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MODELS
1001B & 1751B
POWER SOURCES

Instruction Manual

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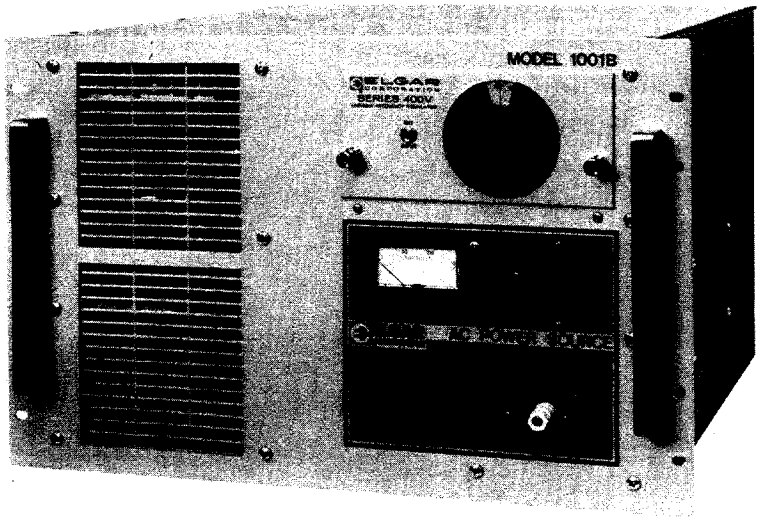
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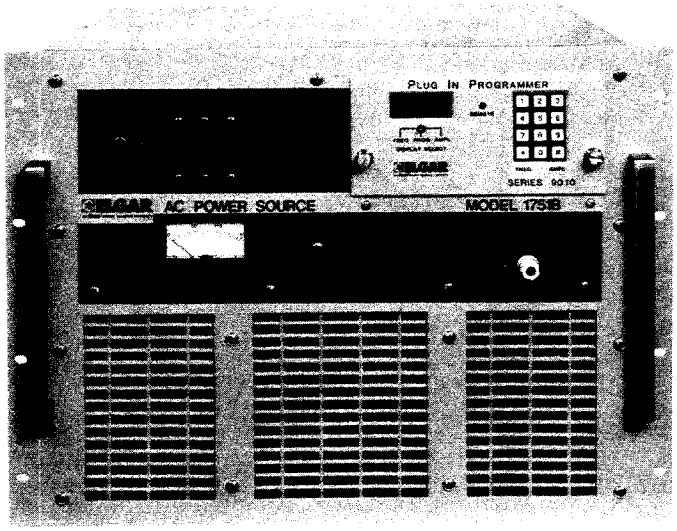
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MODELS 1001B & 1751B

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Paragraph Page

SECTION I
INTRODUCTION AND GENERAL DESCRIPTION

1-1 Scope of Manual 1-1
1-3 Introduction 1-1
1-7 General Description 1-1

SECTION II
SPECIFICATIONS

2-1 Chart of Specifications 2-1

SECTION III
OPERATION

3-1 Inspection 3-1
3-3 Installation and Operation 3-1
3-6 Input Power Reconnections 3-3

SECTION IV
THEORY OF OPERATION

4-1 Circuit Description 4-1
4-7 Power Supplies 4-2
4-9 Interconnections for Multiphase Operation 4-2

SECTION V
MAINTENANCE AND ADJUSTMENT

5-1 Service Information 5-1
5-3 Factory Repair 5-1
5-5 Test Points 5-1
5-7 Output Regulation Adjustment 5-1
5-9 Current Limit Adjustment 5-1
5-12 Periodic Maintenance 5-2
5-14 Troubleshooting 5-2

SECTION VI
PARTS LIST

6-1 General 6-1
6-3 Spare Parts Ordering 6-1

SECTION VII
DIAGRAMS

7-1 General 7-1
7-3 Diagrams (Overall Schematics for Models 1001B & 1751B) 7-1

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LIST OF ILLUSTRATIONS

Figure		Page
1-1	Power Output Derating	1-2
1-2	Typical Harmonic Distortion at Rated Power	1-2
3-1	Rear Panel Terminal Strip Connections	3-2
3-2	Input Power Reconnections	3-3
4-1	Interconnections for Multiphase Operation (Model 1751B)	4-3
4-2	Interconnections for Multiphase Operation (Model 1001B)	4-4
4-3	Vector Diagram	4-5
4-4	SS Series or Quasi-Square Vector Diagrams	4-6
4-5	Signal Routing Plug-In Connections	4-8
5-1	Top View Model 1001B	5-3
5-2	Top View Model 1751B	5-4
5-3	Circuit Board Parts Layout	5-5

LIST OF TABLES

2-1	Specifications Chart	2-1
5-1	Test Equipment Required	5-2

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SECTION I
INTRODUCTION AND GENERAL DESCRIPTION

1-1. SCOPE OF MANUAL

1-2. This manual describes the Models 1001B and 1751B Power Sources manufactured by Elgar Electronics Corporation. It provides operating, maintenance, and adjustment instructions; circuit descriptions; schematic diagrams; and parts lists.

1-3. INTRODUCTION

1-4. The Elgar Power Sources described in this manual provide AC power at precise frequencies for testing, motor operation, and frequency conversion. The basic power amplifier consists of two DC supplies and a direct coupled amplifier driving a tapped output transformer. Nominal output voltages of the two units are: 1001B, 0-65, 0-130, 0-260 VAC; 1751B, 0-32, 0-130 and 0-260 VAC. Total available output power for the two units respectively is, 1000VA and 1750VA at full rated output voltage. Output power at less than full rated voltage is derated as illustrated in Figure 1-1. Figure 1-2 illustrates a typical harmonic distortion curve. Input power for the Model 1751B is 115/200V three phase 47-63 Hz or 230V delta. The Model 1001B may be wired for either 115 or 230V input power, 47-63 Hz single phase.

1-5. Output power frequency is established by a plug-in oscillator. Output frequency range for these units is 45 Hz to 5 KHz. A variety of plug-in oscillators is available, with frequency accuracies up to .0001%.

1-6. These Elgar Power Sources facilitate equipment tests to meet military-specification operating requirements over the frequency range of 47 to 63 Hz or 47 to 425 Hz. The basic power source output is single phase, however, multi-phase power may be obtained by stacking two or three power sources, all driven by one multi-phase plug-in oscillator.

1-7. GENERAL DESCRIPTION

1-8. These Elgar Power Sources are contained in standard rack mount enclosures. A meter for output voltage monitoring, a power on indicator lamp, a voltage amplitude control and a power circuit breaker that applies line power to the unit are located on the front panel. Cooling air for the power amplifier is drawn through a front panel grill and exhausted at the rear of the enclosure.

1-9. The enclosure contains heatsink assemblies which comprise a two section power amplifier. Control circuitry is mounted on a plug-in circuit board with test points and adjustment controls available at the top of the board. Output power is available at a rear panel terminal block and at front-panel binding posts.

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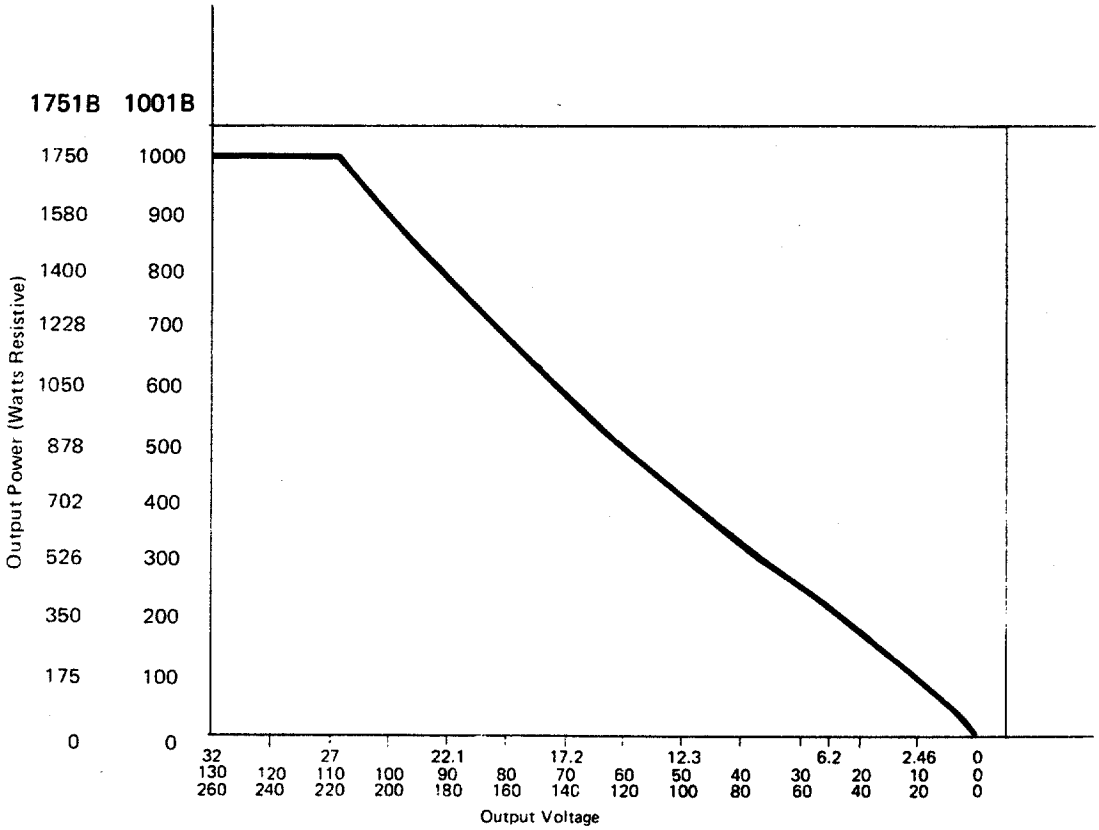


Figure 1-1. Power Output Derating

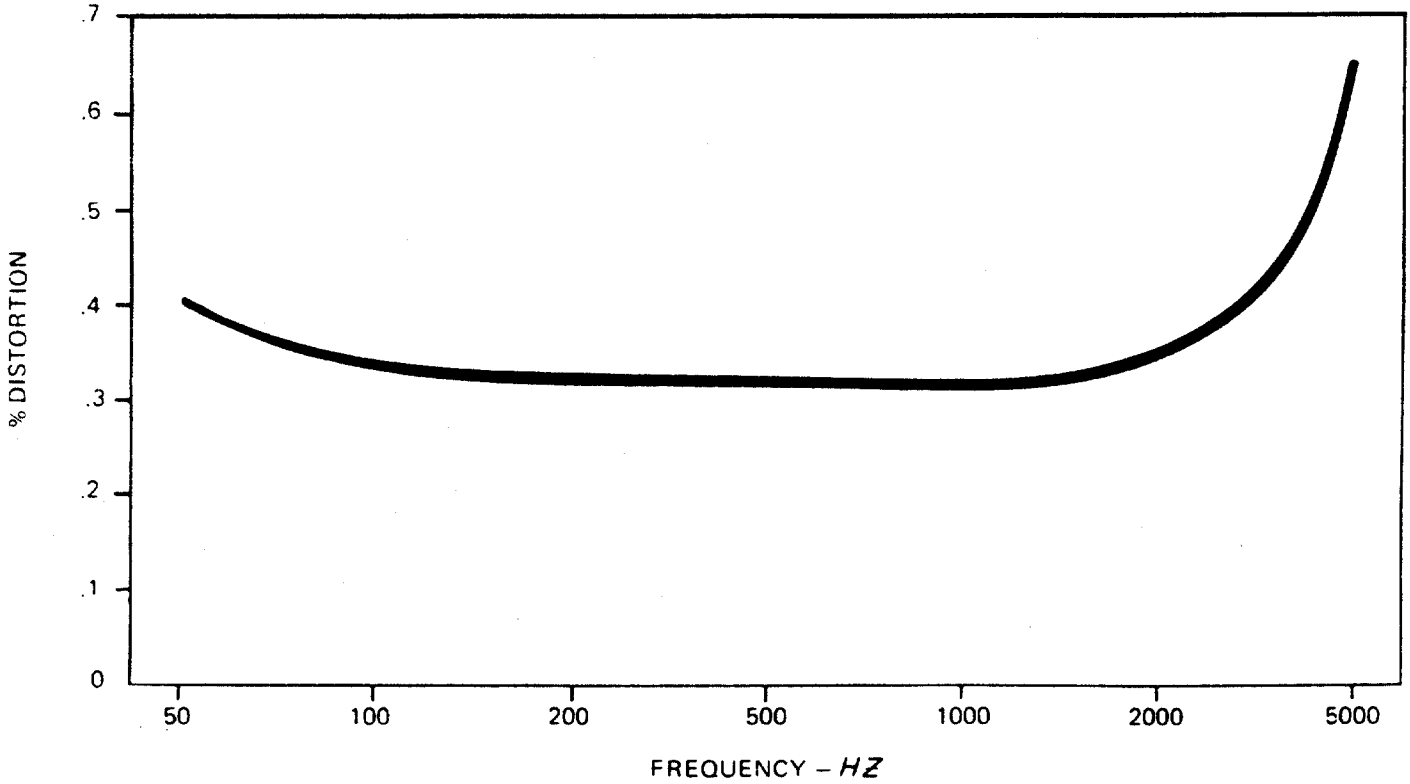


Figure 1-2. Typical Harmonic Distortion at Rated Power

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SECTION II
SPECIFICATIONS

	1001B	1751B
Output Power	0-1000VA	0-1750VA
Power Factor	Unity to ±.7	
Output Voltage (adjustable)	0-65 0-130 0-260	0-32 0-130 0-260
Output Frequency Range	45 Hz – 5 kHz	
Output Distortion	Less than .9% 45 Hz – 5 kHz Less than .5% 100 Hz – 1 kHz	
Output Noise	70 dB below full output	
Load Regulation	±1%, No load to full load over frequency range, adjustable to zero for specific load and frequency	
Line Regulation	±.25% for 10% input line change	
Output Protection	Overload and short circuit protected, output recovers immediately when overload or short is removed.	
Input Power	One Phase, 115 or 230VAC, 47-63 Hz	3 phase, 230 L-L, L-N, 208 L-L
Temperature Range	0 – 50°C	
Dimensions	12¼" x 19" x 20" deep	14" x 19" x 20" deep
Approximate Weights	190 lbs	225 lbs

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SECTION III
OPERATION

3-1. INSPECTION

3-2. The Elgar Power Source has been aligned and tested prior to shipment. The instrument is therefore ready for immediate use upon receipt. The following checks should be made, however, to assure that the instrument has suffered no damage during shipment.

1. Inspect the shipping container before accepting it from the carrier. If damage to the container is evident, remove the instrument from the container and visually inspect for damage to the instrument parts.

2. If any damage to the instrument or container is evident, a description of the damage should be noted on the carrier's receipt, and signed by the driver or carrier agent. Save all shipping containers and filler material for inspection.

3. Forward a report of any damage to the Elgar Repair Department, 9250 Brown Deer Road, San Diego, CA 92121-2294. Elgar will provide instructions for repair or replacement of the instrument.

3-3. INSTALLATION AND OPERATION

1. The Elgar Power Source is designed for installation in a standard electrical equipment rack. Install the power source so that the flow of cooling air into the front panel grill and out the rear panel grill is unobstructed.

2. Insert the plug-in oscillator.

3. Connect the load to the appropriate terminal of the rear panel power output terminal block (See Figure 3-1). For bench mounted applications, the front panel binding posts may be used for 115 or 230V output on all models.

4. Connect an input power cord on the rear panel to an appropriate source of single phase power,* for the 1001B, or three phase power for the 1751B.

5. Turn front panel power switch on. The pilot lamp illuminates indicating power is applied to the unit.

6. Adjust the front panel AMPLITUDE control for the desired output voltage as indicated on the front panel voltmeter.

*See main schematic for 115V or 230V input connections.

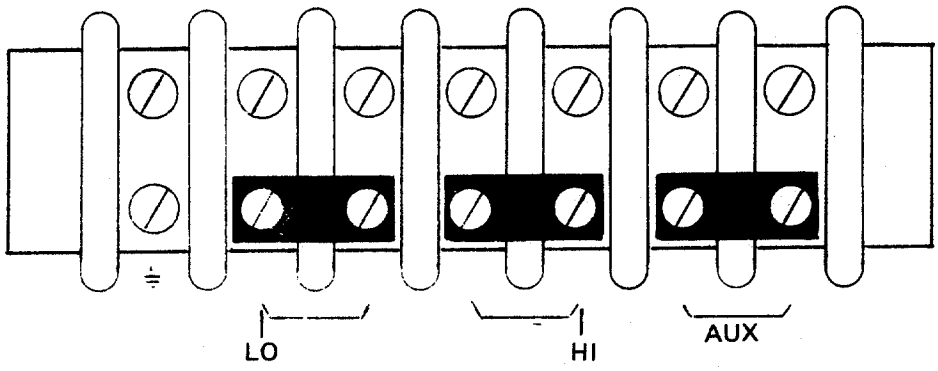
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NOTE

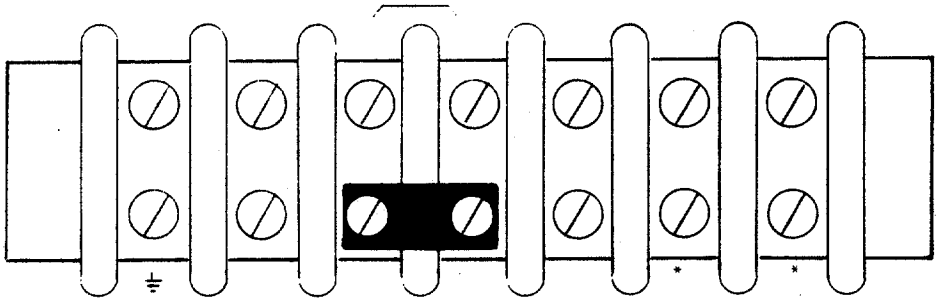
Certain Elgar plug-in oscillators do not require the use of the front panel AMPLITUDE control. Others are remotely programmed. Consult the oscillator instruction manual.

3-4. The front panel voltmeter is connected across a 0-130VAC winding of the output transformer. For the 0-260VAC connection, the meter indicates one half of the output voltage. When using the 0-30VAC output connection; 28V corresponds to a reading of approximately 115V on the front panel meter.

3-5. The output of these units is floating with respect to ground. They may be operated in this mode, or with either output terminal grounded. In either case, the low side of the output should not be operated off ground in excess of 300V.



PARALLEL JUMPER CONNECTIONS FOR 0, 32, and 130 VAC OPERATION



SERIES JUMPER CONNECTIONS FOR 260 VAC OPERATION

* THESE CONNECTIONS NOT ON 1001B, SEE PAGE 4-4

Figure 3-1. Rear Panel Terminal Strip Connections

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3-6. INPUT POWER RECONNECTIONS

A. To reconnect the 1001B for other input voltage – 115, 208, 230 ACV single phase available.

Model 1001B has input reconnection available inside the unit. (See schematic).

Remove top cover (refer to Figure 5-1) for location of TB2, the reconnection point. Rejumper per chart on schematic.

B. To reconnect Model 1751B for other input voltages (115V L-L, 115V L-N, 230V L-L, and 230V L-N three phase available).

Model 1751B has input reconnection available inside the unit. (See schematic).

Remove top cover (refer to Figure 5-2) for location of TB1, the reconnection point. Facing the left side of the unit, TB1 is designated 1 through 12, right to left. Rejumper per chart on schematic.

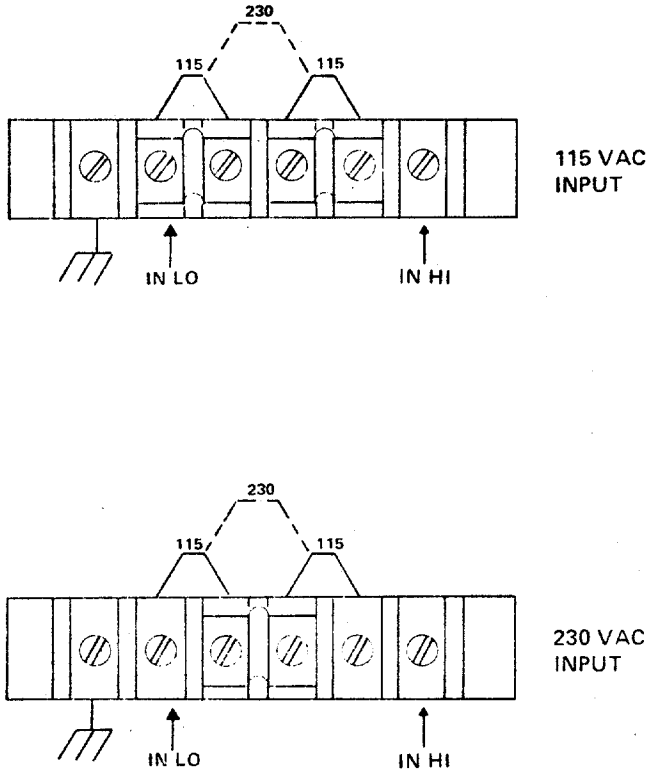


Figure 3-2. Input Power Reconnections

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SECTION IV
THEORY OF OPERATION

4-1. CIRCUIT DESCRIPTION

4-2. The input signal, approximately 3V RMS is normally supplied by an Elgar plug-in oscillator, however an external signal source may be used. For most oscillators, the input signal amplitude to the amplifier is controlled by front panel amplitude control R1. The oscillator signal is applied to the first amplifier stage consisting of differential amplifier Q101 and Q102. The differential amplifier receives feedback from the output amplifier, thereby maintaining approximately zero DC offset to the output transformer. The emitter currents are supplied by R106 from the +12V supply, regulated by CR101. The output of Q102 provides base drive for Q103, operating as a class A amplifier. Q103 supplied base drive for common emitter driver Q107 and emitter follower Q106. Diodes CR102-CR104 provide a small amount of forward bias to the output amplifier to minimize crossover distortion. Q106 and Q107 are drivers for emitter followers Q1 and Q2. These devices are located in the wind tunnel to provide the necessary cooling.

4-3. The power amplifier consists of a number of power transistors mounted on heatsink assemblies in the wind tunnel. The .22 ohm resistors in the emitter of each device are to ensure equal current sharing. The preamplifier and output stage are operated from nominal plus and minus 42 VDC supplies. Thermal switch S1 shown on heatsink No. 1 removes drive signal from the power amplifier in the event the amplifier overheats from excessive load or restricted airflow through the wind tunnel.

4-4. The power amplifier is also protected against overloads or short circuits on the output by current limit transistors Q104 and Q105. The current in the upper half of the power amplifier is sampled across R201 and applied to upper current limit adjustment potentiometer R126. The current signal is then applied to the base of Q104 through resistor R118. When the current signal at the base of Q104 reaches Q104's conduction threshold (approximately 0.6V), drive signal is diverted from Q106, preventing a further increase in output current delivered by the upper half of the power amplifier. Simultaneously the current in the lower half of the power amplifier is sampled across R7 and applied to the lower current limit adjustment potentiometer. This signal is then applied to the base of Q105 through resistor R119. When the current signal at the base of Q105 reaches Q105's conduction threshold, drive signal is diverted from the base of Q107, preventing a further increase in output current of the lower half of the power amplifier.

4-5. The amplifier output (TP-2) is connected to output transformer T2, which steps up the amplifier voltage (approximately 20VRMS) to the required output level. Negative AC feedback is taken from the amplifier output to the base of Q101 through resistor R109. Capacitor C105 across R109 helps stabilize the amplifier against high frequency instabilities.

4-6. Output load regulation is accomplished by passing the wire from the amplifier output through current transformer T3 to the output transformer. As load is applied to the output of the unit a positive

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feedback signal is developed at the secondary of T3 and applied across shunt resistor R125 and regulation adjustment potentiometer R124. This signal is then applied to the input of the differential amplifier through R103. Capacitor C102 and resistor R102 comprise a boost network to increase the positive feedback at the higher output frequency ranges to maintain regulation.

4-7. POWER SUPPLIES

4-8. Plus and minus 42V DC for the amplifier is developed by full wave bridge rectification at the secondary of T1. Filter capacitors and supply bleeder resistors are connected across the output of the bridge.

4-9. INTERCONNECTIONS FOR MULTI–PHASE OPERATION

4-10. Two or three sources may be interconnected to generate two or three phase AC power. Two or three phase signals are developed by a multiphase oscillator installed in the A phase power amplifier. Signals from the oscillator are routed to the B phase and/or C phase power amplifiers through a signal interconnect cable. These signals are then applied to the front panel amplitude control on each amplifier by the signal routing plug-in which must be installed in the unit(s). Upon initial calibration of the system the voltage of the A phase units is adjusted to some value (i.e.) 115VAC. The other phase amplifier(s) output voltages are then adjusted by means of their front panel amplitude controls to equal the output voltage of A phase. After this initial calibration has been accomplished, the voltage control on the A phase amplifier is used to vary the output voltage of all phases simultaneously and equally.

4-11. Two phase operation requires two power sources. Three phase operation may be accomplished with three power sources, two power sources in open delta configuration, or two power sources in phantom wye configuration. Refer to Figure 4-1 for output interconnect information for the various systems.

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OUTPUT CONFIGURATION FOR MODEL 1751B

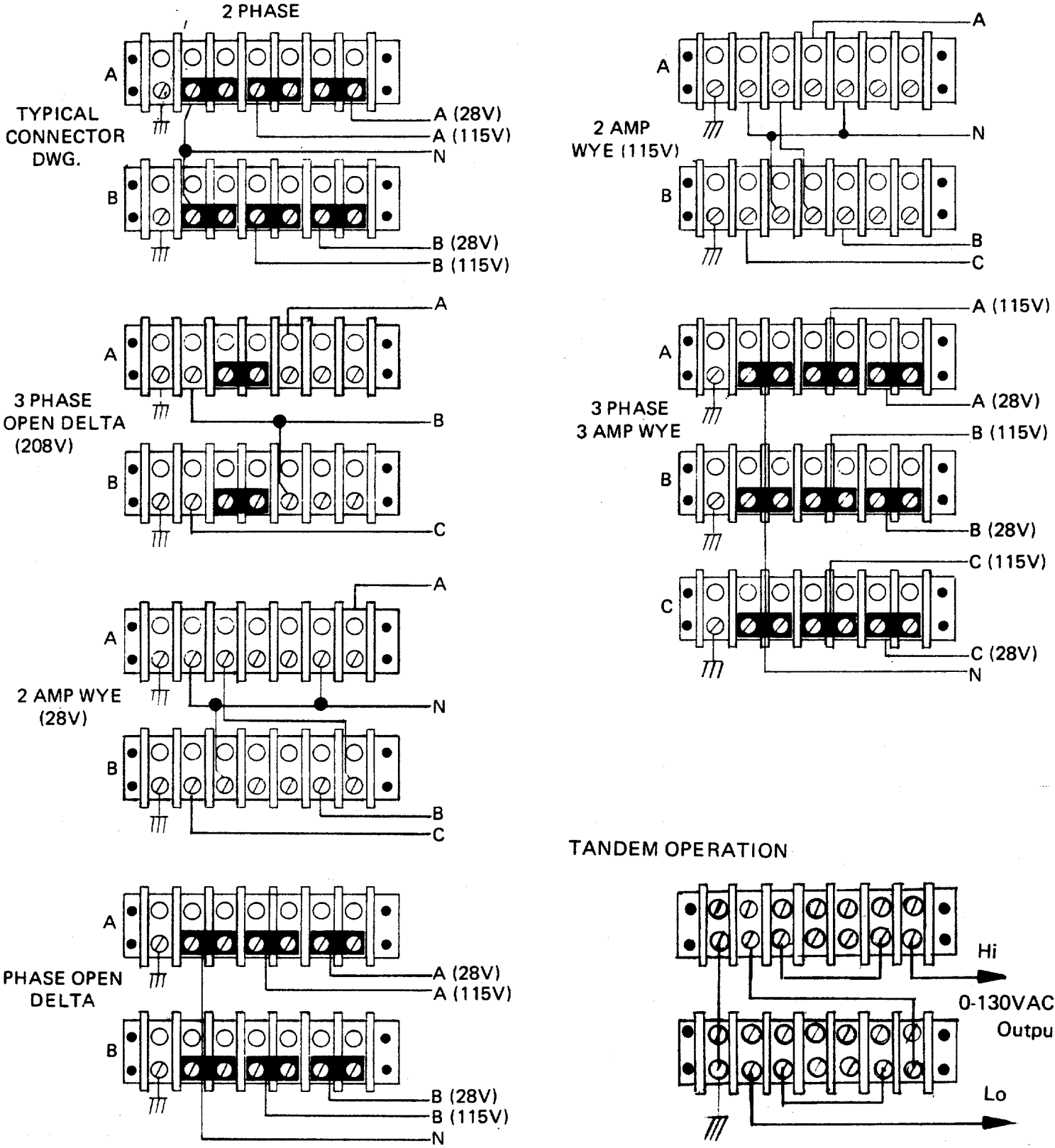
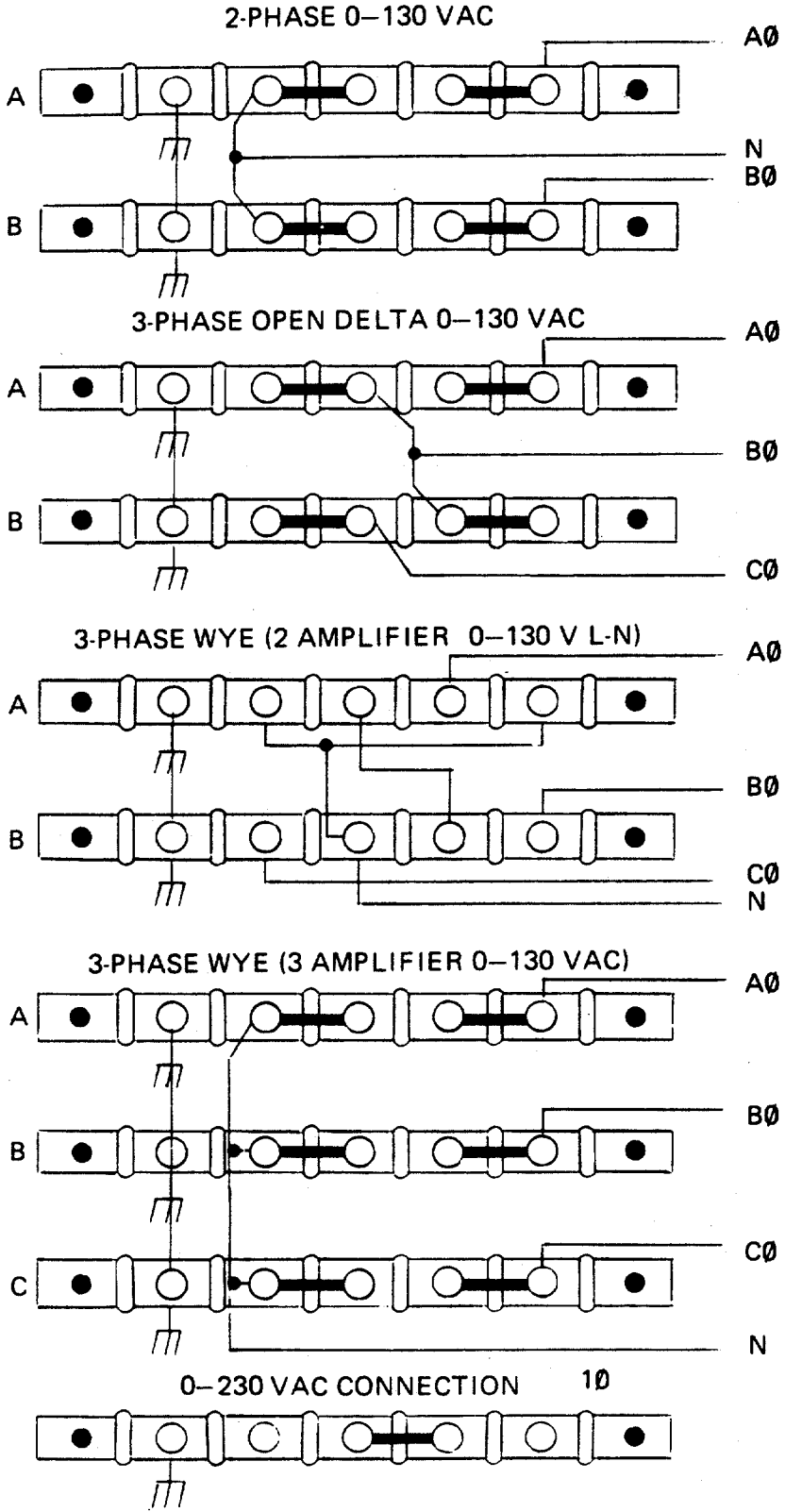


Figure 4-1. Interconnections for Multiphase Operation

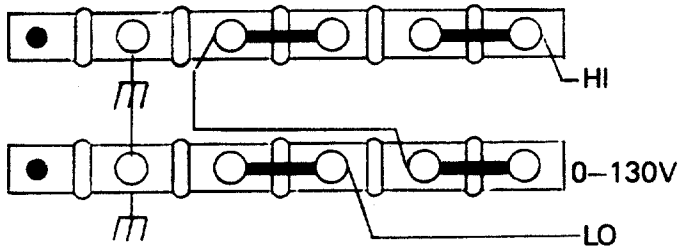
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OUTPUT CONFIGURATIONS FOR MODEL 1001B



EACH AMPLIFIER PLUS INTERCONNECTION BETWEEN UNITS. VALID FOR ALL BUT 2 AMP WYE

TANDEM OPERATION



NOTE: FOR TANDEM OPERATION INTERNAL JUMPERS FOR OUTPUT TRANSFORMER MUST BE CHANGED REFER TO 1001A SCHEMATIC

FOR TANDEM OPERATION, 260V OUTPUT USE STD. INTERNAL CONNECTIONS AND 0-130V OUTPUT. SEE FIG. 7-1

Figure 4–2. Interconnections for Multiphase Operation

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4-12. In the open delta configuration two power amplfiers of equal VA rating are driven by a standard three phase oscillator having 120°phase angle between ØA, ØB and ØC. An open delta requires that the two amplifiers have a 60° phase angle between them and this is accomplished by inverting the second amplifier.

4-13. In these systems the amplifier containing the plug-in oscillator is referred to as the master or A phase source. The second amplifier is referred to as the slave or B phase source.

4-14. The open delta hook-up shown in Figure 4-1 is shown below as a vector diagram, in Figure 4-3.

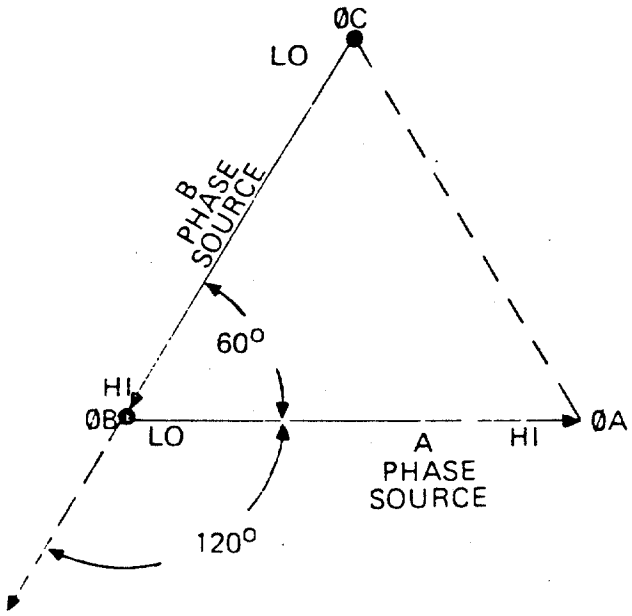


Figure 4-3. Vector Diagram

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4-15. Certain specialized oscillators such as the Super-Stable (SS) series and the Quasi-Square wave series are designed only for the open delta configurations using two amplifiers and have the phase angle between the ØA and ØB drive signals at 60°.

4-16. When using the SS series or quasi-square wave systems, the interconnections would be per Figure 4-4.

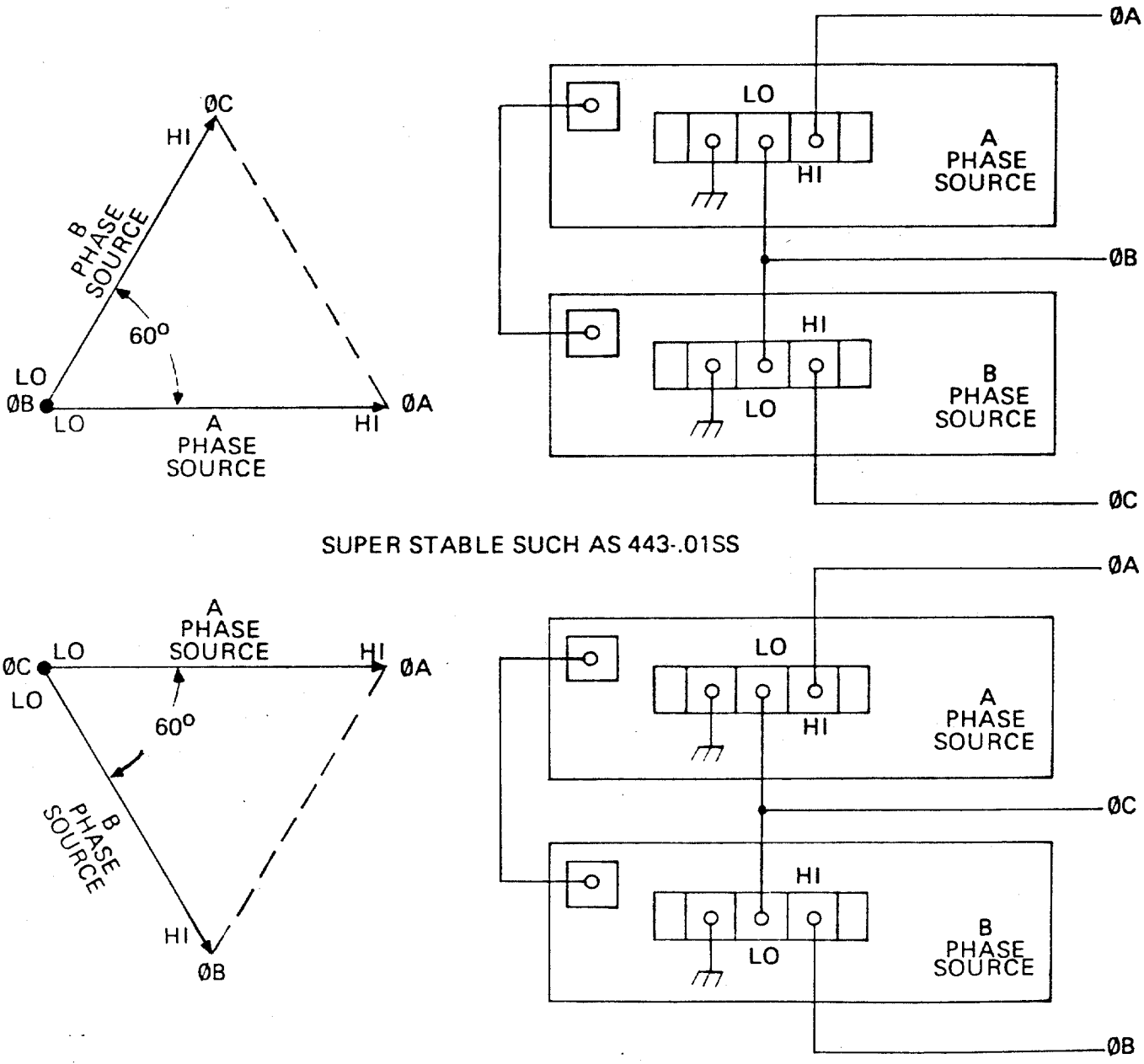


Figure 4-4. SS Series or Quasi-Square Vector Diagrams

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4-17. The 400SR plug-in is a universal signal routing plug-in used in multi-phase systems to route drive signal from a master plug-in oscillator or an external oscillator source. The routing is accomplished by the closing of specific switches on the 8 pole single throw DIP switch. Standard plug-ins are as follows (for special configurations refer to the addendum):

Model 400-A — External oscillator adaptor. Has front panel phone jack and routes signal to power amplifier input. DIP Switch not necessary. If present, switches 7 & 8 must be ON connecting pins 14 to 21 and 16 to 12.

400-B — Blank plug-in used in 2nd amplifier (B phase) of multi-phase system. Routes appropriate signal from oscillator in 1st amplifier in-put. Switches 6,7,8 must be ON, connecting pins 22 to 11, 21 to 14, 16 to 12.

400-C — Blank plug-in used in 3rd amplifier (C phase) of 3 amplifier, 3 phase system. Routes appropriate signal from oscillator in 1st amplfier to 3rd amplifier input. Switches 5, 7, 8 must be ON, connecting pins 22 to 10, 21 to 14, 16 to 12.

Model 400BT — Blank plug-in used in 2nd amplifier(s) in a Tandem System such as 2000-1. Also used in single phase TG704A systems or in phase A of multi-phase TG704A-3 systems. Switches 4, 7, 8 must be ON connecting pins 22 to 9, 21 to 14 and 16 to 12.

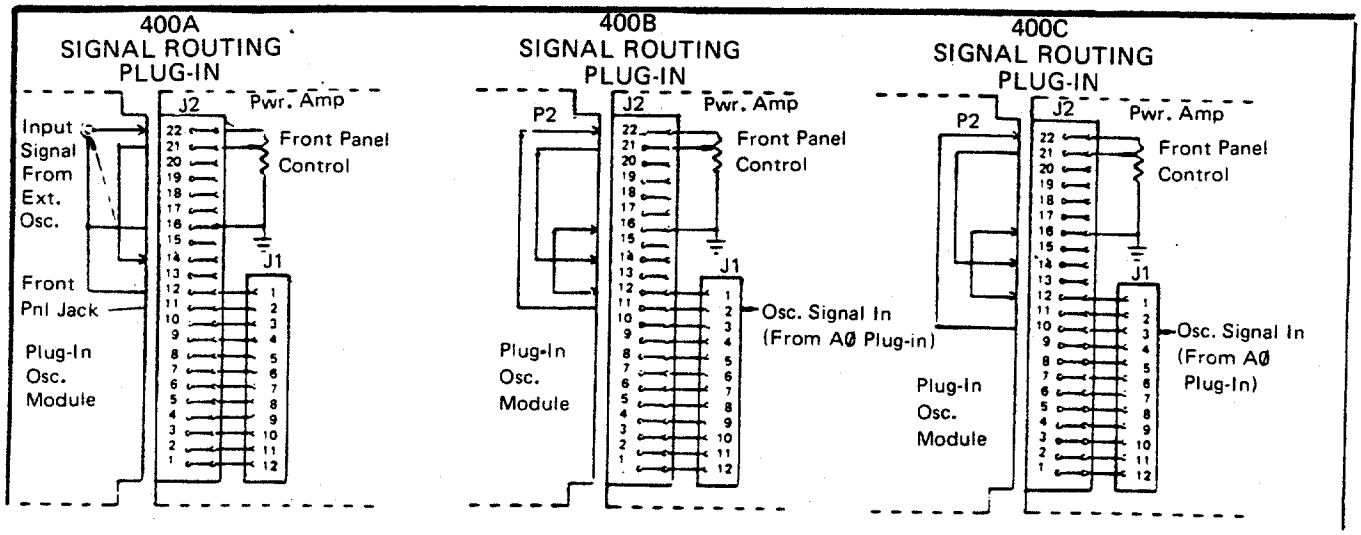
400DPA — Blank plug-in used in single phase DAP systems or in phase A of multi-phase DAP systems. Switches 4 & 8 must be ON, connecting pins 14 to 9, and 16 to 12.

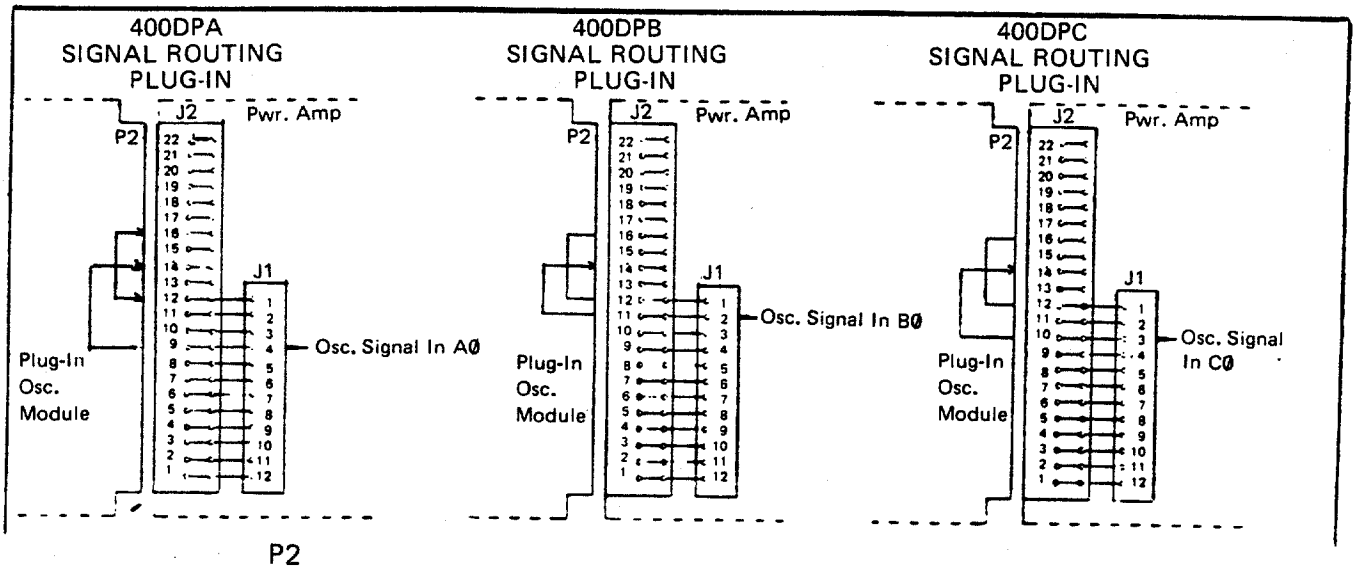
400DPB — Blank plug-in used in phase B of multi-phase DAP systems. Switches 1, 8 must be On connecting pins 14 to 11 and 16 to 12.

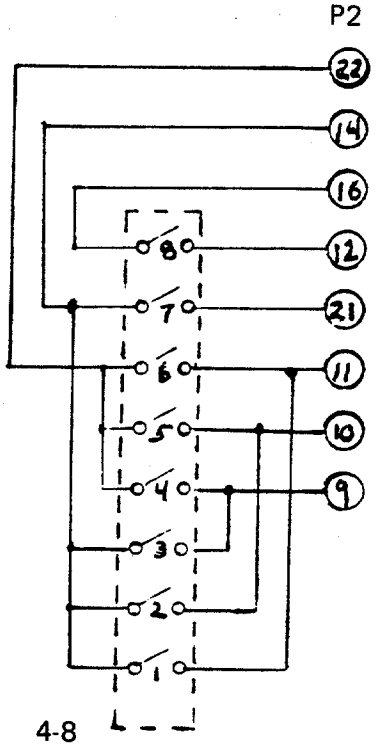
400DPC — Blank plug-in used in phase C of multi-phase DAP systems. Switches 2, 8 must be ON connecting pins 14 to 10 and 16 to 12.

400TGB — Plug-in used in single package 3Ø units such as 1753B when used with TG704A-3. It has front panel B and C phase ampltiude pots. Switches 4,7,8 must be ON connecting pins 22 to 9, 21 to 14, and 16 to 12.

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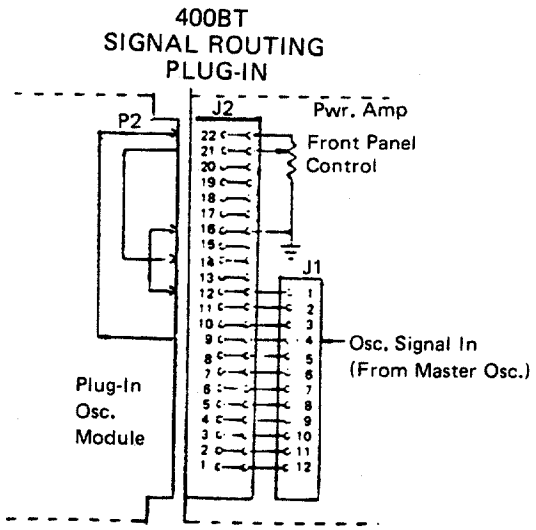


Figure 4-5. Signal Routing Plug-In Connections

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SECTION V
MAINTENANCE AND ADJUSTMENT

5-1. SERVICE INFORMATION

5-2. Questions concerned with the operation, repair or servicing of this instrument should be directed to the Elgar Repair Department. Include the Model and Serial number in any correspondence concerning this instrument.

5-3. FACTORY REPAIR

5-4. Should it be necessary to return an instrument to the factory for repair, please contact the Elgar Repair Department for authorization to make shipment.

DO NOT RETURN THE UNIT FOR REPAIR WITHOUT AUTHORIZATION.

ELGAR
Repair Department
9250 Brown Deer Road
San Diego, CA 92121-2294
1-800-733-5427
Tel: (858) 450-0085
Fax: (858) 678-4482
www.elgar.com

5-5. TEST POINTS

5-6. Test points and adjustment controls are conveniently provided at the top of the amplifier circuit board, accessible by removing the top cover of the instrument (see Figure 5-1). The test points are as follows:

TP1 — Circuit Common — Turret terminal

TP2 — Amplifier output — Red

TP3 - Oscillator signal — Orange

5-7. OUTPUT REGULATION ADJUSTMENT

5-8. The regulation adjustment, R124, is set at the factory of give ±1% load regulation over the full frequency range of the power source. The regulation may require re-adjustment if the load is highly reactive or if zero regulation is desired for a specific load and frequency. To make this adjustment, disconnect the load and read the output voltage. Connect the load and adjust R124 until the same reading is obtained.

NOTE

If the load is heavy enough to cause current limit transistors Q104 and Q105 to conduct, the output voltage will be reduced, giving an indication of poor load regulation. Load voltage fall-off due to current limiting action should not be compensated by the regulation adjustment.

5-9. CURRENT LIMIT ADJUSTMENT

5-10. The current limits have been preset at the factory such that the unit will deliver full rated power at rated output voltage. Re-adjustment of the limits should not be performed unless a malfunction has occurred in the unit, parts have been misplaced and re-adjustment of the limit is indicated.

5-11. Current limit adjustment may be checked by observing the waveform at TP-2 with an oscilloscope.

1. Set the scope sensitivity to 10v/cm.
2. Turn the unit on and adjust output for 110 VAC as indicated on the front panel meter.

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3. Connect 12.1 ohm load to output terminals of the 1001B, and 8.1 ohm load on the 1751B.

4. Adjust current limit pots CW until clipping is observed at TP-2. Adjust limit pots CCW until clipping just disappears.

5-12. PERIODIC MAINTENANCE

5-13. The only periodic maintenance required by the power source is occasional cleaning of the heatsinks. The heatsinks may be inspected through the front panel air grill. If enough dust and dirt have accumulated to restrict the air flow, an air jet should be directed through the front panel grill while the instrument is operating. If this does not dislodge the dirt, the heatsink must be removed to be cleaned.

5-14. TROUBLESHOOTING

5-15. CIRCUIT BREAKER TRIPS. If the circuit breaker trips at no load, a fault in either the power transistors or power rectifiers is indicated. Unplug both heatsinks and try the circuit breaker. If it does not trip, look for a shorted power transistor (power transistors can be tested with an ohmmeter). If the circuit breaker still trips, look for a shorted rectifier bridge. If all diodes and filter capacitors are good, a fault in the power transformer or wiring harness is indicated.

5-16. OUTPUT DISTORTION. Output distortion may be caused by overloading. Check the load current waveform with an oscilloscope since some high crest factor loads may draw considerably more peak current than is indicated by a load ammeter.

5-17. OVERHEATING. If overheating causes thermostat S1 to close, the output voltage will fall to zero. Overheating may be caused by restricted air flow or excessive environmental temperature (greater than 50° C).

TABLE 5-1. TEST EQUIPMENT REQUIRED

Name	Manufacturer and Model Number
Differential Voltmeter	Fluke 931AB
Distortion Analyzer	Hewlett-Packard 333A
Power Variac, capable of at least 30 amps	
Oscilloscope	Tektronix
AC Voltmeter	Weston 1240
AC Ammeter	Weston 433
Resistive Load	States Co. No. 33525
Multimeter	Simpson 260
Variable capacitive load	
Variable inductive load	
Capacitive substitution box	
Resistive substitution box	

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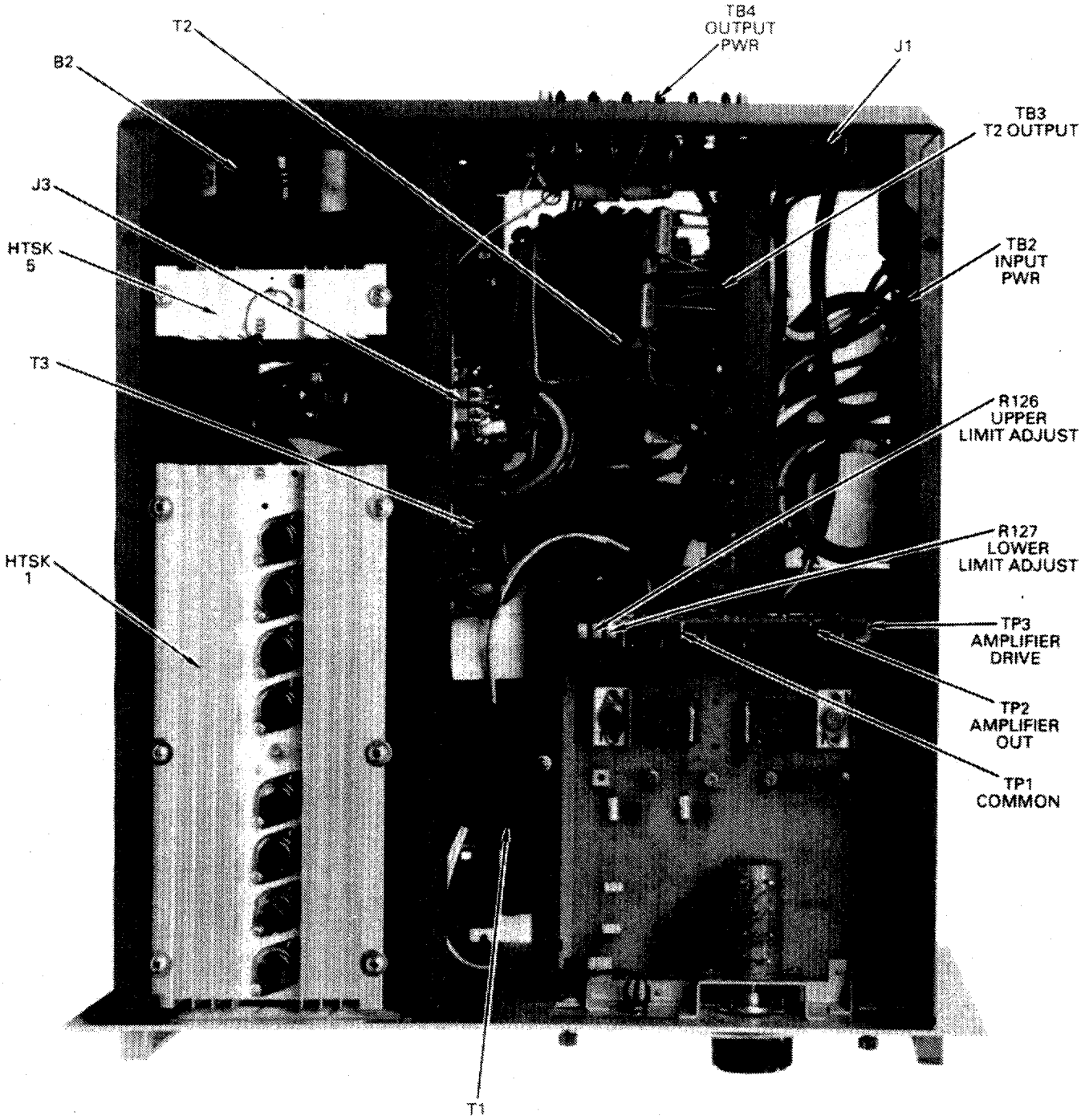


Figure 5-1. Top View, Model 1001B

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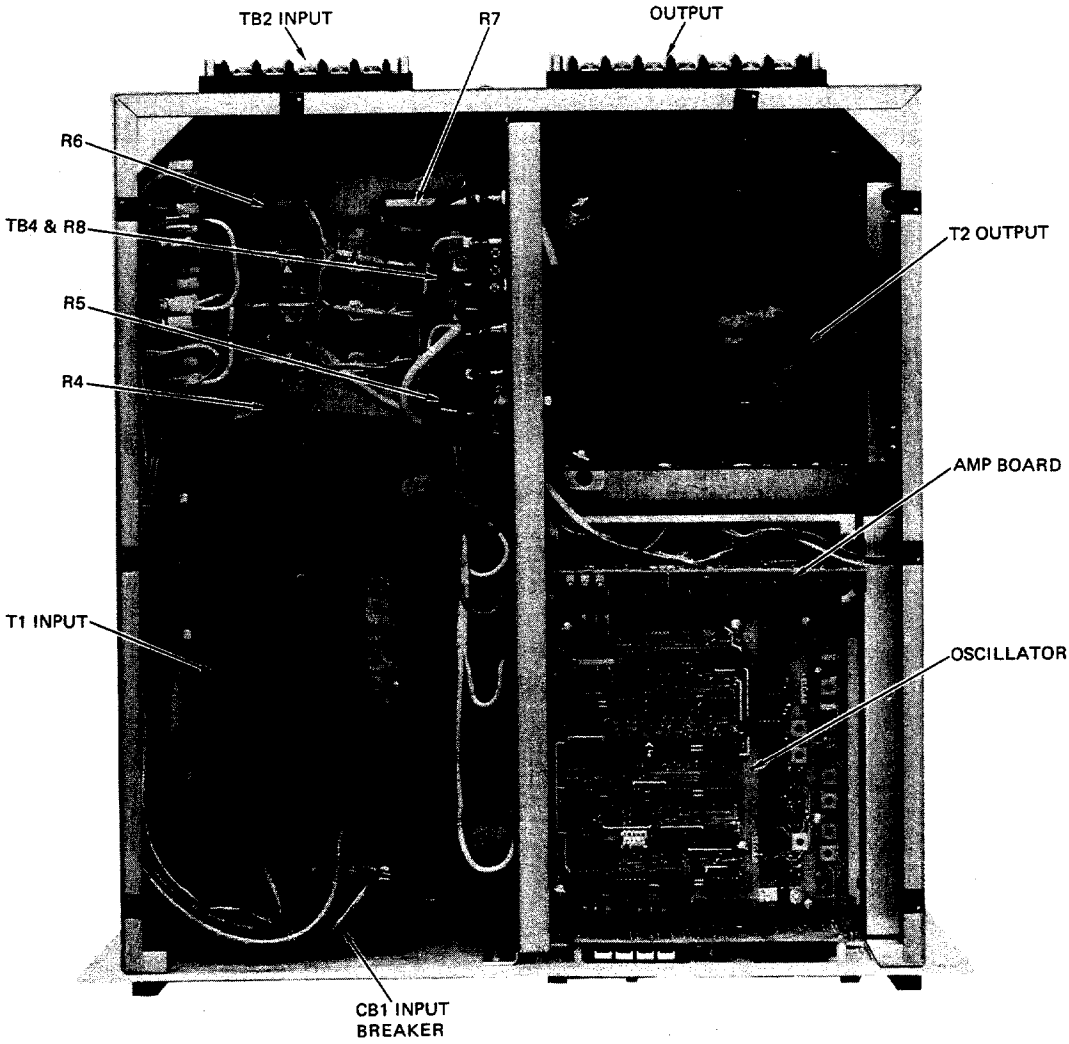


Figure 5-2. Top View, Model 1751B

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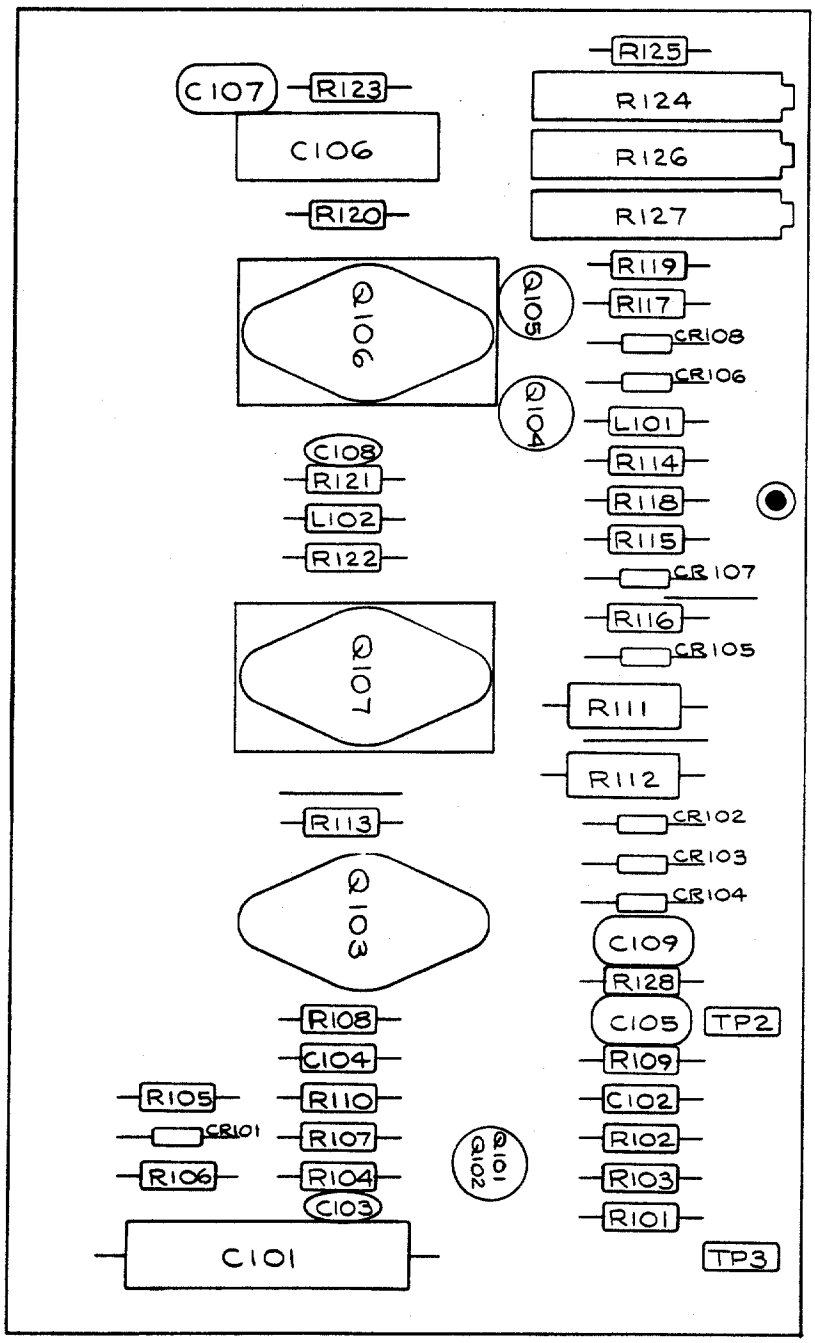


Figure 5-3. Circuit Board Layout

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SECTION VI
PARTS LISTS

6-1. GENERAL

6-2. This section contains a listing of all parts necessary for factory-authorized repair of the unit. Parts are located on the diagrams in Section VII and correlated on the parts list by using their reference designators. Note that trimming capacitors are factory-selected parts and their replacement is considered beyond the scope of customer maintenance.

6-3. SPARE PARTS ORDERING

6-4. When ordering spare parts, specify part name, part number, manufacturer, component value and rating. If complete assemblies are desired contact Elgar Sales & Technical Support. Specify assembly number, instrument series number and instrument name when ordering.

ELGAR ELECTRONINCS CORPORATION
Sales & Technical Support
9250 Brown Deer Road
San Diego, CA 92121-2294
1-800-733-5427
Tel: (858) 450-0085
Fax" (858) 458-0267
Email: sales@elgar.com
www.elgar.com

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1001B CHASSIS ASSEMBLY

SCHEMATIC DESIGNATION	VALUE	DESCRIPTION OR TYPE	RATING	MANUFACTURER NAME	MANUFACTURER PART NUMBER	ELGAR PART NUMBER
B1,2		Fan		Rotron		853-MA2-B4
C1-4	23,200 uF	Capacitor	50V	Sprague	MR2B3	826-239-12
C5-10	.05 uF	Capacitor	600V	Sprague	6PS-S50	822-503-06
CB1		Ckt. Breaker	50A	Airpax	UPL1-1-6-1-503	852-503-52
CR1,3		Diode		I.R.	70H20A	845-702-0A
CR2,4		Diode		I.R.	70HR20A	845-702-0R
DS1		Lamp		Eldema	BG02-RCS-AIC-68K	854-68K-22
M1		Meter		Jewell	82T	857-150-82
Q1,2		Transistor		RCA	2N4348	841-434-8X
R1	10K	Potentiometer		Spectrol	534-9561-10	819-103-53
R2,3	1K	Resistor	10W, 5%	Dale	CW10-1K	808-102-05
R4	4.7 ohm	Resistor	½W, 5%	Speer	RC20GF4R7J	802-4R7-05
R5,6	5.6 ohm	Resistor	5W, 5%	Dale	CW5-5.6	807-5R6-05
R7	.025 ohm	Resistor	50W, 5%	Dale	RH50	810-R02-05
T1		Pwr. Xfmr		Elgar		990-070-96
T2		Output Xfmr.		Elgar		990-407-90
T3		Current Xfmr.		Elgar		990-191-90
C12	.22 uF	Capacitor	600V	Sprague	6PS-P22	822-224-06
		HEATSINKS				
CR201,301,401,501		Diode		Westinghse.	A327B	845-368-DX
Q201-208,301-308, 401-408,501-508		Transistor		RCA	2N4348	841-434-8X
R201-208,301-308, 401-408,501-508	.22 ohm	Resistor	5W, 10%	Dale	CW5-.22	807-R22-05
S101		Thermostat		Elmwood	2450-21-272	861-340-0X
K1		RELAY		P&B	R10E1X4	861-R10-E1
		RELAY SOCKET		P&B	27E152	861-27E-15
		RLY SPRING CLIP		P&B	20C250	861-20C-25

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1751B CHASSIS ASSEMBLY

SCHEMATIC DESIGNATION	VALUE	DESCRIPTION OR TYPE	RATING	MANUFACTURER		ELGAR PART NUMBER
				NAME	PART NUMBER	
C1-4	20,000 uF	Capacitor	50V	Cornell	FAHM-203-50-B6	826-213-11
C5,6	.22 uF	Capacitor	600V	Sprague	6PS-P22	822-224-06
B1,2		Fan		Rotron		853-MA2-B4
CB1		Ckt. Breaker	15A	Airpax	UPG111-6-1-153	852-153-54
CR1-6		Diode		I.R.	1N1186A	845-118-6A
CR7-12		Diode		I.R.	1N1186AR	845-118-6R
DS1		Lamp		Eldema	BG02-RCS-AIC-68K	854-68K-22
M1		Meter		Jewell	82T	857-150-82
R1	10K	Potentiometer		Spectrol	534-9561-10	819-103-53
R2,3	10K	Resistor	2W, 5%	Speer	RC42GF103J	804-103-05
R4,5	5.6 ohm	Resistor	5W, 5%	Dale	CW5	807-5R6-05
R6,7	.025 ohm	Resistor	50W, 5%	Dale	RH50	810-R02-05
R8	4.7 ohm	Resistor	½W, 5%	Speer	RC20GF4R7J	802-4R7-05
Q1,2		Transistor		Motorola	MJ15003	841-150-03
T1*		Power Xfmr		Elgar		990-497-90
T2		Output Xfmr		Elgar		990-244-90
T3		Current Xfmr		Elgar		990-137-90
		HEATSINKS				
CR201,301,401,501, 601,701		Diode		Westinghse.	368D	854-368-DX
Q201-208,301-308, 401-408,501-508, 601-608,701-708		Transistor		RCA	2N6259	841-625-9X
R201-208,301-308, 401-408,501-508, 601-608,701-708	.22 ohm	Resistor	5W, 5%	Dale	CW5	807-R22-05
S101		Thermostat		Elmwood	2450-21-272	861-340-0X
*T1 New design Alternate Part		Power Xfmr		Elgar		5900288-01

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AMPLIFIER BOARD 608-107-44

SCHEMATIC DESIGNATION	VALUE	DESCRIPTION OR TYPE	RATING	MANUFACTURER		ELGAR PART NUMBER
				NAME	PART NUMBER	
C101	10 uF	Capacitor	200V	IMB	JA2A106K	822-106-10
C102,104	FSV					
C103	220 pF	Capacitor	500V	ARCO	DM15-221J	820-221-05
C105	200 pF	Capacitor	500V	ARCO	DM15-201J	820-201-05
C106	50 uF	Capacitor	50V	Sprague	500D506G050DD7	824-506-71
C107	220 uF	Capacitor	10V	Sprague	196D227X0010MA3	823-227-61
C108	.0022 uF	Capacitor	500V	Erie	811-000-X5F0-222K	821-222-00
C109	300 pF	Capacitor	500V	ARCO	DM15-301J	820-301-05
CR101		Zener	12V	Motorola	1N5242	843-524-2X
CR102-108		Rectifier	200V	Motorola	1N4003	845-400-3X
Q101,102		Diff. Amp.		National	2N3810	849-381-3X
Q103		Transistor		RCA	2N3583	839-358-3X
Q104		Transistor		Fairchild	2N3567	835-356-7X
Q105		Transistor		Fairchild	2N3638	834-363-8X
Q106		Transistor		Motorola	2N4912	839-491-2X
Q107		Transistor		Motorola	2N4900	838-490-0X
L101	150 uH	Choke		Nytronics	SWD150	851-150-01
L102	470 uH	Choke		Nytronics	SWD470	851-470-01
R101	3.32K	Resistor	1/8W, 1%	Dale	RN60C3321F	813-332-1F
R102,108,114	FSV	Resistor	½W, 5%			
R103	4.75K	Resistor	1/8W, 1%	Dale	RN60C4751F	813-475-1F
R104,123	4.7K	Resistor	½W, 5%	Speer	RC20GF472J	802-472-05
R105,106	6.2K	Resistor	½W, 5%	Speer	RC20GF622J	802-622-05
R107	1.2K	Resistor	½W, 5%	Speer	RC20GF122J	802-122-05
R109	33.2K	Resistor	1/8W, 1%	Dale	RN60C3322F	813-332-2F
R110,115,117	10K	Resistor	½W, 5%	Speer	RC20GF103J	802-103-05
R111,112	2.2K	Resistor	1W, 5%	Speer	RC32GF222J	803-222-05
R113,128	33 ohm	Resistor	½W, 5%	Speer	RC20GF330J	802-330-05
R116	1.8K	Resistor	½W, 5%	Speer	RC20GF182J	802-182-05
R118,119	68 ohm	Resistor	½W, 5%	Speer	RC20GF680J	802-680-05
R120,122	100 ohm	Resistor	½W, 5%	Speer	RC20GF101J	802-101-05
R121,125	15 ohm	Resistor	½W, 5%	Speer	RC20GF150J	802-150-05
R124	1K	Potentiometer		Bourns	3059Y	819-102-30
R126,127	10 ohm	Potentiometer		Bourns	3059Y	819-100-30

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SECTION VII
DIAGRAMS

7-1. GENERAL

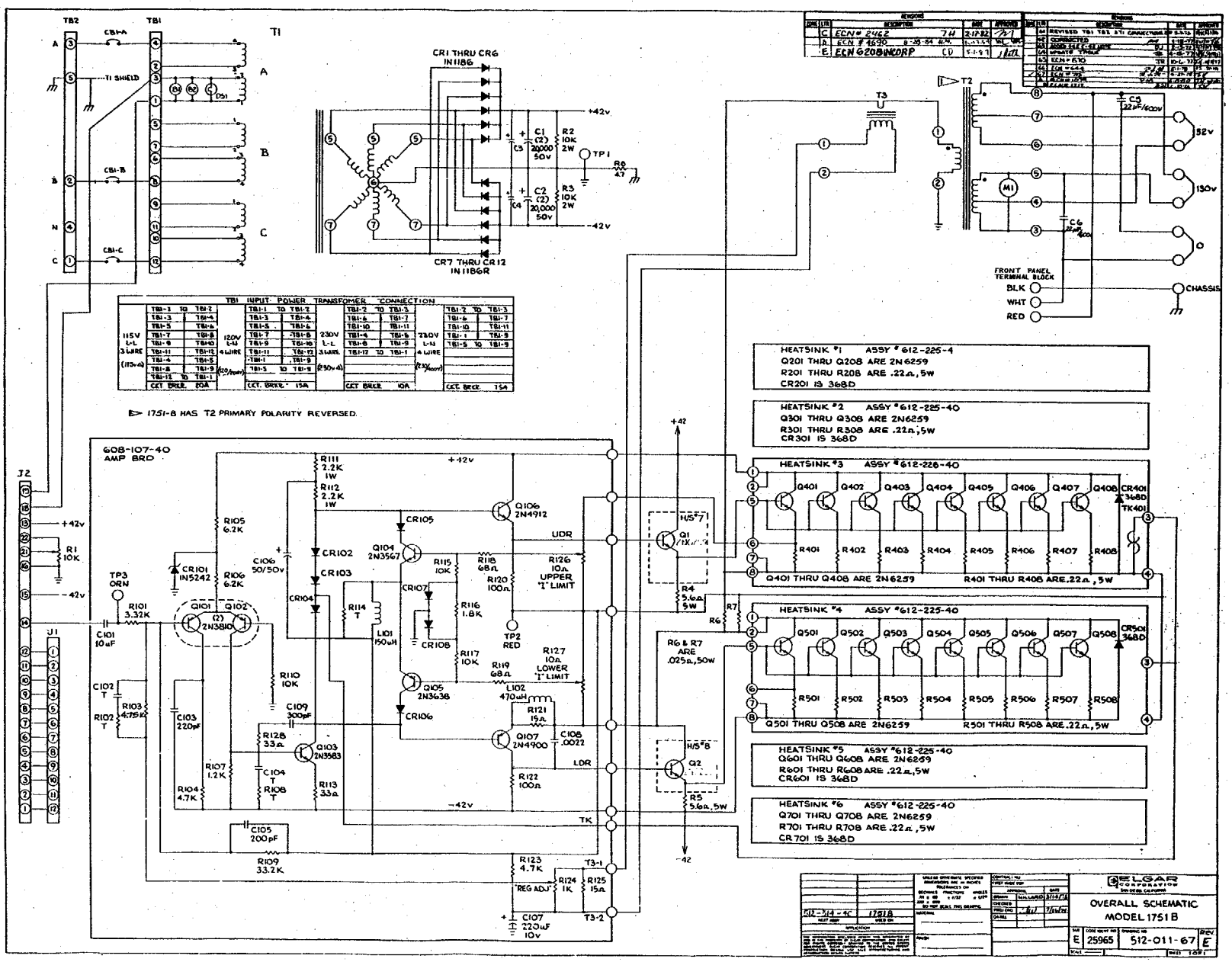
7-2. This section contains the schematic diagrams for the AC power sources. The schematic diagram should be used to understand the theory of operation as an aid in troubleshooting the unit. Reference designators shown on schematics correspond to reference designators shown in parts lists, where exact component values are given. Components identified as "trim" are factory-selected parts whose values are determined at time of final checkout.

7-3. DIAGRAMS

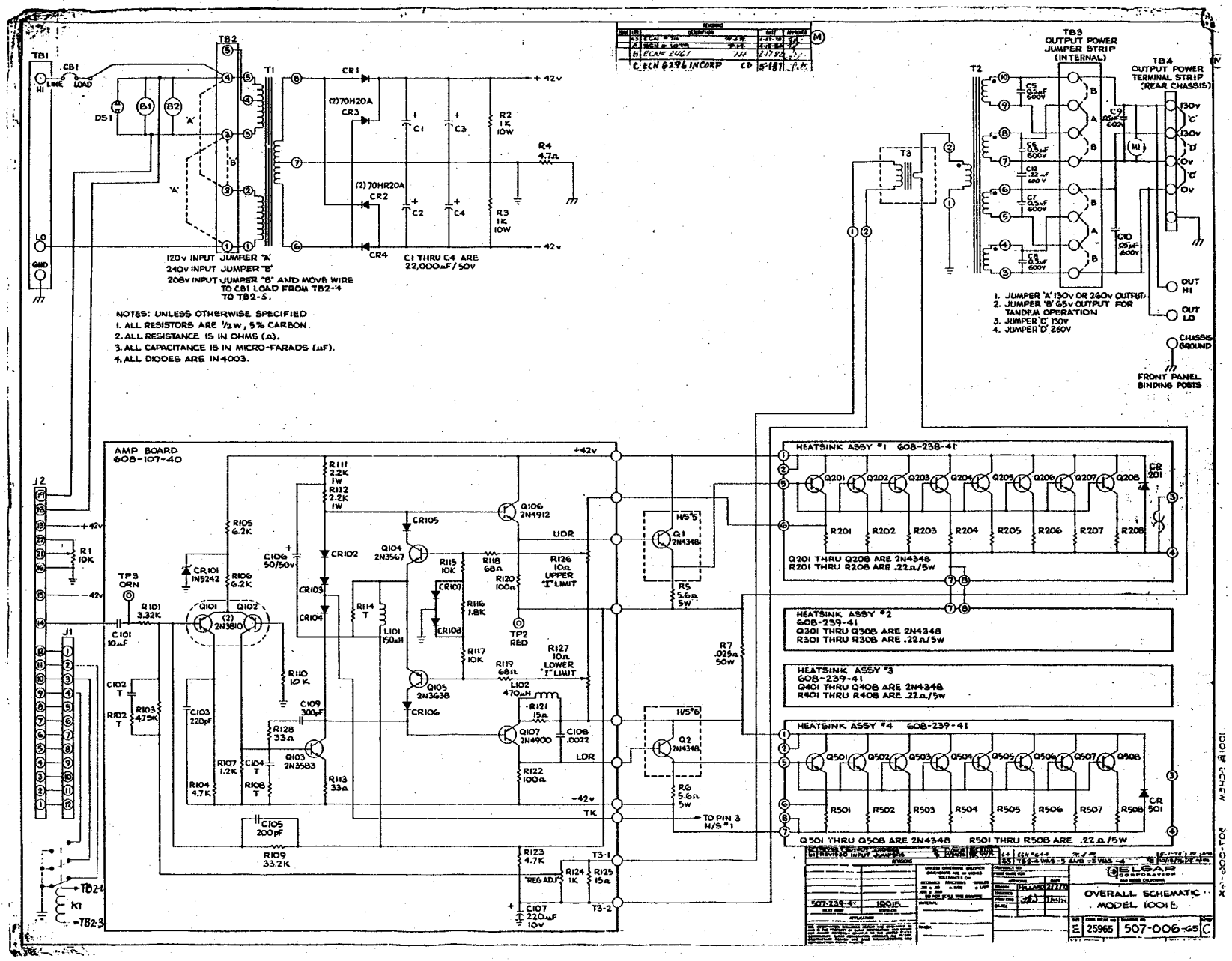
7-4. Diagrams included in this section are :

a. Overall Schematic, Model 1001B
b. Overall Schematic, Model 1751B

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