

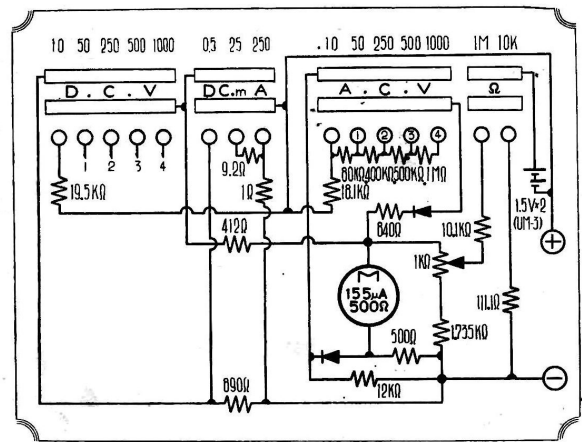
Caby

MULTIMETER

MODEL A-10

INSTRUCTION MANUAL

TYPE A-10 SCHEMATIC DIAGRAM



CABY ELECTRIC WORKS

Main Features

1. Pocket type tester equipped with a meter of 155µA DC in sensitivity. Ranges are selected by a rotary switch to perform just as standard type testers.
2. Provided with DC current ranges 0.5mA~250mA, this tester serves well for alignment and inspection of instruments with big current like TV and full-size amplifiers.
3. Through the internal batteries (UM-3x2), measures resistance of from 2Ω upto 1MΩ. High resistance of upto 100MΩ is measurable by applying external battery source.
4. Inductance of audio-coils and static capacitance of condensers are measured by jointly applying external AC source.
5. Newly devised battery holders facilitate change of batteries, sure contact ensured.

Range of Measurement.

- DC/V: 10—50—250—500—1K (2KΩ/V)
 AC/V: 10 50 250—500—1K (2KΩ/V)
 DC/mA: 0.5—25—250 (250mV)
 Ohm: 0—10KΩ 0—1MΩ
 Center—110Ω 11KΩ
 Battery: Internal 1.5V (UM3)×2
- db: —20~+22 (at AC/10V range)
 +20~+36 (at AC/50V range)
 (0db=0.775V)
- By applying external source.
- µF: 0.0001 (100PF)~0.03µF 0.01~0.6µF
 H: 10~1000H
 MΩ: 0.1~100MΩ

Caution.

1. Range is confirmed each time before measuring. If by mistake voltage is measured on an ohm or current range, it will burn off the shunt or deteriorate the rectifier, damaging the meter itself.
2. High is the sensitivity of the meter equipped, and care must be taken to handle the instrument not to give it big vibration or shock.
3. When 0Ω position is adjusted on the ohm range, if the 0Ω position adjusted on 1MΩ range shifts more than three graduations when it is changed over to 10KΩ range, or 0Ω adjustment is ineffective on 10KΩ range, the pointer not reaching 0Ω position, it indicates the internal batteries consumed and they are to be replaced with fresh ones as soon as possible.
4. Batteries out of life must be immediately removed from the instrument; otherwise components inside will get corroded by leakage of the electrolyte.
5. When the internal batteries are changed, the fixing bolt on — side of the battery is screwed down no more tightly than the end plate on the — side is moved right and left by the finger.
6. When voltage or current is not ascertained of its value, measurement is always started on the highest range to know its approximate value. Lower ranges may be selected accordingly.
7. The instrument must not be exposed long in high temperature and moisture.

Instructions for Use.

1. Measurement of voltage and current.

The tip of the red test lead is inserted into (+) jack on the right side of the face panel, and that of the black test lead into (-) jack. The selector switch in the center is set at a prescribed range. In case of DC, the red prod is connected to the plus potential and the black prod to the minus potential to read the indication of the meter.

2. Measurement of resistance.

- a. The selector switch is set either at 10KΩ or at 1MΩ range. The test prods connected to the tester are shorted, and the pointer of the meter is adjusted by 0Ω ADJ knob on the right to have it rest on 0 position at the extreme right of the scale.
- b. The pins are then opened and applied to the resistance to measure to read the indication of the meter
- c. The upper figures appearing on the ohm scale indicate the resistance measured on 1MΩ range; the lower ones indicate that on 10KΩ range.

3. Measurement of decibel.

The instrument does not incorporate load resistance of 600Ω for measuring decibel. It is required to be put in parallel to measure decibel.

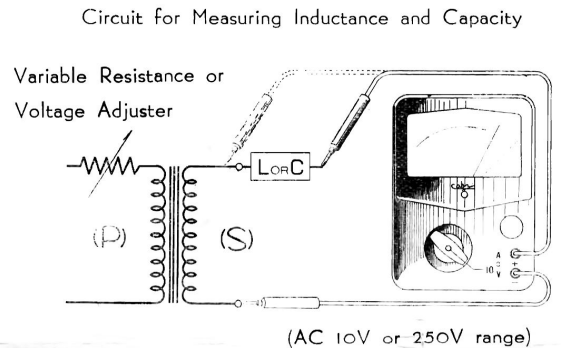
4. As is with the vacuum tube circuit where DC current falls on with AC current, it is cut off by putting in a condenser of 0.1μF to 0.2μF to measure AC element. The condenser is connected in series to either + or - side.

How to Measure Electrostatic Capacity of Condensers, Coil Inductance and Insulation Resistance by this Tester.

By the joint use of outside current source, electrostatic capacity of condensers, inductance of low frequency choke coils, high resistance and insulation resistance of condensers can easily be checked by this tester.

Outside current sources required for measurement are as follows:

Measurement	Range	Source
Capacity	0.0001μF(100PF)-0.03μF	AC 250V-50/60 c/s
Capacity	0.01μF-0.6μF	AC 10V- " "
Inductance	10H-1000H	AC 10V- " "
High resistance & insulation resistance	0.1MgΩ-100MgΩ	DC 250V



How to Measure :

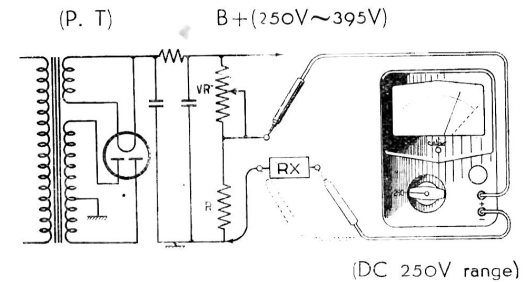
See the circuit given. First the tester is connected to the current source as shown in dotted lines, and VR inserted in the primary or secondary of the transformer is adjusted so that the pointer of the meter may indicate the full scale. Then one of the testing prods is shifted to the component to be measured putting it in series in between the current source and the prod, and the meter indicates the value.

Before measuring the electrostatic capacity of a condenser, the quality of it had better be checked.

When the B-source of a radio receiver is employed as outside current source, the following table is referred to for circuit constant :

VR value & wattage	R value & wattage	Source
30KΩ & over 1W	50KΩ & over 1.5W	250V-395V

Circuit for Measuring High Resistance by Employing B-Voltage of a Radio Receiver as Current Source.



- Note.
- 1. The electrostatic capacity of electrolytic condensers can not be measured.
 - 2. If VR wattage is small, it will become heated, and measurement must be made in as short a time as possible.
 - 3. If B-source voltage is too high. a breeder resistance is used.