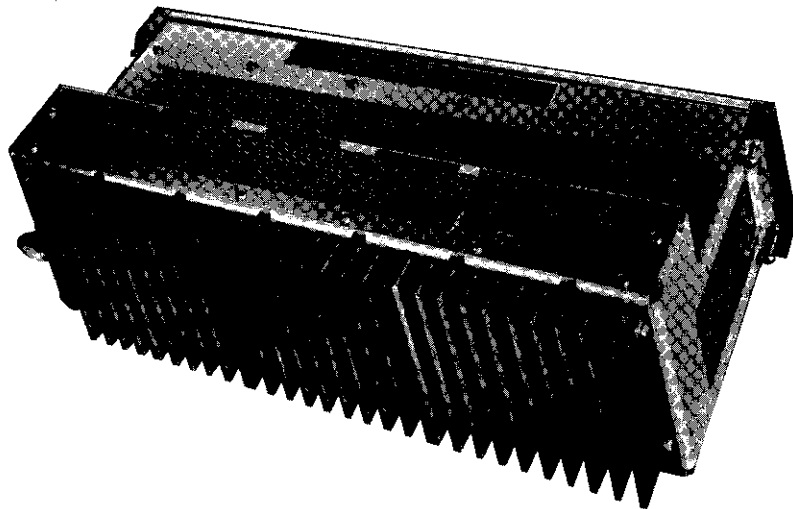


NSCL-ELECTRONIC

**INSTRUCTION MANUAL
MODEL AEC-320-9**



POWER DESIGNS INC.

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IMPORTANT

The Model AEC 320-9 bearing the serial number on the cover of this manual has been modified in accordance with a Supplement to TID-20893 (Rev. 4) "STANDARD NUCLEAR INSTRUMENT MODULES", July 1974. This Supplement dated November 1978, entitled "ADDENDUM AND ERRATA" provides for automatic remote sensing of the + and - 6 volt outputs through pins 4 and 8 of the Nuclear Instrument Bin/Power Supply interface connectors PG-13 and PG-14, if the bin is suitably wired for this service.

In old Bins, where this wiring is not provided, the Model AEC 320-9 will function such that the sensing points for the + and - 6 volt outputs will automatically be made at PG-14. The power supply output connector and regulation of the 6 volt outputs will be maintained at this connector in accordance with para. D "REGULATION" of page A-9 of Appendix A of Specification TID-20893 (Rev. 4).

Where the necessary wiring is provided in the Bin (A wire #22 awg should be connected between Pin 4 on PG-13 and the +6V bus at the Bin module connector bulkhead. Similarly a wire should be connected between Pin 8 on PG-13 and the -6V bus at the bulkhead), the Load regulation of the 6 volt outputs is improved by 20 millivolts or greater for a 10A load change at the Module connectors and the voltage drop in the PG-13/PG-14 connector pins (5-8 MV) is compensated for the same load change.

MODEL AEC-320-9
NIM POWER SUPPLY

1.1 GENERAL DESCRIPTION

The Model AEC-320-9 power supply is a ± 6 , ± 12 and ± 24 VDC source designed to mount at the rear of a modular instrumentation bin (NIM) in accordance with the AEC Report TID-20893 (Rev. 4).

The supply, exceeds the requirements of a Type V-H supply as described in the appendix of the specification, providing higher output currents and total VA.

When operated at an input voltage of 234 VAC, 117 VAC at 0.5A is available at the AC bin Busses.

Due to the restricted volume available and the high operational reliability required, only the highest quality components are utilized.

The mechanical package meets the requirements of the AEC Specification except for an increased depth to 8.5".

1.2 ELECTRICAL SPECIFICATIONS

1.2.1 INPUT

103-129V (117V nominal) 47-65HZ 350 watts or
206-258V (234V nominal) 47-65HZ 350 watts

1.2.2 OUTPUT

+ 24VDC, 0-1.5 Amperes current shared
- 24VDC, 0-1.5 Amperes current shared
Total combined currents must not exceed 2 Amperes

+ 12VDC, 0-3A current shared
- 12VDC, 0-3A current shared
Total combined currents must not exceed 4 Amperes

+ 6VDC, 0-10A current shared
- 6VDC, 0-10A current shared
Total combined currents must not exceed 10 Amperes

117VAC, 0-5A
Total power output capability
150 VA with equally shared currents
130 VA with unbalanced currents

1.3 MECHANICAL SPECIFICATIONS

- 1.3.1 Dimensions: See outline drawing PS-AEC-320-9-1
- 1.3.2 Weight: 25 lbs.
- 1.3.3 Shielding: The power supply is enclosed within an integral metal electrostatic shield. Portions of the shield assembly are screwed together with screws spaced no more than 3 inches apart. Dust covers are perforated with holes no larger than 0.16 inches diameter for convection cooling.
- 1.3.4 Assembly to NIM Bin: Slotted holes in the shield (dust covers) assemblies and adjustable mounting blocks at each end of the supply facilitate installation of the supply and maintain shielding integrity even with a distorted bin. See Section 2 of this manual for instructions.

1.4 REGULATION AND STABILITY

- 1.4.1 Short Term: After a 60 minute warmup, the DC output voltages do not depart from a band of .05% over the combined range of no load to full load and input voltages of 88% to 110% of nominal over any 24 hour period, at constant ambient temperature.
- 1.4.2 Long Term: Under constant load, input line voltage and ambient temperature, the DC output voltages do not drift more than $\pm 0.3\%$ over a six month period after an initial warmup of 24 hours.

1.5 NOISE AND RIPPLE

The combined output noise and ripple on any DC output voltage does not exceed 3 millivolts peak-to-peak as observed on an oscilloscope with a 50 MHz bandwidth.

1.6 TEMPERATURE

- 1.6.1 Operating: 0-50 °C without derating. Derates 3%/°C for temperatures to 60 °C maximum. Ambient temperature is defined as the existing one foot from the rear of the supply.
- 1.6.2 Storage: - 40 °C to + 85 °C
- 1.6.3 Temperature Coefficient: The change in any output voltage for changes in ambient temperature is less than .01%/°C.

1.7 OUTPUT IMPEDANCE

The output impedance of any DC voltage sourced is less than 0.3 ohms at any frequency to 100 KHz.

1.8 RECOVERY TIME

The DC output voltages will recover to the levels indicated in the following table within 100 microseconds for step changes in load current having a rise or fall time of one ampere per microsecond.

OUTPUT	MIN. LOAD	CURRENT CHANGE	VOLTAGE FROM NOMINAL (IN 100 us)
± 6V	0.5A	4.5A	.06V
± 12V	0.2A	1.8A	.012V
± 24V	0.1A	0.9A	.024V

NOTES:

1. All semiconductor components are silicon and of hermetically sealed construction and are inspected for compliance to specifications on a 100% basis.
2. Semiconductors are derated to at least 50% of manufacturers voltage and current rating and 25% of power rating.
3. Electrolytic capacitors are computer grade with minimum 10 year operating life and 2 year shelf life at ambient temperatures of 95 °C. Tantalum capacitors are CS-13 hermetically sealed units.
4. Resistors ½ watt or less are 1% high stability metal film types (except for bleeder and R/C networks). Resistors over ½ watt are wirewound and derated to 50% of manufacturers ratings.
5. Voltage reference zeners have temperature coefficients lower than .002%/°C and I/F noise levels under 25 microvolts peak-to-peak.
6. Voltage adjusting trimmer potentiometers are hermetically sealed, military grade types.
7. Printed circuit board utilize flame retardant G11 glass woven base epoxy resin material with an operating temperature rating of 150 °C. The land side is coated with a clear epoxy varnish to protect the board against "bridging" of adjacent lands due to environmental contamination.
8. The power transformer utilizes Class F insulating materials and is designed for a 65 °C rise above a 95 °C ambient. Laminations are 29 GA. grain-oriented steel for minimum core losses.
9. All wire utilizes teflon insulation and conforms to Military Specification MIL-W-16878, Type E (600 Volt).
10. Each regulator system is protected with separate fuses against a failure mode which may result in a power transformer overload insufficient to blow a primary fuse but large enough to damage a transformer winding.
11. Output circuits of each source are protected against damage due to load faults which can short one output into another for indefinite periods of time.

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SECTION 2 INSTALLATION

2.1 INTERFACE CONNECTOR

The Model AEC-320-9 is furnished with a bin interface connector (PG-14) which facilitates assembly and removal. A mating connector (AMP Type 202650-2) should be incorporated in the Nuclear Instrument Module Bin. The wiring of these connectors is shown in the appended interface connection drawing. The drawing conforms to National Bureau of Standards Drawing ND-515 (Rev. L).

2.2 ASSEMBLING THE POWER SUPPLY TO THE BIN

The Model AEC-320-9 power supply mounting is designed to compensate for slight mechanical variations in the Bin. To facilitate mounting, use the following procedures (See outline drawing PS-AEC-320-9-1):

1. Connect the Power Supply connector PG-14 to the Bin connector, PG-13. Removal of the bottom dust cover of the Power Supply may facilitate the mating of the two connectors.
2. Loosen (about one-half turn) the screws (labels #1 and #2) holding the top and bottom dust covers to the supply.
3. Loosen (about one-half turn) the two 6-32 screws at each end of the supply which hold the mounting blocks to the chassis (#3).
4. Insert the captive screws into the mounting blocks and assemble the power supply to the Bin using the captive screws. Bring the captive screws snug, but do not Tighten them at this time.
5. Push the dust covers forward until they make solid contact with the bin connector bulkhead.
6. Push the mounting against the dust covers. Good contact between the mounting blocks, dust covers and bin bulkhead will insure good shielding.
7. Tighten the captive screws to lock the mounting blocks to the bin bulkhead.
8. Tighten the 6-32 screws holding the mounting blocks to the chassis.
9. Tighten the screws securing the dust covers to the chassis.

APPENDIX

GENERAL

This section contains the schematic diagram, a location of components drawing and an electrical parts list.

All electrical parts are listed in the sequence of their circuit designation numbers as shown on the schematic diagram.

All components used in the power supply or supplied as replacements are carefully inspected at the factory. Inspections are performed on a 100% basis or at AQL levels to Military Specification MIL-Q-9858 under which Power Designs, Inc. has been qualified.

All semiconductors are inspected on a 100% basis, not only for operating parameters, but also for critical characteristics related to reliability and predictable life expectancy. Some of these characteristics are observed when the device is taken beyond its normal operating regions. These test techniques have been developed under a "predictable reliability" program in operation at Power Designs, Inc. for the past twelve years. Under this program, quality control procedures are constantly revalued and updated as advances are made in solid state technology and experience is gained from field history.

Semiconductor manufacturers are continually modifying their products. Complete lines are discontinued to be replaced by devices having improved gain, operating voltage levels and frequency responses. The high gain, closed loop DC amplifiers used in regulator circuits are particularly sensitive to slight changes in these parameters. Commercial or military "equivalent" transistors may affect the performance of the power supply. We can assure compliance with the original specifications if replacement semiconductors are ordered from the factory.

All replacement semiconductors are processed and stocked at the factory to insure complete interchangeability with the devices in the original equipment.

When ordering replacements, please identify the device as thoroughly as possible, giving the model and serial number if available.

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ELECTRICAL PARTS LIST

Circuit Number	Description	Part Number
C101	Capacitor, ceramic, 0.1 mf, 600 vdc	CC-37-6
C102	Capacitor, electrolytic, 41,000 mf, 18 vdc	CE-413-18
C103	Capacitor, plastic film, 0.0022 mf, 200 vdc	CP-A0022-2
C104	Capacitor, plastic film, 0.01 mf, 200 vdc	CP-16-2
C105	Capacitor, ceramic, 390 pf, 1000 vdc	DD-391
C106	Capacitor, tantalytic, 6.8 mf, 35 vdc	CE-6A8-35
C107	Capacitor, electrolytic, 350 mf, 10 vdc	CEX-350-10
C108, C109	Capacitor, tantalytic, 33 mf, 10 vdc	CE-33-10
C110	Capacitor, tantalytic, 6.8 uf, 35 vdc	CE-6A8-35
C111	Capacitor, ceramic, 680 pf, 200 vdc	CP-27-2
C112	Capacitor, tantalytic, 6.8 mf, 35 vdc	CE-6A8-35
C201	Capacitor, electrolytic, 41,000 mf, 18 vdc	CE-413-18
C202	Capacitor, plastic film, 0.0022 mf, 200 vdc	CP-A0022-2
C203	Capacitor, plastic film, 0.033 mf, 200 vdc	CP-18-2
C204	Capacitor, ceramic, 330 pf, 100 vdc	CCT-330P-101
C205	Capacitor, tantalytic, 6.8 mfd, 30 vdc	CE-6A8-35
C206	Capacitor, electrolytic, 350 mf, 10 vdc	CEX-35-10
C207, C208	Capacitor, tantalytic, 33 mf, 10 vdc	CE-33-10
C209	Capacitor, tantalytic, 6.8 uf, 35 vdc	CE-6A8-35
C210	Capacitor, plastic film, 0.0022 uf, 200 vdc	CP-A0022-2
C211	Capacitor, tantalytic, 6.8 mf, 35 vdc	CE-6A8-35
C301	Capacitor, ceramic, 0.1 mf, 600 vdc	CC-37-6
C302	Capacitor, electrolytic, 3200 mf, 30 vdc	CE-322-30
C303	Capacitor, plastic film, 0.01 mf, 200 vdc	CP-16-2
C304	Capacitor, ceramic, 330 pf, 100 vdc	CCT-330P-101
C305	Capacitor, tantalytic, 6.8 mf, 35 vdc	CE-6A8-35
C306	Capacitor, electrolytic, 260 mf, 15 vdc	CEX-260-15
C307, C308	Capacitor, tantalytic, 33 mf, 10 vdc	CE-33-10
C401	Capacitor, electrolytic, 3200 mf, 30 vdc	CE-322-30
C402	Capacitor, plastic film, 0.0022 mf, 200 vdc	CP-A0022-2
C403	Capacitor, ceramic, 150 pf, 100 vdc	CCT-150P-101
C404	Capacitor, tantalytic, 6.8 mf, 35 vdc	CE-6A8-35
C405	Capacitor, electrolytic, 260 mf, 15 vdc	CEX-260-15
C406, C407	Capacitor, tantalytic, 33 mf, 10 vdc	CE-33-10
C501	Capacitor, ceramic, 0.1 mf, 600 vdc	CC-37-6
C502	Capacitor, electorlytic, 1500 mf, 50 vdc	CE-152-50
C503	Capacitor, plastic film, 0.0047 mf, 200 vdc	CP-26-2
C504	Capacitor, tantalytic, 1 mf, 35 vdc	CE-1-35
C505	Capacitor, electrolytic, 140 mf, 25 vdc	CEX-140-25
C506, C507	Capacitor, tantalytic, 33 mf, 10 vdc	CE-33-10
C601	Capacitor, electrolytic, 3200 mf, 30 vdc	CE-322-30
C602	Capacitor, plastic film, 0.0022 mf, 200 vdc	CP-A0022-2
C603	Capacitor, tantalytic, 1 mf, 35 vdc	CE-1-35
C604	Capacitor, electrolytic, 140 mf, 25 vdc	CEX-140-25
C605, C606	Capacitor, tantalytic, 33 mf, 10 vdc	CE-33-10
CR101	Rectifier Bridge	VB225-F
CR102	Diode, silicon	FS88
CR103	Diode, silicon	SI-5A2
CR104	Diode, silicon	GI-44A
CR201	Diode, silicon	FS88
CR202	Diode, silicon	SI-5A2
CR203	Rectifier, silicon controlled	MS9918-2
CR204	Diode, silicon	GI-44A
CR301	Rectifier Bridge	VS248X
CR302	Diode, silicon	GI-44
CR303	Diode, silicon	SI-5A2
CR401	Diode, silicon	GI-44
CR402	Diode, silicon	SI-5A2
CR501	Rectifier Bridge	VS248X
CR502	Diode, sillocn	SI-5A2
CR601	Diode, silicon	SI-5A2

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ELECTRICAL PARTS LIST

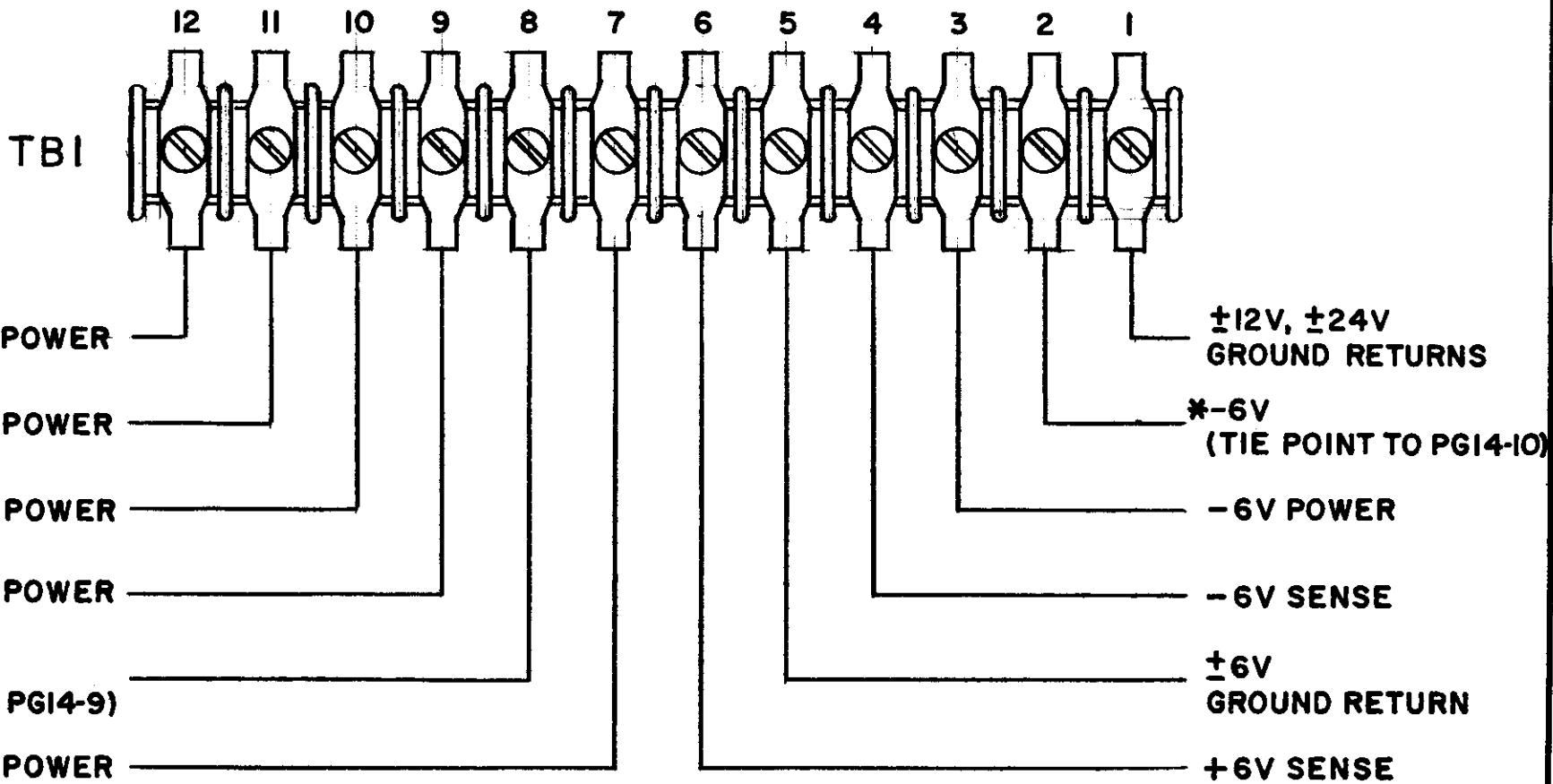
Circuit Number	Description	Part Number
F1, F2	117V Operation: Fuse, 5 A, Slo-Blo	MDX-5
F1, F2	234V Operation: Fuse, 3 A, Slo-Blo	MDA-3
F101	Fuse, 15 A, fast-blo	AGC-15
F201	Fuse, 15 A, fast-blo	AGC-15
F301	Fuse, 5 A, fast-blo	300108
F401	Fuse, 5 A, fast-blo	300108
F501	Fuse, 3 A, fast-blo	300106
F601	Fuse, 3 A, fast-blo	300106
J1	Connector, receptacle	201359-3
P1	Connector, plug	200512-3
PG14	Connector, receptacle	202651-2
Q101	Transistor, silicon, NPN	ID1700
Q102, Q103	Transistor, silicon, NPN	SD1700C
Q104	Transistor, silicon, NPN	MS2270/U
Q105	Transistor, silicon, PNP	RA1028A
Q201	Transistor, silicon, PNP	SD6945A
Q202, Q203	Transistor, silicon, PNP	MS6945
Q204, Q205	Transistor, silicon, PNP	RA1028A
Q301	Transistor, silicon, NPN	ID1700
Q302	Transistor, silicon, NPN	SD1700C
Q303	Transistor, silicon, NPN	TI2270/U
Q401	Transistor, silicon, PNP	SD6945A
Q402	Transistor, silicon, PNP	MS6945
Q403	Transistor, silicon, PNP	RA1028A
Q501	Transistor, silicon, PNP	MS6945
Q502	Transistor, silicon, NPN	MS2270/U
Q503	Transistor, silicon, NPN	TI2270/U
Q504, Q505, Q506	Transistor, silicon, PNP	RA1028A
Q601	Transistor, silicon, NPN	ID1700
Q602	Transistor, silicon, PNP	2N4234
Q603	Transistor, silicon, PNP	RA1028A
Q604, Q605, Q606	Transistor, silicon, NPN	TI2270/U
R101	Resistor, wire wound, 100 ohm, $\pm 5\%$, 3w	RW-101-3KA
R102	Resistor, composition, 27 ohm, $\pm 10\%$, 1/2w	EB2701
R103	Resistor, composition, 100 ohm, $\pm 10\%$, 1/2w	EB1011
R104	Resistor, precision, metal film, 2.6K ohm, $\pm 1\%$, 1/4w	RD-262-1QA
R105, R106	Resistor, precision, metal film, 365 ohm, $\pm 1\%$, 1/4w	RD-3650-1QA
R107	Resistor, precision, metal film, 12.1K ohm, $\pm 1\%$, 1/4w	RD-1212-1QA
R108	Resistor, composition, 56 ohm, $\pm 10\%$, 1/2w	EB5601
R109	Resistor, wire wound, 100 ohm, $\pm 5\%$, 3w	RW-101-3KA
R11	Resistor, composition, 4.7K ohm, $\pm 10\%$, 1/2w	EB4721
R111	Resistor, composition, 330 ohm, $\pm 10\%$, 1/2w	EB3311
R112	Resistor, composition, 1K ohm, $\pm 10\%$, 1/2w	EB1021
R113	Resistor, precision, metal film, 604 ohm, $\pm 1\%$, 1/4w	RD-6040-1QA
R114	Resistor, wire wound, trimmer, 500 ohm, $\pm 5\%$, 1w	RWT-501-3BHS
R115	Resistor, precision, metal film, 3.92K ohm, $\pm 1\%$, 1/4w	RD-3921-1QA
R116	Resistor, composition, 82 ohm, $\pm 10\%$, 1/2w	EB8201
R117	Resistor, composition, 100 ohm, $\pm 10\%$, 1/2w	EB1011
R118	Resistor, composition, 680 ohm, $\pm 10\%$, 1/2w	EB6811
R119, R120	Resistor, wire wound, 0.1 ohm, $\pm 10\%$, 7w	RW-F1-4RA
R121	Resistor, wire wound, trimmer, 5K ohm, $\pm 10\%$, 11/4w	RWTP-502-C4
R122	Resistor, composition, 27 ohm, $\pm 10\%$, 1/2w	EB2701
R123	Resistor, composition, 47 ohm, $\pm 10\%$, 1/2w	EB4701
R124, R125	Resistor, composition, 2.7 ohm $\pm 10\%$ 1/2w	EB27G1

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ELECTRICAL PARTS LIST**

Circuit Number	Description	Part Number
R201	Resistor, wire wound, 100 ohm, $\pm 5\%$, 3w	RW-101-3KA
R202	Resistor, composition, 330 ohm, $\pm 10\%$, 1/2w	EB3311
R203	Resistor, composition, 27 ohm, $\pm 10\%$, 1/2w	EB2701
R204	Resistor, precision, metal film, 2.6K ohm, $\pm 1\%$, 1/4w	RD-262-1QA
R205, R206	Resistor, precision, metal film, 365 ohm, $\pm 1\%$, 1/4w	RD-3650-1QA
R207	Resistor, precision, metal film, 12.1K ohm, $\pm 1\%$, 1/4w	RD-1212-1QA
R208	Resistor, composition, 56 ohm, $\pm 10\%$, 1/2w	EB5601
R209	Resistor, wire wound, 100 ohm, $\pm 5\%$, 3w	RW-101-3KA
R210	Resistor, composition, 4.7K ohm, $\pm 10\%$, 1/2w	EB4721
R211	Resistor, composition, 330 ohm, $\pm 10\%$, 1/2w	EB3311
R212	Resistor, composition, 1k ohm, $\pm 10\%$, 1/2w	EB2021
R213	Resistor, precision, metal film, 3.92K ohm, $\pm 1\%$, 1/4w	RD-3921-1QA
R214	Resistor, wire wound, trimmer, 500 ohm, $\pm 5\%$, 1w	RWT-501-3BHS
R215	Resistor, precision, metal film, 604 ohm, $\pm 1\%$, 1/4w	RD-6040-1QA
R216	Resistor, composition, 82 ohm, $\pm 10\%$, 1/2w	EB8201
R217	Resistor, composition, 100 ohm, $\pm 10\%$, 1/2w	EB1011
R218	Resistor, composition, 82 ohm, $\pm 10\%$, 1/2w	EB1011
R219	Resistor, composition, 100 ohm, $\pm 10\%$, 1/2w	EB8201
R220	Resistor, composition, 330 ohm, $\pm 10\%$, 1/2w	EB3311
R221	Resistor, wire wound, trimmer, 5K ohm, $\pm 10\%$, 11/4w	RWTP-502-C4
R222, R223	Resistor, wire wound, 0.1 ohm, $\pm 10\%$, 7w	RW-F1-4RA
R224	Resistor, composition, 27 ohm, $\pm 10\%$, 1/2w	EB2701
R301	Resistor, composition, 5.6K ohm, $\pm 10\%$, 1/2w	EB5621
R302	Resistor, composition, 470 ohm, $\pm 10\%$, 1/2w	EB4711
R303	Resistor, composition, 100 ohm, $\pm 10\%$, 1/2w	EB1011
R304	Resistor, precision, metal film, 280 ohm, $\pm 1\%$, 1/4w	RD-281-1QA
R305	Resistor, precision, metal film, 2.15K ohm, $\pm 1\%$, 1/4w	RD-2151-1QA
R306	Resistor, wire wound, 0.6 ohm, $\pm 5\%$, 10w	RW-F6-3EA
R307	Resistor, composition, 560 ohm, $\pm 10\%$, 1/2w	EB5611
R308	Resistor, precision, metal film, 750 ohm, $\pm 1\%$, 1/4w	RD-751-1QA
R309	Resistor, wire wound, trimmer, 500 ohm, $\pm 5\%$, 1w	RWT-501-3BHS
R310	Resistor, precision, metal film, 1.3K ohm, $\pm 1\%$, 1/4w	RD-132-1QA
R311	Resistor, precision, metal film, 1.74K ohm, $\pm 1\%$, 1/4w	RD-1741-1QA
R312	Resistor, composition, 1k ohm, $\pm 10\%$, 1/2w	EB1021
R313	Resistor, composition, 220 ohm, $\pm 10\%$, 1/2w	EB2211
R401	Resistor, composition, 5.6K ohm, $\pm 10\%$, 1/2w	EB5621
R402	Resistor, composition, 470 ohm, $\pm 10\%$, 1/2w	EB4711
R403	Resistor, composition, 100 ohm, $\pm 10\%$, 1/2w	EB1011
R404	Resistor, precision, metal film, 2.15K ohm, $\pm 1\%$, 1/4w	RD-2151-1QA
R405	Resistor, precision, metal film, 280 ohm, $\pm 1\%$, 1/4w	RD-281-1QA
R406	Resistor, wire wound, 0.6 ohm, $\pm 5\%$, 10w	RW-F6-3EA
R407	Resistor, composition, 1K ohm, $\pm 10\%$, 1/2w	EB1021
R408	Resistor, precision, metal film, 750 ohm, $\pm 1\%$, 1/4w	RD-751-1QA
R409	Resistor, precision, metal film, 1.74K ohm, $\pm 1\%$, 1/4w	RD1741-1QA
R410	Resistor, precision, metal film, 1.3K ohm, $\pm 1\%$, 1/4w	RD-132-1QA
R411	Resistor, wire wound, trimmer, 500 ohm, $\pm 5\%$, 1w	RWT-501-3BHS
R412	Resistor, composition, 1K ohm, $\pm 10\%$, 1/2w	EB1021
R413	Resistor, composition, 10 ohm, $\pm 10\%$, 1/2w	EB1001
R501	Resistor, wire wound, 2.5K ohm, $\pm 5\%$, 3w	RW-252-3KA
R502	Resistor, composition, 100 ohm, $\pm 10\%$, 1/2w	EB1011
R503	Resistor, wire wound, 600 ohm, $\pm 5\%$, 3w	RW-601-3KA
R504	Resistor, precision, metal film, 1.5K ohm, $\pm 1\%$, 1/4w	RD-152-1QA
R505	Resistor, composition, 330 ohm, $\pm 10\%$, 1/2w	EB3311
R506	Resistor, precision, metal film, 12 ohm, $\pm 1\%$, 1/4w	RD-1240-1QA
R507	Resistor, precision, metal film, 2.43K ohm, $\pm 1\%$, 1/2w	RD2431-1A
R508	Resistor, wire wound, 1 ohm, $\pm 5\%$, 7w	RW-010-3'A
R509	Resistor, precision, metal film, 2.43K ohm, $\pm 1\%$, 1/4w	RD2431-1QA
R510	Resistor, precision, metal film, 2.74K ohm, $\pm 1\%$, 1/4w	RD-2741-1QA
R511	Resistor, precision, metal film, 604 ohm, $\pm 1\%$, 1/4w	RD-6040-1QA
R512	Resistor, precision, metal film, 1.58K ohm, $\pm 1\%$, 1/4w	RD-1581-1QA
R513	Resistor, precision, metal film, 3.92K ohm, $\pm 1\%$, 1/4w	RD-3921-1QA
R514	Resistor, wire wound, trimmer, 1K ohm, $\pm 5\%$, 1w	RWT-102-3BHS

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ELECTRICAL PARTS LIST**


Circuit Number	Description	Part Number
R601	Resistor, wire wound, 2.5K ohm, $\pm 5\%$, 3w	RW-252-3KA
R602	Resistor, composition, 100 ohm, $\pm 10\%$, 1/2w	EB1011
R603	Resistor, wire wound, 600 ohm, $\pm 5\%$, 3w	RW-601-3KA
R604	Resistor, composition, 3.9K ohm, $\pm 10\%$, 1/2w	EB3921
R605	Resistor, precision, metal film, 1.5K ohm, $\pm 1\%$, 1/4w	RD-152-1QA
R606	Resistor, precision, metal film, 2.43K ohm, $\pm 1\%$, 1/2w	RD-2431-1A
R607	Resistor, precision, metal film, 12 ohm, $\pm 1\%$, 1/4w	RD-1240-1QA
R608	Resistor, wire wound, 1 ohm, $\pm 5\%$, 7w	RW-010-3RA
R609	Resistor, precision, metal film, 2.43K ohm, $\pm 1\%$, 1/4w	RD2431-1QA
R610	Resistor, precision, metal film, 2.74K ohm, $\pm 1\%$, 1/4w	RD-2741-1QA
R611	Resistor, precision, metal film, 604 ohm, $\pm 1\%$, 1/4w	RD-6040-1QA
R612	Resistor, wire wound, trimmer, 1K ohm, $\pm 5\%$, 1w	RWT-102-3BHS
R613	Resistor, precision, metal film, 3.92K ohm, $\pm 1\%$, 1/4w	RD-3921-1QA
R614	Resistor, precision, metal film, 1.58K ohm, $\pm 1\%$, 1/4w	RD-1581-1QA
S1	Thermostat (normally closed) Open - 275 °F ± 7 °F Close - 245 °F ± 10 °F	STH-2
S2	Thermostat (normally open) Open - 152 °F ± 5 °F Close - 176 °F ± 6 °F	STH-7
T1	Transformer	TTM-AEC-320-9-100
TB1	Terminal Block	PS-AEC320-9-40
U101	Integrated circuit	UA-3403DC
U301	Integrated circuit	RC741D
U401	Integrated circuit	RC741D
VR101	Diode, silicon, zener	IN825G-K
VR102	Diode, silicon, zener	IN825J, K
VR201	Diode, silicon, zener	IN825G-K
VR202	Diode, silicon, zener	IN825J, L
VR301, VR302	Diode, silicon, zener	IN825G-K
VR401, VR402	Diode, silicon, zener	IN825G-K
VR501	Diode, silicon, zener	SV359E-G
VR502	Diode, silicon, zener	IN825G-K
VR601	Diode, silicon, zener	SV359E-G
VR602	Diode, silicon, zener	IN825G-K
	Line Cord	B72026-2



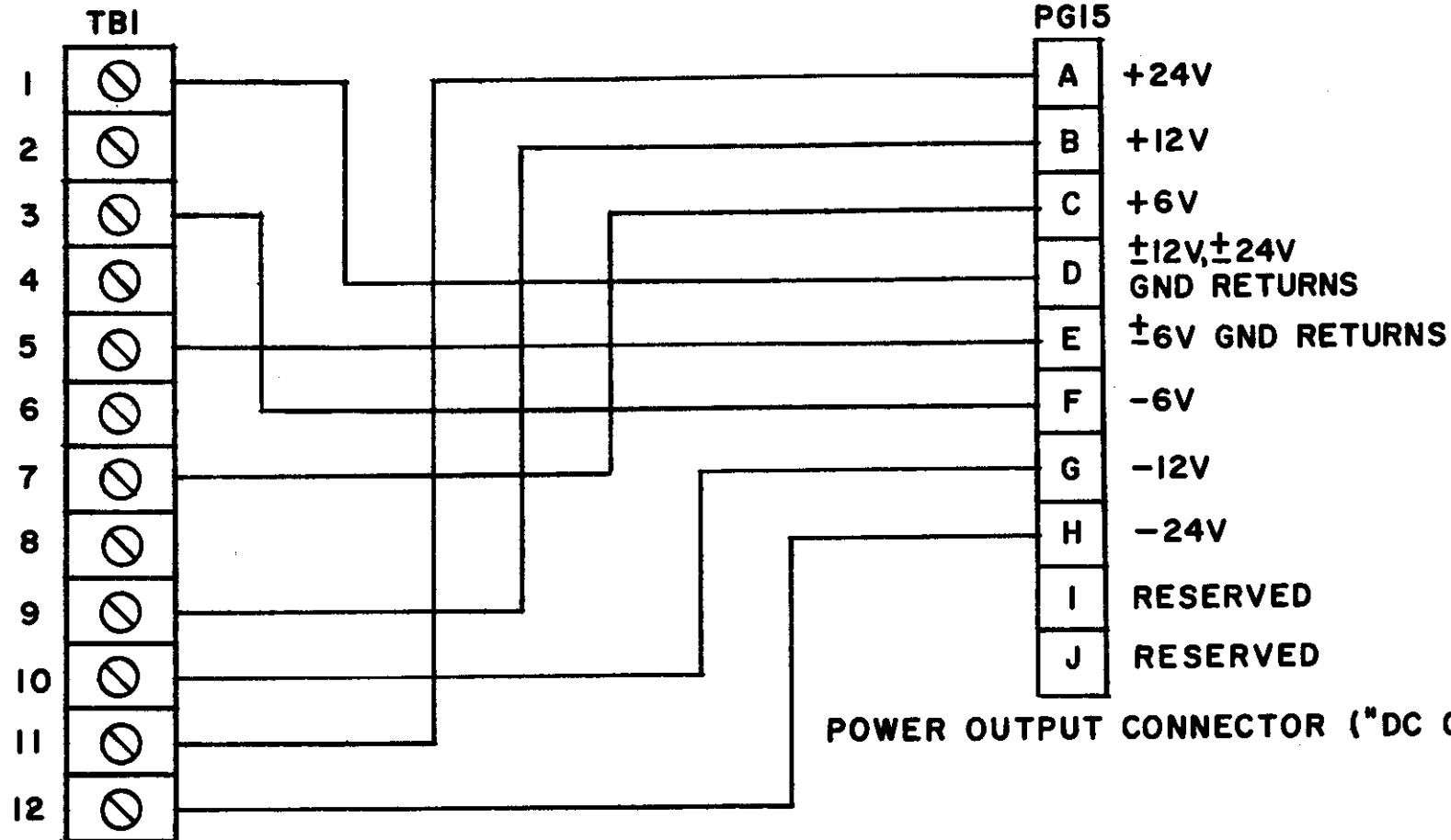
* TIE POINT ONLY, SHOULD NOT BE USED FOR POWER.
 ** LOCATED UNDERNEATH TOP DUST COVER.

DO NOT SCALE THIS DRAWING

UNLESS OTHERWISE SPECIFIED		
TOLERANCES	FRACTIONAL ± 1/64	DECIMAL ANGLES ± .005 ± 0°30'
DIMENSIONS AND TOLERANCES TO BE HELD		
REMOVE ALL BURRS AND SHARP EDGES		

A RELEASED		APPRO. DATE
SYM.	DESCRIPTION	APPRO. DATE
REVISIONS		
DRAWING NO. PS-AEC320-9-41		REV. A
TITLE OUTPUT ACCESS		
TERMINAL BLOCK **		SCALE -#
DRAWN #	CHECKED	APPROVED
DATE 7/26/79	DATE	DATE 7/26/79
		POWER DESIGNS INC.
WESTBURY, NEW YORK		

973102A-18-IS



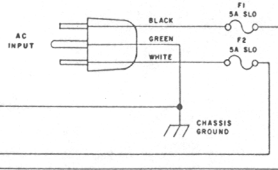
POWER OUTPUT CONNECTOR ("DC OUTPUT")

A	RELEASED	APPR.	DATE
SYM.	DESCRIPTION	APPR.	DATE
REVISIONS			
DRAWING NO. PS-AEC320-9-45			REV A
TITLE WIRING ASSEMBLY ROUTING CONNECTOR/COVER			
DRAWN HC	CHECKED	APPROVED	
DATE 9/18/79	DATE	DATE 9/26/79	
		POWER DESIGNS INC.	
WESTBURY, NEW YORK			

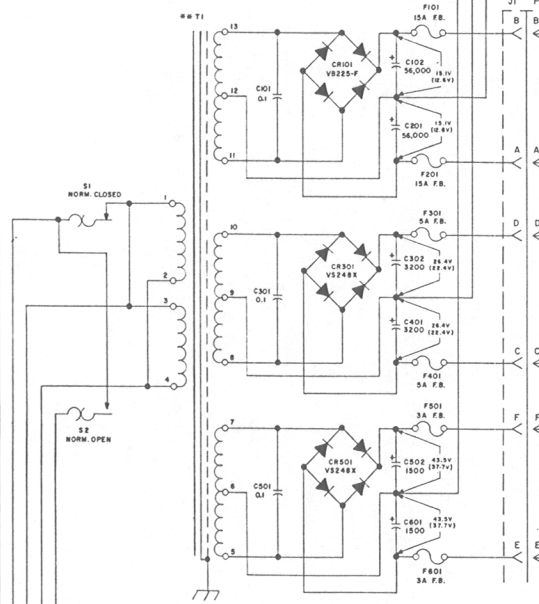
DO NOT SCALE THIS DRAWING

UNLESS OTHERWISE SPECIFIED
 TOLERANCES FRACTIONAL DECIMAL ANGLES
 $\pm 1/64$ $\pm .005$ $\pm 0^{\circ}30'$
 DIMENSIONS AND TOLERANCES
 TO BE HELD
 REMOVE ALL BURRS AND SHARP EDGES

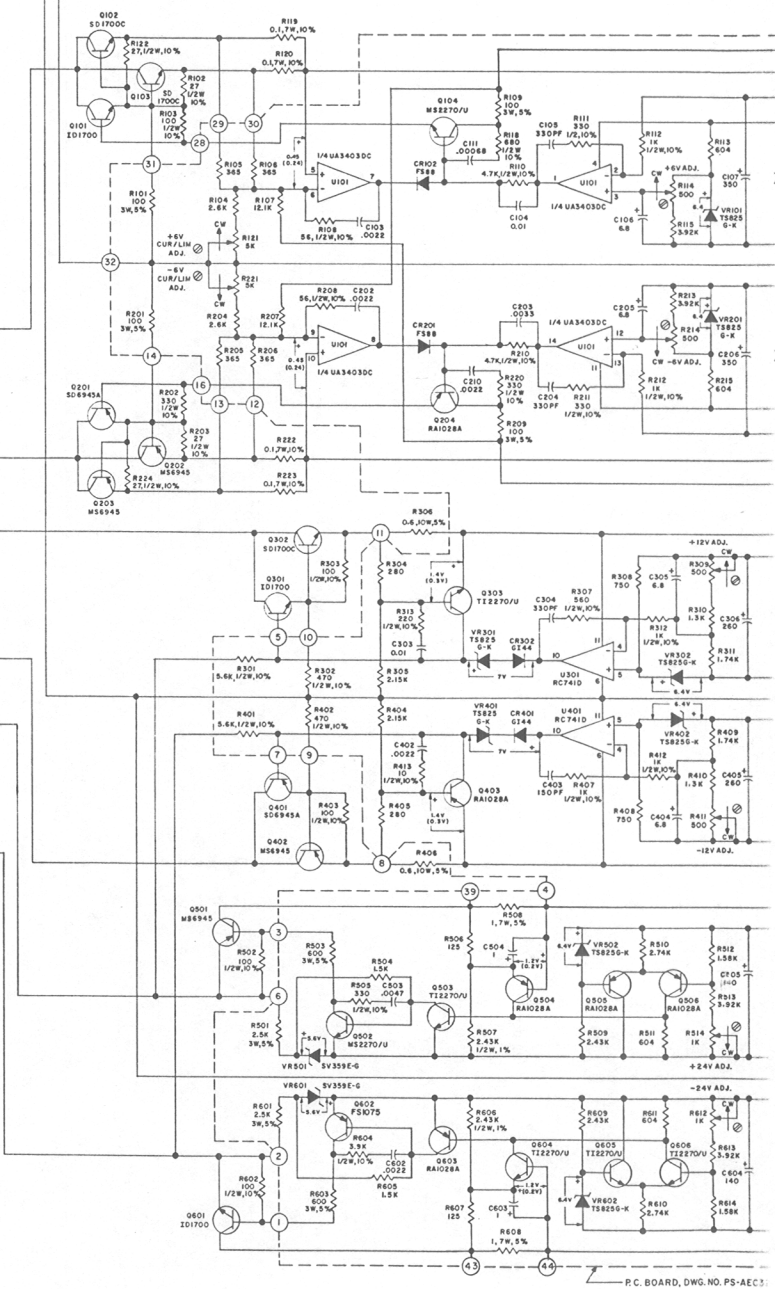
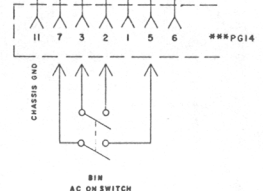
NOTE: AC LINE FUSES APPEAR ON ALL UNITS.
 FOR 117V OPERATION F1 & F2 ARE 5A, 250V SLO-BLO.
 FOR 234V OPERATION F1 & F2 ARE 3A, 250V SLO-BLO.



TRANSFORMER CONNECTED FOR 117V OPERATION
 FOR 234V OPERATION REMOVE JUMPERS BETWEEN TERMINALS
 1B3 AND 2B4. ADD JUMPER BETWEEN TERMINALS 2 & 3.



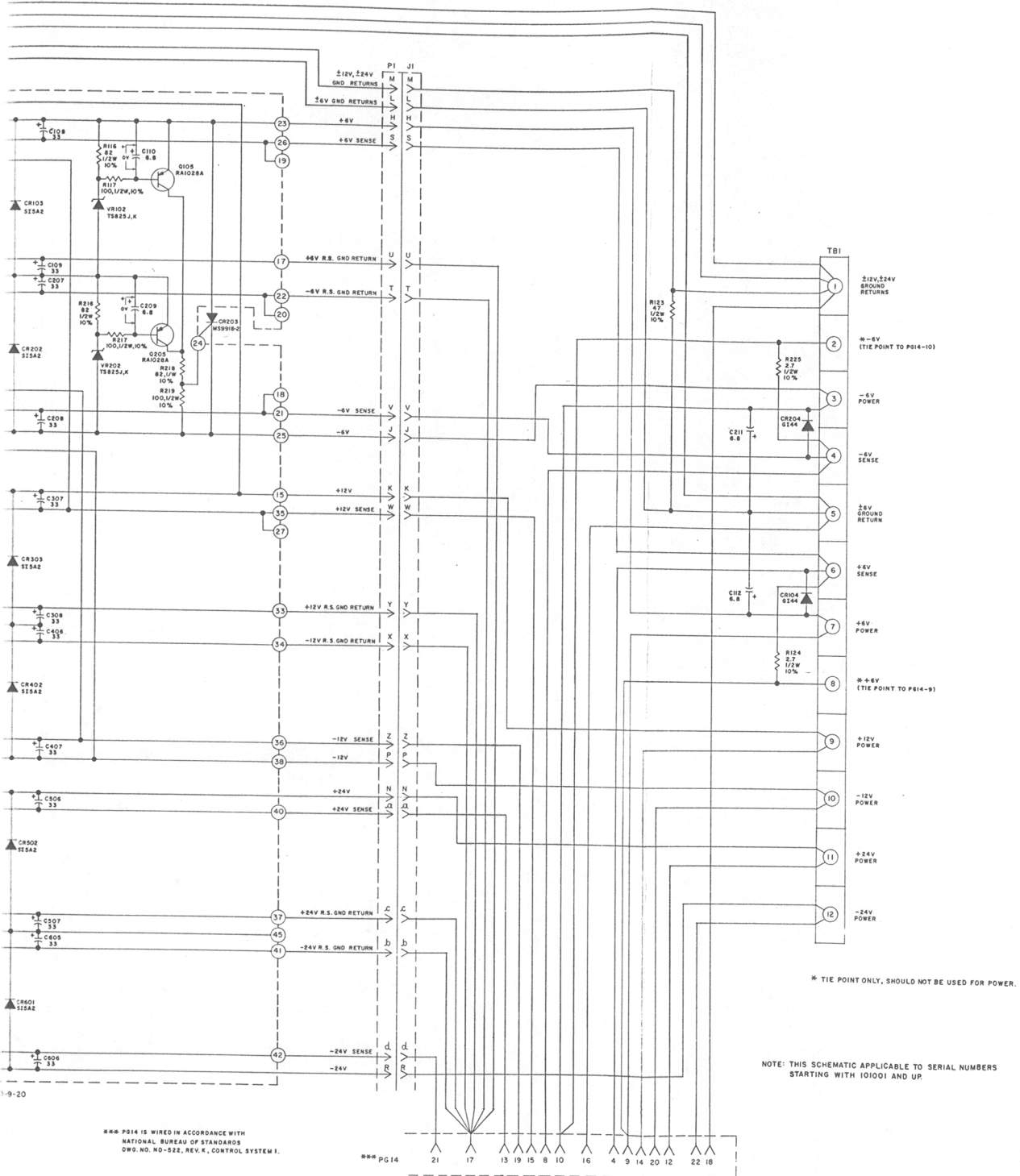
UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS ARE IN OHMS, 1/4W, 1%
 ALL CAPACITORS ARE IN MICROFARADS
 ALL VOLTAGES INDICATED ARE MEASURED AT 115V AC, 60HZ INPUT
 WITH OUTPUT VOLTAGES AS SHOWN. VOLTAGES INDICATED WITHOUT
 PARENTHESES ARE NO LOAD VOLTAGES. VOLTAGES INDICATED WITH
 PARENTHESES ARE FULL LOAD VOLTAGES WITH THE 2.24V SUPPLIES
 EACH LOADED TO 1 AMP. THE 5.12V SUPPLIES EACH LOADED TO 5 AMPS.
 AND THE 5.4V SUPPLIES EACH LOADED TO 5 AMPS. VOLTAGES ARE DC,
 UNLESS OTHERWISE INDICATED.



P.C. BOARD, DWG. NO. PS-AEC-1



BIN POWER CONNECTOR NOT PART OF POWER SUPPLY (SEE NO-S19 & NO-S22)



*** PG14 IS WIRED IN ACCORDANCE WITH NATIONAL BUREAU OF STANDARDS DWG. NO. NO-522, REV. K, CONTROL SYSTEM I.

*** PG14

* TIE POINT ONLY, SHOULD NOT BE USED FOR POWER.

NOTE: THIS SCHEMATIC APPLICABLE TO SERIAL NUMBERS STARTING WITH 101001 AND UP.

SHEET 1 OF 3 SHEETS

NOTICE
 PATENTS HAVE BEEN GRANTED PATENT APPLICATIONS ARE PENDING OR IN PROCESS OF PREPARATION ON THE PROPRIETARY PORTIONS OF THE CIRCUITS SHOWN ON THIS DRAWING. REPRODUCTION IN WHOLE OR IN PART MAY NOT BE MADE WITHOUT PERMISSION.

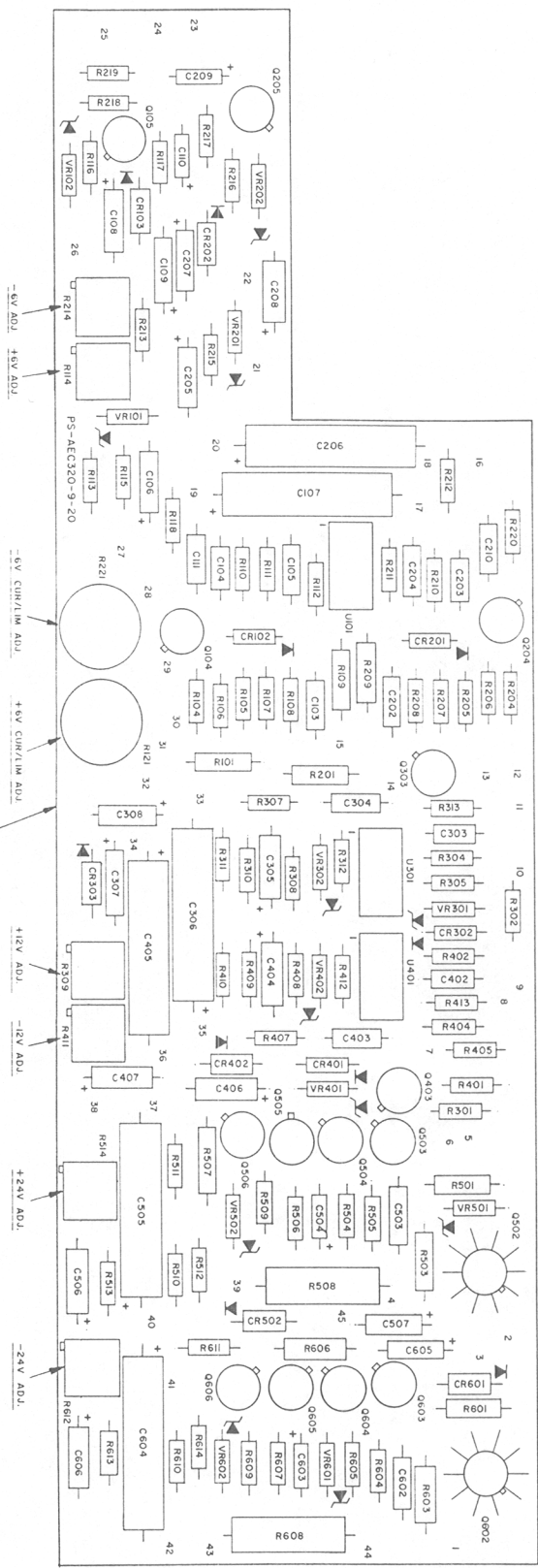
M	REVISED, ECN NO. 3221	
L	REVISED, ECN NO. 3151	
K	REVISED, ECN NO. 3144	
J	REVISED, ECN NO. 3044	
H	REVISED, ECN NO. 3020	
G	REVISED, ECN NO. 2991	
F	REVISED, ECN NO. 2943	
E	REVISED, ECN NO. 2837	
D	REVISED, ECN NO. 2845	
C	REVISED, ECN NO. 2694	
B	REVISED, ECN NO. 2725	
A	RELEASED	

DRAWING NO. PS-AEC320-9 2

TITLE SCHEMATIC MODEL AEC-320

DATE	CHECKED	APPROVED
DATE	DATE	DATE

Power Designs Inc.
 NEW YORK



PC BOARD, PS-AEC320-9-20

SHEET 3 OF 3

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
A					RELEASED
B					REVISED, ECN 2725
C					REVISED, ECN 2694
D					REVISED, ECN 2837
E					REVISED, ECN 2943
F					REVISED, ECN 2991
G					REVISED, ECN 3020
H					REVISED, ECN 3044
I					REVISED, ECN 3151
J					REVISED, ECN 3144
K					REVISED, ECN 3151
L					REVISED, ECN 3221
M					REVISED, ECN 3221

DRAWING NO. PS-AEC320-9-2
 TITLE LOCATION OF COMPONENTS
 MODEL AEC-320-9
 DATE 6/24/76
 POWER DESIGNERS, INC.
 NEW YORK, N.Y.

GUARANTEE

POWER DESIGNS INC. guarantees to the original purchaser, each instrument sold by us, or our authorized agents, and all the parts thereof, to be free from defects in material or workmanship under normal use and service within the specified ratings and operating conditions. The provisions of this warranty shall not apply to any product which has been subjected to misuse or which has been repaired or altered in any way by the purchaser.

POWER DESIGNS' obligations under this guarantee is hereby limited to the repair or replacement of the instrument, or part thereof, which is returned to us by the original owner within five (5) years after date of shipment, and which shall prove, after our examination to be defective. Certain product categories as listed are limited to a one (1) year guarantee. All other terms and conditions shall apply.

A minimum retest and inspection charge of \$50.00 will be applicable to units returned for repair in warranty unless the unit is found to be defective.

All products returned under warranty must be shipped prepaid to the factory with documentation explaining the malfunction noted. The units will be evaluated, repaired or replaced and promptly returned prepaid if warranty claims are substantiated.

Products covered by a five year guarantee include Regulated Low Voltage D.C. Laboratory Power Supplies; Precision Low Voltage Power Sources; Low Voltage NIM Power Sources.

Products covered by a one year guarantee include Precision High Voltage Power Sources; Modular High Voltage Power Sources; Special Purpose Power Sources: Custom OEM Power Supplies.

POWER DESIGNS INC., reserves the right to discontinue any instrument without notice, or to make modifications in design at any time, without incurring any obligation to make these modifications in instruments previously sold.

POWER DESIGNS INC
Westbury, L.I., New York