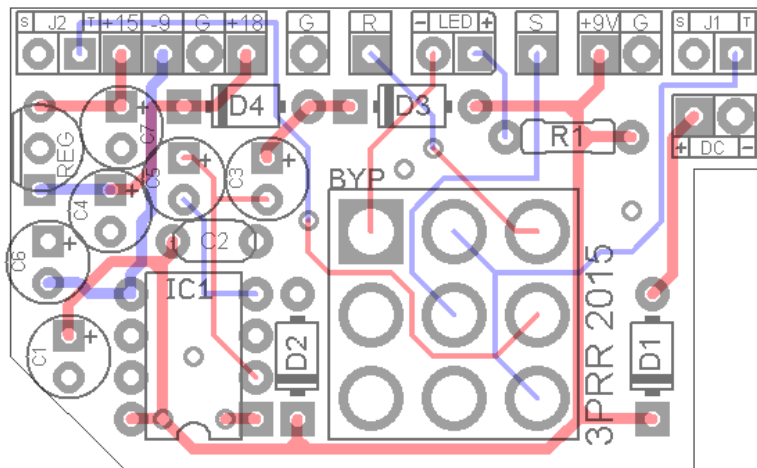
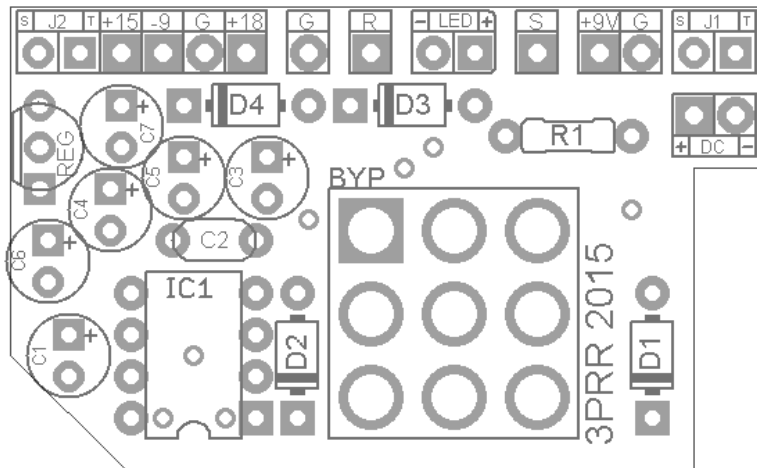


3PRR

FX TYPE: Utility

© 2015 madbeanpedals

1.815"W x 1.11"H

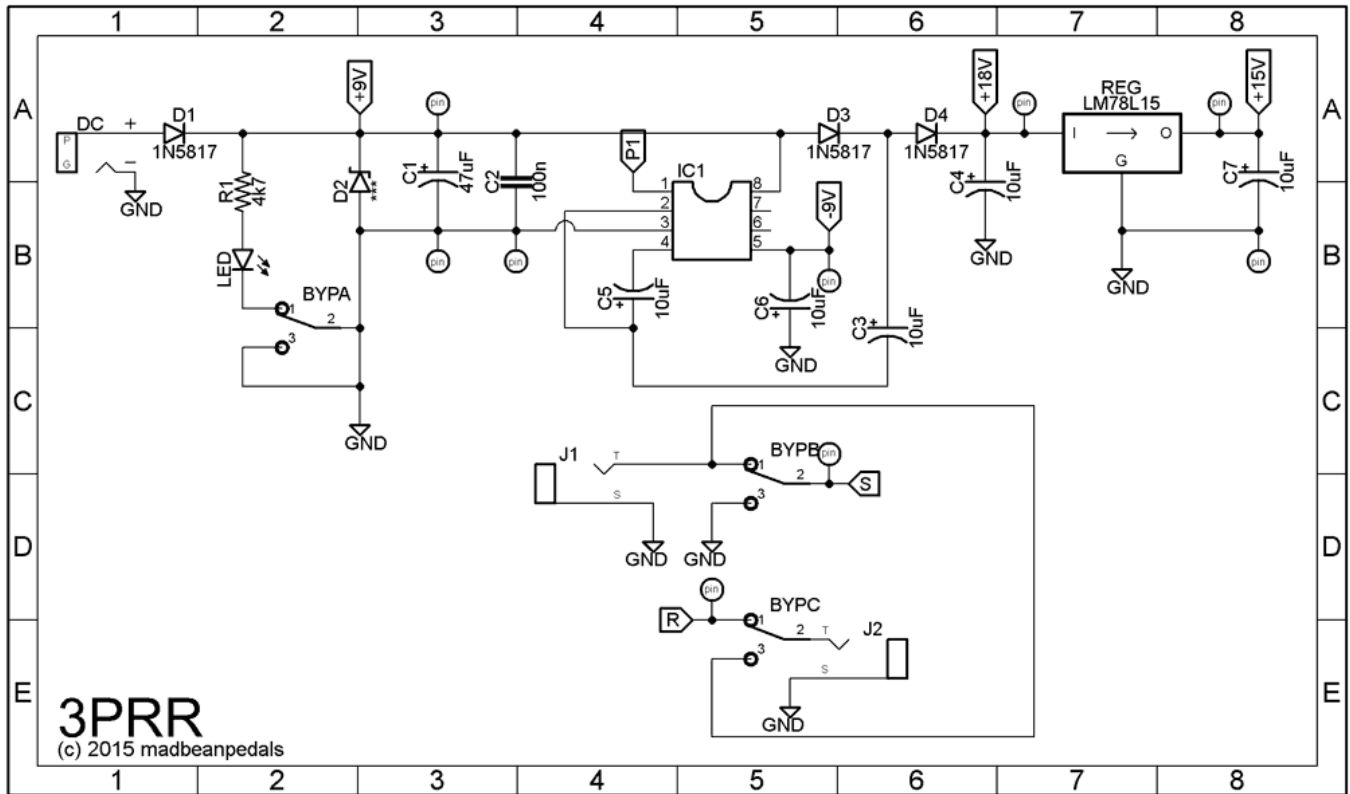


2015 change-log: Removed 10R current limiting resistor.

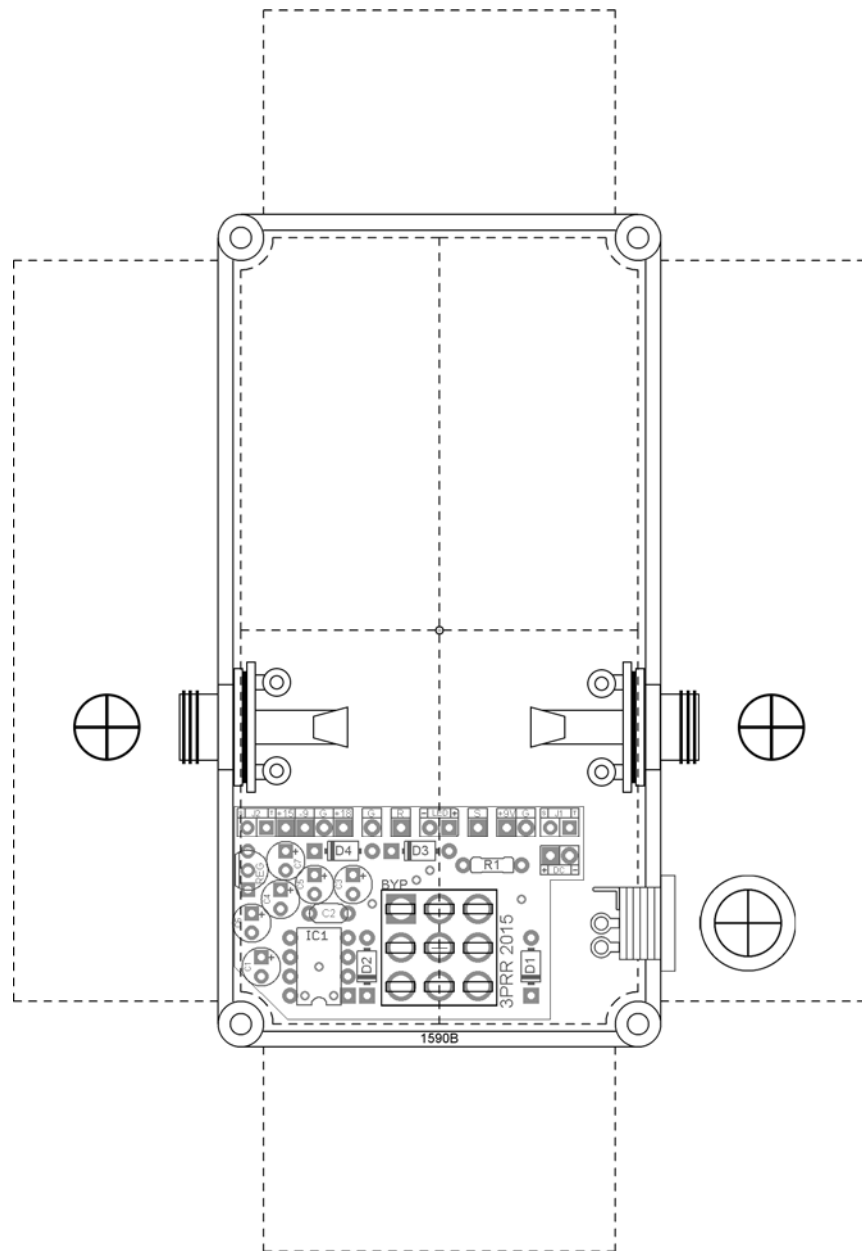
This PCB is designed for the typical BLUE 3PDT footswitch. Other footswitches may or may not fit into the pad spacing allotted.

Terms of Use: You are free to use purchased **3PRR** circuit boards for both DIY and small commercial operations. You may not offer **3PRR** boards for resale or as part of a "kit" in a commercial fashion. Peer to peer re-sale is, of course, okay.

Resistors		Value	QTY	Type	Rating
R1	4k7	4k7	1	Carbon / Metal Film	1/4W
Caps		100n	1	Film / MLCC	25v
C1	47uF	10uF	5	Electrolytic	25v
C2	100n	47uF	1	Electrolytic	25v
C3	10uF	1N5817	3		
C4	10uF	Zener	1	9.1/12/15v	1W
C5	10uF	LM78L15	1	T0-92	
C6	10uF	Charge Pump	1	*see notes	
C7	10uF	LED	1	3mm or 5mm	
Diodes		3PDT	1	Solder Lug Footswitch	
D1	1N5817				
D2	Zener				
D3	1N5817				
D4	1N5817				
LED	3MM/5MM				
Regulator					
REG	LM78L15				
IC					
IC1	Charge Pump				
Switch					
BYP	3PDT				



1590B
4.43"W x 6.47"H



This is the top down view looking at the front face of the 1590B enclosure.

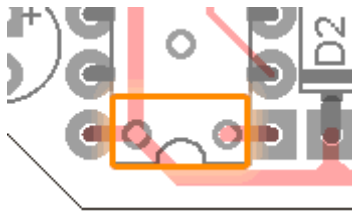
The **3PRR** is a combination of two utility circuits onto a single PCB: a charge pump / voltage inverter and bypass switcher. The switching mechanism is true bypass with effect input grounded, and the charge pump section can provide + or - 9v, +18v (unregulated) and/or +15v (or +12v) regulated. All outputs can be used simultaneously, if needed, so long as the circuit load does not exceed the current supply available through the charge pump. This ranges from 20mA-100mA depending on the charge pump used.

Building tips:

The 3PDT switch and components are mounted on the **same side of the PCB** (the one with the component silk screen). The entire assembly is flipped over to mount in the enclosure.

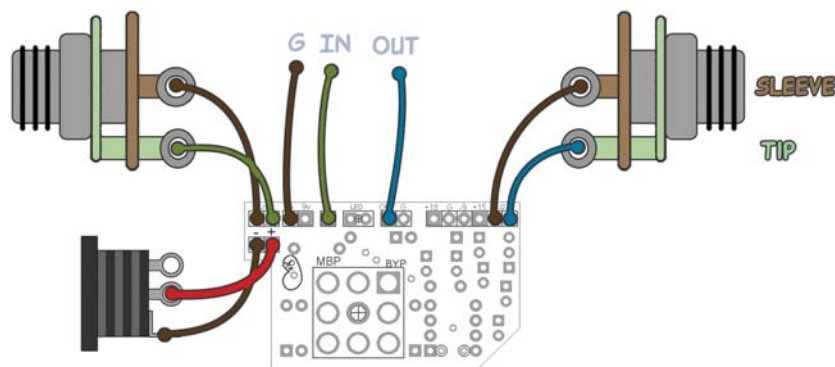
The 9v output is a courtesy output. This can be used if you are building two effects in a larger enclosure that have different power requirements. Example: a boost that uses 18v and a compressor that uses 9v. In this case, the 9v pad and G pad would be wired to the compressor. The 18v pad and the other G pad would be wired to the boost. You should be able to combine positive and negative ground effects, too. Example: a fuzz that uses -9v and a boost that uses +9v.

You can use any of the following charge pumps: MAX1044**CPA**, TC1044**SCPA**, ICL7660**SCPA**, and the LT1054. There are two small pads connected to pins 1 and 8 of IC1. These pads must be jumpered for all the charge pumps **EXCEPT** the LT1054. *Do not jumper the pads for the LT1054.*



Special note: These pads were masked over by the manufacturer; they are still solder-able since they are plated through. Just heat up the jumper and let your solder flow into both pads.

This wiring diagram shows what you will see inside the enclosure.



Charge Pumps:

Type	Suffix	Connect Pads?	Max Input Voltage	Max Current	Zener Diode (D2)
LT1054	-	NO	16v	100mA	15v
ICL7660	SCPA	YES	12v	45mA	12v
MAX1044	CPA	YES	10v	20mA	9.1v
TC1044	SCPA	YES	12v	20mA	12v

Type: These are the four most common charge pumps used in guitar effects. However, you should be able to use any pin compatible charge pump so long as it will accept a 9v input.

Suffix: When ordering parts, make sure you get the ones with these exact suffix. The ICL and TC brands have both “CPA” and “SCPA” types. You need the “SCPA” type. The MAX one only has the CPA, but that is the correct one to use for the Road Rage. The LT1054 does not have the CPA or SCPA category.

The two pads under IC1 must be connected according to the list above. Failure to connect the pads correctly will result in an audible whine in your audio path. The LT1054 is the only one that does NOT need the pads connected.

Max Voltage: This is the maximum input voltage the charge pump can accept. Note that when you use higher input voltages, your outputs will scale accordingly; a 12v in means 24v out instead of 18v. The 15v output on the RR PCB will still be 15v since that is determined by the regulator.

Max Current: This is very important. This is the maximum amount of current the charge pump can supply. So, why not use the LT1054 for everything since it has the most current output? Because it is more expensive. If you are using the Road Rage to run a dirt pedal at 18v, one of the other charge pumps will suffice 99% of the time since dirt pedals tend to draw low current. However, some effects (like an analog delay or Univibe) will have higher current consumption. In those cases, the LT1054 is necessary.

Zener Diode: This diode will protect your IC from an over-voltage supply. This is optional (the 3PRR work without it) but if you need to protect the circuit from using a wrong power supply, then use this list to determine what value Zener to use.

Regulators:

The Road Rage is laid out for a TO-92 style regulator. This should suffice in most cases since most charge pumps tap out at a maximum of 100mA. A TO-220 style regulator will not fit standing up due to the extra height of the tab on top. You may be able to mount a TO-220 on the bottom of the board by bending the mounting pins at right angles, but I have not tried this. Keep in mind that the 220 pinout is also the opposite of what’s on the 3PRR PCB.

How to use the Road Rage:

I need -9v output to power a fuzz circuit

Solder D1, D2, C1, C2, C5 and C6 to the PCB. Omit D3, D4, C4, C7, and REG . Connect your DC jack to the “DC” pads and take your output from the -9/G pins (-9v and ground). BTW: ground is ground. No matter if you are using a positive or negative ground circuit always connect ground from the Road Rage to the ground on your circuit. In the case of a fuzz, we just connect -9 to the -9v supply pad on the fuzz circuit board. It is that simple.

I need +18v output for my overdrive pedal (or whatever)

Solder everything except C5, C6, C7, and REG to the Road Rage PCB. Connect your DC jack to the “DC” pads and take the output from +18/G. Jumper the two C6 pads to connect pin5 of IC1 to ground.

I need +15v output for my overdrive pedals (or whatever)

Solder everything except C5 and C6. Connect your DC jack to the “DC” pads and take the output from +15/G. Jumper the two C6 pads to connect pin5 of IC1 to ground.

I need all the voltage outputs to use a power supply for my breadboard or really weird effect pedal

Solder everything. Connect all the outputs.

07.27 Update: The pads for the boost option on pg.4 have been increased in size and labeled for easier soldering. This is the only change.

