ERICSSON

LBI-38551

Mobile Communications

MASTR® II BASE STATION 12/24V POWER SUPPLY

19A149979P1 - 120 VOLT/60 Hz

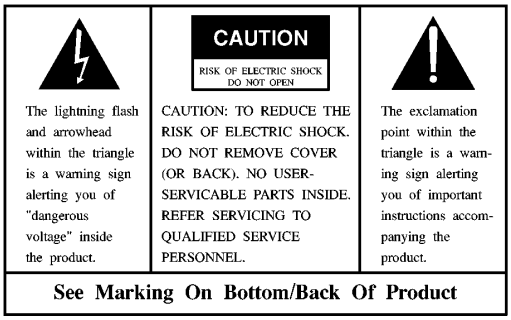
19A149979P2 - 230 VOLT/50 Hz

CAUTION

THESE SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID ELECTRIC SHOCK DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL

WARNING: TO PREVENT FIRE OR ELECTRIC SHOCK HAZARD. DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.



Maintenance Manual

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SPECIFICATIONS*

OUTPUT VOLTAGE	
Transmit and Receive Simultaneously	26.0 Vdc ±1.0 Vdc @ 15 Amps (F801A) 13.0Vdc ±0.5Vdc @ 3Amps (J801)
Receive only	Vdc @ 3 Amps (J801)
INPUT VOLTAGE	121 Vac ±20% (60 Hz version) 230 Vac ±15% (50 Hz version)
INPUT FREQUENCY	60 Hz ± 2 Hz (60 Hz version) 50 Hz ± 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 0-18 Amp output	100% (Continuous Duty)
OUTPUT VOLTAGE RIPPLE	< mV p-p @ 25°C < mV p-p @ -30°C
OUTPUT TRANSIENT RESPONSE	
Overshoot	Not to exceed 30 Volts (F801A)
Undershoot	Not less than 22 Volts (F801A)
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) 20 Amp (High Current Port)
DIMENSIONS (HxWxD)	5.25" x 19" x 10.35"
WEIGHT	45 lbs.
OPERATING ENVIRONMENT	-30°C To + 60°C

* These specifications are intended primarily for the use of the service personnel.

IMPORTANT SAFETY INFORMATION

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 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, and

   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 them 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 19A149979P2 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.

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.

Figure 1 - 60 Hz Power Supply (19A149979P1, Rev. A)

Figure 2 - 50 Hz Power Supply (19A149979P2, Rev. A)

DESCRIPTION

The ERICSSON GE MASTR® II Base Station 12/24 Volt Power Supply provides up to 429 watts to power a MASTR II 800 or 900 MHz base station receiver, system circuitry, and transmitter. The nominal 12 volt output is actually 13.0 Vdc and provides a maximum of 3 amperes to power the receiver and system circuitry. The nominal 24 volt output is actually 26.0 Vdc and provides a maximum of 15 amperes to power the transmitter power amplifier.

The 60 Hz Model (19A149979P1) operates from a nominal 121 Vac, 60 Hz source. If a 208/220/240Vac, 60 Hz source is used, an external step-down transformer (similar to 19C307148P1) must be used with the '979P1 supply. The 50 Hz model (19A149979P2) provides the same output as the '979P 1 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.

NOTE

A ferroresonant power supply is designed to work specifically at a given frequency. The 60 Hz 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 (±20% for P1, ± 15% for P2), the output voltage will not vary more than 2 %. A ferroresonant power supply provides inherently excellent line voltage surge protection, and fewer parts for high reliability. No active semiconductor devices are used which could reduce reliability.

The output voltages will vary depending on the load currents that the supply is being asked to source. As the load current rises, the output voltage will drop. Typical output voltages for various load currents are as follows:

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(s) F1 (F1 and F4 for P2), the high current output fuse F2, and the low current output fuse F3. The primary fuse(s) protect the input wiring to the ferroresonant transformer (one 10 amp fuse for P1, two 5 amp fuses for P2). The output fuses F2 (20 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 conditions. Thus, the dual courtesy receptacles are rated for 3 amps.

CIRCUIT ANALYSIS

In the 60 Hz power supply ('979P 1), the ON/OFF switch (S1) provides line voltage to the power supply through the primary line fuse F1. Line current flows through F1 to the courtesy receptacle prior to S1. This allows line voltage to always be available at the receptacles. Current then flows through the primary of stepdown 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 addition input line voltage suppression.

In the 50 Hz power supply ('979P2), 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 would only open if the transformer develops an internal short.

The step-down transformer (T1) is a ferroresonant type which has inherently good input line voltage regulation. This eliminates the need for additional high current regula-

LOAD CURRENT CONDITIONS		12 V OUTPUT	24 V OUTPUT
TX AND RX SIMULTANEOUSLY	(15 + 3 AMPS)	~13.0 VDC	~26.0 VDC
RX ONLY	(0 + 3 AMPS)	<15.8 VDC	<29.0 VDC
NO LOAD	(0 + 0 AMPS)	<16.3 VDC	<30.0 VDC

tors. C9 serves as a resonating capacitor across the secondary taps of the transformer.

The transformer steps the input voltage down to approximately 28 Vac across two secondary windings. Each winding drives two separate full wave bridge rectifiers consisting of D1A, B through D4A, B. The rectifiers are dual diode packages and are mounted on heat sink HS 1. During the first half of the period diodes D1B, D2A, D3B, and D4A are conducting and delivering current which is summed at the input to the high current filter. During the second half of the period diodes D1A, D2B, D3A, and D4B are conducting and also delivering current which is summed at the input to the high current filter. The high current filter consists of C1-C4, C7, L1, and R1. It is designed to reduce the output ripple to less than 100 mV p-p for any current load up to 15 amps. It also keeps transient responses greater than 22 volts and less than 30 volts. Resistor R1 is a 30 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 30 volts under any load condition. The high current filter sources up to 15 amps through the 20 amp fuse F2 to the high current output port F801A on the rear wall of the chassis. F801A-1 and F801A-2 are A + and A-, respectively, and connect to the transmitter power amplifier.

The two secondary windings are also center tapped to produce a step-down voltage of around 14 Vac which is also fed to the two full wave bridge rectifiers. During the first half of the period, diodes D2A and D4A provide a conduction path for current going to both the high current filter and the low current filter. During the second half of the period, diodes D1A and D3A provide the conduction path for current going to the high current filter and the low current filter. The low current filter consists of C5, C6, L2, and R2. It is designed to reduce the output ripple to less than 100 mV p-p for any current load up to 3 amps. It also keeps transient responses greater than 11 volts and less than 18 volts. Resistor R2 is a 100 ohm, 10 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. The low current filter sources up to 3 amps through the 5 amp fuse F3 to the low current output port J801 on the rear wall of the chassis. J801-1, 2, 3 and J801-4,5,6 are A+ and A-, respectively, and connect to the receiver and system circuitry.

The power supply is rated for a nominal 26.0 Vdc for a 15 amp load out of F801A and for a nominal 13.0 Vdc for a 3 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 15.8 Vdc at J801 and less than 29.0 VDC at F801A.

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, D3, and D4 and the heat sink.

WARNING

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

TROUBLE-SHOOTING

The trouble-shooting procedure in Table 1 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.

ADJUSTMENTS

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

INSTALLATION

The power supply is normally installed in an EIA 19 inch wide rack of a MII base station 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.

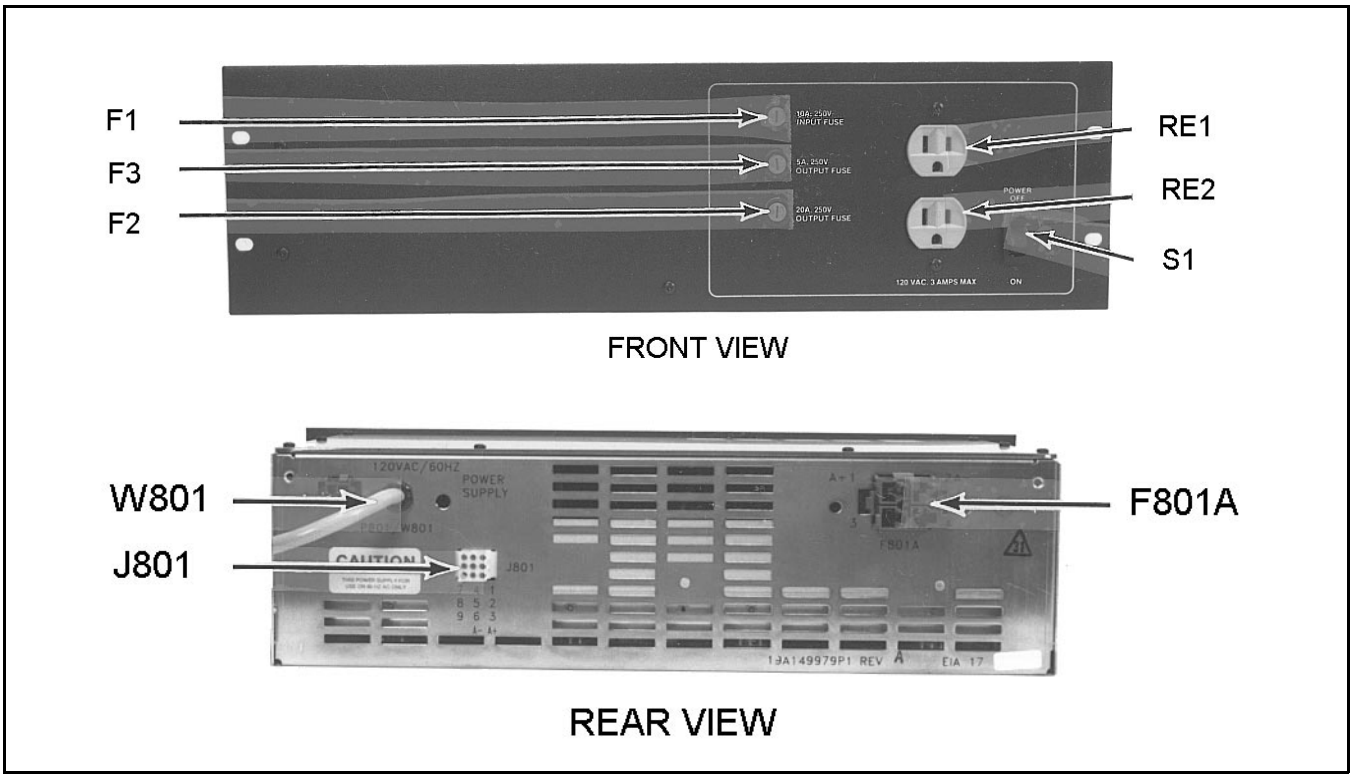

Figure 3 - 60 Hz Power Supply (19A149979P1, Rev. A)

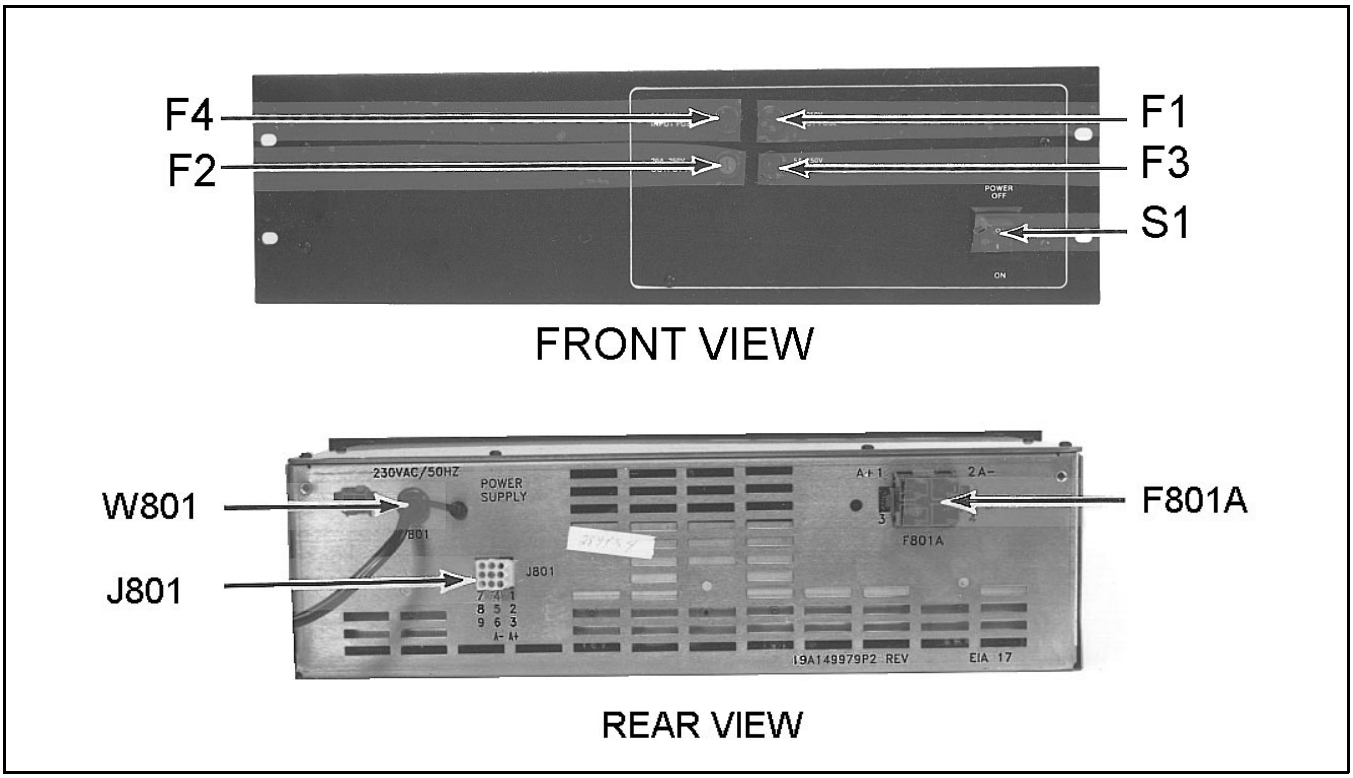

Figure 4 - 50 Hz Power Supply (19A149979P2, Rev. A)

FUSE REPLACEMENT

To replace a defective fuse, perform the following procedure:

1. Place ON/OFF switch to the OFF position.

2. For fuses F1 (F1 & F4 on '979P2), F2, or F3; remove cap from fuse holder and replace fuse with a fuse of the same type and rating.

WARNING

To avoid possible electric shock, DO NOT operate this power supply with the fuse cover removed.

WARNING

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.

Table 1 - 60 Hz Power Supply 19A149979P1

SYMPTOM	PROCEDURE
No output voltage at J801	Check the following: 1. Open F1, F3 or S1. 2. AC voltage on W801. 3. Open D1, D2, D3, or D4.
No output voltage at F801A	Check the following: 1. Open F1, F2 or S1. 2. AC voltage on W801. 3. Open D1, D2, D3, or D4.
Low output voltage on F801A. 0 < Vo < 25.0 Vdc	Check the following: 1. If one of the dual diodes on D1, D2, D3, or D4 is shorted. **NOTE**: All four diode packages contain two diodes each. 2. Line frequency < 60 Hz. 3. Load current greater than 15.0 amps.
Low output voltage on J801. 0 < Vo < 12.5 Vdc	Check the following: 1. If one of the dual diodes on D1, D2, D3, or D4 is shorted. **NOTE**: All four diode packages contain two diodes each. 2. Line frequency < 60 Hz. 3. Load current greater than 3.0 amps.
High output voltage on F801A (>30.0 Vdc) or J801 (>16.3 Vdc).	Check the following: 1. R1 not connected between pos. 1 and 2 on F801A. 2. R2 not connected between pos. 1 and 4 on J801. 3. Line frequency >60 Hz.

Table 2 - 50 Hz Power Supply 19A149979P2

SYMPTOM	PROCEDURE
No output voltage at J801	Check the following: 1. Open F1, F3, F4 or S1. 2. AC voltage on W801. 3. Open D1, D2, D3, or D4.
No output voltage at F801A	Check the following: 1. Open F1, F2, F4 or S1. 2. AC voltage on W801. 3. Open D1, D2, D3, or D4.
Low output voltage on F801A. 0 < Vo < 25.0 Vdc	Check the following: 1. If one of the dual diodes on D1, D2, D3, or D4 is shorted. **NOTE**: All four diode packages contain two diodes each. 2. Line frequency < 50 Hz. 3. Load current greater than 15.0 amps.
Low output voltage on J801. 0 < Vo < 12.5 Vdc	Check the following: 1. If one of the dual diodes on D1, D2, D3, or D4 is shorted. **NOTE**: All four diode packages contain two diodes each. 2. Line frequency < 50 Hz. 3. Load current greater than 3.0 amps.
High output voltage on F801A (>30.0 Vdc) or J801 (>16.3 Vdc).	Check the following: 1. R1 not connected between pos. 1 and 2 on F801A. 2. R2 not connected between pos. 1 and 4 on J801. 3. Line frequency >50 Hz.

ERICSSON

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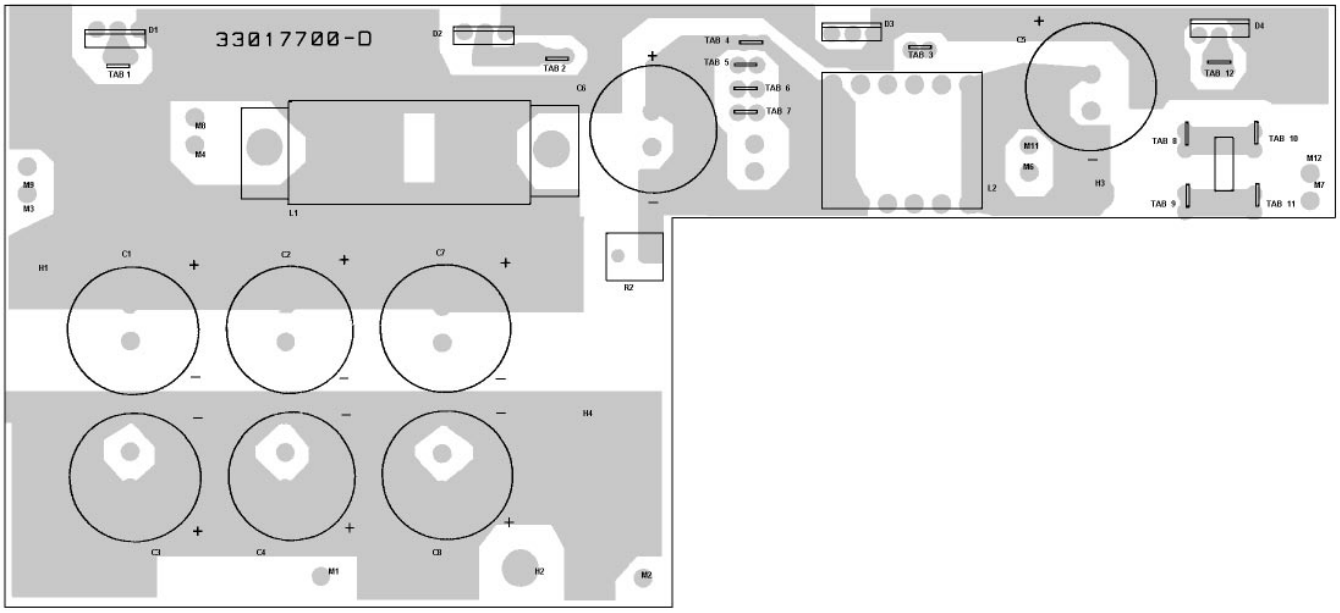
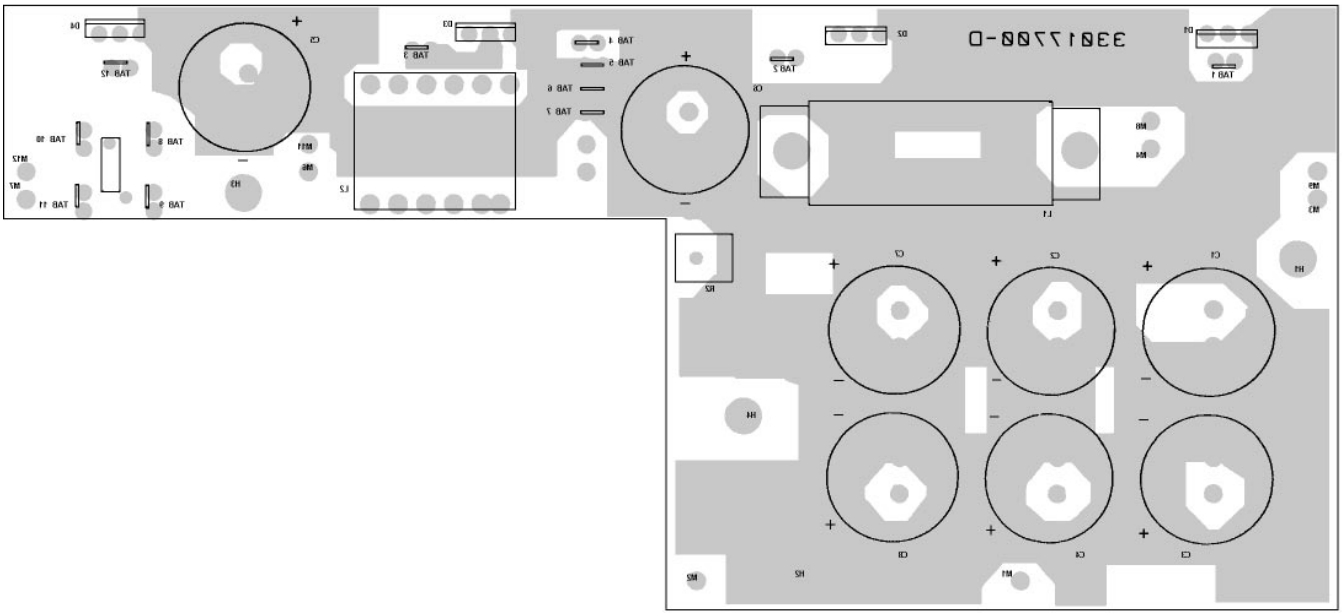
COMPONENT SIDE



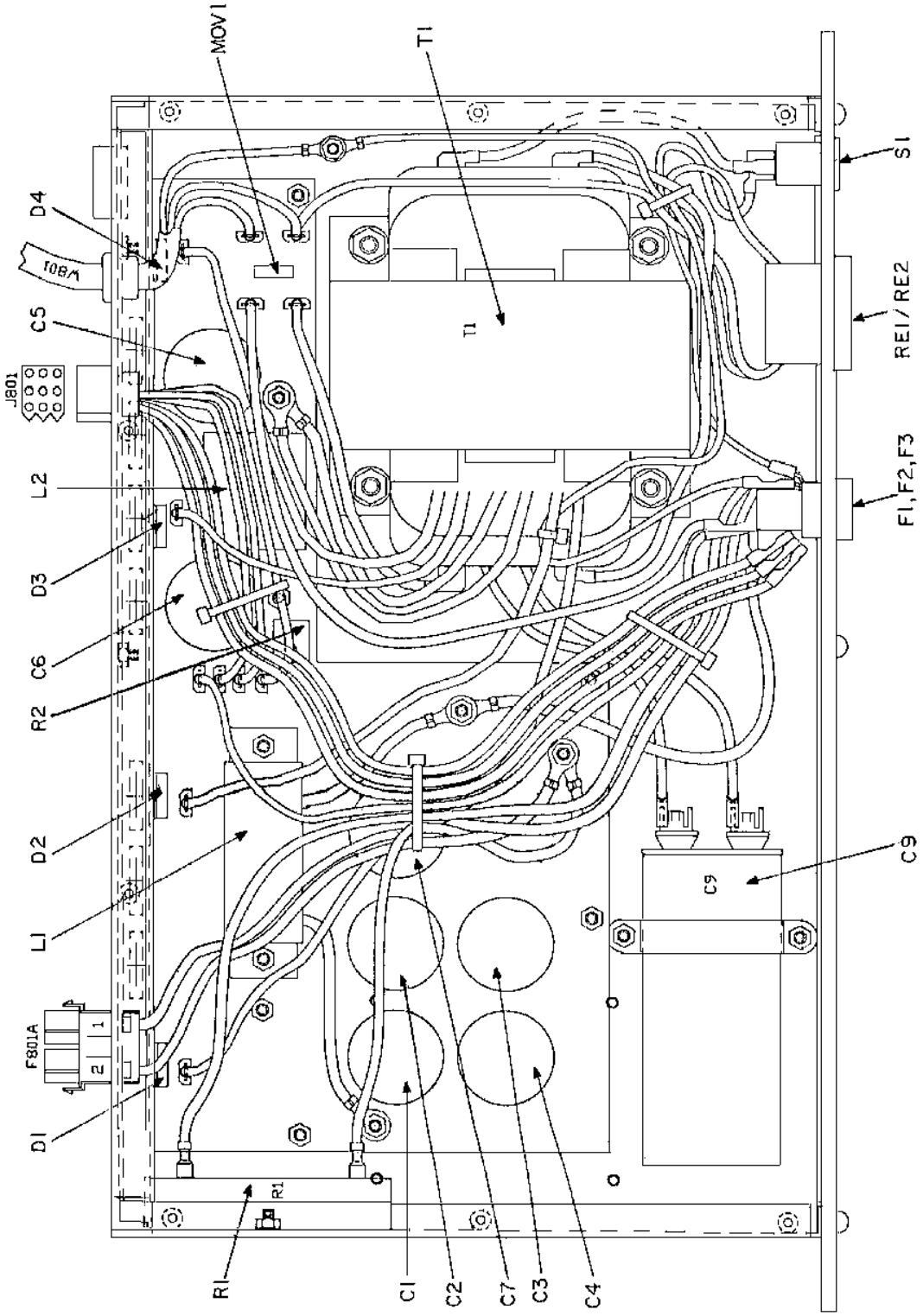
(33017704, Sh. 1)
(33017700, Sh. 1)

SOLDER SIDE

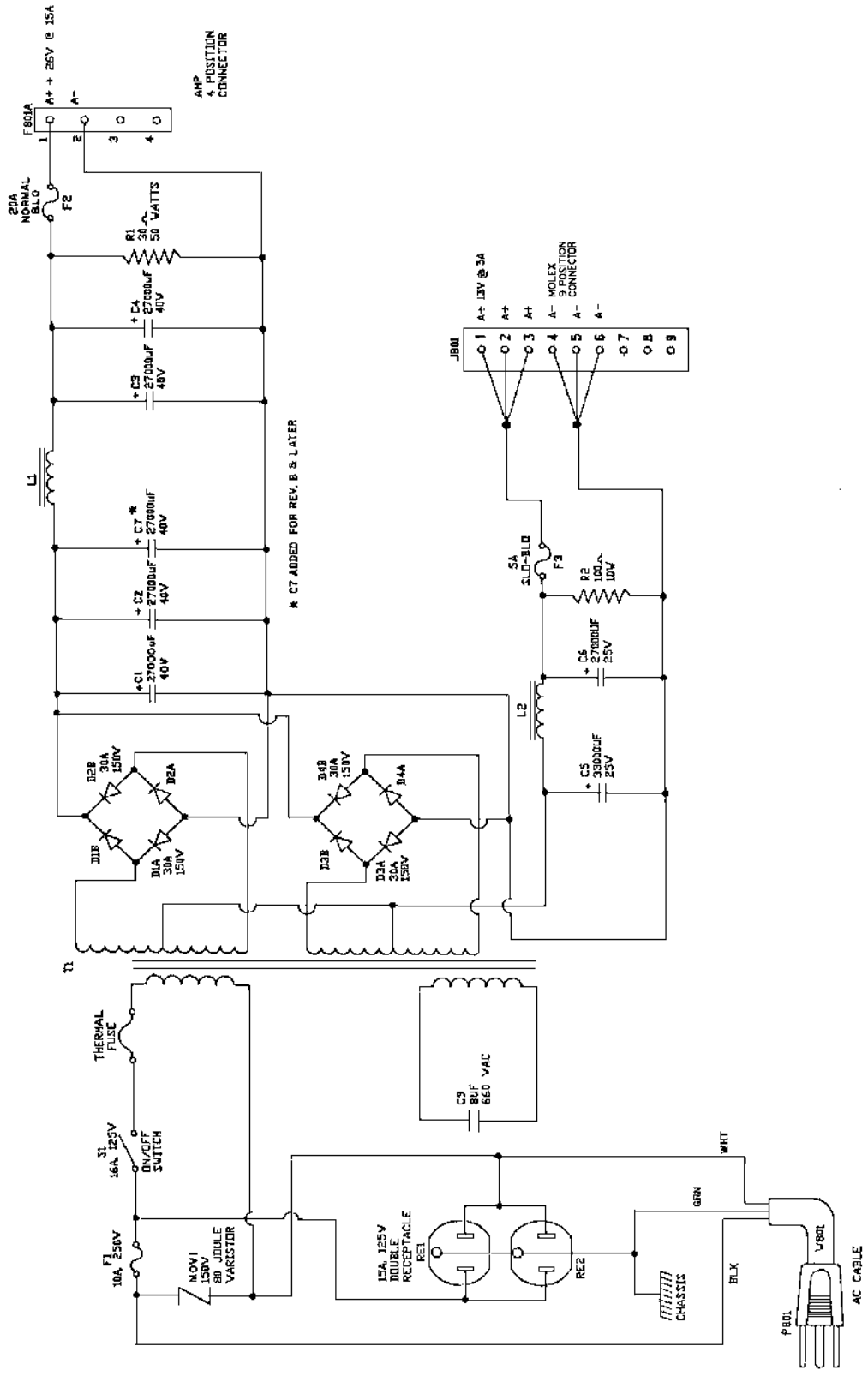


(33017704, Sh. 1)
(33017700, Sh. 2)

PRINTED CIRCUIT BOARD
50 Hz AND 60 Hz MODELS



60 Hz POWER SUPPLY
19A149979P1, Rev. A



60 Hz POWER SUPPLY
19A149979, Rev A

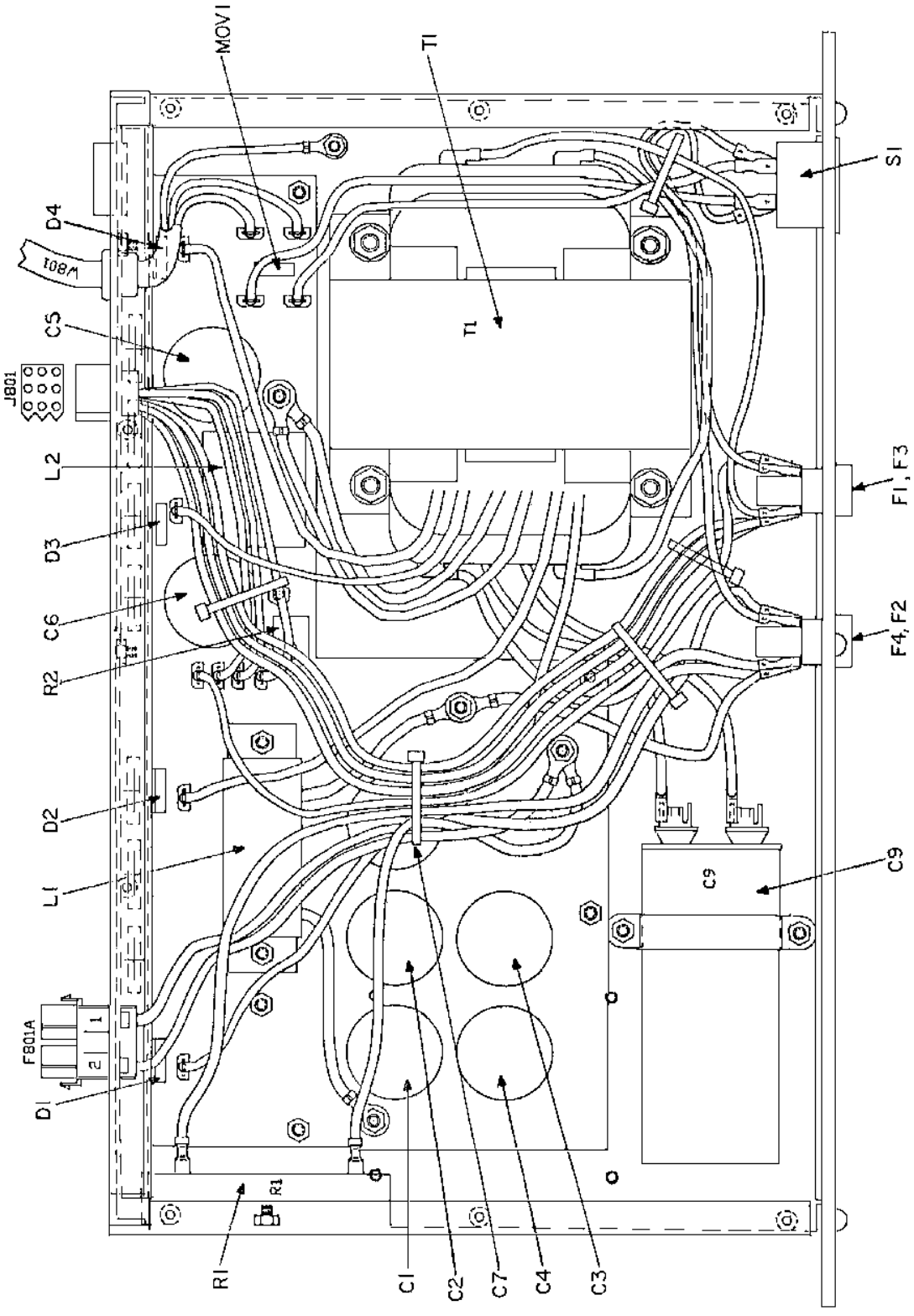
(289PS3, Sh. 1, Rev. C)

12/24 VOLT POWER SUPPLY
19A149979P1
ISSUE 1

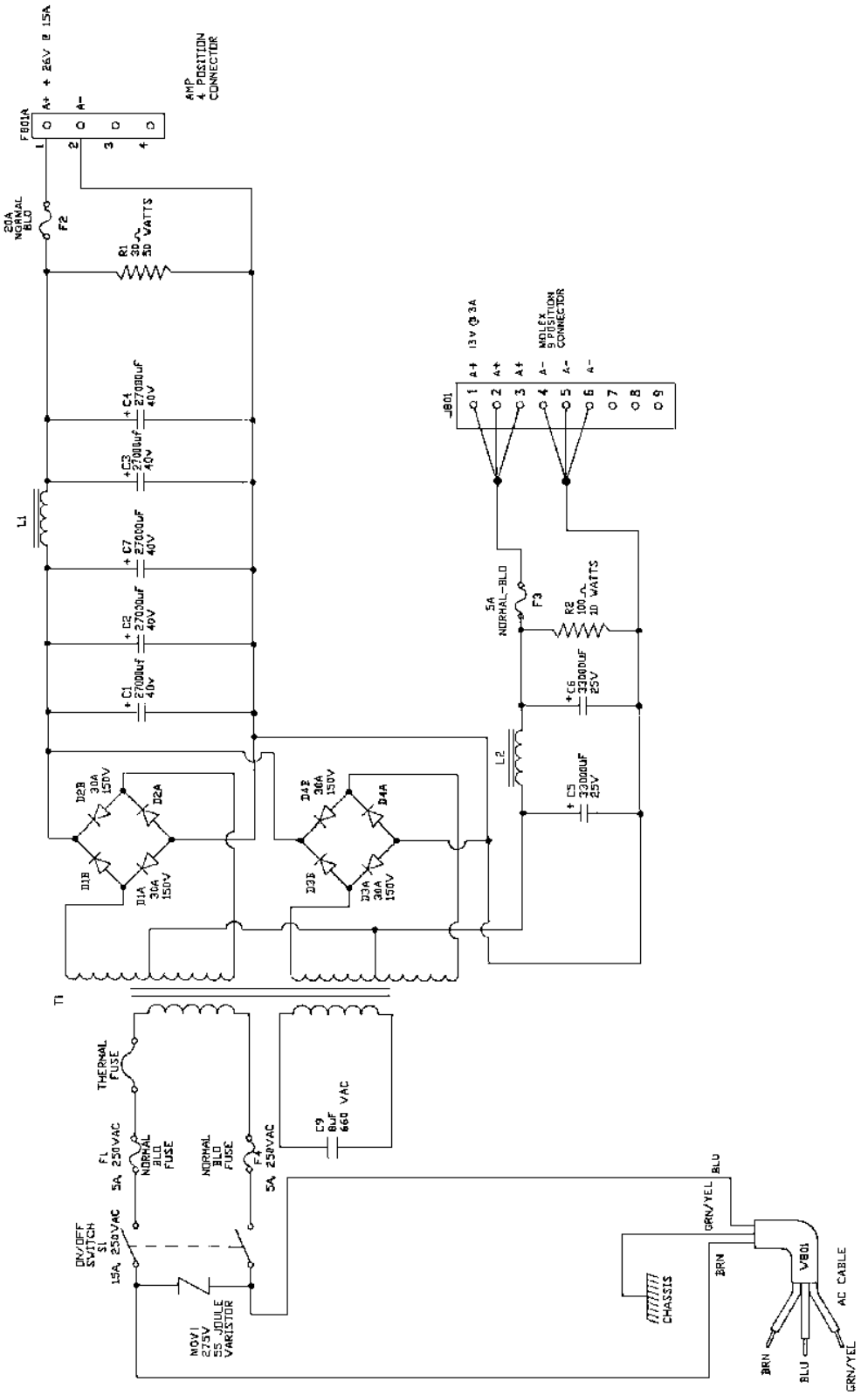
SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C9	M29/17032400	Polypropylene: 8 uF, 660Vac, similar to Ronken P61A24805M05.
		- - - - - - - - - - - FUSES - - - - - - - - - - -
F1	M29/09013901	Non-time delay Glass/Ferrule Fuse: 10 amps, 250V; similar to Bussmann AGC-10.
F2	M29/09013903	Normal blow Fuse: 20 amps, 32V; similar to Bussman AGC-20.
F3	M29/09016300	Slow Blow Fuse: 5 amps, 250V; similar to Bussmann MDL-5.
		- - - - - - - FUSE HOLDER & BLOCKS - - - - - - -
	M29/09014200	Fuse Holder, screwdriver slot design: similar to Bussmann "HTB-96I". (Used with F1 thru F3).
		- - - - - - - - - - CONNECTOR - - - - - - - - - -
FB01A	M29/40028600	Connector: 4 position; sim to AMP 641685-2.
J801	M29/40027400	Connector: 9 position; sim to Molex 03-09-1091.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	M29/16012302	Wirewound Resistor: 30 ohms, 50 w; similar to IRC PW-50E-30OHMS-5% (with bracket).
		- - - - - - - - - RECEPTACLES - - - - - - - - - -
RE1 and RE2	M29/40027800	Receptacle: power, 3 wire grounding, 15 amps at 125V; similar to GE 5242-9.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	M29/20003300	SPST: 16 amps, 125V switch; similar to Carling RA9L1VBBOV.
		- - - - - - - - - TRANSFORMER - - - - - - - - -
T1	M29/289CV3	Ferro-Resonant Transformer.
		- - - - - - - - - - WIRE HARNESS - - - - - - - -
W1 thru W30	M29/289LW3	Wiring Harness.
W801	M29/11022301	Power Cord.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	M29/07062200	Top Cover.
	M29/07063000	Front Panel.
	M29/22043800	Machine screw, TORX head: 3.5m x 1/2; Quantity 8; similar to Camcar/Textron Inc. Secures cover.
	M29/22044600	Machine screw, hex head; No. 8-32 x 5/8" secures C9 to case.
	M29/22041502	Hex nut: No. 8-32, quantity 4; secures C9, R1, and ground wire to case.
	M29/05065600	Bracket for C9; similar to GE X9827065P21.
	M29/22041501	Hex nut: No. 6-32 x .250, quantity 10; used to secure PCB,
	M29/22043201	Nylon Standoff: Quantity 7; Used to separate PCB from case.
	M29/11022000	Strain relief, black similar to Heyco 1200. To secure W801 to case.
	M29/22041504	Nut: 1/4-20 x 7/16, quantity 4; secures T1 to case
	M29/22041503	Nut: No. 10-32, quantity 4; used to secure terminal lugs to PCB.
	M29/22010305	Washer: #6, used to secure RE1/RE2.
	M29/22044500	Nut, 3.5M: used to secure RE1/RE2.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
		HEAT SINK / PCB ASSEMBLY M29/91034501 (REV. 0)
		(Assembly includes the following:)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1 thru C4	M29/17034301	Aluminum electrolytic: 27000 uF, 40V.
C5	M29/17034300	Aluminum electrolytic: 33000 uF, 25V; sim to UCC KME25VB333M35X50LL.
C6	M29/17031500	Aluminum electrolytic: 27000 uF, 25V; sim to UCC KME25VB273M35X50LL.
C7	M29/17034301	Aluminum electrolytic: 27000 uF, 40V (Rev. B & later).
		- - - - - - - - - - CHOKES - - - - - - - - - -
L1	M29/289C5	Output Choke: .7 mH, 15 amps.
L2	M29/289FC4	Output Choke: .4 mH, 3 amps.
		- - - - - - - - - - RECTIFIERS - - - - - - - - -
D1 thru D4	M29/18030500	Dual Schottky Rectifier: 30 amps, 150V; similar to GI FED30CP.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R2	M29/116013800	Resistor: 100 ohm 10%, 10 watt.
		- - - - - - - - - - VARISTOR - - - - - - - - -
MOV1	M29/18008013	Varistor: 150V, 80j metal oxide; similar to GE V150LA20A.
		- - - - - - - - - - TERMINALS - - - - - - - - -
TB1 thru TB11	M29/13048100	FASTON tabs; similar to Amp 62650-1.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	M29/22045500	Pem Stud: #10-32. Quantity 4, secures PCB.
	M29/22041503	Keeper Nut: #10-32, 1/8" thick. Quantity 4, secures PCB.
	M29/22046700	Rivet: Quantity 2, secures L1.
	M29/22025001	Flat washer: #10. Quantity 2, secures L1.
	M29/11024400	Heatsink.
	M29/31016703	Heat Transfer Pad: To insure good thermal conductivity between D1-D4 and heat sink.
	M29/22027710	Hex head screw: No. 4-40 x .5; quantity 4, used to secure D1-D4 to heat sink.



50 Hz POWER SUPPLY
19A149979P2, Rev. A



50 Hz POWER SUPPLY
19A149979P2, Rev. A

(289PS4 Sh. 1, Rev. C)

12/24 VOLT POWER SUPPLY
19A149979P2
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C9	M29/17032400	Polypropylene: 8 uF, 660Vac, similar to Ronken P61A24805H05.
		- - - - - - - - - - FUSES - - - - - - - - - -
F1	M29/09016000	Normal Blow Fuse: 5 amps, 250V; similar to Bussmann GDA-5.
F2	M29/09013903	Normal blow Fuse: 20 amps, 32V; similar to Bussman AGC-20.
F3 and F4	M29/09016000	Normal Blow Fuse: 5 amps, 250V; similar to Bussmann GDA-5.
		- - - - - - - FUSE HOLDER & BLOCKS - - - - - - -
	M29/09016100	Fuse Holder, screwdriver slot design: similar to Bussmann "HTH-96M". (Used with F1, F3, and F4).
	M29/09014200	Fuse Holder, screwdriver slot design: similar to Bussmann "HTE-96I". (Used with F2).
		- - - - - - - - - - CONNECTOR - - - - - - - - - -
F801A	M29/40028600	Connector: 4 position; sim to AMP 641685-2.
J801	M29/40027400	Connector: 9 position; sim to Molex 03-09-1091.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	M29/16012302	Wirewound Resistor: 30 ohms, 50 w; similar to IRC PW-50E-30OHMS-5% (with bracket).
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	M29/20003900	DPST.
		- - - - - - - - - - TRANSFORMER - - - - - - - - - -
T1	M29/289CV4	Ferro-Resonant Transformer.
		- - - - - - - - - - WIRE HARNESS - - - - - - - -
W1 thru W30	M29/289LW4	Wiring Harness.
W801	M29/11023800	Power Cord.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	M29/07062200	Top Cover.
	M29/07063700	Front Panel.
	M29/22043800	Machine screw, TORX head: 3.5m x 1/2; Quantity 8; Secures cover.
	M29/22044600	Machine screw, hex head; No. 8-32 x 5/8" secures C9 to case.
	M29/22041502	Hex nut: No. 8-32, quantity 4; secures C9, R1, and ground wire to case.
	M29/05065600	Bracket for C9; similar to GE K9827065P21.
	M29/22041501	Hex nut: No. 6-32 x .250, quantity 10; used to secure PCB.
	M29/22043201	Nylon Standoff: Quantity 7; Used to separate PCB from case.
	M29/11023900	Strain relief, black similar to Heyco 3772. To secure W801 to case.
	M29/22041504	Nut: 1/4-20 x 7/16, quantity 4; secures T1 to case
	M29/22041503	Nut: No. 10-32, quantity 4; used to secure terminal lugs to PCB.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
		HEAT SINK / PCB ASSEMBLY M29/11024300 (REV. A)
		(Assembly includes the following:)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 thru C4	M29/17034301	Aluminum electrolytic: 27000 uF, 40V.
C5 and C6	M29/17034300	Aluminum electrolytic: 33000 uF, 25V; sim to UCC KME25VB333M35X50LL.
C7	M29/17034301	Aluminum electrolytic: 27000 uF, 40V.
		- - - - - - - - - - CHOKES - - - - - - - - - -
L1	M29/289C5	Output Choke: .7 mH, 15 amps.
L2	M29/289FC4	Output Choke: .4 mH, 3 amps.
		- - - - - - - - - - RECTIFIERS - - - - - - - - - -
D1 thru D4	M29/18030500	Dual Schottky Rectifier: 30 amps, 150V; similar to GI PED30CP.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R2	M29/116013800	Resistor: 100 ohm 10%, 10 watt.
		- - - - - - - - - - VARISTOR - - - - - - - - - -
MOV1	M29/18008011	Varistor: 275V, 55j metal oxide; similar to GE V275LA15A.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
TB1 thru TB12	M29/13048100	FASTON tabs; similar to Amp 62650-1.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	M29/22045500	Pem Stud: #10-32. Quantity 4, secures PCB.
	M29/22041503	Keeper Nut: #10-32, 1/8" thick. Quantity 4, secures PCB.
	M29/22046700	Rivet: Quantity 2, secures L1.
	M29/22025001	Flat washer: #10. Quantity 2, secures L1.
	M29/11024400	Heatsink.
	M29/31016703	Heat Transfer Pad: To insure good thermal conductivity between D1-D4 and heat sink.
	M29/22027710	Hex head screw: No. 4-40 x .5, quantity 4, used to secure D1-D4 to heat sink.