

Squeezebox

Power Supply Upgrade

Assembly Manual
revision 2.1



Product Liability ***(please read before proceeding)***

Assembly is relatively simple and should require no more than a couple of hours to complete. If you follow our instructions this product, while not being UL approved, will be UL compliant. **The danger of electrical shock exists with this product and therefore you should use extreme caution during the assembly, test and use of this equipment.**

Since this is a kit and we have no control over the finished product, Welborne Labs assumes no responsibility and cannot be held liable for damage or personal injury resulting from the use of this product. Therefore, by proceeding with the assembly and use of this product, the Buyer agrees to hold Welborne Labs harmless from, and Buyer hereby assumes the entire responsibility and liability for, any and all damage or injury of any kind or nature whatever, including death, as to all persons, whether Buyer's employees, agents or otherwise, and as to all property, including Buyer's own property, caused by, resulting from, arising out of, or occurring in connection with, the use by Buyer himself or any other person, of the Squeezebox Power Supply Upgrade Kit.

ASSEMBLY

Please read through these instructions one time before beginning assembly.

Tools required for Assembly

Soldering Iron
Wire Cutters
Wire Strippers
Screw Drivers
Socket Head Drivers
Electrical Tape

Parts List

Before beginning, check the parts list against the parts provided with your kit. Notify us immediately if any parts are missing.

D1-D4	3A/100V	Schottky Low Noise Diodes
D5, D6	1A/100V	Diode
C1-C9	4700uf/16V	Nichicon low impedance Electrolytic Capacitor
C10, C11	100uf/50V	Nichicon low impedance Electrolytic Capacitor
C12	.01uf/600V	Wima Film Capacitor
R1	1.21K	1% Metal Film Resistor (1.1K for Duet)
R2	3.65k	1% Metal Film Resistor (6.81K for Duet)
R3	1k	1% Metal Film Resistor
U1		LT Voltage Regulator
F1		Fuse Holder and Ceramic Fuse 0.5A
T1		Transformer
HS		Heatsink w/hardware
CB		Circuit Board
CT		Center Standoff
SOL		Silver Solder
IECH		IEC Connector
CON1		Chassis Connector 2 pin
CON2		Umbilical Connector 2 Pin
CON3		Squeezebox Power Connector
UMB		Teflon Umbilical Cable
WIRE		Hookup Wire
CH		Chassis
FEET		Chassis Feet

ASSEMBLY

Always keep in mind that you are the manufacturer of this product. Therefore the final appearance of this unit and its proper operation will largely depend upon the care taken during the assembly of this kit. We recommend that your work surface be padded, free of debris and kept clean during assembly. This will prevent the chassis from becoming accidentally scratched. Keep finger prints to a minimum and clean up the unit after assembly with some general purpose household window cleaner, like Windex. Be conscious of your wiring, don't create antennas out of the hookup wire by making big loops and arches. Keep all wiring neat, lead lengths short and routed close to the chassis. Believe us when we say "neat wiring sounds mo better".

Let's get started.

You will begin by inserting and soldering the parts to the circuit board. It is recommended that you do one part at a time and follow the stepped sequence outlined on the following page. The parts have been individually marked and bagged each with a reference designator that corresponds to a location silkscreened on the circuit board. For example resistor R1, capacitor C7, diode D2, etc. See Figure 1 below.

Unless noted otherwise, all of the parts will be mounted on the silkscreen side of the circuit board, with their leads protruding through the board, and soldered on the bottom side of the board. The leads can be bent outward, as shown in Figure 2 below, to help hold the part in place while you solder it.

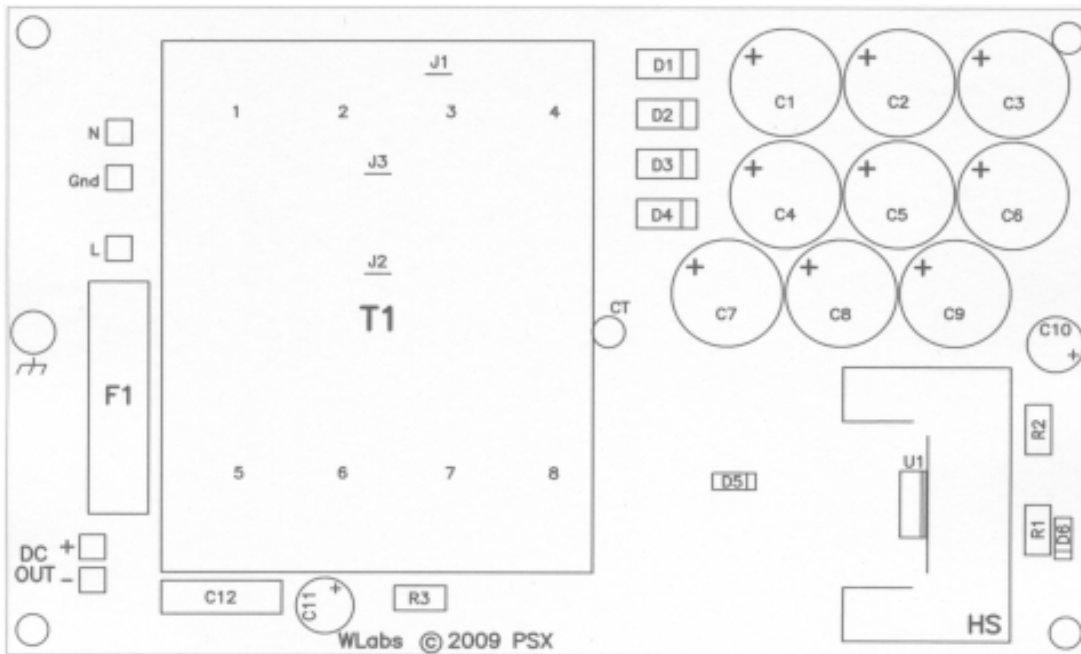


Figure 1

Unless otherwise noted, each part's body should be mounted flush and snug against the circuit board as shown in Figure 3. This is especially important with the large capacitors C1 through C9 as, you will see later, the circuit board is a tight fit inside of the enclosure. **Finally, trim the excess component lead wire as close to the board as possible.**



Figure 2

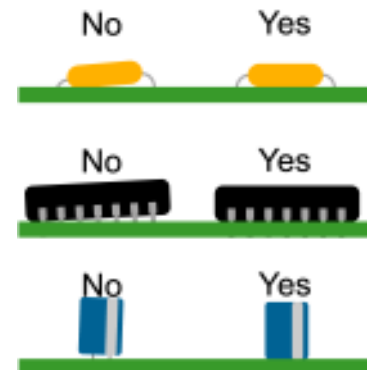


Figure 3

ASSEMBLY

We recommend you follow the assembly sequence outlined below.

- 1) Install and solder the low profile components first. Start with resistors R1-R3 and then diodes D1-D6. Note the polarity of the diodes D1-D6 which have a white or silver band at one end of their body. This band corresponds to the small line at one end of the diode on the circuit board silkscreen. Mount D5-D7 snug against the circuit board however diodes D1-D4 should be mounted approximately 1/4 inch above the board for better air flow.
- 2) Install and solder capacitors C10 and C11 (note polarity). The white stripe on the side of the capacitor is adjacent to the negative lead.
- 3) Install and solder Wima capacitor C12. This cap is not polarized.
- 4) Solder the Fuse holder clips for F1. It's easiest to snap the fuse into the end clips and then solder to the board.
- 5) Attach the black heatsink to the voltage regulator U1 with the provided screw.
- 6) Install the heatsink to the circuit board soldering the three leads of U1 and the two heatsink pins. Once again make sure the heatsink is snug to the board.
- 7) Next you will install transformer T1 but first you must install jumper wires J1-J3 depending upon the ac voltage that will be used. For 115Vac, cut two pieces of short wire and solder one for J2 and J3. These wires should be soldered on the bottom side of the board.

For 230Vac, cut one piece of short wire and solder it in the place for J1.
- 8) Mount transformer T1 on the board and note its correct orientation (the leads are labeled 1-4 and 5-8 on the transformer). Solder the transformer snug against the board.
- 9) Install and solder the electrolytic capacitors C1 thru C9 (note polarity). The white stripe on the side of the capacitor is adjacent to the negative lead. It is very important these capacitors are installed perpendicular and snug against the board.
- 10) Locate the bag labeled CT and grab the short 1/4" screw and threaded standoff. Attach it to the board so that the standoff is on the bottom side.

Remember to trim all excess component lead wires as close to the board as possible.

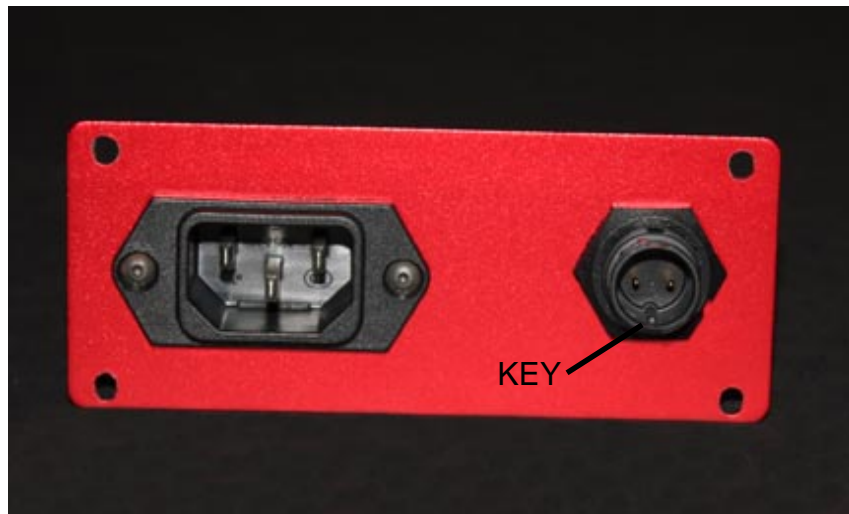
This completes the assembly of the circuit board.

ASSEMBLY

Now would be a good time to test the power supply to insure that it works before installing it into the chassis. Install the ceramic fuse F1 into its fuse holder. Connect an AC source to the three pads on the circuit board labeled N, L and Gnd. At the other edge of the circuit board are two pads labeled DC OUT + and -. Using a DC voltmeter you should measure 5 volts (9 volts for Duet) across these two pads when AC power is applied. If you obtain a reading of 5 volts (9 volts for Duet), then proceed with the next steps. If you do not measure 5 volts (9 volts for Duet), then turn off the power and recheck your work. Contact us if you have questions or encounter problems.

Next unbox the chassis pieces. Use a padded surface free of sharp objects so you will not scratch the chassis box. Do NOT install the feet yet.

Locate the bag labeled 'CON1' and mount this connector to the rear chassis plate. Rotate the connector so the key pin is at the bottom, as shown in the picture below, and tighten the nut. Be careful not to scratch the plate when tightening the nut.



Next locate the bag labeled 'IECH' and mount this connector to the rear chassis plate using the provided hardware.



ASSEMBLY

Next cut five short pieces of wire each to a length of 1 inch and strip 1/4 inch of insulation from each end. Solder one end of these wires to each terminal of connectors CON1 and the IECH.

Now slide the circuit board into the chassis box using the bottom most rails on each side. Slide the board about two thirds of the way into the chassis as shown below in figure 4. Bend the connector wires downward and slip them into the circuit board pads. Use something to hold the rear panel in position while you solder the wires to the circuit board. You can solder the wires from either the top or bottom side of the circuit board. Trim the excess lead wire from the bottom of the board.

Now you can slide the circuit board into the chassis and attach the front and rear panels with the provided hardware. Apply the feet now too.

This completes the assembly of the power supply

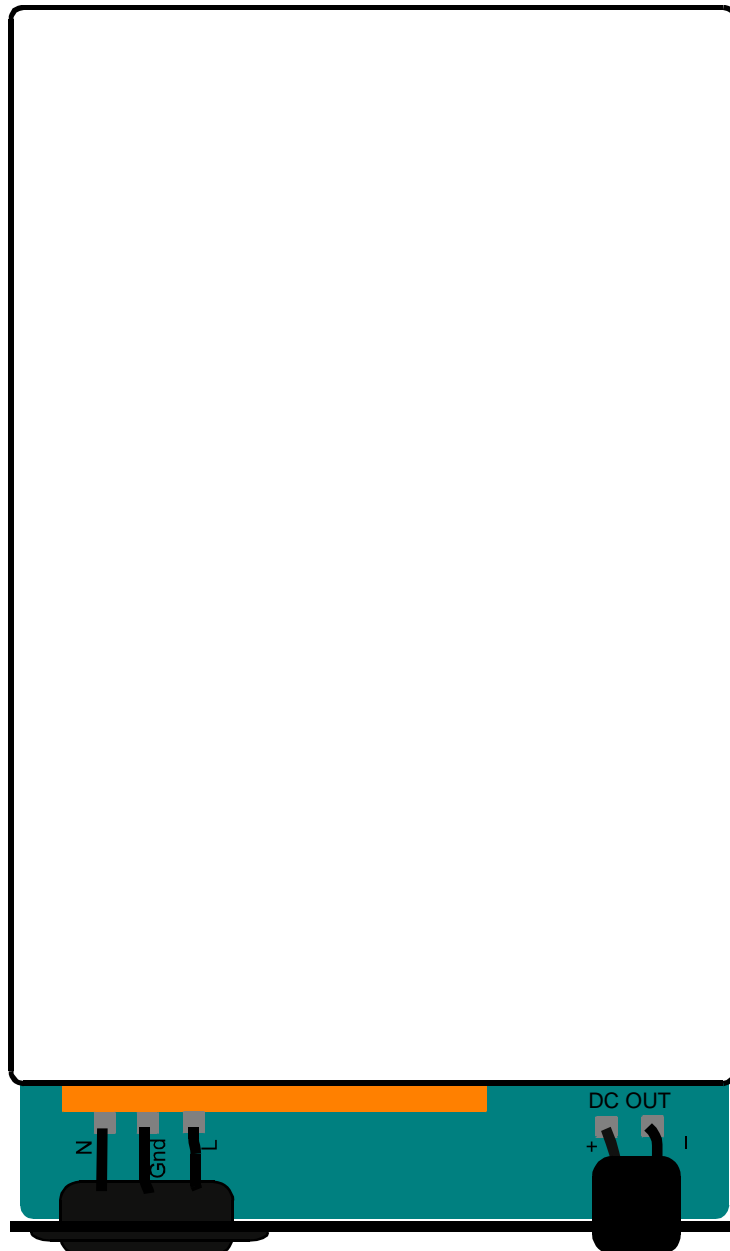


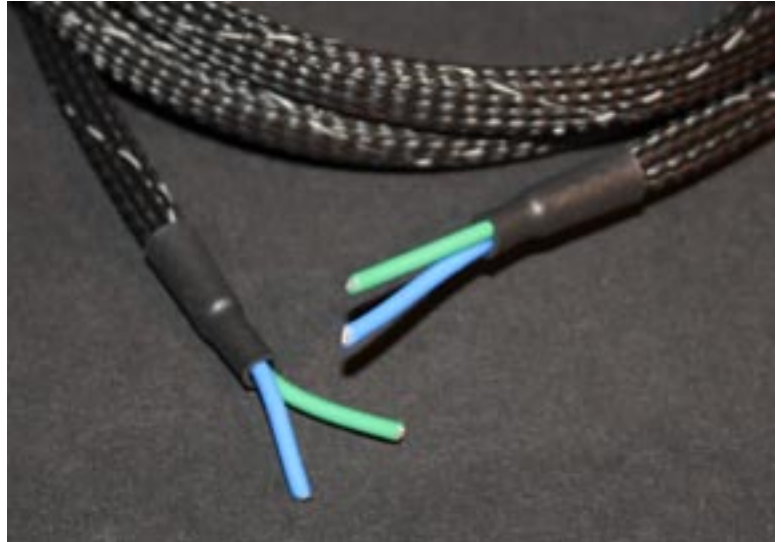
Figure 4

ASSEMBLY

The final task is to assemble the umbilical cord. Locate the bags labeled 'CON2' and 'CON3' as well as the two lengths of 18ga wire and outer braided jacket. First decide how long you would like this cable to be. We have supplied a length of 3 feet but, in general, the shorter this cable is the better.

Cut the two 18ga. wires to your preferred length and then cut the outer braided jacket to a length that is one inch shorter than the wires.

Slide the braid over the two wires. Cut two 1/2 inch pieces of the black heatshrink tubing and slide one over each end of the braid, as shown to the right, and apply heat. **A hair dryer is the best form of heat to use but try keep the hot air aimed at the tubing and not the braid because the braid will melt if it is allowed to get too hot.**



Now you will solder connector CON2 to the cable. Slide the rubber boot and strain relief over the braided jacket as shown to the right. Be careful not to disturb the heatshrink that you previously applied to the jacket. **If you look on the face of this connector you will see that one of the pins is marked with a very small dot. Solder the blue wire to the connector pin associated with this dot. Solder the green wire to the remaining pin.** The 18ga copper wire is too big to slide into the connector's solder cups, so pry away a few pieces of the fine wire and snip them off thus reducing the diameter of the copper wire. They should then slide into the solder cups. **Don't apply too much heat or you can melt the plastic connector.**



Snap the strain relief into the back of the connector until it clicks. I then like to put a few drops of superglue between the strain relief and heatshrink tubing.

Finally, slide the rubber boot up over the back of the connector assembly.

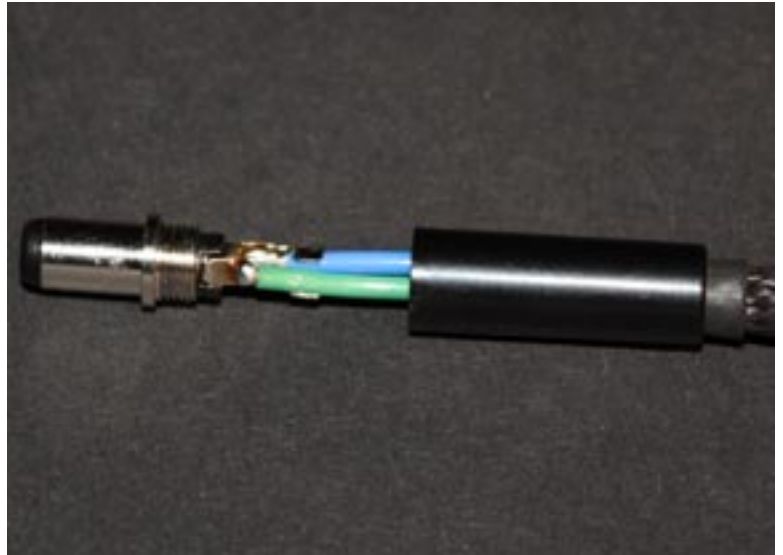
ASSEMBLY

On the opposite end of the cable strip slide the black connector shell up onto the cable. You may need to expand the opening on the back of the connector just a little bit. Once again be careful not to disturb the heatshrink tubing. Strip 1/8 inch of insulation from each wire and solder them to CON3 as shown in the photo to the right.

The green wire is soldered to the short center tab of the connector and the blue wire is soldered to the long ground tab. Use a pair of pliers to crimp the strain relief to the outer teflon jacket of the cable. The 18ga copper wire is too big to slide into the connector tab hole, so once again pry away a few pieces of the fine wire and snip them off thus reducing the diameter of the copper wire.

Slide the connector's shell up onto the back of the connector.

Once the cable assembly is finished you should use an ohmmeter to test the continuity of the connections and make sure the ground and hot wires have not shorted together.



This completes the assembly of the Squeezebox power supply upgrade kit. If the power supply board previously tested good, then you can proceed to connect the umbilical cord between the power supply and your squeezebox and power up the unit.