Grommes~Precision
Precision Electronics

AXIOM 60 & AXIOM 125
INSTRUCTION MANUAL

Grommes~Precision
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Grommes~Precision is an American manufacturer of original, custom, and private labeled audio/electronic equipment for use in commercial, consumer, and industrial applications since 1946.

AXIOM 60 & AXIOM 125 INSTRUCTIONS

Thank you for purchasing from Grommes~Precision!

Grommes~Precision and its commercial audio division, Precision Electronics, has been designing, engineering, and manufacturing quality sound equipment in the United States since it started operation in March of 1946. Over a half a century of quality, service, and flexibility as "Your Personal Manufacturer" have made us one of the last American audio manufacturers. If you have any questions with this or any one of our other fine products, give us a call. When you talk with a member of the Grommes~Precision team you'll be speaking with someone who had a hand in concept, design, production, or testing of this very product.

I. UNPACKING PROCEDURES

INSPECTION

This unit was carefully checked and packed before leaving the factory. However, it is always a good idea to inspect the shipping container and unit for indication of improper handling. If the unit has been damaged, make an immediate claim to the dealer or distributor from whom it was purchased. If the unit was shipped to you, notify the transportation company without delay, saving all packing materials, in order to process the claim.

INITIAL PERFORMANCE CHECK

Continue the inspection by running a performance check. Connect a test speaker to the 4-8 ohm direct output terminals (see page 6) and a tuner, tape deck, or CD player to the auxiliary input and set the controls for operation. CAUTION: TO PROTECT THE SPEAKER FROM DAMAGE, DO NOT TURN THE UNIT ON UNTIL ALL CONNECTIONS HAVE BEEN MADE. IN ADDITION, MAKE SURE THE UNIT IS GROUNDED BEFORE TESTING. If the unit should be inoperable and no damage is noted, please notify the factory at 1-847-678-3222 and ask for Technical Support.

II. INSTALLATION INFORMATION

RACK MOUNTING

For best results use a 10-32 class UNF-2B or 12-24 class UNC-2B rack and 0.625 inch machine screws (metric: M5X8-6H or M6X1-6H, 15.88mm). It is recommended that the drive of these screws be phillips in order to protect the finish from unnecessary scratches. Also recommended are nylon or plastic washers which will not only help protect the finish but also aid in retaining the screws.

CONVECTION, FAN COOLING, AND VENTILATION

This unit is cooled via convection and therefore designed for continuous operation. Do not block the unit's heatsink fins or vent holes located in the cover. If the unit will be rack mounted, you must utilize a cooling fan that is capable of exhausting not less than 300CFM. The fan must be mounted to the inside top of the rack, above the amplifier.

TECHNICAL SUPPORT

A troubleshooting chart is located at the end of this manual for your convenience. If you are in need of further assistance, you can reach our design engineers at 1-847-599-1799. Grommes~Precision is based in Gurnee, Illinois and is on Central Standard Time. Our hours of operation are Monday - Friday from 8:00am to 4:00pm. Troubleshooting information can also be found at our website www.grommesprecision.com.

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WARNINGS

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

WARNING: DO NOT USE THIS IN LIFE-SAFETY APPLICATIONS. THIS UNIT IS FOR COMMERCIAL AUDIO ONLY.

CAUTION: In the event the transformer's thermal breaker does not reset, have trouble investigated by an authorized service technician or return it to the factory.

CAUTION: There are no user-replaceable parts within the unit. Have all internal servicing done by a qualified technician.

CAUTION: These devices are not intended for use in hazardous locations as defined by the National Electrical Code (NEC) and by the National Fire Protection Association (NFPA).

III. DESCRIPTION & SPECIFICATIONS

DESCRIPTION

The AXIOM 60 & AXIOM 125 are 1.5 channel high fidelity commercial audio amplifiers that provide 60 or 125 watts of continuous RMS power directly into 4-8 ohm or transformer isolated 25V or 70.7V lines. Designed for all-in-one telephone paging solutions, the AXIOM 60 & AXIOM 125 includes a balanced 600 ohm/Tel-Page input (with a tamper resistant volume control located on the rear panel that is capable of muting two aux inputs (defeatable), which are strapped in parallel.

FEATURES

- 60 or 125 Watts of Continuous RMS Power
- Independent Input Gain Control for 600 ohm/Tel-Page
- Automatic voice activated Hi-Z muting.
- Built-in Transformer isolated outputs for 25V and 70.7 volt line operation.
- Built Tough: Multiple Protections Including Relay, Short Circuit, & A/C Circuit Breaker
- No maintenance: Convection Cooling
- Rugged Power Supply Designed for Constant & Consistent Duty.

SPECIFICATIONS

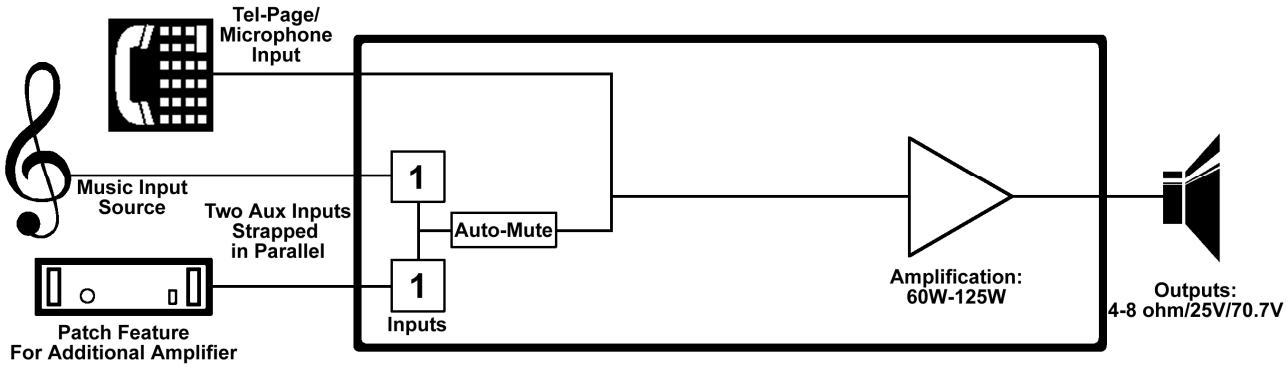
Power output:	60 Watts RMS (Axiom 60); 125 Watts RMS (Axiom 125
Mixing Channels:	1.5 (Main Channel + Independent 600 ohm/Tel-Page Input)
Inputs:	2 Aux in Parallel; 600 ohm/Tel-Page
Input Sensitivity/Impedance:	Tel-Page/600 ohm: 75mv/600 ohm Auxiliary: 250 mv/10k ohm
Outputs:	4-8 ohm, 25V, 70.7V
Distortion at Rated Output:	≤0.3%THD
Frequency Response:	±1dB 20Hz to 20kHz (Direct Output); ±1dB 50Hz to 15kHz (25V or 70.7V)
Hum/Noise:	90dB Below Rated Output

ACCESSORIES

- Optional Isolation Transformer Available
- Speaker Line-Lightning Suppressor (SLS)
- Tel-Page Line Lightning Suppressor (TLS)

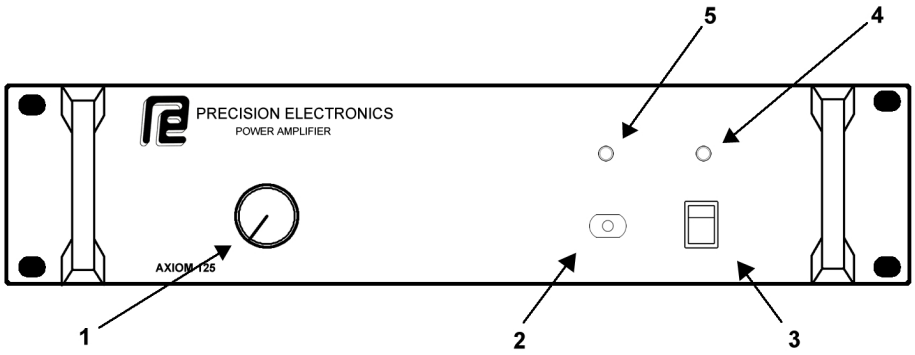
AXIOM 60 & AXIOM 125 INSTRUCTIONS

IV. PRODUCT OVERVIEW



AXIOM Series Power Amplifier

V. THE FRONT PANEL



1 - VOLUME CONTROL

This gain control adjusts the master volume level of output for the amplifier.

2 - CIRCUIT BREAKER

Pushing this plunger will reset the circuit breaker should the breaker trip. There are two reasons why the circuit may need to be reset: 1) the amplifier is continuously being overloaded; or 2) the internal temperature surpasses the safe operating range. NOTE: Before resetting the circuit, be sure to first correct the problem causing the overload or overheating.

3 - POWER SWITCH

This switch turns the unit on or off.

4 - POWER INDICATOR

This green LED will light when the power is switched on.

5 - OVERLOAD INDICATOR

This red LED will light/flash at full power and on peaks. A steady bright glow could indicate a shorted speaker line, too much load, or oscillation in the system.

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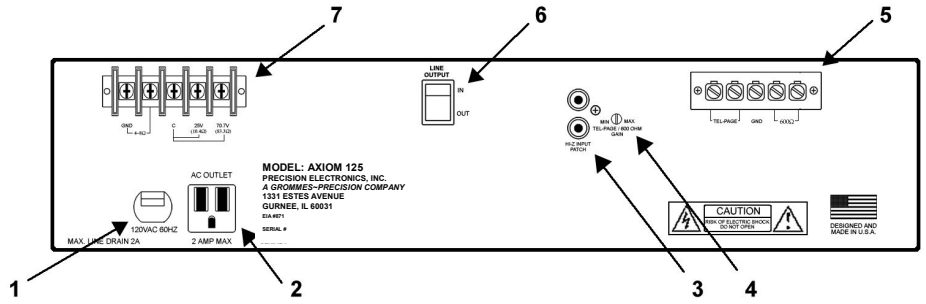
VI. THE BACK PANEL



1 - AC Line Cord

Three conductor line cord for AC supply voltage.

2 - Grounded AC Convenience Outlet

Grounded outlet to run additional equipment (2 amp maximum).

3 - Input/Patch

These are two high impedance inputs connected in parallel. One is for signal input, the other for strapping to a second amplifier that will increase the wattage of the entire system.

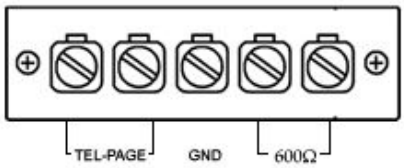
4 - 600 ohm/Tel-Page Input Gain Control

This recessed control adjusts the level of the 600 ohm Tel-Page input without effecting the level of the high impedance input. It is factory preset at 0. This input will automatically mute the Hi-Z inputs. To defeat this feature see “Part VIII. The Auto-Mute Circuit” on page 6.

NOTE: This control works in conjunction with the master volume located on the front pane. If the master volume control is set at 0, then, regardless of how loud the 600 ohm/Tel-Page gain is set, the amp will not send an output to the speakers.

5 - INPUT TERMINAL SCREW STRIP

This strip is designed to accept either a 600 ohm balanced input or a Tel-Page balanced input. These inputs, differing only in sensitivity, are

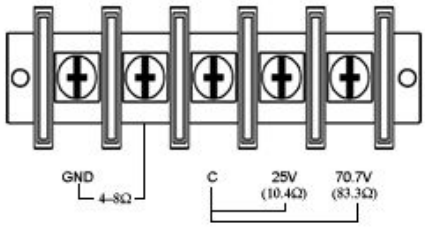


designed for wide acceptance without the need for any accessories. It is recommended to use ground reference on the input whenever and wherever possible.

6 - 25V/70.7V LINE OUTPUT SWITCH

If using 25V or 70.7V output, this switch must be in the LINE IN position. This serves a dual purpose: 1) it connects the output transformer in and out of circuit, and 2) it controls a low cut filter. This filter is designed to protect speaker line transformers and speaker horns by preventing low frequency overload.

7 - OUTPUT TERMINAL SCREW STRIP



Three (3) outputs are provided on this strip: 1) the voice coil output for a 4 ohm speaker load and 2) the 25V and 70.7V speaker line output. For more information on speaker load hook-up, see “Part VII. Speaker Installation”

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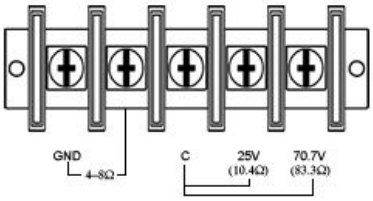
VII. SPEAKER INSTALLATION

CONNECTING FOR DIRECT 4-8 OHM OPERATION

Connect 4 or 8 ohm speaker(s) to terminals 1 and 2. For proper signal phasing, observe +/- polarity. **NOTE**: This output is a bridged. Do not ground either of these two terminals.



CONNECTING FOR 25V/70.7V LINE OPERATION

For 25V output, connect the load to terminals 3 (-) and 4 (+). Do not connect any output wire to terminal 6. For 70.7V output, connect the load to terminals 3 (-) and 5 (+). Do not connect any output wire to terminal 6. **NOTE**: When using the amp's 25V or 70.7V line operation, the tap setting on the proper impedance matching transformer determines the individual speaker's power level. Using these transformers allows the speakers to be placed at longer distances from the amplifier without significant power loss. The number of speakers for a line-driven central amplifier system is limited to the power available from the amplifier. The sum of all connected speakers' power settings must not exceed the total power available from the amplifier.

USING THE PROPER WIRE SIZE AND LENGTH

Cable distance should be kept as short as possible to minimize power loss. The chart below can be used as a general guide showing various wire sizes and the maximum distance related to cable loading that speakers can be placed from the unit for an approximate –0.5dB loss (-12.5% power). To allow for future expansion and distributed cable line loss, it is recommended the total system wattage should not exceed 85% of the amplifier's rated output. To determine the total system wattage, sum the wattage tap of all speaker(s)/horn(s) used.

2 WIRE COPPER CABLE LENGTHS FOR SPEAKER LINES AT –0.5dB LOSS IN SPL (12.5% POWER LOSS IN WATTS)

AWG SIZE	LOW IMPEDANCE SPEAKER LINE			70.7V SPEAKER LINE (FOR 25V LINE DIVIDE ALL 70.7V LENGTHS BY 8) NOMINAL POWER IN LOAD								
	4 OHMS	8 OHMS	16 OHMS	7.5W	15W	30W	60W	100W	125W	250W	400W	500W
10	120	240	480	-	-	5,000	2,500	1,500	1,100	550	365	275
12	75	150	300	-	6,200	3,100	1,550	940	750	375	230	185
14	50	95	190	7,600	3,800	1,900	950	600	450	225	140	110
16	30	60	120	4,800	2,400	1,200	600	370	290	145	90	-
18	20	40	75	3,000	1,500	750	375	230	180	90	-	-
20	15	25	50	1,920	960	480	240	150	110	-	-	-
22	10	15	30	1,200	600	300	150	95	-	-	-	-
				WIRE LENGTHS IN FEET								

FURTHER INFORMATION

For further guidance regarding speaker installation (selection, placement, impedance matching with or without transformers, phasing), see www.grommesprecision.com/precisionelectronics.

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VIII. THE AUTO-MUTE CIRCUIT

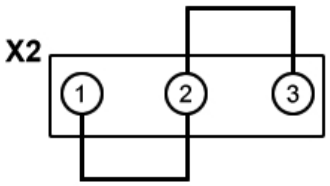
DISABLING OR ENABLING THE AUTO-MUTE CIRCUIT

The AXIOM series of mixer amplifiers include a built-in automatic mute circuit. The MIC/TEL-PAGE/600 ohm input channel, can automatically mute the AUX channel. This unit is factory installed to automute, however, the mute is defeatable by moving the internal mute jumper to its other position.

To defeat the auto-mute circuit follow these steps. 1) Unplug A/C and all other connections from the unit. 2) Remove the hood and find the input board located on the back panel. 3) On the board locate the header X2 (See the figure to the right). Change the shunt position from positions 1 and 2 to 2 and 3 and the auto-mute will be defeated.

The Auto-Mute Circuit

Connect shunt here to **disable** the Auto-Mute



Connect shunt here to **enable** the Auto-Mute (Factory-Preset)

X. USING TRUMPET SPEAKERS

LOW CUT FILTER AUTOMATICALLY ENABLED WHEN 25V/70.7V SWITCH SET TO "LINE IN"

If using 25V or 70.7V output, the 25V/70.7V line output switch on the back panel is set n the LINE IN position. This serves a dual purpose: 1) it connects the output transformer in and out of circuit, and 2) it controls a low cut filter. This filter is designed to protect speaker line transformers and speaker horns by preventing low frequency overload.

XI. MAINTENANCE

The AXIOM series is built to last and therefore comes equipped with multiple built-in protections including relay, short circuit, and AC circuit breaker. If the unit is overloaded (e.g. too many speakers, shorted speaker line, mismatched line impedance [e.g. 8 ohm speaker on 70.7V line]) or overheated (e.g. obstructed or poor ventilation of the unit, mismatched line impedance) the unit will fail to provide output. Overloading and overheating of the amp can lead to premature output failure.

RESETTING THE AC CIRCUIT BREAKER

If a the unit is overloaded or it overheats, the AC line circuit breaker on the front panel will open. Before resetting the circuit, determine and correct the problem causing the overload of overheating (see "Part X. Troubleshooting" on page 8 for a chart to help guide you in determining the cause of the problem). If after exhausting the possibilities, the circuit breaker will not reset, have the unit serviced by a qualified technician. **NOTE**: If the unit is rack mounted, you must utilize a cooling fan that is capable of exhausting not less than 300CFM.

REPLACING THE FUSES

Additional protection is provided by fuses in the power supply which protect the transformer. If an output is shorted the fuses will blow. Before replacing the fuses, determine and correct the problem causing the fuses to blow (see "Part X. Troubleshooting" on page 8 for a chart to help guide you in determining the cause of the problem). To safely replace the fuses: 1) Disconnect the AC power cord; 2) Remove the top cover screws and cover; 3) Replace blown fuses with **same type and size**; 4) Reinstall the top cover securely; 5) Reconnect the AC power cord.

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X. TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION(S)
Power Indicator on Front Panel Does Not Glow:	No AC power present.	• Verify the unit is receiving AC power. • Verify the AC outlet has proper AC voltage available.
	Unit's AC circuit breaker is tripped.	• Verify the AC circuit breaker is not tripped. If so, depress the plunger to reset. • Verify the unit's internal fuse(s) has not tripped. If it has, replace the tripped fuse with the same type and value fuse.
Overload Indicator on Front Panel Glows Steadily:	Input or output impedance not matched	• Check that the proper input/output line impedance matches the selected input/output connections used.
	Signal in level too high	• Lower the signal in level.
No Audio Output:	No input signal source.	• Verify that proper signal/level is being supplied.
	Incorrect input signal connection	• Verify that the signal input connection is correctly con-
	Incorrect output connections	• Check that the output connection has been properly made.
	600 ohm/Tel-Page gain control on back panel too low	• Check 600 ohm/Tel-Page gain control setting (recessed on
No Automatic Muting of Input Signal:	Internal jumper setting	• Check that the internal mute jumper is not disabled. (See
	Insufficient 600 ohm/Tel-Page gain	• Check 600 ohm/Tel-Page gain control setting (recessed on back).
Low, High, or Distorted Level:	Volume setting	• Check the corresponding gain control on the front panel or
	Signal input level is too low	• Check that adequate input signal level is strong enough.
	Signal input level is too high	• Reduce input signal accordingly.
	Input or output impedance not matched	• Check that the proper input/output line impedance matches
	Possible low resistance or shorted wiring across the audio in and/or across the speaker out	• Check/correct system wiring.

SERVICING

If the unit requires service: 1) Obtain a Return Authorization (RA) Number at 847-599-1799; 2) Include a detailed written explanation outlining the nature of the problem and your contact information; and 3) Ship pre-paid to Grommes~Precision, 1331 Estes Ave., Gurnee, IL 60031, USA. If the unit is under warranty, repairs or a replacement will be made in accordance with Grommes~Precision's warranty policy.

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