



Owners Manual For The
Powerbloc
Series Amplifiers



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Owners Record

The serial number is located on the rear of the unit. Record this number in the space provided below. Refer to this when calling your dealer regarding this product.

Register your product at www.legacyaudio.com/register

Model: Powerbloc

Please Choose: Mono, 2 or 4

Serial No: _____

Date of purchase: _____

Thank you for listening with Legacy Audio. These hand-crafted instruments will provide you with many years of listening enjoyment.

Share your Legacy speakers/electronics with the Legacy community. Post your Legacy experience and system photos at facebook.com/legacyaudio . Like the page to receive the latest Legacy announcements.

Warranty

Legacy Audio supports its customers and products with pride. We cheerfully warrant our amplifiers from defects in materials and workmanship for a period of three (3) years. Please register your product with Legacy Audio. Should you require service Legacy will require a proof of purchase in order to honor the warranty - so please keep your receipt.

- The warranty applies to the original owner and is not transferable.
- The warranty applies to products purchased from an "Authorized Legacy Dealer".
- The warranty on active components such as digital processors or amplifiers is three (3) years
- The warranty on dealer stock will extend for a maximum of two years from invoice.

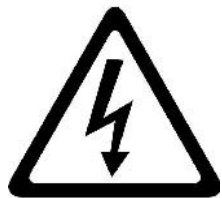
The warranty does not cover transportation costs of product to or from the customer, distributor or dealer, or related shipping damage.

Exclusions from Warranty

The following situations or conditions are not covered by the Legacy Audio warranty:

- Accidental damage, electrical abuse or associated equipment failure.
- Use inconsistent with recommended operating instructions and specifications
- Damage caused by modification or unauthorized service
- Costs associated with the removal and reinstallation of defective products. Consequential damage to other products.
- Normal wear such as fading of finishes due to sunlight.

Safety



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT USE THE AMPLIFIER NEAR WATER OR IN WET LOCATIONS, DO NOT EXPOSE IT TO RAIN OR MOISTURE, DO NOT EXPOSE IT TO DRIPPING OR SPLASHING FROM OTHER SOURCES, AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS (SUCH AS VASES) ARE PLACED ON IT. DOING SO MAY RESULT IN DAMAGE TO THE UNIT AND THE RISK OF ELECTRIC SHOCK, WHICH MAY RESULT IN BODILY INJURY OR DEATH.

WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE COVER. NO USER-SERVICEABLE PARTS INSIDE.

Do not block any ventilation openings.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.

The power cable should be unplugged from the outlet during severe electrical storms, or when unused for a long period of time.

Grounding: Adequate precautions should be taken so that the grounding provisions built into an electrical product are never defeated.

Care

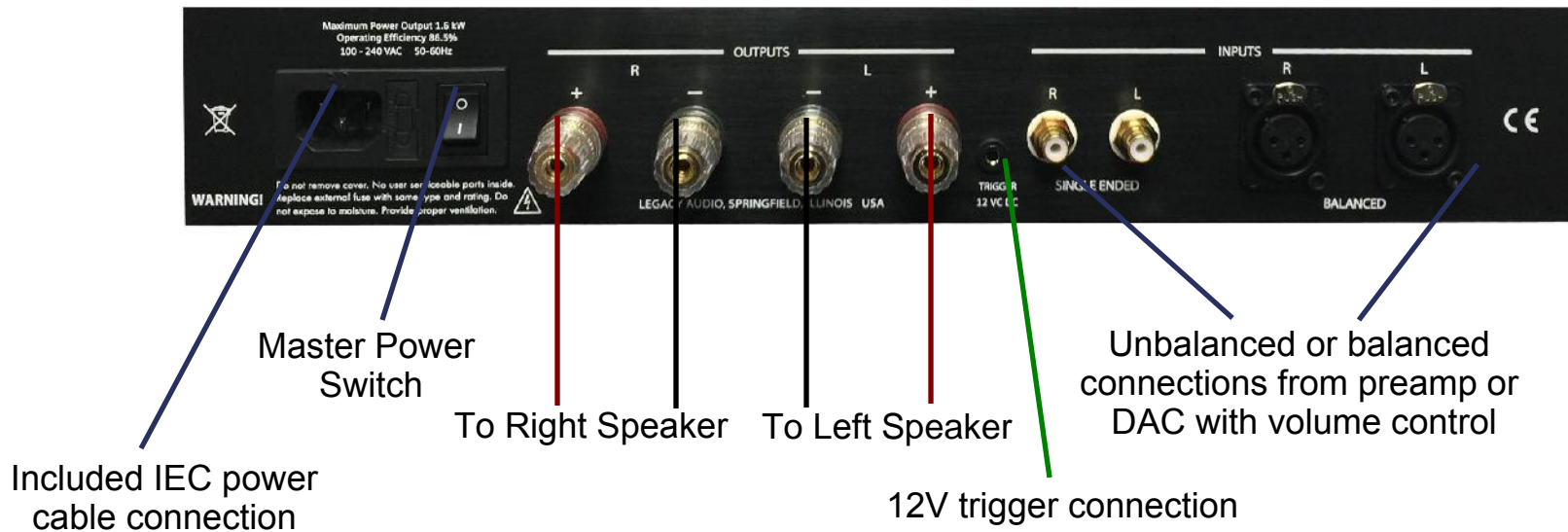
If you wish to clean your amplifier, use a diluted ammonia based window cleaner. Do not use any abrasive cleaners or chemical solvents. Take care not to damage the aluminum faceplate, since aluminum is a medium hardness metal and can be scratched by the careless use of tools during the installation. Save your box and packing material; they may be necessary for moving or shipping the unit.



Connections

Be certain all associated equipment is turned off before making any connections. Position your amplifier as near the final location as possible while leaving sufficient access to its rear panel connectors. To provide for adequate ventilation you should allow at least a couple of inches on each side of the amplifier. Check that the amplifier is turned off. Insert the power cord into the AC LINE INPUT on the back panel and then connect it to an appropriate power source.

Powerbloc2



Connections

Powerbloc4

To Positive Binding Post
Speakers 1, 2, 3, 4



Included IEC power
cable connection

Master Power Switch

To Negative Binding Post
Speakers 1, 2, 3, 4

12V trigger connection

Unbalanced or balanced
connections from preamp or
DAC with volume control

Connections

The Powerbloc Series of amplifiers uses a universal power supply. The included IEC power cable or any other IEC standardized cable can be utilized.

The 12V trigger allows your Powerbloc to interface with the rest of your system. The trigger can receive signals from your receiver, preamplifier or other gear, to toggle the Powerbloc power off and on with the rest of your system.



Switch toggled left = triggered on/off

Switch toggled right = always on

Powering Up

Make sure the master power switch at the back of the unit is on by pressing down on the (I). When the (0) is pressed down, the master power switch is off.

The control switch is located under the display window on the front panel. When the control switch is toggled to the left, triggered on/off is engaged so the power amp will power on when it receives a signal from the optional 12V trigger. When the power switch is toggled to the right, the power amp is always on.

Recommended power up sequence is source followed by preamp/processor, then your amplifier. Powering down should be done in reverse order.

Troubleshooting

Symptom	Probable Cause	Solution
No power Front panel not illuminated	Power cord is disconnected Rear panel power switch set to off '0' position Front panel switch toggled to left position, no 12VDC input AC fuse is blown	Connect power cord, verify at power strip Set rear panel switch to on '1' position Connect 12 VDC input from source If not using trigger, toggle front panel switch to right ON position Replace rear panel fuse with same rating.
Amplifier won't trigger on or off	DC trigger source wired in reverse or voltage too low	Test with 9 Volt batter
	Front panel switch toggled to right position	Toggle to left for triggered control
Power on, but no sound	Bad connection from preamplifier or controller	Check input connection or try a different cable or a different speaker
	Over-current protection circuitry has been activated	Check speaker load impedance. Check speaker wires and connections. Unplug amplifier for 30 seconds to reset
	No signal present	Play CD or other source verifying input selector on preamp. Streaming is less reliable for this test.
No sound from one or two channels Distorted sound	Internal fuse blown on channels' supply Internal fuse is degraded Shorting of output Rubbing speaker voice-coil Intermittent contact	Contact Legacy Audio at 800-283-4644 Check speaker cable connections Verify by driving speaker with different channel
Hum heard from speakers	Problem with preamplifier or source component	Disconnect inputs to amplifier with power off, then power on to verify
	Ground loop	Be sure amp is on same power circuit. Isolate with Ebtech HumX or other ground lifter
	Ground loop from cable TV	Install cable isolation device such as the Xantech 634 Ground Breaker. Refer to www.xantech.com
Top cover feels unusually warm	Inadequate ventilation	Allow 2" of open space above amplifier. Do not stack without forced air circulation

An Engineers Perspective: *by Legacy Chief Bill Dudleston*

Regarding the Powerbloc2 and Powerbloc4 Amplifiers, are they identical in build, excepting the number of channels?

Nearly. Both have dual 30 amp peak power supplies. However the Powerbloc4 shares a supply with two channels, whereas the Powerbloc2 dedicates a separate supply to each channel, thus providing greater output into impedances below 4 ohms. Circuit path is otherwise the same.

What prompted you to return to amplifier manufacturing?

We never really stopped. Besides the amplifiers built for us by CODA, we assembled our own amps for professional speakers and subwoofers for years. In 1998 we licensed high efficiency circuitry from LGT with conventional power supplies and massive transformers. We experimented with a vast range of designs for another 10 years before working with the early ICEpower designs. When you design with DSP, it is advantageous to provide powered channels and ICEpower had the first good sounding wide bandwidth units that offered high reliability.

Why did you choose ICEpower?

I should provide some history:

Nearly twenty years ago Karsten Nielson defended his PHD thesis to Malcom Hawksford on a new type of Class D amplifier design. At this time most class D amps were limited bandwidth (used in subs mostly). B&O hired Nielsen to run an 8 person R&D facility in Denmark to set new standards for Class D amps.

In 2001 the 'A' series amps brought high efficiency but limited sustained current. 2005 brought the 200ASC amps which caught the eye of audiophile designers like Jeff Roland. These modules had excellent sonic qualities but did not boast higher current supplies as built.

In 2014 ICEpower released the amplifier that I had been waiting for. This unit met their original design goals: distortion of 0.006%, bandwidth from 1Hz to 100kHz, the lowest of noise levels, no transformer hum, 83% efficiency and 30amps of peak current. This amp is the 700ASC and it has the industry's highest reliability thanks to an amazing regimen of tests (like 70g/12ms of acceleration applied in 6 directions, short circuit protection, RFI rejection, etc). Presently 80% of ICEpower's 50 employees are directly involved in research. The folks at ICEpower make up one of the most focused design groups that I have encountered.

An Engineers Perspective: *by Legacy Chief Bill Dudleston*

Have you looked at other designs?

Most definitely. The power on demand concept is not new. You might recall Carver's Magnetic Field design and Soundcraftsman's Phase Control Regulation, and some variations on Class H designs as much as 40 years ago. The power supplies were pretty soft and none of them sustained current for extended periods despite their clever designs at the time. Early Pulse Width Modulated designs (Class D) weren't considered high performance yet with their lower damping factor, impedance dependency, R.F. emissions, output filtering requirements, and slower switching rate. Now we have ICEpower, Hypex, Pascal, Abletech, Tripath's class T, BASH, etc., each with their variations on pulse width modulated designs. All of these designs had to address these 4 problems one way or another. I have tested all of these amps in my lab for extended periods. Tripath and Abletech are particularly cost efficient, and BASH is a hybrid of a Class D and Class AB design. ICEpower, Pascal and Hypex are well established in the pro world for durability and huge dynamics.

Even with the sophistication of these modern designs owing largely to semiconductor development, adequate execution is paramount for reliability. The failure rate on the subwoofer modules industry wide was pretty atrocious over the past decade as speaker manufacturers were looking for the greatest output/cost.

In the end the units with the highest quality capacitors, adequate heat sinking for the transistors, and ample transistor capability make for a lasting design and consistently clean, powerful sound.

We chose the ASC 700 modules for these very reasons. Extremely durable and very capable in to our high power handling loudspeakers, most of which are 4 ohm. These amps are built to last.

To the listener what ultimately matters is the sound. We found this amplifier can hold its own with the best amplifiers today. We install up to four of these units into the flagship DSP controlled Legacy V speaker system. That's the strongest endorsement I can give it.

Designer Notes

The Powerbloc series amplifiers utilize three of the most important advances in modern amplifier design. Among the qualities of these technologies, feedback is delivered directly at the output of the amplifier to provide very low output impedance, resulting in a much higher damping factor for precise bass control superior to most Class AB designs. The result is a stable, efficient, wide-bandwidth amplifier with effortless dynamics.

Intelligent Switch-mode Power Supply with superior control of the amplifier section. Proprietary chip design assures smoother interaction.

Controlled Oscillating Modulator provides a self-oscillation closed loop system that suppresses non-linearities in the output stage delivering a very high power supply rejection ratio. The ICEpower's 60 dB PSRR compares to the 0 dB in a basic Class D design, while both modulation and regulation are accomplished in the same block.

Multivariable Enhanced Cascade Control applies a secondary feedback loop after the output filter, compensating the non-linearities of the output filter itself while the inner loop compensates the modulator and power stage.

ICEpower Features

Universal Mains SMPS (85 - 264VAC, 47Hz - 63Hz)

Balanced inputs and outputs

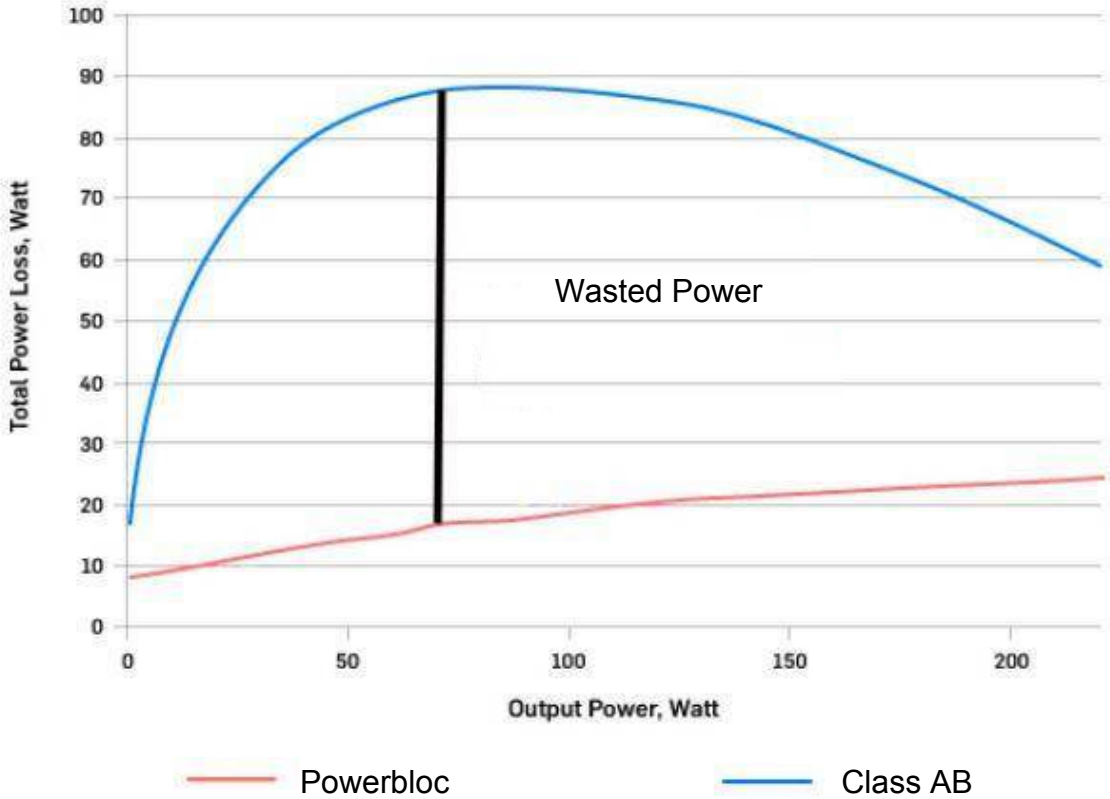
Comprehensive protection scheme (thermal, over-current, high-frequency, under-voltage)

Mechanically rugged construction (Tested for 70G shocks in six directions)

Pre-approved for Safety, EMC and RoHS compliance

Designer Notes

Power loss of the Powerbloc amplifier and power loss of a Class AB amplifier with highest theoretically possible efficiency



Specifications for Powerbloc2

Power Output:	325 watts per channel x 2 @ 8 ohms, 650 watts per channel x 2 @ 4 ohms
Inputs:	2 balanced XLR, 2 unbalanced RCA
Outputs:	2 pair gold plated safety approved five-way binding posts
Damping factor:	1,000< 1kHz
Voltage Gain:	27.4 dB
Dynamic Range:	117 dB
Peak Current:	30 amps/channel
THD:	0.005% at rated output
TIM:	0.0045% at rated output
Dimensions:	3" H x 17" W x 14" D
Unit Weight:	13 lbs
Shipping Dimensions:	9" H x 22" W x 18" D
Shipping Weight:	18 lbs

Specifications for Powerbloc4

Power Output:	325 watts per channel x 4 @ 8 ohms, 650 watts per channel x 4 @ 4 ohms
Inputs:	4 balanced XLR, 4 unbalanced RCA
Outputs:	4 pair gold plated safety approved five-way binding posts
Damping factor:	1,000< 1kHz
Voltage Gain:	27.4 dB
Dynamic Range:	117 dB
Peak Current:	30 amps shared channels 1,2 and 30 amps shared channels 3,4
THD:	0.005% at rated output
TIM:	0.0045% at rated output
Dimensions:	3" H x 17" W x 14" D
Unit Weight:	15 lbs
Shipping Dimensions:	9" H x 22" W x 18" D
Shipping Weight:	22 lbs

CE Declaration of Conformity

Legacy Audio

3023 E. Sangamon Ave.
Springfield, IL 62702 USA
800-283-4644

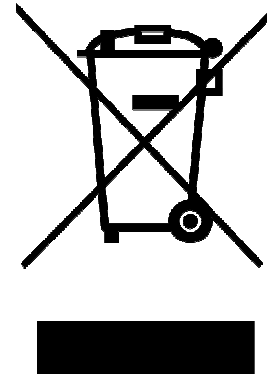
States that this product is in conformity with the essential requirements and other relevant provisions of:

Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC



All information contained in this manual is accurate to the best of our knowledge at the time of publication. In keeping with our policy of ongoing product improvement, we reserve the right to make changes to the design and features of our products without prior notice.

WEEE Compliance



Product Disposal—
Certain international, national and/or local laws and/or regulations may apply regarding the disposal of this product. For further detailed information, please contact the retailer where you purchased this product or the Legacy Audio Distributor in your country. A listing of Legacy Audio Distributors can be found on the Legacy Audio website www.legacyaudio.com or by contacting Legacy Audio at: 3023 E. Sangamon Ave., Springfield, IL 62702, USA—Phone: +1 217 544-3178.

Notes:



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