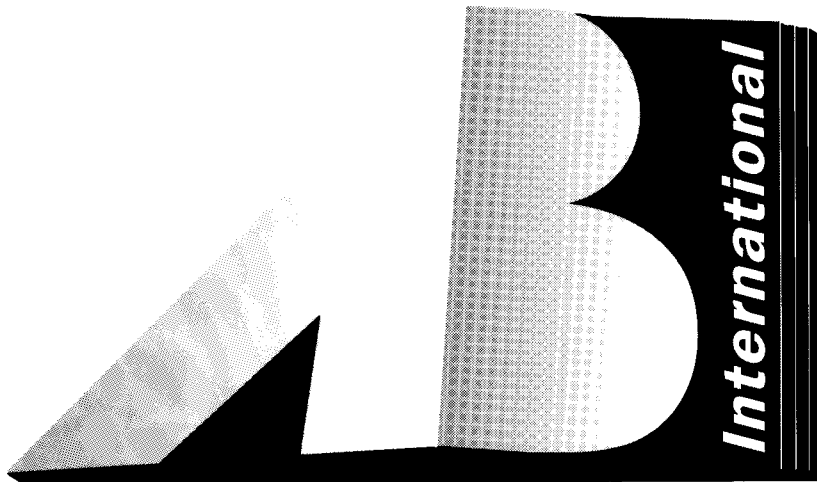


# **AB INTERNATIONAL**

**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<sup>1/4</sup> inches of vertical panel space, with 11<sup>7/8</sup> inches required behind the panel. Total depth, including handles is 13<sup>5/16</sup> 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

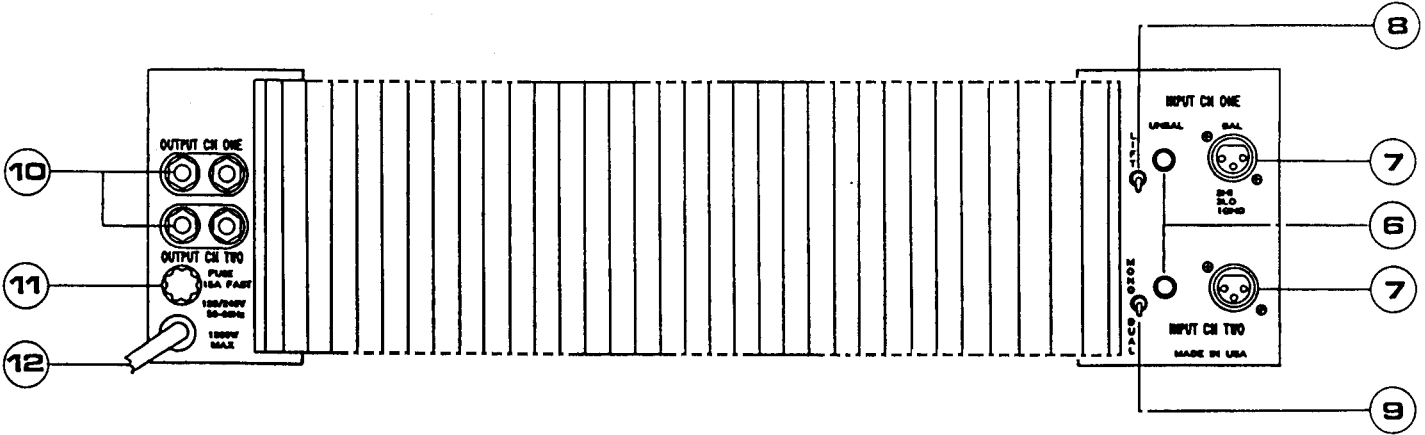
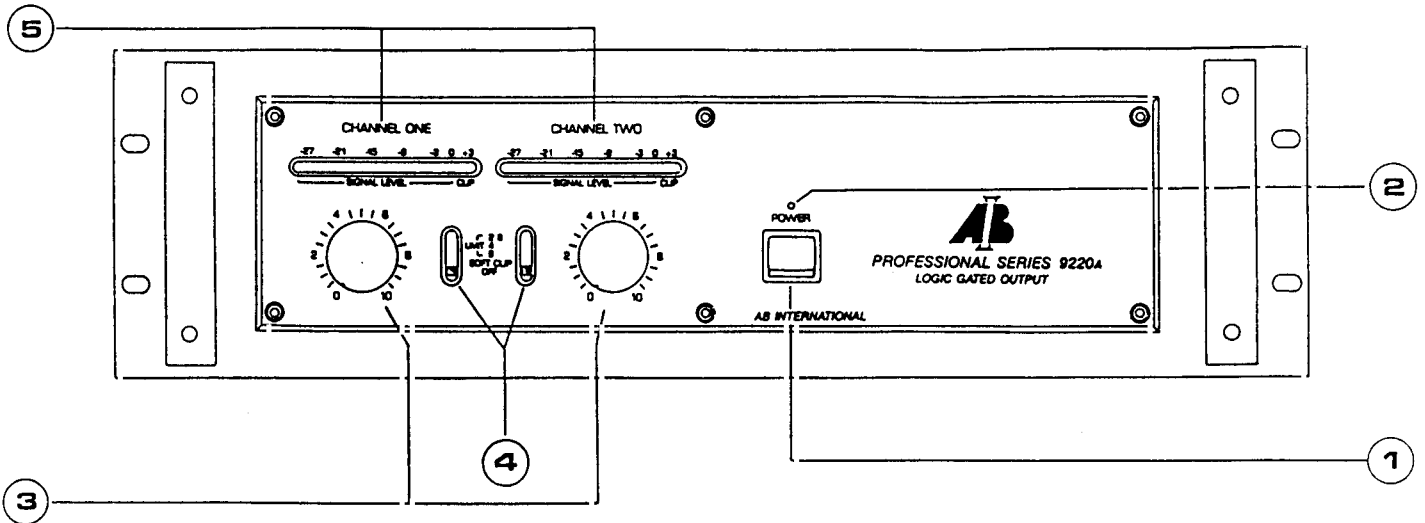
Professional Series power amplifiers are specified for operation from 120/240 Volt 50/60 Hz mains supply.

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**

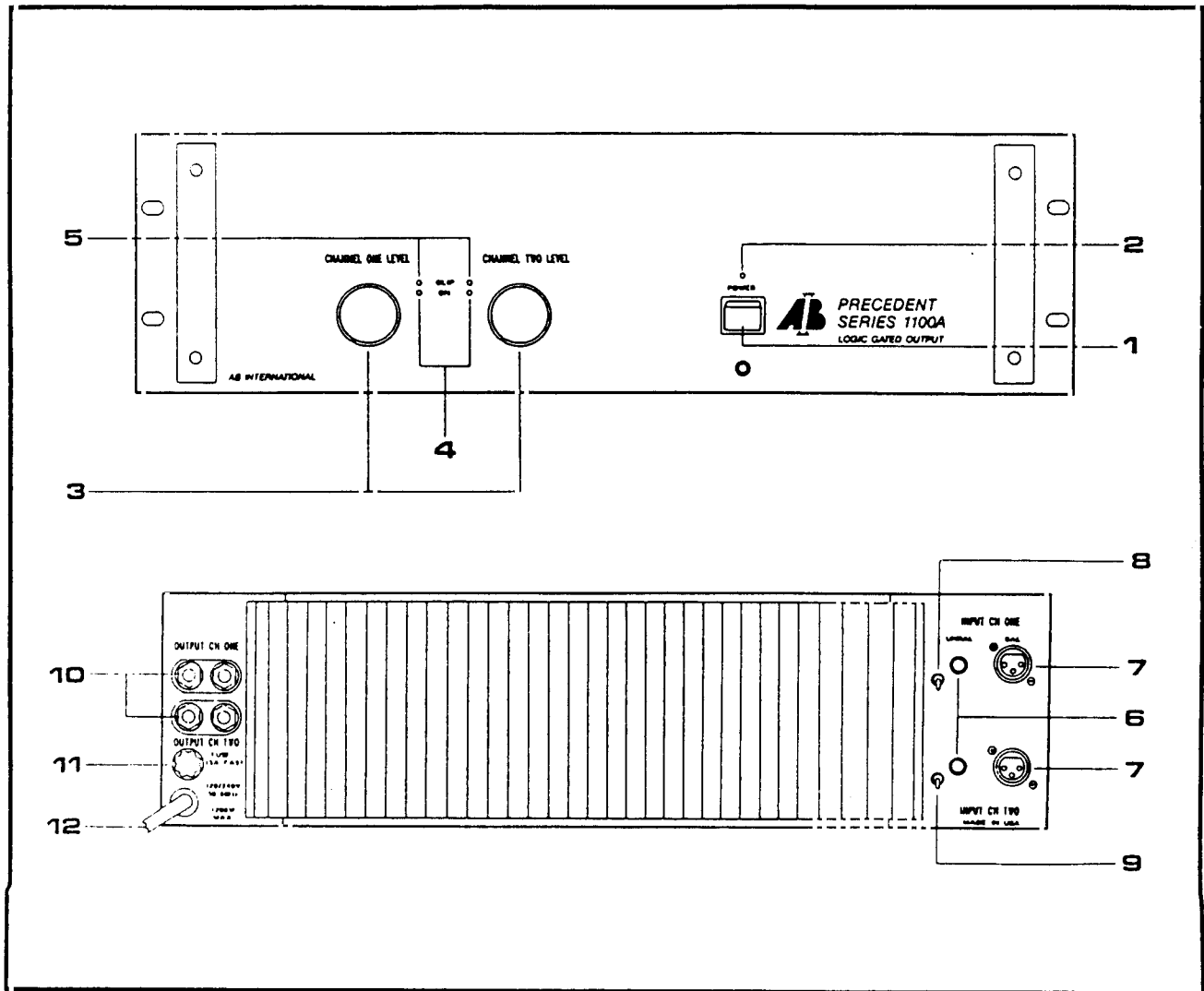
The fuse holder contains the Primary AC Fuse. The fuse should only be replaced with one of the same type. If fuses continue to blow out, stop replacing the fuse and refer servicing to qualified personnel.

#### 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:**

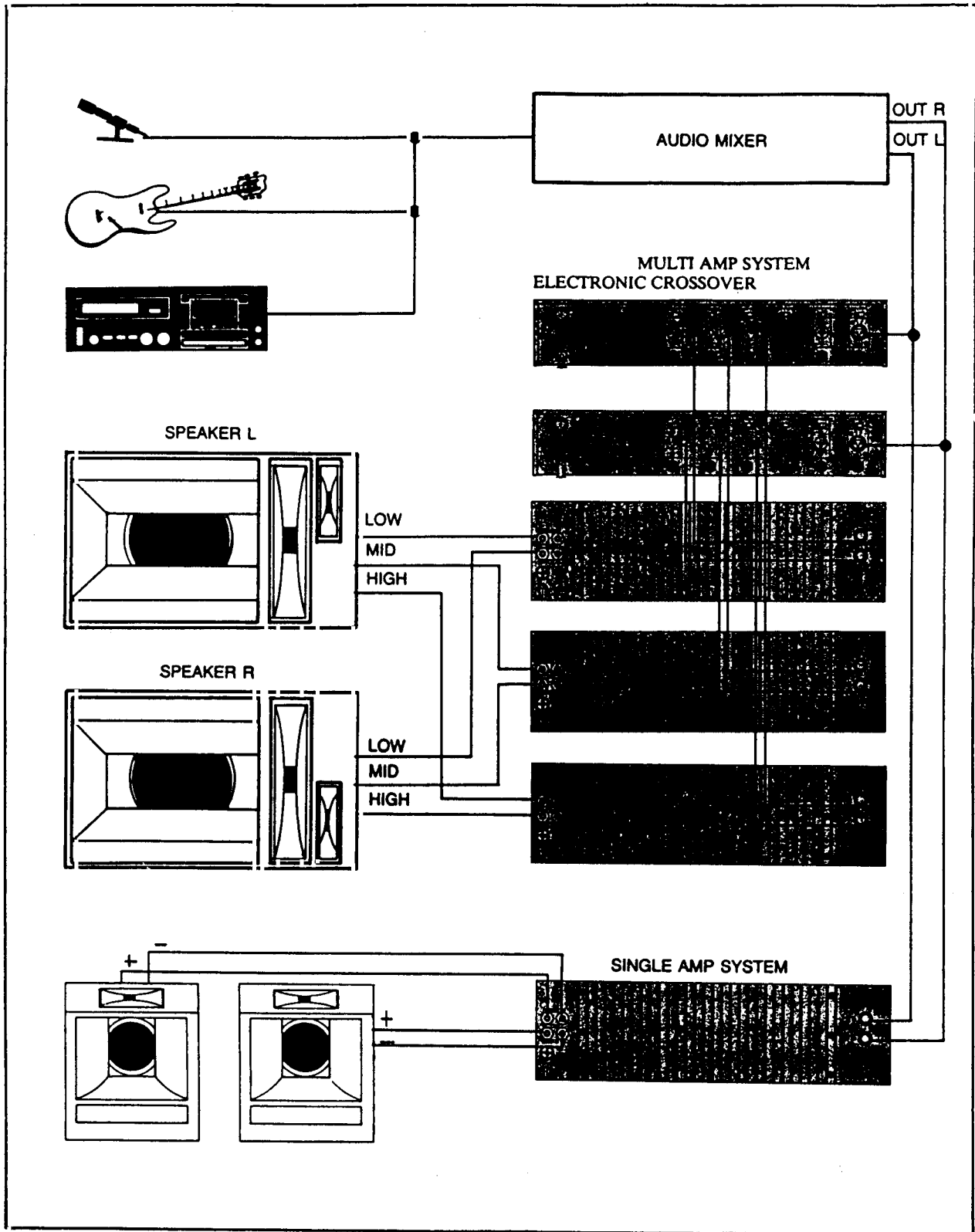
The **900A** and **1100A** amplifiers are a product of the most advanced technology and manufacturing techniques and are fully protected against overheating, input overload and shorted or mismatched loads. As is the case with any precision instrument, some care should be taken in the unit's operation. 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

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

**Slew Rate:** Closed loop response greater than 40v per micro second.

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**Thermal Protection:** Thermal sensor activates channel shut down at 95°C.

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**D.C. Protection:** D.C. sensor activates channel shut-down if a D.C. condition exists.

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**Turn-on-Delay:** 3 Seconds, solid-state actuated

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**Heat-Sink and Cooling:** High efficiency, convection cooled with "Venturi" style fan assist providing extra power handling utilizing massive heat-sink extrusions.

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**Input Connectors:** (2) 1/4 Inch Phone Jacks (unbalanced)  
(2) XLR (balanced)

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**Output Connectors:** Dual 5-way Binding Posts

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**Weight:** 34 lbs. (17.7 kg) **9220A**  
39 lbs. (19.6 kg) **9420A**

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**Controls & Indicators:** *(Front Panel)* 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.  
*(Rear Panel)* Dual/Mono switch and Ground Lift Switch.

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**Power: (Input)** 100-130 VAC, 50/60 Hz 90W (idle)  
1000 Watts (maximum) **9220A**  
1500 Watts (maximum) **9420A**

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**Dimensions:** 5<sup>1/4</sup>" H (13.3 cm) 19" W (48.3 cm)  
11<sup>7/8</sup>" D (30.2 cm) behind panel  
13<sup>3/8</sup>" D (34.0 cm) overall



**Specifications** PRIOR SEPT. 1987

<b>Type:</b>	Two channel audio power amplifier
<b>Gain:</b>	31dB (each channel) 900A 33dB (each channel) 1100A
<b>Continuous Average Power Output:</b>	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
<b>Frequency Response: Distortion:</b>	Plus /Minus 0.5dB 20Hz-20kHz No more than 0.25% THD or IM, 0.01W to rated power, 20Hz to 20kHz (typically 0.01%)
<b>Hum and Noise:</b>	101dB below rated output (unweighted 20kHz bandwidth)
<b>Input Sensitivity: Input Impedance: Input Connectors:</b>	1.6V RMS for rated output 15K ohms, nominal (2) 1/4 -inch phone jacks (unbalanced) (2) XLR (balanced)
<b>Output Connectors: Controls &amp; Indicators:</b>	Dual 5-way binding posts (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)
<b>Power:</b>	100-130VAC, 50-60Hz 90W (idle), 1000W (maximum) 900A 1500W (maximum) 1100A
<b>Dimensions:</b>	5-1/4" H (13.3cm) 19" W (48.3cm) 11-7/8" (30.2cm) behind panel 13-3/8" (34cm) overall
<b>Weight:</b>	39 lbs (17.7kg) 43 lbs (19.6kg)

## Precedent Series Amplifiers

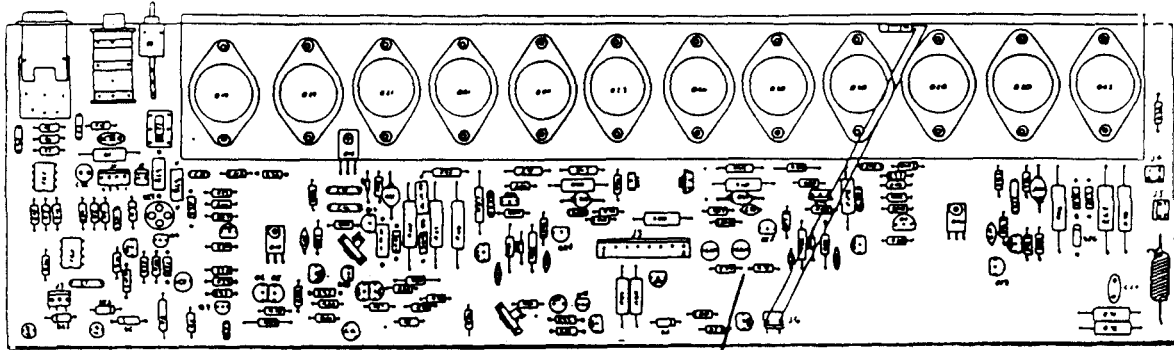
### SPECIFICATIONS

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Type:	Two Channel Audio Power Amplifier
Gain:	31 dB (each Channel) <b>900A</b> 33 dB (each Channel) <b>1100A</b>
Continuous Power:	350 watts per channel at 8 ohms <b>900A</b>
Average Power:	590 watts per channel at 4 ohms <b>900A</b>
Output:	775 watts per channel at 2 ohms <b>900A</b>
(120 VAC Line, 1KHz, single channel driven)	925 watts bridged mono at 8 ohms <b>900A</b> 1123 watts bridged mono at 4 ohm <b>900A</b>
Continuous Power:	525 watts per channel at 8 ohms <b>1100A</b>
Average Power:	850 watts per channel at 4 ohms <b>1100A</b>
Output:	1100 watts per channel at 2 ohms <b>1100A</b>
(120 VAC Line, 1KHz, single channel driven)	1300 watts bridged mono at 8 ohms <b>1100A</b> 1700 watts bridged mono at 4 ohms <b>1100A</b>
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

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

# DC LATCH TEST PROCEDURE



TEST POINT

Your AB International amplifier is equipped with a D.C. Latch Protection Circuitry. In a case where a D.C. voltage of  $\pm$  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  $\frac{1}{4}$  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.
- 2) 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

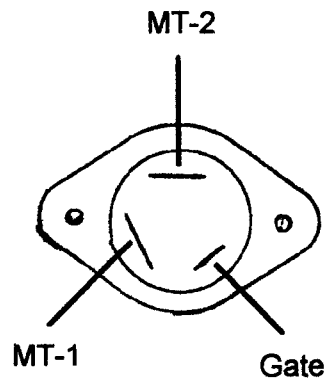
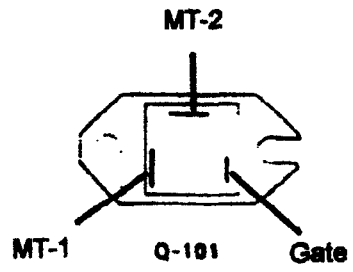
ABI		DIODES		USA
ID. #	ZENIER	VOLTS	W/A	
1N4733	ZENIER	5.1	1w	
1N4735	ZENIER	6.2	1w	
1N4737	ZENIER	7.5	1w	
1N4742	ZENIER	12	1w	
1N4745	ZENIER	16	1w	
1N4749	ZENIER	24	1w	
1N4752	ZENIER	33	1w	
1N4001	SW/DIODE	50	30	UPDATED TO 1N4004
1N914	SW/DIODE	75	75ma	
1N5186	SW/DIODE	200	200	UPDATED TO FR303
FR303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

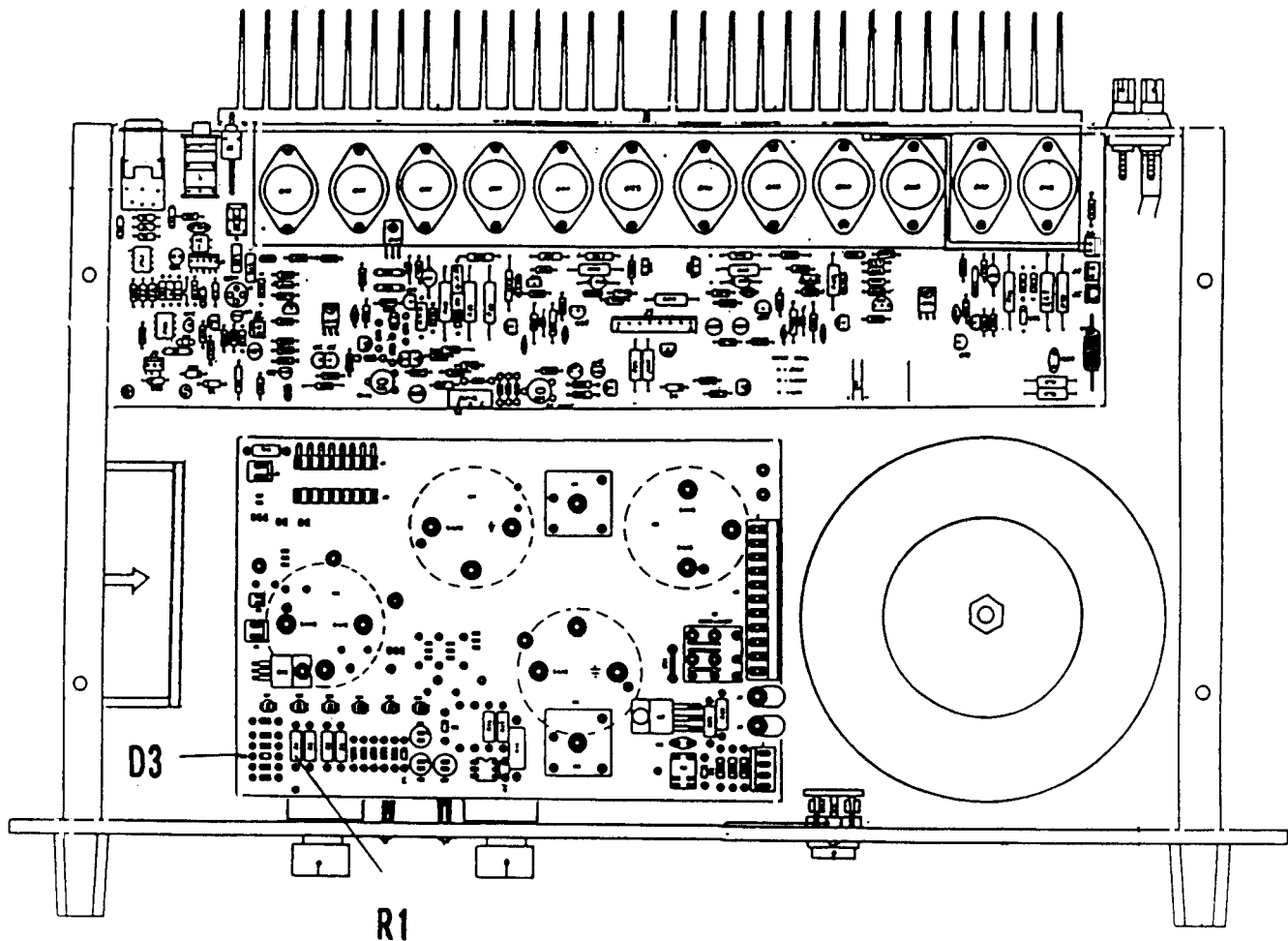
# AB INTERNATIONAL COMPONENT DATA

ABI		TRANSISTER UPDATES				USA		
ORIG.	REV. 1	REV. 2	REV. 3	REV. 4	CASE TYPE	POLL.	ICmax	Vceo
MPS8599	A56	2N5401			TO-92	PNP	240ma	150
MPSL01	2N5550	2N5551			TO-92	NPN	600ma	160
MPSL51	2N5400	2N5401			TO-92	PNP	240ma	150
MPS6571	2N4401	2N5551			TO-92	NPN	600ma	160
710	2N4920					PNP		
RCA1C12	2238	MJE15030			TO-220	NPN	8a	120
2N5416					T05	PNP	1a	350
2N3440					T05	NPN	1A	350
MJE340					TO-225	NPN	.5a	300
MJE350					TO-225	PNP	.5a	300
MJH11021					TO-218	PNP	15a	250
TIP122					TO-220	NPN	.5a	100
TIP127					TO-220	PNP	.5a	100
TIP31B					TO-220	NPN	3a	60
TIP32B					TO-220	PNP	3a	60
TIP142					TO-220	NPN	10a	100
TIP147					TO-220	PNP	10a	100
2N3405								
2N4920					TO-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					TO-218	NPN	10a	150
2SA1186					TO-218	PNP	10a	150
MJL21193					TO-3PBL	PNP	16a	250
MJL21194					TO-3PBL	NPN	16a	250
2SA1553					TO-3PBL	PNP	15a	230
2SC4029					TO-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)

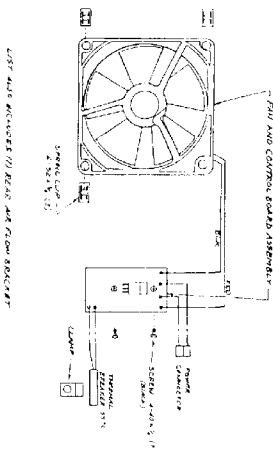
**NOTE:** THIS CAN BE ACCOMPLISHED BY  
SOLDERING FROM THE TOP SIDE OF  
THE PCB.

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

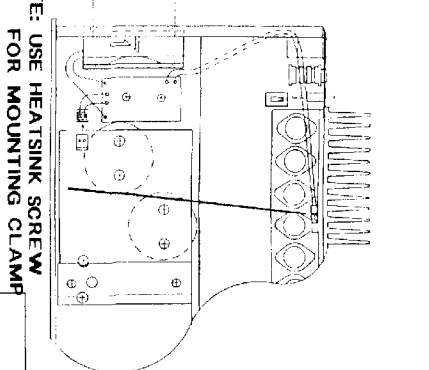


# FAN INSTALLATION MODEL 900A/1100A FOR SERIAL NUMBERS 060090-XX THRU 010092-XX

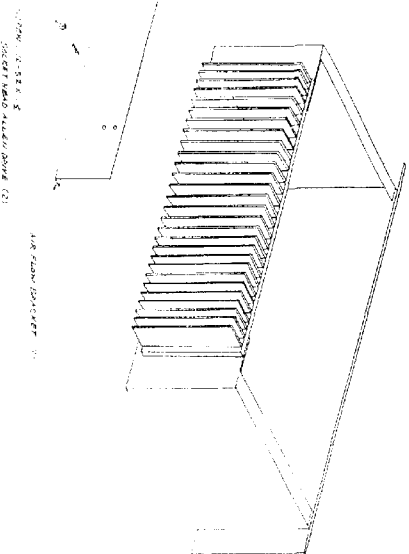
## 1 MATERIALS LIST



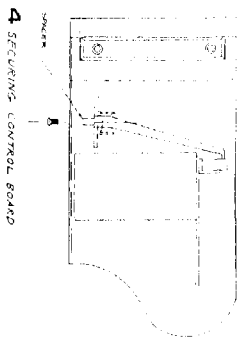
## 3 THERMAL BREAKER POSITIONING



## 5 REAR AIR FLOW BRACKET MOUNT BRACKET AS SHOWN



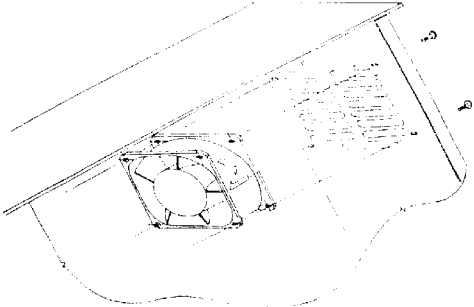
## NOTE: USE HEAT SINK SCREW FOR MOUNTING CLAMP



## 4 SECURING CONTROL BOARD

## 2 FAN INSTALLATION

NOTE: 1. FAN MUST BE MOUNTED DURING INSTALLATION  
2. FAN MUST BE MOUNTED AND DESIGNED AIR FLOW  
DIRECTION MUST BE



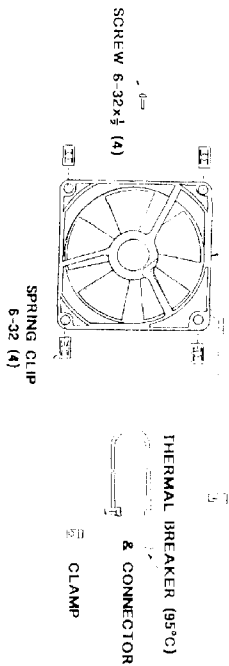
NOTE: POWER SUPPLY REV. G ONLY

ALL INFORMATIONAL ELECTRONICS, INC.  
NOTE: FAN (FD) IS NOT A COMPONENT  
PART OF THE POWER SUPPLY  
DATE: 5-1-86  
REVISION: 001-001-010

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

**1. MATERIAL LIST**

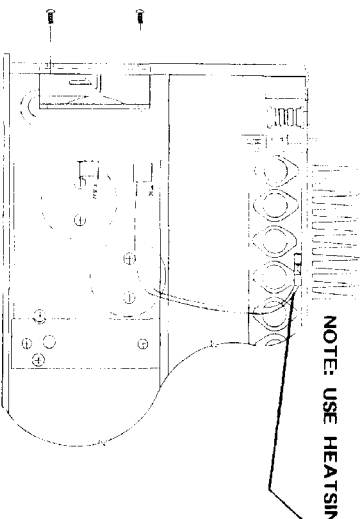
FAN (24V DC FOR 900A & 48V DC FOR 1100A)



LIST ALSO INCLUDES (1) REAR AIRFLOW BRACKET & SCREWS

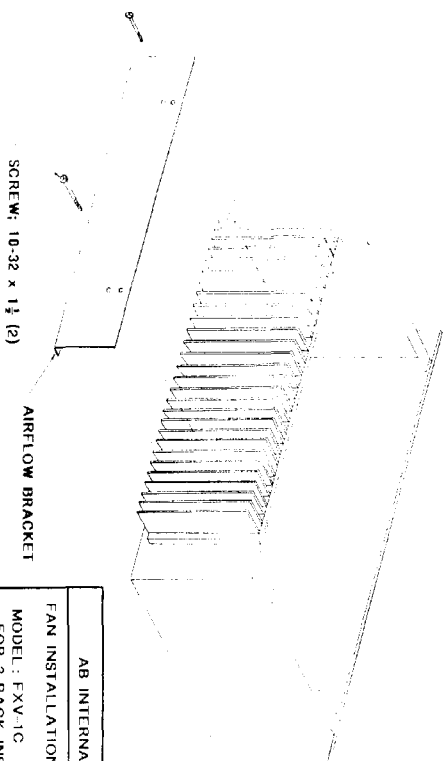
**3. THERMAL BREAKER & FAN CONNECTIONS**

NOTE: ROUTE BREAKER WIRES AS SHOWN



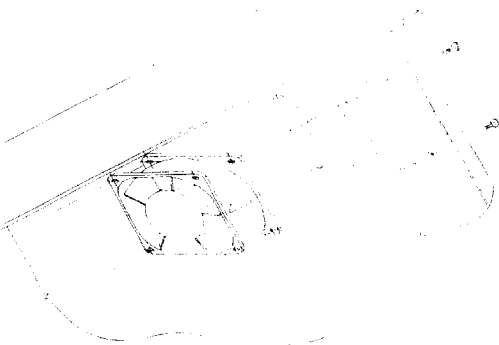
NOTE: USE HEATSINK SCREW FOR MOUNTING CLAMP

**4. REAR AIRFLOW BRACKET MOUNTING**  
ATTACH BRACKET TO HEATSINK



**2. FAN INSTALLATION**

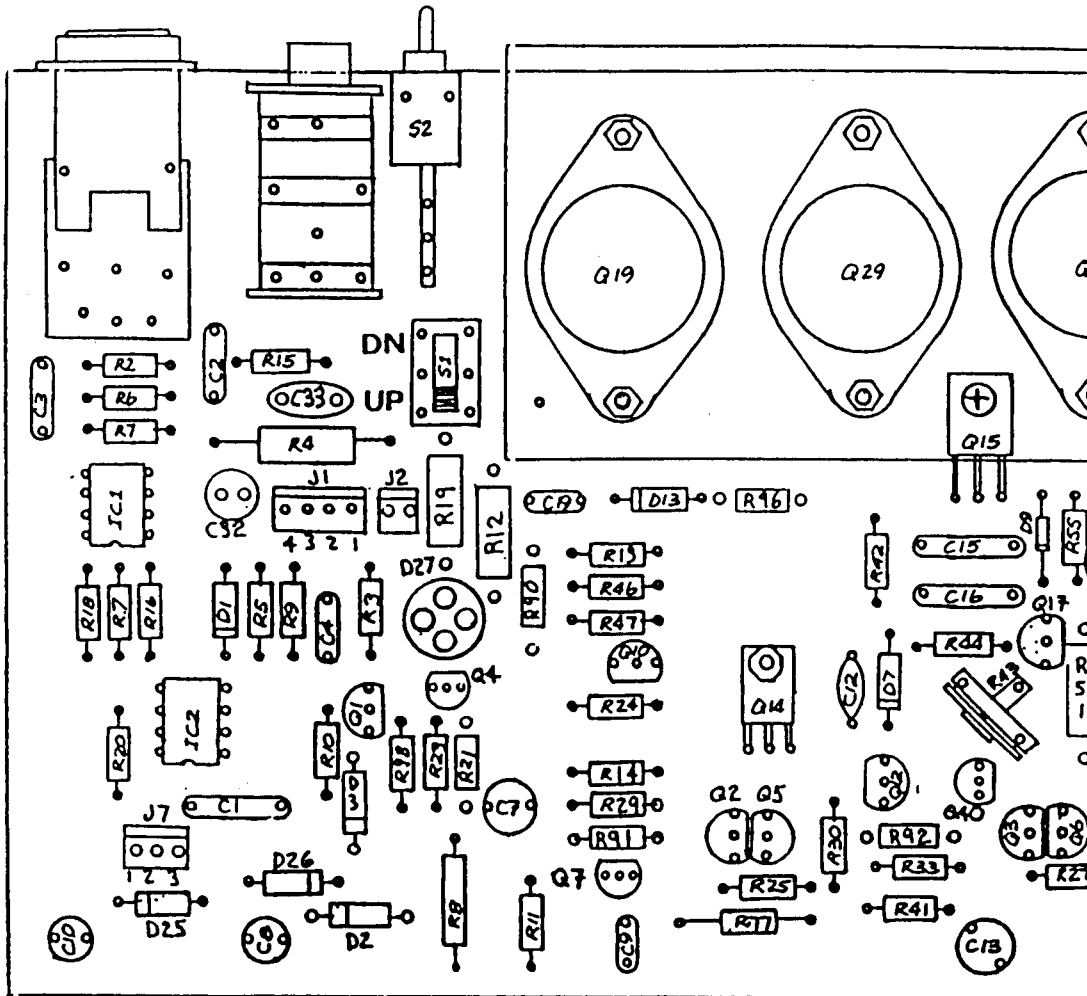
NOTE: 1. AMP MUST BE UNPLUGGED DURING INSTALLATION.  
2. OBSERVE AIR FLOW DIRECTION ARROW



AB INTERNATIONAL
FAN INSTALLATION INSTRUCTIONS
MODEL: EXV-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.

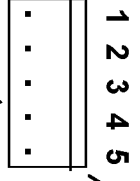
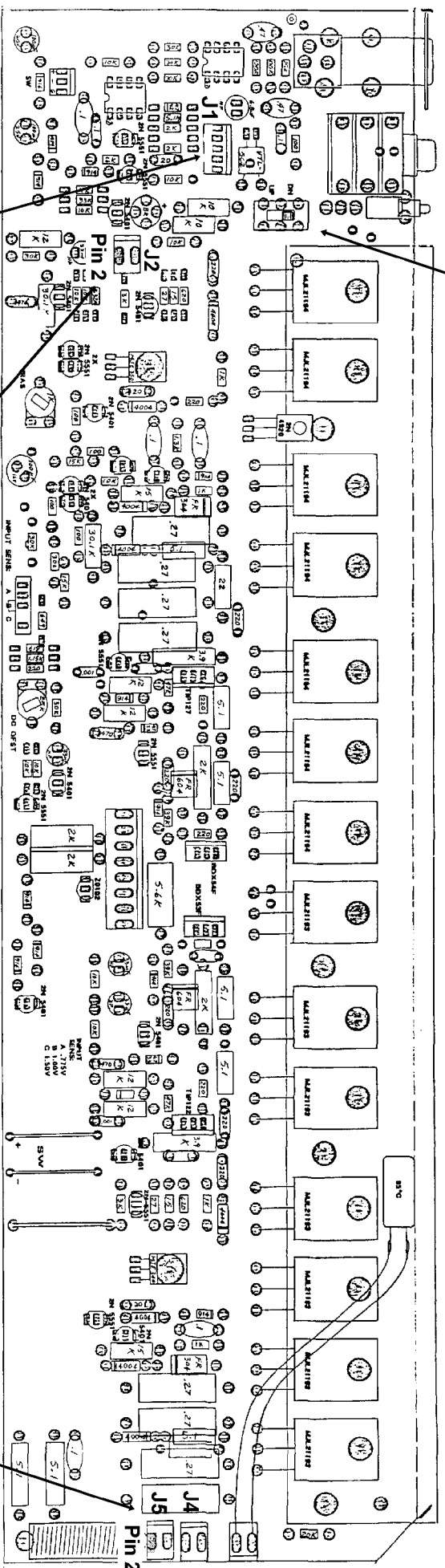
- 3) Apply an even thin coat of white Silicon Thermal Compound to angle. Failure to do so may cause improper heat transfer.

**NOTE: EXCLUDE STEP ONE FOR DUAL CHANNEL PCB**

# 900A/1100A Output Pcb Replacement Guide

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)

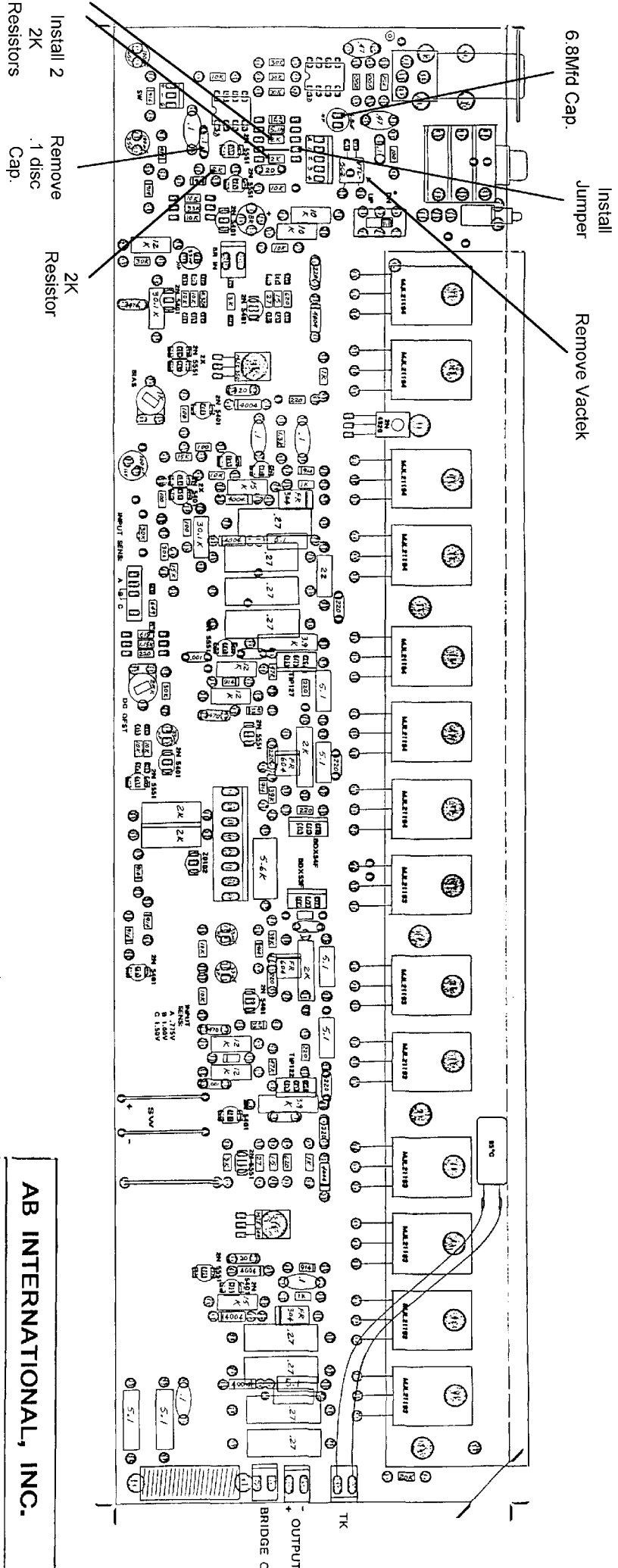


Input sensitivity switch SW-2: Position A=.775V, B=1.0V, C=1.5V. For rev "C-F" place switch in "C" position, for rev "G-J" place switch in same position as old pcb or as in the opposite channel.

**Bridge Wire (yellow wire) connects as follow (FAILURE TO CONNECT CORRECTLY WILL RESULT IN DAMAGE):**  
 If the replacement output pcb is for channel1 (top board) the bridge wire connects to J5 pin 2.  
 If the replacement output pcb is for channel 2 (bottom board) the bridge wire connects to J2 In 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.

9220A, 9420A Output pcb replacement modification  
 "D-G" rev to "J" rev

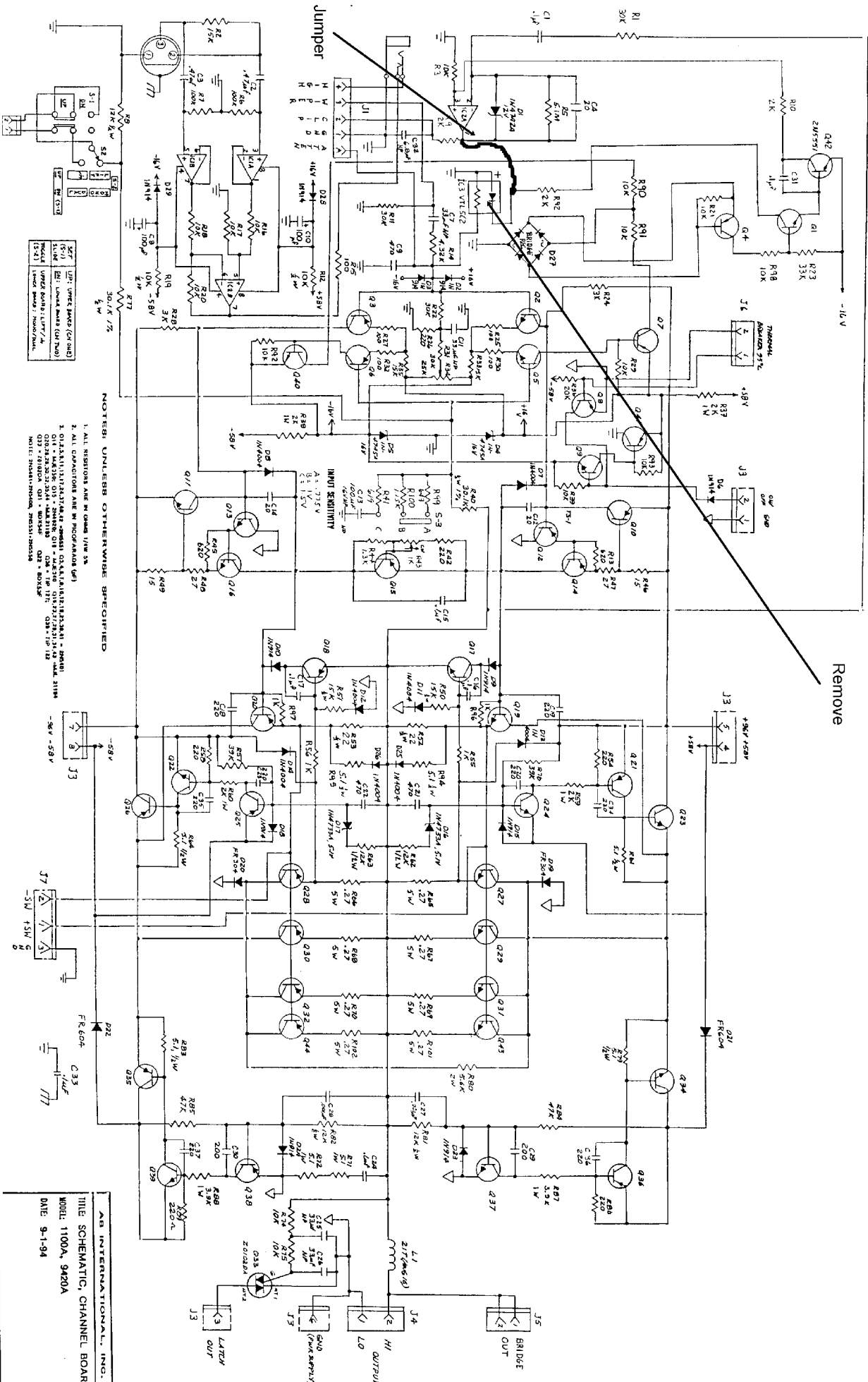


AB INTERNATIONAL, INC.

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

DATE: 9-7-94

ASSY NO. 502-610 REV. J



NOTES: UNLESS OTHERWISE SPECIFIED:

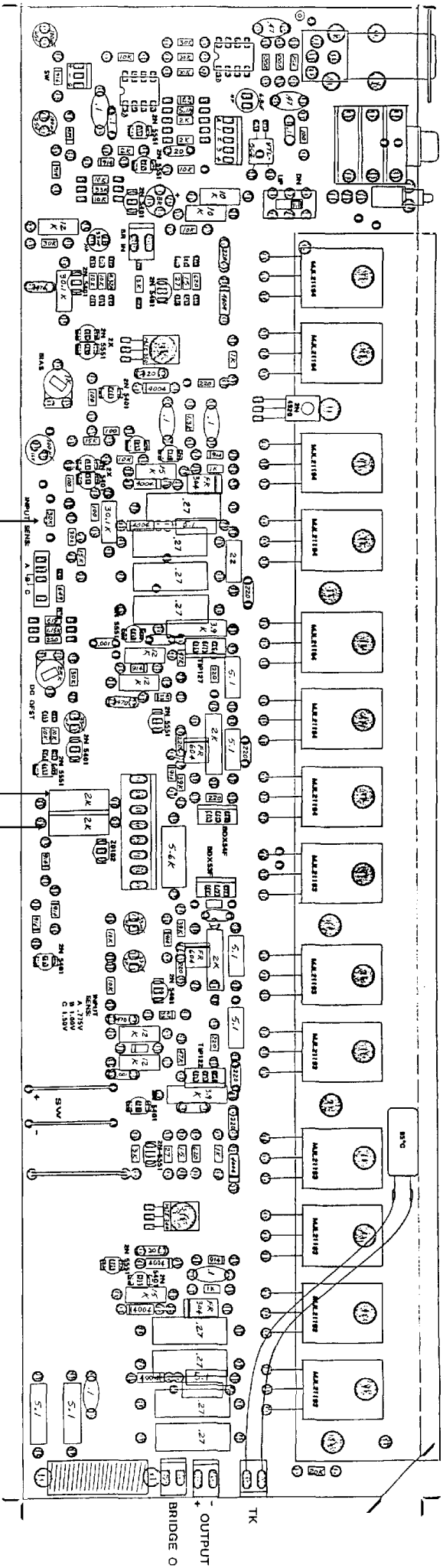
1. ALL RESISTORS ARE IN OHMS UNLESS SPECIFIED
2. ALL CAPACITORS ARE IN PICOFARADS (PF)
3. DIMENSIONS IN PARENTHESES ARE MOUNTING DIMENSIONS - BRIDGE DIMENSIONS ARE IN PARENTHESES - DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS
4. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS
5. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS

ASB INTERNATIONAL, INC.  
 TITLE SCHEMATIC, CHANNEL BOARD  
 MODEL 1100A, 9420A  
 DATE 9-1-94  
 REV. J

ASSEMBLY NO. 502-670

# 9220A, 9420A Output pcb replacement Modification

"J" rev to "J" rev.



Remove  
30K Resistor

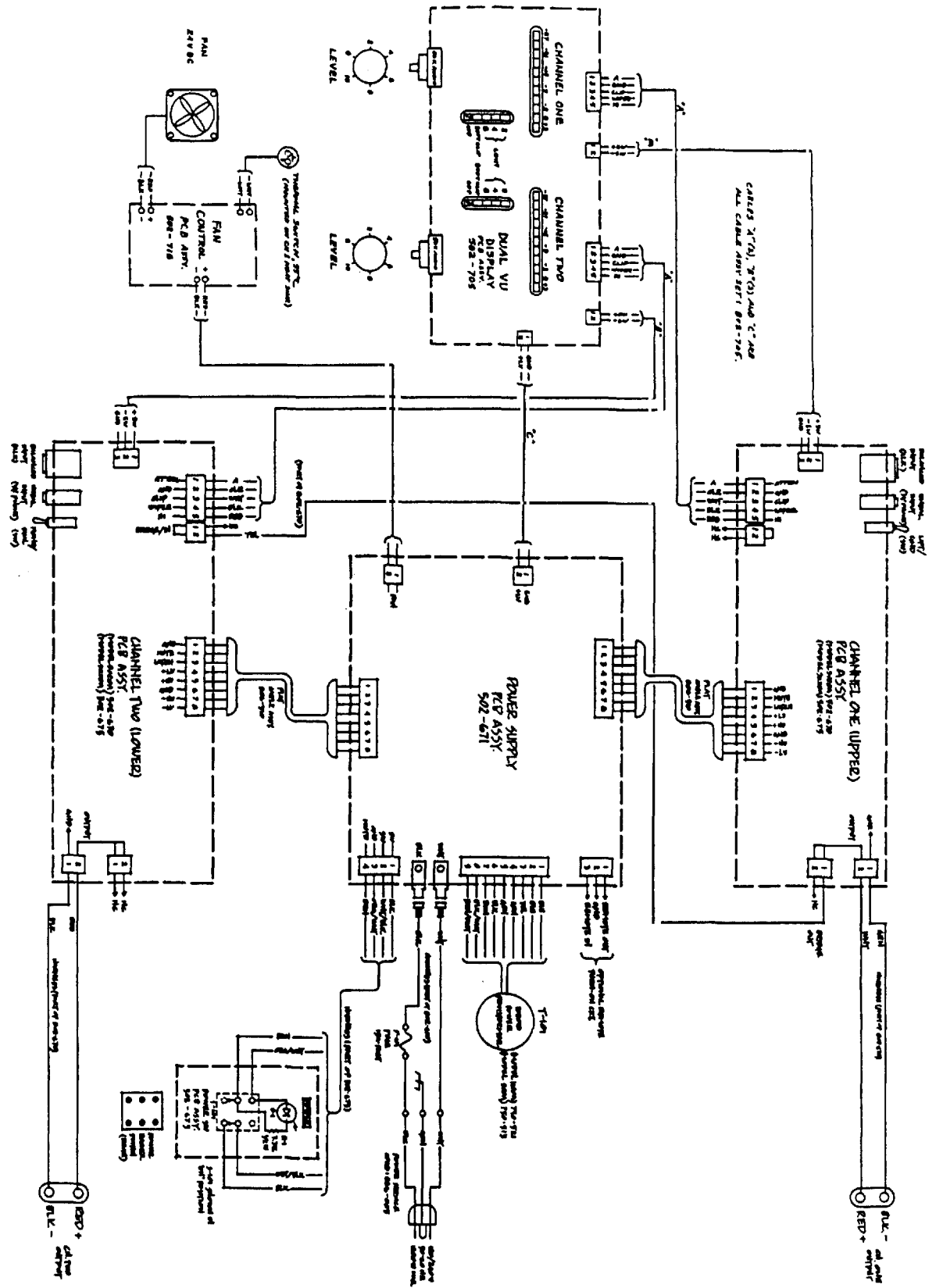
Check value of old resistors to  
new resistors, if different  
install old resistors in new pcb

**AB INTERNATIONAL, INC.**

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

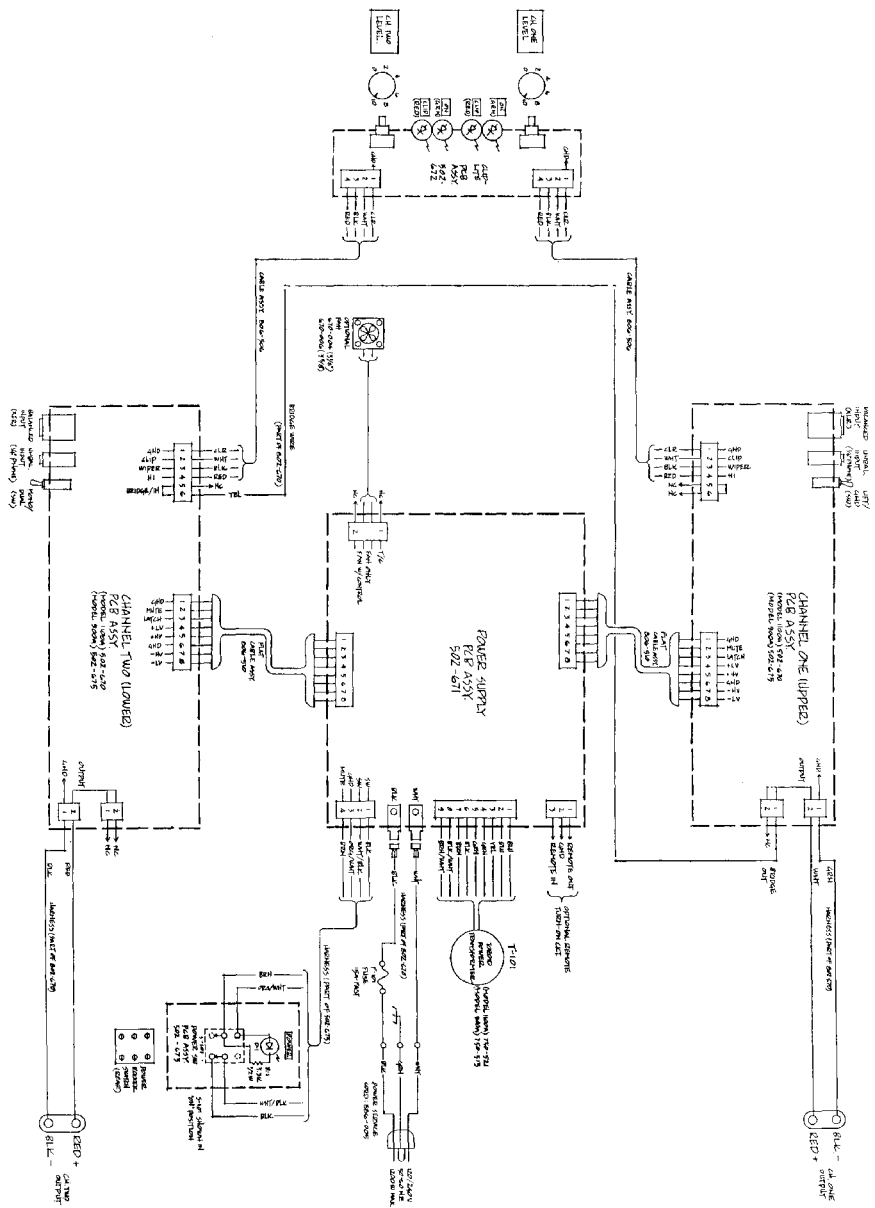
**DATE: 9-7-94**

**ASSY NO. 502-610 REV. J**



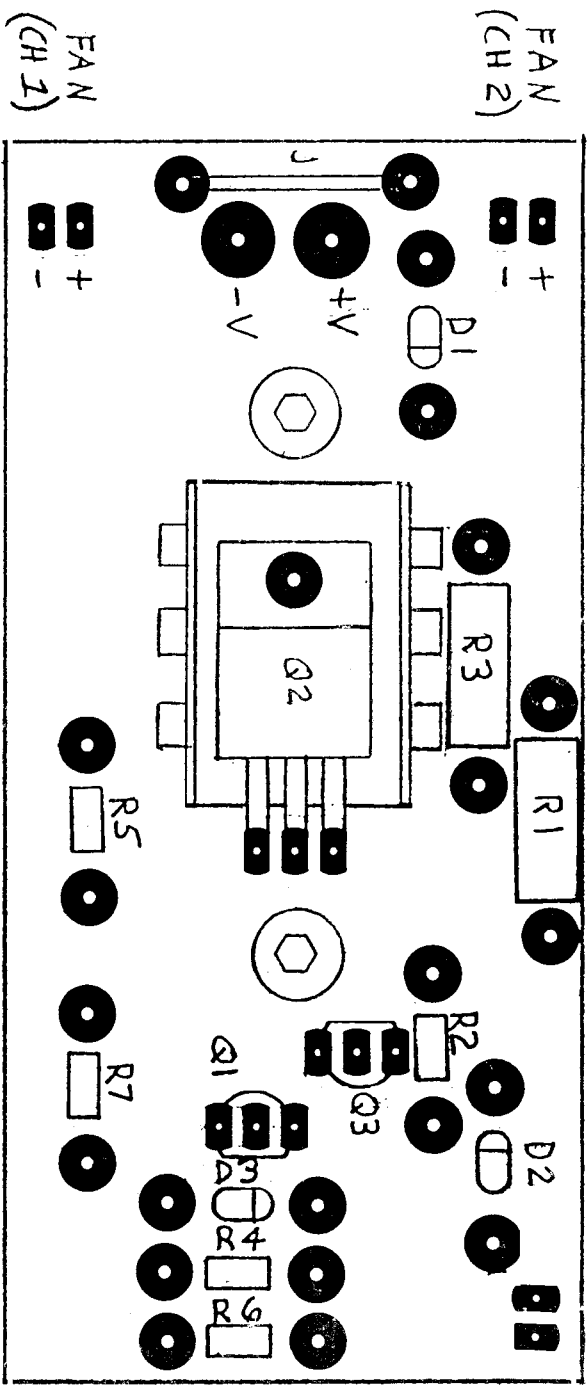
A.B. INTERCOMM, INC.  
 MODEL MASTER SCHEMATIC  
 PARTS LIST 8-29-51, K-1  
 ASSEMBLY NO. 355-9110  
 355-9110





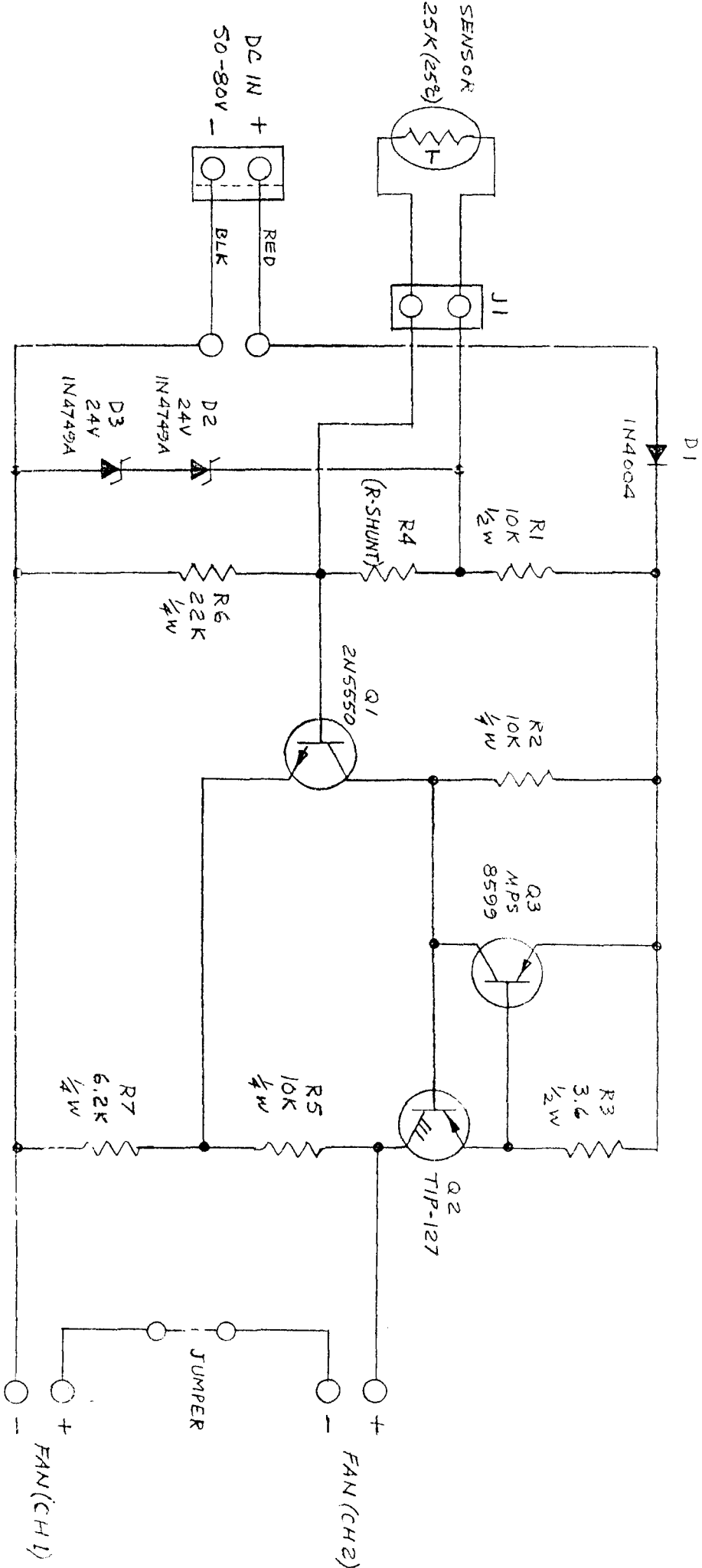
1. THIS INSTRUMENTAL ILL  
 2. THIS INSTRUMENT SCHEMATIC  
 3. MODEL: 502-671/404  
 4. DATE: 8-1-68, RCD  
 5. ASSEMBLY NO. 502-671 (404)  
 6. 502-671 (404)

THERMAL  
 SENSOR



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

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



AB INTERNATIONAL, INC.

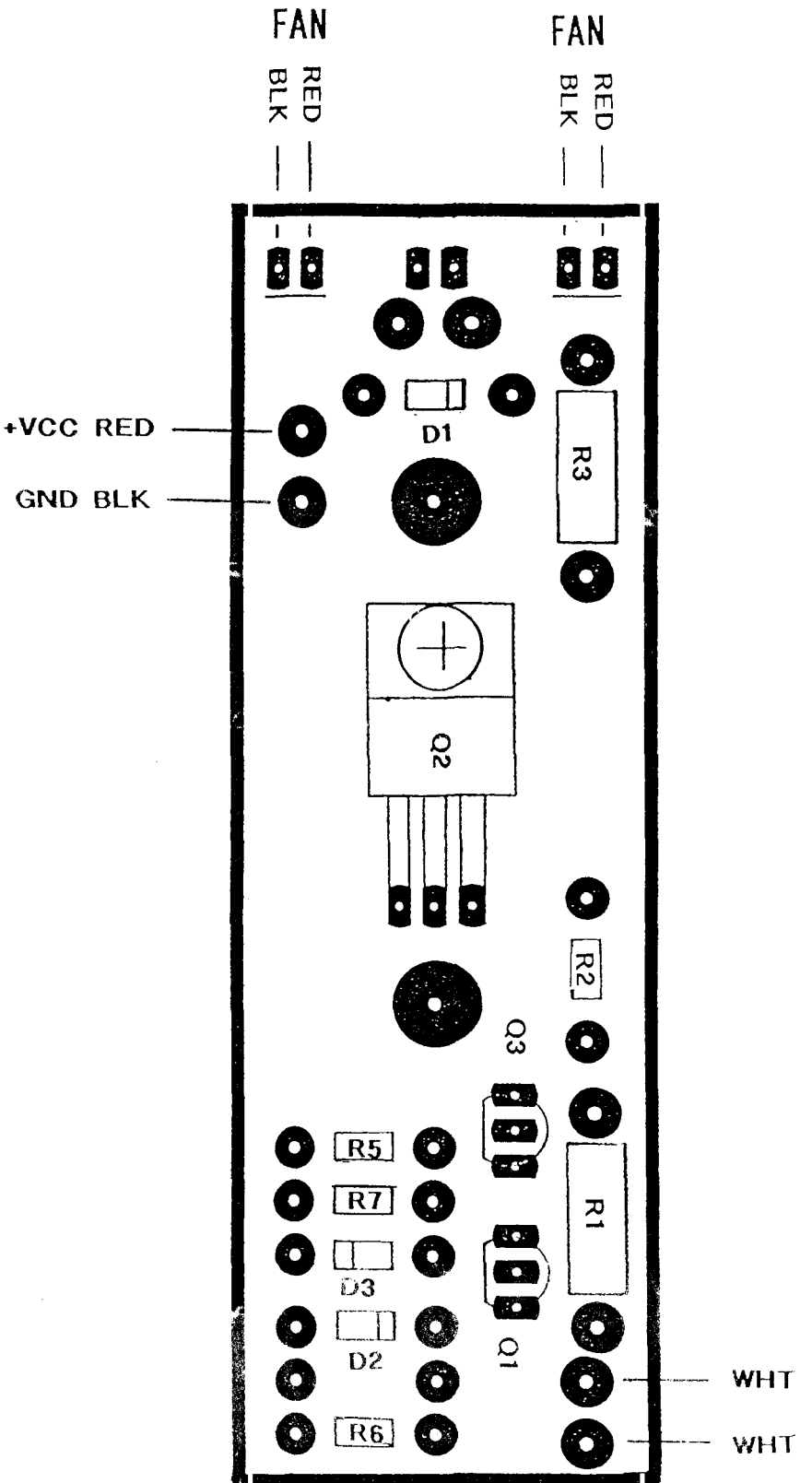
SCHEMATIC: FAN CONTROL C1

MODEL: 1200C

DATE: 4-90 GEO. A

ASSEMBLY NO. 502-713

THERMAL SENSOR



AB INTERNATIONAL, INC.

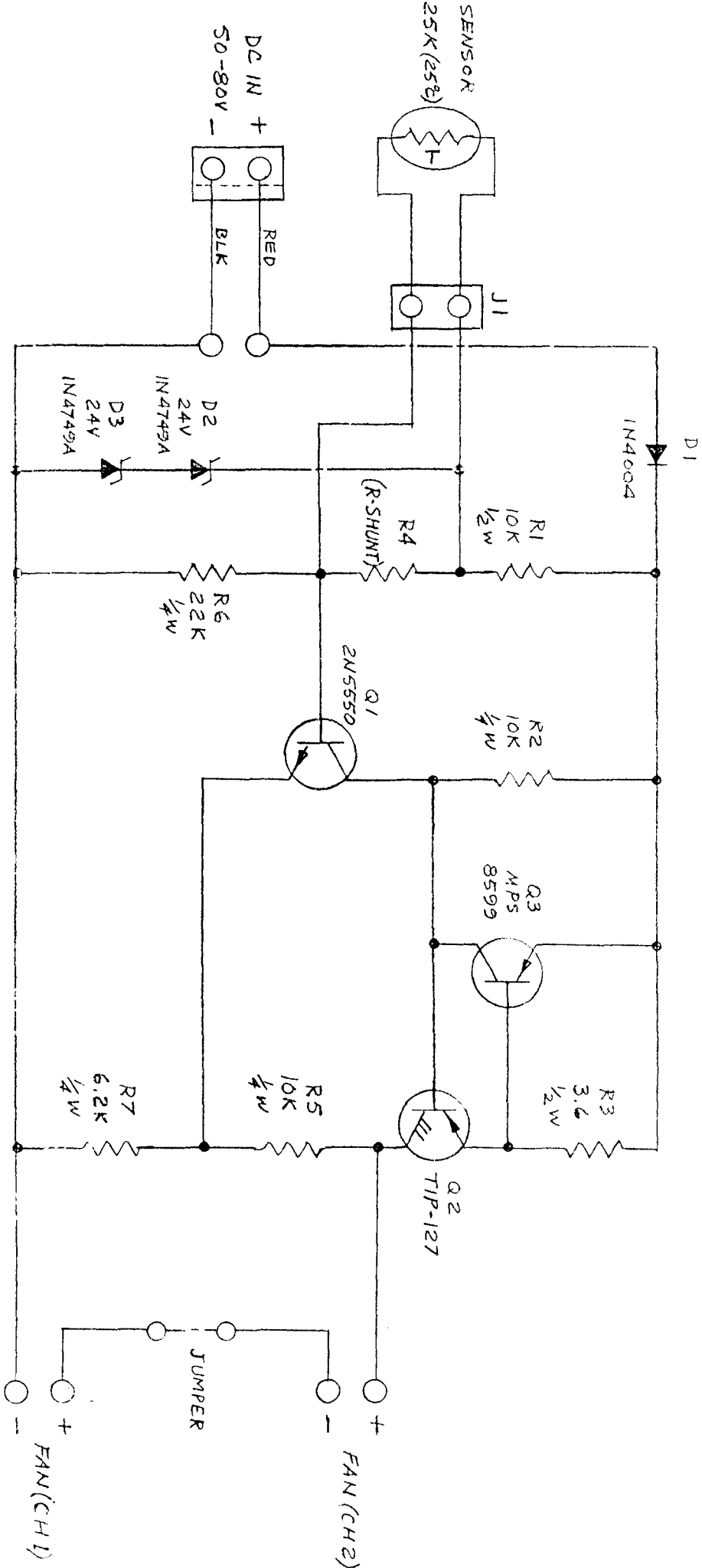
TITLE: FAN CONTROL BOARD

MODEL: 1200C

DATE 11-91

ASSY. NO. 502-713

REV. C



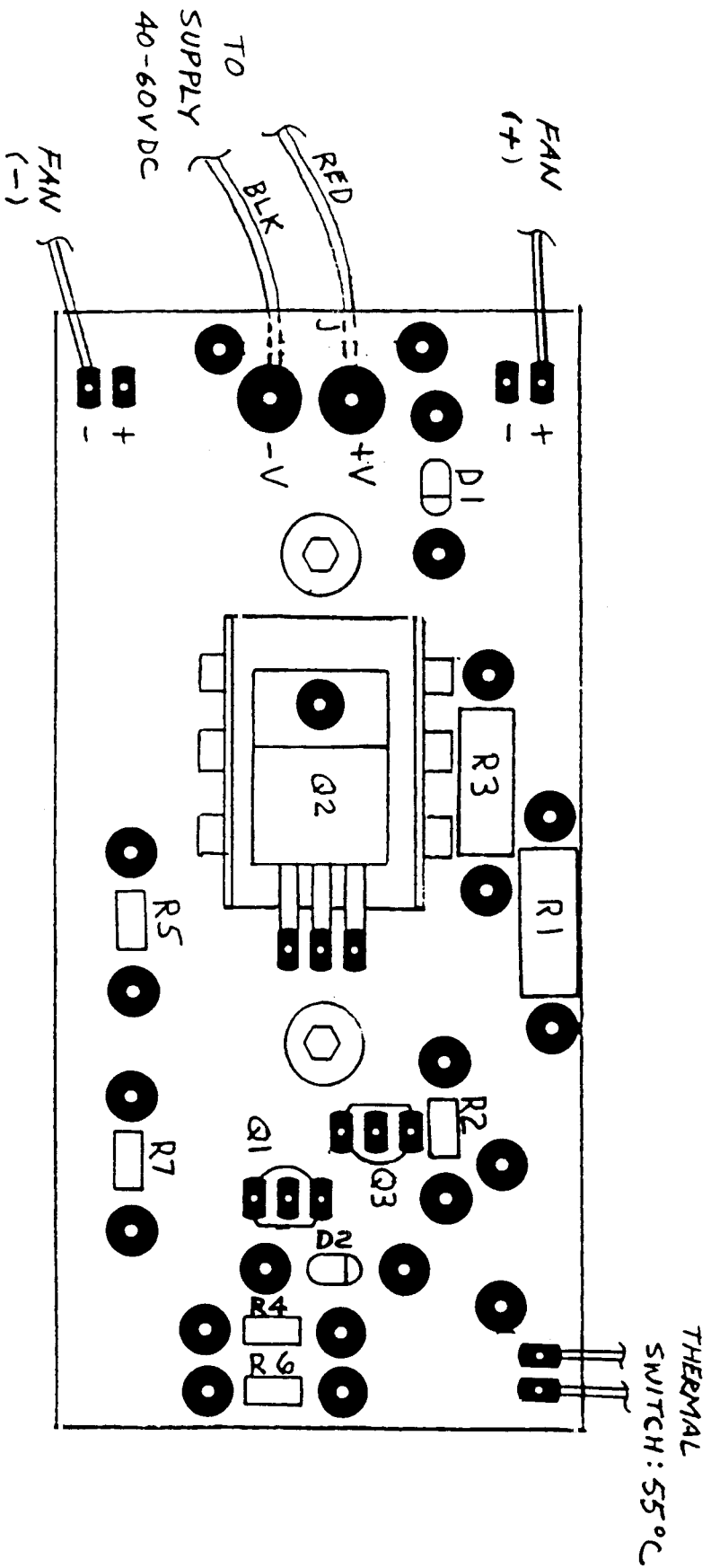
AB INTERNATIONAL, INC.

SCHEMATIC: FAN CONTROL C1

MODEL: 1200C

DATE: 4-90 GEO. A

ASSEMBLY NO. 502-713



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

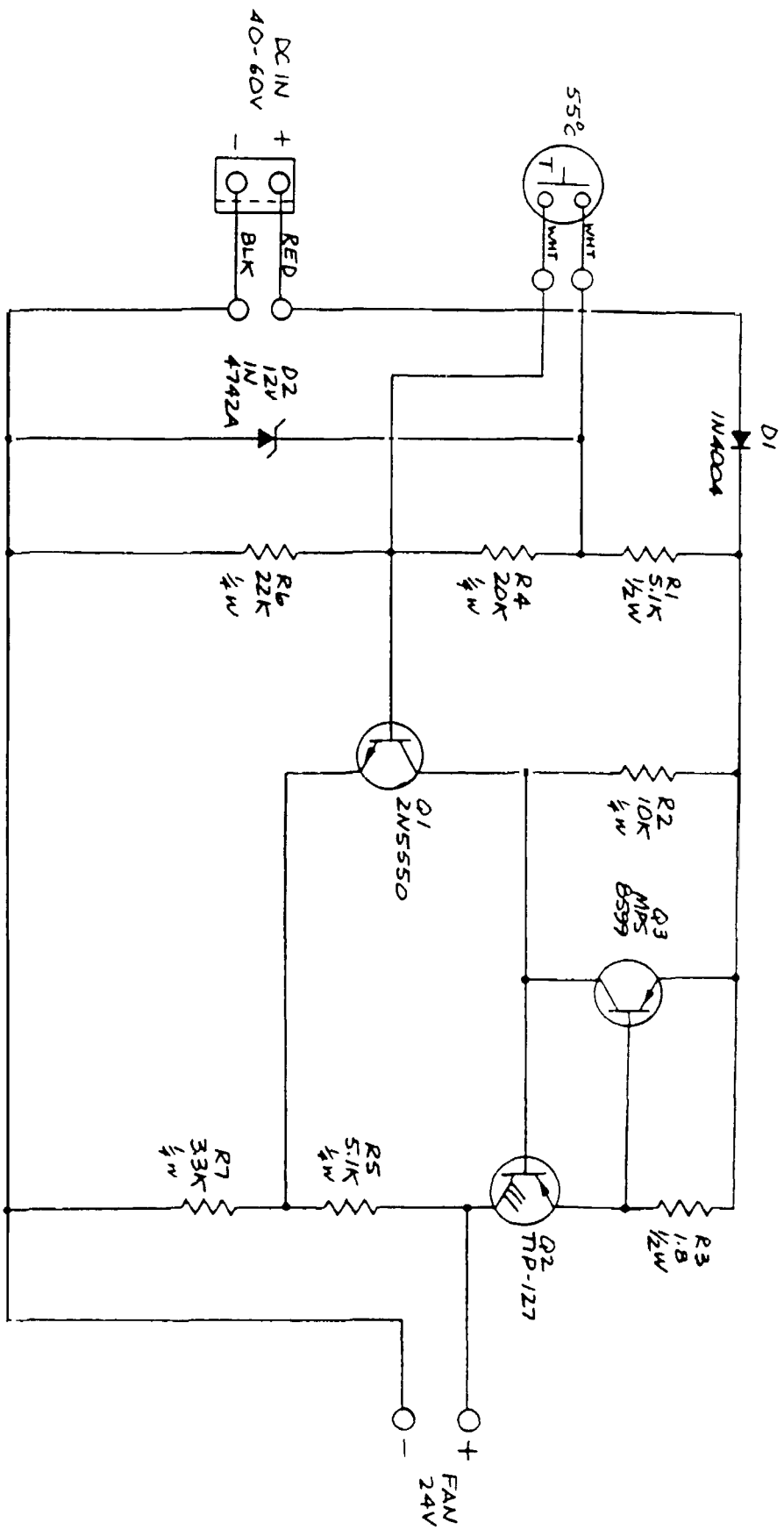
AB INTERNATIONAL, INC.

ASSY: FAN CONTROL BD.

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

DATE: 7-20-90 GEO.A

ASSY NO: 502-716 REV. A

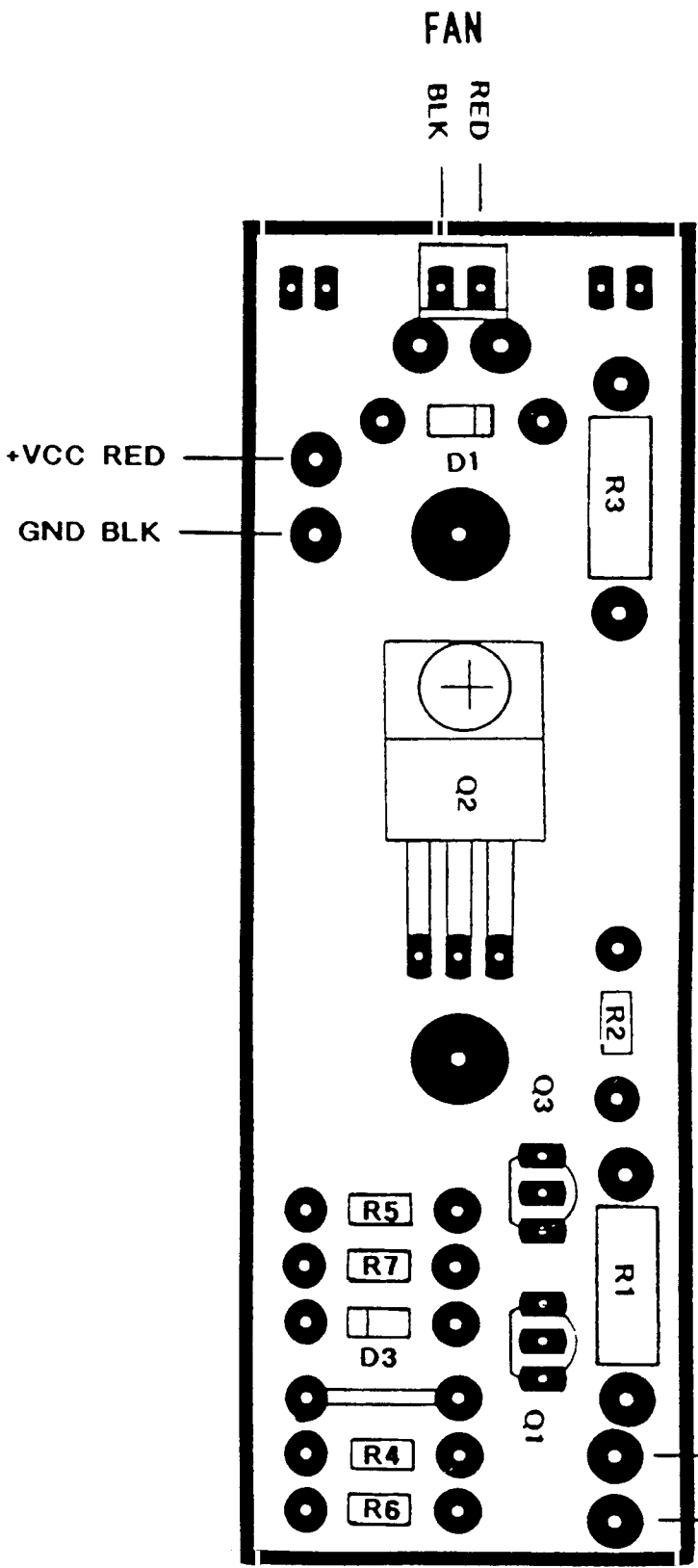


NOTE: REV. POWER SUPPLIES ONLY 6-90/12-91

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.**

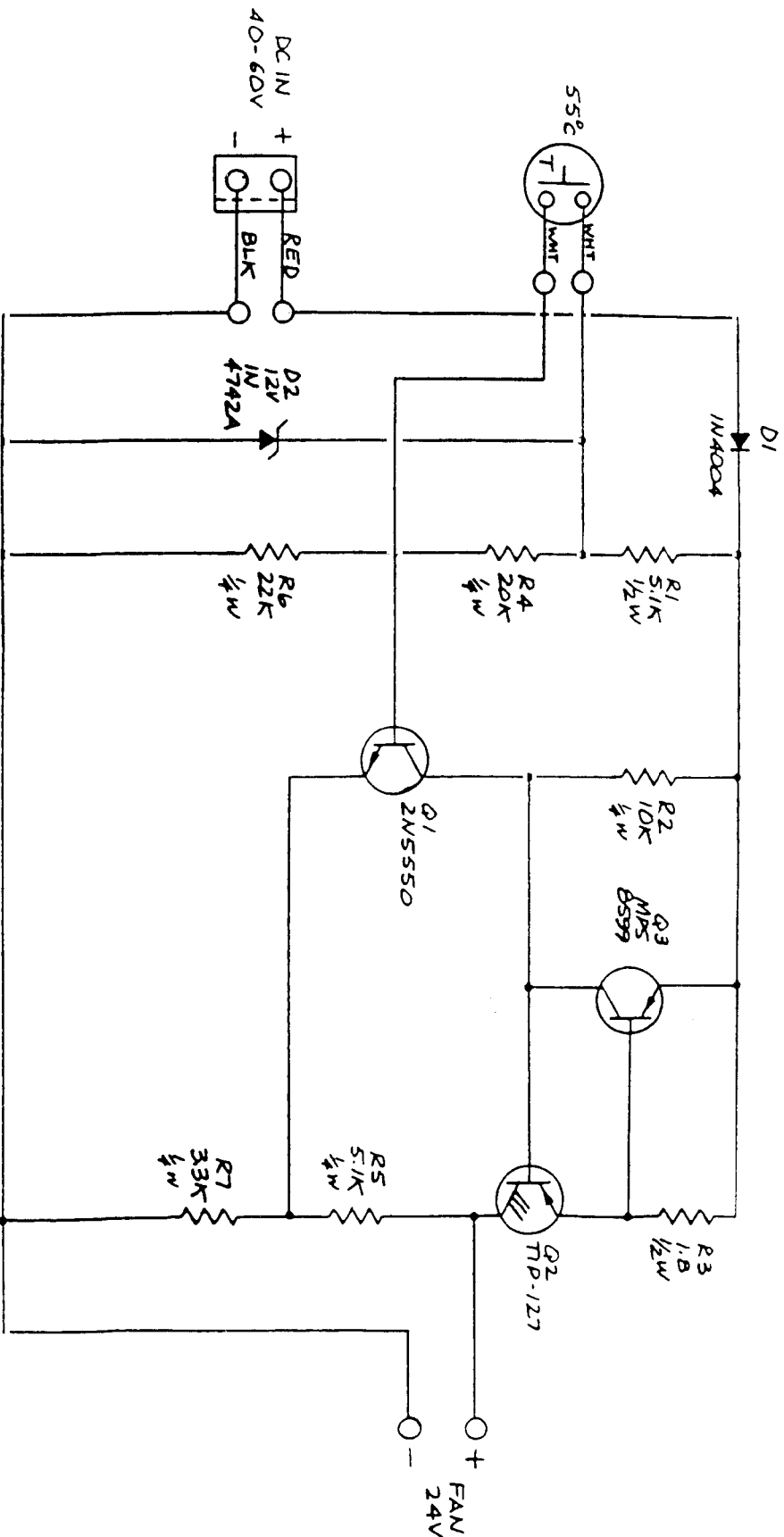
TITLE: FAN CONTROL PCB

MODEL: FX1B ,TWO-RACK AMPS

DATE 11-91

ASSY. NO. 502-716 REV. C





D2 = 12v zener for 24v fan or  
 24v zener for 48v fan

R3 = 1.8 ohm 1/2w for 24v fan or  
 3.6 ohm 1/2w for 48 v fan

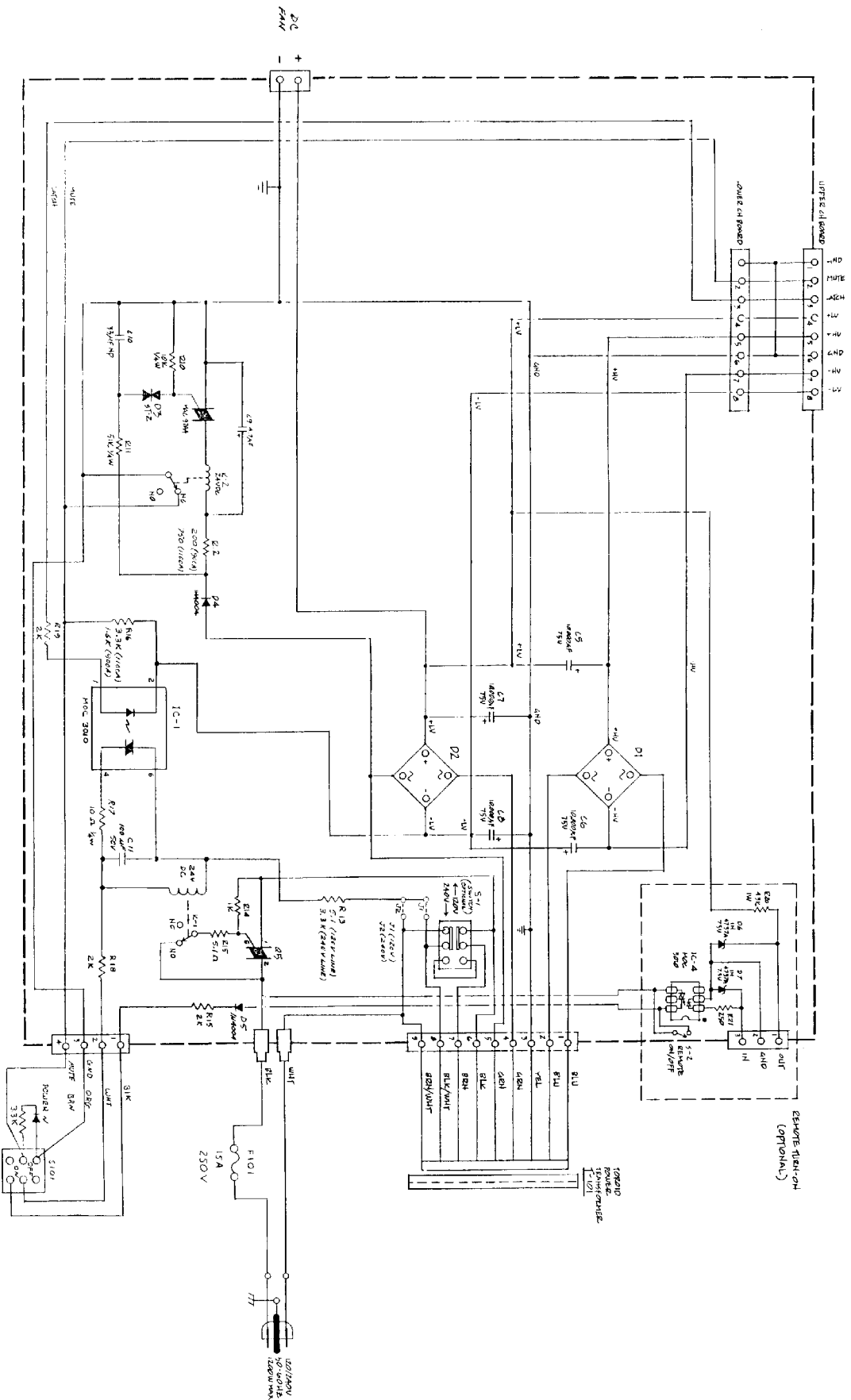
**AB INTERNATIONAL, INC.**

TITLE: FAN CONTROL CIRCUIT

MODEL: FX1B, TWO-RACK AMPS

DATE 11-91

ASSY. NO. 502-716 REV. C

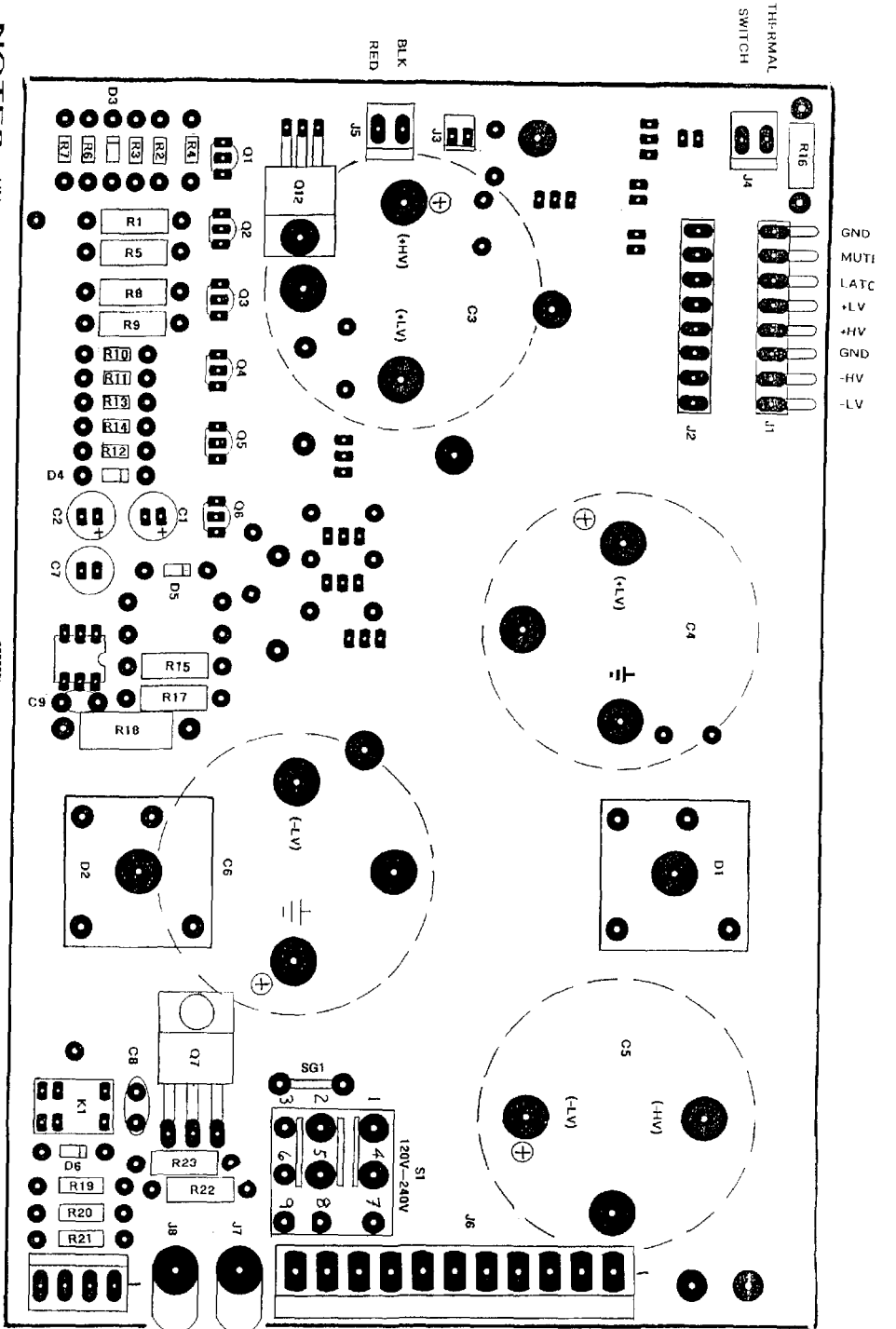


- NOTES: UNLESS OTHERWISE SPECIFIED:
- 1) ALL CAPACITORS ARE IN OHMS UNLESS STATED OTHERWISE.
  - 2) ALL CAPACITORS ARE IN MICROFARADS (μF) UNLESS STATED OTHERWISE.
  - 3) ALL RESISTORS ARE IN OHMS UNLESS STATED OTHERWISE.

NOTE: 900A = 9220, 1100A = 9420

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

AB INTERNATIONAL, INC.  
 TITLE: REMOTE FLASH UNIT POWER SUPPLY  
 MODEL: 900A / 1100A  
 DATE: 6-18-90 360-A.  
 REVISIONS: 1-101 502-581 REV G



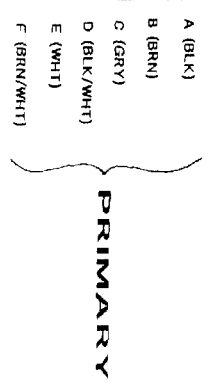
NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS,  $\frac{1}{2}$ W, 5%
2. ALL CAPACITORS ARE IN MICROFARADS ( $\mu$ F)
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 (PIN POSITION)	A	B	C	D	E	F	SWITCH POSITION
180-110 VAC	BLACK	BROWN	BLK/WHT	GRAY	BRN/WHT	WHITE	120 POS.
115-130 VAC	BLACK	GRN	GRY	BLK/WHT	WHITE	BRN/WHT	120 POS.
200-215 VAC	BLACK	BEIGN	BLK/WHT	GRAY	BRN/WHT	WHITE	240 POS.
220-230 VAC	BLACK	BDWN	GRY	BLK/WHT	BRN/WHT	WHITE	240 POS.
235-250 VAC	BLACK	BDWN	GRAY	BLK/WHT	WHITE	BRN/WHT	240 POS.

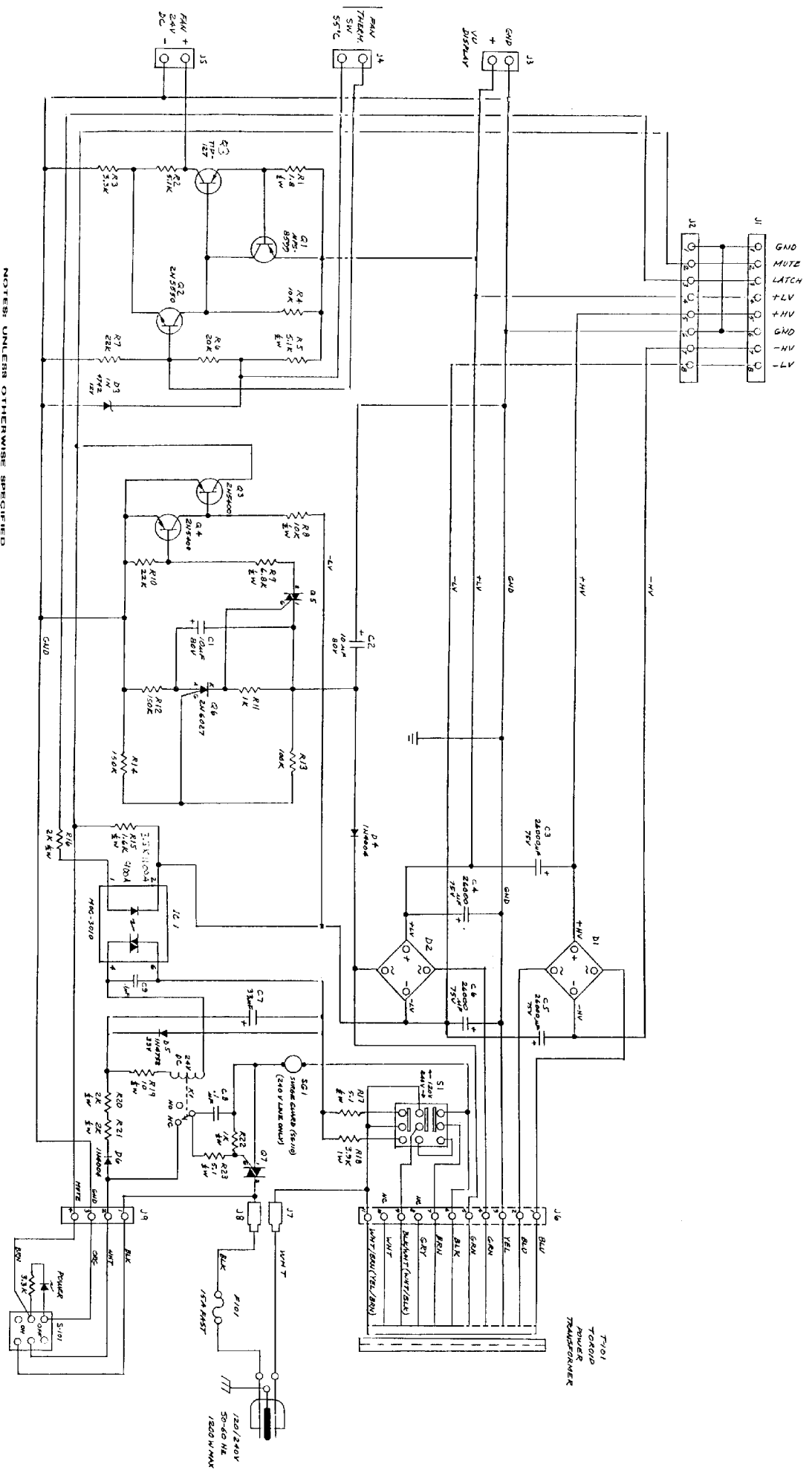
### CHANGING AC LINE VOLTAGE WIRING

- 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



### 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

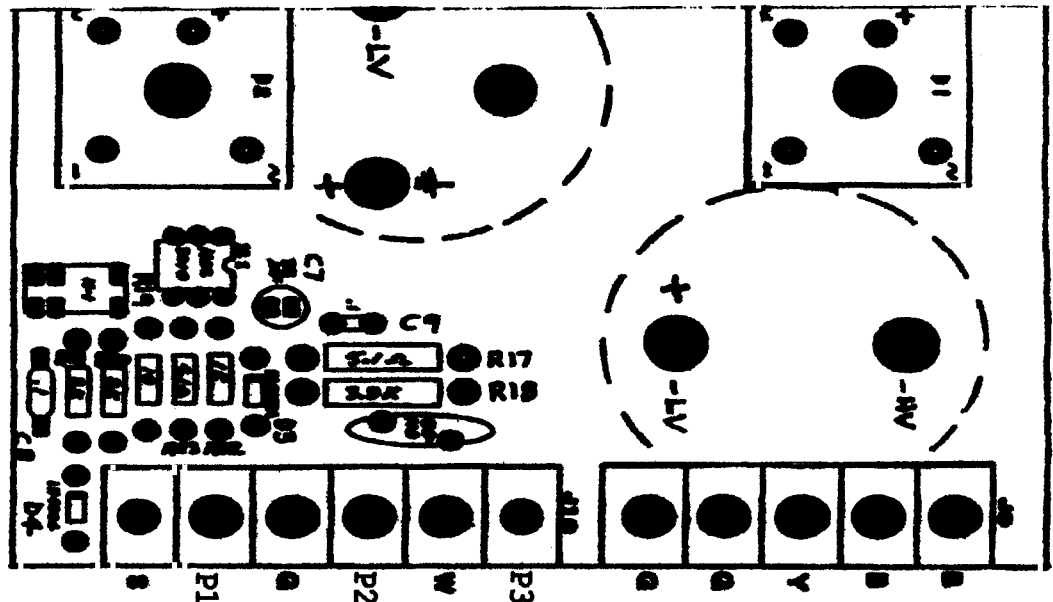


- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE IN OHMS, Ω OR 5%
  2. ALL CAPACITORS ARE IN MICROFARADS (µF)
  3. M INDICATES MASSIVE GROUND
  4. ⚡ INDICATES SUPPLY VOLTAGE CIRCUIT
  5. ALL VOLTAGES ARE AS FOLLOW:
  6. HV: 120V (200A), 1200W (100A)
  7. LV: 24V (700A), 12.5V (1000A)

NOTE: 900A = 9220, 1100A = 9420

AD 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:

- Brown/White
- Black/White
- White
- Grey
- Brown
- Black

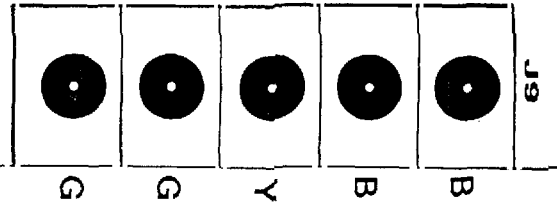
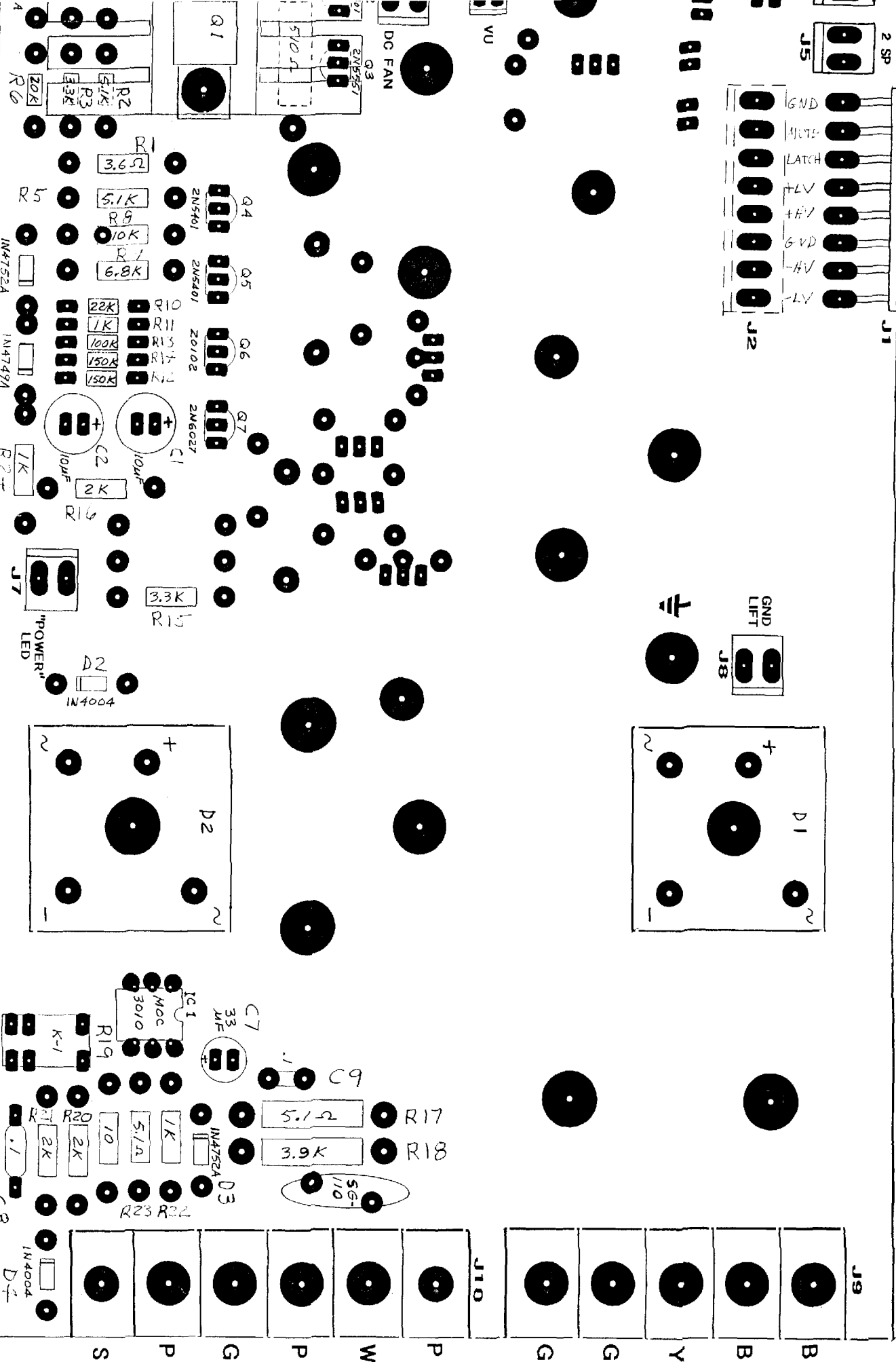
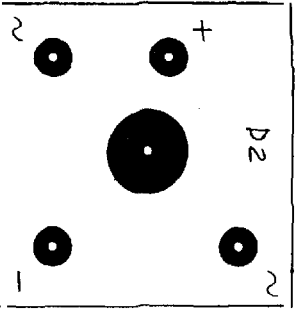
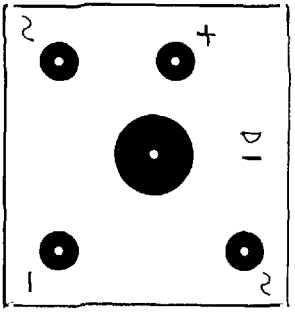
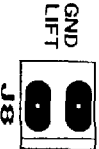
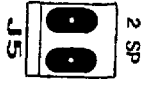
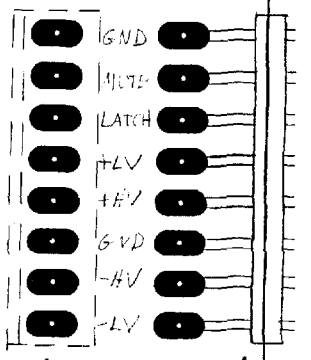
For transformers with  
Primary colors of:

- White
- Purple
- Brown
- Orange
- Grey
- Black

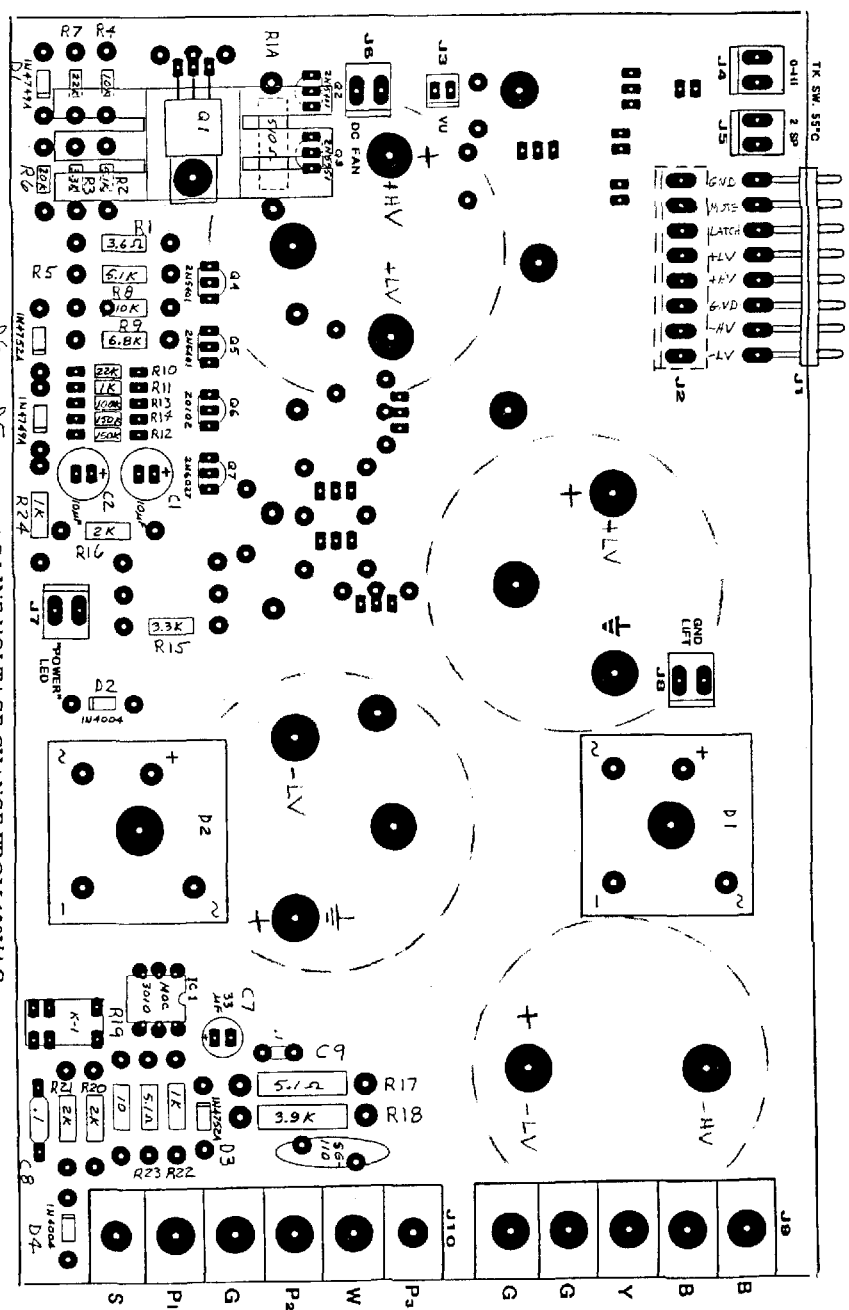
Secondary wiring Blue x 2, Yellow, Green x 2 remains unchanged.  
Note: Some xfrms had Blue x 2, Yellow, Violet x 2 (Instead of Green)

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

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



5.0  
D-1



**AC LINE VOLTAGE CHANGE FROM 120VAC  
FOR POWER SUPPLY REVISION "K"**

- STEP**
1. REMOVE AMPLIFIER FROM ANY AC POWER SOURCE.
  2. DETERMINE DESIRED AC LINE VOLTAGE AND SELECT PROPER AMPLIFIER SETTING. CHOOSE OF THE FOLLOWING: 100VAC, 180VAC, 220VAC, 240VAC.
  3. FOLLOW WIRE CONNECT PROCEDURE CLOSELY.

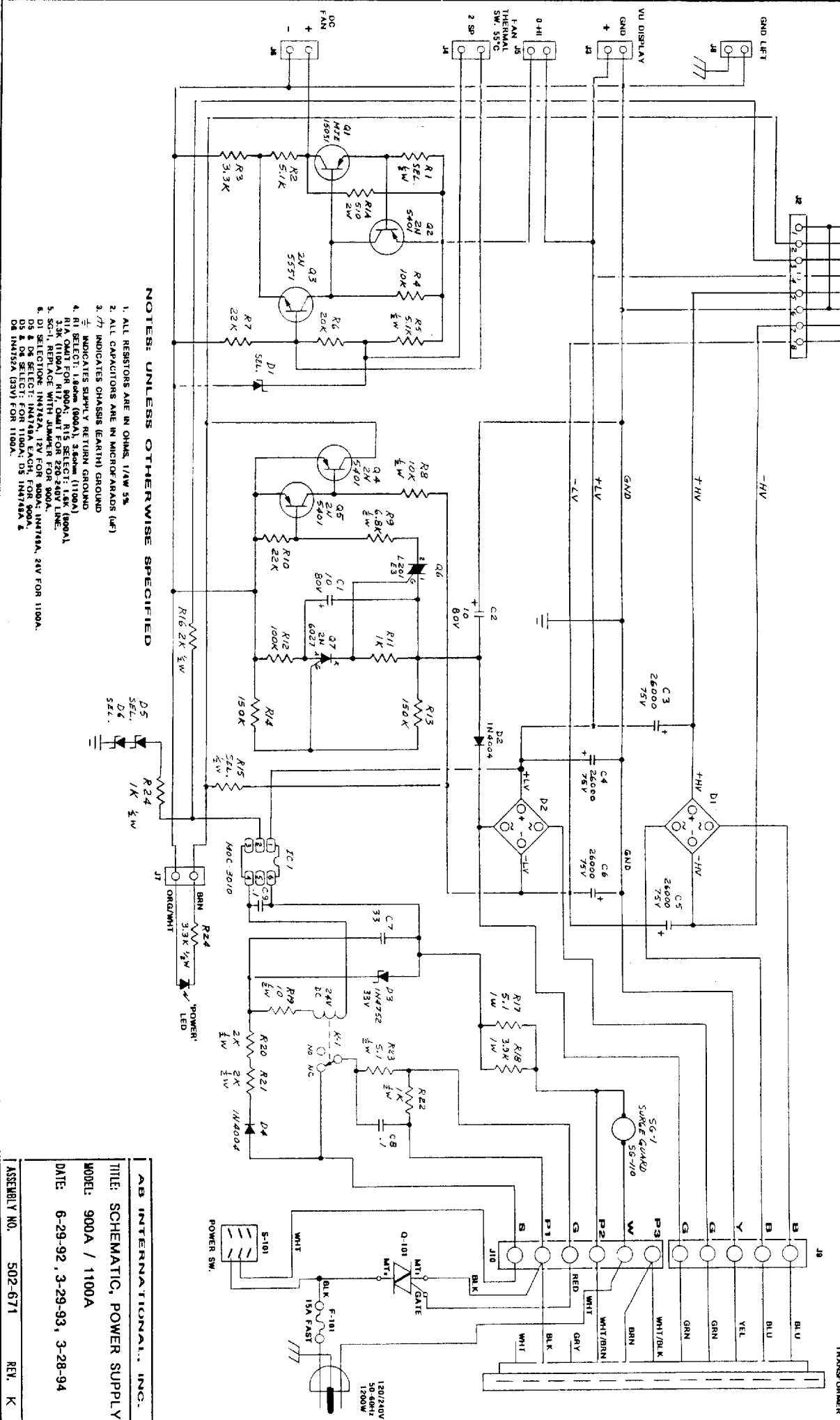
- 100V**
1. LOCATE TERMINAL P1 ON THE POWER SUPPLY AND REMOVE THE BLANK WIRE & BRONZE WIRE FROM P1 AND SECURE THEM.
  2. LOCATE THE GRAY AND WHITE WIRES FROM THE TRANSFORMER AND PLACE THEM ON TERMINAL P2.

- 220V**
1. LOCATE P1 AND P1 ON THE POWER SUPPLY. RELOCATE THE BLANK WIRE ON THE TRANSFORMER FROM P1 TO P1.
  2. LOCATE AND MOVE THE BRN WIRE OF THE TRANSFORMER FROM P1 TO P1.
  3. REMOVE THE BRN WIRE CONNECTED TO P2 AND SECURE.
  4. LOCATE THE WHI WIRE FROM THE TRANSFORMER AND CONNECT IT TO P2.
  5. LOCATE R17 & R19 ON THE POWER SUPPLY AND REMOVE IT BY CUTTING THE LEADS.
  6. CHANGE THE FUSE FROM 15A TO 10A.

- 240V**
1. LOCATE P1 AND P1 ON THE POWER SUPPLY. RELOCATE THE BLANK WIRE ON THE TRANSFORMER FROM P1 TO P1.
  2. LOCATE AND MOVE THE BRN WIRE OF THE TRANSFORMER TO FROM P1 TO P1.
  3. LOCATE R17 & R19 ON THE POWER SUPPLY AND REMOVE IT BY CUTTING THE FUSE.
  4. CHANGE FUSE FROM 15A TO 10A.

- NOTES UNLESS OTHERWISE SPECIFIED**
1. ALL RESISTORS ARE IN OHMS, UNLESS OTHERWISE SPECIFIED.
  2. ALL CAPACITORS ARE IN MICROFARADS (UF).
  3. R1 SELECT: 1.8 ohm (900A, 9220), 3.6 ohm (1100A, 9420)
  4. R1A OHM FOR 900A, 9220
  5. R1S SELECT: 1.6K (900A, 9220), 3.2K (1100A, 9420)
  6. R17 OHM FOR 220V, 240V
  7. R19: 10K (1100A, 9420)
  8. R1: 10K (1100A, 9420)
  9. R1: 10K (1100A, 9420)
  10. R1: 10K (1100A, 9420)
  11. R1: 10K (1100A, 9420)
  12. R1: 10K (1100A, 9420)
  13. R1: 10K (1100A, 9420)
  14. R1: 10K (1100A, 9420)
  15. R1: 10K (1100A, 9420)
  16. R1: 10K (1100A, 9420)
  17. R1: 10K (1100A, 9420)
  18. R1: 10K (1100A, 9420)
  19. R1: 10K (1100A, 9420)
  20. R1: 10K (1100A, 9420)
  21. R1: 10K (1100A, 9420)
  22. R1: 10K (1100A, 9420)
  23. R1: 10K (1100A, 9420)

AS International Electronics, Inc. 1804 Westway Blvd. 10000 The Woodlands, TX 77380 Phone: 281-358-5811	
<b>TITLE: POWER SUPPLY BOARD</b>	
<b>MODEL: 900A, 1100A, 9220, 9420</b>	
<b>ATD AMPS</b>	
<b>DATE: 3-28-94</b>	<b>REV. K</b>
<b>PART NO. 502-671</b>	

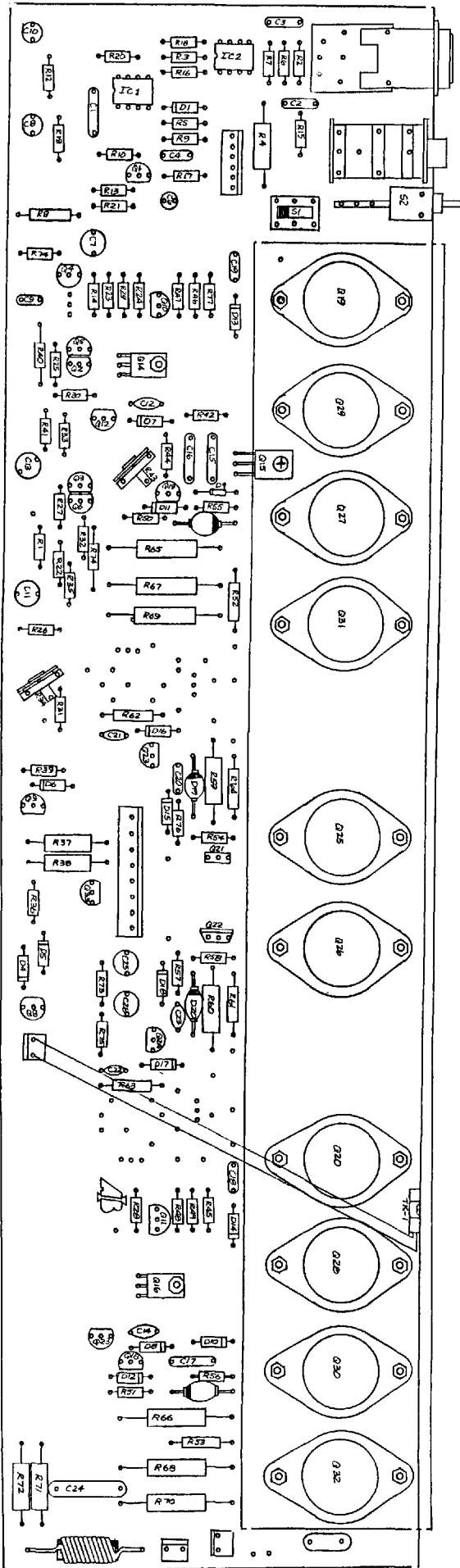


- NOTES: UNLESS OTHERWISE SPECIFIED**
1. ALL RESISTORS ARE IN OHMS, 1/W 5%
  2. ALL CAPACITORS ARE IN MICROFARADS (µF)
  3.  $\text{---}$  INDICATES CHASSIS (EARTH) GROUND
  4.  $\text{---}$  INDICATES SUPPLY RETURN GROUND
  5. R1 SELECT: 180Ω (900A), 3.6Ω (1100A)
  6. R2 (ONLY FOR 900A), R15 SELECT: 1K (900A), 1.2K (1100A)
  7. S6-1, REPLACE WITH JUMPER FOR 900A.
  8. D1 SELECT: INT172A, 12V FOR 900A; INT174A, 24V FOR 1100A.
  9. D5 & D6 SELECT: INT172A EACH; FOR 900A.
  10. D5 & D6 SELECT: FOR 1100A; D5 INT175A & D6 INT175A (25V) FOR 1100A.

D5 SEL. 1/K Ω W  
 D4 SEL. 1/K Ω W  
 D3 SEL. 1/K Ω W  
 D2 SEL. 1/K Ω W  
 D1 SEL. 1/K Ω W

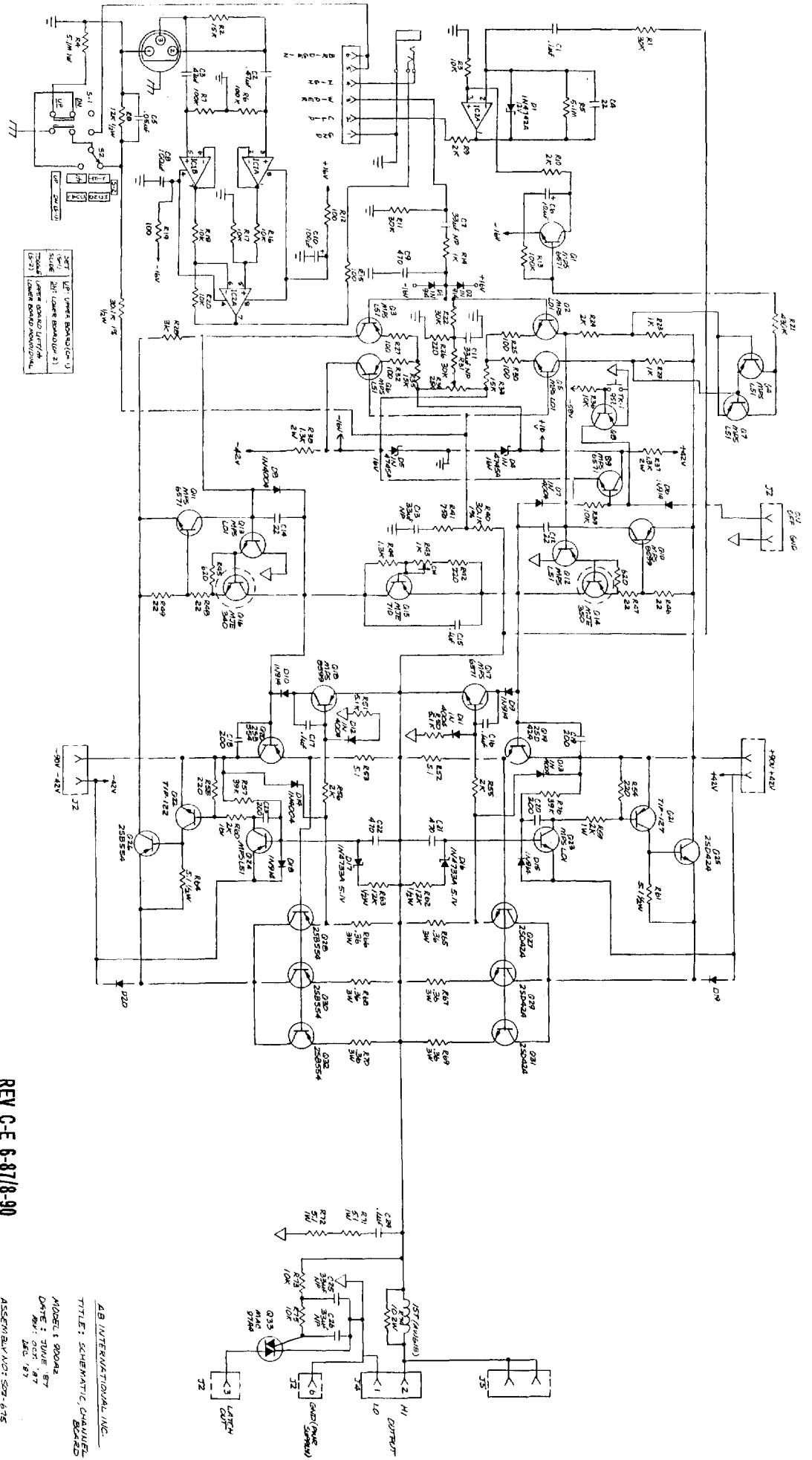
AB INTERNATIONAL, INC.  
 TITLE: SCHEMATIC, POWER SUPPLY  
 MODEL: 900A / 1100A  
 DATE: 6-29-92, 3-29-93, 3-28-94  
 ASSEMBLY NO. 502-671 REV. K





REV C-E 6-87/8-90

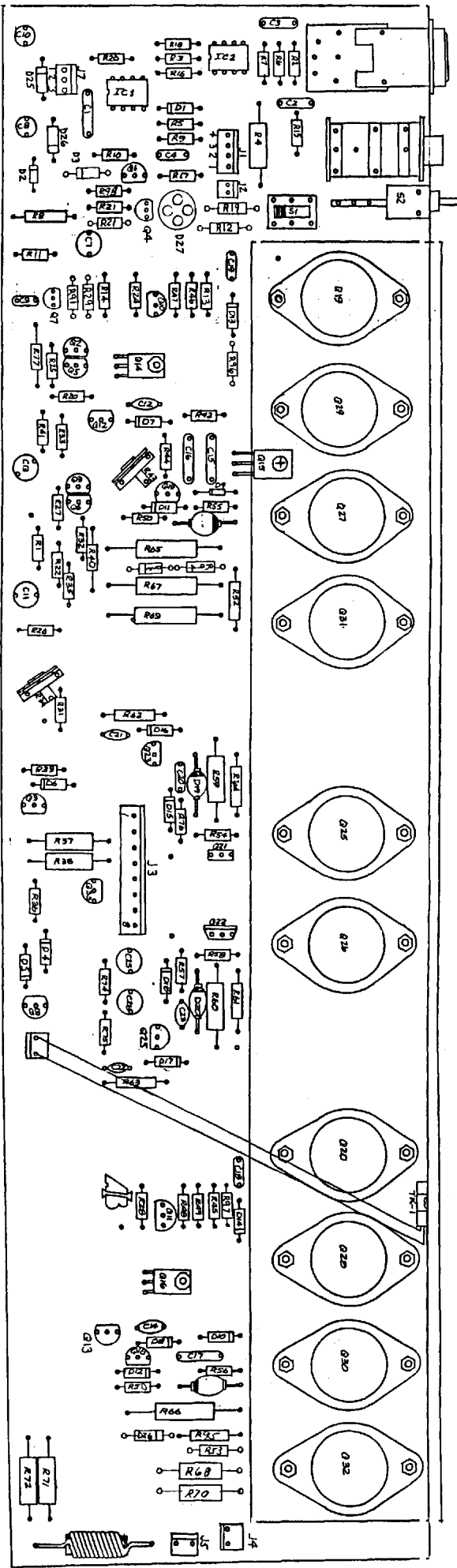
AB INTERNATIONAL, LLC  
 ASSEMBLY PCB, 90042  
 PN 1 502-475



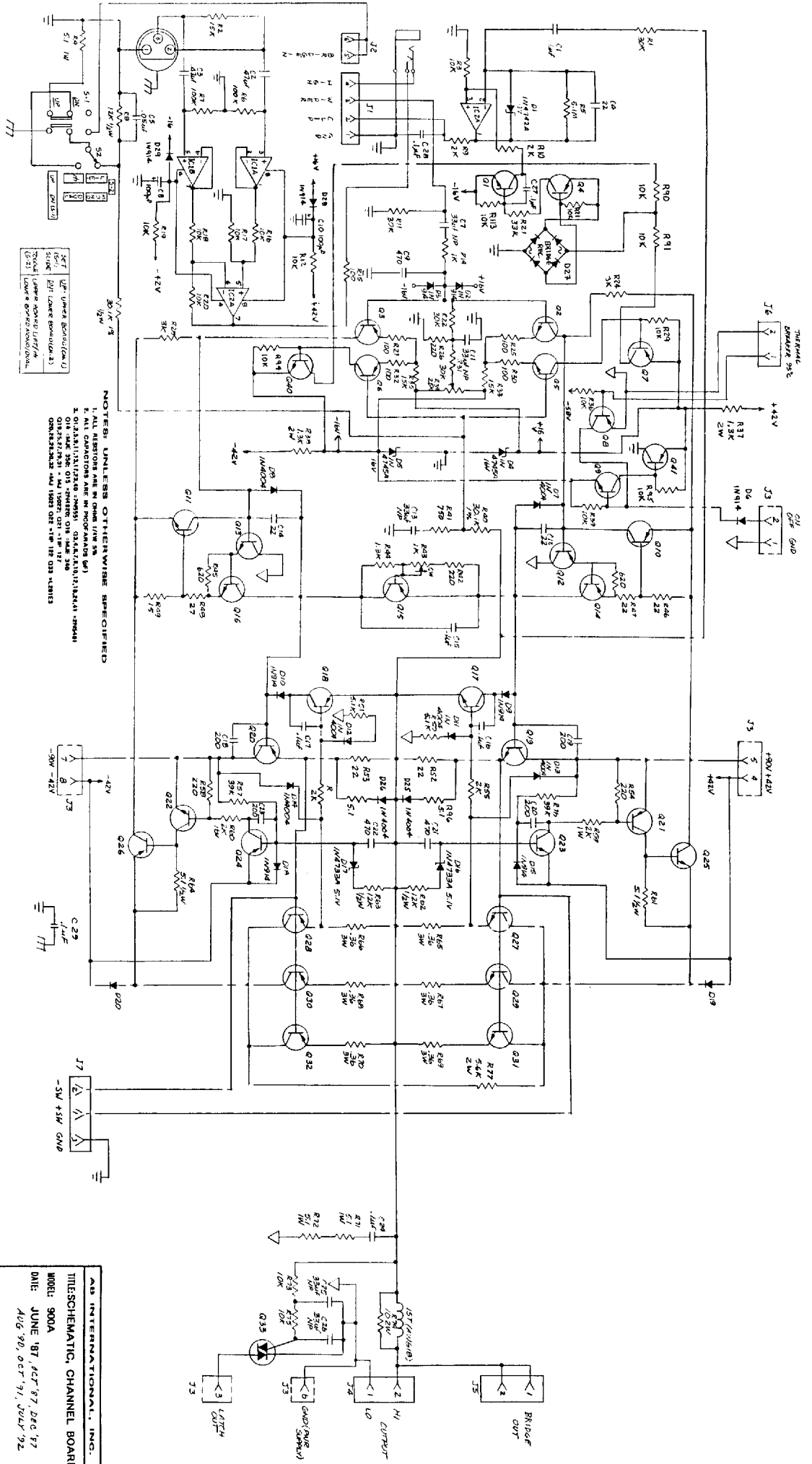
207	UPPER BOARD(10-1)
208	UPPER BOARD(10-2)
209	UPPER BOARD(10-3)
210	UPPER BOARD(10-4)
211	UPPER BOARD(10-5)
212	UPPER BOARD(10-6)
213	UPPER BOARD(10-7)
214	UPPER BOARD(10-8)
215	UPPER BOARD(10-9)
216	UPPER BOARD(10-10)
217	UPPER BOARD(10-11)
218	UPPER BOARD(10-12)
219	UPPER BOARD(10-13)
220	UPPER BOARD(10-14)
221	UPPER BOARD(10-15)
222	UPPER BOARD(10-16)
223	UPPER BOARD(10-17)
224	UPPER BOARD(10-18)
225	UPPER BOARD(10-19)
226	UPPER BOARD(10-20)
227	UPPER BOARD(10-21)
228	UPPER BOARD(10-22)
229	UPPER BOARD(10-23)
230	UPPER BOARD(10-24)
231	UPPER BOARD(10-25)
232	UPPER BOARD(10-26)
233	UPPER BOARD(10-27)
234	UPPER BOARD(10-28)
235	UPPER BOARD(10-29)
236	UPPER BOARD(10-30)
237	UPPER BOARD(10-31)
238	UPPER BOARD(10-32)
239	UPPER BOARD(10-33)
240	UPPER BOARD(10-34)
241	UPPER BOARD(10-35)
242	UPPER BOARD(10-36)
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244	UPPER BOARD(10-38)
245	UPPER BOARD(10-39)
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300	UPPER BOARD(10-94)
301	UPPER BOARD(10-95)
302	UPPER BOARD(10-96)
303	UPPER BOARD(10-97)
304	UPPER BOARD(10-98)
305	UPPER BOARD(10-99)
306	UPPER BOARD(10-100)

REV C-E 6-87/8-90

AB INTERNATIONAL INC.  
 TITLE: SCHEMATIC, CHASSIS BOARD  
 MODEL: 800A8  
 DATE: JUNE 87  
 REV: OCT 87  
 ASSEMBLY: NOT SET 675



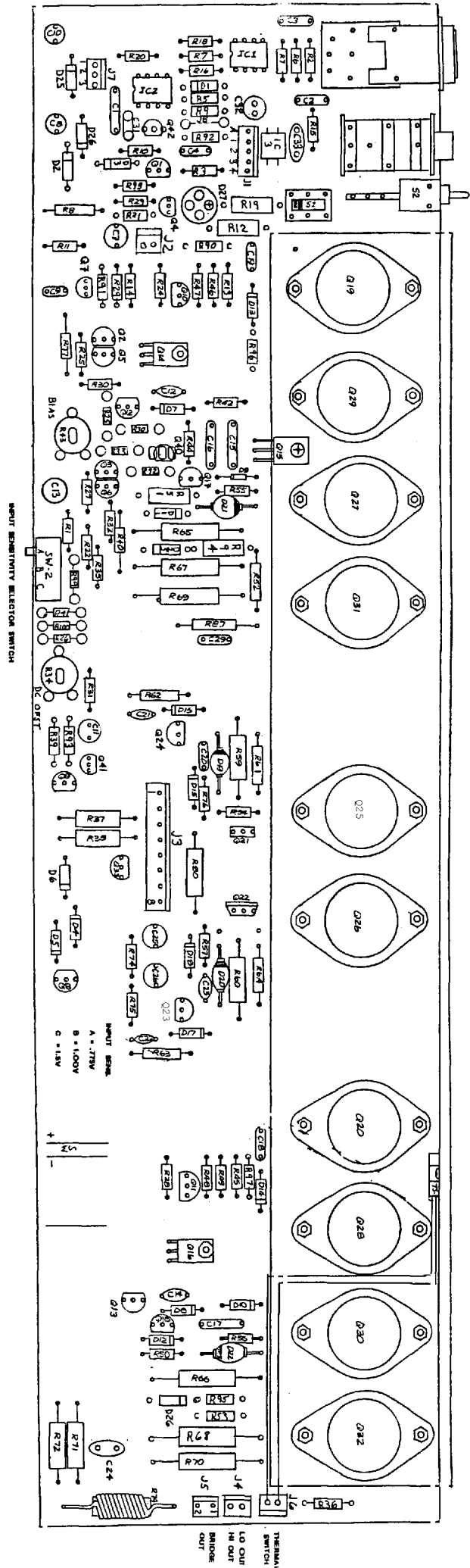
AB INTERNATIONAL, INC  
 ASSEMBLY PCB, 90042  
 P/N 502-685 REV F  
 AUG 90 JK



- 1. ALL RESISTORS ARE IN OHMS UNLESS NOTED
- 2. ALL CAPACITORS ARE IN MICROFARADS UNLESS NOTED
- 3. DIODES ARE 1N4148 UNLESS NOTED
- 4. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED
- 5. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED
- 6. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED
- 7. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED
- 8. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED
- 9. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED
- 10. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED

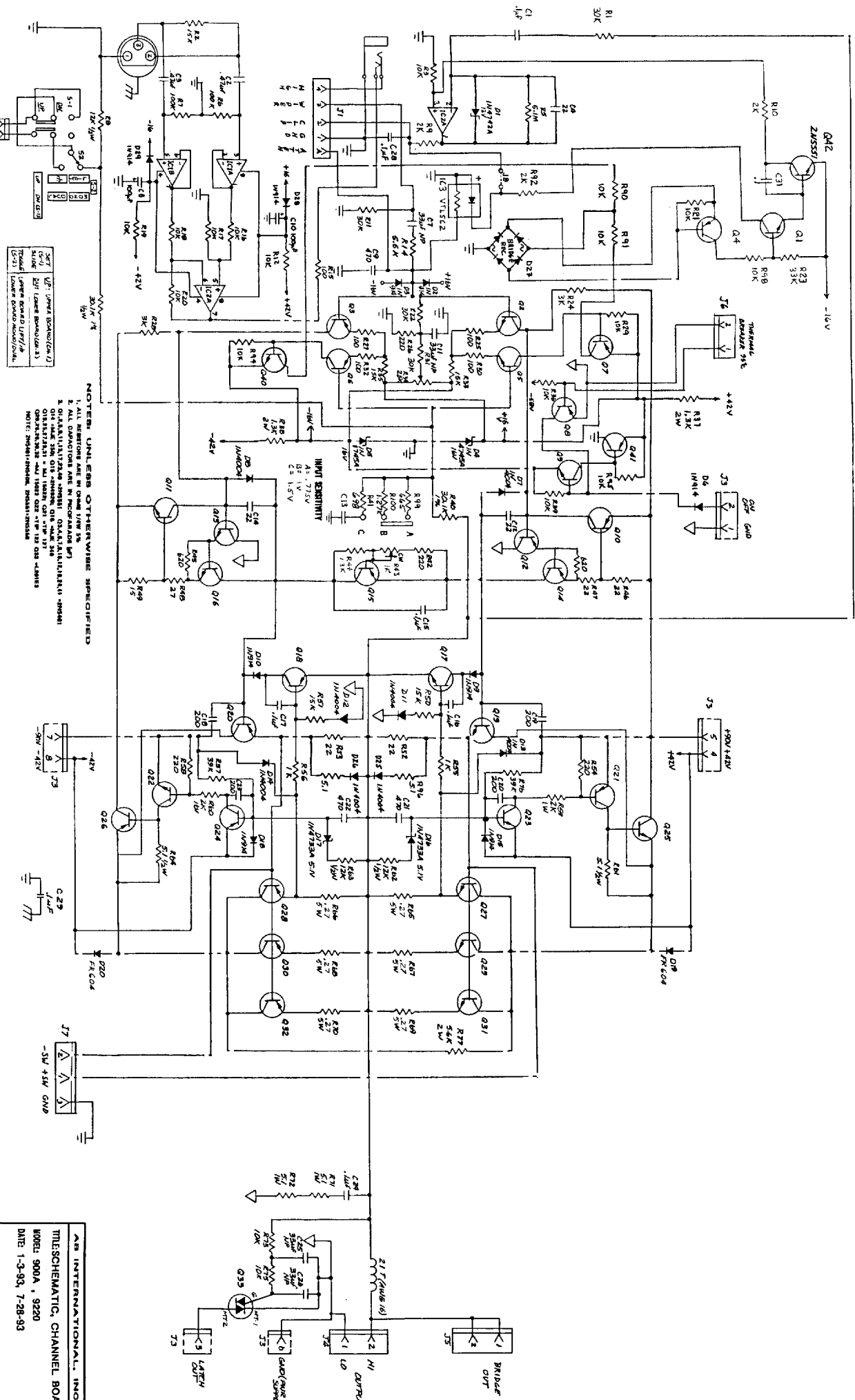
NOTES: UNLESS OTHERWISE SPECIFIED  
 1. ALL RESISTORS ARE IN OHMS UNLESS NOTED  
 2. ALL CAPACITORS ARE IN MICROFARADS UNLESS NOTED  
 3. DIODES ARE 1N4148 UNLESS NOTED  
 4. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED  
 5. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED  
 6. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED  
 7. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED  
 8. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED  
 9. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED  
 10. Q1, Q2, Q3, Q15, Q18, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35 ARE 2N3904 UNLESS NOTED

ASB INTERNATIONAL, INC.  
 TITLESCHMATIC CHANNEL BOARD  
 WORK: 900A  
 DATE: JUNE '87, OCT '87, DEC '87  
 AUG '90, OCT '91, JULY '92  
 ASSEMBLY NO. 502-675 REL. F



NOTE: 9229 TO 9228 CONVERSION, REMOVE IC1 & C11, INSERT J1

AB INTERNATIONAL
TITLE ASSEMBLY 900A, 9220
DATE JAN 1993 JK
302-810 REV. G

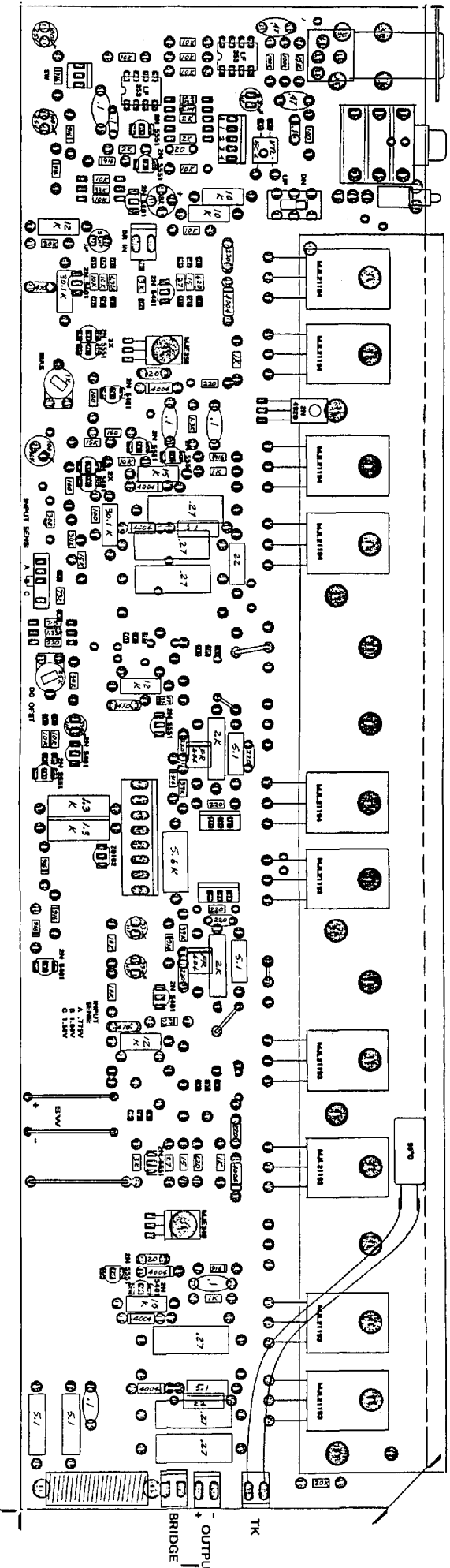


NOTE: 90A TO 92A CONVERSION, REMOVE IC3 & C11, INSERT J1

Q1	2N3638	Q10	2N3638
Q2	2N3638	Q11	2N3638
Q3	2N3638	Q12	2N3638
Q4	2N3638	Q13	2N3638
Q5	2N3638	Q14	2N3638
Q6	2N3638	Q15	2N3638
Q7	2N3638	Q16	2N3638
Q8	2N3638	Q17	2N3638
Q9	2N3638	Q18	2N3638
Q19	2N3638	Q19	2N3638
Q20	2N3638	Q20	2N3638
Q21	2N3638	Q21	2N3638
Q22	2N3638	Q22	2N3638
Q23	2N3638	Q23	2N3638
Q24	2N3638	Q24	2N3638
Q25	2N3638	Q25	2N3638
Q26	2N3638	Q26	2N3638
Q27	2N3638	Q27	2N3638
Q28	2N3638	Q28	2N3638
Q29	2N3638	Q29	2N3638
Q30	2N3638	Q30	2N3638
Q31	2N3638	Q31	2N3638
Q32	2N3638	Q32	2N3638

NOTES: 1. UNLESS OTHERWISE SPECIFIED  
 2. ALL DIMENSIONS ARE IN INCHES  
 3. DIMENSIONS IN PARENTHESES ARE FOR REFERENCE ONLY  
 4. DIMENSIONS ARE FOR REFERENCE ONLY  
 5. DIMENSIONS ARE FOR REFERENCE ONLY  
 6. DIMENSIONS ARE FOR REFERENCE ONLY  
 7. DIMENSIONS ARE FOR REFERENCE ONLY  
 8. DIMENSIONS ARE FOR REFERENCE ONLY  
 9. DIMENSIONS ARE FOR REFERENCE ONLY  
 10. DIMENSIONS ARE FOR REFERENCE ONLY

ASB INTERNATIONAL, INC.
THIS SCHEMATIC, CHANNEL BOAT
MODEL 900A, 9220
DATE 1-5-93, 7-28-93
ASSEMBLY NO. 502-675
REV. G



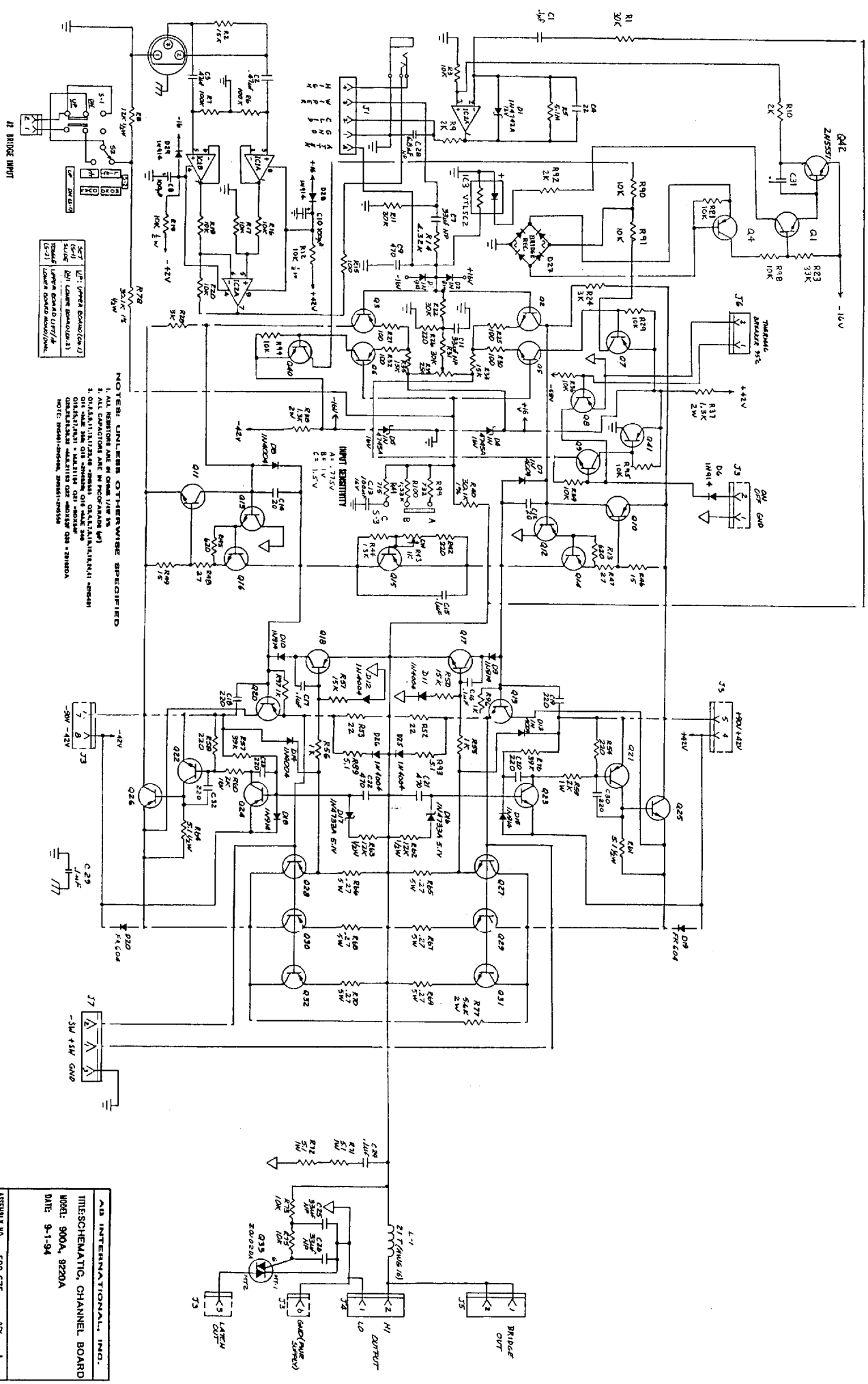
AB INTERNATIONAL, INC.

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

DATE: 9-7-94

ASSY NO. 502-575

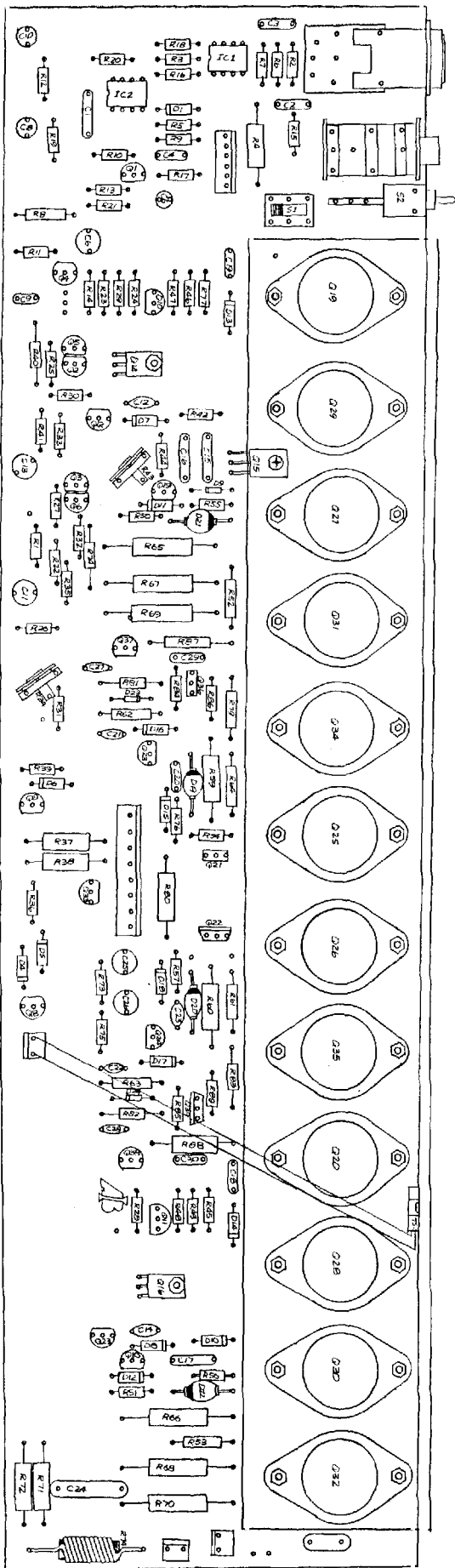
REV. J



- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE IN OHMS UNLESS
  2. ALL CAPACITORS ARE IN MICROFARADS UNLESS
  3. QUALITY DESIGNATION IS IN PARALLELS UNLESS
  4. QUALITY DESIGNATION IS IN SERIES UNLESS
  5. QUALITY DESIGNATION IS IN SERIES UNLESS
  6. QUALITY DESIGNATION IS IN SERIES UNLESS
  7. QUALITY DESIGNATION IS IN SERIES UNLESS
  8. QUALITY DESIGNATION IS IN SERIES UNLESS
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  10. QUALITY DESIGNATION IS IN SERIES UNLESS
- NOTE: DIMENSIONS: DIMENSIONS: DIMENSIONS

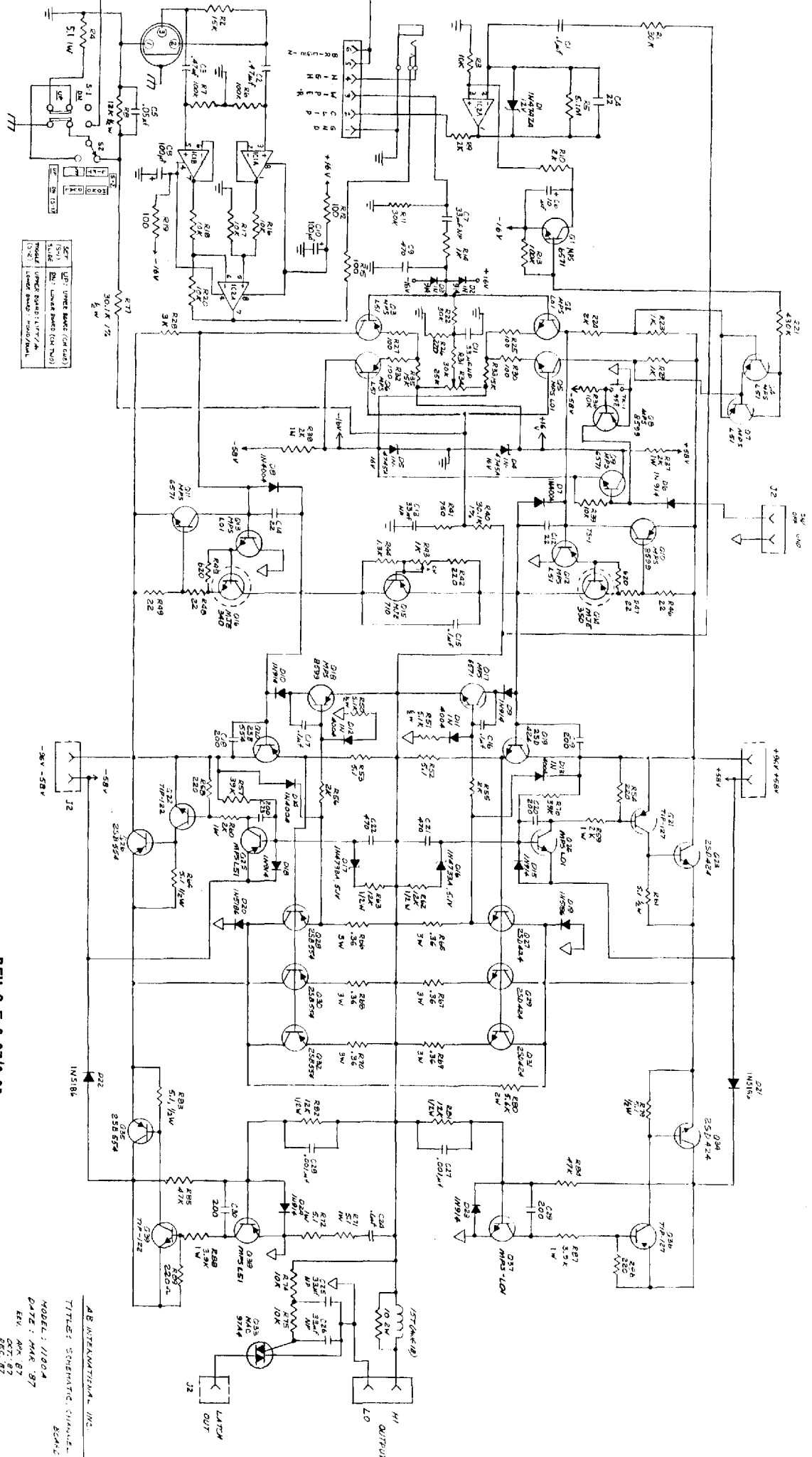
AB INTERNATIONAL, INC.  
 ITTESCHENMATIC CHANNEL BOARD  
 MODEL 900A, 9200A  
 DATE 9-1-94  
 ASSEMBLY NO. 502-675 REV. J





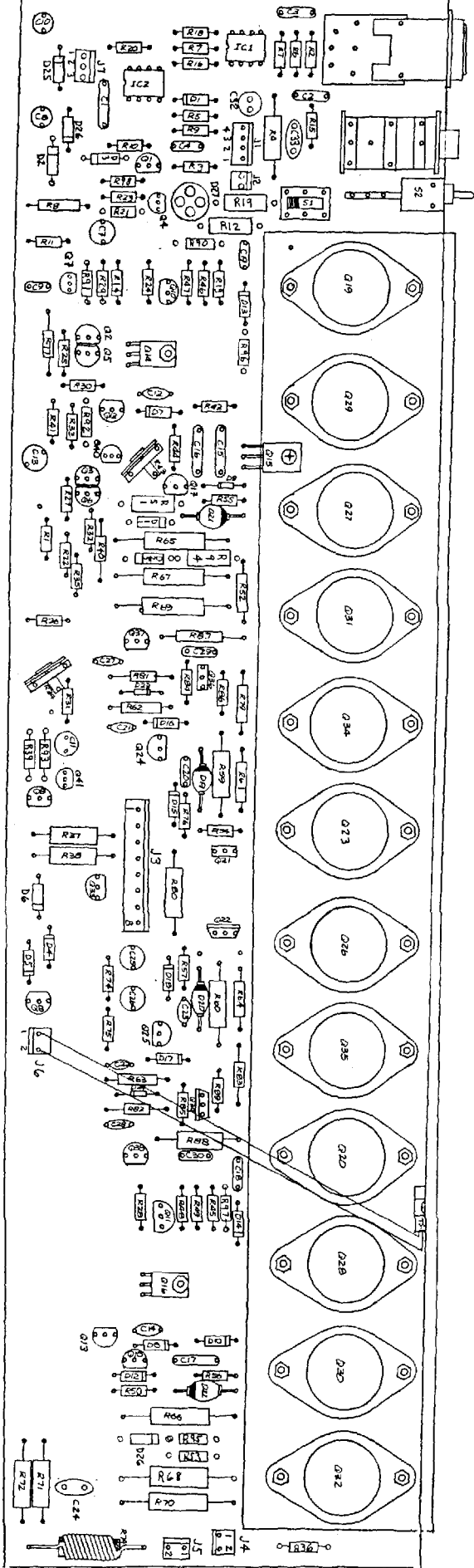
REV C-E 6-87/8-90

A/B INTERNATIONAL, INC  
 ASSEMBLY PCB, 110C4  
 PN: 562-470



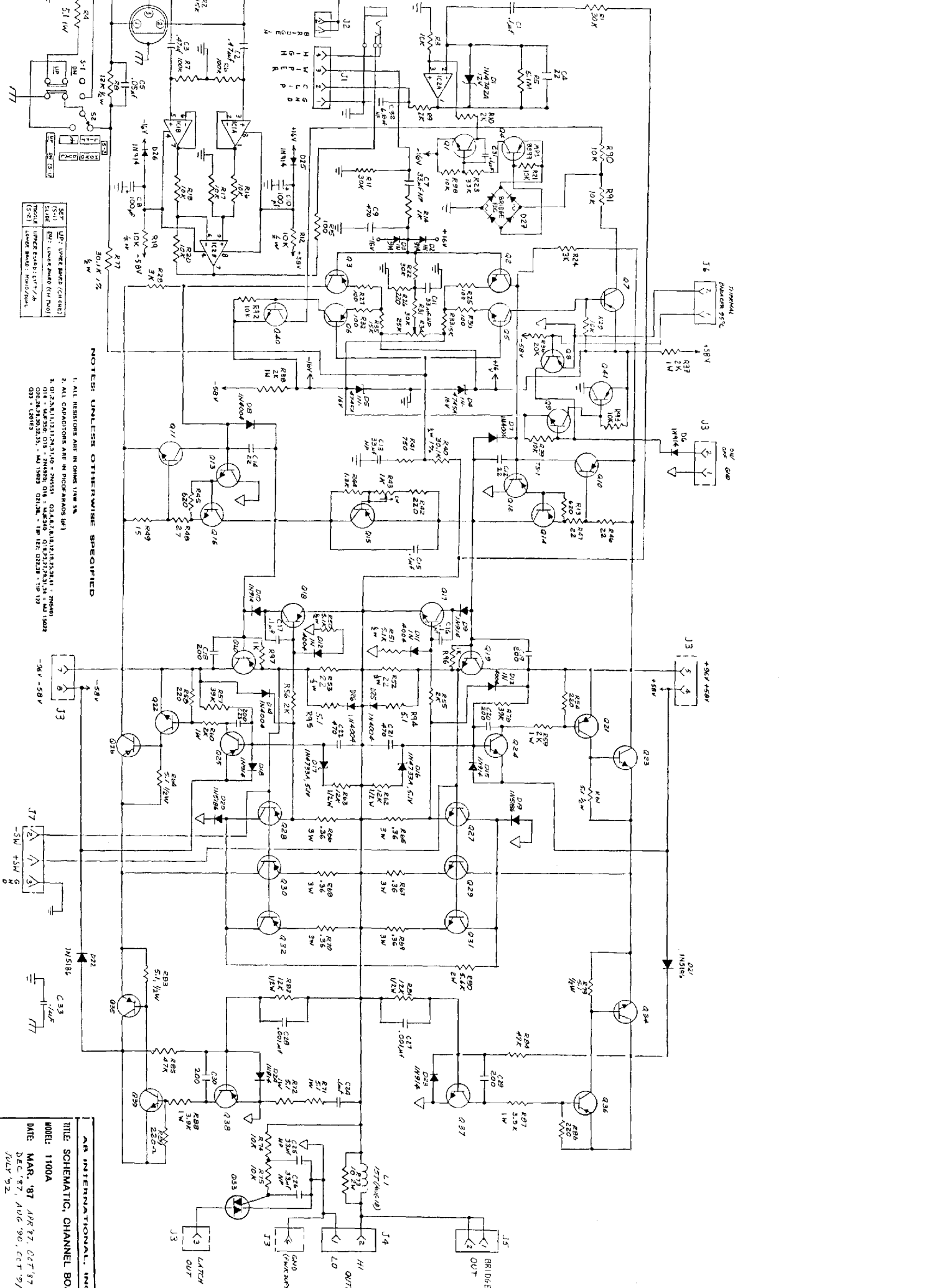
REV C-E 6-87/8-90

AE INTERNATIONAL, INC.  
 TITLE: SCHEMATIC CHANGE  
 MODEL: 11004  
 DATE: MAR 87  
 BY: [Signature]  
 DEC 87  
 ASSEMBLY NO: 502-870



NOTE: 900A = 9220, 1100A = 9420

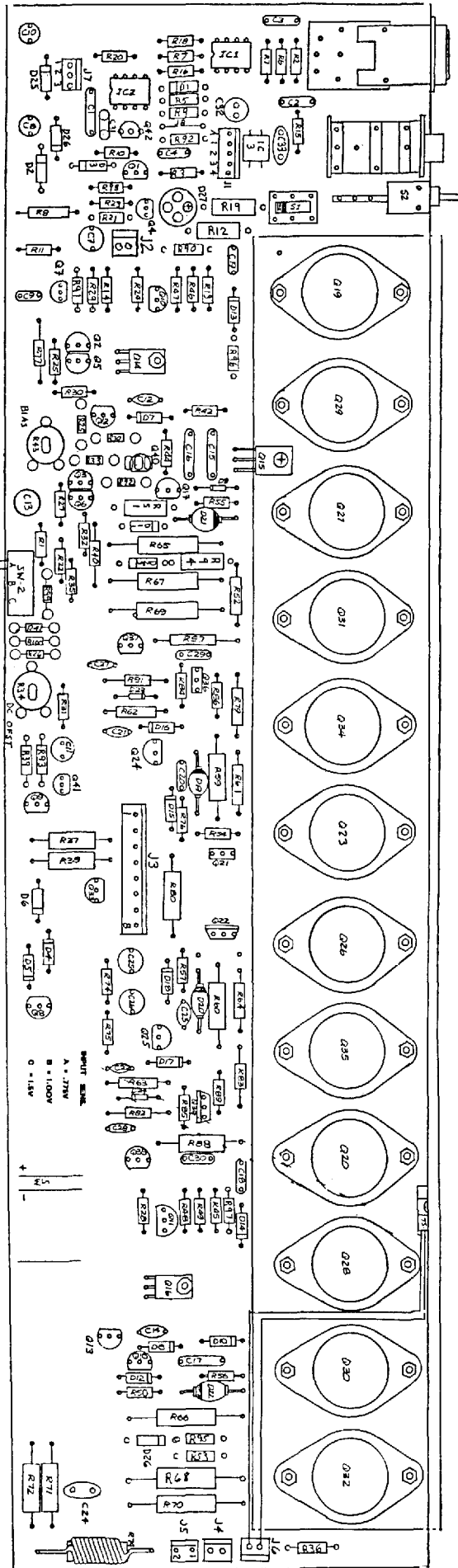
AB INTERNATIONAL, INC.  
 ASSEMBLY PCB, 1100A  
 PW: 502-670 REV. F  
 AUG 90 JK



NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS UNLESS
2. ALL CAPACITORS ARE IN PICOFARADS (P)
3. Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35, Q36
4. D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12
5. C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33
6. J1, J2, J3, J4, J5
7. T1

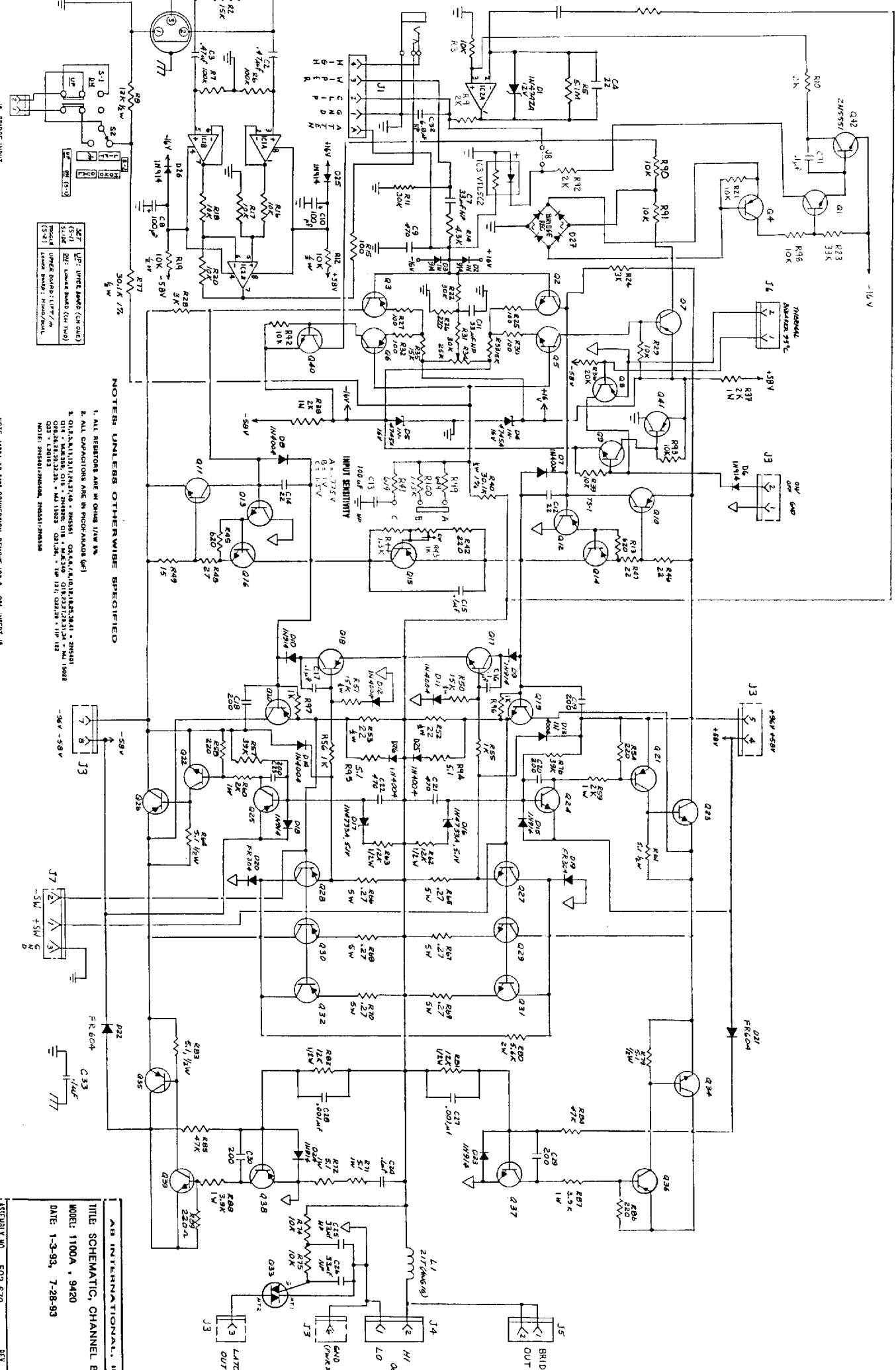
AR INTERNATIONAL, INC	
TITLE: SCHEMATIC, CHANNEL BOX	
MODEL: 1100A	
DATE: MAR-'87	APR 87, C.T.'87
DEC '87, AUG '90, C.T.'91	JULY '92
ASSEMBLY NO. 502-670	REV. F



INPUT SENSITIVITY SELECTOR SWITCH

NOTE: (1)MA TO 9428 CONNECTION, REMOVE (C) 1, C(1), WEEBY IN

AB INTERNATIONAL INC.
TITLE ASSEMBLY 11MA, 9420
DATE JAN 1953 JK
52-517 REV. 6

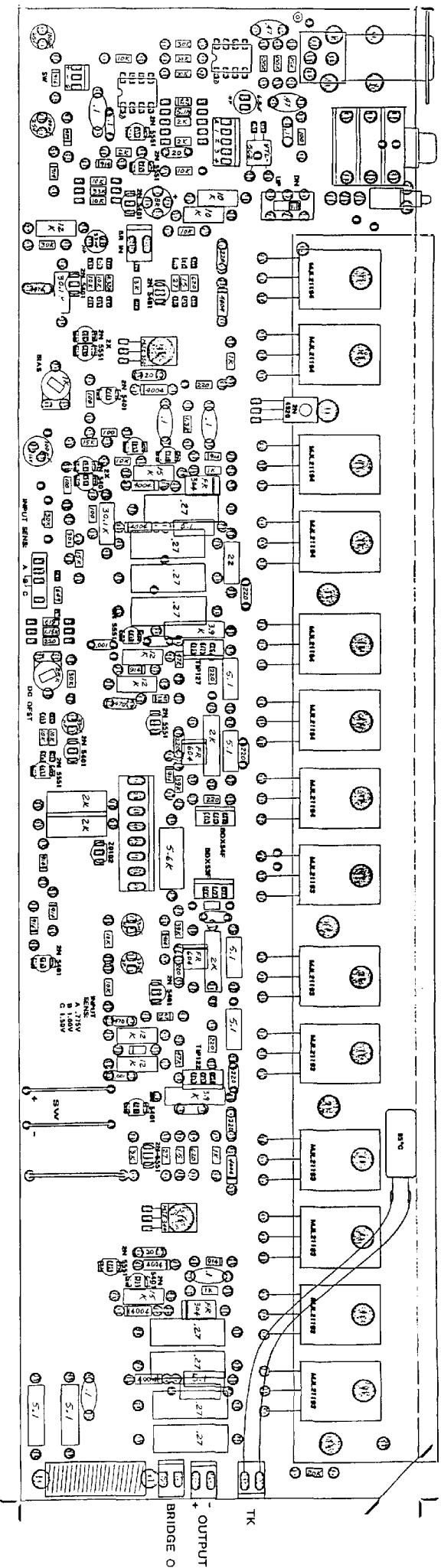


11 BRIDGE INPUT

Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	
2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	
2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638	2N3638

NOTES: UNLESS OTHERWISE SPECIFIED  
 1. ALL RESISTORS ARE 1/4 WATT  
 2. ALL CAPACITORS ARE IN MICROFARADS (μF)  
 3. Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35  
 NOTE: 2N3638-1, 2N3638-2, 2N3638-3, 2N3638-4, 2N3638-5, 2N3638-6, 2N3638-7, 2N3638-8, 2N3638-9, 2N3638-10, 2N3638-11, 2N3638-12, 2N3638-13, 2N3638-14, 2N3638-15, 2N3638-16, 2N3638-17, 2N3638-18, 2N3638-19, 2N3638-20, 2N3638-21, 2N3638-22, 2N3638-23, 2N3638-24, 2N3638-25, 2N3638-26, 2N3638-27, 2N3638-28, 2N3638-29, 2N3638-30, 2N3638-31, 2N3638-32, 2N3638-33, 2N3638-34, 2N3638-35

AB INTERNATIONAL, INC.  
 TITLE SCHEMATIC, CHANNEL BO  
 MODEL 1100A, 9420  
 DATE 1-3-93, 7-28-93  
 ASS'Y NO. 502-670  
 REV. G

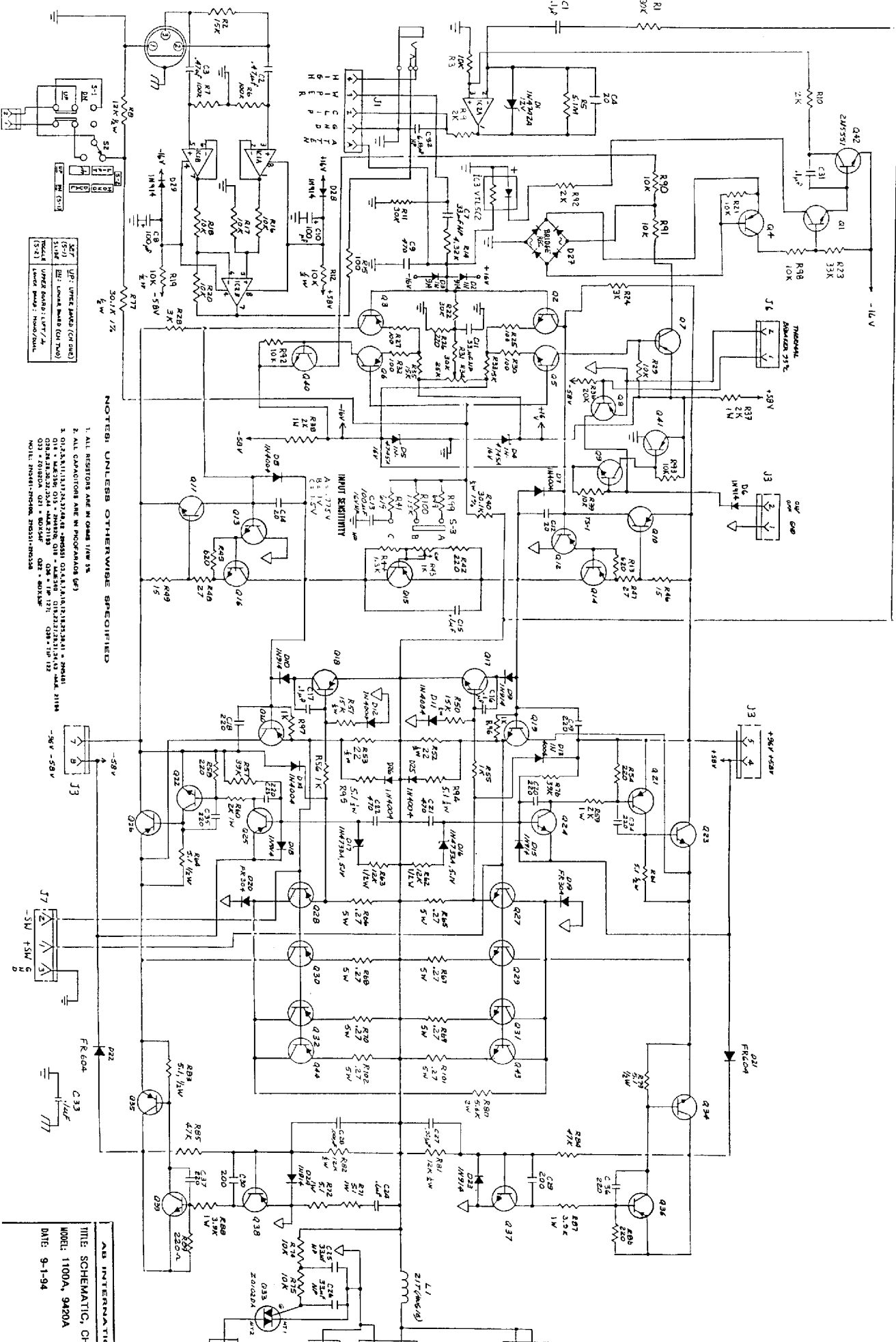


AB INTERNATIONAL, INC.

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

DATE: 9-7-94

ASSY NO. 502-610 REV. J



NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS UNLESS SPECIFIED
2. ALL CAPACITORS ARE IN PICOFARADS UNLESS SPECIFIED
3. Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35, Q36, Q37, Q38, Q39, Q40, Q41, Q42, Q43, Q44, Q45, Q46, Q47, Q48, Q49, Q50, Q51, Q52, Q53, Q54, Q55, Q56, Q57, Q58, Q59, Q60, Q61, Q62, Q63, Q64, Q65, Q66, Q67, Q68, Q69, Q70, Q71, Q72, Q73, Q74, Q75, Q76, Q77, Q78, Q79, Q80, Q81, Q82, Q83, Q84, Q85, Q86, Q87, Q88, Q89, Q90, Q91, Q92, Q93, Q94, Q95, Q96, Q97, Q98, Q99, Q100, Q101, Q102, Q103, Q104, Q105, Q106, Q107, Q108, Q109, Q110, Q111, Q112, Q113, Q114, Q115, Q116, Q117, Q118, Q119, Q120, Q121, Q122, Q123, Q124, Q125, Q126, Q127, Q128, Q129, Q130, Q131, Q132, Q133, Q134, Q135, Q136, Q137, Q138, Q139, Q140, Q141, Q142, Q143, Q144, Q145, Q146, Q147, Q148, Q149, Q150, Q151, Q152, Q153, Q154, Q155, Q156, Q157, Q158, Q159, Q160, Q161, Q162, Q163, Q164, Q165, Q166, Q167, Q168, Q169, Q170, Q171, Q172, Q173, Q174, Q175, Q176, Q177, Q178, Q179, Q180, Q181, Q182, Q183, Q184, 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Q517, Q518, Q519, Q520, Q521, Q522, Q523, Q524, Q525, Q526, Q527, Q528, Q529, Q530, Q531, Q532, Q533, Q534, Q535, Q536, Q537, Q538, Q539, Q540, Q541, Q542, Q543, Q544, Q545, Q546, Q547, Q548, Q549, Q550, Q551, Q552, Q553, Q554, Q555, Q556, Q557, Q558, Q559, Q560, Q561, Q562, Q563, Q564, Q565, Q566, Q567, Q568, Q569, Q570, Q571, Q572, Q573, Q574, Q575, Q576, Q577, Q578, Q579, Q580, Q581, Q582, Q583, Q584, Q585, Q586, Q587, Q588, Q589, Q590, Q591, Q592, Q593, Q594, Q595, Q596, Q597, Q598, Q599, Q600, Q601, Q602, Q603, Q604, Q605, Q606, Q607, Q608, Q609, Q610, Q611, Q612, Q613, Q614, Q615, Q616, Q617, Q618, Q619, Q620, Q621, Q622, Q623, Q624, Q625, Q626, Q627, Q628, Q629, Q630, Q631, Q632, Q633, Q634, Q635, Q636, Q637, Q638, Q639, Q640, Q641, Q642, Q643, Q644, Q645, Q646, Q647, Q648, Q649, Q650, Q651, Q652, Q653, Q654, Q655, Q656, Q657, Q658, Q659, Q660, Q661, Q662, Q663, Q664, Q665, Q666, Q667, Q668, Q669, Q670, Q671, Q672, Q673, Q674, Q675, Q676, Q677, Q678, Q679, Q680, Q681, Q682, 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AB INTERNATIONAL, INC.

TITLE SCHEMATIC, CHANNEL BOARD

MODEL: 1100A, 9420A

DATE: 9-1-94

ASSEMBLY NO. 502-670

REV. J