

**1. GENERAL**

**1.1 MODEL COMPLEMENTS**

**F2366A/F2367A Power Supply**

- FHN5569A Housing
- FKN5865A Battery Cable
- TKN6848A DC Cord
- TPN1150A Power Supply
- TRN6247A PC Board
- TRN6663A Chassis

**1.2 DESCRIPTION**

(See Figures 1 and 2)

The F2366A Power Supply is factory wired to operate from a 110 V ac source. Model F2367A is factory wired to operate from a 242 V ac source; the user supplies the power input plug.

The TPN1150A Power Supply provides a dc output of 14 V. Output regulation is maintained by a negative side, series pass regulator. The collectors of the series pass transistors are grounded to facilitate efficient heat dissipation. Fully transistorized circuits protect the supply from damage due to excessive output current. The supply also has circuitry that protects connected units from damage due to excessive output voltage.

**1.3 SPECIFICATIONS**

**Output Voltage:**

14 V $\pm$ 0.1 V with a maximum intermittent load current of 25 A.

Intermittent load is defined as 1 minute of 25 A output current and 4 minutes of 3.5 A (or less) output current for every five minute interval at +25°C. One minute of 25 A output current should be linearly derated to 30 seconds at +60°C.

**Output Current:**

10 A at +25°C, derated linearly to 6.0 A at +60°C.

**Output Voltage Ripple:**

Less than 25 mV p-p at a continuous output current of 10 A.

**Input Voltage:**

100, 110, 121, 200, 210, 221, 232, or 242 V ac, 50 or 60 Hz.

**Battery Trickle Charge:**

2 A maximum (refer to Table 1). In case of power failure, the battery functions as the power source.

Table 1. Trickle Charge Values

Trickle Charge	Battery Voltage
2 A	10.8 V
1 A	12.4 V

**NOTE**

The above specifications are measured at the power supply chassis.

## 2. PRELIMINARY CONNECTIONS AND ADJUSTMENTS

### 2.1 INPUT TRANSFORMER

Before ac input power is applied to the unit, terminal board TB1 must be wired to accommodate the input level of the ac source. When the level of the ac source has been determined, connect the black and white wires and JU1, JU2, and JU3 as shown in Table 2. Spare fuses are provided with both models to accommodate input line voltage strapping changes.

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#### CAUTION

IF model F2366A is modified in the field to be connected to an ac source of 200 V or more, the three-prong plug **MUST BE CUT OFF** and replaced with a high voltage plug.

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#### NOTE

If the unit has just been repaired or if there is a possibility of unit malfunctioning, check the resistance values at points 1 through 11 (as indicated on the schematic diagram) before applying ac power. If any of the readings are incorrect, refer to the troubleshooting table for this unit.

### 2.2 DC OUTPUT CONNECTOR J1

Both power supplies are factory wired to have a dc output polarity at J1 (shown on the schematic diagram). The output is wired for Micom/Triton radios. Micom 100 radios require a different dc connector. If needed, remove the existing connector and wire the new connector (provided with the power supply) as follows:

J1-1 red lead  
J1-2 green lead  
J1-3 black lead

### 2.3 OUTPUT LEVEL ADJUSTMENT

Connect a dc voltmeter between pin 1 of J1 and ground. Adjust R18, located on the power supply circuit board, for a meter reading of 14.0 V.

### 2.4 BATTERY CONNECTION

(See Figure 2)

Connect battery terminal red lead (+) to power supply BAT (+14 V), and battery terminal black lead (-) to power supply GND.

## 3. TROUBLESHOOTING

(Figures 3 and 4, showing the location of chassis mounted components, are adjacent to the parts list.)

### 3.1 VOLTAGE AND RESISTANCE MEASUREMENTS

Nominal voltage measurements in the power supply circuit are shown on the schematic diagram. Voltages are given for no output current (no load condition), 5 A of output current, and 25 A of output current. Resistance measurements to ground are also shown on the schematic diagram.

### 3.2 LOCATING PROBLEMS

If the power supply is malfunctioning, disconnect the ac power cord immediately. Use an ohmmeter set on the RX100 scale to check the resistance to ground at points 1 through 11 (as noted on the schematic diagram). When measuring resistances, allow enough time for the meter to fully charge any capacitors in the circuit. If the charging time is too slow, switch to the RX scale to speed up charging, then switch back to the RX100 scale for the resistance reading.

After checking the circuit resistances, check the symptom column of the troubleshooting table for the symptoms that have been observed in the unit. Using



the schematic diagram as reference, troubleshoot each of the components or circuits listed as possible causes of the trouble. When the defective component is found, apply the remedy described in the third column. Check the resistances at point 1 through 11 before reapplying ac power following a repair. Adjust the dc output level as described in paragraph 2.2.

**NOTE**

The line fuse is usually weakened by the increased line

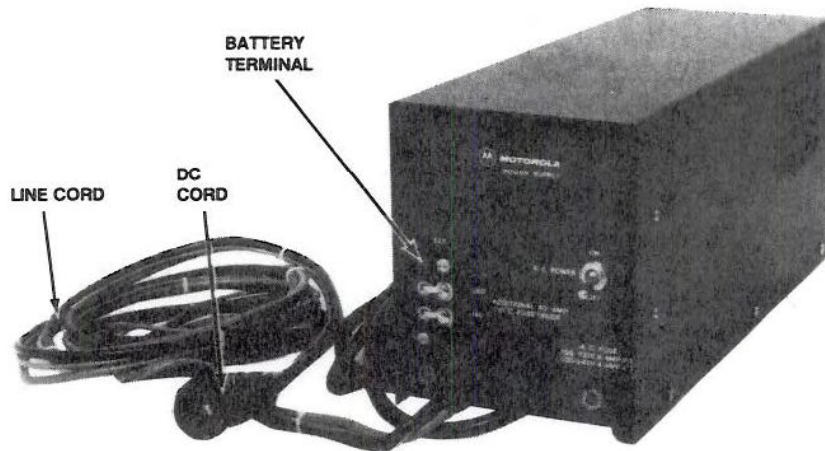
current drawn when the crowbar fuse blows. Whenever the crowbar fuse blows, replace both the line fuse and the crowbar fuse.

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**WARNING**

Disconnect the power supply from the ac source whenever line fuse F2 blows or is removed from the circuit.

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Figure 1. F2366A/F2367A Power Supply

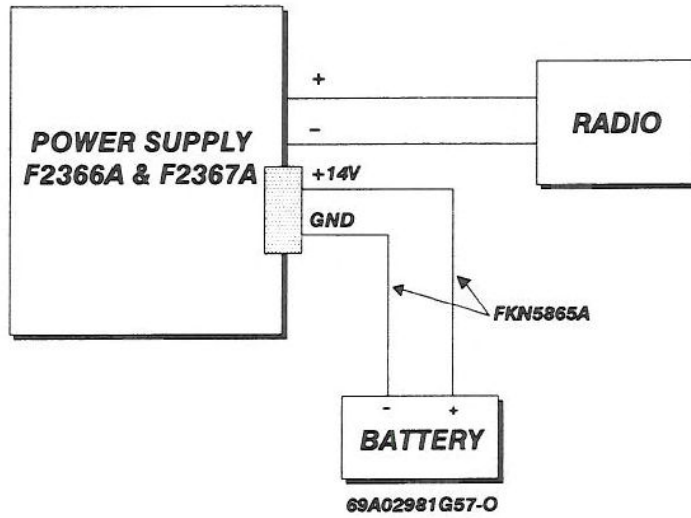


Figure 2. System Configuration

Table 2. Input Transformer Connections

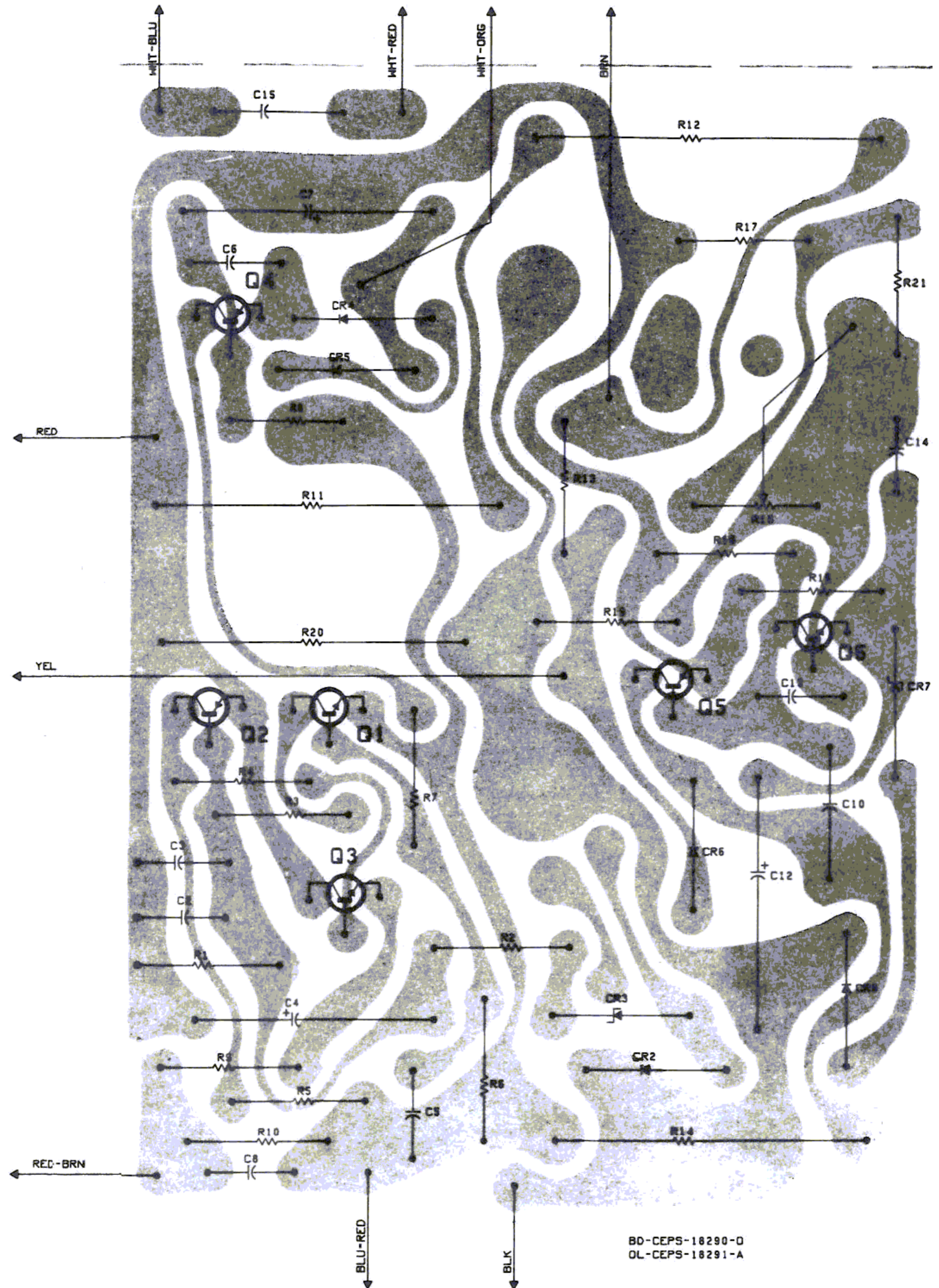
Source Volt-age	White Wire	Black Wire	JU1	JU2	JU3
100	TB1-2	TB1-1	TB1-1 to TB1-4	TB1-2 to TB1-5	NC
110	TB1-6	TB1-1	TB1-1 to TB1-4	TB1-2 to TB1-5	TB1-3 to TB1-7
121	TB1-3	TB1-1	TB1-1 to TB1-4	TB1-3 to TB1-7	NC
200	TB1-5	TB1-1	TB1-2 to TB1-4	NC	NC
210	TB1-6	TB1-1	TB1-2 to TB1-4	NC	NC
221	TB1-7	TB1-1	TB1-2 to TB1-4	NC	NC
231	TB1-6	TB1-1	TB1-3 to TB1-4	NC	NC
242	TB1-7	TB1-1	TB1-3 to TB1-4	NC	NC



TROUBLESHOOTING CHART

SYMPTOM	POSSIBLE CAUSE	REMEDY
A. Crowbar fuse open	Q9 or Q10 is shorted.	Check and replace if necessary Q9 and/or Q10.
	Short circuit in output	Locate and remove short, replace both fuses.
	Excessive output current	Disconnect any loads that would cause the output current to exceed 40 amps.
	Rectifier diode shorted to chassis	Locate faulty diode with ohmmeter and replace.
B. Line fuse open	TB1 wire for wrong input voltage	Rewire TB1 and replace both fuses.
C. No dc output	Crowbar fuse blown	See A above.
	Line fuse blown	See B above.
	Q9 and/or Q10 are defective	Check Q9 and Q10 and replace if necessary.
	Q5 is shorted	Check Q5 and replace, if necessary.
D. Low output voltage	Improper wiring of T1	Check T1 wiring, reconnect if necessary.
E. Output voltage is not adjustable	Q6 defective	Check Q6; replace if necessary
	R18 open	Check R18; replace if necessary
F. Points 1 or 2 measure zero ohms to ground	Q9 or Q10 is shorted	Check Q9 and Q10; replace if necessary
	Q11 is shorted	Replace Q11
H. Point 5 measures zero ohms to ground and ohmmeter shows no evidence of output capacitor charging.	Shorted output capacitor	Check output capacitors; replace if necessary
	Insufficient ohmmeter current	Check ohmmeter
I. Point 8 measures zero ohms to ground	Q9 or Q10 is shorted from base to collector or Q8 is shorted.	Check Q8, Q9, and Q10 and replace if necessary

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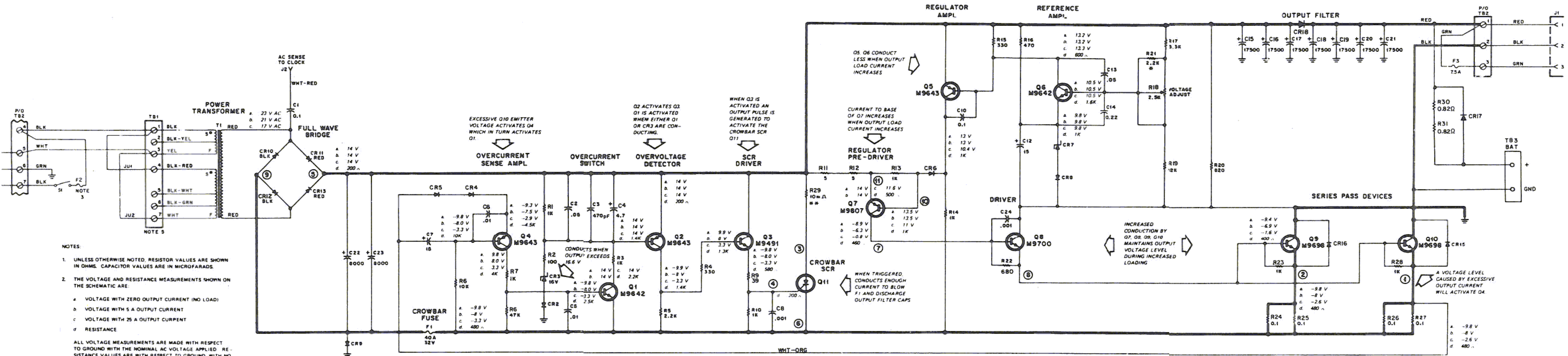


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OL-CEPS-18291-A



# POWER SUPPLY

Models F2366A and F2367A



- NOTES:
- UNLESS OTHERWISE NOTED, RESISTOR VALUES ARE SHOWN IN OHMS. CAPACITOR VALUES ARE IN MICROFARADS.
  - THE VOLTAGE AND RESISTANCE MEASUREMENTS SHOWN ON THE SCHEMATIC ARE:
    - a. VOLTAGE WITH ZERO OUTPUT CURRENT (NO LOAD)
    - b. VOLTAGE WITH 5 A OUTPUT CURRENT
    - c. VOLTAGE WITH 25 A OUTPUT CURRENT
    - d. RESISTANCE
  - ALL VOLTAGE MEASUREMENTS ARE MADE WITH RESPECT TO GROUND WITH THE NOMINAL AC VOLTAGE APPLIED. RESISTANCE VALUES ARE WITH RESPECT TO GROUND, WITH NO INPUT VOLTAGE, USING RX100 SCALE.
  - FOR 100, 110, OR 121 V AC INPUT VOLTAGES USE AN 8 AMP, 120 V, FAST BLOW, 3 AG FUSE. FOR 200, 210, 221, 231, OR 242 V AC INPUT VOLTAGES USE A 4 A, 240 V, FAST BLOW, 3 AG FUSE.
  - LEGEND
    - ◇ THEORY NOTE

- SHOWN JUMPED FOR 121 V AC OPERATION.
- CIRCLED NUMBERS SHOULD ALWAYS BE OHMMETER TESTED BEFORE APPLYING AC POWER.

\* RESISTOR R21 MAY BE OMITTED AT FACTORY.  
 \*\* RESISTOR R29 CONSISTS OF A LENGTH OF WIRE.

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REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
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### PARTS LIST

TRN6247A Power Supply Circuit Board PL-3643-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
<b>CAPACITOR, fixed: uF:</b> unless otherwise stated		
C1	8-82905G30	0.10 ±10%; 50 V
C2	21-82372C07	.05 +80-20%; 25 V
C3	21-82187B07	470 pF ±10%; 500 V
C4	23-82783B12	4.7 ±20%; 50 V
C5, 6	21-82428B59	.01 +80-20%; 200 V
C7	23-83214C26	15 ±10%; 25 V
C8	21-82187B14	.001 ±10%; 100 V
C9		NOT USED
C10	8-83514E02	0.1 ±10%; 50 V
C12	23-83214C26	15 ±10%; 25 V
C13	21-82372C07	.05 +80-20%; 25 V
C14	8-82905G11	0.22 uF ±10%; 50 V
<b>DIODE: (SEE NOTE)</b> silicon		
CR2	48-83654H01	Zener type: 16 V
CR3	48-83461E01	silicon
CR4, 5	48-83654H02	silicon
CR6	48-83654H01	silicon
CR7	48-82256C38	Zener type: 9.1 V
CR8	48-83654H01	silicon
<b>TRANSISTOR: (SEE NOTE)</b>		
Q1	48-869642	NPN; type M9642
Q2	48-869643	PNP; type M9643
Q3	48-869491	NPN; type M9491
Q4, 5	48-869643	PNP; type M9643
Q6	48-869642	NPN; type M9642
<b>RESISTOR, fixed: ±5%; 1/4 W:</b> unless otherwise stated		
R1	6-124A49	1k
R2	6-124A25	100
R3	6-124A49	1k
R4	6-124A37	330
R5	6-124A57	2.2k
R6	6-124A89	47k
R7	6-124A49	1k
R8	6-124A73	10k
R9	6-124E15	39
R10	6-124A49	1k
R11, 12	17-82177B04	5 ±10%; 5 W
R13	6-124A49	1k
R14	6-127A49	1k; 2 W
R15	6-124A37	330
R16	6-124A41	470
R17	6-124A61	3.3k
R18	18-83083C06	var: 2.5k
R19	6-124A75	12k
R20	6-127A47	820; 2 W
R21	6-124A57	2.2k
NON-REFERENCED ITEM		
	14-861196	INSULATOR, transistor: for (Q3)

NOTE:  
For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

FKN5065A Battery Cable PL-2005-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	09-84277B02	Receptacle, fuse
	29-10262A06	Lug, 2 used
	65-84161B01	Fuse, 40 A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
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TRN6663A Power Supply Chassis PL-4095-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
<b>CAPACITOR, fixed: uF:</b> unless otherwise stated		
C15 thru C21	23-83093G20	17500 nF ±10%; 20 V
C22, 23	23-83093G14	8000 uF ±10%; 35 V
C24	21-82187B14	.001 uF ±10%; 100 V
<b>DIODE WITH HEAT SINK (except where indicated): (SEE NOTE)</b>		
CR9	1V80778B30	silicon
CR10	1V80778B31	silicon
CR11	1V80778B30	silicon
CR12	1V80778B31	silicon
CR13	1V80778B30	silicon
CR15, 16	48-82525G14	silicon (no heat sink req'd)
<b>FUSE:</b> 40 amp; 32 V		
<b>TRANSISTOR: SEE NOTE</b>		
Q7	48-869807	PNP; Type M9807
Q8	48-869700	PNP; Type M9700
Q9, 10	48-869698	NPN; Type M9698
Q11	48-84973C01	silicon control rectifier
<b>RESISTOR fixed: ±5%; 1/4 W:</b> unless otherwise stated		
R22	6-124A45	680
R23	6-124A49	1k
R24 thru 27	17-82177B50	0.10 ±10%; 7 W
R28	6-124A49	1k
R29	30-10286D01	wire lead; No. 16 ga; 4-1/2" req'd.
<b>TRANSFORMER, power:</b> pri #1: pins 1 and 3 with pin 2 tapped pri #2: pins 3 and 7 with pins 5 and 6 tapped sec.: pins 8 and 9		
T1	25-83814K01	
<b>BOARD, terminal</b> 7-screw terminal		
TB1	31-82272B04	
NON-REFERENCED ITEMS		
	14-83967A03	WASHER, shoulder; 8 req'd
	14-84548A01	INSULATOR, washer; 4 req'd
	43-84379C05	SPACER, threaded
	9-82083C01	HOLDER, fuse
	42-10217A02	STRAP, cable, harness; 8 req'd
	26-83854K01	HEATSINK
	29-859665	LUG ring-tongue; 6 req'd
	14-84268A01	INSULATOR, transistor
	1V80778B28	BRACKET AND SOCKET ASSEMBLY
	31-83927K01	TERMINAL, fuse block
	14-83813K01	INSULATOR, capacitor
	3-488100	SCREW, machine; 6-32 x 1-1/4" 4 req'd.
	3-135506	SCREW, machine; 6-32 x 1-1/4"

NOTE:  
For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
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TKN6848A Remote Power Supply Wiring PL-4096-O

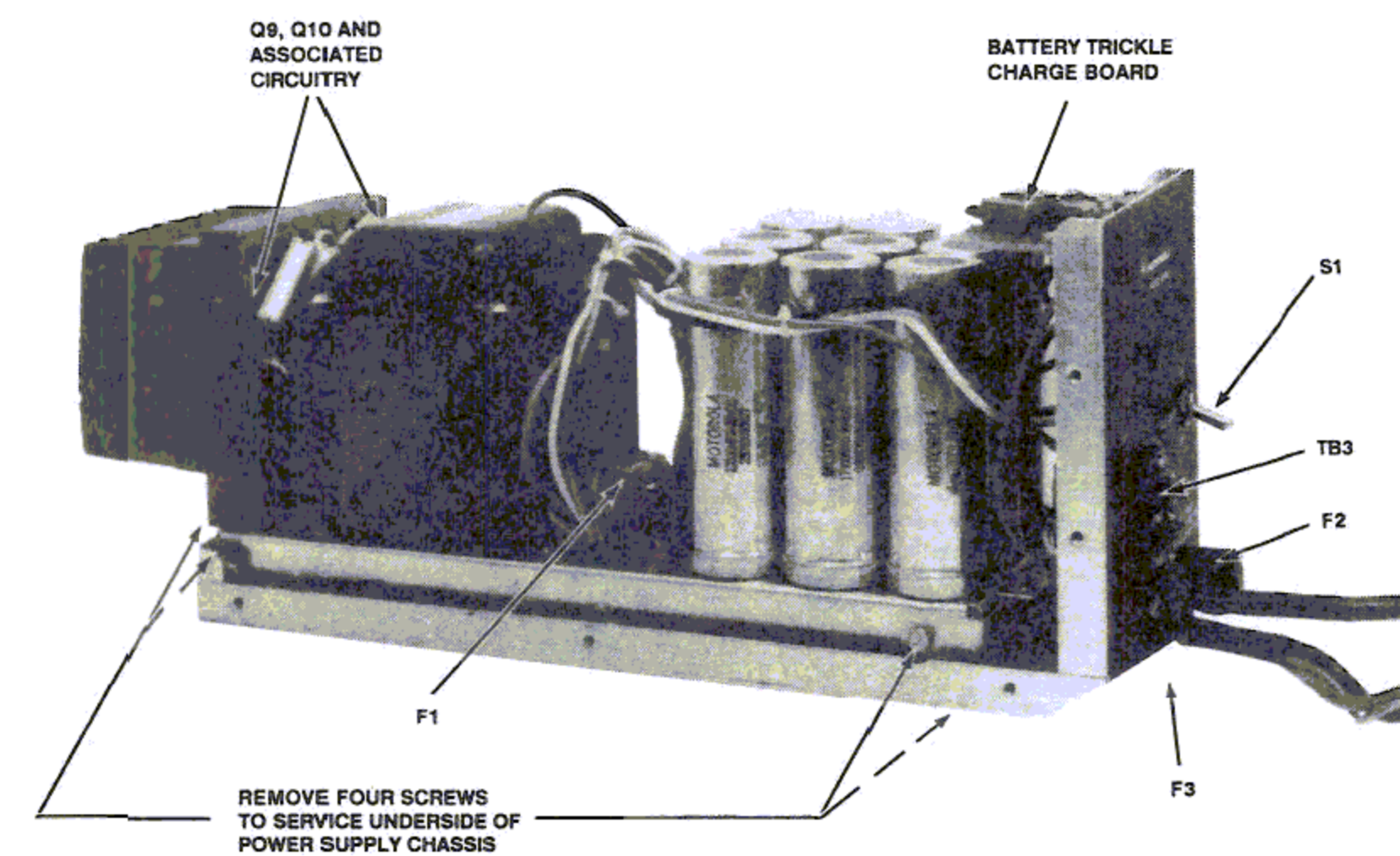
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
<b>CONNECTER, receptacle:</b> includes: HOUSING, female 3-circuit CONTACT, female: 2 req'd CONTACT, female		
J1	15-83468K01 9-83472K03 9-83472K04	
MECHANICAL PARTS		
	42-84936F01 42-10217A02 29-10262A06 29-848902	STRAIN RELIEF, cable STRAP, cable harness; 12 req'd LUG, #8; 2 req'd LUG, #14

FHN5569A Power Supply Housing PL-4097-D

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
<b>DIODE:</b> Silicon		
CR17, CR18	48-82732C08	
<b>FUSE:</b> 4 A; 250 V 7.5 A; 32 V		
F2	65-61688	
F3	65-86099	
<b>CONNECTOR, receptacle:</b> includes: HOUSING, female 3-circuit (for Micom 100/ Triton 20 radios only) CONTACT, female; 3 used		
J1	15-10183A81	
	39-83600M01	
	42-83790M01	RETAINER, strain relief; 2 used
	3-119947	SCREW, tapping 6-20x3/8"; 2 used
<b>RESISTOR:</b> 0.82 ohm, 10 W		
R30, R31	17-02650H01	
<b>SWITCH, toggle:</b> SPST		
S1	40-858304	
<b>BOARD, terminal:</b> 10-screw terminal		
TB2	31-82596E02	
TB3	31-00898182	2-screw terminal

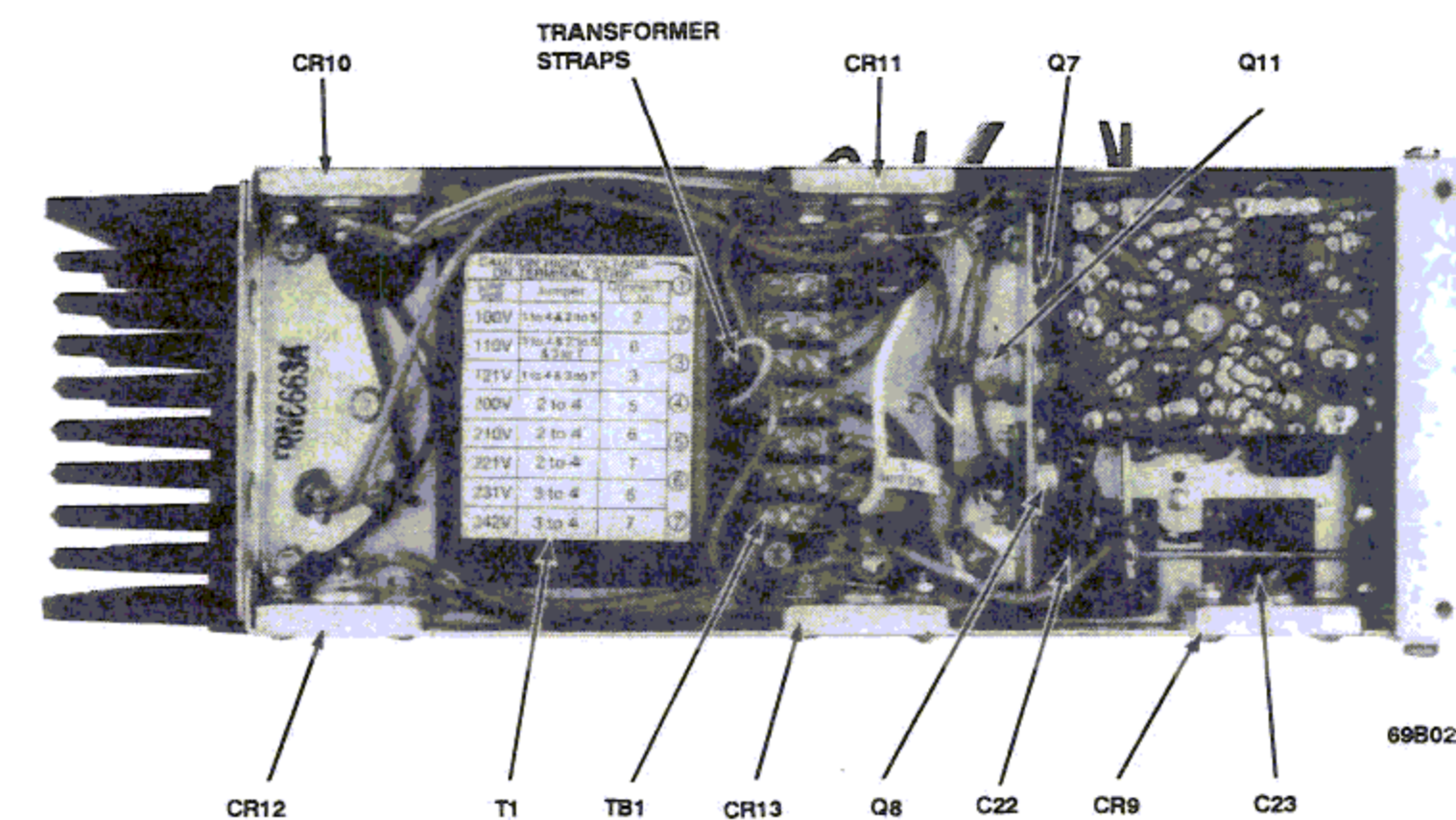
MECHANICAL PARTS

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	2-119913	LOCKNUT, 8-32 x 11/32"; 4 req'd
	2-120908	NUT; 5/32" x 32, 2 req'd
	3-7208	SCREW, machine 8-32 x 3/4"; 4 req'd
	3-138647	SCREW, machine 8-32 x 3/8"; 10 req'd
	7-82173L01	BRACKET, chassis mtg;
	13-82174L01	ESCUTCHEON, power supply
	14-82179L01	INSULATOR, switch
	15-83460L01	HOUSING, bottom
	15-84707K01	HOUSING, top
	33-84797K01	NAMEPLATE, (serial No.)
	37-482052	BUMPER, rubber; 4 req'd
	42-82018H01	RETAINER, cable
	9-82083C01	FUSEHOLDER, with hardware; 2 req'd
	29-859665	LUG, 8 req'd
	65-84161B01	FUSE, 40 A (spare)
	65-135212	FUSE, 8 A; 250 V (F2 for 100, 110, and 121 V ac)
	1-80789B02	AC LINE CORD ASSEMBLY
	4-132718	LOCKWASHER, 7/16"
	2-10054A74	NUT, clip on 6-32, 10 req'd
	3-131965	SCREW, tapping 6-32 x 3/8"; 2 req'd
	4-135069	WASHER, flat; .172 x 375" x .036; 10 req'd.
	5-83519L01	GROMMET
	3-138806	SCREW, machine; 8-32 x 5/16" 4 req'd.



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Figure 3. Side View of Power Supply with Cover Removed



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Figure 4. Bottom of Supply Exposed for Servicing