INSTRUCTION MANUAL

VOLT-OHM-MILLIAMMETER

10,000 OHMS/VOLT DC
4,000 OHMS/VOLT AC

MODEL HC-1015B

WARNING

1. READ THIS OPERATING INSTRUCTION THOROUGHLY AND FOLLOW THEM CAREFULLY.

2. TO AVOID ELECTRICAL SHOCK, DISCONNECT TEST LEAD BEFORE REMOVING COVER.

3. DO NOT OPERATE WITH COVER REMOVED.

4. TO PREVENT FIRE, USE 2 A/250V FUSE ONLY, TO REPLACE FUSE, REMOVE REAR COVER.

5. IF METER IS TO BE STORED AT TEMPERATURES ABOVE 122° F (50° C) REMOVE BATTERY.

GENERAL DESCRIPTION

The **ALTAI** Volt-Ohm-Milliammeter **HC-1015B** is a rugged, accurate, easy to operate pocket sized compact instrument. A high 10,000 ohms/VDC and 4,000 Ohms/VAC sensitivities and linear meter movement offers accurate measurements of DC and AC voltages, direct currents, resistance and decibels on 90° Arc mirrored scale. The **HC-1015B** uses the most modern components and circuit technics into high-impact case. If it is kept clean and is not subjected to extreme shock or continuous vibration the **HC-1015B** will give you many years of trouble free service.

SPECIFICATIONS

ELECTRICAL

Range: 18 measuring ranges

DC voltage : 0 - 2.5 - 50 - 250 - 1000 volts

AC voltage : 0 - 10 - 50 - 250 - 1000 volts

DC current : 0 - 10 - 250 mA

Resistance : Rx 10, Rx 1K

Decibel : -20dB to 62dB at AC volt ranges.

Accuracies : DC V./A 4% F.S, AC V 5% F.S.
Resistance: 4° Arc of scale length

Sensitivity : 10,000 ohms/VDC, 4,000 ohms/VAC

BAT test : 1.5V size AA ; 9V battery.

PHYSICAL

Function range switch: 14 position, located at the center of the pannel, this control is used to select factor to be measured and range as indicated thereon.

O Adjuster: A potentiometer, located at the left side of the panel adjusting the meter pointer to the Zero mark on the OHMS scale of the meter dial when the test leads are shorted together.

Mechanical adjuster: Screw, located right below the center of the meter scale to set pointer to Zero mark at the left side of the scale.

(–) Jack: Plug-in connector at the lower left on the panel for BLACK, negative test lead.

(+) Jack: Plug-in connector at the lower right on the front panel for RED, positive test lead.

Power supply: One 1.5–Volt, size "AA" cell for Ohmmeter.

Size: 5-3/4" x 2-1/2" x 1-1/4"

Weight: 4.8 oz

OPERATING INSTRUCTIONS

CAUTION

When making voltage or current measurements as a personal protection, form the habit of turning off all power to the circuit under test. Connect the test leads at the desired points in the circuit, then turn on the power while taking readings. Turn off the power before disconnecting the test leads from the circuit.

PRELIMINARY ADJUSTMENTS

Adjust pointer for Zero before any measurements are made. Check that the pointer indicates zero at the extreme left end of the black scale, if it is off zero use a small screw driver to turn the screw on the meter movement slowly CW or CCW until the pointer is exactly over the zero mark.

INTERNAL BATTERY CHECK

In order to check the battery condition, insert the black test lead into the (–) jack, and the red test lead into the (+) jack. Set the range switch to the Rx10 position and short the ends of the two test leads together. Adjust the ZERO control located on the left side of the panel. If the pointer can not be brought to the zero mark replace the 1.5 volt size "AA" cell. (see MAINTENANCE)

OPERATING SUGGESTIONS

1. Set the range switch to the proper position before making any measurement.
2. Never apply more voltage or current than the amount noted in each position.
3. When the voltage or current to be measured is not known, always start with the highest range in each case.
4. If meter indication is in the lower half of scale and falls within the range of a lower scale reset selector switch to the lower range for greatest accuracy.

5. If the meter won't work at all, check the fuse located on the PCB, If it is blown repace it. (see MAINTENANCE)

6. Avoid placing the meter in a place where severe vibration is encountered and do not store it in excessively hot or damp places. Although very rugged, The meter is a sensitive measuring device and should be handled accordingly.

7. Do not check resistance when voltage or current is present in the circuit.

8. Discharge a capacitor before measuring it.

9. When the meter is not in use, keep the selector switch to "OFF" position, this provides direct short across meter movement for minimum needle bounce when transporting meter.

10. If you should accidentally apply excessive voltage or current on certain range, disconnect the leads from the circuit as quickly as posible, check instrument operation on that range by applying proper input. If the meter does not operate properly check fuse, if it is blown replace it.
(see MAINTENANCE)

OPERATING PROCEDURES

DC VOLTAGE MEASUREMENT

1. Set the selector switch to appropriate DC voltage range, if the voltage is unknown, use the highest range.
2. Plug the BLACK test lead into the (–) jack and the RED test lead into the (+) jack.
3. If you know the polarity of the circuit to be tested, connect the black probe to the negative side.
4. If you don't know the polarity, connect the probes to opposite sides of the circuit and watch the pointer. If it deflects to the left, reverse the probes, The RED probe will now be connected to the positive side.
5. Read as follows:

DC V Range	Read Scale	Multiply By
0 – 2.5	0 – 250	0.01
0 – 50	0 – 50	1.
0 – 250	0 – 250	1.
0 – 1000	0 – 10	100.

DC CURRENT MEASUREMENT

1. Set the selector switch to the appropriate DC mA range, If current is unknown use the highest range.

2. Plug the BLACK test lead into the (–) jack, and the RED test lead into the (+) jack.

3. Using the test leads, connect the meter in series with the circuit under test, if the pointer deflects to the left, reverse the test prods.

4. Read as follows:

DC mA range	Read Scale	Multiply By
0 – 10	0 – 10 (V, mA)	1.
0 – 250	0 – 250(V, mA)	1.

AC VOLTAGE MEASUREMENT

1. Set the selector switch to the appropriate AC V range. If voltage is unknown use highest range.

2. Plug the test leads into the jacks, and place test prods on each side of the AC voltage to be measured. (Polarity of test probes is unimportant on AC voltage).

3. Read as follows:

AC V Range	Read Scale	Multiply By
0 – 10	AC 10V (red)	1
0 – 50	0 – 50 (black)	1
0 – 250	0 – 250 (black)	1
0 – 1000	0 – 10 (black)	100

RESISTANCE MEASUREMENT

1. Set the selector switch to the appropriate OHM range.
2. Plug the BLACK test lead into the (–) jack, and the RED test lead into the (+) jack.
3. Short the leads by touching the prods together. Pointer should read zero at the right hand end of the uppermost scale, if it doesn't, use the ohm adjust knob on the left side of the panel to line up the pointer with zero. (If pointer can't be brought to zero, replace battery).
4. Connect the test prods across the resistance to be measured.

NOTE

Disconnect all power from resistance to be measured before applying the test prods.

5. Take reading on the "Ω" scale and multiply it by the multiplication factor indicated by the selector switch.

6. If there is little or no pointer movement from the left side of the scale, reset the selector switch to a higher range in an effort to get a greater deflection. The best readability on an ohmmeter range is between midscale and zero ohms.

NOTE

When switching ranges, readjust pointer to "O" ohms each time.

DECIBEL MEASUREMENT

1. Plug the test leads into correct jacks.

2. Set the selector switch to one of the AC V ranges.

3. For a range switch setting of 10 ACV, read dB directly on the bottom scale in dB. For other settings of the range switch, add the appropriate number of dB to the dB scale reading as noted on the chart at the lower right on the meter face.

NOTE

For absolute dB measurements, circuit impedance must be 600 ohms. O dB=1mW dissipated in a 600 ohm impedance. (Equivalent to 0.775 volts across 600 ohms).

Battery Check

1. Set the selector switch to the appropriate BAT range.
2. Plug the black test lead into the (–) jack, and the red test lead into the (+) jack.
3. Using the test leads, connect the red test lead to the (+) battery terminal and black test lead to the (–) battery terminal.
4. Read the scale to determine the battery condition.
   If the reading is in the red "REPLACE" zone, the battery should be replaced. If in the green "GOOD" zone, the battery has considerable life. If the reading is in the "?" zone should consider marking a replacement, since very weak power is remaining.

CAUTION

Always be sure you indentify the battery polarity correctly before testing the battery.

MAINTENANCE

GENERAL

1. No periodic maintenance is required other than replacement of the battery, fuse and

visual inspection of the **HC-1015B**

2. Keep instrument clean and dry, Do not use solvent to clean, Use damp cloth.

3. The only field replaceable parts are the 1.5V "AA" cell and 2 A/250V fuse.

BATTERY REPLACEMENT

1. Remove the screw in the rear cover of the case, and lift the back off from the front section.

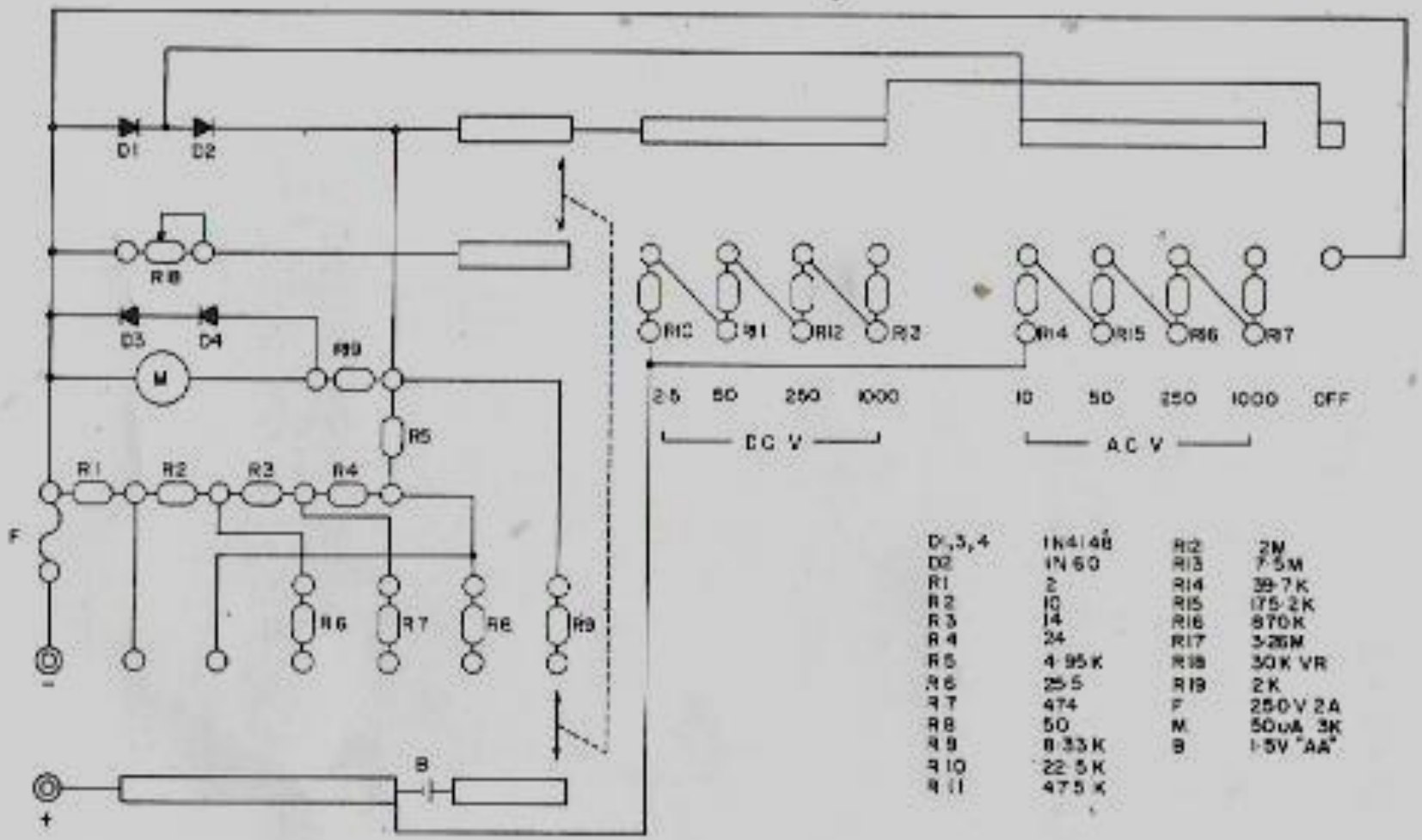
2. Note the orientation of the "AA" cell in its compartment, Repace battery observing polarity as indicated battery polarity marking on the bottom of the battery compartment.

3. Carefully replace the rear cover back, retighten the screw. Do not tighten excessively or you will strip the threads in the case.

FUSE REPLACEMENT

1. To replace fuse follow the same procedures discribed above. Replace blown fuse with a new 2 Amp/250volt, type 3AG or equivalent only.

SCHEMATIC DIAGRAM



D1,3,4	1N4148	R12	2M
D2	IN60	R13	7·5M
R1	2	R14	39·7K
R2	10	R15	175·2K
R3	14	R16	870K
R4	24	R17	3·26M
R5	4·95K	R18	30K VR
R6	25·5	R19	2K
R7	474	F	250V 2A
R8	50	M	50uA 3K
R9	8·33K	B	1·5V "AA"
R10	22·5K		
R11	475 K		

250 mA 10mA 1·5V 9V X10 X1K

DC mA — BAT — OHM

ALTAI

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