

Assembly Instructions MP-P2 Power Supply and Chassis Base Plate

The MP-P2 Power Supply is the supply designed to power the mother board and its complement of plug-on boards including the MP-09 Microprocessor Board, disk controller board, memory boards and up to eight interface boards on the SWTPC Computer system. It includes the power transformer, bridge rectifier, two large filter capacitors and power interconnect board. The power interconnect board is a circuit board supporting the protection fuses, +16 volt rectifier with filter, and the mother board wiring connector. The connector greatly aids in interconnecting and servicing the unit.

Before starting on the power supply, you must have already completed assembly of the mother board and must have the MP-F2 chassis kit, or the one you plan to use with the unit available for assembly.

When the SWTPC Computer is being assembled, work on only one board at a time. Each of the computer's boards and their associated parts must not be intermixed to avoid confusion during assembly.

MP-B3 Mother Board Connector

- () Cut eight 18" pieces of #18 gauge or heavier wire.
- () Following the table below, solder one end of each of the eight wires to the MP- B3 Mother Board connection points listed and solder the appropriate connector pin onto the other end. Attach the wires to the MP-B3 Mother Board from the "TOP" side of the board.

TOP FRONT OF MP-B2

<u>MP-B3 Terminal</u>	<u>J4 Connector Pin Gender</u>	<u>J4 Connector Pin #</u>
No Connection	--	1
GND	female	2
+16	female	3
-16	female	4
GND	female	5
GND	female	6
+8	female	7
+8	female	8
+8	female	9
No Connection	--	10
No Connection	--	11
No Connection	--	12

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- () Following the table on the previous page, plug each of the wires with the cylindrical pins into the appropriate holes of the male nylon connector block. The female block will be attached to the power inter-connect board. The pins are inserted from the back side of the connector and each of the holes are numbered on the connector. Check the position of each wire with the Power Supply Wiring Diagram before pressing each pin into the connector.
- () This completes the mother board connector wiring.

MP-PS Power Supply PC Board Assembly

NOTE: When assembling the board use a low wattage soldering iron (not a gun). Do not use acid core solder or any type of paste flux. We will not guarantee or repair a kit on which either product has been used. Use only the solder supplied with the kit or 60/40 alloy resin core equivalent.

- () Remove any oxidation from the copper on the circuit board with a piece of Scotchbrite®.
- () Before installing any parts on the circuit board, check the copper side of the board over carefully for incomplete etching and foil "bridges" or "breaks". It is unlikely that you will find any but it is best to find them now if there are any.
- () Install the capacitors on the board. Be sure to orient the electrolytic capacitor correctly. The polarity is indicated on the component layout drawing. Capacitors C2 and C3 are not installed on the board. Capacitor C4 is not used. Solder.

As with all other components unless otherwise noted, use the parts list and the component layout drawing to locate each part and install from the "TOP" side of the board, bending the leads along the bottom side of the board and trimming so that 1/16" to 1/8" of wire remains.

- () Install the diodes on the board. The diodes must be turned to match the outlines on the component layout drawing. Diode D5 is not used. Solder.
- () Attach the fuse clips on the board. Turn the clips so the ridge on the end of each clip will keep the fuse centered when snapped into place. Solder.

Scotchbrite® is a registered trademark of the 3M Corp.

- () Install the 12-pin Molex Wafercon® connector, J3, on the board oriented as shown in the component layout drawing. The trimmed corners on the end of the connector must be oriented correctly (exactly as shown in the component layout drawing). If any of the pins loosen while inserting the Wafercon® on the board be sure to push them down all the way flush with the connector. Solder.
- () Install the twelve male PC pins in the twelve-pin female Molex connector shell. The pins must be installed from the back or numbered side of the connector. Now attach and solder this connector in the J4 position on the board. Orient the connector as shown in the component layout drawing.
- () Install the 6-pin Molex Wafercon® connector, J1 on the board oriented as shown in the component layout drawing. The trimmed corners on the edge of the connector must be oriented correctly. Solder.
- () Connector J2 is not used on this version of the board. No resistors, EMI nor Q1 as listed in the parts list are used on this board.

Assembling the MP-F2 Chassis Base Plate and its Components
Preparing the Transformer

- () Compare the lengths of the two red and red-yellow transformer secondary wires. Trim the wires so the three are all the same length but do not trim any more than necessary. Solder the proper connector pin onto each of these three wires using the table below for reference.
- () Solder a male connector pin onto one end of a 12" piece of heavy gauge wire using the table below for reference. Attach and solder a #6 ground lug to the other end of the same wire. This ground lug is chassis ground and gets attached later to the capacitor clamp screw shown in the power supply wiring diagram.

<u>Origin of Wire</u>	<u>J1 Connector Pin Gender</u>	<u>J1 Connector Pin #</u>
T1 red	female	1
T1 red-yellow	female	2
T1 red	male	3
No connection	--	4
Chassis Ground	male	5
No connection	--	6

- () Following the table above, plug each of the wires with the cylindrical pins into the appropriate holes of the 6-pin male nylon connector block. The pins are inserted from the back side of the connector and each of the holes is numbered on the connector block. Check the position of each wire with the power supply wiring diagram before pressing each pin into the connector block.

Wafercon® is a registered trademark of the Molex Corp.

Assembling the Chassis

- () Attach the rear panel (the one with the large opening) to the baseplate using five #6-32 x 3/8" screws, lockwashers and nuts. The screws along the bottom are roundhead while those on the side are flathead. Leave the screws finger tight until all have been installed then tighten completely. The power supply wiring diagram shows proper orientation of the panel.
- () Attach the four rubber feet to the bottom of the chassis about 1 1/2" in from each corner.
- () Loosely attach the two large electrolytic capacitor clamps to the baseplate using five #6-32 x 3/8" screws, lockwashers and nuts. Orient the clamps as shown in the power supply wiring diagram.
- () Attach the bridge rectifier to the chassis using a #8-32 x 3/4" screw, lockwasher and nut. The bridge rectifier must be oriented so its lugs are as shown in the power supply wiring diagram.
- () Attach the five terminal lug strip to the chassis using a #6-32 x 3/8" screw, lockwasher and nut. Orient the lug strip as shown in the power supply wiring diagram.
- () Install the fuseholder on the rear panel of the chassis. Place the 1/2" rubber washer between the fuseholder and the outside of the chassis.
- () Crimp the strain relief onto the line cord at a point about 4" from the end of the line cord. While compressing the strain relief with a pair of pliers, insert it into the chassis from the outside of the chassis and release.
- () Snap the power switch into place. Orient the switch as shown in the power supply wiring diagram.
- () Attach and solder each of the three line cord wires as listed in steps 1 thru 3 of the wiring table. The wire in step 3 of the wiring table should be attached and soldered to the bottom opening on the lug strip. This allows the top opening to be used for other connections. Be sure the solder connection is neat and that neither the wire nor solder come into contact with the metal baseplate.

- () Complete steps 4 and 5 of the wiring table. The wire to the lug strip should be attached and soldered to the bottom opening on the lug strip. This allows the top opening to be used for other connections. Be sure the solder connection is neat in that neither the wire nor solder come into contact with the metal baseplate.
- () Attach the power transformer to the chassis using four #8-32 5/8" screws, flatwashers, lockwashers and nuts. Orient the transformer so the heavy wires are toward the front of the chassis as shown in the power supply wiring diagram. Be sure the screws are tight.
- () Attach the fan and fan guard to the chassis using four #6-32 x 1" Phillips head screws, flatwashers, lockwashers and nuts. The fan guard is placed on the outside of the rear panel with the grill turned away from the panel. Orient the fan itself as shown in the power supply wiring diagram.
- () The power transformer on the computer has been designed for operation at either 120 or 240 VAC, 50 or 60 Hz. To wire the computer for 120 VAC, 50 or 60 Hz operation, follow steps 6 thru 9 of the wiring table. To wire the computer for 240 VAC, 50 or 60 Hz operation, follow steps 6A thru 6D of the wiring table.
- () Using the power supply wiring diagram for reference, attach the chassis ground on connector J1 under the nut holding the small electrolytic capacitor clamp. Leave the nut loose.
- () Install the two large electrolytic capacitors into their clamps. The capacitors must be oriented as shown in the power supply wiring diagram. Loosely secure the capacitors to the clamps using two #6-32 x 3/4" screws, lockwashers and nuts.
- () Double check the polarity marked on the top of the, filter capacitors with that shown in the power supply wiring diagram. The "+" shown on the capacitors must match with that shown on the diagram. This is very important.
- () Check to make sure that all connections have been soldered on the MP-PS power inter-connect board.
- () Carefully set a #10 internal star lockwasher on each of the four electrolytic capacitor lugs. Now orient the assembled MP-PS power inter-connect board as shown in the power supply wiring diagram and place it on top of the two electrolytic capacitors.
- () Carefully start a # 10-32 x 5/16" screw into each of the four lugs. Be sure that the lockwashers do not slip off of the lugs. If they do, you will have to remove the board and start over. The lugs on the capacitors are composed of aluminum and are easily stripped and cross-threaded. If there is any resistance when installing any of the four screws, stop and find the problem. The screws should be tight but not so tight as to strip the aluminum capacitor lugs. Technically they should be torqued to 20 inch-pounds.

- () Now tighten the two capacitor clamp tension screws and the five screws holding the clamps to the chassis.
- () If the transformer has spaded lugs on its green secondary wires they should be pressed onto the AC terminals of the bridge rectifier RECT1 as shown in the power supply wiring diagram and in steps 12 thru 13 of the wiring table. If the secondary leads do not have spaded lugs installed, the wires should be soldered directly to the AC terminals of the bridge rectifier using a high wattage soldering iron.
- () Cut six 10-inch pieces of heavy gauge wire, preferably three pieces of each of two colors. Attach and solder a female pin onto one end of all but one of the wires. Attach and solder a male pin onto one end of this remaining wire. Attach and solder the unattached ends of three of the wires with female pins to the (-) terminal of the bridge rectifier RECT1. Attach and solder the unattached ends of the remaining three wires (two with female pins and one with a male pin) to the (+) terminal of bridge rectifier RECT1. Be sure to use a high wattage soldering iron. Use the table below for reference.

<u>Origin of Wire</u>	<u>J3 Connection Pin Gender</u>	<u>J3 Connector Pin #</u>
RECT1(-)	female	4
RECT1(-)	female	5
RECT1(-)	female	6
RECT1(+)	female	10
RECT1(+)	female	11
RECT1(+)	male	12

- () Following the table above, plug each of the wires with cylindrical pins into the appropriate holes of the 12-pin male nylon connector block. The pins are inserted from the back side of the connector and each of the holes numbered on the connector block. Check the position of each wire with the power supply wiring diagram before pressing each pin into the connector block.
- () Use a wire tie to bundle the wires at the base of the transformer on the side adjacent the rear panel. Include the fan wires in the bundle.
- () Check to see that all connections have been soldered.
- () Snap the two Tinnerman nuts on the two oversized holes on the perforated protection cover. Set the cover in place under the cooling fan and secure to the chassis using two #6-32 x 3/8" screws.

- () Plug connectors J1 and J3 onto their mating connectors on the MP-PS power inter-connect board. Use the power supply wiring diagram reference.
- () Install fuses F1 thru F4 into their appropriate fuse holders. Fuse F1 is installed in the fuse holder on the rear panel. Use the MP-PS component layout drawing for other fuse locations. Fuse values are listed in the MP-PS parts list.
- () Attach the front panel to the baseplate using five #6 - 32 -3/8" screws, lockwashers and nuts. The screws along the bottom are roundhead while those along the side are flathead. Leave the screws finger tight until all have been installed then tighten completely.
- () Snap the RESET and ABORT switches into the front panel. The RESET switch goes on the left and the ABORT switch on the right. Orient the switch so their terminals are oriented as shown in the power supply wiring diagram. If the buttons on any of the switches read upside down from the outside of the chassis, carefully remove the button with your fingers, invert and reinstall.

This completes the power supply assembly.

Parts List _MP-PS Power Supply Board

Diodes

___ *RECT1	25A bridge rectifier	___ *D4	1N5402 diode
___ *D1	1N4003 diode	___ *D5	1N4003 diode (omitted on some units)
___ *D2	1N5402 diode		
___ *D3	1N4003 diode		

Capacitors

___ *C1	1000 mfd @25 VDC electrolytic capacitor	___ *C3	91000 mfd @15 VDC electrolytic capacitor
___ *C2	14,000 mfd @25 VDC electrolytic capacitor	___ C4	0.01 mfd @50 capacitor (omitted on some units)
		___ C5	0.1 mfd capacitor

Fuses

___ F1	2 1/2 amp slo-blo fuse	___ F3	2 amp standard fuse
___ F2	10 amp standard fuse	___ F4	1/2 amp standard fuse

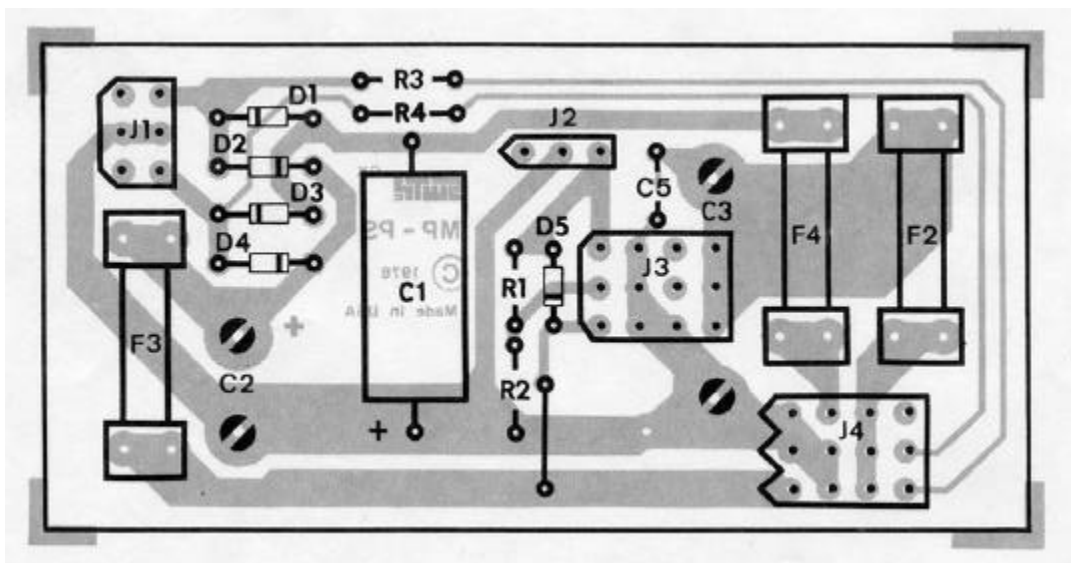
Resistors

___ R1	240 or 243 ohm precision resistor (omitted on some units)	___ R3	470 ohm 1/2 watt resistor (omitted on some units)
___ R2	2000 or 2030 ohm precision resistor (omitted on some units)	___ R4	470 ohm 1/2 watt resistor (omitted on some units)

Miscellaneous

___ *S1	SPST power switch	___ *EMI	120/240 VAC 50-60 Hz interference filter (omitted on some units)
___ *T1	power transformer 120/240 VAC 50-60 Hz primary - 8.0 VAC @10A and 26.0 VAC @1A secondary	___ *Q1	LM317 adjustable voltage regulator (omitted on some units)

*All components flagged with a * must be oriented as shown in the component layout drawing.



WIRE			FROM			TO		
STEP	LENGTH	GAUGE	PART	TERMINAL	SOLDER	PART	TERMINAL	SOLDER
Wiring Table - 69K Computer								
1	-	-	Line Cord	Green	-	TS1	C	yes
2	-	-	Line Cord	Black	-	F1	A	yes
3	-	-	Line Cord	White	-	TS1	D	no
4	4"	heavy	TS1	B	yes	S1	A	yes
5	3"	heavy	F1	B	yes	S1	B	yes
110 Volt Transformer Wiring								
6	-	-	T1	Black	-	TS1	B	no
7	-	-	T1	Brown	-	TS1	B	no
8	-	-	T1	Brn/Yel	-	TS1	D	no
9	-	-	T1	Blk/Red	-	TS1	D	no
220 Volt Transformer Wiring								
6A	-	-	T1	Black	-	TS1	B	no
6B	-	-	T1	Brown	-	TS1	E	no
6C	-	-	T1	Brn/Yel	-	TS1	D	no
6D	-	-	T1	Blk/Red	-	TS1	E	yes
10	full	-	Fan	A	-	TS1	B	yes
11	full	-	Fan	B	-	TS1	D	yes
12	-	-	T1	Green	-	RECT1	AC 1	yes
13	-	-	T1	Green	-	RECT1	AC 2	yes