RRBB

FX TYPE: Breadbuddy
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Overview

The **RRBB** is a breadboard plug-in version of the Road Rage voltage converter utility. It plugs directly into a breadboard setup and outputs different voltages that are commonly used in guitar pedals. While it's designed with the madbeanpedals **ProtoRig** in mind, it should work with any number of prototype/breadbwwoarding setups.

The RRBB takes a standard unfiltered 9v input and outputs the following:
- +9v filtered
- +18v filtered
- -9v filtered
- One adjustable output that ranges from about +16v to +1.2v.

You have the option to use different charge pump ICs. The ones I recommend are (pay attention to the suffixes):
- MAX1044**CPA**
- TC1044**SCPA**
- TC7662**BCPA**
- LT1054

The first three will generally provide about 20-30mA of output current for the converted voltages (+9 to +18, -9). The LT1054 has about 100mA of on tap so it's more suited for high current circuits. There are likely several other voltage converter/charge pump ICs that will work with the RRBB. The ones listed are simply the most common.
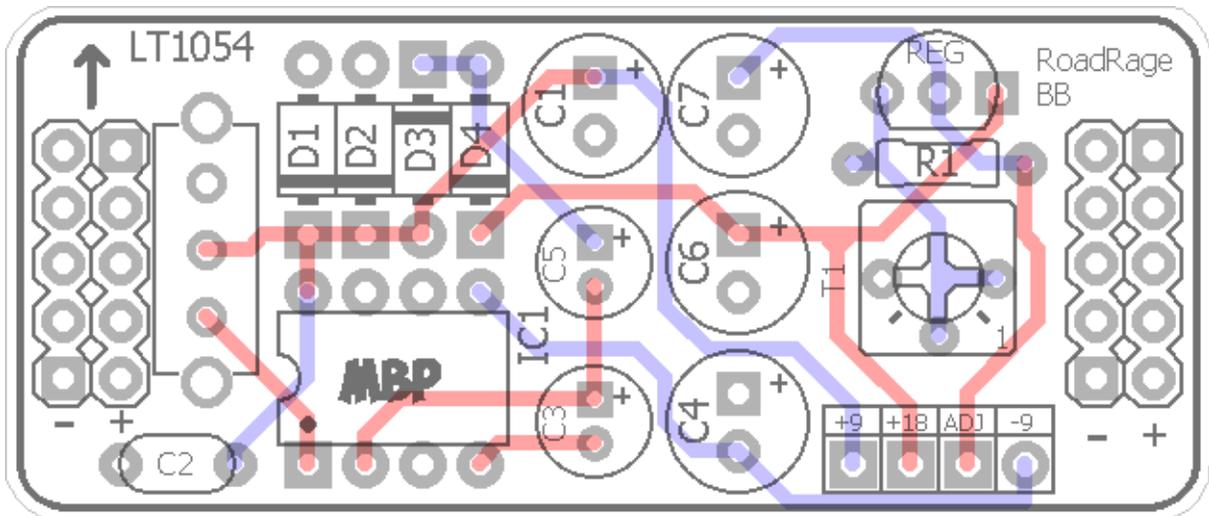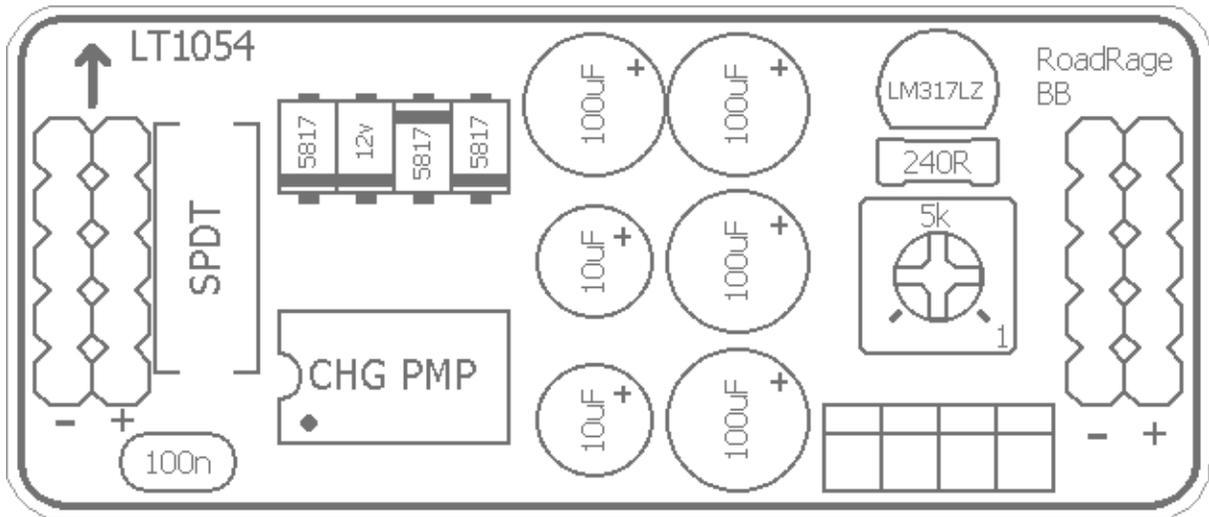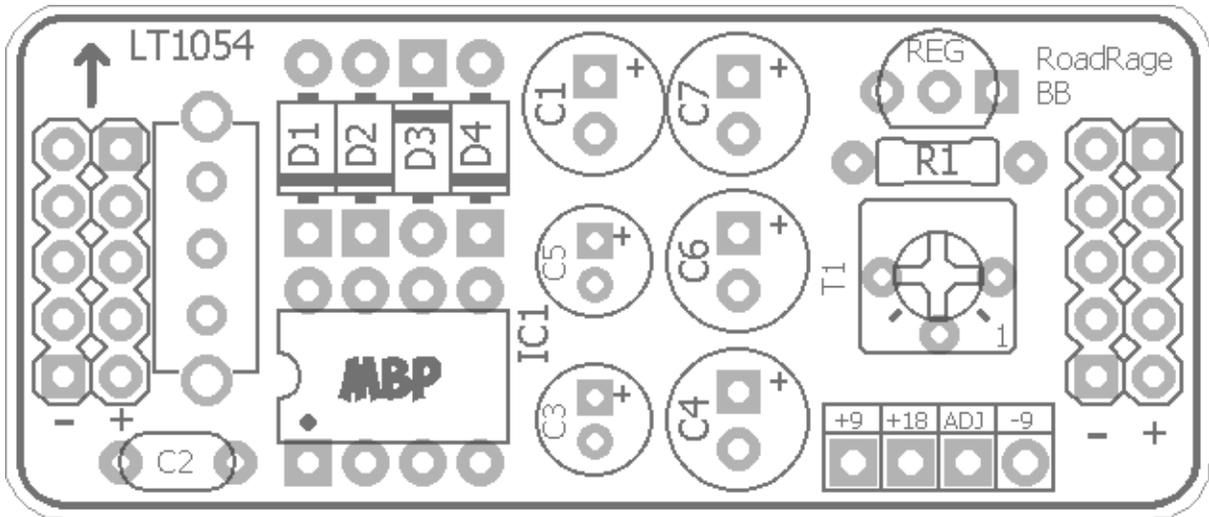
Controls

- **For the LT1054, set the *slide switch* to the UP position.** For most other charge pumps the switch should be set to the DOWN position. In the up position, pins 1 and 8 are disconnected. In the down position they are shorted together. You cannot damage charge pumps by putting the switch in the wrong position. Just be mindful of using the correct setting!

- The T1 trimmer sets the positive voltage output on the ADJ pad. It ranges from about +16v to about 1.2v.

NOTE: If you are using the RRBB with the mbp ProtoRig, the Filter switch on the ProtoRig should be set to "Unfiltered".

Technical assistance for your build(s) is available via the madbeanpedals forum. Please go there rather than emailing me for assistance on builds. This is because (1) I'm not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates a record from which other members may benefit.

Layout   **RRBB**

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Resistors		Value	QTY	Type
R1	240R	240R	1	Metal Film
Caps		100n	1	MLCC or Film
C1	100uF	10uF	2	Electrolytic
C2	100n	100uF	4	Electrolytic
C3	10uF	1n5817	3	
C4	100uF	12v	1	1W Zener
C5	10uF	LM317LZ	1	TO-220 style
C6	100uF	CHG PMP	1	several options
C7	100uF	SPDT	1	On/On, slide
Diodes		5k	1	Bourns 3362p
D1	1n5817			
D2	12v Zener			
D3	1n5817			
D4	1n5817			
Regulator				
REG	LM317LZ			
IC				
IC1	CHG PMP			
Switch				
BOOST	SPDT			
Trimmer				
T1	5k			

The two 5-pin double headers used for the RRBB **are included** with the PCB.

I've created a Mouser project that contains the parts I recommend for this build. It can be found here: https://www.mouser.com/ProjectManager/ProjectDetail.aspx?AccessID=9e4e519675
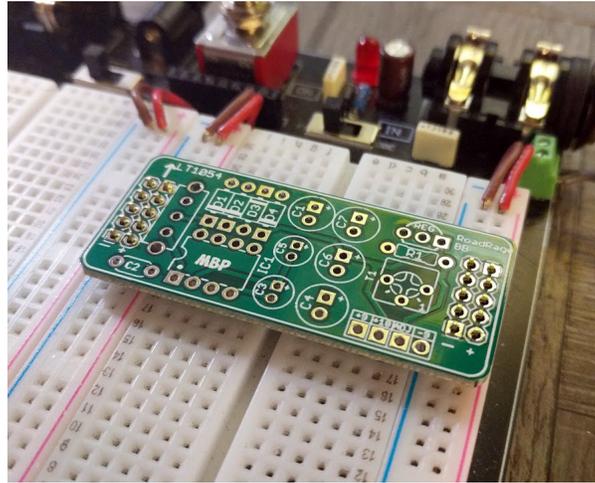
- It has two LOW ESR 10uF caps (good for efficiency in the charge pump circuit).
- It includes three different charge pump options.

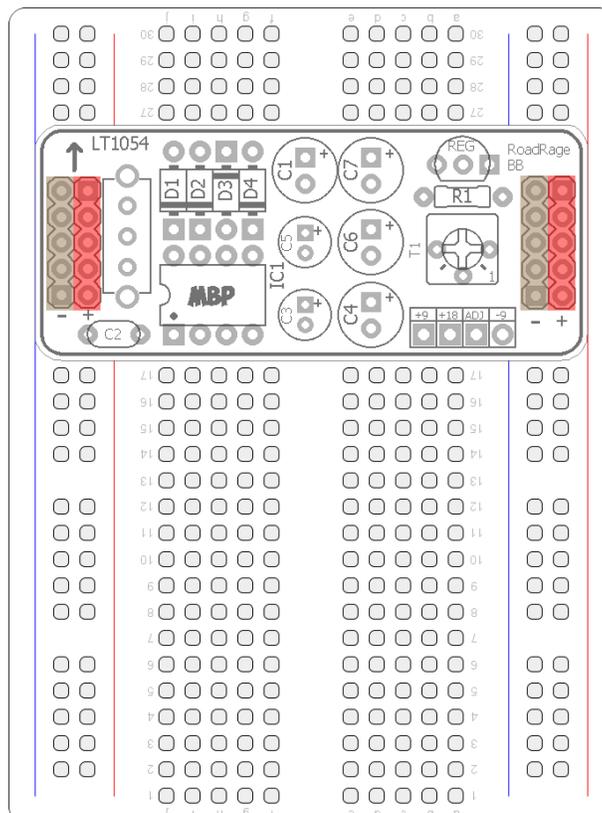It <u>does not</u> have the slide switch. That was specifically designed for this one: https://www.taydaelectronics.com/slide-switch-1p2t-through-hole-0-5a-50vdc.html

Alternatively, you can source just about everything you need from smallbear, Stompboxparts and/or Tayda if Mouser is not an option for you.

Build Tips

The RRBB uses two 5-pin double row headers soldered directly to the PCB. These headers plug directly into the "-" and "+" rails on a standard breadboard. To make sure you have a perfect fit, I suggest first plugging in the headers to the breadboard, then mounting the PCB. Now solder the first and last pin of each column. This will ensure your pins and PCB are perfectly aligned. After doing that, remove the entire unit and solder the rest of the header pins (doing that will prevent then pins from getting too hot an melting the breadboard). You can do this as a first step or after you've populated the board. The order doesn't matter.
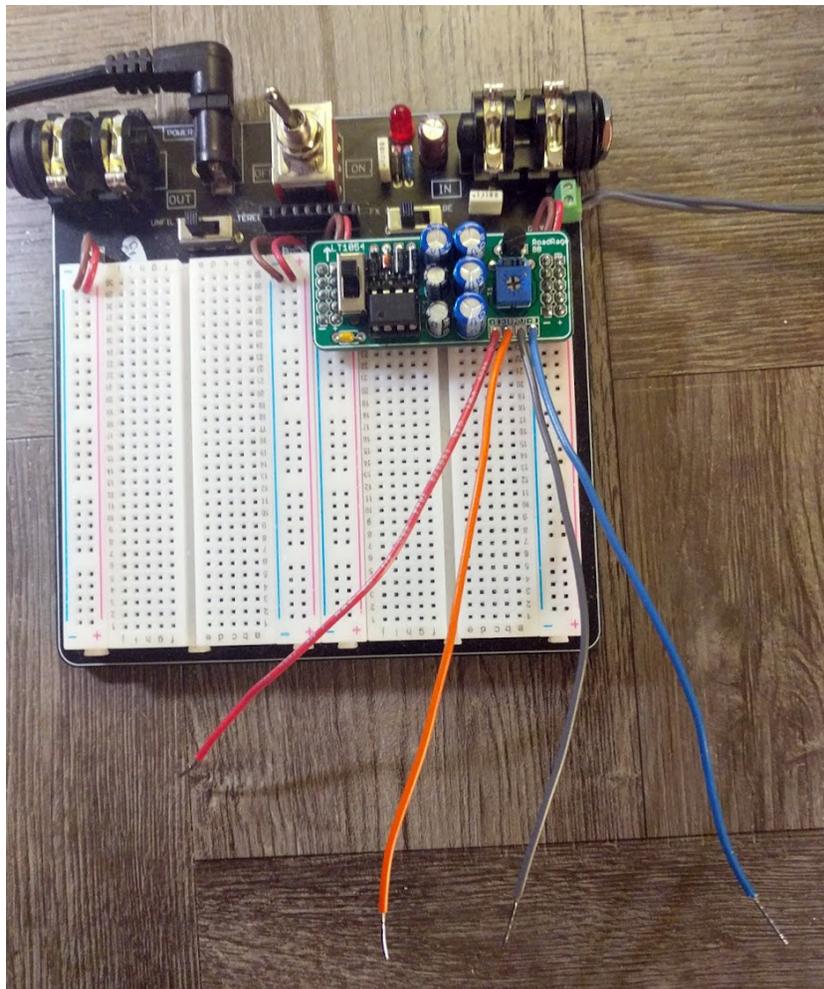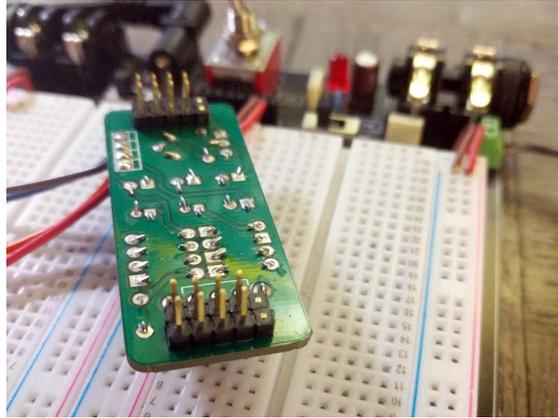

Make sure you are aware of the pin order. On the PCB it's "-" then "+" left to right. I did it this way because that's how the breadboards on the ProtoRig are oriented. If your breadboards are situated the opposite way, you just need to rotate the RRBB 180° to fit your prototyping/breadboarding setup.

Build Tips

If you *are* using the mbp Protorig, then the first row of the breadboards is already wired for ground and power. This means you cannot plug the RRBB into the top row, which is inconvenient for the limited breadboarding area. I suggest you just clip the top row of pins on the RRBB in that case so you can keep the RRBB out of the way.

Using different colored wires is a good idea so you don't accidentally plug the wrong power into a part or parts!

IC1	LT1054
1	4.1
2	4.82
3	0
4	-4.28
5	-9.06
6	2.55
7	1.34
8	9.24
REG	LM317LZ
1	17.84
2	16.29
3	15.56

- 9.42vDC One Spot
- Current Draw: ~ 10mA
- Testing Conditions:
- LT1054, on the ProtoRig, T1 trimmer full CCW, no load.

BBRR
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