

**raleigh
audio**

Mark IV

**Premium
Power Supply**

**Assembly
Manual**

Kit version

Use this manual with the Raleigh Audio Premium Power Supply, version 1.2

Required Tools and Supplies

35 to 50 Watt soldering iron
Diagonal cutting pliers
Long-nose pliers
Wire stripper
Solder

Warnings and Cautions

Caution – Use only solder that is intended for electrical circuits. Do not use acid or corrosive flux of any kind.

Support

You may contact us with questions on constructing this kit by sending an e-mail message to support@raleighaudio.com

Power Requirements

The Power Supply requires 120VAC at 100mA or 230VAC at 50mA.

Notes

Steps marked with the note symbol ♪ mean that the component must be oriented in a particular way.

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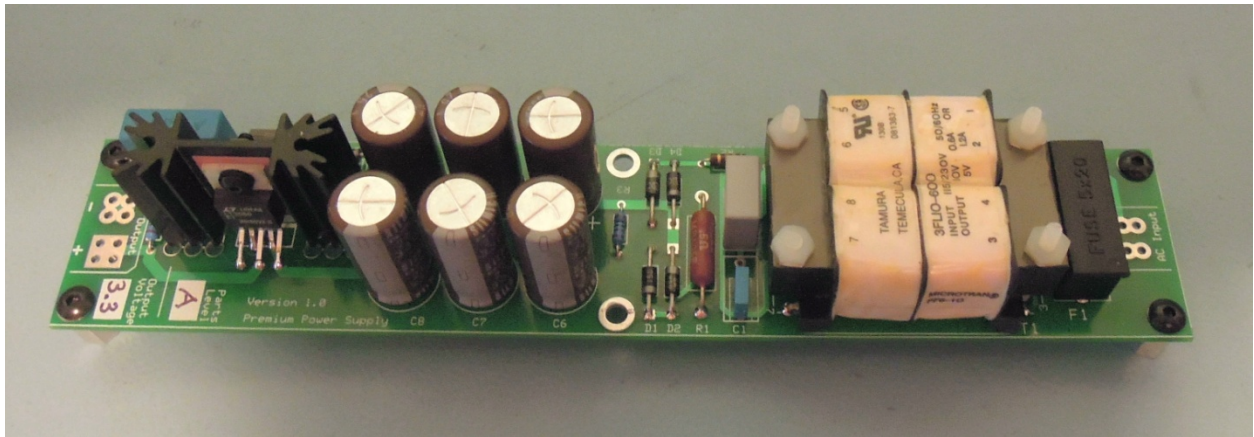
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Assembly Instructions

Before you start, read through the instructions completely to the end. Inventory the kit contents to become familiar with the parts and to make sure you have everything.

In the following steps you will populate the PC board. All of the components are mounted on the top of the board, which has the components labeled with white silkscreen.

Steps preceded by a “note” (J) deal with components which must be oriented properly.



The Premium Power Supply takes the mains line voltage (120VAC or 230VAC) and produces a programmable DC output.

Premium Power Supply Assembly

1. Mount four $\frac{3}{8}$ " standoffs on the bottom of the board at the corners and secure with 6-32 x $\frac{1}{4}$ " screws.
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2. Mount a $\frac{3}{8}$ " standoff in the hole next to C3 and secure with a 6-32 x $\frac{1}{4}$ " screw.
-

3. Insert a 1K (brown, black, black, brown, brown) resistor in the following two locations: R3 and R4.

Solder and trim the leads. Save the leads snipped from the resistors.

4. Insert a 330 Ω (orange, orange, brown, gold) carbon composition resistor in location R2.

Solder and trim the leads.



5. Insert an MBR150 (marked on body) diode in the following two locations: D1 and D3. Orient the diodes such that the end with the stripe is closest to the edge of the board.

Solder and trim the leads.



6. Insert an MBR150 (marked on body) diode in the following two locations: D2 and D4. Orient the diodes such that the end with the stripe is closest to the center of the board.

Solder and trim the leads.



7. Insert a MBR150 (marked on body) diode in location D5. Orient the diode such that the end of the diode with the band is closest to resistor R6.

Solder and trim the leads.

8. Insert a 0.5Ω (marked on body) Mills resistor in location R1.

Solder and trim the leads.

NOTE: The locations for capacitors C1 and C2 are sized to accept different size capacitors, depending on application. If you are inserting the smaller capacitor in those locations, make sure that you insert the capacitor within the smaller outline box.

9. Insert a 10nF (marked 10n on body) capacitor in location C1.

Solder and trim the leads.

10. Insert a 100nF (marked 100n on body) capacitor in location C9.

Solder and trim the leads.

The output voltage of the Regulator is determined by the value of resistor R5.

Voltage	R5
3.3V	332K
5V	499.0K
8V	820K
10V	1.00M
12V	1.21M

There is a white square next to the output pads that may be used to indicate the output voltage. If your board has not been labeled, write the output value in the white square.

11. Install the appropriate Caddock resistor in location R5. Install the resistor such that the body of the resistor is raised about $\frac{1}{4}$ " above the surface of the board.

Solder and trim the leads.

12. Insert the fuse holder in location F1.

Solder the pins.

13. Insert a 200nF (marked 200n on body) capacitor in location C2.

Solder and trim the leads.

14. Insert the proper fuse in the fuse holder cover and install the cover and fuse in the fuse holder.

The fuse should be:

100mA “slow-blow” (time delay) for 120VAC

50mA “slow-blow” (time delay) for 230VAC

15. Insert a 4.7uF (marked 4u7J63 on body) capacitor in location C10.

Solder and trim the leads.

16. Wire the jumpers on the bottom of the board for your mains line voltage. You may use leads snipped from resistors to form the jumpers. Trim the leads flush on the top of the board.

For 120VAC:

Connect pad A to pad B

Connect pad C to pad D.

For 230VAC:

Connect pad E to pad F.

WARNING:

Non-conductive Nylon screws are provided to secure the transformer in the next step. Do not substitute metal screws, which will cause a short circuit that will damage the circuit and may cause bodily injury or even death.



17. Insert the transformer, T1, in its location. Align the transformer such that the pin numbers on the transformer match the pin numbers on the board. Secure the transformer with three 4-40 x 1" Nylon screws and Nylon nuts. Insert the screws from the bottom of the board with the nuts on the transformer frame. Tighten the screws snugly but do not over-tighten.

Note that a fourth Nylon screw has already been mounted on the transformer in the hole closest to pin 7. This will ensure proper orientation of the transformer because there is no hole in the board for this location.

18. Solder and trim all eight pins on the transformer.



19. Insert a 330 μ F capacitor in the following three locations: C3, C4 and C5. Orient the capacitors such that their negative leads (marked on side) are closest to the edge of the board.

Solder and trim the leads.



20. Insert a 330 μ F capacitor in the following three locations: C6, C7 and C8. Orient the capacitors such that their negative leads (marked on side) are closest to the edge of the board. (nearest LED pads)

Solder and trim the leads.

21. Install the heatsink in its location and solder the pins.

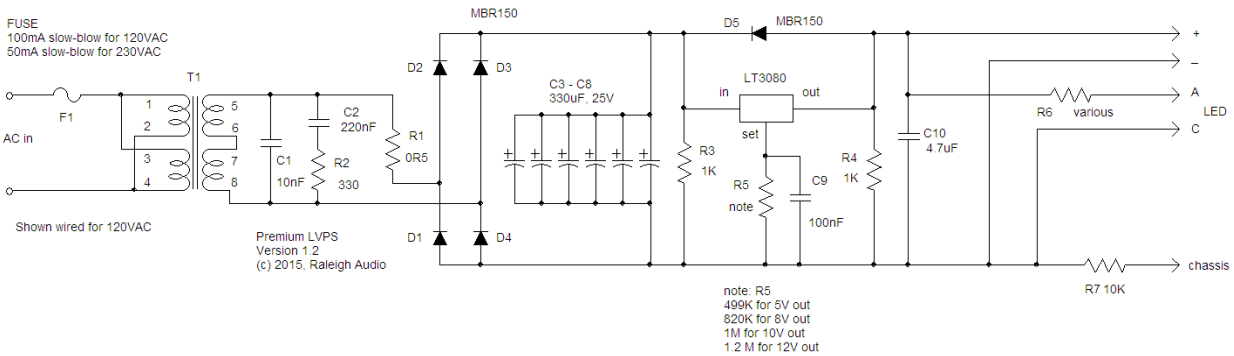


22. Insert the LT3080 regulator module in location U1.

- Insert an insulator between the regulator and the heatsink.
 - Secure with a 4-40 x $\frac{3}{8}$ " screw, lock washer and a nut, using an insulating bushing on the screw with the head of the screw on the side with the regulator.
 - Tighten the screw moderately tight.
 - Solder and trim the five pins on the regulator.
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All components should now be installed on the board. Check that all leads are soldered and that there are no “solder bridges” that connect things that should not be connected.

Schematic Diagram



Options

If this power supply is used to power a “power on indication” LED, then R6 will be used to set the intensity of the LED. You will choose the value of this resistor empirically, depending upon the type of LED used and the desired intensity of the light.

This power supply may be used to power a circuit from the “+” and “-” outputs, with or without being referenced to a common system “chassis ground.”

- If you want to isolate this supply from chassis ground, do not make any connection to the “chassis” pad.
- If you want to reference the negative “-” output to the system ground, then connect the “chassis” pad to the chassis ground.
- Resistor R7 may be used to limit the loop current flowing through this ground connection. If R7 is a jumper (zero Ohms,) then there is no limit to the loop current.

Parts List (Level B)

Designator	Part	Description	Qty
	PC board	version 1.0	1
T1	Transformer, 5VA		1
D1- D5	Diode, MBR150	cylinder, value marked on body	5
U1	Regulator, LT3080	5-pin transistor	1
C2	Capacitor, 200nF	Grey square	1
C3 – C8	Capacitor, 330 μ F, 25V	brown cylinder	6
C9	Capacitor, 100nF	Grey square	1
C10	Capacitor, 4.7 μ F	Blue square	1
C1	capacitor, 10nF	blue square	1
R1	Resistor, 0.5 Ω Mills	Brown cylinder, value marked on body	1
R2	Resistor, 330 Ω carbon composition	orange, orange, brown, gold bands	1
R3, R4	Resistor, 1K Ω	brown, black, black, brown, brown bands	2
R5	Resistor, various Caddock	grey square, value marked on body	1
R6	Resistor, various value		
R7	Resistor, 10K optional	brown, black, black, red, brown bands	1

	Standoff, 6-32 x 3/8"		5
	Screw, 6-32 x 1/4"		10
F1	Fuse holder	black rectangle	1
	Fuse holder cover		1
	Fuse, 50mA or 100mA "slow-blow" (time delay)	glass cylinder	1
	Screw, Nylon 4-40 x 1"		3
	Nut, Nylon 4-40		3
	heatsink, medium, 1"		1
	screw, 4-40 x 3/8		1
	washer, lock, 4-40		1
	nut, 4-40		1
	insulating bushing	black cylinder	1
	insulator, heatsink	grey square	1

Document Version History

Version	Description
1.0	Original document to support parts level A
1.2	(This document) to support parts level B

Parts Level History

Version	Description
A	Original production level
B	LED and chassis connection provided