HAGERMAN
TECHNOLOGY

Piccolo

Moving Coil Headamp
Kit Manual

Warnings

This product does not use any dangerous voltages. Power is supplied by a 12V wall-wart. The instructions in this manual are a suggested guide only and no liability is assumed by Hagerman Technology LLC.

Copyrights & Trademarks

Disclaimer

The information contained in this document is subject to change without notice. Hagerman Technology LLC shall not be liable for errors contained herein or for consequential damages in connection with the furnishing, performance, or use of this material. See Chapter 6 for warranty information.

1 Before You Begin

Description

Congratulations! You have just purchased one of the highest performance-per-dollar audiophile products available. The Piccolo MC headamp fits between your MC cartridge and your MM phonostage providing the necessary increase in gain. The world-class circuit design employs low noise discrete matched JFET pairs for a very neutral and linear gain stage. No feedback is used. Both gain and input loading are independently adjustable. This flexibility allows perfect matching for any cartridge.

The half-kit contains a circuit board with the surface mount JFETs pre-installed and a few nuts and bolts. All remaining components can be purchased from DigiKey.

Features

- Discrete JFET zero-feedback circuit design
- Adjustable loading
- Adjustable gain
- Super low noise operation
- Internal battery or AC power operation

Tools

You will need a few basic shop tools (screwdriver, pliers, wire cutters, etc.) and a fine-tip soldering iron to build this kit. The delicate and difficult to install surface mount components have been pre-installed for your convenience.

2 Parts to Buy

Parts List

Parts can be ordered directly from **www.digikey.com**. A few screws, nuts, and miscellaneous have been included in the half-kit for your convenience.

Component	Qty	DigiKey	Reference Designators
100uF 25V	13	P12924	C20, C21, C3, C4, C5, C6, C7, C8, C9, C12, C13, C14, C15
100nF polyprop	6	P3104	C10, C11, C16, C17, C1
BAT47(3)	3	497-2492-1	D4, D2, D3
120uH	1	DN2570	L1
LM2941	1	LM2941CT	U2
ICL7662	1	TC7662BCPA	U1
LED	1	160-1610	D1
Switch, 4 pos	1	CKC7005	S2
Switch 6 pos	1	CKC7003	S1
RCA jack	4	CP-1424	J1x, J2x
DC jack	1	SC1047	J3
10R0 1/4W 1%	5*	10.0XBK	R12, R13, R14, R15
22R1	10*	22.1XBK	R3x, R4x, R2x
47R5	5*	47.5XBK	R1x
100	10*	100XBK	R17, R18, R19, R20, R1x
221	10*	221XBK	R1x, R2x, R11x
232	5*	232XBK	R10x
475	10*	475XBK	R1x, R7x, R8x
1k00	5*	1.00KXBK	R1x, R2x, R22
3k32	5*	3.32KXBK	R21
4k75	10*	4.75KXBK	R2x, R5x, R6x, R16x
47k5	5*	47.5KXBK	R1x
221k	5*	221KXBK	R9x
Battery Holder	1	2477K	
Knob	2	226-4126	
Box	1	HM366	
Power Supply	1**	MT7145	

* Minimum order quantity.
** Use T974-P5P for 240Vac.

3 Assembly

Chassis

Using the printed drill guide, mark the center of each hole on the chassis cover plate. Drill small pilot holes for each. Then using a step-drill bit or appropriately sized bits, enlarge the holes to their specified size. The box can be spray painted to the color of your choice. If you do, use a countersink bit to remove paint from the screw holes, thus insuring electrical contact between top plate and bottom cover. Add rubber feet to bottom.

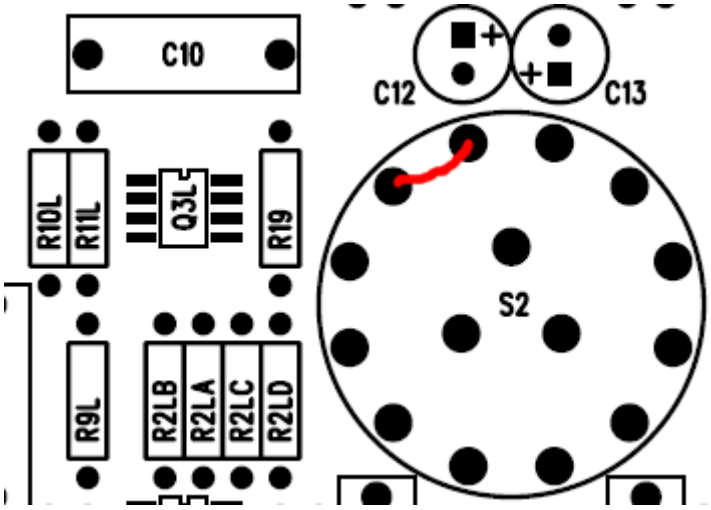
Circuit Board

Assemble in the specified order, soldering and clipping leads before continuing. The surface mount JFETS have been pre-installed for your convenience. Beware of component polarity! Not all diodes or electrolytics are lined up the same way. The square hole is the positive lead (except on diodes, where it is the cathode).

- Install all resistors. Use the guide in the back of this manual. For dc offset reduction, change R10 to 232 ohms.
- Install diodes and inductor.

- ❑ Install ICL7662.
- ❑ Install terminal shields (wings facing outwards).
- ❑ Install LED.
- ❑ Install LM2941 regulator
- ❑ Install RCA jacks.
- ❑ Install electrolytics.
- ❑ Install remaining capacitors.

If you want the Piccolo to be permanently on (not recommended for battery operation), then you can add a jumper as shown to S2. This converts the originally "off" position to a 0dB gain setting.



- ❑ Install rotary switches with the alignment stub toward the bottom. Cut stub off.

Remove the nuts from the rotary switches and line up circuit board onto top panel. Insert the dc jack such that it fits onto circuit board and into panel hole. Add nut. This sets the proper mounting height of jack. Solder in place. Remove panel. Put nuts back onto switches to make sure the lock rings do not fall off.

- ❑ Add battery holder on backside with two #6 screws and washer standoffs. The screws form threads in the plastic. Do not over tighten. Solder leads.
- ❑ Add the #6 x 1" screw in the central ground hole (near loading switch) facing upwards. Secure in place with a nut. Add another nut loosely about ½" up.

If you do not build in the recommended stock chassis configuration, you can reduce the potential for high frequency noise contamination by forcing the dc-dc converter to operate at a higher frequency. Connecting pin 1 of U1 to pin 8 does this. Add a jumper on bottom of board (only works with the TC7662BCPA).

Testing

The circuit board is now complete and ready to mount in the chassis. But first, plug it in and turn it on. The LED should light. If you have test equipment, apply a small input signal (below 0.1V) and measure the output.

Final Assembly

Mount the LED dome to top panel. Secure with plastic ring. Remove nuts from rotary switches and mount circuit board onto top plate. Secure in place with switch and dc jack nuts. Underneath, rotate the #6 nut so that it touches the plate. Add #6 knurled knob on topside. This forms the turntable ground lug. Add knobs. Insert batteries and mount cover plate to box with four #6 screws.

4 Installation and Use

Testing

First do a visual check to insure all components have been installed and in the proper orientation. With batteries installed, turning the gain knob away from the off position will turn the amplifier on. LED should light up.

Installation

Connect the Piccolo between your turntable and MM phonostage. Connect the turntable ground wire to the knurled ground lug. Set the gain to accommodate your cartridge's output level. Adjust resistive loading to taste.

Cartridge	Gain
<0.2mV	26dB
0.2mV – 0.6mV	20dB
0.6mV – 2mV	12dB

Hum

The Piccolo is very quiet on it's own. However, in rare cases an installation environment might be noisy with stray fields. If you are experiencing hum, check for broken grounds, unshielded interconnects, nearby power transformers, etc.

5 Specifications

The following specifications are subject to change without notice.

Item	Specification
Gain	12dB, 20dB, 26dB
Input Impedance	47, 100, 220, 470, 1k, 47k ohm
Output Impedance	<300 ohms
Bandwidth (-3dB)	10Hz to 1MHz
Distortion	<0.01% @1kHz
SNR (phono)	85dB ref 5mV A-weighted
Overload	140mV @ 1kHz @ 26dB
Size	3” x 5” x 2”
Power	6Vdc to 24Vdc @ 15mA
Battery Life	4 alkaline AA, 200 hours

6 Warranty & Service

Warranty

Hagerman Technology LLC warrants this product free of defects in materials and workmanship for 10 years. If you discover a defect, Hagerman Technology LLC will, at its option, repair or replace the product at no charge to you provided you return it during the warranty period, transportation charges prepaid to Hagerman Technology LLC. This warranty does not apply if the product has been damaged by negligence, accident, abuse or misuse or misapplication, has been damaged because it has been improperly connected to other equipment or has been modified without the express written permission of Hagerman Technology LLC. This warranty is limited to the replacement or repair of this product and not to damage to equipment of other manufacturers.

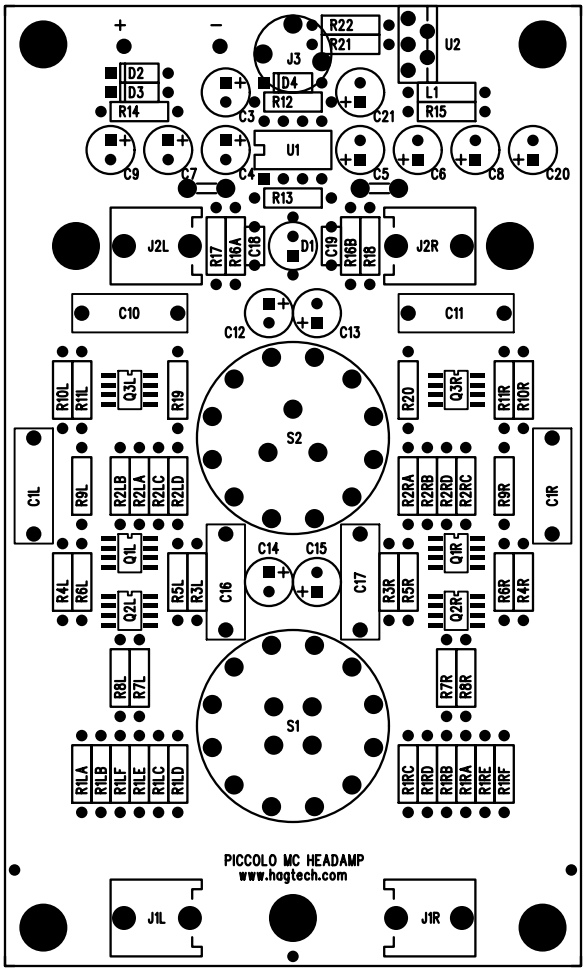
Any applicable implied warranties, including warranty of merchantability, are limited in duration to a period of the express warranty as provided herein beginning with the original date of purchase and no warranties, whether express or implied shall apply to the product thereafter. Under no circumstances shall Hagerman Technology LLC be liable for any loss, direct, indirect, incidental, special, or consequential damage arising out of or in connection with the use of this product.

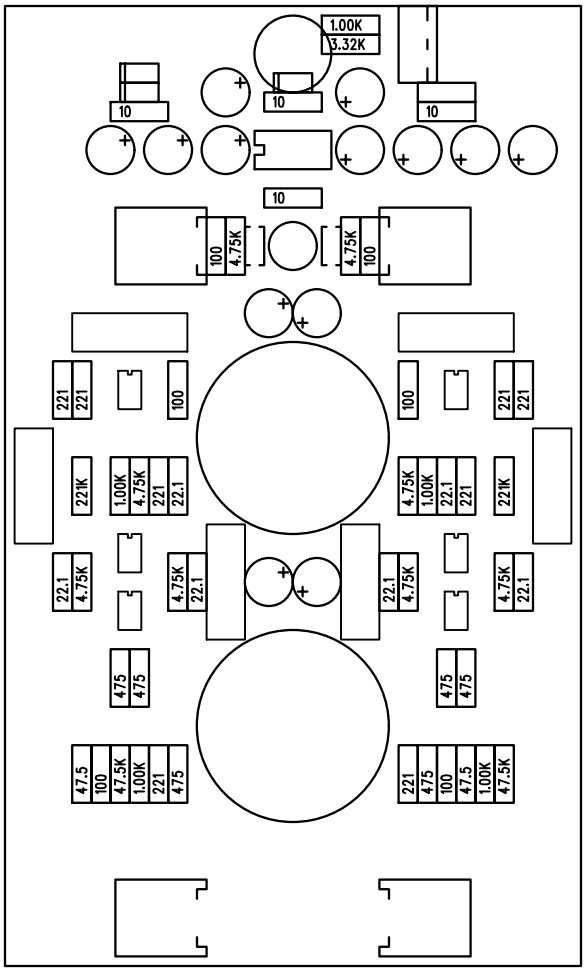
Service

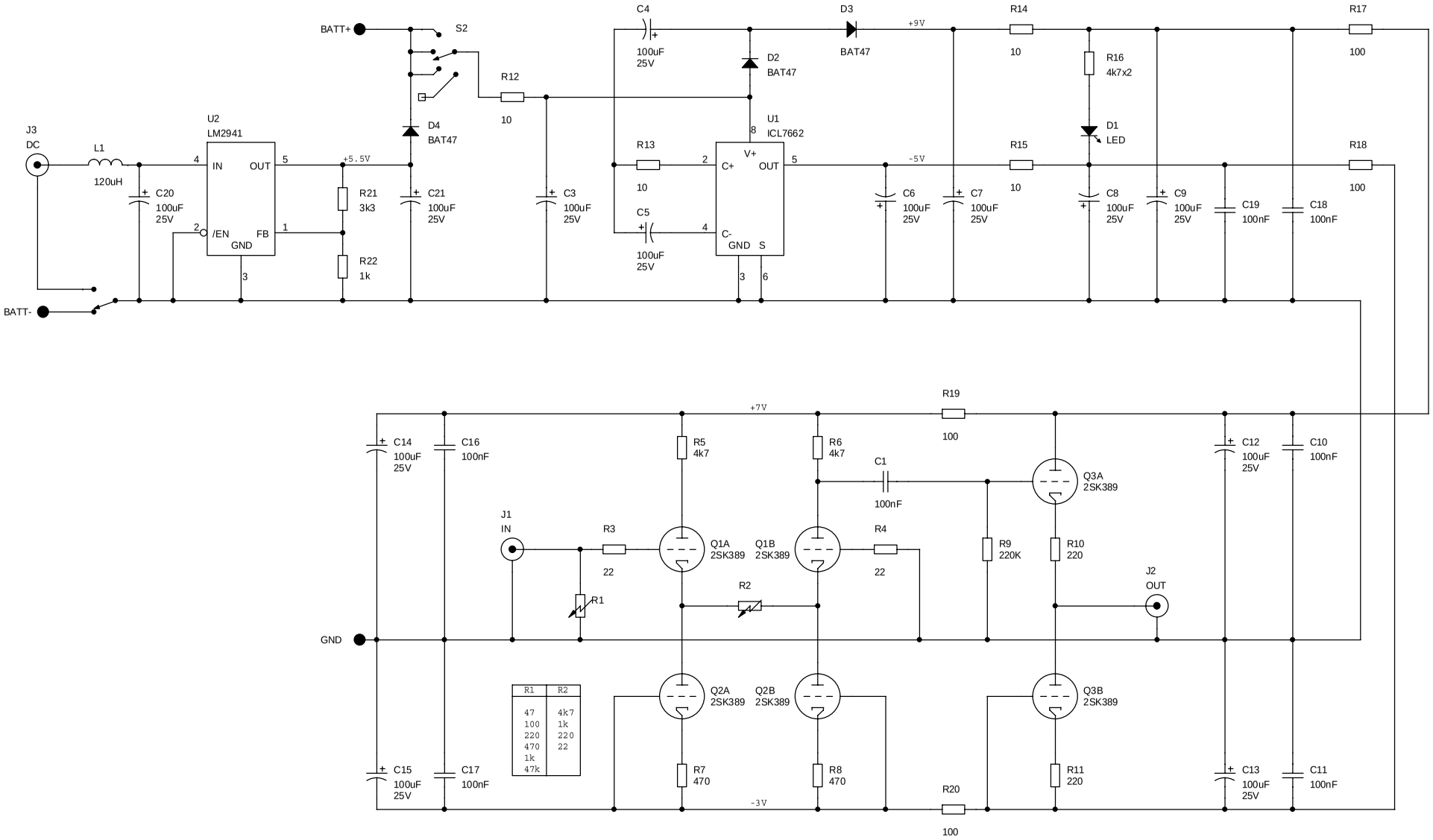
Refer to Chapter 4 for troubleshooting information. If the problem persists, contact Hagerman Technology for service at **http://www.hagtech.com**.

Hagerman Technology LLC
PO Box 26437
Honolulu, HI 96825 USA

808-383-2704 (voice)
808-394-6076 (fax)


+
−
R22
R21
U2
J3
D2
D3
D4
L1
R14
R12
R15
C3
C21
C9
C7
C4
U1
C5
C6
C8
C20
R13
J2L
R17
R16A
C18
D1
C19
R16B
R18
J2R
C10
C11
C12
C13
R10L
R11L
Q3L
R19
R20
Q3R
R11R
R10R
S2
C1L
R9L
R2LB
R2LA
R2LC
R2LD
R2RA
R2RB
R2RD
R2RC
R9R
C1R
C14
C15
Q1L
Q1R
R4L
R6L
R5L
R3L
C16
C17
R3R
R5R
R6R
R4R
Q2L
Q2R
R8L
R7L
R7R
R8R
S1
R1LA
R1LB
R1LF
R1LE
R1LC
R1LD
R1RC
R1RD
R1RB
R1RA
R1RE
R1RF
PICCOLO MC HEADAMP
www.hagtech.com
J1L
J1R


1.00K
3.32K
10
10
10
10
100
4.75K
4.75K
100
221
221
100
100
221
221
22K
1.00K
4.75K
221
22.1
4.75K
1.00K
22.1
221
22K
22.1
4.75K
4.75K
22.1
22.1
4.75K
4.75K
22.1
475
475
475
475
47.5
100
47.5K
1.00K
221
475
221
475
100
47.5
1.00K
47.5K



Hagerman Technology LLC
P.O. Box 26437
Honolulu, HI 96825

Title
Piccolo MC Headamp

Size	Document Number	Rev
	n/a	B

Date: **Wednesday, May 09, 2007** Sheet **1** of **1**