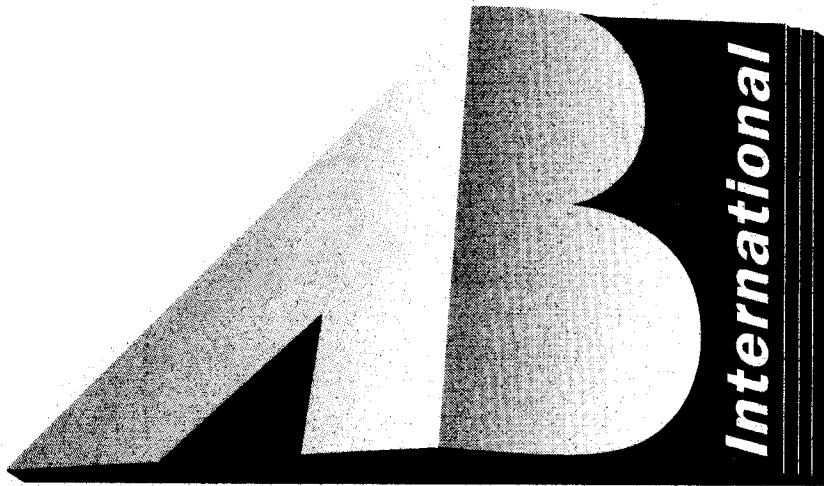


# **AB INTERNATIONAL**

**MODEL 950**

## **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 Precedent Series amplifiers. New owners are encouraged to read the entire contents prior to placing amplifiers into service.

## Precedent 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 provide the required separation of  $F_T$  break points for absolute stability. Fully complimentary drive and loading is employed 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 unit's compact size and light weight.

## Installation

All AB International amplifiers are designed for mounting in a standard 19 inch equipment rack, or one of the many rack type portable cases available on the market. 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 conditions, provided that sufficient air flow is allowed to reach the heat sink array. If the unit is to be placed on a shelf, or a similar unenclosed area, allow four inches 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 of the unit. If the amplifier is to be mounted in an equipment rack or cabinet with other heat producing equipment, ensure environmental operating temperatures do not exceed  $55^{\circ}\text{C}$  ( $131^{\circ}\text{F}$ ). Should overheating occur because of inadequate ventilation, thermal protection circuitry will automatically protect the amplifier. When a safe operating temperature is restored, the amplifier will resume normal operation.

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

## Power Connections

Precedent Series power amplifiers are specified for operation from 120-240 Volt, 50-60 Hz mains supply.

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

## **Power Connections (Cont'd)**

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.

## **Thermal Protection**

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

Should the heatsink reach 95° C, thermal protection circuitry will automatically disconnect the amplifier's output stage from the load (loudspeaker) until the temperature decreases sufficiently. The action of removing the load eliminates output current, resulting in an immediate temperature drop. The thermal protection circuit will automatically reconnect the load when the temperature drops below 95° C.

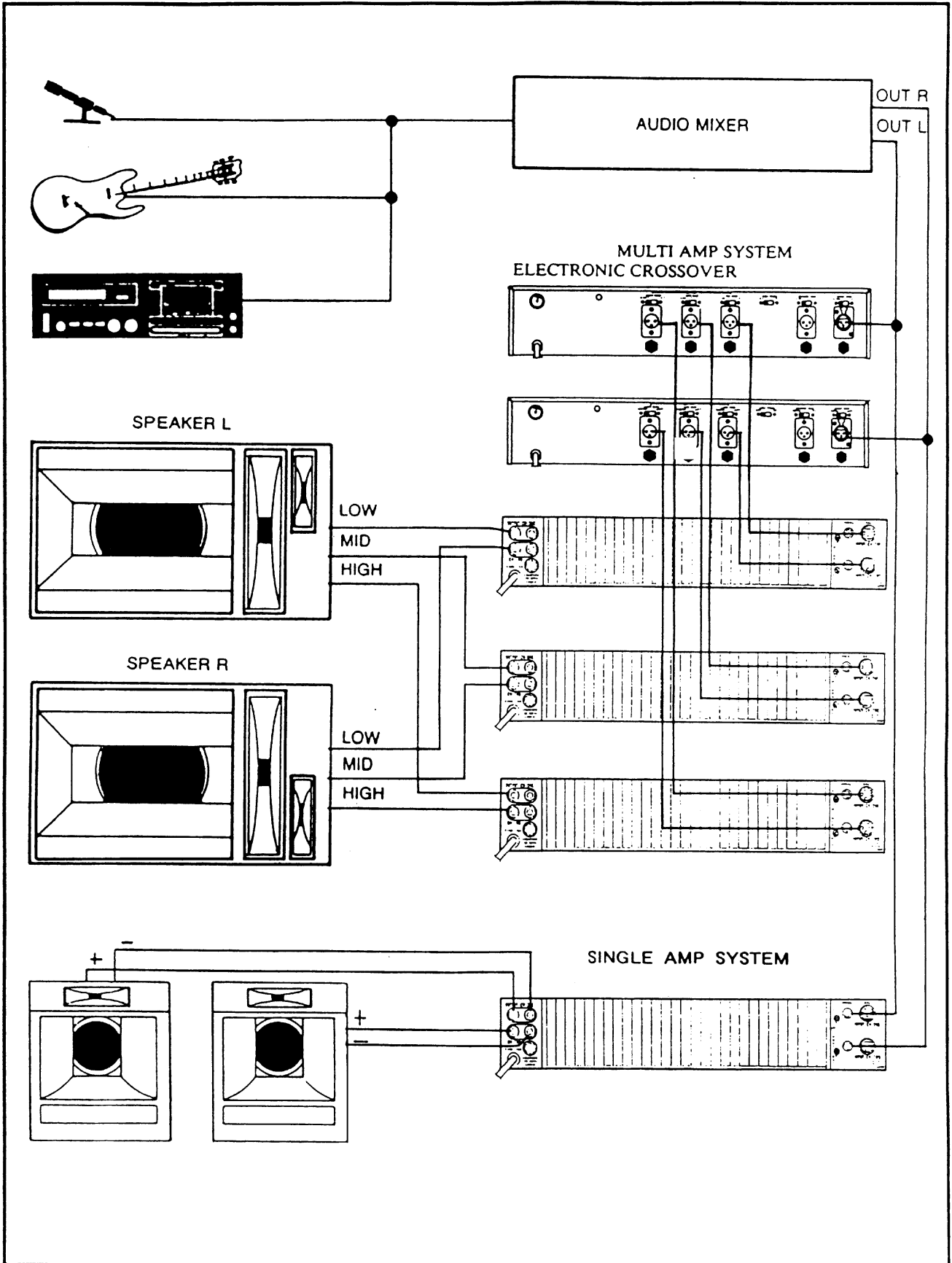
## **Fan Assist Cooling**

To provide continuous operation under adverse operating conditions, a Dual Fan Forced Air Cooling System has been added for extra protection. Temperature is controlled automatically by a thermal switch which turns on the Cooling System when required.

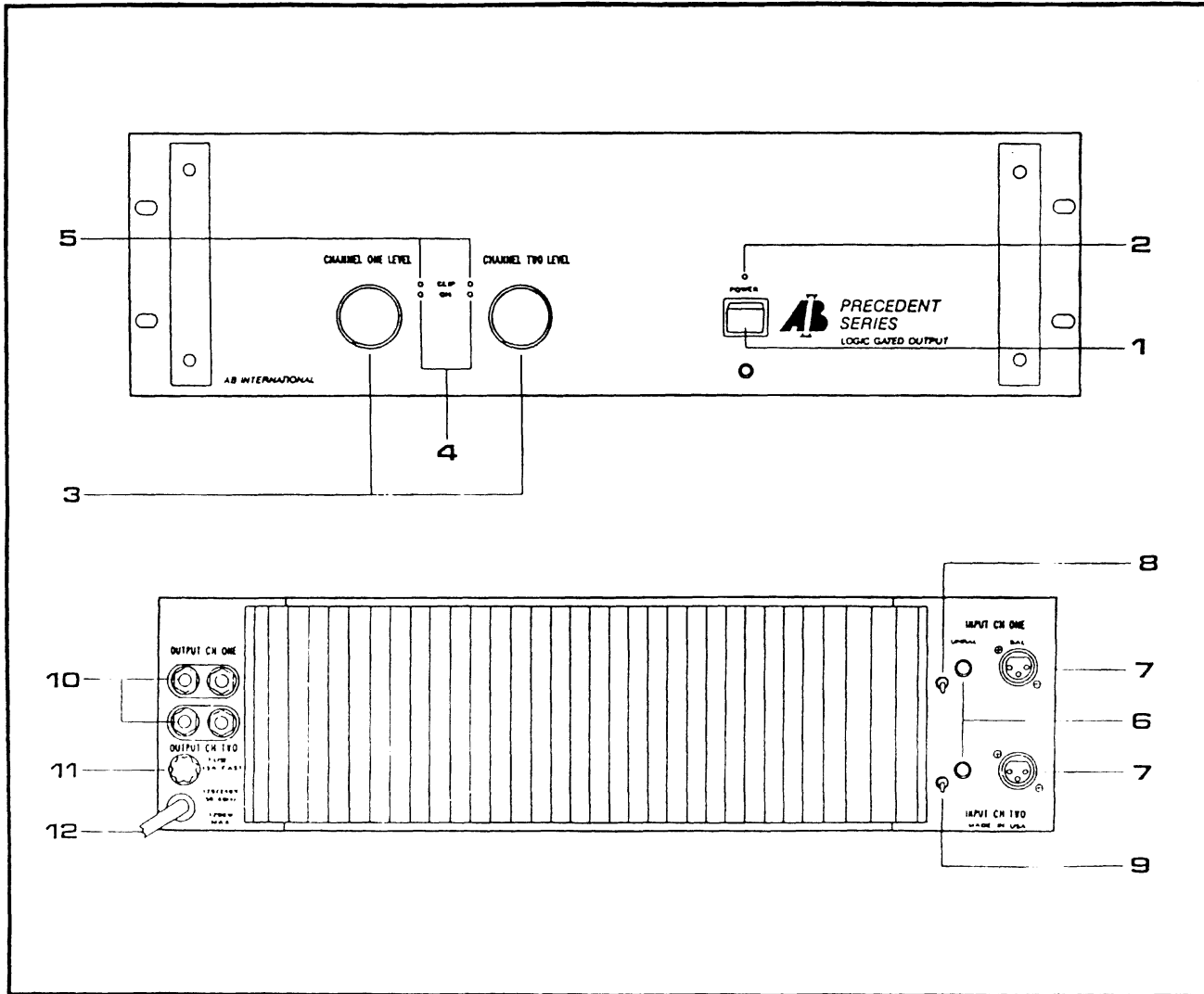
## **SOFT CLIP SPEAKER PROTECTION**

Each channel incorporates Soft Clip Circuitry. When the amplifier is driven into a clip state the Soft Clip Circuitry is activated and attenuates the input signal to a level where there is no hard clipping or D.C. present at the output of the amplifier.

# Rear Panel Connections



## 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 (OPTIONAL)**

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 **950** amplifier is 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 **8** ohms or above.
6. Adjust output using the CHANNEL ONE control and Set CHANNEL TWO level to "0".

## Precedent Series Amplifiers

### SPECIFICATIONS MODEL 950

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Type:	Two Channel Audio Power Amplifier
Gain:	31 dB (each Channel)
Continuous Average Power Output: (120 VAC Line, 1KHz, single channel driven)	<b>400</b> watts per channel at 8 ohms <b>600</b> watts per channel at 4 ohms <b>600</b> watts per channel at 2 ohms <b>950</b> watts bridged mono at 8 ohms
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:	Select: "A" .775V, "B" 1.00V or "C" 1.50V for rated power. Shipped at "B" 1.00V Std.
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.

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**Turn-On Delay:** 3 Seconds, solid-state actuated.

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**Heat Sink and Cooling:** High efficiency, fan cooled with “Venturi Style” assist providing extra power handling utilizing finned 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:** 5-way Binding Posts

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**Weight:** 29 lbs. (13.2 kg)

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

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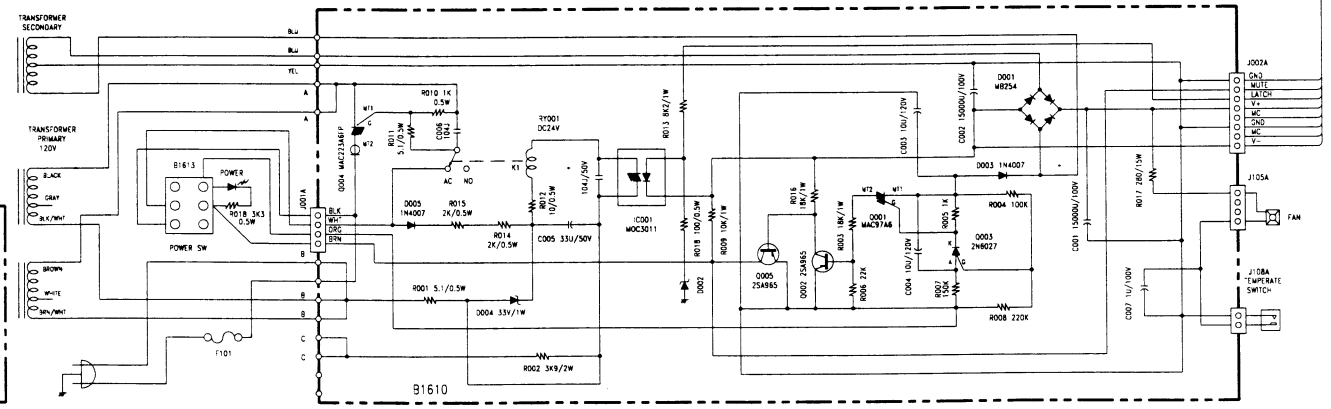
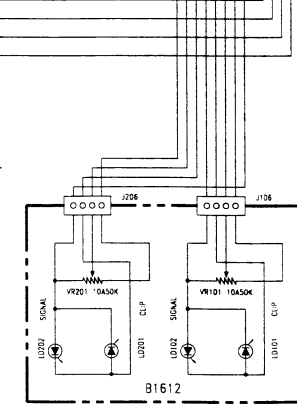
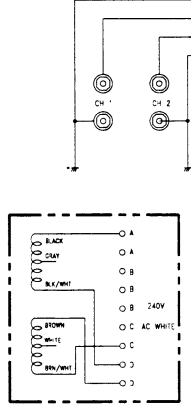
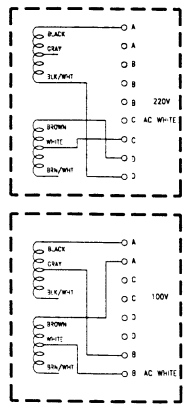
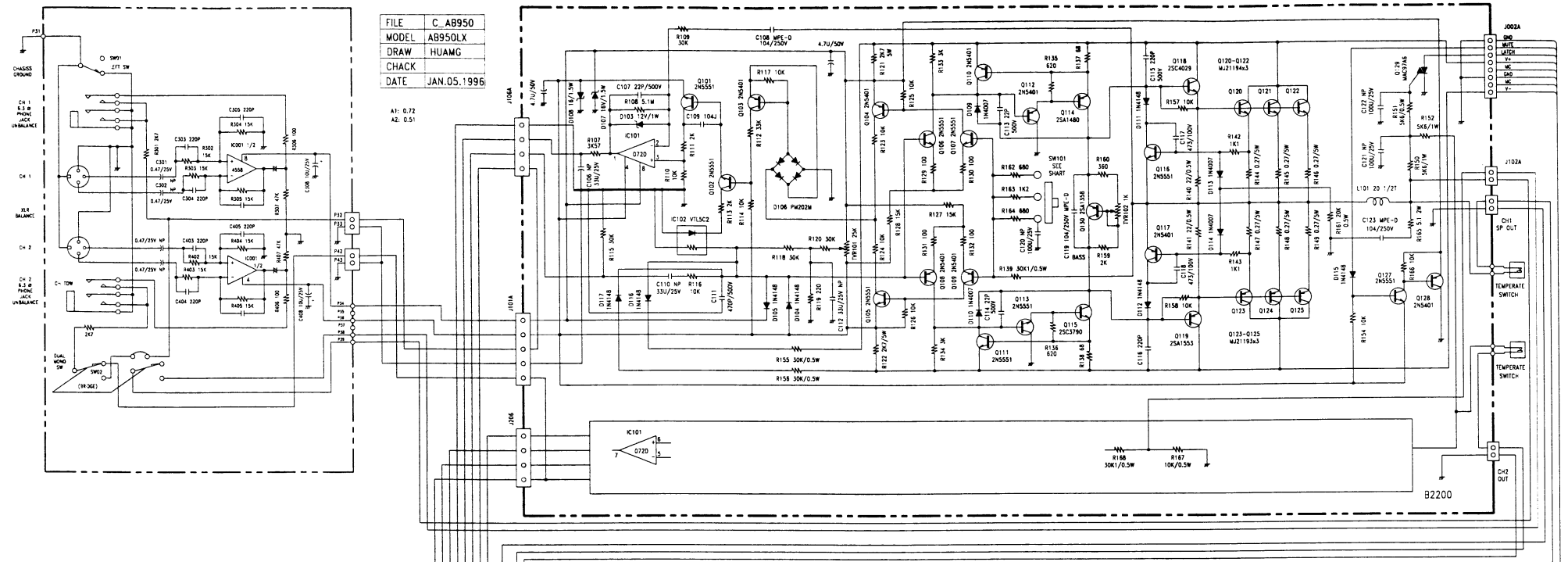
**Power (Input):** 100-130 VAC, 50/60 Hz 90 W (idle)  
1000 Watts (maximum)

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**Dimensions:** 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

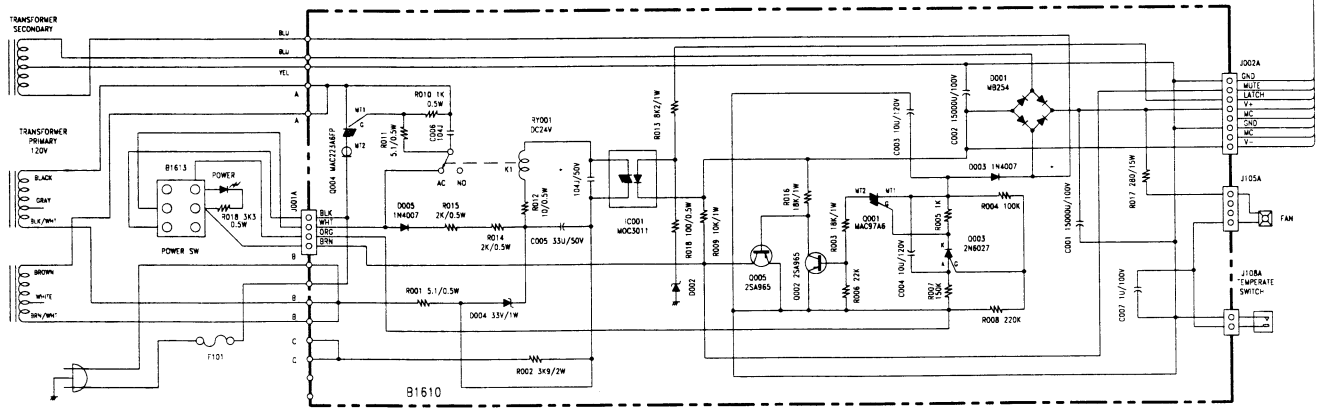
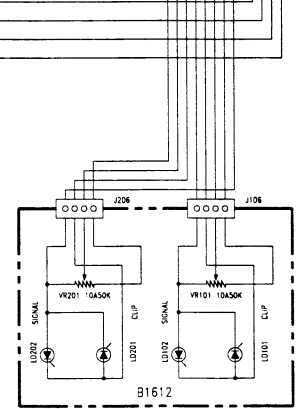
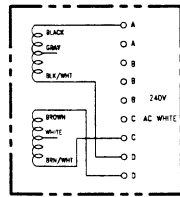
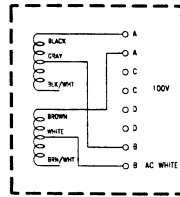
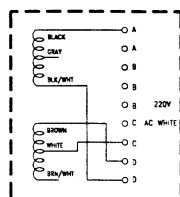
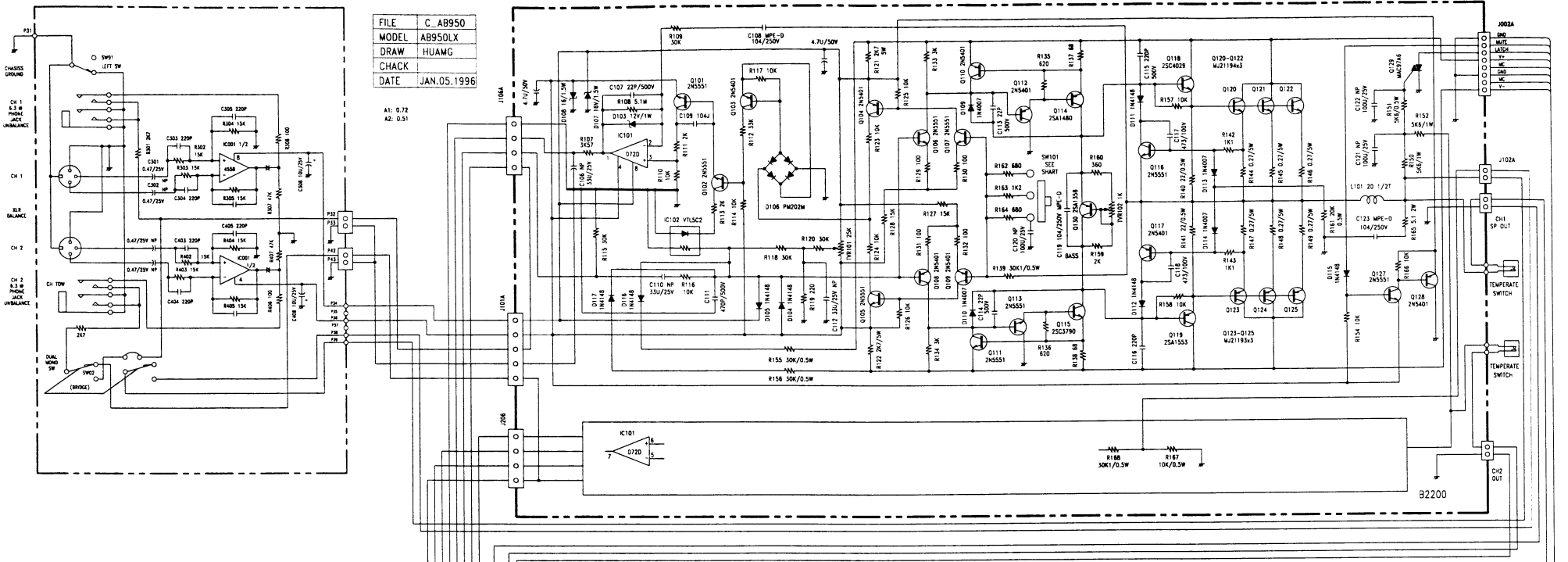
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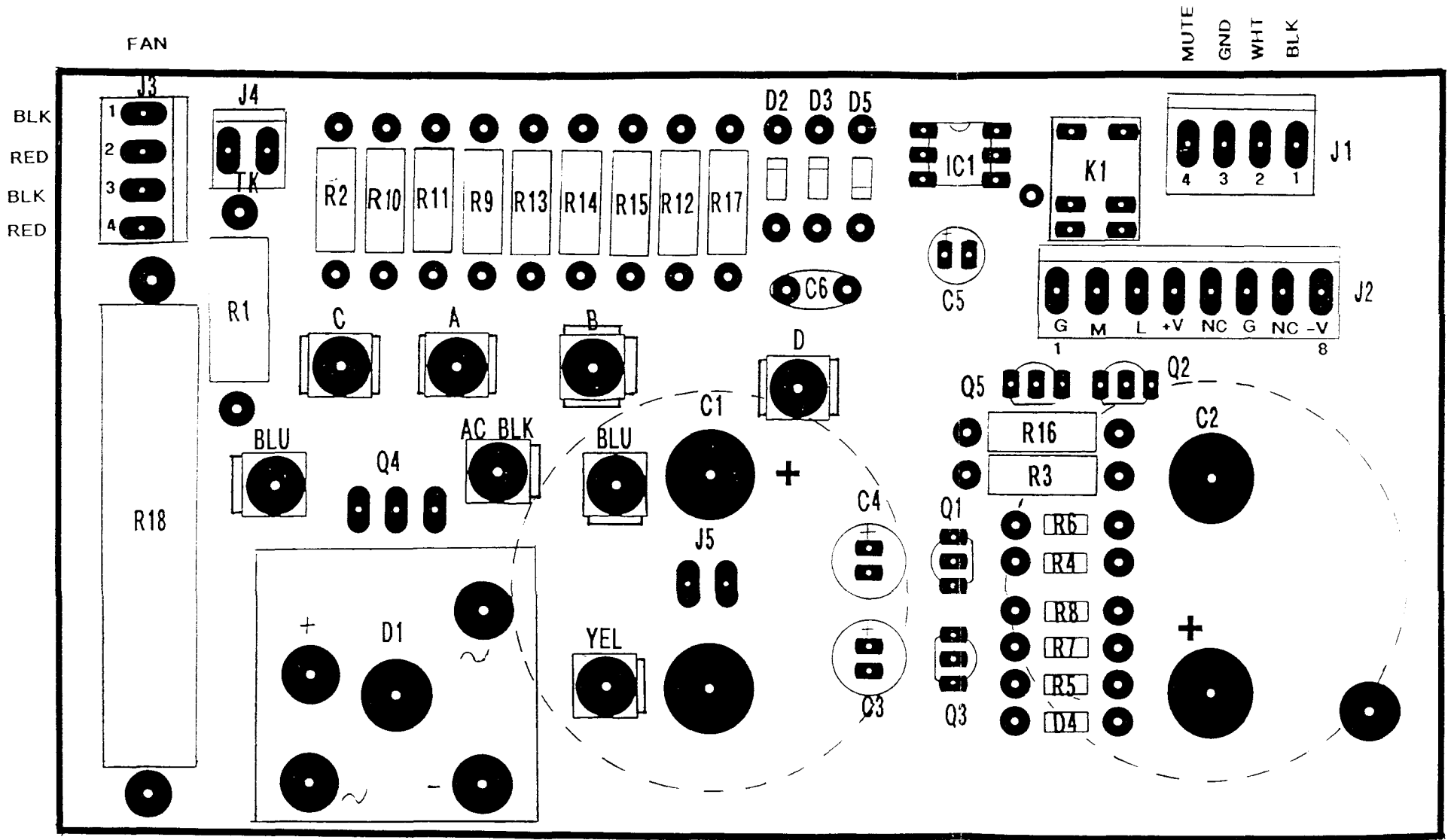
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A2: 0.51

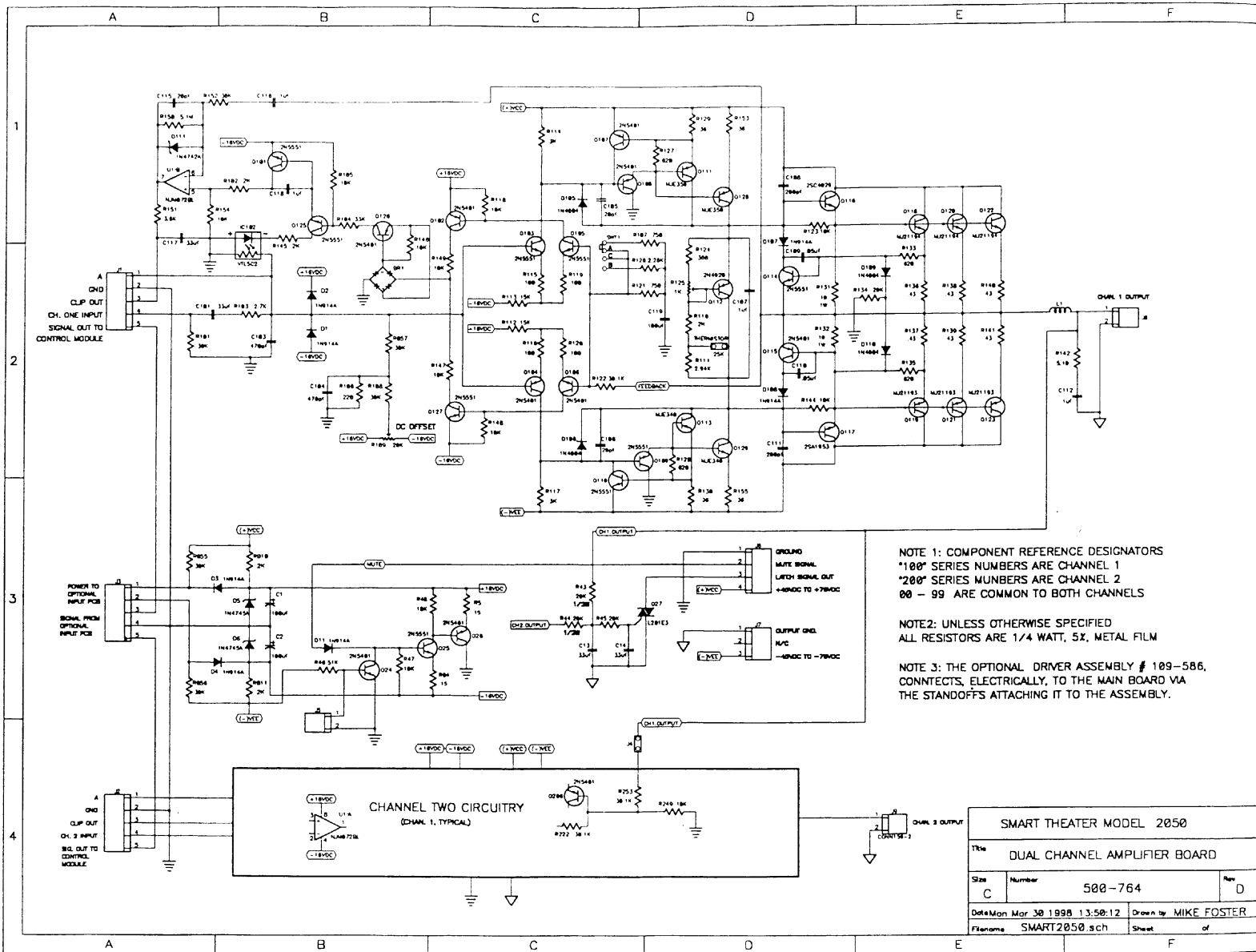


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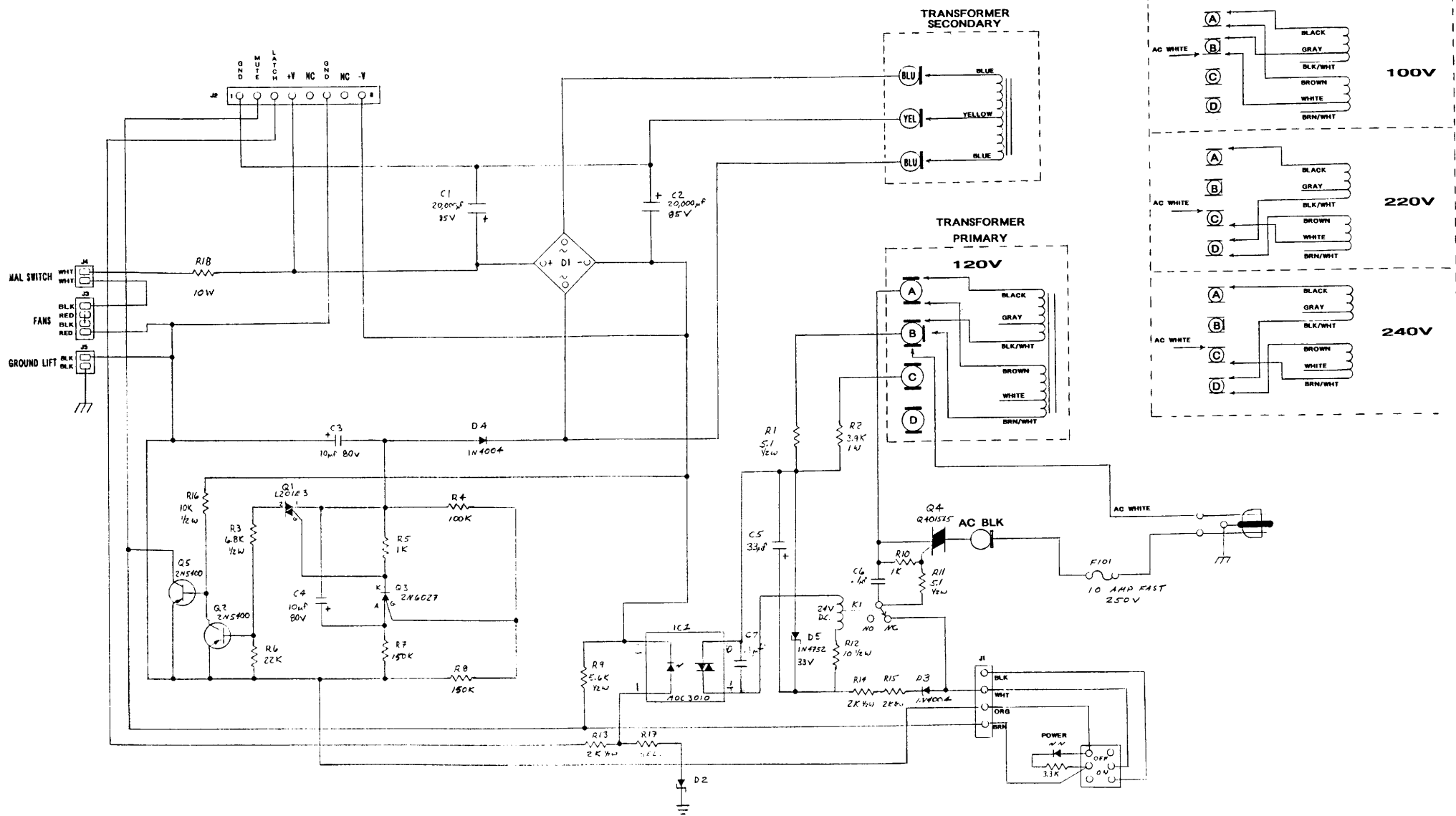




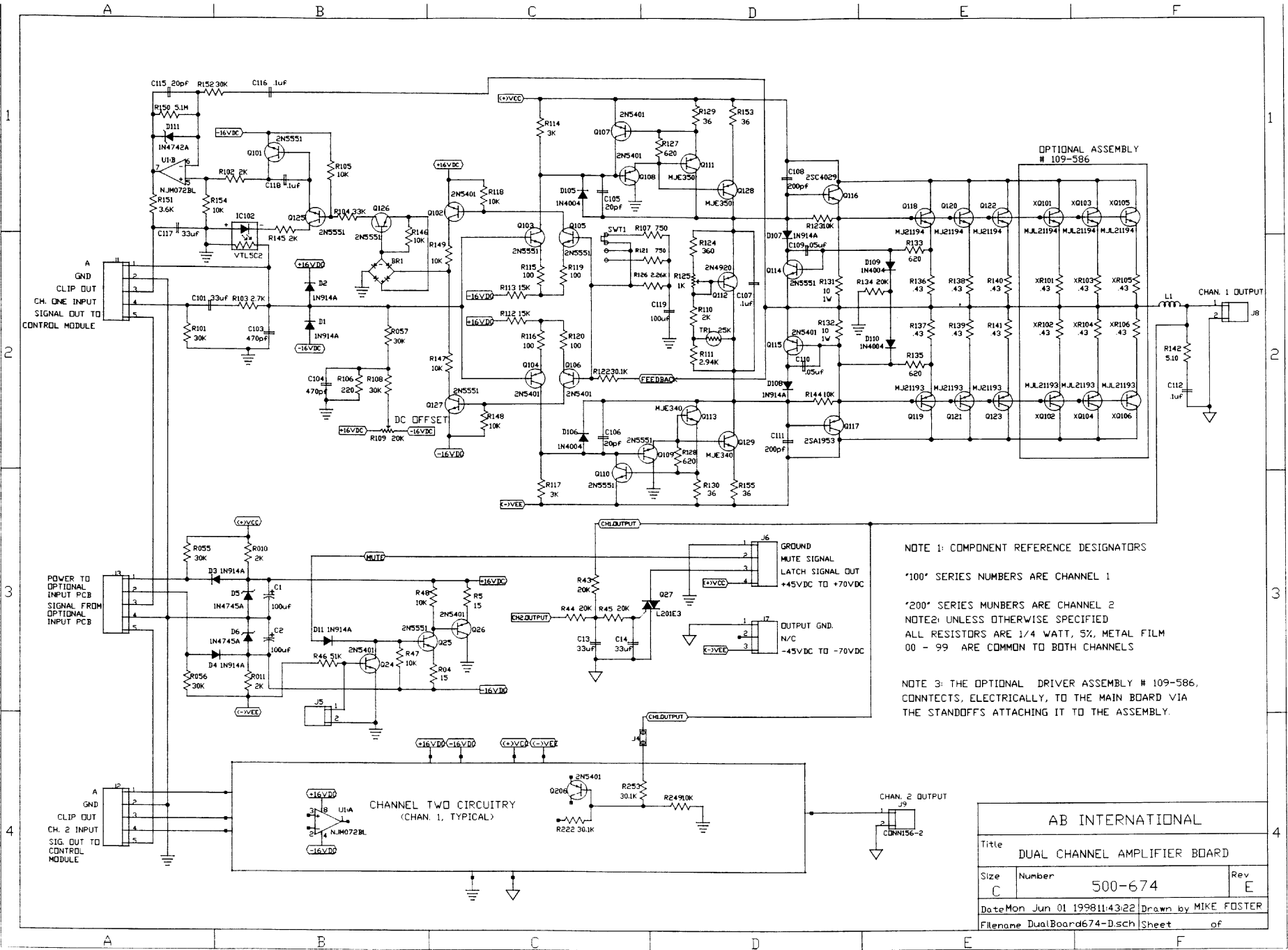


SMART THEATER MODEL 2050			
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Filename SMART2050.sch	Sheet		of









NOTE 1: COMPONENT REFERENCE DESIGNATORS

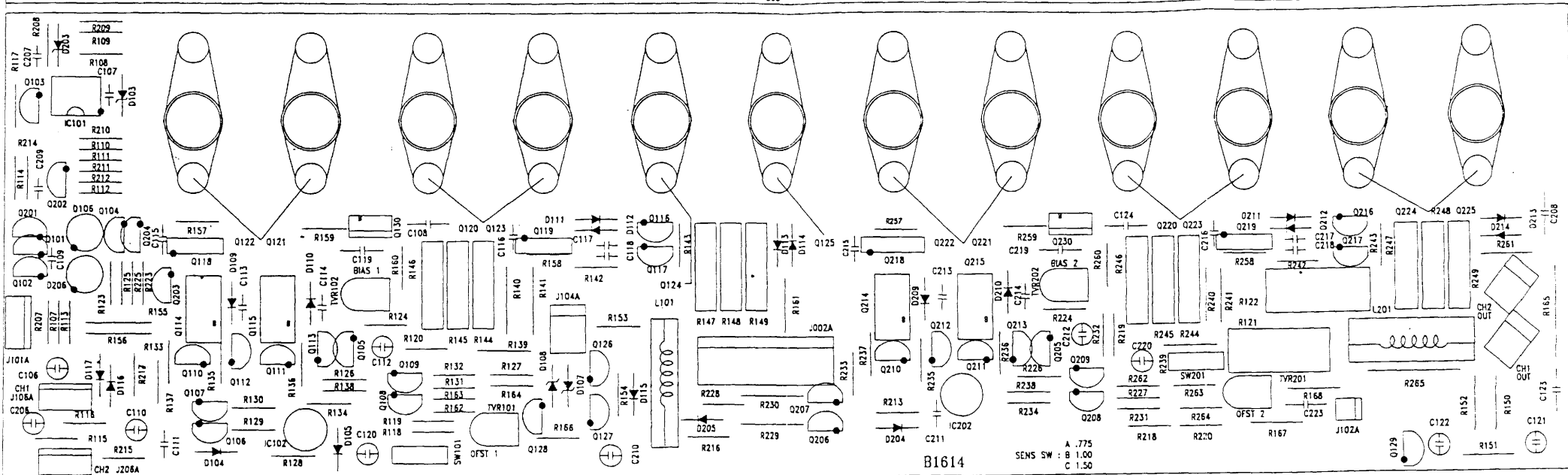
'100' SERIES NUMBERS ARE CHANNEL 1

'200' SERIES NUMBERS ARE CHANNEL 2

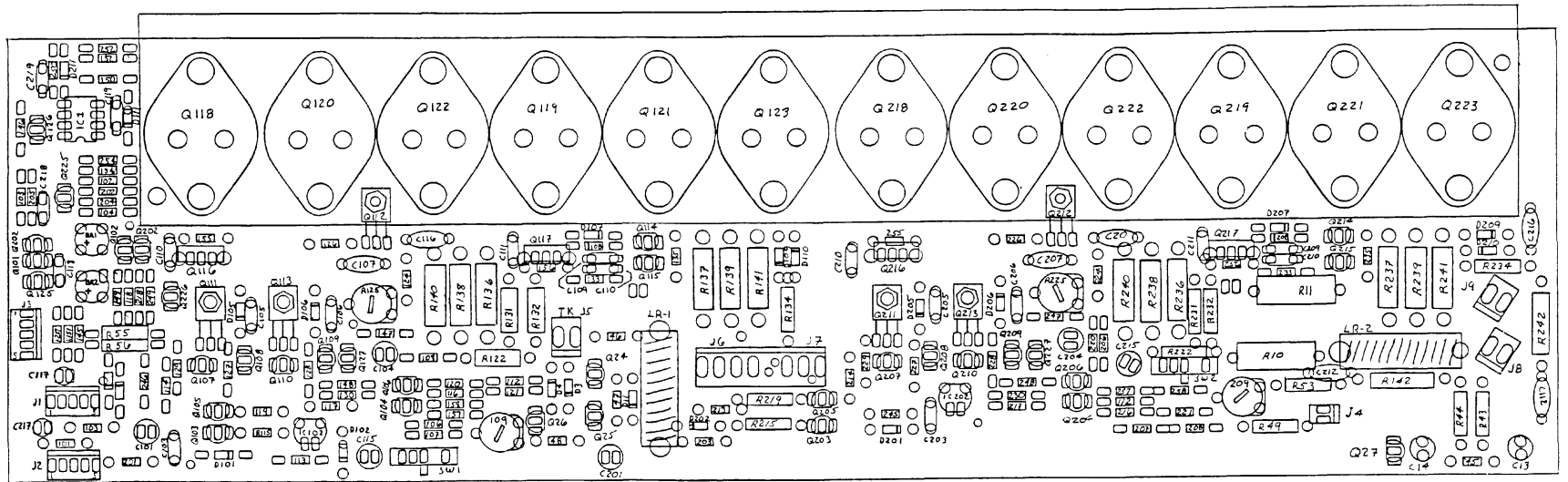
NOTE 2: UNLESS OTHERWISE SPECIFIED  
ALL RESISTORS ARE 1/4 WATT, 5%, METAL FILM  
00 - 99 ARE COMMON TO BOTH CHANNELS

NOTE 3: THE OPTIONAL DRIVER ASSEMBLY # 109-586,  
CONNECTS, ELECTRICALLY, TO THE MAIN BOARD VIA  
THE STANDOFFS ATTACHING IT TO THE ASSEMBLY.

AB INTERNATIONAL			
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Size C	Number 500-674	Rev E	
Date Mon Jun 01 1998 11:43:22	Drawn by MIKE FOSTER		
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Sheet		of	



MODEL	AB-650LX	SIZE	383x106.5	VERSION	PR-4	UNIT	TH / CH
B1614		SCALE	2:1	DATE	09.10.94		
		DRAWN	DESIGN	CHECKED	GLR/SPY		
WANGINE ELECTRONICS CO., LTD.		ALVIN SHIH					



NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE IN OHMS, 1/4W 5%
2. ALL CAPS ARE IN PICOFARADS
3. CIRCUIT REF. NUMBERS: 100 SERIES, CH ONE  
200 SERIES, CH TWO  
0-99, COMMON TO BOTH CHANNELS