

MICRONTA®

FET – VOM

INSTRUCTION MANUAL



Catalog Number 22-208

CUSTOM MANUFACTURED FOR

RADIO SHACK  A DIVISION OF TANDY CORPORATION

Your **MICRONTA FET VOM** has all the advantages of a VTVM, with the portability of a VOM. A dual-Field Effect Transistor provides the high input impedance, with circuit stability that rivals the finest VTVMs.

Power is provided by 2 batteries — a 1½-volt type "C" for the Resistance function and a standard 9-volt rectangular type for the FET Amplifier.

Ranges are set up as convenient multiples of 1 and 3. With the high-sensitivity 300 millivolt full-scale DC voltage range, you can measure down to 10 millivolts of DC voltage (+ or -). The 100 microamp DC current range will let you measure DC currents down as low as just a few microamperes. AC Voltages and DB functions combine to provide great versatility at low AC signal levels (down to about 1/10th of a volt).

The DC polarity switch makes it convenient to check DC voltages without switching leads for opposite polarity. A front panel Battery Check switch assures accurate readings because you know when the 9-volt battery is beginning to weaken.

47" (120 cm) well-insulated test leads with spring-steel banana-type plugs result in firm, safe, low-resistance circuit connections.

The large 5" (12 cm) color-coded meter scale incorporates a mirrored scale to eliminate parallax reading errors.

Your FET VOM is ideally suited for service, engineering, lab, hobby or class-room use — rugged in construction — portable and accurate. The meter movement is automatically protected from excess circuit current/voltage damage.

SPECIFICATIONS:

METER : 5", 25 μ A 3-color, mirrored scale

DC VOLTAGE : 8 Ranges

0.3-1-3-10-30-100-300-1000V

Input impedance; 10 megohm (1000 V range is
32 megohms)

Accuracy ; $\pm 3\%$ full scale

AC VOLTAGE : 5 Ranges

3-30-100-300-1000 V

Input impedance ; 10K Ω /volt

Accuracy ; $\pm 4\%$ full scale

DC CURRENT : 5 Ranges

100 μ -3m-30m-300mA-10A

Terminal Voltage ; 316 mV

Accuracy ; $\pm 3\%$ full scale

RESISTANCE : 5 Ranges

Rx1-Rx10-Rx1K-Rx10K-Rx1M (center scale 10)

Rx1 ; 0-1K

Rx10 ; 0-10K

Rx1K ; 0-1M

Rx10K ; 0-10M

Rx1M ; 0-1000M

Accuracy ; $\pm 3\%$ of scale-length

ACCESSORIES

Test Leads ; 47" (120 cm) spring-steel, banana
plug style

BATTERIES: Requires one type "C" battery and one
9-volt rectangular type

SIZE: 7" x 5½" x 3-1/8" (18 x 14 x 8 cm) (HWD)

WEIGHT: 1.76 lbs (800g)

DESCRIPTION OF CONTROLS

ZERO ADJ. — use this control to balance the internal circuitry to obtain "0" reading when the FET VOM is ON.

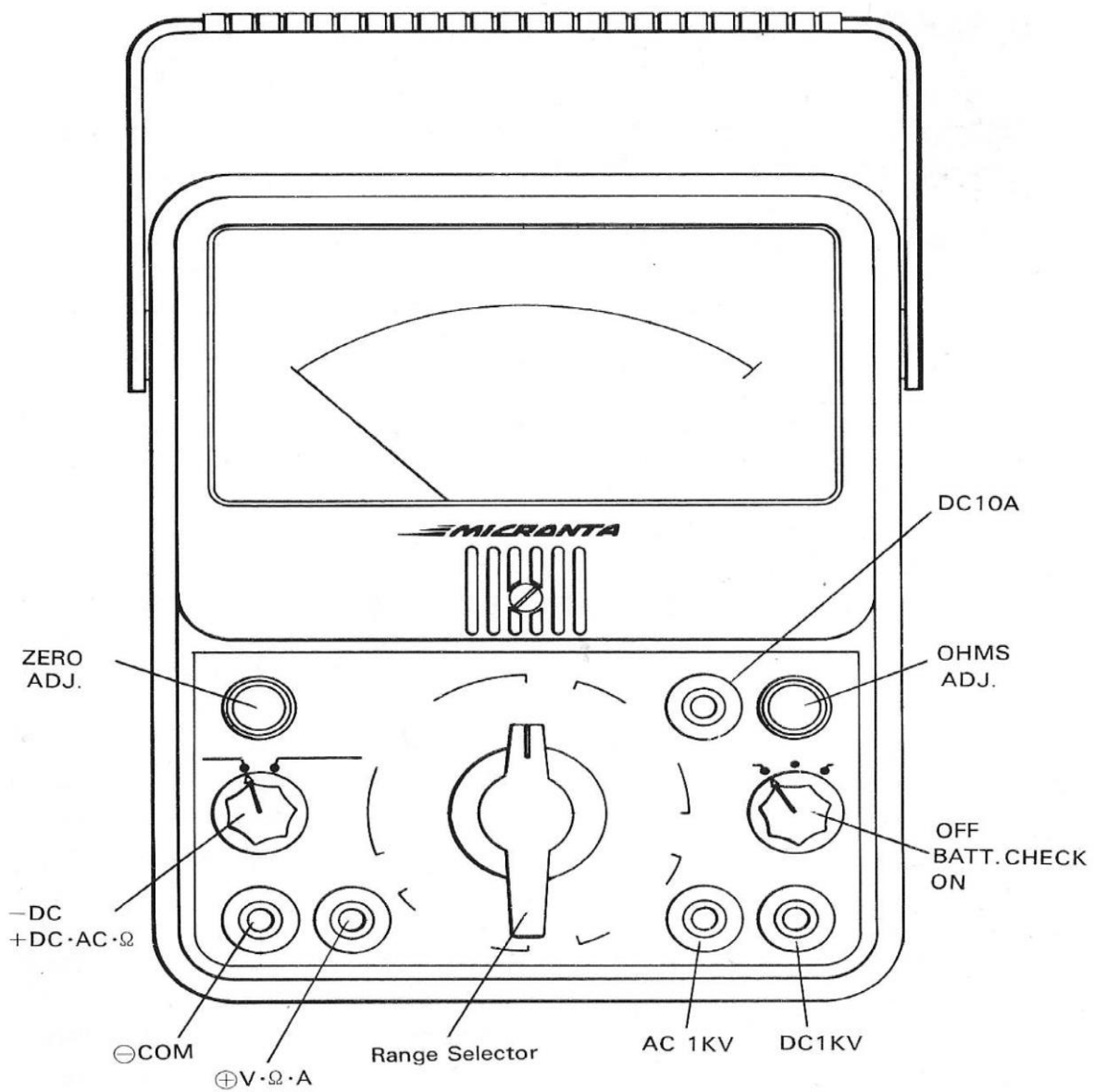
—DC/+DC, AC, Ω — is the polarity reverse switch. Set to +DC, AC, Ω when measuring all but "—DC" currents and voltages.

Range Selector — use the position that will result in a meter reading in the upper 1/3rd of the scale.

OHMS ADJ. — use this control to set meter reading to "0" on the green OHMS scale when using the resistance function (with meter probes connected together).

OFF/BATT. CHECK/ON — use to turn the FET VOM "on" or to check condition of the 9-volt battery. When not in use, leave in the OFF position.

Jacks — use $\ominus$ COM and $\oplus$ V $\cdot$ Ω $\cdot$ A unless you are measuring high DC or AC voltages. When measuring DC or AC voltages of 300-1000 volts, use $\ominus$ COM together with DC 1KV or AC 1KV. For DC currents of 300 milliamperes up to 10 amperes, use the 10A DC jack together with the $\ominus$ COM jack.



BEFORE YOU USE YOUR FET VOM

Remove the case back and install the batteries; take care to observe proper polarity as indicated on the battery compartments. Replace the case back.

When unit is OFF, if the pointer does not normally rest exactly over the O's at the left side of the scale, adjust the plastic screw in the lower center of the meter face to bring the needle to "0".

Check meter zero balance when you first turn the FET VOM "on". The pointer should rest directly over the 0 at the extreme left end of the scale (be sure the mechanical zero adjustment has been set as noted in the above paragraph). Now, set Range Selector to .3 DC V, plug in test leads, short test probe tips together and switch the polarity reverse switch back and forth — adjust ZERO ADJ. so the pointer rests exactly over the left hand 0 (in either position of the polarity reverse switch).

Check condition of the 9-volt battery by using the BATT. CHECK position; as long as the pointer gives an indication up to the "BATTERY OK" point on the meter, the 9-volt battery is OK. If reading is below that point, replace the 9-volt battery. We recommend Radio Shack's Catalog Number 23-583, or 23-553 for extra-long-life.

For most accurate readings, keep the meter laying flat on a non-metallic surface. Also, use a Range position that results in a meter reading in the upper 1/3rd of the meter scale.

Always observe correct test lead polarity when making DC measurements; the polarity-reverse switch is provided to permit you to make quick polarity changes.

Exercise extreme caution when measuring voltages of 150 and above.

When not in use, or when moving your Instrument, leave ON/OFF switch in the **OFF** position.

USING YOUR FET VOM

DC VOLTAGE MEASUREMENTS

1. Plug the test leads into the correct jacks — Black into $\ominus$ **COM** and Red into $\oplus$ **V · Ω · A**.
2. Set Range Selector to one of the DCV positions; it is best to start at the top and work down. Set the polarity-reversal switch to **+ DC, AC, Ω** .
3. Connect the test probe tips to the circuit under test. If the meter reads backwards, set the polarity-reversal switch to **— DC**.
4. Set Range Selector as required to obtain a meter reading in the upper 1/3rd of the meter scale.
5. Read the voltage on the **black DC** scales.
6. For voltages between 300 and 1000 volts, plug the Red test lead into the **DC 1KV** jack. **Use extreme care when using this high-voltage range.**

NOTE: The **DC 1KV** jack is for use only with DC voltages of 300 to 1000 volts.

AC VOLTAGE MEASUREMENTS

1. Plug the test leads into the correct jacks — Black into $\ominus$ **COM** and Red into $\oplus$ **V · Ω · A**.
2. Set Range Selector to one of the **ACV** positions; it is best to start at the top and work down. Set the polarity-reversal switch to + **DC · AC · Ω** .
3. Connect the test probe tips to the circuit under test. Set Range Selector as required to give a meter reading in the upper 1/3rd of the meter scale.
4. Read the voltage on the red **AC** scale.
5. For voltages between 300 and 1000 volts, plug the Red test lead into the **AC 1KV** jack. **Use extreme care when using this high-voltage range.**

NOTE: The **AC 1KV** jack is for use only with AC voltages of 300 to 1000 volts.

DC CURRENT MEASUREMENTS

1. Plug the test leads into the correct jacks — Black into $\ominus$ **COM** and Red into $\oplus$ **V · Ω · A**.
2. Set Range Selector to the 300 m / 10A DC A position. Set the polarity-reversal switch to + **DC · AC · Ω** .
3. Open up the circuit in which you want to measure current and connect the Black test probe to the negative side and the Red to the positive side of the circuit.
4. Apply power to the circuit under test. Set Range Selector to a position which will give a meter reading in the upper 1/3rd of the scale. Read current on the black DC scale.
If the meter reads backwards, set polarity-reversal switch to — **DC**.

NOTE: Do not attempt to read AC current.

NOTE: If the current will be greater than 300 milliamps, plug the Red test lead into the DC 10A jack.

RESISTANCE MEASUREMENTS

Before taking any resistance measurements, disconnect power to the unit under test and discharge capacitors. It is best to remove batteries and unplug line cords.

1. Plug the test leads into the proper jacks — Black to $\ominus$ COM and Red to $\oplus$ V $\cdot$ Ω $\cdot$ A. Set polarity-reversal switch to + DC $\cdot$ AC $\cdot$ Ω .
2. Set Range Selector to one of the OHMS positions; touch the probe tips together and adjust OHMS ADJ. control to bring the pointer to the "0" on the top OHMS scale (green).
3. Now, connect the probe tips across the circuit or part under test. When measuring resistance, it is best to disconnect one side of the part under test (thus the remainder of the circuit will not interfere with the reading).
4. Read the resistance on the green OHMS scale; use the proper multiplier to obtain the correct value (R "times" 1, 10, 1,000, 10,000 or 1,000,000, depending on the position of the Range Selector).

NOTES: When you are unable to adjust the pointer to "0" on the OHMS scale in any OHMS position, the 1.5-volt C cell battery must be replaced.

The polarity-reversal switch must be left in the + DC $\cdot$ AC $\cdot$ Ω position for all resistance measurements.

DECIBEL MEASUREMENTS

1. Plug the test leads into the proper jacks — Black into $\ominus$ COM and Red into $\oplus$ V $\cdot$ Ω $\cdot$ A.

2. Set Range Selector to one of the **ACV** positions; use a range that provides a meter reading in the upper 1/3rd of the meter scale.
3. Read dB on the dB scale, adding the appropriate number of dB to the dB scale reading as noted in the chart at the lower right of the meter face.

NOTE: For absolute dB measurements, circuit impedance must be 600 ohms. 0 dB=1 milliwatt dissipated in a 600 ohm impedance (equivalent to 0.775 volts across 600 ohms).

For additional ideas and information on how to use your Instrument, we suggest you obtain a copy of Radio Shack's book **REALISTIC GUIDE TO VOM'S AND VTVM'S**.

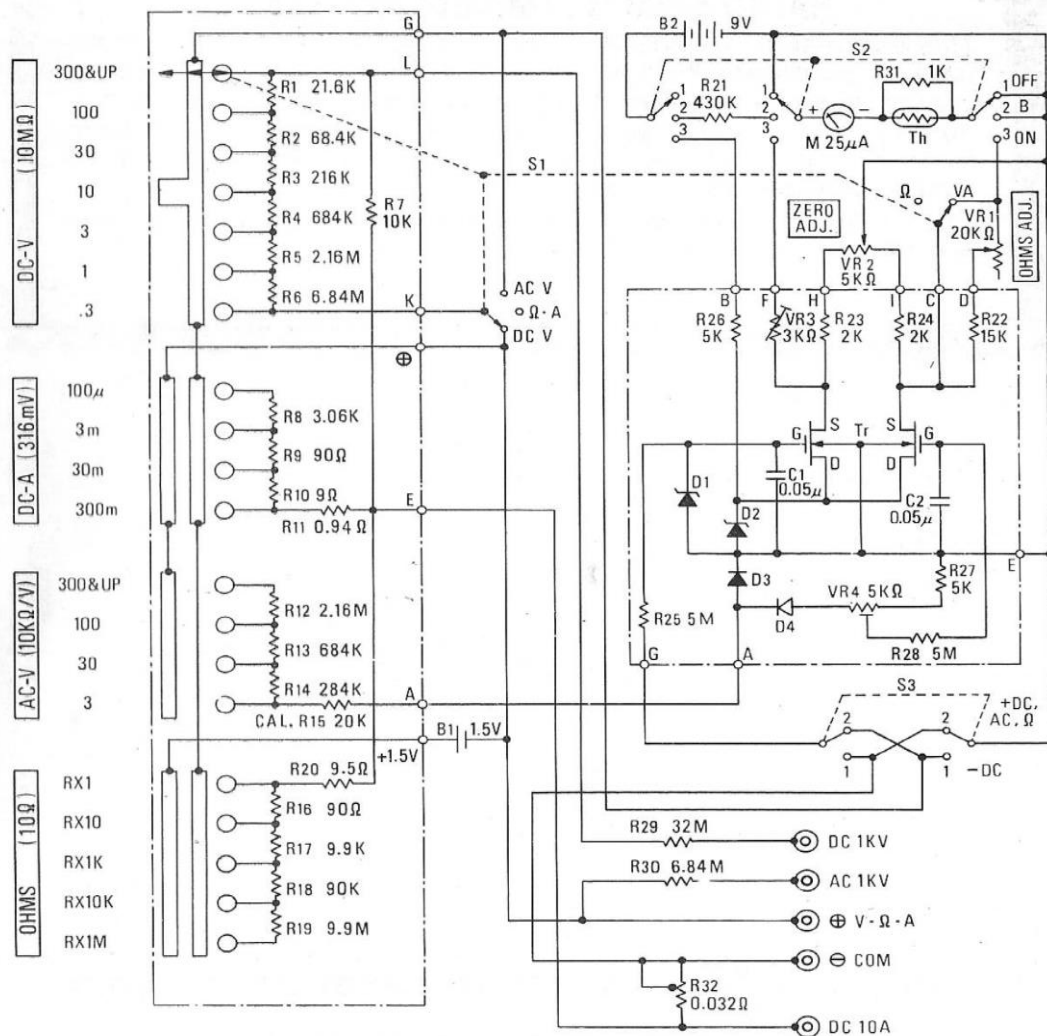
MAINTENANCE

Your FET VOM is ruggedly constructed and the meter movement is automatically protected from voltage or current overloads. Thus, your Instrument should require little or no service or repair — providing you treat it with a normal amount of respect. Don't subject your unit to excessive shock or measuring abuse.

Periodically check the condition of the 9-volt battery. When using the **BATT. CHECK** switch, the meter pointer should read above the **BATT. OK** line. If not, replace the 9-volt battery. We recommend Radio Shack's Catalog Number 23-583 or 23-553 for extra-long-life.

If you can no longer "zero" the meter reading on an **OHMS** range, with the probes shorted together, it's time to replace the 1½-volt **C** battery. We recommend Catalog Number 23-581, or 23-551 for extra-long-life.

SCHEMATIC DIAGRAM



NOTE : Resistance values are indicated in ohms unless otherwise specified (K=1,000 ohms and M=megohms). Capacitance values are shown in microfarads unless otherwise noted (P=micro-microfarads).

RADIO SHACK LIMITED WARRANTY

This equipment is warranted against defects for 90 days from date of purchase. Within this period, we will repair it without charge for parts and labor. Simply **bring your sales slip** as proof of purchase date to any Radio Shack store. Warranty does not cover transportation costs. Nor does it cover equipment subjected to misuse or accidental damage.

This Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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