

**INSTRUCTIONS**  
**FOR**  
**MODEL 785 TYPE 6**  
**INDUSTRIAL CIRCUIT TESTER**

**WESTON ELECTRICAL INSTRUMENT CORPORATION**  
**NEWARK 5, NEW JERSEY, U. S. A.**



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**FOR**  
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●  
Additional copies of this Instruction  
Book are available at 25 cents each.  
●

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# INSTRUCTIONS FOR MODEL 785 TYPE 6 INDUSTRIAL CIRCUIT TESTER

**GENERAL:** The Model 785 Type 6 incorporates in one complete instrument exceptionally broad coverage for measurement of a-c or d-c voltage, current and resistance. A 100 millivolt full scale range is provided to be used with external shunts for measurement of d-c current in excess of 10 amps. A-c current above 10 amps may be measured with external current transformers. The selection of ranges is sufficiently broad to handle measurements on all types of control equipment and electronic apparatus in addition to power circuits. Illustrated Step-by-Step Test Procedure for each type of measurement are shown on pages 4 through 12.

**INSTRUMENT:** The instrument is a 4½" type, having a movement considerably larger than that used in 3½" meters. The movement is adjusted to 50 microamperes full scale with an internal resistance of 2,000 ohms. This provides a 100 millivolt drop, which is desirable when using external shunts. The rectifier network is pre-adjusted and is mounted on the back of the meter studs. The network is replaceable with a new interchangeable unit if damaged by overload.

**SENSITIVITY:** The d-c voltage ranges have a 50 microampere (20,000 ohms per volt) sensitivity to allow the instrument to be used in most of the high resistance circuits encountered in electronic testing.

A-c voltage ranges are at a 1 milliampere (1,000 ohms per volt) sensitivity which in general is ideal for all alternating current voltage measurements.

**SCALES:** To facilitate rapid operation, and to avoid errors, the a-c calibration on the instrument scale is printed in red, and the d-c and ohmmeter markings are printed in black.

**PANEL:** The panel is molded of high-grade bakelite in order to maintain leakage resistance far above that required in a high sensitivity analyzer.

All a-c panel engraving is red; d-c and ohmmeter engraving is white.

**RANGES:** The Tester has the following ranges:

VOLTS		CURRENT		OHMS	
D-C	A-C	D-C	A-C	Full Scale	Center Scale
20,000 Ω/V	1,000 Ω/V	50 μA	0.5 Amp	0-3,000	25
0.1	5	1 MA	1 Amp	0-30,000	250
1.0	15	10 MA	5 Amp	0-300,000	2,500
10	30	100 MA	10 Amp	0-3 Meg.	25,000
50	150	1 Amp		0-30 Meg.	250,000
200	300	10 Amp			
500	750				
1000					

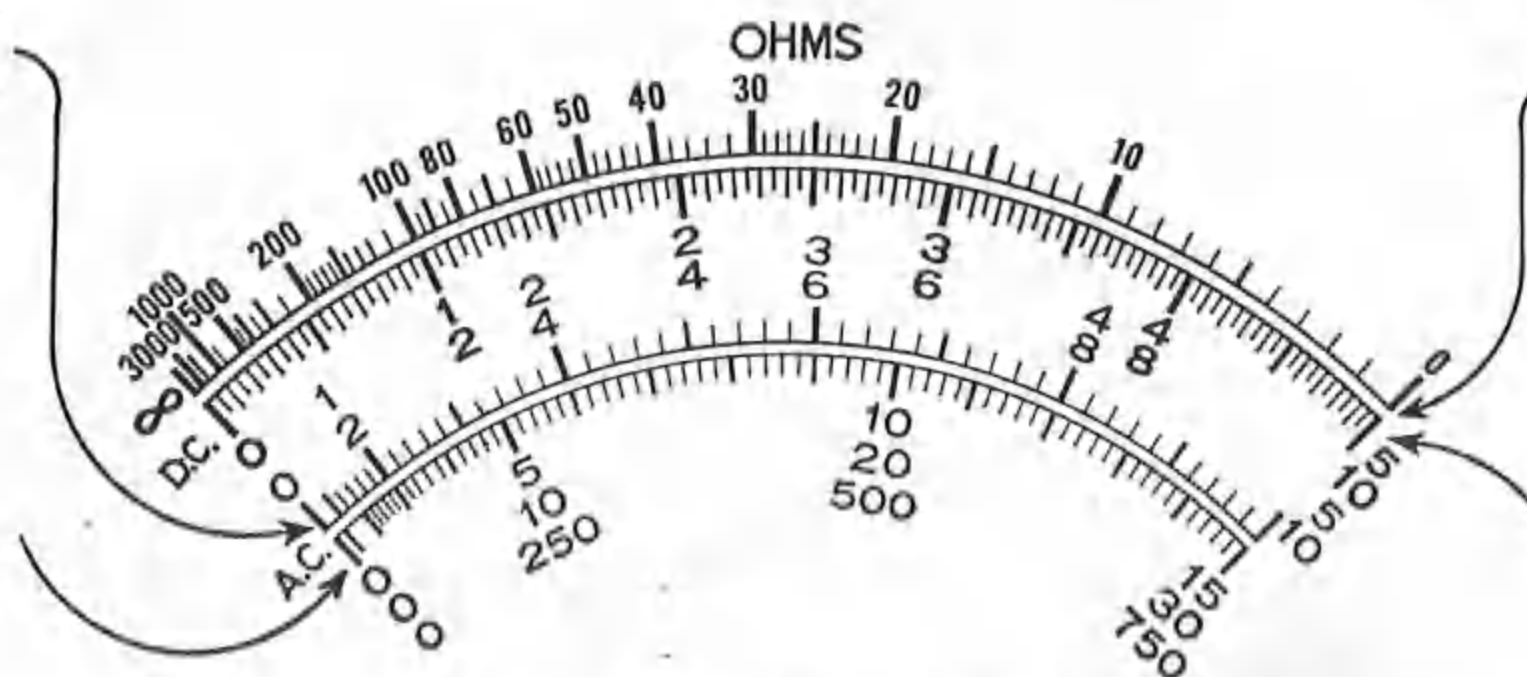
All Type 6 Testers have connections to the 50 microampere pin jacks adjusted for 100 millivolts full scale. External 100 millivolt shunts for higher d-c current ranges may be ordered and readings taken on the basis of full scale deflection for the full current range of the external shunt. Care should be taken to select ranges which give good readability on the d-c arc such as 50, 100 or 200 amperes.

All a-c current ranges operate through an internal current transformer connected to the instrument circuit. The .5, 1 and 5 ampere ranges have been selected so they may be used with external current transformers, such as Weston Model 604, to extend the range to a considerably higher value.

A-c volt, d-c volt and ohm ranges are brought out to pin jacks. The pair of pin jacks marked 50 μ AMPS DC - MV connect directly across the moving coil when the Functional Switch is indexed to the D-C Volts 50 μ A - MV position. This range is useful for current measurements below 50 microamperes and for use with external 100 millivolt shunts for high current ranges.

Read all A-C Current and 5 Volt A-C ranges on this arc.

Read all A-C Volt ranges, except 5 Volts on this arc.



Read Ohmmeter ranges on this arc.

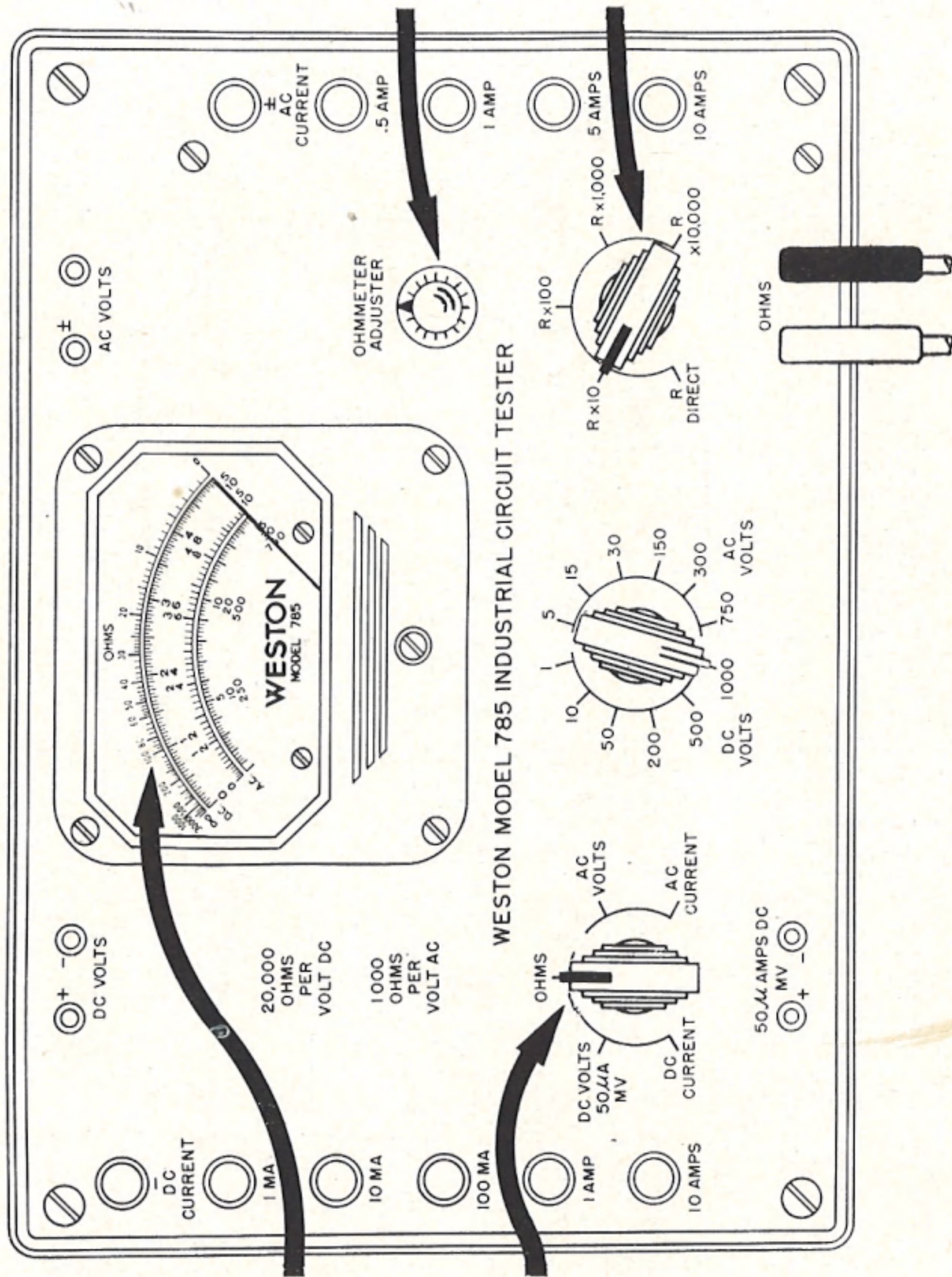
Read D-C Volts and Current ranges on this arc.

Full Size Scale of Model 785 Type 6



# STEP-BY-STEP TEST PROCEDURE

## Resistance Measurements



5. Read Resistance on this arc using multiplier factor in accordance with Ohm Range Switch settings.

2. Index Functional Switch to OHMS position.

4. Short test leads together and set pointer to top scale position by rotating OHMMETER ADJUSTER.

3. Rotate Ohm Range Switch to ohm range desired, i.e.:

Resistance to be measured	Use Range
1/4 to 100 ohms	R x 1
100 to 1,000 ohms	R x 10
1,000 to 10,000 ohms	R x 100
10,000 to 100,000 ohms	R x 1,000
100,000 to 30 meg	R x 10,000

1. Plug Black test lead in right hand OHMS pin jack.

Plug Red test lead in pin jack to left.

### —CAUTION—

Make sure all voltage is turned off before connecting the instrument to the device being checked.

### —NOTE—

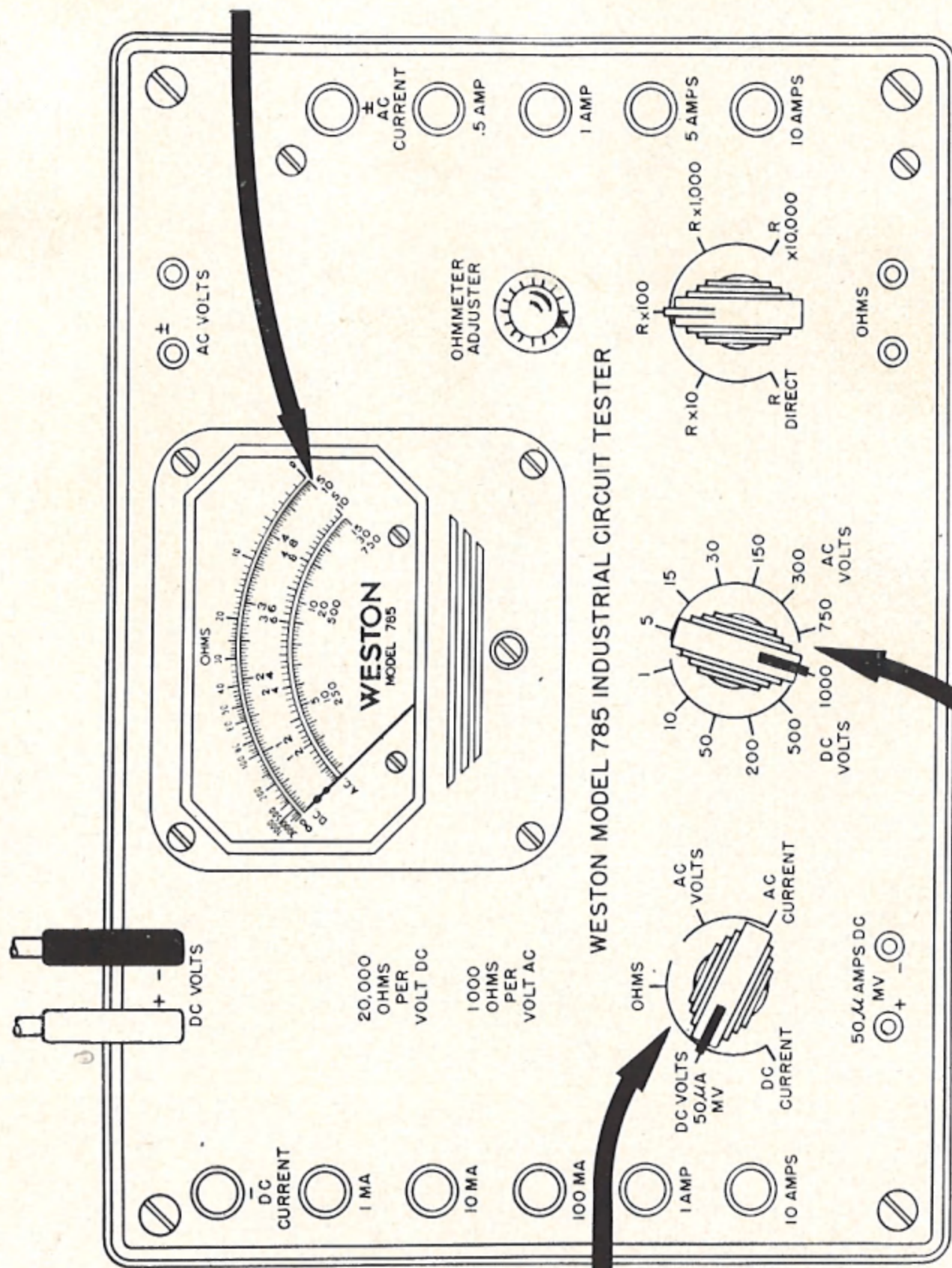
When checking electrolytic condensers for leakage the Red lead will be positive when connections are made as in Step 1.



# STEP-BY-STEP TEST PROCEDURE

## D-C Voltage Measurements

1. Plug Black test lead in -DC VOLTS pin jack.  
Plug Red test lead in +DC VOLTS pin jack.



2. Index Functional Switch to DC VOLTS 50 μA-MV position.

3. Rotate Volt Range Switch to desired volt range.

4. Read D-C Voltage on this arc, i.e.:
- | Switch Setting | Scale Used    |
|----------------|---------------|
| 1 V            | 10 ÷ 10       |
| 10 V           | 10 Full Scale |
| 50 V           | 5 × 10        |
| 200 V          | 10 × 20       |
| 500 V          | 5 × 100       |
| 1000 V         | 10 × 100      |

### —CAUTION—

If voltage to be measured is unknown, start at 1000 V range and work down.

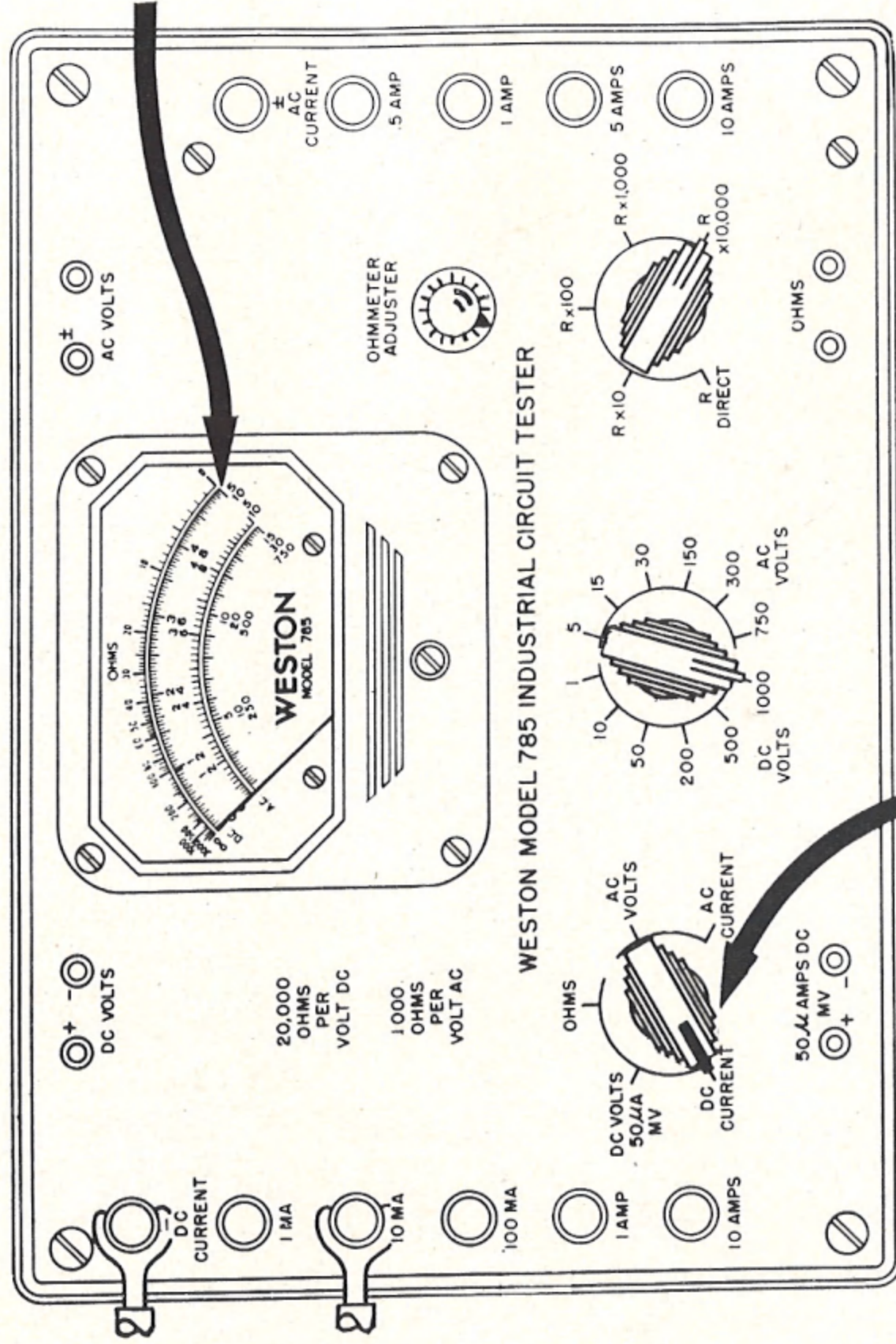


# STEP-BY-STEP TEST PROCEDURE

## D-C Current Measurements (1 Milliampere to 10 Amperes)

### D-C Current Measurements (1 Milliampere to 10 Amperes)

1. Connect one spade terminal to -DC CURRENT binding post.  
Connect other spade terminal to binding post marked with desired range.



3. Read D-C Current on this arc, i.e.:  
Switch Setting      Scale Used  
1 MA.....10 ÷ 10  
10 MA.....10 Full Scale  
100 MA.....10 × 10  
1 AMP.....10 ÷ 10  
10 AMPS.....10 Full Scale

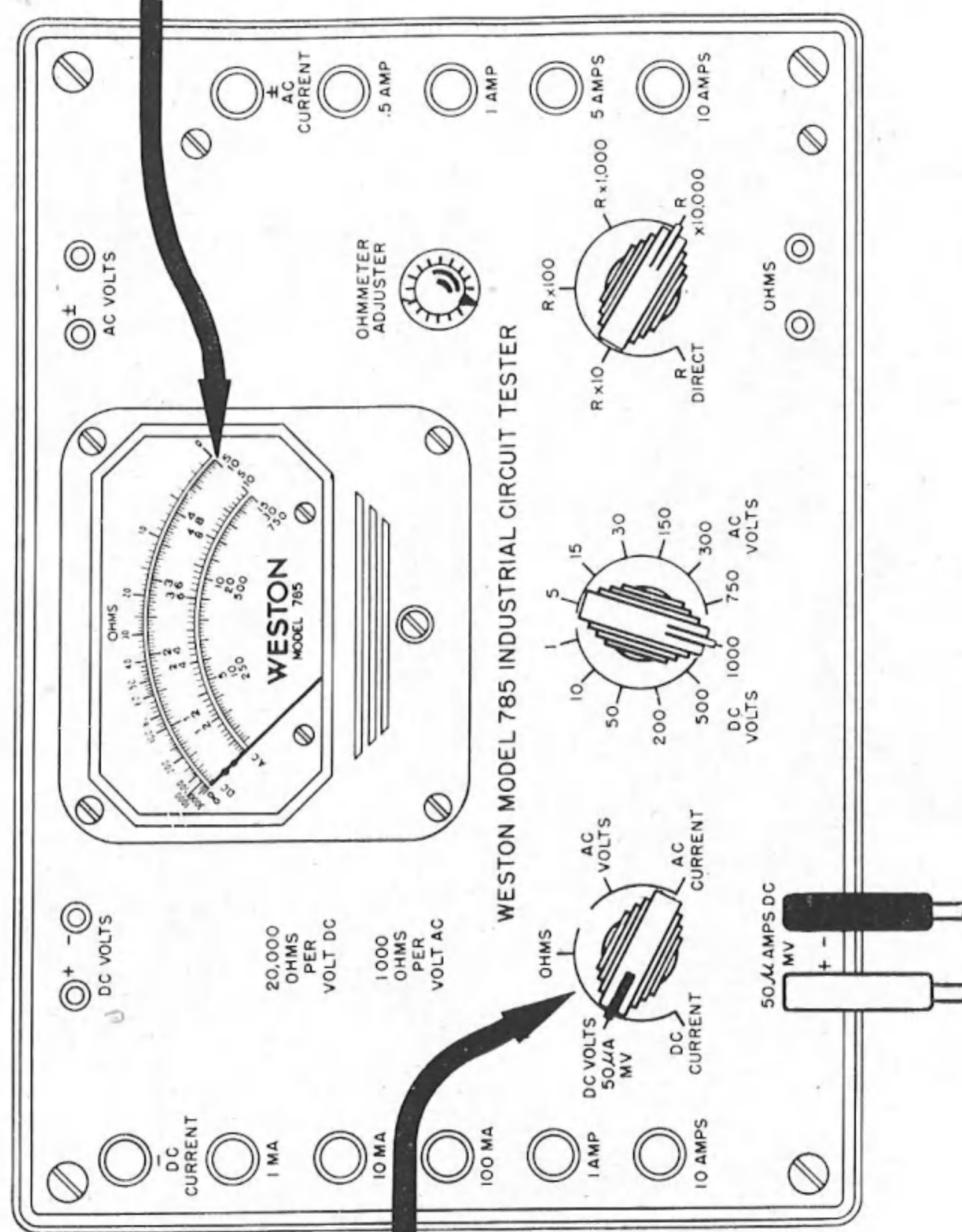
2. Index Functional Switch to DC CURRENT position.



# STEP-BY-STEP TEST PROCEDURE

## D-C Current Measurements (50 Microamperes)

### D-C Current Measurements (50 Microamperes)



3. Take readings of 50 Microamperes full scale on this arc.

2. Index Functional Switch to DC VOLTS-50  $\mu$ A-MV position.

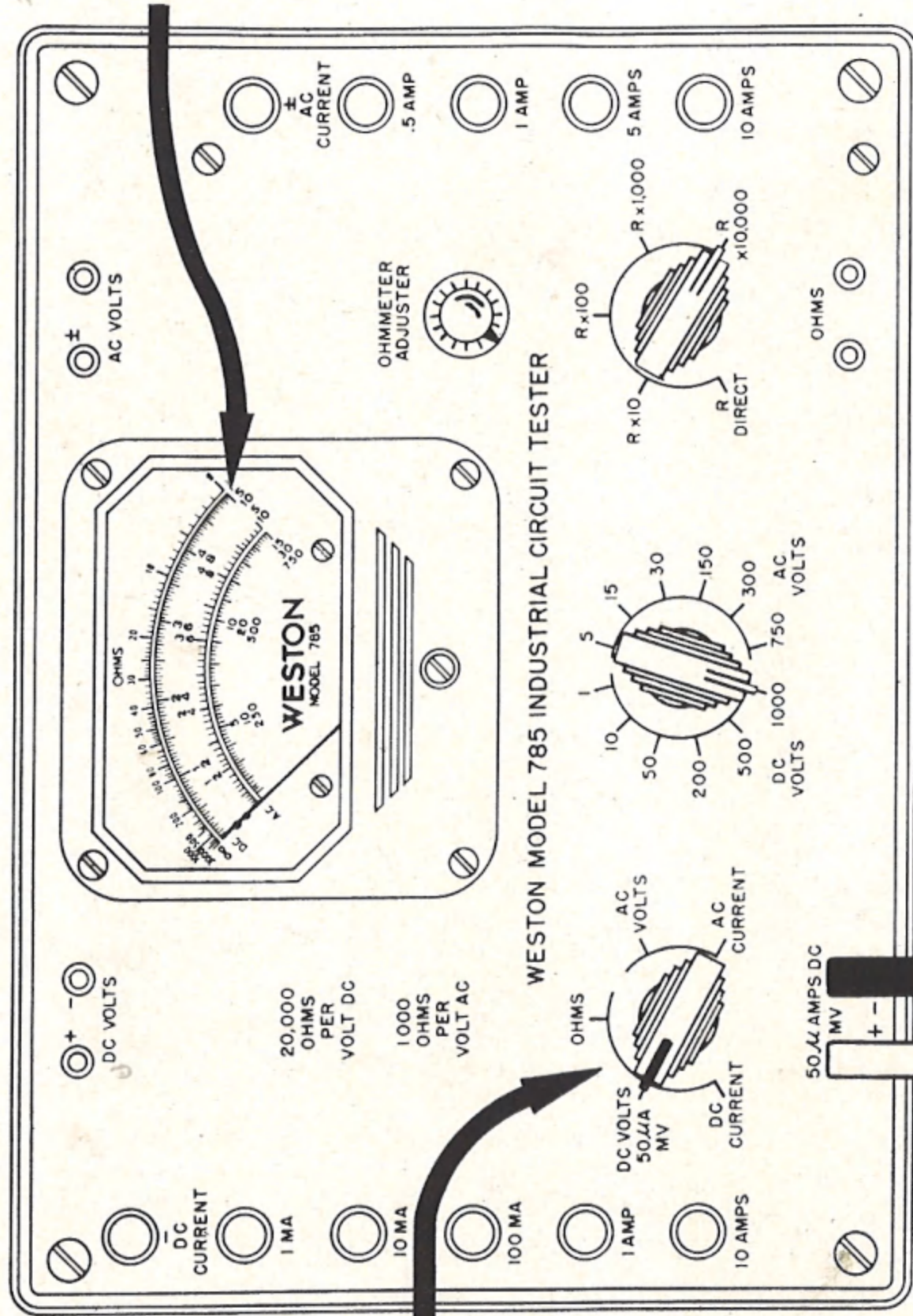
1. Plug Black test lead in -50  $\mu$ AMPS DC-MV pin jack.  
Plug Red test lead in +50  $\mu$ AMPS DC-MV pin jack.



Mr. Tibbette Fra 4656 - FULL SCALE DEF. - 100 M.V.

# STEP-BY-STEP TEST PROCEDURE

## D-C Current Measurements (Using 100 MV External Shunt)



4. Take current readings based on current rating of the shunt at 100 Millivolts full scale. (Select a shunt that will give good readability on D-C arc, e.g.: 50, 100, 200 Amperes.)

3. Index Functional Switch to DC VOLTS-50  $\mu$ A-MV position.

100 MV EXTERNAL SHUNT

2. Connect regular spade terminal leads to the thumb screws on the shunt.

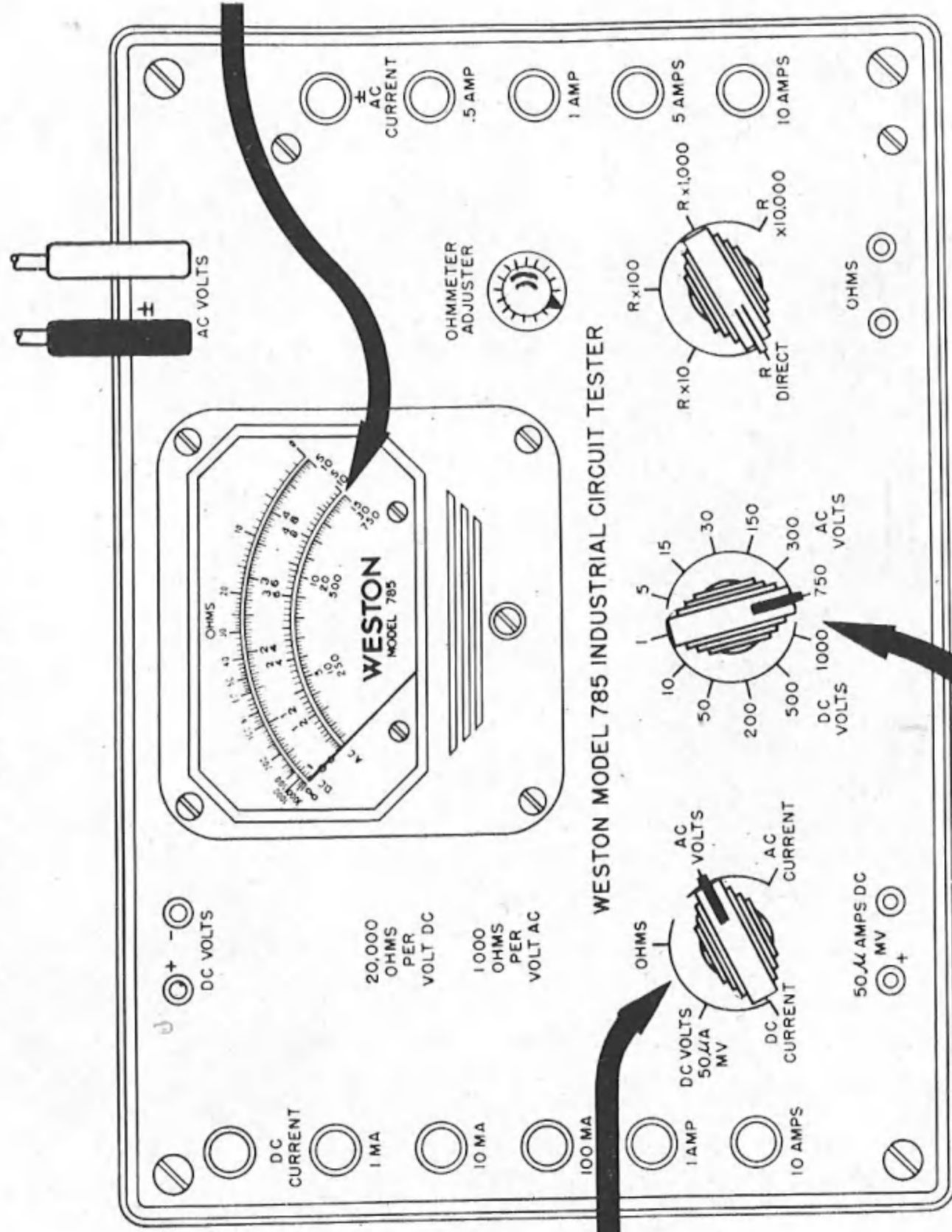
1. Connect Millivolt terminals on external shunt to 50  $\mu$ AMPS DC-MV pin jacks using special leads supplied with shunt.



# STEP-BY-STEP TEST PROCEDURE

## A-C Voltage Measurements

1. Plug test leads in AC VOLTS pin jacks.



2. Index Functional Switch to AC VOLTS position.

4. Read A-C Voltage on one of the Red arcs, i.e.:

Switch Settings	Scale Used
5 V	5 Full Scale
15 V	15 Full Scale
30 V	30 Full Scale
150 V	15 × 10
300 V	30 × 10
750 V	750 Full Scale

3. Rotate Volt Range Switch to desired volt range.

—CAUTION—

If voltage to be measured is unknown, start at 750 volt range and work down.

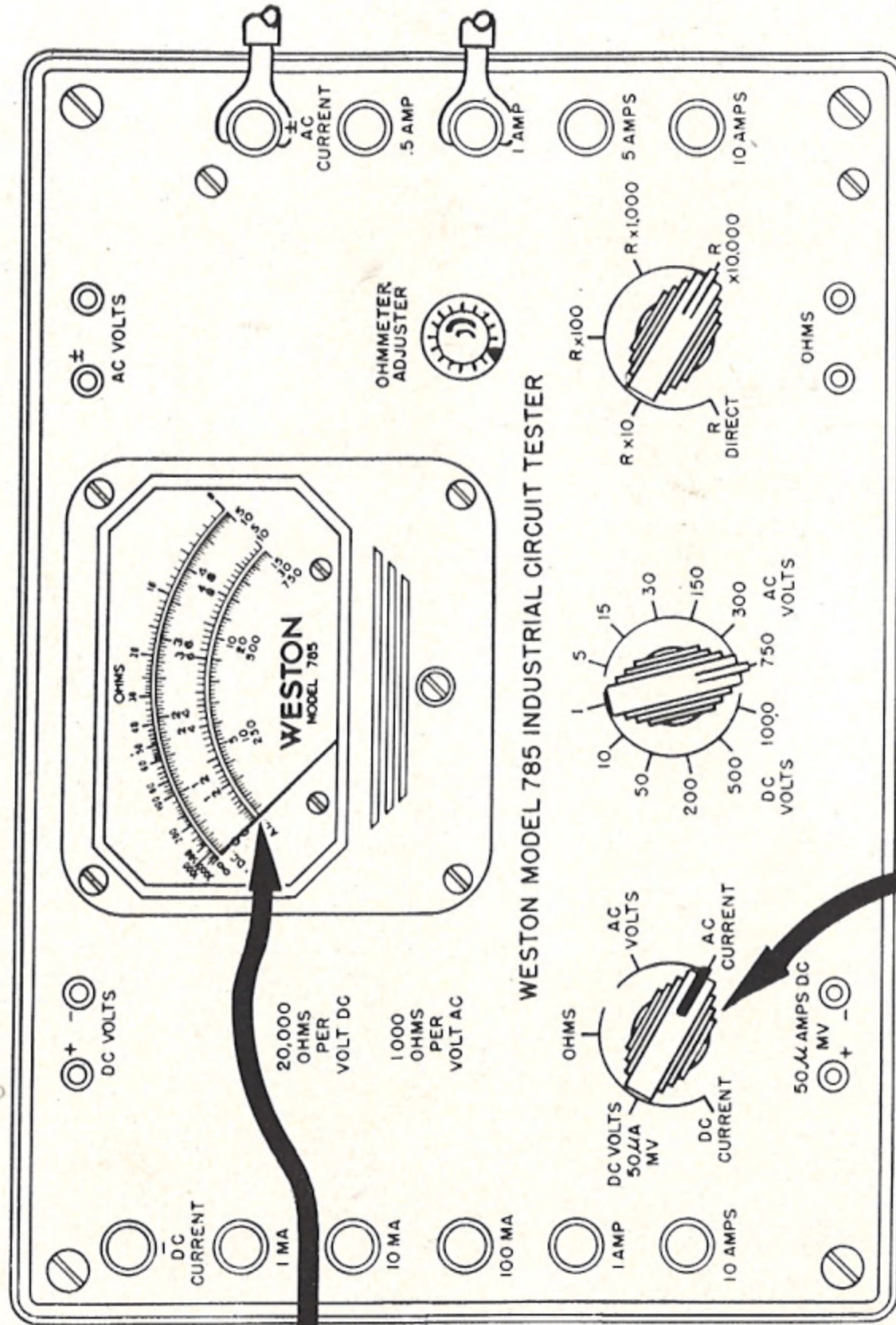


# STEP-BY-STEP TEST PROCEDURE

## A-C Current Measurements

### A-C Current Measurements

1. Connect one spade terminal to  $\pm$  AC CURRENT binding post.  
Connect other spade terminal to binding post marked with desired range.



3. Read A-C Current on one of the Red arcs, i.e.:
- | Range   | Scale Used    |
|---------|---------------|
| 1/2 Amp | 5 $\div$ 10   |
| 1 Amp   | 10 $\div$ 10  |
| 5 Amps  | 5 Full Scale  |
| 10 Amps | 10 Full Scale |

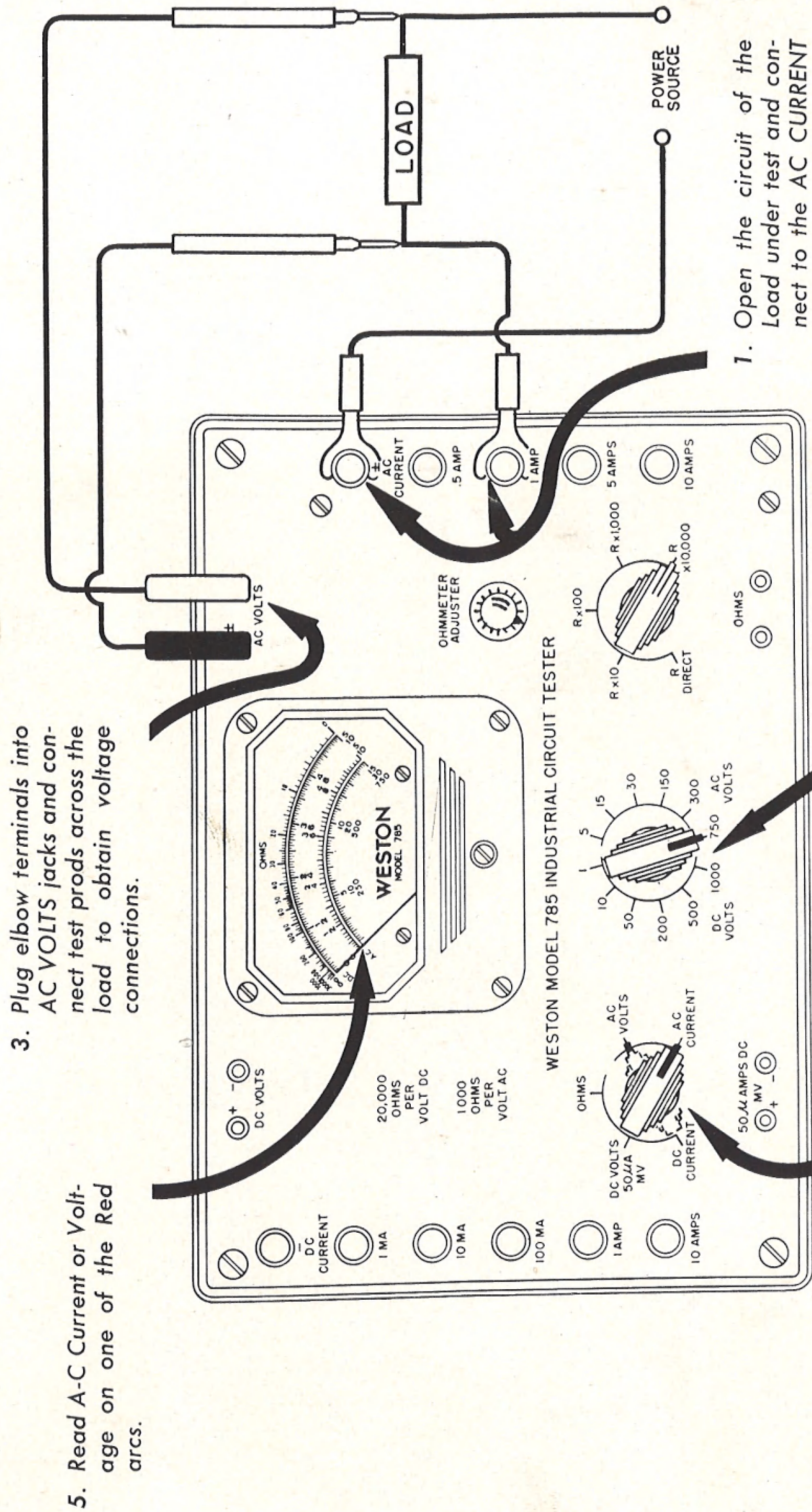
2. Index Functional Switch to AC CURRENT position.



# STEP-BY-STEP TEST PROCEDURE

## Combination A-C Current and Voltage Measurements

### Combination A-C Current and Voltage Measurements



3. Plug elbow terminals into AC VOLTS jacks and connect test prods across the load to obtain voltage connections.

5. Read A-C Current or Voltage on one of the Red arcs.

1. Open the circuit of the Load under test and connect to the AC CURRENT binding post for range of current expected.

2. Index Volt Range Switch to expected voltage drop across the load.

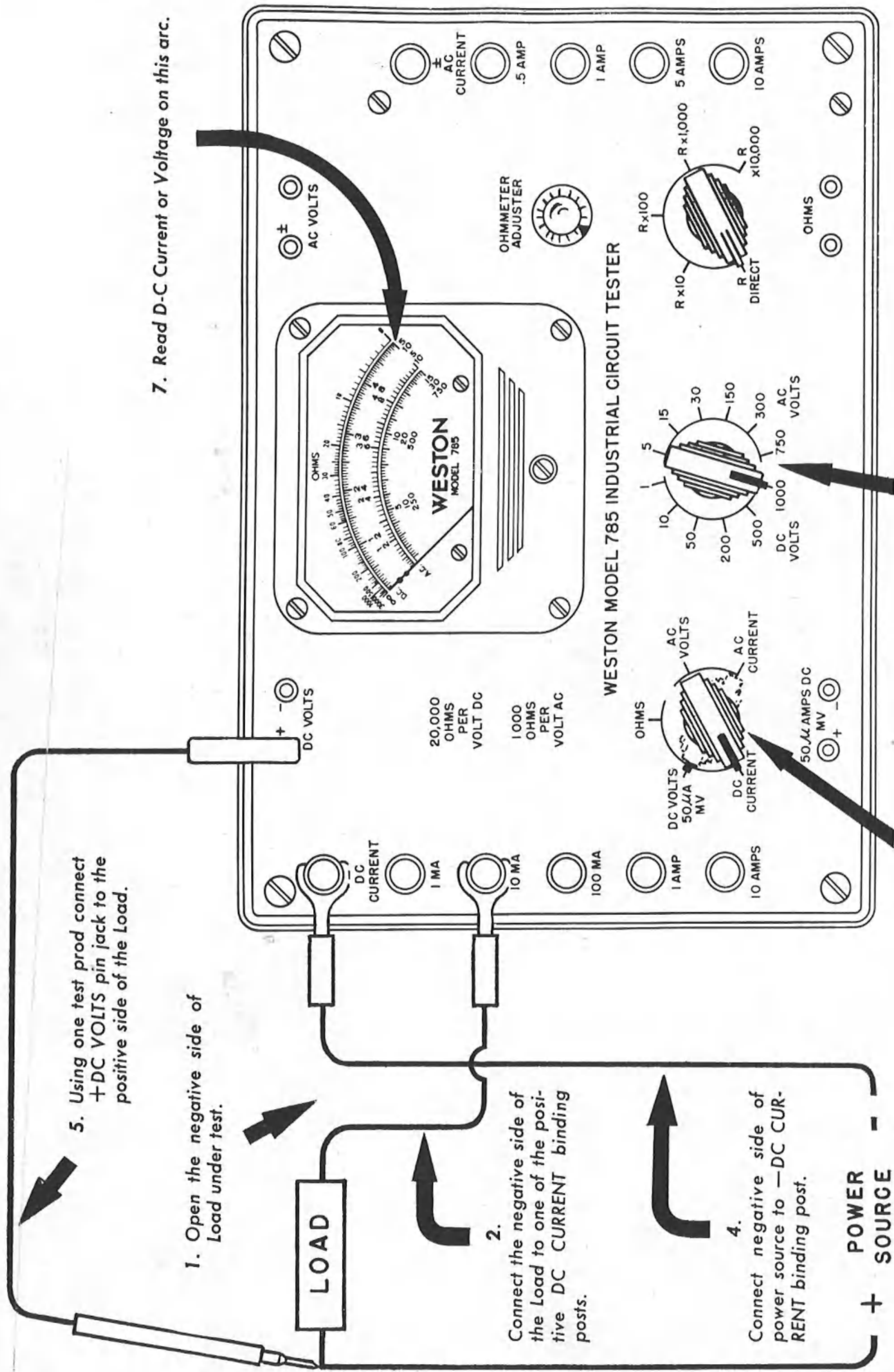
4. Take A-C Current or Voltage readings by indexing Functional Switch to AC CURRENT or AC VOLTS position.



# STEP-BY-STEP TEST PROCEDURE

## Combination D-C Current and Voltage Measurements

### Combination D-C Current and Voltage Measurements



5. Using one test prod connect +DC VOLTS pin jack to the positive side of the Load.

1. Open the negative side of Load under test.

2. Connect the negative side of the Load to one of the positive DC CURRENT binding posts.

4. Connect negative side of power source to -DC CURRENT binding post.

6. Take D-C Current or Voltage readings by indexing Functional Switch to DC CURRENT or DC VOLTS position.

3. Index Volt Range Switch to expected voltage drop across Load under test.



## GENERAL INFORMATION

**MILLIVOLT DROP ON A-C CURRENT RANGES:** The following current transformer drops on various a-c current ranges are given as general information and are approximate in value. Individual instruments may vary 10 percent above or below these values as the primary drop of the current transformer is not held to a specific value.

Range—A-C Amperes	Approx. Primary Drop Millivolts
10 Amp	90
5 Amp	100
1 Amp	250
0.5 Amp	400

**TEMPERATURE COMPENSATION:** Improved temperature compensation covering a much wider temperature range than that found in the Type 3 has been incorporated on d-c current, a-c voltage, and a-c current ranges. This is an important factor in field tests under severe temperature conditions.

**OHMS:** Before making resistance measurements and when changing ranges the operator should short the test leads and rotate the OHMMETER ADJUSTER until the pointer indicates exactly full scale, as outlined under the Step-By-Step Test Procedure. The accuracy of the readings obtained depends largely upon the care with which this setting is made. The d-c battery potential on the four lower ohm ranges is 1.5 volts. On the R  $\times$  10,000 range the d-c battery potential is 15 volts. This permits the ohm ranges to be used on all types of low voltage condensers and other low voltage equipment to measure leakage, resistance, etc.

When the ohmmeter ranges are used it must be kept in mind that the extreme right OHM pin jack is connected to the negative end of the internal ohmmeter battery. Therefore when testing electrolytic condensers for leakage, the negative side of the condenser should be connected to the — pin jack on the lower right. This information is important in order to obtain the resistance of the condenser under correct polarity conditions.

**A-C VOLTS:** All a-c ranges operate at 1000 ohms per volt. This sensitivity is entirely sufficient for the most sensitive a-c readings, and is preferred to higher sensitivity as much more accurate readings can be obtained. When the current density in an instrument rectifier gets far below a 1 mil or 1000 ohm per volt value, its temperature and resistance characteristics become very critical, therefore standard 1000 ohms per volt a-c ranges are supplied. Note that when taking readings on a-c,

the 5-position Functional Switch below the meter must be indexed to the A-C VOLTS position. Accurate readings can be taken on the a-c ranges over a wide band of frequencies extending over the complete audio spectrum. The meter has a substantially flat frequency characteristic up to 7000 cycles, and at this point starts to drop off at approximately .5% per thousand cycles.

**A-C CURRENT:** For a-c current readings it is noted that the top right binding post marked with a  $\pm$  sign has the same instantaneous polarity as the pin jack with the  $\pm$  marking, labeled A-C VOLTS. Connect one of the current leads to the A-C VOLTS binding post and the other lead to the post marked with the required range. It is advisable to start with the high range and work down.

**COMBINATION A-C CURRENT-VOLTAGE MEASUREMENTS:** To check relay circuits for both voltage and current, it is possible to make both the current and voltage connections to the test set and to take readings by merely rotating the Functional Switch. On the a-c circuit, the current ranges and voltage ranges are completely insulated. If potentials are used above 50 volts, it is advisable to be certain that the  $\pm$  A-C CURRENT binding post and the  $\pm$  A-C VOLTS pin jack leads are connected to the same side of the a-c circuit. The series circuit can be made to the relay through the A-C CURRENT binding posts and the potential leads connected across the circuit. The Functional Switch can then be rotated from the A-C VOLTS position to the A-C CURRENT position and readings taken of both voltage and current on the relay or equivalent device. This makes the Tester the equivalent of a two instrument device, as this single operation can be carried out very rapidly. Due to the extremely small current drain on the a-c voltmeter, no errors will appear in taking the a-c current readings.

**D-C VOLTS:** All d-c voltage ranges operate at 20,000 ohms per volt. Separate pin jacks are provided at the upper left of the meter. These are connected by indexing the Functional Switch to the position marked D-C VOLTS—50  $\mu$  A - MV.

**D-C CURRENT:** For d-c current readings, the top left binding post should be connected to the negative side of the circuit using one of the heavy current leads. The other lead should be connected to the positive binding post of the required range, starting with a high current range to prevent overloading the meter.



### COMBINATION D-C CURRENT-VOLTAGE MEASUREMENTS:

Where voltage and current readings are to be taken on relays or similar equipment using d-c potentials, only three leads are required. The negative of the D-C CURRENT binding posts is directly connected to the negative pin jack for D-C VOLTS. Connections can be made to the D-C CURRENT binding posts. A single test lead is plugged in the + pin jack marked D-C VOLTS to avoid any short circuits. The test lead is then connected to the positive side of the relay or the circuit as required. By indexing the Volt Range Switch to the required volt range, readings on all d-c current and voltage can be taken on the instrument by merely rotating the Functional Switch from the D-C CURRENT to the D-C VOLTAGE position.

**BATTERIES:** This Tester requires two batteries—A 1.5 volt flashlight cell (Burgess #2, Eveready #950, or Rayovac #2LP size D) is used for the R, R × 10, R × 100, and R × 1,000 ranges. (It should be replaced when it is no longer possible to bring the pointer to the top scale or zero mark on any of these four ranges)—One 15 volt Eveready #411 Minimax battery is used for the R × 10,000 range. An Eveready #413 battery may be used and will fit in the battery clamp if the #411 is not available.

**BATTERY REPLACEMENT:** To replace 1.5 volt flashlight cell:

1. Place the thumb over the positive battery end of the clamp pressing toward the battery.
2. Pull up the wire ring clamp.
3. Remove the old cell.

4. Replace it with a new unit with the positive battery terminal toward the thumb clamp.
5. Refasten the ring clamp by placing the open end of this clamp over the two projections at the negative end.
6. Snap the closed end over the thumb clamp.

To replace the 15 volt battery:

1. Rotate one of the thumb screws a sufficient number of turns to allow removal of this battery.
2. Note that the thumb screws are formed to fit in the terminal holes on the battery.

**TEST LEADS AND CABLE:** Two pair of standard leads are supplied with this instrument. The test leads may be replaced by ordering Test Leads Nos. D-70033 and D-70034. The cable may be replaced by ordering #12 cable, D-4516.

**INSTRUCTION BOOK:** One copy of this instruction book, which you are now reading, is supplied with each Tester. In the latter section of this book abundant data is available in regard to the operation of the Tester, for condenser leakage measurements. Instructions for taking insulation resistance measurements by using the Model 792 in conjunction with this Tester, as well as information on the Model 766 Types 1 and 2 high voltage multipliers are also included. The Instruction Book should be kept inside of the Tester when it is being transported so that it will be available for immediate use should questions arise as to its most efficient operation.

## CONDENSER LEAKAGE MEASUREMENTS

Condenser leakage measurements are essential in order to segregate shorted or leaky condensers. The sensitive ohm ranges on the Model 785 make these tests very easy. Measurements of paper condensers should always be made using the top or R × 10,000 range. All paper condensers should not show any appreciable leakage on this range due to the fact that leakage lower than 50 megohms is liable to indicate moisture in the condenser which may result in a final breakdown.

In general electrolytic condensers used in power supplies should be rejected if their leakage resistance is below 600,000 ohms. Any value much below this will cause heating in the condenser resulting in further injury and final breakdown.

Electrolytic condensers should be measured on the R × 10,000 range. Their leakage is a finite

value, usually between 600,000 ohms and 10 megohms. A definite advantage of a sensitive ohmmeter of this type is, that a maximum potential on any range of only 15 volts d-c is used to obtain the high megohm readings. Therefore, any resistance test can be taken on any normal electrolytic condenser regardless of its voltage rating.

On by-pass condensers used on cathode circuits of the 5, 10 and 25 microfarad types, with voltage ratings as low as 50 volts, considerably lower resistance readings may be obtained. However, all electrolytic condensers should have a resistance of at least 100,000 ohms to function correctly in receiver circuits. The condenser should be connected with its negative terminal to the right hand OHMS jack which will apply the correct polarity to the electrolytic condenser.



## INSULATION RESISTANCE MEASUREMENTS IN CONJUNCTION WITH MODEL 792

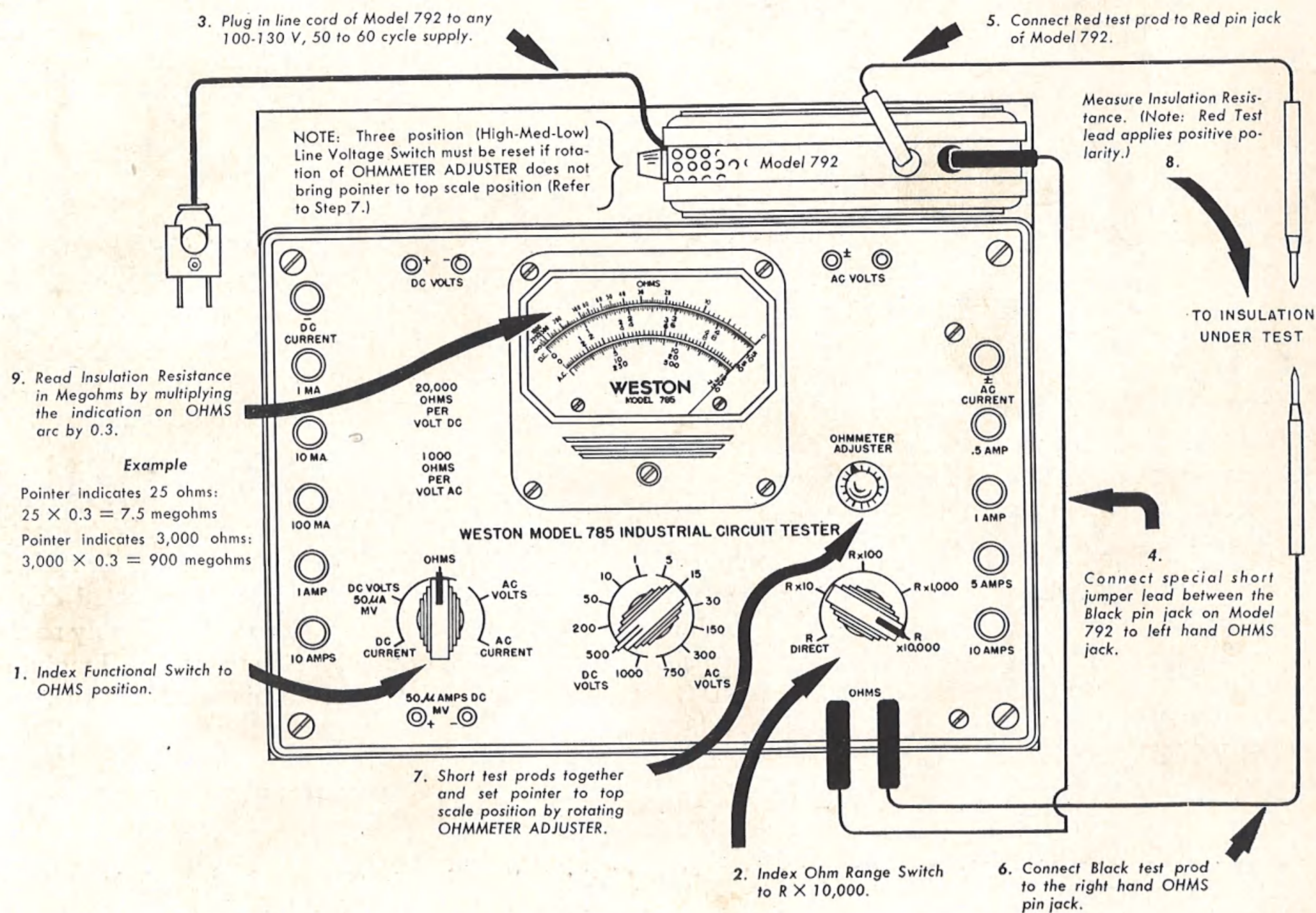
This device is used to adapt the Model 785 Industrial Circuit Tester to the measurement of resistance up to 900 megohms. A supply line of 100 to 130 volts, 50 to 60 cycles a-c, is required to operate the self-contained d-c power supply which is incorporated in the unit. These supply lines are almost universally available, therefore, this unit can be used to advantage in nearly all applications of cable, motor, transformer and general insulation testing within its range.

For Step-By-Step Test Procedure of Model 792 Insulation Resistance Tester in conjunction with Model 785, refer to the illustration at the bottom of this page.

A d-c potential of approximately 500 volts appears across the test prods for all values of circuit resistance above 50 megohms. For resistances below 50 megohms, this voltage decreases gradu-

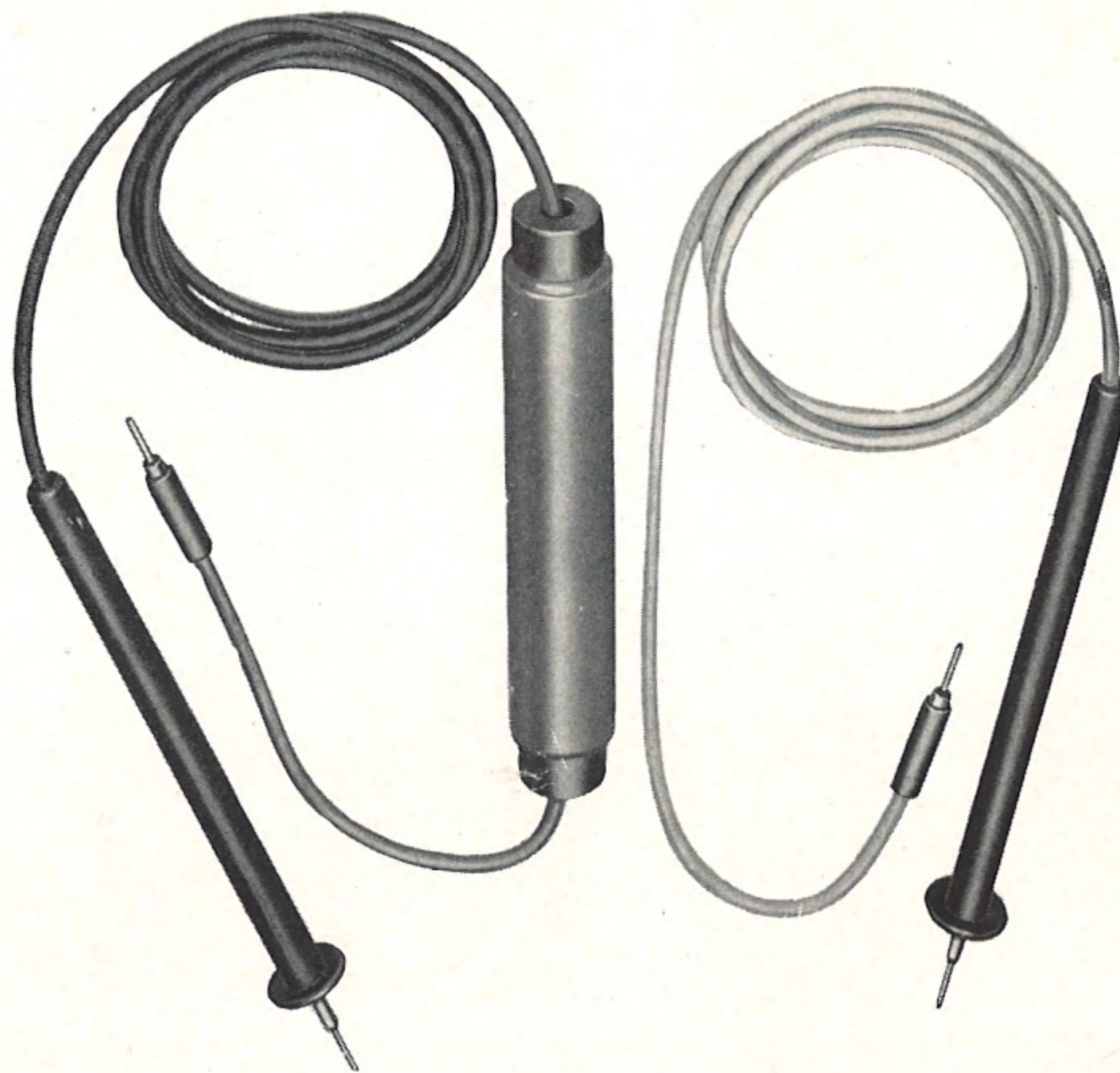
ally until at short circuit it is reduced to zero due to the internal protective resistance. This characteristic tends to automatically protect poor insulation from damage which might be caused by the application of full voltage. Insulation in good condition is well able to withstand 500 volts without damage. This characteristic also provides complete protection from shock as the current is limited to 60 microamperes maximum.

A potential of approximately 500 volts d-c was selected for this device to conform with the recommendations of the A.I.E.E. The voltage is low enough to permit the measurement of leakage of all mica condensers and of all paper condensers having a voltage rating of 150 volts or higher. Better results are obtained when leakage measurements of electrolytic condensers are taken with the regular ohmmeter ranges.





## HIGHER D-C VOLTAGE RANGES WITH WESTON MODEL 766 TYPES 1 AND 2 TELEVERTER MULTIPLIERS



These high voltage multipliers are used to extend the range of 20,000 ohms per volt analyzers to 5,000 or 10,000 volts. They have been designed for use with Weston Models 772, 779 and 785, all types. The Type 1 Model 766 provides 5,000 volt readings full-scale. The Type 2 is designed for 10,000 full-scale readings. These units are supplied with a spring clamp, which can be mounted on the bench or test panel for physically holding the multiplier unit in position.

It is advisable to keep the analyzer at ground or chassis potential when measuring high voltages. Where the positive potential is grounded to the chassis as on most cathode ray tube equipments, plug the 6" lead from the televerter into the -D-C VOLTS jack. Connect the separate lead from the +DC VOLTS jack to the chassis or low potential point under measurement, and the long lead from the televerter to the high negative potential point. Set the Model 785 Volt Range Switch to 5.0 volts, read 5,000 volts full-scale when using the Type 1 Model 766 and 10,000 volts full-scale when using the Type 2 unit.

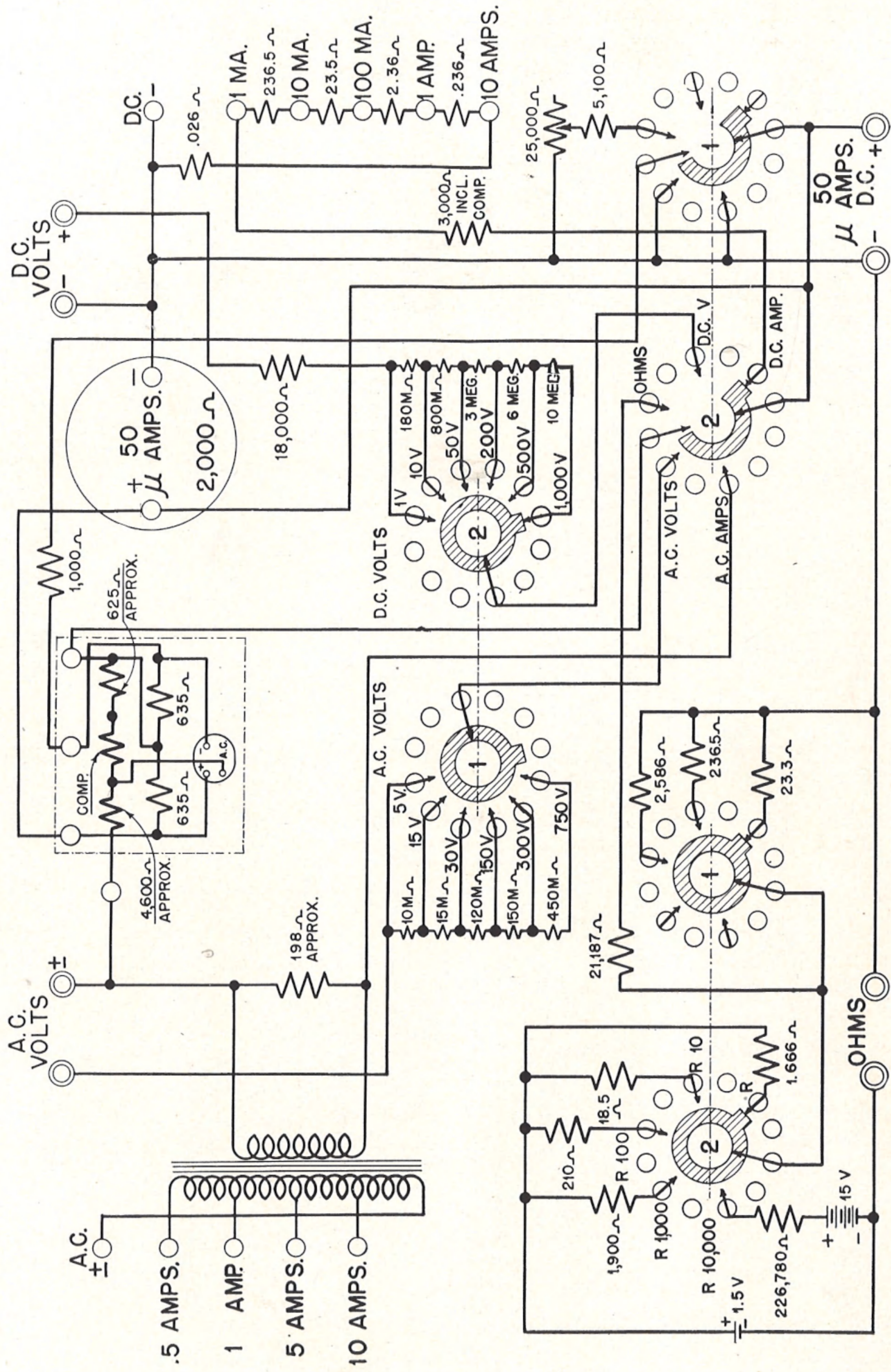
If the negative of the circuit is at or near chassis potential, reverse the procedure, connecting the 6" televerter lead to the +DC VOLTS jack; connect the separate lead from the -DC VOLTS jack to the chassis or low potential point and the long televerter lead to the high positive potential point. Set the Volt Range Switch as outlined above.

The televerter and leads are designed and manufactured to pass A.I.E.E. dielectric specifications. **CAUTION:** These leads should be inspected at periodic intervals to make certain that the insulation on the wire has not deteriorated due to age or rough treatment. The unit is doubly sealed for protection against moisture, and will maintain its accuracy under severe humid conditions.

CARE SHOULD BE EXERCISED  
IN TAKING HIGH POTENTIAL READINGS.  
USE ONE HAND AT A TIME



# WIRING DIAGRAM OF MODEL 785 TYPE 6 INDUSTRIAL CIRCUIT TESTER





PARTS LIST FOR MODEL 785—TYPE 6—ONLY

No 411 15VOLT  
 BATTERY  
 MINIMA

Note: When Ordering Part, Specify Serial Number Of Circuit Tester.

NOMENCLATURE	QUANTITY PER INST.	PART No.	NOMENCLATURE	QUANTITY PER INST.	PART No.		
Wooden Carrying Case.....	1	D-118849	Compensating Resistor 3000 ohms	1	D-118855		
Metal Case .....	1	D-118850	Resistor Spool 2586 ohms .....	1	D-118843		
Panel .....	1	D-118852	Resistor Spool 2.36 ohms.....	1	D-93451		
Screws, Panel to Case.....	4	ND-22213	Resistor Spool 18.5 ohms.....	1	D-93452		
Body for Pin Jack.....	8	D-106252	Resistor Spool 23.5 ohms.....	1	D-81393		
Pin Jack Mtd.....	8	D-106253	Resistor Spool 198 ohms .....	1	D-93453		
Shakeproof Terminals .....	8	ND-19561	Resistor Spool 1000 ohms .....	1	D-76881		
No. 104 Binding Posts Mtd.....	11	D-66898	Resistor Spool 1900 ohms .....	1	D-76975		
Extension—Binding Post .....	4	D-72951	Resistor Spool 10,000 ohms.....	1	D-93410		
10 Amp. Shunt Mtd.....	1	D-87630	Resistor Spool 15,000 ohms.....	1	D-87557		
1 Amp. Shunt Mtd.....	1	D-118853	Resistor Spool 18,000 ohms.....	1	D-70766		
Transformer .....	1	D-87632	Resistor Spool 21,187 ohms.....	1	D-83010		
Case—Transformer .....	1	D-112394	Ceramic Resistor 120,000 ohms....	1	D-118851		
Screws	} For Mounting Transformer	} 1 ND-19245	Ceramic Resistor 150,000 ohms....	1	D-108939		
Nuts			1 D-89534	Ceramic Resistor 180,000 ohms....	1	D-108940	
Washers			1 ND-21529	Ceramic Resistor 226,780 ohms....	1	D-108956	
Rheostat .....	1	D-116177	Ceramic Resistor 450,000 ohms....	1	D-108943		
Knob for Rheostat.....	1	ND-23835	Ceramic Resistor 800,000 ohms....	1	D-108947		
Switch (Functional) .....	1	D-87627	Ceramic Resistor 3 meg.....	1	D-108949		
Switch (A.C. & D.C. Volts).....	1	D-87629	Ceramic Resistor 6 meg.....	1	D-108951		
Switch (Ohmmeter) .....	1	D-87628	Ceramic Resistor 10 meg.....	1	D-108953		
Nuts—Mtg. Switches & Rheostat..	4	D-79547	Carbon Resistor 5,100 ohms.....	1	ND-20034		
Knob—Switches .....	3	D-83038	Rectifier Circuit Assembled for				
Screws—Switch Knob .....	1	D-76857	Meter.....	1	D-118861		
Battery Clamp Mtd. (1.5 V. Cell)..	1	D-118817	Screws	} For Mounting Meter	} 4 J-10200		
Clip (1.5 V. Cell).....	1	D-93418	Lockwashers			4	ND-10599
Battery Bracket (15 V. Cell).....	2	D-118854	Nuts			4	D-89534
Contact Screw .....	2	D-118818	Moving Element Balanced				
Screw	} For Clamp And Bracket	} 6 ND-20695	(includes M.C.-pivots-spgs.-				
Washer			6 ND-21859	pointer) .....	1	D-109096	
Resistor Spool 1.666 ohms.....	1	D-116257	Scale Plate .....	1	D-118961		
Resistor Spool 23.3 ohms.....	1	D-116260	Battery 1.5 Volt .....	1	ND-19637		
Resistor Spool 210 ohms .....	1	D-118842	Battery 15 Volt.....	1	ND-23912		
Resistor Spool 236.5 ohms.....	2	D-116262	Test Leads Mtd.....	1 pr.	D-70033-34		
			No. 12 Cables Mtd.....	1 pr.	D-4516		



NOTES