CIRCUIT DESCRIPTION

To better understand the circuit operation, refer to the Schematic Diagram while you read the following description. Each section of the Power Supply will be discussed individually.

PRIMARY CIRCUIT

The circuit breaker, transformer primary, and two terminals of the power output socket are wired in series across the AC line. The Power Supply may be controlled by the off-on switch in the equipment being used with it. The dual primary winding may be connected in series for 240 VAC line operation, or in parallel for use on a 120 VAC line.

HIGH VOLTAGE SECONDARY CIRCUIT

The high voltage winding applies approximately 282 volts AC (rms) to a full-wave voltage doubler rectifying circuit consisting of silicon diodes D1, D2, D3, and D4, and capacitors C1 and C2. These diodes are connected so that during one-half cycle, capacitor C2 becomes charged; during the next half cycle capacitor C1 is charged. Resistors R1, R2, R3, and R4 are connected in the circuit to provide a discharge path for capacitors C1 and C2. The capacitors are charged individually, but discharge in series to produce a DC voltage equal to approximately twice the applied peak AC voltage. Excellent dynamic regulation is provided by the large capacitance values of C1 and C2. The output of the voltage doubler circuit has a low ripple content and no further filtering is required.

LOW VOLTAGE CIRCUIT

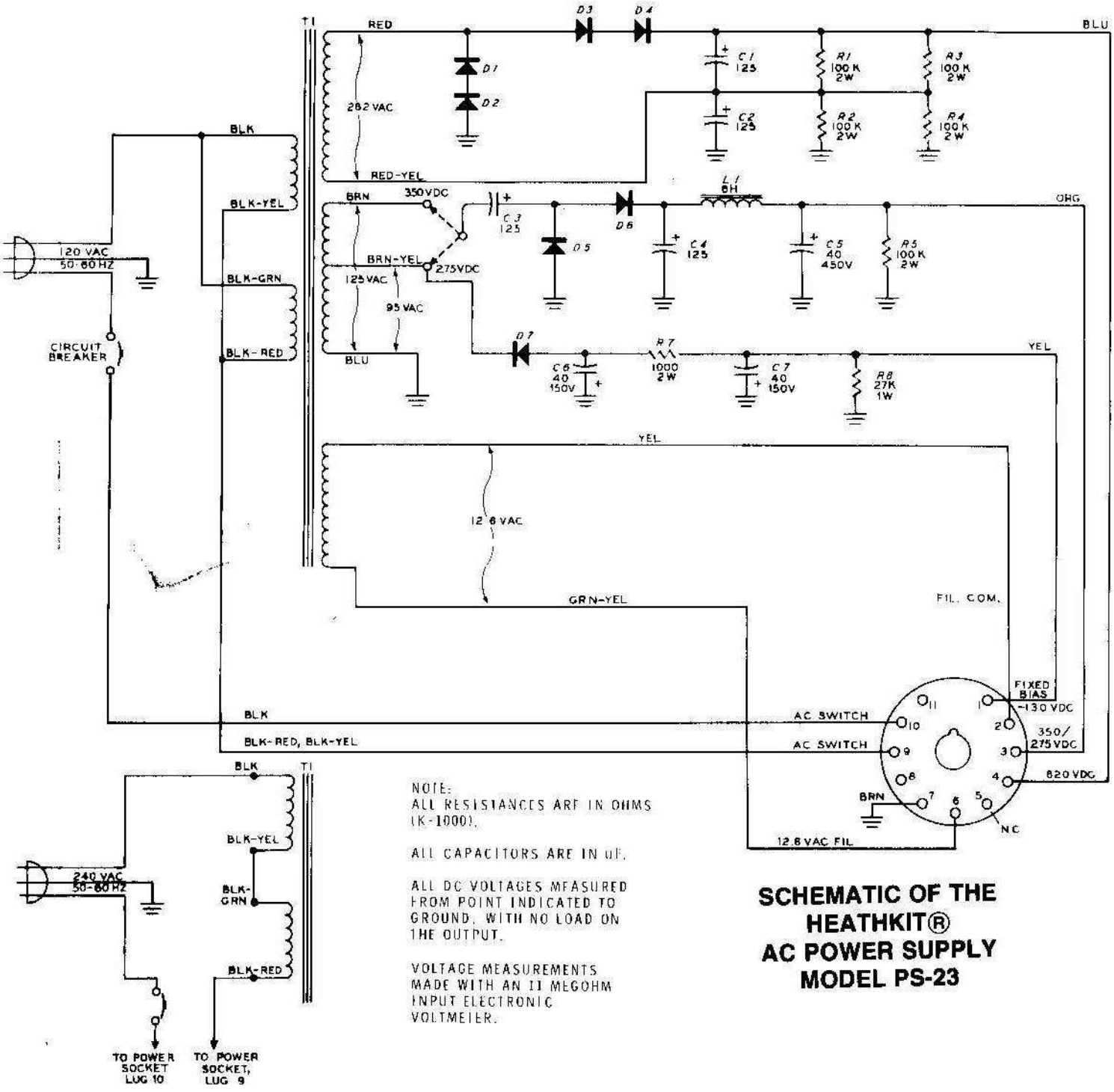
The low voltage winding is tapped so that either 95 or 125 volts AC (rms) may be applied to a half-wave voltage-doubler rectifying circuit consisting of diodes D5 and D6, and capacitors C3 and C4. Capacitor C4 is also used with choke L1 and capacitor C5 in a pi filter; C4 is the input capacitor in the filter network. The use of a high-capacitance input pi filter network provides a well filtered DC output that has a very low percentage of ripple.

BIAS VOLTAGE CIRCUIT

The bias voltage is obtained from the low tap on the low voltage winding. About 95 volts AC (rms) is applied to half-wave rectifier diode D7. Capacitors C6 and C7, with resistor R7, provide a filter network to remove the ripple from the bias voltage. −130 volts of fixed bias is coupled to the power output socket.

FILAMENT VOLTAGE CIRCUIT

The 12.6 volt filament winding provides 12.6 VAC to the power output socket.



NOTE:
ALL RESISTANCES ARE IN OHMS (K-1000).

ALL CAPACITORS ARE IN uF.

ALL DC VOLTAGES MEASURED FROM POINT INDICATED TO GROUND, WITH NO LOAD ON THE OUTPUT.

VOLTAGE MEASUREMENTS MADE WITH AN 11 MEGOHM INPUT ELECTRONIC VOLTMETER.

SCHEMATIC OF THE HEATHKIT® AC POWER SUPPLY MODEL PS-23

PARTS LIST

Check each part against the following list. The key numbers correspond to the numbers on the Parts Pictorial (Illustration Booklet, Page 1).

To order a replacement part, always include the Part Number and use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, use one of the "Expedited Parts Order Forms" at the rear of this Manual, or refer to "Replacement Parts" inside the rear cover. Your Warranty is inside the front cover. For pricing information, refer to the separate "Heath Parts Price List."

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
RESISTORS				
A1	1-46-1	1	27 kΩ (red-violet-orange), 1-watt	
A2	1-15-2	1	1000 Ω (brown-black-red), 2-watt	
A2	1-24-2	5	100 kΩ (brown-black-yellow), 2-watt	
CAPACITORS				
B1	25-20	2	40 μF, 150 volt electrolytic	
B2	25-36	1	40 μF, 450 volt electrolytic	
B3	25-265	4	125 μF, 500 volt electrolytic	
HARDWARE				
#6 Hardware				
C1	250-8	8	#6 × 3/8" sheet metal screw	
C2	250-89	9	6-32 × 3/8" screw	
C3	252-3	9	6-32 nut	
C4	254-1	10	#6 lockwasher	
C5	259-1	1	#6 solder lug	
#8 Hardware				
C6	250-137	6	8-32 × 3/8" screw	
C7	252-4	10	8-32 nut	
C8	254-2	10	#8 lockwasher	
C9	259-2	2	#8 solder lug	

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
MISCELLANEOUS				
D1	57-27	7	1N2071 diode	
D2	431-1	1	2-lug terminal strip	
D3	431-11	1	5-lug terminal strip	
D4	431-86	1	6-lug terminal strip	
D5	481-1	2	Metal capacitor mounting wafer	
D5	481-3	2	Phenolic capacitor mounting wafer	
D6	438-29	1	11-pin plug	
D7	440-1	1	Plug cap	
D8	434-118	1	11-lug socket	
D9	435-1	1	Socket mounting ring	
D10	65-17	1	Circuit breaker (2.92 ampere)	
D11	73-4	1	5/16" grommet	
D12	75-71	1	Strain relief	
	54-807	1	Power transformer	
D13	46-56	1	Filter choke	
D14	200-1311-2	1	Chassis	
D15	205-1662-1	1	Bottom plate	
D16	100-538-2	1	Cabinet shell	
D17	261-6	4	Rubber foot	
	347-52	6'	8-wire cable	
	346-7	9"	Large sleeving	
	89-23	1	Line cord	
	390-926	1	Caution label	
	391-34	1	Blue and white label	
D18	490-5	1	Nut starter	
	597-260	1	Parts Order Form	
	597-308	1	Kit Builders Guide	
		1	Manual (See Page 1 for part number.)	
			Solder	