PHILCO MODEL 025-A VOLT-OHM-MILLIAMMETER

Philco Model 025-A is a complete unit for testing circuits, checking A-C or D-C voltages, amperes or milliamperes, and also measuring resistances—ohms or megohms. It can also be used to measure capacity. When used in connection with a suitable signal generator, it enables all necessary tests to be made on a receiver. The various tests with the Model 025-A are made as follows:

OUTPUT METER

Be sure the ohmmeter knob is in the "Off" position. Turn the selector knob to the "A.C." position.

To use the meter for checking output (such as when adjusting compensating condensers in a set with the aid of a signal generator), the two special adapter leads provided are used. Insert the "phone tip" end of one of these leads into the "output" jack and the other into one of the lower voltage "positive (+) volts" jacks, depending on the strength of the signal to be measured. The other ends of the leads are to be slipped over the output prongs of the output tube or tubes in the set under test. If the set uses a single output tube, connect to the plate and cathode (plate and filament in tubes having no cathode); in push-pull sets slip one adapter over the plate of each output tube. The comparative output of the set at different adjustments is indicated by the comparative amount of deflection of the meter needle.

Output jack is for use only in measuring output of receiver. When measuring A-C voltages, use A-C jack, as described below under "A-C Voltmeter."

D-C VOLTMETER

Be sure the ohmmeter knob is in the "Off" position. Turn the selector knob to the "D.C." position.

To use the meter to measure D-C voltages, employ the two leads having phone tips at one end and test prods on the other. Insert the tip at the opposite end of the lead carrying the black prod into the jack marked D.C. (−) and the tip on the lead carrying the red prod into one of the jacks marked D.C. (+), depending on the voltage range needed. For example, if you wish to measure a voltage which will be between 30 and 100, insert the tip into the jack marked 100V+. The voltage measured will be indicated on the upper D-C scale. When using the 300V+ jack, multiply the reading on the 30-volt scale by 10; when using the 1000V+ jack, multiply the reading on the 10-volt scale by 100.

A-C VOLTMETER

Be sure the ohmmeter knob is in the "Off" position. Turn the selector knob to the "A.C." position.

Insert the phone tip of the lead carrying the black prod into the jack marked A.C.±, and the one carrying the red prod into one of the "positive volts" jacks, depending on the voltage to be measured. Read voltages on the scales marked "A.C.", the same as explained above under D-C Voltmeter.

Do NOT use "OUTPUT" jack to measure A-C voltages.

D-C MILLIAMMETER

Be sure the ohmmeter knob is at "Off". Turn the selector knob to the "10 mils" or "100 mils" position (depending on current to be measured).

Insert the phone tip on the black prod lead into the "MILS–" jack and the red prod lead into the 10+ or 100+ jack, corresponding to the position of the selector switch. Read milliamperes on the 0-10 D-C volt scale. Multiply reading by 10 if using the 100 mil jack.

OHMMETER

NOTE—While using the ohmmeter, the "0 Adj." is turned "On" and adjusted for the scale being used. *At all other times the control must be in the "Off" position to insure correct readings.*

Resistance is measured on the top scale on the meter. Three ohmmeter ranges are available—0-150 ohms, 0-15,000 ohms and 0-1.5 megohms. Set the selector switch at the proper one of the three positions, depending upon the approximate value of the circuit or unit to be measured, and insert the leads carrying the test prods, black into the top right-hand jack (Ohms + −) and red into one of the three below it, corresponding to the position of the selector switch.

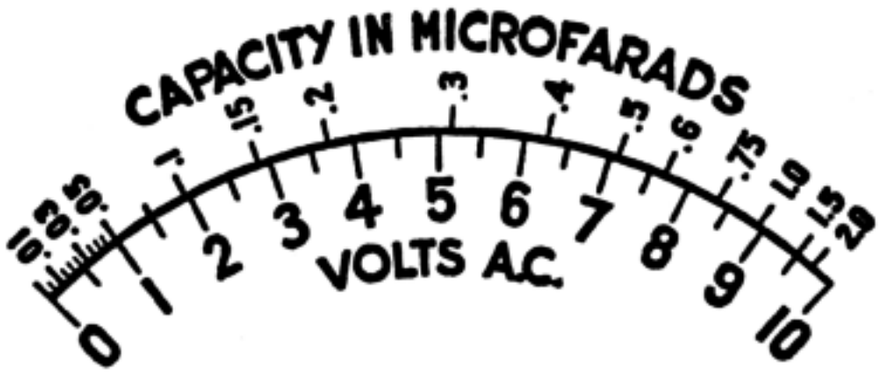
Touch the metal tip of the test prods together, turn the ohmmeter knob "ON" and to the right until the meter reads "zero." You can then measure the resistance desired by touching the test prods to the terminals of the circuit or unit. If using the 15,000-ohm connections, add two zeros to the meter reading; if the 1.5 meg. connections, add four zeros to the meter reading.

The 025-A ohmmeter has a series arrangement throughout the three resistance scales, *and no current is drawn at any time except when resistance tests are actually being made.* The circuit is so arranged that

leaving the "0 adjuster" in the "On" position does not cause any current drain from the batteries. However, it must be left in the "Off" position when voltage and current scales are being used, otherwise the meter readings will be incorrect.

A single 1½-volt flashlight cell is used on the 0-150 ohm scale. This battery should be checked occasionally to make sure that it is in good condition.

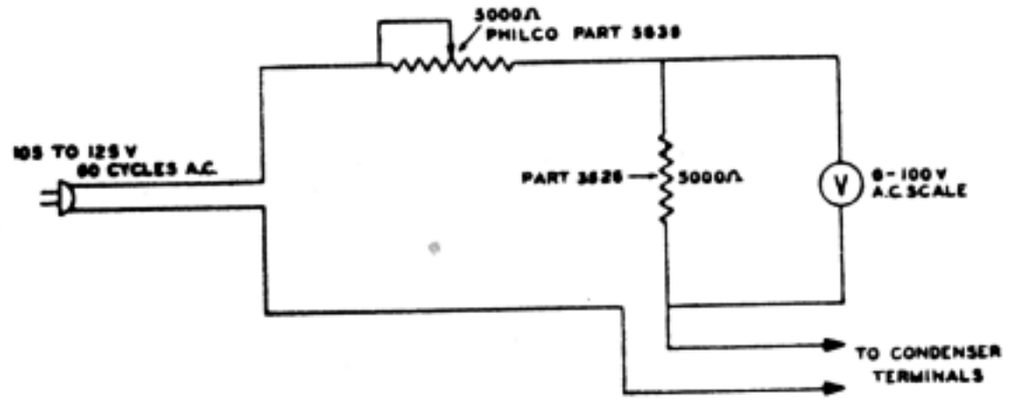
CAPACITY METER



CALIBRATION CHART FOR CAPACITY

To measure capacity it will be necessary to use a Philco potentiometer and a cartridge-type resistor, value shown in diagram herewith.

Make the connections as shown in the diagram, using the 0-100 volt A-C scale of the meter and adjusting potentiometer for 100 volts with the test prods (leading to condenser to be tested) in short circuit. Use calibration chart for capacity.



EXTERNAL CIRCUIT FOR CAPACITY METER

REPLACING BATTERY:

Model 025-A contains two Philco type P-155, 22½-volt dry battery units secured to (inside) the case by clamps. The batteries should be replaced when their voltage drops below 17 volts (indicated by inability to obtain a "zero adjustment" on the meter). To replace the batteries, remove the brass head bolts which hold the clamps (after removing front panel of instrument), disconnect the batteries and lift them from case.

To replace the 1½-volt cell simply remove the plate and spring on the back of the 025-A case. The battery then slips in very easily.

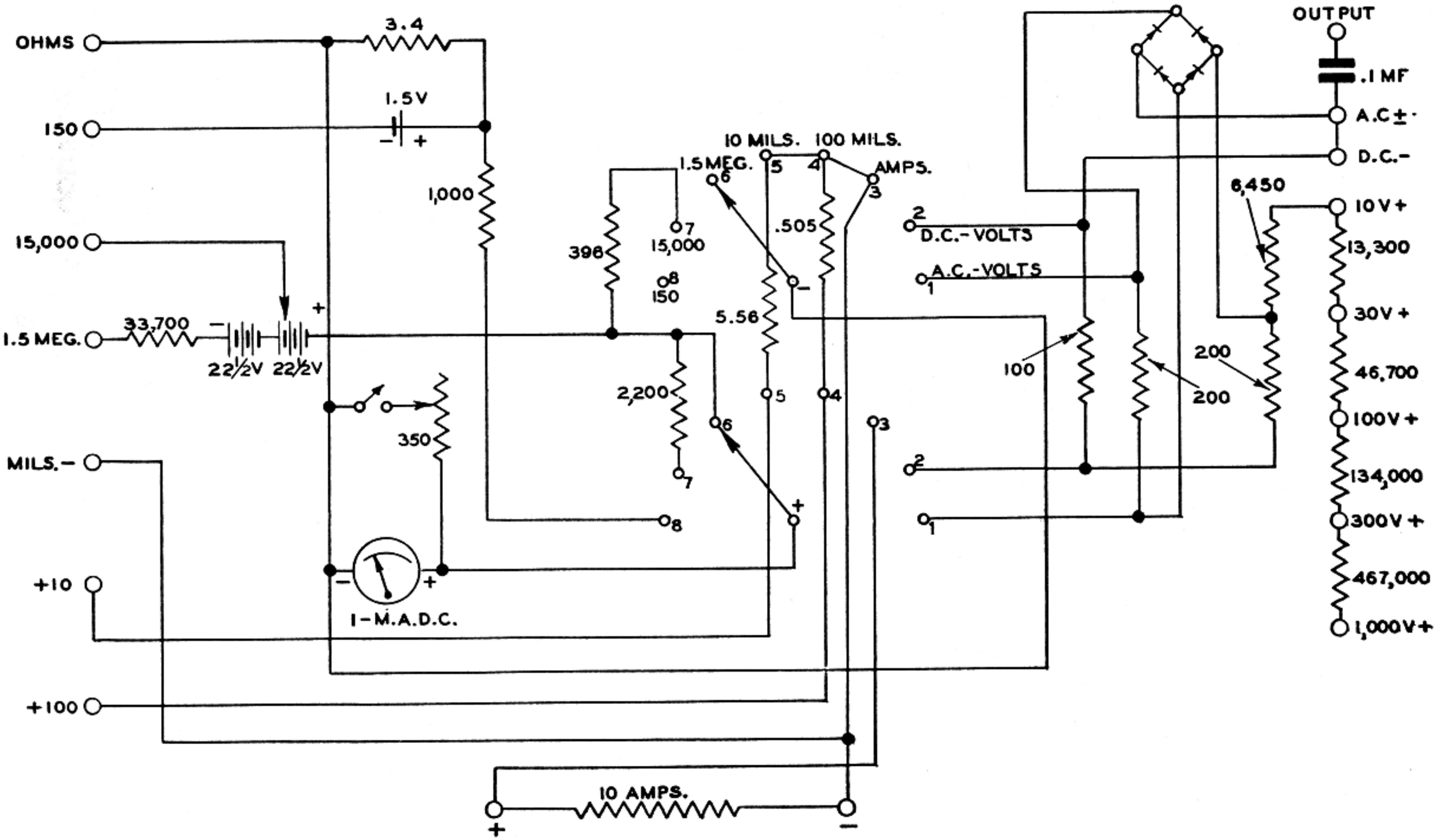
Connect the + terminal of the top battery to the –22½ terminal of the bottom battery. Connect the green lead to the –22½ terminal of the top battery, the white lead to the + terminal of the bottom battery, and the red to the –3 terminal of the bottom battery.

FAILURE IN OPERATION:

See "Failure in Operation" paragraph for Model 026 volt-ohm-milliammeter, page 10.

REPLACEMENT PARTS

Schem. No.	*Description*	*Part No.*
1	Resistor (3.4 ohms)	33-1222
2	Resistor (1000 ohms)	33-3017
3	Resistor (33,700 ohms)	33-1120
4	Potentiometer (350 ohms)	33-5168
5	Resistor (2200 ohms)	33-3287
6	Resistor (396 ohms)	33-1221
7	Meter	45-2048
8	Switch (indexing)	42-1068
9	Resistor (5.5 ohms)	33-3149
10	Resistor (.505 ohms)	33-3148
11	Resistor (100 ohms)	33-3143
12	Resistor (200 ohms)	33-3144
13	Resistor (200 ohms)	33-3144
14	Rectifier	41-3120
15	Condenser (.1 mfd.)	30-4455
16	Resistor (6450 ohms)	33-1119
17	Resistor (13,300 ohms)	33-1121
18	Resistor (46,700 ohms)	33-1122
19	Resistor (134,000 ohms)	33-1123
20	Resistor (467,000 ohms)	33-1124
21	Shunt Resistor (10 amps.)	33-3161
	Binding Post	5978
	Case (battery)	28-4155
	Case End (battery)	27-8042
	Spring (battery case end)	38-8216
	Felt Feet (case)	27-7602
	Nut (case feet)	W-317
	Jack (phone tip)	42-1223
	Jack (phone tip)	42-1222
	Spring (phone jack)	28-1263
	Insulator (phone jack)	27-8428
	Insulator (phone jack)	27-8429
	Knob Assembly	27-4007
	Pointer	27-4277
	Test Prod (red lead)	45-2215
	Test Prod (black lead)	45-2216



PHILCO MODEL 025-A VOLT-OHM-MILLIAMMETER (SCHEMATIC DIAGRAM)