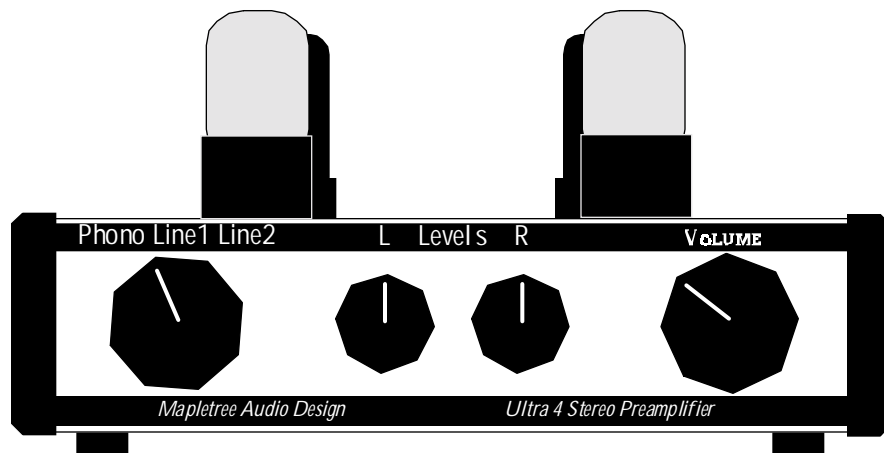




Modular Series

Ultra 4A Stereo Phono/Line Preamp



User's Manual

Rev. July 18/03

Mapletree Audio Design
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Introduction

The Mapletree Audio Design *Ultra 4A Stereo Phono/Line Preamplifier* is part of the MAD Modular Series of preamp/power supply components. It offers the audiophile a number of desirable features:

- ◆ Compact chassis layout for use with separate power supply for low noise.
- ◆ Exclusive use of octal tubes, known for low distortion and musicality.
- ◆ Precise RIAA equalization (± 0.5 dB) using passive/active filters.
- ◆ Low output impedance.
- ◆ Parallel output jacks.
- ◆ Phono gain of 50 dB suitable for all moving magnet (MM) type phono cartridges.
- ◆ Individual channel level controls.
- ◆ Optional Alps Blue Velvet volume control.

Power Supply Connections

The MAD *Ultra 4A* consists of a preamplifier chassis with provision for connection to a separate power supply. This allows separation between the two units and eliminates induced hum originating from power supply circuitry and components. The MAD *PS 1* power supply is recommended for the *Ultra 4A*. It provides 12 VDC (regulated) at 1 A for the heater supply and +200 VDC at full load (14 mA) for the B+ plate supply. The power connections to the preamplifier chassis are made through a special 3-conductor power cord that plugs into jacks located on the rear panels of the power supply and preamplifier chassis.

CAUTION: Do not operate the power supply when it is not connected to the preamp. Damage of components may result.

Once the interconnecting power cord is securely attached between the two chassis and the line cord is plugged in, the black rocker switch is used to activate the power supply. The green pilot lamp on the power supply chassis indicates that the unit is on. It takes about 30 seconds for the tubes to reach operating temperature ready for use. During operation, it is normal for the power supply chassis to become warm to the touch.

The power supply is protected by a 0.5 A/250 V fast-acting fuse which can be accessed by unscrewing the fuse holder on the rear panel of the power supply. Under normal conditions, it should not be necessary to replace the fuse. If power fails to come on, you can check the fuse and replace with a spare if necessary. If the fuse blows a second time, you should not try to operate the unit. Contact Mapletree Audio Design for information regarding service. See the *PS 1/PS 2 User's Manual* for more information.

Signal I/O Connections

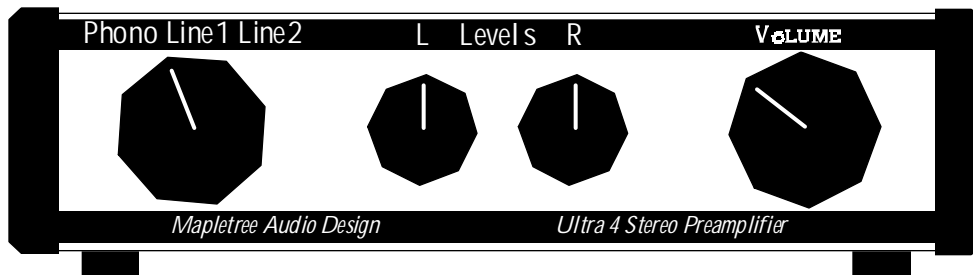
The signal input/output jacks are located on the rear panel of the preamplifier chassis. RCA jacks are provided for phono input, two line inputs, and two line outputs. Left channel jacks are at the top and right channel jacks are at the bottom. A binding post is provided for phono ground. The phono input resistance is 47 k Ω which matches standard MM phono cartridge loading requirements. The input capacitance is approximately 50 pF. The line input impedance is 220 k Ω , which provides minimal loading of any line source such as CD/DVD player, tape deck, tuner, or PC sound card. The line output impedance is less than 500 Ω , which is suitable for connection to a power amplifier through cables up to 10 ft in length. The ground wire from the turntable should be connected to the ground binding post to minimize hum pickup.



Ultra 4A rear view

Front Panel Controls

The front panel controls are (left to right) the 3-position Source Selector Switch (Phono-Line1-Line2), the Left Level and Right Level controls, and the Volume Control, which



Ultra 4A front view

adjusts the gain of both channels simultaneously. The level controls are normally both set at their maximum position (12 o'clock). Channel balance can be adjusted if necessary by reducing the level of the louder channel. These controls can also be used to reduce the overall gain of the preamp so that the volume control is near its mid position at normal listening levels. In this case, both level controls should be turned counterclockwise by the same amount or as required to achieve the desired balance.

Tubes

Vacuum tube socket locations are shown in the preceding photo. The 12SC7s are toward the rear of the chassis. The tubes supplied are new-old stock (NOS) and have been pre-tested. A burn-in period of several hours may be needed to achieve the best sonic performance. Tube life should be thousands of hours. Aging tubes may result in a reduced gain in one or both channels or an increase in noise levels. Infrequently, a heater may burn out which is indicated by total loss of sound. Replacement tubes can be obtained from several suppliers in the U. S. and Canada. Mapletree Audio Design will attempt to provide replacement tubes to customers at cost plus shipping. Some listeners enjoy trying different brands and variants of tubes. The highly regarded 12SX7GT is equivalent to the 12SN7GT. Should the need arise, it is possible to re-wire the *Ultra 4A* to accommodate 6 V tubes. Consult Mapletree Audio Design or a qualified technician.

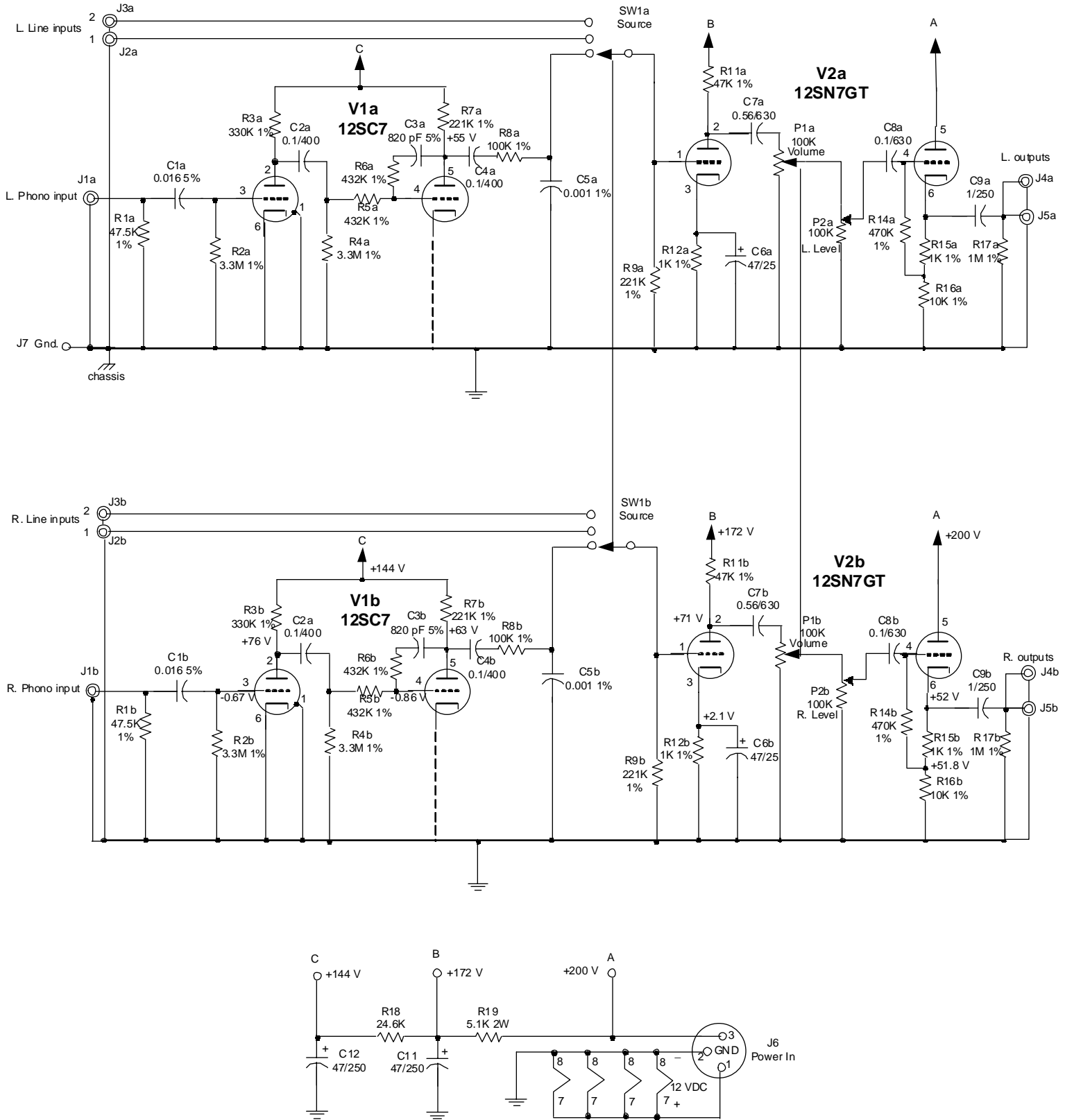
Warranty

Assembled MAD components are warranted for 2 years to the original purchaser for failure of parts (excluding tubes) and workmanship. Tubes are warranted for 90 days exclusive of shipping cost. Service, including parts and labor (but excluding shipping), is free within the warranty period.

MAD Ultra 4A

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Parts List

Reference No.	Description
C1a,b	0.016 uF 5% paper/oil capacitor
C2a,b, C4a,b	0.1 uF/400 V metalized polypropylene film capacitor
C3a,b	820 pF/300V 5% silver mica capacitor
C5a,b	0.001/250 V 1% polypropylene film capacitor
C6a,b	47uF/25 V electrolytic capacitor
C8a,b	0.1 uF/630 V metalized polypropylene film capacitor
C7a,b	0.56 uF/630 V metalized polypropylene film capacitor
C9a,b	1 uF/250 V metalized polypropylene film capacitor
J1a,b–J5a,b	RCA gold plated phono jack
J6	Chassis jack (power in)
J7	Ground binding post
P1a,b	100K dual audio taper potentiometer
P2a,b	100K linear potentiometer
R1a,b	47.5K 1W 1% metal film resistor
R2a,b, R4a,b	3.3M 0.6W 1% metal film resistor
R3a,b	330K 0.6W 1% metal film resistor
R7a,b, R9a,b	221K 0.6W 1% metal film resistor
R5a,b, R6a,b	432K 0.6W 1% metal film resistor
R8a,b	100K 0.6W 1% metal film resistor
R11a,b	47K 0.6W 1% metal film resistor
R12a,b, R15a,b	1K 0.6W 1% metal film resistor
R14a,b	470K 0.6W 1% metal film resistor
R16a,b	10K 0.6W 1% metal film resistor
R17a,b	1M 0.6W 1% metal film resistor
R18	24.6K 0.6W 1% metal film resistor
R19	5.1K 2W metal oxide resistor
SW1	3 position, 2-pole rotary switch (shorting)
V1a,b	12SC7 tube
V2a,b	12SN7GT tube

Circuit Operation

Referring to the schematic diagram, both channels are identical. The following description refers to either channel unless otherwise noted. The phono input signal is applied to input jack J1, loaded by resistor R1, then capacitor coupled to the grid of the first section of the 12SC7 which is configured as a common-cathode voltage amplifier. The value of C1 and its parallel trimmer capacitor sets the low frequency breakpoint in the RIAA equalization curve at 50 Hz. The negative grid bias is obtained through the 3.3 M Ω grid resistor R2. The output from this stage is capacitor coupled through C2 to the second stage which uses the second section of the 12SC7 also configured as a common-cathode voltage amplifier. The feedback network consisting of R5, R6, and C3 implements the turnover frequency of the RIAA curve at 500 Hz. Bias is again obtained through the leakage grid current flowing through the 3.3 M Ω resistor R4.

The signal is then capacitor coupled through C4 to the phono terminal of the source selector switch (SW1). The passive network comprised of R8 and C5 implements the roll-off frequency of the RIAA curve at 2130 Hz. The selector switch is used to steer either the amplified phono signal or one of two line input signals (jacks J2 and J3) to the third stage, which utilizes the first section of the 12SN7GT in a common-cathode voltage amplifier configuration giving a gain of around 22 dB. This stage is self-biased by cathode resistor R12, bypassed at audio frequencies by capacitor C6. The output of this stage is capacitor coupled through C7 to the volume control potentiometer P1 and then to the level control potentiometer P2. The wiper of the level control is capacitor coupled through C8 to the grid of the output stage, which employs the second section of the 12SN7GT configured as a cathode-follower. This stage has a voltage gain of less than unity but provides a low output impedance suitable for driving cable capacitance without loss of high frequencies. Grid bias is obtained by resistors R14 and R15 while R16 establishes the plate voltage and current to provide maximum output voltage swing. The output voltage is taken from the cathode of the output stage, capacitor coupled to the output jacks J4 and J5 through capacitor C9.

MAD Ultra 4A Specifications

Phono Section (100 k Ω load)

Max. RIAA error: 0.5 dB 30–20 kHz

Maximum Gain: 50 dB

Noise: less than 3mV for gain of 50 dB; less than 1 mV for gain of 38 dB

Input resistance at 1 kHz: 47 k Ω

Line Section (100 k Ω load)

Frequency response (1 V output): 20 Hz–200 kHz –0.5 dB

Max. output voltage: 15 V rms

Gain: 22 dB

Channel balance: ± 0.5 dB

Hum and noise: less than 0.5 mV at full gain

Input impedance (1 kHz): 220 k Ω

Output impedance (1 kHz): 450 Ω

Power requirements: +12 VDC @ 1A, +200 VDC @ 14 mA (ground is common to both supplies)