Simpson

INSTRUMENTS THAT STAY ACCURATE

OPERATOR'S MANUAL

WARNING

For safe usage, it is essential that the operator read this manual carefully before using the instrument for any measurements.

MODEL 265

VOLT-OHM-MILLIAMMETER

SIMPSON ELECTRIC COMPANY

853 Dundee Ave., Elgin, Illinois 60120
Area Code 312, Telephone 697-2260
In Canada, Bach-Simpson, Ltd., London, Ontario

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OBSOLETE

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Figure 1-1. Model 265 Volt-Ohm-Milliammeter

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WARNING

The Simpson Model 265 is designed to prevent accidental shock to the operator when properly used. However, no engineering design can render safe an instrument which is used carelessly. Therefore, this manual must be read carefully and completely prior to making any measurements. Failure to follow directions can result in a serious or fatal accident.

SHOCK HAZARD: As defined in American National Standard, C39.5, Safety Requirements for Electrical & Electronic Measuring & Controlling Instrumentation, a shock hazard shall be considered to exist at any part involving a potential in excess of 30 volts rms (sine wave) or 42.4 volts DC or peak and where a leakage current from that part to ground exceeds 0.5 milliampere, when measured with an appropriate measuring instrument defined in Section 11.6.1 of ANSI C39.5.

NOTE: The proper measuring instrument for the measurement of leakage current consists essentially of a network of a 1500 ohm non-inductive resistor shunted by a 0.15 microfarad capacitor connected between the terminals of the measuring instrument. The leakage current is that portion of the current that flows through the resistor. The Simpson Model 229-Series 2 AC Leakage Current Tester meets the ANSI C39.5 requirements for the measurement of AC leakage current and can be used for this purpose. To measure DC Leakage current, connect a 1500 ohm non-inductive resistor in series with a Simpson 0-500 DC microammeter and use this as the measuring instrument.

SECTION I

INTRODUCTION

1.1 GENERAL

1.1.1 The Simpson Model 265 (see Figure 1-1), is a rugged, high performance, battery operated Volt-Ohm-Milliammeter capable of making a wide variety of electrical measurements simply and accurately.

1.1.2 It features both AC and DC current ranges, a single range/function switch, and meter overload protection. These features, in combination with other functions and ranges (refer to Table 1-1) make the 265 an exceptional, general purpose, portable and laboratory instrument, . . . equally suitable for servicing, production, inspection and engineering applications.

1.1.3 The use of a self shielding temperature compensated taut band meter with knife-edge pointer assures freedom from friction, excellent readability, resolution, and repeatability over a wide temperature range. A varistor in the meter circuit provides overload protection for the meter movement.

1.2 ACCESSORIES

All accessories required for the operation of the Instrument are furnished with the Instrument, and listed in Table 6-1. Other accessories and replacement parts are listed in Table 6-2.

1.3 TECHNICAL DATA

Table 1-1 lists the technical specifications for the Simpson Model 265 Volt-Ohm-Milliammeter.

NOTE: Accuracy specifications apply to measurements made with the Instrument in a horizontal position and at reference conditions.

Table 1-1. Model 265 Technical Data

1. DC Voltage:

Ranges (full scale):	.3V, 3V, 12V, 60V, 300V, 600V
Accuracy:	±2% of full scale on all ranges
Sensitivity:	20,000 ohms/volt

2. Resistance:

Ohms Range	Test Voltage (Open Circuit)	Test Current (Short Circuit)
R x 1	1.5V	125 mA
R x 100	1.5V	1.25 mA
R x 1K	1.5V	125 μA
R x 10K	7.5V	72.5 μA

Ohms Center:	12 ohms (R x 1 range)
Accuracy:	±2° of arc

3. AC Voltage:

Ranges (full scale):	3V, 12V, 60V, 300V, 600V
Accuracy:	±3% of full scale on all ranges
Sensitivity:	5,000 ohms/volt
Frequency Response:	Frequency response curves and correction information are covered in Figure 1-2.

4. DC Current:

Ranges (full scale):	60 μA, 1.2 mA, 12 mA, 120 mA, 0.6 A, 1.2A, 12 A
Voltage Drop:	250 mV maximum, all current ranges
Accuracy:	±2% of full scale on all ranges

5. *Rated Circuit-to - Ground Voltage: 600 volts RMS (sinewave), or 850 VDC or peak.

*Per ANSI C-39-5-1974: The specified voltage with respect to ground which may be safely and continuously applied to the circuits of an Instrument.

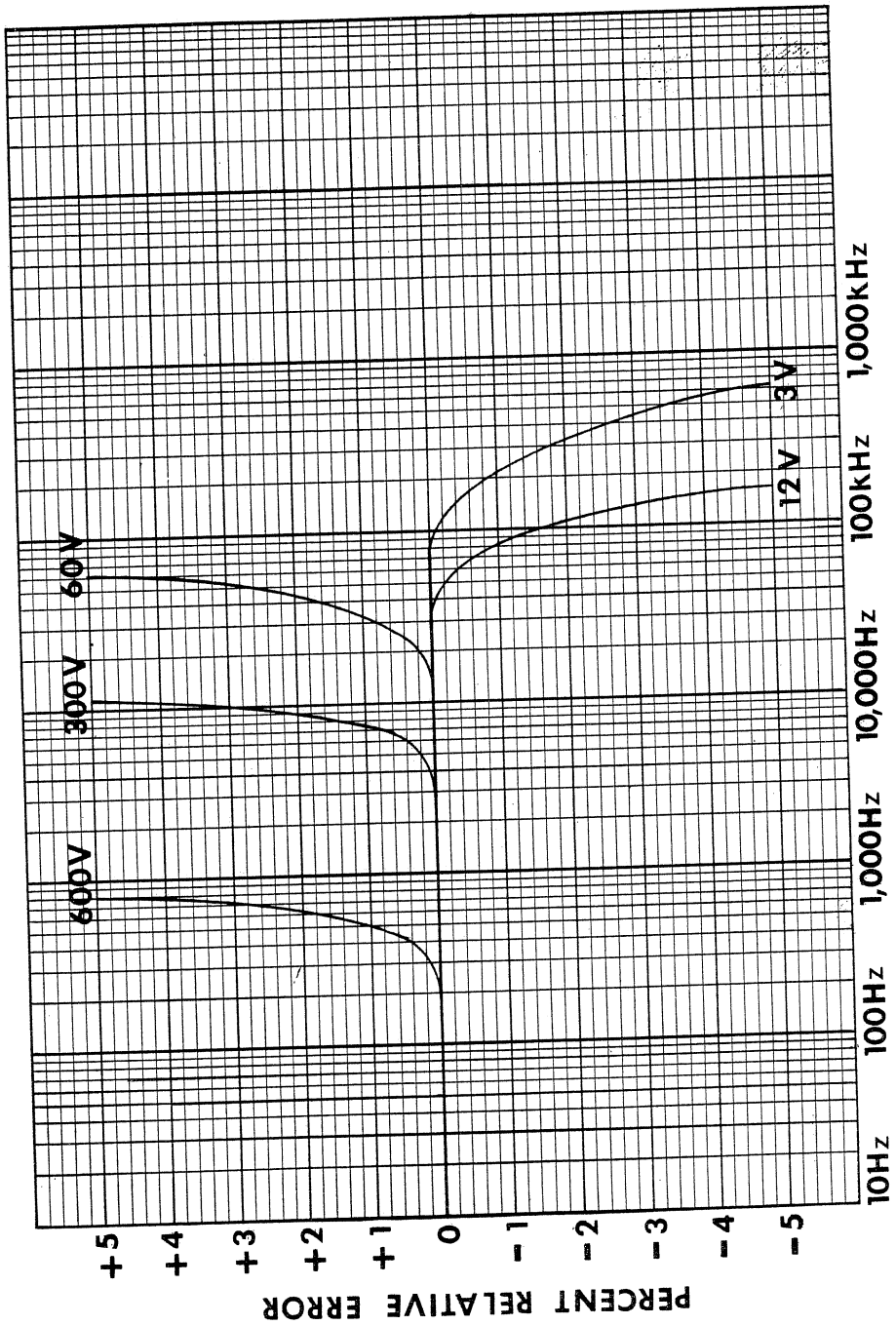

Figure 1-2. Frequency Response Curves for AC Voltage Ranges

6. AC Current:

Ranges (full scale)	Voltage Drop (60 Hz)
.12 A	750 mV
1.2 A	65 mV
12 A	50 mV

Accuracy: ±3% of full scale on all ranges

Frequency Response: .12A, 1.2A Ranges:
Essentially flat from 30 Hz to beyond 40 kHz.
12A Range:
Essentially flat from 30 Hz to 4 kHz. Approx. 0.5 dB down at 8 kHz and less than 3 dB down at 20 kHz.

7. Readout: 4½ inch, temperature compensated 50 μA (full scale) taut band meter.

8. Reference Conditions: +25°C ±5°C, 45% to 75% relative humidity.

9. Overload Capability:

Voltage: Voltage ranges up to and including 300 volts AC and DC will withstand a momentary overload of 5 times full scale. The 600 volts AC and DC ranges will withstand a momentary overload of 2.5 times full scale.

Current: Current ranges will withstand a momentary overload of 5 times full scale.

10. Power Requirements: Five batteries (Refer to 5.5 for installation instructions):
One 1.5V cell, D Size, Eveready No. 950 or equivalent.
Four 1.5V cells, AA size, Eveready No. 915 or equivalent.

11. Dimensions: 5-1/4" x 7" x 3-1/8" (133 x 178 x 79 mm)

12. Weight: 3-1/2 pounds (1.6 Kg)

SECTION II

INSTALLATION

2.1 UNPACKING AND INSPECTION

2.1.1 Examine the shipping carton for any sign of damage prior to unpacking. If there is none, inspect the Instrument and packing material for obvious damage from mechanical shock, water leakage, or other causes. The Instrument should be physically free of marks or scratches, and the electrical performance should be checked as soon as possible. If there is any indication of damage, file a complaint with the carrier immediately. Also check that all accessories are included (see Table 6-1).

2.1.2 The shipping carton and packing materials should be saved for future storing or shipping of the Instrument.

2.2 POWER REQUIREMENTS

2.2.1 The Simpson Model 265 is powered by five batteries supplied with the Instrument. Refer to Table 1-1, item 9 for specifications.

2.2.2 The batteries are packaged separately in the shipping carton. For installation instructions refer to paragraph 5.5.

2.3 INSTALLATION

The Instrument can be used in the horizontal, inclined, or vertical positions. The specifications shown in Table 1-1 are with the meter in the horizontal plane.

SECTION III

CONTROLS, CONNECTORS AND INDICATORS

Table 3-1 describes all the controls, connectors and indicators of the Model 265 Volt-Ohm-Milliammeter. Become thoroughly familiar with each of these items, prior to operating the Instrument for the first time.

Table 3-1. Controls, Connectors and Indicators

1. Function/Range Selector Switch:	This is a twenty position rotary switch which serves as a combination function, and range selector switch.
DC Volt Positions:	These positions are marked .3, 3, 12, 60, 300, 600 and connect the + input jack to the DC volts measuring circuits. The polarity of the signal at the + input jack must be positive with respect to the COMMON − input jack.
DC Current (mA) Positions:	These positions are marked 60 μA, 1.2, 12, 120 and connect the + input jack to the DC milliamperes measuring circuits. The polarity of the signal at the + input jack must be positive with respect to the COMMON − jack.
DC AMPS:	This position connects the DC AMPS jacks (see item 4) to the DC amperes measuring circuits.
OHMS Positions:	These positions are marked R x 1, R x 100, R x 1K, R x 10K and connect the + input jack to the ohms measuring circuits.
AC Volt Ranges:	These positions are marked 3, 12, 60, 300, 600 and connect the + input jacks to the AC volts measuring circuits.
AC AMPS:	This position connects the AC AMPS jacks (see item 3) to the AC amperes measuring circuits.

Figure 3-1. Model 265, Front Panel

Controls, Connectors, and Indicators

2. +, COMMON – Jacks: These jacks in conjunction with the function/range switch, provide the input connections for the AC volts, DC volts, DC milliamperes and ohms measurement circuits.

3. AC AMPS COMMON, and AC AMPS Jacks: The AC AMPS, .12, 1.2, and 12 jacks jacks provide the input connections to the AC AMPS measurement circuits, when the function/range selector switch is in the AC AMPS position. The AC AMPS COMMON jack connects to the common side of these circuits.

4. DC AMPS Jacks: These jacks are marked +.6, +1.2 and +12. They provide the input connections to the DC AMPS measurement circuits when the function/range switch is in the DC AMPS position. The polarity of the signal at the +.6, +1.2, or +12 input jacks must be positive with respect to the COMMON – jack. The COMMON – jack (see item 2) connects to the common side of these circuits.

5. OHMS ADJ. Potentiometer: This control is part of the ohms measuring circuits and adjusted for a meter indication of zero (0) ohms.

NOTE: If this adjustment cannot be made, battery replacement may be necessary (refer to paragraph 5.5).

6. Meter: This is a 4-1/2 inch taut band, 50 μA meter. It provides the readout for the measuring circuit selected by the function/range switch.

7. Mechanical Zero: This is a phenolic screw located in the case below the center of the dial and is used to adjust the meter pointer to mechanical zero (no input signal applied).

SECTION IV

OPERATION

4.1 GENERAL

WARNING

The Simpson 265 is designed to prevent accidental shock to the operator when properly used. However, no engineering design can render safe an instrument which is used carelessly. Therefore this manual must be read carefully and completely prior to making any measurements. Failure to do so may result in a serious or fatal accident.

4.2 SAFETY PRECAUTIONS

4.2.1 The Model 265 Volt-Ohm-Milliammeter should only be used by personnel qualified to recognize shock hazards and trained in the safety precautions required to avoid possible injury. Refer to "SHOCK HAZARD" definition on page iv.

4.2.2 Do not work alone when making measurements of circuits where a shock hazard can exist. Notify another person that you are, or intend to make such measurements.

4.2.3 Locate all voltage sources and accessible paths prior to making measurement connections. Check that the equipment is properly grounded and the right rating and type of fuse(s) is installed. Set the Instrument to the proper range before power is applied.

4.2.4 Remember, voltages may appear unexpectedly in defective equipment. An open bleeder resistor may result in a capacitor retaining a dangerous charge. Turn off power and discharge all capacitors before connecting or disconnecting test leads to and from the circuit being measured.

4.2.5 For your own safety, inspect the test leads for cracks, breaks or crazes in the insulation, prods and connectors before each use. If any defects exist, replace the test leads immediately.

4.2.6 Do not make measurements in a circuit where corona is

present. Corona can be identified by a pale-blue color emanation from sharp metal points in the circuit, the odor of ozone and its sound.

4.2.7 Hands, shoes, floor and workbench must be dry. Avoid making measurements under humid, damp, or other environmental conditions that could affect the dielectric withstanding voltage of the test leads or Instrument.

4.2.8 For maximum safety, do not touch test leads or Instrument while power is applied to the circuit being measured.

4.2.9 Use extreme caution when making measurements in an RF circuit where a dangerous combination of voltages could be present, such as in a modulated RF amplifier.

4.2.10 Do not make measurements using test leads which differ from those originally furnished with the Instrument.

4.2.11 Do not come into contact with any object which could provide a current path to the common side of the circuit under test or power line ground. Always stand on a dry insulating surface capable of withstanding the voltage being measured, or that could be encountered.

4.2.12 Do not connect the Model 265 to any circuit in which any terminal of the instrument will be subjected to a voltage that exceeds the rated circuit-to-ground voltage stated in Table 1-1, (Item 5). Exceeding this voltage may result in insulation failure, harmful to the Instrument and possibly result in a shock hazard.

4.3 PRELIMINARY NOTES AND ADJUSTMENTS

Prior to operation of the Instrument, the following should be reviewed and performed.

4.3.1 Connect the banana plug of the red test lead into the + input jack and the banana plug of the black test lead into the COMMON – input jack.

4.3.2 Set the meter mechanical zero by using an appropriate screwdriver and rotating the phenolic adjusting screw (Table 3-1, item 7) until the meter pointer indicates zero (0). Then, back off

slightly (less than 1/16 of an inch) to relieve pressure on the adjusting mechanism. This adjustment should be made with the Instrument placed in its operating position (refer to 2.3).

4.3.3 When reading the indications on the AC and DC voltage and current scales, place the decimal point according to the range selected. For example:

a. On the 12 mA DC range, the 0 to 12 scale is used and the indication is read directly in milliamperes. On the 1.2 mA range, the same scale is used except that an indication of "12" now represents 1.2 mA.

b. On the .3 DC volts range, the 0 to 300 scale is used. An indication of "300" can be read as .300 volts or 300 millivolts.

NOTE: DC indications are read on the black scales and AC indications are read on the red scales.

4.3.4 When reading the OHMS scale the indication is multiplied by the factor marked on the range setting. For example, if the meter pointer indicates 3 minor divisions above "10" with the range selector switch set to R x 100, the value of the resistance being measured is 13 x 100, or 1300 ohms.

4.3.5 The voltage and current accuracy of this type instrument is commonly expressed as a percent of full scale. This should not be confused with accuracy of reading (indication). For example, ±2% of full scale on the 12 volt range allows an error of ±0.24V at any point on the dial. This means that at full scale the accuracy of reading would be ±2%, but at half scale it would be ±4%. Therefore, it is advantageous to select a range which gives an indication as near as possible to full scale.

4.4 DC VOLTAGE MEASUREMENTS

4.4.1 Prior to making measurements, review the SAFETY PRECAUTIONS listed in 4.2.

4.4.2 Accomplish the PRELIMINARY NOTES AND ADJUSTMENTS (Refer to 4.3).

4.4.3 Remove all power from the circuit being measured and discharge all capacitors.

4.4.4 Rotate the function/range selector switch to the appropriate DC VOLTS range position. If the voltage being measured is unknown, rotate the selector switch to the 600V DC position.

4.4.5 Connect the test leads to the circuit being measured. Observe the correct polarity when making connections and do not contact adjacent points.

4.4.6 Apply power to the circuit being measured. Do not touch the test leads or the Instrument while power is applied.

4.4.7 The value of the voltage being measured is indicated on the meter (para. 4.3.3).

4.4.8 Remove all power from the circuit being measured, discharge all capacitors, and disconnect the test leads from the circuit.

4.4.9 Rotate the function/range selector switch to the 600 DC VOLTS position.

4.5 DC MILLIAMPERE MEASUREMENTS

4.5.1 Prior to making measurements, review the SAFETY PRECAUTIONS listed in 4.2.

4.5.2 Accomplish the PRELIMINARY NOTES AND ADJUSTMENTS (refer to 4.3).

4.5.3 Rotate the function/range selector switch to the appropriate DC mA position. If the current is unknown, rotate the switch to the 120 mA position.

4.5.4 Remove all power to the circuit being measured and discharge all capacitors. Open the circuit in which the current is to be measured and connect the test leads in series with the circuit. Observe the correct polarity and insure that the Model 265 is not connected across a low impedance voltage source which could result in a current through the Instrument in excess of the range position marking. Failure to do so may damage the Instrument.

4.5.5 Apply power to the circuit being measured. Do not touch the test leads or the Instrument.

4.5.6 The value of the current being measured is indicated on the meter (refer to 4.3.3).

4.5.7 Remove all power from the circuit being measured and discharge all capacitors.

4.5.8 Disconnect the test leads and reconnect the circuit which was originally opened.

4.5.9 If no additional current measurements are required, rotate the function/range selector switch to the 600 DC VOLTS position. This avoids the possibility of accidentally applying voltage to the current circuits which could damage the internal shunts.

4.6 AC VOLTAGE MEASUREMENTS

4.6.1 Prior to making measurements, review the SAFETY PRECAUTIONS listed in 4.2.

NOTE: The Model 265 employs an average responding ac measuring circuit. However, the Instrument is calibrated, based on the equivalent rms values of a true sine wave. Therefore, when other than sine wave signals are being measured, remember that the accuracy will be affected.

4.6.2 Accomplish the PRELIMINARY NOTES AND ADJUSTMENTS (refer to 4.3)

4.6.3 Rotate the function/range selector switch to the appropriate AC VOLTS position. If the voltage being measured is unknown, rotate the switch to the 600 AC VOLTS position.

4.6.4 Remove all power from the circuit being measured and discharge all capacitors.

4.6.5 Connect the test leads to the circuit being measured. Avoid contacting adjacent points.

4.6.6 Apply power to the circuit being measured. Do not touch the test leads or the Instrument while power is applied.

4.6.7 The value of the voltage being measured is indicated on the meter (para. 4.3.3).

4.6.8 Remove all power from the circuit being measured, discharge all capacitors, and then disconnect the test leads.

4.6.9 Rotate the function/range selector switch to the 600 AC VOLTS position.

4.7 RESISTANCE MEASUREMENTS

4.7.1 Accomplish the PRELIMINARY NOTES AND ADJUSTMENTS (refer to 4.3).

4.7.2 Remove all power from the circuit being measured and discharge all capacitors.

4.7.3 Rotate the function/range selector switch to the OHMS position that will result in a meter indication near center scale (for the resistance being measured). If the approximate resistance is not known, start with the R x 10K range.

NOTE: If the circuit being measured contains polarity sensitive device(s) such as a semiconductor(s), this must be remembered when interpreting the measurement results.

CAUTION

Check that the OHMS range being used will not damage any of the semiconductors (refer to Table 1-1, item 2 and 4.7.4).

4.7.4 If the purpose of the resistance measurement is to check a semiconductor in or out of a circuit (forward and reverse bias resistance measurements), consider the following, **prior** to making the measurement:

a. The polarity of the voltage at the input jacks is opposite to the input jack markings. Therefore, be certain that the polarity of the test leads is correct for the application.

b. Insure that the range selected will not damage the semiconductor. Refer to Table 1-1, item 2 and review the specification limits of the semiconductor according to the manufacturer's ratings.

(1) If the semiconductor is a silicon diode or conventional silicon transistor, no precautions are normally required.

(2) If the semiconductor material is germanium check the ratings of the device and refer to Table 1-1, item 2 before using the R x 1, R x 100 ranges. When in doubt, use the R x 1 K range.

4.7.5 Connect the tips of the test leads together.

4.7.6 Rotate the OHMS ADJ control for a zero (0) indication on the OHMS scale.

4.7.7 Separate the tips of the test leads. The pointer should return to the left side on the OHMS scale and come to rest over the infinity (∞) mark.

4.7.8 Check for alternate resistance paths other than the resistance being measured. These paths can result in a measured value which is lower than the actual value of the resistance being measured.

4.7.9 Connect the test leads to the resistance being measured. Avoid contacting adjacent points.

4.7.10 The value of the resistance being measured is indicated on the meter (see para. 4.3.4).

4.7.11 Disconnect the test leads.

4.7.12 If no additional resistance measurements are required, rotate the function/range switch to 600 AC VOLTS position. This avoids the possibility of accidentally applying voltage to the resistance circuits of the Instrument.

4.8 DIRECT CURRENT MEASUREMENTS

4.8.1 Prior to making measurements, review the SAFETY PRECAUTIONS listed in paragraph 4.2.

4.8.2 Accomplish the PRELIMINARY NOTES AND ADJUSTMENTS (see para. 4.3).

4.8.3 Rotate the function/range selector switch to DC AMPS position.

4.8.4 Insert the banana plug of the black (negative) test lead into the COMMON, – input jack. If the approximate current being measured is unknown, insert the banana plug of the red test lead into the +12 input jack. Otherwise, use the appropriate lower current jack.

CAUTION

When making current measurements above 5 amperes, limit the duration of measurement to less than 1 minute. If a longer duration is required, use test leads having an appropriately higher, continuous current rating.

4.8.5 Remove all power to the circuit being measured and discharge all capacitors. Open the circuit in which the current is to be measured and connect the test leads in series with the circuit. Observe the correct polarity and insure that the Model 265 is not connected across a low impedance voltage source which may result in a current through the Instrument in excess of the range selected. Failure to do so may damage the Instrument.

4.8.6 Apply power to the circuit being measured. Do not touch the test leads or Instrument.

4.8.7 The value of the current being measured is indicated on the meter (para. 4.3.3).

4.8.8 Remove all power from the circuit being measured and discharge all capacitors.

4.8.9 Disconnect the test leads and reconnect the circuit which was originally opened.

4.8.10 If no additional current measurements are required, rotate the function/range selector switch to the 600 VOLTS DC position. This avoids the possibility of accidentally applying voltage to the current circuits, which could damage the internal shunts.

4.9 ALTERNATING CURRENT MEASUREMENTS

4.9.1 Prior to making measurements, review the SAFETY PRECAUTIONS listed in paragraph 4.2.

NOTE: The Model 265 employs an average responding ac measuring circuit. However, the Instrument and its meter scale are calibrated based on the equivalent rms values of a true sine wave. Therefore, when other than sine wave signals are being measured, remember that the accuracy will be affected.

4.9.2 Accomplish the PRELIMINARY NOTES AND ADJUSTMENTS (see para. 4.3).

4.9.3 Rotate the function/range selector switch to AC AMPS position.

4.9.4 Insert the banana plug of the black test lead into the AC AMPS COMMON jack (upper left corner of panel). If the current being measured is unknown, insert the banana plug of the red test lead into the "12" input jack. Otherwise, use the appropriate lower current jack.

4.9.5 Remove all power from the circuit being measured and discharge all capacitors.

4.9.6 Open the circuit being measured and connect the test leads in series with the circuit. Be sure that the Instrument is not connected across a low impedance voltage source which could result in a current through the Instrument in excess of the range selected. Failure to do so may damage the Instrument.

4.9.7 Apply power to the circuit being measured. Do not touch the test leads or the Instrument.

4.9.8 The value of the current being measured is indicated on the meter (para. 4.3.3).

4.9.9 Remove all power from the circuit being measured and discharge all capacitors.

4.9.10 Disconnect the test leads and reconnect the circuit which was initially opened.

CAUTION

If no additional current measurements are required, rotate the function/range selector switch to the 600 AC VOLTS position. This avoids the possibility of accidentally applying voltage to the current circuits which could damage the current transformer.

4.10 CAPACITOR CHECKS

4.10.1 The R x 10K range of the 265 can be used to provide a useful check on the condition of a capacitor. The procedure is the same as for resistance measurements (see para. 4.7).

NOTE: The results obtained should always be confirmed by making an actual capacitance measurement.

4.10.2 A good capacitor will produce a deflection to the right when the test leads are connected across it. Then the pointer will gradually return to the left end of the scale (infinite resistance) as the capacitor becomes charged by the ohms circuit batteries and current ceases to flow. Small capacitors produce a small deflection which disappears quickly.

NOTE: If the capacitor check is repeated, the capacitor should be discharged first, or the test lead connections reversed.

4.10.3 An open capacitor has, by definition, infinite resistance; no current will flow and no deflection will be produced.

4.10.4 A shorted capacitor will produce a deflection which persists, indicating a permanent and finite resistance value.

4.11 COMBINATION AC CURRENT-VOLTAGE MEASUREMENTS

4.11.1 AC current-voltage relationships can be simply determined, using two sets of test leads. One set is connected as for AC ampere measurements and the other is connected to the + and

COMMON – jacks as for AC volts determinations. The Instrument can then be switched back and forth from AC AMPS to the desired AC VOLTS position for comparison readings.

4.11.2 The voltage range progression is downward from the AC AMPS position so that no damage to the Instrument will result. The current transformer primary remains connected, and completely isolated from the other measuring circuits.

4.11.3 Particularly valuable in this measurement is the extremely low insertion loss of the transformer primary (Table 1-1, item 5).

NOTE: The wide frequency response of the AC current and voltage ranges (Table 1-1, items 3 and 5) make the 265 very useful for measurements in the low impedance high power audio circuits; such as high-fidelity amplifier output stages. Thus, the Model 265 provides in a single instrument, a function normally requiring two special single-purpose meters.

4.12 OPERATION WITH THE SIMPSON AMP-CLAMP MODEL 150

WARNING

1. DO NOT come into contact with the current-carrying conductor. Keep hand at actuating lever portion of the Amp-Clamp and away from the jaw end.

2. Do not apply the Amp-Clamp to any conductor having a potential greater than 600 volts.

3. Do not apply the Amp-Clamp to any conductor carrying a current which exceeds 300 amperes.

Operation

4.12.1 The Model 150 is a clamp-on AC ammeter adapter, used for making AC current measurements without opening the circuit being measured. Six ranges are provided:

0 to 6, 12, 30, 60, 120, 300 amperes

Accuracy is +3% of full scale, and the usable frequency range is from 30 Hertz to 1000 Hertz.

4.12.2 The procedure for operation of the 265 with the Simpson Amp-Clamp Model 150 is covered in the Model 150 Operator's Manual. Basically, it consists of the following:

a. Prior to making any measurements, review the Safety Precautions listed in 4.2 and the Model 150 Operator's Manual.

b. Connect the leads of the Model 150 to the +, COMMON – jacks of the 265.

c. Set the 265 function/range selector switch to the 3 AC VOLTS position.

d. Set the Model 150 to the desired current range.

e. Clamp the jaws of the 150 around the single conductor under test.

f. Read the value of the current through the conductor on the 0 to 3 VAC scale of the 265, using the appropriate green numerical markings.

SECTION V

MAINTENANCE

5.1 GENERAL

The Simpson Model 265 Volt-Ohm-Milliammeter is carefully designed and constructed with high quality components. By providing reasonable care, and following the instructions in this manual, the user can expect a long service life from his Model 265.

5.2 WARRANTY

The Simpson Electric Company Warranty Policy is printed on the back cover of this manual. Read carefully before requesting a warranty repair.

NOTE: For assistance of any kind, including help with the instrument under warranty, contact the nearest Authorized Service Center listed on the last pages of this manual or contact the Factory Service Manager. Give full details of the difficulty and include the model and serial number of the unit and date of purchase. Shipping instructions will be promptly sent to you. If an estimate of charges for non-warranty work or other service work is required, a firm quote estimate will be furnished upon receipt of the unit. Service work will not be performed without customer approval.

5.3 SHIPPING

The Instrument should be packaged carefully, and shipped prepaid to the destination indicated. Insure the Instrument.

5.4 CASE REMOVAL

Whenever battery or fuse replacement, or other maintenance is

required, the Instrument must be removed from its case. The procedure is as follows:

a. Place the Instrument, face down, on a soft padded surface.

b. Completely unscrew the 4 recessed screws located at the 4 corners of the case.

c. Lift the case off the Instrument and set it aside. Maintenance can now be performed on the Instrument.

5.5 BATTERY REPLACEMENT (See Figure 5-1)

5.5.1 Battery replacement is indicated whenever the Instrument cannot be adjusted to zero (0) ohms on the OHMS ranges. If the adjustment cannot be made on the R x 1, R x 100, or R x 1K range, replace the 1.5V, D size cell. If the adjustment cannot be made on the R x 10K range the four (4) 1.5V, AA size cells must be replaced.

5.5.2 The procedure for replacing batteries is as follows:

a. Remove the Instrument from its case (refer to 5.4).

b. To remove the D size cell, grasp at the center and pull directly up. To install new cell, insert the − side first, push against the − terminal spring clip, and then gently push the + side of the cell into place.

c. To remove the AA cells lift up the end which contacts the flat side of the spring clip. To install, insert the end which contacts the edge side of the spring clip and then push down the other end of the cell. Check that the cell is fully inserted and is making good electrical contact with the spring clips.

5.6 FUSE REPLACEMENT (See Figure 5-1)

5.6.1 Fuse replacement is indicated when there is no meter deflection on any of the DC, AC VOLTS or OHMS ranges but the AC AMPS ranges are operating properly.

5.6.2 The procedure for replacing the 1/2 ampere fuse F1, is as follows:

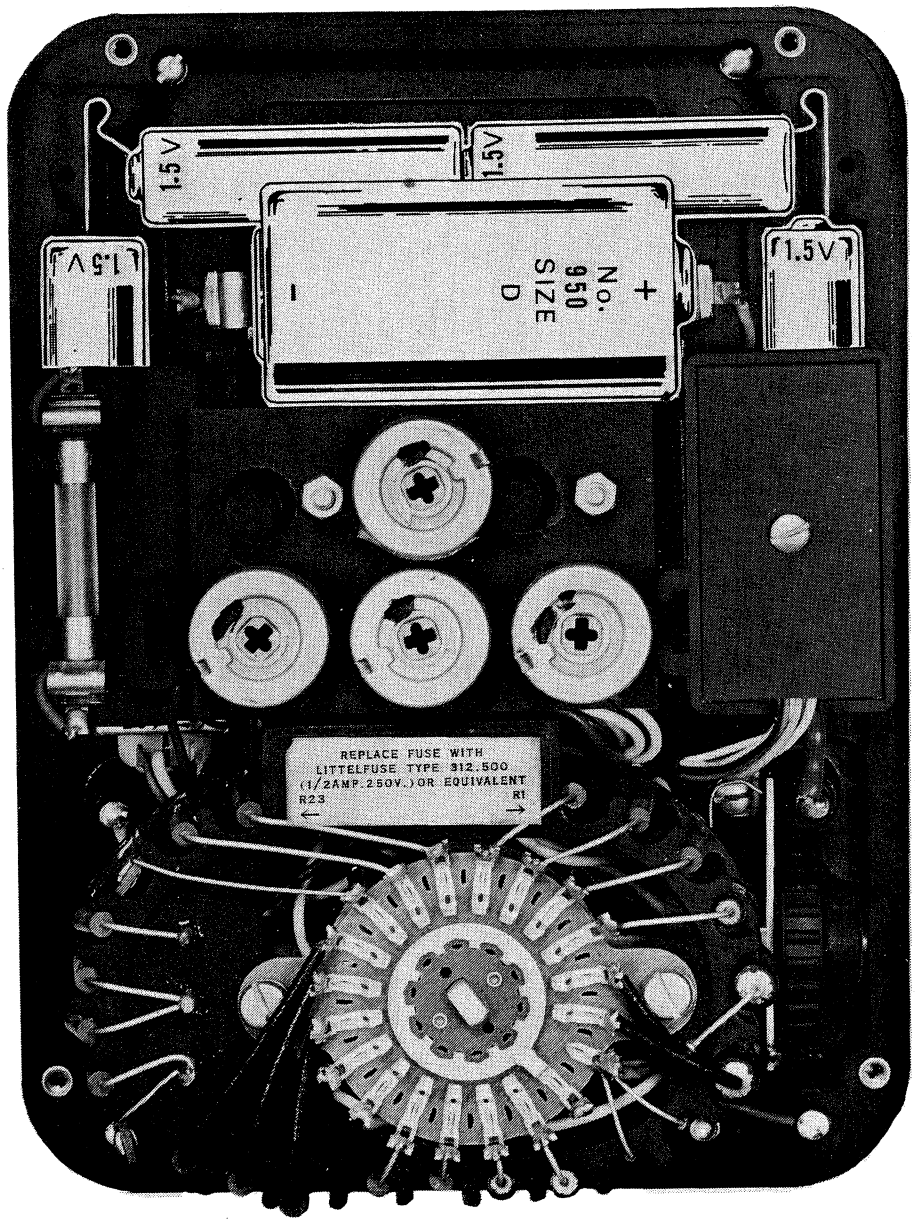

Figure 5-1. Model 265, Rear Interior (Case Removed)

a. Remove the Instrument from its case (refer to 5.4).

b. Pull the defective fuse out of its retaining spring clips.

c. Snap-in the replacement fuse and reinstall the Instrument into its case.

5.7 CALIBRATION (See Figure 5-1)

CAUTION

Calibration adjustments should only be performed by a qualified technician knowledgeable in the precautions, procedures and equipment required.

Four calibration adjustments are provided. These are trimmer potentiometers. R35 and R36 are used to calibrate the AC voltage ranges, R37 calibrates the AC current ranges, and R38 calibrates the basic meter circuit (.3V/60 μA range) and therefore affects all functions and ranges.

5.8 PREVENTIVE MAINTENANCE

5.8.1 Daily Care

a. Immediately clean all spilled materials from the Instrument and wipe dry. If the spillage is corrosive, use a suitable cleaner to neutralize the corrosive action during cleaning.

b. Whenever the Instrument is not in use, rotate the function/range selector switch to the 600 DC VOLTS position.

c. Whenever possible, avoid prolonged exposure or usage in areas which are subject to temperature and humidity extremes, vibration or mechanical shock, dust or corrosive fumes, or strong electrical or electromagnetic interferences.

5.8.2 Monthly Care

a. Verify Instrument accuracy by performing operational checks using known accurate, stable sources. If the need for recalibration is indicated, contact your nearest Simpson Authorized Service Center (refer to last page of this manual).

b. If the Instrument has not been used for 30 days, check the batteries for leakage and replace if necessary.

5.8.3 Annual Care

It is recommended that the Instrument be returned annually to your nearest Simpson Authorized Service Center, or the factory for a complete over-all check, adjustment and calibration.

5.8.4 Storage

When the Instrument is not in use it should be stored in a room free from temperature extremes, dust, corrosive fumes, and mechanical vibration or shock. If storage time exceeds 30 days, batteries should be removed.

SECTION VI

ACCESSORIES, REPLACEMENT PARTS AND SCHEMATIC DIAGRAM

Table 6-1. Accessories Furnished With the Instrument

Quantity	Description	Catalog Number
1	Test Lead Set — One red and one black, each 4 ft. long with combination probe tips and removable rubber sleeved alligator clips at one end and banana plugs on opposite end.	00115
1	1.5 volt, size D battery	*
4	1.5 volt, size AA batteries	*
1	Operator's Manual	5-116245

*Batteries are standard items available from local retail stores. Refer to Table 1-1, item 9.

Table 6-2. Accessories and Replacement Parts

Description	Catalog Number
Carrying case, black vinyl "Ever-Redy" style	0805
Carrying case, black vinyl, sheath style	1818
Carrying case, roll top, black phenolic	0249
Protective cover, black (fits over face of VOM)	02163
Knob, Function/Range selector switch	1-110299
Flexible probe, spring loaded with retractable grip tip	00118
Fuse, 1/2A, 250V, 3AG	1-115595
Hi-voltage Probe, 30K VDC	00511
Amp Clamp, Model 150	00532
Carrying case, Amp Clamp, Model 150	00548

SCHEMATIC DIAGRAM

MODEL 265

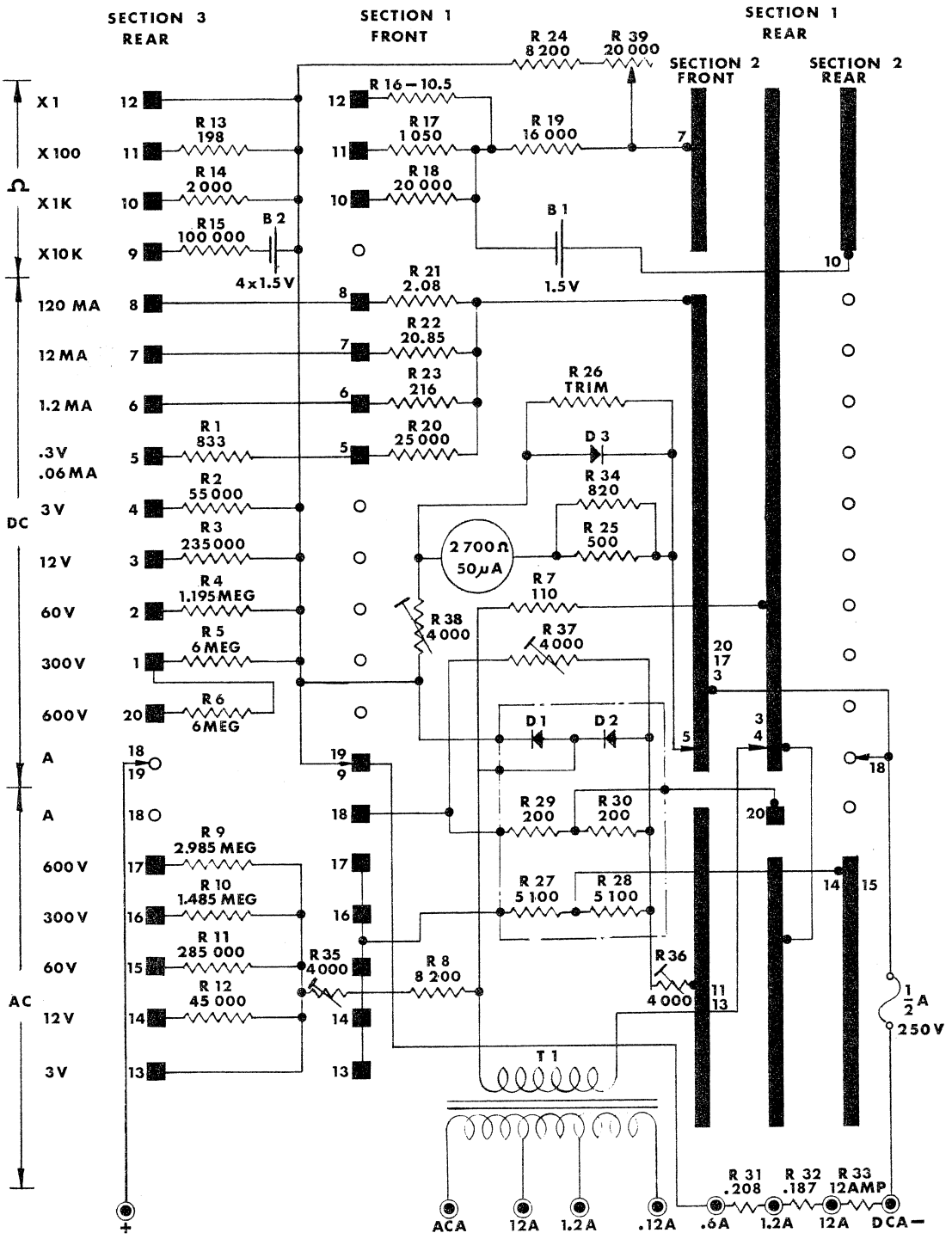

Figure 6-1. Schematic Diagram