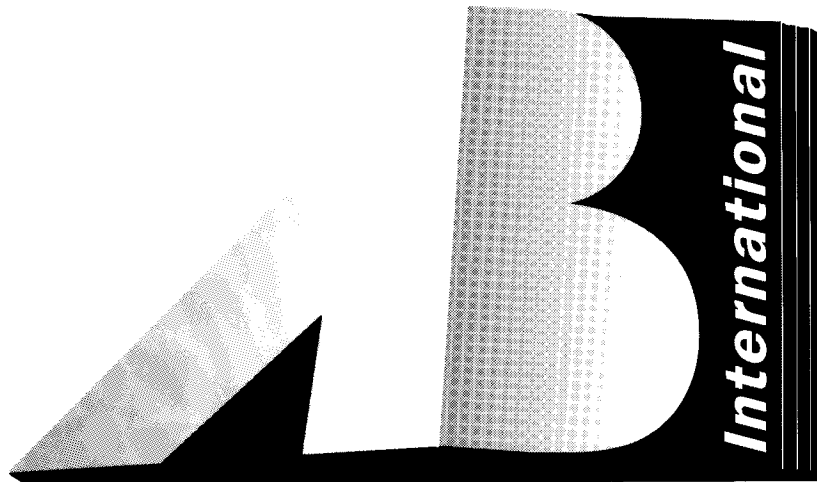


AB INTERNATIONAL

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

OWNER'S MANUAL



AB International Electronics

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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^{1/4} inches of vertical panel space, with 11^{7/8} inches required behind the panel. Total depth, including handles is 13^{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

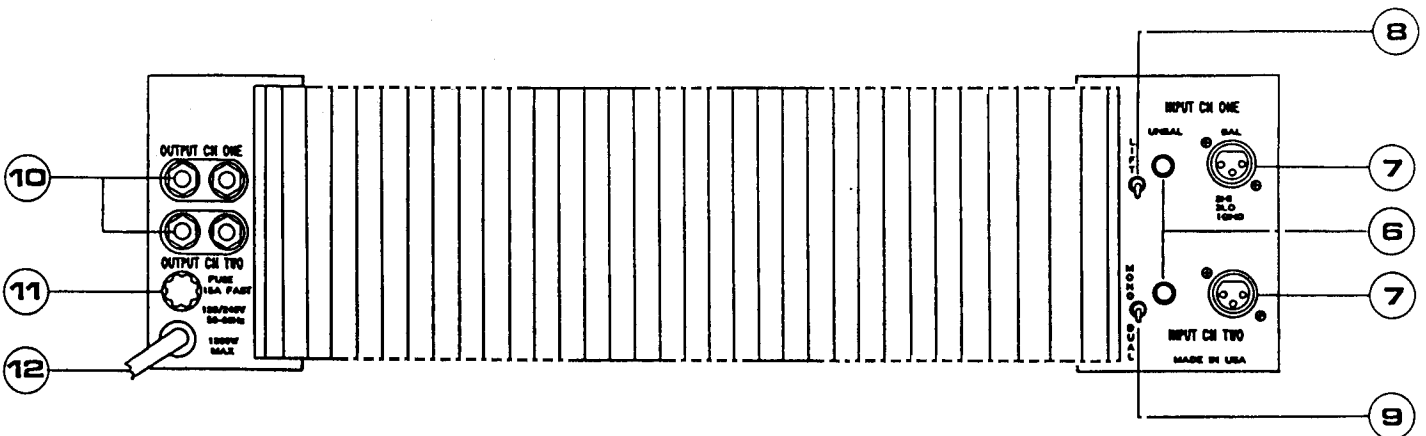
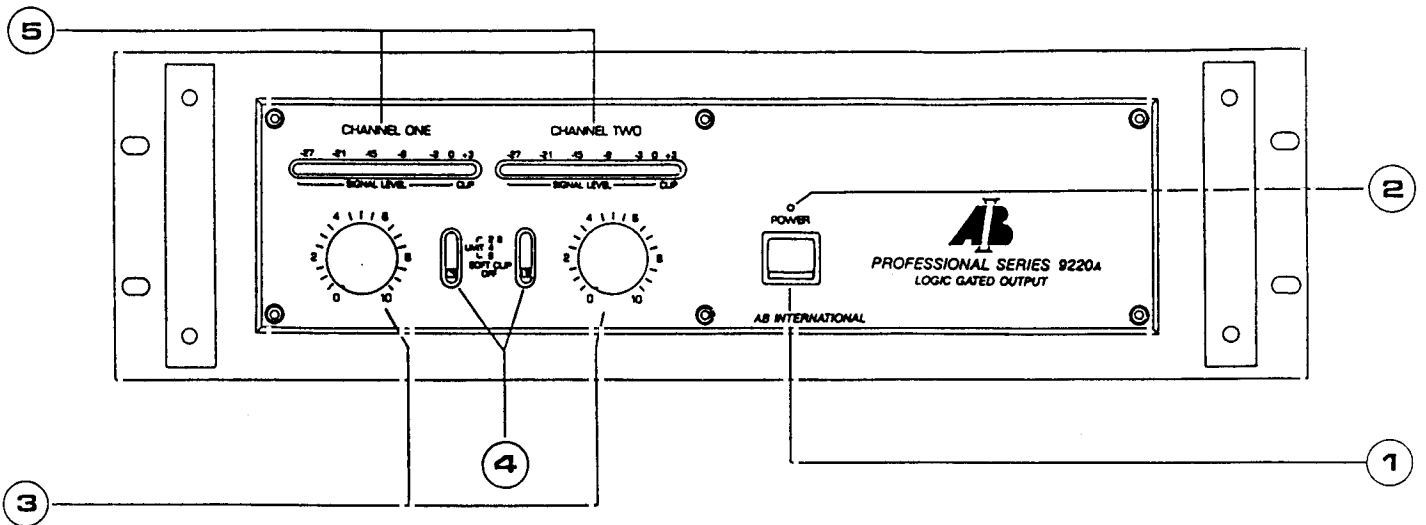
Professional Series power amplifiers are specified for operation from 120/240 Volt 50/60 Hz mains supply.

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!

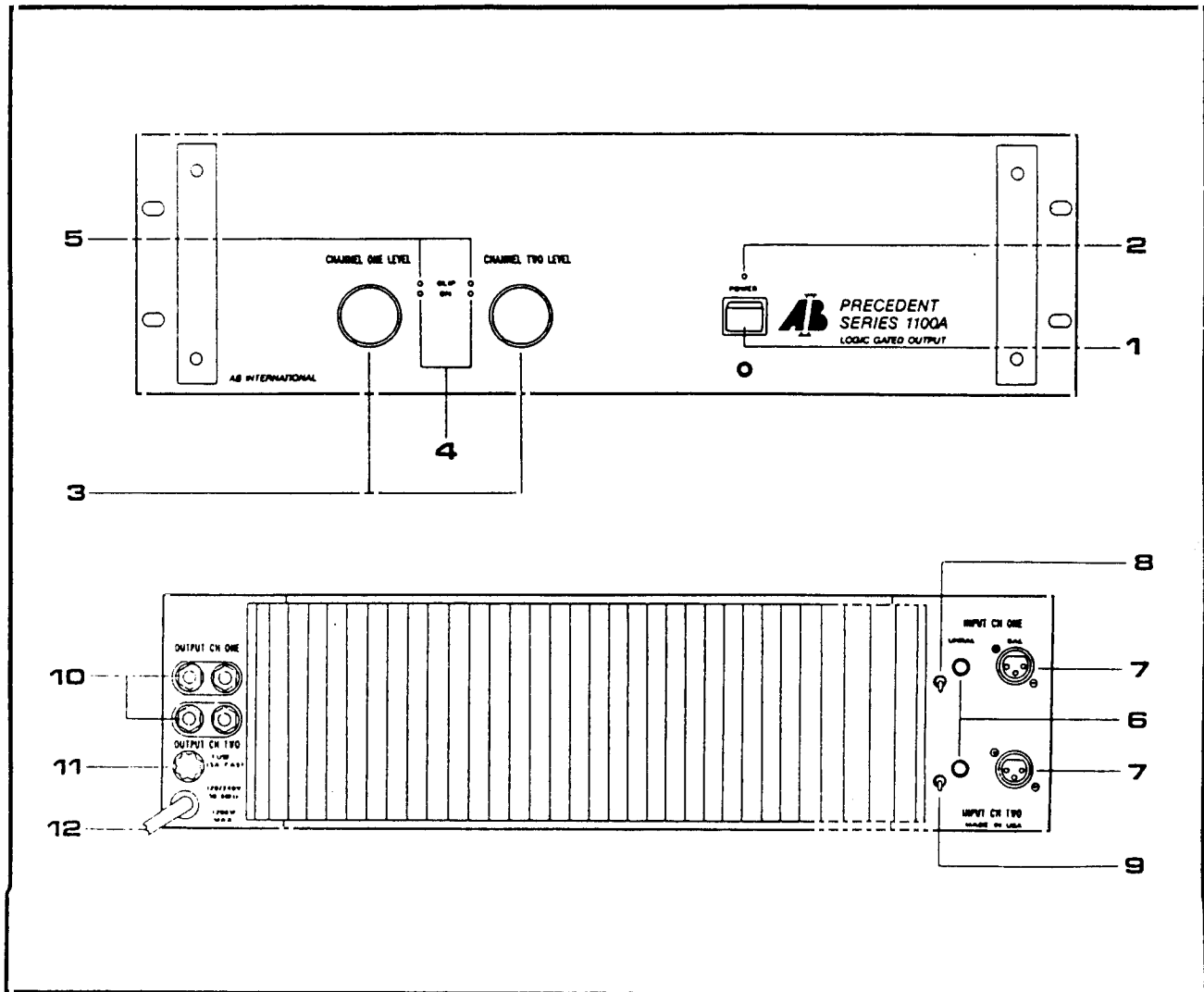
11. **FUSE HOLDER**

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:

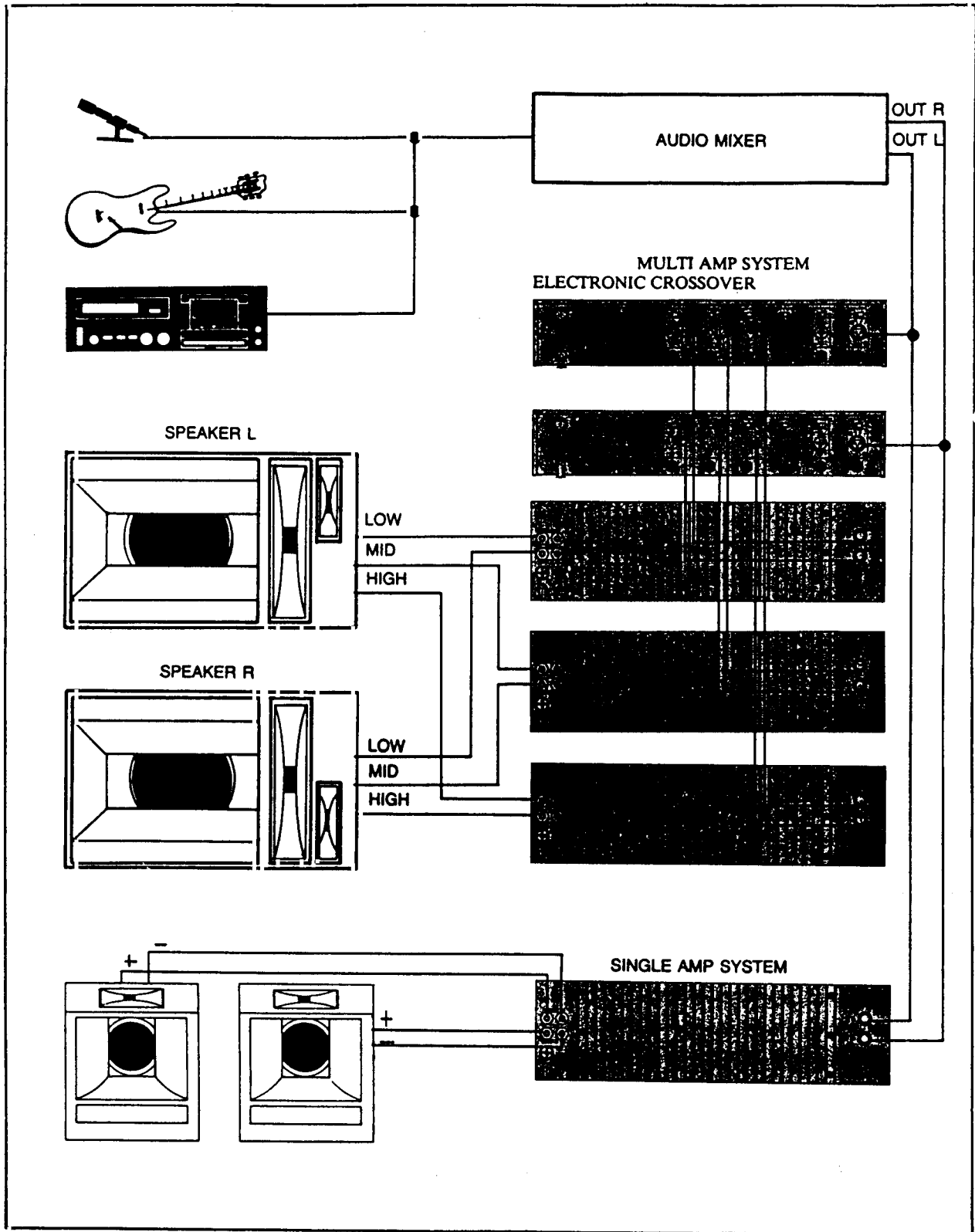
The **900A** and **1100A** amplifiers are a product of the most advanced technology and manufacturing techniques and are fully protected against overheating, input overload and shorted or mismatched loads. As is the case with any precision instrument, some care should be taken in the unit's operation. 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
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Gain:	31dB (each channel) 9220A 33dB (each channel) 9420A
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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
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Distortion:	No more than 0.25% THD or IM, 0.01W to rated power, 20Hz to 20KHz (0.01% Typical)
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Hum and Noise:	104dB below rated output (unweighed 20KHz bandwidth)
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Input Sensitivity:	1.7 VRMS for rated power
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Input Impedance:	15K ohms, nominal
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Transient Intermodulation Distortion:	less than 0.02%
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Crosstalk:	-86dB.
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Damping Factor:	500:1 at 1KHz
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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: Distortion:	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%)
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