HICKOK 539B/C
Main Meter Testing
By William Eccher

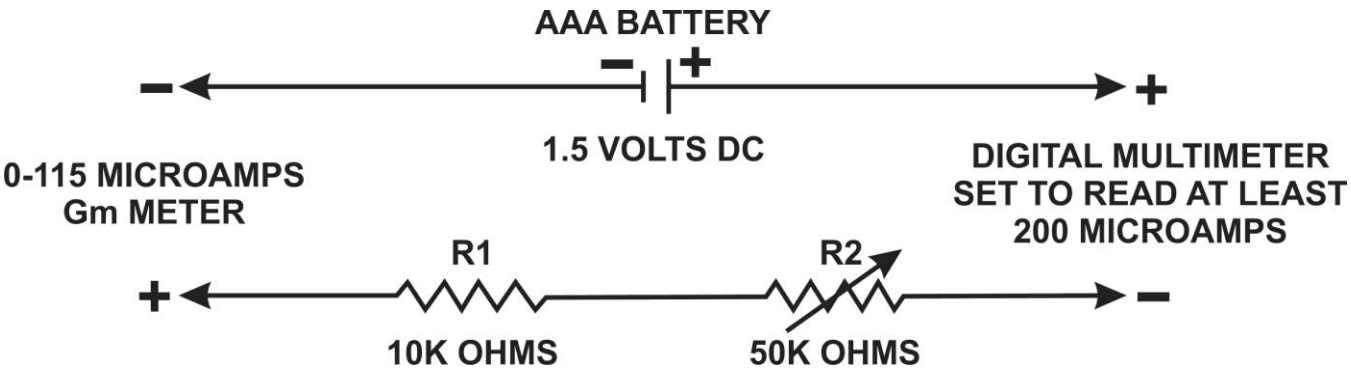
You should read the entire document before doing the test. The GM Meter Test Schematic is to test the Hickok Main Meter if you don't have the All In One II from VHSystems you will need to build this circuit before following the instruction from the All In One II manual.

Great care should be taken before doing any work on your tester:

CAUTION HIGH VOLTAGES - TAKE THE NECESSARY PRECAUTIONS

GM METER TEST SCHEMATIC

Meter Test is fully independent of Load Box Electronics



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The testing steps are in black with **bold black and red used for emphasis.**

Solutions, if any, are given in green with bold black for emphasis.

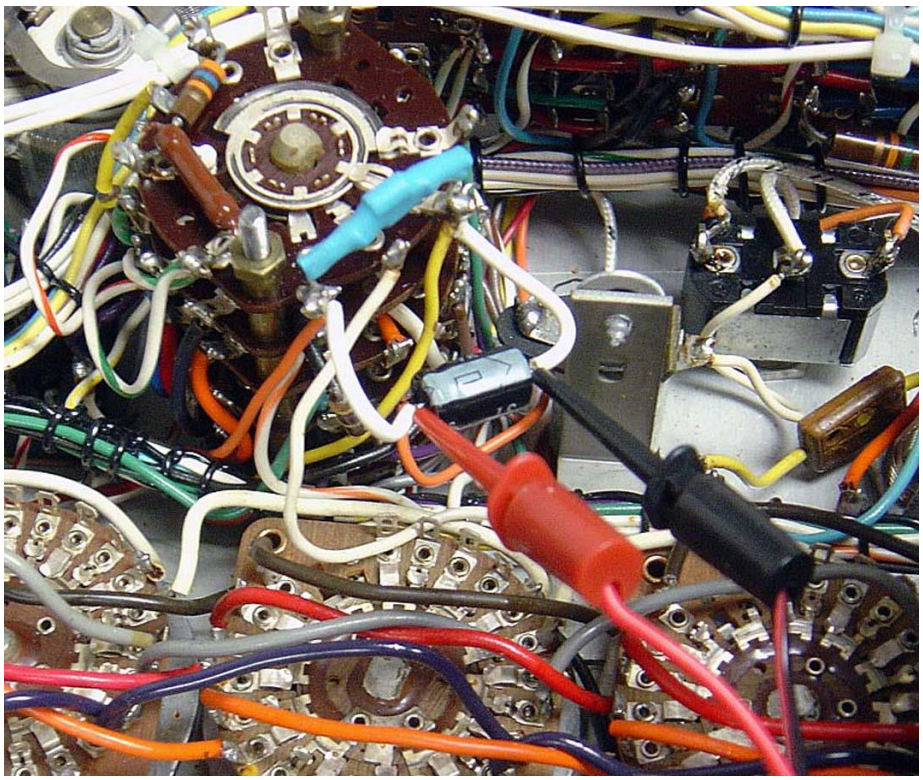
1. MAIN METER TEST:

DO NOT CONNECT AC POWER TO THE TUBE TESTER

The All-In-One uses current for these tests while simultaneously testing for voltage across the meter terminals. Full scale specs are 115uA at 172.5mV for the 1500 ohm meter resistance.

Rotate the **Function Switch** half-way between positions **G and H**, which will isolate the meter from all circuits. Connect the **Main Meter Test** as shown with the test leads to C4, the 100MFD Meter Capacitor located on or connected to the **Shorts Switch.**

The Main Meter is safe with this circuit.



Left picture shows the replacement capacitor C4 with the test leads connected.
Picture on the right shows connections to GM Meter Test terminals.
Polarity is important for the Main Meter to indicate correctly.

Hopefully you have prepared some sort of fixture that will support the tester face up.
Damage will likely occur if it rests on the internal parts.

Now turn the tester face up while being careful not to disconnect the test leads.

Adjust the Meter test control to min and connect the Multimeter (set to measure microamps) to the **Test Current Pin Jacks as shown on the top left of the picture**

This picture shows the Main Meter reading ½ of full scale and with the Digital Multimeter indicating 57.5 microamps

Increase the control on the Main Meter Test and observe following scale points. If the readings are way off, confirm that the Function Switch is still positioned between G & H.

Digital Multimeter to Main Meter readings.

38.33 uA = 1/3 of full scale
57.50 mV

76.67 uA = 2/3 of full scale
115.00 mV

57.50 uA = 1/2 of full scale.
86.25 mV

115.00 uA = full scale
172.50 mV

If you unable to obtain 115.0 microamps the internal battery will need to be replaced.

If the meter reads too high or too low, it may be correctable by adjusting the metal plate mounted on the side of the meter, which is a magnetic shunt. By loosening the mounting screw and sliding the plate back and forth, small adjustments can be made.

Keep in mind that it is better to allow an error at full scale, since Gm readings seldom go over two thirds of full scale. If the meter is still indicating over one small division high for the first two thirds of full scale you may elect to ignore, repair or replace. If the Main Meter is not the later 539C plastic type I do have a procedure that may work, but somewhat risky.
Disconnect the Main Meter Test leads and set the Function switch to position C.