

TRIPLET



INSTRUCTION MANUAL
MODEL 630-M TYPE 1
VOLT-OHM-MILLIAMMETER

MANUAL ONLY \$.50

SAFETY NOTICE

Electricity can be dangerous. Observe good safety practice when making measurements on electrical circuits.

Never touch any exposed energized electrical circuit since contact may cause burns or produce lethal electrical currents.

Before making any measurement with the V.O.M. make sure that the switches and test leads are all in their proper locations for the function and range desired.

Never make a range or a function change in the V.O.M. while connected in or to a live circuit.

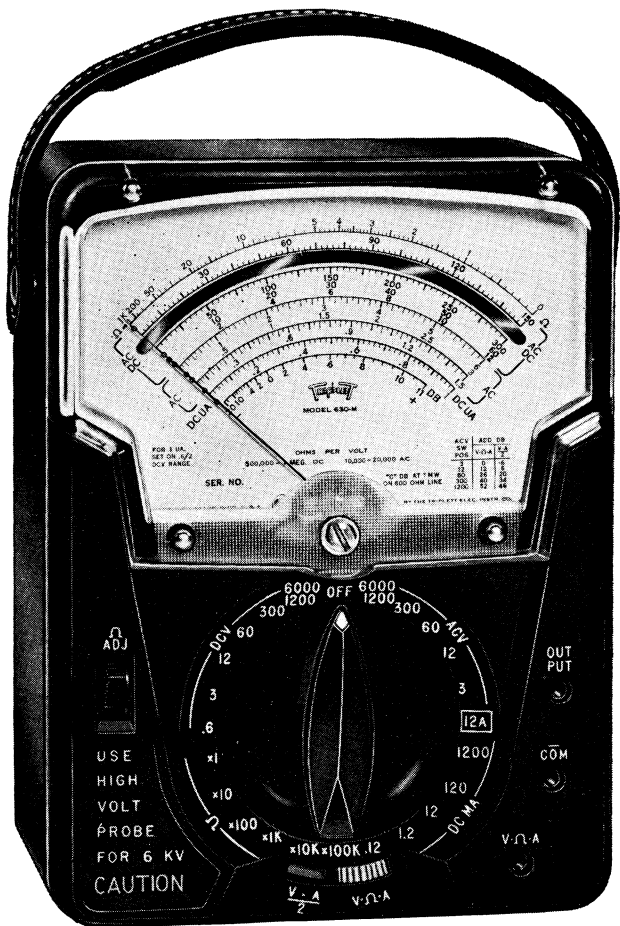
When measuring high voltages special additional precautions are necessary. Turn off the power before connecting the test probes. Make sure that any capacitors in the circuit are discharged. If no voltage is present, clip the test probes to the circuit. Arrange the V.O.M. and test leads to be clear of grounds, etc.

Turn on the power, and make your reading. Do not handle or touch the V.O.M., test leads or probes while the power source is on. Turn off the power - observe the meter to see that it has returned to "Zero", before removing the probes from the circuit.

CAUTION - In High Power circuit areas such as distribution transformers, dangerous arcs of explosive nature can occur if the circuit is shorted. A V.O.M. switched to a current or low ohm range, when it should be on a voltage range could be the cause of an explosive short. *Always be sure that the V.O.M. is set up for the correct function and range before attempting any measurement.*

TABLE OF CONTENTS

Specifications	4
Introduction	6
General Instructions	8
Measuring DC Volts	10
Measuring AC Volts	12
Measuring DC Current	14
Measuring Output Volts (Decibels)	15
Measuring DC Resistance	18
Maintenance	19
Accessories	20
Schematic	25
Parts List	26
Printed in U.S.A.	Part No. 84-146-090166-3



Model 630-M

SPECIFICATIONS

DC Volts

0-0.6-3-12-60-300 at 500,000 Ohms/Volt

0-0.3-1.5-6-30-150 at 1 Megohm/Volt

0-600 at 250,000 Ohms/Volt

0-1200 at 125,000 Ohms/Volt

AC Volts

0-3-12-60-300-1200 at 10,000 Ohms/Volt

0-1.5-6-30-150-600 at 20,000 Ohms/Volt

DC Microamperes

0-1 at 300 M. V.

0-60-600 at 300 M. V.

0-120 at 600 M. V.

DC Milliamperes

0-6-60-600 at 300 M. V.

0-1.2-12-120-1200 at 600 M. V.

DC Amperes

0-6 at 300 M. V.

0-12 at 600 M. V.

Ohms

0-1K-10K-100K (4.4-44-440 at center scale)

Megohms

0-1-10-100 (4400-44,000-440,000 Ohms center scale)

Output Volts (AC)

Capacitor in series with AC Volt

Ranges to 300 VAC

Decibels

—20 to +51, on 600 Ohms line

Protection

Meter movement protected against heavy overload
by use of diodes.

Scales

4.5 inches long (max.) with mirror.

Batteries

One 1.5 volt battery. Battery is packed separately.

Test Leads

One red and one black lead supplied, each 48 inches long.

Two push-on type alligator clips included.

Rubber Feet

Four rubber feet are supplied to fit into four holes in the rear of the VOM case.

Size

3-11/32" x 5 1/2" x 7 1/2"

Weight

Approx. 4 lbs.

ACCURACY

(Calibrated at 77° F. in Horizontal Position)

DC Ranges

All 1 1/2 %

AC Ranges (Calibrated on 60 cycle sine wave)

All 3 %

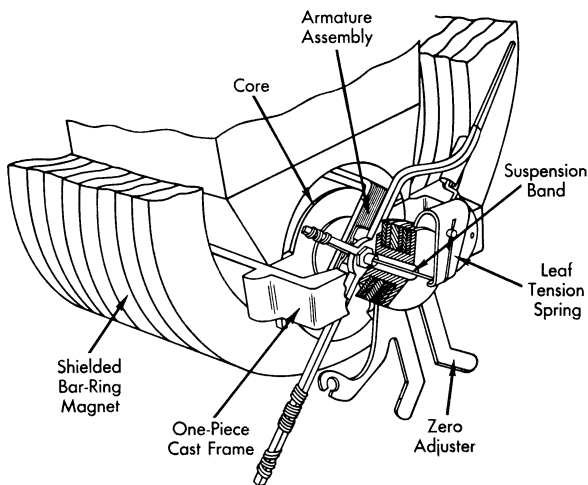
Resistance ranges

All 1 1/2 % of scale length

INTRODUCTION

The Model 630-M is a rugged portable volt-ohm microammeter. It has been designed to make fast, accurate measurements on all types of electrical and electronic equipment and is backed by a company which has been making quality instruments and test equipment for over half a century.

The indicating portion of the Model 630-M is actuated by the latest concept in instrumentation, namely, a taut band suspension meter (shown below) having a sensitivity of 1 microampere full scale. This meter, by omitting conventional pivots, bearings and hairsprings, provides the following advantages:



1. Increased repeatability by elimination of friction between pivots and bearings.
2. Greater ruggedness and durability as no moving parts are in contact and the elimination of the hairspring prevents snagging and tangling. The tension spring acts as a built in shock absorber.
3. Temperature variations can not cause sticky operation of the pointer.

Reference to the illustration will assist in understanding the principle of operation. The moving coil floats in the magnet by virtue of the suspension bands which are held in tension by a spring. These bands, which are fabricated of a precious metal alloy, provide torque and carry the current to the moving coil. The moving coil assembly is held by a rigid one piece die cast frame in a large self-shielded "Bar Ring" magnet.

GENERAL INSTRUCTIONS

The following section should be read carefully; it contains instructions and precautions to be observed in making measurements with the VOM.

- For greatest accuracy, measurements should be taken with your VOM in the horizontal position.
- Measurements are made with the test leads plugged into the COM—and V- Ω -A jacks, except when measuring output volts (DB). For these ranges the V- Ω -A test lead is plugged in the output jack (one test lead is in the COM—jack for all measurements).
- The alligator clips provided with the VOM fit over the end of the test probes. When measuring high voltages, the use of these alligator clips will allow measurement without handling the test probes. As a safety measure, always shut off power source before attempting to connect alligator clips.
- When the approximate value of the quantity being measured is not known, always start on the highest range. For greatest accuracy, choose the range which will allow readings to be taken in the upper (right hand) portion of the scale.
- Readings are taken on the scale having the appropriate significant figures (both 3 and 300 volts are read on the 0-300 scale) by multiplying or dividing by a factor of 10 or 100 as indicated by the range/scale ratio (ie: on the 3 volt range divide the scale readings by 100).
- Whenever possible, the test probes should be disconnected from the voltage source (or the source shut off) before the range switch or polarity switch positions are changed. This practice will result in an increased life and reliability for the VOM.
- The Meter Zero Adjust Screw is located on the lower center of the meter cover. It should be periodically adjusted so the meter pointer is on zero with no input into the VOM.

- Readings on the sensitive voltage, current and resistance ranges may sometimes be different than calculated values.

Thermo-electric or electro-chemical reactions can sometimes generate voltage (or current) in a circuit due to elevated temperatures from soldering, contact of dissimilar metals, chemical fumes or moisture. Also, the fingers should never touch the metal parts of the test probes since body resistance can cause erroneous readings—particularly on the high ohm-meter ranges.

CAUTION: Always observe the following rules and procedures when making measurements in high voltage circuits:

1. Turn off equipment or other source of voltage, before connecting test probes. Make sure no capacitors in the circuit being tested remain charged to a high voltage.
2. Install alligator clips on test probes. While holding the insulated section of the test probe, check circuit to see if any voltage (or current) is present. If no voltage is present, connect the alligator clips to the circuit to be measured.
3. Turn on equipment or voltage source, and take required readings. **DO NOT** handle or touch the VOM, test leads or test probes with power source turned on.

Observing the above rules and precautions will result in continued accurate measurements with your VOM at increased safety to equipment and personnel.

MEASURING DC VOLTS

0-.3-1.5-6-30-150-600 DC Volts:

1. Insert test leads in V- Ω -A and COM—jacks.
2. Place selector switch in appropriate position.
3. Place function switch in VA/2.
4. Connect the test probes across the voltage to be measured as shown on page 11.
5. Read voltage on black "DC" scale.

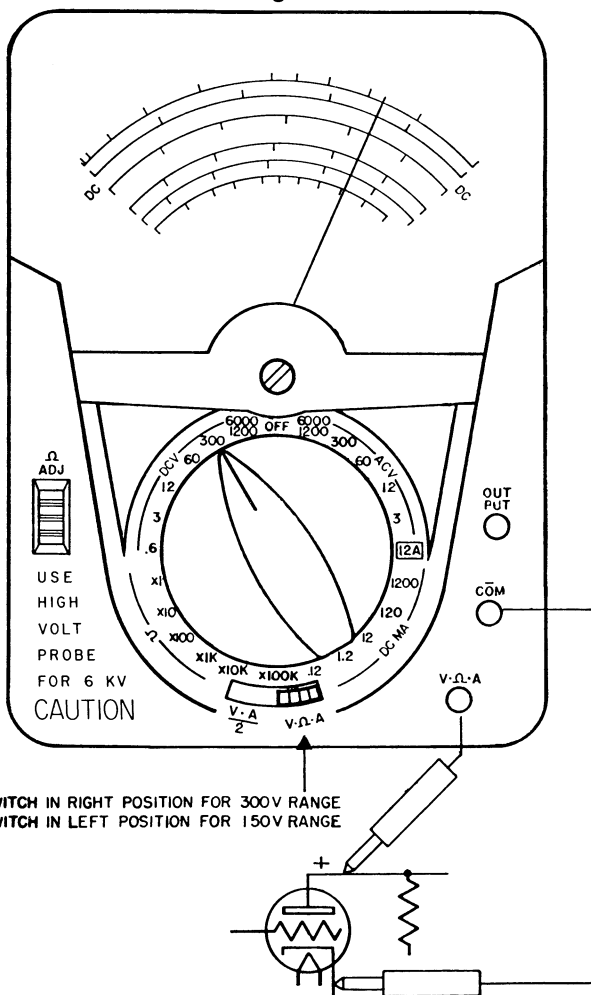
0-.6-3-12-60-300-1200 DC Volts:

1. Insert test leads in V- Ω -A and COM—Jacks.
2. Place selector switch in appropriate position.
3. Place function switch in V- Ω -A.
4. Connect the test probes across the voltage to be measured as shown on page 11.
5. Read voltage on black "DC" scale.

0-3000-6000 DC Volts:

Use accessory high voltage probe.

Measuring DC Volts



CAUTION: For maximum safety do not handle tester or leads when connected to high voltages. Make certain that no condensers are charged by a high voltage.

MEASURING AC VOLTS

0-1.5 AC Volts:

1. Insert test leads in V- Ω -A and COM—jacks.
2. Place selector switch in 3 VAC position.
3. Place function switch in VA/2.
4. Connect the test probes across the voltage to be measured as shown on page 13.
5. Read voltage on lower red 0-1.5 "AC" scale.

0-3 AC Volts:

1. Insert test leads in V- Ω -A and COM—jacks.
2. Place selector switch in 3 VAC position.
3. Place function switch in V- Ω -A.
4. Connect the test probes across the voltage to be measured as shown on page 13.
5. Read voltage on lower red 0-3 "AC" scale .

0-6-30-150-600 AC Volts:

1. Insert test leads in V- Ω -A and COM—jacks.
2. Place selector switch in appropriate ACV position.
3. Place function switch in VA/2.
4. Connect the test probes across the voltage to be measured as shown on page 13.
5. Read voltage on black "AC" scale.

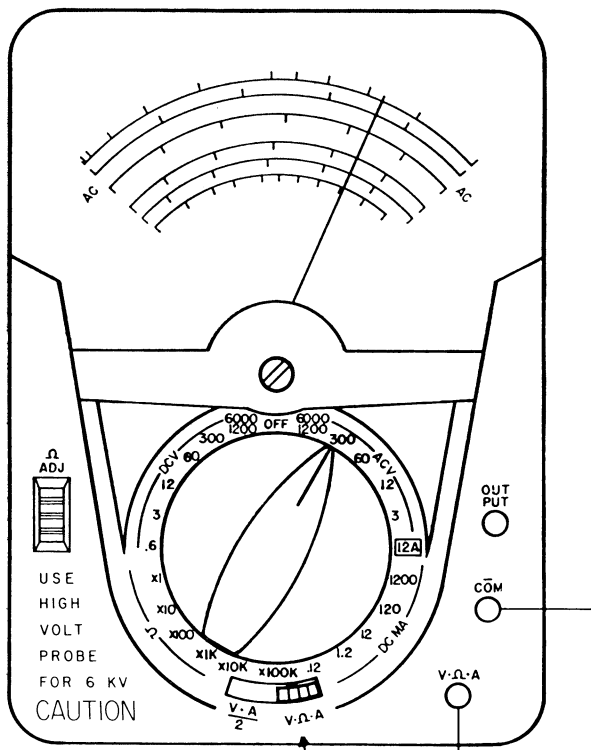
0-12-60-300-1200 AC Volts:

1. Insert test leads in V- Ω -A and COM—jacks.
2. Place selector switch in appropriate ACV position.
3. Place function switch in V- Ω -A.
4. Connect the test probes across the voltage to be measured as shown on page 13.
5. Read voltage on black "AC" scale.

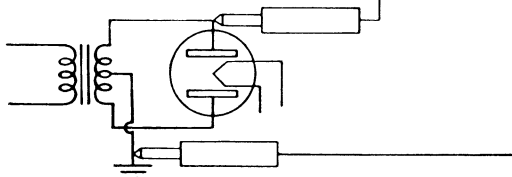
0-3000-6000 AC Volts:

Use accessory high voltage probe.

Measuring AC Volts



SWITCH IN RIGHT POSITION FOR 300 V RANGE
SWITCH IN LEFT POSITION FOR 150 V RANGE



MEASURING DC CURRENT

0-1 Microamperes:

1. Insert test leads in V- Ω -A and COM—jacks.
2. Place selector switch in 0.6 DC Volts.
3. Place function switch in VA/2.
4. Connect the test probes in series with the circuit (use alligator clips) as shown on page 15.
5. Read current on black 0-1 μ A scale.

0-.06-.6-6-60-600 MA & 0-6 AMPS:

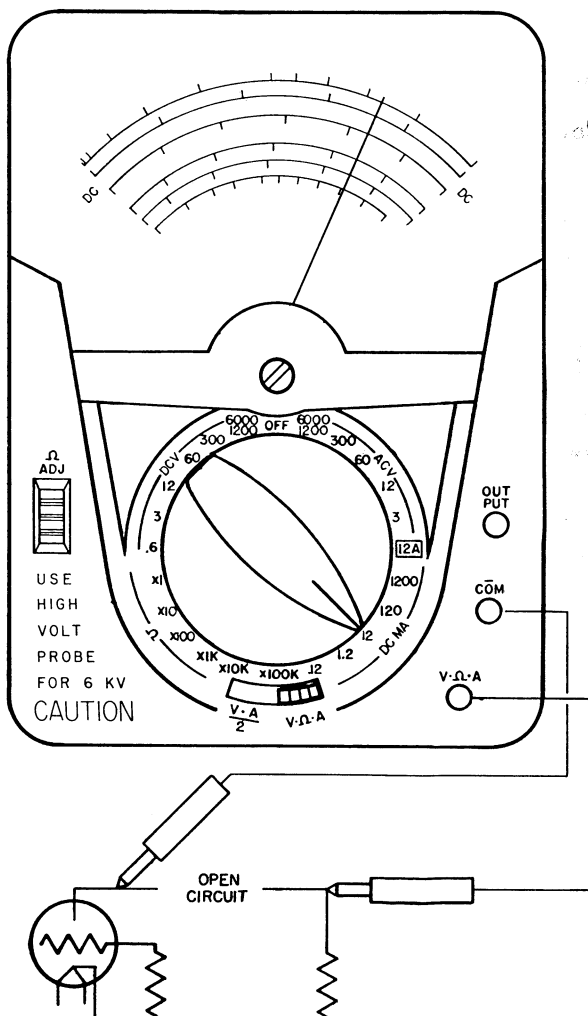
1. Insert test leads in V- Ω -A and COM—jacks.
2. Place selector switch in appropriate position.
3. Place function switch in VA/2.
4. Connect the test probes in series with the circuit (use alligator clips) as shown on page 15.
5. Read current on black "DC" scale.

0-.12-1.2-12-120-1200 MA & 0-12 AMPS:

1. Insert test leads in V- Ω -A and COM—jacks.
2. Place selector switch in appropriate position.
3. Place function switch in V- Ω -A.
4. Connect the test probes in series with the circuit (use alligator clips) as shown on page 15.
5. Read current on black "DC" scale.

Voltage drop is 300 MV in V- Ω -A positions and 600 MV in VA/2 positions. In most cases this voltage drop will not affect the circuit being measured; however, in some low voltage transistor circuits it may be necessary to compensate the circuit on readings for the added voltage drop.

Measuring DC Current



MEASURING OUTPUT VOLTS (Decibels)

Amplifier output is usually expressed in decibels (DB). The decibel is a standard unit of measure used in sound, recording, radio and telephone work to express gain, loss and power levels. Gain or loss is usually expressed as a number of DB above or below a reference level. This instrument is calibrated for a 0 DB reference level when 1 milliwatt of power is developed in a 600 ohm load (0.775 ACV into 600 ohms).

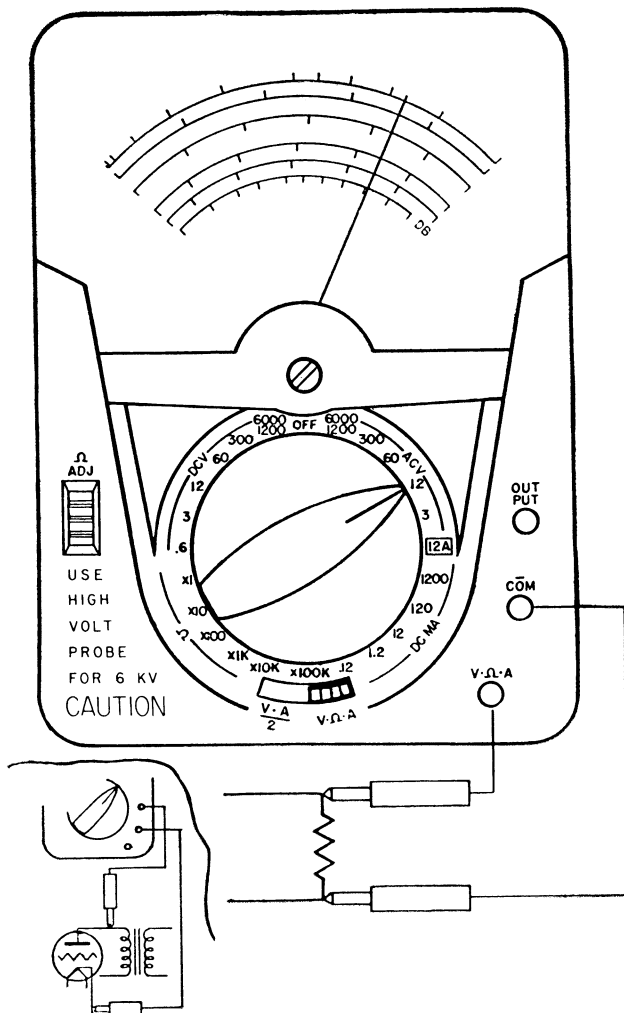
A 0.1 mfd, 400 volt capacitor is connected in series with the OUTPUT jack to block the DC often present in output circuits (DC in the circuit will cause an erroneous AC reading). **Caution:** do not use the OUTPUT range in circuits where the sum of the peak AC voltage and DC voltage is greater than the 400 volt rating of the blocking capacitor. The impedance of the 0.1 mfd capacitor is usually ignored at audio frequencies, however, it may have an effect at low frequencies.

—20 to +51 DB:

1. Insert test leads in to V- Ω -A and COM—jacks.
2. Place selector switch in appropriate ACV position.
3. Place function switch in appropriate position.
Note: See AC Volt section.
4. Connect test probes across voltage to be measured as shown on page 17.
5. Read DB on black "DB" scale.
6. Add (or subtract) DB value read from value indicated on DB chart or meter dial (ie: if —2 DB read on the 10 VAC range, add +10 DB, thus the actual value will be +8 DB).

Do not confuse the DB with the VU (Volume Unit) which is also based on 1 milliwatt into 600 ohms, but is measured with a VU meter having special ballistic characteristics. The DB reading will be only relative if the load or line impedance is not 600 ohms.

Measuring Output Volts (DB)



MEASURING DC RESISTANCE

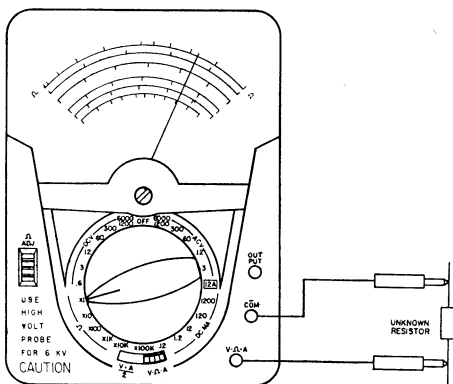
X1 thru X100K Ohms Ranges:

1. Place selector switch in appropriate ohms range.
2. Short test probes together.
3. Adjust " Ω ADJ" control until meter reads zero ohms.
4. Connect test probes to component being measured.
5. Read ohms on top red " Ω " scale (multiply value read times range switch factor).

The component being measured should be disconnected from the circuit before its resistance is measured since any added circuit path can cause an error in measurement. Also, any voltage or current present in the circuit during measurement can cause an error in resistance measurement.

When using the ohmmeter for general continuity and circuit tracing it is recommended the X1K resistance range be used. The lower battery drain on this range (compared to the X1 range) will result in increased battery life.

Measuring DC Resistance



MAINTENANCE

Battery Replacement

A 1.5 volt Burgess No. 2 battery, or equivalent, is used on all ohmmeter ranges. If the pointer cannot be adjusted to zero when the selector switch is on one of these ranges and the test prods are touched together, the battery should be replaced.

To replace the battery, remove the four screws in the bottom of the case and lift the back up and off. Remove the old battery and replace with a new one. Be careful to observe polarity as indicated on the battery compartment.

Fuse Replacement

Spare 1 amp fuse is supplied with this instrument. CAUTION: Use only the fuses supplied or identical fuses as listed in the parts list. The substitution of fuses or other types and values may not afford proper protection and may also disturb the accuracy of the meter.

Cleaning The Plastic Window

The plastic window has been treated at the factory to dissipate static charges that otherwise would attract the meter pointer and make it cling to the window.

If cleaning is required, use cotton dipped in a solution of household detergent and water. After cleaning, allow the solution to dry without rubbing or polishing.

ACCESSORIES

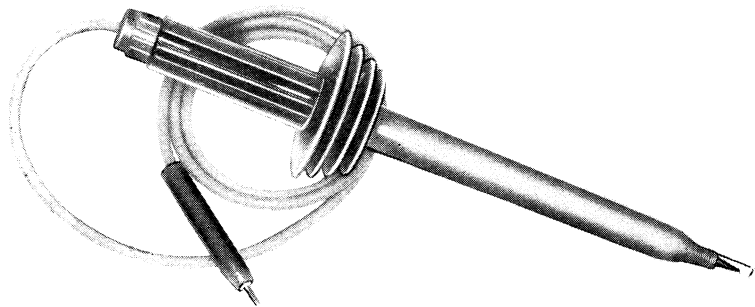
The usefulness and range of your VOM can be extended by the use of the following listed accessories.

HIGH VOLTAGE MEASUREMENTS

Accessory probes are available for measuring high voltages such as found in television receivers and other equipment. To use these probes, plug the probe into the V- Ω -A jack, connect the black ground lead into the COM—jack, and set the selector switch to the position indicated below.

Use extreme caution in measuring high voltages—observe all the rules and precautions listed in the "General Instructions" regarding high voltage measurement.

Kilovolt Probe Part No.	Range	Set Selector Switch To	Read on Range	Multiply By
79-247	0-5KV DC	3 VDC	0-60V	100
79-230	0-6KV AC	3 VAC	0-60V	100
79-152	0-30KV AC	3 VAC	0-300V	100



CASES

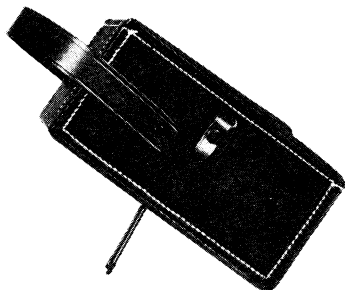
LEATHER CARRYING CASE



Model 639-OS

CASE 639-OS

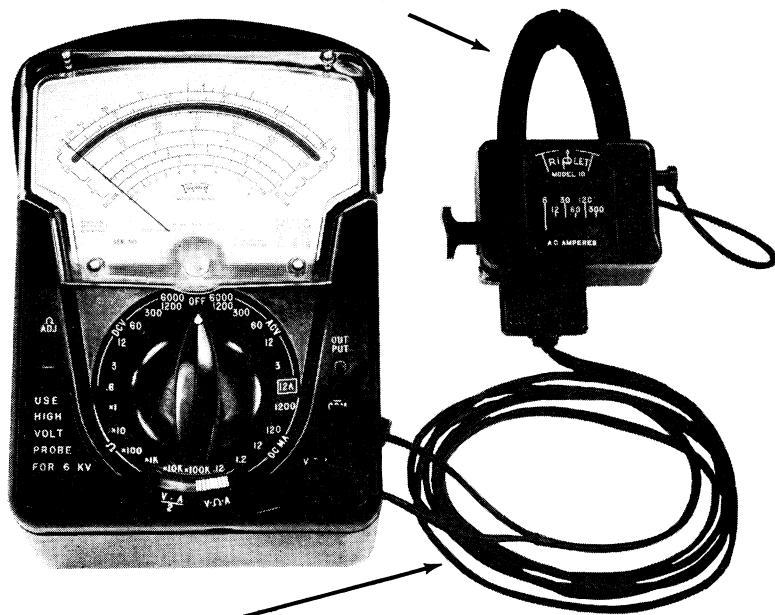
Black leather case, has built-in stand on back. Flaps open to permit use of tester in case. Compartment for accessories. For use with 630 series testers. Felt lined. Leather strap handle.



AC CURRENT MEASURING ADAPTER

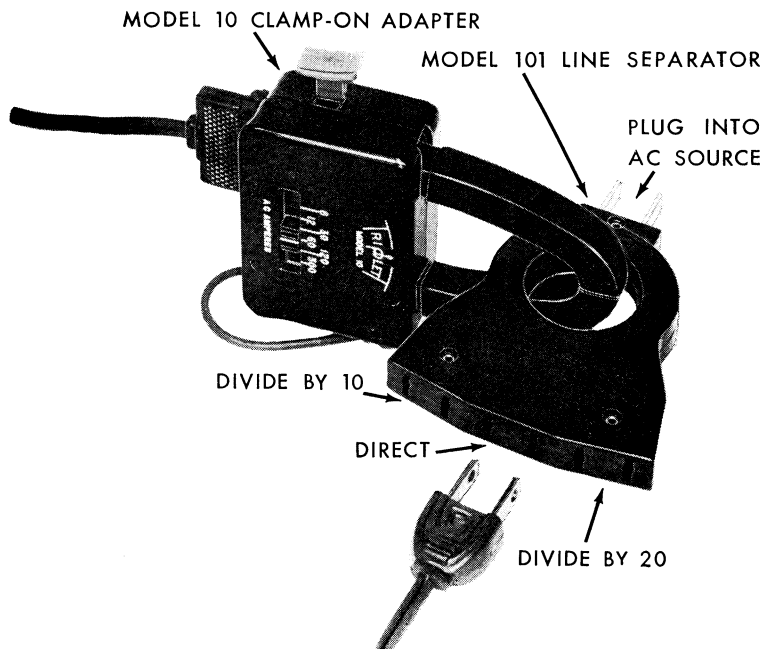
AC line loads can be checked easily, without breaking the conductors or insulation of the circuit under test, when the **Model 10 Clamp-On Ammeter Adapter** (Part No. 60A-211) is used. The Adapter is connected with a **No. 611 Lead Assembly** (Part No. 79A-160). The lever on the side of the Model 10 Adapter is pressed to open the split yoke of the adapter so it can be placed over and closed around the lead or bus bar carrying the current being measured. Readings up to 300 AC amperes can be made.

MODEL 10 CLAMP-ON ADAPTER



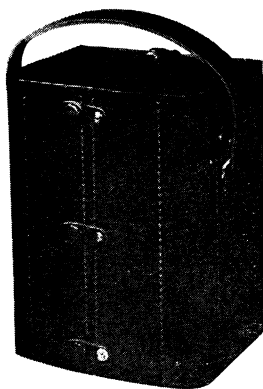
NO. 611 LEAD ASSEMBLY

The **Model 101 Line Separator** (Part No. 60A-218) is used to divide a circuit using two-conductor cable so one conductor can be encircled by the adapter yoke. The Model 101 is plugged into the AC outlet and the AC cord of the equipment to be measured is plugged into the appropriate socket on the Model 101. The split yoke of the Model 10 Adapter is clipped through the loop in the Model 101 to make the current measurement. Use of the "Divide By 10" and "Divide By 20" sockets on the Model 101 Line Separator makes a convenient and fast method of measuring extremely low AC currents.



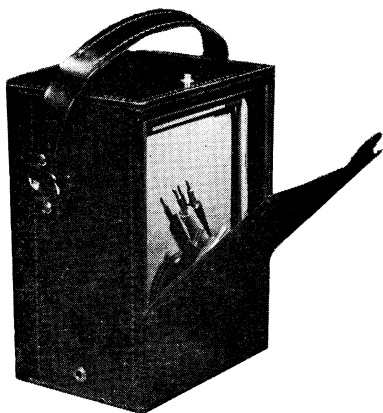
CASES

LEATHER CARRYING CASES



Model 639-N

639-N black cowhide leather carrying case. For use with 630 series testers. Stand included at no extra cost. Leather strap handle.

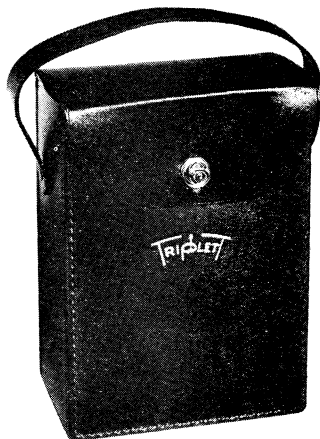


Rear view shows large accessory compartment permitting free access to tester stand, leads, and instructions.

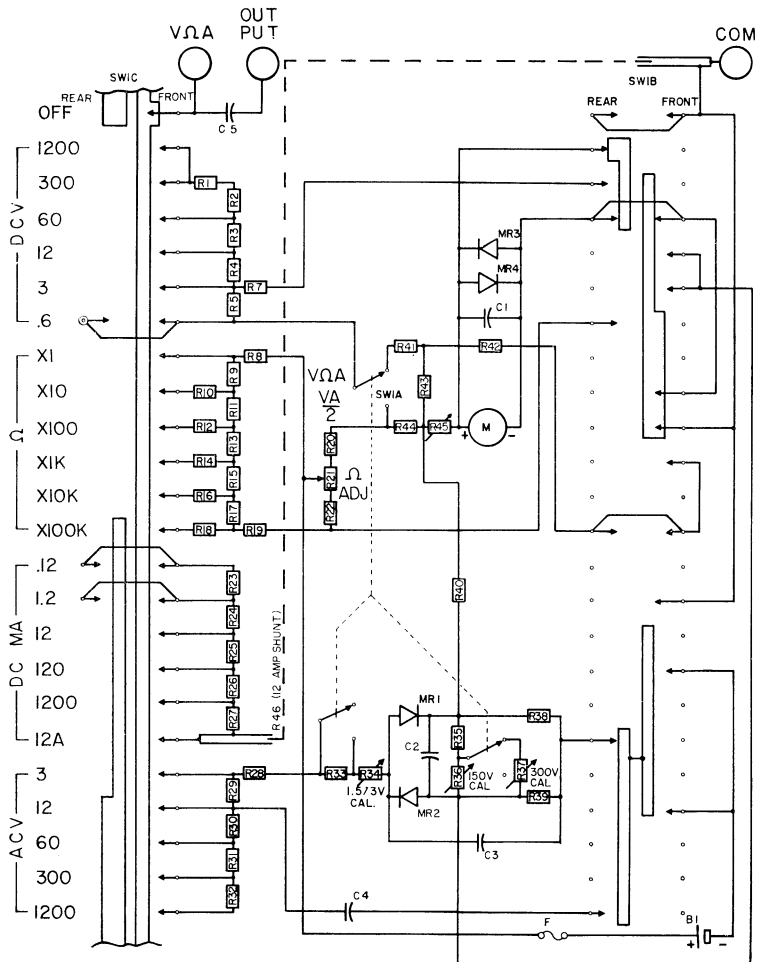
Model 639/639-P

Model 639 leather carrying case has adequate space for Triplett 630 series tester, instructions, and accessories. Black cowhide leather, provided with strong leather strap handle.

Model 639-P is a leather carrying case padded with $\frac{3}{8}$ " sponge rubber which gives the instrument maximum protection. Has adequate space for any 630 series tester, instructions, and leads. Black cowhide; leather strap handle.



SCHEMATIC



REPLACEMENT PARTS FOR MODEL 630-M

CKT SYM	DESCRIPTION	PART NO.
B1	Battery, 15V	2426-1
	Case (complete w/handle)	10B-784
C1	Capacitor, .01MFD, 50V	43-198
C2	Capacitor, .01MFD, 50V	43-198
C3	Capacitor, 18 MMFD	43-197
C4	Capacitor, Variable, 25-280 MMFD	43-250
C5	Capacitor, .1 mfd, 400V	43-69
	Etched Circuit w/Resistors	87A-111
	Etched Circuit w/Switch; Resistors	87A-112
F	Fuse 1 AMP	3207-15
MR3, 4	Overload Diode	10991
M	Instrument complete w/VOM Panel & Front	52A-3068
MR1, 2	Metallic Rectifier	11056
R1	Resistor; 60 M	15-4482
R2	Resistor; 60 M	15-4482
R3	Resistor; 24 M	15-3824
R4	Resistor; 4.5 M	15-4776
R5	Resistor; 1.2 M	15-1553
R6	Not Used	
R7	Resistor; 495K ohms	15-4499
R8	Resistor; 3.7 ohms	15-3224
R9	Resistor; 33.03 ohms	15-4643
R10	Resistor; 6.86 ohms	15-4642
R11	Resistor; 331.9 ohms	15-4644
R12	Resistor; 71 ohms	15-4125
R13	Resistor; 3297 ohms	15-4646
R14	Resistor; 755 ohms	15-4647
R15	Resistor; 33K ohms	15-2591
R16	Resistor; 9.4K ohms	15-4612
R17	Resistor; 330K ohms	15-4650
R18	Resistor; 276K ohms	15-4651
R19	Resistor; 24.9K ohms	15-4670
R20	Resistor; 196K ohms	15-4663

REPLACEMENT PARTS FOR MODEL 630-M

CKT SYM	DESCRIPTION	PART NO.
R21	Resistor, Variable; 100K ohms	16-158
R22	Resistor; 499K ohms	15-4638
R23	Resistor; 4584 ohms	15-4653
R24	Resistor; 450.7 ohms	15-4654
R25	Resistor; 45.07 ohms	15-4655
R26	Resistor; 4.507 ohms	15-4656
R27	Resistor; .4507 ohms	15-4657
R28	Resistor; 7.5K ohms	15-1181
R29	Resistor; 90K ohms	15-2543
R30	Resistor; 480K ohms	15-2544
R31	Resistor; 2.4M ohms	15-2513
R32	Resistor; 9.0M ohms	15-1541
R33	Resistor; 4.42K ohms	15-4662
R34	Resistor, Variable; 5K ohms	16-168
R35	Resistor; 10K ohms	15-4669
R36	Resistor, Variable; 50K ohms	16-165
R37	Resistor, Variable; 20K ohms	16-166
R38	Resistor; 24.9K ohms	15-4670
R39	Resistor; 24.9K ohms	15-4670
R40	Resistor; 499K ohms	15-4638
R41	Resistor; 106.2K ohms	16-4664
R42	Resistor; 365K ohms	15-4666
R43	Resistor; 335K ohms	15-4666
R44	Resistor; 255K ohms	15-4665
R45	Resistor, Variable; 10K ohms	16-167
R46	Shunt, 12 AMP	90A-797
SW1	Switch Rotary complete	22A-503
SWIC	Switch Rotary (C deck only)	22B-501
	Knob w/Clip	34B-62
	Test Leads (1 pair)	79A-127

WARRANTY

The Triplett Electrical Instrument Company warrants instruments manufactured by it to be free from defective material or factory workmanship and agrees to repair or replace such instruments which, under normal use and service, disclose the defect to be the fault of our manufacturing. Our obligation under this warranty is limited to repairing or replacing any instrument or test equipment which proves to be defective, when returned to us transportation prepaid, within ninety (90) days from the date of original purchase.

This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons or service stations in any way so as, in our judgment to injure their stability or reliability or which have been subject to misuse, negligence or accident or which have had the serial number altered, effaced, or removed. Neither does this warranty apply to any of our products which have been connected, installed, or adjusted otherwise than in accordance with the instructions furnished by us. Accessories including all vacuum tubes and batteries not of our manufacture used with this product are not covered by this warranty.

The Triplett Electrical Instrument Company reserves the right to discontinue models at any time, or change specifications, price or design, without notice and without incurring any obligation.

Upon acceptance of this material the purchaser agrees to assume all liability for any damages and bodily injury which may result from the use or misuse of the material by the purchaser, his employees, or others, and that The Triplett Electrical Instrument Company shall incur no liability for direct or consequential damage of any kind.

Parts will be made available for a maximum period of five (5) years after the manufacture of this equipment has been discontinued. Parts include all materials, charts, instructions, diagrams, accessories, et cetera, which were furnished in the standard or special models.

This warranty and conditions of sale are in lieu of all others expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products.

