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# Owner's Manual

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## Model BL2

INPUT CONTROLLER

**audio research**  
HIGH DEFINITION®

5740 GREEN CIRCLE DRIVE / MINNETONKA, MINNESOTA 55343-4424 / PHONE 612/939-0600 FAX 612/939-0604

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## Preface

Please take the time to carefully read this instruction manual prior to installation or use of your BL2 Input Converter. Because it is a highly advanced electronic instrument, there are several facts and procedures you should know before you place it in operation.

## Introduction

The Audio Research BL2 Balanced Line Driver – Input Converter is designed to accommodate music lovers who wish to use single-ended (RCA Connector) input sources – digital or analog – for the reproduction and enjoyment of music in their balanced-operation home audio systems.

The advantages of balanced operation have long been known to the audio engineering community. They include: the ability to run long interconnects without interference from noise on the AC line or sources of noise in close proximity to the cables. (motors, electronic components, etc.) This occurs because the ground currents are carried on a separate drain wire, isolated from the signal-carrying hot and neutral conductors. Better and simpler amplifier and line amp circuits can thus be utilized without need for phase inverters (required to cope with two-pin RCA type connectors).

The Audio Research BL2 balance Line Driver-Input Converter converts single-ended sources to true balanced operation. It uses innovative equal-path-length phase-splitter circuitry with the ability to accept up to five input sources, plus tape handling functions. Owners of Audio Research LS5 or LS2B Line Stage Amplifiers can thus continue to enjoy their existing single-ended sources (sounding their best driving the high 1.5 megohm input impedance of the BL2) and get tape handling convenience as well (listen to one source as you record from another).

The BL2 is housed in a first-rate Audio Research mechanical package with a 3½" H. by 19" W. face-plate. The BL2 is designed to stack neatly beneath the LS5 or LS2B, allowing easy connection with a single pair of half-meter balanced interconnects. Toggle switches control on-off manual muting, source/monitor and selection of Tape 1 or 2, while two rotary knobs control input source selection and, conversely, record output selection. Muting is automatic at turn-on and in brown-out conditions.

The BL2 is a truly unique product in design and function, unlike any other currently available. Sonically, you will find it has the purity, openness and neutrality that have become the hallmark of Audio Research.

Just as you would not purchase and attempt to operate an expensive camera, computer system or high-performance automobile without first learning something about performance parameters and correct operating procedures, so too your BL2 Input Converter requires some familiarization before you make it part of your music reproduction system. Your reward, in terms of maximum performance and a long services life, will be well worth the effort.

## Warnings

1. To prevent fire, or shock hazard, do not expose your BL2 to rain or moisture.
2. 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.
3. The power cord on your BL2 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 powerline grounding of the BL2 chassis to provide absolute protection from electrical shock.
4. For continued protection against fire hazard, replace the fuse only with the same type and rating as specified at the fuse holder.

## Packaging

Save all packaging in a dry place away from fire hazard. Your BL2 Input Converter 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 BL2 from unnecessary damage or delay.

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## Description of Controls

**INPUT SELECTOR:** Detents indicate selection of various source material options: "Tuner" for AM/FM radio tuners; "Video" for audio input from HiFi video tapes, disks or broadcasts; "Phono" for phono preamplifiers; "CD" for compact disc players or digital-to-analog processors; "Aux" for any additional high level source—tape, tuner, CD, video, etc.

**RECORD SELECTOR:** Detents mark selection of the source to be routed to recording equipment.

**NOTE:** See "Monitor/source" for primary tape recorder selection.

**POWER SWITCH:** Supplies power from AC wall outlet to BL2 when in "Power" position. Although not strictly necessary, it is nonetheless good practice to put the BL2 in "Mute" before turning on power for maximum protection of your power amplifier(s) and speakers.

**TAPE 1/ TAPE 2:** With the "Source/Monitor" switch in the "monitor" position, this switch selects the output of either tape machine for playback.

**MONITOR/SOURCE:** In "Monitor" position this control selects the audio output of the primary tape recorder. "Source" accesses the input selector's five high-level sources.

**MUTE/OPERATE SWITCH:** In "Mute" position, shorts the main outputs of the line stage amplifier to allow listening interruptions for telephone answering or other reasons. This switch should always be activated between listening uses or switching of inputs. This simple precaution will prevent inadvertent misuse of your BL2 and help protect your power amplifier(s) and speakers from unexpected transient signal pulses. In "Operate" position, this switch allows the signal to pass normally to the outputs.

**POWER/MUTING CIRCUIT LED;** Glows green to indicate unit is on and receiving power from the power supply. Note that for approximately 3 seconds after start-up or in "Mute" mode, this LED will glow more dimly, indicating proper operation of the muting circuit. In the "Operate" mode (after warm-up) the LED brightens and your BL2 is ready for normal operation.

## Connections

**INPUT CONNECTORS:** All are clearly marked to indicate use. The inputs are 1.5 megohm impedance.

**MAIN OUTPUT CONNECTORS:** There is one set of output connectors; They have (balanced) XLR type connectors. These should be connected to your Balanced-input Line Stage Amplifier..



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**NOTE:** The XLR connector pin leads are as follows: 1-shield; 2-positive; 3-negative. If used with a power amplifier which utilizes different pin leads for positive, negative and/or shield, the signal being fed to the loudspeakers will be incorrect. Please consult your Audio Research dealer.

At the performance level of the BL2, high-quality audio signal interconnect cables are critical to preserving maximum fidelity. Audio Research interconnect cables are highly recommended for connection to your power amplifier(s) and to other ancillary equipment. See your authorized Audio Research dealer for recommended lengths.

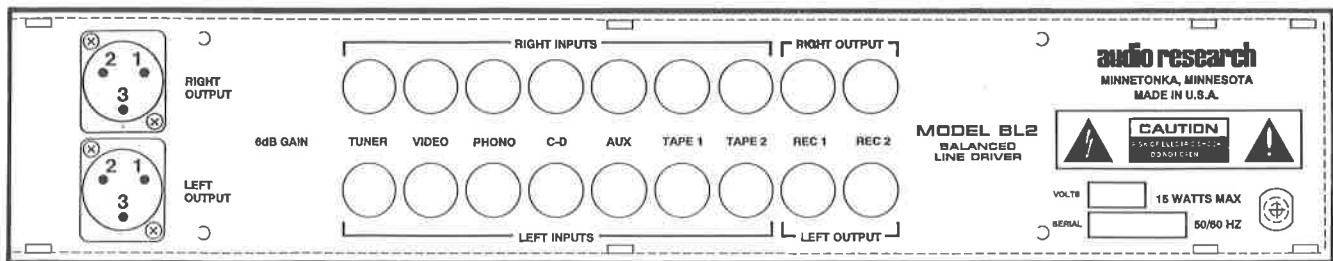
**TAPE OUTPUT CONNECTORS:** The BL2's Tape Outputs should be connected to your tape deck's "REC" or "LINE" inputs. These outputs supply whatever is selected by the Selector Control to the tape deck for recording. Level is non-variable and approximately the same as the selected input source.

## Installation Instructions

While the BL2 does not dissipate an unusual amount of heat, it is important that it be provided with reasonable airflow to assure long, trouble-free opera-

tion. In addition, the following installation guidelines will help insure maximum sonic performance as well as reliable service.

1. Upright and horizontal mounting is suggested if extended operation (longer than one hour) is contemplated.
2. Do not "stack" the BL2 on top of a power amplifier: not only could this cause overheating, but "hum" may be introduced into the BL2 from the proximity of the amplifier's power transformer.
3. Do not place or operate your BL2 on a soft or irregular surface such as a rug. This will prevent proper ventilation.
4. Do not operate your BL2 without the top and bottom covers installed. These are required both for safety as well as shielding from interference (except in service operations).
5. If rack mounting is employed, use Audio Research Rack Mount Ventilators (RMV-3) below and above your BL2.
6. If side-by-side mounting with other equipment is employed, place the BL2 to the left of the other chassis, so as to provide maximum spacing between the transformer of the BL2 and the other component.



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## Operating Procedure

### Start-Up:

1. Make sure Power switch is set to "Off" position; Mute switch should be in "Mute" position.
2. Secure all rear-panel connections between BL2, pre-amplifier and input sources. Note: Given the advanced performance capabilities of the BL2, it is extremely important that high-quality interconnects be used for connection to ancillary electronics. Audio Research brand interconnects, in either unshielded or RFI-shielded configurations, are strongly recommended. Your authorized Audio Research dealer can assist you in determining optimal lengths for your system.
3. Plug 3-prong powerline cord from rear of BL2 into grounded AC wall receptacle.
4. Turn Power switch to "On." Green LED will glow *dimly* for approximately 3 seconds while power supply stabilizes, indicating operation of automatic muting circuit. After this warm-up muting period, the LED will brighten when "Operate" is selected, indicating that your BL2 is ready for operation.

Note: For superior sonic performance, a warm-up period of at least one hour is recommended. In addition, your BL2 may be safely left "on" continuously for maximum performance at all times.

5. Rotate input selector to source desired; set switch options to positions desired.
6. Activate input source, then deactivate Mute switch.

### Muting Provisions:

The BL2 has several provisions to help protect against misuse of the exceptional dynamic range and wide bandwidth that it offers. It is not subject to damage itself, but some power amplifiers and speakers are more limited in their ability to withstand sig-

nal extremes. These provisions, both manual and automatic, are designed not to interfere with a flawless listening experience of unprecedented realism, while giving reasonable protection against warm-up surges and power line interruptions. However, for absolute protection of associated equipment some operator understanding, and responsibility, is required.

Initial "settling" time of all circuit parameters within the BL2 requires approximately 5 to 10 minutes. The automatic muting circuitry timer is adjusted for about 3 seconds. (This is because recurrent interruption "settling" time is much less. You would not want to wait for 5 to 10 minutes each time such an interruption occurred.)

The Mute/Operate Switch allows manual disabling of the BL2 outputs during the switching of equipment. Use of this switch will minimize stress on your amplifier even if it is "off". It is also highly recommended that manual muting be employed during the initial 3 second warm-up period as well as during turn-off for maximum protection.

While it is true that the automatic muting will provide reasonably adequate protection against speaker burnout during these periods, it has limitations. At the 3 second point the automatic timer "releases" the output. Although this is normally adequate protection, utilization of the manual mute provision will completely avoid stress to your speakers.

Some solid-state power amplifiers have a DC offset present at their input connections. (This, of course, should not be.) Operation of the manual muting switch with such an amplifier connected will result in a "click" or "pop" in your loudspeaker (commensurate in level with the amount of the offset) each time the switch is activated. Repair or replacement of such amplifiers is suggested.

# Limited Warranty

## Terms and Conditions

### 1. LIMITED WARRANTY

Audio Research warrants the product designated herein to be free of manufacturing defects in material and workmanship, subject to the conditions hereinafter set forth, for a period of three (3) years from the date of purchase by the original purchaser or no later than five (5) years from the date of shipment to the authorized Audio Research dealer, whichever comes first, excepting vacuum tubes which are warranted for 90 days only (See 6), and CD players or transports, which are warranted for two (2) years from date of purchase (four (4) years from date of shipment).

### 2. CONDITIONS

This Warranty is subject to the following conditions and limitations. The Warranty is void and inapplicable if the product has been used or handled other than in accordance with the instructions in the owner's manual, abused, or misused, damaged by accident or neglect or in being transported, or the defect is due to the product being repaired or tampered with by anyone other than Audio Research or an authorized Audio Research repair center. The product must be packed and returned to Audio Research or an authorized Audio Research repair center by the customer at his or her sole expense. Audio Research will pay return freight of its choice. A RETURNED PRODUCT MUST BE ACCOMPANIED BY A WRITTEN DESCRIPTION OF THE DEFECT AND A PHOTOCOPY OF THE ORIGINAL PURCHASE RECEIPT. This receipt must clearly list model and serial number, the date of purchase, the name and address of the purchaser and authorized dealer and the price paid by the purchaser. Audio Research reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any product without notice or obligation to any person.

### 3. REMEDY

In the event the above product fails to meet the above Warranty and the above conditions have been met, the purchaser's sole remedy under this Limited Warranty shall be to return the product to Audio Research or an authorized Audio Research repair center where the defect will be rectified without charge for parts or labor, except vacuum tubes (See 6).

### 4. LIMITED TO ORIGINAL PURCHASER

This Warranty is for the sole benefit of the original purchaser of the covered product and shall not be transferred to a subsequent purchaser of the product.

### 5. DURATION OF WARRANTY

This Warranty expires on the third anniversary (second for CD players and transports) of the date of purchase or no later than the fifth anniversary (fourth for CD players and transports) of the date of shipment to the authorized Audio Research dealer, whichever comes first.

## Warranty Outside the U.S.A.

Audio Research has authorized distribution in many countries of the world. In each country, the authorized importing retailer or distributor has accepted the responsibility for warranty of products sold by that retailer or distributor. Warranty service should normally be obtained from the importing retailer or distributor from whom you purchased your product.

### 6. VACUUM TUBES

Vacuum tubes are warranted for the original 90-day period only.

### 7. DEMONSTRATION EQUIPMENT

Equipment used by an authorized dealer for demonstration purposes is warranted to be free of manufacturing defects in materials and workmanship for a period of three (3) years from the date of shipment to the dealer, or two (2) years in the case of CD players and transports. Vacuum tubes are warranted for 90 days. After the first year, demo equipment needing warranty service must be packed and returned to Audio Research by the dealer at his sole expense. Audio Research will pay return freight of its choice. A returned product must be accompanied by a written description of the defect on an AUDIO RESEARCH RETURNED GOODS AUTHORIZATION form. Dealer-owned demonstration equipment sold at retail within three (3) years of date of shipment to the dealer is warranted to the first retail customer to be free of manufacturing defects in materials and workmanship for the duration of the 3-Year Limited Warranty remaining (as measured from the date of shipment of the equipment to the dealer); this period of warranty is two (2) years in the case of CD players and transports. Vacuum tubes are not warranted for any period under these conditions of sale. In the event warranty service is needed under these conditions, the owner of the equipment must provide a copy of his purchase receipt, fulfilling the requirements described under "2. Conditions" above. The product must be packed and returned to Audio Research or an authorized Audio Research repair center by the customer at his or her sole expense. Audio Research will pay return freight of its choice.

### 8. MISCELLANEOUS

ANY IMPLIED WARRANTIES RELATING TO THE ABOVE PRODUCT SHALL BE LIMITED TO THE DURATION OF THIS WARRANTY. THE WARRANTY DOES NOT EXTEND TO ANY INCIDENTAL OR CONSEQUENTIAL COSTS OR DAMAGES TO THE PURCHASER. Some states do not allow limitations on how long an implied warranty lasts or an exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

### 9. WARRANTOR

Inquiries regarding the above Limited Warranty may be sent to the following address:

Audio Research  
5740 Green Circle Drive, Minnetonka, Minnesota 55343-4424  
ATTN: Customer Services.

In the unlikely event of service required beyond the capability of the importer, Audio Research will fulfill the conditions of the warranty. Such product must be returned at the owner's expense to the Audio Research factory, together with a photocopy of the bill of sale for that product, a detailed description of the problem, and any information necessary for return shipment.

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The automatic muting operates as follows:

1. The manual mute switch always disables both "main" outputs and overrides any automatic provisions, even when the BL2 is turned off. (The "Operate" position of the manual mute switch is functional only when the unit is not in the automatic mute mode.)
2. The 3 second warm-up timer will restart automatically and the LED will dim if the power is temporarily interrupted for 0.1 second or more.

Note: Power supply regulation of the BL2 is effective down to 100VAC without serious sonic degradation.

3. The automatic muting of the BL2 is designed to be effective only against power line interruptions and power line failures. It will not mute against subsonic signal transmissions from your input source. *Proper Fusing of speakers is essential to protect against excessive audio level or power amplifier faults.*

## Shut-Down:

1. Set "Mute" switch to "Mute" position.
2. Turn off power amplifier(s).
3. Turn off all input sources.
4. Set BL2 Power Switch to "Off" position.

## Servicing

Because of its careful design and exacting standards of manufacture, your BL2 should normally require only minimal routine service to maintain its high level of performance.

**CAUTION:** Your BL2 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.

Should service be necessary, please contact your Audio Research dealer, or Audio Research Customer Service (612) 939-0600.

## Cleaning

To maintain the visual appearance of your BL2 line stage amplifier, occasionally wipe the front panel and top cover surfaces 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 "brushed" grain of the front panel finish.



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# Specification

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## Model BL2

**FREQUENCY RESPONSE:** dc to 500kHz. (-3dB point.)

**DISTORTION:** Less than .01% at 2V RMS output. (Typically less than .002% at 1kHz.)

**GAIN:** 6dB.

**INPUT IMPEDANCE:** 1.5 Megohms.

**OUTPUT IMPEDANCE:** 60 ohms balanced.

**OUTPUT DC OFFSET:** Less than 2mV dc.

**OUTPUT BEFORE CLIP:** 18V RMS out balanced (9V RMS input) 16V RMS into 600 ohm balanced load.

**NOISE:** Less than 18  $\mu$ V RMS balanced IHF weighted.

**INPUTS:** Tuner, Video, Phono, CD, Aux, Tape 1, Tape 2 (unbalanced).

**OUTPUTS:** Main (Balanced); Record 1, Record 2 (unbalanced).

**SWITCHES:** Record Select, Input Select, On/Off, Tape 1/2, Monitor/Source, Mute/Operate.

**POWER REQUIREMENTS:** 100-135VAC 60Hz (200-270VAC 50/60Hz) 15 watts maximum.

**DIMENSIONS:** 19" (48 cm) W x 3 $\frac{1}{2}$ " (8.9 cm) H (standard rack panel) x 11 $\frac{3}{4}$ " (29.8 cm) D Handles extend 1 $\frac{1}{2}$ " (3.8 cm) forward of the front panel. Rear chassis fittings extend  $\frac{9}{16}$ " (1.4 cm).

**WEIGHT:** 9.0 lbs. (4.1 kg) Net; 19.0 lbs. (8.6 kg) Shipping.

Specifications subject to change without notice.

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