# PHILCO MODEL 026 VOLT-OHM-MILLIAMMETER

## 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.*

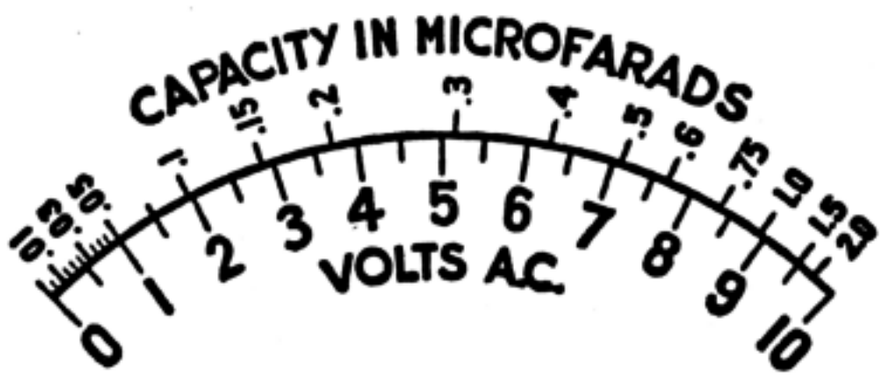
Resistance is measured on the top scale on the meter. Three ohmmeter ranges are available—0-150 ohms, 0-15,000 ohms and 0-1.5 megohms. Set the selector switch at the proper one of the three positions, depending upon the approximate value of the circuit or unit to be measured, and insert the leads carrying 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.

Turn the ohmmeter knob "ON". Then rotate the knob about ¼ turn. Now touch the metal tips of the test prods together and adjust the ohmmeter knob 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.

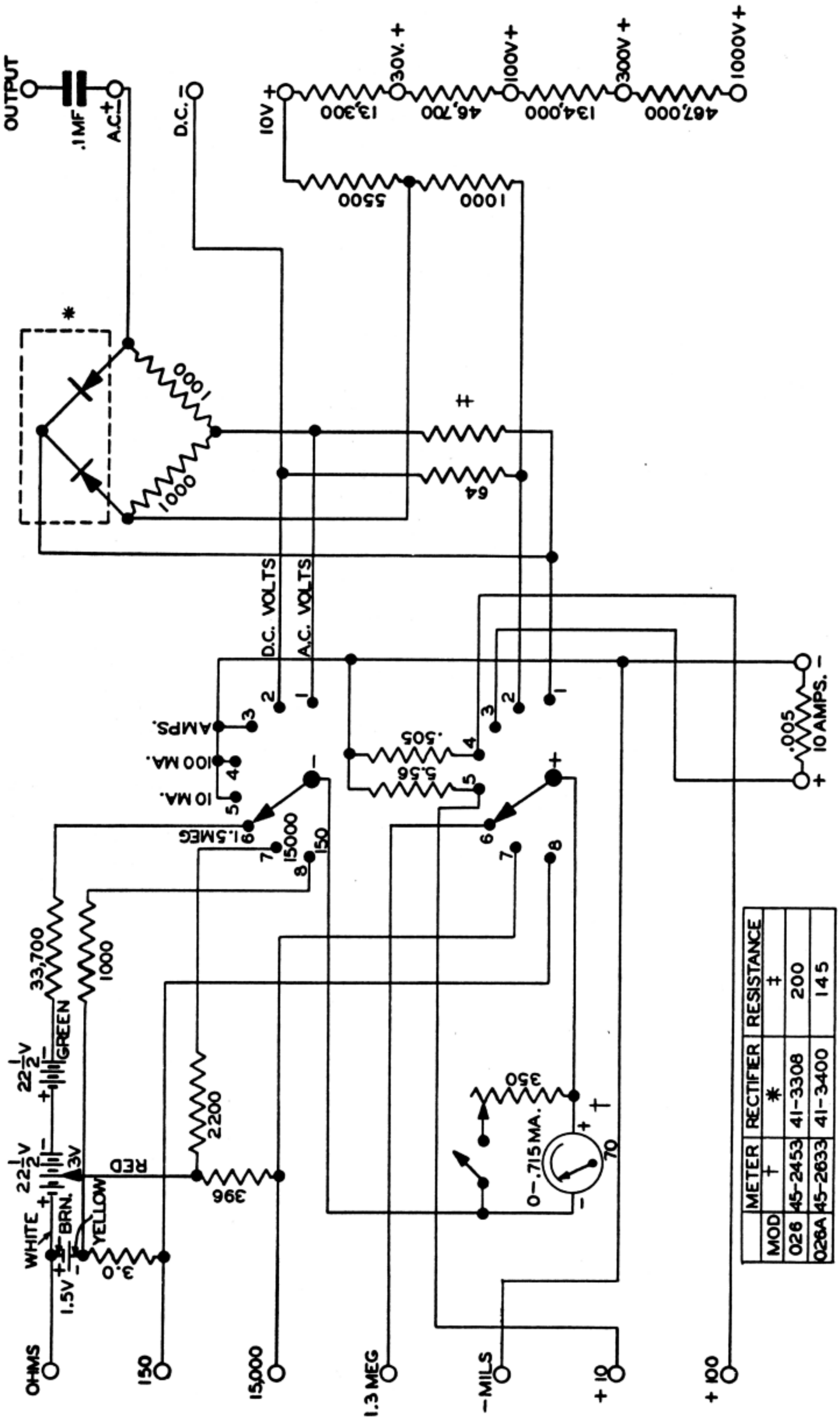
The 026 ohmmeter has a series arrangement throughout the three resistance scales, *and no current is drawn at any time except when resistance tests are actually being made.* The circuit is so arranged that leaving the "0 adjuster" in the "On" position does not cause any current drain from the batteries. However, it must be left in the "Off" position when voltage and current scales are being used, otherwise the meter readings will be incorrect.

## CAPACITY METER

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



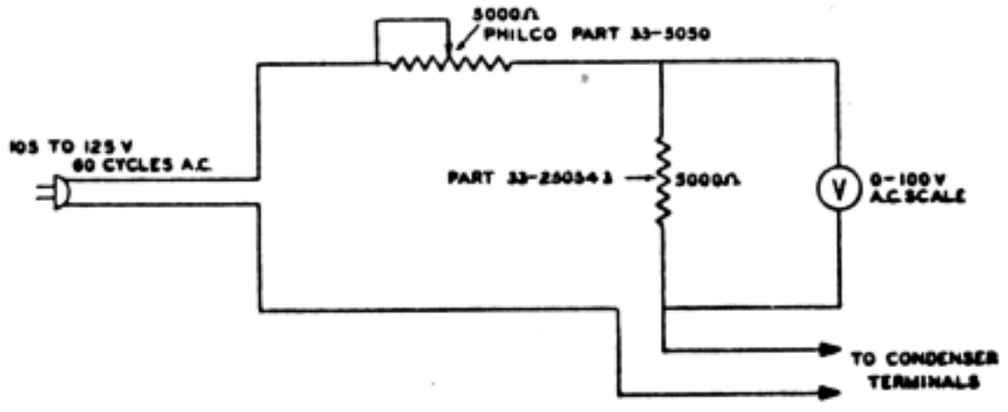

CALIBRATION CHART FOR CAPACITY




PHILCO MODELS 026, 026A VOLT-OHM-MILLIAMMETERS (SCHEMATIC DIAGRAM)

| | METER | RECTIFIER | RESISTANCE |
|---|---|---|---|
| MOD | † | * | ‡ |
| 026 | 45-2453 | 41-3308 | 200 |
| 026A | 45-2633 | 41-3400 | 145 |

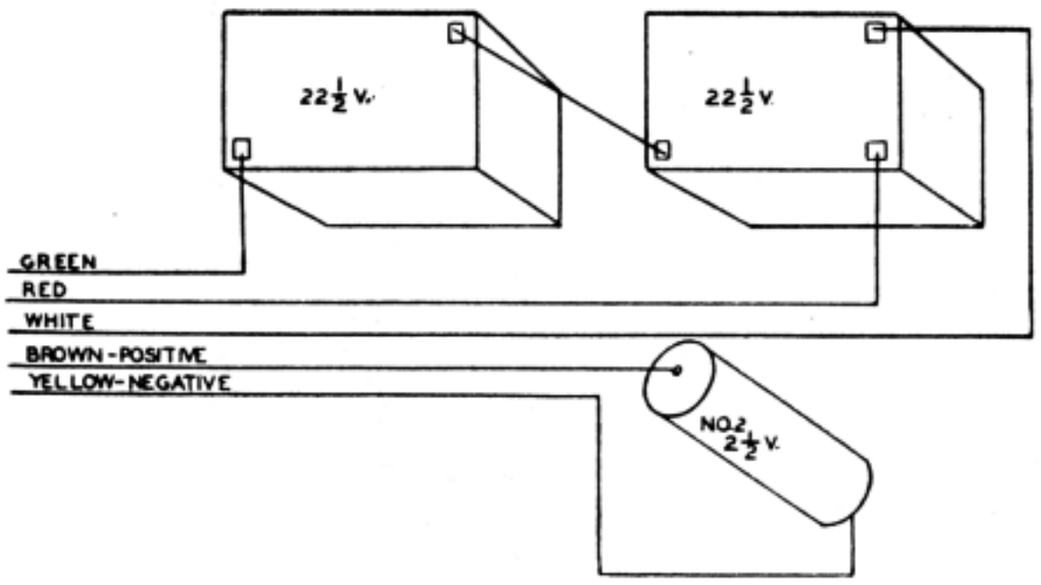
Make the connections as shown in the diagram, using the 0-100 volt A-C scale of the meter and adjusting potentiometer for 100 volts with the test prods (leading to condenser to be tested) in short circuit. Use calibration chart for capacity test.




EXTERNAL CIRCUIT FOR CAPACITY METER

## REPLACING BATTERIES:

Model 026 requires two 22½-volt dry battery units, size 4″ x 3″ x 2½″, with a 3-volt tap, and one 1½-volt flashlight cell, size No. 2, for operation of the ohmmeter circuit. This battery should be checked occasionally to make sure that it is in good condition.




WIRING OF BATTERIES

To install the batteries, take off the front instrument panel from the case by removing the screws around the outer edge of panel. The 22½-volt batteries are then secured to the inside top and bottom of the case by clamps which are held in place by bolts and nuts. Four holes are provided in the case; two in the back, one in the top and one in the bottom, for attaching these clamps.

The batteries should be replaced when their voltage drops below 17 volts (indicated by inability to obtain a "zero adjustment").

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.

To install the 1½-volt cell simply remove the plate and spring on the back of the 026 case. The battery then slips in very easily.

## FAILURE IN OPERATION:

If instrument fails on 150-ohm range, check for open 3.4-ohm resistor, open 1000-ohm resistor in series with 1.5-volt cell, or weak cell.

If instrument fails on 15,000-ohm range, check for open 396-ohm shunt resistor, 2200-ohm resistor in series with 4.5-volt negative lead, or weak batteries.

If instrument fails on 1.5-megohm range, check for open 33,700-ohm series resistor.

If all D-C voltage readings are 50% too high, check for open 100-ohm D-C shunt resistor or faulty 5500-ohm first multiplier.

If all A-C voltage readings are too high, check for open 200-ohm A-C shunt resistor.

If instrument gives no readings on any A-C scale, check for shorted meter rectifier.