

**MICRONTA®**

# Service Manual

208

## FET-VOM

Catalog Number: 22-208



CUSTOM MANUFACTURED FOR RADIO SHACK  A DIVISION OF TANDY CORPORATION

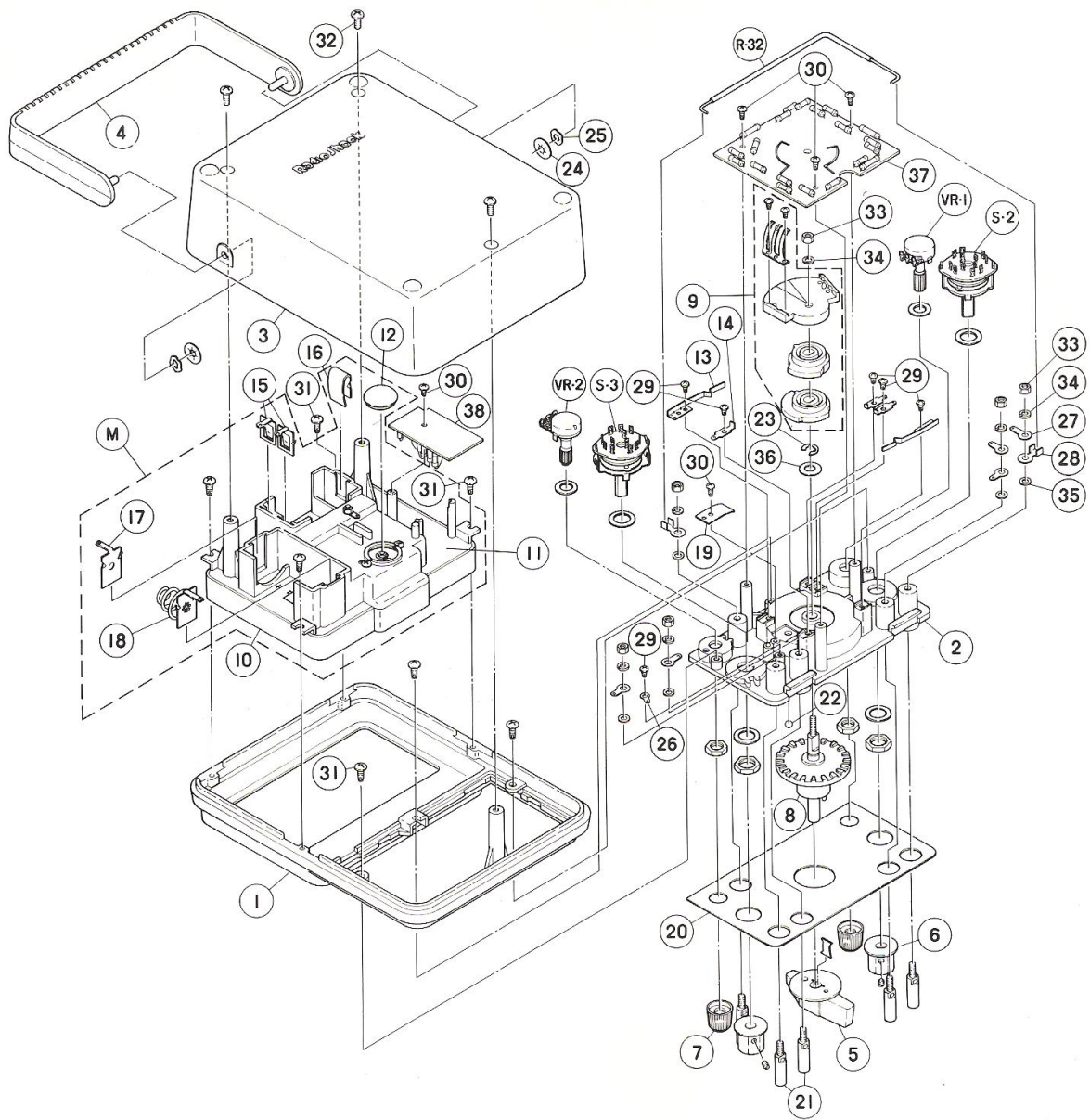
## SPECIFICATIONS

|                        |                                                               |                                               |
|------------------------|---------------------------------------------------------------|-----------------------------------------------|
| <b>Ranges:</b>         | DC Voltage .....                                              | 0—0.3—1—3—10—30—100—300—1000V                 |
|                        | AC Voltage .....                                              | 0—3—30—100—300—1000V                          |
|                        | DC Current .....                                              | 0—100 $\mu$ —3m—30m—300mA—10A                 |
|                        | Resistance .....                                              | 0—1K—10K—1Meg—10Meg—1000Meg (center scale 10) |
|                        | Decibels .....                                                | —20 to +62 dB in 5 ranges                     |
| <b>Accuracy:</b>       | DC Voltage .....                                              | $\pm 3\%$ of full-scale                       |
|                        | AC Voltage .....                                              | $\pm 4\%$ of full-scale                       |
|                        | DC Current .....                                              | $\pm 3\%$ of full-scale                       |
|                        | Resistance .....                                              | $\pm 3\%$ of scale length                     |
| <b>Sensitivity:</b>    | DC Voltage .....                                              | 10 megohm (1000V range is 32 megohms)         |
|                        | AC Voltage .....                                              | 10K $\Omega$ /volt                            |
|                        | DC Current .....                                              | 316 mV                                        |
|                        | Frequency Response .....                                      | 30 — 200 kHz at 3, 10 V Range                 |
| <b>Meter Movement:</b> | 5", 3-color, mirrored scale, 25 $\mu$ A movement              |                                               |
| <b>Battery:</b>        | Requires one type "C" battery and one 9-volt rectangular type |                                               |

## ACCESSORIES

|                                                 |       |
|-------------------------------------------------|-------|
| 47" spring-steel, banana plug style leads ..... | 1 set |
| Instruction manual .....                        | 1     |

## EXPLODED VIEW



## CAL PARTS LIST

## MECHANICAL PARTS LIST

| DESCRIPTION |                                                   |                       | RS<br>PART NO. | MFR'S<br>PART NO. | REF.<br>NO. | DESCRIPTION                    | RS<br>PART NO. | MFR'S<br>PART NO. |
|-------------|---------------------------------------------------|-----------------------|----------------|-------------------|-------------|--------------------------------|----------------|-------------------|
|             | Variable Resistor 20 K ohms<br>(HMS ADJ.)         |                       | P-1809         | 23-006            | 1           | Main Panel                     | Z-3637         | 52-052            |
|             | Variable Resistor 5 K ohms<br>(ZERO ADJ.)         |                       | P-1808         | 23-005            | 2           | Sub Panel                      | Z-3615         | 52-054            |
| VR-3        | Semi-Fixed VR (6BN-3K)                            |                       |                |                   | 3           | Case                           | Z-3635         | 52-051            |
| VR-4        | Semi-Fixed VR (5BN-5K)                            |                       |                |                   | 4           | Handle                         | H-6226         | 52-073            |
| S-2         | Rotary Switch (1-3-3)<br>(OFF/BATT./ON)           |                       | S-1285         | 22-009            | 5           | Selector Knob                  | K-2653         | 52-040            |
| S-3         | Rotary Switch (1-4-2)<br>(—DC/+DC, AC, $\Omega$ ) |                       | S-1284         | 22-008            | 6           | Switch Knob                    | K-2645         | 52-041            |
| Tr          | Transistor Dual FET (1S001Z or equiv.)            |                       |                |                   | 7           | VR Control Knob                | K-2646         | 52-042            |
| D-1         | Zener Diode (WZ-061-0 or equiv.)                  |                       |                |                   | 8           | Selector Shaft                 | RT-1025        | 52-043            |
| D-2         | Zener Diode (WZ-061 or equiv.)                    |                       | DX-0530        |                   | 9           | Cam-Wipper Board Ass'y         |                | 41-002            |
| D-3         | Silicon Diode (1S2473 or equiv.)                  |                       | DX-0299        |                   | *10         | Meter Cover                    | D-5275         | 52-056            |
| D-4         | Germanium Diode (TC2050A or equiv.)               |                       | DX-0491        |                   | *11         | Meter Base                     | Z-3636         | 52-055            |
| C-1, 2      | Ceramic Capacitor (0.05 $\mu$ F)                  |                       |                |                   | *12         | Meter Cap                      | HB-5293        | 52-031            |
| R-1         | Resistor 21.6K                                    | 1/8W P $\pm$ 1%       | NBB-0310       |                   | 13          | Movable Contact                | HB-6524        | 62-017            |
| R-2         | Resistor 68.4K                                    | 1/8W P $\pm$ 1%       | NBB-0355       |                   | 14          | Fixed Contact                  | HB-6523        | 62-018            |
| R-3         | Resistor 216K                                     | 1/8W P $\pm$ 1%       | NBB-0395       |                   | *15         | Battery Contacts 9V Cell       | B-0282         | 62-008            |
| R-4         | Resistor 684K                                     | 1/8W P $\pm$ 1%       | NBB-0434       |                   | *16         | Battery Spring                 | RB-5901        | 62-022            |
| R-5         | Resistor 2.16M                                    | 1/8W P $\pm$ 1%       | NBB-0453       |                   | *17         | Battery Contact ( + ) "C" Cell | B-0286         | 62-020            |
| R-6         | Resistor 6.84M                                    | 1/4W P $\pm$ 1%       | NBE-0469       |                   | *18         | Battery Contact ( — ) "C" Cell | B-0287         | 62-021            |
| R-7         | Resistor 10K                                      | 1/8W P $\pm$ 1%       | NBB-0281       |                   | 19          | Stopper Plate                  | RT-0985        | 62-010            |
| R-8         | Resistor 3.06K                                    | 1/8W P $\pm$ 1%       | NBB-0227       |                   | 20          | Range Plate                    | RT-1024        | 70-013            |
| R-9         | Resistor 90                                       | 1/8W P $\pm$ 1%       | NBB-0127       |                   | 21          | Terminal                       | HB-6463        | 80-006            |
| R-10        | Resistor 9                                        | 1/8W P $\pm$ 1%       | NBB-0060       |                   | 22          | Steel Ball (4)                 |                |                   |
| R-11        | Resistor 0.94                                     | 1/4W P $\pm$ 1%       |                |                   | 23          | Fastener (ETWJ-4)              |                |                   |
| R-12        | Resistor 2.16M                                    | 1/8W P $\pm$ 1%       | NBB-0453       |                   | 24          | Push Nut (4)                   |                |                   |
| R-13        | Resistor 684K                                     | 1/8W P $\pm$ 1%       | NBB-0434       |                   | 25          | Wave Washer (WW-4)             |                |                   |
| R-14        | Resistor 284K                                     | 1/8W P $\pm$ 1%       | NBB-0404       |                   | 26          | Solder Lug (2.3)               |                |                   |
| R-15        | Resistor 20K                                      | 1/8W P $\pm$ 1%(Cal.) | NBB-0306       |                   | 27          | Solder Lug (B-4)               |                |                   |
| R-16        | Resistor 90                                       | 1/8W P $\pm$ 1%       | NBB-0127       |                   | 28          | Solder Lug (C-3)               |                |                   |
| R-17        | Resistor 9.9K                                     | 1/8W P $\pm$ 1%       | NBB-0280       |                   | 29          | Screw (TP 2.3 $\times$ 4)      |                |                   |
| R-18        | Resistor 90K                                      | 1/8W P $\pm$ 1%       | NBB-0364       |                   | 30          | Screw (TP 2.3 $\times$ 6)      |                |                   |
| R-19        | Resistor 9.9M                                     | 1/4W P $\pm$ 1%       | NBE-0481       |                   | 31          | Screw (TP 3 $\times$ 8)        |                |                   |
| R-20        | Resistor 9.5                                      | 1/8W P $\pm$ 1%       | NBB-0062       |                   | 32          | Screw (B 3 $\times$ 8)         |                |                   |
| R-21        | Resistor 430K                                     | 1/8W P $\pm$ 5%       | NBB-0421       |                   | 33          | Nut (M3)                       |                |                   |
| R-22        | Resistor 15K                                      | 1/8W P $\pm$ 5%       | NEB-0297       |                   | 34          | Spring Washer (3)              |                |                   |
| R-23        | Resistor 2K                                       | 1/8W P $\pm$ 5%       | NEB-0213       |                   | 35          | Flat Washer (3-8-0.5)          |                |                   |
| R-24        | Resistor 2K                                       | 1/8W P $\pm$ 5%       | NEB-0213       |                   | 36          | Flat washer (6-13-1)           |                |                   |
| R-25        | Resistor 5M                                       | 1/8W P $\pm$ 10%      | NFB-0465       |                   |             |                                |                |                   |
| R-26        | Resistor 5K                                       | 1/8W P $\pm$ 5%       | NEB-0251       |                   |             |                                |                |                   |
| R-27        | Resistor 5K                                       | 1/8W P $\pm$ 5%       | NEB-0251       |                   |             |                                |                |                   |
| R-28        | Resistor 5M                                       | 1/8W P $\pm$ 10%      | NFB-0465       |                   |             |                                |                |                   |
| R-29        | Resistor 32M                                      | 1/2W P $\pm$ 1%       | NBF-0497       |                   |             |                                |                |                   |
| R-30        | Resistor 6.84M                                    | 1/4W P $\pm$ 1%       | NBB-0469       |                   |             |                                |                |                   |
| R-31        | Resistor 1K                                       | 1/8W P $\pm$ 5%       |                |                   |             |                                |                |                   |
| R-32        | Resistor 0.032 (10A shunt)                        |                       |                | 15-523            |             |                                |                |                   |
| M           | Meter (Assembled w/Th, R31)                       |                       | M-0350         | 40-008            |             |                                |                |                   |
| 37          | Printed Circuit Board (Large) Ass'y               |                       | X-7512         | 42-001            |             |                                |                |                   |
| 38          | Printed Circuit Board (Small) Ass'y               |                       | X-7513         | 42-002            |             |                                |                |                   |
| Th          | Thermister (Included in Meter Ass'y)              |                       |                |                   |             |                                |                |                   |

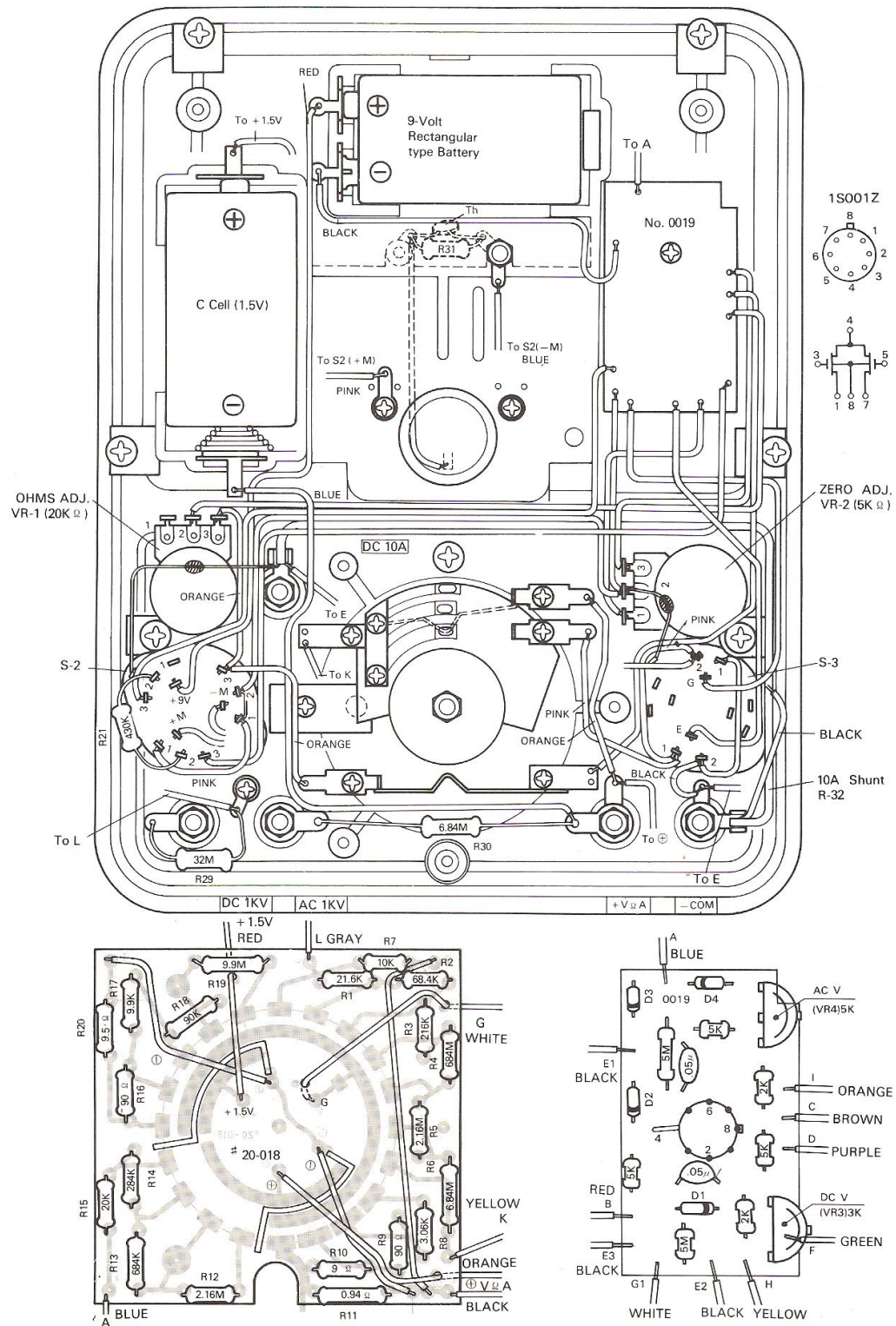
\*Marked parts included in the meter Ass'y.

## CALIBRATION PROCEDURE

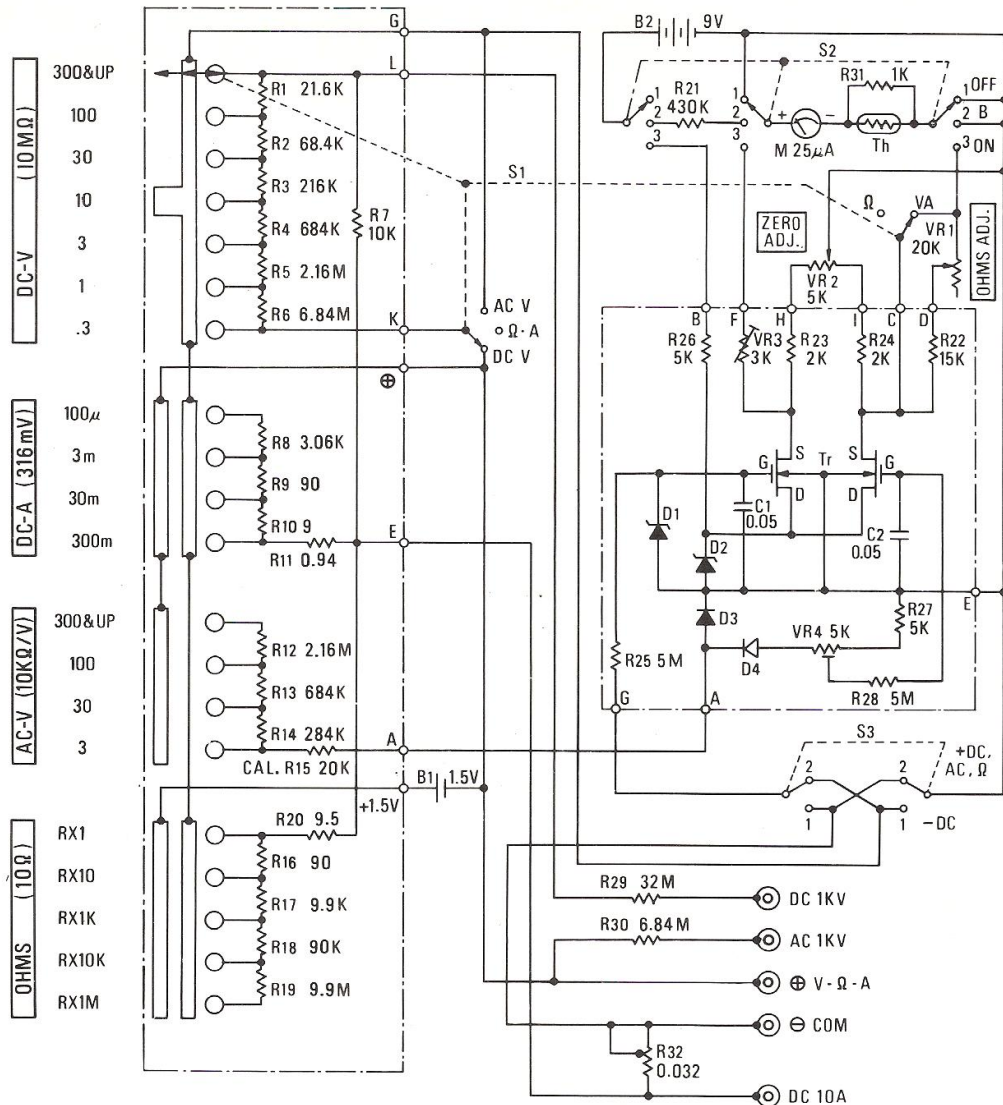
Note: Lay meter flat on a non-metal surface.

- When unit is OFF, adjust mechanical meter zero.
- Check battery condition, using the BATT. CHECK function.
- When unit is ON, adjust ZERO ADJ.
- Calibration is as follows,
  - Set Range Selector to 100V DC and apply a 100V DC calibration voltage; adjust VR3 for precise meter reading.
  - Set Range Selector 100V AC and apply a 100V AC calibration voltage; adjust VR4 for precise meter reading.

# PRINTED CIRCUIT BOARD AND WIRING



# 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**  **A DIVISION OF TANDY CORPORATION**

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