User Guide for the LM1875 Stereo Amplifier Kit

Chipamp.com

Product Manual

LM1875 Stereo Amplifier Kit

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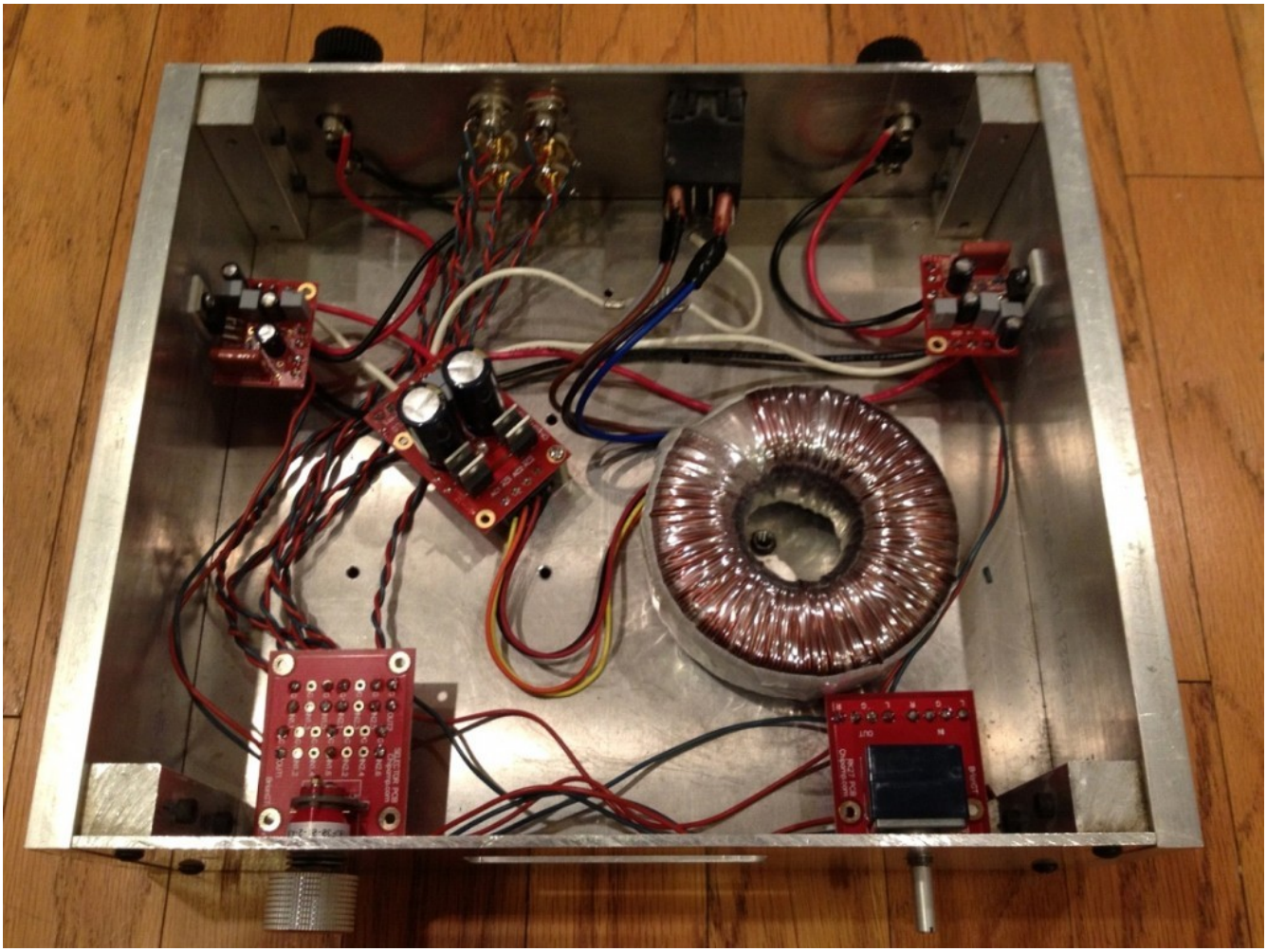

Completed LM1875 Stereo Amplifier with optional volume control and input selector

1 Introduction

Thank you for purchasing the LM1875 Audio Amplifier kit from Chipamp.com. We hope that this project will bring you the joy and satisfaction of building and listening to an electronics project that you made yourself. The purpose of this guide is to help you smoothly build out the kit. Most of this information was contributed by Brian Bell with help from Peter Daniel(audiosector.com) and other members of the diyAudio.com community, to whom we give much respect and appreciation.

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Most of the material in this manual is a replication of information from the diyAudio forum.

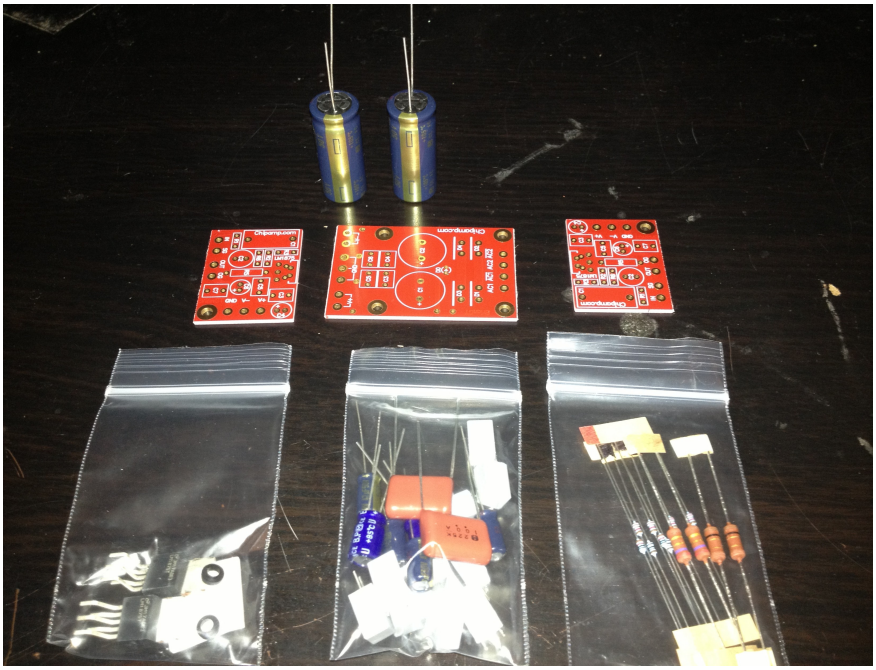
Here is a link to the original post:

http://www.diyaudio.com/forums/chip-amps/122793-finally-made-lm1875-amp.html

2 General Safety Precautions....

It is assumed the builder of this kit is familiar with the dangers of handling exposed electrical wiring. The assembly of this kit will require the practice of safety around household voltage, be it 120 or 240 VAC. It is not recommended that you work without the supervision of someone knowledgeable if that person is not yourself.

3 Building Instructions:



1. **Remove all contents from bags and identify the components of the kit. Make sure that we did not make an error in packing your order.**

Each Order should contain:

2x Amplifier PCB for LM1875
1x Power Supply PCB for LM1875
2x LM1875 Integrated Circuits
2x Mounting Pad for LM1875
2x Screw Insulator for LM1875

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Resistors:	Capacitors:	Diodes:
4x 22.1kΩ	2x 22µF bipolar (optional)	4x MUR860
2x 10kΩ	4x 47µF	1x Blue LED
2x 1kΩ	10x 0.1µF	
2x 2.7Ω	2x 2.2µF	
2x 1Ω	2x 1500µF	

2. Once you have all parts, prepare your work area for soldering. For soldering tips, refer to the Appendix at the back of this guide. Starting with the components towards the center of the PCB, solder your connections, matching the component designations with the parts list and PCB. Be aware of the polarity of the electrolytic capacitors. Also note the tab marks for the diode bridge. The white line indicates that the diodes must face their heat-sink toward said line.

3. Component Designations

Amplifier Components

R1 - not used (optional resistor to ground before C1)
R2 - 22kΩ (input to ground resistor)
R3 - 1kΩ (gain resistor , gain = 1 + R4/R
R4 - 22kΩ (nfb resistor - on bottom of pcb)
R5 - 2.7Ω 2w (optional - zobel network)
R6 - jumper (optional resistor between input ground and output ground)
C1 - 2.2µF (optional input capacitor)
C2 - 22µF bipolar (optional)
C3 - 0.1µF (power supply decoupling)
C4 - 0.1µF (power supply decoupling)
C5 - 0.1µF (power supply decoupling)
C6 - 47µF (power supply decoupling)
C7 - 0.1µF (optional - zobel network)

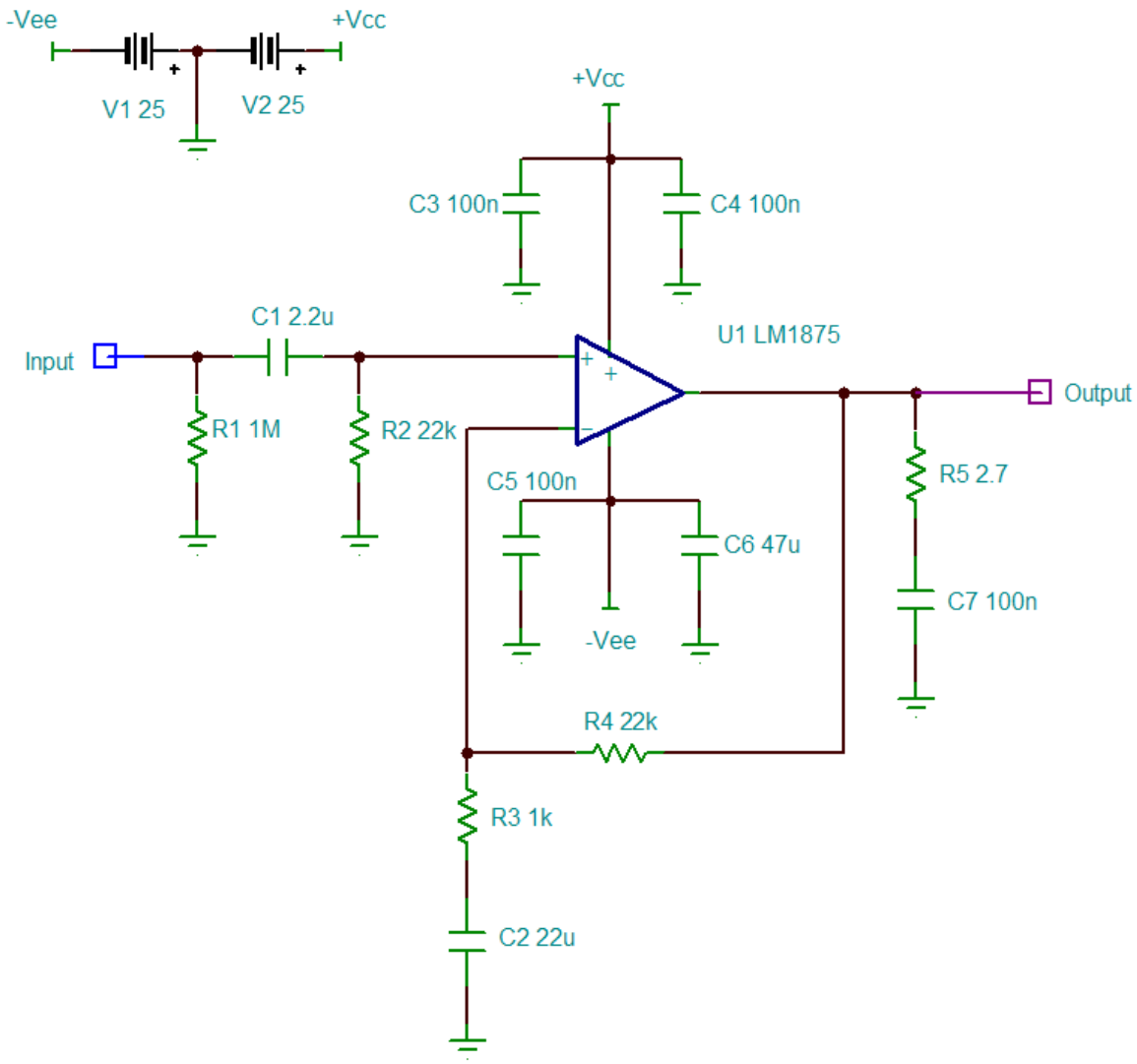
Power Supply Components

R0 - 10kΩ (series resistor for LED)
R1,R2 - 1Ω 2W (optional "snubber" network capacitors)
C1,C2 - 1500µF (main power supply caps)
C3,C4 - 0.1µF (power supply decoupling)
C5,C6 – 0.1µF (optional "snubber" network capacitors)
D0 - blue LED
D1-D4 - MUR860

4. After the Power Supply and Amplifier PCBs have been populated, the next step is to wire the connections for power, signal, and ground. For power, Chipamp.com suggests a toroid

transformer with an secondary voltage that falls within specifications of the LM1875 datasheet.

Transformer selection:
A 160va 2x18vac Avel Lindberg transformer from Parts Express, and anything similar should work. The acceptable power supply range from V+ to V- is 16-60v. See the datasheet for power output levels with various supply voltage.



As for the wiring connections:

Amp board:
V+ = goes to the V+ connection on PSU board
V- = goes to the V- connection on PSU board
GND = goes to GND connection on PSU board
IN = goes to positive input signal

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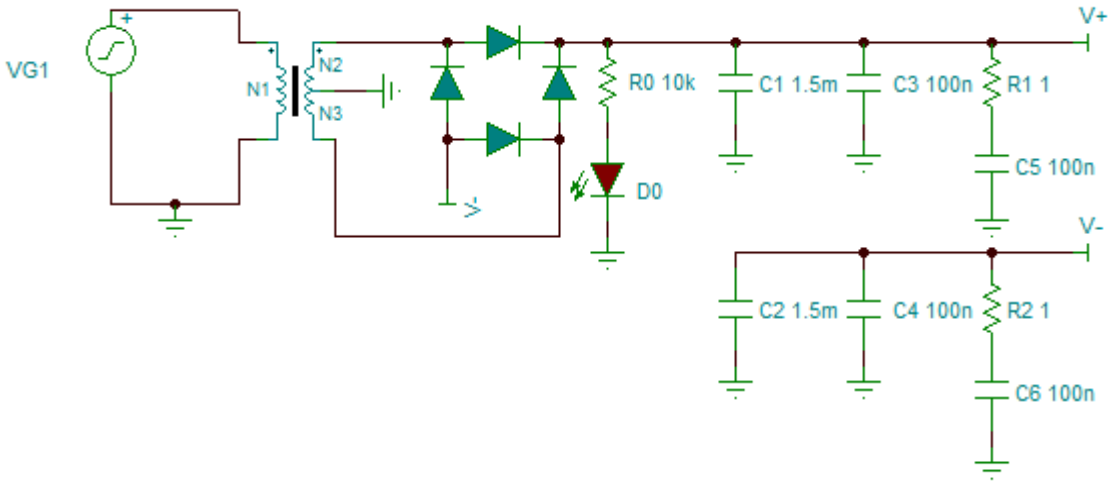
SG = goes to input ground (signal ground)
OUT = goes to positive output terminal
OG = goes to output ground

PSU board:
AC1 connections = goes to first secondary winding on transformer
AC2 connections = goes to second secondary winding on transformer
(for center-tapped tranformer, connect center-tap to either AC1(bar over top) or AC2 (no bar)
V+ = goes to V+ connections on amp boards
V- = goes to V- connections on amp boards

Note: I would highly recommend using different colors for V+ and V-. For this amp, the wiring as done with what I had on hand, and will be rewired for the final chassis setup.

GND = goes to GND connections on amp boards, and also a connection to the central chassis ground



5. **Testing Procedure once boards are assembled:**

1. First, make sure to wire up the fuse and AC terminals correctly. Test with a multimeter set on ACV to make sure that your switch works. Wire from the AC H terminal on the AC socket to a fuse holder, and then into a switch.
2. Connect the first wire of the transformer primary to the AC H connection on the power switch.
3. Connect the second wire of the transformer primary to the AC N connection on the ac input terminal.
4. Connect the earth ground from the ac inlet to the main chassis ground
   For US or other 120v countries, if your transformer has dual primaries and is specified

for either 115vac or 230vac, such as the Avel Lindberg common transformers, wire both the pairs of primary parallel with each other.

5. Wire one of the GND connections on the PSU board to the chassis ground.

Once the transformer secondaries are connected to the PSU board along with the chassis ground connection, power up the amp to check the output DC voltages. Measuring from GND to V+ and from V- to GND should show ~25vdc if you are using a 2x18vac transformer.
The LED on the PSU board should also be lit up, if installed correctly.
Once the power supply voltages are verified, power the amp down, and wire up one amplifier board to the V+, V- and GND connections from the PSU board to the amp board.
power up the amp again, and check the DC offset of the amplifier with the multimeter, by setting it to the minimum DC voltage setting, and measuring from OUT to OG. You should measure between 10-30mV, but under 100mV is acceptable.
if all checks out, power down amp, and hook up the other channel and test it.
once both channels are verified, connect the RCA input terminals to the IN and SG connections on the amp boards for both channels. Also connect the OUT and OG connections on the amp boards to the output terminals on the chassis.
power the amp up again, and test the amp with a test speaker for both channels.
Once all is verified, connect to your system and enjoy!

Other Connections:
For the input AC connections, put the AC H connection in series with a fuse (I used 2A slo blow), and in series with a power switch if desired. This will then wire into the first primary. Wire the AC N connection to the other primary wire. Wire the AC earth ground connection to the main chassis ground.

Variations:
-One could decide to remotely wire the D0 power supply LED to the front panel for indicating the the

4 Resources....

Datasheet from National:
http://www.ti.com/lit/ds/symlink/lm1875.pdf
(the schematic in manual is very close to the actual circuit used on the amplifier PCB)

A good soldering guide:

http://www.elexp.com/t_solder.htm

Voltages from the transformer secondary windings:

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If you have a 2x18vac transformer, you should now measure 18vac across each secondary.
-power off the amp, and wire the secondary windings from the transformer into the AC1 and AC2 terminals on the power supply board.

I also installed output terminals for the output connections under the pcb, so that I could wire the test speakers directly into the PCB. For the final chassis wriing, the wires going to the output terminals will be wired directly to the PCB.

For heatsinks, I tested with the small heatsinks that I had on hand. With a single heatsink per channel, they got quite hot, so I connected 3 together to obtain a reasonable temperature for the heatsinks.