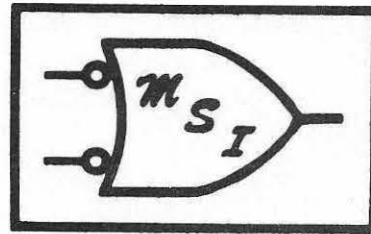
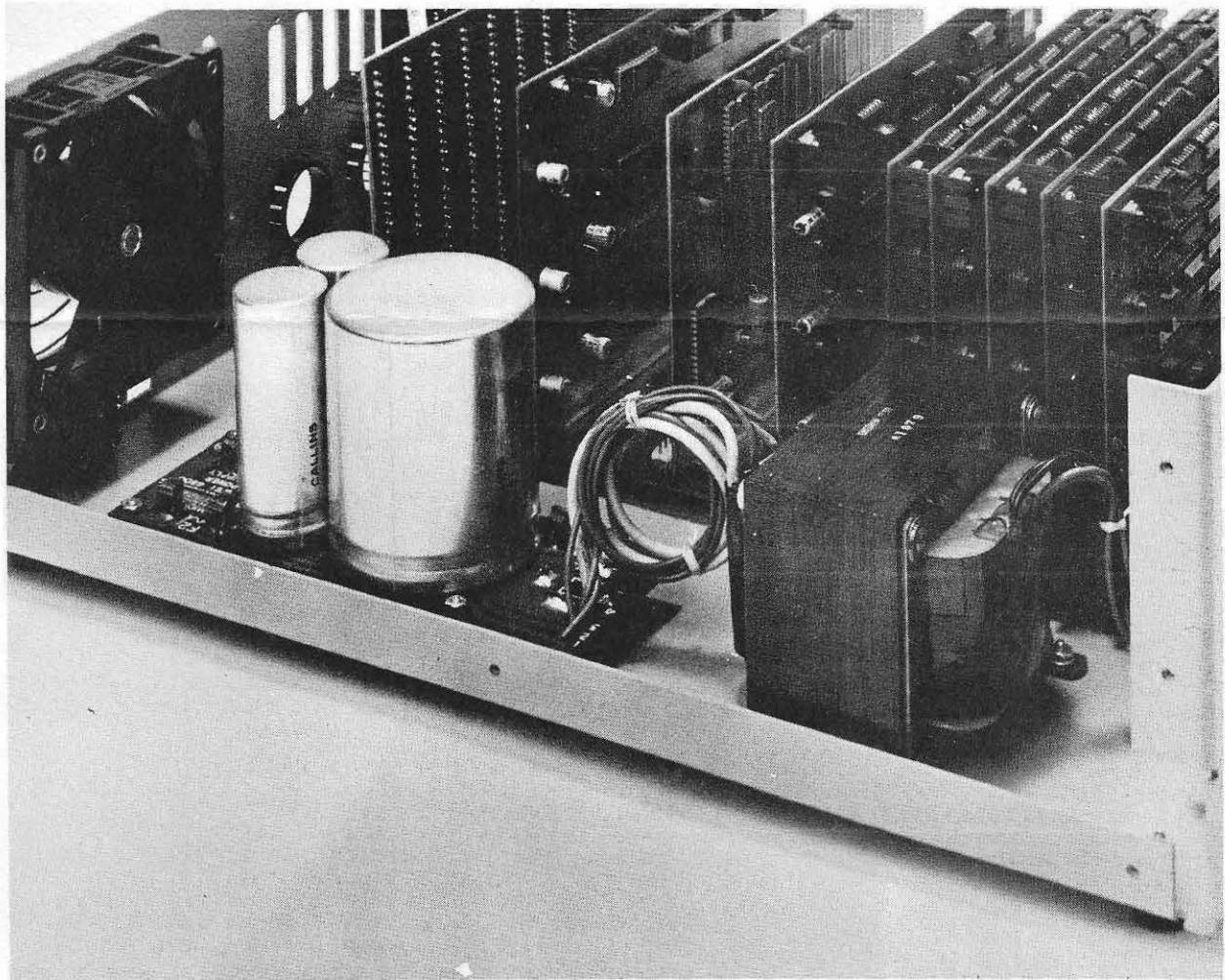


# POWER SUPPLY



## MODEL PS-1



*Midwest Scientific Instruments, Inc.  
Olathe, Kansas*



## MSI 6800 POWER SUPPLY, MODEL PS-1

### GENERAL DESCRIPTION

The MSI 6800 Power Supply, Model PS-1, is designed to furnish unregulated +8, -15, and +15 volts to the mother board of the MSI 6800 Computer System. The power transformer contains a split primary, each winding of which is tapped so as to accommodate different conditions of load and line voltage. The power supply can be operated from 105 to 130 volts AC or from 210 to 260 volts AC. The power supply is designed to deliver +8 V.D.C. at 18 amperes, -15 V.D.C. at 3 amps, and +15 V.D.C. at 3 amps, to the power supply busses in the computer system.

The bridge rectifiers and large electrolytic filter capacitors are all mounted directly on the PS-1 printed circuit board for the greatest ease of construction. The primary of the power transformer is fused and each of the 3 DC power supply outputs are individually fused on the printed circuit board. The bridge rectifiers mount on the non-component side of the printed circuit board where they can be easily heat sunk against the bottom chassis of the computer system.

### P.C. BOARD ASSEMBLY INSTRUCTIONS

Before beginning assembly of the PC board, perform the following steps. Referring to the parts list, and the Power Supply Assembly Drawing, No. 100004, carefully check the parts kit in order to properly identify each component and make sure that all the necessary parts are included.

Next, carefully examine the P.C. Board itself for any flaws or defects. A magnifying glass is helpful in identifying the presence of any hairline shorts between foils, incomplete etching of the board or breaks in the foil. Such defects are rare but a careful preliminary examination is very worthwhile. Any defects should be corrected before beginning assembly of the board. Normally, we recommend using a 30 watt soldering iron for all assembly. However, in the case of the power supply board a larger soldering iron is very helpful due to the large mass of the circuit board foils and the components which are involved. Use only solder having a resin core, never use any type of acid based solders. A 60/40 or 63/37 alloy is recommended.

Be careful to orient the bridge rectifiers and capacitors properly according to their correct polarity.

The PC board has been silk screened to show the proper placement of all components. Refer also to the Power Supply Assembly Drawing, No. 100004, for correct placement and orientation of all components. Refer also to the Power

Supply Schematic Diagram, Drawing No. 100000, for the wiring configuration.

#### ASSEMBLY PROCEDURE

On the Model PS-1 Power Supply the capacitors and fuse clips mount on the silk screened (component) side of the board. The two bridge rectifiers mount on the opposite (non-component) side of the board. It is best to build up the chassis, which will house the power supply, first since the placement of bridge rectifiers are determined by height of the four plastic spacers, lock washers, and hexnuts.

( ) Locate the six fuse clips and mount them on the component side of the printed circuit board, using a pair of clips for each fuse position F1, F2, and F3. Use No.4 BHM screws, #4 lock washers, and hexnuts to mount the clips. Insert the machine screw through the fuse clip then through the printed circuit board. Install the lock washer and hexnut on the non-component side of the PC board.

( ) Insert the two bridge rectifiers into the PC board from the non-component side of the board. Be sure to orient the bridge rectifiers correctly so that the positive terminal of each rectifier goes to the foil on the PC board which is marked positive. Do not solder the bridge rectifiers or trim the leads at this time.

( ) Install four 6-32 x 1 inch BHM screws, using four 1/2 inch spacers, #6 lockwashers, and hexnuts in position to receive the power supply PCB.

( ) Install the power supply PCB on the four mounting screws and tightly secure to the chassis using another set of four #6 lockwashers and hexnuts. Be sure that the bridge rectifiers remain in position on the PCB during this procedure.

( ) After making sure the power supply PCB is securely mounted, then push the bridge rectifiers down flat against the bottom of the chassis and bolt into position using two 6-32 x 3/4 inch BHM screws, #6 lockwashers, and hexnuts.

( ) After securing the rectifiers into their proper positions, solder the bridge rectifiers to the PC board.

( ) Temporarily, remove the power supply P.C. board from its mounting on the chassis to facilitate the remaining steps of power supply construction.

( ) Solder the bridge rectifiers to the PCB on the bottom side at this time. Be careful not to disturb the position of the rectifier during this procedure.

( ) Install capacitors C1, C2, and C3 on the component side of the PCB. These capacitors mount upside down using 10-32

BHM screws to secure the capacitors to the PCB. Be sure that there is a #10 lock washer on each screw prior to its insertion. Be careful to orient these capacitors correctly so that the positive terminal of each capacitor is in contact with the positive foil of the PCB.

( ) Trim the secondary power transformer leads, 2 black and 3 white, to an approximate length of 7 inches which will allow them to reach the power supply P.C. board easily. Strip and tin each lead.

( ) Referring to the Chassis Wiring Diagram, Drawing No. 100029, solder the transformer primary leads to the lower holes of the 10 lug terminal strip (ITEM NO.4, Chassis Parts Kit). The primary leads should first be cut to a length of 5 inches, stripped, and tinned.

( ) Solder the three 17 volt secondary wires to the P.C. board. This winding consists of 2 black wires, which attach to Pads 5 and 6, and 1 white wire, which attaches to Pad 7. These wires are inserted from the top side of the board and should be soldered on the bottom side.

( ) Solder the two 8 volt secondary wires to the PC board. These two white wires can be identified by their larger diameter. These wires solder to Pads 8 and 9 on the PC board. These wires should be inserted from the top side of the board and soldered on the bottom side.

( ) Locate two 18 gauge wires, yellow and green, and two 16 gauge wires, red and black, trim these four wires to 15 inches in length. These wires should be inserted from the bottom side of the power supply PC board and soldered on the top side. They will pass underneath the mother board of the MSI 6800 system, insert from the bottom side of the mother board and should be soldered on the top side.

( ) Solder the black wire to Pad 1 of the power supply board.

( ) Solder the red wire to Pad 2 of the power supply board.

( ) Solder the yellow wire to Pad 3 of the power supply board.

( ) Solder the green wire to Pad 4 of the power supply board.

( ) Upon completion of this phase of the power supply PC board, carefully examine the board for the presence of any solder splashes, solder bridges, or shorts between adjacent pads on the board. These must be carefully removed before proceeding with check-out of the board. A magnifying glass greatly aids in the detection of such defects. If available, excess flux may be removed from the board with trichlorethylene. This also makes the detection of defects

much easier.

( ) The power supply PC board may now be re-secured into position in the computer chassis as before, and the power transformer mounted using four 6-32 x 3/4 inch BHM screws, #6 flatwashers, #6 lockwashers, and hexnuts.

( ) The leads from the power supply P.C. board may now be soldered to the mother board. They should be inserted from the bottom side and soldered on the top side of the board.

( ) Solder the BLACK lead to the mother board ground bus.

( ) Solder the RED lead to the mother board +8 Volt bus.

( ) Solder the YELLOW lead to the mother board +12 Volt bus.

( ) Solder the GREEN lead to the mother board -12 Volt bus.

#### POWER SUPPLY CHECKOUT PROCEDURE

( ) First double check the wiring of the power supply and chassis to make sure that it is correct as shown in the Chassis Wiring Diagram.

( ) Using an ohmmeter, check between ground and the +8 Volt bus, the +12 Volt bus, and the -12 Volt bus to be sure that no shorts to ground are observed before applying power to the system. Also, make sure that no shorts exist between mother board ground and chassis ground.

( ) Install the 2 amp slo-blo fuse in the fuse holder on the rear of the chassis. Install a 20 A. fuse at F1 and 3 A. fuses at F3 and F4.

( ) Do not plug in any circuit boards into the mother board until the voltage checks have been made and ascertained to be correct.

( ) Apply A.C. power to the system. Using a voltmeter, measure between ground (logic common which is ground on the mother board not chassis ground) and each of the mother board power busses. With no load on the power supply, the voltages should be approximately plus and minus 16 volts on the busses labelled 12 volts, and +10 volts on the unregulated +8 volt bus. If the voltages check as expected, then the circuit boards may be installed for complete system checkout.

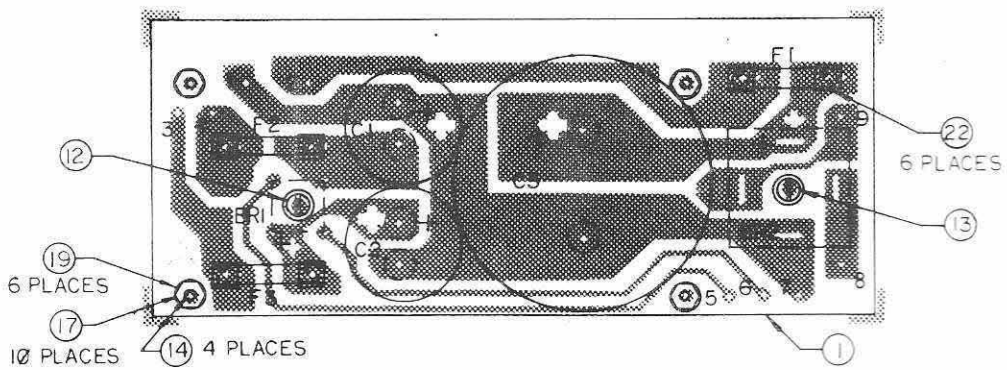
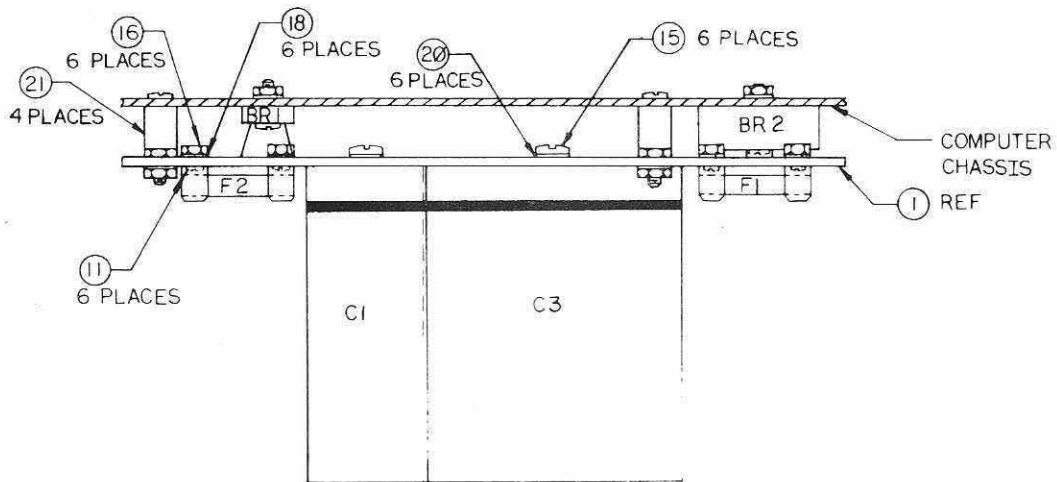
## MSI 6800 COMPUTER, PS-1, POWER SUPPLY

## PARTS LIST

<u>ITEM NO.</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>REFERENCE DESIGNATION</u>	<u>MSI PART NO.</u>
1	1	PCB, PS-1, Power Supply		976
3	2	CAPACITOR, 19,000uf, 20VDC	C1, C2	197
4	1	CAPACITOR, 140,000uf, 15VDC	C3	196
6	1	BRIDGE RECTIFIER, 6 Amp	BR1	141
7	1	BRIDGE RECTIFIER, 35 Amp	BR2	139
9	2	FUSE, 3 Amp	F2, F3	936
10	1	FUSE, 20 Amp	F1	937
11	6	SCREW, 4-40 x 1/4", B.H.M.		715
12	1	SCREW, 6-32 x 1/2", B.H.M.		724
13	1	SCREW, 6-32 x 3/4", B.H.M.		725
14	4	SCREW, 6-32 x 1", B.H.M.		726
15	6	SCREW, 10-32 x 3/8" B.H.M.		925
16	6	NUT, 4-40, Hex		714
17	10	NUT, 6-32, Hex		721
18	6	WASHER, #4, I.T.L.		744
19	6	WASHER, #6, I.T.L.		745
20	6	WASHER, #10, I.T.L.		747
21	4	STAND OFF, 1/2"		753
22	6	FUSE CLIP		819
23	1	TRANSFORMER, A1079		931



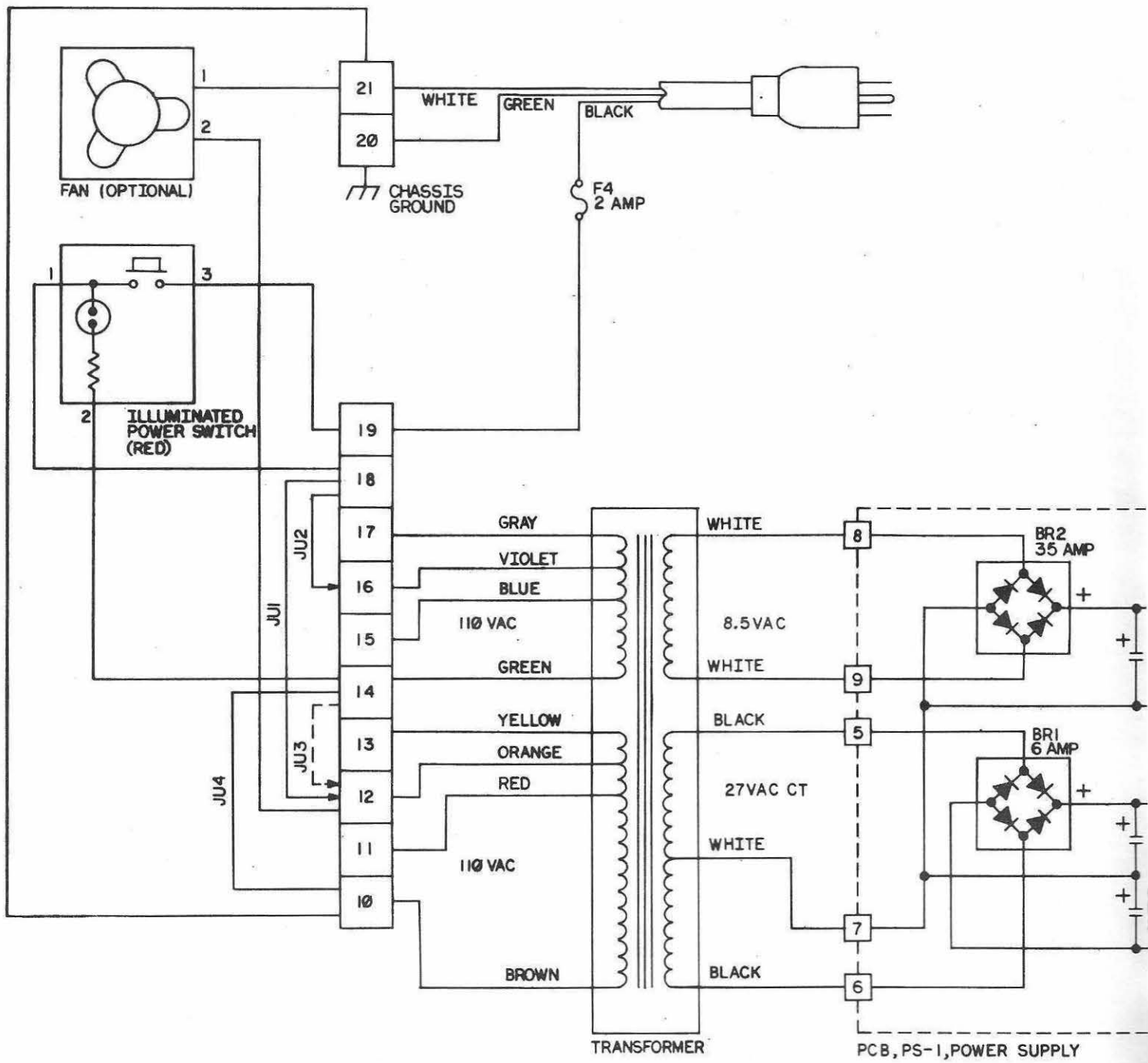




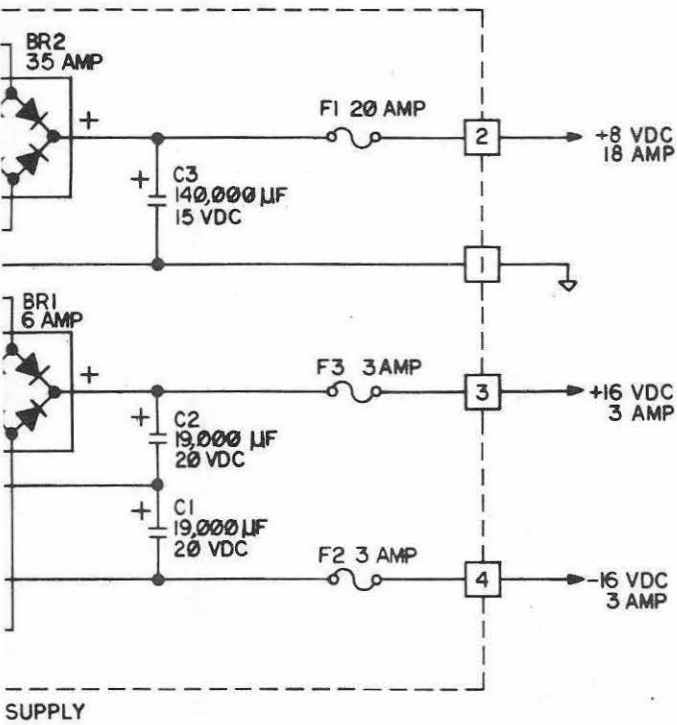
REVISIONS						
REV	ZONE	DESCRIPTION	DR	CK	APR	DATE
1		UPDATED TO MATCH ETCH				11-30-77
2		RELOCATED CAPACITOR MTG HOLES	ka			12-14-77

22	6	FUSE HOLDER				819
21	4	STAND OFF, 1/2"				753
20	6	WASHER, #10 I.T.L.				747
19	6	WASHER, #6 I.T.L.				745
18	6	WASHER, #4 I.T.L.				744
17	10	NUT, 6-32, HEX				721
16	6	NUT, 4-40, HEX				714
15	6	SCREW, 10-32 X 3/8", BHM				925
14	4	SCREW, 6-32 X 1", BHM				726
13	1	SCREW, 6-32 X 3/4", BHM				725
12	1	SCREW, 6-32 X 1/2", BHM				724
11	6	SCREW, 4-40 X 1/4", BHM				715
10	1	FUSE, 20 AMP	F1			937
9	2	FUSE, 3 AMP	F2, F3			936
7	1	BRIDGE RECTIFIER, 35 AMP	BR2			139
6	1	BRIDGE RECTIFIER, 6 AMP	BRI			141
4	1	CAPACITOR, 140,000 µF, 15 VDC	C3			196
3	2	CAPACITOR, 19,000 µF, 20 VDC	C1, C2			197
1	1	PCB, PS-1, POWER SUPPLY				976
ITEM	QTY	DESCRIPTION	REF DES	MSI P. N.		

PARTS LIST			
DRWN K. Osh	DATE 11-9-77	<i>Midwest Scientific Instruments</i> <i>Olathe, Kansas</i>	
CHK K. Osh	DATE 11-16-77		
APPR Osh	DATE 11-30-77		
MATERIAL		TITLE MSI 6800 COMPUTER ASSY, PS-1, POWER SUPPLY	
SIZE 24 36	MSI PART NO. REF 976	DRWG NO. 100004	REV 2
SCALE 1/1	SHEET	OF	



REVISIONS						
REV	ZONE	DESCRIPTION	DR	CK	APR	DATE
1		REVISED & REDRAWN	K.O.	K.O.		11-20-77
2		ADDED JU4 - REVISED NOTES 1 & 2 REVISED SWITCH & TRANSFORMER - F4 FROM: 3 AMP TO: 2 AMP				



2. FOR 220 VAC:

INPUT VOLTAGE	JU2 TIE 18 TO:	JU3 TIE 14 TO:
214-225	13	18
(DO NOT USE JU1 & JU4)	16	12
	17	13

1. FOR 110 VAC:

INPUT VOLTAGE	JU1 TIE 18 TO:	JU2 TIE 18 TO:
107-112	13	13
(DO NOT USE JU3)	12	16
	13	17

NOTES: UNLESS OTHERWISE SPECIFIED

DRWN K. OPHIR	DATE 9-2-77	Midwest Scientific Instruments Olathe, Kansas		
CHK K. OPHIR	DATE 10-4-77			
APPR D.A.L.	DATE 10-3-77	TITLE MSI 6800 COMPUTER SCHEM, POWER SUPPLY		
MATERIAL	SIZE 24 36	MSI PART NO. _____	DRWG NO. 100000	REV 2
	SCALE	SHEET	OF	