

**raleigh
audio**

Mark IV

**Premium
Regulator**

**Assembly
Manual**

Kit version

Use this manual with the Mark IV Low Voltage Regulator Version 1.3, parts level D

Required Tools and Supplies

35 to 50 Watt soldering iron
Diagonal cutting pliers
Long-nose pliers
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 Regulator Module requires an input voltage of between 5VAC and 7VAC at 6VA to 12VA, depending on the load.

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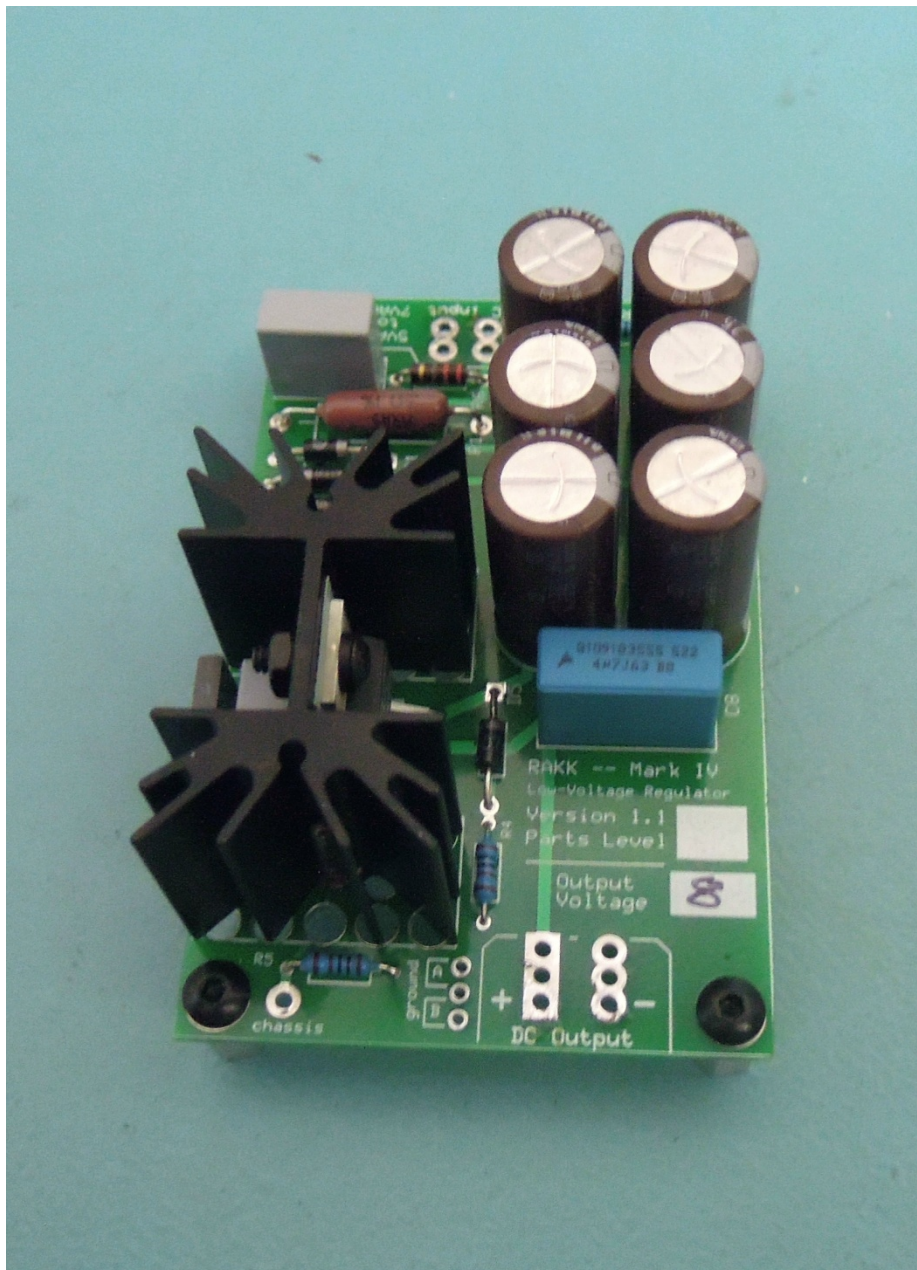
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Assembly Instructions

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 boards. All of the components are mounted on the top of the boards, which has the components labeled with white silkscreen.

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



TIP: you may find it convenient to solder the components with leads, like resistors and diodes, from the top of the board.

1. Mount four standoffs on the bottom of the Regulator board and secure with 6-32 screws.
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2. Insert a 1K (brown, black, black, brown, brown) resistor in the following three locations: R2, R4 and R5.

Solder and trim the leads.

3. Insert a 330 Ω (orange, orange, brown, gold) carbon composition resistor in location R6.

Solder and trim the leads.



4. Insert an MBR150 (marked on body) diode in the following two locations: D2 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.



5. Insert an MBR150 diode in the following two locations: D1 and D4. Orient the diode such that the end with the stripe is closest to capacitor C2.

Solder and trim the leads.



6. Insert a MRB150 diode in location D5. Orient the diode such that the end of the diode with the band is closest to capacitor C3.

Solder and trim the leads.

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

Solder and trim the leads.

NOTE: The locations for capacitors C9 and C10 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.

8. Insert a 10nF (marked 10n on body) capacitor in location C10.

Solder and trim the leads.

9. Insert a 100nF (marked 100n on body) capacitor in location C7.

Solder and trim the leads.

The output voltage of the Regulator is determined by the value of resistor R3.

Voltage	R3
3.3V	330K
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.

10. Install the appropriate Caddock resistor in location R3. Install the resistor such that the body of the resistor is raised about ¼” above the surface of the board.

Solder and trim the leads.

11. Insert a 200nF (marked 200n on body) capacitor in location C9.

Solder and trim the leads.

12. Insert a 4.7uF (marked 4u7J63 on body) capacitor in location C8.

Solder and trim the leads.



13. Insert a 330 μ F capacitor in the following three locations: C4 – C6. Orient the capacitors such that their negative leads (marked on side) are closest to the edge of the board.

Solder and trim the leads.



14. Insert a 330 μ F capacitor in the following three locations: C1 – C3. Orient the capacitors such that their negative leads (marked on side) are closest to capacitors C4 – C6.

Solder and trim the leads.

15. Install the heatsink in its location.

Solder the pins.



16. 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.

17. Solder and trim the five pins on the regulator module.

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.

Optional Grounding

The LVPS Regulator may be used either as a positive voltage supply or a negative voltage supply, depending on how it is referenced to ground.

For a positive supply, install jumper A.

For a negative supply, install jumper B.

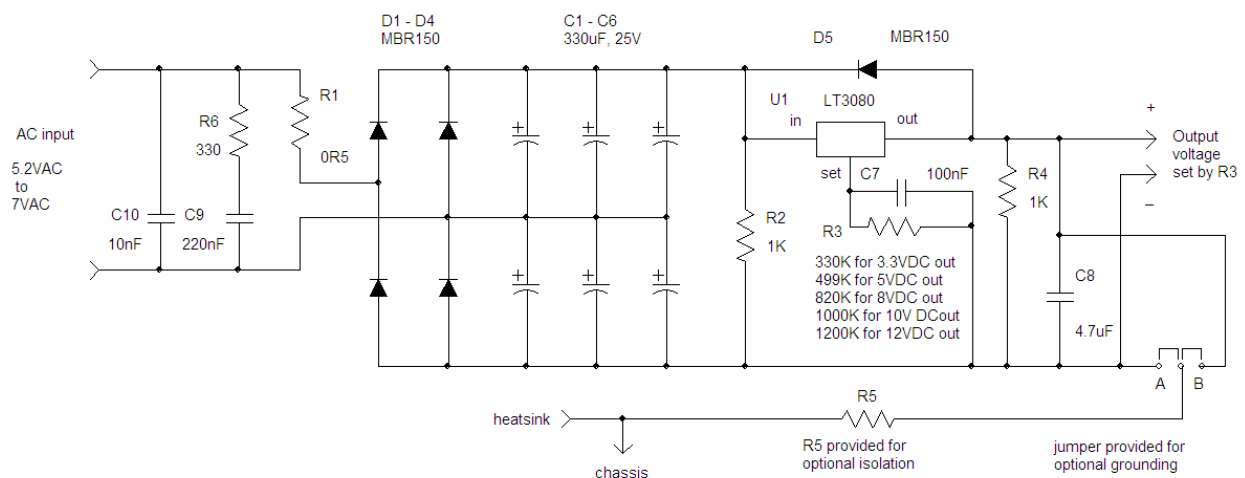
To inhibit ground loops, there is an optional resistor (R5). When R5 is installed and the chassis pad connected to the ground, then all current should be drawn from the +/- output pads on the supply. An example of where this could be used is for powering a USB adapter with a ground connection from a computer. The R5 will keep the supply from floating and suppress any ground loop.

If jumper A or jumper B is installed and R5 isolation is not desired, then place a jumper in the R5 location.

It is not necessary to provide a ground reference at the supply by installing jumper A or jumper B. The ground reference could be elsewhere in the system.

It is possible that the supply could be biased at some elevated voltage by the attached load. In this case, there should be no ground reference at the supply.

Schematic Diagram



Parts List (Level D)

Premium Regulator Module Parts

Designator	Part	Description	Qty
	PC board	version 1.3	1
D1 – D5	Diode, MBR150	cylinder, value marked on body	5
C10	Capacitor, 10nF, 63V	blue rectangle, value marked on body	1
C1 – C6	Capacitor, 330µF, 25V	brown cylinder	6
C7	Capacitor, 100nF, 63V	grey rectangle, marked 100n	1
C9	Capacitor, 200nF, 63V	grey rectangle, 200n	1
C8	Capacitor, 4.7uF, 63V	blue rectangle, value marked on body	1
R1	Resistor, Mills 0.5Ω	brown radial cylinder, value marked on body	1
R2, R4, R5	Resistor, 1KΩ	brown, black, black, brown, brown bands	3
R3	Resistor various values	Caddock, grey rectangle	1
R6	Resistor, 330Ω	orange, orange, brown, gold bands	1
U1	Regulator	LT3080	1
heatsink		black	1
insulator		grey rectangle	1
insulating bushing		black cylinder	1
screw, 4-40 x 3/8			1
nut, 4-40			1
washer, 4-40			1
standoff		3/8" if regulator to be mounted on chassis 1/4" if regulator stacked on another regulator	4
screw	6-32 x 1/4"	only if 3/8" standoffs supplied	8

Document Version History

Version	Description
1.0	Original document to support parts level C
1.1	Clarify grounding
1.2	(this document) Minor parts changes for availability

Parts Level History

Version	Description
C	Original production level
D	$R1 = 0.5\Omega$, $C9 = 200\text{nF}$