User Guide

REFERENCE 10
Stereo Preamplifier

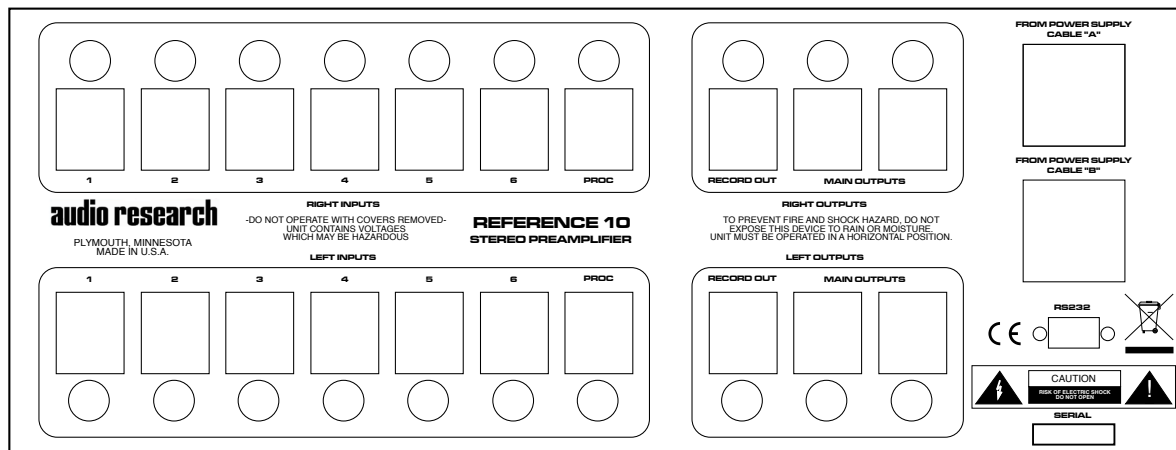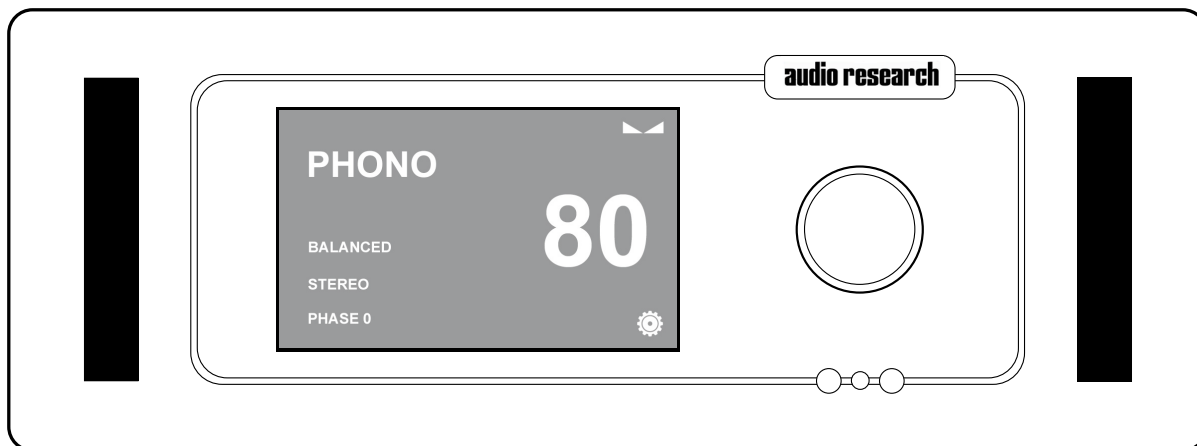**audio research**
H I G H   D E F I N I T I O N ®

Contents

Thank you for selecting the Reference 10 as part of your music listening system. The engineers and designers at Audio Research have spent countless hours of listening and testing to create a preamplifier of the highest caliber for music reproduction. The Reference 10 has been designed to provide you many years of playback.

Please take a few minutes to read through this guide to help you better understand and optimize your new preamplifier. If you have any questions regarding the operational functions, contact your dealer or distributor for assistance.
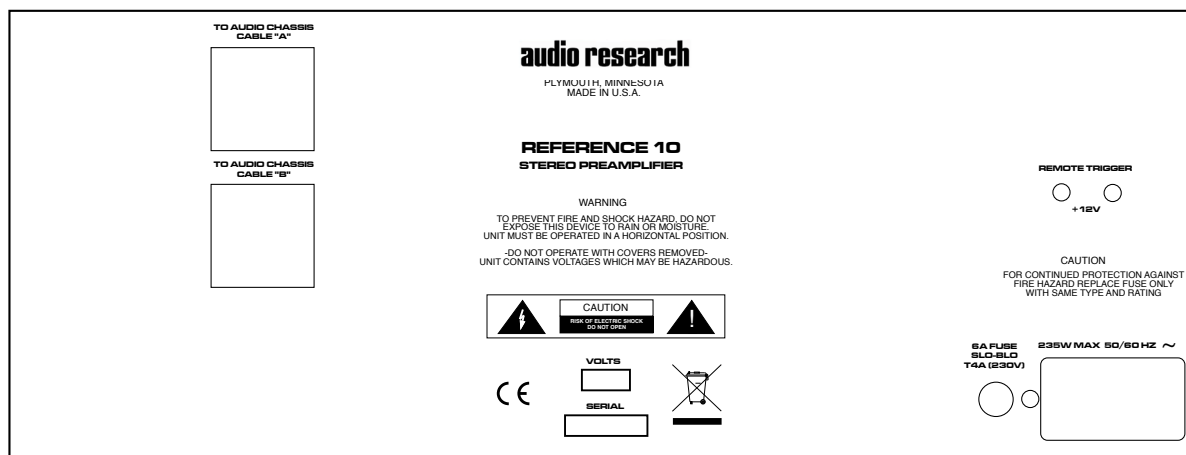
Sit back and enjoy your new preamplifier and the enhancements it will bring to your system. The Reference 10 will bring new life to your entire music collection.

Happy listening!

Audio Chassis

PHONO

80

BALANCED

STEREO

PHASE 0

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1   2   3   4   5   6   PROC

RIGHT INPUTS

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PLYMOUTH, MINNESOTA
MADE IN U.S.A.

-DO NOT OPERATE WITH COVERS REMOVED-
UNIT CONTAINS VOLTAGES
WHICH MAY BE HAZARDOUS

LEFT INPUTS

1   2   3   4   5   6   PROC

REFERENCE 10
STEREO PREAMPLIFIER

RECORD OUT   MAIN OUTPUTS

RIGHT OUTPUTS

TO PREVENT FIRE AND SHOCK HAZARD, DO NOT
EXPOSE THIS DEVICE TO RAIN OR MOISTURE.
UNIT MUST BE OPERATED IN A HORIZONTAL POSITION.

LEFT OUTPUTS

RECORD OUT   MAIN OUTPUTS

FROM POWER SUPPLY
CABLE "A"

FROM POWER SUPPLY
CABLE "B"

RS232

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

SERIAL

Power Supply Chassis

audio research

TO AUDIO CHASSIS
CABLE "A"

TO AUDIO CHASSIS
CABLE "B"

audio research

PLYMOUTH, MINNESOTA
MADE IN U.S.A.

REFERENCE 10
STEREO PREAMPLIFIER

WARNING

TO PREVENT FIRE AND SHOCK HAZARD, DO NOT
EXPOSE THIS DEVICE TO RAIN OR MOISTURE.
UNIT MUST BE OPERATED IN A HORIZONTAL POSITION.

-DO NOT OPERATE WITH COVERS REMOVED-
UNIT CONTAINS VOLTAGES WHICH MAY BE HAZARDOUS.

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

REMOTE TRIGGER

+12V

CAUTION

FOR CONTINUED PROTECTION AGAINST
FIRE HAZARD REPLACE FUSE ONLY
WITH SAME TYPE AND RATING

VOLTS

SERIAL

6A FUSE
SLO-BLO
T4A (230V)

235W MAX 50/60 HZ ~

To prevent fire, or shock hazard, do not expose your Reference 10 to rain or moisture.

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

The detachable power cord on your Reference 10 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 10 chassis to provide absolute protection from electrical shock.

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

The appliance coupler at the rear of this unit must be accessible for emergency power disconnect.

A note about packaging...
Save all packaging in a dry place away from fire hazard. Your Reference 10 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 Reference 10 from unnecessary damage or delay.

Installation of Vacuum Tubes

Before operating the Reference 10...
This unit has been shipped with the vacuum tubes installed in protective foam in a separate box packed inside the shipping carton. Remove the tubes carefully from the protective foam. Using a phillips-head screwdriver to loosen the fastening screws, remove the top cover and set aside.

After removing the top cover and the vacuum tubes packed in protective foam, see the accompanying illustrated sheet (fig. 1 + 2) for instructions on installing the tubes for your Reference 10 in their proper locations in the power supply and audio chassis. Note that the numbers written on each tube correspond to a 'V' number printed on the circuit board next to each tube socket. Insert each tube firmly, carefully aligning the tube pins with the corresponding socket holes.
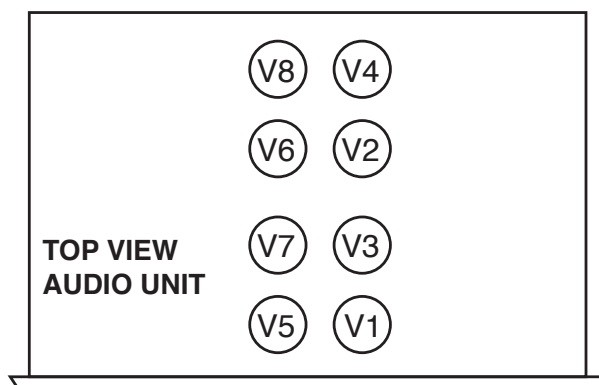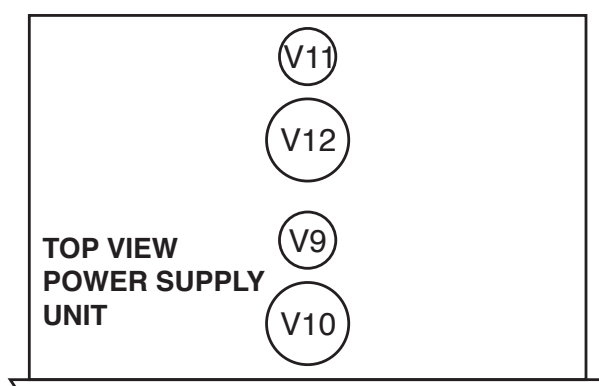
fig. 1

TOP VIEW
AUDIO UNIT

(V8) (V4)
(V6) (V2)
(V7) (V3)
(V5) (V1)

fig. 2

TOP VIEW
POWER SUPPLY
UNIT

(V11)
(V12)
(V9)
(V10)

In your System

While the Reference 10 does not dissipate an unusual amount of heat, it is important that it be provided with reasonable airflow to assure long, trouble-free operation. In addition, the following installation guidelines will help insure maximum sonic performance as well as reliable service:

Operate unit in upright and horizontal position, prefer-ably on solid, non-metal shelving.

Do not stack the preamp on top of a power amplifier: not only could this cause overheating, but hum may be introduced into the preamp from the proximity of the amplifier's power transformer.

Do not stack components or other objects directly on top of the Reference 10.

Do not place or operate your preamp on a soft or irregular surface such as a rug. This will prevent proper ventilation.

Do not operate your preamp without the top and bottom covers installed. These are required both for safety as well as shielding from interference (except in service operations by qualified personnel).

Ensure a minimum of 8-10" clearance above the unit when placed on shelving.

NOTE: Please do not connect the Reference 10 to a power source, or attempt to power up the unit, without first connecting the umbilical cables between the two chassis. Failure to follow this protocol can result in significant, non-warranted damage to the preamplifier.

Analog Connections

Input Connectors: The Reference 10 provides seven pairs of BAL/SE input connectors: 1, 2, 3, 4, 5, 6, and Processor. The BALANCED/SINGLE ENDED selector (touch screen) or BAL/SE (remote) should be selected to match the type of connection used (BAL or SE) on each input.
Connect either the BAL or SE connectors for each input. Never connect the BAL and SE connectors simultaneously for each input.

Output Connectors: Two pairs of BAL/SE main outputs are provided.

Record Output: The BAL/SE tape outputs should be connected to your recorder's 'Record' or 'Line' inputs. These outputs provide a fixed-level two-channel signal (L, R) to your recorder from whichever input is selected. The non-variable output level will be the same as the output of the selected source.
It is possible to dub or copy from one recorder to another by connecting the output of the source recorder to an unused set of stereo inputs (e.g. 5 or 6). The signal will then be routed to the Record Out connectors when that input source is selected.

RS-232 Connection: The RS-232 connection allows for remote control via systems such as Creston or other automation systems.

12V In/Out Start Jacks: The +12V DC input/output jacks provide the ability to remotely turn on and off other linked components such as power amplifiers having similar capabilities.

Power-Up Procedure

Secure all rear-panel connections between Reference 10, power amplifier(s) and input sources.

Plug three-prong power cord from rear of chassis into grounded A.C. wall outlet. The Power switch defaults to 'off' when the unit is plugged into a power receptacle.

Press power switch (either remote or front panel). The screen will initially display 'Now Loading' for a few seconds, after which it will display the Audio Research logo followed by 'Reference 10' (fig. 3 + 4). The main display screen will then appear on the screen, and 'MUTE' will be flashing. Once 'MUTE' becomes solid, depress the front panel MUTE button (right button) or touch the word 'MUTE' on the screen to initiate normal operation.

Select input source, then BAL or SE as necessary.

fig. 3

fig. 4

Shut-Down

Activate 'Mute' function.

Set Volume level to 0.

Turn off power amplifier(s).

Press Power switch to 'off'.

Turn off input sources.

Front Panel Controls

The Reference 10 has one microprocessor-driven rotary control and two buttons (Power and Mute).

Rotary control: Adjusts Volume (output level) up or down for both L and R channels, and adjusts the balance when the balance function is selected on the main screen. Volume control is also selectable via Vol UP and Vol DN buttons on the remote control. Volume adjustment is indicated in the display window by numeric digits on 0–103 scale.

Do not turn volume up beyond normal listening levels when 'mute' is engaged to avoid unexpected or possibly damaging sound levels. Reduce volume level whenever changing input sources, even when muted.

Power On/Off: (left button beneath rotary control) Supplies power from A.C. wall outlet to preamp; indicated by active display window.
The Reference 10 requires approximately 40 seconds to warm up; this time is required to stabilize the power supply. See 'Power-Up Procedure' on the adjacent page for details. The same cycle also occurs in the event of a power interruption.

Mute: (right button beneath rotary control) When activated, electrically mutes all output of the preamplifier; indicated by 'Mute' in display window. 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' disappears from the display window allowing normal operation.
The Reference 10 also has automatic muting to help protect system components during A.C. power interruptions or low line voltage. When sensing these conditions, the preamp automatically goes into 'Mute' and disables all outputs. The 40-second warm-up timer will restart and 'Mute' will flash in the display window when normal power conditions have been restored.
Note that automatic muting is only designed to protect against power line interruptions or severe voltage drop. It will not mute in the event of subsonic transmissions from a faulty input source, amplifier failure or speaker malfunction.

Remote Control only Functions

Input 1-6: Allows direct selection of each of the 6 inputs of the Reference 10.

Processor (PassThru): Selects external A-V (home theater) processor as input source and controller of volume level for R and L channels. Reference 10 provides Unity Gain when this input is selected.
When engaged, 'Pass Thru' will appear in the display, and the gain is fixed and not adjustable. The preamp will also mute the input after 'Pass Thru' is engaged.
Before unmuting the 'Pass Thru' input, be sure to turn the volume down on the home theater processor. Never connect a source with a fixed level output (DVD player, tuner, CD, etc.) to the 'Pass Thru' input or the amplifier(s) and speaker system could be damaged when the Reference 10 is unmuted.

BAL/SE: Select as appropriate for each input. For source components having balanced (XLR) connections to the Reference 10, select BAL. For single-ended (RCA) sources, select SE. Once selected for an input source, the setting is memorized.

Invert: Inverts absolute phase of the output signal.

Mono: Sums L and R input for mono output from any source selected.

Display Down/Display Up (DSP DN/DSP UP):   Decreases/increases display intensity, offering 6 levels of brightness and display 'off'. In display 'off' mode the display will illuminate for 10 seconds when any button (except Power on/off) is selected, allowing for control function navigation.

Balance (BAL L/BAL R): Adjusts balance left or right. Adjustment appears in display window as movable marker on bar graph. Useful for compensating for uneven speaker placement or imbalanced output from a phono cartridge.

Hours: When pressed, displays number of operating hours vacuum tubes have been in service. NOTE: After replacing tubes, this function should be reset to '0'. See further instructions under 'Hours Meter' in the section 'Interactive Touch Screen Operation' for details.

Interactive Touch Screen Operation

The Reference 10 has been designed with a 7" interactive touch screen for reliable and easy usage. The interface is programmed so that the desired item for change simply needs to be touched to either toggle between functions, or bring up a secondary menu for function selection.

Input Selection: To change inputs, touch the currently displayed input name on the screen. The input bar will appear, listing all seven input options. Touch the desired input to change (fig. 5).
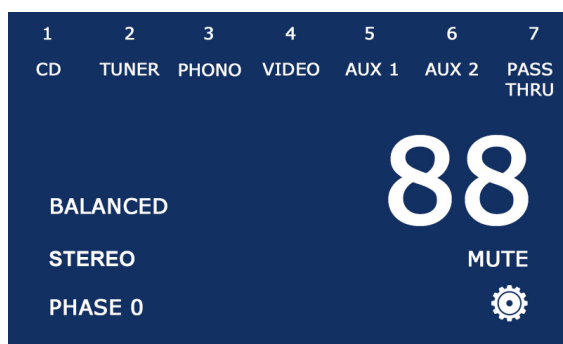

fig. 5

Balanced/SE, Stereo/Mono, Phase 0/180: To change any of these functions, touch the word you wish to affect and it will toggle between the two different options for each category (fig. 6).

fig. 6

Mute/Operate: Toggle mute on and off by touching the screen where 'MUTE' or 'OPERATE' is displayed. You may also use the right button beneath the rotary control to toggle between mute and operate.

Balance: Touch the balance icon located in the top right position of the screen (it appears as a double ramp). The balance slider will appear beneath the input name. Using the rotary control, adjust the balance as needed to right or left channels. When the balance is not at center, a '+' sign will appear to the right or left side of the balance icon indicating to which channel the balance is offset. To re-center balance, either use the rotary control to bring the balance back to center or touch the inverted triangle above the balance slider (fig. 7).
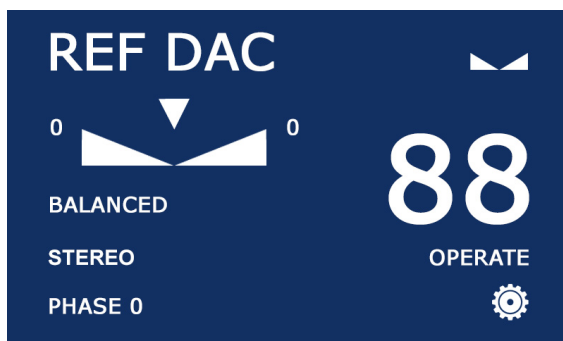

fig. 7

SETTINGS MENU

Touching the settings icon located in the bottom right of the screen (it appears as a gear) brings you to a submenu with different options related to the setup and functionality of the Reference 10 (fig. 8).
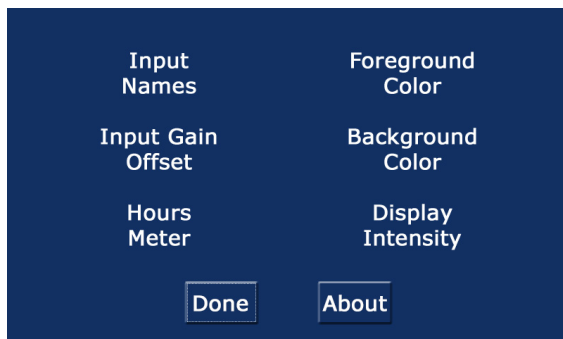

fig. 8

Input Names: Selecting Input Names will allow you to customize the names of each input on the Reference 10. Once selected, the input bar will appear at the top of the screen with an alphanumeric keyboard below it. To change the name of any input, simply touch the input until it is highlighted and type in the new name. When input naming is complete, select 'DONE' to go back to the settings menu.

Input Gain Offset: You may experience some devices playing consistently louder than others (for example, a CD player may always play louder than a turntable). In this event, the Input Gain Offset can be engaged to balance the overall volume between the differing inputs, alleviating the need to adjust the master volume when changing between inputs. The Input Gain Offset screen is designed so you can make adjustments easily to each input in real time. For best results, play all devices connected to the Reference 10 simultaneously, and from the Input Gain Offset page, change inputs by touching the input bar. If an input is louder or softer than another, use the up and down arrows to adjust accordingly (fig 9).

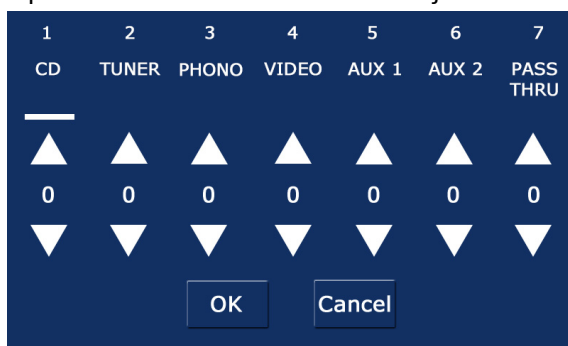| 1	2	3	4	5	6	7
CD	TUNER	PHONO	VIDEO	AUX 1	AUX 2	PASS THRU
▲	▲	▲	▲	▲	▲	▲
0	0	0	0	0	0	0
▼	▼	▼	▼	▼	▼	▼

OK   Cancel

fig. 9

Hours Meter: The Hours Meter displays the total number of hours the Reference 10 has been running. This is useful to gauge tube life and prepare for eventual replacement. The hours meter may be reset after the tubes have been changed by touching the 'Reset' button located in the bottom right of the screen.

Foreground/Background Color: The Reference 10 has ten color options for both screen background and text. Selecting either one of these options from the settings menu will allow you choose a new color to customize the display on your Reference 10. Please note that the currently selected color is not displayed in the choices shown, nor do you have the option to choose the same color for both the background and foreground (fig. 10).

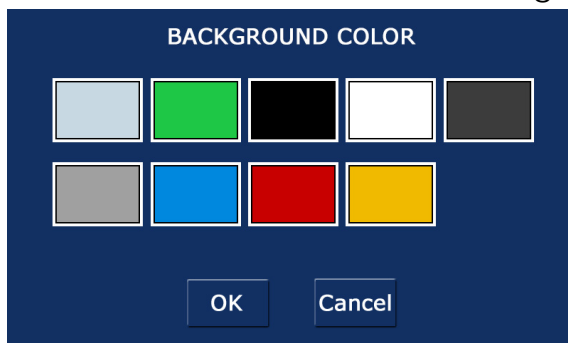BACKGROUND COLOR

OK   Cancel

fig. 10

Display Intensity: Display Intensity adjusts the backlight for the screen and its overall brightness. There are six levels plus 'off', with '6' being the brightest. When 'off' is selected, the display will remain on for 8 seconds and then shut off. To return illumination to the screen, simply touch it or press a button on the remote. When adjusting the brightness, the words 'Display Intensity' will reflect the overall setting seleted. The display intensity can also be adjusted from the remote using the 'DSP UP' and 'DSP DN' buttons.

About: Touching the 'About' button displays a screen with the current software version of the Reference 10. This information can be useful in the event the Reference 10 needs troubleshooting. In the bottom right of the About screen is a 'Defaults' button. Selecting the defaults button will return all settings in the Reference 10 as they were shipped from the factory. Please note that resetting the Reference 10 back to factory settings does NOT reset the hours meter.

Troubleshooting

It is possible for a static discharge to temporarily disable the microprocessor that allows the controls to function. If this should occur, depress the 'Mute' button, then turn off the preamp and unplug the preamp from the A.C. receptacle for 60 seconds. Reconnect the A.C. plug and turn the preamp back on, along with other components. The controls should resume normal operation. If the problem persists, contact your dealer or Audio Research Customer Service at 763-577-9700.

Servicing

CAUTION: Your Reference 10 contains sufficient levels of voltage and current to be lethal. Do not tamper with a component or part inside the unit. Refer any needed service to your authorized Audio Research dealer or other qualified technician.

The vacuum tubes inside your Reference 10 are quality tubes and with normal use should not need to be changed for approximately 4,000 hours of use. Replacement tubes should be of equivalent quality and are available from Audio Research. Note that tube numbers (V1, V2 etc.) match printed numbers next to tube sockets on circuit board.

Should service be necessary, please contact your Audio Research dealer, or Audio Research Customer Service at 763-577-9700.

Cleaning

To maintain the new appearance of this unit, 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 front panel. A small, soft paintbrush is effective in removing dust from bevels, the recessed nameplate 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, or may be obtained from the authorized retailer or from the Audio Research Customer Service Department. 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.

Frequency Response: +0 -3dB 0.1Hz to 200kHz at rated output. (BALANCED, 200k ohms load.)

Distortion: Less than .006% at 2V RMS Balanced output.

Gain: Main output (SE or BAL input): 12dB Balanced output, 6dB Single Ended output. Tape output: 0dB. (Processor input: 0dB Balanced)

Input Impedance: 120K ohms Balanced, 60K ohms SE, Inputs (7): 1, 2, 3, 4, 5, 6, PROCESSOR. (XLR and RCA connectors).

Output Impedance: 600 ohms Balanced, 300 ohms SE main (2), 20K ohms minimum load and 2000pF maximum capacitance. Outputs (3): 2 main, 1 tape (XLR and RCA connectors).

Output Polarity: Non inverting.

Maximum Input: 20V RMS maximum Balanced, (10V RMS SE).

Rated Outputs: 2V RMS (1V RMS SE) into 200K ohm balanced load (maximum balanced output capability is 30V RMS at less than 0.5% THD at 1kHz).

Crosstalk: -80dB or better at 1kHz.

Controls: Volume (104 steps). Push Buttons: Power, Mute, Interactive Touch Screen. Rear RS-232 control and IR input.

Power Supplies: Electronically regulated low and high voltage supplies. Automatic 40 sec. warm-up/brown-out mute. Line regulation better than .01%.

Noise: 1.7uV RMS residual IHF weighted balanced equivalent input noise with volume at 1 (109dB below 2V RMS output.)

Tube Complement: (8)-6H30P dual triodes, plus (2 each) 6550C and 6H30P in power supply.

Power Requirements: 100-135VAC 60Hz (200-20VAC 50/60Hz) 220 watts. Standby: 2.2 watts.

Dimensions: Width 19" (48 cm)
                      Height 7" (17.8 cm) (standard rack panel)
                      Depth 15.5" (39.4 cm)
Handles extend 1.5" (3.8 cm) forward of the front panels.

Weight: Audio Chassis: 23.6 lbs. (10.7 kg) Net; 33.3 lbs. (15.1 kg) Shipping.
                      Power Supply Chassis: 37.65 lbs. (17.07 kg) Net; 47.35 lbs. (21.48 kg) Shipping.

This unit is RoHS compliant

audio research

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FINE SOUNDS
G R O U P