audio research

Reference 750 SEL

HIGHDEFINITION®

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HIGH DEFINITION®

There is only One Reference®

Thank You.

Thank you for choosing the Reference 750 SEL to be a part of your high performance music listening system. Since 1970, Audio Research has been creating some of the world's finest audio equipment. Each piece is handcrafted in Minnesota, and has been designed to provide many years of listening enjoyment.

We understand you are eager to begin listening; however, please take a few minutes to read through this guide for useful information concerning the operation of your new amplifier. Once installed, please allow an appropriate break-in period to fully appreciate the benefits this amplifier will provide to your system.

After reading the user guide, if you have any further questions regarding your amplifier, contact your dealer or Audio Research customer service - they will be happy to help you make the most of your new component.

Happy Listening!

Contents

The lightning flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated ‘dangerous voltage’ within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the product.

The 3 wavy lines symbol within an equilateral triangle is intended to alert the user to the presence of a hot surface on the exterior case of the product.

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

- Warning: The apparatus shall be connected to a mains socket outlet with a protective earthing connection.
- Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.
- DO NOT EXPOSE THIS APPARATUS TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, ARE PLACED ON THE APPARATUS.
- TO COMPLETELY DISCONNECT THIS APPARATUS FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD FROM THE AC RECEPTABLE.
- THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY ACCESSIBLE.
- The user-replaceable fuses of the Reference 750 SEL shall only be replaced with a fuse of the correct breaking capacity and voltage rating as specified below and on the rear panel of the amplifier.

  (1) 2 Amp MDQ slo-blo for LV power transformer in 120V units.
  (1) 4 Amp MDQ slo-blo for start-up circuit in 120V units.
  (1) 20 Amp MDA for main power in 120V units.
  (1) T1 Amp fast-blo for LV power transformer in 220, 240V units.
  (1) T3.15 Amp fast-blo for start-up circuit in 220, 240V units
  (1) 10 Amp MDA for main power in 220, 240V units.

Speaker terminal banana jacks are plugged/capped for units sold in countries where this is required due to power cord plug pin shape.

To prevent fire, or shock hazard, do not expose your Reference 750 SEL to rain or moisture.

Do not place objects containing water on top of this unit.

This unit contains voltages which can cause serious injury or death. Do not operate with covers removed. Refer servicing to your authorized Audio Research dealer or other qualified personnel.

The detachable power cord on your Reference 750 SEL is equipped with a heavy gauge, 3-conductor cable and a standard three-prong grounding plug. For absolute protection, do not defeat the ground power plug. This provides power line grounding of the Reference 750 SEL chassis to provide absolute protection from electrical shock.

The appliance coupler (a.c. power connector) at the rear of this unit must be accessible for emergency power disconnect.

The power button on the front of this unit, when off, does not disconnect all power from this unit. This unit is in sleep mode when not on.

For continued protection against fire hazard, replace the fuse only with the same type and rating as specified at the fuse holder

This unit is RoHS compliant.

Handling and moving the Reference 750 SEL

At 170 lbs. (77.2 Kg) net weight per chassis, the Reference 750 amplifier is too heavy for one person to lift. To avoid injury, do not attempt to unpack, lift or move the unit without the help of at least one other person.

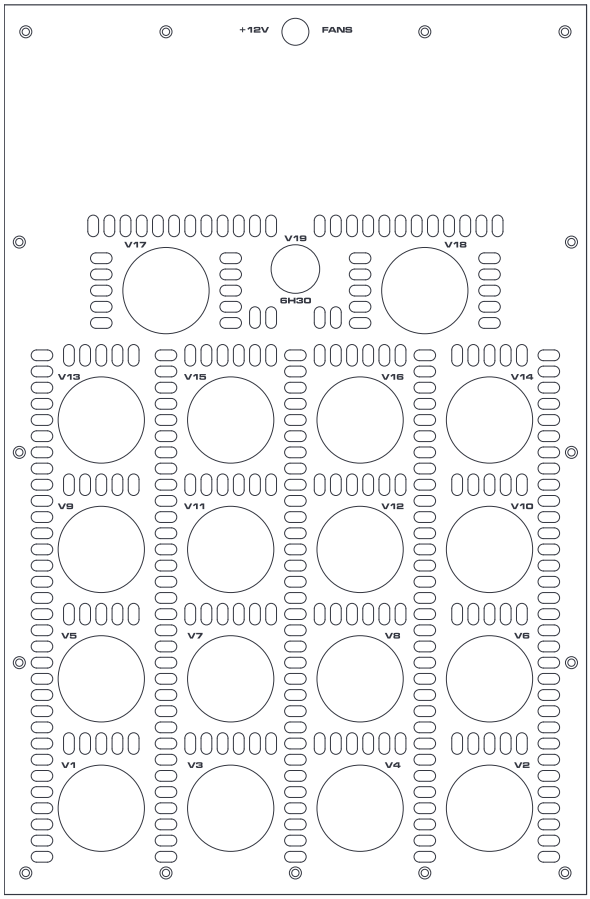
A note about packaging...

Save all packaging in a dry place away from fire hazard. Your Reference 750 SEL amplifier is a precision electronic instrument and should be properly cartoned any time shipment is made. You may not have occasion to return your unit to the factory for service, but if that should prove necessary, or another occasion requiring shipment occurs, the original packaging will protect your Reference 750 SEL from unnecessary damage or delay.

Important

The AC power supply cord must be disconnected from the amplifier before replacement or installation of vacuum tubes.

Vacuum Tube Placement



Before operating the Reference 750 SEL

Your Reference 750 SEL amplifier is shipped with the vacuum tubes packed in a separate foam-lined carton. These must be unpacked and installed before you attempt to operate the amplifier. Included are one 6H30 input tube, two KT150 drivers, and 16 KT150 output tubes. In addition, two power-supply regulator tubes - one 6H30 and one 6550 - are located inside on the upper or second-level circuit board.

Follow the procedure on the next pages to remove the top cage prior to vacuum tube installation.

Vacuum Tube Installation

Carefully remove each vacuum tube from its protective foam and match its location 'V' number (written on the base of the tube) to the'V' number screened next to each socket on the top plate of the Reference 750 SEL. Firmly seat each tube in its matching socket, taking care to align the key at the base of each KT150 to its socket hole.

To access the internal vacuum tubes, use the supplied Phillips-head screwdriver to remove all fastening screws on one of either of the two side panels; the tube sockets will be visible near the center of the board.

Ventilation Requirements
A minimum of 12 inches (30cm) clearance is required above the top of the amplifier. If the unit is operated in an enclosure or equipment rack, keep in mind the above ventilation requirements to make certain that adequate airflow above, to each side and to the rear is provided.

The ambient operating temperature should never exceed 86ºF (30ºC). Improper installation will cause premature component and /or tube failure and will affect your warranty as well as the service life of the unit. If you have any questions about correct installation, please consult with your authorized Audio Research dealer or contact the factory at service@audioresearch.com.

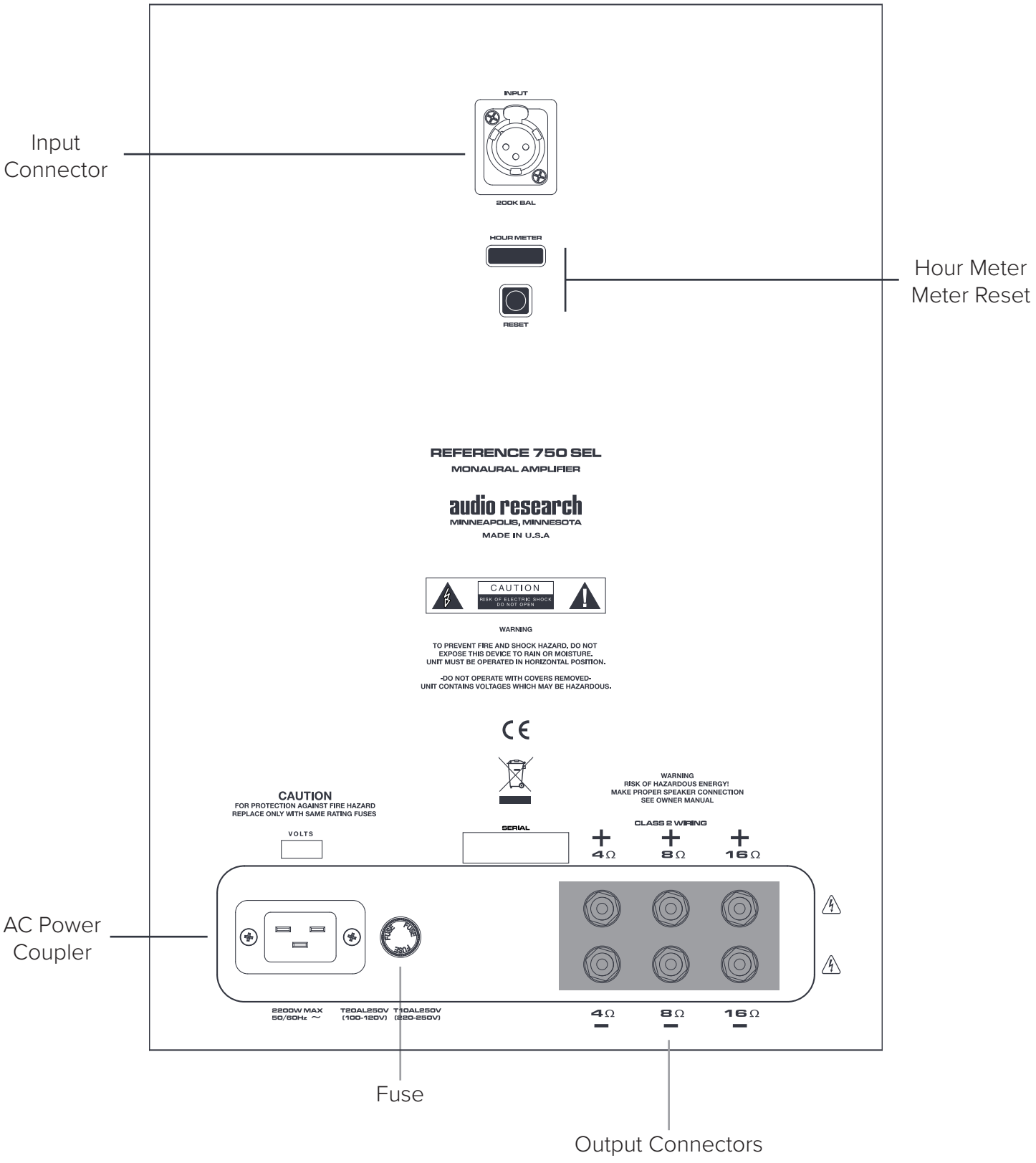
In Your System
To ensure normal component life and safe operation, this unit should only be operated in an upright position. The special non-marring elastomer feet provide adequate spacing and stability only on a smooth, hard surface, and must be on a dedicated shelf or amp stand capable of supporting 170 lbs. Check with the manufacturer of your support system to be sure it is rated to handle this weight.

The Reference 750 SEL power transformer generates a magnetic field that could, in some installations, induce hum in sensitive electronics such as turntables, phono cartridges and phono stage preamplifiers. For this reason, we recommend that any such products and their interconnecting cables be kept a minimum of 12” away from the Reference 750 SEL.

Vacuum Tube Life Expectancy
The vacuum tubes in your Reference 750 SEL have been burned in, tested and electrically matched to provide the best performance and reliability of your amplifier. That said, vacuum tubes wear out with use and must be periodically replaced. The KT150 output tubes in the Reference 750 SEL should have an estimated life of approximately 3000 hours, while the smaller 6H30 tubes should have a life expectancy of approximately 4000 hours. These life expectancies are only approximate. Please consult with your dealer or Audio Research customer support for more information. Warning: Tube replacement should be installed by skilled or service personnel, or a qualified technician.

Installation of Optional Cover
To install the optional fan-cooled tube cover, first align the front of the cover with the top front edge of the amplifier, making sure the fans are positioned at the rear. Note that there are five holes along the top edge of each side panel; these should match up with corresponding holes along the bottom side edges of the tube cover. Before settling and aligning the tube cover at the rear, insert the 12V DC plug attached to the fans into the 12V socket located at the back edge of the anodized top plate. Then secure and align the tube cover completely, insert supplied screws and tighten moderately.

Back Panel Connections



Input Connector
The Reference 750 SEL uses a fully balanced circuit topology and thus has one balanced XLR input connector on the rear panel. It therefore requires a balanced preamplifier output, as provided by most Audio Research preamplifiers. Connect your preamplifier's output to the Reference 750 SEL before turning on the amplifier.

Output Connectors
Heavy-duty output terminals are provided on the rear panel for 4, 8, or 16-ohm speaker impedance loads. Using high-quality speaker cables, securely fasten the (-) speaker lead to the appropriate (black) terminal, then the (+) lead to the matching (red) terminal. It is important sonically that your entire system be connected so that the audio signal arriving at the speakers has correct, or 'absolute' polarity (i.e., non- inverted). Do not over tighten the output terminal connectors on the amp (use a hex driver and tighten snugly -do not over tighten). Follow your speaker manufacturer's impedance specification. The Reference 750 SEL puts out the same amount of power whether the 4, 8, or 16-ohm terminals are used.

Impedance Matching
It is important to use as close as possible an impedance match between the amplifier and speaker for optimum transfer of power to the speaker with minimum distortion. In the case of speaker systems with significant variations in impedance throughout the frequency spectrum, such as most electrostatic types, determine the best impedance match empirically for best overall sonic results by trying different output taps. Connect the Reference 750 SEL input to the preamplifier or electronic crossover using only the highest grade of audio interconnect cables. To avoid sonic degradation use the shortest practical length of cables.

Important
Use the best available speaker wires and interconnects. Audio Research cannot emphasize this enough. As better components and systems are developed, it becomes increasingly important to avoid the limitations of inferior system interconnections.

Note
In general, contact enhancers are not recommend for use on vacuum tube contact pins. With continual exposure to heat and air, many of these substances can form gummy, dust-collecting residues which actually reduce contact and degrade sonic performance. Proper external use of these preparations – on interconnect plugs, speaker connections, etc.– is subject to the discretion of the owner. Contact Audio Research for specific recommendations.

AC Power Connection

It is important that the Reference 750 SEL be connected via its supplied 20 amp IEC 12-gauge power cord to a secure, dedicated AC power receptacle. Never connect to convenience power receptacles on other equipment. Only use the power switch on the front of the Reference 750 SEL for On/Off control of the amplifier.

The AC power source for the Reference 750 SEL should be capable of supplying 20 amperes for 120V units, or 10 amperes for 220/240V units. Preferably, the amplifier should be connected to its own AC power circuit branch, protected by a 20 or 30 amp circuit breaker. The preamplifier and other related equipment should be connected to a separate power circuit and breaker. If the power receptacle is more than 25 feet from the building's power entrance and breaker box, circuit wiring capable of 30 amperes should be installed to minimize voltage drop using a 20-amp breaker. Avoid the use of extension cords. If they must be used on a temporary basis, use 12-gauge cords or heavier.

The Reference 750 SEL should be turned on after the other components of your system. If the Reference 750 SEL is turned on before other components, the amplifier will amplify any extraneous turn-on noises those components might generate, which could potentially damage the loudspeakers. Good operating practice dictates that the amplifier should be turned on last, and turned off first in an audio system.

The Reference 750 SEL uses a grounding system that does not require a ground-lifter adaptor plug on the AC power cord to minimize hum. The power cord supplied with the Reference 750 SEL has a standard grounding plug to provide maximum safety when properly connected to a grounded wall receptacle. If there is any question regarding proper grounding procedures in your installation, seek help from a qualified technician. Caution should be taken before using custom after-market power cords: they must be at least 12-gauge and have a standard grounding plug properly installed.

These power cords are to be used with caution, at the sole risk of the owner.

If electronic crossovers or other AC powered equipment is used with the Reference 750 SEL it may be necessary to use "ground lifter" adapters on the power plugs of that equipment to minimize system hum. Generally, the lowest hum is achieved when the only direct connection between audio common "ground" and true earth ground occurs in the preamplifier, through its grounded power cord. Other equipment in the system should have some form of isolation to prevent ground loops and associated hum.

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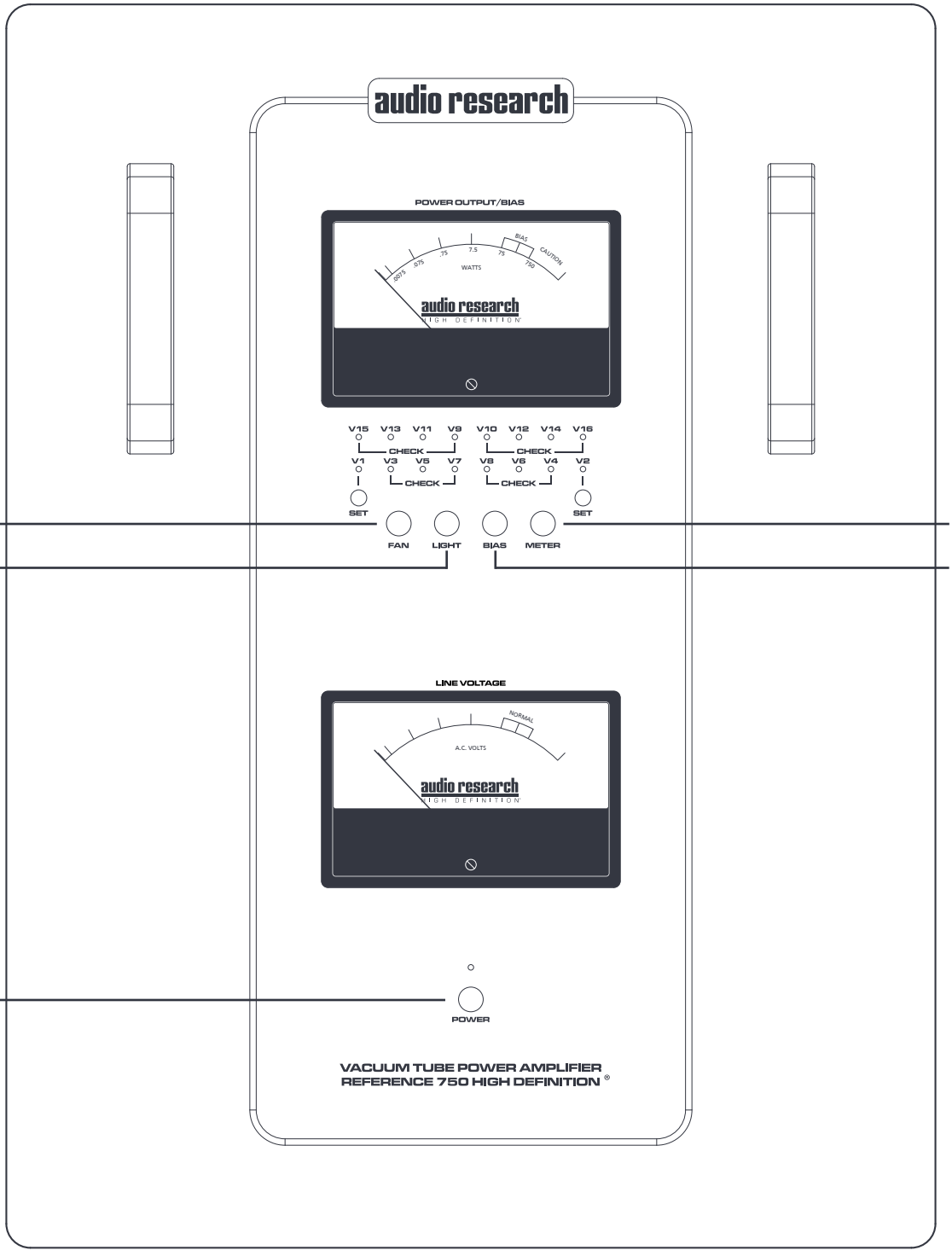
Front Panel Controls



Fan Speed

Light

Meter

Bias

Power

Start-Up

- Secure interconnects between the amplifier and your preamplifier to the appropriate output terminals.

- Attach supplied power cord to rear IEC inlet of amplifier, and plug other end into grounded A.C. power receptacle.

- Turn on preamp and all other components; mute preamp output.

- Press Reference 750 SEL front panel power switch. Allow 45 seconds during the auto mute cycle to allow the amplifier to stabilize voltage before becoming active.

- Unmute preamplifier output, initiate source component signal, and adjust gain as appropriate.

Note

The Reference 750 SEL should be turned on after the other components of your system. If the Reference 750 SEL is turned on before other components, the amplifier will amplify any extraneous turn-on noises those components might generate, which could potentially damage loudspeakers. Good practice dictates that the amplifier should be turned on last and turned off first in an audio system.

Shut-Down

- Mute preamplifier output.

- Turn off Reference 750 SEL via front panel power switch.

Note

To prevent stress to the power supply and vacuum tubes, the control circuitry is programmed with a “hot restart” lockout to prevent turning the unit on within 2 minutes of shutting the unit off. If the Reference 750 SEL power switch is pressed during this lockout period, the power LED will illuminate red to indicate lockout operation. After 2 minutes, normal turn-on can be initiated.

Front Panel Controls

Power

Press the POWER switch to turn the unit on, indicated by a lit green LED directly above the switch. When turned on, there is an automatic warm-up sequence which lasts for approximately 45 seconds before the unit is operational.

Fan

Press the FAN switch to select low (dim Power LED) or high (bright Power LED) for fan speed setting. Only applicable to installed optional top cover with ventilation fans.

Light

Press the LIGHT switch to select high, low, or no meter illumination.

Meter

Press METER button to turn the meter on or off.

Bias

NOTE: Amplifier should be turned on and operating for at least 30 minutes prior to adjusting bias of the output tubes.

Press BIAS switch once and the V1 output tube LED is illuminated with its bias level indicated on the front panel meter. Adjust V1 tube bias level with the plastic flat-bladed bias tool (provided), inserted in the V1 SET hole in the front panel so the meter reading is in the center of the labeled bias range. Press BIAS switch again to check V3 tube bias level which should be within the bias range arc. Press the BIAS switch repeatedly and check the V5, V7, V9, V11, V13 and V15 tube bias levels in the same way. Note that each of the odd V number the tube bias levels are controlled by the V1 bias setting. Press the BIAS switch once more to read and adjust V2 tube bias level with the bias tool in the V2 SET hole in the front panel in same way the V1 tube bias level is adjusted. Again, press the BIAS switch repeatedly to check V4, V6, V8, V10, V12, V14 and V16 tube bias levels, which should all be within the bias range arc. Note that each of the even V number tube bias levels are controlled by the V2 bias setting. Note that the corresponding V number LED is illuminated for each output tube as you proceed through the bias adjustment and monitoring sequence. Press BIAS switch a final time to exit the bias status function and return the meter to the power level monitoring function. The Reference 750 is shipped from the factory with all tubes properly biased and ready to use. It is not necessary to check bias each time the amplifier is turned on. Under typical circumstances, most owners will find that checking the bias level once a month or so will insure proper operation and good service life of the output tubes. Audio Research-supplied output tubes are warranted for 90 days, and under normal conditions should provide up to 3000 hours of service life. This expected life will vary depending on conditions of use ventilation, speaker loads, average playing level and AC voltage and line condition.

Complete sets of replacement tubes or individual tubes are available from Audio Research, and are strongly recommended for best sonic performance and reliability. These tubes are burned in, measured, matched and specifically selected for your Audio Research amplifier. Contact your authorized dealer for suggested retail prices.

Hour Counter

An LCD hour counter of elapsed tube operating time can be viewed on the back panel. This displays accumulated hours of vacuum tube service life. If the amplifier is unplugged from AC supply, the total accumulated hours are retained. Beneath the hour counter is a recessed hour counter reset button; after replacing vacuum tubes, press this button to reset the hour counter back to zero. Note that once the hour counter has been reset, it is no longer possible to recall the previous hour count.

Break-in

All quality stereo equipment benefits from a break-in period; during this time, the various components, wiring and solder connections change as electrical signals pass through them. While your Reference 750 SEL will sound very good out of the box, it will only improve with continued use.

Vacuum Tubes

It is recommended that you replace the vacuum tubes of your Reference 750 SEL in sets. All of the tubes in your amplifier have been matched to have similar operating characteristics, to provide the best sound quality and reliability. In the event you need to replace a single output tube, please refer to the numbers written on the silver base at the bottom of the vacuum tube when placing an order. KT150 tubes should be replaced at approximately 3000 hours. 6H30 tubes should be replaced before 4000 hours.

Servicing

Because of its careful design and exacting standards of manufacture, your Reference 750 SEL amplifier should normally require only minimal maintenance to maintain its high level of performance.

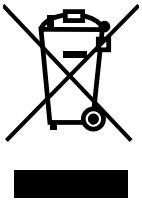
Should you need service, please contact your authorized Audio Research dealer or other qualified technician. Additional questions regarding the operation, maintenance or servicing of your amplifier, please contact the Customer Support Department of Audio Research Corporation at service@audioresearch.com or call 763-577-9700. You may also initiate a service request by visiting the Audio Research website (www.audioresearch.com) and selecting 'Service Repair' found under 'Support' at the top right of the home page.

Caution

Your Reference 750 SEL amplifier contains sufficient levels of voltage and current to be lethal. Do not tamper with a component or part inside the unit. Even with the power turned off, a charge remains in the energy storage capacitors for some time.

Cleaning

To maintain the new appearance of the Reference 750 SEL, occasionally wipe the front panel and top with a soft, damp (not wet) cloth to remove dust. A damp (not wet) microfiber cloth can be used to wipe the meters. A mild, non-alkaline soap solution may be used to remove fingerprints or similar smudges. Cleaners containing abrasives should not be used as they will damage the anodized finish of the front panel. A small, soft paintbrush is effective in removing dust from bevels, and other features of the front panel.



Disposal and Recycling Guidelines

To dispose of this electronic product, do not place in landfill. In accordance with the European Union Waste Electrical and Electronic Equipment (WEEE) directive effective August 2005, this product may contain regulated materials which upon disposal require special reuse and recycling processing.

Please contact your dealer or importing distributor for instructions on proper disposal of this product in your country. Or, contact Audio Research Corporation (763-577-9700) for the name of your importing distributor and how to contact them. Packing and shipping materials may be disposed of in a normal manner.

Audio Research Corporation products are covered by a 3-Year Limited Warranty or a 90-Day Limited Warranty (vacuum tubes). This Limited Warranty initiates from the date of purchase, and is limited to the original purchaser, or in the case of demonstration equipment, limited to the balance of warranty remaining after original shipment to the retailer or importer.

In the United States, the specific terms, conditions and remedies for fulfillment of this Limited Warranty are listed on the warranty card accompanying the product in its shipping carton. The warranty terms are also available on the internet at www.audioresearch.com/en-us/company/warranty-statement. Outside the United States, the authorized importing retailer or distributor has accepted the responsibility for warranty of Audio Research products sold by them.

The specific terms and remedies for fulfillment of the Limited Warranty may vary from country to country. Warranty service should normally be obtained from the importing retailer or distributor from whom the product was purchased.

In the unlikely event that technical service beyond the ability of the importer is required, Audio Research will fulfill the terms and conditions of the Limited Warranty. Such product must be returned at the purchaser's expense to the Audio Research factory, along with a photocopy of the dated purchase receipt for the product, a written description of the problem(s) encountered, and any information necessary for return shipment. The cost of return shipment is the responsibility of the purchaser.

Audio Research Corporation does not warrant compatibility of Audio Research products with future operating systems and/or hardware of other manufacturers.

Power Output: 750 watts per channel continuous from 20Hz to 20kHz. 1kHz total harmonic distortion typically 0.5% at 750 watts, below .04% at 1 watt. Approximate actual power available at “clipping” 850 watts (1kHz). (Note that actual power output is dependent upon both line voltage and “condition” i.e.: if power line has high distortion, maximum power will be affected adversely, although from a listening standpoint this is not very critical.)

Power Bandwidth: (-3dB points) 15Hz to 150kHz.

Frequency Response: (-3dB points at 1 watt) 1 Hz to 200 kHz.

Input Sensitivity: 4.6V RMS Balanced for rated output (24 dB gain into 8 ohms)

Input Impedance: 200K Ohms Balanced

Output Polarity: Non-inverting. Balanced input pin 2+ (IEC-268)

Output Taps: 16 ohms, 8 ohms, 4 ohms

Output Regulation: Approximately 0.5dB 16 ohm load to open circuit (Damping factor approximately 17).

Overall Negative Feedback: 13dB

Slew Rate: 20 volts/microsecond

Rise Time: 1.5 microseconds

Hum & Noise: Less than 0.2mV RMS – 110dB below rated output (IHF-A weighted, input shorted, 16 ohm output).

Power Supply Energy Storage: Approximately 1300 joules.

Power Requirements: 105-130VAC 60Hz (260-750VAC 50Hz) 2100 watts at rated output, 2400 watts maximum, 800 watts at “idle”.

Tubes Required: 8 Matched pair KT150 Power Output; 1 6550WE Regulator; 1 6H30 Regulator Amplifier; 1 matched pair KT150 Driver; 1 6H30 follower.

Dimensions:

Width 13.5” (34.3 cm)
Height 23” (58.4 cm)
Depth 20.8” (52.8 cm)

Handles extend 1.5” (3.8 cm) forward and rearward.

Weight: 170 lbs. (77.2 kg) Net; 395 lbs. (180 kg) per pair shipped weight.

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