Film-Tech

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Instructions

FOR EQUIPMENT Type

61000
POWER SUPPLY
115 V. A.C. LINE
4-78

700 to 1000 watt

61000-1 16mm version

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PREFACE

THIS STRONG POWER SUPPLY is a single phase, full wave bridge type, silicon power supply for use with 700-1000 watt xenon projection lamps.

THE POWER SUPPLY is designed to operate from a 115 volt (105-125V.) AC source, draws 27.5 amperes from a 115V. line and is rated for continuous duty.

THREE TAPS on the primary side of the T1 transformer are provided to compensate for variations in the AC line voltage. The rating on the taps are 105, 115 and 125 volts. The transformer tap terminal block has two positions and is marked for 105 and 115 volts. The 125 volt tap from the transformer is folded back and taped.

THE AC LEAD CORD is an optional item on the power supply for use with a projection lamp and a standard item on the power supply for use with a follow-spot. The AC lead is a 12 foot, #10 AWG, 3 conductor cord with a 30 ampere, 125 volt twistlock cord cap for connection to the AC supply line. The AC supply line must be protected with a 30 ampere fuse or circuit breaker.

THE DC OUTPUT RANGE is from 37-55 amperes at 18-22 volts. The DC current to the bulb is adjusted by means of the (8) step dial switch. Position (1) being the lowest and (8) the highest output.

THE POWER SUPPLY is equipped with a cooling fan to maintain a safe operating temperature. A thermal switch located on the rectifier heat sink will stop operation of the power supply and protect the silicon rectifier if the temperature at the heat sink reaches $190^{\circ} + 5^{\circ}$ Fahrenheit.

A CHOKE AND CAPACITOR in the D.C. circuit, reduces the ripple to a minimum consistent with requirements of xenon bulbs for a long life.

A NEON GLOW LAMP is connected across the A.C. supply to indicate when the A.C. circuit to the power supply and from the power supply to the lamphouse is energized.

CIRCUIT BREAKERS are installed in the A.C. control circuit to protect components in the event a malfunction occurs.

AN MS CONNECTOR is wired into the AC control and DC circuit on some models of this power supply, for direct connection to the lamphouses that are equipped with the mating connector.

INSTALLATION - OPERATION

THE POWER SUPPLY with the #10/3 AWG AC lead cord can be plugged into any 30 Ampere, three wire grounded, 115 volt, 60 Hertz single phase outlet. This outlet should be switched to permit turning the power on and off to the power supply.

THIS POWER SUPPLY has three taps on the primary side of the T1 transformer. The power supply is shipped with the 105 volt and 115 volt taps connected to the transformer tap terminal block. The lead T2 from the line relay is attached to the 115 volt post.

IF THE LINE VOLTAGE is 105 volts or lower, connect the T2 lead to the post marked 105 volts. The high voltage tap (125 volts) is not attached to the terminal block but is folded back and taped to the transformer. To operate on this higher voltage, remove the 115 volt tap from the terminal block and connect the 125 volt tap to this open post. Fold back the 115 volt tap and tape to the transformer. Connect the T2 lead from the relay to this terminal post.

THE DIAL SWITCH on the power supply has eight (8) steps. Each step adjusts the DC output approximately two (2) amperes. Position number one (1) giving the lowest output and eight (8) the highest. Always start on position number one (1) for the first ignition of the xenon bulb. Wait a few minutes until the current stabilizes; then adjust the dial switch to obtain the rated current specified by bulb manufacturer. If the correct current cannot be reached by changing the dial switch, then a change must be made at the transformer tap terminal block.

IF THE ARC CURRENT is too high, connect the relay T2 lead to the next higher rated transformer tap and start at position number one (1) on the dial switch.

IF THE ARC CURRENT is too low, connect the relay T2 lead to the next lower rated tap and again start at position number one (1) on the dial switch.

AFTER THE TRANSFORMER TAP, nearest to the rated AC input voltage, is connected to relay lead T2 then the eight (8) steps on the dial switch should permit adjustment over the full current range of the xenon bulb.

IF IT IS DESIRED to operate this equipment on an "Automatic" system from a remote station, all that is necessary is to run #14 THW wire from terminals #6 and #3 on the control circuit terminal strip, to a 5 ampere

MAINTENANCE

VERY LITTLE MAINTENANCE is necessary to keep this equipment in top operating condition. The frequency of cleaning the equipment depends on dust conditions at each installation.

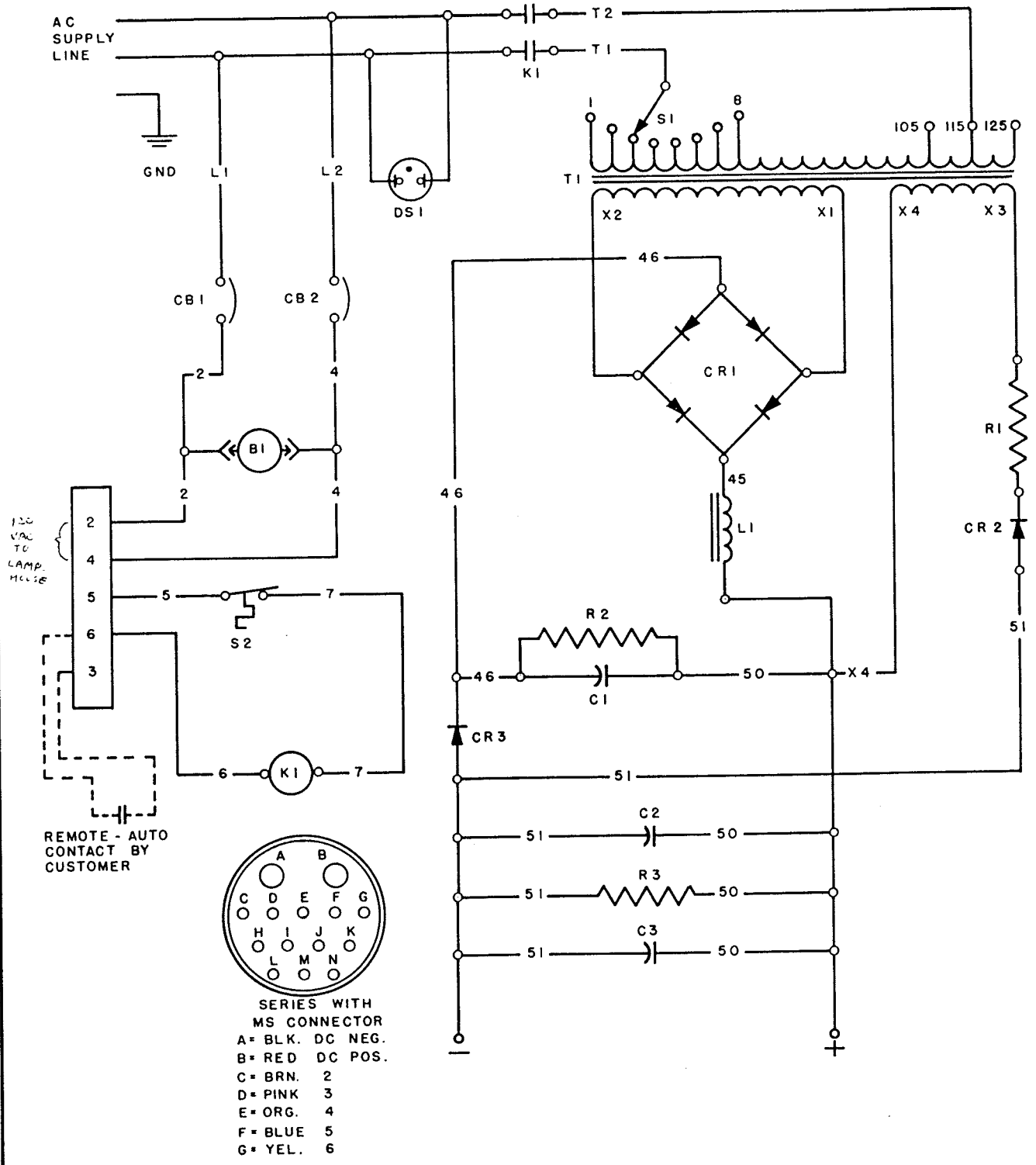
THE RECTIFIER HEAT SINK should be kept clean to permit dissipation of heat generated by the equipment.

PERIODICALLY examine all electrical connections for tightness. A loose connection will cause overheating and possible intermittent operation.

IF THIS POWER SUPPLY is operated in an ambient temperature high enough to permit the internal temperature at the heat sink to reach 190°F. the thermal switch (S2) will shut down the power supply until the temperature falls below this level.

THE COOLING FAN and grill must be kept clean to permit full air flow through the power supply.

POWER SUPPLY SCHEMATIC



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PARTS LIST
WIRING DIAGRAM

Ref. Desig.	Part No.	Description
B1	45227	Blower, Dayton # 40550, 110 cfm
-	61994	Lead Cord, Blower
C1	88233	Capacitor, Filter (37000 MFD, 75V. DC)
C2	88185	Capacitor, Boost (1100 MFD, 150WVDC)
C3	88981	Capacitor, R. F. Bypass (. 01 MFD, 500/1000V. DC) (with R3)
CB1, 2	79107	Circuit Breaker (5 Amp/250V. AC)
CR1	61101	Silicon Bridge, Rectifier
CR2	88982	Diode, Boost (2. 5A, 1000 PIV, with R1)
CR3	84112-A	Diode, Blocking (85A, 400 PRV.)
DS1	61993	Neon Glow Lamp
K1	88116	Power Contactor (50/60 Hz, 30A.)
L1	61000-1WA	Choke (with T1 & S1)
R1	88982	Resistor, Current Limiting (200 Ohm, 25W. with CR2)
R2	88979	Resistor, Bleeder (450 Ohm, 12W.)
R3	88981	Resistor, Bleeder (100K. Ohm 1/2W. with C3)
S1	61971	Dial Switch & Lead
S2	88118	Thermal Switch ($190^{o} \pm 5^{o}$F.)
T1	61000-1WA	Transformer (with L1 & S1)
-	61987	MS Connector and Leads
-	61996	A. C. Power Cord (12', #10/3)
-	84112-A	Forward Diode, Replacement (85A., 600 PRV) Use Philips ECG 6076 or RCA SK 7076
-	61140	Reverse Diode, Replacement (85A., 600 PRV) Use Philips ECG 6077 or RCA SK 7077

TROUBLE SHOOTING

REFER TO THE INSTALLATION-OPERATION section and the schematic diagram of this manual before attempting any trouble shooting. Some models of this power supply have taps on both the primary and secondary sides of the main transformer to compensate for variations in line voltage and supply the proper current for operation of the various xenon bulbs.

IN ADDITION, the power supplies manufactured for use on a supply line of 208/230 volts A. C., or higher have a stepdown transformer to reduce the A. C. supply voltage to 115-120 volts required for the A. C. control circuit in the lamphouse and power supply. This stepdown transformer has a high (blue) and low (brown) voltage tap on the primary side.

THESE TAPS, on both the main transformer and stepdown transformer, must be connected in accordance with the instructions in your manual to insure proper operation and ignition of the xenon bulb.

THE POWER SUPPLIES designed for a higher output current (above 1000 watts) will have two (2) thermal switches. One will be attached to the bridge rectifier heat sink and one on the blocking diode heat sink.

CR1 Rectifier Bridge Test

Remove the rectifier bridge (CR1) #61101, from the power supply. This bridge has two forward and two reverse diodes. Connect one lead of an ohmmeter to the heat sink of the diode being tested. A functional diode will show an infinite resistance in one direction and a low (approximate 15 Ohm) in the other direction. A shorted diode will indicate low resistance in both directions.

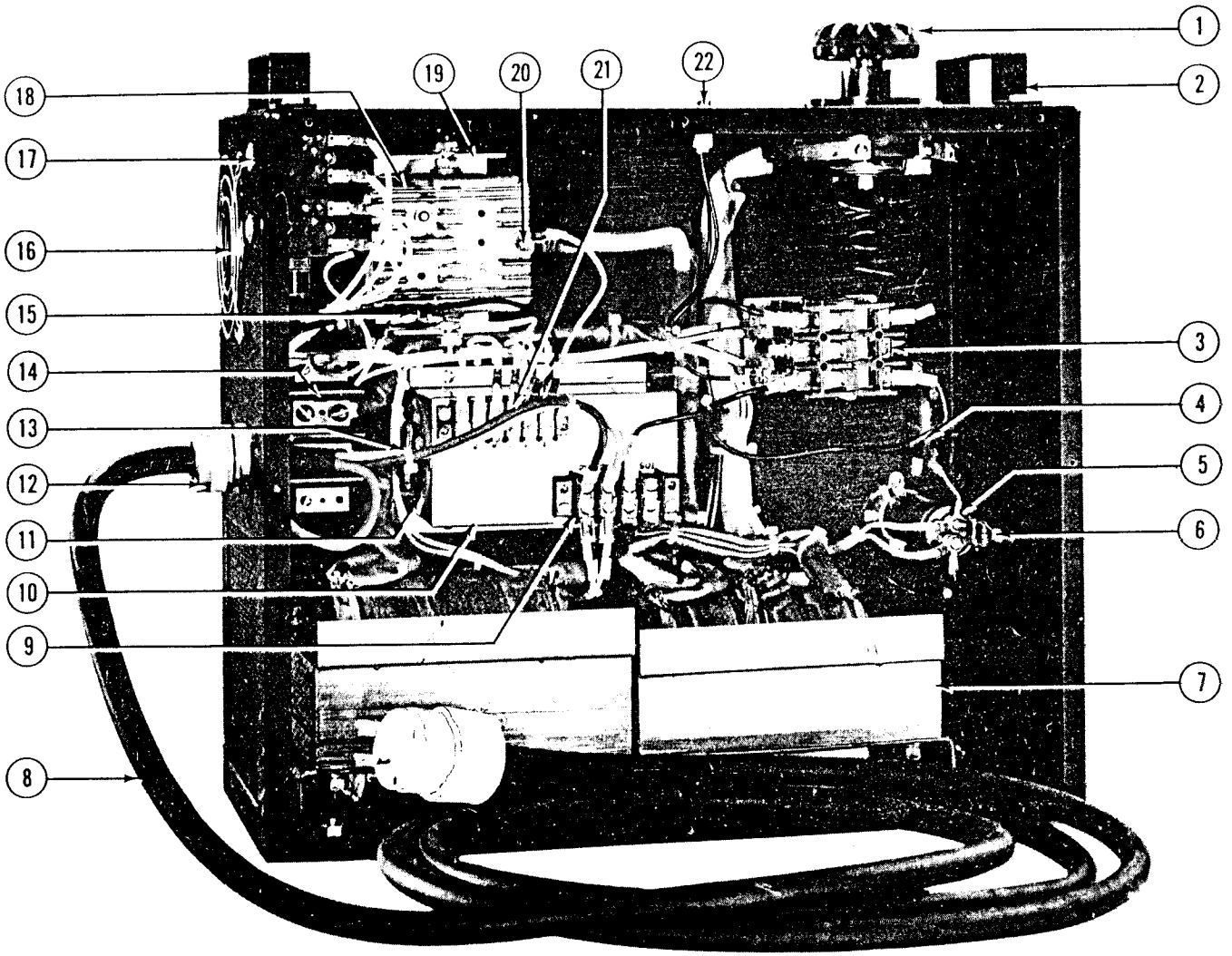
TROUBLE	PROBABLE CAUSE	TEST	REMEDY
Line contactor does not energize (no loud click from contactor when lamp switch is turned on. Red indicator light not lit.	Main power switch not turned on.	Check main line switch.	Turn on.
	Blown line fuses.	Check line fuses.	Replace bad fuses.

TROUBLE	PROBABLE CAUSE	TEST	REMEDY
Line contactor does not energize (no loud click from contactor when lamp switch is turned on. Red indicator light is lit.	Contactor K1 coil burned out.	Check for 115V. AC across terminals 5 & 6 on terminal block with lamp switch on.	If line voltage appears across these terminals replace contactor.
	Circuit breakers CB1, CB2 open.	Check for short.	Reset circuit breakers.
	Defective thermal switch or switches S2 & S3.	Remove one lead at switch and test for continuity with an ohmmeter across switch on bridge rectifier. Repeat same test for switch on blocking diode heat sink.	Replace switch or switches if open.
	Defect in lamphouse A. C. circuit.	(See lamp manual)	
Contactor clicks on but bulb does not ignite.	Contacts in K1 line contactor burned or defective.	Check AC voltage on leads T1 & T2.	Replace contactor if voltage is not indicated.
	Lamphouse igniter.	(See lamp manual)	
	Shorted blocking diode CR3.	(See test under Low-No Load D. C. voltage)	Replace diode.
Repeatedly blows line fuses.	Wrong size fuses.	Check size of fuses.	Replace with proper size fuses.
	Shorted silicon bridge (CR1).	Check bridge. See instruction for test in this manual.	Replace defective bridge.

TROUBLE	PROBABLE CAUSE	TEST	REMEDY
(Cont'd) Repeatedly blows line fuses.	Shorted filter capacitor (C1).	Test with capacitor checker.	Replace if defective.
	Shorted boost capacitor C2.	Same test as C1 above.	Replace if defective.
	Shorted step-down transformer (T2).	Disconnect T1 transformer at relay K1. T2 secondary leads 52 & 54 at CB1&2. Energize AC circuit.	If fuse blows, replace T2 stepdown transformer.
	Shorted trans-former T1.		If fuses still blow after com-pleting tests on other components replace T1 transformer.
Circuit breakers CB1, 2 open repeatedly.	Defective fan in power supply	Disconnect fan.	If circuit breakers do not open, re-place fan.
Lamp power switch not "on".	Defective fan in lamphouse.	----------	See lamp manual trouble chart.
Circuit breakers CB1, 2 open repeatedly.	Defective igniter.	----------	See lamphouse manual trouble chart.
Lamp power switch "On".	Defective contactor (K1).	Remove leads 6-7 from contactor.	If circuit break-ers do not open. replace contactor.

TROUBLE	PROBABLE CAUSE	TEST	REMEDY
Low-no load DC voltage to lamphouse(less than 85 volts DC measured across DC terminal board in power supply).	Defective filter capacitor (C1).	(See test and remedy under repeatedly blows line fuse.)	
	Defective boost capacitor (C2).	Remove and test with capacitor tester if available.	Replace capacitor.
	Defective boost diode (CR2). Possible defect if only 50-60 VDC measured at DC terminal block.	Check continuity across the diode with an ohmmeter. Must show low resistance in only one direction when reversing ohmmeter leads.	If tests show low resistance in both directions or does not show low resistand in either direction, replace diode and R1 resistor assembly.
	Shorted blocking diode CR3. Check voltage at DC terminal block. Possible defect if only 50-60V. DC measured at DC terminal block.	Check with an ohmmeter, the continuity from the (-) heat sink to the negative output lead. Should show continuity in only one direction when reversing ohmmeter leads.	If tests show continuity in both directions, replace diode.
	Defective current limiting resistor R1.	Measure resistance with an ohmmeter. Check reading with listed resistance value ± 20%.	If defective, replace resistor and CR2 diode.
Excessive light flicker.	Defective xenon bulb.	(See lamp manual trouble shooting)	
	Defective silicon diode bridge (CR1).	See previous test for bridge.	Replace if defective.
	Filter capacitor (C1).	See test under repeatedly blows line fuse.	Replace capacitor.

TROUBLE	PROBABLE CAUSE	TEST	REMEDY
(Cont'd) Excessive light flicker.	Boost capacitor (C2).	See test under repeatedly blows line fuse.	Replace capacitor.
Reduced light output.	Defective xenon bulb.	(See lamp manual troubleshooting)	
	Defective silicon diode bridge(CR1).	See previous test for bridge.	Replace if defective.
Xenon bulb does not light (bulb flashes).	Defective xenon bulb.	(See lamp manual trouble shooting)	
	Open blocking diode (CR3).	See previous test for CR3.	Replace CR3 if defective.
Bulb goes out during operation.	B1 blower.	----------	Replace if not operating, clean if dirty and running slow.
	Thermal switch or switches located on CR1 bridge heat sink and blocking diode heat sink.	See test under trouble of line contactor does not energize and indicator light is lighted.	Replace switch if defective. If temperature at heat sink reaches $190^{o}\pm5^{o}$ thermal switch will open.



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PARTS LIST

Item No.	Part No.	Description
1	61971	Dial Switch & Lead (S1)
	543	Screw 1/4-20 x 3/8" Oval Bd. Hd.
	15008	Bearing
	807	Nut 5/16-18 Hex
	15035	Spring
	61967	Contact Finger & Lead Assy.
	15489	Switch Body & Contacts
	61973	Knob & Shaft
	61122	Spacer (Order with 61973)
2	88208	Handle
	542	Screw 1/4-20 x 3/4" Oval Bd. Hd.
	805	Nut 1/4-20 Hex
	876	L'Washer 3/16" Split Ring
3	88116	Relay (K1)
	1382	Screw #10-32 x 3/16" Bd. Hd.
4	88982	Resistor, Current Limiting (R1 with CR2)
	1579	Screw #6-32 x 1/4" Bd. Hd.
5	88185	Capacitor, Boost (C2)
	88125	Clamp
	1579	Screw #6-32 x 1/4" Bd. Hd.
6	88981	Capacitor, RF Bypass (C3 with R3)
7	61000-1WA	Transformer (T1 with L1 & S1)
	1315	Screw 5/16-18 x 5/8" Hex Hd.
	807	Nut 5/16-18 Hex
	853	Washer 5/16" Flat
	877	L'Washer 5/16" Split Ring
8	61996	A. C. Power Cord
	61102	Plug (125V., 30 Amp)
9	88113	Terminal Block
	61108	Marker Strip
	1312	Screw #8-32 x 1/2" Bd. Hd.
10	61106	Bracket
	464	Screw #10-32 x 1/4" Bd. Hd.
11	88233	Capacitor, Filter (C1)
12	61126	Bushing, Strain Relief
13	88979	Resistor, Bleeder (R2)
14	61111	Terminal Block, D. C.
	61121	Marker Strip
	1729	Screw #10-32 x 3/4" Pan Hd.
15	88118	Thermal Switch (S2)
	178	Screw #6-32 x 3/16" Fil. Hd.
	892	L'Washer #6 Shakeproof

Item No.	Part No.		Description
16	45227	*	Blower (B1) Dayton # 40550, 110 cfm
	61127		Mounting Clip
	61994		Lead, Blower
	83131		Finger Guard, Dayton # 40551
	1763		Screw #8-32 x 1" Fil. Hd.
17	79107		Circuit Breaker (CB1, 2)
18	61101		Silicon Bridge Rectifier (CR1)
19	61107		Mounting Bracket, Bridge
	1304		Screw #8-32 x 5/16" Bd. Hd.
20	84112A		Diode, Blocking (CR3)
	1722		Screw #6-32 x 1/2" Hex Hd.
	1494		L'Washer #6 Shakeproof
	795		Nut #8-32 Hex
21	61103		Terminal Block
	61109		Marker Strip
	1312		Screw #8-32 x 1/2" Bd. Hd.
22	61993		Glow Lamp (DS1)

Parts Not Listed Above

61987	MS Connector and Leads
61999	Case, Power Supply
61998	Base Plate
88161	Cover
1487	Ground Bolt 1/4-20 x 7/8" Hex Hd.
889	L'Washer 1/4" Shakeproof
806A	Nut 1/4-20 Hex
881	L'Washer 1/4" Split Ring
853	Washer 5/16" Flat
84112A	Forward Diode (Replacement) ECG 6076
61140	Reverse Diode (Replacement) ECG 6077

* NOTE: 45227 blower has been replaced by the Dayton 40550 which is rated at 110 cfm and is used to make the power supply run cooler than the original blower did.