AN 16-35TS375-3

Handbook
Maintenance Instructions

TS-375/U AND TS-375A/U VOLTMETERS

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE
AIR FORCE AND THE CHIEF OF THE BUREAU OF AERONAUTICS

15 APRIL 1952
Revised 1 August 1953

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Page No.	Date of Latest Revision	Page No.	Date of Latest Revision
6-1	1 August 1953	6-16	1 August 1953
6-2	1 August 1953	6-17	1 August 1953
6-3	1 August 1953	6-18	1 August 1953
6-4	1 August 1953	6-19	1 August 1953
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6-12	1 August 1953	6-27	1 August 1953
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UNSATISFACTORY REPORT

FOR U. S. AIR FORCE PERSONNEL

In the event of malfunctioning, unsatisfactory design or unsatisfactory installation of any of the component units of this equipment, or if the material contained in this book is considered inadequate or erroneous, an Unsatisfactory Report, AAF Form No. 54 or a report in similar form shall be submitted in accordance with the provisions of Army Air Force Regulation No. 15-54, listing:

1. Station and organization.
2. Nameplate data (type number or complete nomenclature if nameplate is not attached to the equipment).
3. Date and nature of failure.
4. Radio model and serial number.
5. Remedy used or proposed to prevent recurrence.
6. Handbook errors or inadequacies, if possible.

FOR U. S. NAVY PERSONNEL

Report of failure of any part of this equipment during its guaranteed life shall be made on Form NAVAER 4112 "Report of Unsatisfactory or Defective Material," or a report in similar form, and forwarded in accordance with the latest instructions of the Bureau of Aeronautics. Such reports of failure shall include:

1. Reporting activity.
2. Nameplate data.
3. Date placed in service.
4. Part which failed.
5. Nature and cause of failure.
6. Remedy used or proposed to prevent recurrence.

CONTRACTUAL GUARANTEE

The Contractor guarantees that at the time of delivery thereof the articles provided for under this contract will be free from any defects in material or workmanship and will conform to the requirements of this contract. Notice of any such defect or non-conformance shall be given by the Government to the Contractor within one year of the delivery of the defective or nonconforming article, unless a different period of Guaranty is specified in the schedule. If required by the Government within a reasonable time after such notice, the Contractor shall with all possible speed correct or replace the defective or nonconforming article or part thereof. When such correction or replacement requires transportation of the article or part thereof, shipping costs, not exceeding usual charges, from the delivery point to the Contractor's plant and return, shall be borne by the Contractor; the Government shall bear all other shipping costs. This Guaranty shall then continue as to correct or replacing articles or, if only parts of such articles are corrected or replaced, to such corrected or replacing parts, until one year after the date of redelivery, unless a different period of Guaranty is specified in the schedule. If the Government does not require correction or replacement of a defective or nonconforming article, the Contractor, if required by the contracting officer within a reasonable time after the notice of defect or non-conformance, shall repay such portion of the contract price of the article as is equitable in the circumstances.

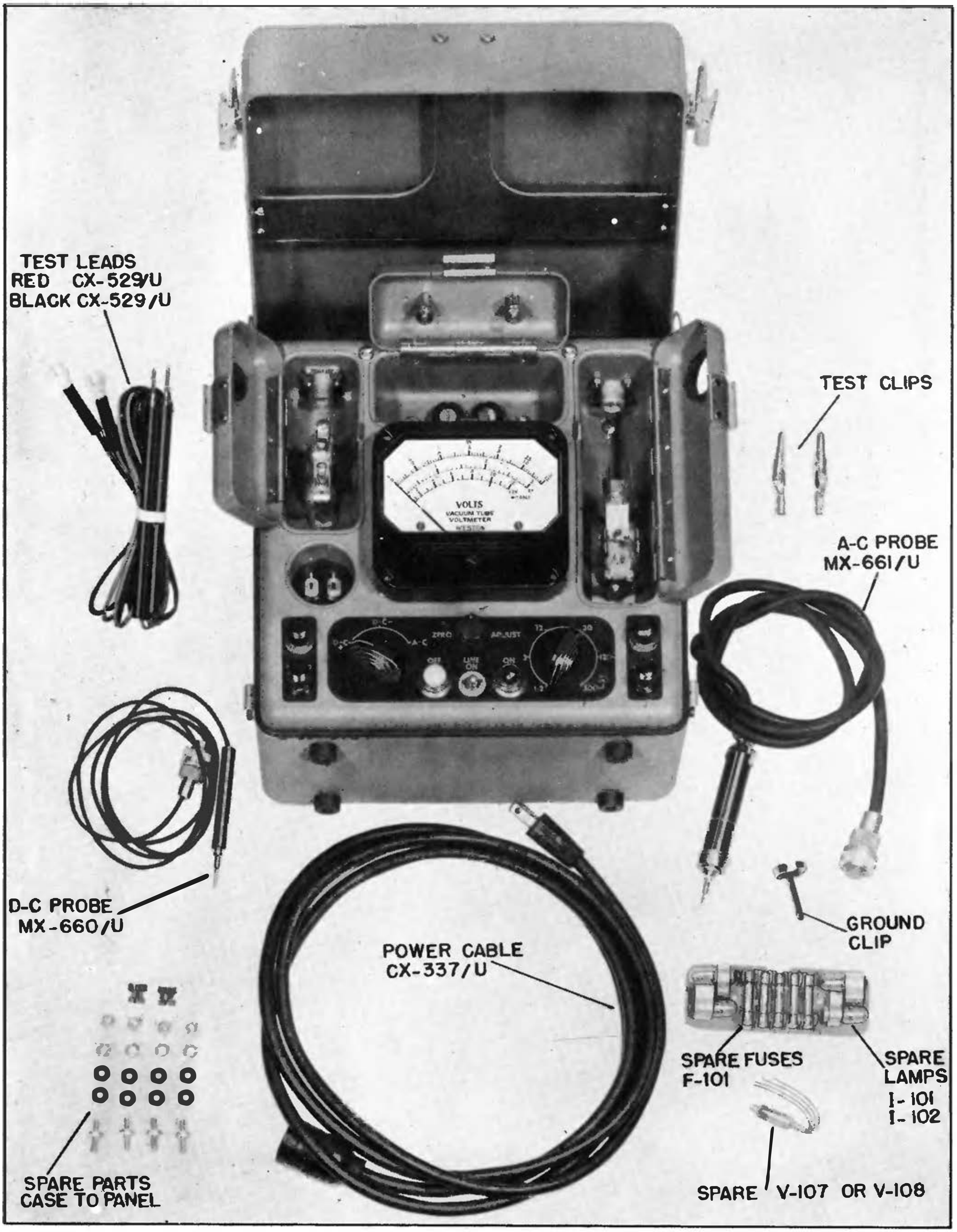


Figure 1—1. Voltmeter TS-375/U, Major Units

SECTION I

GENERAL DESCRIPTION

1. PURPOSE OF HANDBOOK.

a. This handbook describes the operation, maintenance and repair of Voltmeters TS-375/U and TS-375A/U.

b. Since Voltmeters TS-375/U and TS-375A/U have the same function, and are electrically and mechanically interchangeable except for certain internal adjustments, the instructions are based upon Voltmeter TS-375/U but apply equally to Voltmeter TS-375A/U. Where specific differences occur between TS-375/U and TS-375A/U reference will be made to the specific Voltmeter under discussion.

2. PURPOSE OF EQUIPMENT.

a. Voltmeter TS-375/U is a general-purpose high-impedance a-c and d-c voltmeter for servicing and testing radio and radar equipment. It is intended particularly for voltage measurements where the sensitivity or frequency range of standard voltmeters is insufficient, for example d-c grid bias voltage, audio or radio-frequency voltage.

(1) The input impedance is sufficiently high to avoid consideration of the instrument current drain upon the circuit undergoing measurement. For example in circuits where the current drain of a 20,000 ohms-per-volt voltmeter would cause a serious error or operational upset to the circuit, this instrument can be used without difficulty.

(2) For a-c measurements the frequency range includes the radio frequency spectrum up to approximately 300 megacycles, whereas standard a-c voltmeters have a useful upper frequency limit of a few thousand cycles-per-second.

3. EQUIPMENT SUPPLIED.

The major units of the equipment are listed in Table 1-1, and illustrated in figure 1-1. The weight given for the equipment unit is the complete weight including the individual weights of the accessory units. The equipment

TABLE 1-1. EQUIPMENT SUPPLIED

Quantity Per Equipment	Name of Unit	Army-Navy Type Designation	Overall Dimensions (in Inches)			Weight (pounds)	Numerical Series of Reference Symbols
			Height	Width	Length		
1	Voltmeter	TS-375/U or TS-375A/U	10½	10½	6¾	18.5	101-199
	ACCESSORIES						
	PROBES:						
1	A-C Probe	MX-661/U			54	0.3	—
1	D-C Probe	MX-660/U			53	0.1	—
1	Power Cable	CX-337/U (8')			96	0.4	—
1	Test Lead (red)	CX-529/U			60	0.1	—
1	Test Lead (black)	CX-529/U			60	0.1	—
1	Ground Prod	—			1½	0.03	—
2	Alligator Clip	—			1½	0.03	—
	SPARES:						
5	Fuses			¼	1	.02	F-102
1	Diode Rectifier			5/16	1¼	.02	V-107, V-108
2	Binding Post Cap			½	½	.04	—
4	Pilot Lamp			⅜	1⅛	.02	I-101, I-102
8	Rubber Gasket			1/16	⅜	.0003	—
2	Nut			5/16	⅜	.014	—
4	Lock Washer			3/32	1/32	.0012	—
4	Stud-brass			¾	⅜	.035	—
4	Nut			5/16	3/32	.0031	—

unit includes all operating accessories normally required for use as a voltmeter.

4. GENERAL DESCRIPTION.

a. The Voltmeter TS-375/U, shown in figure 1-2, consists of a panel on which are mounted the operating controls, two compartments for stowage of the d-c and a-c probes, a third compartment for the line fuses and general accessory stowage, an indicating instrument, and a receptacle for the power line cord.

b. CASE.—The instrument assembly is mounted in a drawn aluminum case and covered, when not in use, by a drawn aluminum cover gasketed to the case. The case-to-cover gasketing is designed to withstand immersion without leaking. The cover is separable from the case for convenience when the instrument is in use. The instrument can be operated in the vertical or horizontal position.

c. ACCESSORIES.—The line cord, test leads and instruction book are stowed in the case cover. The probes are stored in their marked compartments. All other operating accessories such as clips, ground prods, etc. are stowed in the accessory stowage compartment.

5. UNIT DESCRIPTION.

a. A-C PROBE MX-661/U.—The a-c probe contains a diode rectifier tube and d-c blocking capacitor arranged to provide a minimum frequency error at high frequencies. For the low-frequency panel terminal connection a larger internal blocking capacitor is used.

b. D-C PROBE MX-660/U.—The d-c probe contains an isolating resistor (five megohms) to minimize disturbance to circuits containing a-c in which the d-c voltage is being measured.

c. POWER CABLE CX-337/U (8′).—This is an 8 foot two conductor rubber covered cord with a female connector at one end and a 2 pin male connector at the other end.

d. TEST LEADS CX-529/U.—The test leads consist of one red and one black lead with forked terminals at one end to fit the panel binding posts and test prods at the other end.

e. GROUND PROD.—The ground prod is a spring clip to fit on the ground ring of the a-c probe. It is used for the ground connection to terminals on the component under test.

f. ALLIGATOR CLIP.—These clips may be used on the test prods of the test leads CX-529/U for holding the contacts in position when taking voltage readings.

6. CHARACTERISTICS.

a. POWER SUPPLY.—105 to 125 volts, a-c only, 50 to 1600 cycles, power demand at 115 volts, 28 watts.

b. D-C RANGES.—POSITIVE OR NEGATIVE POLARITY; 1.2, 3, 12, 30, 120 and 300 volts, with a constant input resistance of 30 megohms.

c. A-C RANGES.—1.2, 3, 12, 30 and 120 volts with a 5 megohm resistance on all ranges shunted by approximately five mmf. when using the probe externally. The effective shunt resistance and shunt capacitive reactance vary with frequency, reducing in value as the frequency is increased. See figure 5-7 for the probe input impedance vs. frequency.

d. INPUT CONNECTIONS. — The probe stowage clips in the stowage compartments are arranged to connect the probe tips to the panel terminals when the probes are stowed. The input voltage to be measured is then connected to the panel terminals using standard test leads or wires. In high-frequency circuits, however, the probes must be used for connection to minimize disturbance to the high frequency circuit.

e. FREQUENCY RANGE.—The a-c section is usable from 40 cps. to 50 kc using the panel terminals, and 10 kc to 150 mc using the probe.

f. SCALES.—The indicating instrument is calibrated with three scale arcs, two additional arcs being required because of diode rectifier curvature on the lower a-c range. The lower arc applies to the 1.2 volt a-c range only, the center arc to the 3-volt a-c range only, and the upper arc to all other ranges a-c and d-c. See figure 1-3.

g. The general operating characteristics are summarized in table 5-3.

7. INCLUDED SPARES.

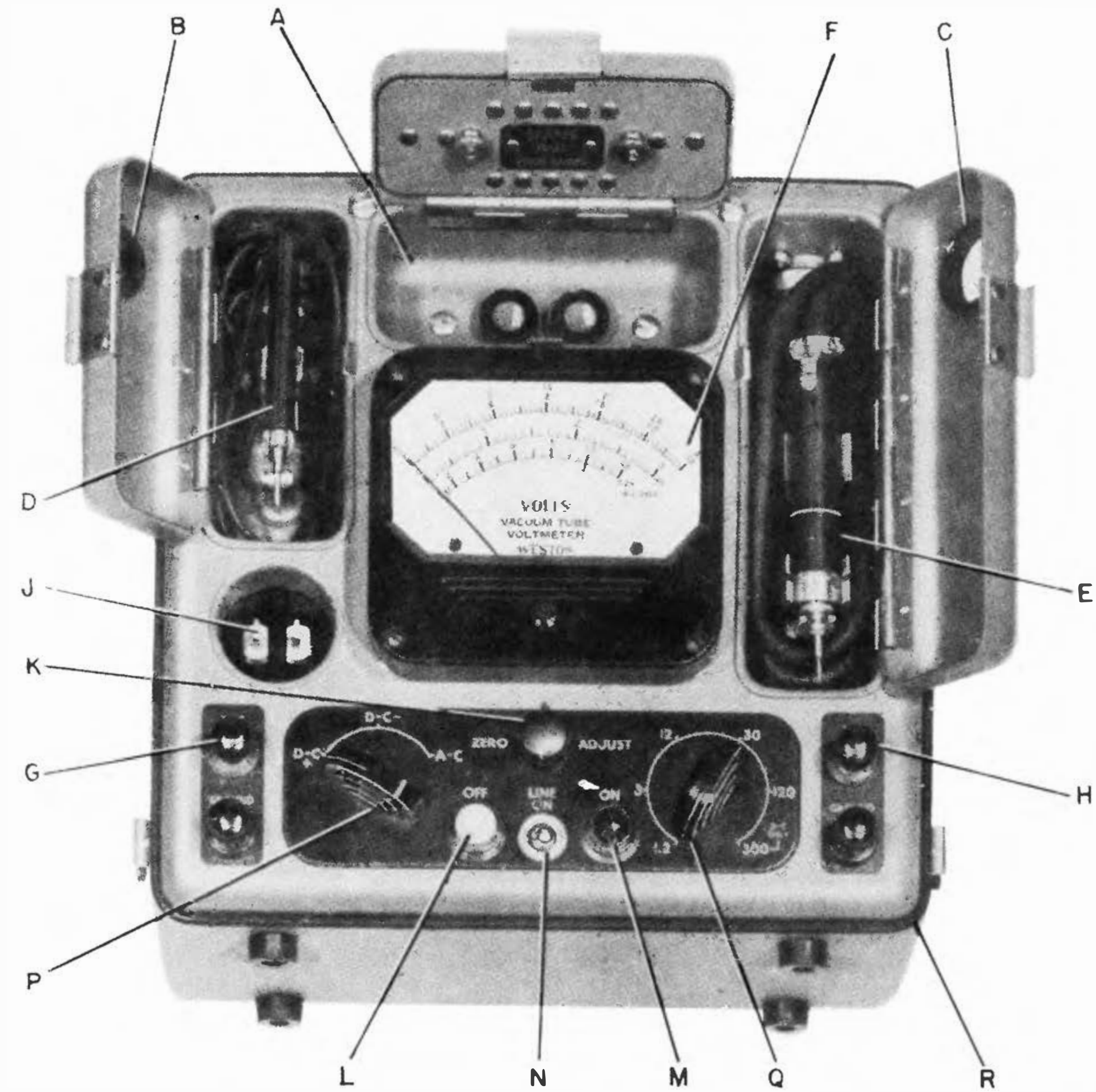
a. SPARES BOX.—The small spares box is mounted inside the equipment under the spare parts compartment (See figure 5-1). It is used for stowing small spare parts such as small rubber gaskets for case sealing, nuts, lockwashers, etc., that would not be normally obtainable and would be difficult to fabricate under service conditions. In the TS-375A/U these spare parts are located in the Accessory Stowage Compartment (See figure 1–2).

b. If spares are available from stock do not use the included spares. Replenish the included spare complement whenever stock spares become available.

c. QUANTITY AND TYPES OF TUBES AND LAMPS.—Six vacuum tubes, two regulator tubes and two pilot lamps are required for operation of the equipment. Tubes and lamps are listed in detail in the following table.

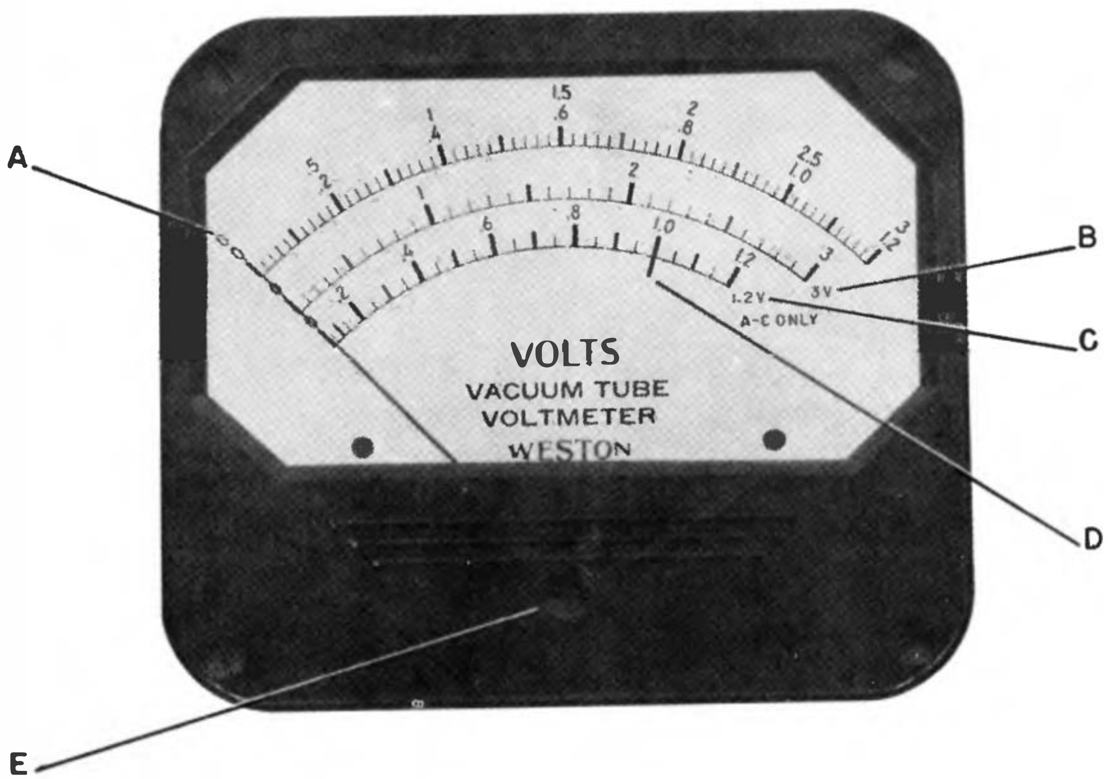
TUBES AND INDICATOR LAMPS

Quantity Used	Spares Supplied	Designation	Symbol Number
2	None	6SJ7	V-101, V-102
1	None	6SL7	V-103
2	1	CK606	V-107, V-108
2	None	991	V-105, V-106
2	4	Lamp	I-101, I-102
1	None	5Y3	V-104



(A) ACCESSORY STOWAGE COMPARTMENT
(B) LEADOUT GROMMET FOR D-C PROBE
(C) LEADOUT GROMMET FOR A-C PROBE
(D) D-C PROBE
(E) A-C PROBE
(F) INDICATING INSTRUMENT
(G) D-C PANEL TERMINALS
(H) A-C PANEL TERMINALS
(J) POWER CABLE RECEPTACLE
(K) ZERO ADJUSTER
(L) STANDBY HEATER PILOT LAMP
(M) LINE PILOT LAMP
(N) LINE SWITCH
(P) SELECTOR SWITCH
(Q) RANGE SWITCH
(R) RUBBER GASKET

Figure 1–2 Voltmeters TS-375/U and TS-375A/U, Front Panel View



(A) TOP SCALE ARC.
(B) 3 VOLT A-C SCALE ARC
(C) 1.2 VOLT A-C SCALE ARC
(D) 1 VOLT A-C REFERENCE LINE
(E) MECHANICAL ZERO CORRECTOR

Figure 1–3. Voltmeter TS-375/U, Indicating Instrument

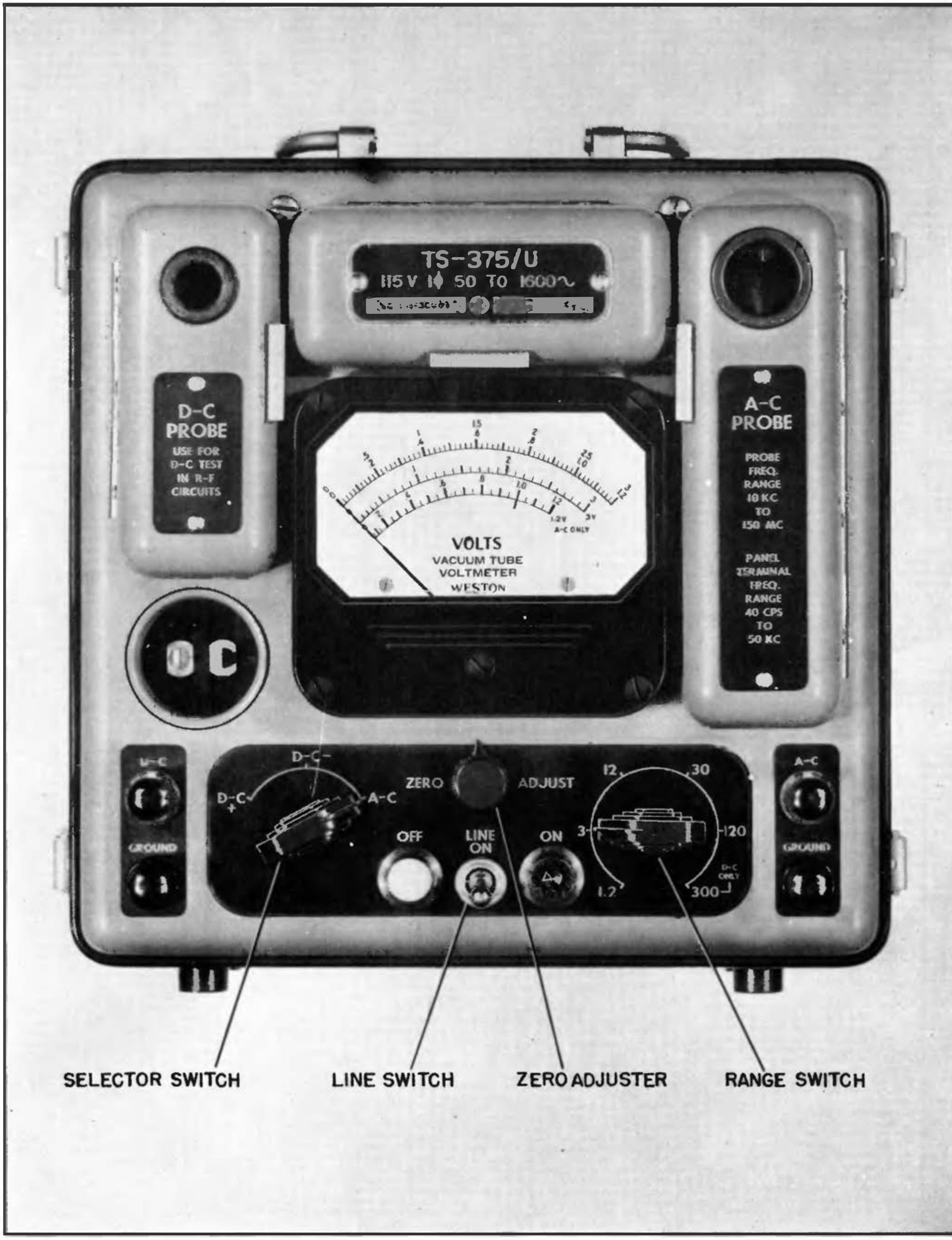


Figure 2–1. Front Panel Showing Controls

SECTION II

OPERATION AND ADJUSTMENT

1. GENERAL.

a. Unlatch the case cover by opening the four snap catches at the sides. Open and remove the cover by disengaging the snap catches.

b. Check the indicating instrument zero setting. If necessary reset the mechanical zero adjusting screw (See figure 1-3).

c. Unwind the power cable from inside the cover, plug into the panel power line receptacle, and connect to the power outlet. Operate only from 105- to 125-volt, 50- to 1600-cycle service power.

(1) The white (heater) pilot should light with the line switch "OFF".

(2) An internal electrical heater is included within the instrument to reduce the internal relative humidity when not in use. The heater is connected to the supply line when the line switch is in the OFF position and disconnected in the ON position.

d. Turn on the line switch (the red pilot light should light), set the selector and range switches to the desired position for the particular measurement being made. Allow at least a 30-second warmup period.

e. Short circuit the input terminals being used (a-c or d-c) and zero the instrument with the panel zero adjuster. Shorting the input circuit during zero adjustment is recommended to avoid the influence of stray leakage or induced voltages which might otherwise lead to setting to a false zero. This is particularly important on low a-c ranges. The zero adjustment is not affected between d-c ranges and no readjustment should be necessary between d-c ranges. Between a-c ranges, however, a slight zero shift may take place, and for accurate measurements zero readjustment on each a-c range is recommended.

f. If the measurement, a-c or d-c, is to be made in a circuit containing any a-c component of radio frequency (above 50 kilocycles) open the corresponding probe compartment and unclip the probe for use.

g. Alternative use of panel terminals and probes is illustrated in figure 2-2 and the proper seating of the probes in their holders is shown in figure 2-3.

2. CONTROLS.

a. The control panel shown in figure 2-1 contains the following operating controls.

(1) Selector Switch: a three-position rotary switch marked "D-C+", "D-C—", and "A-C".

(2) Range Switch: a six-position rotary switch marked with the ranges in volts, "1.2", "3", "12", "30", "120", and "300" volts.

(3) Line Switch: a two-position toggle switch marked "LINE: ON".

(4) Zero Adjuster: an electrical zero adjusting potentiometer rheostat marked "ZERO ADJUST". This adjustment should not be confused with the mechanical zero adjusting screw on the indicating instrument.

3. TERMINALS AND PROBES.

Voltage to be measured may be connected either to the panel terminals or to the probe. When the probe is used it is removed from its compartment and applied to the circuit, as with a standard test lead. When the panel terminals are used the probe is clipped into its holder inside the stowage compartment, which establishes an internal connection to the terminals.

4. INPUT CONNECTIONS.

a. GENERAL.—The one input terminal of both a-c and d-c input circuits is grounded to the chassis of the instrument. Consequently the voltmeter is adaptable only to measurements between circuit points one side of which is grounded, or which may be connected to the voltmeter chassis safely and without disturbance to the circuit.

b. D-C MEASUREMENTS.—D-c voltages of either polarity may be measured by setting the selector switch to the d-c position indicating the polarity to be applied to the ungrounded input terminal. For measurements in circuits containing radio frequency voltage use the d-c probe for connection to the ungrounded side; in straight d-c circuits either the panel input terminal or the probe may be used. In either case the ground connection is made to the ground panel terminal.

c. A-C MEASUREMENTS.

(1) For measurements at frequencies lower than 10 kc the panel terminals *must* be used.

(2) For measurements at frequencies higher than 50 kc the probe *must* be used.

(3) For measurements from 10 kc to 50 kc either the probe or the panel terminals may be used, as convenient.

(4) Below one megacycle the ground connection may be made to the panel ground terminal or to the probe ground ring, as convenient.

(5) Above one megacycle the ground connection *must* be made to the probe ground ring, and kept as short in length as feasible.

(6) In general as the frequency increases toward the top limit of 300 megacycles the input lead lengths,

Figure 2–2. Front View Showing A-C and D-C Probes and Power Cable Connected for Use

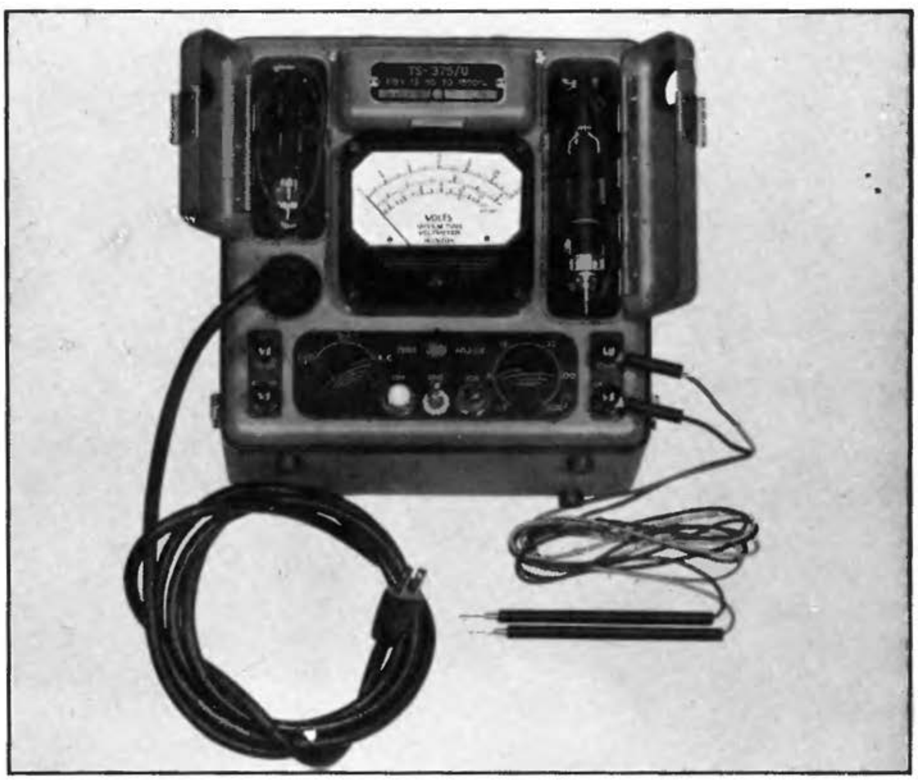


Figure 2–3. Front View Showing Test Leads and Power Cable Connected for Use

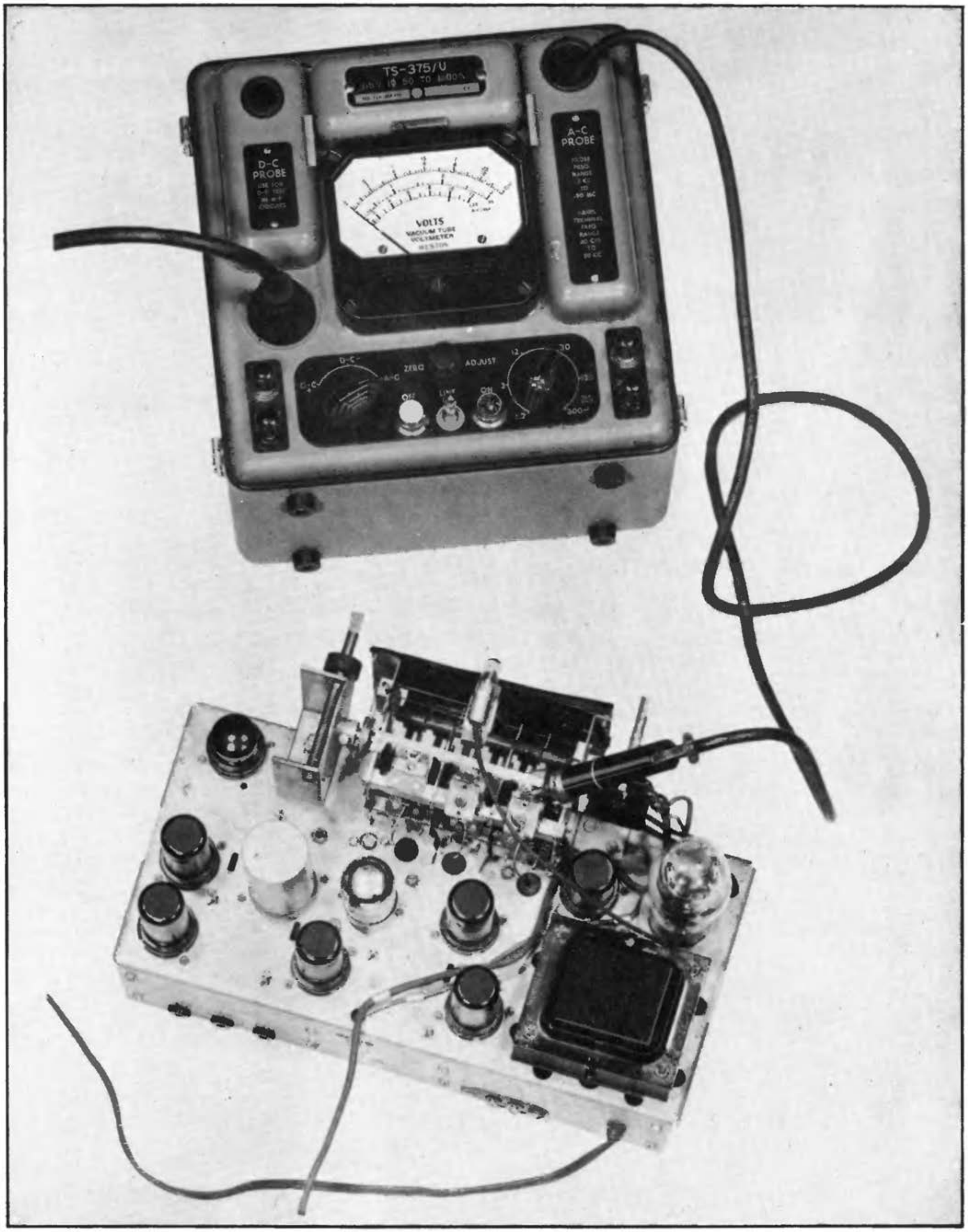


Figure 2–4. Typical Use of A-C Probe at High Frequencies

both ground and ungrounded sides, must be made shorter. For example at 40 megacycles leads three or four inches long are permissible, but above 100 megacycles the prod tips proper must contact the circuit directly. Thus at the higher frequencies it is not possible to measure voltage between circuit points that are widely separated. The ground ring spring clip can serve as a ground prod up to 100 megacycles, but at higher frequencies direct contacting to the ground ring is recommended. The alligator spring clip may be used on the ungrounded prod at frequencies not exceeding 50 megacycles. Figure 2-4 illustrates a typical measurement across the trimmer on a variable capacitor.

(7) On frequencies above 100 megacycles, the loading on the circuit under test may be reduced by removing the probe tip. This may be unscrewed and laid aside momentarily in the spare parts compartment. Connection can then be made to the threaded extension protruding through the polystyrene bushing at the end of the probe.

(8) Any method of connection permissible to a certain maximum frequency may be used at any lower frequency down to the bottom frequency limit of 10 cycles, except that the panel terminals must be used below 10 kc.

(9) The readings are essentially without frequency error from 50 cycles to 150 megacycles. Above and below these frequencies correction factors as indicated by the curves of figure 5-6 may be applied to extend the frequency range from 10 cps to 300 mc.

(10) The foregoing a-c input limitations are summarized diagrammatically in figure 2-5.

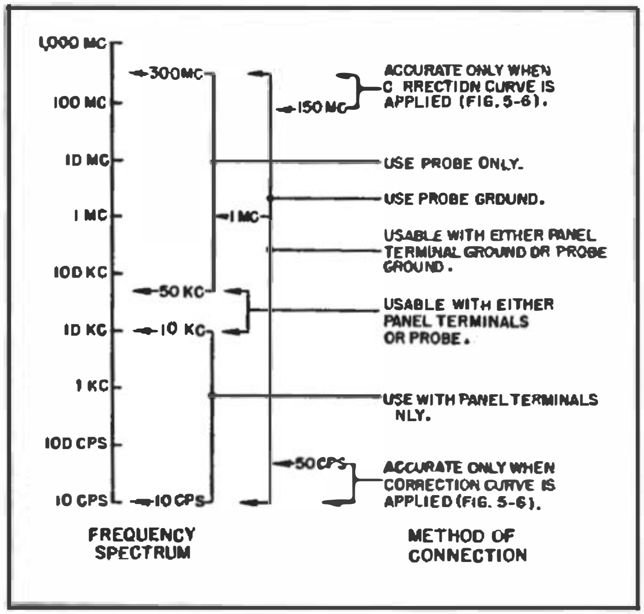


Figure 2–5. A-C Input Connection Variations with Frequency

5. INPUT IMPEDANCES.

The input circuit impedances for both d-c and a-c input circuits using the various methods of connection are listed in Table 2-1.

TABLE 2-1. INPUT IMPEDANCES

D-C SECTION	
A-c resistance (isolation resistor)	5 megohms
D-c resistance (total)	30 megohms
Probe input capacitance	negligible
Panel Terminal input capacitance	25 mmf. approx.
A-C SECTION	
Probe resonant frequency	600 mc approx.
Probe input capacitance	5 mmf. approx.
A-c resistance	5 megohms (max.)*
D-c resistance (leakage)	10,000 megohms minimum
Panel Terminal input capacitance	70 mmf. approx.

* Varies with frequency (see figure 5-7).

6. ACCURACY.

a. GENERAL.—The accuracies for the various ranges and frequencies are tabulated in Table 2-2. If a check on a reliable voltage standard indicates that the error anywhere exceeds the applicable tolerance, the instrument should be repaired.

TABLE 2-2. ACCURACY

SECTION	PERCENT OF FULL SCALE RANGE
D-c Section, all ranges	3%
A-c Section, all ranges	
10 to 50 cps	5%, with correction curve
50 cps to 50 mc	4%, without correction
50 mc to 150 mc	6%, without correction
50 mc to 150 mc	3%, with correction curve
150 mc to 300 mc	8%, with correction curve

NOTE:—The 1.2-volt a-c range is internally adjustable and carries no specific accuracy in service, although it was initially adjusted to conform to the above table.

b. A-C WAVEFORM ERRORS.

(1) WAVE DISTORTION.—The diode rectifier responds to the positive peak value of the applied voltage whereas the indicating instrument is calibrated in rms value of a pure sine wave. Thus if the applied waveform is other than a pure sine wave an error may be expected in the indicated voltmeter reading.

(2) DISTORTED WAVE VALUES.—With distorted waveforms the reading may be interpreted as

0.707 times the positive peak of the voltage being measured.

(3) MAXIMUM ERROR.—With the worst possible phase distribution of harmonic components in the applied waveform, the maximum error cannot exceed the sum of the percentages of all the harmonics. For example, if the total harmonic content is known to be less than 10 percent, the waveform error can be anywhere between 0 and 10 percent. The error may either increase or decrease the reading.

c. MODULATION ERROR. — When modulated waveforms are applied the diode rectifier will respond to the recurrent modulation peaks. The reading will thus be high by an amount dependent upon the percentage modulation and the waveform of the modulation envelope. This error may be considered approximately equal to the percentage modulation if the modulation envelope is a sine wave.

7. TRANSIENT DISTURBANCES.

a. SURGES. — Occasionally the effect of transient surges from power line switches or other sparking devices will be experienced. They are evidenced by erratic motions of the indicating instrument. If sufficiently strong to project through the internal bypassing they may be injected through the line connection to the instrument; but generally they are introduced through inductance in the ground return circuit mutual to the input and the path of the surge.

b. CORRECTIVE MEASURES.—The following corrective measures are suggested.

(1) Locate the source of the disturbance and if possible shut down the offending device during measurements. Such devices are potential radio noise generators and should be corrected as soon as discovered.

(2) Ground the instrument chassis by physically grounding one of the input ground terminals.

(3) Shorten the ground lead to the measured circuit as much as possible.

(4) Place line filters in the power cord to the instrument, and if possible in the power connection to the device being measured.

c. NOTICEABLE EFFECTS.—Transient surges will have no effect unless the surge peak is larger than the peak value of the input voltage being measured. Their effect will therefore generally only be noticed with low or zero applied input voltages.

8. INPUT OVERLOADS.

a. TWO TYPES OF OVERLOAD.—The instrument may be overloaded by applying an excess voltage of the type (d-c or a-c) being measured, which will drive the indicating instrument off scale, or by applying an excess voltage of opposite type, which will not indicate on the instrument but may cause internal damage.

b. The maximum overloads listed in Table 2-3 should not be exceeded under any circumstances.

TABLE 2-3. MAXIMUM INPUT OVERLOADS

Range	Max. Applied D-C (Volts)	Max. Applied A-C (Volts)
1.2 D-C	12	50
3 D-C	30	75
12 D-C	120	150
30 D-C	300	500
120 D-C	500	500
300 D-C	500	500
1.2 A-C	200	12
3 A-C	300	30
12 A-C	400	120
30 A-C	500	200
120 A-C	500	200

c. D-C OVERLOAD. — Overload on the d-c ranges can result in burnout of the d-c probe resistor.

d. A-C OVERLOAD.—Overloads on the a-c ranges can result in burnout of the a-c probe resistor, flashover in the probe blocking capacitor or destruction of the diode rectifier (V-108).

9. OPERATING NOTES.

a. CIRCUITS CONTAINING BOTH A-C AND D-C.—The d-c ranges are insensitive to a-c components in the input voltage, and conversely the a-c ranges are insensitive to d-c components. Thus if a circuit to be measured contains both a-c and d-c, both input circuits may be connected simultaneously and the two components of voltage measured independently by simply switching between a-c and d-c positions on the selector switch. As the ground connection is already common this type of connection simply requires connection of both ungrounded input terminals together.

b. D-C EFFECT.—When the a-c input terminals are connected to a source of a-c containing d-c the indicating instrument may momentarily jump off scale. This is caused by charging of the input blocking capacitor and is a normal operating characteristic.

c. HAND CAPACITANCE.—When measuring high-frequency voltages in circuits where capacitive loading must be kept to a minimum, the a-c probe should be held with the hand behind the white line around the probe case. This will minimize hand capacitance which otherwise would add two to three mmf of shunt capacitance.

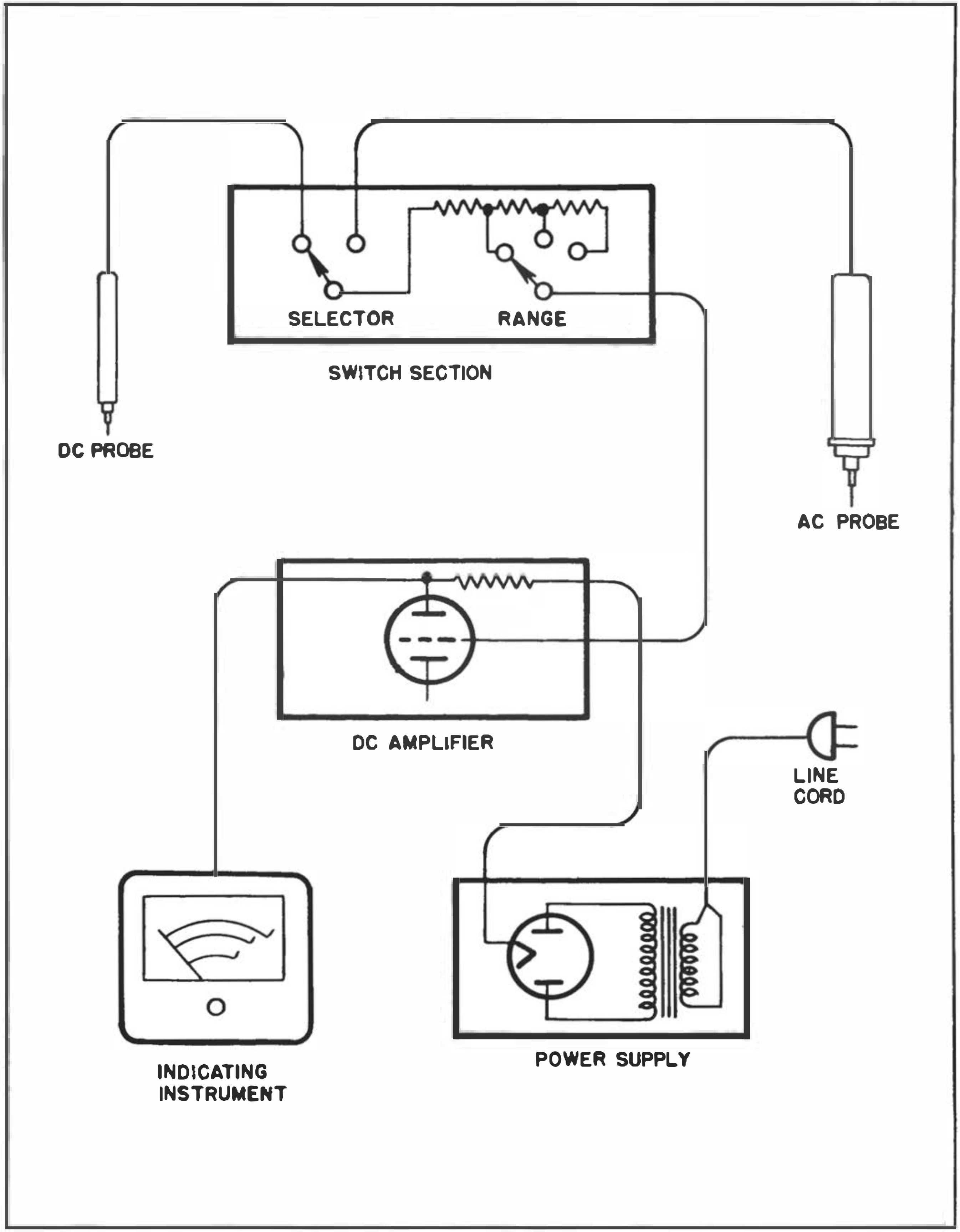


Figure 3–1. Voltmeters TS-375/U and TS-375A/U, Block Diagram

SECTION III

THEORY OF OPERATION

1. GENERAL.

a. UTILITY.—Voltmeter TS-375/U is a testing voltmeter that differs from conventional direct indicating voltmeters primarily in high input impedance (resulting in low current drain from the circuit being measured) and frequency range on alternating-current voltage measurements. If, for example, it is desired to measure the bias or signal level on an amplifier-tube grid, connection of a conventional voltmeter would demand so much operating current from the grid circuit that the voltage values indicated would be meaningless and operation of the circuit would be affected seriously. In this and similar cases use of this instrument is valuable.

b. INPUT IMPEDANCE.—High input impedance is obtained through use of an amplifier placed between the circuit being measured and the instrument actually giving the indication. No voltage gain is necessarily obtained but the amplifier can be made to respond to an input current far too small to drive the indicating instrument directly; a power gain is thereby derived. For example on the 3-volt d-c range, full scale indication requires 300 microwatts of energy in the indicating instrument circuit, whereas the vacuum tube voltmeter as a whole demands only 0.3 microwatt from the measured circuit, a power gain of 1000.

c. METHOD OF A-C MEASUREMENT.—The instrument including the amplifier is fundamentally a direct current device, and is applied directly to the point of measurement in the case of d-c voltages. It is adapted to alternating current measurements by adding a diode rectifier between the point of measurement and the amplifier input. A-c input to the rectifier then produces a direct current resultant for operation of the amplifier in the same fashion as for measurement of d-c voltages.

d. STABILITY.—The requirement for retention of calibration under various conditions of operation such as tube changes, line voltage fluctuation, etc. requires an amplifier having an unusual degree of stability. Any change of gain (ratio of output to input voltage) would directly influence accuracy of indication. The amplifier circuit was specifically developed for calibration stability and employs a compound feedback action wherein vacuum tube and supply voltage variations have negligible effect.

e. RECTIFIER LOCATION.—An important function of the instrument is the measurement of r-f voltages at frequencies as high as practicable. As a-c voltage is converted to d-c by the rectifier tube the attainment of frequency range is directly dependent upon applying the rectifier at or as close to the point of measurement as possible. For this reason the diode rectifier tube is mounted in a special test probe for connection to the point of measurement with a minimum of conductor length. The resultant d-c is then fed back to the instrument for measurement.

2. BLOCK DIAGRAM.

a. The six major circuit sections are shown in the block diagram (See figure 3-1). Energy from the circuit under test is picked up through either probe, is subdivided in the switch section and fed to the input amplifier grid. The power supply energizes the amplifier which in turn operates the indicating instrument in proportion to the potential at the amplifier input grid.

b. BASIC CIRCUITS.—The equipment unit for purposes of explanation can be subdivided into six basic circuit sections, as follows:

(1) Power Supply
(2) D-C Amplifier
(3) Switch Section
(4) D-C Probe
(5) A-C Probe
(6) Indicating Instrument

c. POWER SUPPLY.—(See figure 3-1.) The power supply is designed to supply the d-c amplifier with the necessary supply voltages for its operation.

d. D-C AMPLIFIER.—(See figures 3-2 and 3-3.) The d-c amplifier is designed to receive the input voltage to be measured from the probe without drawing appreciable current from the circuit being measured, and drive the relatively insensitive indicating instrument in response to this input voltage. The amplifier must have a high degree of stability to maintain calibration accuracy.

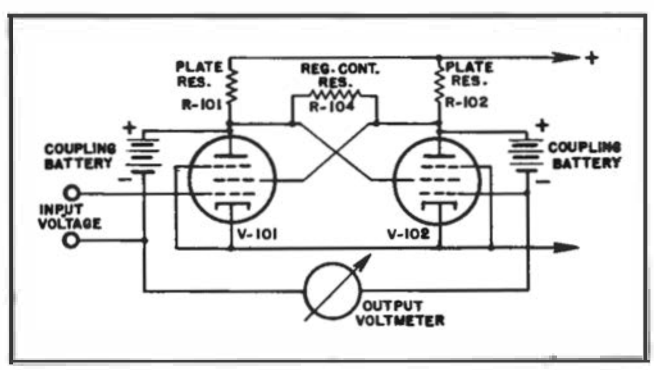


Figure 3—2. D-C Amplifier, Simplified Circuit

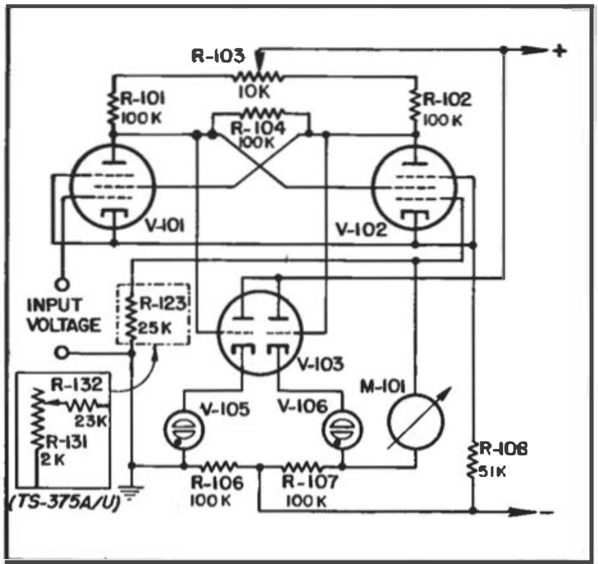


Figure 3-3. D-C Amplifier, Practical Circuit

e. SWITCH SECTION.—(See figure 3-4.) The switch section comprises the range and function selector switches, together with the necessary group of accurately adjusted resistors to obtain the various ranges. The range switch is actually a calibrated attenuator located between the input probes and the amplifier to divide the input voltage for range selection. The selector switch selects between the d-c and the a-c probe, and performs certain other circuit switching functions necessary to each type of measurement. Refer to paragraph 5 of this section for details.

f. D-C PROBE.—The d-c probe is similar in construction to a standard test probe except that an isolating resistor is built into the tip to minimize capacitive loading when connected to circuits containing high frequency voltages.

g. A-C PROBE.—(See figure 3-5.) The A-C Probe contains a diode type of rectifier tube for converting a-c voltages to d-c. It is designed specifically to measure a-c voltages at the highest possible frequency by minimizing the inherent distributed inductance and capacitance between the rectifier tube elements and the point of measurement.

h. INDICATING INSTRUMENT.—The Indicating Instrument operates from the output of the d-c amplifier, and is calibrated in terms of the various voltage ranges, d-c and a-c.

3. POWER SUPPLY.

a. The power supply is a conventional assembly of power transformer, full-wave rectifier tube and capacitor-resistor filter circuit.

b. VOLTAGE SUPPLIED.—The following voltages and currents are supplied to the amplifier section:

(1) 250 volts d-c at 7 ma. for amplifier plate supply.

(2) 6.3 volts a-c at 1.35 amperes for amplifier and diode tube heaters and the "on" pilot light (I-101).

c. LINE SWITCH.—The line switch (S-101) is arranged to connect two internal heater resistors (R-128 and R-129) when in the "OFF" position. This serves to keep the interior of the instrument dry when not in operation. The series connected "OFF" pilot light (I-102) indicates when the heaters are in operation. With this switch in the "ON" position, the red pilot light is energized through the power transformer and the internal heaters are disconnected from the power line.

d. FILTER ELEMENTS.—Because of the operating characteristics of the amplifier it is not necessary to regulate the plate voltage supply or to completely filter the power rectifier output. A filter resistor (R-105, 5100 ohms) is used instead of the customary filter reactor, and lower values of filter capacitor (C-101 and C-102, 2 mfd. each) than usual are used.

e. PLATE VOLTAGE.—Because of the amplifier circuit ground point the negative (—) side of the plate voltage supply is not grounded to the chassis as is common practice in radio and radar power supplies. Ground potential is approximately 100 volts from the negative (—) side and 150 volts from the positive (+) side, giving the overall plate supply voltage of 250 volts.

f. TRANSIENTS.—Under certain conditions of operation transient voltages (radio noise) may be injected into the instrument through the line cord connection. To minimize this effect the line is by-passed to the chassis at the line cord connector (C-108 and C-109, 510 mmf each). In addition the negative (—) plate supply lead is by-passed to the chassis (C-107, .02 mfd.) to isolate low frequency transients and line surges that cannot be by-passed effectively on the line side of the transformer.

4. D-C AMPLIFIER SECTION.

a. OBTAINING STABILITY.—The amplifier is a compound feedback circuit combining regeneration and degeneration to obtain gain stability. Whenever gain stability is desired it is general amplifier practice to employ an amplifier having a gain much larger than the final gain desired, and degenerating the excess gain by reverse feedback from the output back to the input end. In theory the higher the gain inherent in the amplifier and the greater the resultant degeneration the greater the overall stability in the face of changes in the gain ratio of the amplifier proper. Thus stability is in part a problem of obtaining a high gain so that the advantages of a high degree of degeneration can be realized.

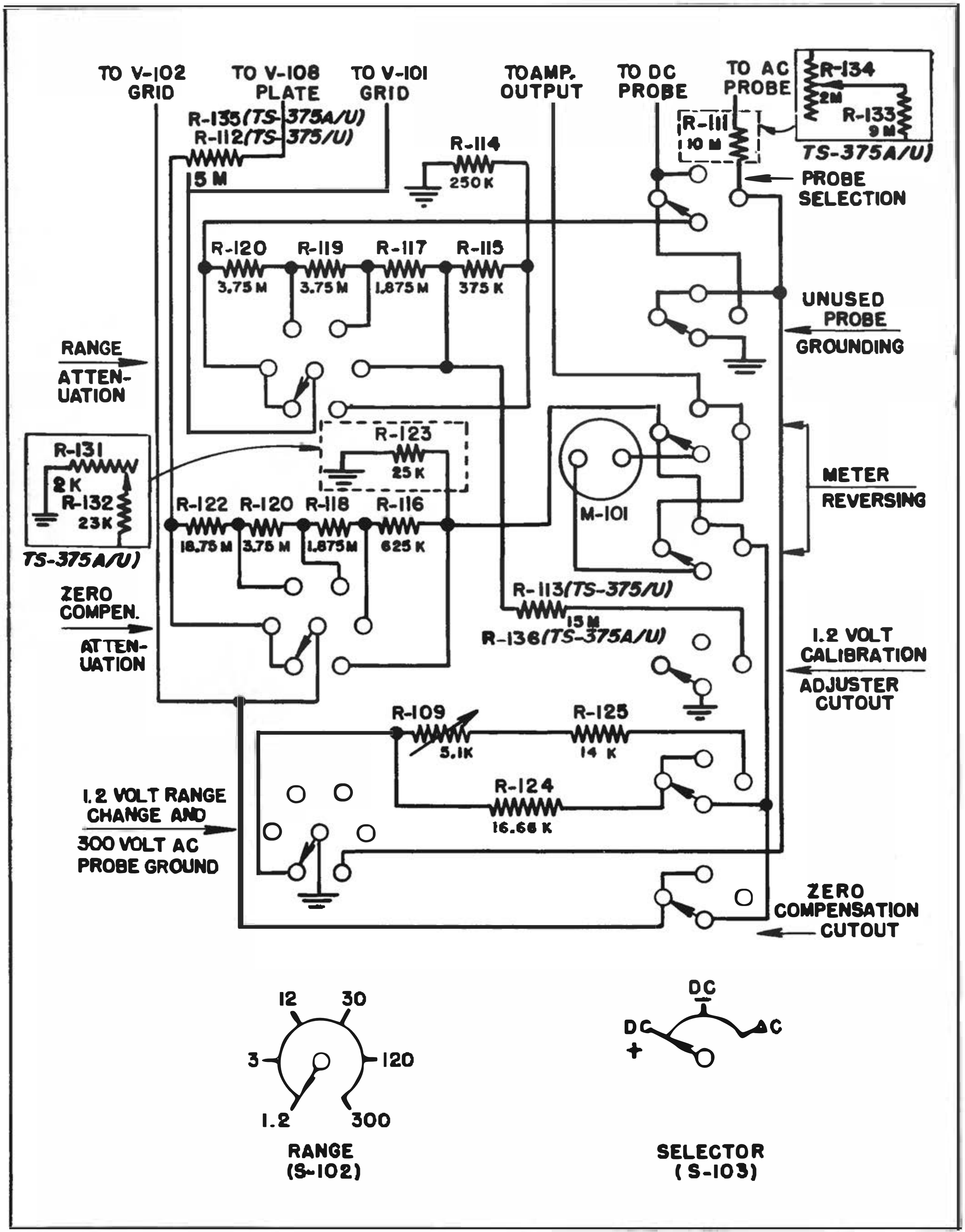


Figure 3–4. Switch Section, Switching Functions

b. REGENERATION. — In the compound feedback circuit the additional gain necessary for stability is obtained by regeneration. By this method a gain ratio far greater than the actual gain of the amplifier tubes proper can be realized.

c. CIRCUIT DESCRIPTION.—The action of the amplifier is illustrated by the simplified functional diagram of figure 3-2. The circuit is essentially a bridge with the two amplifier tubes and the two plate resistors forming the four bridge arms. The d-c input voltage is impressed upon the control grid of the left hand amplifier tube (V-101) while the right hand amplifier tube (V-102) serves as a compensating tube to minimize supply voltage variations and drift effects upon the bridge balance. The regenerative action is obtained by cross-connecting the plates and screen grids of the tubes in the manner of a multi-vibrator type of oscillator. The screen grids then serve as secondary control electrodes rather than as screen grids in the conventional sense. The cross-connected resistor (R-104) serves as a control of the degree of regeneration obtained by loading the tube plate circuits. The cathode-connected suppressor grids serve to suppress secondary emmission effects in the conventional manner.

d. DEGENERATION.—Degeneration is obtained by conductively coupling the plate of each tube to its control grid through coupling batteries. The grid of V-101 is coupled through the input circuit whereas the control grid of V-102 is directly connected to the negative (—) end of its coupling battery. The output indicating voltmeter is connected between the negative (—) ends of the coupling batteries so that bridge unbalance in response to an input voltage will supply an unbalance current to the voltmeter circuit for indication.

e. VOLTAGE POLARITY.—The voltage appearing across the output voltmeter in response to an input voltage has a polarity in opposition to the input polarity, as indicated by the polarity signs on the input and indicating instrument circuits. Thus the voltage appearing between the two control grids is the difference voltage

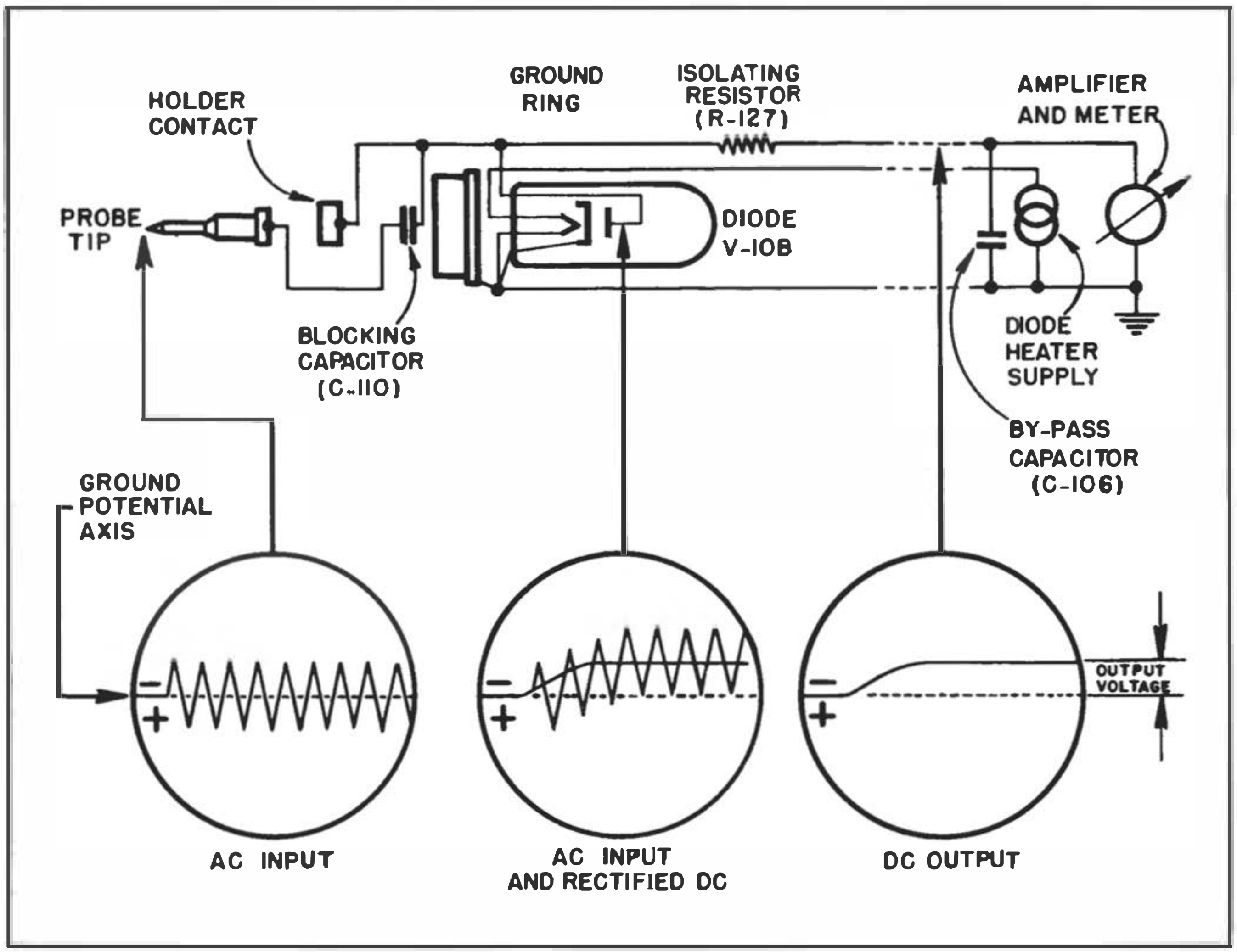


Figure 3–5. A-C Probe Section, Rectifier Action

between input and output and must be considerably smaller than the total input voltage swing. Furthermore, as the tube gain is increased by regeneration in the plate-screen grid circuit, the difference becomes less and less to the point where the output voltage is equal to the input voltage. The regeneration control resistor (R-104) is adjusted to this condition which is the optimum point for stability.

f. BALANCE.—At this point of optimum adjustment the amplifier plate-screen grid circuit is critically regenerated, and would be on the verge of self-sustained oscillation if the degenerative connections to the control grids were disconnected or otherwise rendered inoperative. In the overall sense the amplifier is degenerative but internally consists of a regenerated section around which a degenerative circuit is connected. The amplifier may also be visualized as an amplifier having an infinite gain (secured in this case by critical regeneration) which is completely degenerated externally; thus the stability improvement envisioned in any degenerative amplifier by greater gain and more degeneration is carried to its logical endpoint.

g. EFFECT OF SCREEN GRIDS.—At the point of critical regeneration the screen grids do the actual work of unbalancing the bridge to produce an output while the control grids exert only a transient type of control to initiate the action. For any steady value of input voltage the potential of each control grid with respect to its cathode is the same, and the potential difference between the grids is zero. This feature of zero grid voltage excursion in response to an input voltage is highly desirable because it entirely removes the effect of the curved grid voltage-plate current characteristic common to all tubes, and the amplifier is strictly linear in its input to output relationship.

h. PRACTICAL CIRCUIT.—The practical amplifier circuit is shown in figure 3-3. It is entirely similar in function to the simplified circuit of figure 3-2 but the addition of certain components is dictated by practical circuit limitations and operating conditions.

(1) Voltage regulator tubes (V-105 and V-106, Type 991) replace the coupling batteries. The low variational resistance characteristic to this type of regulator tube is similar in effect to a battery.

(2) The voltage regulator tubes require a continuous keep-alive current, necessitating the addition of keep-alive bleeder resistors (R-106 and R-107, 100,000 ohms each) from each tube to the negative (—) plate supply lead.

(3) The keep-alive current required by the coupling tubes would be an excessive current drain from the amplifier tube plate circuit proper so a twin-triode tube is added as a cathode follower between the amplifier plates and the loaded coupling tube circuits. No further amplification is contributed by this tube except for the advantages gained by removing all plate loading from the amplifier tubes proper.

(4) Because of inherent differences between tubes and other circuit components it is necessary to initially balance the bridge to zero output with zero applied input. The zero adjusting potentiometer (R-103, 10,000 ohms) serves this purpose by controlling the plate series resistance of one amplifier tube relative to the other.

(5) A cathode resistor (R-108, 51,000 ohms) must be added between the amplifier tube cathodes and the negative (—) plate supply lead because of the voltage drop added by the bleeder resistors.

5. SWITCH SECTION.

a. SWITCHES. — The Switch Section consists of a range switch (S-102) for selecting the desired range of input voltage, and a Selector Switch (S-103) for selecting the desired function, d-c input of either polarity or a-c input. Reference is made to the simplified switch circuit of figure 3-4.

(1) RANGE SWITCH.—The range switch with its connected resistors is essentially an input attenuator and changes range by accurately dividing the input voltage. In addition on a-c ranges it is necessary to correct for the contact potential of the diode rectifier in the a-c probe (Paragraph 9. *a.* (1)) so the contact potential of a balancing diode is applied through a second attenuator section similar to the range attenuator. The attenuation is not changed when switching from the 3-volt to the 1.2-volt range; instead the range is changed by changing the range of the output voltmeter by the application of a shunting resistance (R-124) across the voltmeter resistor (R-123 in the TS-375/U or R-131 and R-132 in the TS-375A/U). Thus when switching from 3 volts to the 1.2 volt range the only connection change is reduction of the output voltmeter range by shunting. The range switch also grounds the a-c probe lead in the 300-volt position so that the instrument will not be functional on a-c input voltages that can damage the diode rectifier.

(2) SELECTOR SWITCH.—The selector switch has three positions, D-C+, D-C—, and A-C, and primarily serves to switch the range switch between the d-c and a-c probe and to reverse the polarity of the indicating instrument. It also has several secondary functions which can best be illustrated by separate explanation.

(a) In each position the appropriate probe is connected to the range attenuator, and the unused probe is grounded to completely prevent insulation leakage or capacitive coupling interferences in the event voltages are applied to the unused probe.

(b) The polarity of the indicating instrument is reversed between the D-C+ and D-C— positions. On a-c ranges the diode rectifier in the a-c probe develops a rectified d-c voltage that is negative (—) with respect to

the ground so the indicating instrument polarity remains the same between the D-C— and A-C positions.

(c) In the A-C position the 1.2-volt a-c range calibration adjustment rheostat (R-109) and its series resistor (R-125) is connected in place of the normal 1.2-volt range-changing resistor (R-124). This makes the 1.2-volt a-c range calibration adjustment effective only in the A-C switch position.

(d) In the A-C position a 15 megohm scale correcting resistor is shunted across the lower section of the range attenuator. This resistor assists in removing a slight scale tracking error on the 12, 30 and 120 volt a-c ranges where individual scale arcs are not used.

(e) In both d-c positions the balancing diode (V-107) is shorted out because the balancing contact potential is only required on a-c ranges (Paragraph 7. *f*.).

b. CIRCUIT ISOLATION.—The resistors comprising the input and balancing attenuators have a total resistance of many megohms and on low ranges carry a relatively low order of current. They thus are quite susceptible to stray leakage currents and some precautions must be observed in design. The panel resistor deck (E-104) which carries the attenuator resistors, and the range switch do not support any component or portion of any circuit that is appreciably above ground potential. Also the wiring between the panel resistor deck and the range switch and all associated wiring to probe receptacles, amplifier tube grids, etc., is not allowed to touch any portion of the circuit carrying appreciable voltage.

c. ATTENUATION.—The range attenuator in combination with the resistor in the probes is calculated to deliver 2.5 volts to the D-C Amplifier when full scale voltage is applied on all ranges except the 1.2 volt range. On the 1.2 volt range the amplifier input is reduced to 1.0 volt for full scale indication by the output shunt resistor (Paragraph 5 (1)). A constant resistance is presented to the probe circuits of 25 megohms by the attenuator proper.

6. D-C PROBE.

a. CONSTRUCTION.—The d-c probe comprises a test probe similar in construction to a standard-type test probe except for inclusion of an isolating resistor (R-126, five megohms), and an AN single-pin connector plug.

b. INPUT RESISTANCE.—The five-megohm isolating resistor together with the 25-megohm range attenuator resistance presents a total input resistance of 30 megohms to the circuit in which a measurement is being made.

c. CAPACITANCE LOADING. — The isolating resistor serves to minimize capacitive loading of the measured circuit which is important if the circuit contains r-f voltages, and particularly resonant circuits which might be thrown out of alignment during the measurement.

d. STOWAGE. — When making measurements in purely d-c circuits the isolating resistor serves no useful purpose. In such cases the d-c probe may be stowed in the d-c probe compartment and the voltage for measurement applied to the panel input terminals by means of standard test leads or wire connections. When the probe is clipped into its holder in the probe compartment the ungrounded panel terminal makes connection to the probe tip through the lower probe holder clip.

7. A-C PROBE.

a. CONSTRUCTION.—The a-c probe consists of a diode rectifier tube (V-108, type CK-606-BX), an isolating resistor (R-127, five megohms) and a blocking capacitor (C-110, 500 mmf), cased in a cylindrical bakelite case similar in appearance to a standard test probe but larger in diameter. In addition to the conventional test probe tip prod the contact end carries a circumferential ring for making a short ground connection when measuring high-frequency a-c voltages. The general construction and the electrical circuit is shown in figure 3-5.

b. DIODE ACTION.—The diode rectifier tube is shunt-connected across the input circuit with the cathode connected to ground and the plate connected to the ungrounded input lead. It thus rectifies the a-c input by passing the positive half-cycles of a-c to ground. A few half cycles of positive conduction to ground then will build up a negative potential at the plate as described by the oscilloscope illustrations in figure 3-5. The blocking capacitor will then in a short time build up a charge above ground almost equal to the positive half-cycle peaks of the a-c wave. This d-c voltage is delivered through the isolating resistor to the instrument proper for indication. After the a-c input has been applied for several cycles the diode conducts only a sufficient portion of each positive peak to supply the small d-c current demanded by the range attenuator in the instrument.

c. PEAK ACTION.—The d-c voltage developed at the diode plate is therefore almost equal to the positive (+) peaks of the input wave, and the instrument is essentially a peak, or crest, voltmeter. However the reading should be in terms of the effective a-c voltage, or the root-mean-square (rms) value, which is lower than the peak value. The instrument is therefore calibrated in terms of the rms value of a pure sine waveform, which has a peak value equal to $\sqrt{2}$ (1.414) times its rms value. Thus the rectified d-c voltage developed at the diode plate is approximately 1.414 times the indicated a-c voltage. Conversely the rms value of a sine wave is 1/1.414 (or 0.707) times the peak value.

d. D-C ATTENUATION.—The excess d-c voltage developed by the a-c probe is compensated for by an additional resistance (R-111, 10 megohms in Voltmeter TS-375/U and R-133, 9 megohms and R-134 rheostat in Voltmeter TS-375A/U) in the a-c probe-attenuator lead.

e. METER CALIBRATION.—At high levels of a-c input to the probe the rectified d-c output is almost directly proportional to the a-c input. On low ranges, however, the non-linear space path resistance, characteristic to all rectifiers becomes increasingly effective and calibration will not fit a uniform meter scale with sufficient accuracy. The low a-c ranges, 1.2 and 3 volts, therefore must have individually calibrated scale arcs (See figure 1-3). On the higher a-c ranges a slight mistracking still exists but is compensated satisfactorily by a scale tracking resistor (R-113 in Voltmeter TS-375/U and R-136 in Voltmeter TS-375A/U) which affects the division of the range attenuator by a very slight amount (Paragraph 5. *a.* (2) *(d)*).

f. CONTACT POTENTIAL. — In thermionic (hot cathode) rectifiers the cathode omission alone will develop a negative (—) potential on the plate with no a-c input. This is termed the "contact potential" of the plate with respect to the cathode. In the type CK-606-BX tube with the circuit load here used the contact potential is approximately .9 volt. The probe diode contact potential is compensated in the instrument by adding a similar diode to the grid circuit of the other amplifier tube (V-102) on a-c ranges (Paragraph 9. *a.* (1)).

g. FREQUENCY LIMITS.—An important feature of the a-c section is the frequency range over which it is usable. The low-frequency limit is determined by the impedance of the input blocking capacitor which becomes appreciable and causes a voltage drop and a reading error. This indicates use of a large value of blocking capacity for low-frequency accuracy. On the other hand, a physically large blocking capacitor would increase the inductance and capacitance to ground in the input circuit lowering the upper useful frequency limit. Thus a large capacitor is desirable at low frequencies and a small capacitor is desirable at high frequencies. This two-capacitor arrangement is realized by equipping the probe proper with a small capacitor (C-110, 500 mmf) but arranging the probe stowage holder to contact the probe after the small probe capacitor so that a larger blocking capacitor (C-113, .02 mfd.) can be located in the internal lead to the a-c panel terminal. Thus by using the a-c probe externally for high frequencies and the panel terminals for low frequencies a greater frequency range is obtained than would be the case with a single blocking capacitor in the probe only. The small co-axial contact ring immediately behind the probe-tip prod serves to make this connection when the probe is stowed in its holder.

h. HIGH-FREQUENCY MEASUREMENTS. — In high-frequency measurements the ground return connection must be short and in close proximity to the ungrounded connection. For example, if the ground connection were made at the ground panel terminal at a frequency of 50 megacycles the entire circuit loop comprising the probe cable and the ground lead may resonate and cause readings high by as much as several hundred percent. Conversely this type of connection is perfectly good practice at for example 500 kc. The a-c probe is equipped with a close ground connection point in the form of a co-axial ring for use at high frequencies. This ground ring also serves as a convenient point of attachment for accessory connection hardware such as the ground clip prod.

i. FREQUENCY ERRORS.—At and near the upper frequency limit the a-c probe becomes affected by several actual or possible sources of error. These are negligible under ordinary conditions of measurement but in special cases may become appreciable and so are described.

(1) As before stated the upper frequency limit is determined primarily by the resonant frequency of the small circuit loop comprising the rectifier tube elements and leads, the leads between the rectifier tube and the tip prods including the blocking capacitor, and any external lead length. As the input frequency approaches the input circuit resonant frequency and resonant voltage buildup causes a high reading error. The upper frequency limit may be very approximately considered as 1/3 the resonant frequency because above that the resonant buildup may exceed several percent.

(2) The waveform of the input voltage may contain harmonics that are near the resonant frequency of the probe circuit, causing a high reading error by resonant buildup. The offending harmonic may be only a few percent of the fundamental but when its voltage component is magnified by resonance an appreciable error can develop. Fortunately, however, at the higher frequencies the input voltage is generally derived from resonant circuits or devices and the harmonic content is much lower than is usually the case at, for example, audio frequencies.

(3) In the diode rectifier space path the electrons have a certain mass and require a short though finite amount of time in transit from cathode to plate. The resultant lag causes some error at high frequencies known as "transit time" error. However in this case it is negligible in comparison to the resonant error except at low values of input voltage where it shows up as a mistracking of scale calibration.

j. OTHER CAUSES OF ERROR.—Certain other possible errors and operation considerations are independent of frequency and should be kept in mind when making measurements at any frequency.

(1) Harmonics in the input waveform can affect the value of the positive peak to which the instrument responds and so can introduce a "waveform error". Unless the ratio of positive peak to rms value is known this error cannot be evaluated. However, certain non-sinusoidal waveforms in common use have known "crest factor" ratios and correction to the reading can be applied. With distorted sine waves a useful relationship is that the error cannot exceed the sum total of the harmonic content in percent, and probably will be less than half of this maximum.

(2) Waveforms modulated at a lower frequency will have recurrent positive peaks which are greater than 1.414 times the rms value of the entire wave. A high reading "modulation error" will therefore result. The single exception is in the case of waves modulated 100% with flat topped pulses. In this case the instrument reads the rms value of the wave during the duty cycle which is generally the desired measurement anyway.

(3) With pulse modulation another error becomes apparent if the duty cycle is very short, as in the case of radar modulation. The duration of the peaks becomes so short relative to the fundamental pulsing frequency that the rectified voltage drops appreciably between pulses. This causes a low reading error that becomes larger as the duty cycle is made smaller.

8. INDICATING INSTRUMENT.

a. GENERAL.—The indicating instrument (I-101) is a microammeter having a current range of 0-100 microamperes and an internal resistance of approximately 1000 ohms. It indicates the amplifier output voltage by responding to the current that flows through the output resistor. By placement in the current side of the output circuit rather than directly in series with the output resistor, its internal resistance does not figure in the calibrated circuit, and need not be adjusted accurately.

b. SCALE ARCS AND ADJUSTMENT.—The scale carries three scale arcs; a 1.2 volt a-c arc, a 3 volt a-c arc, and a third arc for all d-c ranges and the remaining a-c ranges. The mechanism is equipped with a mechanical zero adjusting screw. The front face of the instrument is pictured in figure 1-3.

9. MINOR COMPONENTS.

a. SECONDARY FACTORS.—The following secondary functions are described in detail separately from the description of the six basic circuit sections because they serve to satisfy minor requirements not basic to the circuit operation.

(1) COMPENSATING DIODE.—The contact potential of the a-c probe diode rectifier (Paragraph 7) is compensated by a compensating diode (V-107) identical with the rectifier diode but which is not used for rectification. Compensation could be accomplished by using a fixed voltage but a zero drift factor would be introduced because the contact potential varies somewhat with the heater supply voltage. By use of a second diode connected to the other side of the amplifier, heater supply voltage changes will affect both diodes equally, minimizing zero drift. The compensating diode is switched out of the circuit on d-c ranges.

(2) COURSE ZERO ADJUSTMENT.—The two amplifier tubes (V-101 and V-102) are likely to be quite different in their control grid potentials required for balance of the bridge for zero indication. The zero adjusting potentiometer (R-103) in the plate circuit can partially correct this condition but a major part of the unbalance in most cases is the difference in cathode temperature between tubes. To correct this a coarse zero adjustment (internal) is provided in the form of a differentially connected heater supply rheostat (R-110, 3 ohms) to balance the tube initially. The plate circuit potentiometer is then used as a fine zero adjustment.

(3) LOW-VOLTAGE CALIBRATION.—A specification requirement is adjustable calibration on the 1.2 volt a-c range. For this purpose a calibration adjustment rheostat (R-109, 5100 ohms) and an associated fixed series resistor (R-125) are switched into the circuit in place of the 1.2-volt d-c range resistor (R-123 in Voltmeter TS-375/U and R-131 and R-132 in Voltmeter TS-375A/U) in the a-c selector switch position (Paragraph 5. (2)). Calibration is adjustable for about 20% either side of the nominal center position of the calibration adjustment rheostat.

b. STRAY VOLTAGE EFFECTS.—A possible cause for erratic operation could be the appearance of stray a-c voltages at the elements of the amplifier or diode tubes. If large, such strays could rectify within the tube causing d-c error or interference potentials to appear. For this reason complete internal by-passing with suitable by-pass capacitors is necessary.

(1) LINE CAPACITORS.—Line-By-Pass Capacitors (C-108 and C-109, 519 mmf. each) are mounted directly at the line circuit receptacle to ground any high frequency line transients that may enter through the line cord.

(2) POWER-SUPPLY FILTER.—Low frequency transients that may pass by the line by-pass capacitors are by-passed in the power supply through the relatively large capacitor (C-107, .02 mfd.) and through the filter capacitors (C-101 and C-102).

(3) A-C PROBE CABLE BY-PASSING.—When using the instrument for high-frequency a-c measurements a considerable high-frequency voltage may de-

velop on the a-c probe cable. This possible condition requires very complete by-passing of the cable where it enters the case. A special two-section capacitor (C-112) is mounted as an integral part of the probe cable receptacle (J-103) to effectively ground the instrument end of the cable at high frequencies. Each section of the capacitor is a feed-through low inductance design to minimize coupling with other circuits within the case.

(4) D-C PROBE BY-PASSING.—The d-c probe is also by-passed, but with a standard capacitor (C-111, 510 mmf.), which is satisfactory by-passing for the amount of high frequency that might be present on the d-c probe cable.

(5) LOW FREQUENCY BY-PASSING. — The probe by-pass capacitors are too low in capacitance for effective low-frequency by-passing so an additional group of higher value capacitors are included further along in the circuit. They include a second a-c probe by-pass capacitor (C-106, .01 mfd.), grid by-pass capacitors on each amplifier tube (C-104 and C-105, .01 mfd. each) and a compensating diode by-pass capacitor (C-103, .01 mfd.).

c. CALIBRATION ADJUSTMENTS ON VOLTMETER TS-375A/U. — Two additional internal adjustments have been added to the TS-375A/U. R-131 is a 2,000 ohm potentiometer used for top mark adjustment of the amplifier. In addition a 2 megohm potentiometer (R-134) is used to adjust the sensitivity of all a-c ranges. These are secondary adjustments used to facilitate the overall adjustment of the a-c and d-c ranges respectively and have been included by making variable a small part of the resistors R-123 and R-111 respectively in the TS-375/U. These adjustments are factory set and are not to be touched except as described in Section IV paragraph 4. *c.*

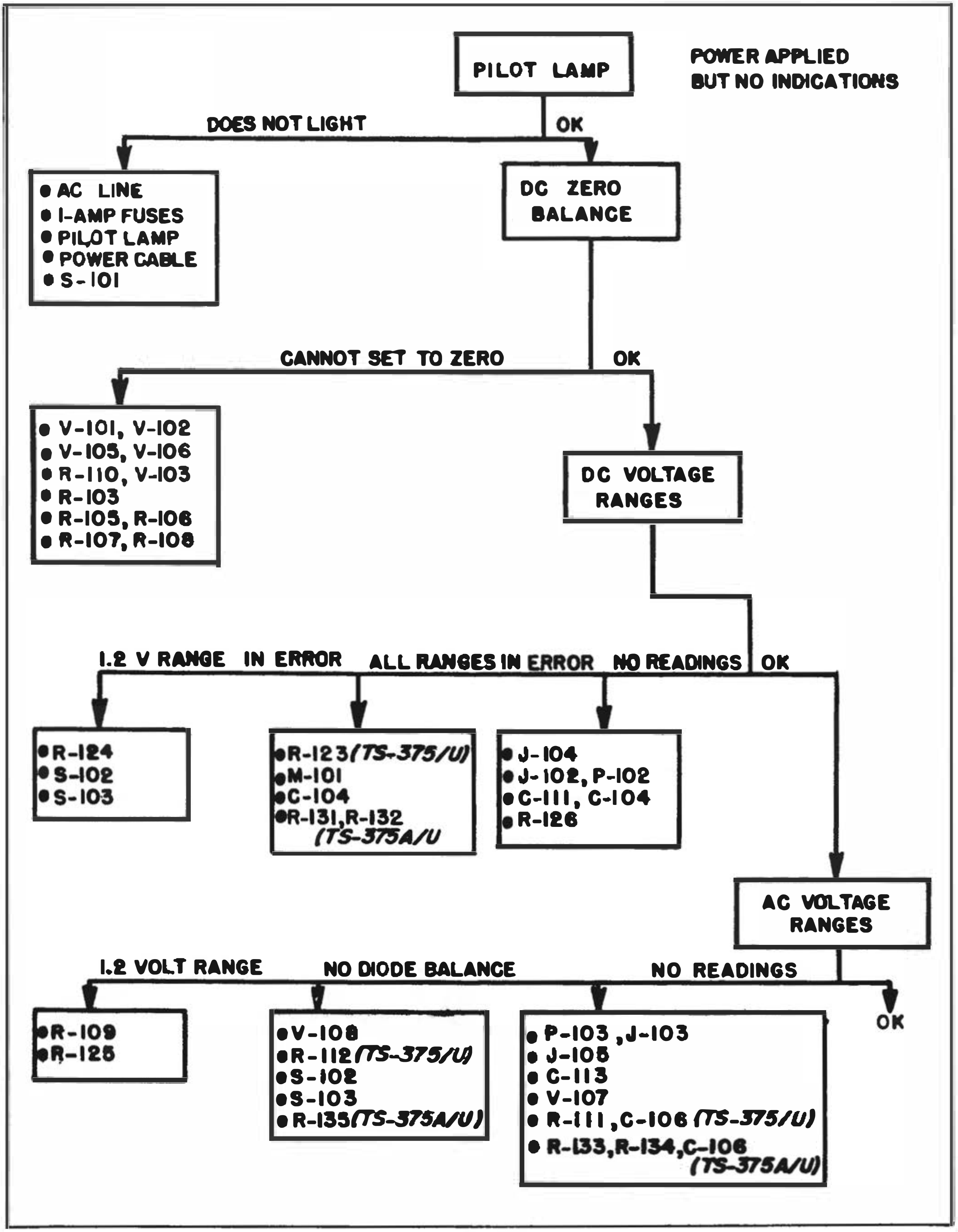


Figure 4-1. Trouble Analysis Chart for Voltmeters TS-375/U and TS-375A/U

SECTION IV

MAINTENANCE

1. ROUTINE PERFORMANCE CHECK.

a. ZERO ADJUSTMENT. — Check the instrument thoroughly by applying d-c and a-c voltages of known values to the various ranges. Check the panel zero adjustment on each range before each calibration check. If the instrument pointer cannot be set to zero on any of the ranges, or erratic readings are noted, proceed with adjustment or repair as required. Refer to figure 4-1.

CAUTION

Do not attempt to operate the instrument outside of its case near high-frequency power equipment. R-F voltages may be induced into the circuit in sufficient amount to cause erratic operation.

2. REQUIRED TEST INSTRUMENTS.

a. 1000-ohms-per-volt readings:
TS-297/U multimeter, or,
Weston 663, Simpson 443, Navy "OE" } alternates

b. 20,000-ohms-per-volt readings:
TS-352/U multimeter, or,
Navy "OE", Simpson 260, Weston 790 } alternates

c. Vacuum tube voltmeter:
TS-375/U, or,
RCA-165, Radio City 662 } alternates

d. Tube Tester:
Signal Corps Type I-177A, or,
Hickok 540 or 547 alternates

3. DETAILED INSPECTION PROCEDURE.

a. REMOVAL.—Remove the instrument from the combination case by removing the four nuts on the underside of the case and lift the panel from the case.

b. GRID CURRENT.—Excessive amplifier tube grid current due to a gassy V-101 amplifier tube will cause zero shifting between d-c ranges. Check as follows.

(1) Warm up for at least five minutes. Short circuit the d-c input terminals.

(2) Set to the 300-volt d-c ranges and carefully adjust the zero control R-103. Switch to the 3-volt d-c range and note any zero shift. See figure 1-2.

(3) If the zero shift exceeds two percent of the scale, replace V-101. If the zero shift does not exceed five percent the tube used as V-101 may be used as V-102, and the tubes may be interchanged. Recheck after exchange or replacement.

c. LOOSE TUBE ELEMENTS.—If the internal structure in either amplifier tube is loose, motion of the elements may cause erratic shifting of zero. Check as follows.

(1) Warm up for one minute. Set to the 1.2-volt d-c range.

(2) Tap each amplifier tube, V-101 and V-102, several times, using a small metal object such as a #18 drill. Note any shift of zero during the tapping operation.

(3) If the zero shift exceeds three percent of the scale range replace the corresponding tube.

d. A-C PROBE BLOCKING CAPACITOR LEAKAGE.—D-c leakage in either blocking capacitor, (C-110 or C-113), will cause error when measuring a-c in the presence of d-c voltages. Check as follows.

(1) Warm up for five minutes. Set to the 1.2-volt a-c range. Carefully adjust ZERO ADJUST (R-103) (See figure 1-2). Switch to the 120-volt a-c range without resetting zero.

(2) With the a-c probe stowed, apply approximately 100 volts d-c to the a-c input with the negative applied to the ungrounded terminal. After a few seconds switch to the 1.2-volt a-c range and note the reading.

(3) If the reading exceeds 10 percent of the scale, leakage is excessive. Replace C-113 (See figure 5-6).

(4) Repeat with the a-c probe removed and the d-c applied to the probe directly. If the meter reading exceeds 10% of scale, leakage is excessive. Replace C-110 (See figure 3-5).

e. AMPLIFIER GAIN.—The d-c amplifier is designed and adjusted to have a gain of unity, that is the output voltage delivered to the indicating instrument load is equal to the input voltage from the relatively high-resistance range attenuator network. If defective or out of adjustment all ranges will be high or low in calibration by approximately the same percentage. The amplifier gain adjustment may be checked without a standard voltage source as follows.

(1) Warm up for five minutes. Set to the 1.2-volt d-c range and apply approximately one volt input.

(2) Insert a resistance of approximately 50,000 ohms in series with the indicating instrument. Note any change in reading.

(3) NO CHANGE indicates a perfectly adjusted amplifier. A deflection of up to 10 percent of the scale is tolerable. Upscale deflection indicates that the amplifier gain is greater than unity and calibration will be high; a downscale deflection indicates an amplifier gain less than unity and a low calibration.

(4) If the amplifier gain is outside the limits of the foregoing test, check the tubes, supply voltages and the values of resistors.

(5) The amplifier gain is set in the amplifier design by selection of a proper medium value of resistor R-104 (100,000 ohms). A higher value will increase the amplifier gain above unity, and vice versa. In the event that tubes within specification limits are unobtainable, this resistor may be changed to a higher or lower value as an emergency measure. In this event the resistor should be tagged to indicate replacement with the original value when tubes within specification limits are obtainable.

f. TUBE TESTING.

(1) In the event of any functional failure of undetermined cause the tube should be completely tested on a standard tube checker (See paragraph 2). The test should include checking for element short circuits. Particularly cathode-heater shorts.

(2) The Type 991 voltage regulator tubes may be checked directly in the instrument while operating by measuring the voltage drop across the elements with a voltmeter of 20,000 ohms-per-volt or higher sensitivity (See paragraph 2). The characteristic voltage drop should be between 55 and 70 volts.

g. VOLTAGE, CURRENT AND RESISTANCE CHECKS.

(1) Figure 5-7 lists the voltages and resistance values normally appearing between the tube elements or other circuit points, and ground. The instrument must be turned off when checking resistance values. A voltmeter having a sensitivity of 20,000 ohms-per-volt or higher is required for d-c voltages, and 1000 ohms-per-volt or higher for a-c voltages. Refer to paragraph 2 for test instruments.

(2) Figure 5-8 lists the tube element currents normally existing in the socket contacts indicated.

4. ADJUSTMENTS (INTERNAL).

Two internal adjustments are provided; a coarse zero adjustment for centering the panel zero corrector, and a calibration adjustment for the 1.2-volt a-c range.

a. ZERO BALANCE ADJUSTMENT.

(1) Turn on and warm up for one minute. Set to the 3-volt d-c range. Short circuit the input terminals. Set the panel zero corrector to approximately its center position.

(2) Locate the coarse zero adjuster (R-110, see figure 5-1) on the chassis. Using a screwdriver or fingernail, adjust to obtain an instrument reading within approximately 10 percent of its zero position. The indicating instrument will respond rather slowly to motion of the coarse zero adjuster and some time may be required for the adjusting procedure.

(3) Make a final zero adjustment with the panel zero adjuster.

b. 1.2-VOLT A-C RANGE CALIBRATION ADJUSTMENT.

CAUTION

This adjustment should be attempted only if an accurate standard source of one volt a-c having good waveform is available.

(1) Warm up for at least five minutes. Set to the 1.2-volt a-c range. Carefully adjust zero with the a-c input terminals short circuited. Connect the input to the one-volt standard voltage source.

(2) Locate the calibration adjuster (R-109) on the chassis (See figure 5-1). Set the adjuster until the indicating instrument indicates exactly one volt (the elongated scale division).

(3) Recheck the zero position, and repeat the adjustment if any noticeable shift has occurred.

(4) If it is necessary to replace V-107 or V-108, the spare type CK606 diode may be used (See figure 5-1). No matching is required between tubes for V-107 and V-108. The replacement tube when used in either position may not balance the other diode in contact potential until it is operated for 5 or 6 hours. However such unbalance as may be noted when using a new tube will be within the rotational limit of R-103 (See figure 5-1).

c. AMPLIFIER AND OVERALL A-C ADJUSTMENT.

(1) The TS-375A/U has two additional internal adjustments that are not in the TS-375/U (See figure 5–1A). R-131 is a 2,000 ohm rheostat with a screw driver slotted shaft that controls the amplifier gain within limits and will thus affect the top mark calibration of all d-c and a-c ranges. R-134 is a two megohm rheostat used to adjust the sensitivity of all the a-c ranges. Do not attempt to adjust these controls unless suitable laboratory standards are available to check all ranges and to follow these adjustments with the complete procedure described in paragraph (4b).

SECTION V

SUPPLEMENTARY DATA

1. SPECIAL MEASUREMENTS.

Voltmeter TS-375/U can be used to measure electrical quantities other than voltage by external connection of relatively simple accessory components. It can thus serve as an emergency measuring device whenever special test equipment normally used for this purpose is not available. The high input impedance compared with conventional d-c and a-c voltmeters allows a materially greater range and sensitivity in such special measurements than could be obtained with the same circuits using conventional voltmeters.

a. MEGOHM RESISTANCE MEASUREMENT.—A useful resistance range of approximately 1000 ohms to 1000 megohms can be obtained by connecting a d-c source of voltage as shown in figure 5-10. This range is particularly adapted to the measurement of insulation leakage in equipment and in components that have been affected by moisture or fungus growth.

(1) Connect to a 3-volt d-c voltage source as shown. Two dry cells and a potentiometer rheostat are suggested. The potentiometer can have any resistance between 1000 and 10,000 ohms.

(2) Set the voltmeter to the 3-volt d-c range of a polarity in agreement with the battery. Short circuit the unknown resistor connections (Rx) and adjust the battery potentiometer to obtain a full scale reading (3 volts).

(3) Insert the unknown resistance and note the voltage reading obtained.

(4) Refer the voltage reading obtained to the curve of figure 5-9 and obtain the value of the unknown resistance. The curve is based upon the voltmeter input resistance of 30 megohms, giving a center scale resistance value of 30 megohms.

(5) If voltages higher than 3 volts must be applied to the unknown resistance, for example to promote breakdown in insulation, a higher voltage source may be used by switching the instrument to a corresponding voltage range. The only requirement is that the top mark adjustment be made with the unknown resistance connection short circuited. The readings are still taken on the 0-3 volt scale for direct reference to the curve regardless of the actual range used. The curve is still valid for all voltages because the input resistance remains a constant 30 megohms on all ranges.

b. CAPACITANCE MEASUREMENT.—The capacitance of an unknown capacitor may be measured by the connections shown in figure 5-11, using an a-c voltage source and a reference capacitor of known capacity. The method is similar to that suggested for resistance measurement except that a shunt connection is used.

(1) Select a capacitor of known value (Zs) near the estimated capacity of the unknown capacitor.

(2) Connect a 3-volt source of alternating current to the voltmeter through the reference capacitor as shown. Any frequency within the power input frequency range of the voltmeter, 50 to 1600 cycles, is satisfactory. A step-down transformer with a potentiometer in the primary is suggested.

(3) Set to the 3-volt a-c range. With the unknown capacitor connections open adjust the source voltage to obtain a full scale (3 volts) reading.

(4) Connect the unknown capacitor and note the voltage reading obtained.

(5) Refer the voltage reading to the curve of figure 5-10 and obtain the ratio value.

(6) Multiply the value of the reference capacitor by the ratio to obtain the value of the unknown capacitor. For example a reference capacitor of .01 mfd. and a ratio of 0.16 indicates a value of .0016 mfd.

(7) Capacitance measurements by this method would be valid for any value of applied voltage as in the case of resistance measurements. However no reason generally exists for increasing the applied voltage to a capacitor for measurement purposes.

(8) Polarized electrolytic capacitors may be measured by placing a polarizing battery in series with the capacitor during the measurement. The polarity of the battery with respect to the capacitor must be observed. A fresh battery of low internal resistance should be used; standard power supplies are not recommended because of their relatively large internal resistance.

(9) Reference capacitors below .01 mfd are not recommended because the voltmeter input capacitance becomes an appreciable source of error at lower values. The low practical limit of measurement thus becomes approximately .0001 mfd. (100 mmf.). The upper limit is determined solely by the ability of the a-c source to deliver the necessary current, and for a small filament heating type transformer would be in the order of 1000 mfd.

c. INDUCTANCE MEASUREMENTS.—The inductance of an unknown reactor may be measured in the same manner as capacitance.

(1) Connect and proceed exactly as specified above for the measurement of capacitance, except substitute a reference inductor of known value for the reference capacitor.

(2) Inductance measurement is a particularly effective method of detecting short circuited turns in inductive devices such as transformers, motors, generators, etc. In this case the reference inductance can be a component similar to the suspected faulty component. If the suspected component is not faulty the instrument will read exactly half scale (1.5 volts), otherwise the reading will be lower indicating a lowered inductance caused by shorted turns or other failure.

(3) Reference inductors larger than 10 henries are not recommended because of voltmeter input loading errors. The high practical limit of measurement then becomes approximately 1000 henries. The lower limit is determined solely by the ability of the a-c voltage source to deliver the required current, and for the small filament heating type of transformer previously mentioned would be in the order of .001 henry (1 millihenry) using a reference inductance of .1 henry.

d. LOW A-C VOLTAGE MEASUREMENTS.—Low a-c voltages in low impedance circuits may be measured by applying a step-up transformer to the voltmeter input. The high input impedance of the voltmeter allows connection to a relatively high impedance transformer secondary without serious burden to the transformer.

(1) Audio-type transformers having a secondary winding designed for driving a class A simplifier are well suited. The turns ratio of course must be known.

(2) Use the lower a-c ranges; higher ranges will place an unnecessary burden on the transformer and may cause an appreciable error. Use potentials that are within the limits of the lower a-c ranges, in order to be sure that the transformer iron is not worked at too high a level.

(3) The indicated voltage is divided by the transformer turns ratio to obtain the primary input voltage value.

(4) The impedance ratio of audio transformers is equal to the square of the turns ratio. For example a transformer having a ratio of primary to secondary impedance of 100 would have a turns ratio of 10. A common type of transformer is the line-to-grid coupling transformer having a connection combination of 200 to 20,000 ohms impedance. This is a turns ratio of 10 which is a convenient figure for division. With this transformer a low range of 0.12 volts (120 millivolts) is obtained.

(5) The lower frequency limit of high quality audio transformers for measurement purposes is approximately 50 cycles. The upper frequency limit is a complex function of the natural resonant frequency of the secondary winding and the nature of the circuit to which the primary is connected.

e. LOW D-C CURRENT MEASUREMENTS.—The d-c input circuit normally used for measuring d-c voltages may be used for measuring low d-c currents as well. The high input sensitivity provides a current sensitivity normally impossible in conventional microammeters. One possible objection however is the rather high insertion voltage drop equaling the equivalent indicated voltage as a voltmeter.

(1) The lowest d-c voltage range, 1.2 volts, has a current sensitivity for full scale deflection of 0.04 microampere based upon the input resistance of 30 megohms. The scale is not figured for a top mark of four but readings may be taken as 0 to 1.2 and divided by 30 to obtain the reading in microamperes.

(2) For higher current ranges a shunt resistor may be placed across the input terminals. Table 5-1 lists several suggested shunt values and the resulting current ranges.

TABLE 5-1. SUGGESTED D-C CURRENT RANGES

Range in Microamps	Shunt Value for 1.2 Volt Range
0.04	none
0.12	15 megohms
0.3	4.62 megohms
1.2	1.03 megohms
3	404,000 ohms
12	100,000 ohms
30	40,000 ohms
120	10,000 ohms
300	4,000 ohms
1200	1,000 ohms

f. DECIBEL MEASUREMENTS.—The a-c section may be used for the measurement of decibel (db) values by converting the observed voltage reading into db. The curves of figure 5-12 are arranged for convenient conversion.

(1) By definition the decibel is the logarithm (base 10) of the ratio of two values of power (watts) multiplied by 10, or:

$$db = 10 \times \log_{10} \frac{P1}{P2}$$

In this sense it is conventionally used to express the gain of amplifiers, loss in attenuators, and other values that are essentially a power ratio.

(2) As power is proportional to the square of the voltage across a circuit it follows that the decibel is also

equal to the logarithm of the ratio between two voltages, multiplied by 20, or:

$$db = 20 \log_{10} \frac{e1}{e2}$$

The voltages must necessarily be measured across the same value of impedance to maintain the relationship against the power developed by each voltage.

(3) The decibel is also used to express the absolute power in a circuit by calling 0 db a definite amount of power. In telephone sound practice 0 db is usually established at 6 milliwatts (.006 watt).

(4) Furthermore by stating some definite impedance value for the circuit as well as the power at 0 db, voltage and db will have a definite relationship and a voltmeter may be calibrated in db. In standard telephone practice the impedance is stated as 500 ohms. (The usual telephone line impedance.) Thus a 500-ohm telephone line at a level of 0 db would be delivering 6 milliwatts of power and would have a voltage across the line of 1.732 volts. At 10 db the power level would be 60 milliwatts and the line voltage would be 5.05 volts.

(5) Curve 1 of figure 5-12 is the db-voltage relationship for a 500 ohm impedance circuit, with 0 db at 6 milliwatts. Curve 4 gives the variation in db for different impedance values with any constant applied voltage. To convert data derived from Curve 1 to an impedance value other than 500 ohms, determine the db value to be added or subtracted for the new impedance directly from Curve 4.

(6) Curve 2 of figure 5-12 is a db-voltage ratio curve for determining the db relationship between any two values of voltage. First calculate the voltage ratio by dividing the one voltage by the other, then apply the calculated ratio to the ratio coordinate and derive the equivalent db value.

(7) Curve 3 of figure 5-12 is the db-power ratio curve for determining the db relation between any two values of power. Determine the power ratio and apply to the curve as described for Curve 2.

2. VACUUM TUBE COMPLEMENT.

a. Table 5-2 lists the type and number of tubes used in actual operation of equipment.

TABLE 5-2. FUNCTIONAL TUBE COMPLEMENT

Type of Tube	Description	No. Used	Function	Reference Symbol
6SJ7	Pentode	2	Input and balancing	V-101, V-102
6SL7	Dual Triode	1	Buffer Output	V-103
CK606	Sub Miniature Diode	2	Probe Rectifier and balancing diode	V-107, V-108
991	Gas Filled Regulator	2	Voltage Regulator	V-105, V-106
5Y3		1	Power Rectifier	V-104

TABLE 5-3. TECHNICAL OPERATING CHARACTERISTICS

D-C Voltage Ranges	1.2, 3, 12, 30, 120 and 300 volts full scale
A-C Voltage Ranges	1.2, 3, 12, 30, and 120 volts full scale
A-C Calibration	rms of a sine wave, or .707 of the positive peak of a complex wave
Frequency Range	Panel Terminals; 40 cps to 50 kc, to 10 cps with correction curve. Probe; 10 kc to 150 mc, to 300 mc with correction curve.
A-C Probe Input Capacitance	5 mmf. approximately
A-C Probe Resonant Frequency	600 mc approximately
A-C Probe Input Resistance	5 megohms approximately
A-C Panel Terminal Input Capacitance	70 mmf approximately
D-C Probe Isolating Resistance	5 megohms
D-C Panel Terminal Input Capacitance	25 mmf approximately
D-C Input Resistance	30 megohms, total on all ranges
Calibration Adjustment	1.2-volt a-c range only
Power Supply	105 to 125 volts, 50 to 1600 cps. a-c only
Power Consumption	Operating; 28 watts approximately. Standby (Heater): 14 watts approximately
Ambient Temperature Range	−40 to +55 degrees C, −40 to +131 degrees F
Internal Temperature Range	Operating; 25°C and 77°F approximately Standby; 20°C and 68°F approximately

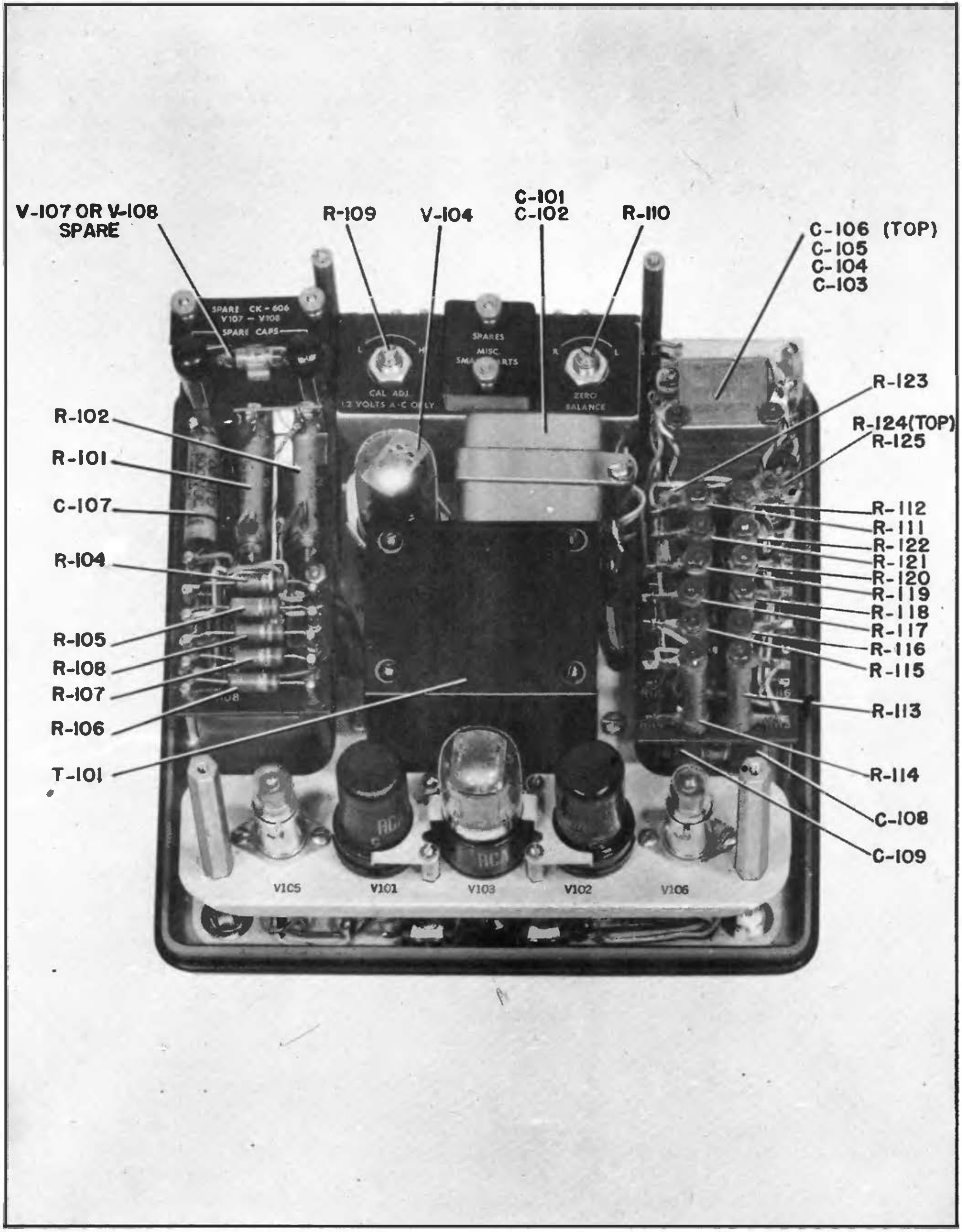


Figure 5–1. Voltmeter TS-375/U, Internal Rear Oblique View

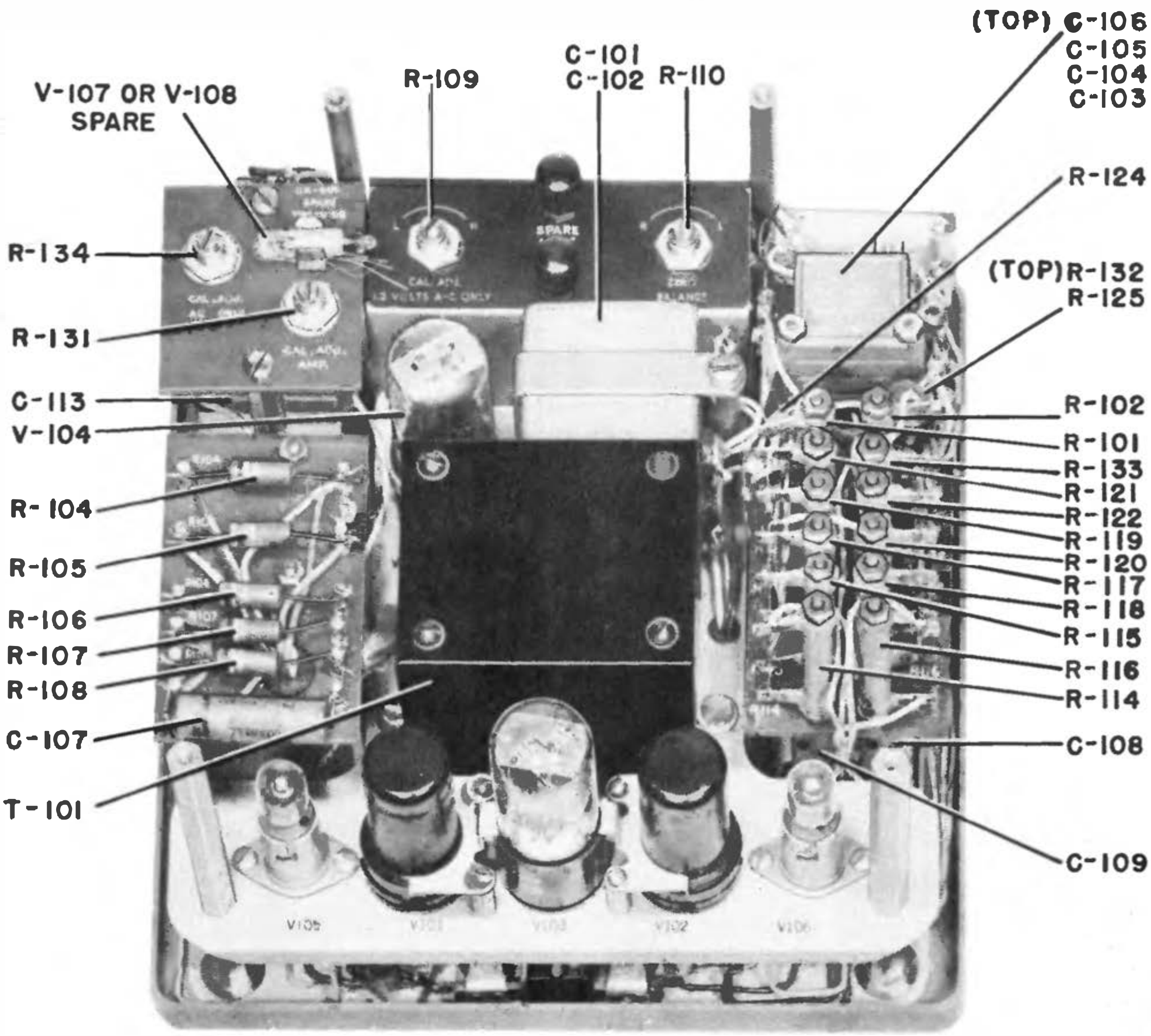


Figure 5-1A. Voltmeter TS-375A/U, Internal Rear Oblique View

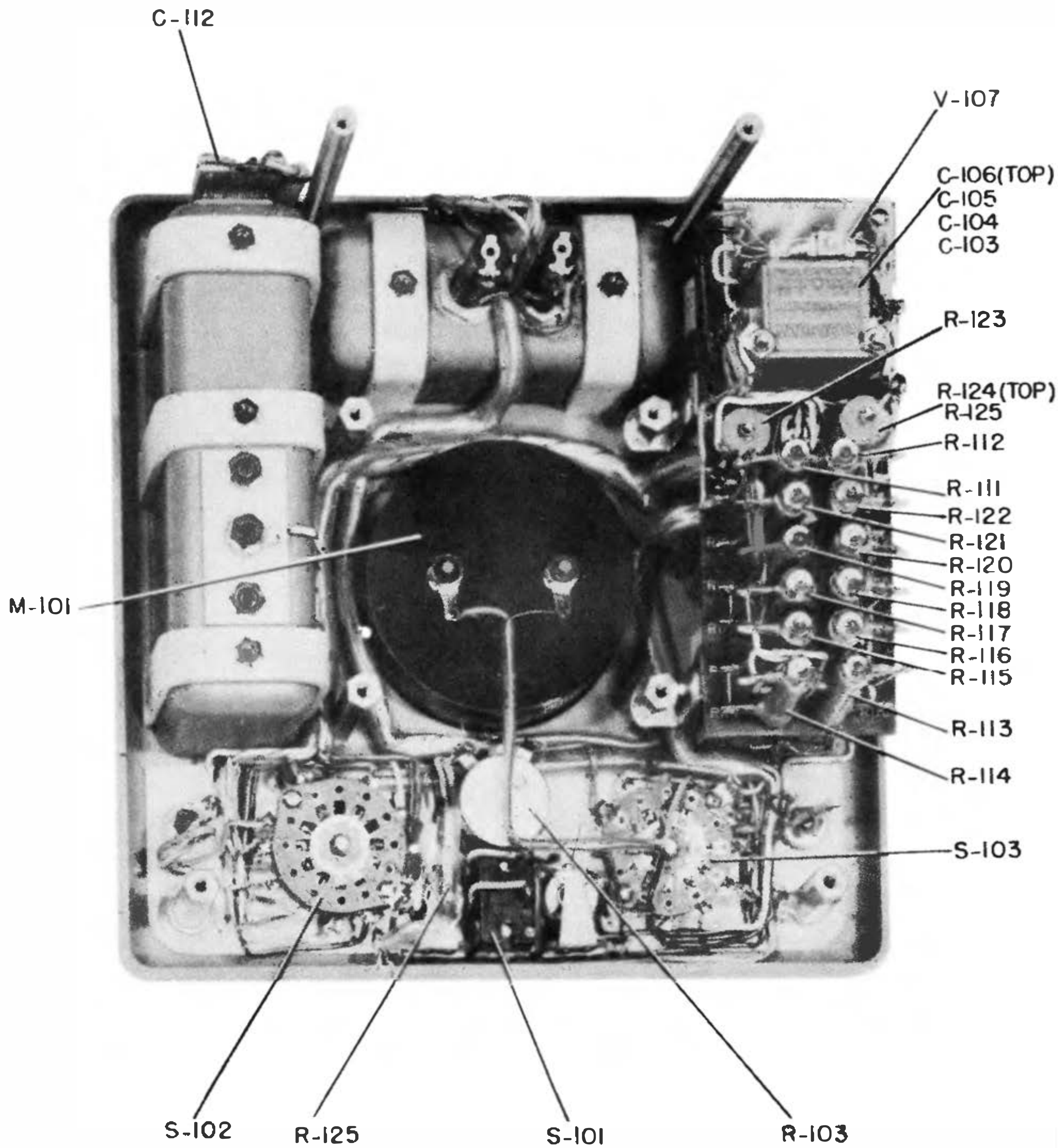


Figure 5–2. Voltmeter TS-375/U, Panel Underside

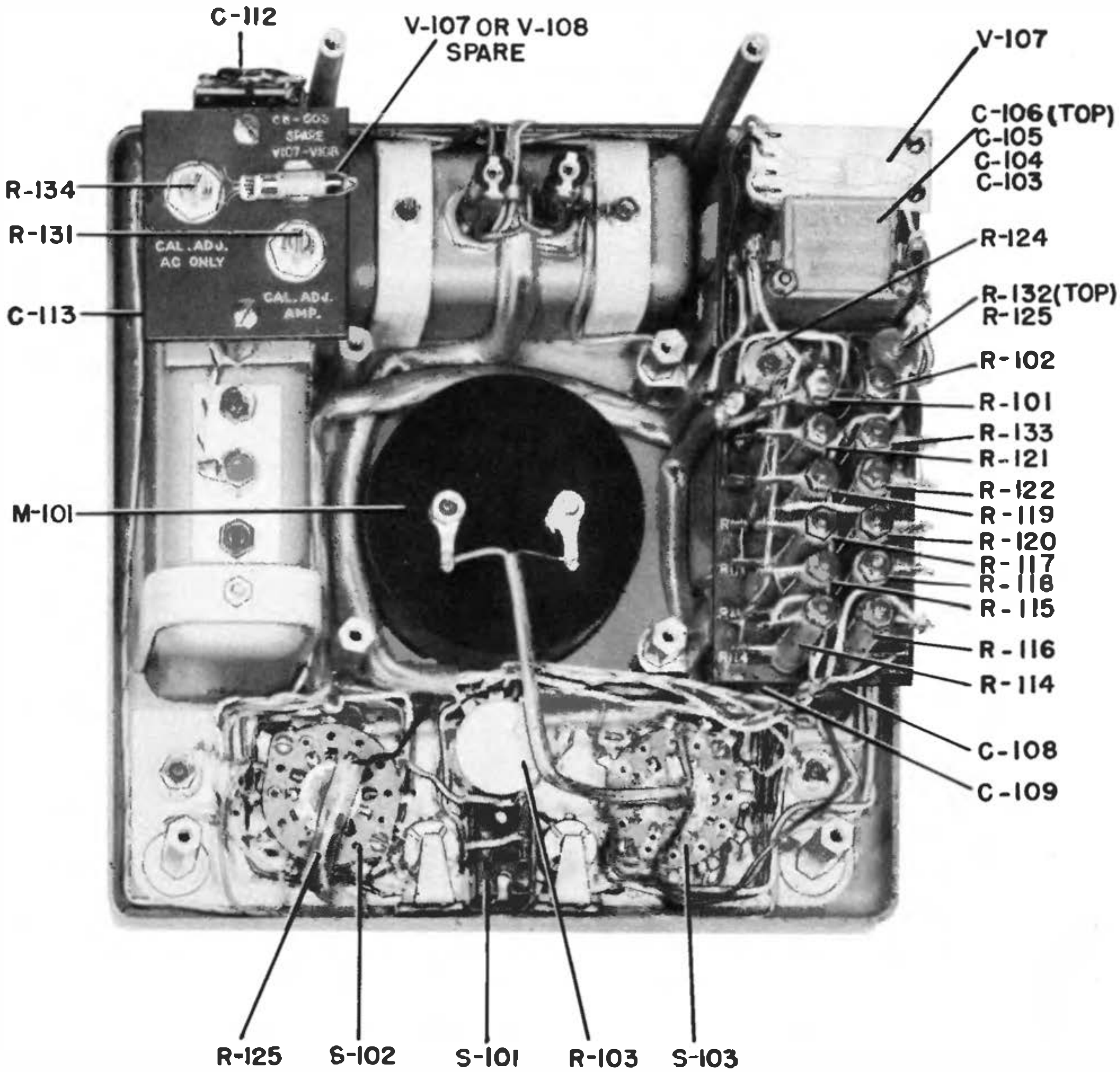


Figure 5-2A. Voltmeter TS-375A/U, Panel Underside

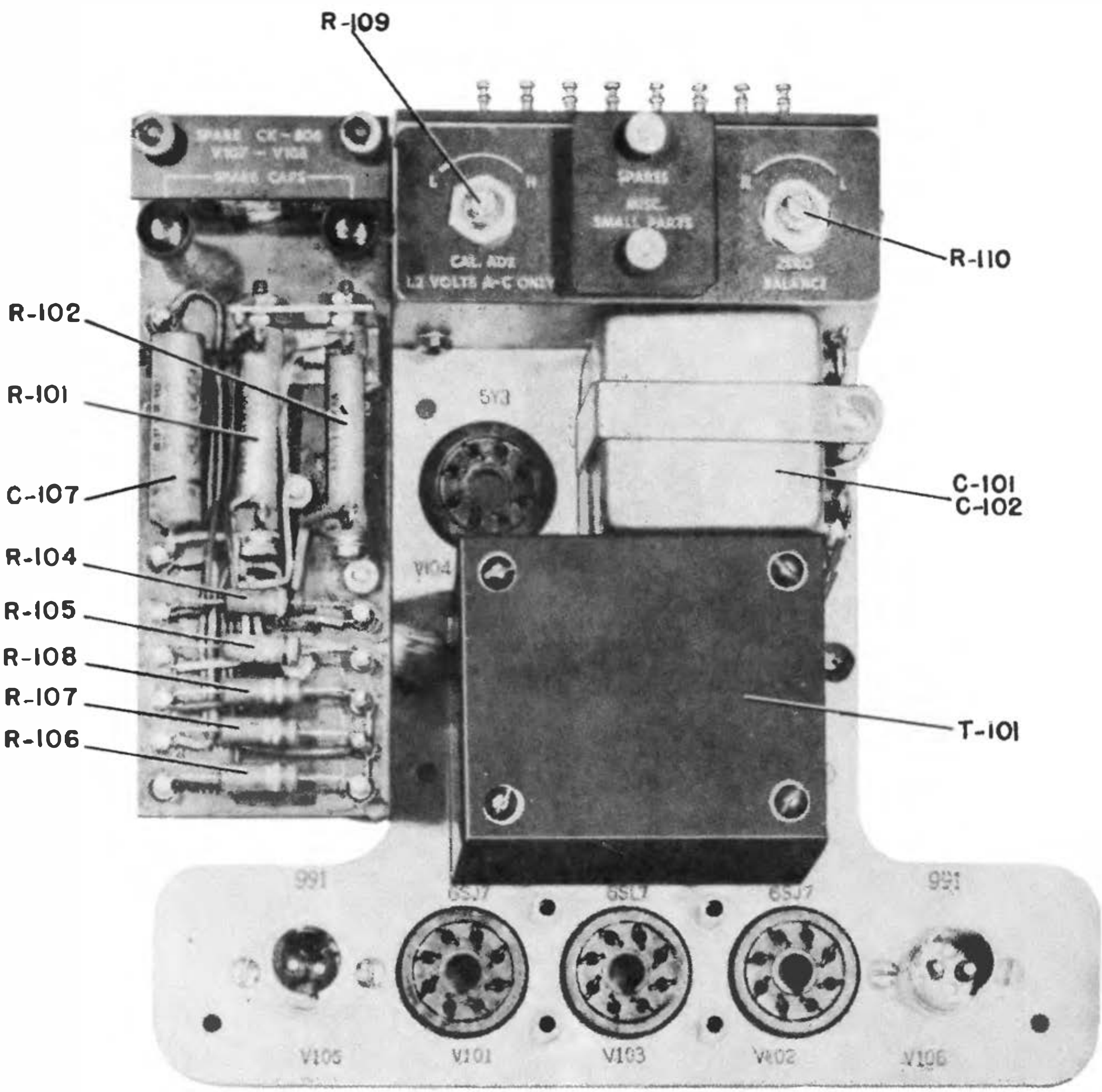


Figure 5–3. Voltmeter TS-375/U, Chassis Underside

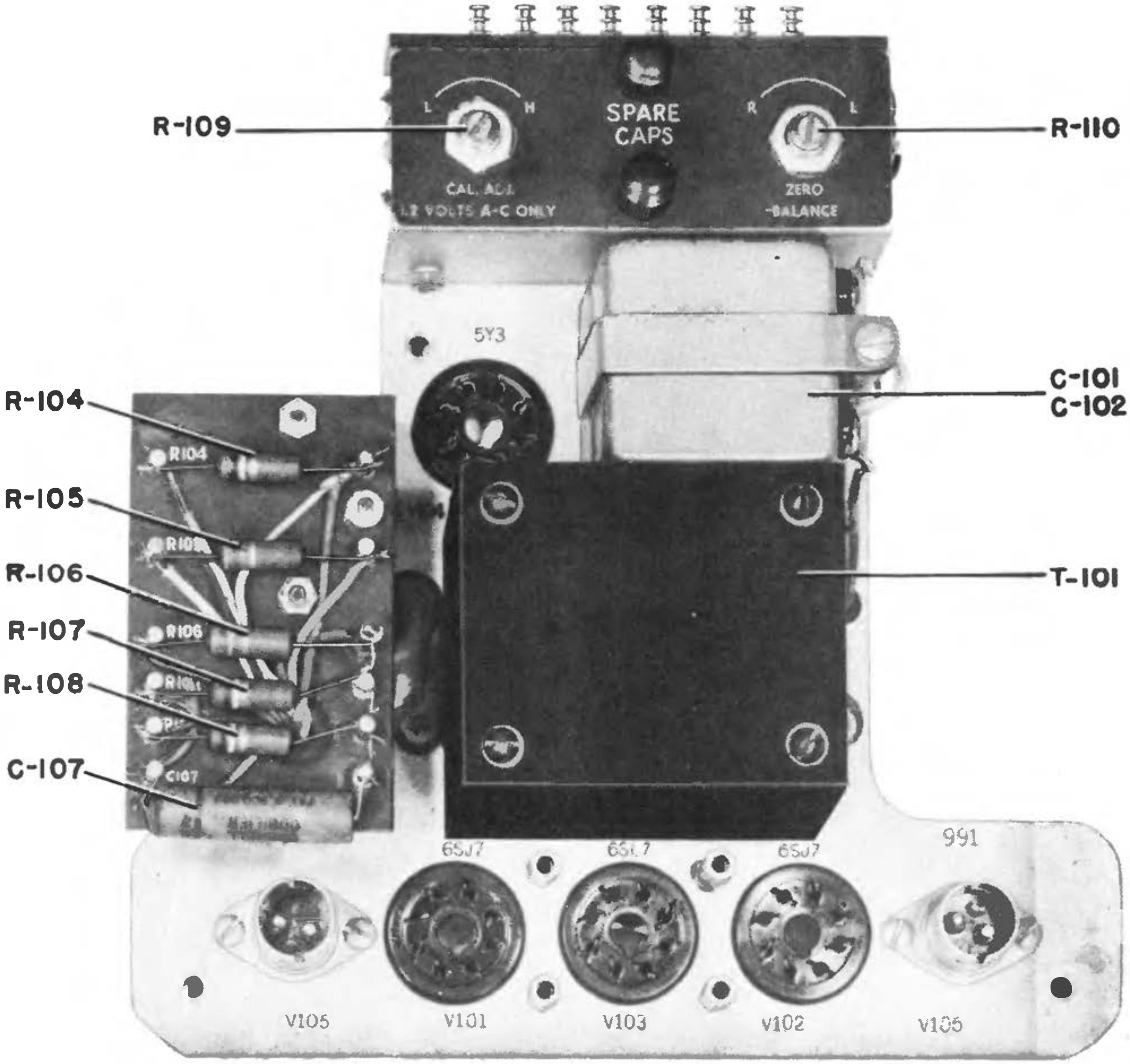


Figure 5-3A. Voltmeter TS-375A/U, Chassis Underside

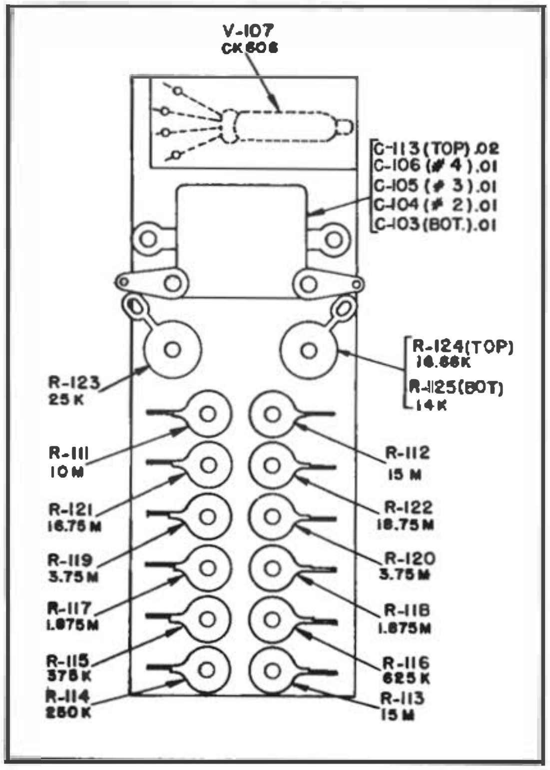


Figure 5–4. Voltmeter TS-375/U, Component Locations, Panel Resistor Deck

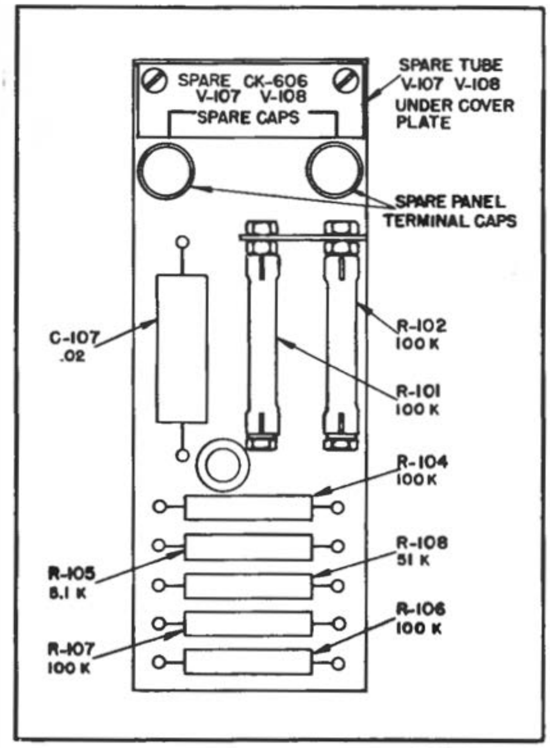


Figure 5–5. Voltmeter TS-375/U, Component Locations, Chassis Resistor Deck

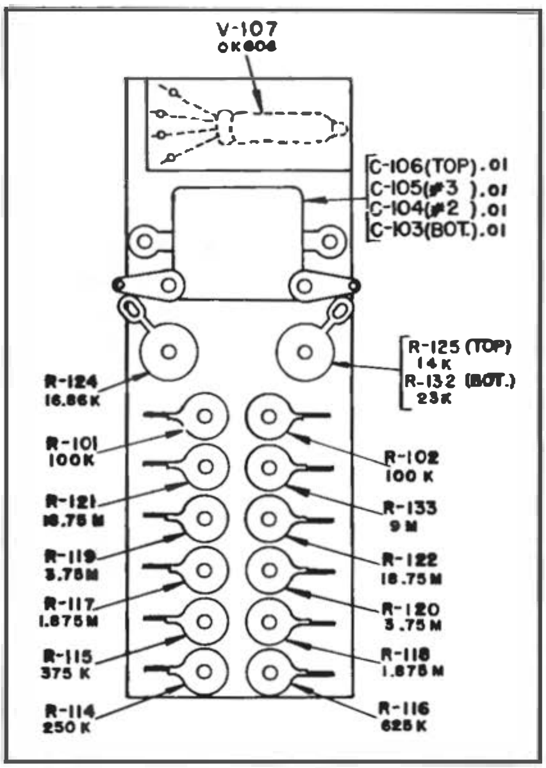


Figure 5–4A. Voltmeter TS-375A/U, Component Locations, Panel Resistor Deck

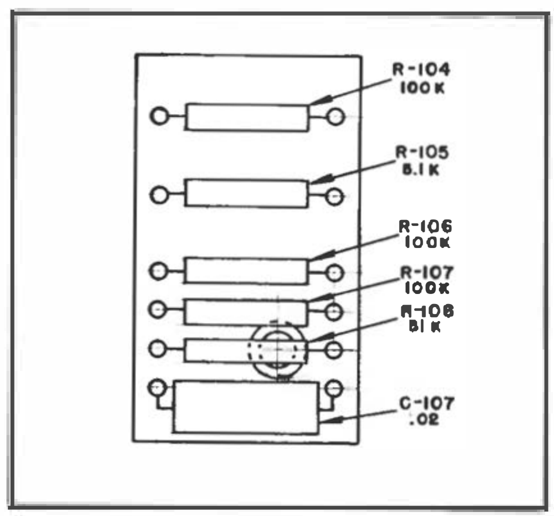


Figure 5–5A. Voltmeter TS-375A/U, Component Locations, Chassis Resistor Deck

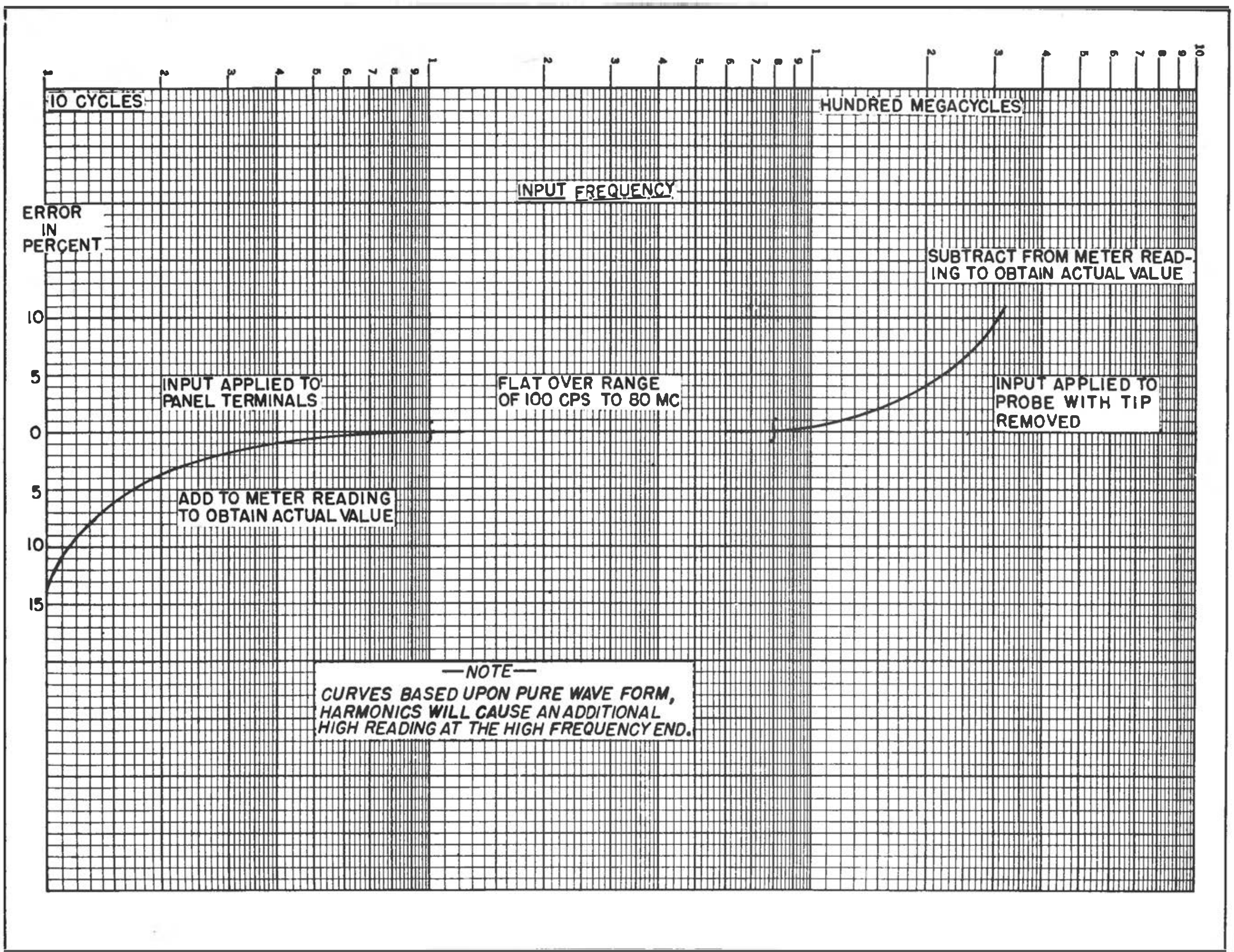


Figure 5-6. Frequency Correction Curve

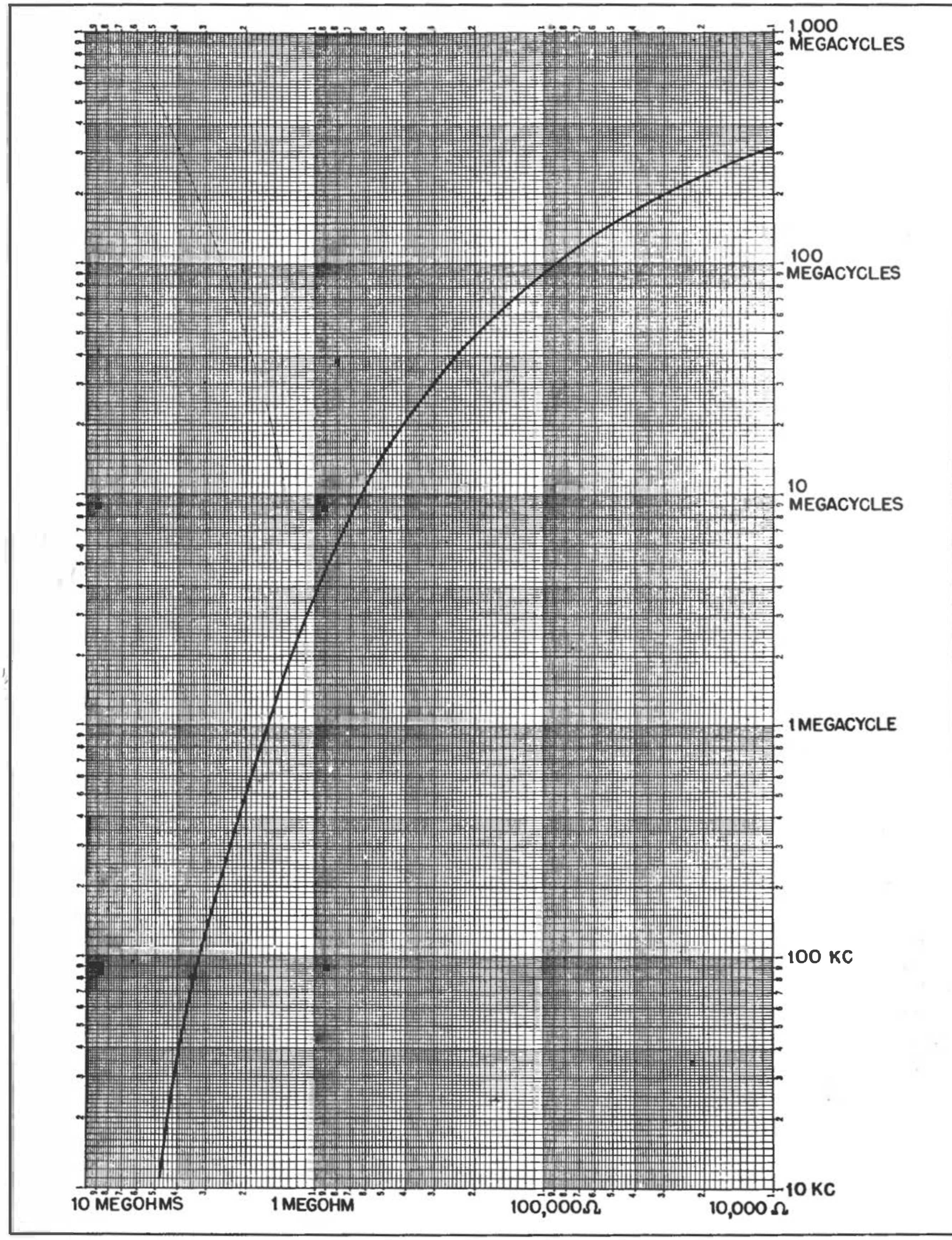
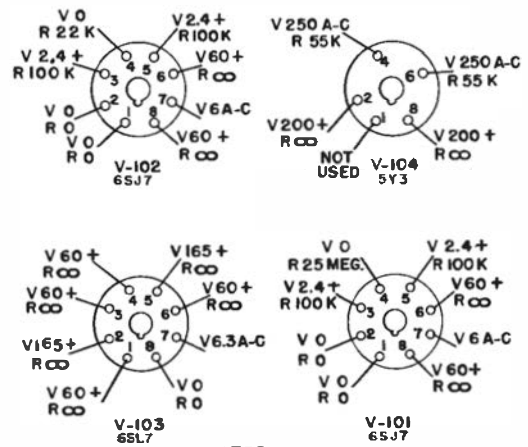


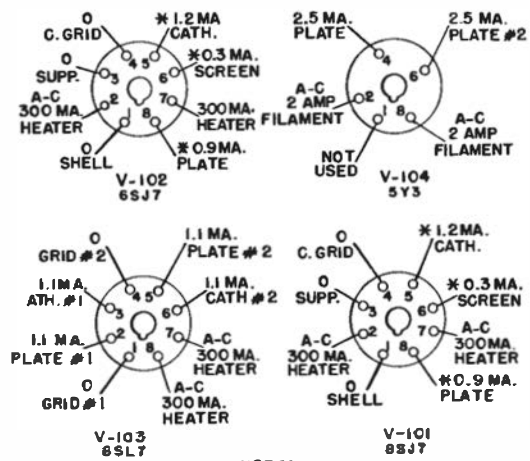
Figure 5–7. A-C Probe Input Impedance Characteristic



— NOTES —

(A) SET TO 3 V D-C + RANGE
(B) ALL VOLTAGES TO GROUND UNLESS OTHERWISE INDICATED
(C) VOLTAGES A-C + OR - WITH RESPECT TO GROUND AS INDICATED
(D) LINE VOLTAGE 115 VOLTS
(E) D-C VOLTAGES 20,000 OHMS PER VOLT; A-C VOLTAGES 10,000 OHMS PER VOLT [SEE PAGE 4-1 PARAGRAPH 2]
(F) SOCKETS UNDERSIDE VIEW
(G) CAUTION: BE SURE POWER IS TURNED OFF BEFORE TAKING RESISTANCE READINGS

Figure 5–8. Voltmeters TS-375/U and TS-375A/U Voltage and Resistance Chart



— NOTES —

(A) MILLIAMPS (MA.) OR AMPERES (AMP.) AS INDICATED.
(B) D-C UNLESS INDICATED AS A-C
(C) SET TO 3 V D-C + RANGE
(D) LINE VOLTAGE 115 VOLTS
(E) SOCKET UNDERSIDE VIEW
*(F) * CURRENT DEPENDS ON POSITION OF ZERO ADJUSTING CONTROLS R-103 & R-110*

Figure 5–9. Voltmeters TS-375/U and TS-375A/U Tube Element Current Chart

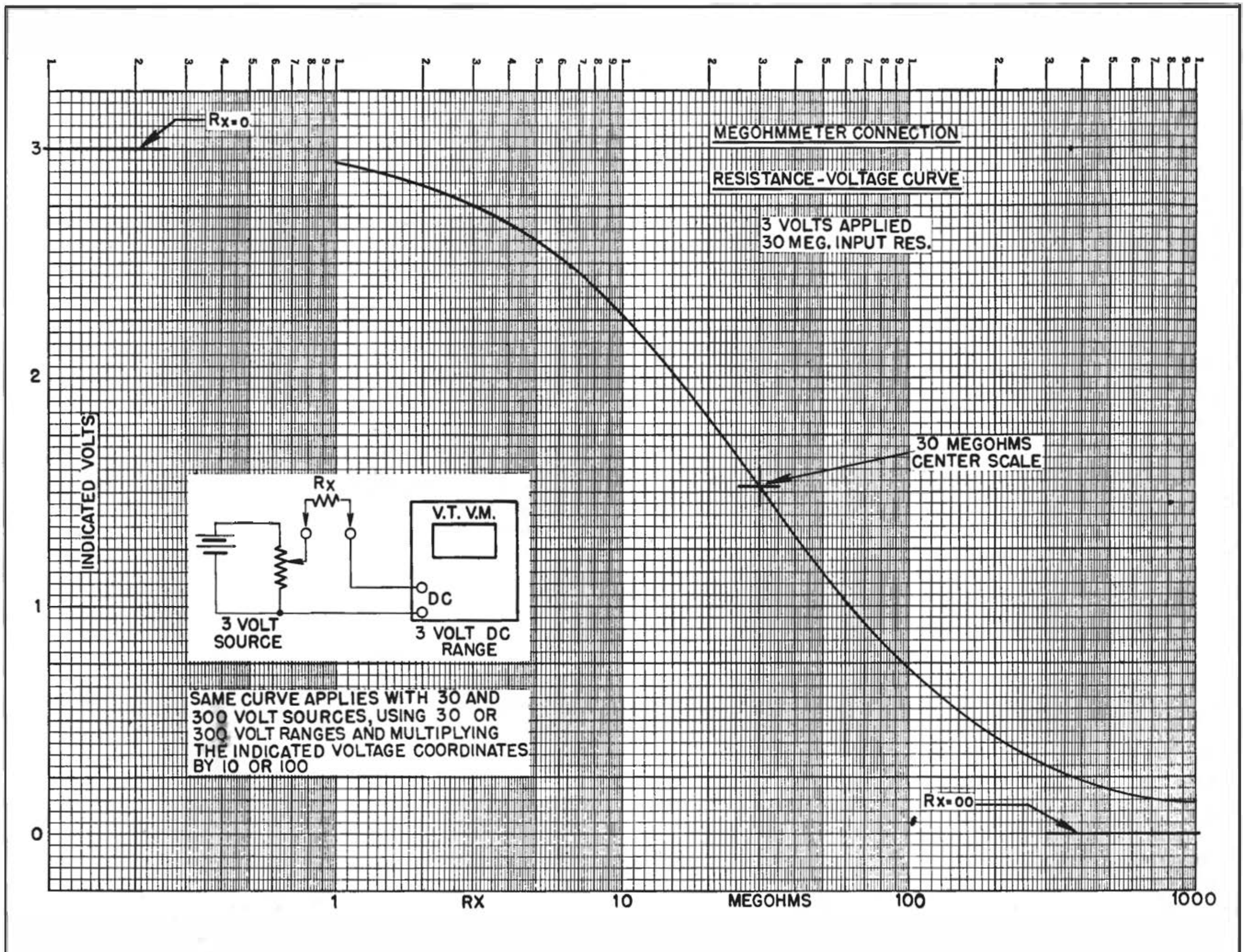


Figure 5-10. Resistance Measurement

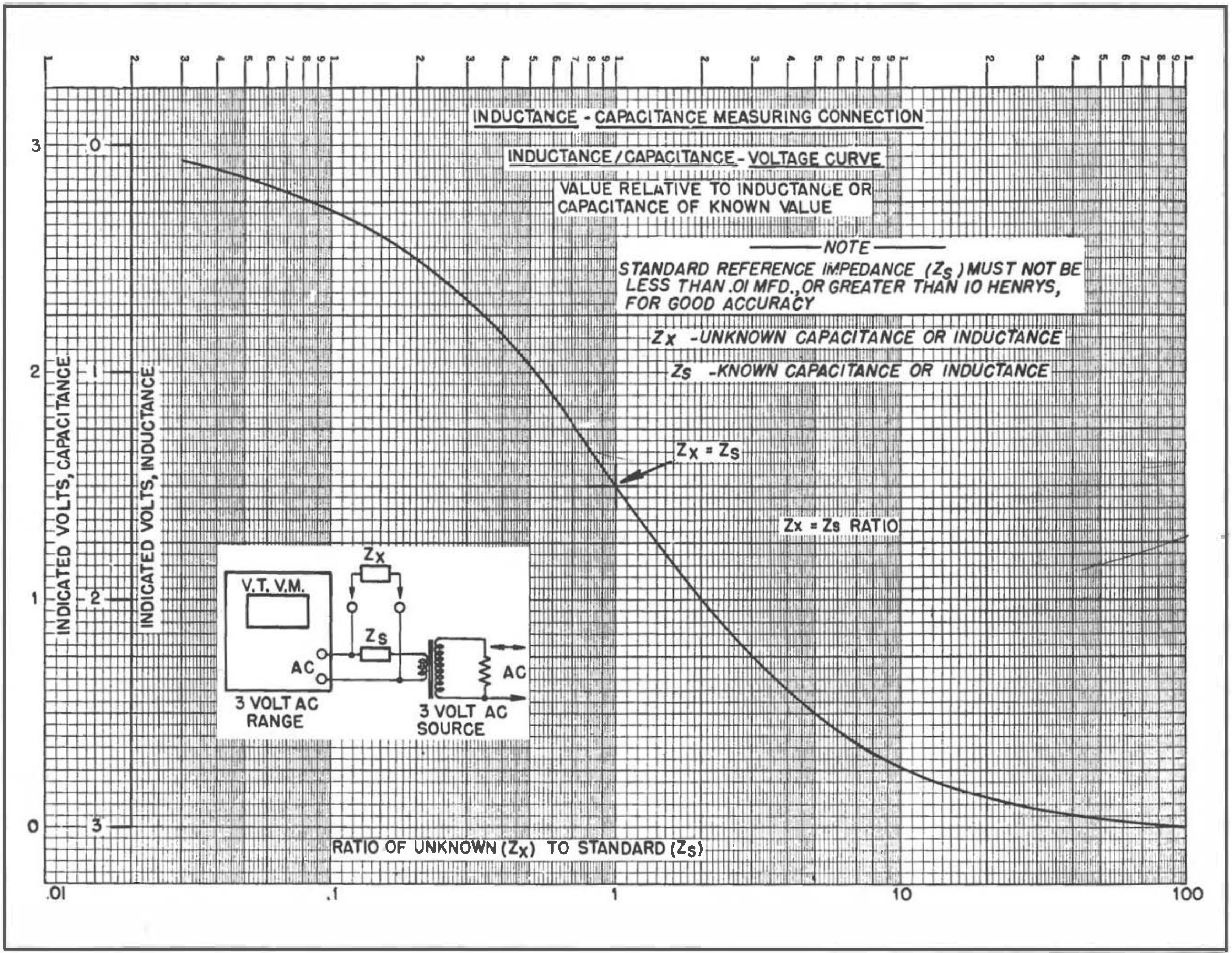


Figure 5-11. Capacitance and Inductance Measurement

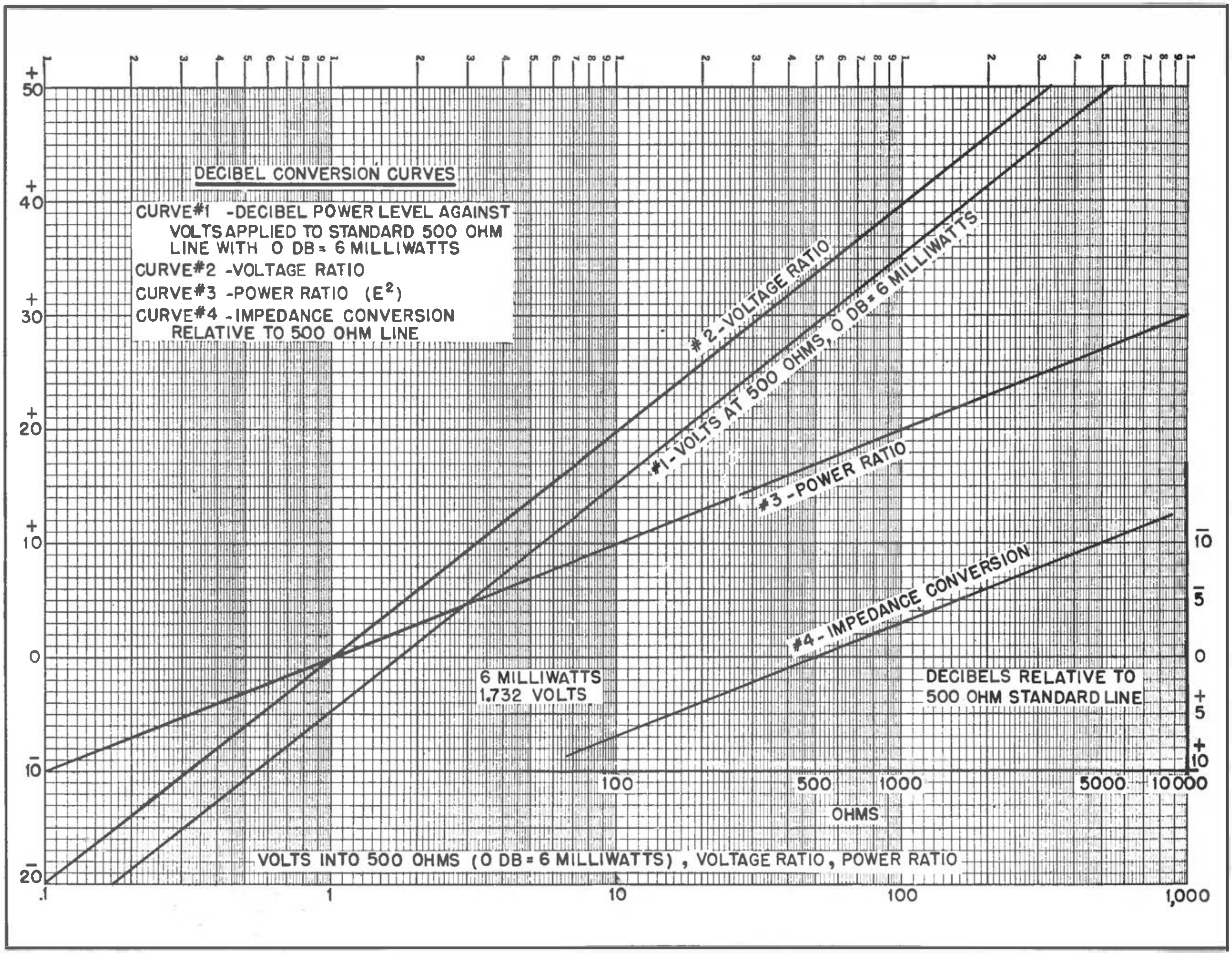


Figure 5-12. Decibel Chart

SECTION VI

TABLE OF REPLACEABLE PARTS

1. GENERAL

a. TABLE OF REPLACEMENT PARTS.-The primary purpose of this table is to identify replaceable electrical (and mechanical) components as to part and number, function and manufacturers for Voltmeter TS-375/U Contract NObsa-30009 and Voltmeter TS-375A/U Contract NOa(s)-9616, 12224, and N383s-30174, 36339, 38158, 45654, and 60744. It does not constitute a complete electrical (and mechanical) breakdown but lists electrical (and mechanical) parts as are reasonably subject to loss or failure. The hatchmark (#) in column two indicates unassigned Army and Navy Stock numbers.

2. ORDERING OF SPARE PARTS.

a. GENERAL.-Each Service using this list has established certain depots and service groups for the storage and issue of spare parts to its organizations requiring them. The regulations of each Service should be studied to determine the method and source for requisitioning spare parts. The information in this list, as to manufacturer's or contractor's name, type, model or drawing number, is not to be interpreted as authorization to field agencies to attempt to purchase identical or comparable spare parts direct from the manufacturer or a wholesale or retail store except under emergency conditions as covered by existing regulations of the Service concerned.

b. U. S. ARMY PERSONNEL.-This table is for information ONLY and is not to be used as a basis for requisitioning parts. Authorities for obtaining maintenance items are as follows: 1. For using organizations; applicable Service publications of the 00-30 series of AAF Technical Orders.

c. For higher maintenance and supply echelons; the applicable Standard Maintenance List.

d. Where no JAN or Navy standard part number is given to a component, care should be taken in replacing the component with any other part than that listed in the Table of Replaceable Parts. This special part probably has been chosen for a special quality not available in standard components, and use of a standard component may result in decreased life or lowered performance.

3. REFERENCE SYMBOLS.

a. GENERAL.-The reference symbols in column one of the Table of Replaceable Parts correspond to those shown on the line drawings. Each reference symbol consists of a letter followed by a three digit number. The asterisk (*) preceding the reference symbol indicates parts applicable only to Voltmeter TS-375/U. The dagger (†) preceding the reference symbol indicates parts applicable only to Voltmeter TS-375 A/U. The double asterisk (**) after the reference symbol indicates parts applicable to Voltmeter TS-375A/U supplied on Contract N383s-30174, 36339, 38158 and 45654. The double dagger ( ) after the reference symbol indicates parts applicable to Voltmeter TS-375A/U supplied on Contract N383s-60744 and NOa(s)-12224. The absence of a symbol preceding a reference symbol indicates that the parts are applicable to both Voltmeter TS-375/U and Voltmeter TS-375A/U. The letter indicates the type of apparatus or component as explained below:

Letter	Type of Apparatus
C	Capacitor
E	Prod Assembly
F	Fuse
H	Washer or Grommet
I	Light, Indicator
M	Meter
O	Clip
R	Resistor
S	Switch
T	Transformer
V	Tube
W	Cable Assembly or Test Lead
X	Socket

4. COLOR CODE CHARTS FOR RESISTORS AND CAPACITORS.

a. GENERAL.-A standard color code is used for identification of resistance and capacitance values of carbon-type resistors and mica-type condensers (See table 6-2). In the color code numbers are represented by color bands. For example Black = 0, Brown = 1, Red = 2 and so forth.

b. RESISTORS.-Three color bands are used on each resistor to identify its value. The fourth band or lack of band indicates the tolerance. The first band represents the first figure of the resistance value; the second band, the second figure; the third band, the decimal multiplier. For example a 25,000 ohm resistor would be marked as follows: first band-Red; second band-Green; third band-Orange.

c. CONDENSERS.-The color code for condensers is basically the same as the color code for resistors. The exception being that the first three dots indicate digits instead of the first two dots as is the case with resistors. The fourth dot is the decimal multiplier. All readings are in micromicrofarads. For example, a .00025 microfarad (250 micromicrofarads) condenser would be marked as follows: first dot-Red; second dot-Green; third dot-Black; fourth dot-Black. The fifth dot indicates the tolerance; the sixth dot indicates the characteristics.

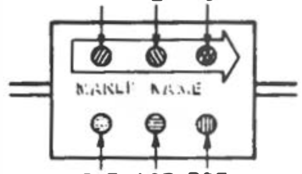
TABLE 6-1. LIST OF MANUFACTURERS

Manufacturer	Address
Allen Bradley	Milwaukee, Wisc.
The American Hdwe. Corp.	New Britain, Conn.
American Phenolic Corp.	1850 S. 54th Ave., Chicago 50, Ill.
American Radio Hdwe. Inc.	152 MacQuesten Pkwy., S., Mt. Vernon, N.Y.
Arrow, Hart & Hegeman Electric Co.	Laurel & Peck Sts., Hartford, Conn.
Atlantic India Rubber Wks. Inc.	1455 W. Van Buren St., Chicago 7, Ill.
Belden Mfg. Co.	4645 W. Van Buren St., Chicago, Ill.
Bussman Mfg. Co.	Univ. at Jefferson, St. Louis 7, Mo.
Canfield Rubber Co.	Garden & Warren Sts., Bridgeport, Conn.
Chicago Industrial Instrument Co.	536 W. Elm St., Chicago 10, Ill.
Clarostat Mfg. Co., Inc.	Dover, N.H.
Continental Carbon Inc.	13900 Lorain Ave., Cleveland 11, Ohio
Cords, Ltd.	780 Frelinghuysen Ave., Newark 5, N.J.
Cornell-Dubilier Corp.	1000 Hamilton Blvd., South Plainfield, N.J.
Detroit Gasket Co.	Burt Rd. & P. M. RR., Detroit 23, Mich.
Drake Mfg. Co.	1713 W. Hubbard St., Chicago 22, Ill.
Erie Resistor Corp.	640 West 12th St., Erie, Penna.
International Resistance Co.	1100 Terminal Commerce Bldg., Phila. 8, Pa.
The James Millen Mfg. Co.	Malden, Mass.
Linear, Inc.	6464 State Rd., Philadelphia, Penna.
Littlefuse, Inc.	4765 No. Ravenswood Ave., Chicago 40, Ill.
Mueller Electric Co.	1583 E. 31st St., Cleveland 14, Ohio
National Gasket Co.	124 E. 25th St., New York 1, N.Y.
Oak Mfg. Co.	1260 North Clybourne Ave., Chicago, Ill.
Q. V. S. Prod. Inc.	45 Dogwood Rd., Orange, N.J.
Radio City Prod. Co., Inc.	152 W. 25th St., New York 1, N.Y.
Raytheon Mfg. Co.	90 Willow St., Waltham, Mass.
Resistance Prod. Co.	714 Race St., Harrisburg, Penna.
Simpson Electric Co.	5208 W. Kinzie St., Chicago, Ill.
U.S. Rubber Co.	1230 Sixth Ave., New York 20, N.Y.
United Transformer Co.	150 Varick St., New York 13, N.Y.
Valley Mfg. Co.	48 Jefferson Ave., Waterbury 85, Conn.
The Vellumoid Co.	54 Rochdale St., Worcester, Mass.
Western Rubber Co.	620 E. Douglas St., Goshen 4, Ind.
Western Elec. Instrument Corp.	614 Frelinghuysen Ave., Neward 5, N.J.

TABLE 6-2. COLOR CODE CHARTS FOR RESISTORS AND CAPACITORS

AMERICAN WAR STANDARD

for CAPACITORS
(MOLDED MICA)

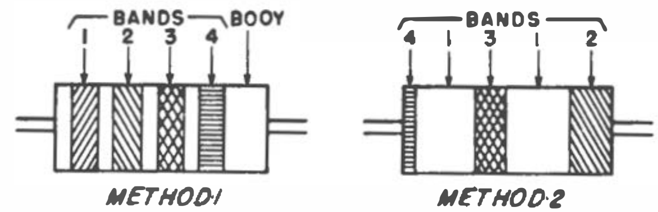


COLOR	1st DOT 1st Digit	2nd DOT 2nd Digit	3rd DOT 3rd Digit	4th DOT Decimal Multiplier	5th DOT Tolerance	6th DOT Characteristics
BLACK	0	0	0	1	±20%	* A
BROWN	1	1	1	10		B
RED	2	2	2	100	± 2%	C
ORANGE	3	3	3	1,000		D
YELLOW	4	4	4	10,000		E
GREEN	5	5	5	100,000		F
BLUE	6	6	6	1,000,000		G
VIOLET	7	7	7	10,000,000		
GRAY	8	8	8	100,000,000		
WHITE	9	9	9	1,000,000,000		
GOLD	—	—	—	0.1	± 5%	
SILVER	—	—	—	0.01	± 10%	

* A - ORDINARY MICA BY-PASS
B - SAME AS A - LOW LOSS CASE
C - BY-PASS OR SILVER MICA CAPACITOR (±200 PARTS / MILLION/C)
D - SILVER MICA CAPACITOR (±100 PARTS / MILLION / C)
E - SILVER MICA CAPACITOR (0 TO +100 PARTS / MILLION / C)
F - SILVER MICA CAPACITOR (0 TO +50 PARTS / MILLION / C)
G - SILVER MICA CAPACITOR (0 TO -50 PARTS / MILLION / C)

RMA STANDARD

for RESISTORS



COLOR	1st BAND 1st Digit	2nd BAND 2nd Digit	3rd BAND Decimal Multiplier	4th BAND Tolerance
BLACK	0	0	1	
BROWN	1	1	10	
RED	2	2	100	
ORANGE	3	3	1,000	
YELLOW	4	4	10,000	
GREEN	5	5	100,000	
BLUE	6	6	1,000,000	
VIOLET	7	7	10,000,000	
GRAY	8	8	100,000,000	
WHITE	9	9	1,000,000,000	
GOLD	—	—	—	±5%
SILVER	—	—	—	±10%
NO COLOR	—	—	—	±20%

METHOD 1	METHOD 2	COLOR
BAND 1	BODY 1	INDICATES FIRST SIGNIFICANT FIGURE OF RESISTANCE VALUE IN OHMS.
BAND 2	END 2	INDICATES SECOND SIGNIFICANT FIGURE.
BAND 3	BAND 3 OR DOT	INDICATES DECIMAL MULTIPLIER.
BAND 4	BAND 4	IF ANY, INDICATES TOLERANCE IN PER CENT ABOUT NOMINAL RESISTANCE VALUE. IF NO COLOR APPEARS IN THIS POSITION, TOLERANCE IS 20%.

TABLE 6-3 . TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
C-101	R16-C-11491-700	CAPACITOR, fixed: Paper dielectric; single section 2 mf plus or minus 20%; 600 vdcw; non-corrosive hermetically sealed metal can; 2" lg x 2" wd x 1 1/8" h; "Dykanol G"; 2 leak proof riveted lug terminals, located on side; no internal ground connections; 2 integral mtg ears 2 3/8" mtg/c	Capacitance element of dc power supply filter	Cornell Dubilier type DYR8200G	Weston part D-122103
C-101**	R16-C-11491-310	CAPACITOR, fixed: Paper dielectric; 2 mfd, +20% -10%; 600 VDCW	Capacitance element of dc power supply filter	JAN CP53B1EF205V	JAN C-25
C-101++	R16-C-11491-700	CAPACITOR, fixed; Paper, JAN type #CP53-B1EF205M; 2MF ± 20%; 600 vdcw; 2 lg x 2" wd x 1 1/8" thk	Capacitance element of dc power supply filter	JAN CP53B1EF205M	JAN C-25
C102	R16-C-11491-700	CAPACITOR, fixed: Same as C-101	Capacitance element of dc power supply filter		
C-102**	R-16-C-11491-310	CAPACITOR, fixed: Same as C-101**	Capacitance element of dc power supply filter		
C-102++	R16-C-11491-700	CAPACITOR, fixed: Same as C-101++	Capacitance element of dc power supply filter	JAN CP53B1EF205M	JAN C-25
C-103	R16-C-10499-1	CAPACITOR, fixed: Mica; 10,000 mmf ± 10%; 600 vdcw; 1 5/8" lg x 1 1/8" wd x 5/16" thk	Plate filter for balancing diode	JAN CM45A103K	JAN C-25
C-104	R16-C-10499-1	CAPACITOR, fixed: Same as C-103	RF filter at input of amplifier		
C-105	R16-C-10499-1	CAPACITOR, fixed: Same as C-103	Cathode by-pass for balancing diode		
C-106	R16-C-10499-1	CAPACITOR, fixed: Same as C-103	RF filter in AC probe output to amplifier		
C-107	R16-C-11255-67-500	CAPACITOR, fixed: Paper Dielectric; 1 section; 20,000 mmf ± 20%; 600 vdcw; wax impregnated paper tube; 15/32" diam x 1 5/8" lg; Halowax impregnated; wire lead terminals	Filter capacitor across R-106	Cornell Dubilier type DT 6S2	Weston Part ND-24167

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
C-107**	R16-C-11255-67-600	CAPACITOR, fixed: Paper dielectric; 20,000 mmf ± 20%; 600 vdcw	Filter capacitor across R-106	JAN CP29A1EF203M	JAN C-25
C-107††	#	CAPACITOR, fixed: Paper; 20,000 mmf ± 20%; 600 vdcw; 1-7/16" lg x 3/4" wd x 5/16" thk	Filter capacitor across R-106	JAN CN42A203M	JAN C-91
C-108	R16-C-10026-16	CAPACITOR, fixed: Mica; 510 mmf ± 20%; 500 VDCW; 51/64" lg x 15/32" wd x 3/16" thk	Line filter	JAN CM20A511M	JAN C-5
C-108**	R16-C-10026-4	CAPACITOR, fixed: Mica dielectric; 510 mmf ± 5%; 500 VDCW	Line filter	JAN CM20A511J	JAN C-5
C-109	R16-C-10026-16	CAPACITOR, fixed: Same as C-108	Line Filter		
C-109**		CAPACITOR, fixed: Same as C-108**	Line Filter		
C-110	R16-C-10026-10-700	CAPACITOR, fixed: Mica, silver button type; 510 mmf ± 10%; 500 VDCW; temperature coefficient letter A; 0.447" diam x 1/10" thk; brass case, silver plated; case forms one terminal, coaxially located eyelet forms other terminal; outer case and eyelet are used for mounting as well as electrical connections	High Frequency Blocking Condensor in RF Probe	Erie Resistor Corp. Type #370 BH Spec #600	Weston Part ND-24141
C-111	R16-C-10026-16	CAPACITOR, fixed: Same as C-108	Electrostatic filter for output of DC probe		
C-111**	R16-C-10026-4	CAPACITOR, fixed: Same as C-108**	Electrostatic filter for output of DC probe		
C-112	R16WS-121985	CAPACITOR ASSEMBLY: 2 metal plates form case and ground for the double balanced fixed mica capacitor, 500 mmf ±20%; temp coef letter A, 5 terminal tabs; 2" lg x 1" wd x 3/16" thk; four mtg hole centers form a square 0.72" on a side, hole diam 0.120", one side of cond is the mtg bracket	Balanced electrostatic and RF filter in output of AC probe	Weston D-121985	Weston part D-121985

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
C-112**	R16-RCP375-2-10-16	CAPACITOR ASSEMBLY: Same as C-112	Balanced electrostatic and RF filter in output of AC probe	RCP 375-2-10-16	RCP 375-2-10-16
C-113	R16-C-10532-10	CAPACITOR, fixed: Mica; 20,000 mmf ± 10%; 500 VDCW; 1 5/8" lg x 1 1/8" wd x 29/64" thk	Low frequency blocking condenser mounted internally	JAN CM50A203J	JAN C-5
E-101	R16-L-4883-250	PROD ASSEMBLY, test: DC probe; assembly consists of prod tip Weston part/dwg D-122047, handle Weston part/dwg D-122046, composition IRC resistor type BTS 5.1 megohms 1/2 watt Weston part/dwg ND-24142, bushing Weston part/dwg D-122048, 50" of rubber covered single conductor wire Weston part/dwg D-73036, plug socket type AN-3106-8S-1S Weston part dwg ND-24103, ferrule for AN socket Weston part/dwg D-122050; shape similar to an ordinary test prod and lead with a resistor in the handle of the prod and with an AN connector at the other end; 54" lg	Test prod and isolating resistor for DC vacuum tube voltmeter	Weston D-122049	Weston D-122049
E-101**	R16-P-5306-10	PROD ASSEMBLY, test: DC probe assembly; consists of prod tip, bushing, handle, 50" rubber covered single cond wire, 5.1 megohm resistor, 1/2 W (Allen Bradley type EB, RCP #1-6-87), plug socket type AN-3106-8S-1S with ferrule for AN socket (RCP #18-89); shape similar to ordinary test prod and lead with resistor in handle of prod and with AN connector at other end; 54" lg	Test prod and isolating resistor for DC vacuum tube voltmeter	RCP-375-28-43	RCP-375-28-43
E101++		PROD ASSEMBLY, test: DC probe; assembly consists of prod tip Chicago Ind. Inst. Co. part per dwg. D-122047, handle Chicago Ind. Inst. Co. part per dwg.	Test prod and isolating resistor for DC vacuum tube voltmeter	Chicago Ind. Inst Co. D-122049	Chicago Ind. Inst. Co. D-122049

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec.No.
E-101++ con't		D-122046, R126 composition IRC resistor type BTS, 5.1 megohms 1/2 watt, bushing Chicago Ind. Inst. Co. part per dwg. D-122048, 50" of rubber covered single conductor wire Chicago Ind. Inst. co. part per dwg. D-73036 plug socket type AN-3106-8s-1s Chicago Ind. Inst. Co. part ND-24103, ferrule for AN socket Chicago Ind. Inst. Co. part per dwg. D-122050; shape similar to an ordinary test prod and lead with a resistor in the handle of the prod and with an AN conductor at the other end; 54" lg.			
E-102	R16-L-4883-200	PROD ASSEMBLY, test: AC test probe; assembly consists of following major parts, probe tip Weston part/dwg D-122017, charging condenser 500 mmf C-110 Erie Resistor Corp type #370 BH spec #600, ferrule Weston part/dwg D-122030, diode tube Raytheon type CK606 (V-107) Weston part ND-24145, resistor IRC Type BTs 5.1 megWeston part/dwg ND-24142, polysterene insert spec for Weston part/dwg D-122026, case Weston part/dwg D-122028; 51" lg three wire rubber covered cable Weston part/dwg ND-24181, socket connector AN-3106-10SL-3S Weston part/dwg ND-24105, one cap for AN socket connector Weston part/dwg D-122041; probe 4 1/2" lg x 3/4" diam overal, cable 51" lg, AN socket connector 1 5/8 lg x 7/8" diam overal; AC measurements from 50 to 150 megacycles with accuracy of ± 5%, from 150 to 300 megacycles with accuracy of ± 12%.	AC probe for rectification of RF and audio voltages	Weston D-122067	Weston part D-122067

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6.3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
E-102**	R16-P-6306-15	PROD ASSEMBLY, test: AC test probe; consists of prod tip, polystyrene insert, 51" lg 3 wire rubber covered cable, probe case 4 1/2" lg x 3/4" diam, charging capacitor (C-110 RCP #2-11-58), diode tube (V-107 Raytheon CK606 RCP #9-59). 5.1 megohm resistor 1/2 W (Allen Bradley type EB RCP #1-6-87), socket connector AN-3106-10SL-3S and AN socket cap (RCP #18-90); shape similar to ordinary test prod and lead with components in handle of prod and with an AN connector on other end; 55" lg	AC probe for rectification of RF and audio voltages	RCP-375-28-44	RCP-375-28-44
E-102++		PROD ASSEMBLY, test: AC test probe; assembly consists of the following major parts, probe tip Chicago Ind. Inst. Co. part per dwg. D-122017, D-122018, charging condenser 500 mmf C-110 Erie Resistor Corp. type #370BH spec D-122019, #600, ferrule Chicago Ind. Inst. Co. part/dwg. D 122030, diode tube D-122020, Raytheon type CK 606 (V-107) Chicago Ind. Inst. Co. part ND-24145, R127 composition resistor IRC type BTS 5.1 megohms 1/2 watt, polystyrene insert spec for Chicago Ind. Inst. Co. part dwg D-122026, case Chicago Ind. Inst. Co. part-dwg D-122028, 51" lg three wire rubber covered cable Chicago Ind. Inst. Co. part ND-24181, socket connector AN-3106-10SL-3S Chicago Ind. Inst. Co. part ND-24105, one cap for AN socket connector Chicago Ind. Inst. Co. part-dwg. D-122041; probe 4 1/2" lg x 3/4" diam. overall, cable 51" lg, AN socket connector 1 5/8" lg x 7/8" diam	AC probe for rectification of RF and audio voltages	Chicago Ind. Inst. Co. D-122067	Chicago Ind. Inst. Co. part D-122067

** Contracts N383s-30174, 38839, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
E-102++ con't		overall. AC measurements from 10KC to 300 megacycles.			
H-101	R16-G-2455-250	WASHER, flat: Neoprene; round 1/8" ID, 3/8" OD, 0.05" thk	Used as gasket to seal case to panel mounting studs against moisture	Detroit Gasket Mfg. Co. special for Weston	Weston part D-121972
H-101**	#	WASHER, flat: Neoprene; round, 7/64" ID x 3/8" OD x 1/64" thk	Used as gasket to seal case to panel mounting studs against moisture	Vellumoid Co. special for RCP	RCP-375-13-207
H-101++	R16-G-2455-250	WASHER, flat: Neoprene; round 1/8" ID, 3/8" OD, 0.05" thk	Used as gasket to seal case to panel mounting studs against moisture	Atlantic India Rubber works, Inc. special for Chicago Ind. Inst. Co.	Chicago Ind. Inst. Co. part D-121972
H-102	R16-WS-121952	WASHER, flat: Clear vinylite; round 0.144" ID, 0.36" OD, 0.04" thk	To decrease leakage from Weston resistor to pin and resistor deck	Valley Mfg. Co. special for Weston	Weston Part D-121952
H-102++	R16-WS-121952	WASHER, flat: Clear vinylite; round 0.144" ID, 0.36" OD, 0.04" thk	To decrease leakage from resistors to pin and resistor deck	National Gasket Co. Special for RCP Valley Mfg. Co. special for Chicago Ind. Inst. Co.	RCP-325-13-212 Chicago Ind. Inst. Co. part D-121952
H-103	R16-G-2455	WASHER, flat: Vellutex; round 0.136" ID, 0.31" OD, 0.045" thk	Gasket between rubber feet and case for water seal	Vellumoid Co. Spec. for Weston	Weston part D-121944 RCP 375-13-210
H-104	R33-G-1898	GROMMET: Rubber, black; fits 1/4" hole diam 1/8" hole diam. 1/16" groove width, 3/16" overall width, 11/32" overall diam	Protects wires passing through chassis	Amer Rad Hdw part #1114	Weston part ND-23283
H-104**	#	GROMMET: Rubber; fits 9/32" diam hole; 3/16" ID x 1/16" groove width x 7/32 W overall x 7/16" OD	Protects wires passing through chassis	Atlantic India Rubber Wks Inc. #382	RCP-375-13-12
H-104++	R33-G-1898	GROMMET: Rubber, black; fits 1/4" hole; 1/8" hole diam, 1/16" groove width, 2/16" overall width, 11/32" overall diam	Protects wires passing through chassis	Amer Rad Hdwe part #1114	Chicago Ind. Inst. Co. Part ND-23283

** Contracts N383s-30174, 36839, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
H-105	#	GROMMET: Rubber, black; fits 3/8" hole; 1/4" hole diam, 1/16" groove width, 1/4" overall width, 9/32" overall diam	Protects wires passing through chassis and resistor deck	US Rubber style G-5092	Weston part ND-21745
H-105**	#	GROMMET: Rubber; fits 3/8" diam hole; 9/32" ID x 1/16" groove width x 1/4" W Overall x 9/16" OD	Protects wires passing through chassis and resistor deck	Atlantic India Rubber Works Inc. #763	RCP-375-13-11
H-105††	#	GROMMET: Rubber, black; fits 3/8" hole; 1/4" hole diam, 1/16" groove width, 1/4" overall width, 9/16" overall diam	Protects wires passing through chassis and resistor deck	Atlantic India Rubber Works, Inc., part #763	Chicago Ind. Inst. Co. part ND-24226
H-106	#	GROMMET: Rubber, black; fits 1" hole; 7/8" hole diam, 1/16" groove width, 1/4" overall width, 1 3/16" overall diam	Protects cable passing through AC probe compartments	Western Rubber Co. part 01151	Weston part ND-24226 RCP-375-13-213
H-106††	#	GROMMET: Rubber, black; fits 1" hole; 7/8" hole diam, 1/16" groove width, 1/4" overall width, 1 3/16" overall diam.	Protects cable passing through AC probe compartments	Western Rubber Co. part 01151	Chicago Ind. Inst. Co. part ND-24226
H-107	R33-G-1906-280	GROMMET: Black, rubber; fits 3/8" diam hole; 7/16" diam hole x 3/32" wd groove x 1/4" wd x 3/4" diam overall	Protects wires passing through resistor deck	Canfield Rubber Co. part 2029	Weston part ND-24113
H-107**	#	GROMMET: Rubber; fits 1/2" diam hole; 3/8" ID x 1/16" groove width x 1/4" W overall x 5/8" OD	Protects wires passing through resistor deck	Atlantic India Rubber Works Inc. #230	RCP-375-13-60
H-107††	R33-G-1906-280	GROMMET: Black, rubber; fits 3/8" diam hole; 7/16" diam hole x 3/32" wd groove x 1/4" wd x 3/4" diam overall	Protects wires passing through resistor deck	Canfield Rubber Co. part 2029	Chicago Ind. Inst. Co. part ND-24113
H-108	#	GROMMET: Black, rubber; fits 3/4" diam hole; 9/16" diam hole x 1/16" wd groove x 1/4" wd x 7/8" diam overall	Protects cable passing through DC probe compartment cover	Atlantic India Rubber Works Inc. part #1720	Weston part ND-24114 RCP-375-13-214

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6.3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec.No.
H-108++	#	GROMMET: Black,rubber; fits 3/4" diam hole; 9/16" diam hole x 1/16" wd groove x 1/4" wd x 7/8" diam overall	Protects cable passing through DC probe compartment cover	Atlantic India Rubber Works Inc part #1720	Chicago Ind. Inst. Co. part ND-24114
H-109**	#	GROMMET: Rubber; fits 9/16" diam hole, 7/16" ID x 1/16" groove width x 1/4" W overall x 3/4" OD	Protects wires passing through chassis	Atlantic India Rubber Works Inc. part #1787	RCP-375-13-74
I-101	R17L-12932-119-115	LIGHT; indicator: w/lens; 1/2" diam, white jewel lens; for miniature bayonet base, T-3 1/4 bulb; open frame; nickel plated brass shell; 1 1/2" lg x 1 3/16" wd x 1 1/8" thk x 3/4" diam overall; 0.687" diam mtg/hole, 5/16" max thk panel; vertically mtd, lamp replaceable from front; threaded jewel; two solder lug terminals, one on each side of base; features shallow depth behind panel	"Off" indicator	Weston D-122009	Weston part D-122009
I-101**	R16-RCP-375-17-16	LIGHT; indicator: Same as I-101	"Off" indicator	RCP-375-17 16W	RCP-375-17-16W
I-101++		LIGHT, indicator: w/lens; 1/2" diam, white jewel lens; for miniature bayonet base, T-3 1/4 bulb; U-shaped frame; 1 9/16" lg x 1 1/8" wd; 0.687" diam mtg./hole, 3/8" max thk panel; vertically mounted, lamp replaceable from front; threaded jewel; (extension bushing); two solder lug terminals; features shallow depth behind panel.	"Off" indicator	Drake Mfg. Co. part spec.#166-K	Chicago Ind. Inst. Co. part D-122009
I-102	R17L-12932-119-110	LIGHT; indicator: w/lens; 1/2" diam, red jewel lens; for miniature bayonet base, T-3 1/4 bulb; open frame; nickel plated brass shell; 1 1/2" lg x 1 3/16" wd x 1 1/8" thk x 3/4" diam overall;	"On" indicator	Weston D-122008 RCP-375-17-16R	Weston part D-122008 RCP-375-17-16R

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TABLE 6.3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
		0.687" diam mtg/hole, 5/16" max thk panel; vertical mtd; lamp replaceable from front; threaded jewel; two solder lug terminals one on each side of base; features shallow depth behind panel.			
I-102++		LIGHT; indicator: w/lens; 1/2" diam, red jewel lens; for miniature bayonet base, T-3 1/4 bulb; U-shaped frame; 1 9/16" lg x 1 1/8" wd; 0.687" diam mtg/hole, 3/8" max thk panel; vertically mounted, lamp replaceable from front; threaded jewel; (extension bushing); two solder lug terminals; features shallow depth behind panel.	"On" indicator	Drake Mfg. Co. part special 166-K	Chicago Ind. Inst Co. D-122008
M-101	R16-M-2107-200	METER, multi-scale; DC type; range 0 to 100 ua; rectangular bakelite flush mtg case; 3 1/4" diam body x 1 1/8" behind flange, rectangular flange 4.25" wd x 3.94" high x 0.70" deep; accuracy ±2%; D'Arsonval movement; full scale sensitivity 100 ua resistance across terminals 1,000 ohms ±15%; calibrated for non-magnetic panel; 3 scale arcs, lowest one 75 degrees deflection 24 divisions with red figures and divisions, middle arc 86 degrees deflection 30 divisions with red figures and divisions, top arc 90 degrees deflection 60 divisions with black figures and divisions; self-contained; four mtg holes 0.147" diam, spaced 1.80" each side of vertical center line and 1.645" each side of horizontal center line two stud terminals 10-32 thd, 0.45" lg.	To indicate units of electrical measurements	Weston D-122111 Spec 973 Subl	Weston part D-122111

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec.No.
M-101**	R16-V-2900-7	METER, multi-scale: Same as M-101		Q.V.S. Meter Co. Special for RCP	RCP-375-5-94
M-101††	#	METER, multi-scale: DC type; range 0 to 100 ua; rectangular bakelite flush mtg case; 3 1/4" diam body x 1" behind flange; rectangular flange 4.25" wd x 3 15/16" high x 5/8" deep; accuracy ±2%; D'Arsonval movement; full scale sensitivity 100 ua resistance across terminals 1,000 ohms ±15%; calibrated for non-magnetic panel; 3 scale arcs, lowest one 75 degrees deflection 30 divisions with red figures and divisions, middle arc 86 degree deflection 30 divisions with red figures and divisions, top arc 90 degrees deflection 60 divisions with black figures and divisions; self-contained; four mtg. holes 0.147 diam, spaced 1.80" each side of vertical center line and 1.645" each side of horizontal center line two stud terminals 10-32 thd, 0.45" lg.	To indicate units of electrical measurements	Simpson Electric Co. special for Chicago Ind. Inst. Co.	Chicago Ind. Inst. Co. part D-122111
R-101	R16-R-18751-780	RESISTOR, fixed: Composition; 100,000 ohms ±1%; 1/2 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Plate load of V-101	Weston part D-108936	Weston part D-108936
R-101**	R16-R-17347-21-700	RESISTOR, fixed: Deposited metal film; 100,000 ohms, ±1%, 2 W; 0.05" per degree C negative; 1 3/4" lg x 1/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	Plate load of V-101	Continental Carbon Inc Type X-2	RCP-375-1-5-153

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U — MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
R-101++	R16-R-17347-21-700	RESISTOR, fixed: Metal film; 100,000 ohms ±1%; 2W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire-wound.	Plate load of V-101	Continental Carbon Inc. Type X-2	Chicago Ind. Inst. Co. part D-108936
R-102	R16-R-18751-780	RESISTOR, fixed: Same as R-101	Plate load of V-102		
R-102**	R16-R-17347-21-700	RESISTOR, fixed: Same as R-101**	Plate load of V-102		
R-102++	R16-R-17347-21-700	RESISTOR, fixed: Same as R-101++	Plate load of V-102		
R-103	R16-P-6925-775	RESISTOR, variable: Wire wound 10,000 ohms 10%; 2 W; solder lug term; metal enclosed phenolic base 1 1/4" diam x 5/8" d; round metal flatted shaft 1/4" diam x 7/8" lg; A taper; insulated contact arm; normal torque; bushing 3/8"-32 x 3/8" lg	Electrical zero corrector	Weston part D-122099 Alternate JAN RA15A1FD103AK	Weston part D-122099 JAN R-19
R-103**	R16-P-6925-775	RESISTOR, variable: Same as R-103	Electrical zero connector	Clarostat Type 43 Alternate JAN RA20A1FD103AK	RCP-375-4 104 JAN R-19
R-103++	R16-P-6925-775	RESISTOR, variable: Same as R-103	Electrical zero connector	Alt JAN RA20A1FD103AK	Chicago Ind Inst. Co. part D-122099 JAN R-19
R-104	R16-R-17347-10-8	RESISTOR, fixed: Composition; 100,000 ohms ±10%; 1 w	Determines ratio of feed-back	JAN RC30AF104K	JAN R-11
R-104**	R16-R-17347-10-25	RESISTOR, fixed: Composition; 100,000 ohms ±10%; 1 w	Determines ratio of feed-back	JAN RC30BF104K	JAN R-11

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr.& Desig. or AWS Type	Cont. or Govt. Dwg. or Spec.No.
R-105	R16-R-17291-30-175	RESISTOR, fixed: Composition; 5100 ohms ±5%; 1 w	Resistance filter	JAN RC30AF512J	JAN R-11
R-105**	R-16-R-17291-30-500	RESISTOR, fixed: Composition; 5100 ohms ±5%; 1 w	Resistance filter	JAN RC30BF512J	JAN R-11
R-106	R16-R-17347-10-8	RESISTOR, fixed: Same as R-104	Biasing network for V-101 and V-102	JAN RC30AF513J	JAN R-11
R-106**	R16-R-17347-10-25	RESISTOR, fixed: Same as R-104**	Same as above		
R-106++	R16-R-17347-10-8	RESISTOR, fixed: Same as R-104**	Same as above		
R-107	R16-R-17347-10-8	RESISTOR, fixed: Same as R-104	Current limiting resistor for V-106	JAN RC30AF513J	JAN R-11
R-107**	R16-R-17347-10-25	RESISTOR, fixed: Same as R-104**	Same as above	JAN RC30AF513J	JAN R-11
R-108	R16-R-17337-29-3	RESISTOR, fixed: Composition; 51,000 ohms ±5%; 1 w	Part of bias network for V-101 and V-102	JAN RC30AF513J	JAN R-11
R-108**	R16-R-17337-29-3	RESISTOR, fixed: Composition; 51,000 ohms ±5%; 1 w	Part of bias network for V-101 and V-102	JAN RC30BF513J	JAN R-11
R-108++	R16-R-17337-29-3	RESISTOR, fixed: Composition; 51,000 ohms ±5%; 1 w	Part of bias network for V-101 and V-102	JAN RC30AF513J	JAN R-11
R-109	#	RESISTOR, variable: Wire wound; 5,000 ohms ±10%; 2 w; 3 solder lug term; metal enclosed phenolic base 1 1/4" diam x 5/8" d; round metal slotted shaft 1/4" diam x 1/2" l; A taper; insulated contact arm; high torque; bushing 3/8"-32 x 3/8" lg	1.2 volt range calibration	Alternate JAN RA20A2SA502AK	JAN R-19
R-109**	R16-P-6917-850-P	RESISTOR, variable: Same as R-109	1.2 volt range calibration	Clarostat-43W-HT Alternate JAN RA20A2SA502AK	RCP-375-4-106 JAN R-19
R-109++	R16-P-6917-850-P	RESISTOR, variable: Same as R-109	1.2 volt range calibration	JAN RA20A2SA512AK	JAN R-19

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-1. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
R-110	R16-P-6861	RESISTOR, variable: Wire wound; 3 ohms 10%; 2 W; 3 solder lug term; metal enclosed phenolic base 1 1/4" diam x 5/8" d; round metal slotted shaft 1/4" diam x 1/2" 1; A taper; insulated contact arm; high torque; bushing 3/8"-42 x 3/8" lg	Coarse zero balance control in heater circuit of V-101 and V-102	Alternate JAN RA20A2SA3R0AK	JAN R-19
R-110**	R16-P-6861	RESISTOR, variable: Same as R-110	Coarse zero balance control in heater circuit of V-101 and V-102	Clarostat-43W-HT Alternate JAN RA20A2SA3R0AK	RCP-375-4-107 JAN R-19
*R-111	R16-R-18770-600	RESISTOR, fixed: Composition; 10 meg ±2%, 0.05w; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Part of AC diode balancing network	Weston D-108953	Weston part D-108953
*R-112	R16-R-18770-920	RESISTOR, fixed: Composition; 15 meg ±2%; 0.037 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Part of AC diode balancing network	Weston D-108954	Weston part D-108954
*R-113	R16-R-18770-920	RESISTOR, fixed: Same as R-112	Corrects AC calibration on amplifier for 12, 30 and 120 volts		
R-114	R16-R-18756-600	RESISTOR, fixed: Composition; 250,000 ohms ±1%; 1/2 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy; low temperature coefficient ceramic tube type	300 volt section of voltage multiplier divider	Weston D-112378	Weston part D-112378

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
R-114**	R-16-4-17353-3-5000	RESISTOR, fixed: Deposited metal film; 250,000 ohms, ±1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	300 volt section of voltage multiplier dicider	Continental Carbon Inc Type X-2	RCP-375-1-5-154
R-114++	R16-R-17353-3-5000	RESISTOR, fixed: Deposited metal film; 250,000 ohms, ± 1%, 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	300 volt section of voltage multiplier divider	Continental Carbon Inc Type X-2	Chicago Ind' Inst. Co. part D-112378
R-115	R16-R-18758-300	RESISTOR, fixed: Composition; 37.5,000 ohms ±1%; 1/2 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy: low temperature coefficient ceramic tube type	120 volt section of voltage multiplier divider	Weston D-122096	Weston part D-122096
R-115**	R16-R-17354-12-105	RESISTOR, fixed: Deposited metal film; 15,000 ohms ±1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant, 2 radial wire leads; axial clearance hole for #6 screw for mtg	120 volt section of voltage multiplier divider	Continental Carbon Inc. Type X-2	RCP-375-1-5 155
R-115++	#	RESISTOR, fixed: Metal film; 375,000 ohms ±1%; 2 W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	120 volt section of voltage multiplier divider	Continental Carbon Inc. Type X-2	Chicago Ind. Inst. Co. part D-122096
R-116	R16-R-18759-186	RESISTOR, fixed: Composition; 625,000 ohms ±1%; 1/2 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating;	Part of diode balancing network for 120 volt AC range	Weston D-122097	Weston part D-122097

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	*Army Stock No. Navy Stock No.*	*Name of Part and Description*	*Function*	*Mfr. & Desig. or AWS Type*	*Cont. or Govt. Dwg. or Spec. No.*
		two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type			
R-116**	R16-R-17362-13-250	RESISTOR, fixed: Deposited metal film; 625,000 ohms, ±1%; 2W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated; moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	Part of diode balancing network for 120 volt AC range	Continental Carbon Inc. Type X-2	RCP-375-1-5-156
R-116++	R-16-R-17362-13-250	RESISTOR, fixed: Metal film; 625,000 ohms, ±1%; 2W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	Part of diode balancing network for 120 volt AC range	Continental Carbon Inc. Type X-2	Chicago Ind. Inst. Co. part D-122097
R-117	R16-R-18763-500	RESISTOR, fixed: Composition; 1.875 meg ±1 1/2%; 0.3 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	30 volt section of voltage multiplier divider	Weston D-122035	Weston part D-122095
R-117**	R16-R-17390-250	RESISTOR, ~~fixed: Deposited metal~~ film; 1.875 meg-ohms, ±1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw mtg	30 volt section of voltage multiplier divider	Continental Carbon Inc Type X-2	RCP-375-1-6-88
R-117++	R16-R-17390-250	RESISTOR, fixed: Metal film; 1.875 meg-ohms ±1%; 2W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating;	30 volt section of voltage multiplier divider.	Continental Carbon Inc Type X-2	Chicago Ind. Inst. Co. D-122095

** Contracts N383s-30174, 36339, 38158, 45654   * Contract NObsr-30009   † Contract NOa(S)-9616   †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
		wire leads; protected by layer of vitreous enamel; stability of wire wound.			
R-118	R16-R-18763-500	RESISTOR, fixed: Same as R-117	Part of diode balancing network for 30 volts AC range		
R-118**	R16-R-17390-250	RESISTOR, fixed: Same as R-117**	Part of diode balancing network for 30 volts AC range		
R-119	R16-R-18764-500	RESISTOR, fixed: Composition; 3.75 meg ±1 1/2%; 0.15 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	12 volt section of voltage multiplier divider	Weston D-122094	Weston part D-122094
R-119**	R16-R-17459-400	RESISTOR, fixed: Deposited metal film; 3.75 megohms, ±1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	12 volt section of voltage multiplier divider	Continental Carbon, Inc. Type X-2	RCP-375-1-6-89
R-119++	R16-R-17459-400	RESISTOR, fixed: Metal film, 3.75 megohms; ±1%; 2 W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	12 volt section of voltage multiplier divider	Continental Carbon, Inc. Type X-2	Chicago Ind. Inst. Co. part D-122094
R-120	R16-R-18764-500	RESISTOR, fixed: Same as R-119	Part of diode balancing network for 12 volt AC range		
R-120**	R16-R-17459-400	RESISTOR, fixed: Same as R-119**	Part of diode balancing network for 12 volt AC range		

** Contracts N383s-30174, 36839, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U — **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	*Army Stock No. Navy Stock No.*	*Name of Part and Description*	*Function*	*Mfr. & Desig. or AWS Type*	*Cont. or Govt. Dwg. or Spec. No.*
R-121	R16-R-18770-930	RESISTOR, fixed: Composition; 18.75 meg ±2%; 0.015 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	1.2 and 3 volt section of voltage multiplier divider	Weston D-122093	Weston part D-122093
R-121**	R16-R-17567	RESISTOR, fixed: Deposited metal film; 18.75 megohms, ±1%, 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	1.2 and 3 volt section of voltage multiplier divider	Continental Carbon, Inc. Type X-2	RCP-375-1-6-78
R-121††	R16-R-17567	RESISTOR, fixed: Metal film; 18.75 megohms ±1%; 2 W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	1.2 and 3 volt section of voltage multiplier divider	Continental Carbon, Inc. Type X-2	Chicago Ind. Inst. Co. part D-122093
R-122	R16-R-18770-930	RESISTOR, fixed: Same as R-121	Part of diode balancing network for the 1.2 and 3 volt AC ranges.		
R-122**	R16-R-17567	RESISTOR, fixed: Same as R-121**	Part of diode balancing network for the 1.2 and 3 volt AC ranges		
*R-123	R16-R-18701-150	RESISTOR, fixed: Wire wound; 25,000 ohms ±1/2%; 1/4 W, maximum operating temperature 55° C, 0.55" diam x 1/2" lg; moisture resistant wax; brass end flanges form extended eyelet terminals; mt by single hole through center for 1/10" diam screw; Weston type #139 spool	Determines DC amplifier sensitivity	Weston D-122121	Weston part D-122121

** Contracts N383s-30174, 38839, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U — **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
R-124	R16-R-18691-750	RESISTOR, fixed: Wire wound; 16,670 ohms ±1/2%; 1/4 W, maximum operating temperature 55° C, 0.55" diam x 1/2" lg; moisture resistant wax; brass end flanges form extended eyelet terminals; mt by single hole through center for 1/10" diam screw; Weston type #139 spool	Determines calibration on 3 volt AC range	Weston D-122122 JAN RB10B16671D	Weston part D-122122 JAN R-93
R-124††	R16-R-18691-750	RESISTOR, fixed: Wire wound; 16,670 ohms ±1/2%	Determines calibration on 3 volt AC range	JAN RB 10B 16671D	JAN R-93
R-125	R16-R-18689-50	RESISTOR, fixed: Wire wound; 14,000 ohms ±1/2%; 1/4 W, maximum operating temperature 55° C, 0.55" diam x 1/2" lg; moisture resistant wax; brass end flanges form extended eyelet terminals; mt by single hole through center for 1/10" diam screw; Weston type #139 spool	Determines in conjunction with R-109 sensitivity of 1.2 volt AC range	Weston D-122123 JAN RB10B14001D	Weston part D-122123 JAN R-93
R-125††	#	RESISTOR, fixed: Wire wound 14,000 ohms ±1%	Determines in conjunction with R-109 sensitivity of 1.2 volt AC range	JAN RB10B14001F	JAN R-93
R-126	R16-R-17493	RESISTOR, fixed: Composition; 5.1 meg ±5%; 1/2 W; characteristic F; 13/32" lg x 1/8" diam (note body diam must not be larger than 0.14"); insulated, moisture resistant	Isolating resistor in DC probe	International Resistance Co. type BTS	Weston part ND-24142
R-126**	R16-R-17493-500	RESISTOR, fixed: Composition; 5.1 megohms ±5%; 1/2 W	Isolating resistor in DC probe	JAN RC20BF515J	JAN R-11
R-126††	R16-R-17493-500	RESISTOR, fixed: Composition; 5.1 megohms ±5%; 1/2 W	Isolating resistor in DC probe	JAN RC20BF515J	JAN R-11 Chicago Ind. Inst. Co. part ND-24142
R-127	R16-R-17493	RESISTOR, fixed: Same as R-126	Isolating resistor in AC probe		

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6.3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec.No.
R-127**	R16-R-17493-500	RESISTOR, fixed: Same as R-126**	Isolating resistor in AC probe		
R-128	R16-R-18648-35	RESISTOR, fixed: Wire wound; 500 ohms ±5%	Heater to keep moisture out when instrument is turned off	JAN RW31G501	JAN R-26
R-129	R16-R-18648-35	RESISTOR, fixed: Same as R-128	Same as above		
R-130	R16-R-17256-55-50	RESISTOR, fixed: Composition; 10 ohms; ± 20%	Reduce brightness of "ON" lamp	JAN RC20AE100M	JAN R-11
R-130**	R16-R-17256-55-60	RESISTOR, fixed: Composition; 10 ohms; ±20%; 1/2 W	Reduce brightness of "ON" lamp	JAN RC20BF100M	JAN-R-11
†R-131	#	RESISTOR, variable: Wire wound 2,000 ohms ±10%; 2 W; 100°C max continuous oper; 3 solder lug term; metal enclosed molded phenolic base 1 1/8" diam x 9/16" d; round metal slotted shaft 1/4" diam x 1/8" lg from mtg surface; A taper, insulated contact arm; high torque; bushing 3/8"-32 x 3/8" lg	Fine adjustment for amplifier output	Clarostat Series 43-HT	Weston part ND-24547
R-131**	R16-P-6893-850	RESISTOR, variable: Same as R-131	Fine adjustment for amplifier output	Clarostat 43W-HT Alternate JAN RA20A2S A202AK	RCP-375-4-105 JAN R-19
R-131††	R16-P-6894-850	RESISTOR, variable: Wire wound; 2 W; 2000 ohms ±10%	Fine adjustment for amplifier output	JAN RA20A2SA 202AK	JAN R 19
†R-132	#	RESISTOR, fixed: Wire wound 23,000 ohms ±1/2%; 1/4 W, max operating temperature 55° C, 0.55" diam x 1/2" lg; moisture resistant wax; brass end flanges form extended eyelet terminals; mt by single hole through center for 1/10" diam screw Weston type #139 spool	Partially determines amplifier sensitivity	Weston D-125889	Weston part D-125889

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60764, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
R-132**	R16-R-18701-143	RESISTOR, fixed: Wire wound 23,000 ohms ±1/2%; 1/4 W	Partially determines amplifier sensitivity	JAN RB10B23001D	JAN R-93
R-132††	#	RESISTOR, fixed: Wire wound 1/2 W; 23,000 ohms ±1%	Partially determines amplifier sensitivity	JAN RB10B23001F	JAN R-93
†R-133	#	RESISTOR, fixed: Composition; 9 meg ±2%; 0.05 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Part of AC diode balancing network	Weston D-108962	Weston part D-108962
R-133**	R-16-R-17540-5000	RESISTOR, fixed: Deposited metal film; 9 megohms, ±1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	Part of AC diode balancing network	Continental Carbon, Inc. Type X-2	RCP-375-1-6-90
R-133††	R-16-R-17540-5000	RESISTOR, fixed: Metal film, 9 megohms ±1%; 2 W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	Part of AC diode balancing network	Continental Carbon Inc. Type X-2	Chicago Ind. Inst. Co. part D-108962
†R-134	#	RESISTOR, variable: Composition 2 megohms, ±20%; 0.25 W; 100° C max continuous oper; 3 solder lug term; metal enclosed molded phenolic base 1 1/8" diam x 9/16" d; roundmetal slotted shaft 1/4" diam x 1/8" lg from mtg surface; A taper; insulated contact arm; high torque; bushing 3/8"-32 x 3/8" lg	Part of AC diode balancing network	Clarostat Series 37	Weston part ND-24546
R-134**	R16=P-5397-60	RESISTOR, variable: Same as R-134.	Part of AC diode balancing network	Clarostat Type 37W-HT	RCP-375-4-112

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
R-134++	#	RESISTOR, variable: Composition, 2 megohms ±20%; 1/3 W; 3 solder lug term; metal enclosed molded phenolic base 15/16" diam x 9/16" depth; round metal slotted shaft 1/4" diam x 1/8" lg from mtg surfaces; straight taper; insulated contact arm; split bushing for locking shaft	Part of AC diode balancing network	International Resistance Co. Type "Q"	Chicago Ind. Inst Co. part ND-24546
+R-135	#	RESISTOR, fixed: Composition; 15,000,000 ohms ±10%; 1/2 W	Part of AC diode balancing network	JAN RC20AE156K	JAN R-11
R-135**	R16-R-17384-500	RESISTOR, fixed: Composition; 15,000,000 ohms ±10%; 1/2 W	Part of AC diode balancing network	JAN RC20BF156K	JAN R-11
+R-136	#	RESISTOR, fixed: Same as R-135	Corrects AC calibration on 12, 30 and 120 volts		
R-136**	R16-R-17384-500	RESISTOR, fixed: Same as R-135**	Corrects AC calibration on 12, 30 and 120 colts		
S-101	R16-S-10730-50	SWITCH, toggle: SPDT; 3A, 250 volts or 6A, 125 volts; bakelite case; 1 5/32" lg x 11/16 wd x 15-16" deep overall; 3/4" lg bat handle; back connected solder terminals; mts by single clearance hole for 15/32"-32 thd x 13-32" lg bushing	To turn off vacuum tube voltmeter and turn on internal heater	AH&H type 81021-Fj	Weston part D-112452
S-101**	R17-S-25863-50	SWITCH, toggle; SPDT; 5 amps, 125 volts	To turn off vacuum tube voltmeter and turn on internal heater	AHH-82303-B JAN ST-12D	JAN-S-23
S-101++	R16-S-10730-50	SWITCH, toggle: SPDT; 3A, 250 volts or 6A, 125 volts; bakelite case, 1 5/32" lg x 11/16" wd x 15/16" deep overall; 3/4" lg bat handle; back connected solder terminals; mts by single clearance hole for 15/32"-32 thd x 13/32" lg bushing	To turn off vacuum tube voltmeter and turn on internal heater	AH&H Type 81021-Fj	Chicago Ind. Inst. Co. part D-112452

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U | **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
S-102	R16-S-11292-590	SWITCH, rotary: 3 pole 5 position; 2 decks; solid silver alloy; phenolic decks; 1 7/8" diam x 1"; solder terminals; single hole mtg bushing 3/8"-32 x 1/4" lg	Range switch	Oak Mfg. Co. special for Weston	Weston part D-122112
S-102**	R16-S-11292-590	SWITCH, rotary: Same as S-102.	Range switch	OAK-34344-H2	RCP-375-3-91
S-102++	R16-S-11292-590	SWITCH, rotary: Same as S-102.	Range switch	OAK-34344-H2	Chicago Ind. Inst. Co. part D-122112
S-103	R16-S-11279-529-500	SWITCH, rotary: 4 pole 3 position; 1 deck; solid silver alloy contacts; phenolic decks; 1 7/8" diam x 13/16" d; solder terminals; single hole mtg bushing 3/8"-32 x 1/4" lg	Selects AC volts +DC volts or -DC volts	Oak--special for Weston	WE-D-122109
S-103**	R16-S11279-529-500	SWITCH, rotary: Same as S-103	Selects AC volts +DC volts or -DC volts	Oak-34343-H1	RCP-375-3-92
S-103++	R16-S11279-529-500	SWITCH, rotary: Same as S-103	Selects AC volts -DC volts or -DC volts	Oak-34343-H1	Chicago Ind. Inst. Co. part D-122109
T-101	R17T-7218-150	TRANSFORMER, power: Filament and plate type; 115 volts, 50 to 1600 cyc; 3 output windings; Sec #1, 500 v at 10 ma CT; impr petroleum residue compound and then potted; enclosed metal case; metal case without terminals 3.12" lg x 2.62" wd x 2.75" deep; 9 active and 4 dummy solder terminals mtd on a line intersecting the mtg bolts and are one 1/2 mtg-c; four 0.173" diam holes on 2 1/2" x 2" mtg-c; diagram Weston dwg D-121995	Supplies power to filaments and plates	Weston D-121994	Weston part D-121994

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec.No.
T-101**	R16-T-6680-30	TRANSFORMER, power: Plate and filament type; primary 115 volts 50-1600 cycles; 3 output winding, sec'd #1-500V CT 10 ma, sec'd #2--5 volts 2.5 amps, sec'd #3--6.3 volts, 2.5 amps, vacuum varnish impregnated; hermetically sealed metal case; 3.12" lg x 2.62" wd x 2.72" h; 9 active and 4 dummy terms mtd on bottom of case; four 8-32 tapped mtg holes on 2 1/2" x 2" mtg/c	Supplies power to filament and plates	Industrial Trans. Co. special for RCP	RCP-375-25-83
T-101++	#	TRANSFORMER, power: Filament and plate type; 115 volts 50 to 1600 cycles primary; 3 secondary windings; Sec #1, 500V at 10 ma CT; Sec #2, 6.3V at 2A; Sec #3, 5V at 2A; Built according to MIL-T-27, Grade 1; 3.12" lg x 2.62" wd x 2.75" deep; four mtg studs on 2 1/2 x 2" mtg/c	Supplies power to filament and plates	United Transformer Co. special for Chicago Ind. Inst. Co.	Chicago Ind.Inst. Co.part D-121994
V-101	N16T-56665	TUBE, electron	DC input voltage amplifier	JA -6SJ7	JAN-1A
V-102	N16T-56665	TUBE, electron: Same as V-101	Balancing section of input of DC amplifier		
V-103++	N16T-56677	TUBE, electron	Output of DC amplifier	JAN 6SL7	JAN 1A
V-103	N16T-56677	TUBE, electron	Output of DC amplifier	JA -6SL7-GT	
V-104	N16T-55735	TUBE, electron: Rectifier	Supplies DC potential to tubes	RMA 5Y3-GT	Weston part ND-23411
V-104**	N16T-55735	TUBE, electron: Full wave rectifier.	Supplies DC potential to tubes	JA -5Y3-GT	JA -1A
V-104++	N16T-55735	TUBE, electron	Supplies DC potential to tubes	JAN-5Y3-GT	JAN-1A
V-105	N16T-69910	TUBE, electron:	Regulates voltage to cathode on pin 8 of V-103	JAN-991 (NE-16)	JA 1A

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-1. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U | MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
V-106	N16T-69910	TUBE, electron: Same as V-105.	Regulates voltage to cathode on pin 3 of V-103		
V-107	N16T-66065	TUBE, electron: Diode, cathode type	RF diode in AC probe	Raytheon CK-606-BX	Weston part ND-24145
V-107++	N16T-66065	TUBE, electron: Diode, cathode type	RF diode in AC probe	Raytheon CK-606-BX	Chicago Ind.Inst. Co. part ND-24145
V-108	N16T-66065	TUBE, electron: Same as V-107	Balancing diode for V-107		
X-101	R16S-6188-10	SOCKET, tube: 8 contact octal; retainer ring mounting; 1.172" diam chassis cutout required; round molded bakelite body 1 1/4" diam x 7/16" h excluding terminals; phosphor bronze silver plated contacts	Socket for V-101	Amphenol type S-8M	Weston part ND-21620 RCP-375-14-8
X-101++	#	SOCKET, tube: 8 contact octal; retainer ring mounting; 1.172" diam chassis cutout required; round molded low loss bakelite body; 1 1/4" diam x 7/16" h excluding terminals; phosphor bronze silver plated contacts	Socket for V-101	Amphenol part 78-S8TM	Chicago Ind.Inst. Co. part ND-21620
X-102	R16S-6188-10	SOCKET, tube: Same as X-101	Socket for V-102		
X-102++	#	SOCKET, tube: Same as X-101++			
X-103	R16S-6188-10	SOCKET, tube: Same as X-101	Socket for V-103		
X-103++	#	SOCKET, tube: Same as X-101++			
X-104	R16S-6188-10	SOCKET, tube: Same as X-101	Socket for V-104		
X-104++	#	SOCKET, tube: Same as X-101++			
X-105	R17H-5974-150	SOCKET, tube: 2 contact bayonet; one piece saddle mounting; two 1/8" mtg holes on 1 1/8" mtg-c, 13/16" diam chassis cutout re-	Socket for V-105	J.H.Millen type 33991	Weston part ND-24175 RCP-375-14-53

** Contracts N383s-30174, 36339, 38158, 45654 * [redacted] † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec.No.
		quired round nickel plated brass body, 25/32" diam x 1 3/16" h excluding terminals; brass button contacts			
X-105++	#	SOCKET, tube: 2 contact bayonet; two; 1.40" mounting holes on 1 1/8" mtg/c; round nickel plated body; 43/64" diam x 29/32" high; two color coded leads cut to correct length	Socket for V-105	Drake Mfg.Co. special for Chicago Ind. Inst. Co.	Chicago Ind. Inst. Co. part ND-24175
X-106	R17H-5974-150	SOCKET, tube: Same as X-105	Socket for V-106		
X-106++	#	SOCKET, tube: Same as X-105++			
F-101	R17F-14240	FUSE, cartridge: 1 amp, opens in 1 second at 200% load, rated continuous at 135 and 110% load; 250 v; one time; glass body; 2 nickel plated brass ferrule terminals; 1 1/4" lg x 1/4" diam; NEC terminals	Line fuse	Little fuse Style 3AG part 312001 Bussman type 3AG	Weston part ND-19540 RCP-375-31-1
F-101++	#	FUSE, cartridge; 1 amp, carry 110% open at 135% in 1 hour; 250V; one time; glass body; 2nickel plated brass ferrule terminals; 1 1/4" lg x 1/4" diam	Line fuse	Bussman Mfg. Co. type A.G.C.-1	Chicago Ind. Inst. Co. part ND-19540
F-102	R17F-14240	FUSE, cartridge: Same as F-101	Line fuse		
O-101	R16WS-122077	CLIP: Round grounding clip for AC probe; nickel plated phosphor bronze; 3/4" diam x 1.18" lg overall	Ground clip for AC probe	Weston D-122077 RCP-375-50-5	Weston part D-122077 RCP-375-50-5
O-101++	R16WS-122077	CLIP: Same as O-101	Ground clip for AC probe	Chicago Ind. Inst. Co. D-122077	Chicago Ind. Inst. Co. part D-122077
O-102	R17C-12190-10	CLIP, Alligator: for making temporary electrical connections; cadmium plated steel; 2" lg x 1/4" wd x 3/8" h overall; one solder lug connection; 3/8" jaw opening	Extra clip for making up a lead	Amer Rad Hdwe #45AT Mueller #60	Weston part ND-22010 RCP-375-13-70

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

TABLE 6.3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec.No.
O-102++	R17C-12190-10	CLIP, Alligator: Same as O-102	Extra clip for making up a lead	Mueller Electric Co. Series 60	Chicago Ind. Inst. Co. part ND-22010
W-101	R15C-36230	CABLE ASSEMBLY, power: Type SJ; two #16 AWG stranded conductors; 250 working volts; 8 ft long; one end of cable terminated with Belden #H-715 rubber plug; other end terminated with Belden #H-1038 motor connector	Line Cord	Belden per Weston D-66187	Weston part D-66187
W-101**	#	CABLE ASSEMBLY, power: Type SJ, 7 ft incl terminations; molded rubber male plug one end, molded rubber female plug other end	Line Cord	Cords Ltd #353-1	RCP-375-28-52
W-101++	#	CABLE ASSEMBLY, power: Type SJ; two #16 AWG stranded conductors; 250 working volts; 8 ft. long; one end of cable terminated with Belden #H-1047 rubberplug, other end terminated with Belden #H-1289 motor connector	Line Cord	Belden Mfg. Co. per Chicago Ind. Inst. Co. D-66187 Cord Cx-337/U	Chicago Ind Inst. Co. part D-66187
W-102	R16-6-4883-260	LEAD, test: #20 stranded tinned copper, 40 strands of #36; red rubber covered; 1,000 volts max; 1/32" wall rubber; 52" lg excluding terminals; Weston test prod, bushing and sleeve parts D-66383; D-65784 and D-65781 on one end, Weston spade terminal and sleeve parts D-79652 and D-79653 at other end.	To make connections from circuit under test to binding posts	Weston D-79650	Weston part D-79650
W-102**	#	LEAD, test: #20 AWG tinned copper wire; stranded, 40 strands #36 wire, red rubber covered, 1000 V max; 52" lg excl term; test prod and tip one end; #10 spade lug other end	To make connections from circuit under test to binding posts	RCP #903SR	RCP #903SR

** Contracts N383s-30174, 36339, 38158, 45654   * Contract NObsr-30009   † Contract NOa(S)-9616   †† Contracts N383s-60744, NOa(S)-12224

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U **MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES**

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or AWS Type	Cont. or Govt. Dwg. or Spec. No.
W-102++	3E 6000-529	LEAD, test: #18AWG stranded tinned copper conductor, c/o 65# 36 AWG strands covered w/thermoplastic, w/protective sleeve of cellulose acetate tubing; 4 ft lg o/a; tipat one end for accom. Mueller type, 60 alligator clip or equivalent and tip at other end to fit desired jack or binding post. One red rubber covered lead.	To make connections from circuit under test to binding posts	Cord Cx-529/U Assembly	Govt. Dwg. #SC-C-10414
W-103	R16-6-4883-270	LEAD, test: #20 stranded tinned copper; 40 strands of #36; black rubber covered; 1,000 volts max; 1/32" wall rubber; 52" lg excluding terminals; Weston test prod, bushing and sleeve parts D-66383, D-65784 and D-65781 on one end, Weston spade terminal and sleeve parts D-79652 and D-79653 at other end	To make connections from circuit under test to binding posts	Weston D-79651	Weston part D-79651
W-103**	#	LEAD, test: #20 AWG tinned copper wire; stranded, 40 strands #36 wire, black rubber covered, 1000 V max; 52" lg excl term; test prod and tip one end; #10 spade lug other end	To make connections from circuit under test to binding posts	RCP #903SB	RCP #903SB
W-103++	3E 6000-529	LEAD, test: #18 AWG stranded tinned copper conductor, c/o 65 #36 AWG strands, covered with thermo plastic, w/protective sleeve of cellulose acetate tubing; 4 ft. lg o/a; tip at one end for accom. Mueller type 60 alligator clip or equivalent and tip at other end to fit desired jack or binding post. One black rubber covered lead.	To make connections from circuit under test to binding posts	Cord Cx-529/U Assembly	Govt. Dwg. #SC-C-10414

** Contracts N383s-30174, 36339, 38158, 45654 * Contract NObsr-30009 † Contract NOa(S)-9616 †† Contracts N383s-60744, NOa(S)-12224

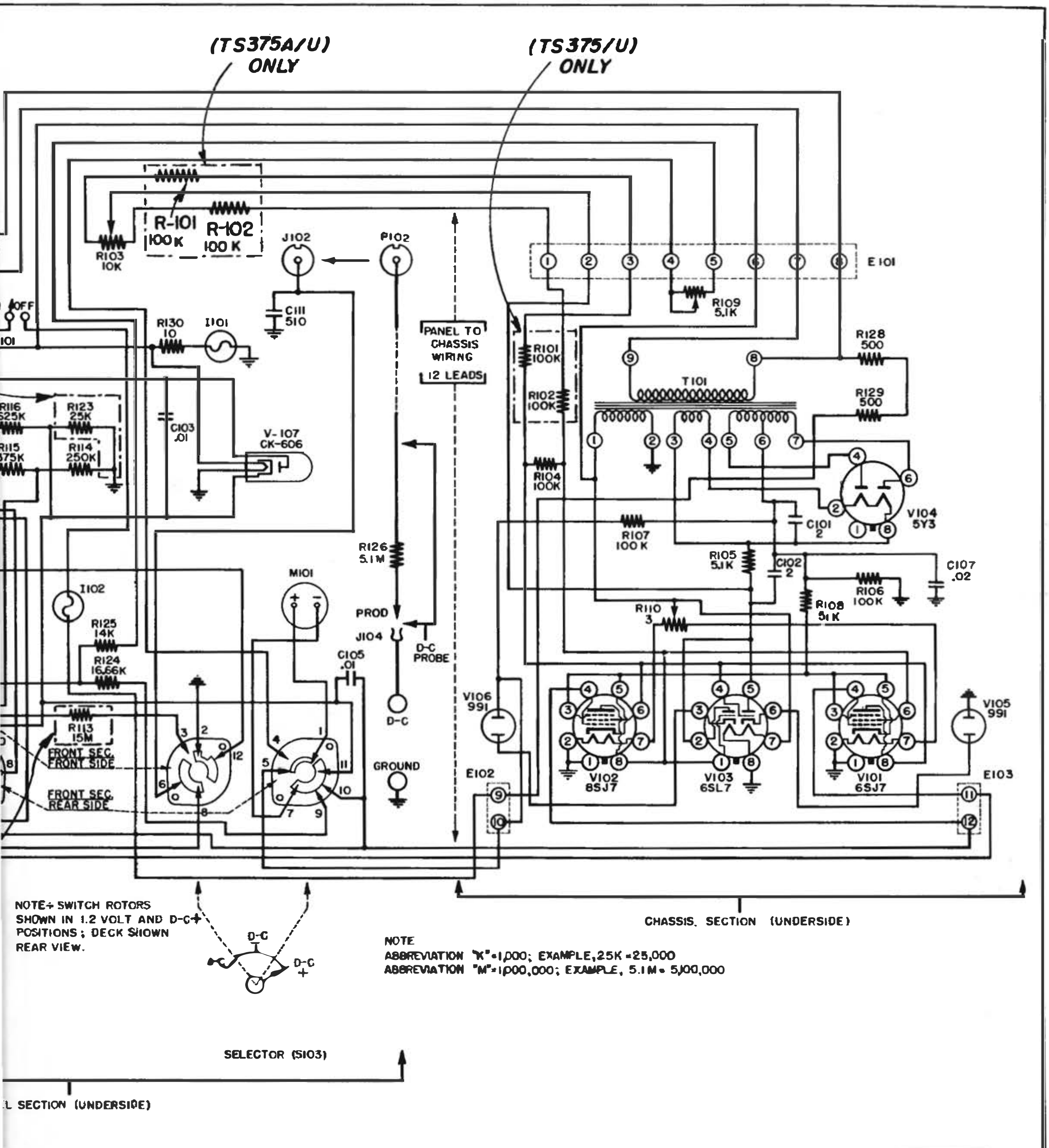
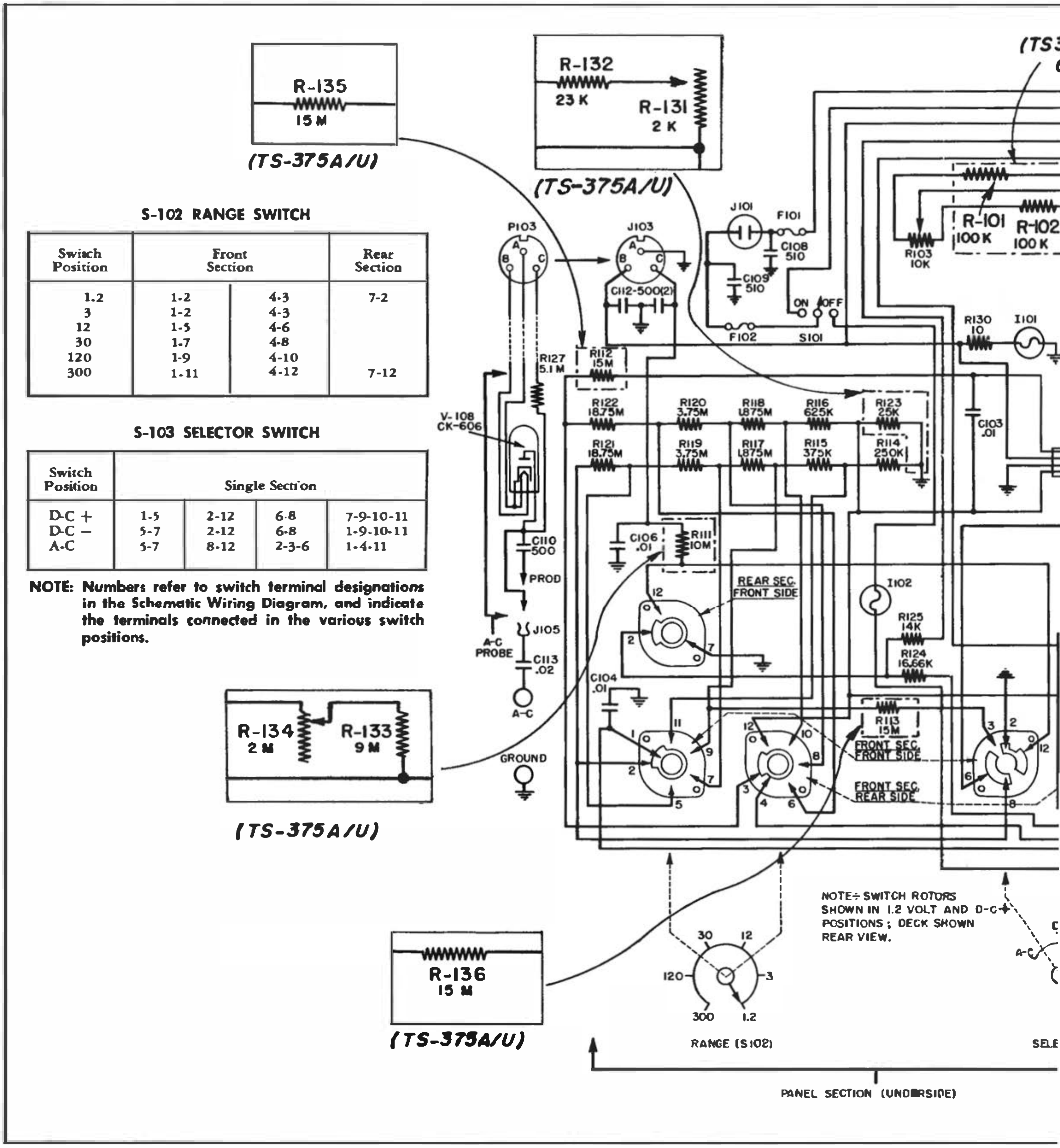


Figure 7-1 Voltmeters TS-375/U and TS-375A/U, Complete Schematic



S-102 RANGE SWITCH

Switch Position	Front Section		Rear Section
1.2	1-2	4-3	7-2
3	1-2	4-3	
12	1-5	4-6	
30	1-7	4-8	
120	1-9	4-10	
300	1-11	4-12	7-12

S-103 SELECTOR SWITCH

Switch Position	Single Section			
D-C +	1-5	2-12	6-8	7-9-10-11
D-C −	5-7	2-12	6-8	1-9-10-11
A-C	5-7	8-12	2-3-6	1-4-11

NOTE: Numbers refer to switch terminal designations in the Schematic Wiring Diagram, and indicate the terminals connected in the various switch positions.

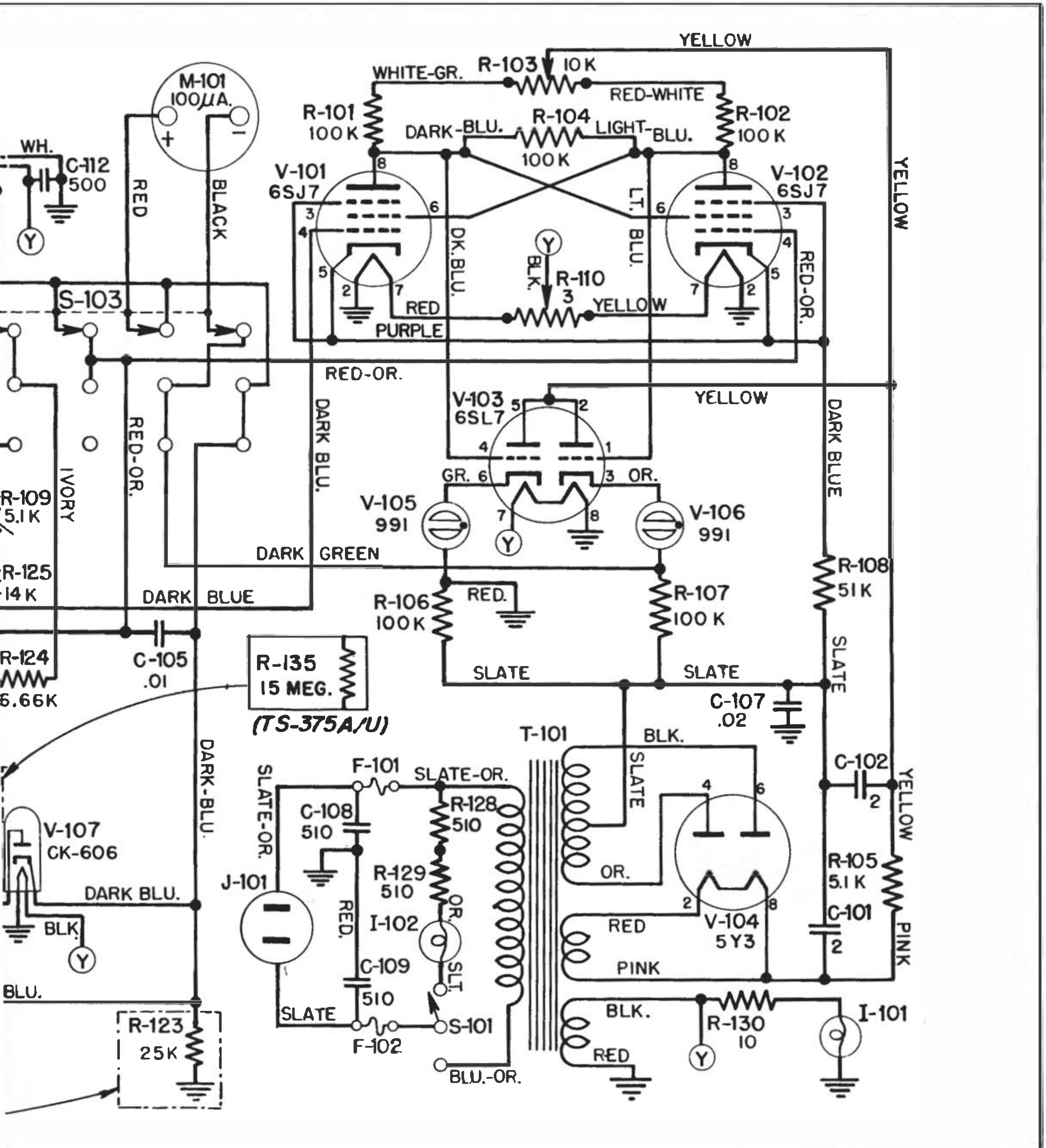
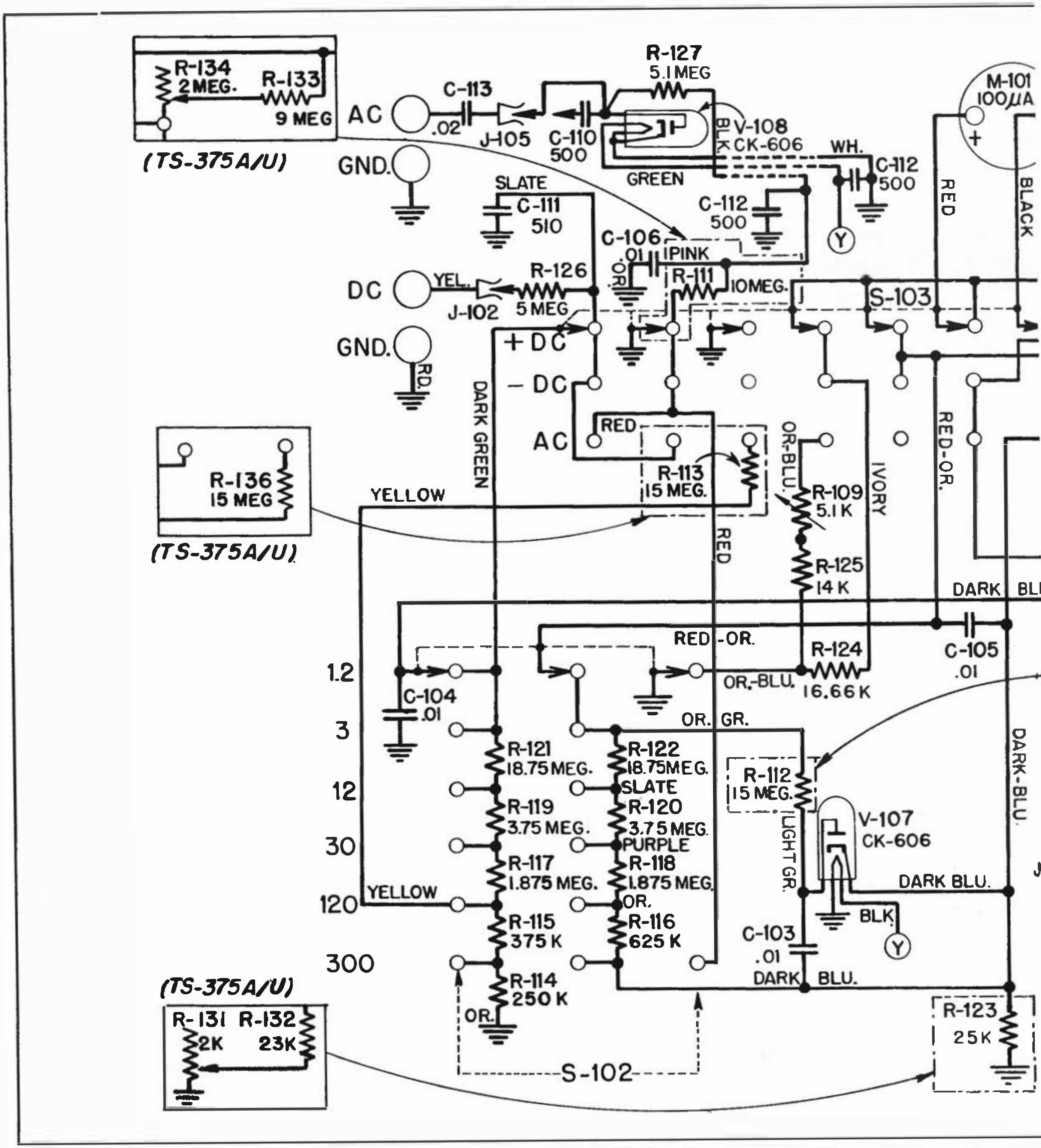


Figure 7-2 Voltmeters TS-375/U and TS-375A/U, Practical Wiring Diagram


R-134
2 MEG.
R-133
9 MEG
(TS-375A/U)
AC
C-113
.02
J-105
C-110
500
R-127
5.1 MEG
V-108
CK-606
BLK.
WH.
GREEN
C-112
500
M-101
100µA
GND.
SLATE
C-111
510
C-106
.01
PINK
OR.
R-111
10 MEG.
S-103
RED
BLACK
DC
YEL.
J-102
R-126
5 MEG
+ DC
– DC
GND.
RD.
DARK GREEN
RED
R-113
15 MEG.
OR-BLU.
R-109
5.1 K
IVORY
RED-OR.
R-136
15 MEG
(TS-375A/U)
YELLOW
R-125
14 K
DARK BLU
RED -OR.
R-124
16.66 K
C-105
.01
1.2
C-104
.01
OR.-BLU.
3
OR. GR.
R-121
18.75 MEG.
R-122
18.75 MEG.
R-112
15 MEG.
12
R-119
3.75 MEG.
SLATE
R-120
3.75 MEG.
V-107
CK-606
30
R-117
1.875 MEG.
PURPLE
R-118
1.875 MEG.
LIGHT GR.
DARK-BLU.
120
YELLOW
R-115
375 K
OR.
R-116
625 K
DARK BLU.
BLK
C-103
.01
300
R-114
250 K
DARK BLU.
(TS-375A/U)
R-131
2K
R-132
23K
OR.
S-102
R-123
25K

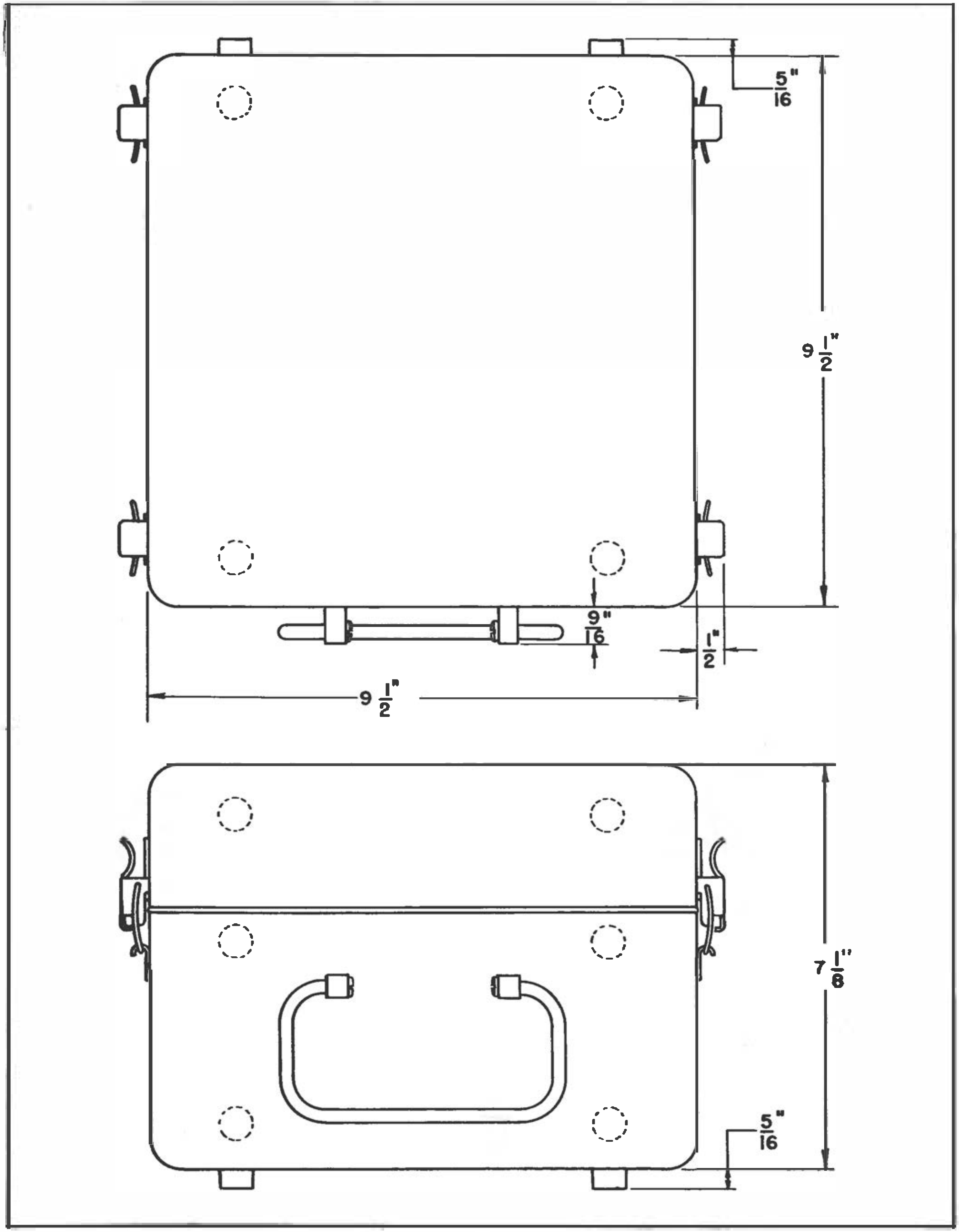


Figure 7–3. Voltmeters TS-375/U and TS-375A/U, Dimensional Drawing

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Maintenance Instructions

VOLTMETERS TS-375/U AND TS-375A/U

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE
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15 April 1952
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In the event of malfunctioning, unsatisfactory design or unsatisfactory installation of any of the component units of this equipment, or if the material contained in this book is considered inadequate or erroneous, an Unsatisfactory Report, AAF Form No. 54 or a report in similar form shall be submitted in accordance with the provisions of Army Air Force Regulation No. 15-54, listing:

1. Station and organization.
2. Nameplate data (type number or complete nomenclature if nameplate is not attached to the equipment).
3. Date and nature of failure.
4. Radio model and serial number.
5. Remedy used or proposed to prevent recurrence.
6. Handbook errors or inadequacies, if possible.

FOR U. S. NAVY PERSONNEL

Report of failure of any part of this equipment during its guaranteed life shall be made on Form NAVAER 4112 "Report of Unsatisfactory or Defective Material," or a report in similar form, and forwarded in accordance with the latest instructions of the Bureau of Aeronautics. Such reports of failure shall include:

1. Reporting activity.
2. Nameplate data.
3. Date placed in service.
4. Part which failed.
5. Nature and cause of failure.
6. Remedy used or proposed to prevent recurrence.

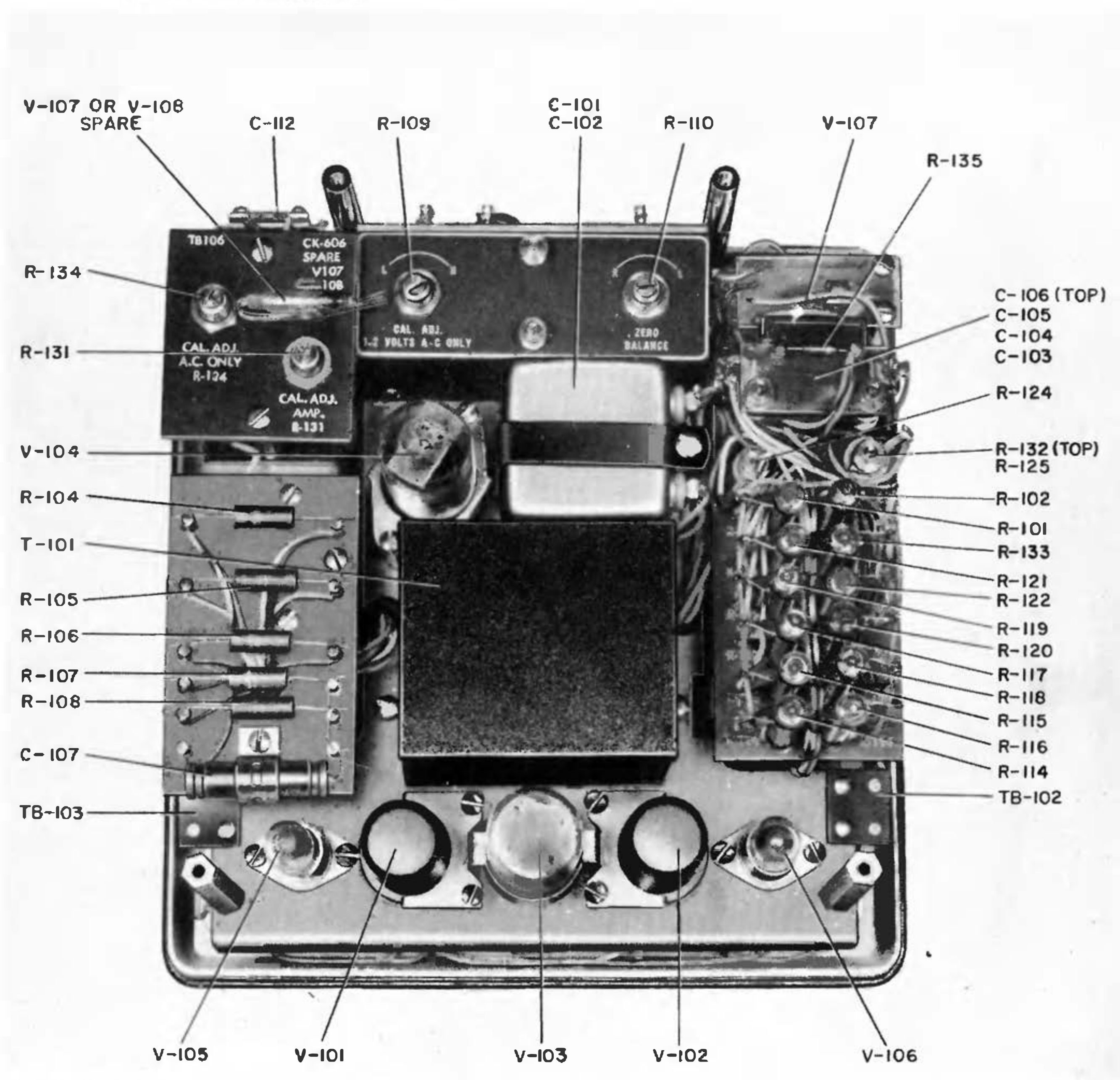


Figure 5-1B. Voltmeter TS-375A/U, Contract N383s-70996, Internal Rear Oblique View

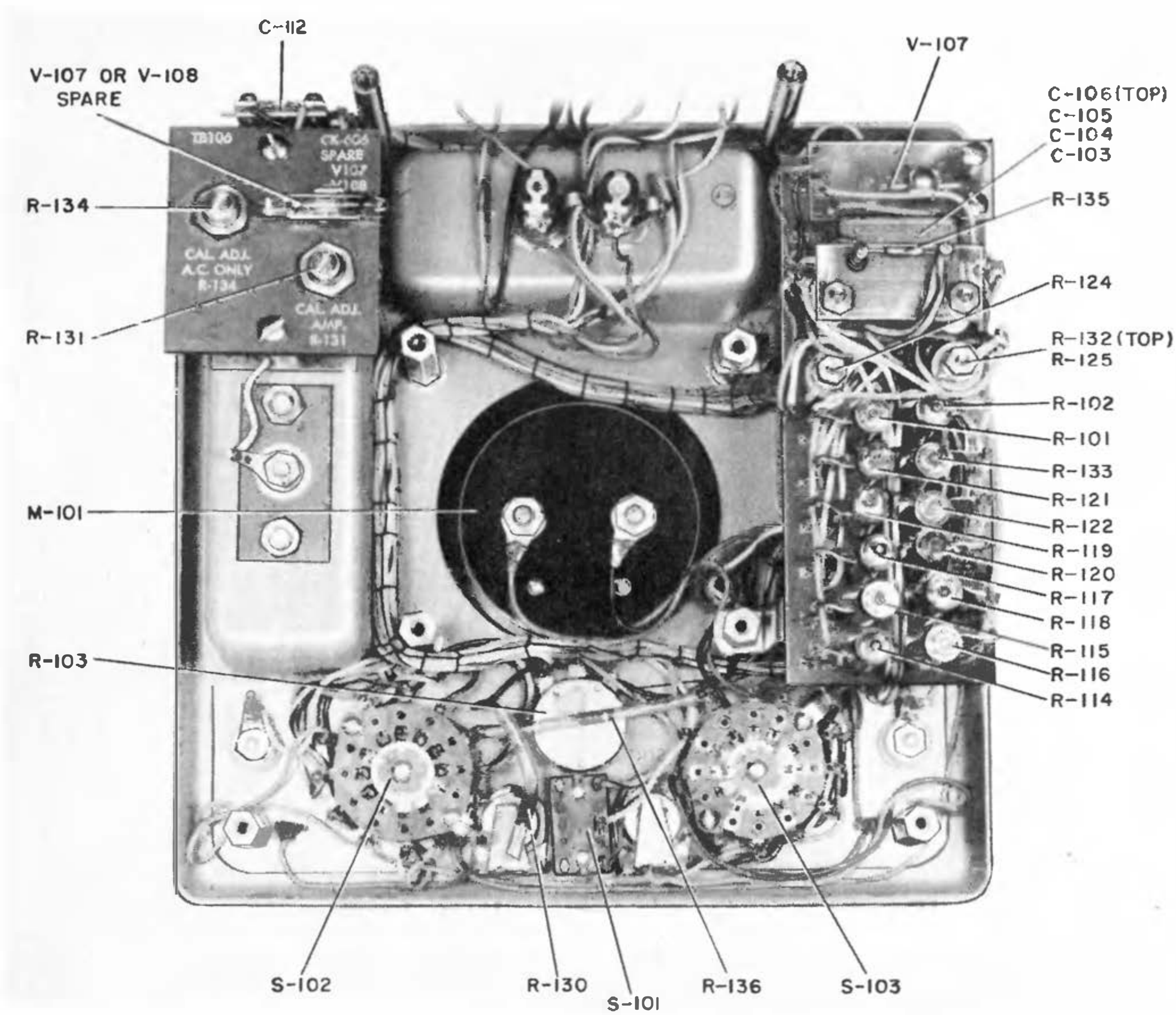


Figure 5-2B. Voltmeter TS-375A/U, Contract N383s-70996, Panel Underside

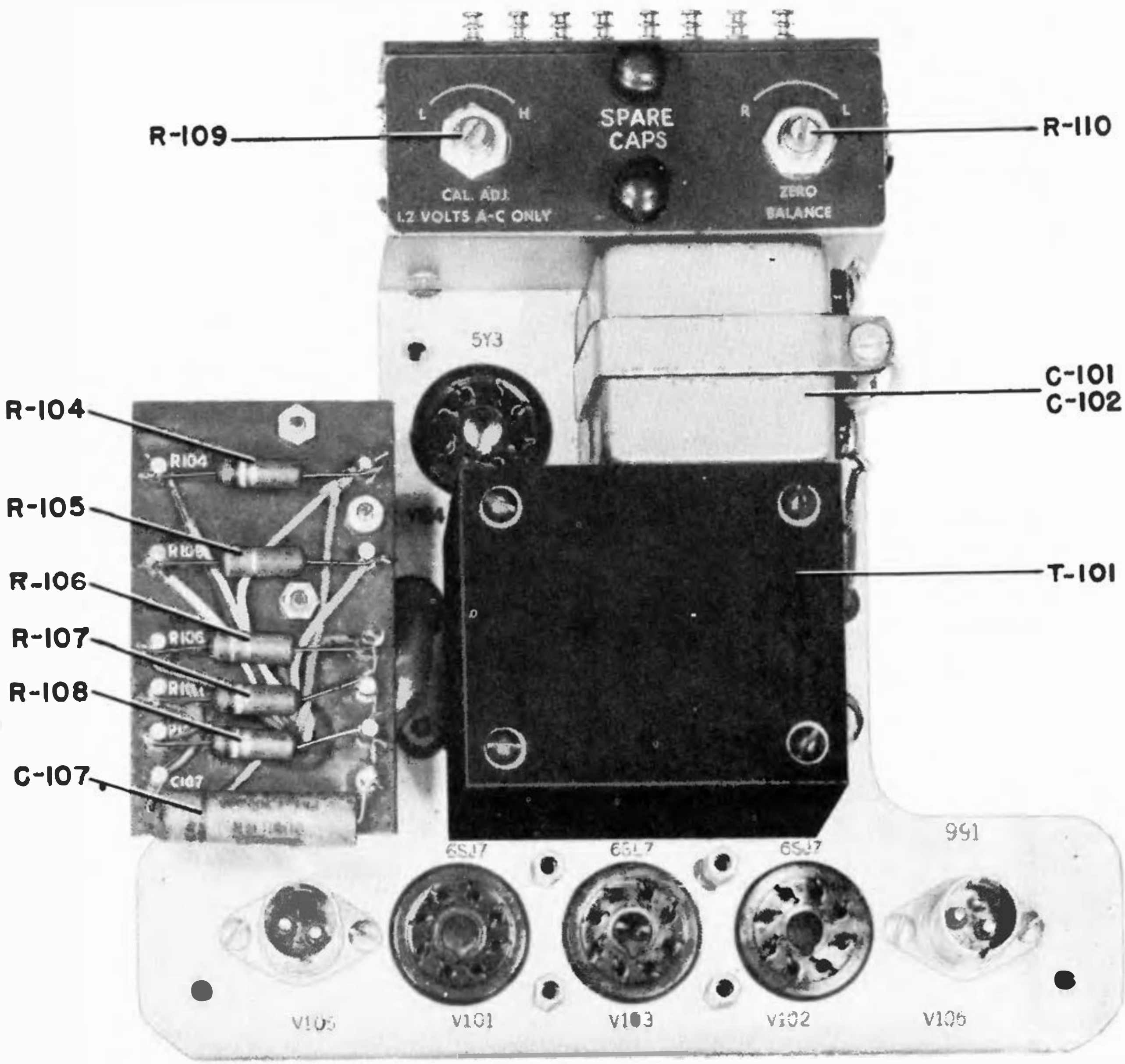


Figure 5-3A. Voltmeter TS-375A/U, Chassis Underside

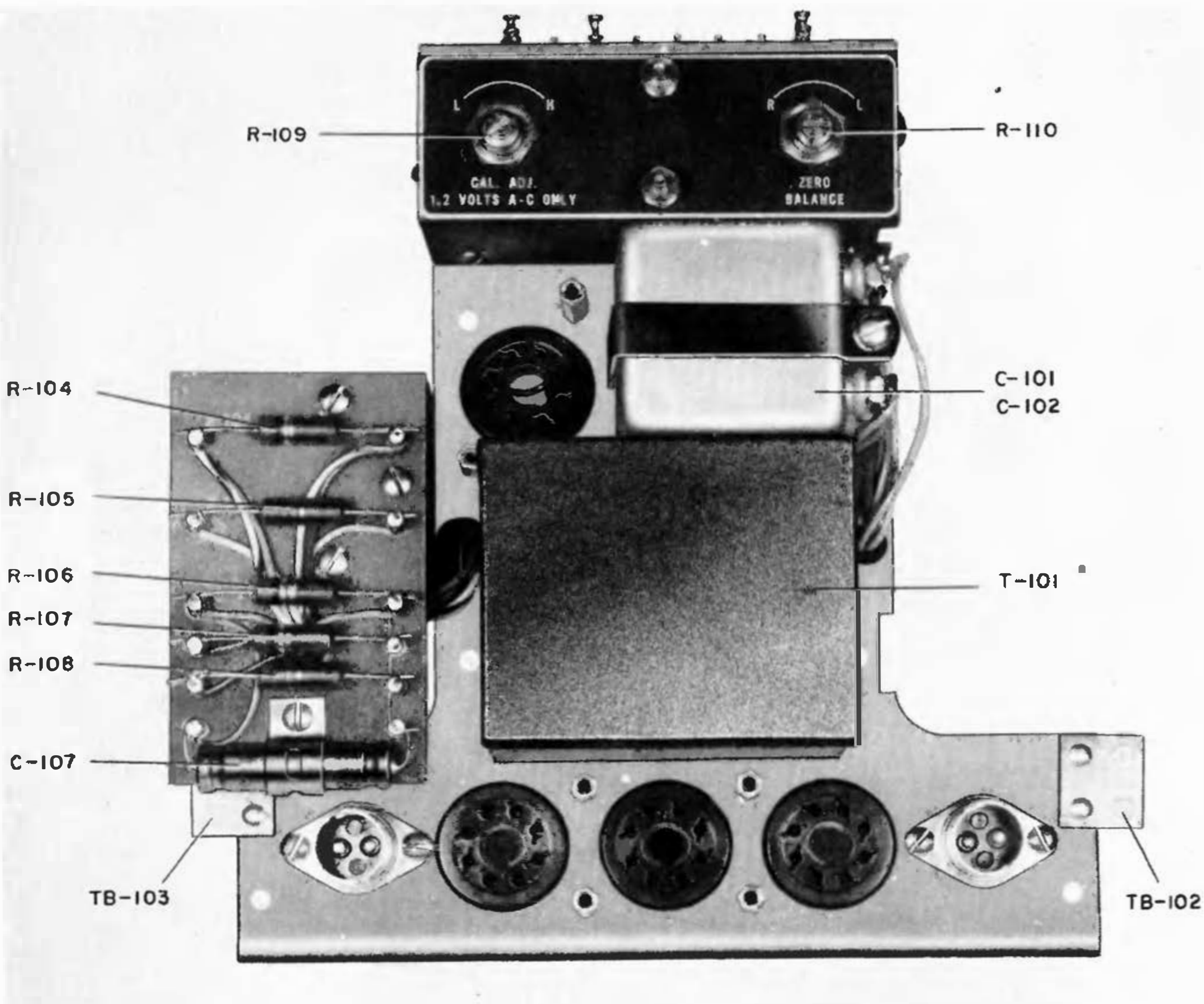


Figure 5-3B. Voltmeter TS-375A/U, Contract N383s-70996, Chassis Underside

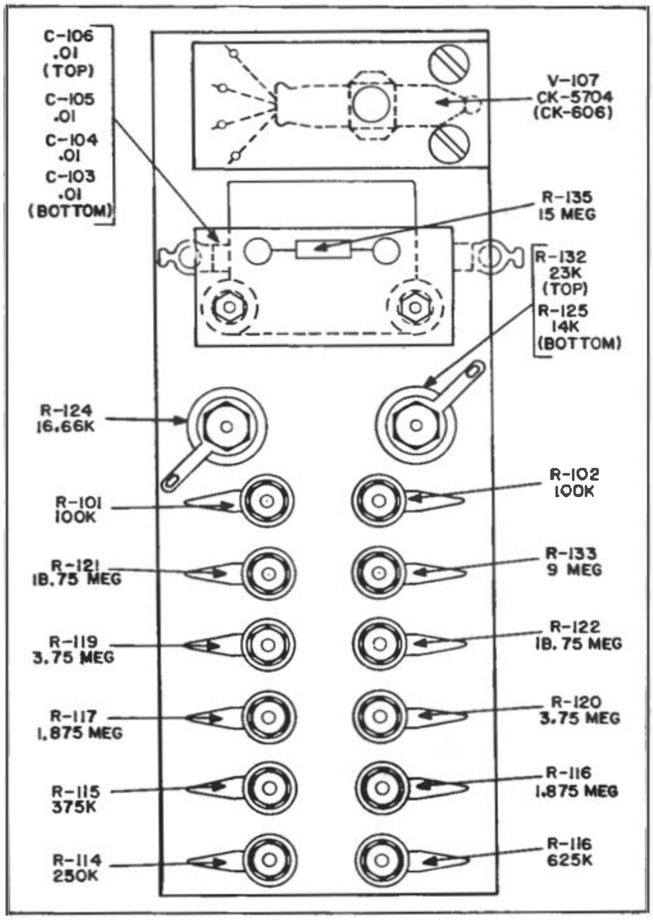


Figure 5-4B. Voltmeter TS-375A/U, Contract N383s-70996, Component Locations, Panel Resistor Deck

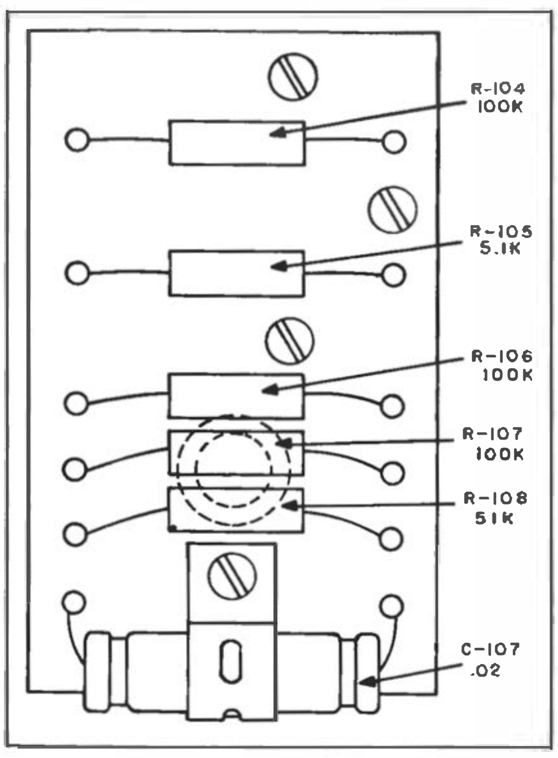


Figure 5-5B. Voltmeter TS-375A/U, Contract N3B3s-70996, Component Locations, Chassis Resistor Deck

SECTION VI
TABLE OF REPLACEABLE PARTS

1. GENERAL.

a. TABLE OF REPLACEABLE PARTS.—The primary purpose of this table is to identify replaceable electrical (and mechanical) components as to part and number, function and manufacturers for Voltmeter TS-375/U Contract NObsr-30009 and Voltmeter TS-375A/U Contract NOa(s)-9616 and 12224 and N383s-30174, 36339, 38158, 45654, 60744 and 70996. It does not constitute a complete electrical (and mechanical) breakdown but lists electrical (and mechanical) parts as are reasonably subject to loss or failure. The hatchmark (#) in column two indicates unassigned Army and Navy Stock numbers.

2. ORDERING OF SPARE PARTS.

a. GENERAL.—Each Service using this list has established certain depots and service groups for the storage and issue of spare parts to its organizations requiring them. The regulations of each Service should be studied to determine the method and source for requisitioning spare parts. The information in this list, as to manufacturer's or contractor's name, type, model or drawing number, is not to be interpreted as authorization to field agencies to attempt to purchase identical or comparable spare parts direct from the manufacturer or a wholesale or retail store except under emergency conditions as covered by existing regulations of the Service concerned.

b. U. S. ARMY PERSONNEL.—This table is for information ONLY and is not to be used as a basis for requisitioning parts. Authorities for obtaining maintenance items are as follows: 1. For using organizations; applicable Service publications of the 00-30 series of AAF Technical Orders.

c. For higher maintenance and supply echelons; the applicable Standard Maintenance List.

d. Where no JAN or Navy standard part number is given to a component, care should be taken in replacing the component with any other part than that listed in the Table of Replaceable Parts. This special part probably has been chosen for a special quality not available in standard components, and use of a standard component may result in decreased life or lowered performance.

3. REFERENCE SYMBOLS.

a. GENERAL.—The reference symbols in column one of the Table of Replaceable Parts correspond to those shown on the line drawings. Each reference symbol consists of a letter followed by a three digit number. The asterisk (*) preceding the reference symbol indicates parts applicable only to Voltmeter TS-375/U. The dagger (†) preceding the reference symbol indicates parts applicable only to Voltmeter TS-375A/U. The double asterisk (**) after the reference symbol indicates parts applicable to Voltmeter TS-375A/U supplied on Contract N383s-30174, 36339, 38158 and 45654. The double dagger (††) after the reference symbol indicates parts applicable only to Voltmeter TS-375A/U supplied on Contract N383s-60744 and NOa(s)-12224. The at one ((*a*) after the reference symbol indicates parts applicable only to Voltmeter TS-375A/U supplied on Contract N383s-70996. The absence of a symbol preceding a reference symbol indicates that the parts are applicable to both Voltmeter TS-375/U and Voltmeter TS-375A/U. The letter portion of the reference symbol indicates the particular type of electrical or mechanical part to which the symbol is assigned, as explained below:

Letter	*Type of Apparatus*
C	Capacitors of all types
E	Miscellaneous electrical parts: prod assemblies insulators, knobs, etc.
F	Fuses
H	Hardware: screws, bolts, studs, washers, grommets, etc.
I	Indicating devices (except meters), indicator lamps, etc.
M	Meters
O	Mechanical parts
R	Resistors: fixed and variable
S	Switches
T	Transformers
V	Vacuum tubes and gas-discharge tubes
W	Wires, cables and cable assemblies
X	Sockets

4. COLOR CODE CHARTS FOR RESISTORS AND CAPACITORS.

a. GENERAL.—A standard color code is used for identification of resistance and capacitance values of carbon-type resistors and mica-type capacitors (See table 6-2). In the color code numbers are represented by colored bands. For example Black = 0, Brown = 1, Red = 2 and so forth.

b. RESISTORS.—Three color bands are used on each resistor to identify its value. The fourth band or lack of band indicates the tolerance. The first band represents the first figure of the resistance value; the second band, the second figure; the third band, the decimal multiplier. For example a 25,000 ohm resistor would be marked as follows: first band—Red; second band—Green; third band—Orange.

c. CAPACITORS.—The color code for capacitors is basically the same as the color code for resistors. The exception being that the first three dots indicate digits instead of the first two dots as is the case with resistors. The fourth dot is the decimal multiplier. All readings are in micromicrofarads. For example, a .00025 microfarad (250 micromicrofarads) capacitor would be marked as follows: first dot—Red; second dot—Green; third dot—Black; fourth dot—Black. The fifth dot indicates the tolerance; the sixth dot indicates the characteristics.

TABLE 6–1. LIST OF MANUFACTURERS

Manufacturer	*Address*
Allen Bradley Co	Milwaukee, Wisc.
The American Hdwe Corp	New Britain, Conn.
American Phenolic Corp	1850 S. 54th Ave., Chicago 50, Ill.
American Radio Hdwe Inc	152 MacQuesten Pkwy., S., Mt. Vernon, N. Y.
Arrow, Hart & Hegeman Electric Co	Laurel & Peck Sts., Hartford, Conn.
Atlantic India Rubber Wks. Inc	1455 W. Van Buren St., Chicago 7, Ill.
Belden Mfg. Co	4645 W. Van Buren St., Chicago, Ill.
Burlington Instrument Co	Burlington, Iowa
Bussman Mfg. Co	Univ. at Jefferson, St. Louis 7, Mo.
Canfield Rubber Co	Garden & Warren Sts., Bridgeport, Conn.
Chicago Industrial Instrument Co	536 W. Elm St., Chicago 10, Ill.
Clarostat Mfg. Co., Inc	Dover, N. H.
Continental Carbon Inc	13900 Lorain Ave., Cleveland 11, Ohio
Cords, Ltd	780 Frelinghuysen Ave., Newark 5, N. J.
Cornell-Dubilier Corp	1000 Hamilton Blvd., South Plainfield, N. J.
Detroit Gasket Co	Burt Rd. & P. M. RR., Detroit 23, Mich.
Dial Light Co. of America, Inc	New York, N.Y.
Drake Mfg. Co	1713 W. Hubbard St., Chicago 22, Ill.
Erie Resistor Corp	640 West 12th St., Erie, Penna.
Industrial Transformer Corp	Gouldsboro, Pa.
International Resistance Co	1100 Terminal Commerce Bldg., Phila. 8, Pa.
The James Millen Mfg. Co	Malden, Mass.
Jetronic Industries, Inc	Philadelphia 27, Pa.
Linear, Inc	6464 State Rd., Philadelphia, Penna.
Littelfuse, Inc	4765 No. Ravenswood Ave., Chicago 40, Ill.
Mueller Electric Co	1583 E. 31st St., Cleveland 14, Ohio
National Gasket Co	124 E. 25th St., New York 1, N. Y.
Oak Mfg. Co	1260 North Clybourne Ave., Chicago, Ill.
Pierce-Roberts Rubber Co	Trenton, N. J.
Q.V.S. Prod. Inc	45 Dogwood Rd., Orange, N. J.
Radio City Prod. Co., Inc	152 W. 25th St., New York 1, N. Y.
Raytheon Mfg. Co	90 Willow St., Waltham, Mass.
Resistance Prod. Co	714 Race St., Harrisburg, Penna.
Simpson Electric Co	5208 W. Kinzie St., Chicago, Ill.
U. S. Rubber Co	1230 Sixth Ave., New York 20, N.Y.
United Transformer Co	150 Varick St., New York 13, N. Y.
Valley Mfg. Co	48 Jefferson Ave., Waterbury 85, Conn.
The Vellumoid Co	54 Rochdale St., Worcester, Mass.
Western Rubber Co	620 E. Douglas St., Goshen 4, Ind.
Western Elec. Instrument Corp	614 Frelinghuysen Ave., Newark 5, N. J.
Zierick Mfg. Corp	New Rochelle, N. Y.

TABLE 6-3. TABLE OF REPLACEABLE PARTS

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
C-101	R16-C-11491-700	CAPACITOR, fixed: Paper dielectric; single section 2 mf plus or minus 20%; 600 vdcw; non-corrosive hermetically sealed metal can; 2" lg x 2" wd x 1 1/8" h; "Dykanol G"; 2 leak proof riveted lug terminals, located on side; no internal ground connections; 2 integral mtg ears 2 3/8" mtg/c	Capacitance element of dc power supply filter	Cornell Dubilier type DYR6200G	Weston part D-122103
C-101** @	R16-C-11491-310	CAPACITOR, fixed: Paper dielectric; 2 mfd, +20% -10%; 600 VDCW	Capacitance element of dc power supply filter	JAN CP53B1EF205V	JAN C-25
C-101++	R16-C-11491-700	CAPACITOR, fixed: Paper, JAN type #CP53-BIEF205M; 2MF ± 20%; 600 vdcw; 2"lg x 2" wd x 1 1/8" thk	Capacitance element of dc power supply filter	JAN CP53B1EF205M	JAN C-25
C-102	R16-C-11491-700	CAPACITOR, fixed: Same as C-101	Capacitance element of dc power supply filter		
C-102** @	R16-C-11491-310	CAPACITOR, fixed: Same as C-101** @	Capacitance element of dc power supply filter		
C-102++	R16-C-11491-700	CAPACITOR, fixed: Same as C-101++	Capacitance element of dc power supply filter	JAN CP53B1EF205M	JAN C-25
C-103	R16-C-10499-1	CAPACITOR, fixed: Mica; 10,000 mmf ± 10%; 600 vdcw; 1 5/8" lg x 1 1/8" wd x 5/16" thk	Plate filter for balancing diode	JAN CM45A103K	JAN C-25
C-104	R16-C-10499-1	CAPACITOR, fixed: Same as C-103	RF filter at input of amplifier		

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

TABLE 6-3. TABLE OF REPLACEABLE PARTS (Cont.)

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No
C-105	R16-C-10499-1	CAPACITOR, fixed: Same as C-103	Cathode by-pass for balancing diode		
C-106	R16-C-10499-1	CAPACITOR, fixed: Same as C-103	RF filter in AC probe output to amplifier		
C-107	R16-C-11255-67-500	CAPACITOR, fixed: Paper Dielectric; 1 section; 20,000 mmf ± 20%; 600 vdcw; wax impregnated paper tube; 15/32" diam x 1 5/8" lg; Halowax impregnated; wire lead terminals	Filter capacitor across R-106	Cornell Dubilier type DT 6S2	Weston Part ND-24167
C-107**	R16-C-11255-67-600	CAPACITOR, fixed: Paper dielectric; 20,000 mmf ± 20%; 600 vdcw	Filter capacitor across R-106	JAN CP29A1EF203M	JAN C-25
C-107@	R16-C-11255-63-15	CAPACITOR, fixed: Paper dielectric; 20,000 mmf ± 10%; 600 vdcw	Filter capacitor across R-106	JAN CP29A1EF203K	JAN C-25
C-107++	#	CAPACITOR, fixed: Paper; 20,000 mmf ± 20%; 600 vdcw; 1-7/16" lg x 3/4" wd x 5/16" thk	Filter capacitor across R-106	JAN CN42A203M	JAN C-91
C-108	R16-C-10026-16	CAPACITOR, fixed: Mica; 510 mmf ± 20%; 500 vdcw; 51/64" lg x 15/32" wd x 3/16" thi	Line filter	JAN CM20A511M	JAN C-5
C-108**	R16-C-10026-4	CAPACITOR, fixed: Mica dielectric; 510 mmf ± 5%; 500 vdcw	Line filter	JAN CM20A511J	JAN C-5
C-109	R16-C-10026-16	CAPACITOR, fixed: Same as C-108	Line filter		

C-109**		CAPACITOR, fixed: Same as C-108**	Line filter		
C-110	R16-C-10026-10-700	CAPACITOR, fixed: Mica, silver button type; 510 mmf ± 10%; 500 vdcw; temperature coefficient letter A; 0.447" diam x 1/10" thk; brass case, silver plated; case forms one terminal, coaxially located eyelet forms other terminal; outer case and eyelet are used for mounting as well as electrical connections	High Frequency Blocking Condensor in RF Probe	Erie Resistor Corp. Type #370 BH Spec #600	Weston Part ND-24141
C-110@	R16-JACZ-A048	CAPACITOR ASSEMBLY: Consists of capacitor, fixed, mica dielectric, silver button type, 510mmf ± 10%, 500 vdcw, 0.450" diam x 0.071" thk; polystyrene bushing (Jetronic part/dwg A-036); nickel-plated brass bushing (Jetronic part/dwg A-030); screw (Jetronic part/dwg A-127); and nut (Jetronic part/ A-044); capacitor case and brass bushing form one terminal, capacitor eyelet and screw form other terminal; terminals are used for mounting as well as electrical connections	High frequency blocking capacitor in AC probe	Jetronic A-048	Jetronic A-048
C-111	R16-C-10026-16	CAPACITOR, fixed: Same as C-108	Electrostatic filter for output of DC probe		
C-111**	R16-C-10026-4	CAPACITOR, fixed: Same as C-108**	Electrostatic filter for output of DC probe		
C-112	R16-WS-121985	CAPACITOR ASSEMBLY: 2 metal plates form case and ground for the double balanced fixed mica capacitor, 500 mmf ± 20%; temp coef letter A, 5 terminal tabs; 2" lg x 1" wd x 3/16" thk; four mtg hole centers form a square 0.72" on a side, hole diam 0.120", one side of cond is the mtg bracket	Balanced electrostatic and RF filter in output of AC probe	Weston D-121985	Weston part D-121985

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
C-112**	R16-RCP375-2-10-16	CAPACITOR ASSEMBLY: Same as C-112	Balanced electrostatic and RF filter in output of AC probe	RCP 375-2-10-16	RCP 375-2-10-16
C-112 @	R16-JACZ-A279	CAPACITOR ASSEMBLY: Double balanced fixed mica dielectric capacitor, 500 mmf ± 20%, 5 terminal tabs; consists of support plate (Jetronic part/dwg A-277), end plate (Jetronic part/dwg A-276-1), 4 mica plates 0.002" thk (Jetronic part/dwg A-276-2), 3 silver plated copper plates with tabs (Jetronic part/dwg A-278); support plate mounts assembly on rear of J-103	Balanced electrostatic and RF filter in output of AC probe	Jetronic A-279	Jetronic A-279
C-113	R16-C-10532-10	CAPACITOR, fixed: Mica; 20,000 mmf ± 10%; 600 vdcw; 1 5/8" lg x 1 1/8" wd x 29/64" thk	Low frequency blocking condenser mounted internally	JAN CM50A203J	JAN C-5
C-113 @	R16-JAN-CM50A203K	CAPACITOR, fixed: Mica dielectric; 20,000 mmf ± 10%; 600 vdcw; 1-5/8" lg x 1-1/8" wd x 23/64" thk	Low frequency blocking capacitor mounted internally	JAN CM50A203K	JAN C-5
E-101	R16-L-4883-250	PROD ASSEMBLY, test: DC probe; assembly consists of prod tip Weston part/dwg D-122047, handle Weston part/dwg D-122046, composition IRC resistor type BTS 5.1 megohms 1/2 watt Weston part/dwg ND-24142, bushing Weston part/dwg D-122048, 50" of rubber covered single conductor wire Weston part/dwg D-73036, plugsocket type AN-3106-8S-1S Weston part dwg ND-24103, ferrule for AN socket	Test prod and isolating resistor for DC vacuum tube voltmeter	Weston D-122049	Weston D-122049

E-101 (Cont.)		Weston part/dwg D-122050; shape similar to an ordinary test prod and lead with a resistor in the handle of the prod and with an AN connector at the other end; 54" lg			
E-101**	R16-P-6306-10	PROD ASSEMBLY, test: DC probe assembly; consists of prod tip, bushing, handle, 50" rubber covered single cond wire, 5.1 megohm resistor, 1/2 W (Allen Bradley type EB, RCP #1-6-87), plug socket type AN-3106-8S-1S with ferrule for AN socket (RCP #18-89); shape similar to ordinary test prod and lead with resistor in handle of prod and with AN connector at other end; 54" lg	Test prod and isolating resistor for DC vacuum tube voltmeter	RCP-375-28-43	RCP-375-28-43
E-101++		PROD ASSEMBLY, test: DC probe; assembly consists of prod tip Chicago Ind. Inst. Co. part per dwg. D-122047, handle Chicago Ind. Inst. Co. part per dwg. D-122046, R126 composition IRC resistor type BTS, 5.1 megohms 1/2 watt, bushing Chicago Ind. Inst. Co. part per dwg. D-122048, 50" of rubber covered single conductor wire Chicago Ind. Inst. Co. part per dwg. 0-73036 plug socket type AN-3106-8s-1s Chicago Ind. Inst. Co. part ND-24103, ferrule for AN socket Chicago Ind. Inst. Co. part per dwg. D-122050; shape similar to an ordinary test prod and lead with a resistor in the handle of the prod and with an AN conductor at the other end; 54" lg.	Test prod and isolating resistor for DC vacuum tube voltmeter	Chicago Ind Inst Co. D-122049	Chicago Ind. Inst Co. D-122049
E-101@	R16-JACZ-B1003	PROD ASSEMBLY, test: DC probe; consists of prod tip, handle, setscrew, 48½" rubber covered single cond wire, 5.1 megohm resistor ½ W (R-126), plug connector AN-3106A-8S-1S-211 with ferrule (Jetronic part/dwg A-010); shape similar to ordinary test prod, with resistor in handle of prod and with AN connector at other end; 54" lg	Test prod and isolating resistor for DC vacuum tube voltmeter	Jetronic B-1003	Jetronic B-1003

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

TABLE 6-3. TABLE OF REPLACEABLE PARTS (Cont.)

MODEL: VOLTMETERS TS-375/U and TS-375A/U MAJOR ASSEMBLY: VOLTMETERS TS-375A/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
E-102	R16-L-4883-200	PROD ASSEMBLY, test: AC test probe; assembly consists of following major parts, probe tip Weston part/dwg D-122017, charging condenser 500 mmf C-110 Erie Resistor Corp type #370 BH spec #600, ferrule Weston part/dwg D-122030, diode tube Raytheon type CK606 (V-107) Weston part ND-24145, resistor IRC Type BTs 5.1 meg Weston part/dwg ND-24142, polysterene insert spec for Weston part/dwg D-122026, case Weston part/dwg D-122028; 51" lg three wire rubber covered cable Weston part/dwg ND-24181, socket connector AN-3106-10SL-3S Weston part/dwg ND-24105, one cap for AN socket connector Weston part/dwg D-122041; probe 4 1/2" lg x 3/4" diam overall, cable 51" lg, AN socket connector 1 5/8 lg x 7/8" diam overall; AC measurements from 50 to150 megacycles with accuracy of ± 5%, from 150 to 300 megacycles with accuracy of ± 12%	AC probe for rectification of RF and audio voltages	Weston D-122067	Weston part D-122067
E-102**	R16-P-6306-15	PROD ASSEMBLY, test: AC test probe; consists of prod tip, polysterene insert, 51" lg 3 wire rubber covered cable, probe case 4 1/2" lg x 3/4" diam, charging capacitor (C-110 RCP #2-11-58), diode tube (V-107 Raytheon CK606 RCP #9-59). 5.1 megohm resistor 1/2 W (Allen Bradley type EB RCP #1-6-87), socket connector AN-3106-10SL-3S and AN socket cap (RCP #18-90); shape similar to ordinary test prod and lead with components in handle of prod and with an AN connector on other end; 55" lg	AC probe for rectification of RF and audio voltages	RCP-375-28-44	RCP-375-28-44

E-102++		PROD ASSEMBLY, test: AC test probe; assembly consists of the following major parts, probe tip Chicago Ind. Inst. Co. part per dwg. D-122017, D-122018, charging condenser 500 mmf C-110 Erie Resistor Corp. type #370BH spec D-122019, #600, ferrule Chicago Ind. Inst. Co. part/dwg. D-122030, diode tube D-122020, Raytheon type CK 606 (V-107) Chicago Ind. Inst. Co. part ND-24145, R127 composition resistor IRC type BTS 5.1 megohms 1/2 watt, polysterene insert spec for Chicago Ind. Inst. Co. part dwg D-122026, case Chicago Ind. Inst. Co. part-dwg D-122028, 51" lg three wire rubber covered cable Chicago Ind. Inst. Co. part ND-24181, socket connector AN-3106-10SL-3S Chicago Ind. Inst. Co. part ND-24105, one cap for AN socket connector Chicago Ind. Inst. Co. part-dwg. D-122041; probe 4 1/2" lg x 3/4" diam. overall, cable 51" lg, AN socket connector 1 5/8" lg x 7/8" diam overall. AC measurements from 10KC to 300 megacycles.	AC probe for rectification of RF and audio voltages	Chicago Ind. Inst. Co. D-122067	Chicago Ind. Inst. Co. part D-122067
E-102@	R16-JACZ-C2037	PROD ASSEMBLY, test: AC probe; consists of prod tip, polystyrene insert, 51" lg three wire rubber covered cable, probe case 2-5/8" lg x 5/8" diam, bushing 1/2" lg x 5/8" diam, clamp (Jetronic part/dwg R-6001), charging capacitor assembly 500 mmf (C-110@@), diode tube (V-107@ Raytheon CK 5704), 5.1 megohm resistor 1/2 W (R-127), plug connector AN-3106A-10SL-3S-211 with ferrule (Jetronic part/dwg A-035); shape similar to ordinary test prod and lead, with electrical parts located in probe case and AN connector on other end; 55" lg	AC probe for rectification of RF and audio voltages	Jetronic C-2037	Jetronic C-2037
H-101	R16-G-2455-250	WASHER, flat: Neoprene; round 1/8" ID, 3/8" OD, 0.05" thk	Used as gasket to seal case to panel mounting studs against moisture	Detroit Gasket Mfg. Co. special for Weston	Weston part D-121972
H-101**	#	WASHER, flat: Neoprene; round, 7/64" ID x 3/8" OD x 1/64" thk	Used as gasket to seal case to panel mounting studs against moisture	Vellumoid Co. special for RCP	RCP-375-13-207

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
H-101++	R16-G-2455-250	WASHER, flat: Neoprene; round, 1/8" ID, 3/8" OD, 0.05" thk	Used as gasket to seal case to panel mounting studs against moisture	Atlantic India Rubber works, Inc. special for Chicago	Chicago Ind. Inst. Co. part D-121972
H-101@	#	WASHER, flat: Neoprene; round, 1/8" ID x 3/8" OD x .02" thk	Used as gasket to seal case to panel mounting studs against moisture	Jetronic A-280	Jetronic A-280
H-102	R16-WS-121952	WASHER, flat: Clear vinylite; round 0.144" ID, 0.38" OD, 0.04" thk	To decrease leakage from Weston resistor to pin and resistor deck	Valley Mfg. Co. special for Weston	Weston Part D-121952
H-102++	R16-WS-121952	WASHER, flat: Clear vinylite; round 0.144" ID, 0.38" OD, 0.04" thk	To decrease leakage from resistors to pin and resistor deck	National Gasket Co. Special for RCP Valley Mfg. Co. special for Chicago Ind. Inst. Co.	RCP-325-13-212 Chicago,Ind. Inst. Co. part D-121952
H-102@	#	WASHER, flat: Clear dynal; round, 9/64" ID x 3/8" OD x 1/32" thk	To decrease leakage from terminals of resistor to pin and resistor deck	Jetronic C-2044-33	Jetronic C-2044-33
H-103	R16-G-2455	WASHER, flat: Vellutex; round 0.136" ID, 0.31" OD, 0.045" thk	Gasket between rubber feet and case for water seal	Vellumoid Co. Spec. for Weston	Weston Part D-121944 RCP 375-13-210 Jetronic C-2043-17
H-104	R33-G-1898	GROMMET: Rubber, black; fits 1/4" hole diam 1/8" hole diam. 1/16" groove width, 3/16" overall width, 11/32" overall diam	Protects wires passing through chassis	Amer Rad Hdw Part #1114	Weston Part ND-23283
H-104**	#	GROMMET: Rubber; fits 9/32" diam hole; 3/16" ID x 1/16" groove width x 7/32 W overall x 7/16" OD	Protects wires passing through chassis	Atlantic India Rubber Wks Inc. #382	RCP-375-13-12
H-104++	R33-G-1898	GROMMET: Rubber, black; fits1/4" hole; 1/8" hole diam, 1/16" groove width, 2/16" overall width, 11/32" overall diam	Protects wires passing through chassis	Amer Rad Hdwe part #1114	Chicago Ind. Inst. Co. Part ND-23283

H-104@	R33-G-1902-40	GROMMET: Rubber, black; fits 1/4" diam hole; 1/8" ID x 1/16" groove width x 3/16" wd overall x 11/32" OD	Protects wires passing through chassis	Atlantic India Rubber Part 1259	Jetronic A-50015-4
H-105	#	GROMMET: Rubber, black; fits 3/8" hole; 1/4" hole diam, 1/16" groove width, 1/4" overall width, 9/32" overall diam	Protects wires passing through chassis and resistor deck	US Rubber style G-5092	Weston Part ND-21745
H-105**	#	GROMMET: Rubber; fits 3/8" diam hole; 9/32" ID x 1/16" groove width x 1/4" W Overall x 9/16" OD	Protects wires passing through chassis and resistor deck	Atlantic India Rubber Works, Inc. #763	RCP-375-13-11
H-105++	#	GROMMET: Rubber, black; fits 3/8" hole; 1/4" hole diam, 1/16" groove width, 1/4" overall width, 9/16" overall diam	Protects wires passing through chassis and resistor deck	Atlantic India Rubber Works, Inc. Part #763	Chicago Ind. Inst. Co. Part ND-24226
H-105@	R33-G-1906-258	GROMMET: Rubber, black; fits 1/2" diam hole; 5/16" ID x 3/32" groove width x 5/16" wd overall x 3/4" OD	Protects wires passing through resistor deck (TB-104)	Canfield Rubber Part 3545	Jetronic A-50015-3
H-106	#	GROMMET: Rubber, black; fits 1" hole; 7/8" hole diam, 1/16" groove width, 1/4" overall width, 1 3/16" overall diam	Protects cable passing through AC probe compartments	Western Rubber Co. Part G1151	Weston Part ND-24226 RCP-375-13-213
H-106++	#	GROMMET: Rubber, black; fits 1" hole; 7/8" hole diam, 1/16" groove width, 1/4" overall width, 1 3/16" overall diam	Protects cable passing through AC probe compartments	Western Rubber Co. Part G1151	Chicago Ind. Inst. Co. Part ND-24226
H-106@	R33-G-1907-24	GROMMET: Rubber, black; fits 1" diam hole; 13/16" ID x 1/16" groove width x 5/16" wd overall x 1 3/16" OD	Protects cable passing through AC probe compartment cover	Pierce Roberts Part 46E	Jetronic A-50015-6
H-107	R33-G-1906-280	GROMMET: Black, rubber; fits 3/8" diam hole; 7/16" diam hole x 3/32" wd groove x 1/4" wd x 3/4" diam overall	Protects wires passing through resistor deck	Canfield Rubber Co. Part 2029	Weston Part ND-24113
H-107**	#	GROMMET: Rubber; fits 1/2" diam hole; 3/8" ID x 1/16" groove width x 1/4" W overall x 5/8" OD	Protects wires passing through resistor deck	Atlantic India Rubber Works Inc. #230	RCP-375-13-60
H-107++	R33-G-1906-280	GROMMET: Black, rubber; fits 3/8" diam hole; 7/16" diam hole x 3/32" wd groove x 1/4" wd x 3/4" diam overall	Protects wires passing through resistor deck	Canfield Rubber Co. Part 2029	Chicago Ind. Inst. Co. Part ND-24113
H-107@	R33-G-1906-323-75	GROMMET: Rubber, black; fits 5/8" diam hole; 5/16" ID x 3/32" groove width x 5/16" wd overall x 7/8" OD	Protects wires passing through resistor board (TB-105)	Canfield Rubber Co. Part 1420	Jetronic A-50015-1

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

MODEL: VOLTMETERS TS-375/U and TS-375A/U MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
H-108	R33-G-1906-350	GROMMET: Black, rubber; fits 3/4" diam hole; 9/16" diam hole x 1/16" wd groove x 1/4" wd x 7/8" diam overall	Protects cable passing through DC probe compartment cover	Atlantic India Rubber Works Inc. Part #1720	Weston Part ND-24114 RCP-375-13-214 Chicago Ind. Inst. Co. Part ND-24114 Jetronic A-50015-5
H-109**	#	GROMMET: Rubber; fits 9/16" diam hole, 7/16" ID x 1/16" groove width x 1/14" W overall x 3/4" OD	Protects wires passing through chassis	Atlantic India Rubber Works Inc. Part #1787	RCP-375-13-74
H-109@	R33-6-1906-251-50	GROMMET: Rubber, black; fits 3/8" diam hole; 9/32" ID x 1/16" groove width x 1/4" wd overall x 9/16" OD	Protects wires passing through chassis	Canfield Rubber Part 1975	Jetronic A-50015-2
I-101	R17L-12932-119-115	LIGHT; indicator: w/lens; 1/2" diam, white jewel lens; for miniature bayonet base, T-3 1/4 bulb; open frame; nickel plated brass shell; 1 1/2" lg x 1 3/16" wd x 1 1/8" thk x 3/4" diam overall; 0.687" diam mtg/hole, 5/16" max thk panel; vertically mtd, lamp replaceable from front; threaded jewel; two solder lug terminals one on each side of base; features shallow depth behind panel	"Off" indicator	Weston D-122009	Weston Part D-122009
I-101**	R16-RCP-375-17-16	LIGHT; indicator: Same as I-101	"Off" indicator	RCP-375-17-16W	RCP-375-17-16W
I-101++		LIGHT, indicator: w/lens; 1/2" diam, white jewel lens; for miniature bayonet base, T-3 1/4 bulb; U-shaped frame; 1 9/16" lg x 1 1/8" wd; 0.687" diam mtg./hole, 3/8" max thkpanel; vertically mounted, lamp replaceable from front; threaded jewel; (extension bushing); two solder lug terminals; features shallow depth behind panel	"Off" indicator	Drake Mfg. Co. Part spec. #166-K	Chicago Ind. Inst. Co. Part D-122009

I-101 @		LIGHT, indicator: w/lens; consists of white jewel lens (Dialco part 81-435), lamp socket (Jetronic part/dwg A-060), insulating bushing (Jetronic part/dwg A-115), bracket (Jetronic part/dwg A-316), washer (Jetronic part/dwg A-110), and bushing (Jetronic part/dwg A-318); 1 3/4" lg x 1 1/16" wd x 13/16" thk x 3/4" diam overall; 11/16" diam mtg hole; vertical mtd, lamp replaceable from front; threaded jewel; solder lug terminals: features shallow depth panel	"Off" indicator	p/o Jetronic C-2041	p/o Jetronic C-2041
I-102	R17L-12932-119-110	LIGHT; indicator: w/lens; 1/2" diam, red jewel lens; for miniature bayonet base, T-3 1/4 bulb; open frame; nickel plated brass shell; 1 1/2" lg x 1 3/16" wd x 1 1/8" thk x 3/4" diam overall; 0.687" diam mtg/hole, 5/16" max thk panel; vertical mtd; lamp replaceable from front; threaded jewel; two solder lug terminals one on each side of base; features shallow depth behind panel	"On" indicator	Weston D-122008 RCP-375-17-16R	Weston Part D-122008 RCP-375-17-16R
I-102++		LIGHT; indicator: w/lens; 1/2" diam, red jewel lens; for miniature bayonet base, T-3 1/4 bulb; U-shaped frame; 1 9/16" lg x 1 1/8" wd; 0.687" diam mtg/hole, 3/8" max thk panel; vertically mounted, lamp replaceable from front; threaded jewel; (extension bushing); two solder lug terminals; features shallow depth behind panel	"On" indicator	Drake Mfg. Co. part special 166-K	Chicago Ind. Inst Co. D-122008
I-102@	#	LIGHT, indicator: w/lens; consists of red jewel lens (Dialco part 81-431), lamp socket (Jetronic part/dwg A-060), insulating bushing (Jetronic part/dwg A-115,) bracket (Jetronic part/dwg A-316), washer (Jetronic part/dwg A-110), and bushing (Jetronic part/dwg A-318); 1-3/4" lg x 1 1/16" wd x 13/16" thk x 3/4" diam overall; 11/16" diam mtg hole; vertical mtd, lamp replacable from front;	"On" indicator	p/o Jetronic C-2041	p/o Jetronic C-2041

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

TABLE 6-3. TABLE OF REPLACEABLE PARTS (Cont.)

MODEL: VOLTMETERS TS-375/U and TS-375A/U MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
I-102@ (Cont.)		threaded jewel; solder lug terminals; features shallow depth behind panel			
M-101	R16-M-2107-200	METER, multi-scale; DC type; range 0 to 100 ua; rectangular bakelite flush mtg case; 3 1/4" diam body x 1 1/8" behind flange, rectangular flange 4.25" wd x 3.94" high x 0.70" deep; accuracy ± 2%; D'Arsonval movement; full scale sensitivity 100 ua resistance across terminals 1,000 ohms ± 15%; calibrated for non-magnetic panel; 3 scale arcs, lowest one 75 degrees deflection 24 divisions with red figures and divisions, middle arc 86 degrees deflection 30 divisions with red figures and divisions, top arc 90 degrees deflection 60 divisions with black figures and divisions; self-contained; four mtg holes 0.147" diam, spaced 1.80" each side of vertical center line and 1.645" each side of horizontal center line two stud terminals 10-32 thd, 0.45" lg	To indicate units of electrical measurements	Weston D-122111 Spec 973 Subl	Weston part D-122111
M-101**	R16-V-2900-7	METER, multi-scale: Same as M-101		Q.V.S. Meter Co. Special for RCP	RCP-375-5-94
M-101++	#	METER, multi-scale: DC type; range 0 to 100 ua; rectangular bakelite flush mtg case; 3 1/4" diam body x 1" behind flange; rectangular flange 4.25" wdx 3 15/16" high x 5/8" deep; accuracy ± 2%; D'Arsonval movement; full scale sensitivity 100 ua resistance across terminals 1,000 ohms ± 15%; calibrated for non-magnetic panel; 3 scale arcs, lowest one 75 degrees deflection 30 divisions with red figures and divisions, middle arc 86 degree deflection 30	To indicate units of electrical measurements	Simpson Electric Co. Special for Chicago Ind. Co.	Chicago Ind. Inst. Co. Part D-122111

M101++ (Cont.)		divisions with red figures and divisions, top arc 90 degrees deflection 60 divisions with black figures and divisions; self-contained; four mtg. holes 0.147 diam, spaced 1.80" each side of vertical center line and 1.645" each side of horizontal center line two stud terminals 10-32 thd, 0.45" lg			
M101 @	R16-JACZ-B1071	METER, Multi-scale: DC type; range 0 to 100 ua; rectangular bakelite flush mtg case; 2-3/4" diam body x 1" behind flange, rectangular flange 4-1/4" wd x 3-5/16" high x 3/4" deep; accuracy ± 2%; D'Arsonval movement; full scale sensitivity 100 ua, resistance across terminals 1,000 ohms ± 15%; calibrated for non-magnetic panel; 3 scale arcs, lower arc 75 degrees deflection 24 divisions with red figures and divisions, middle arc 86 degrees deflection 30 divisions with red figures and divisions, top arc 90 degrees deflection 60 divisions with black figures and divisions; self contained; four mounting holes spaced 1-13/16" each side of vertical center line and 1-21/32" each side of horizontal center line; two stud terminals 10-32 thd, 7/16" lg	To indicate units of electrical measurement	Burlington Model 741 Special for Jetronic	Jetronic B-1071
R-101	R16-R-18751-780	RESISTOR, fixed: Composition; 100,000 ohms ±1%: 1/2 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Plate load of V-101	Weston Part D-108936	Weston Part D-108936
R-101**	R16-R-17347-21-700	RESISTOR, fixed: Deposited metal film; 100,000 ohms, ± 1%, 2 W; 0.05" per degree Cnegative; 1 3/4" lg x 1/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	Plate load of V-101	Continental Carbon Inc. Type X-2	RCP-375-1-5-153
R-101++	R16-R-17347-21-700	RESISTOR, fixed: Metal film; 100,000 ohms ±1%; 2W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture	Plate load of V-101	Continental Carbon Inc. Type X-2	Chicago Ind. Inst. Co. Part D-108936

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
R-101++ (Cont.)		resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire-wound			
R-101 @	R16R18752-10	RESISTOR, fixed: Deposited carbon film; 100,000 ohms ± 1%, 2W; 1-3/4" lg x 1/4" diam; insulated; moisture resistant; twotab terminals 15/32" lg x 3/16" wd; axial clearance hole 3/16" diam for mtg	Plate load of V-101	Jetronic A-50020-1	Jetronic A-50020-1
R-102	R16-R-18751-780	RESISTOR, fixed: Same as R-101	Plate load of V-102		
R-102**	R16-R-17347-21-700	RESISTOR, fixed: Same as R-101**	Plate load of V-102		
R-102++	R16-R-17347-21-700	RESISTOR, fixed: Same as R-101++	Plate load of V-102		
R-102@	R16-R-18752-10	RESISTOR, fixed: Same as R-101 @	Plate load of V-102		
R-103	R16-P-6925-775	RESISTOR, variable: Wire-wound 10,000 ohms 10%; 2 W; solder lug term; metal enclosed phenolic base 1 1/4" diam x 5/8" d; round metal flatted shaft 1/4" diam x 7/8" lg; A taper; insulated contact arm; normal torque; bushing 3/8"-32 x 3/8" lg	Electrical zero corrector	Weston Part D-122099 Alternate JAN RA15A1FD103AK	Weston Part D-122099 JAN R-19
R-103**	R16-P-6925-775	RESISTOR, variable: Same as R-103	Electrical zero corrector	Clarostat Type 43 Alternate JAN RA20A1FD103AK	RCP-375-4 104 JAN R-19
R-103++	R16-P-6925-775	RESISTOR, variable: Same as R-103	Electrical zero corrector	Alt JAN RA20A1FD103AK	Chicago Ind Inst. Co. Part D-122099 JAN R-19
R-103 @	R16-JAN-RA15AFD-103AK	RESISTOR, variable: Same as R-103	Electrical zero corrector	JAN RA15AFD103AK	JAN R-19
R-104	R16-R-17347-10-8	RESISTOR, fixed: Composition; 100,000 ohms ± 10%; 1 w	Determines ratio of feedback	JAN RC30AF104K	JAN R-11

R-104**@	R16-JAN-RC30BF104K	RESISTOR, fixed: Composition; 100,000 ohms ± 10%; 1 w	Determines ratio of feed-back	JAN RC30BF104K	JAN R-11
R-105	R16-R-17291-30-175	RESISTOR, fixed: Composition; 5100 ohms ± 5%; 1w	Resistance filter	JAN RC30AF512J	JAN R-11
R-105**	R16-JAN-RC30BF512J	RESISTOR, fixed: Composition; 5100 ohms ± 5%; 1 w	Resistance filter	JAN RC30BF512J	JAN R-11
R-106	R16-R-17347-10-8	RESISTOR, fixed: Same as R-104	Biasing network for V-101 and V-102	JAN RC30AF513J	JAN R-11
R-106**@	R16-JAN-RC30BF104K	RESISTOR, fixed: Same as R-104**@	Same as above		
R-106++	R16-R-17347-10-8	RESISTOR, fixed: Same as R-104	Same as above		
R-107	R16-R-17347-10-8	RESISTOR, fixed: Same as R-104	Current limiting resistor for V-106	JAN RC30AF104K	JAN R-11
R-107**	R16-JAN-RC30BF104K	RESISTOR, fixed: Same as R-104**@	Same as above	JAN RC30BF104K	JAN R-11
R-108	R16-R-17337-29-3	RESISTOR, fixed: Composition; 51,000 ohms ± 5%; 1 W	Part of bias network for V-101 and V-102	JAN RC30AF513J	JAN R-11
R-108**	R16-JAN-RC30BF513J	RESISTOR, fixed: Composition; 51,000 ohms ± 5%; 1 W	Part of bias network for V-101 and V-102	JAN RC30BF513J	JAN R-11
R-108++	R16-R-17337-29-3	RESISTOR, fixed: Composition; 51,000 ohms ± 5%; 1 W	Part of bias network for V-101 and V-102	JAN RC30AF513J	JAN R-11
R-109	#	RESISTOR, variable: Wire wound; 5,000 ohms ± 10%; 2 W; 3 solder lug term; metal enclosed phenolic base 1 1/4" diam x 5/8" d; round metal slotted shaft 1/4" diam x 1/2" 1; A taper; insulated contact arm; high torque; bushing 3/8"-32 x 3/8" lg	1.2 volt range calibration	Alternate JAN RA20A2SA502AK	JAN R-19
R-109**	R16-P-6917-860-P	RESISTOR, variable: Same as R-109	1.2 volt range calibration	Clarostat-43W-HT Alternate JAN	RCP-375-4 106 JAN R-19
R-109++@	R16-JAN-RA20A2SA-502K	RESISTOR, variable: Same as R-109	1.2 volt range calibration	JAN RA20A2SA502K	JAN R-19
R-110	R16-P-6861	RESISTOR, variable: Wire wound 3 ohms 10%; 2 W; 3 solder lug term; metal enclosed phenolic base 1 1/4" diam x 5/8" d; round metal slotted shaft 1/4" diam x 1/2" 1;	Coarse zero balance control in heater circuit of V-101 and V-102	Alternate JAN RA20A2SA3R0AK	JAN R-19

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
R-110 (Cont.)		A taper; insulated contact arm; high torque; bushing 3/8"-42 x 3/8" lg			
R-110**	R16-P-6861	RESISTOR, variable: Same as R-110	Coarse zero balance control in heater circuit of V-101 and V-102	Clarostat-43W-HT Alternate JAN RA20A2SA3ROAK	RCP-375-4-107 JAN R-19
R-110@	R16-JAN RA20A2SA3ROAK	RESISTOR, variable: Same as R-110	Coarse zero balance control in heater circuit of V-101 and V-102	JAN RA20A2SA3ROAK	JAN R-19
*R-111	R16-R-18770-600	RESISTOR, fixed: Composition; 10 meg ±2%, 0.05 w; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Part of AC diode balancing network	Weston D-108953	Weston Part D-108953
*R-112	R16-R-18770-920	RESISTOR, fixed: Composition; 15 meg ± 2%; 0.037 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Part of AC diode balancing network	Weston D-108954	Weston Part D-108954
*R-113	R16-R-18770-920	RESISTOR, fixed: Same as R-112	Corrects AC calibration on amplifier for 12, 30 and 120 volts		
R-114	R16-R-18756-600	RESISTOR, fixed: Composition; 250,000 ohms ± 1%; 1/2 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy; low temperature coefficient ceramic tube type	300 volt section of voltage multiplier divider	Weston D-112378	Weston Part D-112378

R-114@	R16-R-18756-675	RESISTOR, fixed: Deposited carbon film; 250,000 ohms ±1%, 2W; 1-3/4" lg x 1/4" diam; insulated, moisture resistant; two tab terminals 15/32" lg x 3/16" wd; axial clearance hole 3/16" diam for mtg	300 volt section of voltage multiplier divider	Jetronic A-50020-2	Jetronic A-50020-2
R-114**++	R16-4-17353-3-5000	RESISTOR, fixed: Deposited metal film; 250,000 ohms, ± 1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	300 volt section of voltage age multiplier divider	Continental Carbon Inc Type X-2	RCP-375-1-5-154 Chicago Ind. Inst. Co. Part D-112378
R-115	R16-R-18758-300	RESISTOR, fixed: Composition; 375,000 ohms ±1%; 1/2 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy; low temperature coefficient ceramic tube type	120 volt section of voltage multiplier divider	Weston D-122096	Weston Part D-122096
R-115**	R16-R-17354-12-105	RESISTOR, fixed: Deposited metal film; 15,000 ohms ±1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant, 2 radial wire leads; axial clearance hole for #6 screw for mtg	120 volt section of voltage multiplier divider	Continental Carbon Inc. Type X-2	RCP-375-1-5 155
R-115++	#	RESISTOR, fixed: Metal film; 375,000 ohms ±1%; 2 W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	120 volt section of voltage multiplier divider	Continental Carbon Inc. Type X-2	Chicago Ind. Inst. Co. Part D-122096
R-116	R16-R-18759-185	RESISTOR, fixed: Composition; 625,000 ohms ± 1%; 1/2 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Part of diode balancing network for 120 volt AC range	Weston D-122097	Weston Part D-122097
R-116**	R16-R-17362-13-250	RESISTOR, fixed: Deposited metal film; 625,000 ohms ± 1%; 2W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated; moisture resistant; 2 radial wire leads;	Part of diode balancing network for 120 volt AC range	Continental Carbon Inc. Type X-2	RCP-375-1-5-156

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)12224 @Contract N383s-70996

TABLE 6-3. TABLE OF REPLACEABLE PARTS (Cont.)

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
R-116** (Cont.)		axial clearance hole for #6 screw for mtg			
R-116++	R16-R-17362-13-250	RESISTOR, fixed: Metal film; 625,000 ohms, ±1%; 2W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	Part of diode balancing network for 120 volt AC range	Continental Carbon Inc. Type X-2	Chicago Ind. Inst. Co. Part D-122097
R-116@	R16-R-18759-187	RESISTOR, fixed: Deposited carbon film; 625,000 ohms ± 1%, 2 W; 1-3/4" lg x 1/4" diam; insulated, moisture resistant; two tab terminals 15/32" lg x 3/16" wd; axial clearance hole 3/16" diam for mtg	Part of diode balancing network for 120 volt AC range	Jetronic A-50020-4	Jetronic A-50020-4
R-117	R16-R-18763-500	RESISTOR, fixed: Composition; 1.875 meg ± 11/2%; 0.3 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	30 volt section of voltage multiplier divider	Weston D-122095	Weston Part D-122095
R-117**	R16-R-17390-250	RESISTOR, fixed: Deposited metal film; 1.875 meg-ohms, ±1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw mtg	30 volt section of voltage multiplier divider	Continental Carbon Inc. Type X-2	RCP-375-1-6-88
R-117++	R16-R-17390-250	RESISTOR, fixed: Metal film; 1.875 meg-ohms ±1%; 2W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	30 volt section of voltage multiplier divider	Continental Carbon Inc. Type X-2	Chicago Ind. Inst. Co. D-122095

R-117@	R16-R-18763-750	RESISTOR, fixed: Deposited carbon film; 1.875 meg ± 1%, 2W; 1-3/4" lg x 1/4" diam; insulated, moisture resistant; two tab terminals 15/32" lg x 3/16" wd; axial clearance hole 3/16" diam for mtg	30 volt section of voltage multiplier divider	Jetronic A-50020-5	Jetronic A-50020-5
R-118	R16-R-18763-500	RESISTOR, fixed: Same as R-117	Part of diode balancing network for 30 volts AC range		
R-118**	R16-R-17390-250	RESISTOR, fixed: Same as R-117**	Part of diode balancing network for 30 volts AC range		
R-118@	R16-R-18763-750	RESISTOR, fixed: Same as R-117@	Part of diode balancing network for 30 volts AC range		
R-119	R16-R-18764-500	RESISTOR, fixed: Composition; 3.75 meg ± 1 1/2%; 0.15 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	12 volt section of voltage multiplier divider	Weston D-122094	Weston Part D-122094
R-119**	R16-R-17459-400	RESISTOR, fixed: Deposited metal film; 3.75 megohms, ± 1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	12 volt section of voltage multiplier divider	Continental Carbon, Inc. Type X-2	RCP-375-1-6-89
R-119++	R16-R-17459-400	RESISTOR, fixed: Metal film, 3.75 megohms; ± 1%; 2W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	12 volt section of voltage multiplier divider	Continental Carbon, Inc. Type X-2	Chicago Ind. Inst. Co. Part D-122094
R-119@	R16-R-18764-650	RESISTOR, fixed: Deposited carbon film; 3.75 meg ± 1%, 2W; 1-3/4" lg x 1/4" diam; insulated, moisture resistant; two tab terminals 15/32" lg x 3/16" wd; axial clearance hole 3/16" diam for mtg	12 volt section of voltage multiplier divider	Jetronic A-50020-6	Jetronic A-50020-6
R-120	R16-R-18764-500	RESISTOR, fixed: Same as R-119	Part of diode balancing network for 12 volt AC range		
R-120**	R16-R-17459-400	RESISTOR, fixed: Same as R-119**	Part of diode balancing network for 12 volt AC range		

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)12224 @Contract N383s-70996

TABLE 6-3. TABLE OF REPLACEABLE PARTS (Cont.)

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
R-120 @	R16-R-18764-650	RESISTOR, fixed: Same as R-119++	Part of diode balancing network for 12 volt AC range		
R-121	R16-R-18770-930	RESISTOR, fixed: Composition; 18.75 meg ± 2%; 0.015 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax coating; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	1.2 and 3 volt section of voltage multiplier divider	Weston D-122093	Weston Part D-122093
R-121**	R16-R-17567	RESISTOR, fixed: Deposited metal film; 18.75 megohms, ± 1%, 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated, moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	1.2 and 3 volt section of voltage multiplier divider	Continental Carbon, Inc. Type X-2	RCP-375-1-6-78
R-121++	R16-R-17567	RESISTOR, fixed: Metal film; 18.75 megohms ± 1%; 2 W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	1.2 and 3 volt section of voltage multiplier divider	Continental Carbon, Inc. Type X-2	Chicago Ind. Inst. Co. Part D-122093
R-121 @	R16-R-18770-940	RESISTOR, fixed: Deposited carbon film; 18.75 meg ± 1%, 2 W; 1-3/4" lg x 1/4" diam; insulated, moisture resistant; two tab terminals 15/32" lg x 3/16" wd; axial clearance hole 3/16" for mtg	1.2 and 3 volt section of voltage multiplier divider	Jetronic A-50020-8	Jetronic A-50020-8
R-122	R16-R-18770-930	RESISTOR, fixed: Same as R-121	Part of diode balancing network for the 1.2 and 3 volt AC ranges		
R-122**	R16-R-17567	RESISTOR, fixed: Same as R-121**	Part of diode balancing network for the 1.2 and 3 volt AC ranges		
R-122 @	R16-R-18770-940	RESISTOR, fixed: Same as R-121 @	Part of diode balancing network for the 1.2 and 3 volt AC ranges		

*R-123	R16-R-18701-150	RESISTOR, fixed: Wire wound; 25,000 ohms x ±1/2%; 1/4 W, maximum operating temperature 55° C, 0.55" diam x 1/2" lg; moisture resistant wax; brass end flanges form extended eyelet terminals; mt by single hole through center for 1/10" diam screw; Weston type #139 spool	Determines DC amplifier sensitivity	Weston D-122121	Weston Part D-122121
R-124	R16-R-18691-750	RESISTOR, fixed: Wire wound; 16,670 ohms ± 1/2%; 1/4 W, maximum operating temperature 55° C, 0.55" diam x1/2" lg; moisture resistant wax; brass end flanges form extended eyelet terminals; mt by single hole through center for 1/10" diam screw; Weston type #139 spool	Determines calibration on 3 volt AC range	Weston D-122122 JAN RB10B1667ID	Weston Part D-122122 JAN R-93
R-124++	R16-R-18691-750	RESISTOR, fixed: Wire wound; 16,670 ohms ± 1/2%	Determines calibration on 3 volt AC range	JAN RB 10B 16671D	JAN R-93
R-124@	R16-R-18691-755	RESISTOR, fixed: Wire wound; 16,670 ohms ± 1/2%, 1/4 W; 1/2" lg x 9/16" diam; moisture resistant; two lug terminals 7/16" lg x 3/32" wd; axial clearance hole 5/32" diam for mtg	Determines calibration on 3 volt AC range	Jetronic A-50021-3	Jetronic A-50021-3
R-125	R16-R-18689-50	RESISTOR, fixed: Wire wound; 14,000 ohms ± 1/2%; 1/4 W, maximum operating temperature 55° C, 0.55" diam x 1/2" lg; moisture resistant wax; brass end flanges form extended eyelet terminals; mt by single hole through center for 1/10" diam screw; Weston type #139 spool	Determines in conjunction with R-109 sensitivity of 1.2 volt AC range	Weston D-122123 JAN RB10B14001D	Weston Part D-122123 JAN R-93
R-125++	#	RESISTOR, fixed: Wire wound; 14,000 ohms ± 1%	Determines in conjunction with R-109 sensitivity of 1.2 volt AC range	JAN RB10B14001F	JAN R-93
R-125@	R16-R-18689-75	RESISTOR, fixed: Wire wound; 14,000 ohms ± 1/2%, 1/4 W; 1/2" lg x 9/16" diam; moisture resistant; two lug terminals 7/16" lg x 3/32" wd; axial clearance hole 5/32" diam for mtg	Determines in conjunction with R-109 sensitivity of 1.2 volt AC range	Jetronic A-50021-1	Jetronic A-50021-1
R-126	R16-R-17493	RESISTOR, fixed: Composition; 5.1 meg ± 5%; 1/2 W; characteristic F; 13/32" lg x 1/8" diam (note body	Isolating resistor in DC probe	International Resistance Co. type BTS	Weston Part ND-24142

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)12224 @Contract N383s-70996

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
R-126 (Cont.)		diam must not be larger than 0.14"); insulated, moisture resistant			
R-126**++@	R16-JAN-RC20BF515J	RESISTOR, fixed: Composition; 5.1 megohms ± 5%; 1/2 W	Isolating resistor in DC probe	JAN RC20BF515J	JAN R-11 Chicago Ind. Inst. Co. Part ND-24142
R-127	R16-R-17493	RESISTOR, fixed: Same as R-126	Isolating resistor in AC probe		
R-127**@	R16-JAN-RC20BF515J	RESISTOR, fixed: Same as R-126**++@	Isolating resistor in AC probe		
R-128	R16-JAN-RW31G501	RESISTOR, fixed: Wire wound; 500 ohms ± 5%	Heater to keep moisture out when instrument is turned off	JAN RW31G501	JAN R-26
R-129	R16-JAN-RW1G501	RESISTOR, fixed: Same as R-128	Same as above		
R-130	R16-R-17256-55-50	RESISTOR, fixed: Composition; 10 ohms ± 20%	Reduce brightness of "ON" lamp	JAN RC20AE100M	JAN R-11
R-130**@	R16-JAN-RC20BF100M	RESISTOR, fixed: Composition; 10 ohms; ± 20%; 1/2 W	Reduce brightness of "ON" lamp	JAN RC20BF100M	JAN R-11
+R-131	#	RESISTOR, variable: Wire wound 2,000 ohms ± 10%; 2 W; 100°C max continuous oper; 3 solder lug term; metal enclosed molded phenolic base 1 1/8" diam x 9/16" d; round metal slotted shaft 1/4" diam x 1/8" lg from mtg surface; A taper, insulated contact arm; high torque; bushing 3/8"-32 x 3/8" lg	Fine adjustment for amplifier output	Clarostat Series 43-HT	Weston Part ND-24547
R-131**@	R16-P-6893-850	RESISTOR, variable: Same as R-131	Fine adjustment for amplifier output	Clarostat Series 43W-HT Jetronic CIR-43W-HT2K-10 Alternate JAN RA20A2SA-202AK	RCP-375-4-105 Jetronic Part CIR-43W-AHPK-10 JAN R-19

R-131++	R16-P-6894-850	RESISTOR, variable: Wire wound; 2 W; 2000 ohms ± 10%	Fine adjustment for amplifier output	JAN RA20A2SA-202AK	JAN R-19
+R-132	#	RESISTOR, fixed: Wire wound 23,000 ohms ± 1/2%; 1/4 W, max operating temperature 55° C, 0.55" diam x 1/2" lg; moisture resistant wax; brass end flanges form extended eyelet terminals; mt by single hole through center for 1/10" diam screw Weston type #139 spool	Partially determines amplifier sensitivity	Weston D-125889	Weston Part D-125889
R-132**	R16-R-18701-143	RESISTOR, fixed: Wire wound 23,000 ohms ± 1/2%; 1/4 W	Partially determines amplifier sensitivity	JAN RB10823001D	JAN R-93
R-132++	#	RESISTOR, fixed: Wire wound 1/2 W; 23,000 ohms ± 1%	Partially determines amplifier sensitivity	JAN RB10823001F	JAN R-93
R-132@	R16-R-18701-142-900	RESISTOR, fixed: Wire wound; 23,000 ohms ± 1/2%, 1/4 W; 1/2" lg x 9/16" diam; moisture resistant; two lug terminals 7/16" lg x 3/32" wd; axial clearance hole 5/32" diam for mtg	Partially determines amplifier sensitivity	Jetronic A-50021-3	Jetronic A-50021-3
+R-133	#	RESISTOR, fixed: Composition; 9 meg ± 2%; 0.05 W; 1.75" lg x 0.362" OD with axial clearance hole for 0.165" diam rod; moisture resistant wax; two tab terminals 7/16" lg x 3/16" wd; high accuracy, low temperature coefficient ceramic tube type	Part of AC diode balancing network	Weston D-108962	Weston Part D-108962
R-133**	R16-R-17540-5000	RESISTOR, fixed: Deposited metal film; 9 megohms, ± 1%; 2 W; 0.05% per degree C negative; 1 3/4" lg x 9/32" diam; insulated moisture resistant; 2 radial wire leads; axial clearance hole for #6 screw for mtg	Part of AC diode balancing network	Continental Carbon, Inc. Type X-2	RCP-375-1-6-90
R-133++	R16-R-17540-5000	RESISTOR, fixed: Metal film, 9 megohms ± 1%; 2 W; 1.75" lg x 9/32" OD with axial clearance hole for .140 diam rod; moisture resistant wax coating; wire leads; protected by layer of vitreous enamel; stability of wire wound	Part of AC diode balancing network	Continental Carbon, Inc. Type X-2	Chicago Ind. Inst. Co. Part D-108962
R-133@	R16-R-18770-575	RESISTOR, fixed: Deposited carbon film; 9 meg ± 1%, 2 W; 1-3/4" lg x	Part of AC diode balancing network	Jetronic A-50020-7	Jetronic A-50020-7

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)12224 @Contract N383s-70996

MODEL: VOLTMETERS TS-375/U and TS-375A/U MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
R-133@ (Cont.)		1/4" diam; insulated, moisture resistant; two tab terminals 15/32" lg x 3/16" wd; axial clearance hole 3/16" diam for mtg			
+R-134	#	RESISTOR, variable: Composition 2 megohms, ± 20%; 0.25 W; 100° C max continuous oper; 3 solder lug term; metal enclosed molded phenolic base 1 1/8" diam x 9/16" d; round metal slotted shaft 1/4" diam x 1/8" lg from mtg surface; A taper; insulated contact arm; high torque; bushing 3/8"-32 x 3/8" lg	Part of AC diode balancing network	Clarostat Series 37	Weston Part ND-24546
R-134**@	R16-P-5597-60	RESISTOR, variable: Same as R-134	Part of AC diode balancing network	Clarostat Type 37W-HT Jetronic CLR-37W-2M-20	RCP-375-4-112 Jetronic Part CLR-37W-2M-20
R-134++	#	RESISTOR, variable: Composition, 2 megohms ± 20%; 1/3 W; 3 solder lug term; metal enclosed molded phenolic base 15/16" diam x 9/16" depth; round metal slotted shaft 1/4" diam x 1/8" lg from mtg surfaces; straight taper; insulated contact arm; split bushing for locking shaft	Part of AC diode balancing network	International Resistance Co. Type "Q"	Chicago Ind. Inst Co. Part ND-24546
+R-135	#	RESISTOR, fixed: Composition; 15,000,000 o ms ± 10%; 1/2 W	Part of AC diode balancing network	JAN RC20AE156K	JAN R-11
R-135**@	R16-JAN-RC20BF-156K	RESISTOR, fixed: Composition; 15,000,000 ohms ± 10%; 1/2 W	Part of AC diode balancing network	JAN RC20BF156K	JAN R-11
+R-136	#	RESISTOR, fixed: Same as R-135	Corrects AC calibration on 12, 30 and 120 volts		
R-136**@	R16-JAN-RC20BF-156K	RESISTOR, fixed: Same as R-135**@	Corrects AC calibration on 12, 30 and 120 volts		

S-101	R16-S-10730-50	SWITCH, toggle: SPDT; 3A, 250 volts or 6A, 125 volts; bakelite case; 1 5/32" lg x 11/16 wd x 15-16" deep overall; 3/4" lgbat handle; back connected solder terminals; mts by single clearance hole for 15/32"-32 thd x 13-32" lg bushing	To turn off vacuum tube voltmeter and turn on internal heater	AH&H type 81021-Fj	Weston Part D-112452 Jetronic Part AHH-81021F
S-101**	R17-S-25863-50	SWITCH, toggle; SPDT; 5 amps, 125 volts	To turn off vacuum tube voltmeter and turn on internal heater	AHH-82303-B JAN ST-12D	JAN S-23
S-101++	R16-S-10730-50	SWITCH, toggle: SPDT; 3A, 250 volts or 6A, 125 volts; bakelite case, 1 5/32" lg x 11/16" wd x 15/16" deep overall; 3/4" lg bat handle; back connected solder terminals; mts by single clearance hole for 15/32"-32 thd x 13/32" lg bushing	To turn off vacuum tube voltmeter and turn on internal heater	AH&H type 81021-Fj	Chicago Ind. Inst. Co. part D-112452
S-102	R16-S-11292-590	SWITCH, rotary: 3 pole 5 position; 2 decks; solid silver alloy; phenolic decks; 1 7/8" diam x 1"; solder terminals; single hole mtg bushing 3/8"-32 x 1/4" lg	Range switch	Oak Mfg. Co. special for Weston	Weston Part D-122112
S-102**	R16-S-11292-590	SWITCH, rotary: Same as S-102	Range switch	OAK-34344-H2	RCP-375-3-91
S-102++	R16-S-11292-590	SWITCH, rotary: Same as S-102	Range switch	OAK-34344-H2	Chicago Ind. Inst. Co. Part D-122112
S-102 @	R16-JACZ-B1070	SWITCH, rotary: 3 pole, 6 position; 2 decks; solid silver alloy cont; phenolic body, wax impregnated; 1-7/8" diam x 1-11/32" d; shorting type; solder terminals; single hole mtg, bushing 3/8" -32 thd x 3/16" lg	Range switch	Jetronic B-1070	Jetronic B-1070
S-103	R16-S-11279-529-500	SWITCH, rotary: 4 pole 3 position; 1 deck; solid silver alloy contacts; phenolic decks; 1 7/8" diam x 13/16" d; solder terminals; single hole mtg bushing 3/8"-32 x 1/4" lg	Selects AC volts + DC volts or -DC volts	OAK-special for Weston	WE-D-122109
S-103**	R16-S-11279-529-500	SWITCH, rotary: Same as S-103	Selects AC volts + DC volts or -DC volts	OAK-34343-H1	RCP-375-3-92

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)12224 @ Contract N383s-70996

TABLE 6-3. TABLE OF REPLACEABLE PARTS (Cont.)

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
S-103++	R16-S11279-529-500	SWITCH, rotary: Same as S-103	Selects AC volts + DC volts or -DC volts	OAK-34343-HM	Chicago Ind. Inst. Co. Part D-122109
S-103@	R16-JACZ-B1069	SWITCH, rotary: 4 pole, 3 position; 1 deck; solid silver alloy cont; phenolic body, wax impregnated; 1-7/8" diam x 1-3/32" d; shorting type; solder terminals; single hole mtg, bushing 3/8" -32 thd x 3/16" lg	Selector switch	Jetronic B-1069	Jetronic B-1069
T-101	R17T-7218-150	TRANSFORMER, power: Filament and plate type; 115 volts, 50 to 1600 cyc; 3 output windings; Sec #1, 500 v at 10 ma CT; impr petroleum residue compound and then potted; enclosed metal case; metal case without terminals 3.12" lg x 2.62" wd x 2.75" deep; 9 active and 4 dummy solder terminals mtd on a line intersecting the mtg bolts and are one 1/2 mtg-c; four 0.173" diam holes on 2 1/2" x 2" mtg-c; diagram Weston dwg D-121995	Supplies power to filaments and plates	Weston D-121994	Weston Part D-121994
T-101**	R16-T-6680-30	TRANSFORMER, power: Plate and filament type; primary 115 volts 50-1600 cycles; 3 output winding, sec'd #1-500V CT 10 ma, sec'd #2--5 volts 2.5 amps, sec'd #3--6.3 volts, 2.5 amps, vacuum varnish impregnated; hermetically sealedmetalcase; 3.12" lg x 2.62" wd x 2.72" h; 9 active and 4 dummy terms mtd on bottom of case; four 8-32 tapped mtg holes on 2 1/2" x 2" mtg/c	Supplies power to filament and plates	Industrial Trans. Co. special for RCP	RCP-375-25-83
T-101++	#	TRANSFORMER, power: Filament and plate type; 115 volts 50 to 1600 cycles primary; 3 secondary windings; Sec #1, 500V at 10 ma CT; Sec #2, 6.3V at 2A; Sec #3, 5V at 2A; Built according to MIL-T-27,	Supplies power to filament and plates	United Transformer Co. special for Chicago Ind. Inst. Co.	Chicago Ind. Inst. Co. Part D-121994

T-101++ (Cont.)		Grade 1; 3.12" lg x 2.62" wd x 2.75" deep; four mtg studs on 2 1/2 x 2" mtg/c			
T-101 @	R16-JACZ-B1073	TRANSFORMER, power: Plate and filament type; primary 115 volts 50-1600 cycles; 3 secondary windings; Sec #1, 500 V at 10 ma CT; Sec #2, 5V at 2.5 amps; Sec #3, 6.3 volts at 2.5 amps; impregnated; hermetically sealed metal case; 3-3/16" lg x 2-11/16" wd x 2-3/4" h; 9 active and 5 dummy terms mtd on bottom of case; four 8-32 tapped mtg holes on 2-1/2" x 2" mtg/c	Supplies power to filament and plates	Industrial Transformer Corp. Special for Jetronic	Jetronic B-1073
V-101	N16T-56665	TUBE, electron	DC input voltage amplifier	JAN-6SJ7	JAN-1A
V-102	N16T-56665	TUBE, electron: Same as V-101	Balancing section of input of DC amplifier		
V-103++	N16T-56677	TUBE, electron	Output of DC amplifier	JAN-6SL7	JAN-1A
V-103	N16T-56677	TUBE, electron	Output of DC amplifier	JAN-6SL7-GT	
V-104	N16T-55735	TUBE, electron: Rectifier	Supplies DC potential to tubes	RMA 5Y3-GT	Weston Part ND-23411
V-104** @	N16T-55735	TUBE, electron: Full wave rectifier	Supplies DC potential to tubes	JAN-5Y3-GT	JAN-1A
V-104++	N16T-55735	TUBE, electron	Supplies DC potential to tubes	JAN-5Y3-GT	JAN-1A
V-105	N16T-69910	TUBE, electron	Regulates voltage to cathode on pin 6 of V-103	JAN-991 (NE 16)	JAN-1A
V-106	N16T-69910	TUBE, electron: Same as V-105	Regulates voltage to cathode on pin 3 of V-103		
V-107	N16T-66065	TUBE, electron: Diode, cathode type	RF diode in AC probe	Raytheon CK-606-BX	Weston Part ND-24145
V-107++	N16T-66065	TUBE, electron: Diode, cathode type	RF diode in AC probe	Raytheon CK-606-BX	Chicago Ind. Inst. Co. Part ND-24145
V-107 @	N16T-75704	TUBE, electron: Diode, cathode type	RF diode in AC probe	Raytheon CK 5704	Raytheon CK 5704
V-108	N16T-66065	TUBE, electron: Same as V-107	Balancing diode for V-107		

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-80744,NOa(S)12224 @Contract N383s-70996

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
V-108@	N16T-75704	TUBE, electron: Same as V-107@	Balancing diode for V-107++		
X-101	R16S-6188-10	SOCKET, tube: 8 contact octal; retainer ring mounting; 1.172" diam chassis cutout required; round molded bakelite body 1 1/4" diam x 7/16" h excluding terminals; phosphor bronze silver plated contacts	Socket for V-101	Amphenol Type S-8M	Weston Part ND-21620 RCP-375-14-8 Jetronic Part AMP-58M
X-101++	#	SOCKET, tube: 8 contact octal; retainer ring mounting; 1.172" diam chassis cutout required; round molded low loss bakelite body; 1 1/4" diam x 7/16" h excluding terminals; phosphor bronze silver plated contacts	Socket for V-101	Amphenol Part 78-S8TM	Chicago Ind. Inst. Co. Part ND-21620
X-102	R16S-6188-10	SOCKET, tube: Same as X-101	Socket for V-102		
X-102++	#	SOCKET, tube: Same as X-101++			
X-103	R16S-6188-10	SOCKET, tube: Same as X-101	Socket for V-103		
X-103++	#	SOCKET, tube: Same as X-101++			
X-104	R16S-6188-10	SOCKET, tube: Same as X-101	Socket for V-104		
X-104++	#	SOCKET, tube: Same as X-101++			
X-105	R17H-5974-150	SOCKET, tube: 2 contact bayonet; one piece saddle mounting; two 1/8" mtg holes on 1 1/8" mtg-c, 13/16" dia chassis cutout required round nickel plated brass body, 25/32" diam x 1 3/16" h excluding terminals; brass button contacts	Socket for V-105	J. H. Millen Type 33991	Weston Part ND-24175 RCP-375-14-53 Jetronic Part MLN-33991
X-105++	#	SOCKET, tube: 2 contact bayonet; two; 1.40" mounting holes on 1 1/8" mtg/c; round nickel plated body; 43/64" diam x 29/32" high; two color coded leads cut to correct length	Socket for V-105	Drake Mfg. Co. special for Chicago Ind. Inst. Co.	Chicago Ind. Inst. Co. Part ND-24175

X-106	R17H-5974-150	SOCKET, tube: Same as X-105	Socket for V-106		
X-106++	#	SOCKET, tube: Same as X-105++			
F-101	R17F-14240	FUSE, cartridge: 1 amp, opens in 1 second at 200% load, rated continuous at 135 and 110% load; 250 v; one time; glass body; 2 nickel plated brass ferrule terminals; 1 1/4" lg x 1/4" diam; NEC terminals	Line fuse	Little fuse Style 3AG Part 312001 Bussman Type 3AG	Weston Part ND-19540 RCP-375-31-1
F-101++	#	FUSE, cartridge: 1 amp, carry 110% open at 135% in 1 hour; 250V; one time; glass body; 2 nickel plated brass ferrule terminals; 1 1/4" lg x 1/4" diam	Line fuse	Bussman Mfg. Co. Type A.G.C.-1	Chicago Ind. Inst. Co. Part ND-19540
F-102	R17F-14240	FUSE, cartridge: Same as F-101	Line fuse		
0-101	R16WS-122077	CLIP: Round grounding clip for AC probe; nickel plated phosphor bronze; 3/4" diam x 1.18" lg overall	Ground clip for AC probe	Weston D-122077 RCP-375-50-5	Weston Part D-122077 RCP-375-50-5
0-101++	R16WS-122077	CLIP: Same as 0-101	Ground clip for AC probe	Chicago Ind. Inst. Co. D-122077	Chicago Ind. Inst. Co. Part D-122077
0-101 @	R16JACZ-A189	CLIP: Grounding clip for AC probe (E-102 @); nickel plated spring-temper brass; 11/16" diam x 1-1/4" lg overall	Ground clip for AC probe	Jetronic A-189	Jetronic A-189
0-102	R17C10919-275	CLIP, Alligator: for making temporary electrical connections; cadmium plated steel; 2" lg x 1.4" wd x 3/8" h overall; one solder lug connection; 3/8" jaw opening	Extra clip for making up a lead	Amer Rad Hdwe #45AT Mueller #60	Weston Part ND-22010 RCP-375-13-70 Jetronic Part MUE-60
0-102++	R17C-12190-10	CLIP, Alligator: Same as 0-102	Extra clip for making up a lead	Mueller Electric Co. Series 60	Chicago Ind. Inst. Co. Part ND-22010
W-101	R15C-36230	CABLE ASSEMBLY, power: Type SJ; two #16 AWG stranded conductors; 250 working volts; 8 ft long; one end of cable terminated with Belden #H-715 rubber plug; other end terminated with Belden #H-1038 motor connector	Line Cord	Belden per Weston D-66187	Weston Part D-66187

**Contracts N383s-30174,36339,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)12224 @Contract N383s-70996

TABLE 6-3. TABLE OF REPLACEABLE PARTS (Cont.)

MODEL: VOLTMETERS TS-375/U and TS-375A/U

MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
W-101**	#	CABLE ASSEMBLY, power: Type SJ, 7 ft incl terminations; molded rubber male plug one end, molded rubber female plug other end	Line Cord	Cords Ltd #353-1	RCP-375-28-52
W-101++	#	CABLE ASSEMBLY, power: Type SJ; two #16 AWG stranded conductors; 250 working volts; 8 ft. long; one end of cable terminated with Belden #H-1047 rubber plug, other end terminated with Belden #H-1289 motor connector	Line Cord	Belden Mfg. Co. per Chicago Ind. Inst. Co. D-66187 Cord Cx-337/U	Chicago Ind. Inst. Co. Part D-66187
W-101 @	R16CODL-18-2SJ	CABLE ASSEMBLY, power: Type SJ, 7 ft lg incl terminations; molded rubber male plug one end. molded female plug other end	Line Cord	Cords Ltd 18-2SJ	Jetronic CODL-18-2SJ
W-102	R16-6-4883-260	LEAD, test: #20 stranded tinned copper, 40 strands of #36; red rubber covered; 1,000 volts max; 1/32" wall rubber; 52" lg excluding terminals; Weston test prod, bushing and sleeve parts D-66383; D-65784 and D-65781 on one end, Weston spade terminal and sleeve parts D-79652 and D-79653 at other end	To make connections from circuit under test to binding posts	Weston D-79650	Weston Part D-79650
W-102**	#	LEAD, test: #20 AWG tinned copper wire; stranded, 40 strands #36 wire, red rubber, covered, 1000 V max; 52" lg excl term; test prod and tip one end; #10 spade lug other end	To make connections from circuit under test to binding posts	RCP #903SR	RCP #903SR

W-102++	3E 6000-529	LEAD, test: #18 AWG stranded tinned copper conductor, c/o 65# 36 AWG strands covered w/thermoplastic, w/protective sleeve of cellulose acetate tubing; 4 ft lg o/a; tip at one end for accom. Mueller type, 60 alligator clip or equivalent and tip at other end to fit desired jack or binding post. One red rubber covered lead	To make connections from circuit under test to binding posts	Cord Cx-529/U Assembly	Govt. Dwg. #SC-C-10414
W-102 @	#	LEAD, test: #20 stranded tinned copper wire: 40 strands #36 wire; red rubber covered; 1000 V max; 48" lg excl term; red cellulose acetate test prod (Jetronic part/dwg A-50022-3) and tip (Jetronic part/dwg A-009) one end spade lug (Zierick part 278) and red insulator sleeve (Jetronic part/dwg A-50022-1) at other end	To make connections from circuit under test to binding posts	Jetronic B-1068-501	Jetronic B-1068-501
W-103	R16-6-4883-270	LEAD, test: #20 stranded tinned copper; 40 strands of #36; black rubber covered; 1,000 volts max; 1/32" wall rubber; 52" lg excluding terminals; Weston test prod, bushing and sleeve parts D-66383, D-65784 and D-65781 on one end, Weston spade terminal and sleeve parts D-79652 and D-79653 at other end	To make connections from circuit under test to binding posts	Weston D-79651	Weston Part D-79651
W-103**	#	LEAD, test: #20 AWG tinned copper wire; stranded, 40 strands #36 wire, black rubber covered, 1000 V max; 52" lg excl term; test prod and tip one end; #10 spade lug other end	To make connections from circuit under test to binding posts	RCP #903SB	RCP #903SB
W-103++	3E 6000-529	LEAD, test: #18 AWG stranded tinned copper conductor, c/o 65 #36 AWG strands, covered with thermo plastic, w/protective sleeve of cellulose acetate tubing; 4 ft.	To make connections from circuit under test to binding posts	Cord Cx-529/U Assembly	Govt. Dwg. #SC-C-10414

**Contracts N383s-30174,36039,38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)12224 @ Contract N383s-70996

TABLE 6-3. TABLE OF REPLACEABLE PARTS (Cont.)

MODEL: VOLTMETERS TS-375/U and TS-375A/U MAJOR ASSEMBLY: VOLTMETERS TS-375/U and TS-375A/U LESS ACCESSORIES

Reference Symbol	Army Stock No. Navy Stock No.	Name of Part and Description	Function	Mfr. & Desig. or JAN Type	Cont. or Govt. Dwg. or Spec. No.
W-103++ (Cont.)		lg o/a; tip at one end for accom. Mueller type 60 alligator clip or equivalent and tip at other end to fit desired jack or binding post. One black rubber covered lead.			
W-103 @	#	LEAD, test: #20 stranded tinned copper wire; 40 strands #36 wire; black rubber covered, 1000 V max; 48" lg excl term; black cellulose acetate test prod (Jetronic part/dwg A-50022-4) and tip (Jetronic part/dwg A-009) one end spade lug (Zierick part 278) and black insulator sleeve (Jetronic part/dwg A-50022-2) at other end	To make connections from circuit under test to binding posts	Jetronic B-1068-502	Jetronic B-1068-502

**Contracts N383s-30174,36339, 38158,45654 *Contract NObsr-30009 +Contract NOa(S)-9616 ++Contracts N383s-60744,NOa(S)-12224 @Contract N383s-70996

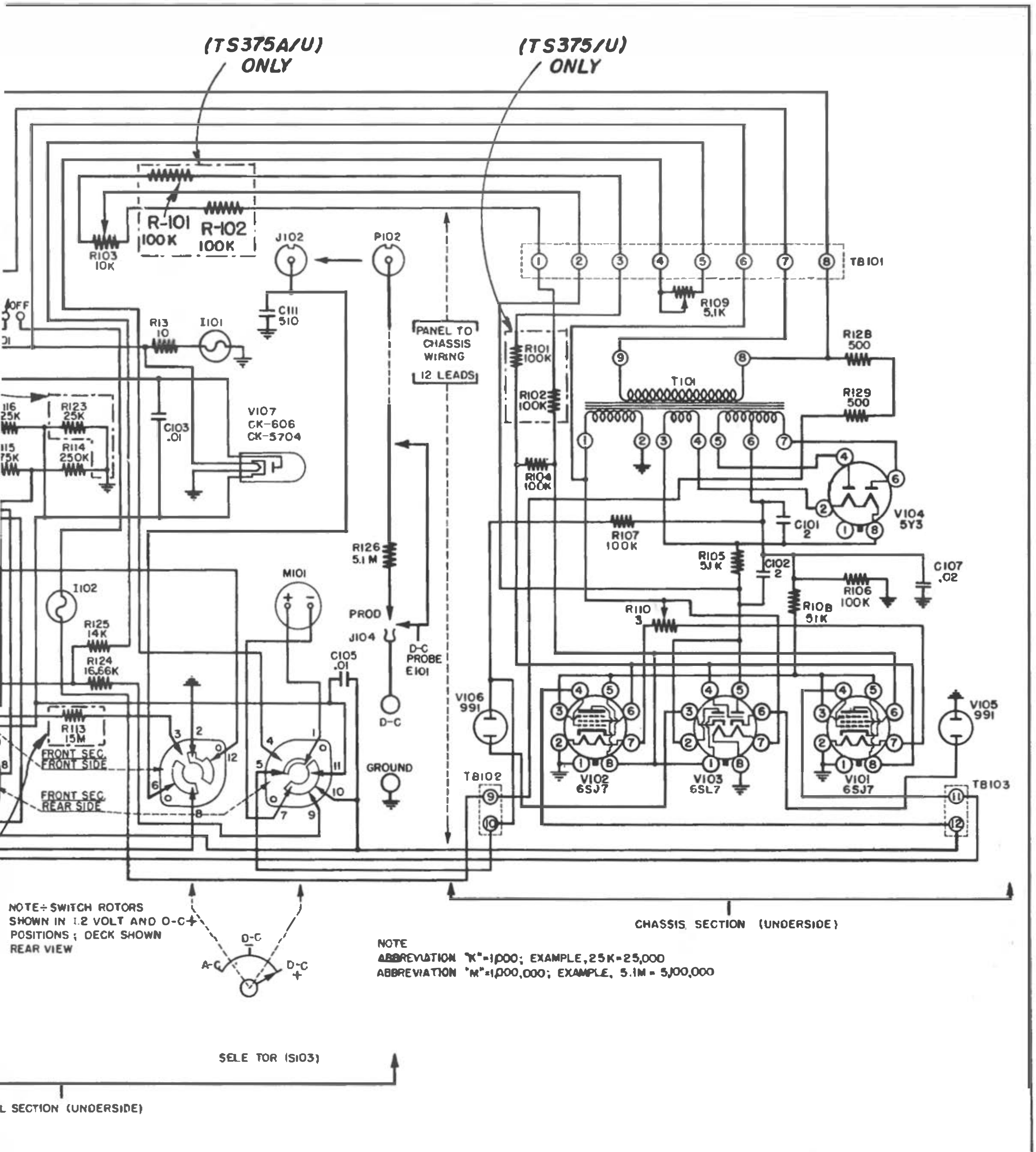
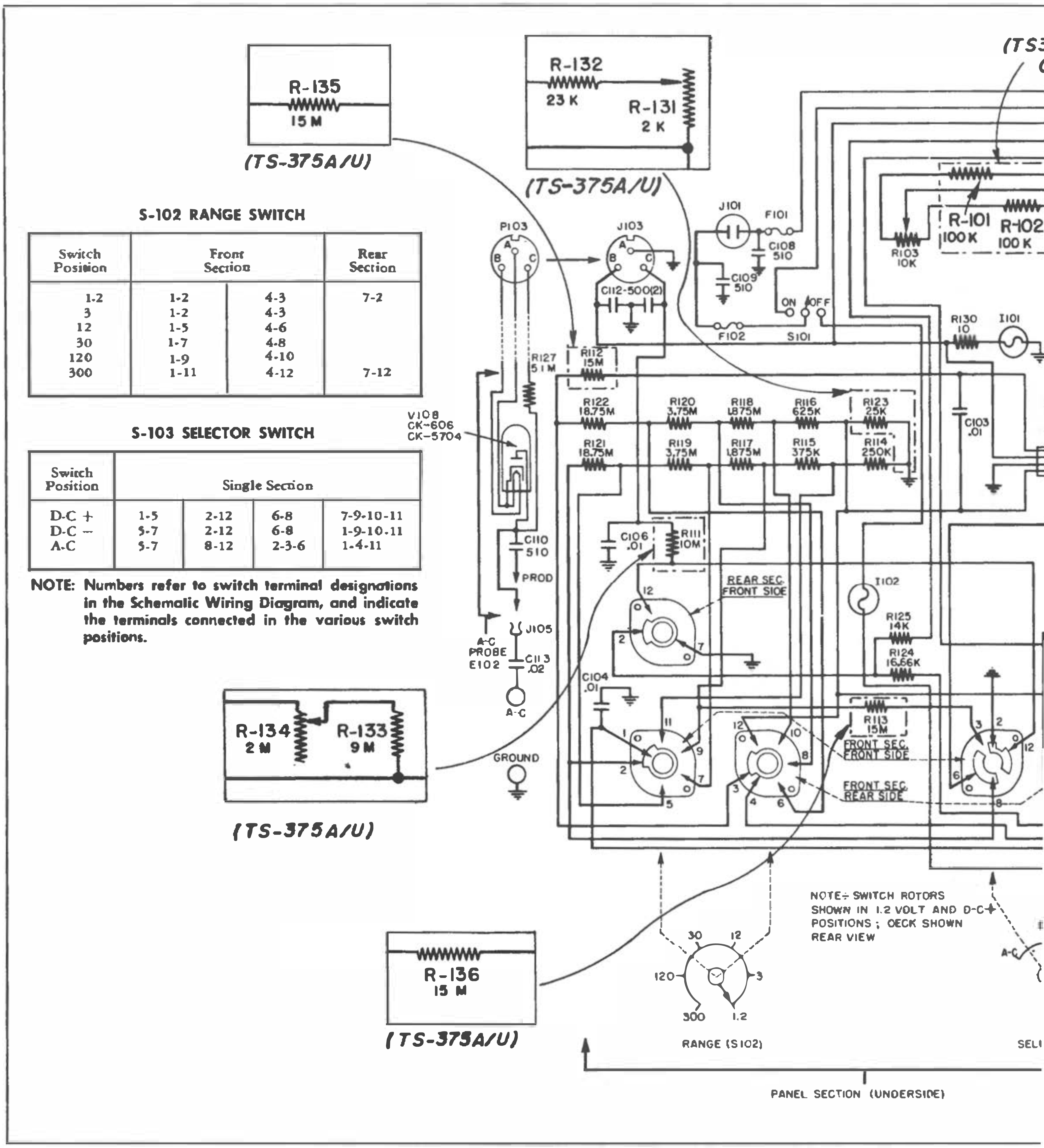


Figure 7-1 Voltmeters TS-375/U and TS-375A/U, Complete Schematic



S-102 RANGE SWITCH

Switch Position	Front Section		Rear Section
1.2	1-2	4-3	7-2
3	1-2	4-3	
12	1-5	4-6	
30	1-7	4-8	
120	1-9	4-10	
300	1-11	4-12	7-12

S-103 SELECTOR SWITCH

Switch Position	Single Section			
D-C +	1-5	2-12	6-8	7-9-10-11
D-C −	5-7	2-12	6-8	1-9-10-11
A-C	5-7	8-12	2-3-6	1-4-11

NOTE: Numbers refer to switch terminal designations in the Schematic Wiring Diagram, and indicate the terminals connected in the various switch positions.

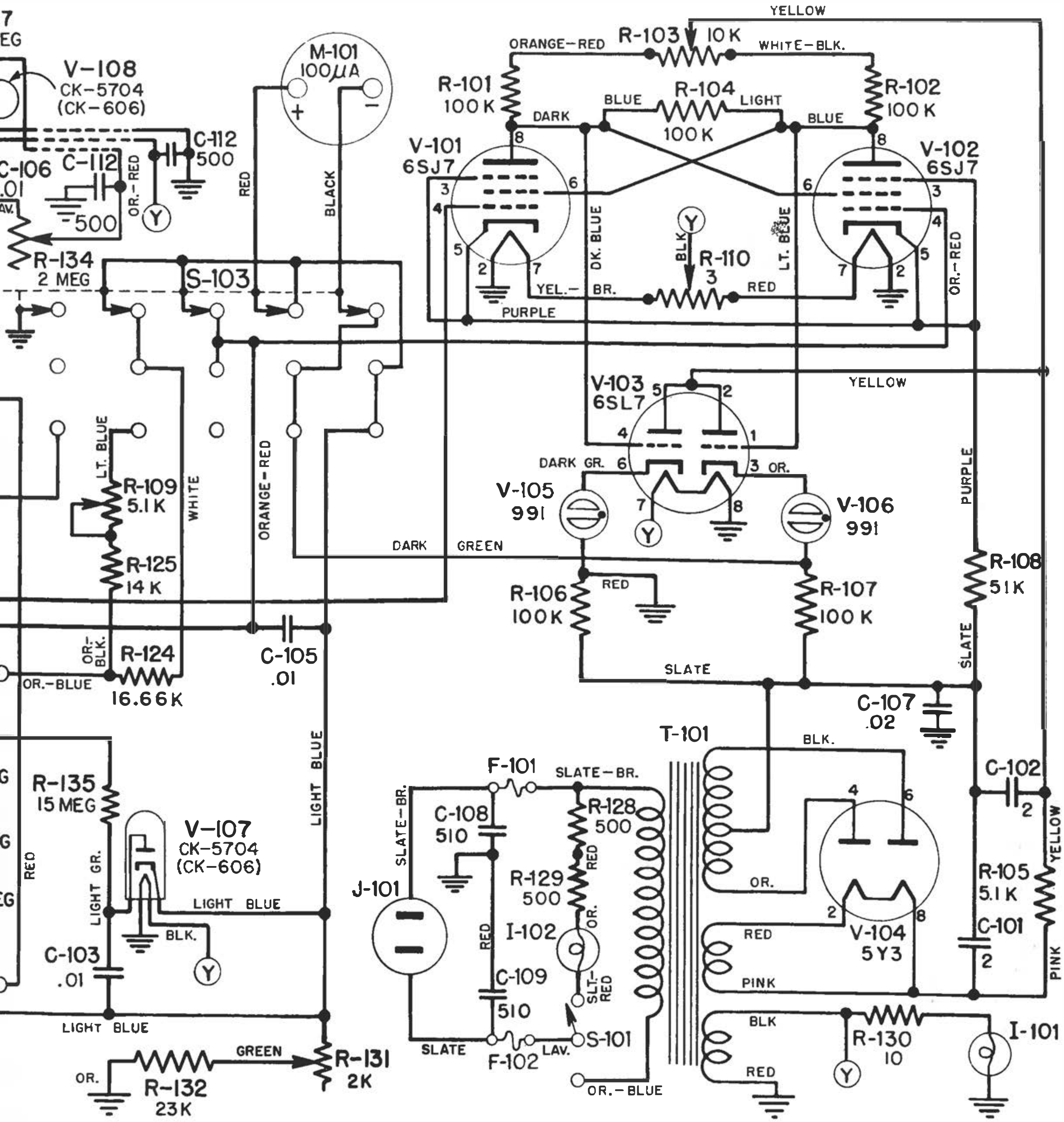


Figure 7-2A. Voltmeter TS-375A/U, Contract N383s-70996, Practical Wiring Diagram

Revised 15 February 1955

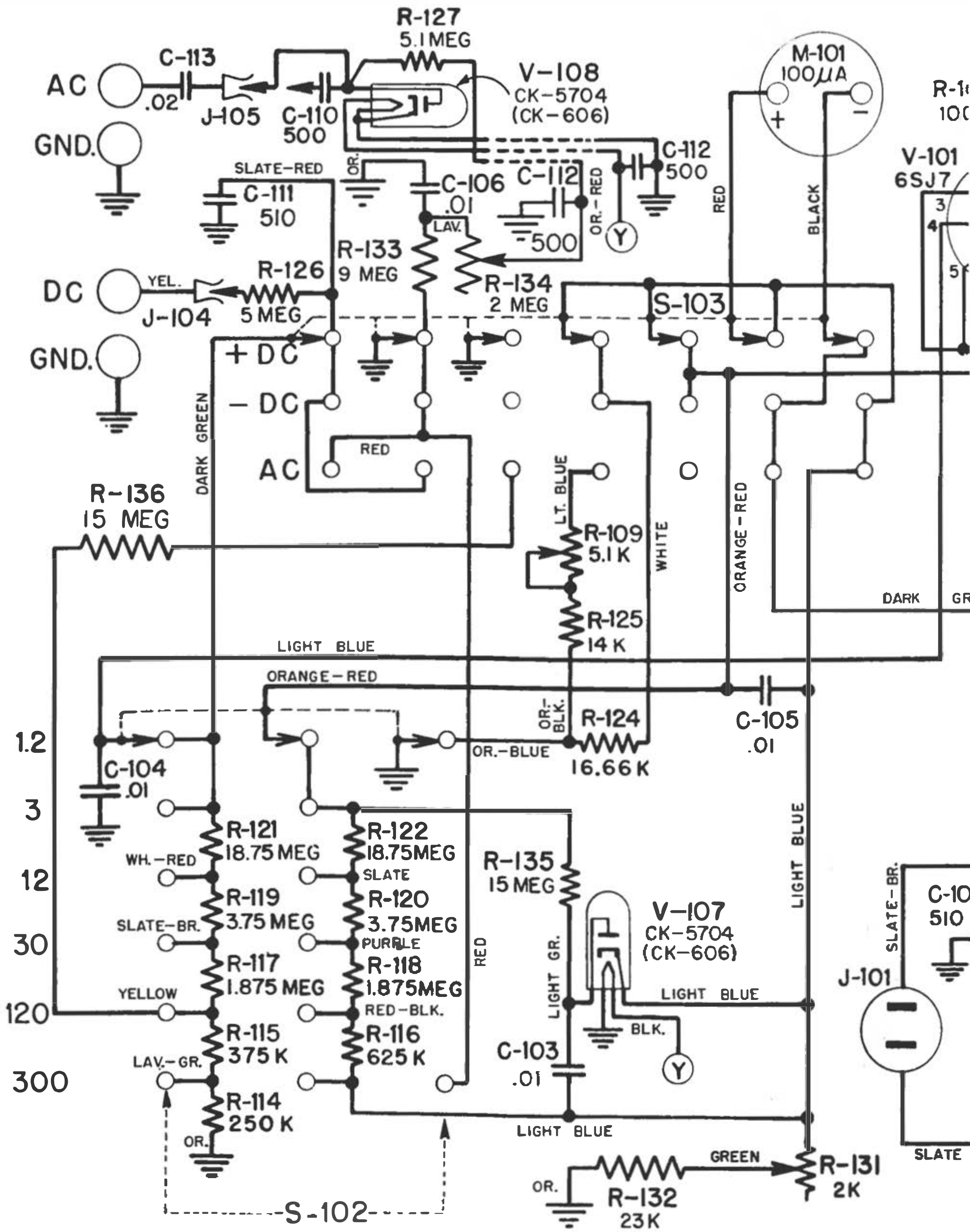


Figure 7-2A. Voltmeter TS-375

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