IMSAI

PS-28U

POWER SUPPLY PS-28U

FUNCTIONAL DESCRIPTION----------

The IMSAI PS-28U is a modular, unregulated power supply for the IMSAI 8080 System. It provides the basic unregulated +8, +16, and -16 system supply voltages and can be configured for the following AC input voltages at either 50 or 60 Hz: 92, 103.5, 115, 126.5, 184, 207, 230, and 253 VAC single phase input.

A power switch location is provided on the PS-28U for use when a front panel is not installed in the system. There is also a line filter and 50/60 Hz switched and unswitched terminals for connecting auxillary power outlets on the back panel.

Physically, the PS-28U measures 16.5" x 5.75" x 5.5" (42 x 15 x 14 cm) and weighs 16 pounds (7.3 kg).

SPECIFICATIONS PS-28U SUPPLY----------

Power Requirements:

Input Voltages:	92, 103.5, 115, 126.5, 184, 207, 230, and 253 volts, single phase, 500 watts (max)
No Load Voltages:	115 VAC, 60 Hz input, nominal taps #6 and #9 in parallel with taps #1 and #4
	+ 8v. supply: + 9.7 volts
	+16v. supply: +18.0 volts
	-16v. supply: -18.0 volts

Current Supplied:

At 115 VAC, 60 Hz, resistive load:

28.0 amperes at 7.0 volts ripple valley
4.5 amperes at +13.5 volts ripple valley
4.5 amperes at -13.5 volts ripple valley

POWER SUPPLY PS-28U
Theory of Operation
Revision 1

At 100 VAC, 50 Hz, resistive load:

25.0 amperes at +7.0 volts ripple valley
4.0 amperes at +13.5 volts ripple valley
4.0 amperes at -13.5 volts ripple valley

THEORY OF OPERATION----------

The PS-28U is an unregulated power supply that provides the basic +8, +16, and -16 voltages for the 8080 system. It is comprised of four major component assemblies: line filter, transformer, rectifiers, and filters.

Line Filter: The line filter is a triple PI L-C filter designed to remove high frequency noise present on the AC line. This filter attenuates line noise above 1MHz in frequency.

Transformer: The transformer is primarily designed for a number of AC input voltages: 92, 103.5, 115, 126.5, 184, 207, 230, and 253 VAC, 50/60 Hz, single phase input. The transformer secondary is connected as three series windings with a center tap. Four MR 1121 diodes full-wave rectify the +8 volts, while a full-wave bridge of four MR 501 diodes rectify the ± 16 volts.

Filtering: The ±16 volt supplies are each filtered by a 10K uF capacitor to ground, providing ±15 average volts at 4.0 amps. The +8 volts is filtered by two 95K uF capacitors to ground, providing 7.3 average volts at the 28 amp rated current.

.1 uF capacitors high frequency bypass each voltage supply and bleeder resistors discharge the filter capacitors when power is turned off.

BOARD: PS-C

ITEM	IMSAI PART #	QUANTITY	DESCRIPTION/IDENTIFYING MARKS
Solder	15-0000001	5'	Rosin Core
Heat Sink	16-0100006	1	Wakefield 690-220-P, Modified
Screw	20-3402001	4	6-32x3/8" Phillips Pan Head Machine
Screw	20-3702001	4	6-32x3/4" Phillips Pan Head Machine
Screw	20-4401001	3	8-32x3/8" Binding Head Machine
Screw	20-4901001	5	8-32x1¼" Binding Head Machine
Screw	20-5402000	8	10-32x3/8" Binding Head Machine
Screw	20-6901001	4	¼-20x1½" Binding Head Machine
Nut	21-3120001	8	6-32 Cad Hex Nut
Lockwasher	21-3350001	8	#6 Internal Tooth
Nut	21-4120001	5	8-32 Cad Hex Nut
Lockwasher	21-4350001	5	#8 Internal Star
Spacer	21-4600002	5	8-32x½" Nylon Threaded
Nut	21-5120001	4	10-32 Cad Hex Nut
Lockwasher	21-5320001	4	#10 Cad Split Ring
Lockwasher	21-5350001	8	#10 Internal Star
Nut	21-6120001	4	¼-20 Cad Hex Nut
Washer	21-6310001	4	¼"x1/16" Cad Flat Washer
Lockwasher	21-6320001	4	¼" Split Ring
Washer	21-6390001	4	¼"x1/16" Nylon Washer
Spacer	21-6600001	4	¼-20x½" Nylon Internal Thread
Wire	22-1014001	48"	14 AWG, White, Alpha 1559, 14-41/30 PVC
Wire	22-1014002	60"	14 AWG, Black, Alpha 1559, 14-41/30 PVC

PS-28U
Parts List

ITEM	IMSAI PART #	QUANTITY	DESCRIPTION/IDENTIFYING MARKS
Wire	22-1018001	60"	18 AWG, Orange, Gavitt 8522
Wire	22-1018002	60"	18 AWG, Yellow, Gavitt 8522
Wire	22-5018001	12"	Twisted Pair, 18 AWG, Yellow/orange, Stranded and Insulated
Line Cord	22-6000001	1	Belden 17239
Grommet	24-0600001	1	Strain Relief Bushing Grommet
Terminal Lug	25-0100001	5	Panduit PV-14-10LF (Vinyl)
Terminals	25-0100002	10	Solderless, ¼", Vaco # D 18304
Transformer	29-0100010	1	Tranex 4-3819-1 Dual Primary
Inductor	29-0200001	3	8uH, 5 Amp, Airco Speer 025834-001K
Resistor	30-3470462	1	470 Ohm, ½ Watt/Yellow, Violet, Brown
Resistor	30-4100462	2	1K Ohm, ½ Watt/Brown, Black, Red
Capacitor	32-2004010	6	.04uF, 500 V Disk Ceramic (.01uF, 1000 V)
Capacitor	32-2010010	3	.1uF, 30 V Disk Ceramic
Capacitor	32-2510060	2	10KuF, 25 V Electrolytic
Capacitor	32-2595060	2	95KuF, 15 V Electrolytic
Fuse	33-0100003	1	Bussman Fusetron MTH 5, 5 Amp
Fuse	33-0100004	1	Bussman Fusetron AGC 2½, 2½ Amp
Fuse Clip	33-0200001	2	# 102068
Fan Guard	34-0200001	1	Rotron 476042
Rectifier	35-1000002	4	MOT MR 1121
Diode	35-1000003	4	MOT MR 501 (Alt: 30S1)
PC Board	92-0000024	1	PS-C Rev. 1
Label Plate	93-0000001	1	Voltage/Frequency Label Plate

ASSEMBLY INSTRUCTIONS

( ) 1. Unpack your board and check all parts against the parts lists enclosed in the package.

COMPONENT INSTALLATION

( ) 2. Insert and solder each of the two 1K Ohm, ½ watt resistors (brown, black, red) at locations R1 and R2 as shown on the Assembly Diagram.

( ) 3. Insert and solder the one 470 Ohm, ½ watt resistor (yellow, violet, brown) at location R3 as shown on the Assembly Diagram.

( ) 4. Insert and solder each of the three .1uF capacitors at locations C5, C6 and C4 as shown on the Assembly Diagram.

( ) 5. Next, bend each of the cathode leads on each of the four rectifier diodes CR4, CR5, CR6 and CR7 as shown in Figure 2. Insert the anode end of of the diodes down as shown in Figure 2 and solder. NOTE: See Assembly Diagram for diode mounting position.

( ) 6. Insert and solder each of the six .04 uF capacitors at locations C7 through C12 as shown on the Assembly Diagram.

( ) 7. Insert and solder each of the three AC filter inductors at locations L1, L2 and L3 as shown on the Assembly Diagram.

( ) 8. Insert and solder each of the two fuse clips in the appropriate locations as shown on the Assembly Diagram. Snap in the appropriate fuse.

TRANSFORMER WIRING

NOTE: There are five pages of diagrams following the the Assembly Instructions. Refer to them when wiring the transformer.

( ) 9. Transformer terminals are designated and used as follows:

Primary A	Primary B
Pin 1 Common	Pin 6 Common
Pin 2 20% Lo Line	Pin 7 20% Lo Line
Pin 3 10% Lo Line	Pin 8 10% Lo Line
Pin 4 Nominal (115/230 VAC)	Pin 9 Nominal (115/230 VAC)
Pin 5 10% Hi Line	Pin 10 10% Hi Line

Secondary (8080 Chassis)

Pin 13 AC Phase 1 to 8V Rect
Pin 15 AC Phase 2 to 8V Rect
Pin 14 Ground

Pin 11 AC Phase 1 to 16V Rect
Pin 17 AC Phase 2 to 16V Rect
Pin 12 tie to Pin 13
Pin 16 tie to Pin 15

Primary Wiring Configurations

Input VAC 50/60 Hz	Strap these Primary lugs	Connect input VAC wires to these lugs
92 VAC	1 to 6, 2 to 7	6 and 7
103.5 VAC	1 to 6, 3 to 8	6 and 8
115 VAC	1 to 6, 4 to 9	6 and 9
126.5 VAC	1 to 6, 5 to 10	6 and 10
184 VAC	6 to 2	1 and 7
207 VAC	6 to 3	1 and 8
230 VAC	6 to 4	1 and 9
253 VAC	6 to 5	1 and 10

Again, be sure to refer to the accompanying diagrams when wiring the transformer.

( ) 10. Solder a ¼" solderless terminal to one end of two 9" yellow wires. Then solder the other ends to the pads at CR4 - CR7. These wires then go to lugs #11 and #17 on the secondary of the transformer.

( ) 11. The other secondary is wired as follows: Lugs #12 and #13 are wired together, and lugs #15 and #16 are wired together. Again, use the ¼" solderless terminals for the connections to lugs #12 and #16; use black wire 5 inches long (#14 or larger). The connection to lugs #13 and #15 are made with the crimp terminals.

( ) 12. Attach a crimp terminal to a 3 inch piece of #14 black wire. Solder one end to the ground trace below lug #14 and then attach the crimp terminal to lug #14.

( ) 13. Note: the AC input lines should be twisted together to avoid radiation.
When operating between 92 VAC and 126 VAC, both COMMONs are tied together, the nearest applicable voltage taps selected and jumpered together, and the AC applied between COMMONs and the taps, essentially paralleling the primaries. It may be desirable to select the next lower taps when operating on 50 Hz line, or when using a fully-loaded chassis.

( ) 14. For AC inputs between 184 VAC and 253 VAC, the primaries should be series connected. This entails selecting the taps as previously described. Now, the AC input goes between the COMMON of one primary and the selected tap of the other primary. A jumper is used between the selected tap of the first primary and the COMMON of the second primary to complete the series circuit. The same considerations regarding 50 Hz and full chassis apply here also as in the 115 VAC case preceeding. For 230 VAC operation, the AC line fuse should be changed to one-half the value recommended for 115 VAC to maintain the same overload protection.

( ) 15. The fan (optional) leads always should be connected to lugs #6 and #9 or #1 and #4 to supply 115 VAC to the fan. This wiring is standard for all input AC wiring configurations.

HEAT SINK INSTALLATION

NOTE: Keep all wiring as short as possible, an extra two inches of #14 wire will reduce the current capacity of the Power Supply.

( ) 16. Insert the four 1121 rectifier diodes CR0 through CR3 through the heat sink (only two are shown in Figures 1 and 3). Solder a 4 inch wire between the anodes of CR0 and CR1 and solder a 4 inch wire between the anodes of CR2 and CR3. The wire used should be #14 or larger (the black wire).

( ) 17. Attach a crimp terminal to the wire from CR0 and CR1. Connect it to terminal #15 of the transformer.

( ) 18. Repeat above (#17) procedure for black wire from CR2 and CR3 and connect it to terminal #13 of the transformer.

( ) 19. Install and bolt heat sink (and diodes) onto the PSC board.

NOTE: WARNING!!! OBSERVE POLARITY

The 4 large capacitors will be destroyed if power is applied while they are installed backwards.

On the two large capacitors C0 and C1, the negative side of the capacitor bolts to the DC ground plane of the PSC board. The positive end of capacitors C0 and C1 bolts to the unregulated 8 volt plane of the PSC board.

( ) 20. Place lockwashers on four 10-32x3/8" screws, insert them from the underside of the board and mount capacitors C0 and C1.

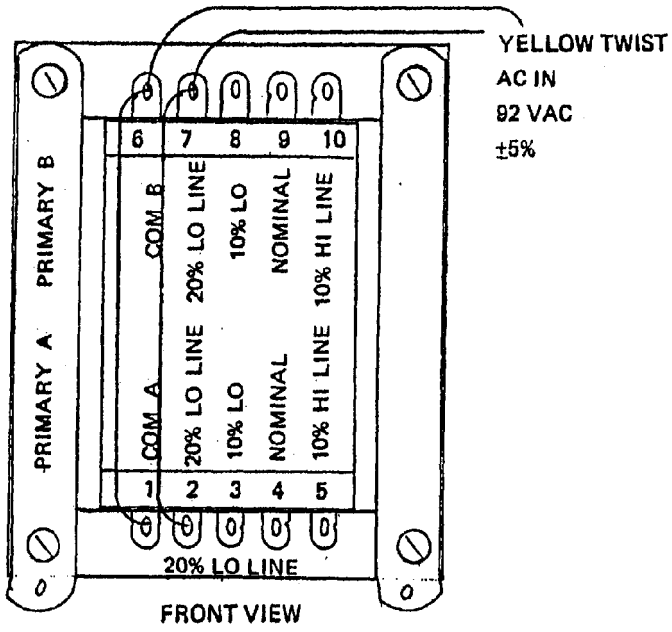
( ) 21. In a similar manner, mount C3 with the negative terminal bolted to the ground plane and positive terminal bolted to the +16 volt plane.

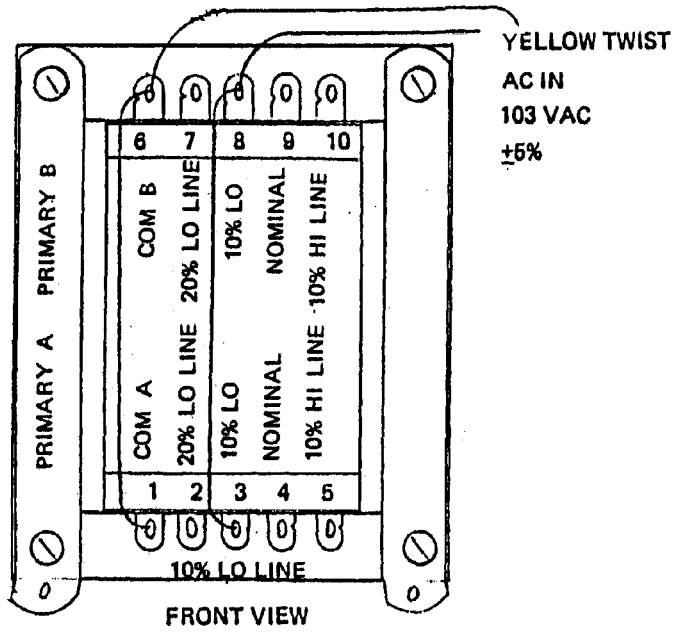
( ) 22. To install capacitor C2, bolt the positive terminal to the DC ground plane and the negative terminal to the negative (-16 volt) plane.

FAN INSTALLATION (OPTIONAL)

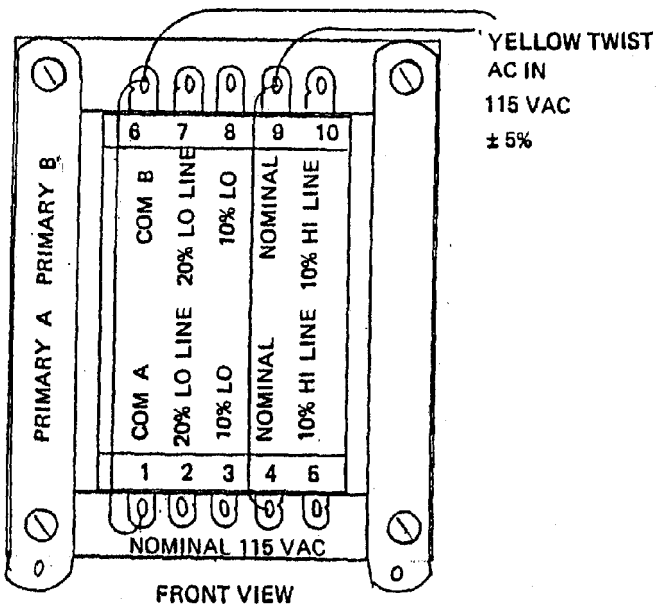
( ) 23. Attach the fan leads to lugs #6 and #9 or #1 and #4 to supply 115 VAC to the fan. This wiring is standard for all input AC wiring configurations.

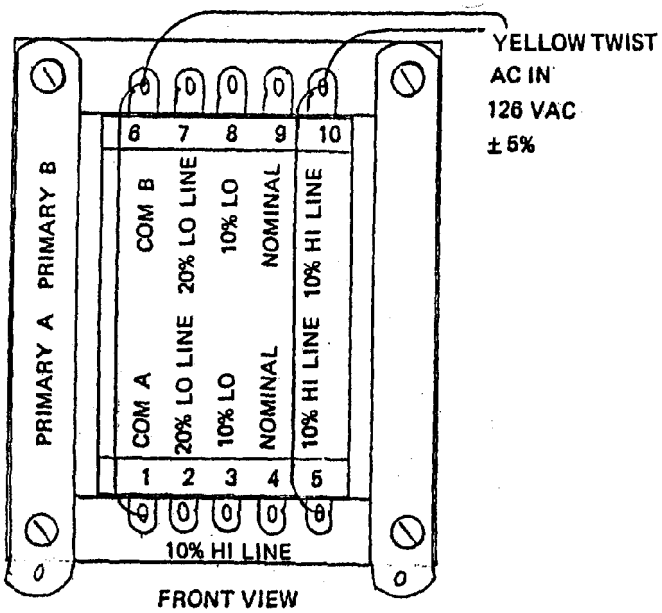
SEE MAINFRAME ASSEMBLY SECTION TO INSTALL POWER SUPPLY IN CHASSIS AND CONNECT TO MOTHER BOARD.



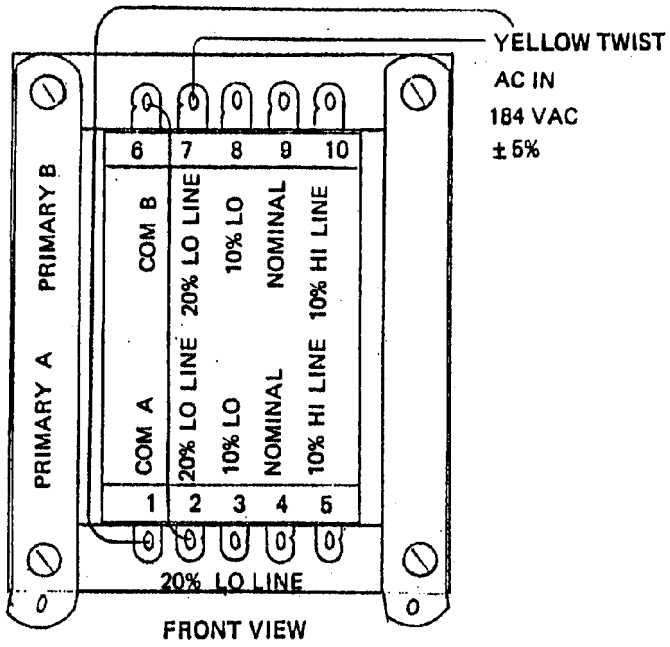


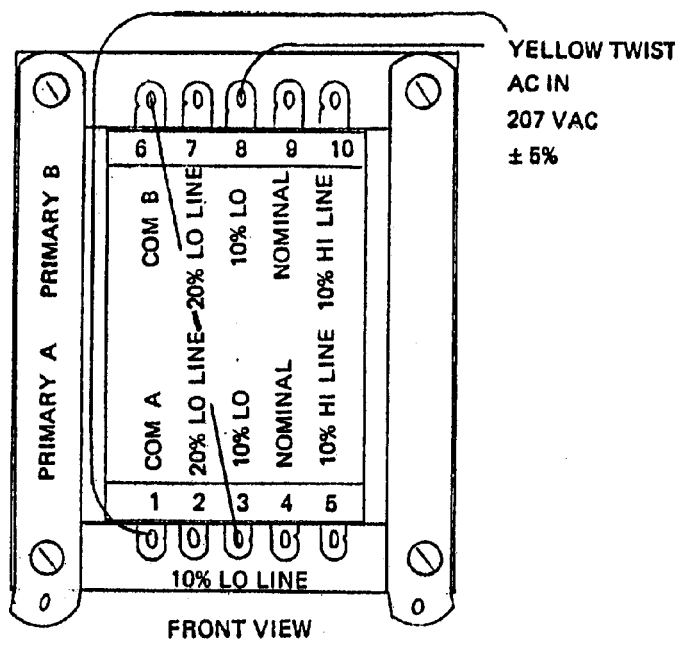
WIRING CHART: 92 – 103 VAC 60 Hz IN
Use next lowest line input taps when operating full chassis or on 50 Hz. See User Guide for more information. Use 5A fuse.



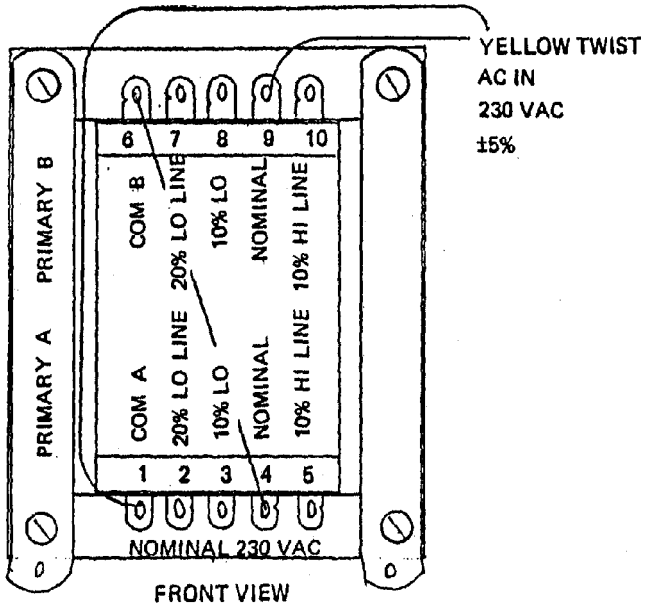


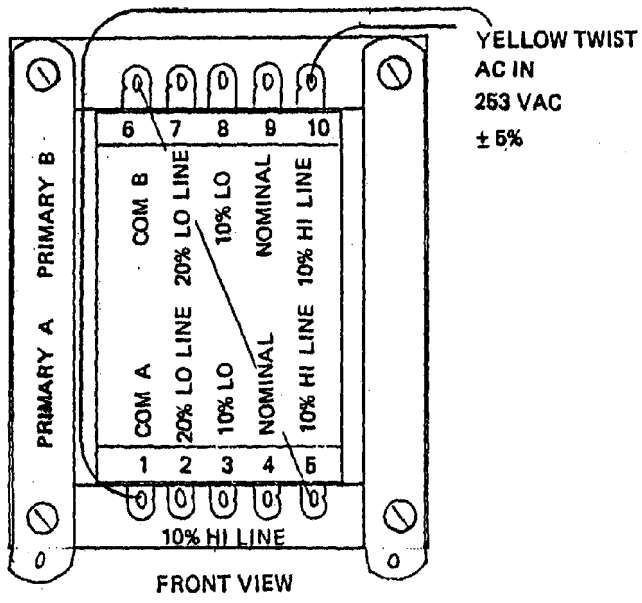
WIRING CHART: 115 – 126 VAC 60 Hz IN
Use next lowest line input taps when operating full chassis or on 50 Hz. See User Guide for more information. Use 5A fuse.



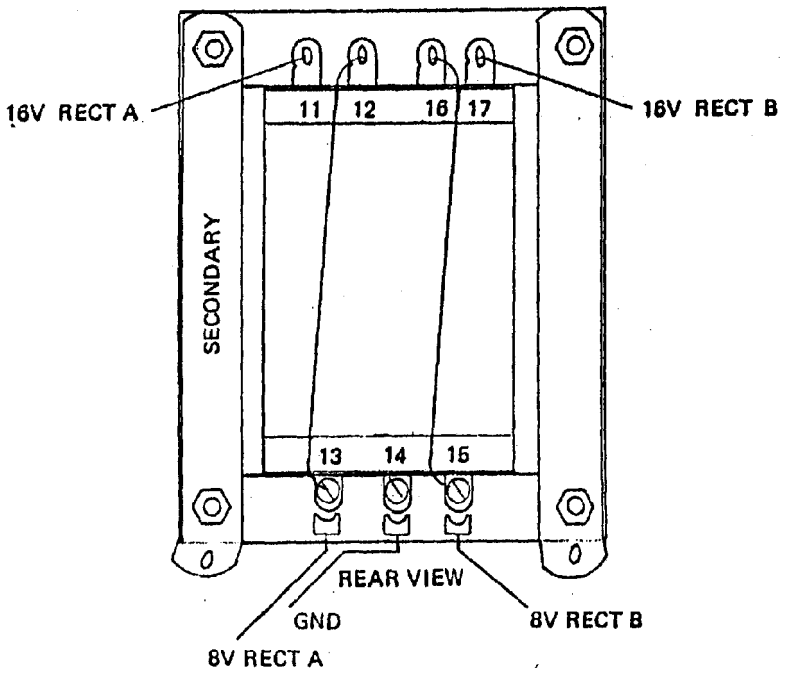


WIRING CHART: 184 – 207 VAC 60 Hz IN
Use next lowest line input taps when operating full chassis or on 50 Hz. See User Guide for more information. Use 2½A fuse.





WIRING CHART: 230 – 253 VAC 60 Hz IN
Use next lowest line input taps when operating full chassis or on 50 Hz. See User Guide for more information. Use 2½A fuse.



SECONDARY WIRING DIAGRAM

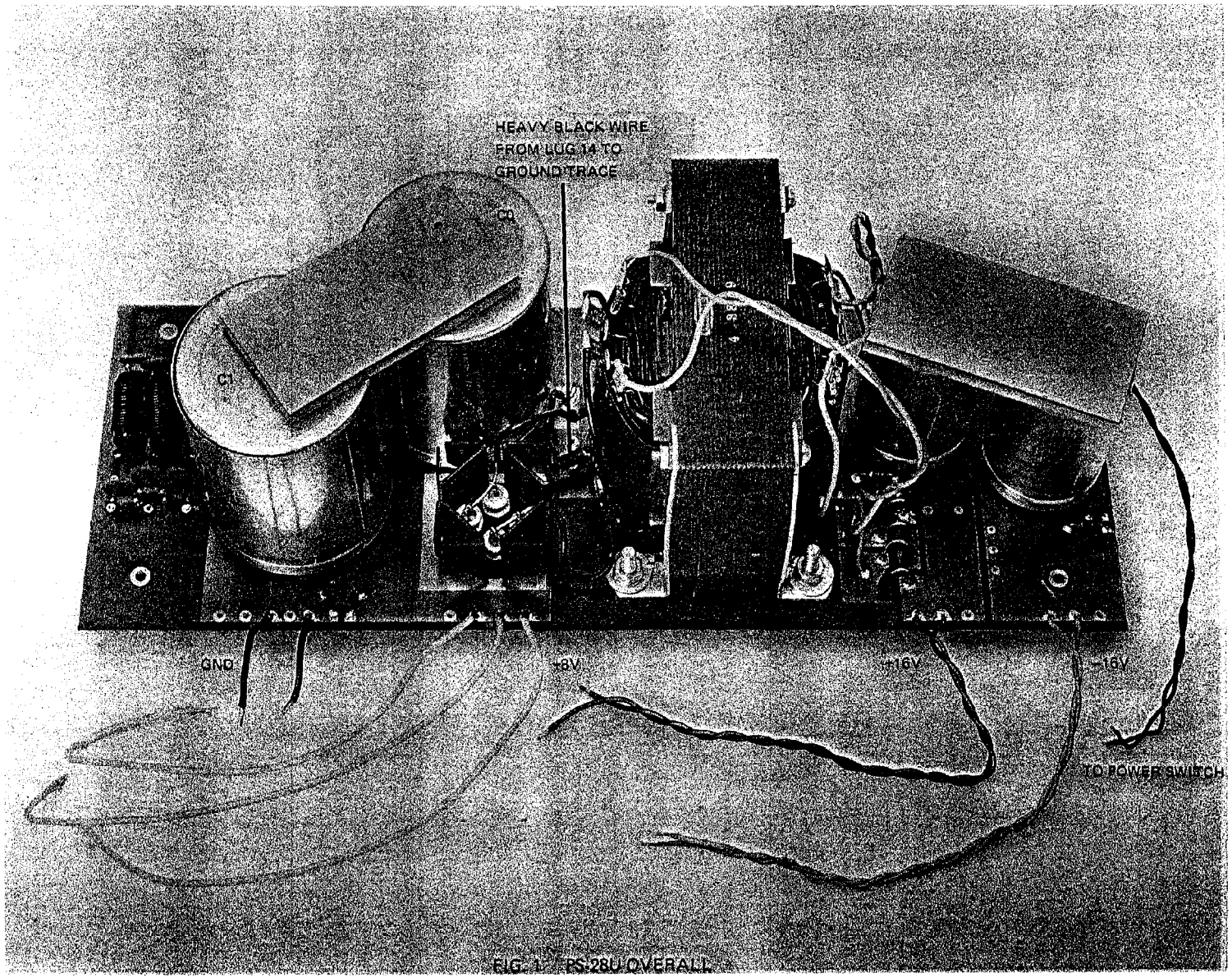


FIG. 1 - PS-28U OVERALL

FIG. 2 PRIN[illegible]WIRING

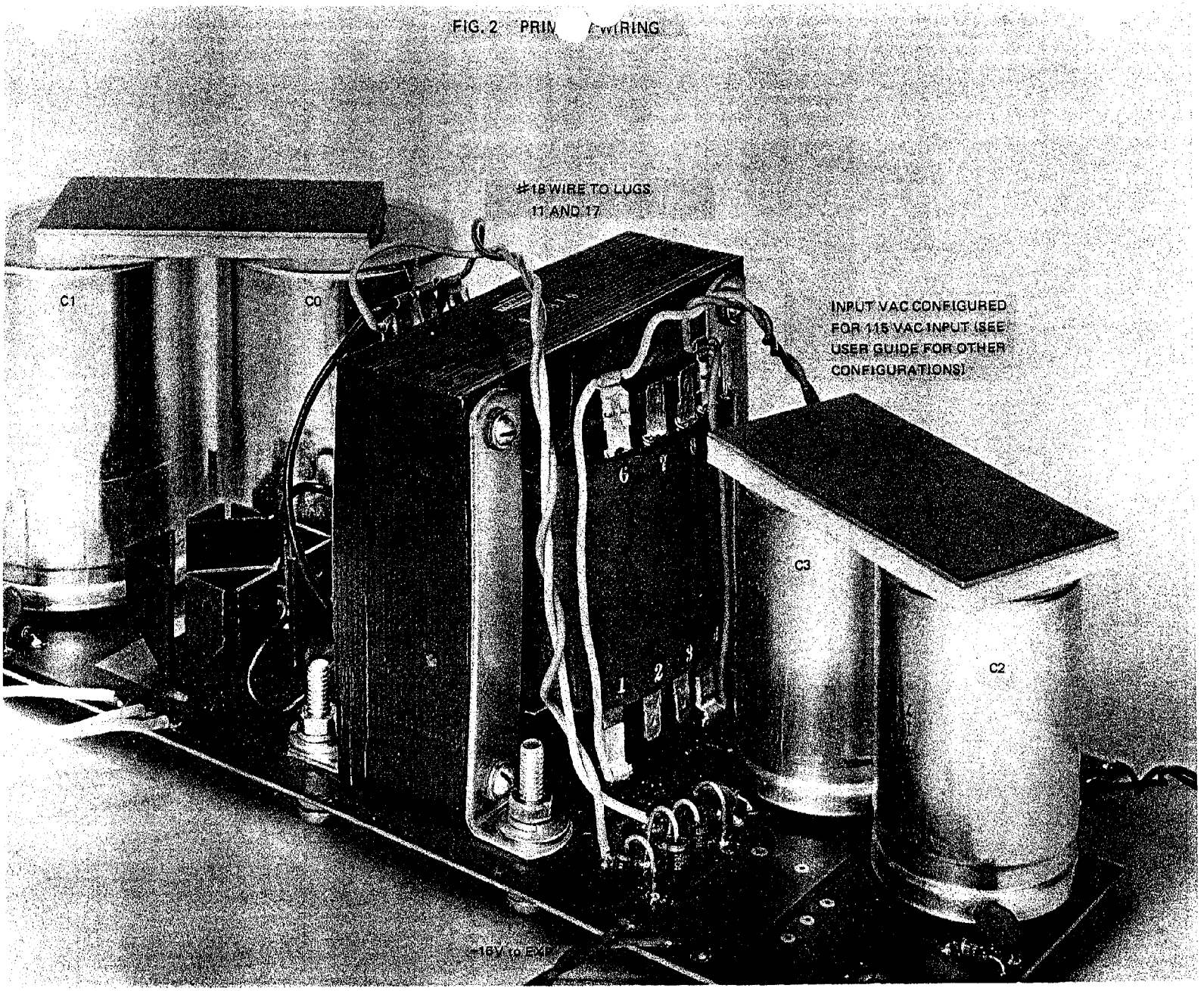
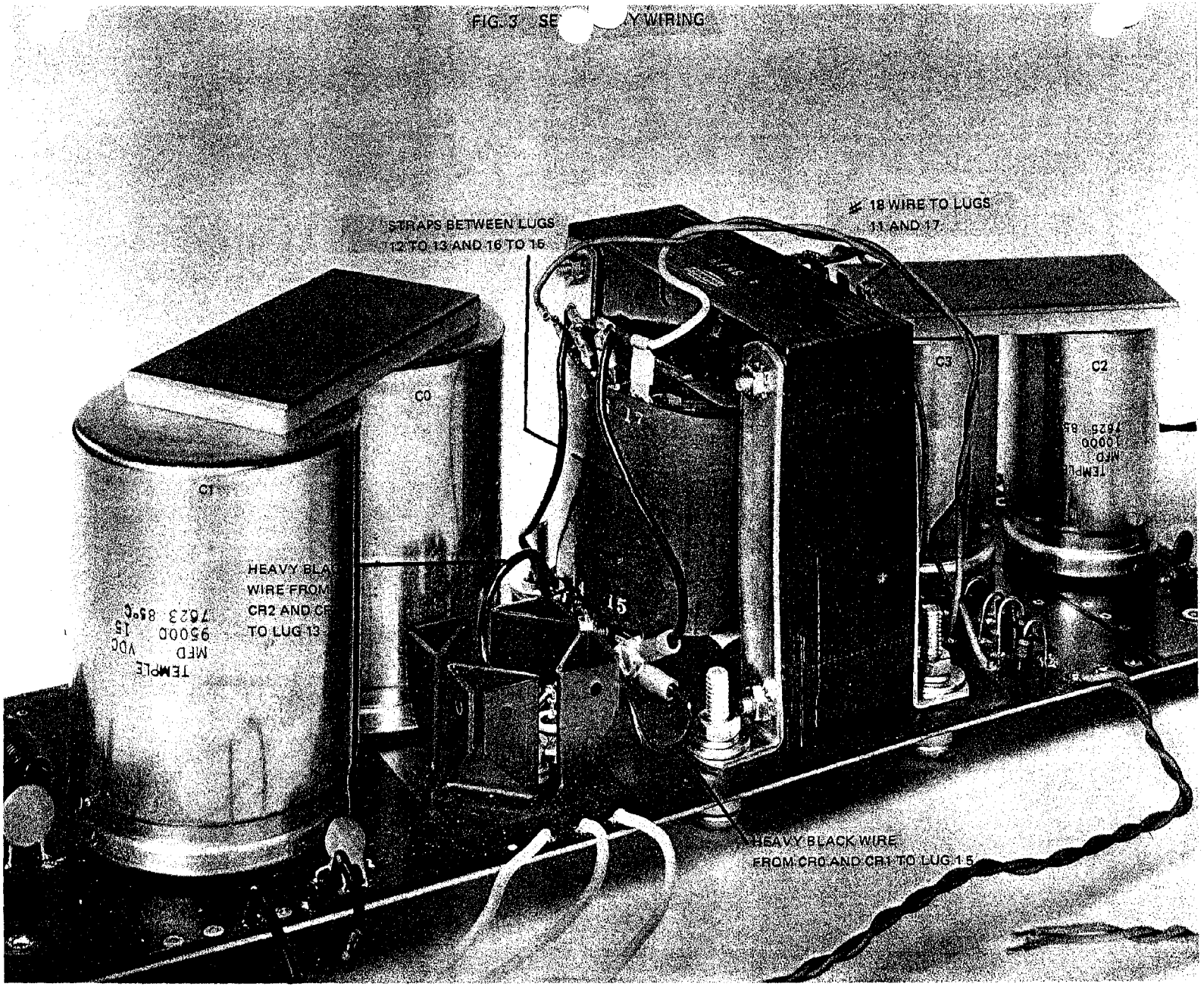
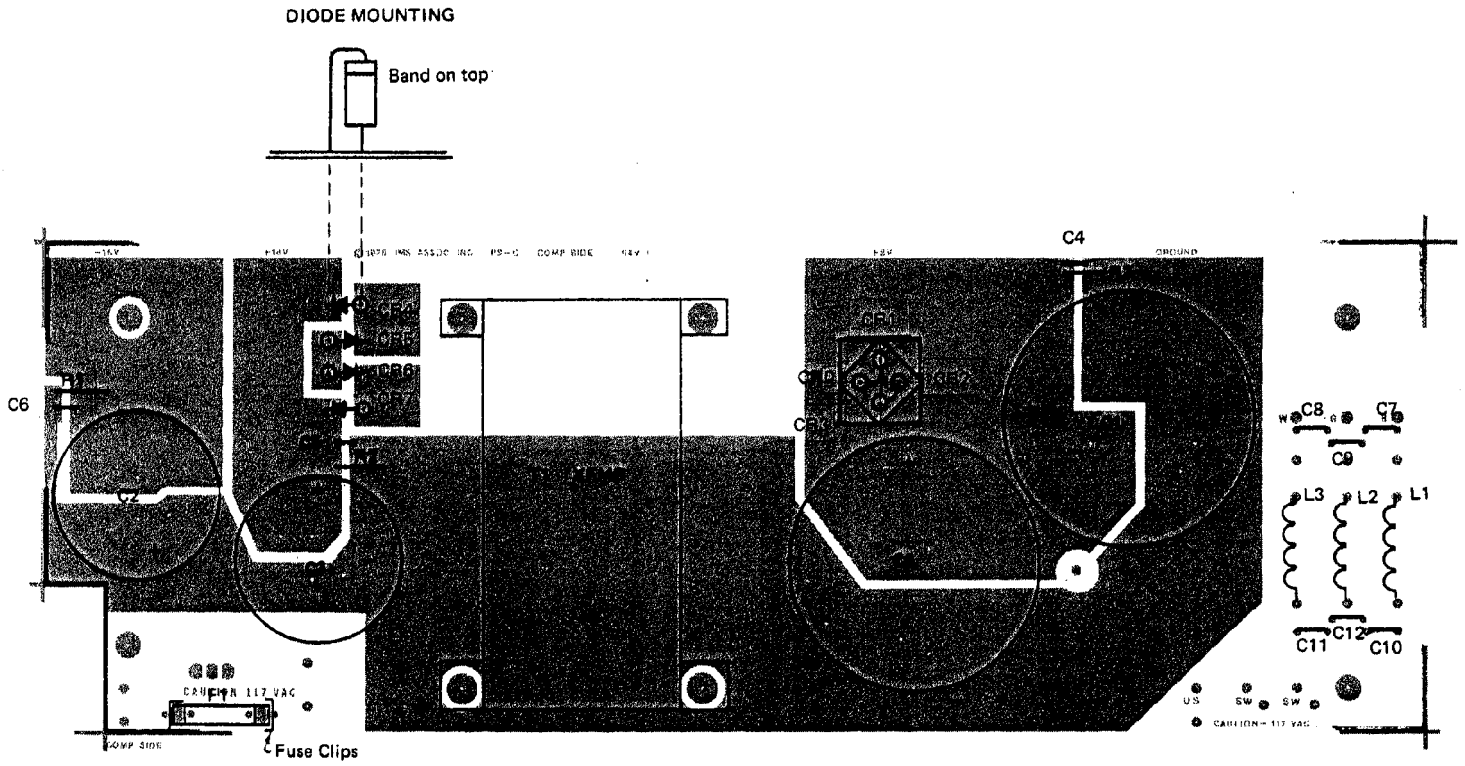


FIG. 3 SE Y WIRING



0	ORIGINAL	5/76
1	MODIFIED	1/77



ASSEMBLY DIAGRAM
PSC-U REV. 1 1/77

USER GUIDE

The PS-28U User's only option is the selection of a transformer primary tap. The transformer provides primary taps which allow selection at AC input voltages ranging from 92 - 126.5 and 184 - 253 VAC at 50/60 Hz.

As the PS-28U is an unregulated supply, the supply voltages are dependent on the load conditions. The user may adjust his/her loaded voltage by picking an appropriate primary tap, but should be careful that the no load voltages do not exceed +11, +18 and -18 volts. These maximums are selected so that the power dissipated in the system's voltage regulators and zener diodes does not exceed the device ratings. Similarly, the user should not allow the +8 supply to fall below 7.0 volts, the point at which the 7805 regulators cease to regulate.

It may be desirable when operating at 50 Hz or with a fully loaded chassis to select the next lower primary taps. This will increase the amount of current available. But, in all cases, the load voltages should not exceed the above levels. Also, the +8 supply should not fall below 7.0 volts.

Large currents require extremely low resistance paths from the power supply to the motherboard. It is suggested that #14 wire in multiple lengths be used to connect the power supply to the motherboard, and that all wires be only as long as necessary. Special care is required to insure low resistance solder connections; the +8 and ground leads are especially critical in this regard. Any significant loss in the supply wiring reduces the power available at the motherboard.

The power switch leads may be connected to the pads provided, or the user may mount a switch directly on the PSC board. Unswitched (marked US) and switched (marked SW) AC pads allow the connection of external equipment.

POWER SUPPLY

FUNCTIONAL DESCRIPTION

The IMSAI PS-28D Assembly is a modular unregulated power supply for the IMSAI 8080 System. It provides the basic unregulated +8, +16, and -16 system supply voltages. The PS-28D requires a 117 volt AC single-phase line input, and includes a line noise filter. 117 volt terminals, both switched and unswitched, are available for line powered options such as the ventilating fan and auxiliary power outlets on the back panel. A power switch location is provided on the PS-28D for use when a front panel is not installed in the system.

Physically, the PS-28D measures 16.5" x 5.75" x 5.5", (42 x 15 x 14 cm), and weighs 16 pounds (7.3 kg).

SPECIFICATIONS: PS-28D SUPPLY

Power Requirements:

110-120 volts AC, single phase, 500 Watts (maximum)

No load voltages - 117 V input, nominal taps (0, #3):

9.7 volts	+18.0 volts	-18.0 volts

Current Supplied - 117 volt input, resistive load:

28.0 amperes at +7.0 volts ripple valley

4.5 amperes at +13.5 volts ripple valley

4.5 amperes at -13.5 volts ripple valley

THEORY OF OPERATION

The PS-28D Assembly is an unregulated power supply that provides the basic +8, +16, and -16 voltages for the 8080 system. It is comprised of four major component assemblies: line filter, transformer, rectifiers, and filters.

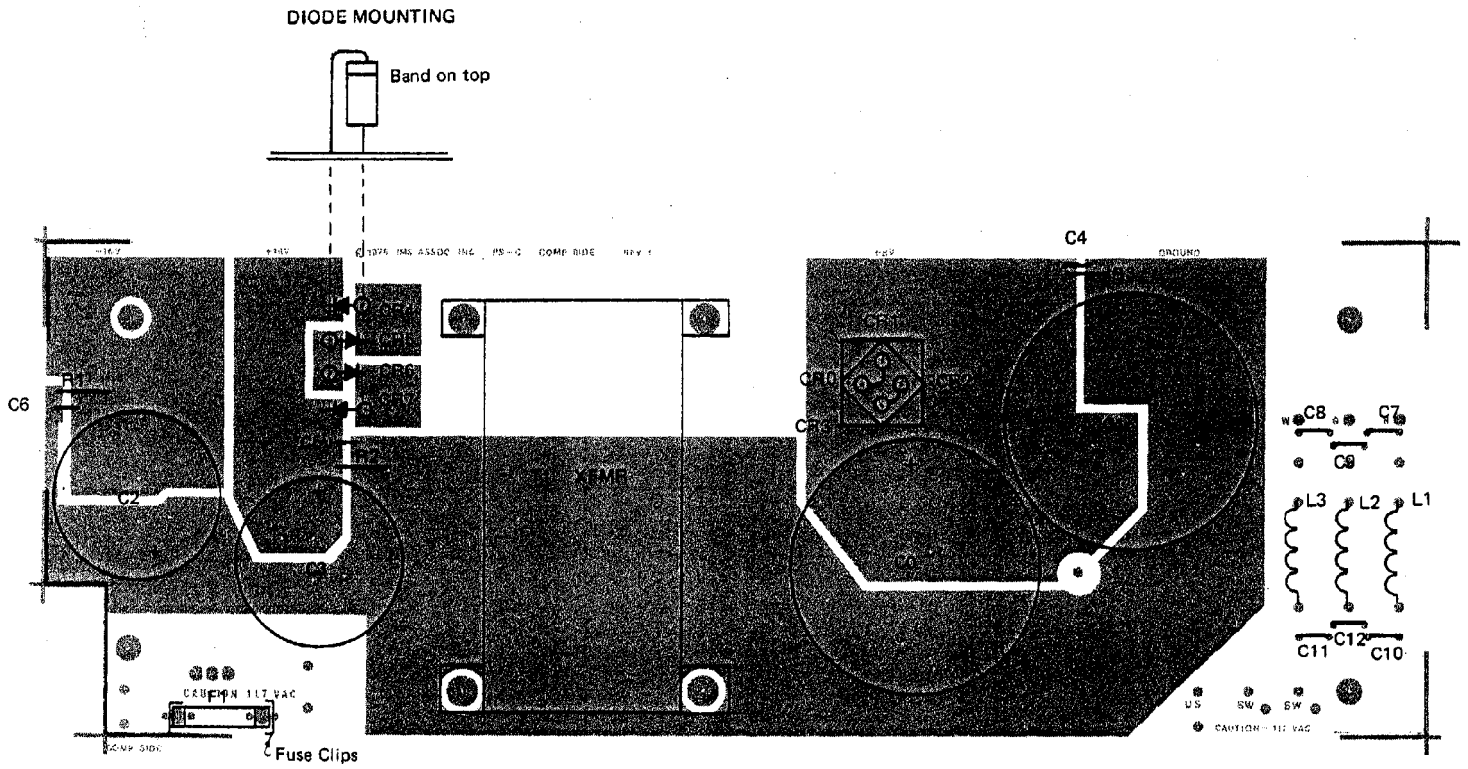
The line filter is a triple PI L-C filter designed to remove high frequency noise present on the AC line. This filter attenuates line noise above 1 MHz in frequency.

The transformer primary is designed for a nominal 117 volt line, and 0, -10%, and +10% taps allow for adjustment to line voltage variations. The transformer secondary is connected as three series winding with a center tap. Four MR 1121 diodes full-wave rectify the +8 volts, while a full-wave bridge of four MR601 diodes rectify the ±16 volts.

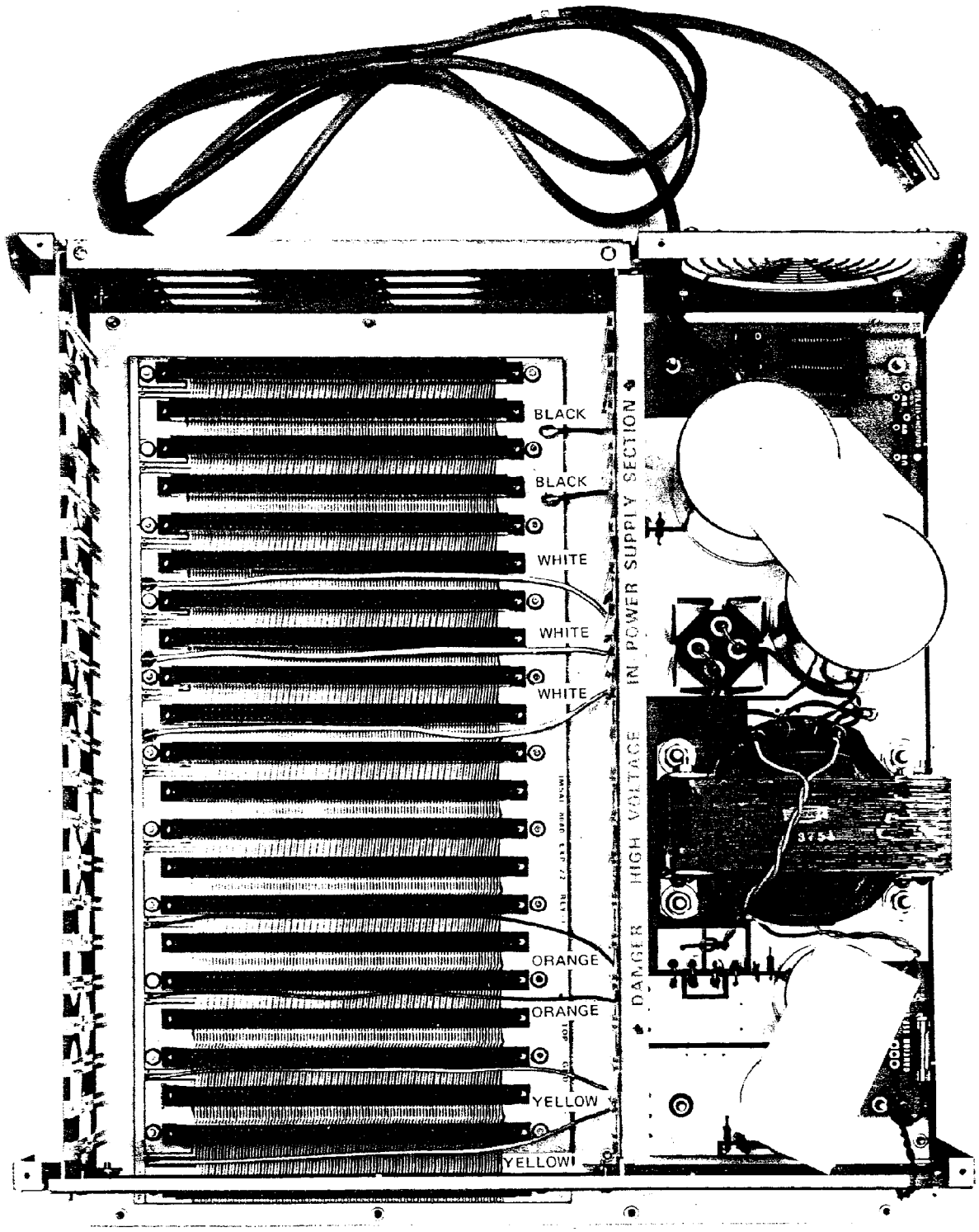
The ±16 volt supplies are each filtered by a 10K uF capacitor to ground, providing +15 average volts at 4.0 amps. The +8 volts is filtered by two 95K uF capacitors to ground, providing 7.3 average volts at the 28 amp rated current.

.1uF capacitors bypass each voltage supply, and bleeder resistors discharge the filter capacitors when power is turned off.

0	ORIGINAL	5/76
1	MODIFIED	1/77



ASSEMBLY DIAGRAM
PSC–D REV. 1 1/77



IMSAI 8080 Overview of Chassis, EXP-22 and PS-28

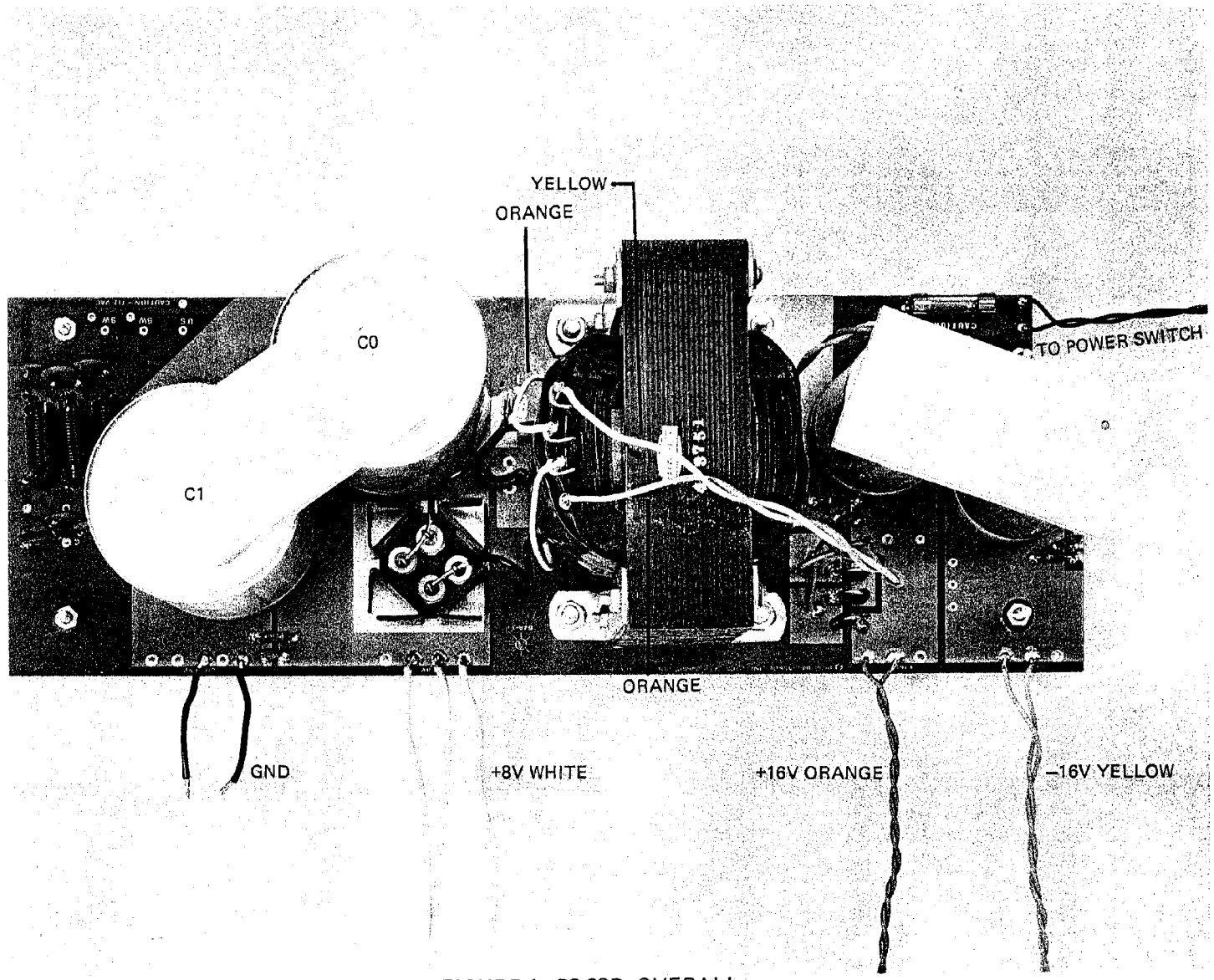


FIGURE 1 PS-28D OVERALL

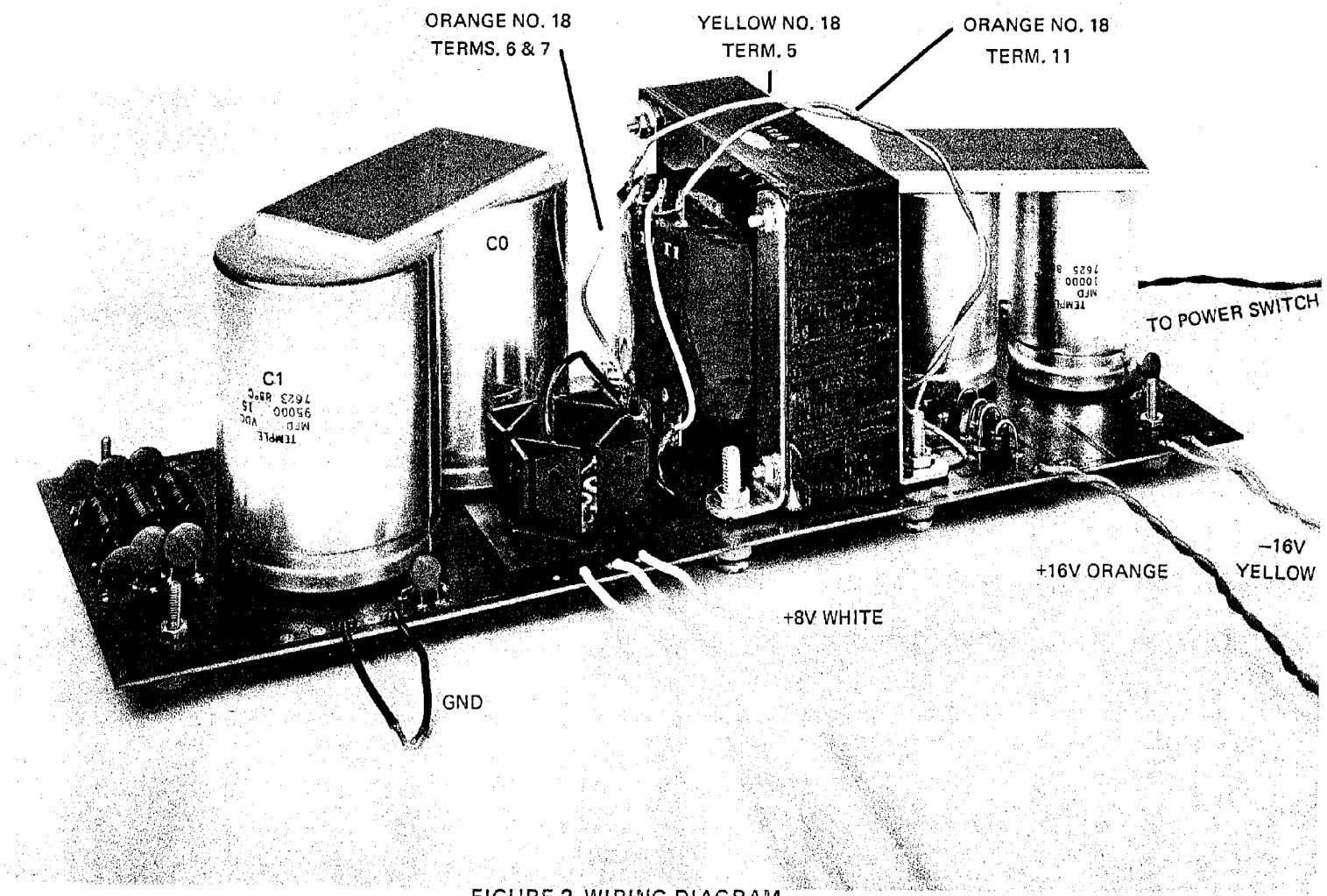


FIGURE 2 WIRING DIAGRAM

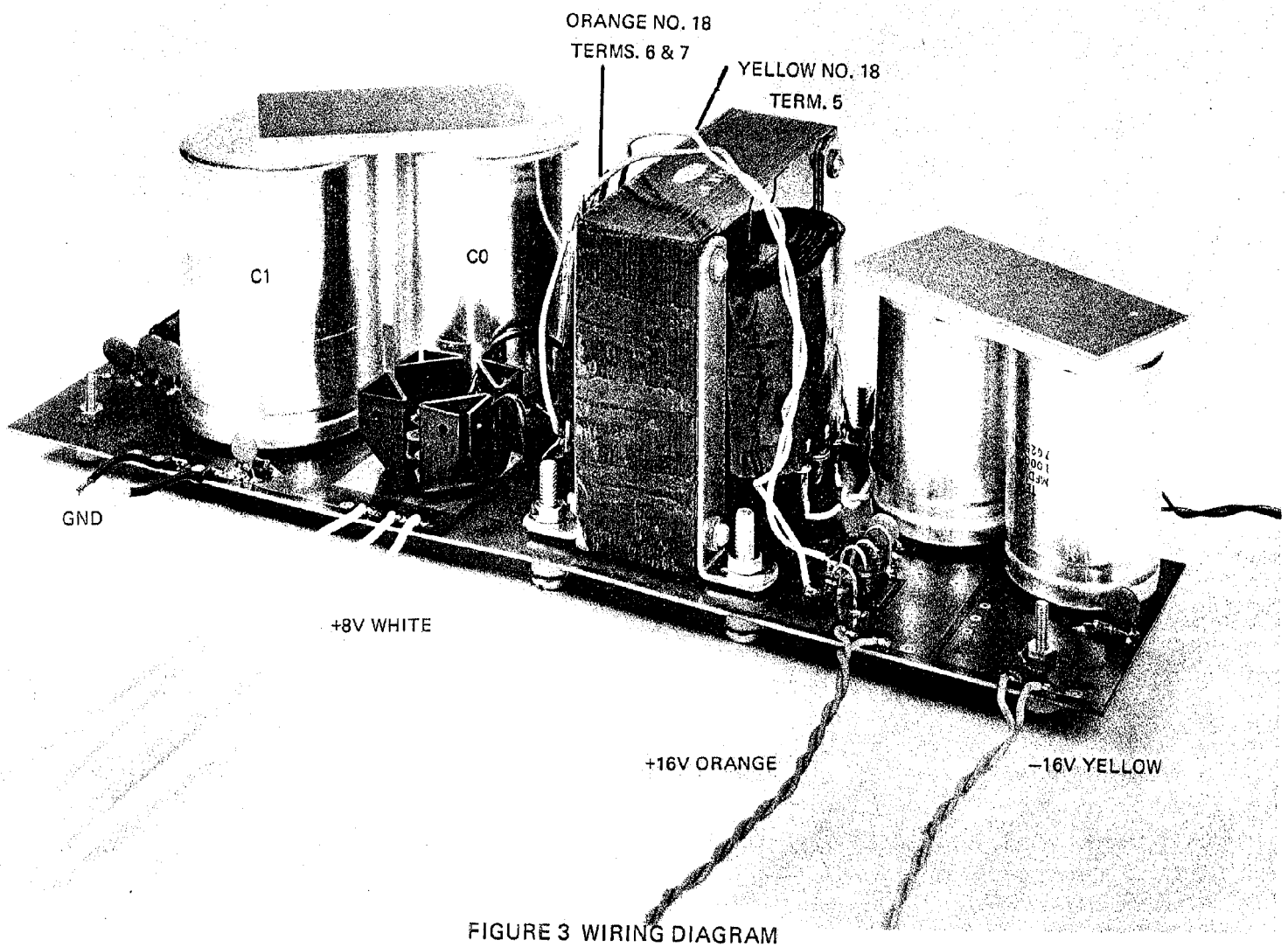


FIGURE 3 WIRING DIAGRAM

BOARD: PS-C

ITEM	IMSAI PART #	QUANTITY	DESCRIPTION/IDENTIFYING MARKS
Solder	15-0000001	5'	
Heat Sink	16-0100006	1	Wakefield, 690-220-P (Modified)
Screw	20-3402001	4	6-32x3/8" Phillips Pan Head CAD Machine
Screw	20-3702001	4	6-32x3/4" Phillips Pan Head CAD Machine
Screw	20-4901001	5	8-32x1¼" Binding Head CAD Machine
Screw	20-5402000	8	10-32x3/8" Binding Head CAD Machine
Screw	20-6901001	4	¼-20x1½" Binding Head CAD Machine
Nut	21-3120001	8	6-32 CAD Hex Nut
Lockwasher	21-3350001	8	#6 CAD Internal Star Lockwasher
Nut	21-4120001	5	8-32 CAD Hex Nut
Lockwasher	21-4350001	5	#8 CAD Internal Star Lockwasher
Spacer	21-4600002	5	8-32x½" Nylon Threaded Spacer, H H Smith
Nut	21-5120001	4	10-32 CAD Hex Nut
Lockwasher	21-5320001	4	#10 CAD Split Ring Lockwasher
Lockwasher	21-5350001	8	#10 CAD Internal Star Lockwasher
Nut	21-6120001	4	¼-20 CAD Hex Nut
Washer	21-6310001	4	¼"x1/16" CAD Flat Washer
Lockwasher	21-6320001	4	¼" CAD Split Ring Lockwasher
Washer	21-6390001	4	¼"x1/16" Nylon Washer, H H Smith 2664
Spacer	21-6600001	4	¼-20x½" Nylon Internal Thread Spacer
Wire	22-1014001	48"	14 AWG, White, Alpha 1559 14-41/30 PVC
Wire	22-1014002	48"	14 AWG, Black, Alpha 1559 14-41/30 PVC
Wire	22-1018001	60"	18 AWG, Orange, Gavitt 8522

PS-28D
Parts List

ITEM	IMSAI PART #	QUANTITY	DESCRIPTION/IDENTIFYING MARKS
Wire	22-1018002	60"	18 AWG, Yellow, Gavitt 8522
Wire	22-5018001	12"	18 AWG, Twisted Pair, Yellow/Orange, Stranded and Insulated
Cord	22-6000001	1	Line Cord, Belden 17239
Bushing	24-0600001	1	Strain Relief Bushing Grommet
Transformer	29-0100001	1	Tranex 4-3751 or Equiv.
Inductor	29-0200001	3	8uH, 5 Amp, Airco Speer 025834-001K
Resistor	30-3470462	1	470 Ohm, ½ Watt/yellow, violet, brown
Resistor	30-4100462	2	1K Ohm, ½ Watt/brown, black, red
Capacitor	32-2004010	6	.04uF, 500V Disk Ceramic (or .01uF, 1000V)
Capacitor	32-2010010	3	.1uF, 30V Disk Ceramic
Capacitor	32-2510060	2	10K uF, 25V Electrolytic
Capacitor	32-2595060	2	95K uF, 15V Electrolytic
Fuse	33-0100003	1	Bussman Fusetron MTH 5 5 Amp
Fuse Clip	33-0200001	2	Fuse Clip, 102068
Fan Guard	34-0200001	1	
Rectifier	35-1000002	4	MOT MR 1121
Diode	35-1000003	4	MOT MR 501
PC Board	92-0000024	1	PS-C Rev. 1
Label	93-0000001	1	Voltage/Frequency Label Plate

General

1) Unpack your board and check all parts against the parts lists enclosed in the package.

Component Installation

2) Insert and solder each of the two 1K ohm, ½ watt resistors (brown/black/red) at locations R1 and R2 as shown on the Assembly Diagram.

3) Insert and solder the one 470 ohm, ½ watt resistor (yellow/violet/brown) at location R3 as shown in the Assembly Diagram.

4) Insert and solder each of the three .1uF capacitors at locations C5, C6 and C4 as shown on the Assembly Diagram.

5) Next bend each of the cathode leads on each of the four rectifier diodes CR4, CR5, CR6 and CR7 as shown in Figure 3. Insert the anode end of the diodes down as shown in Figure 3 and solder.
NOTE: See Assembly Diagram for diode mounting position.

6) Insert and solder each of the six .04uF capacitors C7 through C12 in the locations shown on the Assembly Diagram.

7) Insert and solder each of the three AC filter inductors L1, L2 and L3 in locations as shown on the Assembly Diagram.

8) Insert and solder each of the two fuse clips in locations as shown on the Assembly Diagram. See Figure 1 for clarification. Snap in the fuse.

Transformer Wiring

9) Solder a yellow and an orange wire to the transformer lugs numbers 1 and 3 for AC. Wires should be twisted together. Solder twisted pair ends to the PSC board as shown in Figure 1.

10) Attach an orange wire between lugs 6 and 7 and a yellow wire between lugs 10 and 9. Solder the wire at terminals 6 and 10 only.

11) Next connect a yellow and an orange #18 wire to terminal numbers 5 and 11 respectively. Twist and run the wires across the transformer to the anode pads of the CR4 and CR7. Solder.

12) Temporarily install the transformer with ¼" hardware. Terminals 1, 2, 3 and 4 should face towards the fuse end of the PSC board.

NOTE: Scrape or sand lugs 7, 8, and 9 of the transformer to facilitate solder connections of #14 wires.

13) Take a short, black wire (#14 or larger) and solder to terminal 8 on the transformer.

14) Solder the other end of the short wire used above to the ground trace below terminal number 8 (see Figure 1 for clarification).

Heat Sink Installation

NOTE: Keep all wiring as short as possible. An extra two inches of #14 wire will reduce the current capacity of the Power Supply.

15) Cut a 4½" length of #14 (black) wire. Strip 1" of insulation from one end and ¼" of insulation from the other. Insert the 1" bare wire end through the anode terminals of diodes CR0 and CR1. Then solder the anode terminals CR0 and CR1. Crimp the remaining end of this lead to transformer terminal 9. Reference the board photos to verify correct orientation.

16) Cut a 3½" length of #14 (black) wire. Strip 1" of insulation from one end and ¼" of insulation from the other. Insert the 1" bare wire end through the anode terminals of diodes CR2 and CR3. Then solder the anode terminals CR2 and CR3. Crimp the remaining end of this lead to transformer terminal 7. Reference the board photos to verify correct orientation.

17) Solder transformer terminal 9, which should now support the black wire from CR0-CR1 and the yellow wire from terminal 10. Solder transformer terminal 7, which should now support the black wire from CR2-CR3 and the orange wire from terminal 6.

18) Install and bolt heat sink (and diodes) onto the PSC board.

NOTE: The schematic of the PSC shows the CR0-CR1 wire and the CR2-CR3 wire going to transformer terminals 7 and 9 respectively. While this configuration is acceptable, the configuration resulting from steps 15-17 provides for shorter lead lengths and should be adhered to whenever possible.

NOTE!! WARNING!! OBSERVE POLARITY

The large capacitor will be destroyed when power is applied if they are installed backwards.

On the two large capacitors C0 and C1, the negative side of the capacitor bolts to the DC ground plane of the PSC board. The positive end of the capacitors C0 and C1 bolts to the unregulated 8 volts plane of the PSC board.

19) Place lockwashers of four 10-32x3/8" screws. Insert them from the underside of the board and mount capacitors C0 and C1.

20) In a similar manner, mount C3 with the negative terminal bolted to the ground plane and positive terminal bolted to the +16 volt plane.

21) To install capacitor C2, bolt the positive terminal to the DC ground plane and the negative terminal to the negative (-16 volt) plane.

22) Attach the capacitor brace plates to the bases of the large capacitors with the adhesive backed foam tope located on one side of the brace plate.

SEE MAINFRAME ASSEMBLY SECTION TO INSTALL POWER SUPPLY IN THE CHASSIS AND TO CONNECT TO THE MOTHER BOARD.