ADJUST AC VOLTS TO LINE—is directly beneath the red line. Line adjustment should be made for measurements of ohms, paper and electrolytic condensers and tube testing.

### JACKS

The jacks marked—PAPER CONDENSER—are used to test paper condensers for shorts. Plug into these jacks and proceed as per instructions for testing paper condensers.

The jacks marked 10M-100M OHMS—1-10 MEGOHMS—ELECT. COND.—are used for checking high ohms and electrolytic condensers. The top center jack is the common connection. Connection is made to these jacks with the test leads which are applied to the circuit under test.

The jacks marked AC VOLTS—DECIBELS—are used to check A. C. volts and decibels. See headings for each of these tests.

The jacks marked DCV—MA—1000 OHMS, are used to:  
(1) Measure D. C. volts, (2) D. C. milliamperes and (3) 1000 ohms. The top center jack is common to both the other jacks. See heading marked OHMS—for measuring resistance.

Always set control marked—TUBE and RANGE SELECTOR

—to proper position for the voltage, current or other value to be measured.

#### TO REMOVE TESTER FROM CASE

1. Remove tube in left compartment located under tube chart.
2. Remove the 4 screws only on the vertical left side and the 4 screws only on the right side of the panel.
3. Remove the 4 screws on bottom of wood case.
4. Raise tester about 1" by lifting on panel in a vertical direction.
5. Hold tester in this position while removing the 4 corner brackets in the cabinet.
6. Push line cord through hole in compartment partition.
7. To lift the tester out of the case, take hold of panel and roll to the left to allow the rectifier tube socket to pass thru the opening in the partition.

#### TUBE TEST

This tester may be adapted to two different types of tube tests: (1) POWER OUTPUT or AMPLIFICATION tests, and (2) EMISSION tests. This provision makes it possible to give most tubes a double check.

Complete directions for checking tubes by both methods are given on the separate Tube Chart furnished with the tester. Tube should be discarded when either test shows the tube as BAD.

#### D. C. MILLIAMPERES

1. Set RANGE SELECTOR switch to proper position.
2. Set LINE VOLTS selector switch to the OFF position.
3. Set LOAD 1 control to OFF position.
4. Connect leads to jacks marked DCV-MA-1000 OHMS.
5. Both toggle switches must be set to their DCV-MA position.
6. The meter is now ready to measure milliamperes.
7. Read the 10 Milliampere range direct.  
To read the 1 Ma. range divide reading by 10.  
To read the 50 Ma. scale multiply reading by 5.  
To read the 250 Ma. scale multiply reading by 25.
8. If approximate value is not known set on high range first and rotate to lower range to give wider scale deflection.

#### OHMS

To CHECK 1000 OHMS OR LESS—

1. Connect AC cord to line.
2. Set RANGE SELECTOR on 1000 ohm position.
3. Adjust LINE CONTROL as explained under heading LINE VOLTS CONTROL.
4. Throw the two toggle switches to OHMS position.
5. Have OHMS-ZERO ADJUST control on zero.
6. Use jumper cord in the two jacks marked 10M-100M —1-10 MEGOHMS to short these jacks.
7. Rotate OHMS-ZERO ADJUST control until the meter needle shows full scale deflection. Allow the jacks marked 10M, etc., to remain shorted.
8. Connect unknown resistance across the jacks marked 1000 ohms, by means of leads furnished with tester. The meter will now indicate directly on the low ohms scale the value of resistance being measured.

TO MEASURE OHMS ABOVE 1000—

1. Set RANGE SELECTOR to proper position.
2. Adjust line voltage and toggle switches as before.
3. Place the two test leads furnished in jacks marked 10M-100M OHMS—1-10 MEGOHMS.
4. Contact free ends of cords by holding tips together.
5. Rotate OHMS-ZERO ADJUST until the meter needle shows full scale deflection. The free ends of the cords can now be used to test resistance and continuity.

#### —CAUTION—

Test leads are at high voltage for 1 and 10 megohm measurements. Care should be used in handling.

To read the 10,000 ohm scale multiply the HIGH OHMS scale by 100.

To read the 100,000 ohm scale multiply the HIGH OHMS scale by 1,000.

To read the 1 megohm scale multiply the HIGH OHMS scale by 10,000.

To read the 10 megohm scale multiply the HIGH OHMS scale by 100,000.

#### A. C. VOLTS

1. Set LINE VOLTS control in the OFF position.
2. Set both toggle switches to the ACV position.
3. Set the LOAD 1 control at zero.
4. Rotate RANGE SELECTOR switch to proper position for voltage to be measured.
5. Connect potential to be measured to jacks marked AC VOLTS, etc., by means of leads furnished.
6. Press the VALUE-ACV button.
7. Read directly on the 10 volt scale.  
To read the 50 volt range, multiply the 10 volt scale by 5.  
To read the 250 volt range, multiply the 10 volt scale by 25.  
To read the 500 volt range, multiply the 10 volt scale by 50.  
To read the 1000 volt range, multiply the 10 volt scale by 100.

#### D. C. VOLTS

1. Set the line control in the OFF position.
2. Place both toggle switches in the DCV position.
3. Rotate LOAD 1 control to zero.
4. Rotate the RANGE SELECTOR switch to the proper range for the voltage to be measured.
5. Use jacks marked DCV-MA-1000 OHMS for test leads. Read the 10 volt scale direct.  
To read the 50 volt scale multiply the 10 volt scale by 5.  
To read 250 volt scale multiply 10 volt scale by 25.  
To read the 500 volt scale multiply the 10 volt scale by 50.  
To read the 1000 volt scale multiply the 10 volt scale by 100.

## DECIBELS

1. Set the line control to the OFF position.
2. Set the two toggle switches to the DB position.
3. Set the range selector switch to DECIBELS position.
4. Use jacks marked—DECIBELS—for test leads.
5. Read meter directly on the DECIBEL scale.

NOTE: The decibel scale is calibrated for line impedance of 500 ohms. A higher or a lower line impedance will give slightly different readings.

By means of the DECIBEL METER the loss or gain of each stage of the radio set may be measured. This is accomplished by feeding an oscillator signal of constant amplitude into each stage of the radio and measuring the gain with the meter. The stage tested will determine the band to be used from the oscillator. To set up the audio gain curves for the set the DECIBEL METER is connected to each succeeding stage from detector to speaker and the gain in DECIBELS noted.

To run fidelity curves a continuously variable audio oscillator or a variable frequency record is fed into the detector stage with the DECIBEL range of the 1503 tester connected across the voice coil. The audio amplifier frequency response can be checked with the various frequencies available and plotted in a graph.

## PAPER CONDENSER TESTS

1. Connect A. C. supply cord to line and adjust line voltage as explained under LINE VOLTS control.
2. Test condenser for shorts by means of the one megohm resistance range. A short will be indicated by a constant or intermittent meter reading when condenser is tested across jacks marked—1 MEGOHM. The proper adjustment of ohmmeter following ohms test instructions must be made for this part of condenser test.

3. To test for open condenser set RANGE SELECTOR on position 10 for paper condenser, insert condenser between jacks marked PAPER CONDENSER, and press ACV button. A meter reading will indicate a good condenser. Condensers as low as .002 mfd. may be tested in this way. The value of the meter reading is not important, only an indication is needed and value will vary with different capacities.

CAUTION: Test leads are at high potential. Care should be used in handling.

## ELECTROLYTIC CONDENSERS

1. The AC cord is plugged into the AC line.
2. Adjust LINE VOLTS control as above.
3. Set both toggle switches to ELECT. position.
4. Rotate LOAD 1 control to 100.
5. Place electrolytic condenser across jacks marked—ELECT. COND. The red jack is the positive connection. It is necessary to observe polarity when testing electrolytic condensers.
6. Rotate LOAD 1 to position as shown on panel under LOAD 1 for the condenser of the capacity under test. A good or bad condenser will read directly on the scale.

Since this test was designed for condensers with a rating of 200 volts or more, a one watt resistor should be placed in series with Red jack and positive terminal of the condenser for those rated under 200 volts. Use the following table for resistance values:

100 volt 1 MFD. Condenser . . .	50,000 ohms
100 volt 2 MFD. Condenser . . .	25,000 ohms
100 volt 4 MFD. Condenser . . .	12,000 ohms
100 volt 8 MFD. Condenser . . .	6,000 ohms

For 50 volt condensers double the resistance values.

For 25 volt condensers quadruple the resistance values.

# THE TRIPLETT ELECTRICAL INSTRUMENT CO.

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