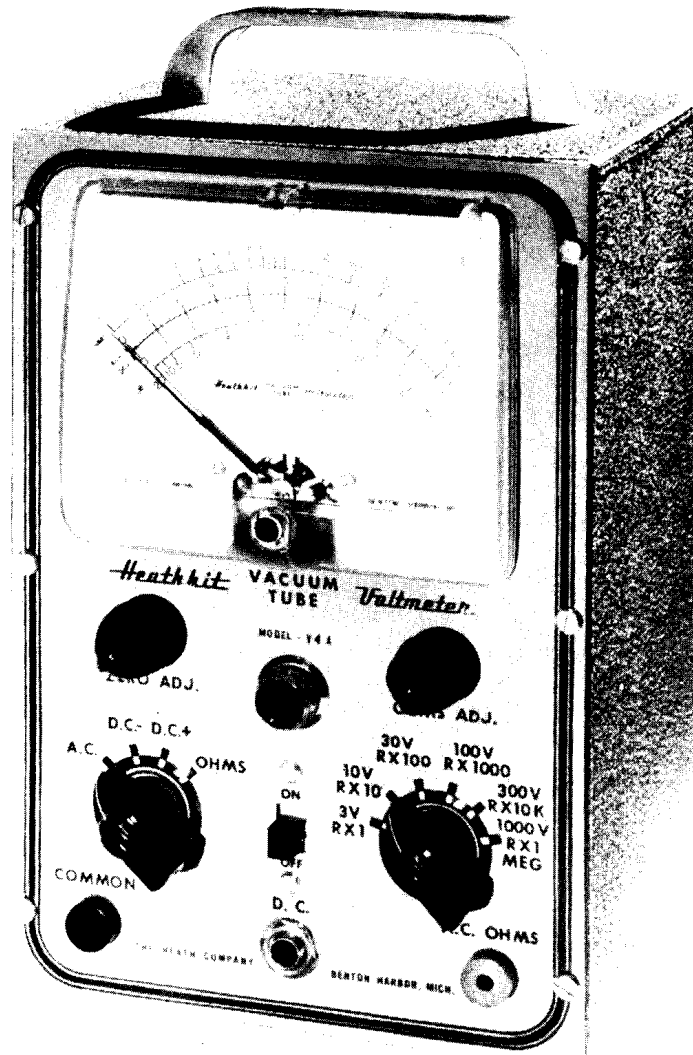


# HEATHKIT

## MODEL V-4A

# VACUUM TUBE VOLTMETER



### SPECIFICATIONS

Power Requirements:	105-125V 50/60 Cycle AC, 10 Watts.
Overall Size:	10" high x 6" wide x 5 $\frac{7}{8}$ " deep.
Kit Shipping Weight:	8 pounds
Meter:	4 $\frac{1}{2}$ " Streamlined case with 200 microampere movement.
Multipliers:	Carbofilm precision type.
Tubes:	1 - 6SN7 Twin triode meter bridge. 1 - 6H6 Twin diode AC rectifier.
Power Supply:	Power transformer and selenium rectifier.
Batteries:	2- 1 $\frac{1}{2}$ Volt standard flashlight cells.
D. C. Voltmeter: 6 Ranges:	0-3, 10, 30, 100, 300, 1,000 volts full scale. With accessory probe to 30,000 Volts
Input Resistance:	11 megohms (1 megohm in probe) on all ranges. 1,100 megohms with accessory probe.
Sensitivity:	3,666,666 ohms per volt on 3 Volt range.
Circuit:	Balanced bridge (push-pull) using twin triode.
Electronic AC Voltmeter: 6 Ranges:	0-3, 10, 30, 100, 300, 1,000 Volts full scale on linear scales reading R. M. S. (.707 of negative peak).
Circuit:	Diode with adjustable compensation.
Electronic Ohmmeter: 6 Ranges:	Scale with 10 ohms center x1, x10, x100, x1,000, x10K, x1 Meg. Measures .1 ohm to 1,000 megohms with internal battery.

## BIBLIOGRAPHY

Many excellent articles on the construction and use of vacuum tube voltmeters have appeared in radio magazines. A few are:

RADIOCRAFT, June, 1945, Electronic Ohmmichecker  
RADIO NEWS, January, 1947, Home Constructed VTVM  
RADIO NEWS, July, 1946, Vacuum Tube Voltmeter  
RADIO NEWS, November, 1945, Electronic Volt-ohmmeter  
RADIO NEWS, February, 1946, Universal Test Instrument  
RADIOCRAFT, May, 1945, Practical VTVM  
VACUUM TUBE VOLTMETERS, A Book by John F. Rider

## RF TEST PROBE KIT

A test probe in kit form for use in measuring RF voltages of up to about 20 Volts is available for \$6.50. The kit contains all parts necessary for the construction of the probe, including 1N34 crystal detector, condensers, resistor, cable and connectors. This probe and cable is simply plugged into the instrument in place of the regular DC test probe assembly and the voltage is read on the lower regular DC ranges.

Order No. 309 RF Test Probe Kit-- \$5.50

## TELEVISION TEST PROBE KIT

A 30,000 volt test probe in kit form for use in testing the high DC voltages in Television receivers is available for \$5.50. The kit contains all parts necessary for the construction of the probe, such as the precision multiplier of 2% accuracy, the molded red and black body and handle, the connectors and the cable. This probe and cable is simply plugged into the instrument in place of the regular DC test probe and with the range switch set at 300 volt, 0 - 30,000 volts is read on the 0 - 30 scale. With range switch set at 100 volt or 30 volt, the instrument reads 0 - 10,000 volts on the 0 - 10 scale and 0 - 3,000 volts on the 0 - 30 scale.

Order No. 336 TV High Voltage Probe Kit—\$5.50

Prices subject to change without notice. The Heath Company reserves the right to change the design of its instruments without incurring liability for equipment previously supplied.

## WARRANTY

The Heath Company limits its warranty on any part supplied with any Heathkit (except tubes, meters, and rectifiers, where the original manufacturer's guarantee only applies) to the replacement within three (3) months of said part which, when returned with prior permission, postpaid, was in the judgment of the Heath Company, defective at the time of sale.

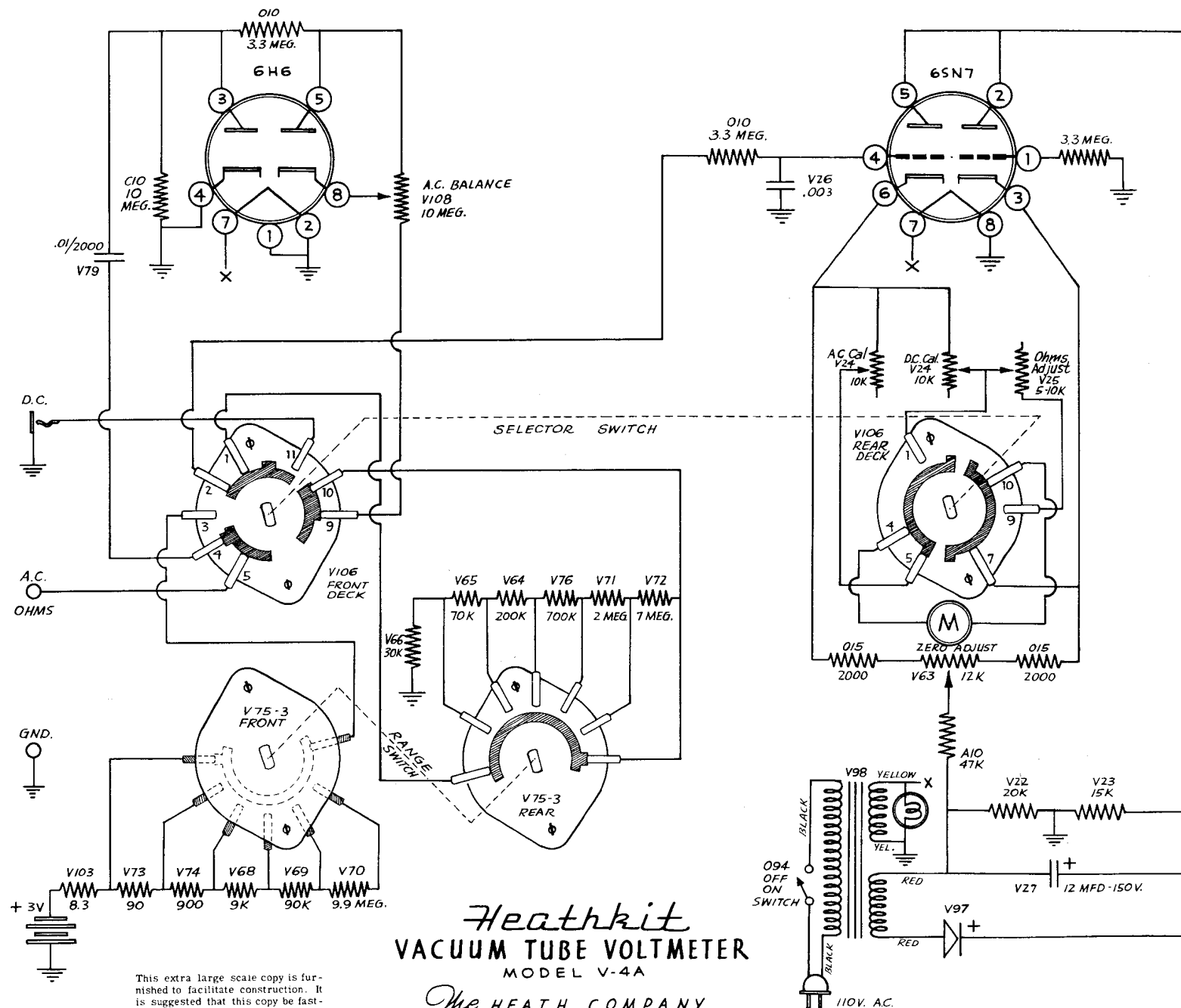
The assembler is urged to follow the instructions exactly as provided. The Heath Company assumes no responsibility for the operation of the completed instrument, nor liability for any damages or injuries sustained in the assembly or operation of the device.

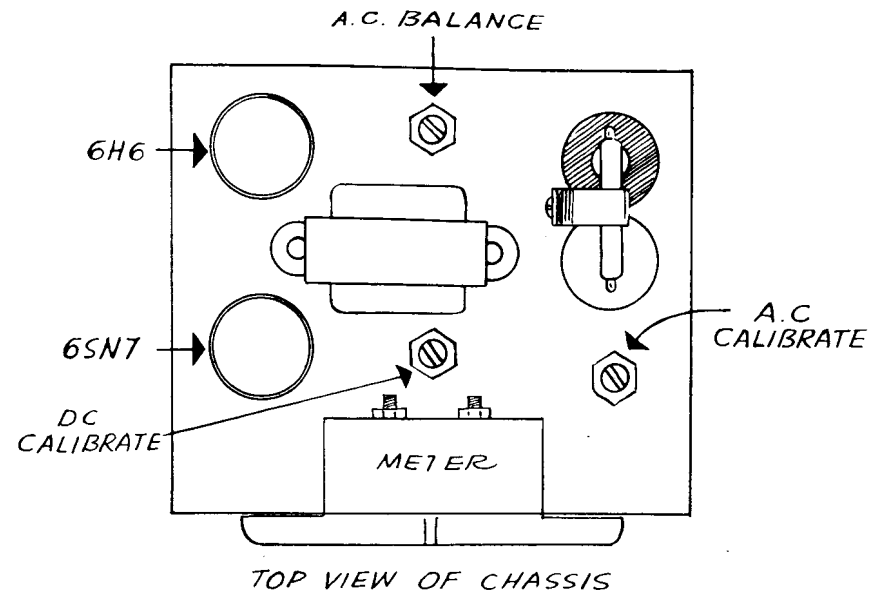
HEATH COMPANY  
Benton Harbor, Michigan

# V-4A VACUUM TUBE VOLTMETER PARTS LIST

Part No.	Parts Per Kit	Description	Part No.	Parts Per Kit	Description
Resistors			Tubes--Lamp		
V103	1	8.3 Ohm Precision	V31	1	6H6 or 6H6 GT Tube
V73	1	90 Ohm Precision	G44	1	6SN7 GT Tube
V74	1	900 Ohm Precision	O39	1	#47 Pilot Lamp
V68	1	9k Ohm Precision	Hardware		
V66	1	30k Ohm Precision	O31	9	6-32 x $\frac{3}{8}$ Screws
V65	1	70k Ohm Precision	K43	2	6-32 x $\frac{1}{2}$ Flat Head Screws
V69	1	90k Ohm Precision	IB48	1	6-32 x 1 Screw
V64	1	200k Ohm Precision	O102	8	#6 x $\frac{3}{8}$ Sheet Metal Screws
V76	1	700k Ohm Precision	O30	2	10-24 x $\frac{3}{8}$ Handle Screws
V71	1	2 Megohm Precision	S22	12	6-32 Nuts
V72	1	7 Megohm Precision	O33	8	Control Nuts
V70	1	9.9 Megohm Precision	TS72	11	#6 Lockwashers
C15	2	2,000 Ohm	O101	8	Control Lockwashers
V23	1	15,000 Ohm	O28	5	Control Nickel Washers
V22	1	20,000 Ohm	O44	2	Speednuts for Jacks
A10	1	47,000 Ohm	O37	1	Solder Lug
V56	1	1 Megohm	O35	3	$\frac{3}{8}$ Grommets
O10	3	3.3 Megohm	O34	4	Rubber Feet
C10	1	10 Megohm	V94	1	Battery Spring Clip
Condensers			V96	1	Battery Spring Bracket
V26	1	.003 MFD	V101	1	Stiffener Bracket
V79	1	.01 MFD-2,000 Volt	Wire--Plugs--Prods--Clip		
V27	1	12 MFD-150 Volt	O77	1	Roll Hookup Wire
Controls			O81	1	Length Spaghetti
V24	2	10k Ohms (AC and DC calibrate)	V46	1	Length Red Test Lead
V25	1	*5k-10k Ohms (Ohms Adjust)	V45	1	Length Black Test Lead
V63	1	12k Ohms (Zero Adjust)	V47	1	Length Shielded Test Lead
V108	1	10 Megohm (AC balance)	O78	1	Line Cord
Switches			V40	1	Red Banana Plug
V106	1	Selector	V39	1	Black Banana Plug
V75-3	1	Range	V41	1	Phone Plug
O94	1	SPST Slide	V42	1	Red Test Prod
Sockets--Terminal Strips--Jacks			V43	1	Black Test Prod
AR32	2	Octal Sockets	V44	1	Alligator Clip
O52	1	Pilot Light Socket	Miscellaneous		
O40	1	Pilot Light Nut	V48	2	Acorn Knobs
O41	1	Pilot Light Bushing	O51	2	Pointer Knobs
O42	1	Pilot Light Jewel	V49C	1	200 Microamp. Meter
O38	2	Single Terminal Strips	V34	2	Flashlight Cells (one calibrated)
V102	2	Battery Term. Strip Assy.	V97	1	Selenium Rectifier
V77R	1	Banana Jack (red)	V98	1	Power Transformer
V77B	1	Banana Jack (black)	V51D	1	Panel
M28	2	Banana Jack Inserts	V52C	1	Chassis
K17	1	Phone Jack	V53	1	Cabinet
			O79	1	Handle

NOTE: \*V25 Control may be supplied in any value between 5,000 and 10,000 ohms.





# WIRING OF EXPORT TYPE 110/220 VOLT POWER TRANSFORMERS

These transformers have a dual primary for use on either 110 Volts or 220 Volts. Wire as shown.

