

TESTS AND CALIBRATION

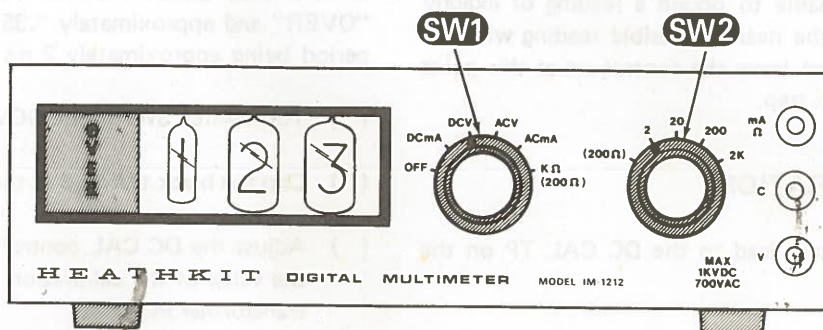


Figure 2-1

In this section of the Manual you will test and calibrate your Digital Multimeter. If at any time you do not obtain the results indicated, refer to the "In Case of Difficulty" section on Page 50. Locate and repair any problem before you continue with the calibration.

Figure 2-1 shows the front switches of your Multimeter. Figure 2-2 (fold-out from Page 41) shows the remaining controls and test points. Carefully study Figures 2-1 and 2-2 and identify the function of each switch and control.

- (✓) Set all ten circuit board controls to their centers of rotation.
- (✓) Turn the DC CAL control 1/4 turn counterclockwise.
- (✓) Set the front panel switches to the following positions.

SW1	OFF
SW2	2.

WARNING: When the line cord is connected to an AC outlet, hazardous voltages will be present at several places. These are shown by the boxed-in area in Figure 2-2.

- (✓) Plug the line cord into an AC outlet.
- () Turn the switch SW1 to the DCV position and allow the unit to stabilize for at least 30 minutes. NOTE: The two right-hand digits (displaying any number) and the decimal point to the left of the left digit should all be lit. No other lamp should be lit.

ZERO ADJUST

- () Plug the black test lead into the V (red) front panel jack.
- () Connect the alligator clip on the black test lead to the rear socket lug of the C (black) jack. This will short the voltage input jack temporarily.
- (✓) Turn the ZERO ADJ control until the readout is .01. Then slowly turn the control until the readout just changes .00. The display should change back and forth between .01 and .00.

- () Remove the black test lead clip from the C (black) jack.

OSCILLATOR ADJUST

Refer to Figure 2-2 (fold-out from Page 41) for the following steps.

- () Turn switch SW1 to the $K\Omega$ position and adjust the OSC ADJ control for a readout of "OVER .85," +15 digits.

NOTE: If you are unable to obtain a reading of exactly "OVER .85," obtain the nearest possible reading with the OSC ADJ control. Then leave the control set at this point and proceed to the next step.

DC VOLTS CALIBRATION

- () Clip the black test lead to the DC CAL TP on the circuit board.

NOTE: Refer to the calibration voltage value written on the transformer insulator to perform the following step. Observe that the calibration voltage number has four digits, whereas the Multimeter can display only three digits. Convert the number to three digits by dropping the fourth digit if it is 4 or less, or by increasing the third digit by one if the fourth digit is 5 or more. For example:

$$1.943 = 1.94$$

$$1.946 = 1.95$$

If the value on the envelope is 2 or higher, the Multimeter OVER lamp will be lit in the following step, but the 2 will not be displayed:

$$2.112 = \text{OVER} .11.$$

- () Turn switch SW1 to the DCV position.
- () Adjust the DC CAL control until the readout matches the value of the calibration voltage.
- () Remove the black test lead clip from the DC CAL test point.

Repeat the preceding steps in the following manner:

- () Turn switch SW1 to the $K\Omega$ position.
- () Adjust the Oscillator Adjust control for a readout of "OVER .85."

NOTE: This time, the reading must fall within 15 digits (that is, no less than "OVER .70," or no more than "OVER 1.00"). If you are unable to calibrate within these limits, refer to the "In Case of Difficulty" section of the Manual. If your Multimeter is operating from a 60 Hz power line during calibration, the infinity display will be "OVER" and approximately ".85." In the unusual case when a 50 Hz power source is used during calibration and the Multimeter is then used on 60 Hz AC, the infinity reading will be "OVER" and approximately ".35." This is due to the count period being approximately 2 ms shorter in the latter case.

- () Turn switch SW1 to the DCV position.
- () Clip the black test lead to the DC CAL TP.
- () Adjust the DC CAL control until the readout matches the value of the calibration voltage as recorded on the transformer insulator.
- () Remove the test lead clip from the DC CAL test point.
- () Return to the "ZERO ADJUST" section on Page 39, and repeat all the previous steps until the correct readings are obtained to this point. NOTE: Because of interaction between controls, you may have to perform these steps several times.

AC VOLTS CALIBRATION

- () Set the front panel switches in the following positions.
SW1: DCV
SW2: 20
- () Touch the black test lead clip to AC CAL TP and adjust the AC TP ADJ control (next to the AC TP) for a readout of 16.3.

NOTE: The readout may vary between 16.2, 16.3, and 16.4. A proper adjustment will cause it to read 16.3 most of the time.

- () Remove the black test lead clip from the AC CAL TP.

- () Turn switch SW1 to the ACV position.
- () Touch the black test lead clip to the AC CAL TP again and allow the display to stabilize.
- () Adjust the AC CAL control (at the rear of the circuit board) for a meter reading of "OVER 0.0."

NOTE: The readout may vary between 19.9, "OVER 0.0," and "OVER 0.1." A proper adjustment will cause it to read "OVER 0.0" most of the time.

- () Repeat the previous four steps until the correct readouts are obtained in both switch positions.
- () Remove the black test lead clip from the AC CAL TP.

OHMS CALIBRATION

- () Turn switch SW1 to K Ω (200 Ω).
- () Remove the black test lead plug from the front panel "V" jack. Connect the alligator clip to fuseholder F1 lug 2 as shown in Figure 2-2.

You will calibrate the five ohms ranges in the following steps. Touch the black test lead tip to the indicated OHMS CAL TP (test point) for each range and adjust the indicated control for an "OVER 00" readout. The decimal point should be at the indicated position as shown under "Meter Reading" in the following chart.

Range Switch	OHMS CAL TP (Test Point)	Control	Meter Reading
() (200 Ω)	200	200 ADJ	"OVER 00"
() 2	2 k	2000 ADJ	"OVER .00"
() 20	20 k	20 k ADJ	"OVER 0.0"
() 200	200 k	200 k ADJ	"OVER 00"
() 2 K	2 M	2 M ADJ	"OVER .00"

HAZARD
VOLTAGE
AREA

- () Repeat the previous five steps as many times as necessary until you obtain a stable reading for each switch position.
- (✓) Turn off the multimeter.
- () Remove the test lead from the front panel jack.

This completes the "Initial Tests and Calibration" section of the Manual. Disconnect the AC line cord from the power source and proceed to the "Final Assembly" section.

done all