

audio research

HIGH DEFINITION®

LS-2

PREAMPLIFIER

OWNERS MANUAL

Thank You

*Thank you for choosing the **LS-2** preamplifier to be part of your high-performance music listening system.*

Since 1970, our focus has remained the advancement of the state-of-the-art in music reproduction. Every Audio Research component is meticulously hand-crafted, thoroughly tested and personally auditioned before it leaves our factory. Our attention to detail, customer service and product support create an unprecedented value. An Audio Research component is more than a purchase, it's an investment.

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

*After reading this user guide, if you have further questions regarding your preamplifier, please contact your dealer or Audio Research customer support - they will be happy to help you make the most of your new **LS-2** preamplifier.*

Happy Listening!

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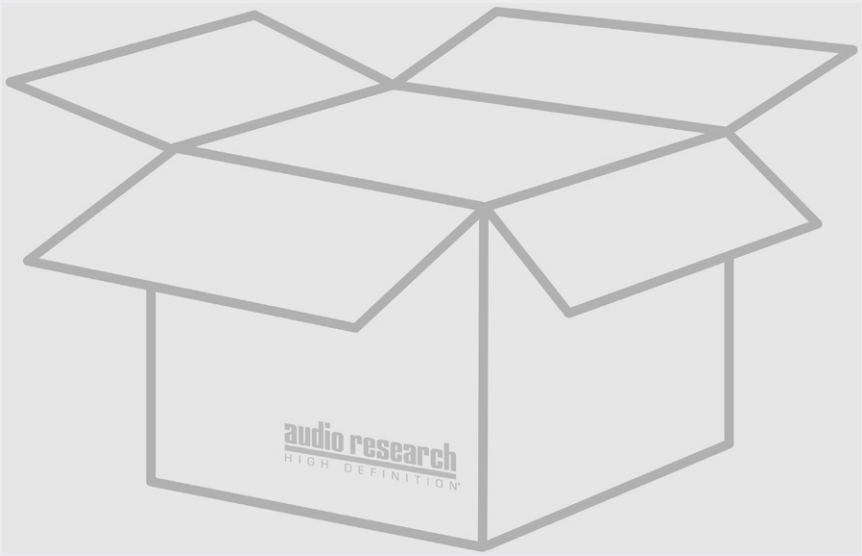
PACKAGING

A note about packaging...

Save all packaging in a dry place away from fire hazard.

Your LS-2 preamplifier 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 other occasion requiring shipment occurs, the original packaging will protect your LS-2 from unnecessary damage or delay.



WARNINGS

To prevent fire, or shock hazard, do not expose your LS-2 to rain or moisture.

Do not place objects containing liquids 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 LS-2 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 LS-2 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.

While the rear IEC power switch disconnects A.C. power from the unit, 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. (In sleep mode, the tubes and audio circuit are powered off; the microprocessor that operates the LS-2 remains on).

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



INSTALLATION

INSTALLATION



Before operating your LS-2

Your LS-2 preamplifier 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 preamplifier. Included are two 6H30 tubes for the analog stage. Proceed according to the following instructions.

Use the provided 9/64” hex driver; remove the 4 cap head screws holding the rear bumpers and slide the cover backwards to install vacuum tubes. (2 dowel pins locate each bumper).

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 printed next to each socket on the circuit board.

Firmly seat each tube in its matching socket, taking care to ‘key’ the tube pins to the socket holes. Retain the tube carton with other packing materials for possible future use. Reinstall cover, dowel pins and bumper. Tighten only until cover is flush with rear panel.

INSTALLATION

In your system

To ensure normal component life and safe operation this unit must be operated only in an upright position. Adequate airflow and proper cooling can occur only if there is no restriction above, below and behind the unit and on either side.

The special non-marring elastomer feet provide adequate spacing and stability only on a smooth, hard surface, and also assist to isolate the preamplifier from spurious vibrations. For upright stability and best performance, never operate the unit while it is sitting on a soft surface such as a thick rug or carpet.

Due to its weight, this preamplifier must be supported on a surface specifically rated for such a load. Check with the manufacturer of your support system to be sure it is rated to handle this weight.

If the unit is to be operated in an enclosure such as an equipment rack, make certain that adequate airflow above and to each side of the unit is provided. Audio Research recommends a minimum of 3-4 inches (8-10 cm) of clearance above the LS-2 to maintain proper ambient operating temperature.

The 'ambient' operating temperature should never exceed 120° F or 49° C. Improper installation will cause premature tube failure and will affect your warranty, as well as the service life of the unit.

It is normal for a vacuum tube preamplifier to run quite warm, and if used for prolonged periods, hot to the touch. All components within are operated at safe, conservative levels well within tolerances.

A Note about Vacuum Tubes

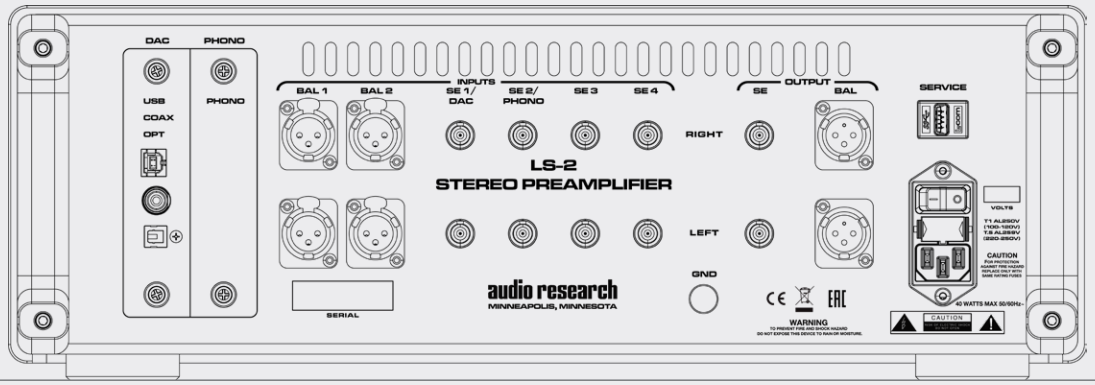
The vacuum tubes in your LS-2 have been burned in, tested and electrically matched to provide the best performance and reliability of your preamplifier. That said, vacuum tubes must be replaced from time to time.

The 6H30 tubes in the LS-2 should have an expected life of approximately 4,000 hours. This life expectancy is only approximate.



CONNECTIONS

CONNECTIONS



Input Connectors

The LS-2 provides six pairs of input connectors; two balanced and four single-ended, labeled BAL 1-2 and SE 1-4.

DAC and Phono Modules (optional)

The LS-2 can be outfitted with optional DAC and phono preamplifier modules. If equipped, these modules share the signal path with the SE1/DAC and SE2/Phono inputs. As such, if the modules are equipped, the SE1 and SE2 inputs cannot be used as line-level inputs. If the phono module is installed, your turntable should be connected to the SE2 input. A grounding lug is provided between the input and output sections of the rear panel.

Output Connectors

One pair each of balanced and single-ended main outputs are provided.

A.C.Power Connection

It is important that the LS-2 be connected via its supplied 15-amp IEC 14-gauge power cord to a secure, dedicated A.C. power receptacle. Never connect to convenience power receptacles on other equipment. Only use the power switch on the front of the LS-2 for On/ Off control of the preamplifier or the remote control.

IMPORTANT: Use the best available speaker wires and interconnects.

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.



OPERATION

OPERATION



Start-Up

1. Secure all rear-panel connections between LS-2, power amplifier(s) and input sources.
2. Plug the three-prong power cord from the rear of chassis into a grounded A.C. wall outlet. Set the rear-panel Power switch next to the A.C. inlet to the on position to power the microprocessor; after about 6 seconds the unit is ready to power up from the front panel.
3. Press power switch (either on the remote or front panel). The preamplifier will begin the warm-up sequence, which lasts approximately 90 seconds. During warm-up the MUTE flashes. When warm-up completes, the unit remains muted. It is possible to bypass the MUTE setting after warmup by pressing MUTE on the touchscreen during warm-up sequence. MUTE flashes light gray and the unit will automatically unmute when warm-up completes.
4. Select input source and adjust the volume as necessary.

Shut-Down

1. Activate ‘MUTE’ function.
2. Turn off power amplifier(s).
3. Press Power button on front panel or remote control.
4. Turn off input sources.

NOTE: The LS-2 incorporates a protective hot- restart lockout that lasts 30 seconds after the Power switch has been pressed. This allows the power supply to fully discharge before the unit is powered back on.

NOTE: The LS-2 should be turned on before the amplifier in your system. If the LS-2 is turned on after the amplifier, it will amplify any extraneous turn-on noises the preamplifier or other source 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.

OPERATION

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 LS-2 will sound fantastic out of the box, it will only improve with continued use.

Mono

Toggle between Stereo and Mono output.

ATTN

Attenuate (ATTN) temporarily lowers the volume to exactly half of the value shown. Disable attenuation by pressing ATTN on the display or the remote, or by toggling Volume Up/Down.

MM/MC

If fitted with the optional Phono Card, the Phono input includes an MM/MC button. This control allows the user to toggle between Moving Magnet (MM) and Moving Coil (MC) operation. When toggled, the preamplifier will automatically mute and the volume will reset to zero.

Mute

When activated, Mute electrically disables all outputs of the preamplifier; indicated by 'MUTE' in display window, beneath the volume readout. This control should be activated before switching inputs, changing connections or shutting down your audio system to help protect your amplifier and speakers from unexpected signal pulses. When deactivated, 'MUTE' is cleared from the display window allowing normal operation.

Input Select Buttons (remote only)

The input buttons labeled BAL 1–2 and SE 1–4 provide direct selection of these six inputs.
SE1 becomes inactive if the optional DAC card is installed (adding USB, Coax, and Optical).
SE2 becomes the phono input if the optional phono card is installed.

Display Brightness Adjustment

The front-panel display offers three brightness settings and a display-off mode that keeps the unit operational. Use DSP UP or DSP DN on the remote to change brightness. Press DISP OFF to activate or de-activate display off mode, any user input wakes the display for about 4 seconds to show the adjustment, then it returns to Off.

Balance

The Balance control adjusts the output from center position to the left or right channels, which in turn will shift the center point of the sonic image. This is useful in the event the main listening position is not centered between the speakers, or can help with certain room anomalies.

<diagram>

To adjust the balance, press the 'BAL L' or 'BAL R' button on the remote. The balance scale will appear in the middle of the display, and the indicator will move in the selected direction:

<diagram>

If the balance has been shifted from the center, the Balance indicator appears beneath the volume indicator on the display.

NOTE: The installed 6H30 vacuum tubes have an average life span of approximately 4,000 hours. After this time, we recommend replacing them to maintain the best performance of your preamplifier.

OPERATION

Settings

The LS-2 has been designed with a simple, intuitive menu to allow adjustment of the various features of the preamplifier.

To adjust the settings, press the 'MENU' button (three horizontal lines) on the front display. This button reveals Device Settings, which includes four pages: Audio, Display, Input Naming, and Device Settings. To return to the input-selection screen, press Return.

AUDIO

1. Input Selector

On the Audio Settings page there is a vertically scrollable input selector. The input shown in the center position is the active input, and it is the one affected when using the Mono, Stereo, or Processor buttons.

2. Processor Mode

When Processor is enabled for the selected input, a warning pop-up will appear. This is because that input will no longer have variable volume control. The output level will be set to unity gain, passing the same signal level as the LS-2 input.

3. Warning

When processor mode is assigned to an input, do NOT connect a source (such as a CD player or phono stage) to that input. This will send full output from the source to your amplifier(s), and could cause serious damage to your loudspeakers or amplifier(s) - not to mention your ears!

4. Balance Control

The current balance index is shown between the Left and Right buttons. Use the Left and Right buttons to adjust the balance.

DISPLAY

1. Brightness

The vertically scrollable Brightness selector allows selection of three levels: High, Medium, and Low. Press RETURN to finalize your selection and exit the menu.

2. Style

The vertically scrollable Style selector allows you to choose color themes to personalize your LS-2. Press RETURN to finalize your selection and exit the menu.

3. Input Naming

On the Input Naming page, use the vertically scrollable input selector and the text box to enter custom input names. The custom name will appear under the standardized input name on the main screen. Press RETURN to finalize your selection and exit the menu

OPERATION

DEVICE SETTINGS

Firmware Version

Displays the current firmware running on your

LS-2. Future firmware updates will be provided by Audio Research using the service USB port on the rear panel.

Update Firmware

Opens a pop-up to start the firmware update process when a USB flash drive is inserted into the rear service port and contains the correct firmware with a higher version number. Press Start to begin or Cancel to return to Device Settings.

Hours

Shows the total accumulated hours of operation for the LS-2 for tracking tube hours.

Factory Reset

Returns Brightness, Style, Input Naming, and Audio settings to their original factory state as shipped by Audio Research. A confirmation pop-up will appear. This does not reset or affect unit hours or firmware.

Reset Tube Hours

Allows the user to reset the Hours indicator in the event that the tubes in the LS-2 are replaced. A confirmation pop-up will appear.



MAINTENANCE

MAINTENANCE

Vacuum Tubes

It is recommended that you replace the 6H30 vacuum tubes of your LS-2 in sets.

The tubes in your preamplifier have been matched to have similar operating characteristics, to provide the best sound quality and reliability.

Servicing

Because of its careful design and exacting standards of manufacture, your LS-2 preamplifier should normally require only minimal maintenance to maintain its high level of performance. Should you need service, please contact your authorized Audio Research dealer. Additional questions regarding the operation, maintenance or servicing of your preamplifier, please contact the Customer Support Department of Audio Research at:
service@audioresearch.com
or call 763-577-9700.

Caution

Your LS-2 preamplifier 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 hours, or even days.

Cleaning

To maintain the new appearance of this preamplifier, occasionally wipe the front panel and top cover with a soft, damp (not wet) cloth to remove dust. 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 LS-2. 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 (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.

WARRANTY

Audio Research 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. In the case of demonstration equipment, the warranty is limited to the balance of warranty remaining after original shipment to the retailer or importer.

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

SPECIFICATIONS

Frequency Response:	-0.3dB 10Hz, -0.3dB 40kHz at rated output (Balanced, 100k ohms load)
THD+Noise:	<0.03% at 2V RMS BAL Output, 10Hz-80kHz Unweighted
Gain - Main output:	12dB Balanced output, 12dB SE output
Input Impedance:	25K ohms Balanced, 25K ohms SE
Output Impedance:	600 ohms Balanced, 375 ohms SE
Output Polarity:	SE - inverting. BAL - inverting
Crosstalk:	-76dB or better at 1kHz
Noise:	-77dBV at Full Output
Tube Complement:	(2)-6H30P dual triodes
Power Requirements:	100-135VAC 60Hz (200-250VAC 50/60Hz) 35 watts maximum. Standby: 4.4 watts.
Standby:	120VAC 60Hz 4.4W
Dimensions:	Width 19" (48.26 cm) Height 7" (17.78 cm) Depth 17.5" (44.45 cm) including knobs and rear bumpers
Weight:	33 lbs. (15 kg) Net; 48 lbs. (21.8 kg) Shipping.



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