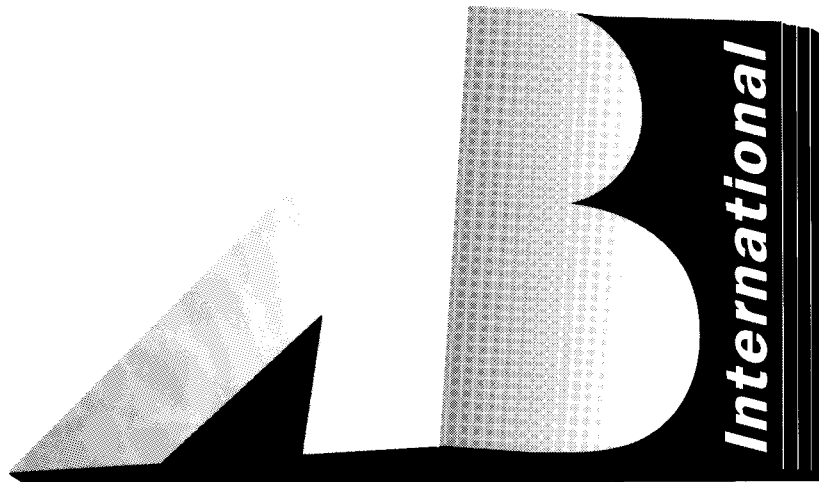


AB INTERNATIONAL

**MODEL 900A / 1100A
MODEL 9220A / 9420A**

SERVICE INFORMATION



AB International Electronics

**1830-6 Vernon Street / P.O. Box 1105
Roseville, Ca 95678 / 916-783-7800**

GENERAL

AB International amplifier products are designed to deliver uncompromised performance in continuous duty commercial and professional audio applications. The following operating instructions cover the installation and operation of the Professional Series amplifiers. New owners are encouraged to read the entire contents prior to placing amplifiers into service.

Professional Series Amplifiers

Circuit Description

To assure absolute long term reliability, the output section of each channel incorporates multiple Motorola Power Transistors, which provide 3 times the amplifiers rated power in watts of dissipation per channel. The output stage is arranged in a fully-complimentary format for class AB/2 operation. The bias current is evenly distributed among all output devices. Bias thermal compensation is accomplished by thermally mating a bipolar semiconductor junction to the heat-producing output device. Triple diffused high power driver transistors are employed along with high speed, high voltage silicon annular devices for the pre-driver and inverter stages. Utilization of these components provides the required separation of F_t break points for absolute stability. Fully complimentary drive and loading is utilized throughout. Only 20 dB of negative feedback is used to reduce forward transfer distortion to minimum levels. VI type energy limiters are incorporated for short circuit protection of the amplifier. Due to the unusually large safe operating area of the output stage, the limiters do not actuate until driving a forty-five degree reactive load of under 2 ohms at full power.

Construction

The amplifiers are designed on an all-modular concept permitting rigorous pre-assembly module testing and maximum service accessibility. Each functional module is fully tested before final assembly. Although components of the highest quality are used throughout, each amplifier is burned in, prior to shipment, at the worst case operating point to eliminate any possibility of component malfunction. All chassis components are precision machined from high quality aluminum and sheet steel stock. The entire package concept is directed toward maximum efficiency of space and structure, accounting for the compact size and light weight.

Professional Series Amplifiers

Thermal Protection

Certain conditions of operation (restricted airflow cooling, sustained high power operation into low impedance loads) can result in a rise in output device case temperature sufficient to affect the amplifiers performance.

Should the heatsink reach 95°C, the output will be automatically disconnected from the load (loudspeaker) and will remain disconnected until the temperature drops below 95°C. The action of removing the load has the effect of eliminating output current. Which, in turn, results in an immediate and rapid drop in temperature. The load will automatically be reconnected when the temperature drops below 95°C.

Fan Assist Cooling

All Professional Series amplifiers are equipped with a two level 24 Vdc fan. The fan speed is determined by the amplifier heatsink temperature. At maximum speed, the fan has a 110 cfm output to assure proper cooling under severe conditions.

Installation

All AB International amplifiers are designed for mounting in a standard 19-inch equipment rack, or one of the many 19-inch rack-type portable cases available. The amplifiers require $5\frac{1}{4}$ inches of vertical panel space, with $11\frac{7}{8}$ inches required behind the panel. Total depth, including handles is $13\frac{5}{16}$ inches. Front panels are machined from solid aluminum stock, with a black textured finish and sturdy rack mount handles.

Placement of the amplifier is not critical for normal operating, provided sufficient air flow is allowed to reach the heatsink array. If the unit is to be placed on a shelf, or a similar unenclosed area, allow four inches of clearance behind the heat-sink to permit vertical air flow through the array. For installation in a cabinet, allow an additional two inches above and one inch below the amplifier to permit air to be drawn around the back. If the amplifier is to be mounted in an equipment rack or cabinet with heat producing equipment, be sure that environmental operating temperatures do not exceed 55°C (131°F). Should overheating occur because of inadequate ventilation, the temperature protection circuitry will automatically protect the amplifier. When a safe operating temperature is restored, the amplifier will return to normal operation.

Because the amplifiers are capable of delivering high power from a relatively small physical package, considerable heat can develop in cabinets containing several instruments. A good rule of thumb to adopt is to provide forced air cooling any enclosure containing four or more instruments.

Power Connections

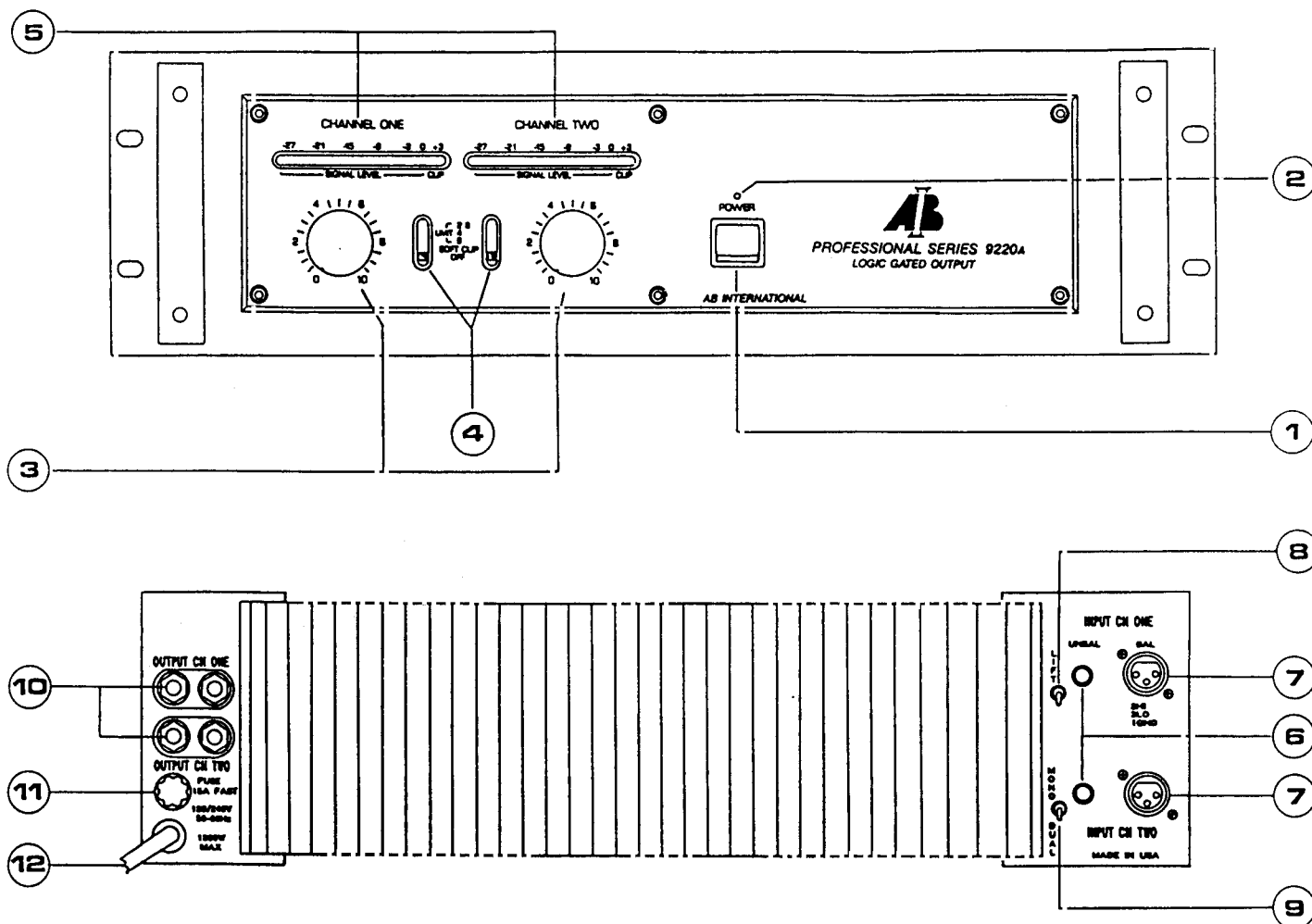
Professional Series power amplifiers are specified for operation from 120/240 Volt 50/60 Hz mains supply.

Equipment for domestic (USA) consumption includes a captive power cord with a three pin polarization plug. **DO NOT REMOVE THE CENTER GROUNDING PIN!**

In new installations and portable sound systems, or any situation in which the mains power is suspect, it is wise to confirm appropriate voltage and line polarity **BEFORE** connecting the instrument to power sources.

Professional Series Amplifiers

Front and Rear Panel Controls



1. POWER SWITCH

To turn the Amplifier ON or OFF, press the upper or lower portion of this switch rocker.

2. POWER INDICATING LED

This LED indicates power is turned ON.

3. LEVEL CONTROLS

Each channel has a separate low-noise 41 click detent rotary level control. Rotate controls clockwise to increase level.

4. "PEAK LIMIT"/"SOFT CLIP" CONTROL

Each channel has a "Peak Limit"/"Soft Clip" switch. Prior to using your amplifier you should first decide which feature best fits your application. If you have need for peak power limiting, select the "LIMIT": "8 ohm", "4 ohm" or "2 ohm" position that corresponds with your speaker load. This will limit the input signal approximately 3dB from rated output and no clip overdrive will occur. Note: 3dB equals half power output. If you select the "SOFT CLIP" position, the amplifier will reach rated output and no hard clipping will occur. The "OFF" position will give no peak limiting or clip protection. If the Red LED regularly illuminates, you should readjust the input level to prevent clipping or select "SOFT CLIP". Most applications will use the "SOFT CLIP" feature since you get both maximum power and protection.

5. SIGNAL STATUS DISPLAY

TWO "11 LED STRIP" output displays are normally off when no signal is present and illuminate progressively as input signal increases. The Green and Yellow LED's represent the amount of signal (in dB) present at the outputs of the amplifier. The Red LED will illuminate when the output level exceeds rated output and the amplifier has gone into "CLIP". If this situation occurs, you should readjust the output level to prevent any speaker damage.

6. UNBALANCED INPUT CONNECTIONS

Unbalanced inputs connect directly to the channel one and channel two quarter inch phone jacks. These inputs take priority over the XLR input jacks.

7. BALANCED INPUT CONNECTIONS

XLR input connectors are provided for the balanced input circuit. Please note that Pin 1: Ground, Pin 2: High, Pin 3: Low.

Professional Series Amplifiers

Front Panel and Rear Panel Controls *(continued)*

8. GROUND/LIFT SWITCH

The GROUND/LIFT SWITCH is provided to eliminate ground loops, between this amplifier and a preamplifier, that can occur in certain installations.

9. DUAL/MONO SELECTOR SWITCH

Bridged mono operation is easily achieved by the supplied toggle switch. The signal should be applied to channel one input only and the corresponding front panel gain control is then used to set the level.

10. OUTPUT CONNECTIONS

Output connections are via five-way binding posts, identified as to polarity with a red and black terminal. We suggest the use of dual banana plugs as a convenient and reliable method of hook-up. They allow rapid removal for polarity reversals. This feature is often necessary in the check out and adjustment of multi-element biamplified and triamplified sound systems. Heavy Class II wire may be used by unscrewing the large plastic portion of the output terminal and inserting the wire into the hole provided. **Note:** It is extremely important when making wire connections that no wire stand or end touches an adjacent terminal!

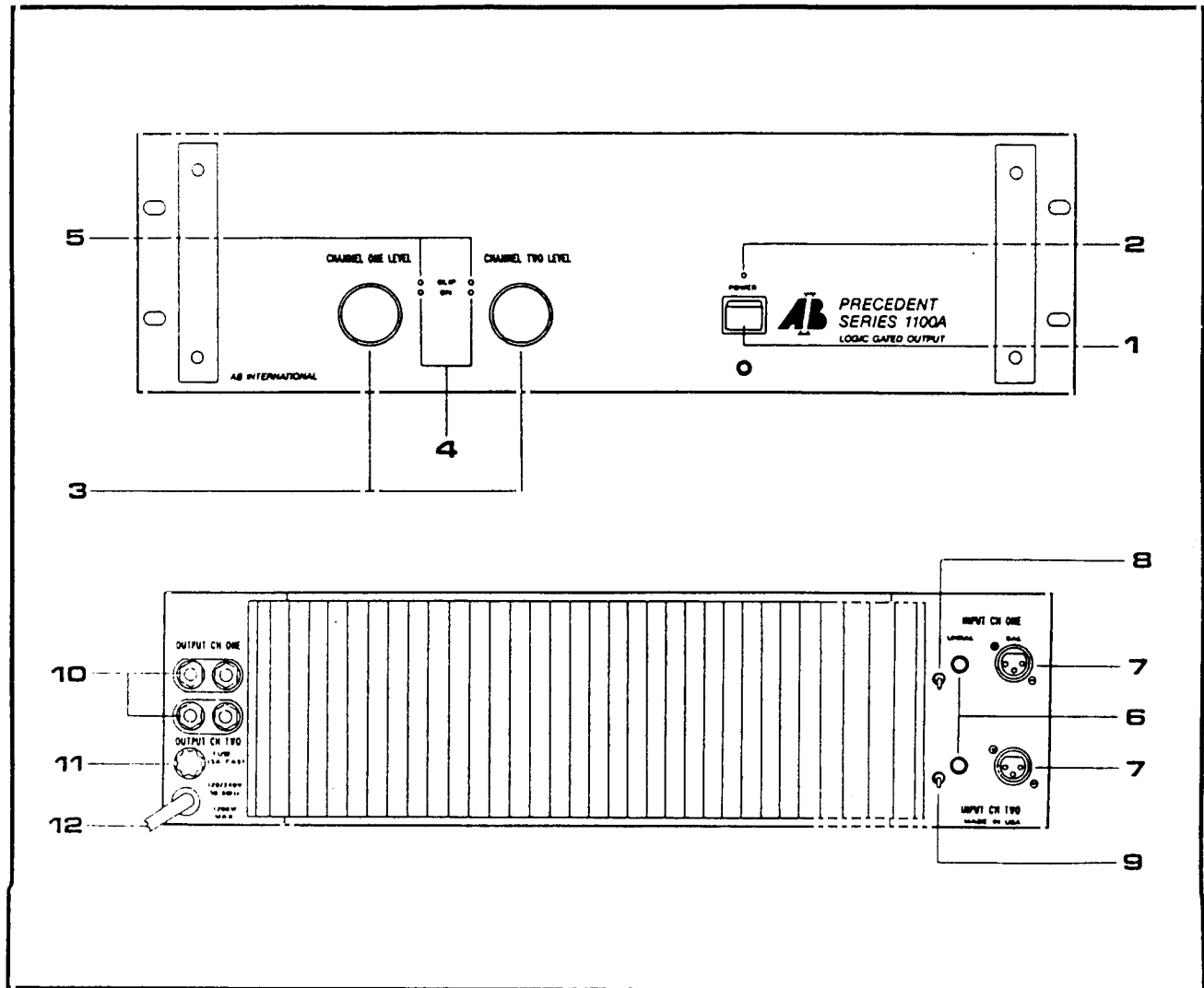
11. FUSE HOLDER

The fuse holder contains the Primary AC Fuse. The fuse should only be replaced with one of the same type. If fuses continue to blow out, stop replacing the fuse and refer servicing to qualified personnel.

12. AC POWER CORD

Plug the Power Cord into an AC outlet that delivers the proper voltage and current for amplifier operation.

Front Panel and Rear Panel Controls



1. POWER SWITCH

To turn the amplifier ON or OFF, press the upper or lower portion of this rocker switch.

2. POWER INDICATING LED

This LED indicates power is turned ON.

3. LEVEL CONTROLS

Each channel has a separate low-noise 41 click detent rotary level control. Rotate controls clockwise to increase level.

4. SIGNAL STATUS INDICATORS

Two green LED indicators are normally off with no signal present and illuminate when signal is present.

5. CLIP INDICATORS

Two red LED indicators illuminate when the input signal levels exceed 3 dB above clipping. Adjust the level control to minimize clipping.

6. UNBALANCED INPUT CONNECTIONS

Unbalanced inputs connect directly to the channel one and channel two quarter inch phone jacks. These inputs take priority over the XLR input jacks.

7. BALANCED INPUT CONNECTIONS

XLR input connectors are provided for balanced input signals. Please note; Pin 1: Ground, Pin 2: High, Pin 3: Low.

8. GROUND/LIFT SWITCH

To eliminate ground loops between this amplifier and a preamplifier in certain installations, a GROUND/LIFT SWITCH is provided.

9. DUAL/MONO SELECTOR SWITCH

Bridged mono operation is easily achieved by the supplied toggle switch. The input should be applied to channel one only and the corresponding front panel gain control is then used to set level. Refer to Bridged Mono Operation, page 9.

10. **OUTPUT CONNECTIONS**

Output connections are via five-way binding posts, identified as to polarity with a red and a black terminal. We suggest the use of dual banana plugs as a convenient and reliable method of hook-up. They allow rapid removal for polarity reversals. This feature is often necessary in the check out and adjustment of multilevel biamplified and triamplified sound systems. Heavy Class II wire may be used by unscrewing the large plastic portion of the output terminal and inserting the wire into the hole provided. It is **EXTREMELY IMPORTANT**, when making wire connections, that **NO** wire strand or end touches the adjacent terminal, shorting the output.

CAUTION:

Never strap the two red output terminals together (in parallel). Never connect either red output terminal to chassis ground.

11. **FUSE HOLDER**

The Fuse Holder contains the Primary AC Fuse. The fuse should only be replaced with one of the same type. If the fuse continues to blow out, stop replacing the fuse and refer servicing to qualified personnel.

12. **AC POWER CORD**

Plug the Power Cord into an AC outlet that delivers the proper voltage and current for amplifier operation.

CAUTION:

The **9220A** and **9420A** amplifiers are a product of the most advance technology and manufacturing techniques and is fully protected against overheating, input overload and shorted or mismatched loads. As is the case with any precision instrument, some care should be taken in the unit's operation. The following precautions should be noted and adhered to. Damage resulting from their omission is not covered under the terms of the warranty.

DO NOT PARALLEL THE TWO OUTPUTS OF EACH CHANNEL BY CONNECTING THEM TOGETHER OR PARALLEL THEM WITH ANY OTHER AMPLIFIER OUTPUT. NEVER CHANGE A FUSE WITH AC POWER CONNECTED. UNDER NO CIRCUMSTANCES SHOULD THE AMPLIFIER BE OPERATED WITH THE COVER REMOVED. THERE ARE NO USER SERVICEABLE COMPONENTS INSIDE. AVOID POTENTIALLY DANGEROUS SHOCK HAZARDS, KEEP THE COVER CLOSED AT ALL TIMES!

BRIDGED MONO OPERATION

1. Set the DUAL/MONO SWITCH to **MONO**.
2. Connect the input signal to channel one's input jack.
3. Connect the speaker load to the two red terminals of each channel. Confirm the (+) terminal of speaker to channel one and the (-) terminal to channel two.
4. **Do not** use the black terminals of either channel.
5. Assure the speaker impedance is 4 ohms or above.
6. Adjust output using the channel one control. Set channel two level to "0".

CAUTION:

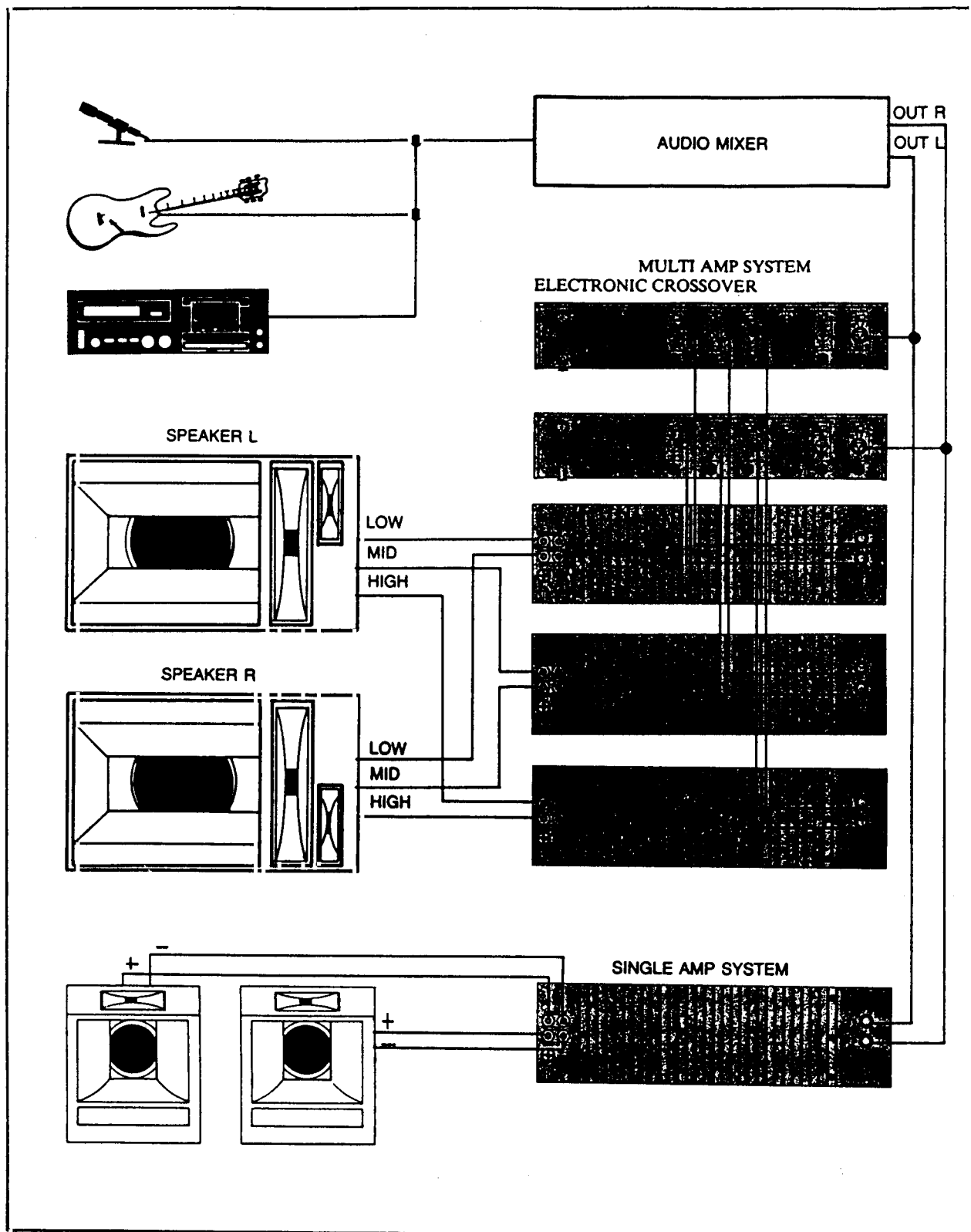
The **900A** and **1100A** amplifiers are a product of the most advanced technology and manufacturing techniques and are fully protected against overheating, input overload and shorted or mismatched loads. As is the case with any precision instrument, some care should be taken in the unit's operation. The following precautions should be noted and adhered to. Damage resulting from their omission is not covered under the terms of the warranty.

DO NOT PARALLEL THE TWO OUTPUTS OF EACH CHANNEL BY CONNECTING THEM TOGETHER OR PARALLEL THEM WITH ANY OTHER AMPLIFIER OUTPUT. NEVER CHANGE A FUSE WITH AC POWER CONNECTED. UNDER NO CIRCUMSTANCES SHOULD THE AMPLIFIER BE OPERATED WITH THE COVER REMOVED. THERE ARE NO USER SERVICEABLE COMPONENTS INSIDE. AVOID POTENTIALLY DANGEROUS SHOCK HAZARDS, KEEP THE COVER CLOSED AT ALL TIMES.

BRIDGED MONO OPERATION

1. Set the DUAL/MONO Switch to **MONO**.
2. Connect the input signal to channel one's input jack.
3. Connect the speaker load to the two red terminals of each channel. Confirm the (+) terminal of the speaker to channel one and the (-) terminal to channel two.
4. **DO NOT** use the black terminals of either channel.
5. Assure the speaker impedance is 4 ohms or above.
6. Adjust output using the CHANNEL ONE control and Set CHANNEL TWO level to "0".

Rear Panel Connections



Professional Series Amplifiers

SPECIFICATIONS

Type:	Two Channel Audio Power Amplifier	
Gain:	31dB (each channel)	9220A
	33dB (each channel)	9420A
Continuous Power:	350 watts per channel at 8 ohms 9220A	
Average Power:	590 watts per channel at 4 ohms 9220A	
Output:	775 watts per channel at 2 ohms 9220A	
(120 VAC Line, 1KHz, single channel driven)	925 watts bridged mono at 8 ohms 9220A	
	1123 watts bridged mono at 4 ohms 9220A	
Continuous Power:	525 watts per channel at 8 ohms 9420A	
Average Power:	850 watts per channel at 4 ohms 9420A	
Output:	1100 watts per channel at 2 ohms 9420A	
(120 VAC Line, 1KHz, single channel driven)	1300 watts bridged mono 8 ohms 9420A	
	1700 watts bridged mono 4 ohms 9420A	
Frequency Response:	Plus/Minus 0.5dB 20Hz to 20KHz	
Distortion:	No more than 0.25% THD or IM, 0.01W to rated power, 20Hz to 20KHz (0.01% Typical)	
Hum and Noise:	104dB below rated output (unweighed 20KHz bandwidth)	
Input Sensitivity:	1.7 VRMS for rated power	
Input Impedance:	15K ohms, nominal	
Transient Intermodulation Distortion:	less than 0.02%	
Crosstalk:	-86dB.	
Damping Factor:	500:1 at 1KHz	

Slew Rate:	Closed loop response greater than 40v per micro second.
Thermal Protection:	Thermal sensor activates channel shut down at 95°C.
D.C. Protection:	D.C. sensor activates channel shut-down if a D.C. condition exists.
Turn-on-Delay:	3 Seconds, solid-state actuated
Heat-Sink and Cooling:	High efficiency, convection cooled with "Venturi" style fan assist providing extra power handling utilizing massive heat-sink extrusions.
Input Connectors:	(2) 1/4 Inch Phone Jacks (unbalanced) (2) XLR (balanced)
Output Connectors:	Dual 5-way Binding Posts
Weight:	34 lbs. (17.7 kg) 9220A 39 lbs. (19.6 kg) 9420A
Controls & Indicators:	<i>(Front Panel)</i> AC Mains Power Switch Power-on LED Indicator, Channel One and Two Level Controls. Each channel contains a selectable variable "Peak Limiter"/ "Soft Clip" feature, Clip LED and an 11 LED "VU" Output Display. <i>(Rear Panel)</i> Dual/Mono switch and Ground Lift Switch.
Power: (Input)	100-130 VAC, 50/60 Hz 90W (idle) 1000 Watts (maximum) 9220A 1500 Watts (maximum) 9420A
Dimensions:	5 ^{1/4} " H (13.3 cm) 19" W (48.3 cm) 11 ^{7/8} " D (30.2 cm) behind panel 13 ^{3/8} " D (34.0 cm) overall

Specifications PRIOR SEPT. 1987

Type:	Two channel audio power amplifier
Gain:	31dB (each channel) 900A 33dB (each channel) 1100A
Continuous Average Power Output:	300 watts per channel at 8 ohms 900A 500 watts per channel at 8 ohms 1100A 500 watts per channel at 4 ohms 900A 750 watts per channel at 4 ohms 1100A
Frequency Response:	Plus /Minus 0.5dB 20Hz-20kHz
Distortion:	No more than 0.25% THD or IM, 0.01W to rated power, 20Hz to 20kHz (typically 0.01%)
Hum and Noise:	101dB below rated output (unweighted 20kHz bandwidth)
Input Sensitivity:	1.6V RMS for rated output
Input Impedance:	15K ohms, nominal
Input Connectors:	(2) 1/4 -inch phone jacks (unbalanced) (2) XLR (balanced)
Output Connectors:	Dual 5-way binding posts
Controls & Indicators:	(Front Panel) AC mains power switch, power-on LED indicator, Channel One and Two level controls, Bridge mode switch, Ground lift switch, 120/240V line switch. Channel one and two signal status indicators (green active red clip)
Power:	100-130VAC, 50-60Hz 90W (idle), 1000W (maximum) 900A 1500W (maximum) 1100A
Dimensions:	5-1/4" H (13.3cm) 19" W (48.3cm) 11-7/8" (30.2cm) behind panel 13-3/8" (34cm) overall
Weight:	39 lbs (17.7kg) 43 lbs (19.6kg)

Precedent Series Amplifiers

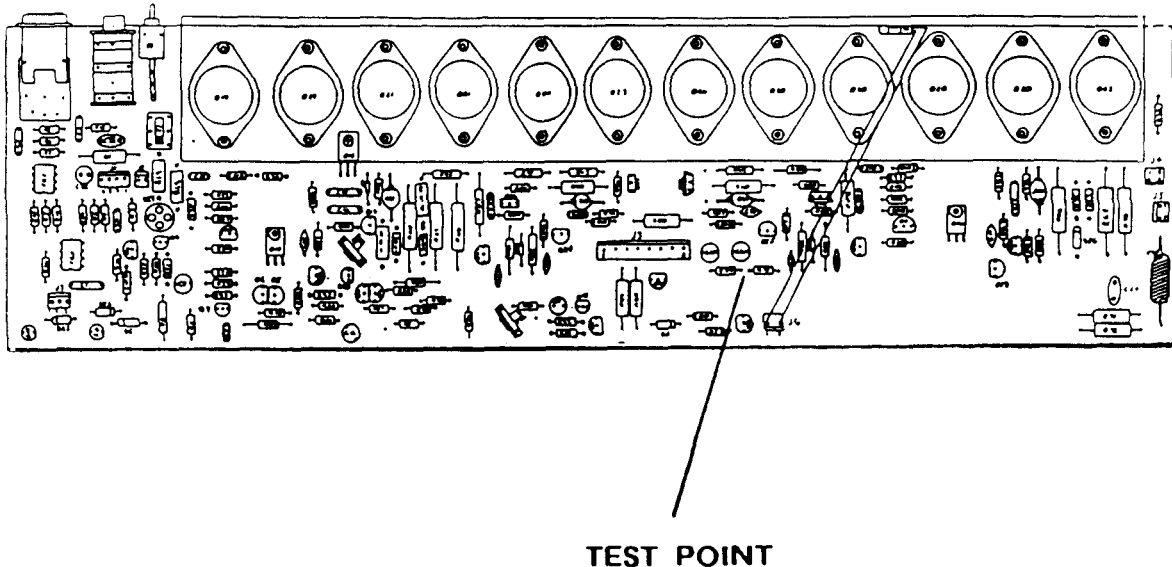
SPECIFICATIONS

Type:	Two Channel Audio Power Amplifier
Gain:	31 dB (each Channel) 900A 33 dB (each Channel) 1100A
Continuous Power:	350 watts per channel at 8 ohms 900A
Average Power:	590 watts per channel at 4 ohms 900A
Output:	775 watts per channel at 2 ohms 900A
(120 VAC Line, 1KHz, single channel driven)	925 watts bridged mono at 8 ohms 900A 1123 watts bridged mono at 4 ohm 900A
Continuous Power:	525 watts per channel at 8 ohms 1100A
Average Power:	850 watts per channel at 4 ohms 1100A
Output:	1100 watts per channel at 2 ohms 1100A
(120 VAC Line, 1KHz, single channel driven)	1300 watts bridged mono at 8 ohms 1100A 1700 watts bridged mono at 4 ohms 1100A
Frequency Response:	Plus/Minus 0.5 dB 20 Hz to 20 KHz
Distortion:	No more than 0.25% THD or IM, 0.01W to rated power, 20 Hz to 20 KHz (0.01% typical)
Hum and Noise:	104 dB below rated output (unweighed 20 KHz bandwidth)
Input Sensitivity:	1.6 VRMS for rated power
Input Impedance:	15K ohms, nominal
Transient Intermodulation Distortion:	less than 0.02%
Crosstalk	-86 dB
Damping Factor:	500:1 at 1 KHz

Slew Rate:	Closed loop response greater than 40 Volts per micro second
Thermal Protection:	Thermal sensor activates channel shut down at 95° C.
DC Protection:	DC sensor activates channel shut down if a DC condition exists.
Turn-On Delay:	3 Seconds, solid-state actuated.
Heat Sink and Cooling:	High efficiency, convection cooled with "Venturi Style" fan assist providing extra power handling utilizing massive heat sink extrusions.
Input Connectors:	(2) 1/4 Inch Phone Jacks (unbalanced) (2) XLR (balanced)
Output Connectors:	5-way Binding Posts
Weight:	29 lbs. (13.2 kg) 900A 34 lbs. (15.4 kg) 1100A
Controls and Indicators:	<i>(Front Panel)</i> AC Mains Power Switch Power-on LED Indicator, Channel One and Two Level Controls. Channel One and Two Signal Status Indicators (green active / red clip) <i>(Rear Panel)</i> Dual/Mono Switch and Ground Lift Switch.
Power (Input):	100-130 VAC, 50/60 Hz 90 W (idle) 1000 Watts (maximum) 900A 1500 Watts (maximum) 1100A
Dimensions:	5 ^{1/4} " (13.3 cm) H, 19" (48.3 cm) W 11 ^{7/8} " (30.2 cm) D, behind panel 13 ^{3/8} " (34.0 cm) D, over all

DC LATCH

TEST PROCEDURE



Your AB International amplifier is equipped with a D.C. Latch Protection Circuitry. In a case where a D.C. voltage of ± 3 volts or greater exist at the output of the channel, it will then trigger a relay at the power supply and shut the amplifier off. Failure to test this circuitry, prior to use of the amplifier, may cause damage to a speaker if a failure occurs in the future.

The D.C. Latch Circuitry is made up of two parts:

- 1) Individual channel RC Network and Triac circuitry.
- 2) Power Supply Relay Network.

Note: The power supply relay network serves the function for all the channels in the amplifier.

Test these circuits by following these procedures:

- 1) Take a 10K $\frac{1}{2}$ watt resistor and apply it across two points--
 - A) The junction of R74 and R75 (see schematic) and,
 - B) Any DC voltage point on the Power Supply.
- Note: You are now forcing the triac to trigger by applying D.C. voltage to the base of the triac.
- 2) If step one worked properly your triac should have triggered and now connected the latch line to ground. When the Power supply latch is connected to ground, the relay (K1) will engage and shut the amplifier off by disengaging the gate of the triac (Q1).
- 3) If step one and two worked properly, shut the amplifier off and discharge the main power supply filter caps. This will engage the Triac Q1 on the power supply. The amplifier should now turn on and work properly.

Notes.

- 1) If you are testing Power Supply PCB Revision B - F:
The amplifier will cycle on and off every few seconds when the D.C. Latch circuit has been triggered.
- 2) If you are testing Power Supply PCB Revision G or Higher:
The amplifier will shut off when the D.C. Latch circuit has been triggered. To reset you must shut the amplifier off and discharge the power supply caps through a 100 ohm resistor.

AB INTERNATIONAL COMPONENT DATA

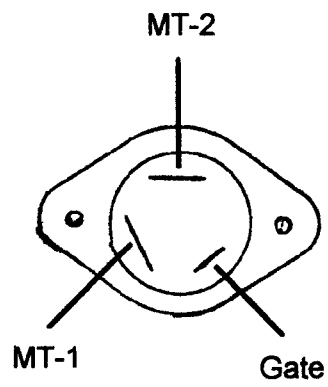
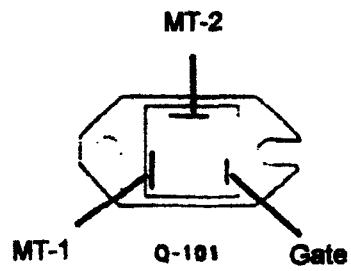
ABI		DIODES		USA
ID. #	ZENIER	VOLTS	W/A	
1N4733	ZENIER	5.1	1w	
1N4735	ZENIER	6.2	1w	
1N4737	ZENIER	7.5	1w	
1N4742	ZENIER	12	1w	
1N4745	ZENIER	16	1w	
1N4749	ZENIER	24	1w	
1N4752	ZENIER	33	1w	
1N4001	SW/DIODE	50	30	UPDATED TO 1N4004
1N914	SW/DIODE	75	75ma	
1N5186	SW/DIODE	200	200	UPDATED TO FR303
FR303	SW/DIODE	200	200	UPDATED TO FR604
1N4004	SW/DIODE	400	30	
FR604	SW/DIODE	400	3A	

ABI		REG. & TRIACS			USA	
ID. #	TYPE	VOLTS	AMPS	POLLARITY	PACKAGE	REPLACEMENT
7808	REG.	8	1.5	POS.	TO-220	
7908	REG.	-8	1.5	NEG.	TO-220	
7812	REG.	12	1.5	POS.	TO-220	
7912	REG.	-12	1.5	NEG.	TO-220	
7815	REG.	15	1.5	POS.	TO-220	
7915	REG.	-15	1.5	NEG.	TO-220	
7818	REG.	18	1.5	POS.	TO-220	
7918	REG.	-18	1.5	NEG.	TO-220	
97A4	TRIAC				TO-92	L201E3
L201E3	TRIAC	200	1		TO-92	Z0102DA
Q4015L5	TRIAC	400	15		TO-220	
Q4025L6	TRIAC	400	25		TO-220	
6027	PUT				TO-92	
Z0102DA	TRIAC				TO-92	

AB INTERNATIONAL COMPONENT DATA

ABI		TRANSISTOR UPDATES			USA			
ORIG.	REV. 1	REV. 2	REV. 3	REV. 4	CASE TYPE	POLL.	ICmax	Vceo
MPS8599	A56	2N5401			T0-92	PNP	240ma	150
MPSL01	2N5550	2N5551			T0-92	NPN	600ma	160
MPSL51	2N5400	2N5401			T0-92	PNP	240ma	150
MPS6571	2N4401	2N5551			T0-92	NPN	600ma	160
710	2N4920					PNP		
RCA1C12	2238	MJE15030			T0-220	NPN	8a	120
2N5416					T05	PNP	1a	350
2N3440					T05	NPN	1A	350
MJE340					T0-225	NPN	.5a	300
MJE350					T0-225	PNP	.5a	300
MJH11021					T0-218	PNP	15a	250
TIP122					T0-220	NPN	.5a	100
TIP127					T0-220	PNP	.5a	100
TIP31B					T0-220	NPN	3a	60
TIP32B					T0-220	PNP	3a	60
TIP142					T0-220	NPN	10a	100
TIP147					T0-220	PNP	10a	100
2N3405								
2N4920					T0-225	PNP	1a	80
MJ15011	MJ15022	MJ21194			T03	NPN	10a	250
MJ15012	MJ15023	MJ21193			T03	PNP	10a	250
2SB554	MJ15023				T03	PNP	16a	200
2SD424	MJ15022				T03	NPN	16a	200
1B04	MJ15011	MJ15022	MJ21194		T03	NPN	7a	250
1B05	MJ15011	MJ15022	MJ21194		T03	NPN	7a	250
MJ21194					T03	NPN	16a	250
MJ21193					T03	PNP	16a	250
MJ15023	MJ21193				T03	PNP	16a	250
MJ15022	MJ21194				T03	NPN	16a	250
2SC2837					T0-218	NPN	10a	150
2SA1186					T0-218	PNP	10a	150
MJL21193					T0-3PBL	PNP	16a	250
MJL21194					T0-3PBL	NPN	16a	250
2SA1553					T0-3PBL	PNP	15a	230
2SC4029					T0-3PBL	NPN	15a	230

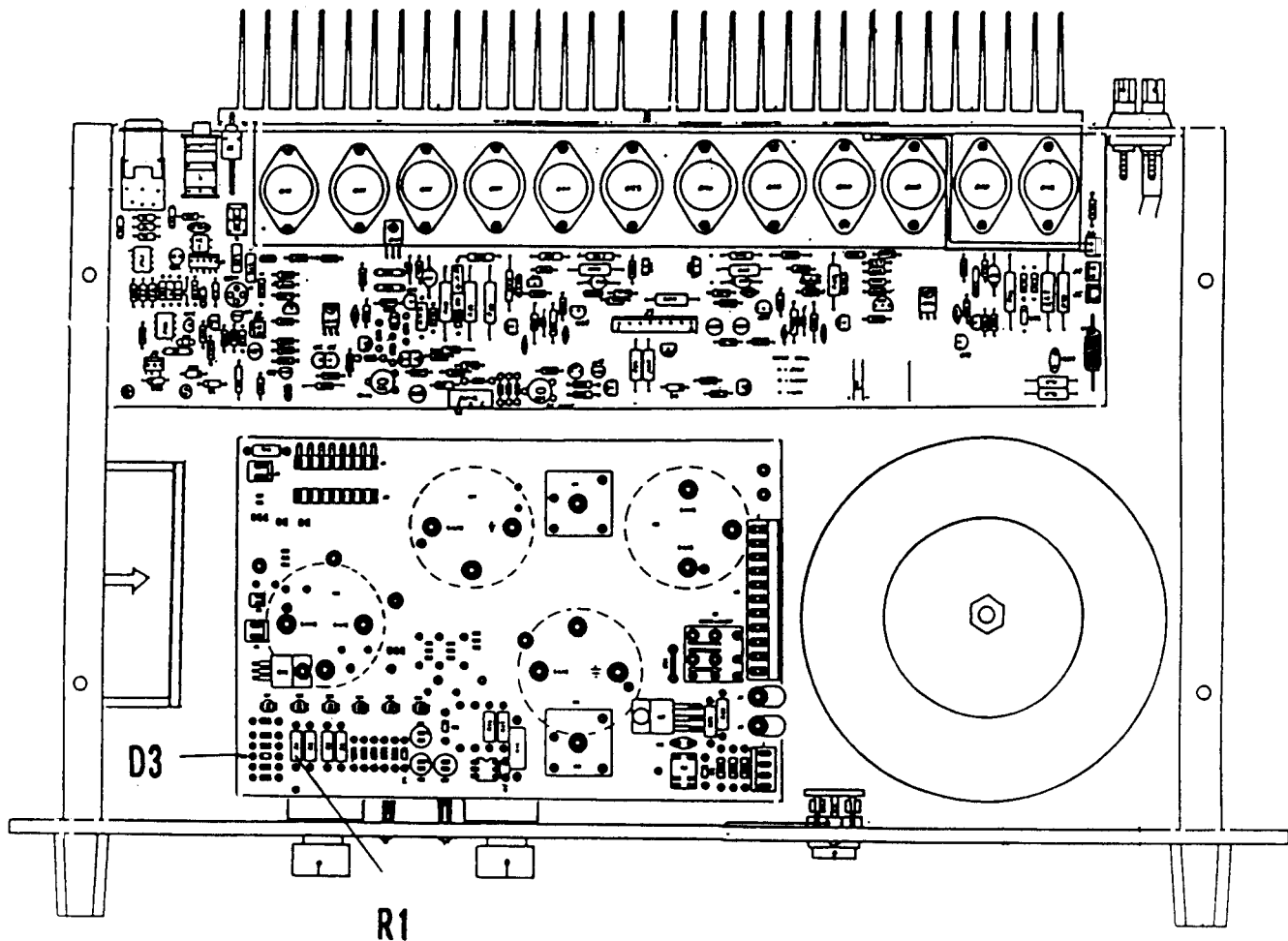
Triac Diagram



FAN CONVERSION 24V TO 48V

MODELS 1100A, 9420A, SUB 1850

POWER SUPPLY REV. H



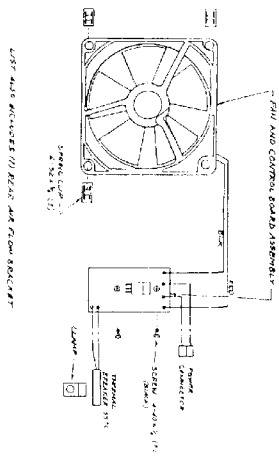
- STEP 1. REMOVE D3 (ZENER 1N4742) 12V
2. REMOVE R1 (RESISTOR 1.8 ohm 1/2W)
3. REPLACE D3 WITH (ZENER 1N4749) 24V
4. REPLACE R1 WITH (RESISTOR 3.6 ohm 1/2W)

NOTE: THIS CAN BE ACCOMPLISHED BY
SOLDERING FROM THE TOP SIDE OF
THE PCB.

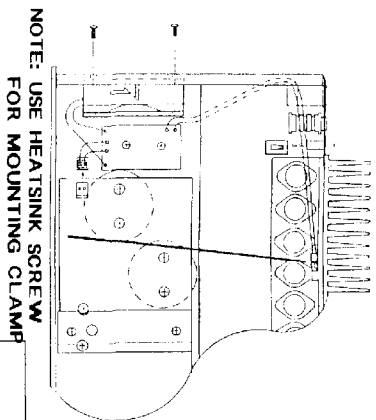
5. REPLACE 24V FAN WITH 48VDC FAN
- NOTE:** FOLLOW FAN INSTALLATION
INSTRUCTIONS.

EAN INSTALLATION MODEL 900A/1100A

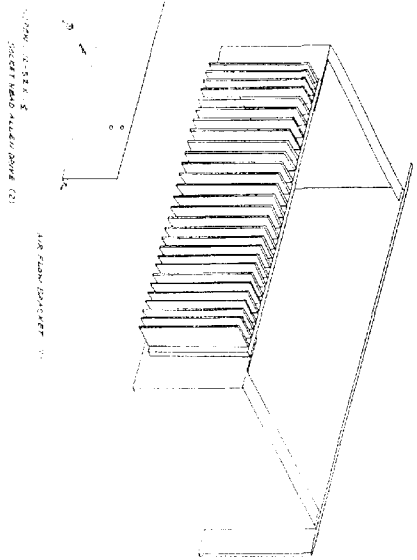
1 MATERIALS LIST:



A'CTG. n'ARF d. n'AS T BE p'L A Ue'D ad S - N'at'u'v'y



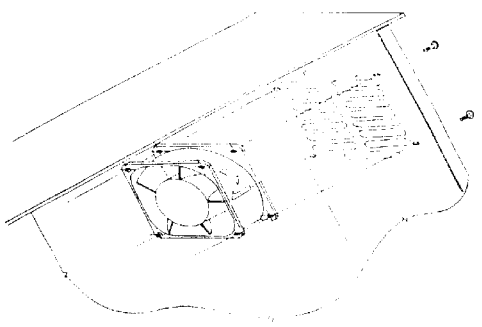
5 REAR AIR FLOW BRACKET
MOUNT BRACKET AS SHOWN



4 SECURING CONTROL BOARD



2 FAN INSTALLATION:



NOTE:
1. AMP MUST BE WIRING DURING INSTALLATION
2. PLACE FAN IN CHASSIS AND OBSERVE AIR FLOW
DIRECTION ARROW.

NOTE: POWER SUPPLY REV. G ONLY

AB INTERNATIONAL ELECTRONICS, INC
TITLE: PLAN (00) 44574444704 11775257003
NUMBER: 445-78, 408 0004 11/0004
AFFR SW 00000
PAGE: 1-4-90
ADDRESS: 11775257003 - 5550

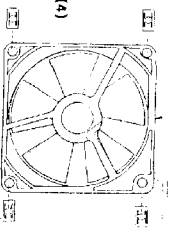
FAN INSTALLATION MODEL 900A/1100A FOR SERIAL NUMBERS 0010092-XX THRU PRESENT

1. MATERIAL LIST

FAN (24V DC FOR 900A & 48V DC FOR 1100A)

SCREW 6-32x $\frac{1}{2}$ (4)

SPRING CLIP
6-32 (4)



THERMAL BREAKER (95°C)

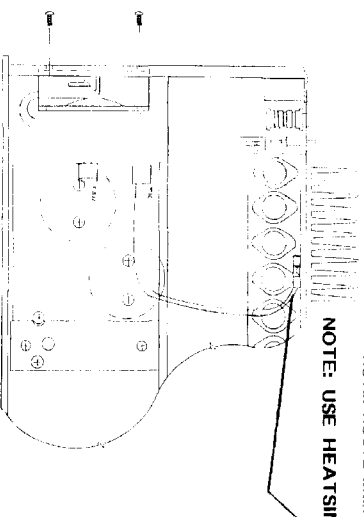
& CONNECTOR

CLAMP

LIST ALSO INCLUDES (1) REAR AIRFLOW BRACKET & SCREWS

3. THERMAL BREAKER & FAN CONNECTIONS

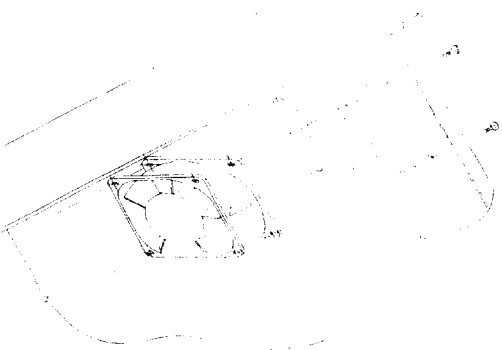
NOTE: ROUTE BREAKER WIRES AS SHOWN



NOTE: USE HEATSINK SCREW FOR MOUNTING CLAMP

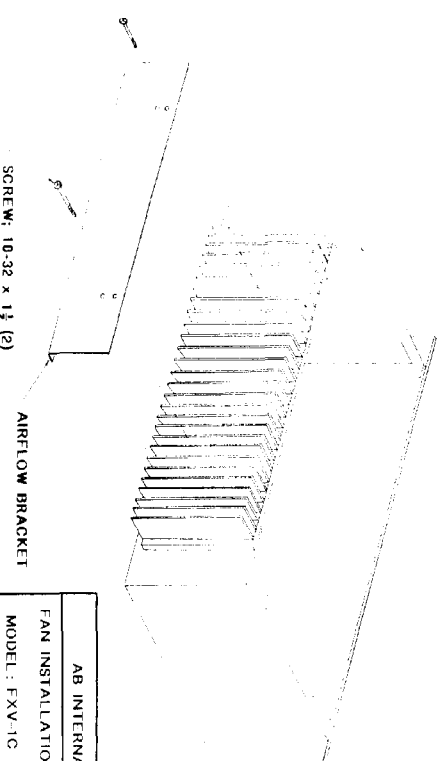
4. REAR AIRFLOW BRACKET MOUNTING

ATTACH BRACKET TO HEATSINK



2. FAN INSTALLATION

NOTE: 1. AMP MUST BE UNPLUGGED DURING INSTALLATION.
2. OBSERVE AIR FLOW DIRECTION ARROW



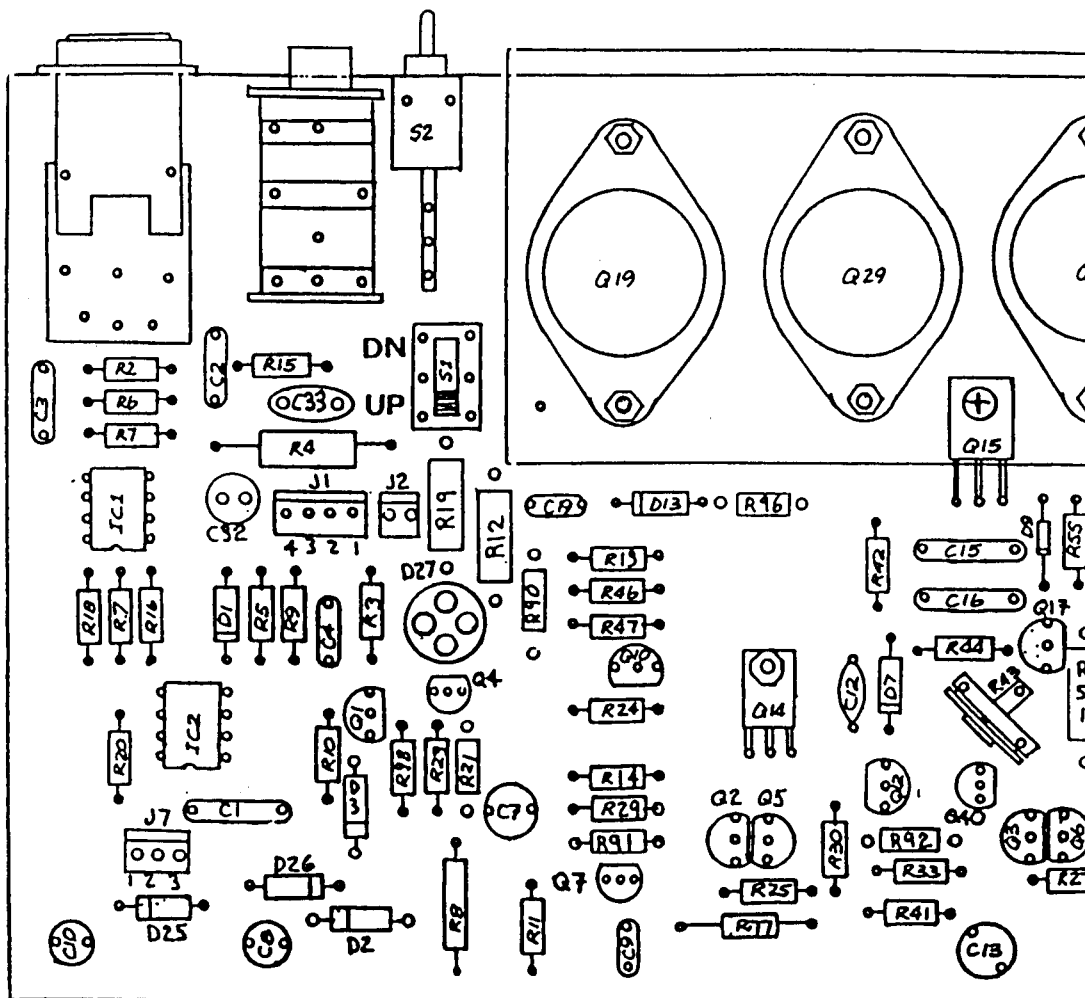
SCREW: 10-32 x 1 $\frac{1}{2}$ (2)

AIRFLOW BRACKET

AB INTERNATIONAL
FAN INSTALLATION INSTRUCTIONS
MODEL: FXV-1C FOR 3-RACK INST.
DATE: 1-2-92
ASSY NO. 109-560

NOTE: POWER SUPPLY REV. H ONLY (24V DC FOR 900A & 48V DC FOR 1100A)

PCB REPLACEMENT GUIDE LINES



- 1) S1 (Switch One) must be placed in proper position. If you are replacing Channel One, S1 must be in the "UP" position. If you are replacing Channel Two PCB, S1 must be in the "DN" position.

*Note: S1 determines the function of S2; either "Ground/Lift" or "Mono/Dual".

- 2) When connecting the Power Supply Ribbon Cable up to the Power PCB's --

*Note: DO NOT MISS PIN THE CABLE, even for a second. The Power Supply Caps have a charge and may damage the PCB circuitry.

- 3) Apply an even thin coat of white Silicon Thermal Compound to angle. Failure to do so may cause improper heat transfer.

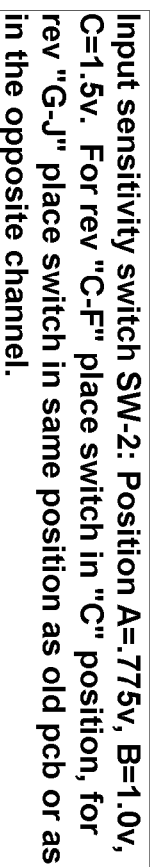
NOTE: EXCLUDE STEP ONE FOR DUAL CHANNEL PCB

Toggle switch function depends on which position the output pcb is placed in (top or bottom board, channel 1 or 2 position)

If the output pcb is in the top or channel 1 placement, it is the "Ground Lift" switch.

If the output pcb is in the bottom or channel 2 placement, it is the "Bridge/Mono" switch.

Place slide switch S1 in "UP" position when replacement pcb is for channel 1 (Top Board)
Place slide switch S1 in "DN" position when replacement pcb is for channel 2 (Bottom Board)

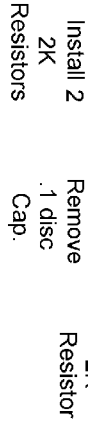


If the replacement output pcb is for channel 1 (top board) the bridge wire connects to J5 pin 2.

DOUBLE CHECK CONNECTIONS BEFORE POWERING UNIT UP

Install shielded cable from level control board to J1. If the new output pcb is a revision "J" and the old output pcb is also a rev "G-J" then all connections will be the same. HOWEVER PLEASE NOTE: If new output pcb (rev J) is a replacement board for a rev "C-F" the shielded cable from the level control pcb will have a 4 pin connector on it. When installing the connector SKIP pin 1 of J1 on the output pcb and install the 4 pin harness plug onto pins 2-5.

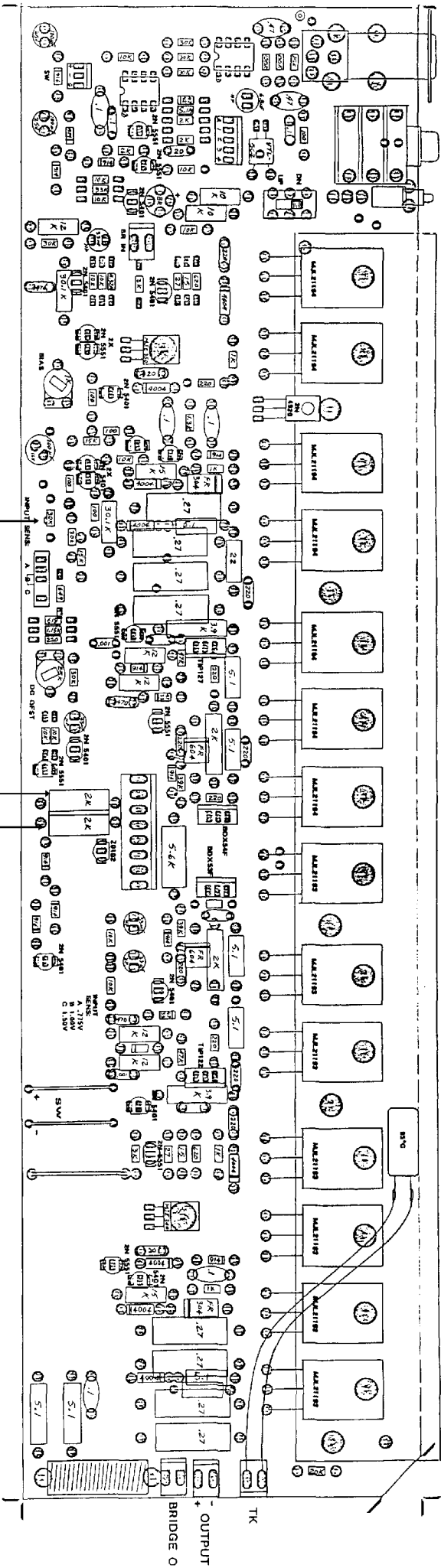
Install 2	Remove	Resistor
2K	.1 disc	
Resistors	Cap.	



TITLE: PCB ASSEMBLY, CHANNEL BOARD
MODEL: 1100A, 9420A

ASSY NO. 502-670 REV. J

9220A, 9420A Output pcb replacement Modification "J" rev to "J" rev.



Remove
30K Resistor

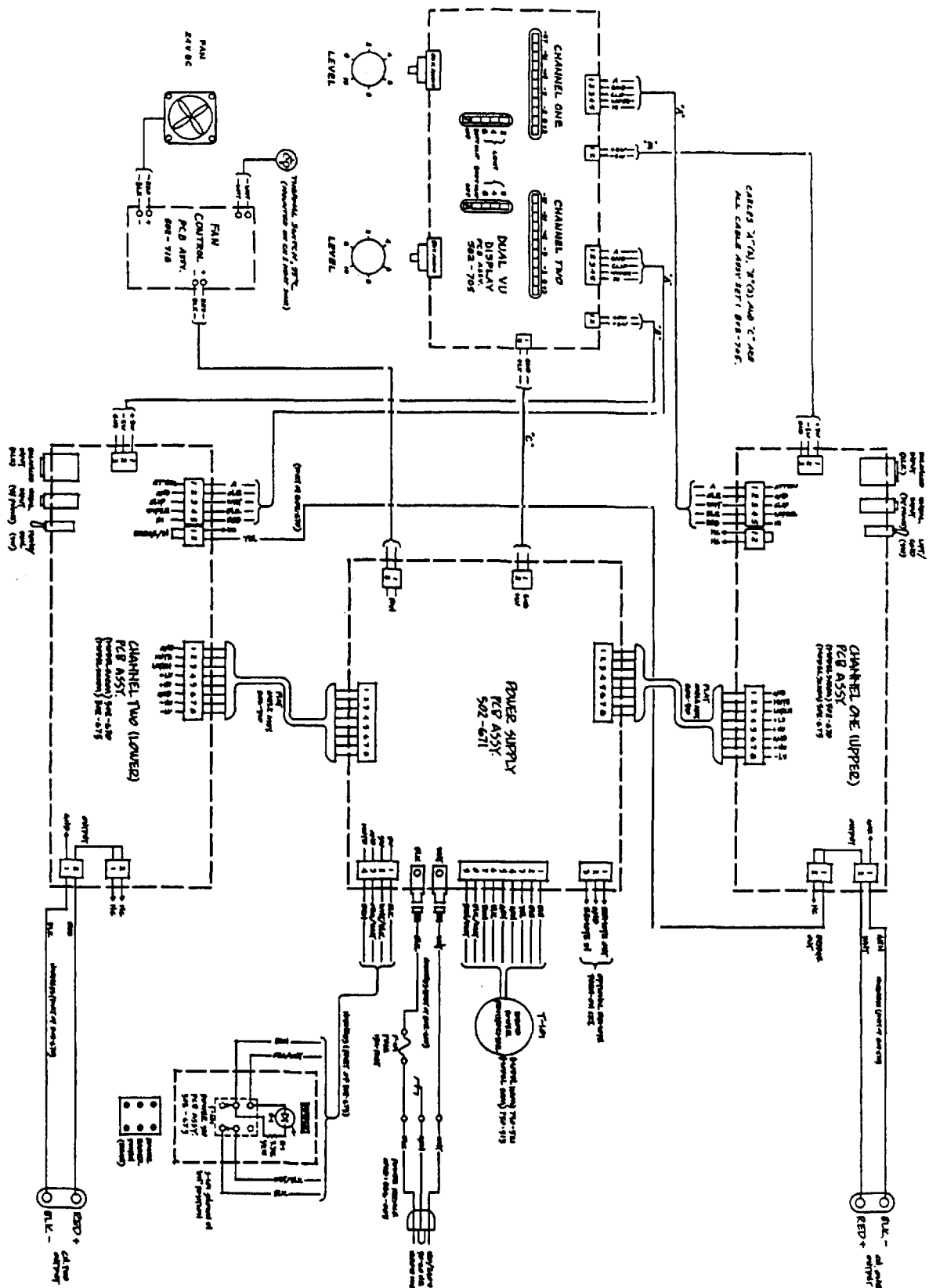
Check value of old resistors to
new resistors, if different
install old resistors in new pcb

AB INTERNATIONAL, INC.

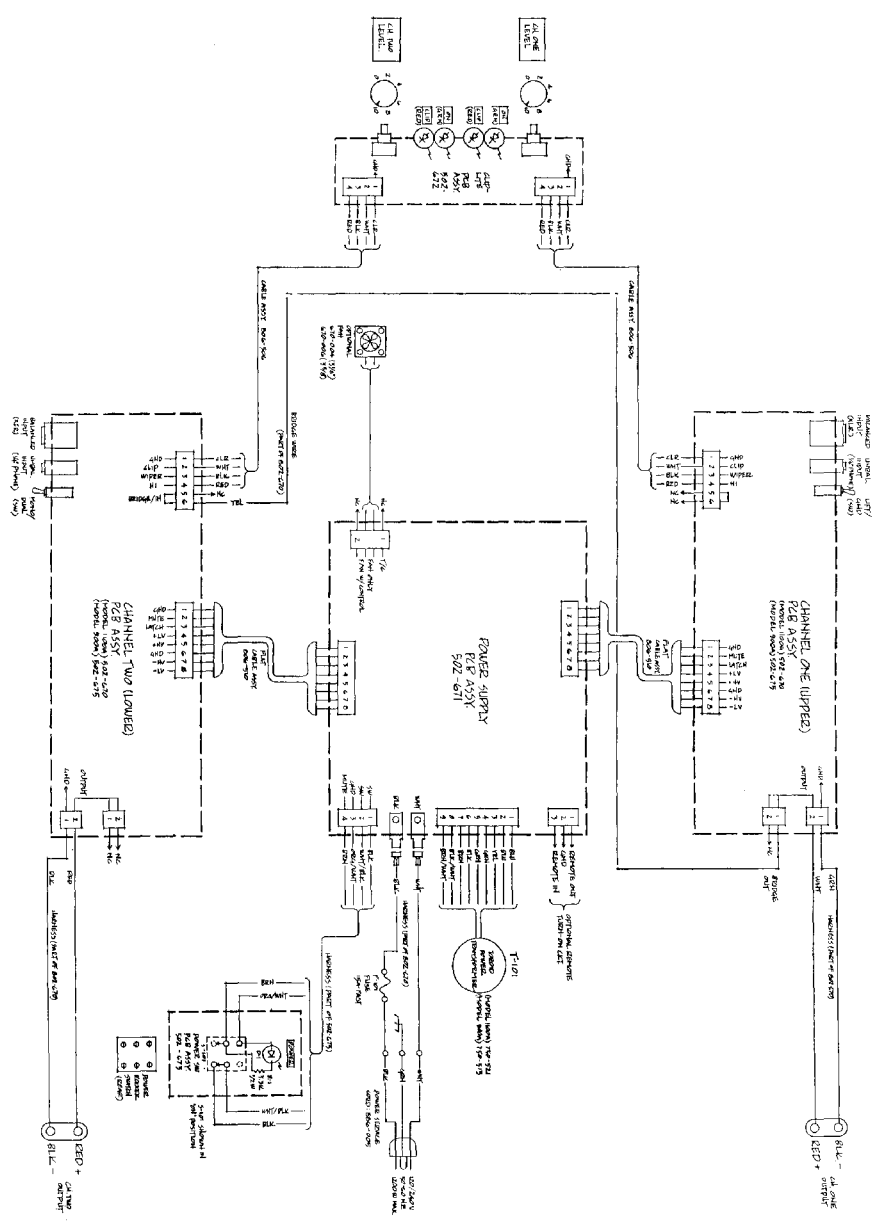
TITLE: PCB ASSEMBLY, CHANNEL BOARD
 MODEL: 1100A, 9420A

DATE: 9-7-94

ASSY NO. 502-610 REV. J

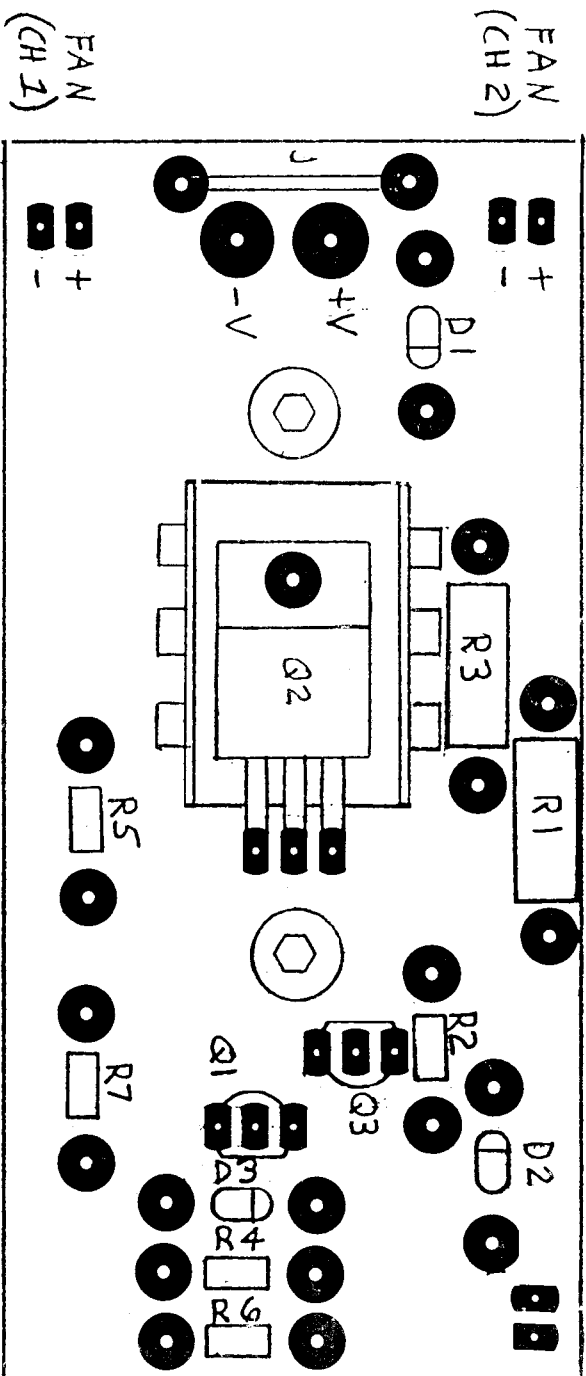


A.B. INSTRUMENTAL, INC.
 MODEL: 502-671/702
 PART: 502-671, R/L
 ASSEMBLY NO. 555-9110
 357-6660



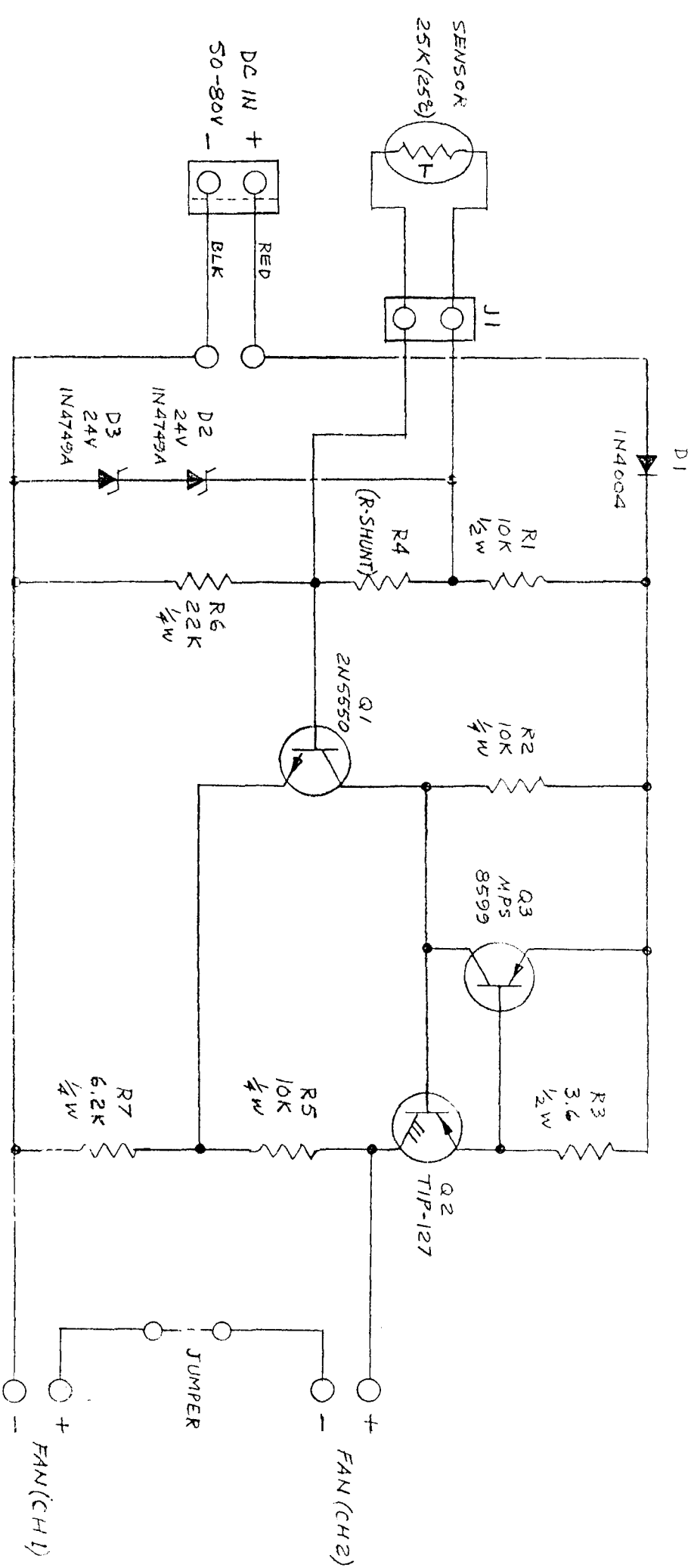
100 INTERNATIONAL, INC.
 THIS INSTRUCTIONS SCHEMATIC
 MODEL: 502-671/100A
 DATE: 8-10-88, R.H.
 ASSEMBLY NO. 555-670 (100A)
 555-670 (100A)

THERMAL SENSOR



NOTE: REV. B ONLY 6-90/12-91

AB INTERNATIONAL INC.
ASSEMBLY DIA.: FAN CONTROL
MODEL: 1200C
DATE: 4-90 J.K.
ASSEMBLY NO. 502-713-B



AB INTERNATIONAL, INC.

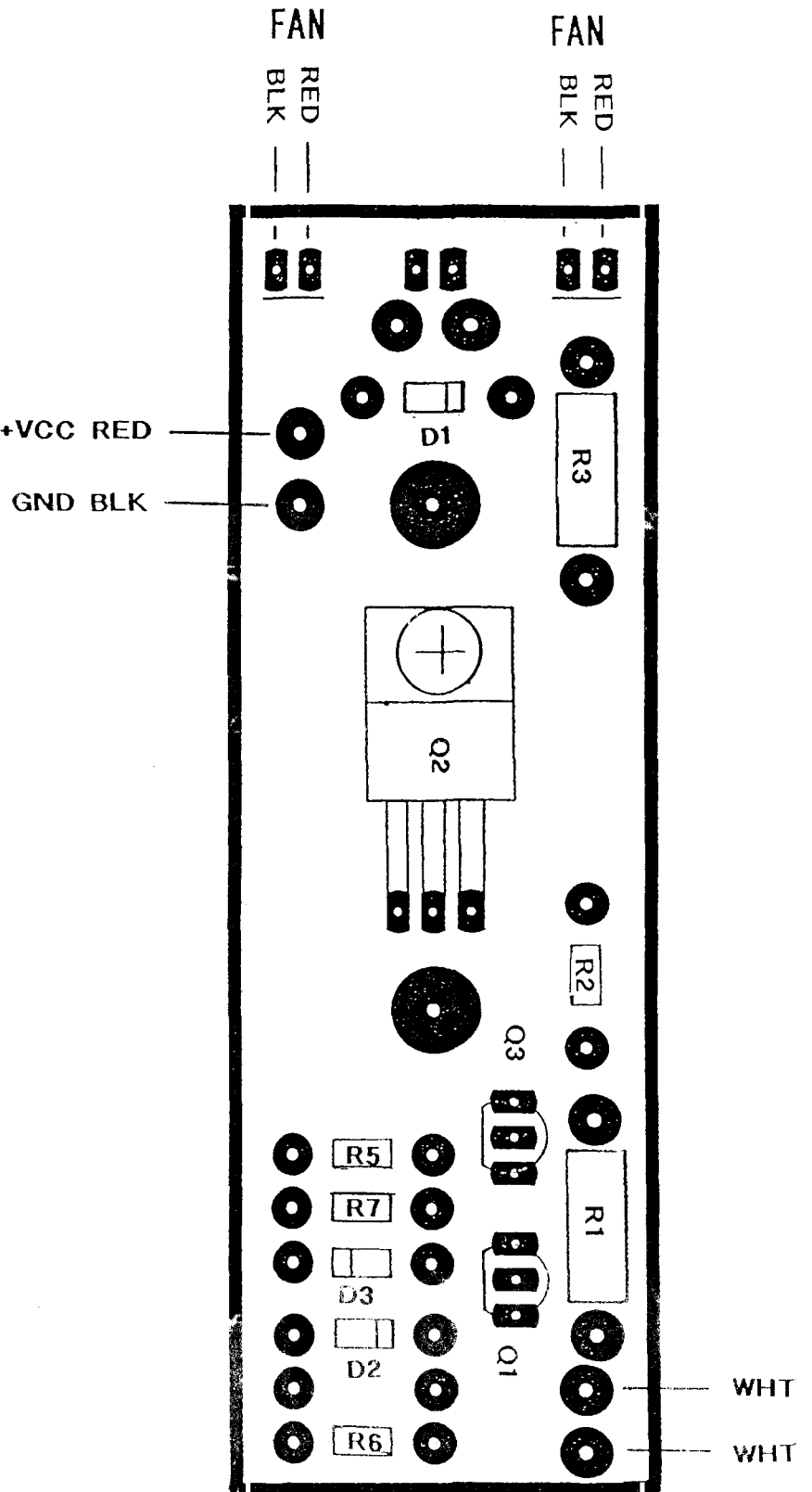
SCHEMATIC: FAN CONTROL C1

MODEL: 1200C

DATE: 4-90 GEO.A

ASSEMBLY NO. 502-713

THERMAL SENSOR



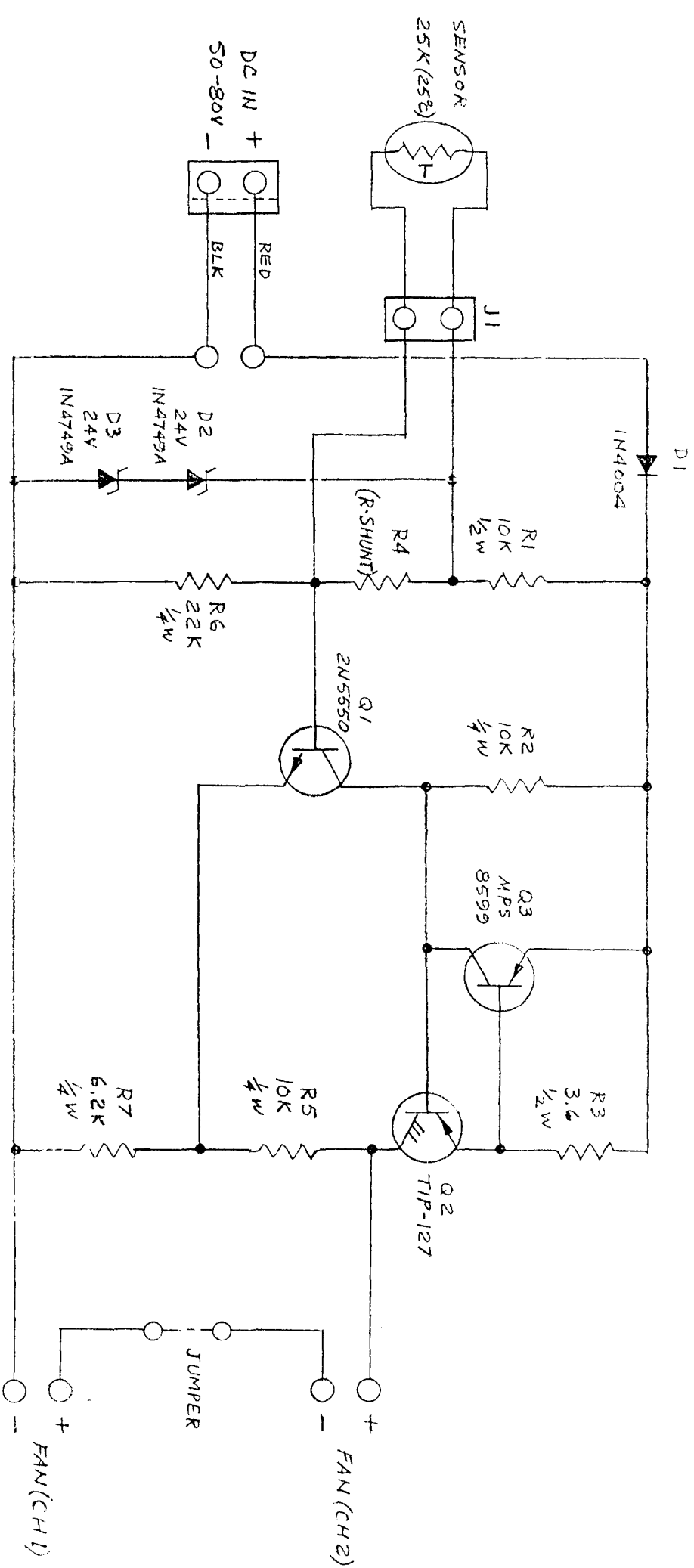
AB INTERNATIONAL, INC.

TITLE: FAN CONTROL BOARD

MODEL: 1200C

DATE 11-91

ASSY. NO. 502-713 REV. C

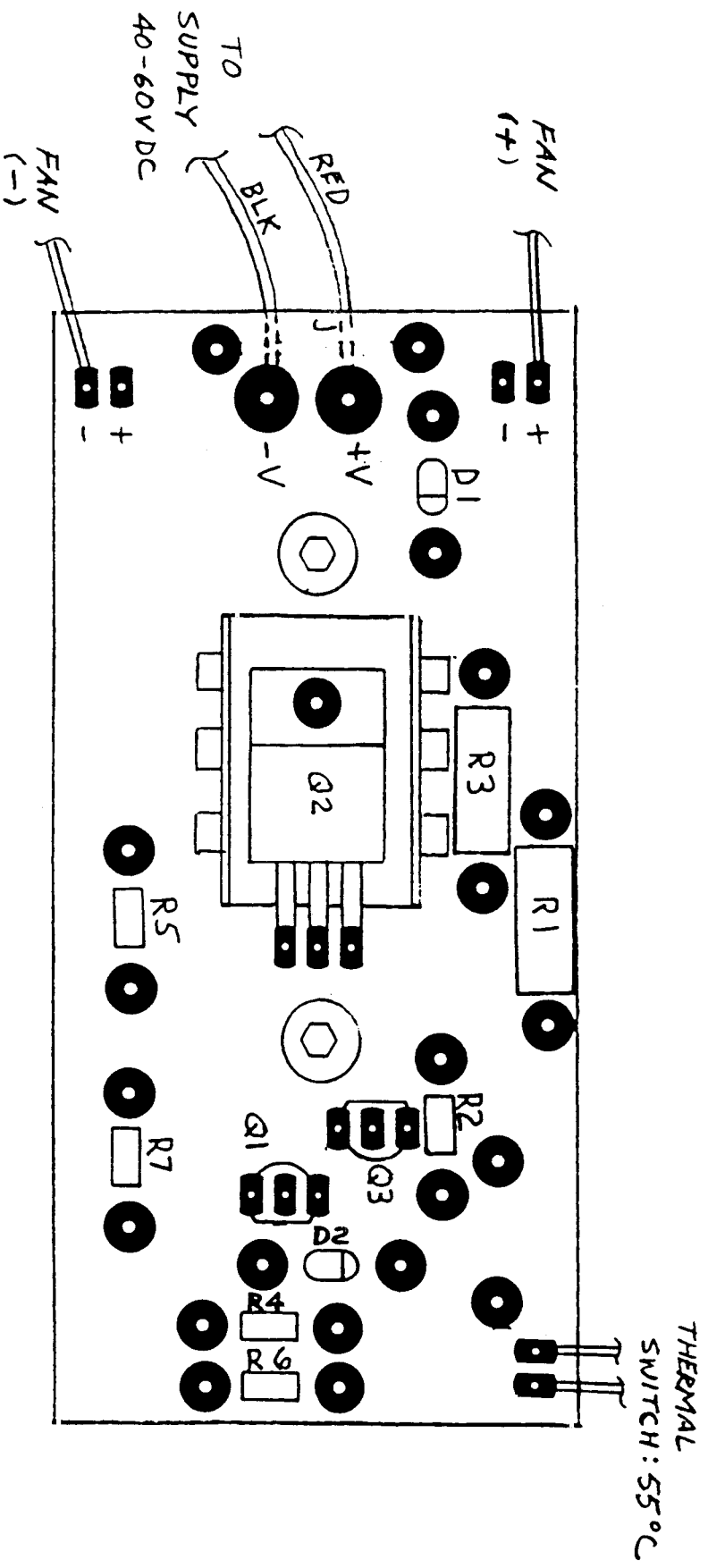


AB INTERNATIONAL, INC.

SCHEMATIC: FAN CONTROL C1

MODEL: 1200C

DATE: 4-90 GEO.A



NOTE: REV G POWER SUPPLIES ONLY 6-90/12-91

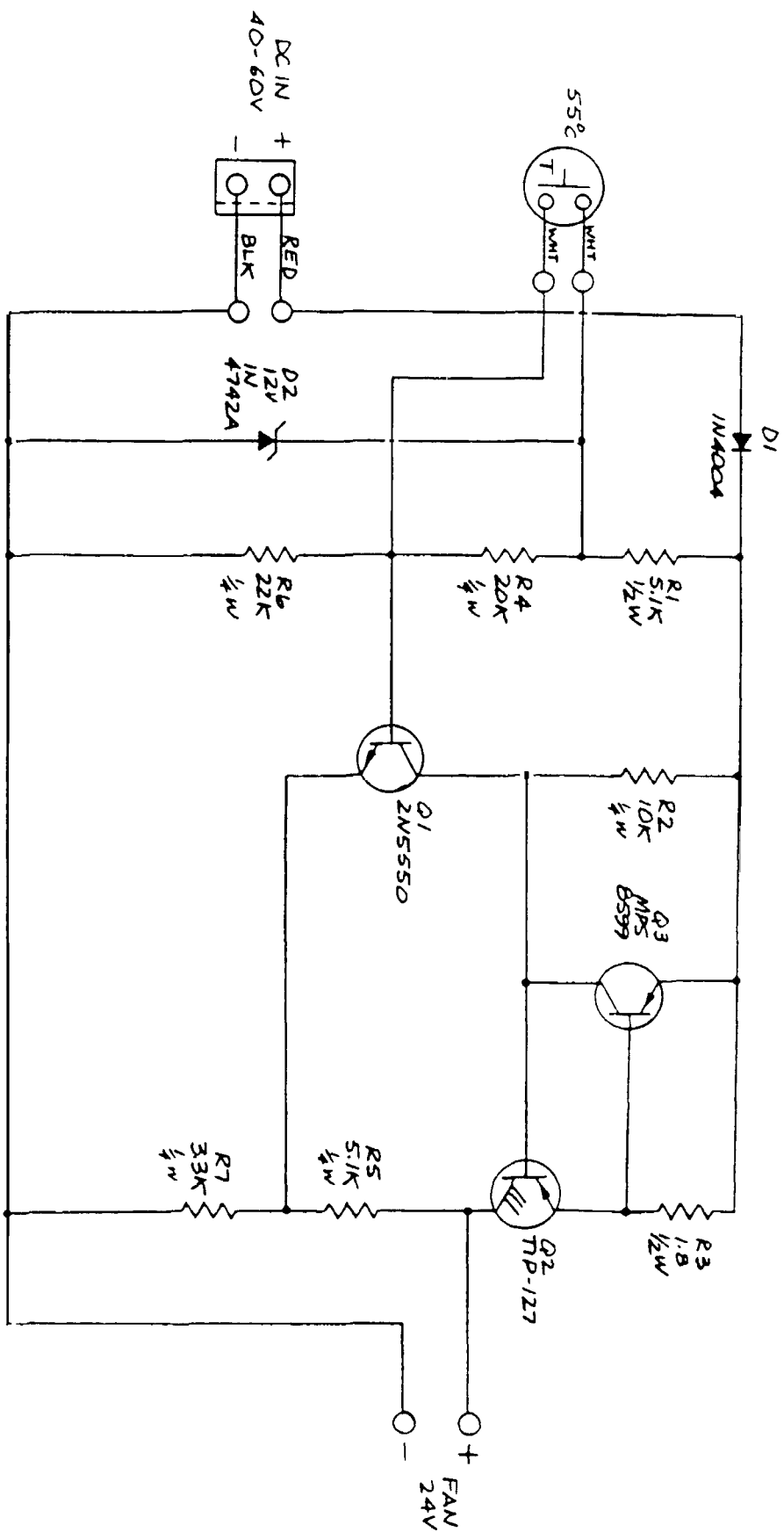
AB INTERNATIONAL, INC.

ASSY. FAN CONTROL BD.

MODEL: 900A/1100A (24V FAN)

DATE: 7-20-90 GEO.A

ASSY NO: 502-716 REV. A

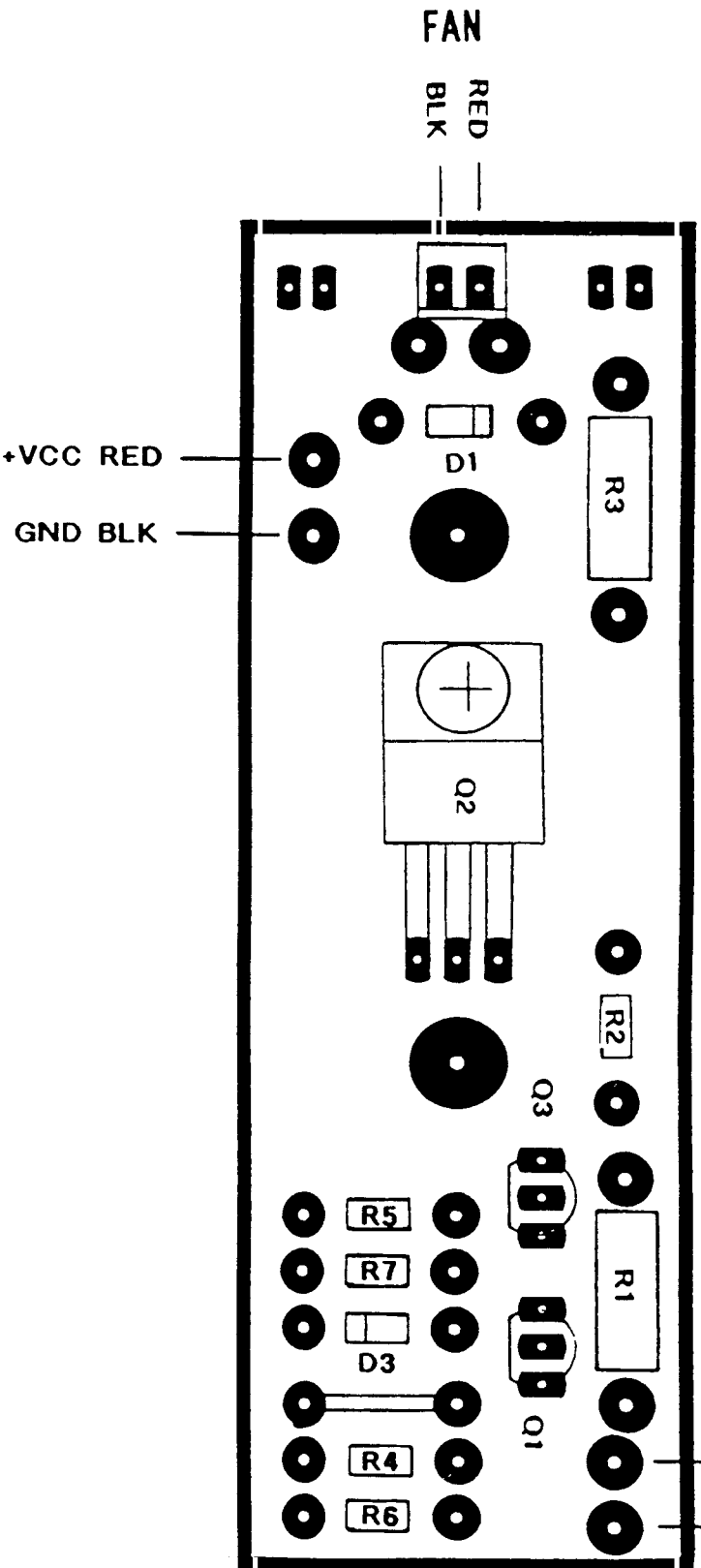


NOTE: REV. POWER SUPPLIES ONLY 6-90/12-91

AB INTERNATIONAL INC
 TITLE: FAN CONTROL CIRCUIT
 (24V FAN)
 MODEL: 900A/1100A
 DATE: 7-17-90 MH.
 ASSEMBLY NO. 502-716 REV. A

THERMAL SWITCH

WHT
WHT



AB INTERNATIONAL, INC.

TITLE: FAN CONTROL PCB

MODEL: FX1B, TWO-RACK AMPS

DATE 11-91

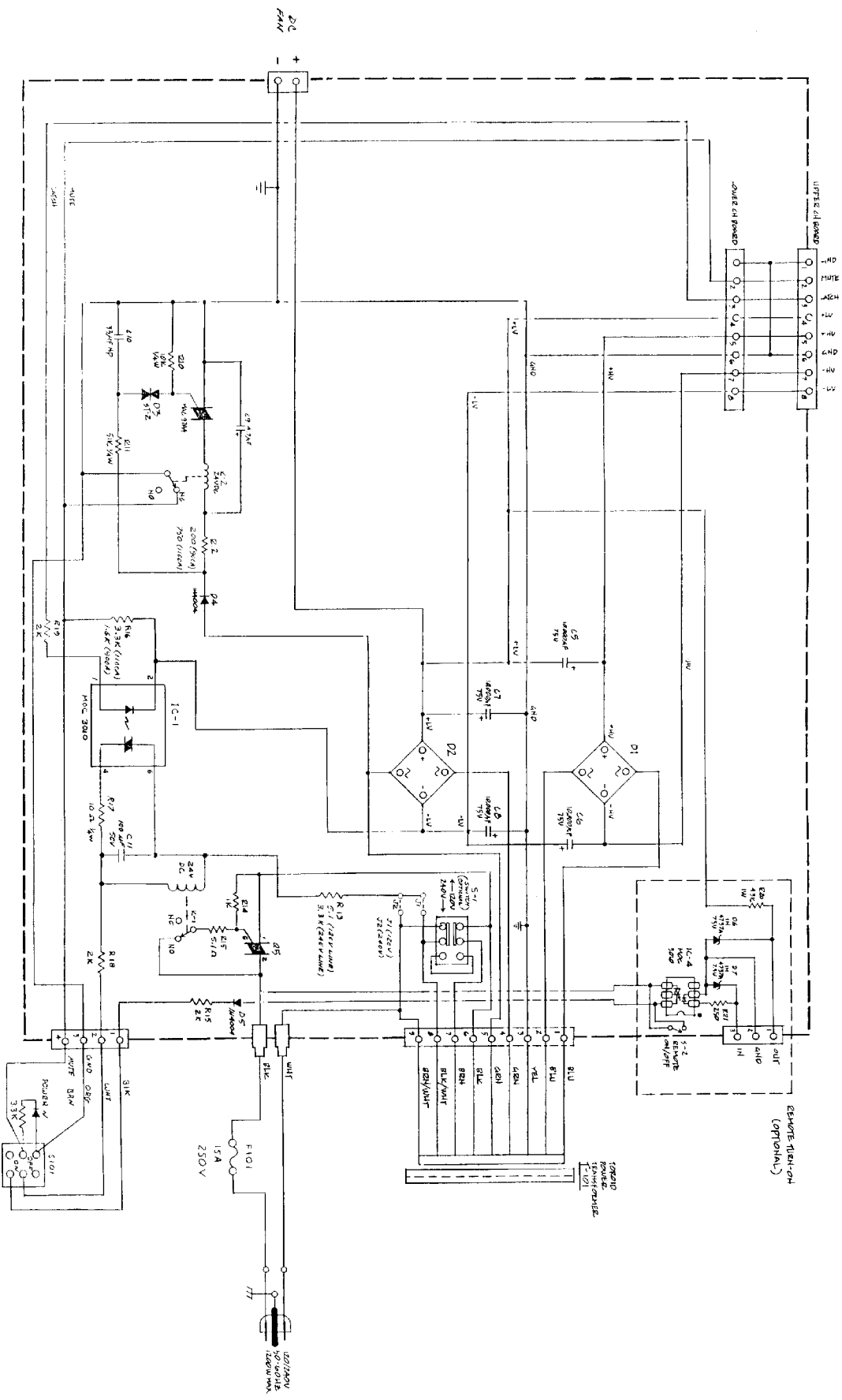
ASSY. NO. 502-716 REV. C



TITLE: FAN CONTROL CIRCUIT

DATE 11-91

ASSY. NO. 502-716 REV. C



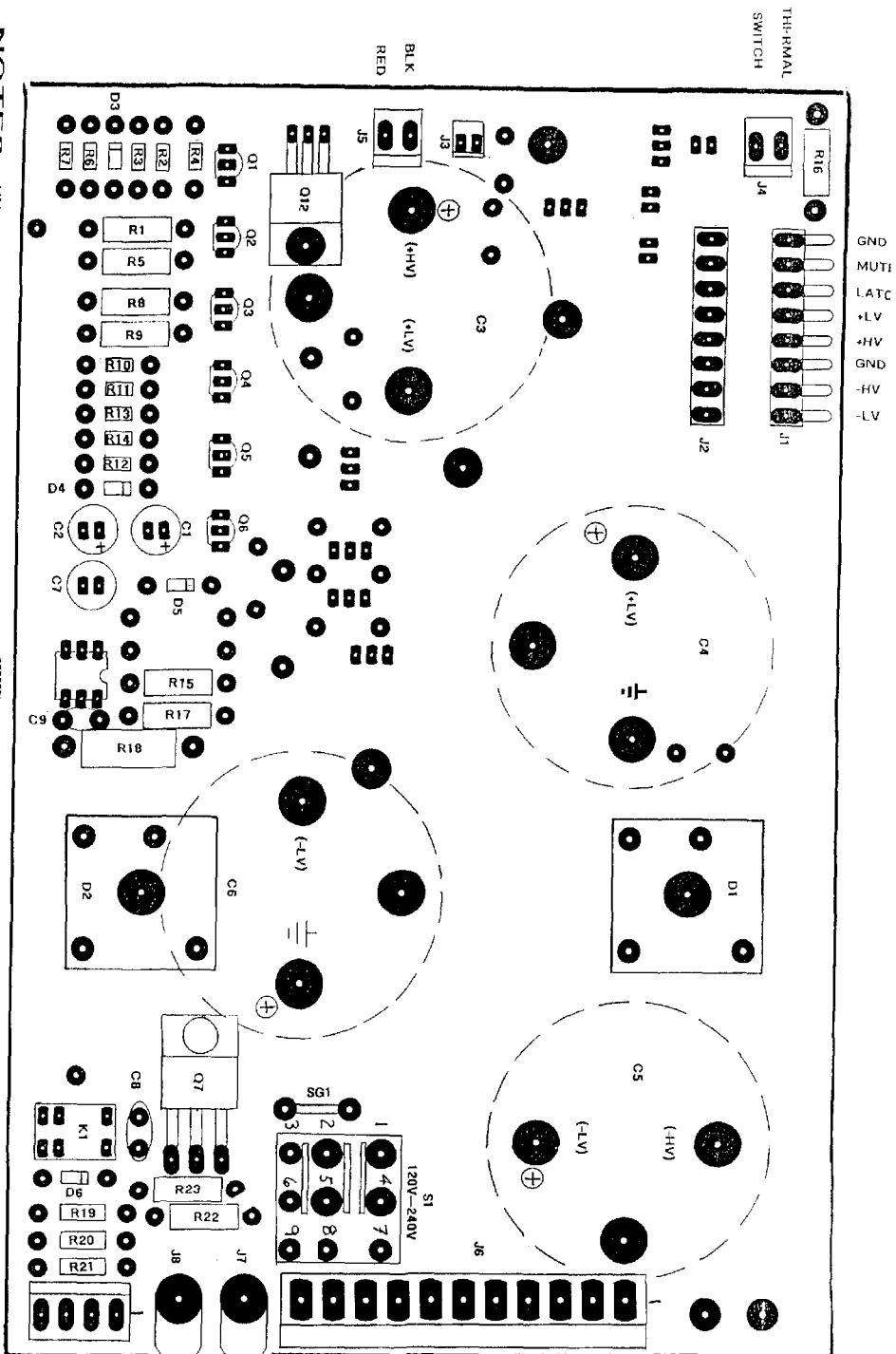
NOTES: UNLESS OTHERWISE SPECIFIED

- 1) ALL CAPACITORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED
- 2) ALL CAPACITORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED
- 3) 100K 1W RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED
- 4) 100K 1W RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED

NOTE: 900A = 9220, 1100A = 9420

NOTE: REV G ONLY 6-90/12-91

AB INTERNATIONAL, INC.
 TITLE: SYNCHRONOUS POWER SUPPLY
 MODEL: 900A/1100A
 DATE: 6-18-90 360-A
 DESIGNED BY: V.D. SIOG - 6/91/REV G



NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS, $\frac{1}{2}W$, 5%
2. ALL CAPACITORS ARE IN MICROFARADS (μF)
3. INDICATES CHASSIS GROUND
4. RAIL VOLTAGES ARE AS FOLLOWS:
+/-HV: 900A 92V; 1100A 108V
+/-LV: 900A 45V; 1100A 53V

PRIMARY AC	WIRE COLOR						MAINS SELECT
WIRE LETTER	A	B	C	D	E	F	POSITION
190-110 VAC	BLACK	BROWN	BLK/WHI	GRAY	BRN/WHI	WHITE	120 POS.
115-130 VAC	BLACK	BROWN	GRAY	BLK/WHI	WHITE	BRN/WHI	120 POS.
200-215 VAC	BLACK	BROWN	BLK/WHI	GRAY	BRN/WHI	WHITE	240 POS.
220-230 VAC	BLACK	BROWN	GRAY	BLK/WHI	BRN/WHI	WHITE	240 POS.
235-250 VAC	BLACK	BROWN	GRAY	BLK/WHI	WHITE	BRN/WHI	240 POS.

CHANGING AC LINE VOLTAGE WIRING

- STEP 1. SELECT PROPER LINE VOLTAGE
2. LOCATE VOLTAGE ON PRIMARY CHART
 3. CHANGE TRANSFORMER WIRES PER CHART
 4. SELECT PROPER SWITCH POSITION (S1)
- NOTE: IF PCB IS NOT LOADED WITH SWITCH (S1), IF NEEDED MOVE THE THREE ORANGE JUMPERS FROM HOLES (1&4, 2&5, 3&6) TO (4&7, 5&8, 6&9). THIS CAN BE SOLDERED FROM THE TOP SIDE OF THE PCB.
5. CHANGE FUSE 100V-120V = 15A
200V-240V = 10A

PRIMARY

AC IN
BLK
WHI
ORG
BRN

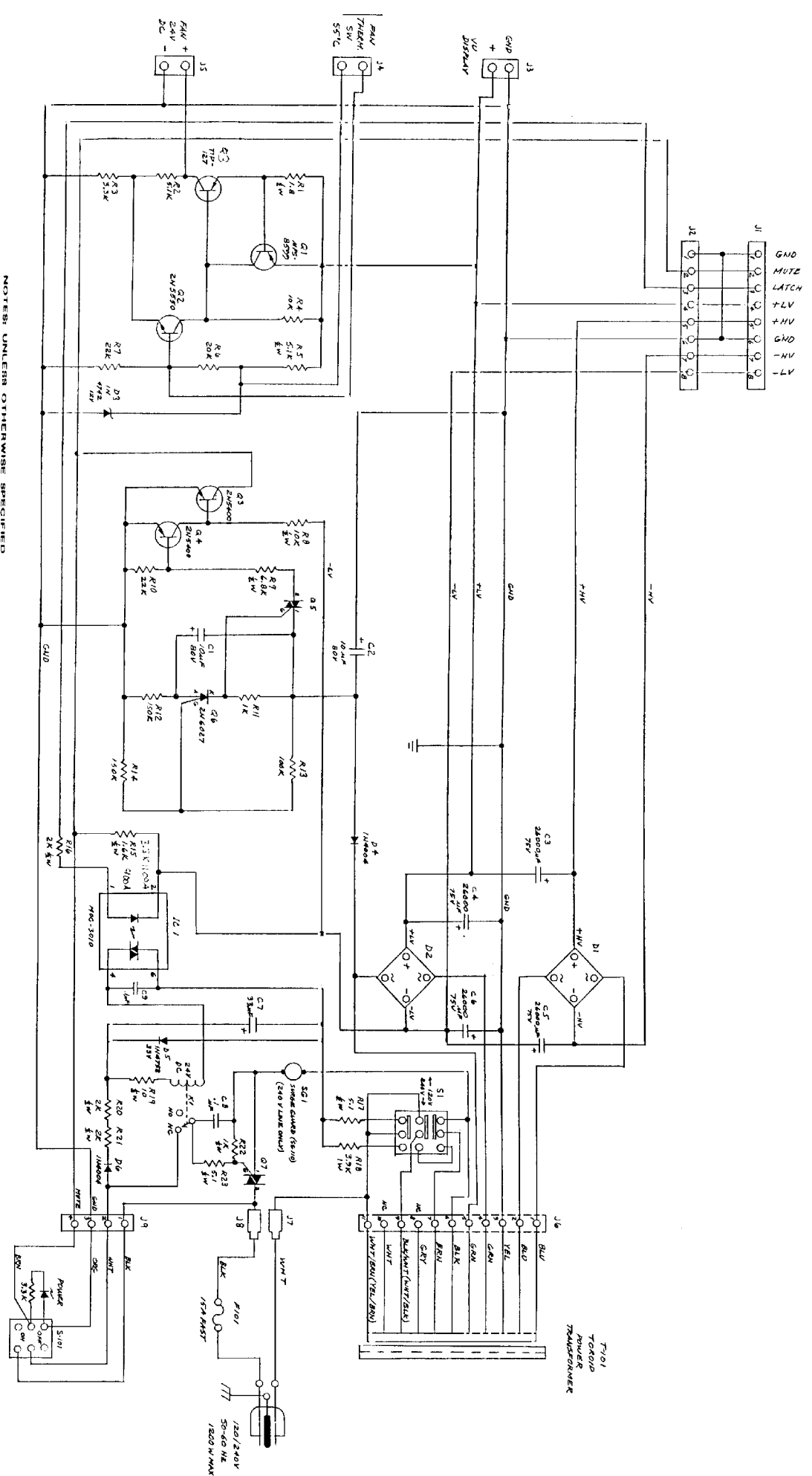
AB INTERNATIONAL, INC.

TITLE: POWER SUPPLY BOARD
MODEL: PRECEDENT 900A / 1100A

NOTE: 900A = 9220, 1100A = 9420

DATE: JAN '92

ASSEMBLY NO. 502-671 REV. H



- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE IN OHMS, Ω W 5%
 2. ALL CAPACITORS ARE IN MICROFARADS (μ F)
 3. IN INDICATES SUPPLY GROUND
 4. IN INDICATES SUPPLY GROUND
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 99. IN INDICATES SUPPLY GROUND
 100. IN INDICATES SUPPLY GROUND

NOTE: 900A = 9220, 1100A = 9420

AB INTERNATIONAL, INC.
TITLE: SCHEMATIC POWER SUPPLY
MODEL: 900A / 1100A
DATE: 1-21-92
ASSEMBLY NO. 502-671 REV. H

Line Voltage Conversion Diagram

For transformers with Primary colors of:

For transformers with Primary colors of:

Brown/White
White
Brown

Black/White
Grey
Black

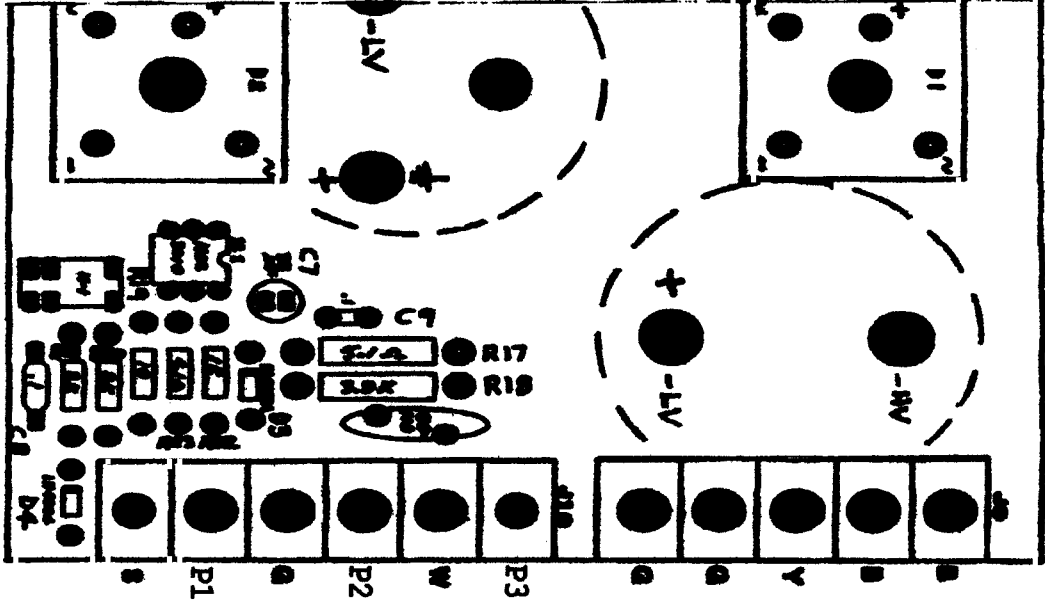
White
Purple
Brown

Orange
Grey
Black

Secondary wiring Blue x 2, Yellow, Green x 2 remains unchanged.
 Note: Some xfmr's had Blue x 2, Yellow, Violet x 2 (Instead of Green)

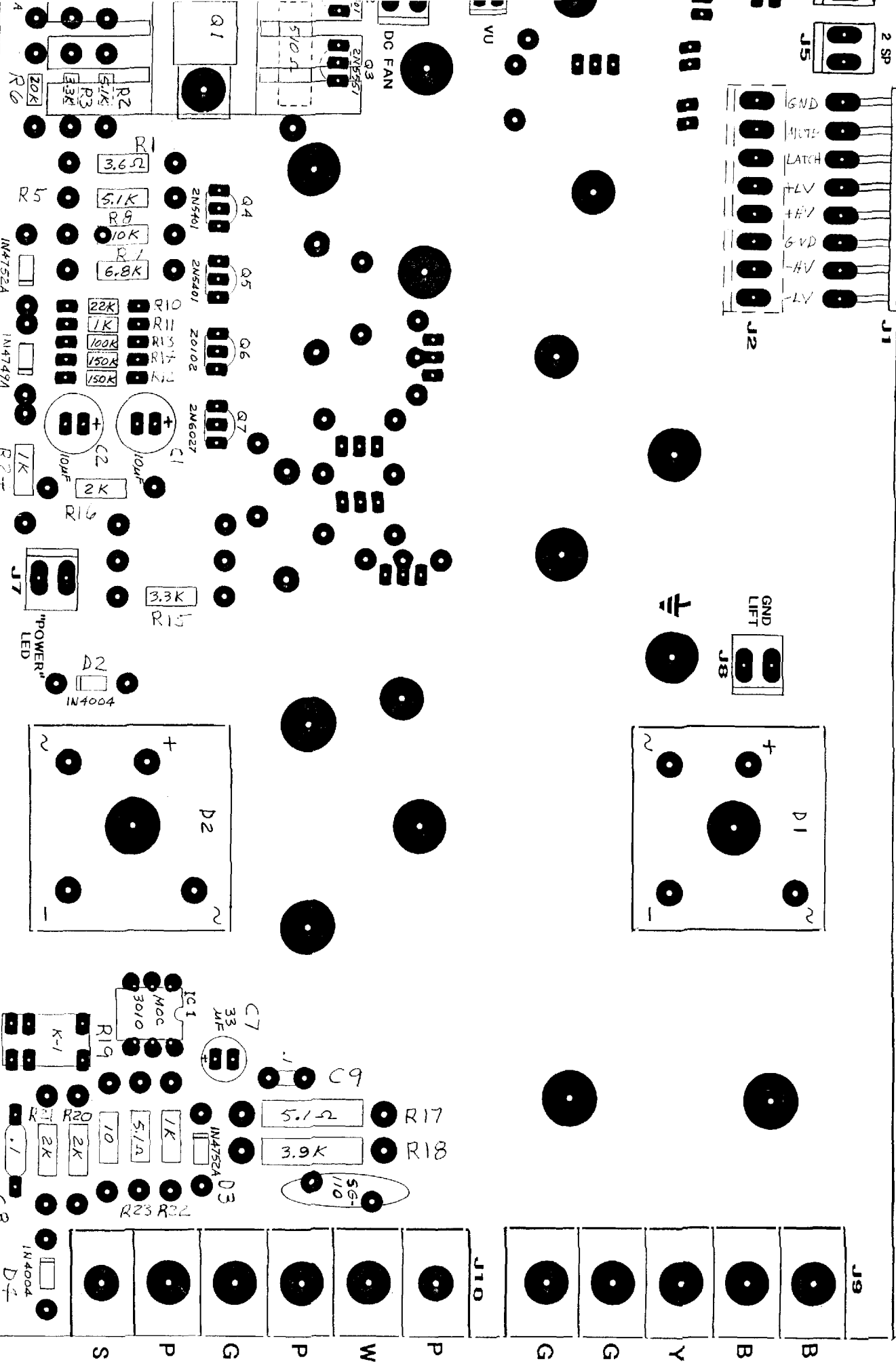
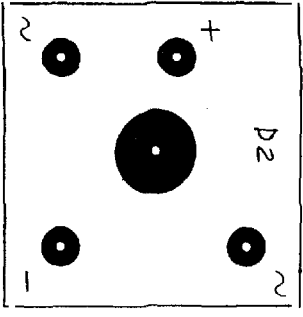
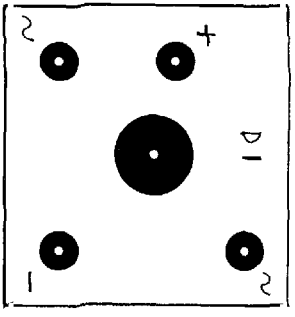
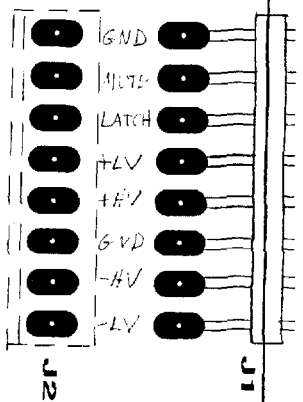
100VAC Wiring	120VAC	100VAC Wiring	120VAC
<div>P3 = N/C</div> <div>P2 = White</div> <div>P1 = Brown</div> <div>Black</div>	<div>P3 = N/C</div> <div>P2 = Brown/White</div> <div>P1 = Brown</div> <div>Black</div>	<div>P3 = N/C</div> <div>P2 = Purple</div> <div>Grey</div> <div>P1 = Brown</div> <div>Black</div>	<div>P3 = N/C</div> <div>P2 = White</div> <div>Orange</div> <div>P1 = Brown</div> <div>Black</div>
220VAC	240VAC	220VAC	240VAC
<div>P3 = Brown</div> <div>Black/White</div> <div>P2 = White</div> <div>P1 = Black</div>	<div>P3 = Brown</div> <div>Black/White</div> <div>P2 = Brown/White</div> <div>P1 = Black</div>	<div>P3 = Brown</div> <div>Orange</div> <div>P2 = Purple</div> <div>P1 = Black</div>	<div>P3 = Brown</div> <div>Orange</div> <div>P2 = White</div> <div>P1 = Black</div>

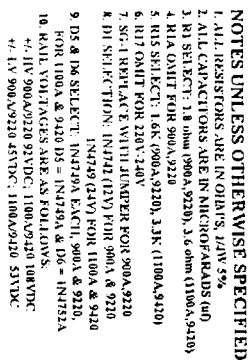
When converting to 220 or 240 VAC remove 5.1
 Ohm 1-watt resistor and replace line fuse with a 10 amp fuse.



W. 55°C

1100A POWER LEVEL





1. REMOVE AMPLIFIER FROM ANY AC POWER SOURCE.
2. DETERMINE DESIRED AC LINE VOLTAGE AND SELECT PROPER AMPLIFIER SETTING. CHOOSE OF THE FOLLOWING: 100VAC, 120VAC, 220VAC, 240VAC.
3. FOLLOW WARNING PROCEDURE CLOSELY.

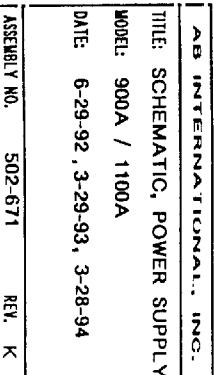
1. LOCATE TERMINAL P1 ON THE POWER SUPPLY AND REMOVE THE BLANKET WITH 4. BROWN WIRE FROM P1 AND SECURE IT.
 2. LOCATE THE GROUND WIRE FROM THE TRANSFORMER AND PLACE THEM ON TERMINAL P1.
- 210V
1. LOCATE P1 AND P3 ON THE POWER SUPPLY. RELOCATE THE BLANKET WIRE OF THE TRANSFORMER FROM P1 TO P3.
 2. LOCATE AND MOVE THE BROWN WIRE OF THE TRANSFORMER FROM P1 TO P2.
 3. REMOVE THE BROWN WIRE CONNECTED TO P1 AND SECURE IT.
 4. LOCATE THE WHITE WIRE FROM THE TRANSFORMER AND CONNECT IT TO P3.
 5. LOCATE K1731 (ORN 12V) ON THE POWER SUPPLY AND REMOVE IT BY CUTTING THE LEADS.
 6. CUTTING THE FUSE FROM 15A TO 10A.
- 140V
1. LOCATE P1 AND P3 ON THE POWER SUPPLY. RELOCATE THE BLANKET WIRE OF THE TRANSFORMER FROM P2 TO P3.
 2. LOCATE AND MOVE THE BROWN WIRE OF THE TRANSFORMER TO FROM P1 TO P2.
 3. LOCATE K1731 (ORN 12V) ON THE POWER SUPPLY AND REMOVE IT BY CUTTING THE LEADS.
 4. CHANGE FUSE FROM 15A TO 10A.

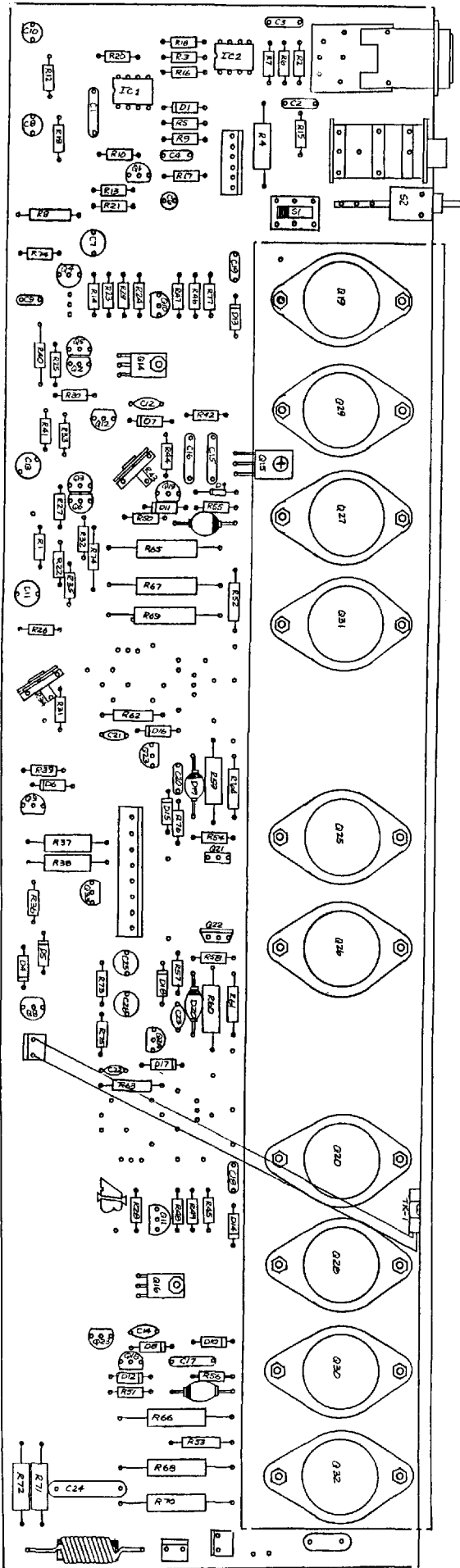
A.B. International Electronics, Inc.
 18204 Western Blvd.
 Houston, Texas 77058
 (913) 445-7800 FAX (913) 784-1898
 Your stores sell

TITLE: POWER SUPPLY BOARD
 MODEL: 900DA,1100DA,9220,9420
 ATD AMPS

DATE: 3-28-94
 PART NO. 502-671

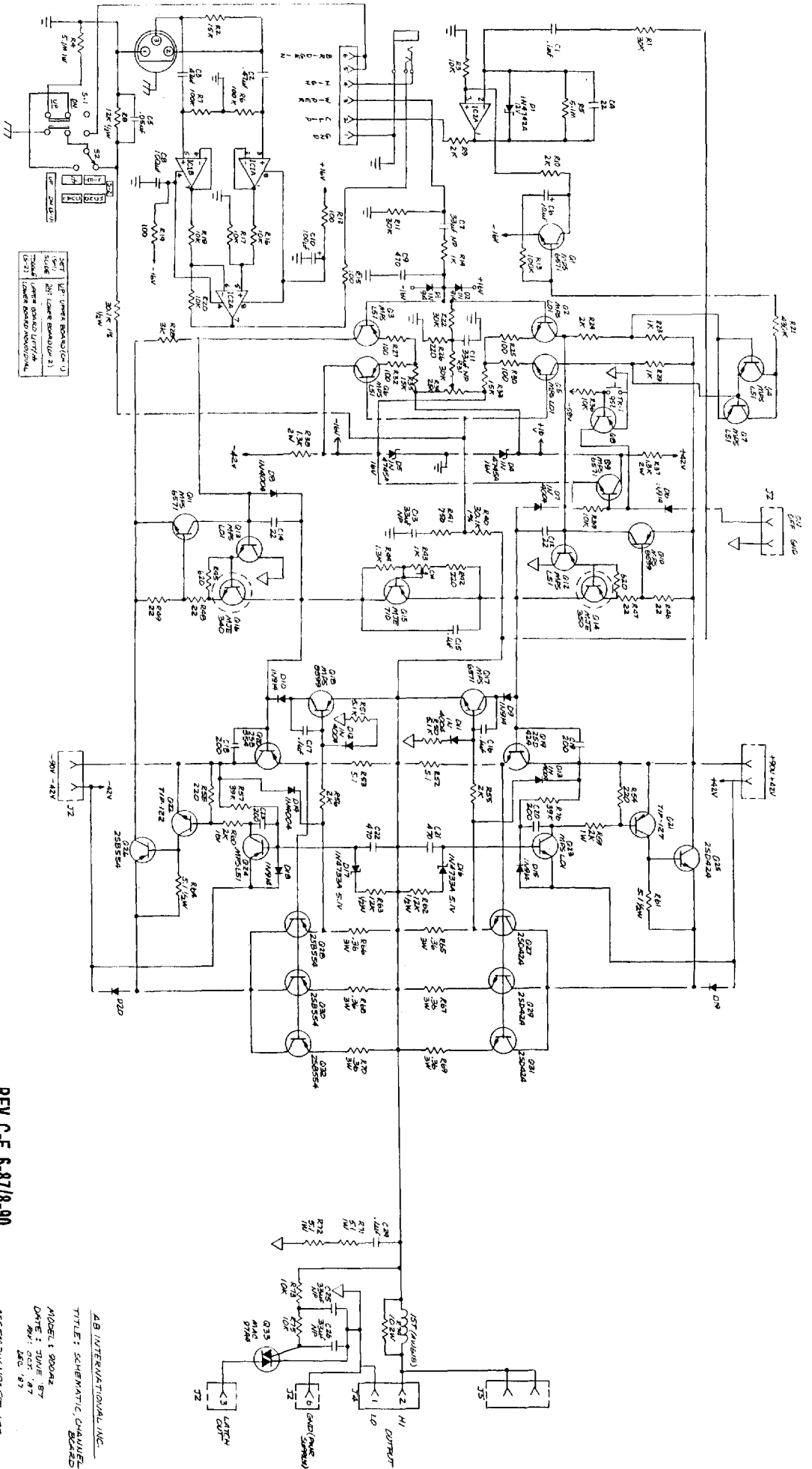
REV. K



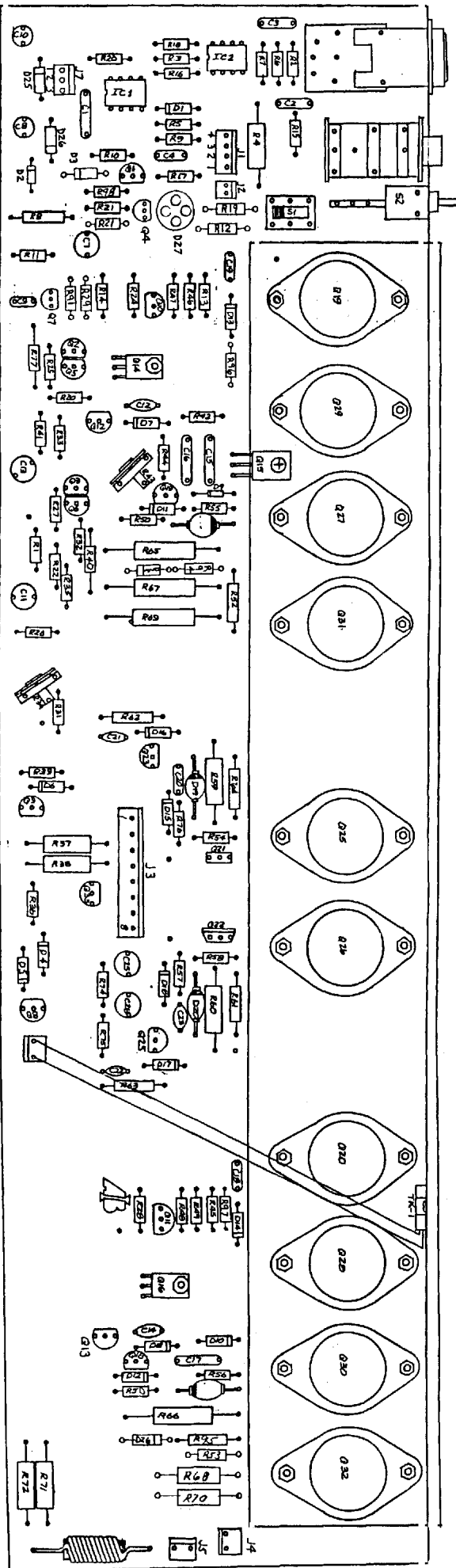


REV C-E 6-87/8-90

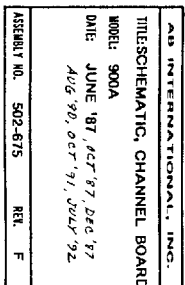
AB INTERNATIONAL, INC.
 ASSEMBLY PCB, 90042
 P/N 502-675

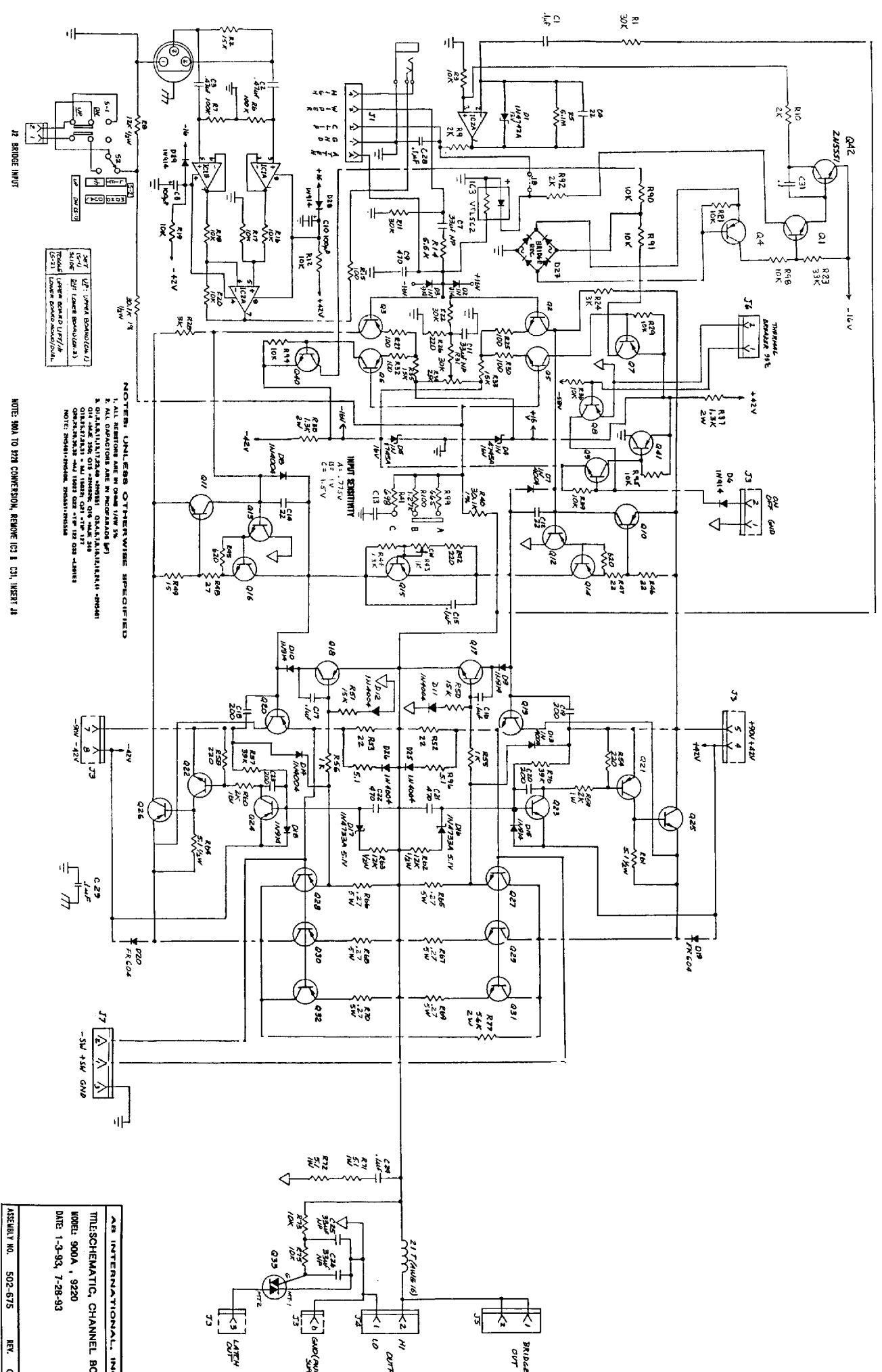


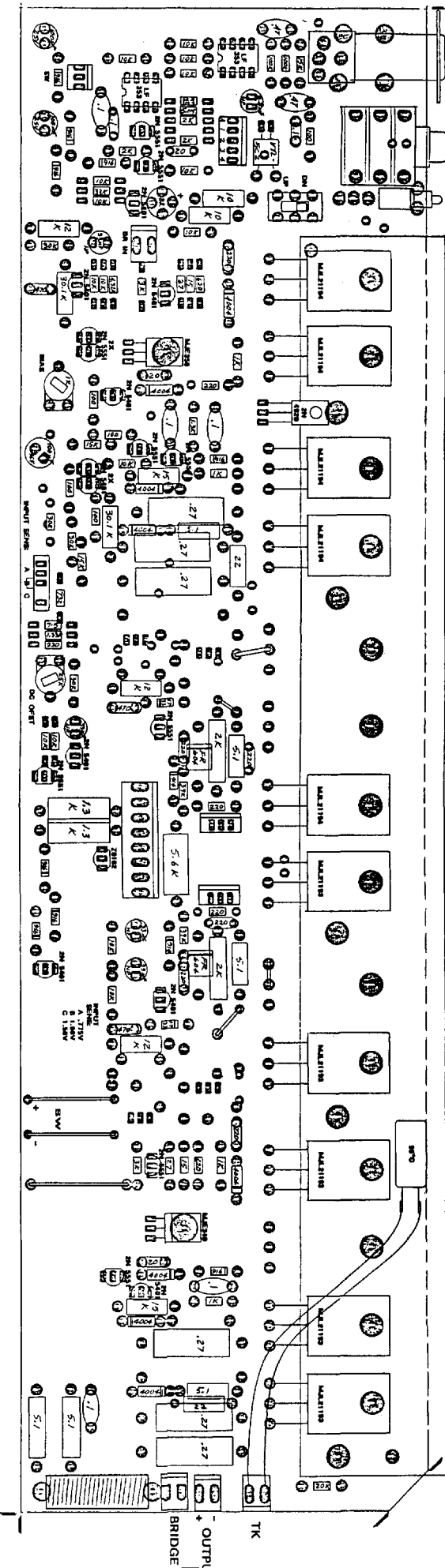
REV C-E 6-87/8-90



AB INTERNATIONAL, INC.
 ASSEMBLY PCB, 90042
 PNI 502-675 REV F
 AUG 90 JK





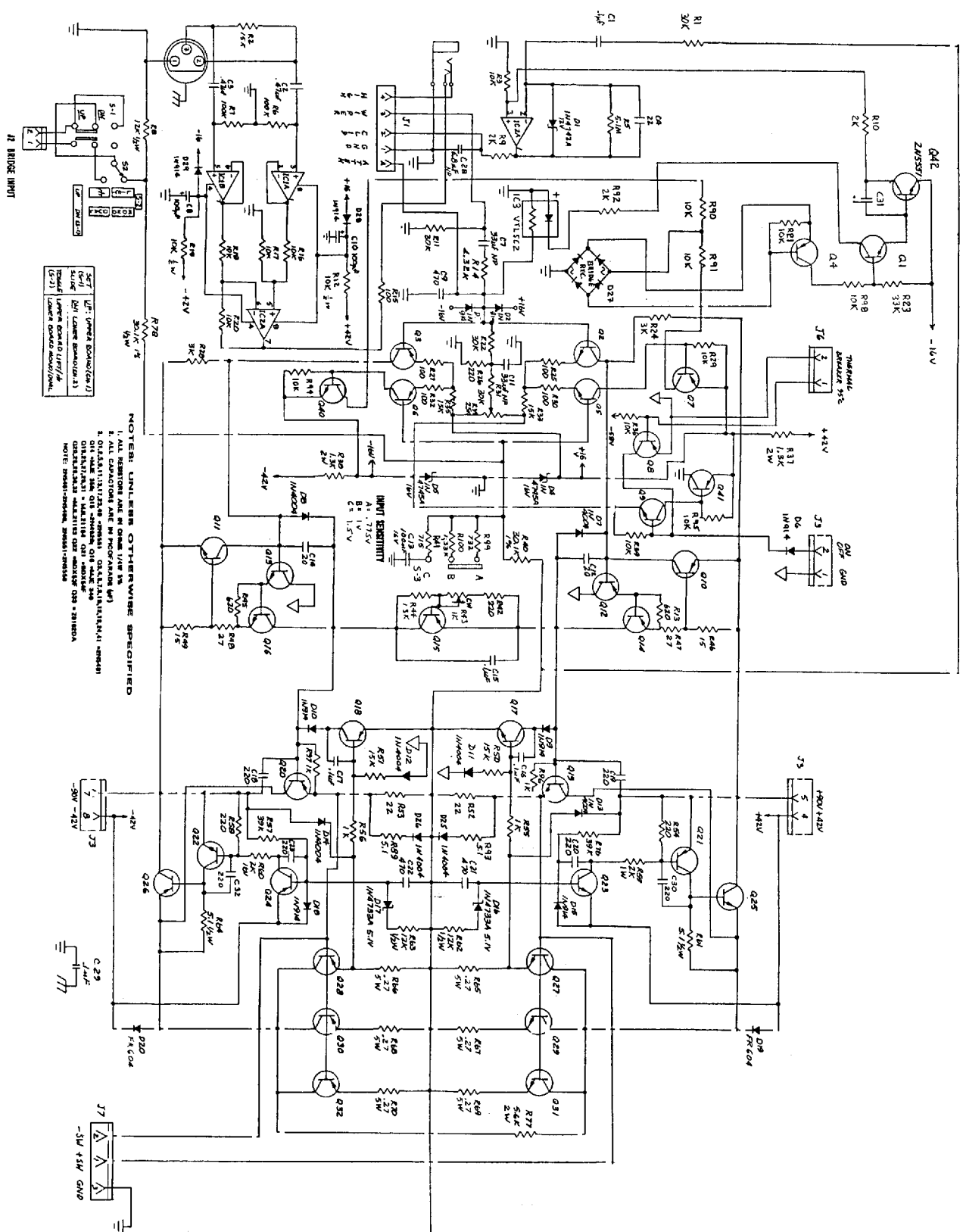


AB INTERNATIONAL, INC.

TITLE: PCB ASSEMBLY, CHANNEL BOARD
 MODEL: 900A, 9220A

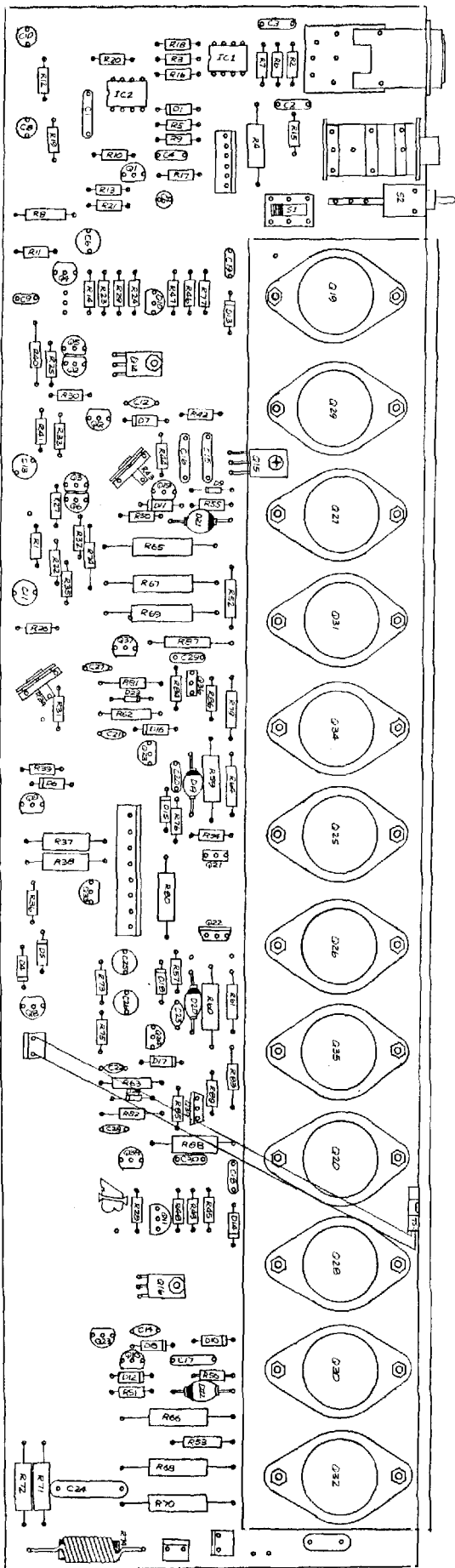
DATE: 9-7-94

ASSY NO.: 502-675 REV. J



NOTES: UNLESS OTHERWISE SPECIFIED
 1. ALL RESISTORS ARE IN OHMS UNLESS
 2. ALL CAPACITORS ARE IN MICROFARADS
 3. DIMENSIONS ARE IN INCHES
 4. DIMENSIONS ARE IN MILLIMETERS
 5. DIMENSIONS ARE IN MILLIMETERS
 6. DIMENSIONS ARE IN MILLIMETERS
 7. DIMENSIONS ARE IN MILLIMETERS
 8. DIMENSIONS ARE IN MILLIMETERS
 9. DIMENSIONS ARE IN MILLIMETERS
 10. DIMENSIONS ARE IN MILLIMETERS

AB INTERNATIONAL, INC.
 WILMINGTON, DELAWARE
 MODEL 900A, 9220A
 DATE 9-1-94
 ASSEMBLY NO. 502-675 REF. J

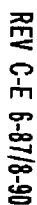


AB INTERNATIONAL, INC.

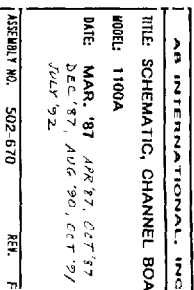
ASSEMBLY PCB, 11004

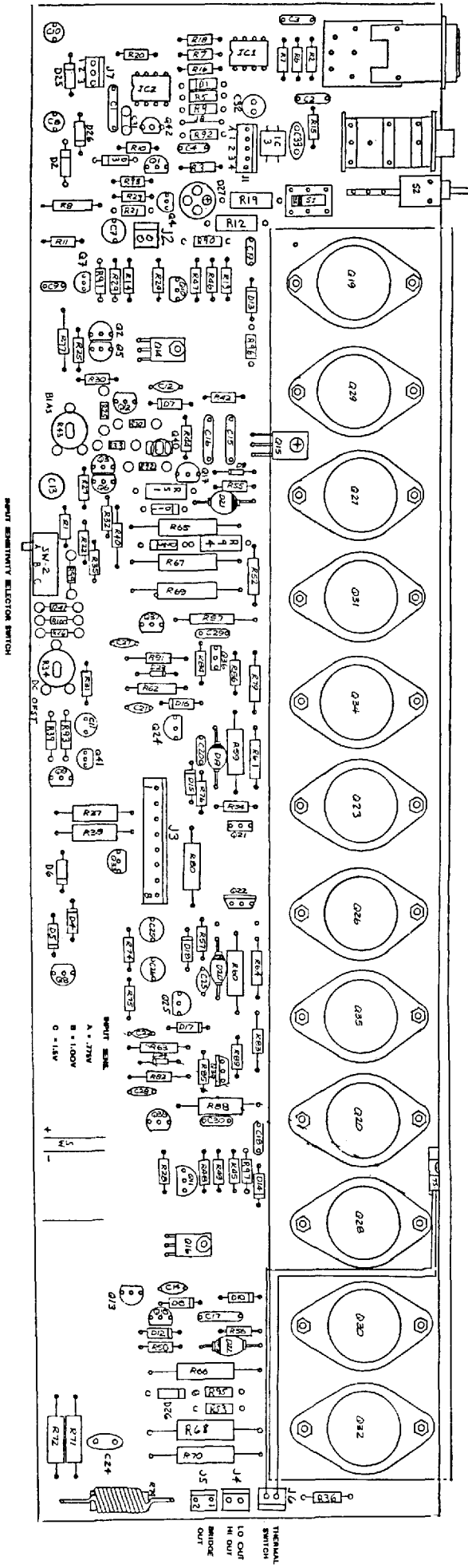
PN: 502-670

REV C-E 6-87/8-90



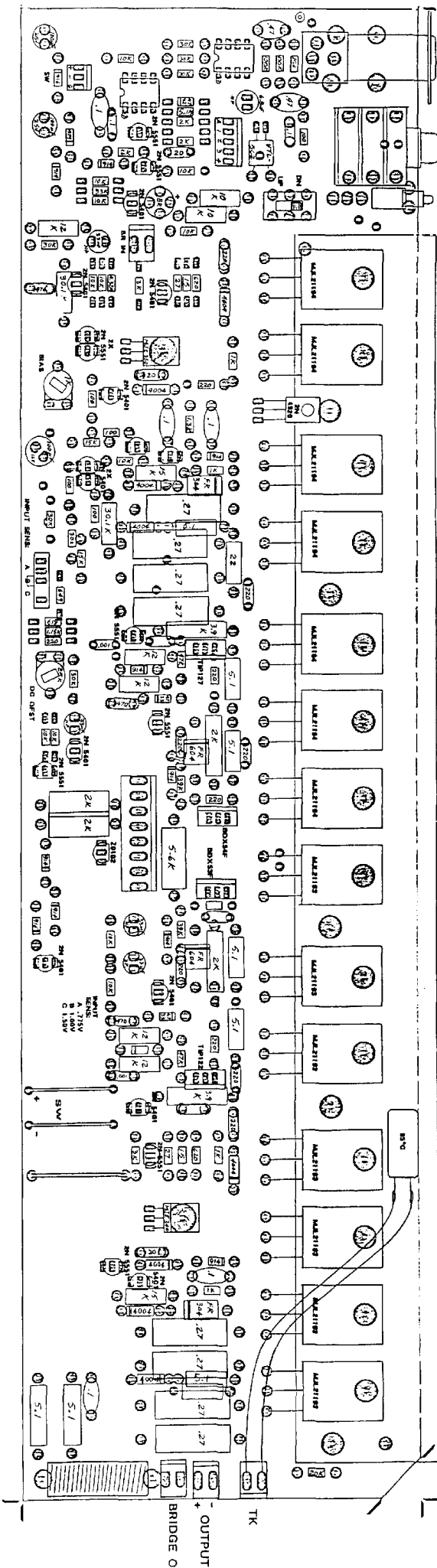
AS INTERNATIONAL, INC.
TITLE: SCHEMATIC, CHANGE-
MODEL: 1100A
DATE: MAR 87
REV. APR 87
OCT 87
DEC 87
ASSEMBLY NO: 592-670





NOTE: 11MA TO 1428 CONNECTION, REMOVE C31 & C31, SEE IN

AB INTERNATIONAL INC.
TITLE: ASSEMBLY 11MA, 9420
DATE: JAN 1953 JC
50-217 REV. 6



AB INTERNATIONAL, INC.

TITLE: PCB ASSEMBLY, CHANNEL BOARD
MODEL: 1100A, 9420A

DATE: 9-7-94

ASSY NO. 502-610 REV. J

