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MASTR[®] II/III

Site Equipment Power Supply

19A149978P1 – 12V, 33AMP; 121VAC/60Hz

19A149978P2 – 12V, 33AMP, 230 VAC/50Hz

19A149978P3 – 12V, 33AMP, 220VAC/60Hz

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The 19A149978P1 power supply is UL recognized and repairs to this unit require only the use of materials listed in the parts list. After a repair, a hi-pot test should be performed to avoid the possibility of a short discharging the input into ground and possibly injure an operator or cause property damage. This manual implies that it is possible to open the unit, check the problem, change the components according to the troubleshooting guide, close the unit and power on the system. After a replacement of components a functional and hi-pot test should be performed. This does not refer to replacing a fuse that does not require opening of the unit. **If anyone other than an authorized M/A-COM Technician attempts to repair this unit, M/A-COM, Inc will assume no responsibility.**

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NOTICE!

Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

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1.0 SPECIFICATIONS¹

OUTPUT VOLTAGE

Transmit and Receive Simultaneously	13.2 VDC \pm 0.6 VDC @ 29 Amps (F801B) 13.2 VDC \pm 0.6 VDC @ 4 Amps (J801)
Receive only	< 16.0 VDC @ 3 Amps (J801)
Transmit only(For 225 watt PA option)	13.2 VDC \pm 0.6 VDC @ 33 Amps (F801B)

INPUT VOLTAGE

121 VAC \pm 20% (60 Hz version)
230 VAC \pm 15% (50 Hz version)
220 VAC \pm 15% (60 Hz version)

INPUT FREQUENCY

60 Hz \pm 2 Hz (60 Hz versions)
50 Hz \pm 2 Hz (50 Hz version)

Note: For every +1.0% change in the input frequency, the output voltage will not vary more than +1.6% from the output voltage measured at the nominal input line frequency.

INPUT LINE SURGE PROTECTION

150 V rated MOV (60 Hz version)
275 V rated MOV (50 Hz version)

DUTY CYCLE (For 0-33 Amp output)

100% (Continuous Duty)

OUTPUT VOLTAGE RIPPLE

< 100 mV p-p @ 25°C
< 200 mV p-p @ -30°C

OUTPUT TRANSIENT RESPONSE

Overshoot	Not to exceed 18 Volts
Undershoot	Not less than 11 Volts

EFFICIENCY

> 70% @ rated TX/RX load current and nominal line voltage

FUSE CAPABILITY

Input	10 Amp (60 Hz version) (2) 5 Amp (50 Hz version)
Output	5 Amp (Low Current Port) 40 Amp (High Current Port)

DIMENSIONS (HxWxD)

5.25" x 19" x 10.35"

WEIGHT

45 lbs.

OPERATING ENVIRONMENT

-30°C To +60°C

¹ These specifications are intended primarily for the use of the service personnel. Refer to the appropriate Specification Sheet for the complete specifications.

2.0 IMPORTANT SAFETY INFORMATION

The following conventions are used throughout this manual to alert the user to general safety precautions that must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions for with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. M/A-COM Inc. assumes no liability for the customer's failure to comply with these standards



The **WARNING** symbol calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** symbol until the conditions identified are fully understood or met.



The **CAUTION** symbol calls attention to an operating procedure, practice, or the like, which, if not performed correctly or adhered to, could result in damage to the equipment or severely degrade the equipment performance.



The **NOTE** symbol calls attention to supplemental information, which may improve system performance or clarify a process or procedure.



The **ESD** symbol calls attention to procedures, practices, or the like, which could expose equipment to the effects of **Electro-Static Discharge**. Proper precautions must be taken to prevent ESD when handling circuit modules.

1. **SAVE THIS MANUAL** - It contains important safety and operating instructions.
2. Before using the product, please follow and adhere to all warnings, safety and operating instructions located on the product and in the manual.
3. **DO NOT** expose product to rain, snow or other type of moisture.
4. Care should be taken so objects do not fall or liquids do not spill into the product.
5. **DO NOT** expose product to extreme temperatures.
6. **DO NOT** use auxiliary equipment not recommended or sold by the manufacturer. To do so may result in a risk of fire, electric shock or injury to persons.
7. To reduce risk of damage to electrical cord, pull by plug rather than cord when disconnecting unit.
8. Make sure the cord is located so it will not be stepped on, tripped over or otherwise

IMPORTANT SAFETY INFORMATION

subjected to damage or stress.

9. An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure:
 - a. That pins on the plug of the extension cord are the same number, size and shape as those of the plug on the power supply.
 - b. That the extension cord is properly wired in good condition.
 - c. That the wire size is large enough for AC ampere rating of unit.
10. DO NOT operate unit with a damaged cord or plug. Replace the damaged cord immediately.
11. DO NOT operate this product in an explosive atmosphere unless it has been specifically certified for such operation.
12. To reduce risk of electric shock, unplug unit from outlet before attempting any maintenance or cleaning.
13. DO NOT operate this product with covers or panels removed. This unit does not contain any user serviceable components.
14. Use only fuses of the correct type, voltage rating and current rating as specified in the parts list. Failure to do so can result in fire hazard.
15. **GROUNDING AND AC POWER CORD CONNECTION** - To reduce risk of electrical shock use only a properly grounded outlet. The unit is equipped with an electric cord having an equipment - grounding conductor and a grounding plug. Be sure the outlet is properly installed and grounded in accordance with all local codes and ordinances.
16. **DANGER** - Never alter the AC cord or plug. Plug into an outlet properly wired by a qualified electrician. Improper connection or loss of ground connection can result in risk of an electrical shock.
17. The Model 19A149978P2 is for use on a circuit having a nominal rating of 230 VAC and is factory equipped with a specific electric cord to permit connection to an acceptable electric circuit. A plug meeting local electrical codes must be supplied by the customer. Make sure the unit is connected to an outlet having the same configuration as the plug. No adapter should be used with this unit.



A ferroresonant power supply is designed to work specifically at a given frequency. The 60 and 50 Hz supplies should be used at their nominal frequency ± 2 Hz.



The 19A149978P1 power supply is UL recognized and repairs to this unit require only the use of materials listed in the parts list. After a repair, a hi-pot test should be performed to avoid the possibility of a short discharging the input into ground and possibly injure an operator or cause property damage. This manual implies that it is possible to open the unit, check the problem, change the components according to the troubleshooting guide, close the unit and power on the system. After a replacement of components a functional and hi-pot test should be performed. This does not refer to replacing a fuse that does not require opening of the unit. **If anyone other than an authorized M/A-COM Technician attempts to repair this unit, M/A-COM, Inc will assume no responsibility.**

3.0 DESCRIPTION

The M/A-COM MASTR II/III Site Equipment Power Supply provides up to 435 watts to power the site equipment receiver, systems circuitry, and transmitter. The power supply normally is used to provide power to MASTR II/III Site Equipment with a maximum of 29 Amps to the power amplifier and 4 Amps for the Receiver/systems circuitry. The supply can also optionally be used to power a 225 watt power amplifier. In this case the supply is connected only to the power amplifier and will provide a maximum of 33 Amps.

The 60 Hz Model (19A149978P1) operates from a nominal 121 VAC, 60 Hz source. If a 208/220/240 VAC 60 Hz Source is to be used, an external step-down transformer (similar to 19C307148P1) must be used with the 978P1 supply. The 50 Hz Model (19A149978P2) provides the same outputs as the '978P1 supply but operates from a nominal 230 VAC, 50 Hz source. The output voltage will change a maximum of + 1.6% for each + 1.0% change in the input line frequency. The 60 Hz Model (19A149978P3) provides the same outputs as the 978P1 and P2 supplies, but operates from a nominal 220 VAC, 60 Hz source.

**NOTE**

A ferroresonant power supply is designed to work specifically at a given frequency. The 60 and 50 Hz supplies should be used at their nominal frequency ± 2 Hz.

The power supply's step-down ferroresonant transformer provides excellent line voltage regulation. For the rated input line voltage range ($\pm 20\%$ for P1 $\pm 15\%$ for P2), the output voltage will not vary more than 2 %. A ferroresonant power supply provides inherently excellent line voltage surge protection, and reduced parts count for high reliability. No active semiconductor devices are used which could reduce reliability.

The output voltage will vary depending on the load current that the supply is being asked to source. As the load current rises, the output voltage will drop. Typically the output voltage will be 13.2 volts for a 33 Amp load, less than 16.0 volts for a 3 Amp load, and less than 16.7 volts for no load.

The operation and servicing of the power supply are completely accessible from the front. The ON/OFF switch and all fuses are located on the front panel. The low profile slot type fuse holders contain the primary fuse F1 (F1 & F4 for 978P2) and the low current output fuse F3. The high current output fuse F2 is mounted behind the front panel fuse cover. The primary fuse F1 (F1 & F4 for 978P2) protects the input wiring to the ferroresonant transformer (10 Amps for P1, 5 Amps each for P2). The output fuses F2 (40 Amps) and F3 (5 Amps) provide external overload protection.

The 60 Hz supply provides a courtesy dual AC receptacle. The primary line current fuse (F1) also provides overcurrent protection for the dual receptacle. The 60 Hz supply draws 5 Amps under nominal conditions and 7 Amps under all extremes. Thus, the dual courtesy receptacles are rated to provide a line current of 3 Amps.



Figure 1 - 60 Hz Power Supply (19A149978P1, Rev. B)



Figure 2 - 50 Hz Power Supply (19A149978P2, Rev. A)

DESCRIPTION



Figure 3 -60 Hz Power Supply (19A149978P3, Rev. A)

4.0 CIRCUIT ANALYSIS

In the 60 Hz power supply (978P1), the ON/OFF switch (S1) provides line voltage to the power supply through the primary line fuse F1. In the Rev. B version, line voltage flows through F1 to the courtesy receptacles prior to S1. This allows line voltage to always be available at the receptacles. In previous models (Rev. A and earlier), S1 applies line voltage to F1 and the courtesy receptacles in turn. Current then flows through the primary of step-down transformer (T1) via the 200°C thermal fuse. The thermal fuse would only open in the unlikely event that an internal short would develop in the transformer. The Varistor (VR1 - 150 V rating) provides additional input line voltage suppression.

In the 50 Hz power supply (978P2), the ON/OFF switch (S1) is a DPST type switching both primary AC lines. In addition, both input lines have 5 Amp fuses (F1 and F4). The Varistor (VR1 - 275 V rating) provides additional input line voltage suppression. When power is applied, current flows through the primary of step-down transformer (T1) via the 200°C thermal fuse. As in the 60 Hz model, the thermal fuse will open if the transformer develops an internal short.

The step-down transformer is a ferroresonant type, which has inherently good input line voltage regulation - eliminating the need for additional high-current regulators. C1 serves as a resonating capacitor across the secondary taps of the transformer.

The transformer steps the input voltage down to approximately 14 volts (for a 33 Amp load) and 16 volts (for a 3 Amp load). It then applies the stepped-down voltage to the full wave rectifier circuitry consisting of D1A,B through D3A,B and the high current filter. The rectifiers are dual diode packages and are mounted on heat sink HS1.

The high current filter consists of C2-C7 and L1. It is designed to reduce the output ripple to less than 100 mV p-p for any current load up to 33 Amps. It also keeps transient responses greater than 11 and less than 18 volts. Resistor R1 is a 10 ohm, 50 watt resistor that serves two functions. One, it acts as a bleeder resistor to discharge the capacitors when the supply is turned off. Two, it provides a minimum current load to prevent the output voltage from ever rising above 18 volts under any load condition. Under normal conditions jumper P802 is installed connecting the bleeder resistor (SW GND) to A-. In 60 Hz models (Rev. A and earlier), prior to Rev. B, this is done using a ground strap externally connected between F801B-2 and F801B-3. When the emergency power option is used, the jumper or ground strap is removed. This allows the relay K3 in charger 344A3168 to ground or open the bleeder resistor. When line voltage is present, the relay grounds the bleeder resistor to A-. In an emergency power condition, the relay open-circuits the bleeder resistor preventing premature drainage of the battery powering the station.

The high current filter sources current to both the high current and the low current output ports. It can source up to 33 Amps through 40 Amp fuse (F2) to the high current terminal strip (F801B) on the rear wall of the power supply chassis. F801B-1 and F801B-2 are A + and A-, respectively, and connect to the transmitter power amplifier. For site equipment that does not have emergency power options, F801B-3 and F801B-4 are not used. For emergency power options, F801B-3 & 4 provide connection between the power supply and the charger. In an emergency power condition, the external battery is connected through the charger, and through the power supply, to provide emergency power for the site equipment.

CIRCUIT ANALYSIS

The high current filter sources up to 4 Amps through 5 Amp fuse (F3) to the 9 pin molex connector (J801). This port provides power to the receiver and system circuitry in the site equipment. J801-1,2,3 are A +, and J801-4,5,6 are A-. An internal jumper between J801-7 and -8 allows a feedthru for the optional emergency power status line. J801-9 provides SW GND for the emergency power options.

The power supply is rated for a nominal 13.2 VDC for a 29 Amp load out of F801B and a 4 Amp load out of J801 (receiving and transmitting simultaneously). When receiving only (a 3 Amp load out of J801), the output voltage is less than 16.0 VDC.

5.0 MAINTENANCE

For disassembly, remove 8 screws and lift off top cover. Disassembly is required before working on the power supply. When replacing any component be certain to use an identical component. Thermal joint compound is required between diodes D1, D2 and D3 and the heat sink.



To avoid electrical shock, disconnect power supply from the AC input power source before removing or replacing any component or assembly.

5.1 TROUBLESHOOTING

The troubleshooting procedure in Tables 1 thru 3 may be helpful in isolating a defective component or assembly in a malfunctioning power supply. When a component or assembly is identified as defective, replace the defective component with an identical component. Be sure to check associated circuitry for any other damaged components before applying power to the unit.

Table 1 - 60 Hz Power Supply 19A149978P1

SYMPTOM	PROCEDURE
No output voltage at J801	Check the following: <ol style="list-style-type: none"> 1. Open F1, F3 or S1 2. AC voltage on W801 3. Open D1, D2 or D3
No output voltage at F801B	Check the following: <ol style="list-style-type: none"> 1. Open F1, F2 or S1 2. AC voltage on W801 3. Open D1, D2 or D3
Low output voltage on F801B or J801. $0 < V_o < 12.5 \text{ VDC}$	Check the following: <ol style="list-style-type: none"> 1. If one of the dual diodes on D1, D2 or D3 is shorted. <p>NOTE: All three diode packages contain two diodes each</p> <ol style="list-style-type: none"> 2. Line frequency < 60 Hz
High output voltage on F801B or J801. $V_o . > 16.7 \text{ VDC}$	Check the following: <ol style="list-style-type: none"> 1. Spade jumper is connected between pos 2 and 3 on F801B (Rev. A and earlier) Plug P802 is connected to connector J802 (Rev. B and later) 2. R1 not connected between pos 1 and 3 on F801B 3. Line frequency > 60 Hz.

Table 2 - 50 Hz Power Supply 19A149978P2

SYMPTOM	PROCEDURE
No output voltage at J801	Check the following: <ol style="list-style-type: none"> 1. Open F1, F3, F4 or S1 2. AC voltage on W801 3. Open D1, D3 or D3 (Also referred to as CR1, CR2 and CR3).
No output voltage at F801B	Check the following: <ol style="list-style-type: none"> 1. Open F1, F2, F4 or S1 2. AC voltage on W801 3. Open D1, D2 or D3
Low output voltage on F801B or J801. $0 < V_o < 12.5 \text{ VDC}$	Check the following: <ol style="list-style-type: none"> 1. If one of the dual diodes on D1, D2 or D3 is shorted <p>NOTE: All three diode packages contain two diodes each</p> <ol style="list-style-type: none"> 2. Line frequency < 50 Hz
High output voltage on F801B or J801. $V_o . > 16.7 \text{ VDC}$	Check the following: <ol style="list-style-type: none"> 1. Plug P802 is connected to connector J802 2. R1 not connected between pos 1 and 3 on F801B 3. Line frequency > 50 Hz

Table 3 - 60 Hz Power Supply 19A149978P3

SYMPTOM	PROCEDURE
No output voltage at J801	Check the following: <ol style="list-style-type: none"> 1. Open F1, F3 or S1 2. AC voltage on W801 3. Open CR1, CR2 or CR3
No output voltage at F801B	Check the following: <ol style="list-style-type: none"> 1. Open F1, F2 or S1 2. AC voltage on W801 3. Open CR1, CR2 or CR3
Low output voltage on F801B or J801. $0 < V_o < 12.5 \text{ VDC}$	Check the following: <ol style="list-style-type: none"> 1. If one of the dual diodes on CR1, CR2 or CR3 is shorted. <p>NOTE: All three diode packages contain two diodes each</p> <ol style="list-style-type: none"> 2. Line frequency < 60 Hz

SYMPTOM	PROCEDURE
<p>High output voltage on F801B or J801. $V_o . > 16.7$ VDC</p>	<p>Check the following:</p> <ol style="list-style-type: none"> 1. Spade jumper is connected between pos 2 and 3 on F801B (Rev. A and earlier) Plug P802 is connected to connector J802 (Rev. B and later) 2. R1 not connected between pos 1 and 3 on F801B 3. Line frequency > 60 Hz.

5.2 ADJUSTMENTS

This power supply has no adjustments or controls other than the ON/OFF switch.

5.3 INSTALLATION

The power supply is normally installed in an EIA 19 inch wide rack of a MII Site Equipment cabinet. It can also be installed in a 19-inch wide stand alone open rack.



NOTE

Insure that ventilation holes in the unit are not obstructed when the unit is mounted or in operation.

5.4 FUSE REPLACEMENT

To replace a defective fuse, perform the following procedure (Refer to Figures 4 thru 6).

1. Place ON/OFF switch to the OFF position.
2. For fuses F1 (F1 & F4 on 978P2) or F3, remove cap from fuse holder and replace fuse with a fuse of the same type and rating.
3. For fuse F2, remove two screws holding fuse cover to front panel. Remove defective fuse and replace with a fuse having the same type and rating. Replace fuse cover and secure using the 2 screws.



1. To avoid possible electric shock, **DO NOT** operate this power supply with the fuse cover removed.
2. No one should be permitted to handle any portion of the equipment that is supplied with high voltage, or to connect any external apparatus to the units while the units are supplied with power. **KEEP AWAY FROM LIVE CIRCUITS.**
3. To avoid electrical shock, disconnect power supply from the AC input power source before removing or replacing any component or assembly.

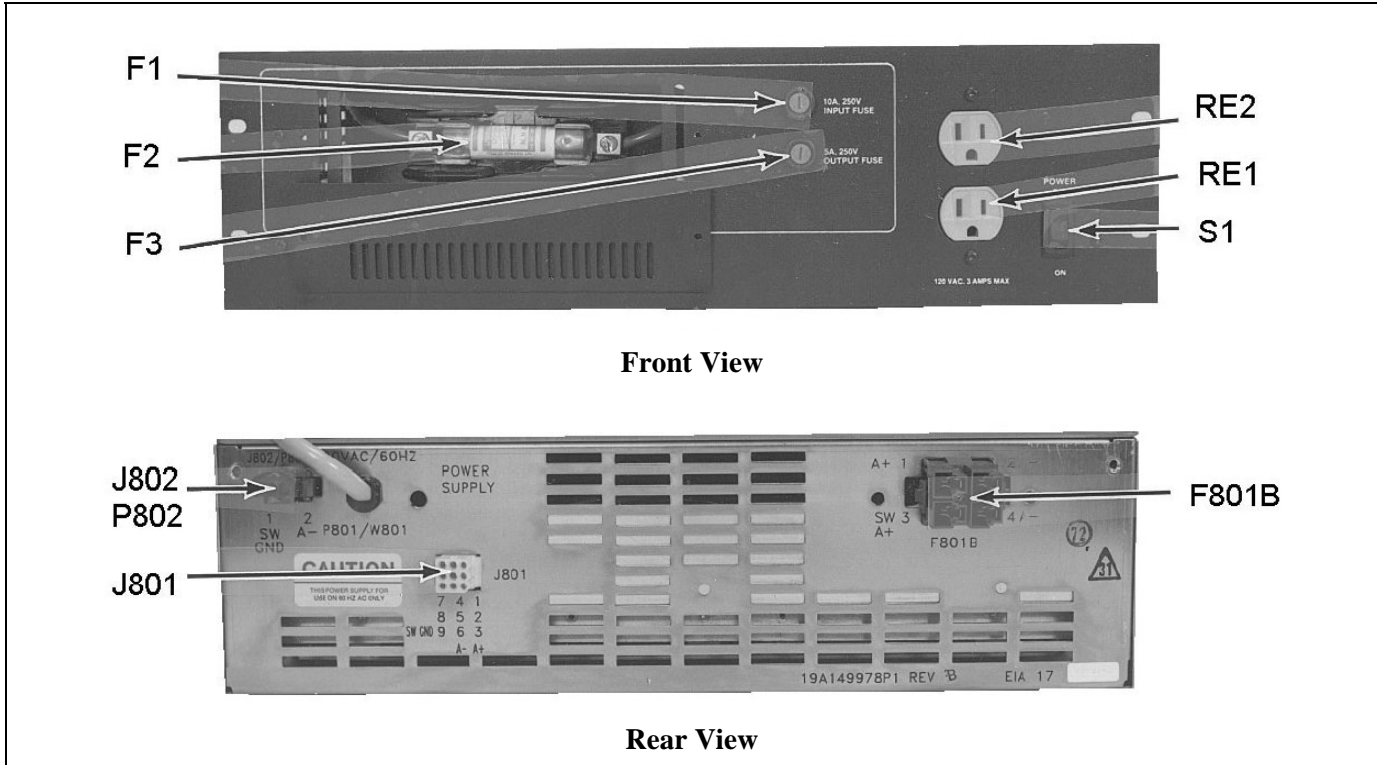


Figure 4 – 60 Hz Power Supply (19A149978P1, Rev. B)

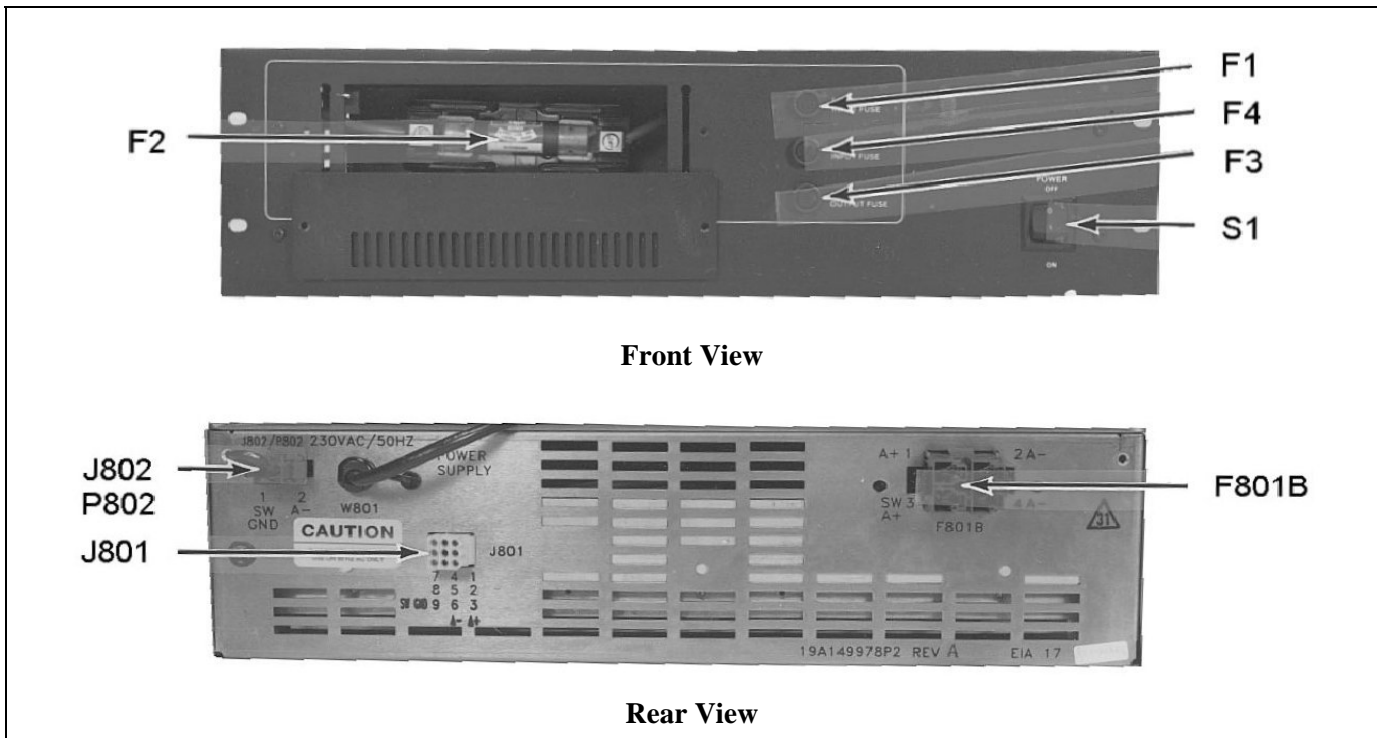


Figure 5 - 50 Hz Power Supply (19A149978P2, Rev. A)

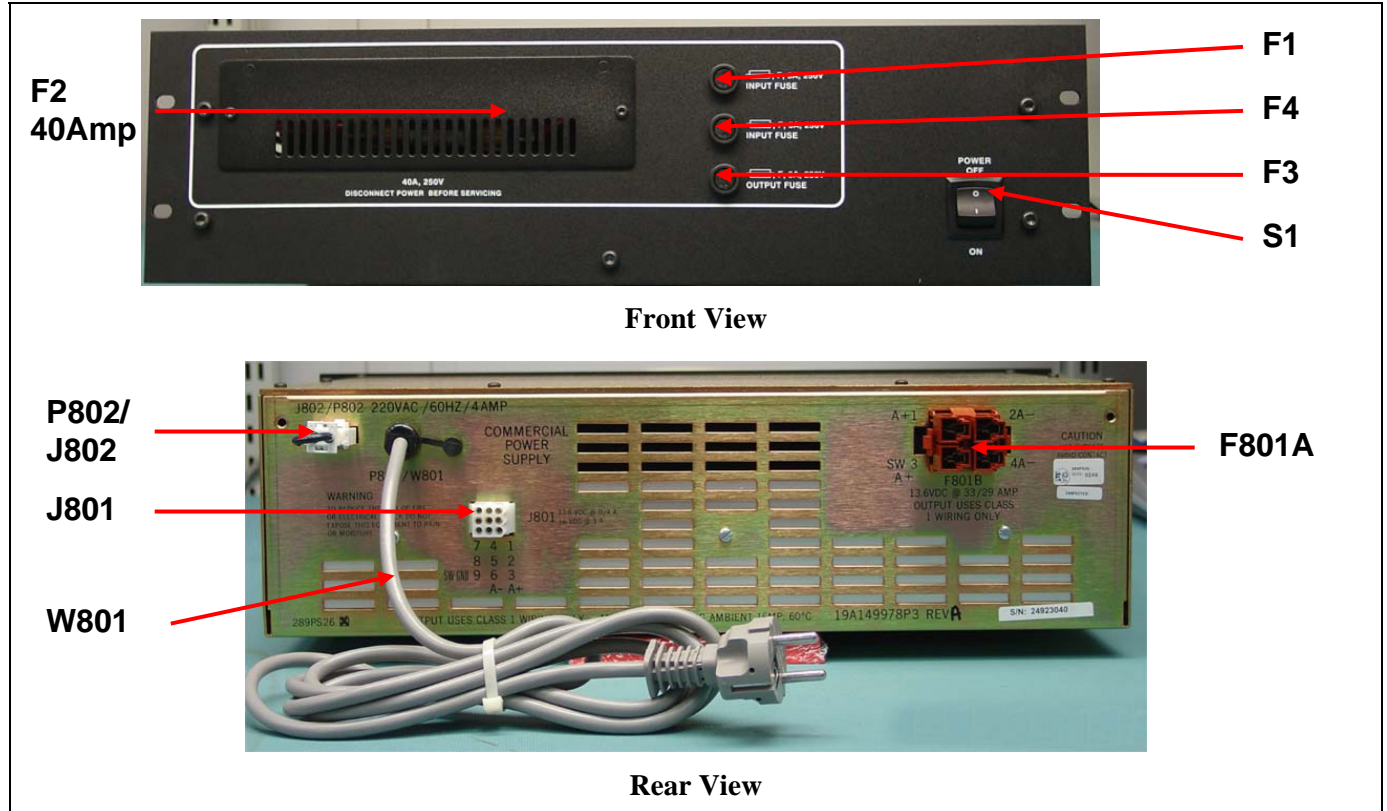


Figure 6 - 60 Hz Power Supply (19A149978P3, Rev. A)

6.0 PARTS LIST

6.1 STATION POWER SUPPLY 19A149978P1²

SYMBOL	PART NUMBER	DESCRIPTION
		---- CAPACITORS ----
C1	M29/17032400	Polypropylene: 8 μ F, 660 VAC, sim to Ronken P61A24805 H05.
		---- FUSES ----
F1	M29/09013901	Non-time delay Glass/Ferrule: 10 Amps, 250V; sim to Bussmann AGC-10.
F2	M29/09015200	Quick Blowing: 40 Amps, 250V: sim to Bussmann NON-40.
F3	M29/09016300	Slow Blowing: 5 Amps, 250V, sim to Bussmann MDL-5.
		---- FUSE HOLDERS & BLOCKS ----
	M29/09014200	Fuse Holder: Screwdriver slot design: sim to Bussmann MTB-961 (Used with F1 and F3).
	M29/09014100	Fuse Block: 30 to 60 Amps, 250V: sim to Bussmann K25060-1C (Used with F2).
		---- TERMINAL BLOCK ----
F801B	M29/30090900	Terminal Strip: 45 Amps, 250V, 4 position; sim to Bussmann 480304-NL. (Rev. 0 and Rev. A)
F801B	M29/2501100	Connector: 4 Position: sim to AMP 641685-2. (Rev. B only)
		---- CONNECTORS ----
J801	M29/40027400	9 Position; sim to Molex 03-09-1091.
J802	M29/40026400	2 Position; sim to AMP 350778-1.(Used in Rev. B. only)
P802	M29/40028500	2 Position; sim to AMP 350777-1. (Used in Rev. B only)
		---- INDUCTOR ----
L1	M29/289C3	Output Choke: 0.8 nH, 33 Amps; sim to Magnetek 289C3. Includes W25 and W25.
		---- RESISTOR ----
R1	M29/16012301	Wirewound: 10 Ohms, 50W. Sim to IRC PW-50E-100EMS-5% (with bracket).
		----RECEPTACLE ----
RE1 and RE2	M29/40027800	Power, 3 wire grounding, 15 amps @ 125V; sim to GE 5242-9.
		---- SWITCH ----
S1	M29/20003300	SPST: 16 amps, 125V; sim to Carling RA911VBB0V.
		---- TRANSFORMER ----
T1	M29/289CV1	Ferro-Resonant Transformer (Rev. 0 only).
T1	M29/289CV5	Ferro-Resonant Transformer (Rev. A and later).

² COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	PART NUMBER	DESCRIPTION
		---- WIRE HARNESS ----
W1 thru W30	M29/289LW1	Wiring Harness (Rev. 0).
W1 thru W30	M29/289LW1	Wiring Harness (Rev. A).
W31		Wire, Black; J801, Pin 9 to R1 (Rev. A).
W1 thru W34	M29/289LW11	Wiring Harness (Rev. B).
		---- MISCELLANEOUS ----
	M29/07057300	Front Fuse Cover (Rev. 0 only).
	M29/07063300	Front Fuse cover (Rev. A and later).
	M29/07056600	Top Cover (Rev. 0 only).
	M29/07062200	Top Cover (Rev. A and later).
	M29/07056700	Front Panel (Rev. C only).
	M29/07062300	Front Panel (Rev. A and later).
	M29/07057400	Back Cover.
	M29/22043800	Machine screw, torx head; 3.5mm x 1.2; sim to Camcar/Textron Inc. Secures cover.
	M29/22027709	Maching screw, hex head; No. 6-32 x 0.625" ; secures C1 to case.
	M29/22041502	Hex nut; No. 8-32, secures C1, R1, L1 and ground wire to case.
	M29/05065600	Bracket for C1; sim to GE K9827065P21.
	M29/22041501	Hex nut: No. 6-32 x 0.250, secures PCB.
	M29/22043200	Nylon Standoff, to keep PCB from case.
	M29/11022000	Strain relief, black: sim to Heyco" "1200". To secure W801 to case.
	M29/22008708	Machine Screw: 10-32 x 5/8", to secure fuse block to front panel and terminal block (F801B to case, REV. 0 and REV. A only).
	M29/22041504	ARCFLT NUT: ¼-20 X 7/16, secures T1 to case.
		HEAT SINK / PCB ASSEMBLY M29/11022900 (REV. 0 only) M29/11024600 (REV. A and later) Assembly includes the following:
		---- CAPACITORS ----
C2 thru C4		Aluminum electrolytic: 27000 µF, 25V; sim to UCC XME25VB273M35X50LL.(Rev. 0 only).

PARTS LIST

SYMBOL	PART NUMBER	DESCRIPTION
C2 thru C4		Aluminum electrolytic: 33000 μ F, 25V; sim to UCC XME25VB333M35X50LL.(Rev. A and later).
C5 thru C7		Aluminum electrolytic: 27000 μ F, 25V; sim to UCC XME25VB273M35X50LL.
		---- RECTIFIERS ----
D1 thru D3		Dual Schottky Rectifier: 30 Amps, 60V; sim to G1 MBR3060.
		---- VARISTOR ----
VR1		Varistor: 150V, 80j metal oxide; sim to GE V150LA20A.
		---- TERMINALS ----
		FASTON Tabs; sim to MagneTek "13048100".
		---- MISCELANEOUS ----
		ARCFLT NUT; ¼-20, secures wire to PCB.
		Screw, Hex head: ¼-20 x0.750 in.
		Lockwasher: 1/4 internal tooth secures wire to PCB.
		Heatsink: 0.063" thick aluminum heat sink; sim to MagneTek 11021900.
		Hex head screw: No. 4-40 x 0.5 with washer to secue D1-D3 to heatsink.
		ACRFLT 4-4C nut: UNC-2B ¼ in., used t secure D1-D3 to heatsink.
		Heat Transfer Pad: To ensure good thermal conductivity between D1-D3 and heatsink.
		Lockwasher: No. 4; used to secure D1-D3 to heatsink.

6.2 STATION POWER SUPPLY 19A149978P2³

SYMBOL	PART NUMBER	DESCRIPTION
		---- CAPACITORS ----
C1	M29/17032400	Polypropylene: 8 μ F, 660 VAC, sim to Ronken P61A24805 H05.
		---- FUSES ----
F1	M29/0901600	Quick Acting Ceramic/Ferrule: 5 Amps, 250V; sim to Bussmann GDA-5.
F2	M29/09015200	Quick Blowing: 40 Amps, 250V: sim to Bussmann NON-40.
F3 and F4	M29/0901600	Quick Acting Ceramic/Ferrule: 5 Amps, 250V; sim to Bussmann GDA-5.
		---- FUSE HOLDERS & BLOCKS ----
	M29/09016100	Fuse Holder: Screwdriver slot design: sim to Bussmann HTB-96N (Used with F1, F3 and F4).
	M29/09014100	Fuse Block: 30 to 60 Amps, 250V: sim to Bussmann K25060-1C (Used with F2).
		---- TERMINAL BLOCK ----
F801B	M29/30090900	Terminal Strip: 45 Amps, 250V, 4 position; sim to Bussmann 480304-NL. (Rev. 0 and Rev. A)
F801B	M29/2501100	Connector: 4 Position: sim to AMP 641685-2. (Rev. B only)
		---- CONNECTORS ----
J801	M29/40027400	9 Position; sim to Molex 03-09-1091.
J802	M29/40026400	2 Position; sim to AMP 350778-1.(Used in Rev. B. only)
P802	M29/40028500	2 Position; sim to AMP 350777-1. (Used in Rev. B only)
		---- INDUCTOR ----
L1	M29/289C3	Output Choke: 0.8 nH, 33 Amps; sim to Magnetek 289C3. Includes W25 and W25.
		---- RESISTOR ----
R1	M29/16012301	Wirewound: 10 Ohms, 50W. Sim to IRC PW-50E-100EMS-5% (with bracket).
		----RECEPTACLE ----
RE1 and RE2	M29/40027800	Power, 3 wire grounding, 15 amps @ 125V; sim to GE 5242-9.
		---- SWITCH ----
S1	M29/20003900	DPST: 16 amps, 125V; sim to Carling RA911VBB0V
		---- TRANSFORMER ----
T1	M29/289CV2	Ferro-Resonant Transformer.

³ COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

SYMBOL	PART NUMBER	DESCRIPTION
		---- WIRE HARNESS ----
W1 thru W36	M29/2B9LW12	Wiring Harness
		---- MISCELLANEOUS ----
	M29/07063300	Front Fuse cover.
	M29/07062200	Top Cover.
	M29/07063600	Front Panel.
	M29/22043800	Machine screw, torx head; 3.5mm x 1.2; sim to Camcar/Textron Inc. Secures cover.
	M29/22041502	Hex nut; No. 8-32, secures C1, R1, L1 and ground wire to case.
	M29/05065600	Bracket for C1; sim to GE K9827065P21.
	M29/22041501	Hex nut: No. 6-32 x 0.250, secures PCB.
	M29/22043200	Nylon Standoff, to keep PCB from case.
	M29/11023900	Strain relief, black: sim to Keyco 3772. To secure W801 to case.
	M29/22008708	Machine Screw: 10-32 x 5/8", to secure fuse block to front panel and terminal block (F801B to case, REV. 0 and REV. A only).
	M29/22041504	ARCFLT NUT: ¼-20 X 7/16, secures T1 to case.
		HEAT SINK / PCB ASSEMBLY M29/11022901 Assembly includes the following:
		---- CAPACITORS ----
C2 thru C4		Aluminum electrolytic: 33000 µF, 25V; sim to UCC KME25VB333M35X50LL.
C5 thru C7		Aluminum electrolytic: 27000 µF, 25V; sim to UCC KME25VB273M35X50LL.
		---- RECTIFIERS ----
D1 thru D3		Dual Schottky Rectifier: 30 Amps, 60V; sim to G1 MBR3060.
		---- VARISTOR ----
VR1		Varistor: 275V, 55j metal oxide; sim to GE V275LA20A.
		---- TERMINALS ----
		FASTON Tabs; sim to MagneTek 13048100.
		---- MISCELANEOUS ----
NU1 thru NU5		ARCFLT NUT; ¼-20, secures wire to PCB.

SYMBOL	PART NUMBER	DESCRIPTION
SC1 thru SC5		Screw, Hex head: ¼-20 x0.750 in.
		Heatsink: 0.063" thick aluminum heat sink; sim to MagneTek 11024400.
		Heat Transfer Pad: To ensure good thermal conductivity between D1-D3 and heatsink.
		Hex head screw: No. 4-40 x 0.5 with washer to secure D1-D3 to heatsink.
		ACRFLT 4-4C nut: UNC-2B ¼ in., used t secure D1-D3 to heatsink.
		Lockwasher: No. 4; used to secure D1-D3 to heatsink.

6.3 STATION POWER SUPPLY 19A149978P3⁴

SYMBOL	PART NUMBER	DESCRIPTION
		----- CAPACITORS -----
C1	801000276PE	Polypropylene: 8 μ F, 660 VAC, sim to Ronken P61A24805 H05.
		----- CONNECTORS -----
J801	M29/40027400	9 Position; sim to Molex 03-09-1091.
J802	M29/40026400	2 Position; sim to AMP 350778-1.
P802	81525010900	2 Position; Plug Assembly (Inserts into J802); sim to AMP 350777-1.
		----- INDUCTOR -----
L1	83289C60000	Output Choke: 0.8 nH, 33 Amps; sim to Magnetek 289C3.
		----- RESISTOR -----
R1	8111000550P	Wirewound: 10 Ohms, 50W. Sim to IRC PW-50E-100EMS-5% (with bracket).
		----- TRANSFORMER -----
T1	83289CV1001	Ferro-Resonant Transformer.
		----- WIRE HARNESSSES -----
W1		From E1 on PCB to rear terminal of fuse F1.
W2		Green lead from receptacle J1 to chassis ground terminal stud.
W3 and W4	8152500743F	Black Wire (Qty. 2).
W5		<i>(Not Used)</i>
W6		From E3 on PCB to piggy back terminal top of switch S1.
W7	81525074324	From transformer T1 terminal 4 to bottom terminal of swich S1.
W8		From E4 on PCB to transformer T1 terminal 1.
W9	81525074315	From transformer T1 terminal 2 to T1 terminal 3.
W10		<i>(Not Used)</i>
W11	81525007317	Red Wire From fuse F2 to E11 on PCB.
W12		From E15 on PCB to side terminal of fuse F3.
W13		From E14 on PCB to resistor R1.
W14		Read lead from J801 to rear terminal of fuse F3.
W15		<i>(Not Used)</i>
W16		Black lead (Pin 9 of J801 to piggy back terminal on resistor R1).
W17		Black lead (Pin 1 of J802 to resistor R1).

⁴ COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	PART NUMBER	DESCRIPTION
W18 and W19		<i>(Not Used)</i>
W20		Black lead (Pin 2 of F801B to E8 on PCB).
W21		White lead (Pin 3 of F801B to E11 on PCB).
W22		White lead (Pin 4 of F801B to E8 on PCB).
W801	831102710001	Power Cord Assembly
		---- MISCELLANEOUS ----
		PCB ASSEMBLY (M29/11022900) Assembly includes the following::
		---- CAPACITORS ----
C2 thru C4	801000280PE	Aluminum electrolytic: 33000 μ F, 25V; sim to UCC XME25VB333M35X50LL..
C5 thru C7	801000274PE	Aluminum electrolytic: 27000 μ F, 25V; sim to UCC XME25VB273M35X50LL.
		---- RECTIFIERS ----
CR1 thru CR3		Dual Schottky Rectifier: 30 Amps, 60V; sim to G1 MBR3060.
		---- VARISTOR ----
VR1	18008011	Varistor: 275V, 55J metal oxide; sim to GE V275LA20A.
		---- TERMINALS ----
	13061815-000	FASTON Tabs; sim to MagneTek 13048100.
		---- MISCELANEOUS ----
	33025900	Printed Circuit Board.
	22045500	PEM STUD #10-32.
	22041503	Nut: KEEPER #10-32.
E1	81525007432	LEADWIRE.
E2		<i>(Not Used)</i>
E3	81525007432d	LEADWIRE.
E4	815250074314	LEADWIRE, 90° Connector..
E5 and E6	8152500743e	LEADWIRE.
E7 thru E9		<i>(Not Used)</i>
E10 and E11		PER STUDS.

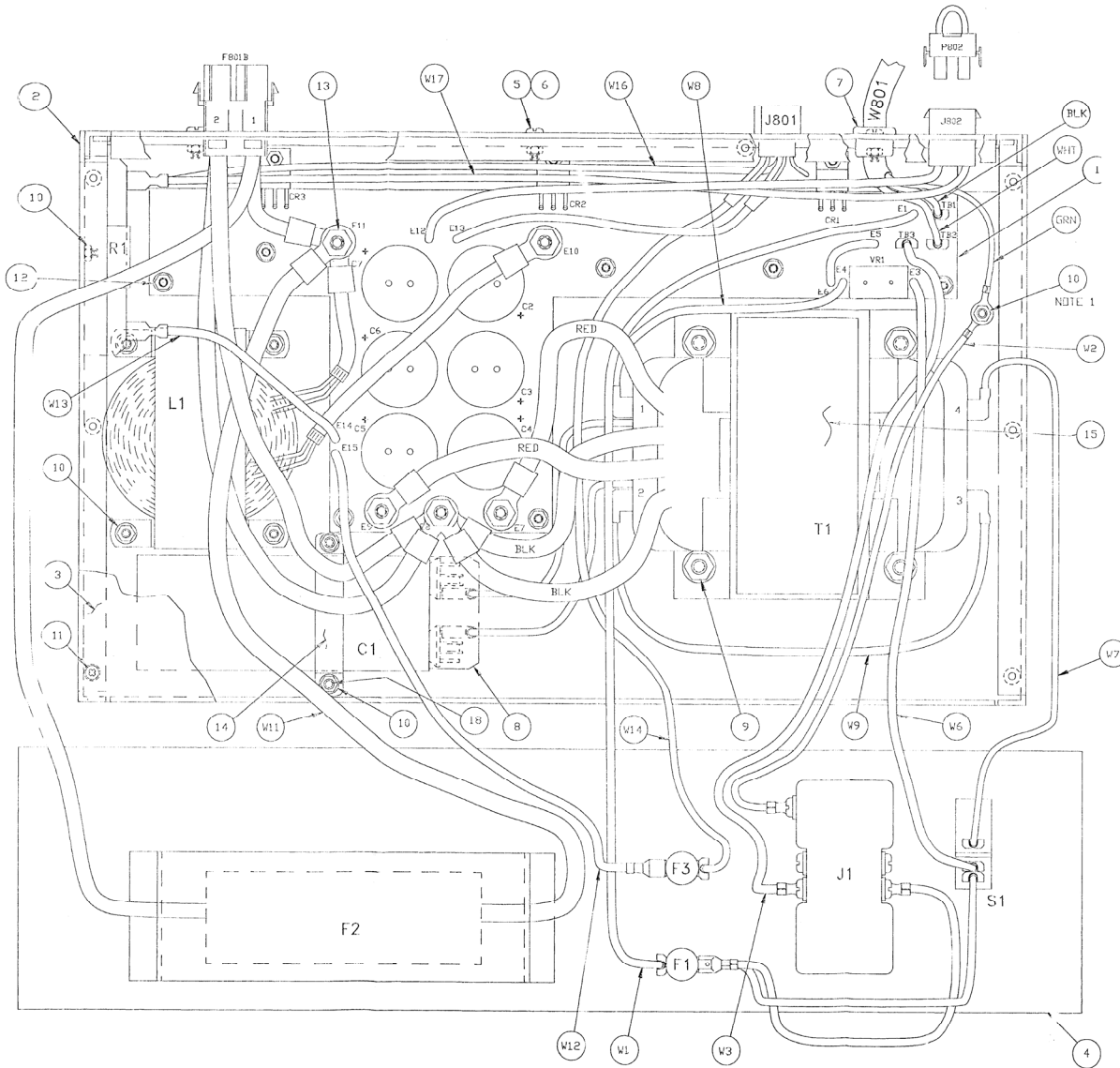
PARTS LIST

SYMBOL	PART NUMBER	DESCRIPTION
E12	81525012900	Connector Assembly.
E13	81525012700	Connector Assembly.
		FRONT PANEL ASSEMBLY 9H910461001 Assembly includes the following:
	83070683000	Panel.
S1	82120003900	Switch
		----- FUSE -----
F1	821097100PE	Fuse: 5 Amp: sim to Bussman GDA-5.
F2	821090190PE	Fuse: 40 Amp: sim to Bussman FRN-R-40 Fustron, Dual-Element, Time-Delay Class RK5 Fuse.
F3 and F4	821097100PE	Fuse: 5 Amp: sim to Bussman GDA-5.
	821090170PE	Fuse Holder (Used with F1, F3 and F4), (Qty. 3).
	82100000XPE	Fuse Block (Used with F2).
F801B	81525011007	Harness Assembly
	83070633000	Fuse Cover (Used with F2).
		----- MISCELLANEOUS -----
	83307069706	Chassis.
	83070622010	Cover.
	83110239000	Strain Relief (Strain relief, black: sim to Keyco 1200. To secure W801 to case).
W801	831102710001	Power Cord Assembly
	81622041502	Nut (Qty. 8).
	81505065600	Bracket (Bracket for C1; sim to GE K9827065P21).
	81622044600	Screw (Qty. 2).
	81622009003	Screw: #6-32 x 0.312 (Qty. 3).
	81622010305	Washer: Internal tooth lock (Qty. 3)
	81622041504	Nut: #1/4"-20 keeper nut. (ARCFLT NUT: ¼-20 X 7/16, secures T1 to case) (Qty. 4).
	81572067900	Terminal boot (Used with C1).
	81622008708	Screw: Used with Front Panel Fuse Block for F2.
	81622010307	Washer, Lock: Used with Front Panel Fuse Block for F2.
	81622043800	Screw, Used with F2 Fuse Cover.
	81622058000	Nut: Nylon, Used with F2 Fuse Cover (Qty. 2).
	81622041503	#10-32 keeper nut (Qty. 10).
	81622041502	#8-32 keeper nut. (Hex nut; No. 8-32, secures C1, R1, L1 and ground wire to case)
	81622049500	Screw: #10-32 x 0.375 (Front Panel) (Qty. 5).
	81622049625	Washer (Qty. 5).

SYMBOL	PART NUMBER	DESCRIPTION
	8311024500	Ty-wrap (Qty. 4).
	81535002900	Pad.
	80243019000	Cement: sim to LOCTITLE.
	81622046400	Screw #M3.5.
	81622043200	Spacer. (Nylon Standoff, to keep PCB from case)
	86122041501	#6-32 keeper nut. (Hex nut: No. 6-32 x 0.250, secures PCB)

7.0 ASSEMBLY DIAGRAMS

7.1 60 HZ POWER SUPPLY 19A149978P1



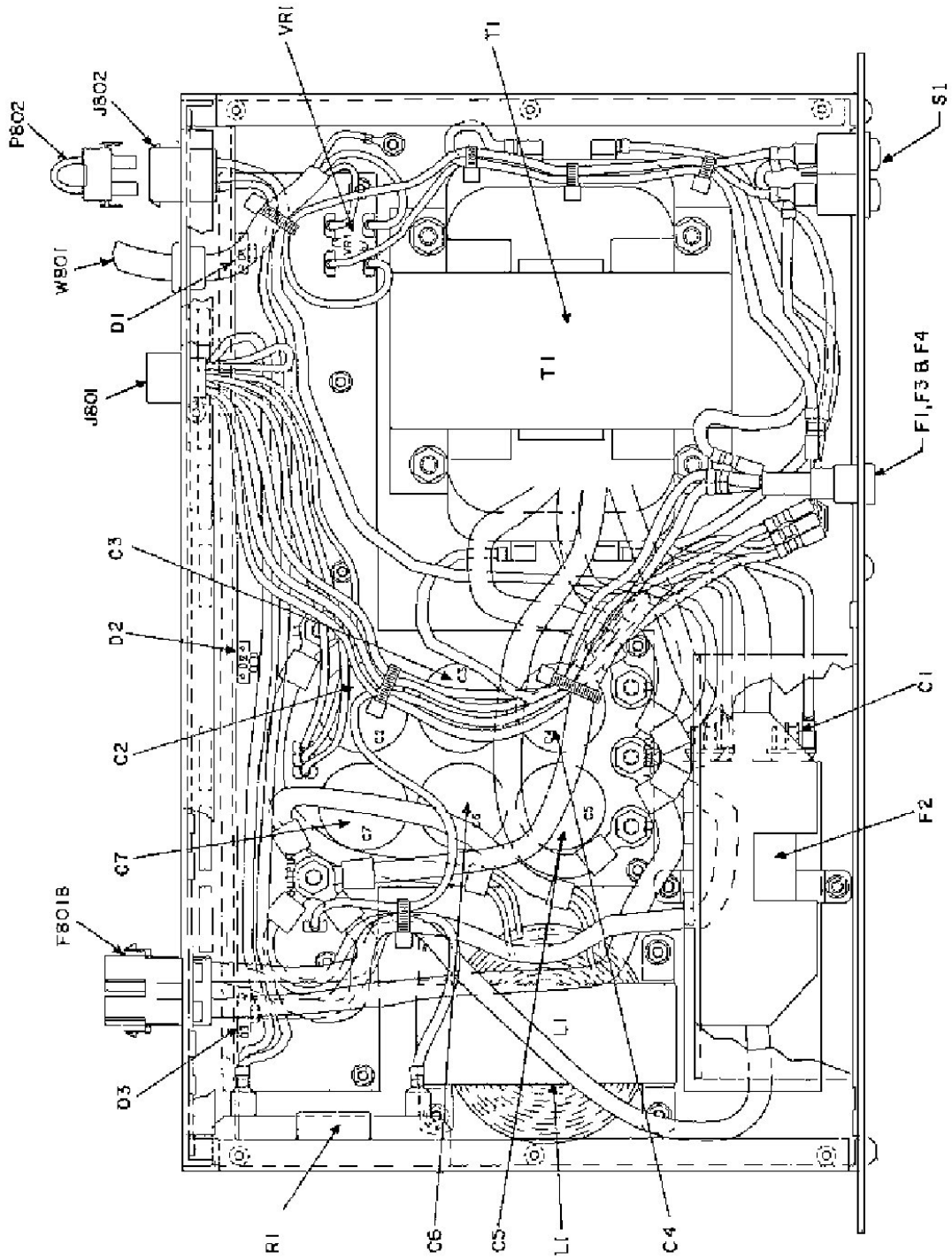
NOTES:

1. GROUND WIRE NEEDS TO HAVE (ONE) NUT PER LUG.
2. STAMP MOST RECENT REVISION CODE FROM "MAGNETKE POWER SUPPLY AND CHARGER REVISION CHANGES" IN THIS AREA USING AERO BRAND INK #1250, BLOCK (STOCK #7400).
3. STAMP CODE (XXYY) IN THIS AREA USING AERO BRAND INK #1250, BLACK (STOCK #7400). XX=YEAR, YY=WEEK OF YEAR

ITEM #	DESCRIPTION	TORQUE INL
11	3.5M SCREW	6-8
12.5	#6-32 NUT	6-8
9	#1/4-20 NUT	28-32
10	#8-32 NUT	14-16
13	#10-32 NUT	20-23
20	#10-32 SCREW	18-20
18	#8-32 SCREW	14-16

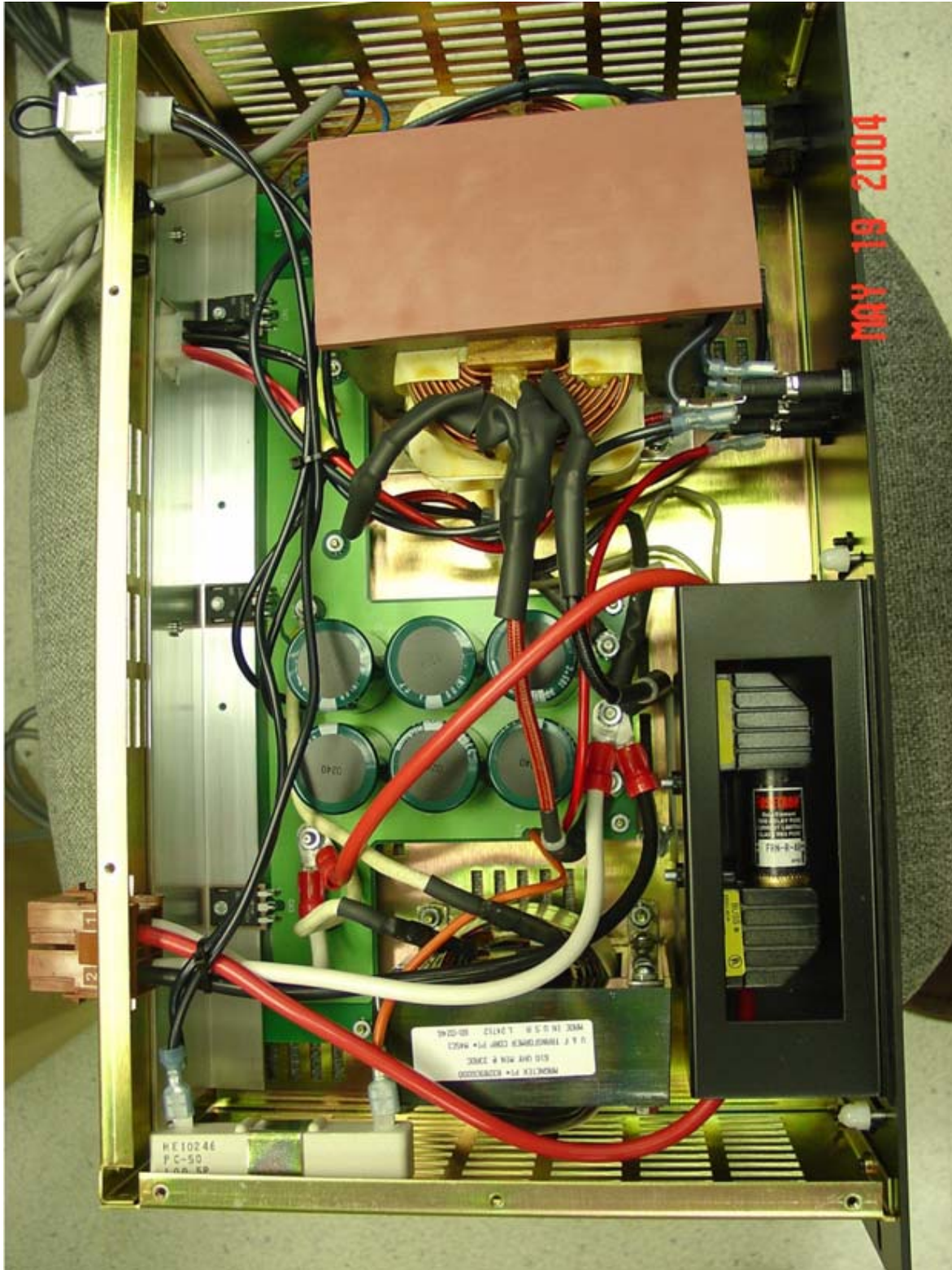
(289PS17, Sh. 1, Rev. H)

7.2 50 HZ POWER SUPPLY 19A149978P2



(Made from 289PS18, Sh. 2, Rev.Q)

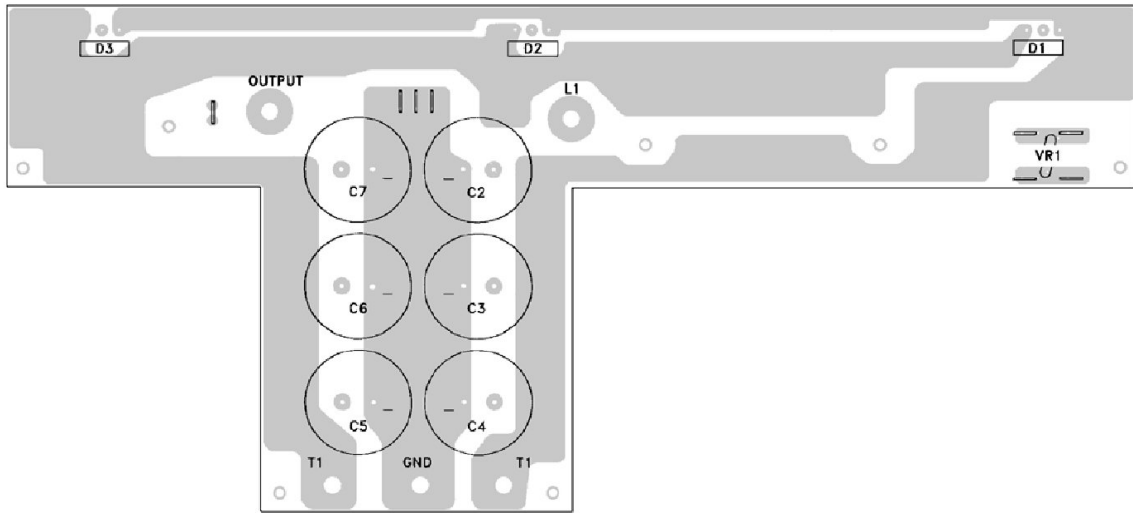
7.3 60 HZ POWER SUPPLY 19A149978P3



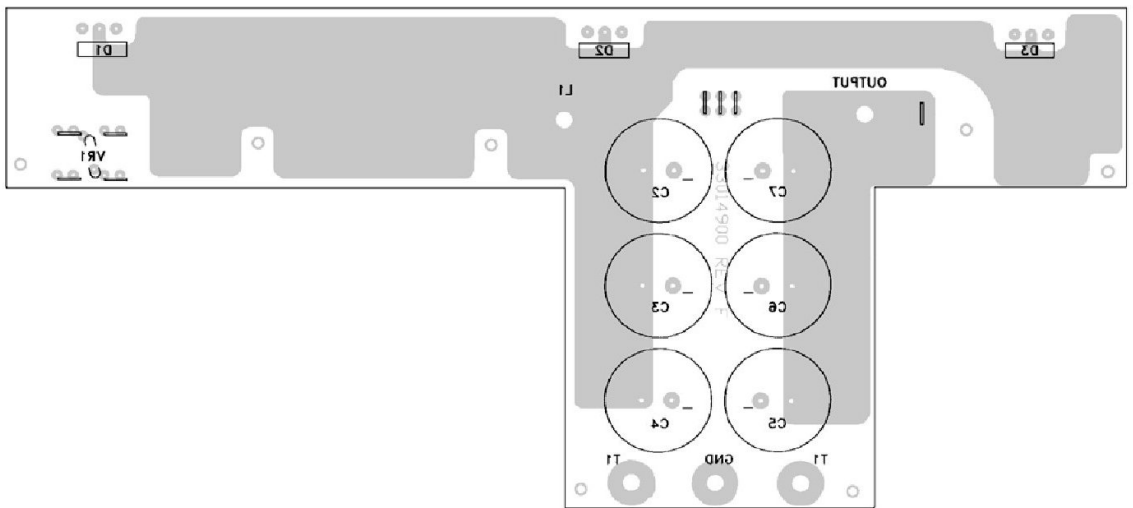
(289PS26)

8.0 OUTLINE DIAGRAMS

8.1 PRINTED CIRCUIT BOARD⁵ 50 Hz AND 60 Hz MODELS



(33014904, Rev. F)
 (33014900, Sh. 1, Rev. F)
COMPONENT SIDE



(33014904, Rev. F)
 (33014900, Sh. 2, Rev. F)
SOLDER SIDE

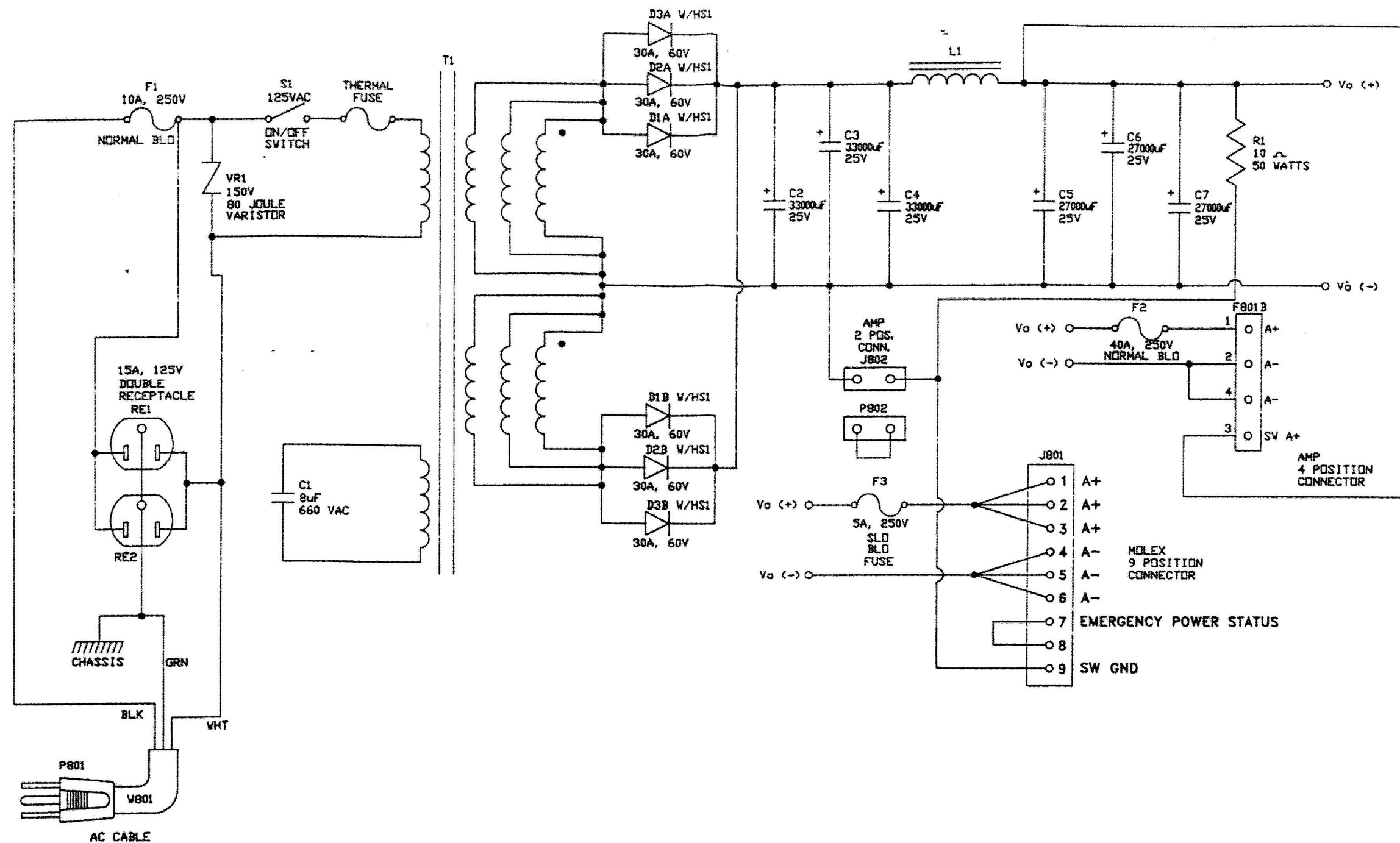
⁵ M29/11022900 (Rev. 0 only)/M2911024600 (Rev. B and Later)



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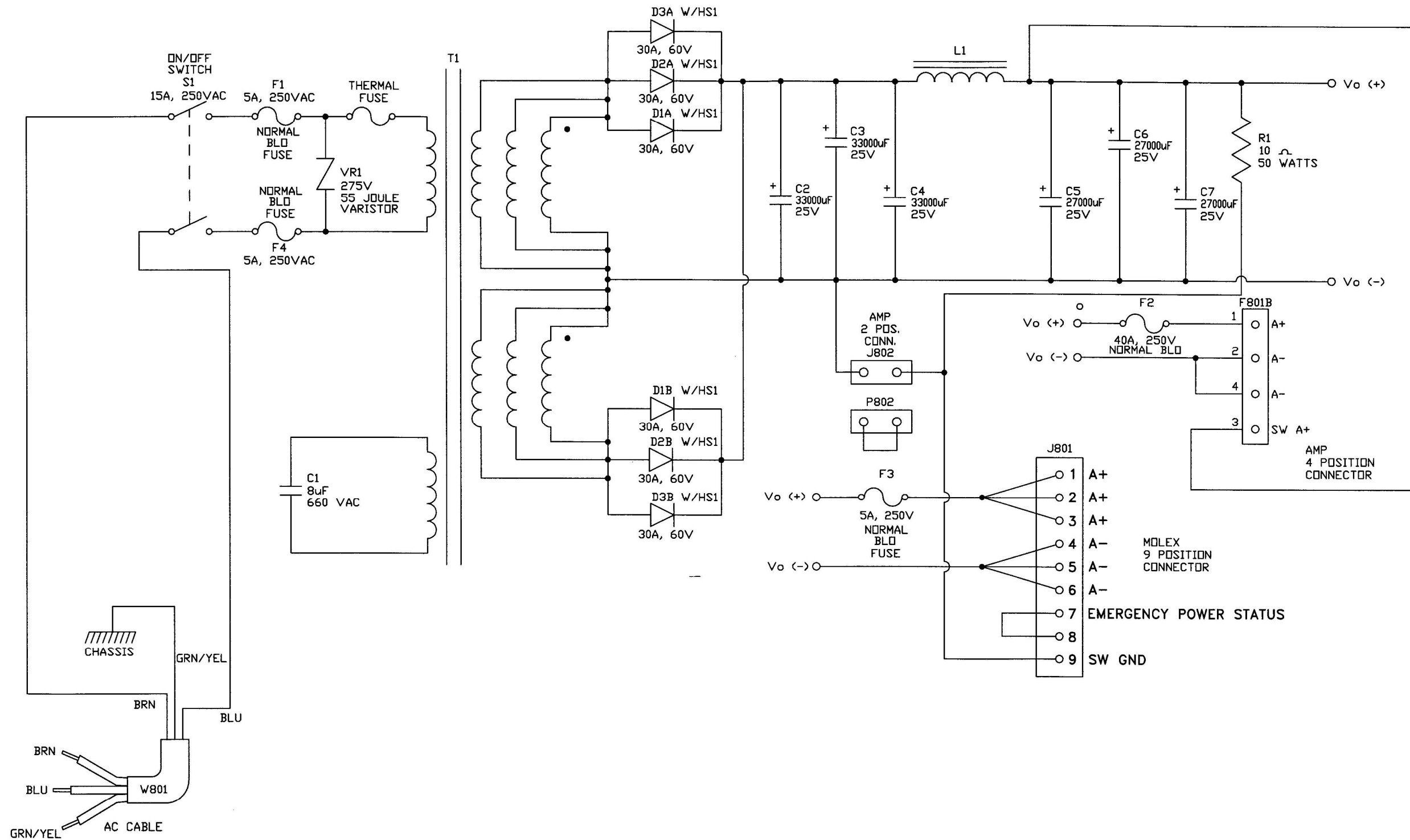
9.0 SCHEMATIC DIAGRAMS

9.1 60 HZ POWER SUPPLY 19A149978P1 (289PS17)



(289PS17, Rev. A)

9.2 50 HZ POWER SUPPLY 19A149978P2 (289PS18)

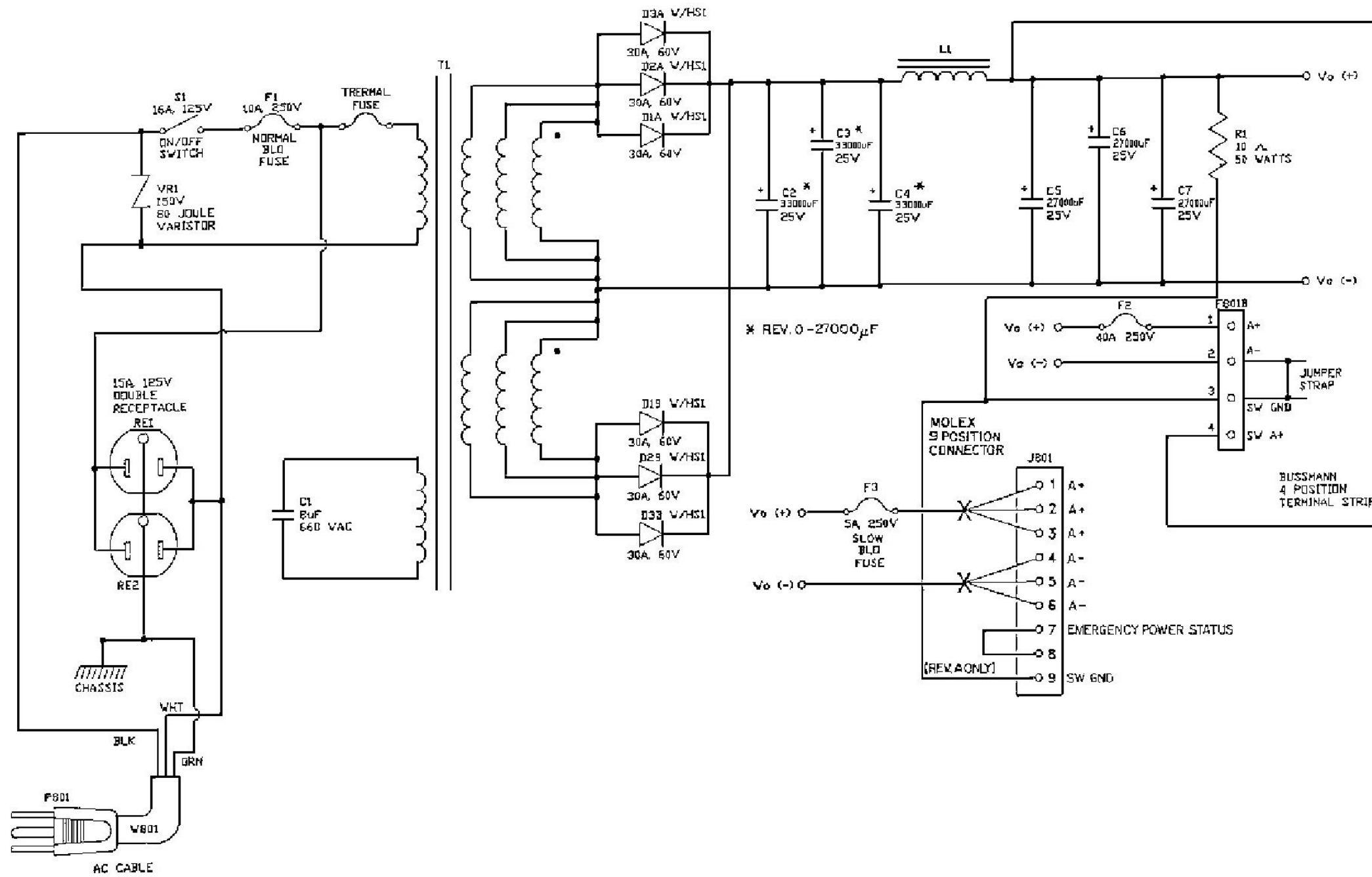


9.3 60 HZ POWER SUPPLY 19A149978P3 (289PS26)

(289PS26, Rev. A)

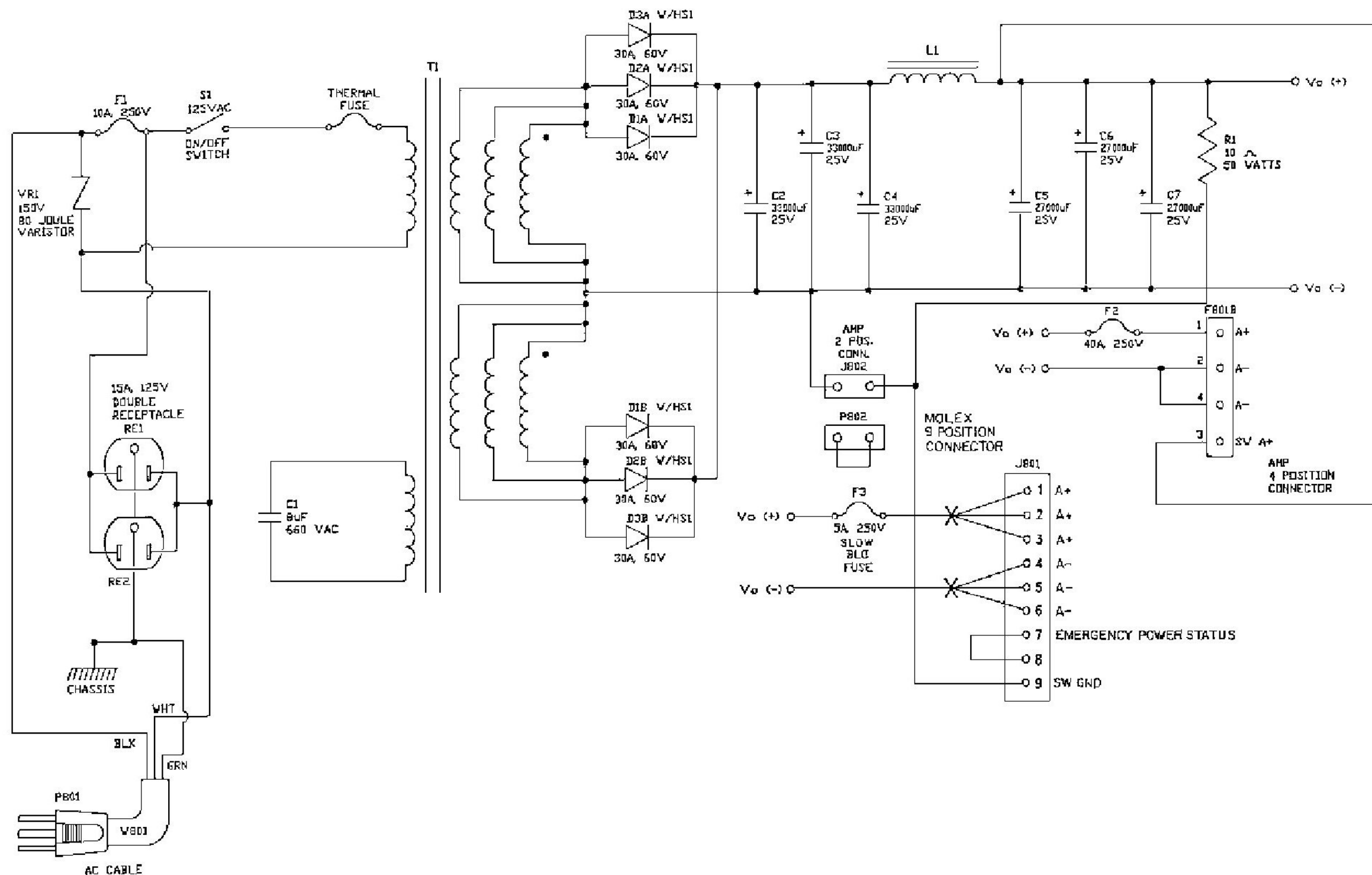
(Schematic Diagram not available)

9.4 60 HZ POWER SUPPLY 19A149978P1 (REV. 0 & REV. A)

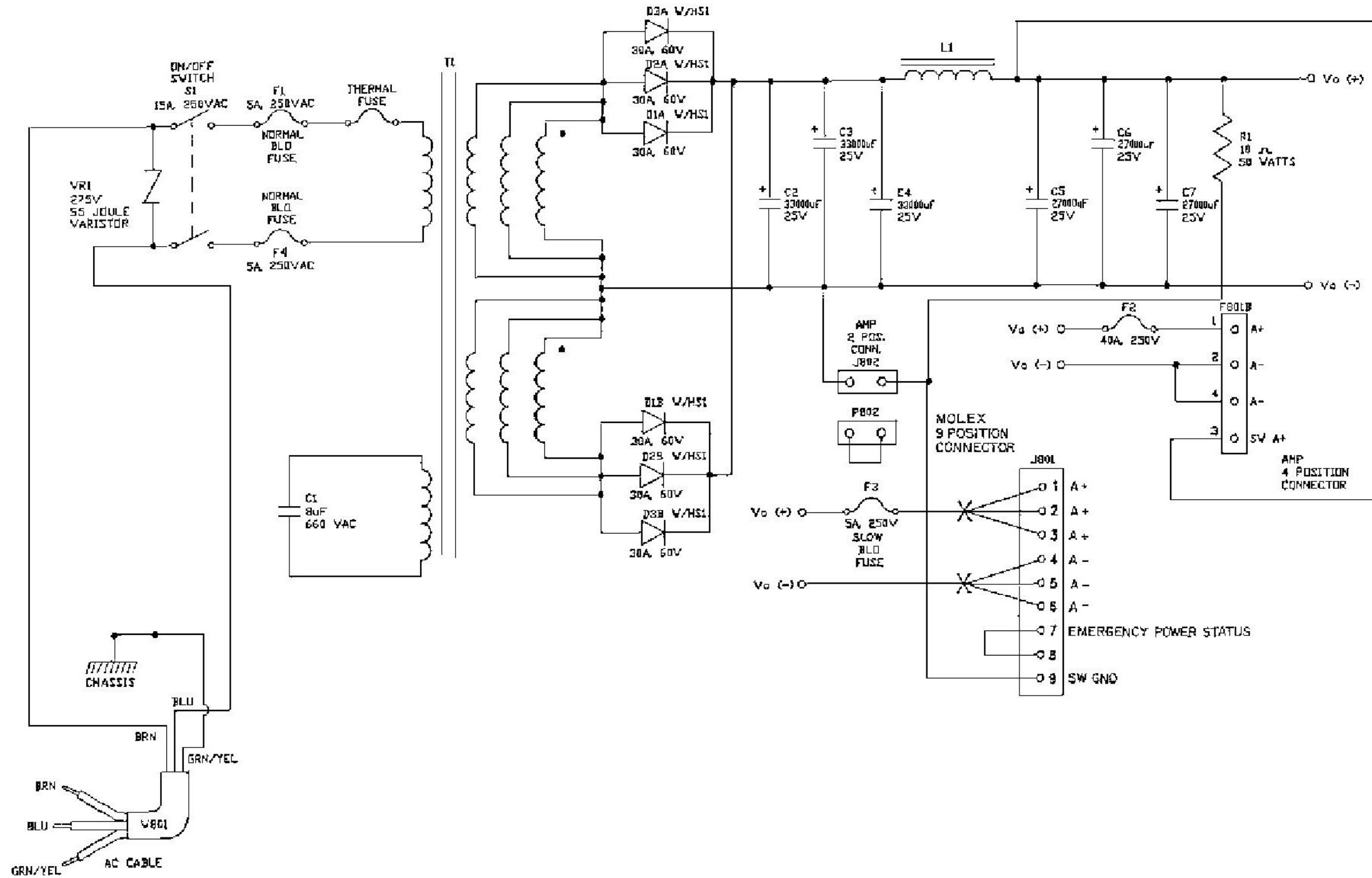


(289PS1, Sh. 1, Rev. 1)

9.5 60 HZ POWER SUPPLY 19A149978P1 (REV. B)



9.3 50 HZ POWER SUPPLY 19A149978P2



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