



Boulder 2008 Isolated Preamplifier

Owners Manual

V1.1 5/21/02

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APPENDIX

RECORDING

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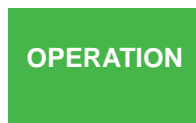
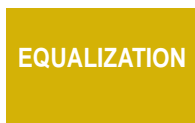
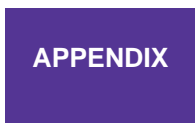
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CARTRIDGE SETUP

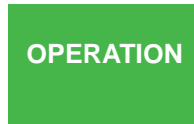
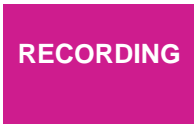
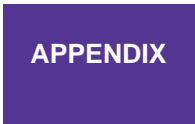
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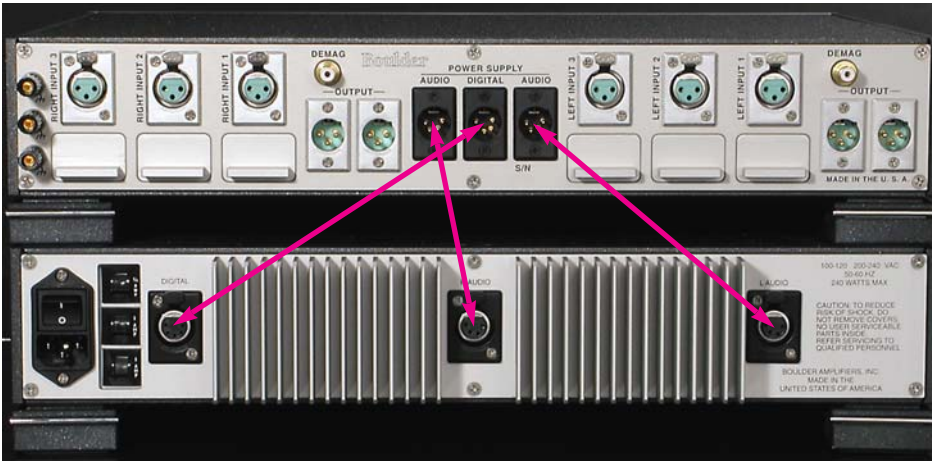
GETTING STARTED

PLACEMENT OF THE 2008 PHONO PREAMPLIFIER

Your Boulder 2008 Preamplifier is designed to reduce interference from external magnetic and radio fields (RF). While placement is not critical, known magnetic fields should be avoided. Power transformers in other pieces of nearby equipment, including the 2000 Power Supply should be kept away by 2 feet or more.

Because the preamplifier and its power supply are heavy, a solid, stable surface should be used. As both will generate some heat, they should be allowed to have good air circulation around them. In particular, make certain that the fins on the rear of the supply are not blocked.

You may want to have some access to the rear panels for cable changes.



CONNECTING THE POWER SUPPLY TO THE 2008

Your Boulder 2008 Phono Preamplifier is supplied with a Boulder 2000 Triple Power Supply. Each of the three supplies is independent of the others except for the front panel LED which confirms correct power supply operation of all three supplies.

Three cables are provided for connecting the power supply to the main chassis. Two of these cables have 4 pin connectors and are used for connecting the left and right audio supplies ($\pm 27V$). The third one

has 5 pin connectors and is used for the digital supplies (+5V).

Care must be taken not to confuse these as any attempt to insert the wrong connector will result in a damaged connector.

WARNING: Connect and disconnect these cables only with the power supply turned off for at least 1 minute.

CONNECTING TO THE MAINS OUTLET

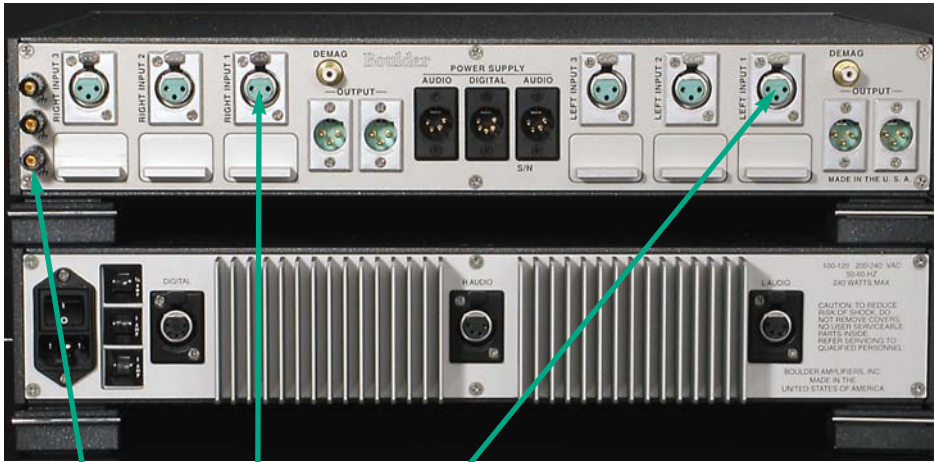
Your 2000 Power Supply is supplied with a mains cord suitable to the location where it was purchased. Make certain that the “O” is pushed on the rocker switch before connecting to your mains.

One of the features of the 2000 is its universal automatic voltage-selecting power supply. Simply plug it into any standard outlet. (Exact voltage and frequency compatibility is stated in the specifications section.)



1-3

GETTING
STARTED



CHASSIS
GROUND
TERMINALS

RIGHT
INPUT #1

LEFT
INPUT #1

CONNECTING TO A TURNTABLE

Balanced inputs are provided for connecting up to three turntables to the 2008. To avoid hum pickup in the cabling, it is important to follow these instructions.

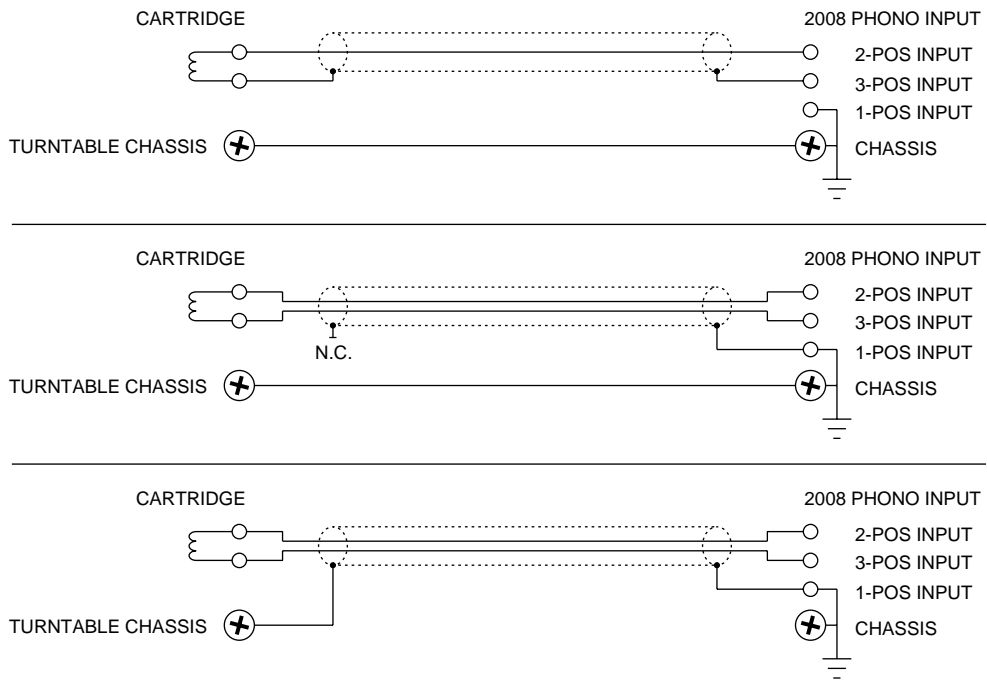
Do not connect pin 1 (chassis/ground) to either pin 2 or 3 at any point in the cable, turntable chassis, or tonearm. Pins 2 and 3 must only connect directly to the cartridge pins. This can be accomplished by several wiring schemes shown on the next page.

Do not use the Boulder ABL2 input adapter or other “standard” RCA Phono to XLR adapter because they connect pin 1 to pin 3. These are intended only for line level use.

Use either a connection from pin 1 to the turntable chassis or a wire from the CHASSIS screw terminal to the turntable chassis. Using both might form a ground loop which will create hum.

One pair of Boulder PHRCA Adapters are provided. These will convert 2008 inputs to RCA and give acceptable performance. A separate ground wire is provided. However, obtaining a dedicated cable with a connector specifically for your tonearm and with 3-pin connectors is preferred.

PHONO CABLES





RIGHT
OUTPUTS

LEFT
OUTPUTS

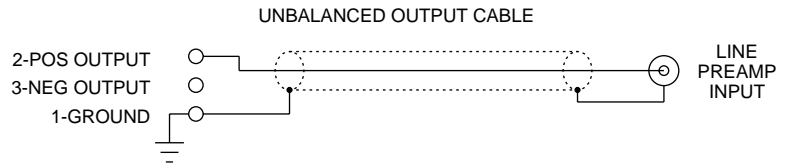
CONNECTING TO A BALANCED INPUT PREAMPLIFIER

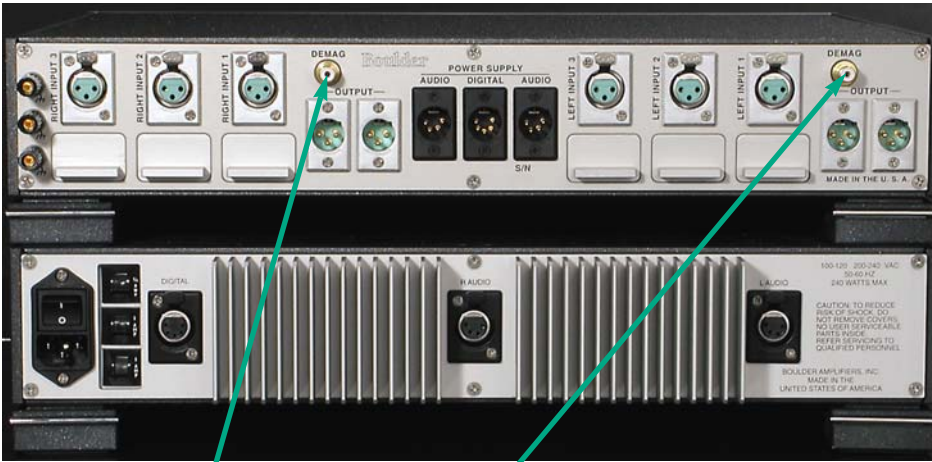
For maximum sonic advantage, connect your 2008 Preamplifier's balanced outputs to balanced inputs such as provided on the Boulder 2010 Preamplifier. With the 2008's low output impedance, distances of more than 50 meters between Phono Preamplifier and Line Preamplifier are practical. Connect each preamplifier input to the connectors labeled "OUTPUT."

CONNECTING TO AN UNBALANCED INPUT PREAMPLIFIER

A special cable is required to make this connection. This cable connects pin 1 to the shield and pin 2 to the center pin. It leaves the output pin 3 unconnected.

Connecting the unused output pin (usually pin 3) to ground will cause excessive ground currents and degrade performance. Use an ohmmeter or continuity checker to determine how a cable is wired.





RIGHT
DEMAGNETIZER
JACK

LEFT
DEMAGNETIZER
JACK

CONNECTING A CARTRIDGE DEMAGNETIZER

The Boulder 2008 Phono Preampifier has RCA jacks for connecting your cartridge demagnetizer. Connect each channel of the demagnetizer to the left and right jacks labeled DEMAG.

For further instructions, see page 2-2 and 3-5, or consult your Boulder dealer.

CARTRIDGE SET UP

PERSONALITY CARD

Each 2008 input has two slots for personality cards, one for left, and one for right channels. The cards serve two functions— switches to set the electronics for the type of cartridge used at that input, and places to solder the custom load termination resistor and capacitor.

The 2008 is shipped with all 6 cards installed in the rear panel and 4 additional spare cards.

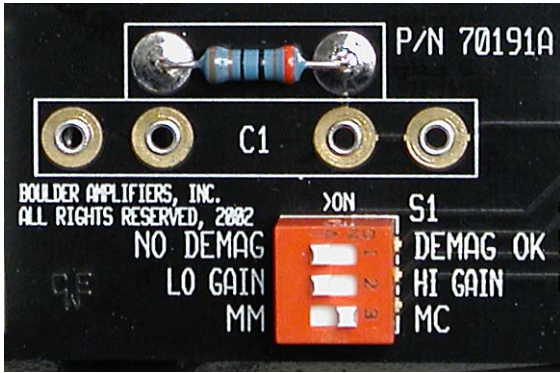
The cards installed for inputs 1 and 2 are set to HI GAIN and MC, and have a load resistor installed to set the input impedance to 100Ω. These are the most commonly used settings for a MC cartridge.

The cards installed for input 3 are set to HI GAIN and MM, and have no additional load resistor thus leaving the input impedance at 47KΩ. These are the most common settings for a MM cartridge.

WARNING: Press the POWER pushbutton until the POWER indicator is off before removing or inserting the personality card. Failure to do so might result in very loud clicks.

To remove, pull the card firmly. To insert, push the card until it completely seats into the connector and the face is flush to the panel.





MOVING COIL OR MOVING MAGNET SELECTION

Set the bottom switch to either Moving Coil (MC) or Moving Magnet (MM) depending on your type of cartridge.

In the MC position, the maximum input resistance is 1000Ω without additional components installed on the card. Two of the cards are shipped with a resistor to bring the impedance down to 100Ω, which is recommended for MC. Also in the MC position, an additional low noise, 20 dB gain stage is inserted at the input.

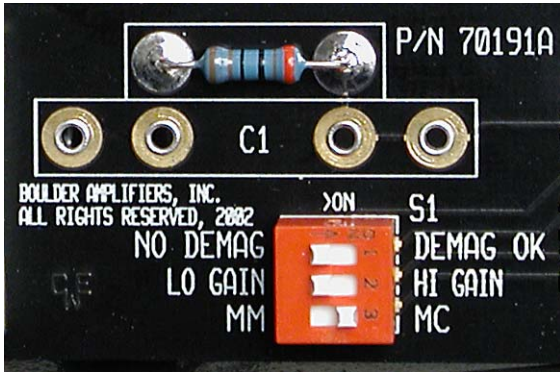
In the MM position, the maximum input resistance is 47K Ω without additional components installed on the card. This is the impedance recommended for MM.

GAIN SELECTION

The middle switch marked LO GAIN, HI GAIN adjusts the output stage gain by 10 dB. This switch is used to more closely match your preferred volume setting on your line preamplifier.

When using modern very low output cartridges, it is recommended to try setting this switch to HI GAIN.

If in doubt about a setting, try the HI GAIN position first. If you find that you are having to reduce the volume on your line preamplifier more than usual, then you might try the LO GAIN position to ensure you are not overloading the input of your line preamplifier.



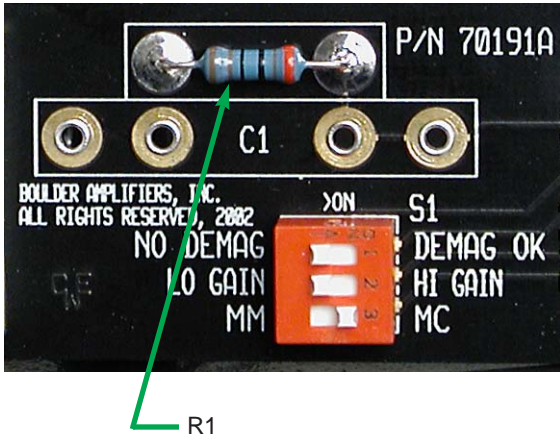
DEMAGNETIZER SELECTION

A DEMAG connector for your cartridge demagnetizer is provided on the rear panel. If you want to allow demagnetization of the cartridge connected to a particular input, set the top switch to DEMAG OK. Otherwise, set it to NO DEMAG.

Only the inputs which have the switch set to DEMAG OK will be connected to the DEMAG connector when the DEMAG indicator is red.

WARNING: Do not demagnetize a MM cartridge.

**CARTRIDGE
SET UP**



CARTRIDGE LOADING – RESISTIVE

For MC cartridges, the maximum resistive load is 1,000 Ohms. This is the value when there is no resistor added to the Personality Card. This value may be lowered by adding a resistor (as shown) at R1 whose value is calculated by the following:

$$R1 = 1 / (1 / R_{\text{DESIRED}} - .001)$$

Some typical values are:

Desired R (Ω)	R1 (Ω)
50	52.3
100	110
200	249
500	1,000

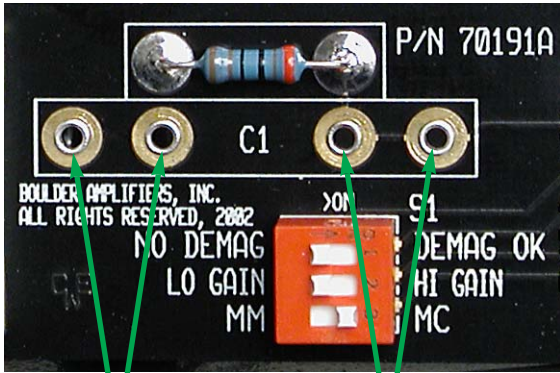
For MM cartridges, the maximum resistive load is 47,000 Ohms. This is the value when there is no resistor added to the Personality Card. This value may be lowered by adding a resistor (as shown) at R1 whose value is calculated by the following:

$$R1 = 1 / (1 / R_{\text{DESIRED}} - .0000213)$$

Some typical values are:

Desired R (Ω)	R1 (Ω)
1,000	1,020
5,000	5,620
10,000	12,700
20,000	34,800

**CARTRIDGE
SET UP**



CONNECT CAPACITOR
FROM ONE LEFT HOLE
TO ONE RIGHT HOLE

CARTRIDGE LOADING – CAPACITIVE

The 2008 Phono Preamplifier inputs have only “parasitic” capacitance of less than 50 pF directly across the cartridge inputs. If desired, additional capacitance can be added on the personality card at C1. The capacitor chosen should be 50 pF less than the desired value.

Solder holes are provided for two different size capacitors. There are two pairs of holes as shown, two at left and two at right. Each pair is connected together. The capacitor need be soldered to only one of the left and one of the right holes.

All solder holes have grommets to reinforce the PC board when parts are installed and removed. Do not remove these grommets.

BOULDER SUGGESTS: While there are some cartridge manufacturers who recommend using capacitive loading, we suggest that you do not do so. Adding more capacitance only lowers the resonant frequency of the capacitor and the cartridge winding inductance, particularly with MM cartridges. The resonance peak is still just as high and destructive to the sound.

Instead, try a lower resistor value; the lower the value, the “heavier” the load and the lower the resonance peak (not frequency) thus giving better dampening to the cartridge.

With low level MC cartridges, there is virtually no effect of capacitive loading because the cartridge output impedance is inherently very low.

OPERATION

POWERING UP

With all your connections made, you are ready to listen to your Boulder 2008 Phono Preamplifier.

Push on the upper portion of the rocker switch on the rear panel of the 2000 Triple Power Supply. The indicator on the supply will first turn red, then amber.

The indicator will be amber during normal operation. If for any reason, any of the power supplies' voltages are low, the indicator will change to red.

Press the POWER pushbutton on the front of the 2008. The POWER indicator will be amber. The MUTE indicator will be red and the output will be muted for the first 3 seconds.

The front panel POWER pushbutton can be used for everyday turn on and off. This pushbutton mutes the outputs, turns off the audio electronics, and puts the 2008 in a standby mode.

If you are going to turn off the 2000 power supply, it is highly recommended to turn off the 2008 by pressing the POWER pushbutton first causing the POWER indicator to be off.



3-1

OPERATION



INPUT SELECTION

The Boulder 2008 Phono Preamplifier provides inputs for 3 cartridges. These can be from one or more turntables. Only one of these inputs can be used at a time.

Select an input by pressing one of the pushbuttons labeled ONE through THREE. The 2008 will immediately mute the outputs and the MUTE indicator will be red for 3 seconds. After that time, the output will be unmuted and the MUTE indicator will be off.

Anytime a different input is selected, the 2008 will similarly mute for 3 seconds.

It is not recommended to select an input that has no cartridge connected. Make connections to an input first and then select the input. If it is necessary to have all inputs disconnected, then mute the preamplifier temporarily.



MONO

To enhance monaural recordings, it is often desired to mix the left and right channels together to form a true monaural signal. In the 2008 it is possible to do this at the output of both channels by turning on MONO mode.

Pressing the MONO pushbutton will place the 2008 into monaural mode and the MONO indicator will be red.

To return to normal stereo operation, again press the MONO pushbutton. The MONO indicator will be off.

3-2

OPERATION



EQUALIZATION

The Boulder 2008 Phono Preamplifier provides the standard RIAA record equalization curve and two optional curves. The optional curves are achieved by installing PC cards. See the Equalization section for more details. The EQ1 and EQ2 pushbuttons only operate if the cards are installed.

Select an equalization curve by pressing one of the pushbuttons labeled RIAA, EQ1 or EQ2. The 2008 will immediately mute the outputs and the MUTE light will be red for 3 seconds. After that time, the output will be unmuted and the MUTE indicator will be off.

Anytime a different equalization is selected, the 2008 will similarly mute for 3 seconds.

If the chosen equalization curve is RIAA, the RIAA indicator will be amber. If the chosen equalization curve is either EQ1 or EQ2, its respective indicator will be red.





LOW CUT FILTER

The Boulder 2008 Phono Preamplifier uses a 3 pole (18 dB/octave) low cut filter which may be switched to one of 3 frequencies or completely out (off). The frequency response will be -3 dB at either 5, 10 or 20 Hz.

Because this filter is fairly steep, its effect is virtually negligible in the audio band. It is recommended that it be kept turned on in order to avoid excessive woofer travel caused by imperfect records.

Select a low cut frequency point by pressing one of the pushbuttons labeled 5 HZ, 10 HZ, or 20 HZ. The chosen frequency indicator will be amber.

To completely turn off the filter, press the pushbutton labeled OUT. The OUT indicator will be amber and none of the frequencies' indicators will be illuminated.

WARNING: Due to some low frequency content of many recordings, care should be taken in regard to volume level when changing low cut filter frequencies as there may be some audible transient (click). This effect is normal.



CARTRIDGE DEMAGNETIZATION

Various moving coil cartridge manufacturers have an accessory box used to demagnetize their particular cartridge. The Boulder 2008 Phono Preamplifier provides a convenient way to connect your cartridge to its demagnetizer.

WARNING: It is best to turn the volume completely down during the demagnetization process.

To demagnetize your cartridge, make certain that the demagnetizer used for that *particular* cartridge is connected to the DEMAG connectors on the rear panel. Also, one or both of the switches on the personality card (see pg. 2-2) for that input must be set to DEMAG OK, otherwise the DEMAG pushbutton will not function.

Select the input connected to that cartridge by pressing its corresponding pushbutton. Press the DEMAG pushbutton. This will mute the 2008 output, the DEMAG and MUTE indicators will be red, and your cartridge will be connected to your demagnetizer.

Now you can activate your demagnetizer as per your cartridge manufacturer's instructions. When the demagnetizer's cycle is complete, press the DEMAG again. The DEMAG indicator will turn off, the cartridge will be reconnected to the 2008's input. After 3 seconds, the MUTE indicator will turn off and the 2008 will be unmuted.

WARNING: Use of this feature is at your own risk. Boulder Amplifiers, Inc. assumes no responsibility for damaged cartridges.



MUTE

The Boulder 2008 Phono Preamplifier provides an output mute feature which is turned on by two different methods.

First, the outputs are muted for three seconds when the 2008 is first turned on or an input or equalization pushbutton is pressed. Also, it will be muted when the demagnetization feature is on and for 3 seconds afterwards. The MUTE indicator will be red.

Second, the outputs may be muted at any time for your convenience by simply pressing the MUTE pushbutton. the MUTE indicator will be red.

To unmute, press the MUTE pushbutton again. The MUTE indicator will turn off and the outputs will unmute unless there has been a 3 second cycle initiated by the first method above. In that case the outputs will remain muted and the MUTE indicator red until that timeout has finished.

When the POWER pushbutton is used to turn off the 2008 or there is no power, the outputs will mute by de-energizing the unmute relay.

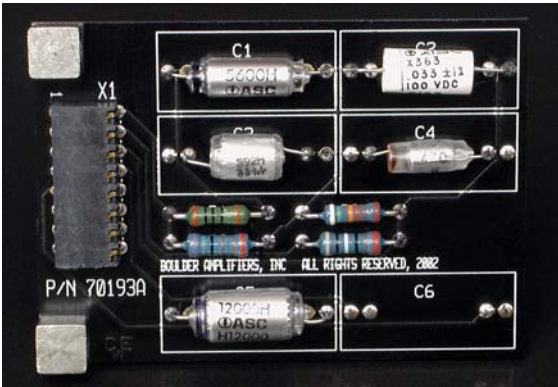
EQUALIZATION

EQUALIZATION CARDS

The Boulder 2008 Phono Preamplifier uses one of three equalization curves selected by the front panel pushbuttons labeled RIAA, EQ1, and EQ2. The 2008 is shipped with the RIAA as standard. Optional equalizations may be purchased and installed by your Boulder dealer. These are PC cards which are installed into the EQ1 and EQ2 positions.

If no card has been installed, the EQ1 or EQ2 pushbuttons will not function.

The following pages show the five equalization curves, including the standard RIAA, available from Boulder as an option. All graphs are referenced to 0 dB at 1 kHz. For other curves, consult your Boulder dealer.

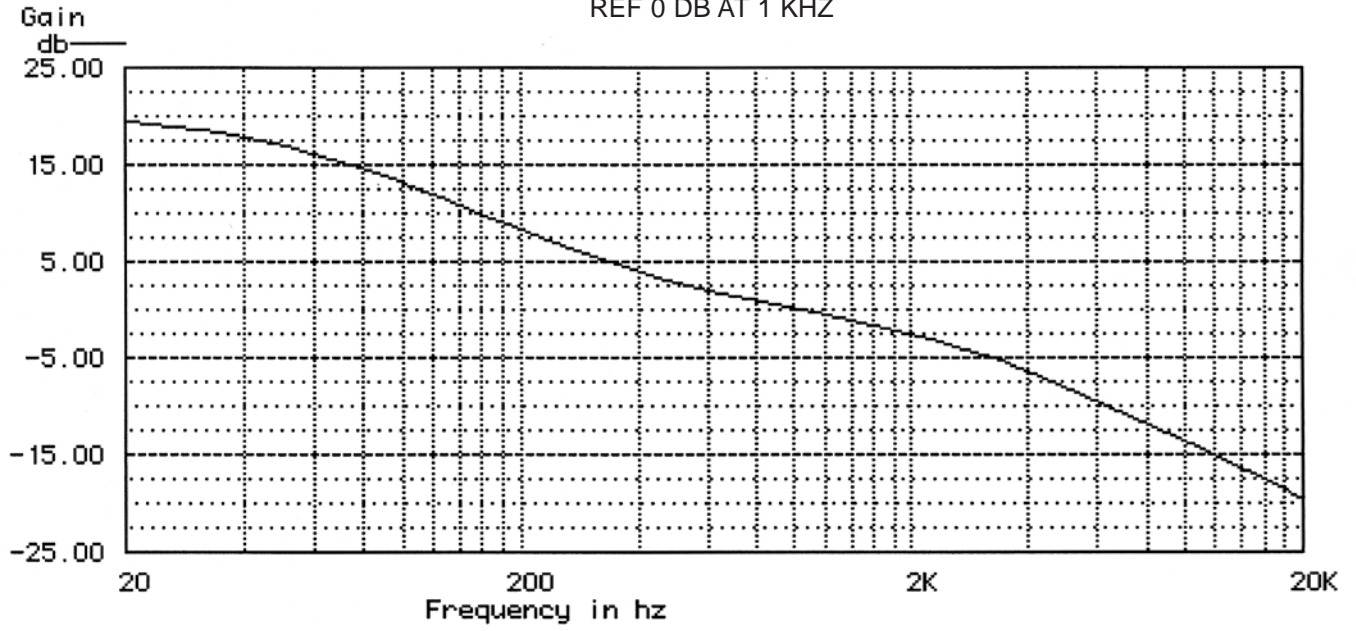


4-1

EQUALIZATION

RIAA REPRODUCE EQUALIZATION

REF 0 DB AT 1 KHZ

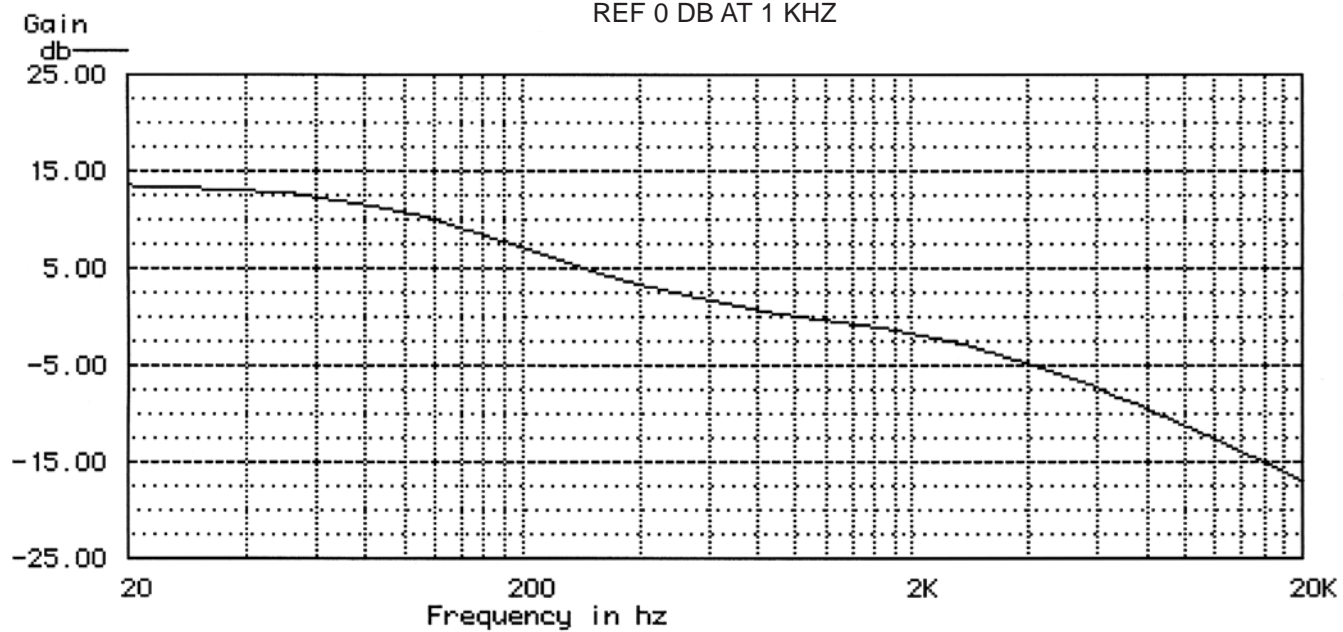


4-2

EQUALIZATION

FFRR REPRODUCE EQUALIZATION

REF 0 DB AT 1 KHZ

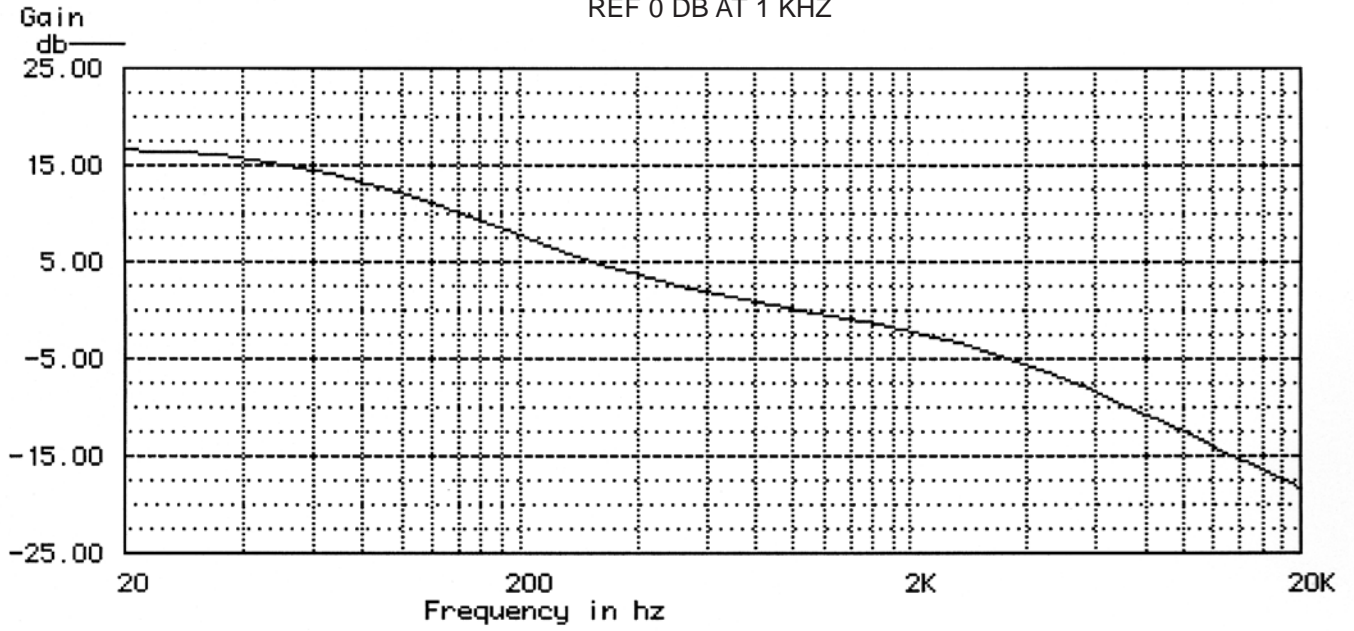


4-3

EQUALIZATION

EMI REPRODUCE EQUALIZATION

REF 0 DB AT 1 KHZ

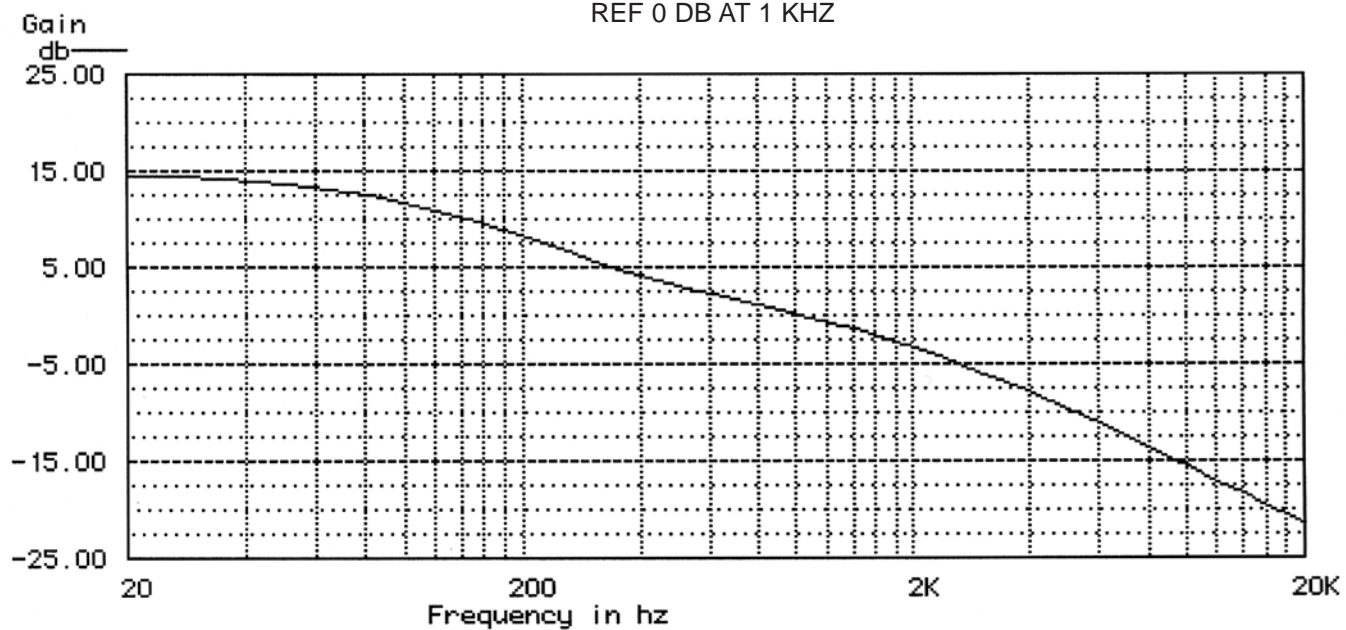


4-4

EQUALIZATION

COLUMBIA REPRODUCE EQUALIZATION

REF 0 DB AT 1 KHZ

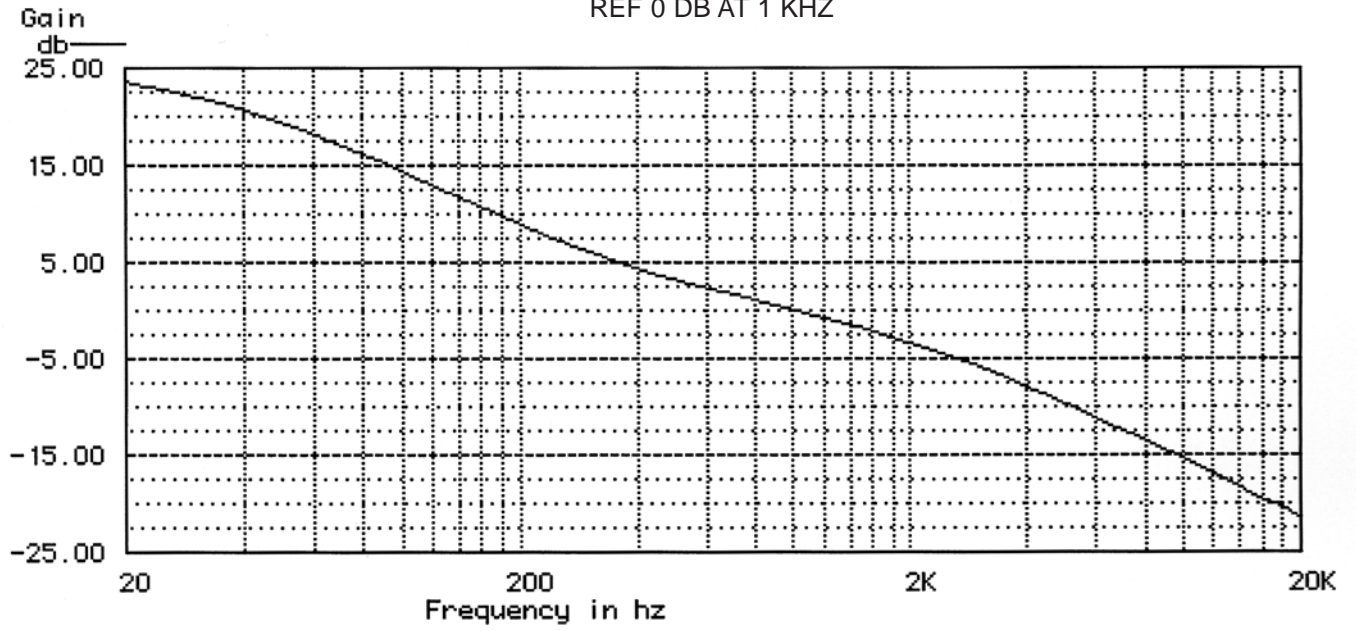


4-5

EQUALIZATION

NARTB REPRODUCE EQUALIZATION

REF 0 DB AT 1 KHZ



4-6

EQUALIZATION



RIGHT
OUTPUTS

LEFT
OUTPUTS

USING A RECORDER CONNECTIONS

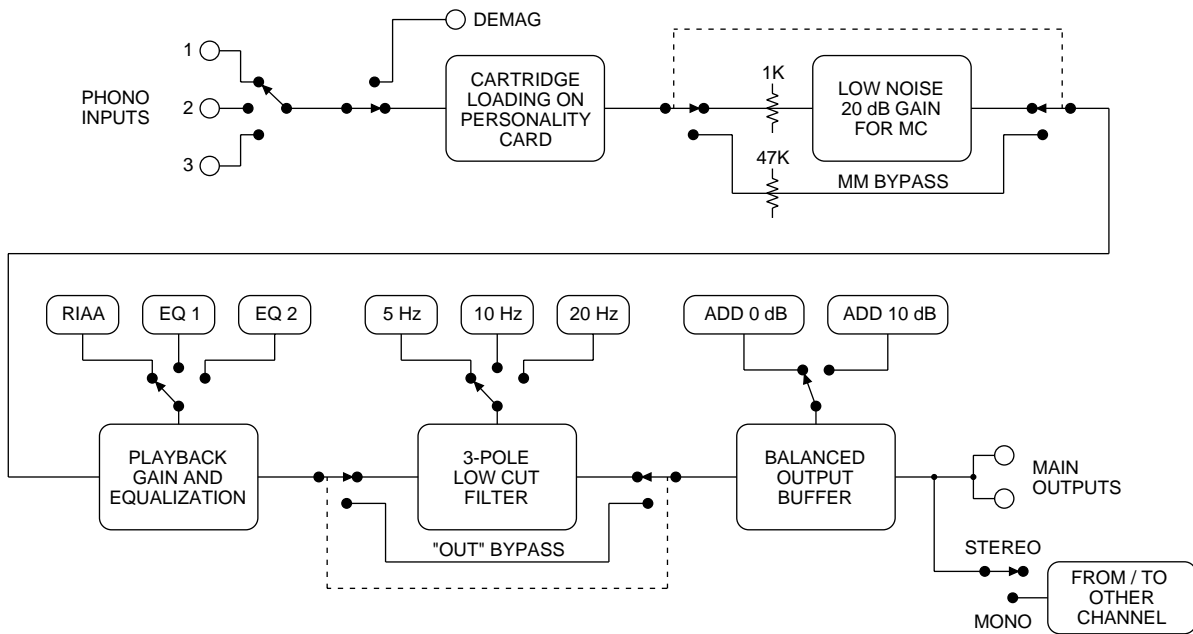
A recording device may be connected to the Boulder 2008 Phono Preamplifier. You may use balanced or unbalanced connections for both input and outputs as previously described in the sections on connecting sources and power amplifiers.

Either of the outputs may be connected to the input of your recording device.

6-1

RECORDING

2008 AUDIO BLOCK DIAGRAM



7-1

APPENDIX

BOULDER 2008 PHONO PREAMPLIFIER SPECIFICATIONS

Inputs	3 Balanced, Converts to Unbalanced
Input Impedance, Maximum	MC: 1000 ; MM: 47k
1kHz Gain, RIAA	MC: 64 or 54, MM: 44 or 34dB
Noise (EIN), MC	160 μ V A-wtd, 275 μ V Flat, 20 Hz to 20kHz
Outputs	2 Balanced, for either listening or recording
Maximum Output Level	28 Vrms
Distortion, THD	0.005%
Output loaded with 150	Less than 1/2 dB distortion change
Frequency Response, 20 Hz to 20 kHz	RIAA: \pm 0.10 dB
Crosstalk, L to R or R to L	-100 dB or better 20 Hz to 20kHz
Output Impedance	100 Balanced
Preamp Size, W X H X D	18.0 x 4.25 x 15.5 inches
Power Supply Size, W X H X D	18.0 x 4.25 x 15.5 inches
Power Requirements	90-120 V / 200-240 V, 50-60 Hz, 240 W Max. (75W nominal)

TROUBLESHOOTING		
SYMPTOM	CAUSE	REMEDY
No power indication on 2000	Power switch is not on	Turn on power switch
	Preamplifier is not plugged in	Connect to an AC outlet
	Home circuit breaker is tripped	Reset circuit breaker
Red power indication on 2000	Low line voltage	Have line voltage checked
	Power supply's breakers tripped	Reset breakers on rear panel
	Defective power supply cables	Have cables tested
	Defective power supply or preamp	Return to dealer for service
Amber POWER indication on 2008, but no sound is heard	Preamp is muted, MUTE is red	Push MUTE so indicator is off
	No signal from turntable	Check turntable connections
	No signal out to preamplifier	Check connections to preamp
	No power supply to channel(s)	Turn off power supply, check cables
Hum is heard	Preamp is faulty	Return to dealer for servicing
	No ground connection	Check or install ground wire
	Duplicate ground connection	Use only one ground wire to turntable, or use the ground in a balanced cable
	Preamp or turntable is too close to 2000 or other power supply	Move preamp and/or turntable away from power supply

	TROUBLESHOOTING	
SYMPTOM	CAUSE	REMEDY
One channel is louder than the other	Gain switch not set equal	Set gain switches on personality cards to same setting
	MM/MC switch not set equal	Set MM/MC switches on personality cards to same setting
	Cartridge loading is not equal	Check cartridge loads on personality cards

7-4

APPENDIX

NOTES

7-5

APPENDIX