



Pump'd Up Rangemaster Plus v2.1

This is our revision of a vintage favorite! We have studied many versions of this classic circuit, and gave it the royal GuitarPCB.com treatment. Included in this version is a charge pump, which allows you to use a vintage Germanium PNP transistor and still share power with your other standard negative-ground pedals, or combine this with another circuit in the same enclosure and share a power source.

The original Rangemaster was a treble booster. This build incorporates 3 different tonal selections. The first will give you classic Rangemaster treble boost. The second setting boosts highs and mids. The third setting boosts the full tonal range of a guitar, or "band pass" setting. With size in mind, the circuit board was designed to fit in a small, 1590A enclosure. The 3 tonal selections are made with a small SPDT On-Off-On switch, again, with the 1590A enclosure in mind for those who like tiny pedals.

The board will accommodate 3-pin TO-5 sockets, if you desire to use these. Many PNP Germanium transistors that are available today, such as NOS 2n404, 2n1307, 2n1305, CV7355, etc. come in a TO-5 package.

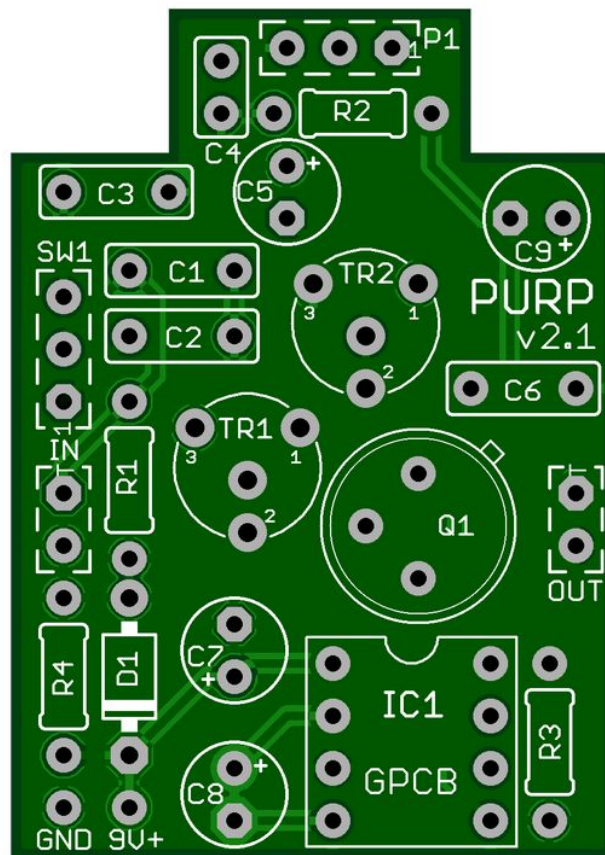
Notes on this build:

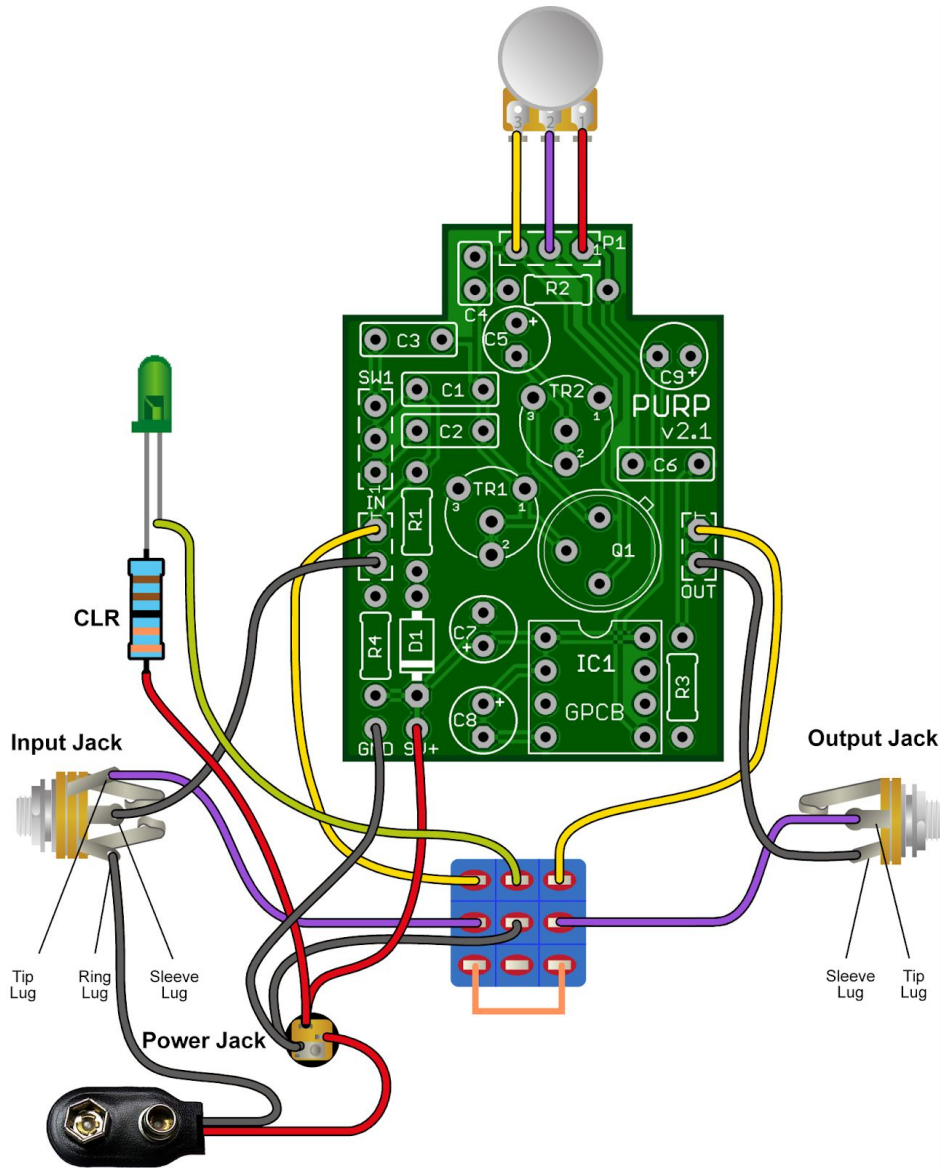
- You will need to bias this circuit. With the transistor in, and a good 9V power supply attached (no half-dead batteries allowed) use a Digital Multimeter (DMM) to measure between ground and the collector of Q1. The layout shows which pins are which. Turn the BIAS trimmer until the collector voltage is negative 6.8-7.2 V (assuming you have the red test lead on the collector, black on ground)
- To adjust the TR2 'GRIT' trimmer properly, turn TR1 all the way up. The further clockwise you turn it, the louder and more of an overdriven sound you will get. Once you have it hooked to your amp, you may want to adjust it back up by 5-15% to suit your tonal preferences.
- The input capacitors (C1, C2, and C3) are what control the tonal balance. When the switch is in the middle (OFF position), only C1 is active. Flip the switch to activate C2, and C1 and C2 are active. Flip the other way to activate C3, and both C1 and C3 are active. You can adjust the values of these caps (slightly) to get the values that suit your taste. Barry likes C2 set at 22n, whereas I have seen other versions of this circuit use a 10n capacitor here.
- The gain of your PNP Germanium transistor should be between 60 and 100 hFE, and low leakage as possible.
- The C4 capacitor is a hiss filter. In case your transistor has some leakage, using this will reduce the hiss. If your transistor has zero or very low leakage, then I recommend omitting this. This capacitor was not part of the vintage circuit, but is an enhancement added by us. I recommend NOT using this until you have heard your pedal hooked up to your amp rig and determine if you have some high-end hiss. 150-220pF should do the trick.
- You can also try increasing the output capacitor, C6; I suggest up to 22n, and see if that suits your liking better than the default 10n.

Part	Value
D1	1n4001
R1	1M
R2	200k
R3	1M
R4	1M
C1	6n8
C2	22n
C3	47n
C4	150p
C5	47u

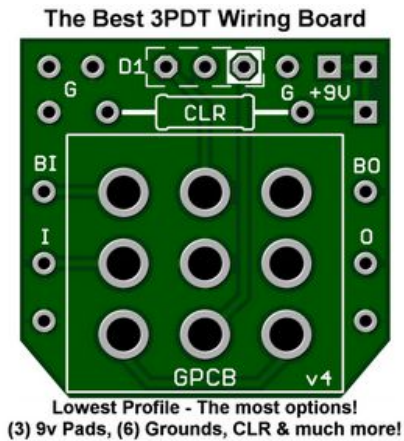
Part	Value
C6	10n
C7	47u
C8	10u
C9	47u
IC1	7660S or 1044
TR1 - BIAS	100k
TR2 - GRIT	10k
P1 - LEVEL	A10k
SW1 - TONE	SPDT_ON-OFF-ON
Q1	PNP Germanium 60-100 hFE

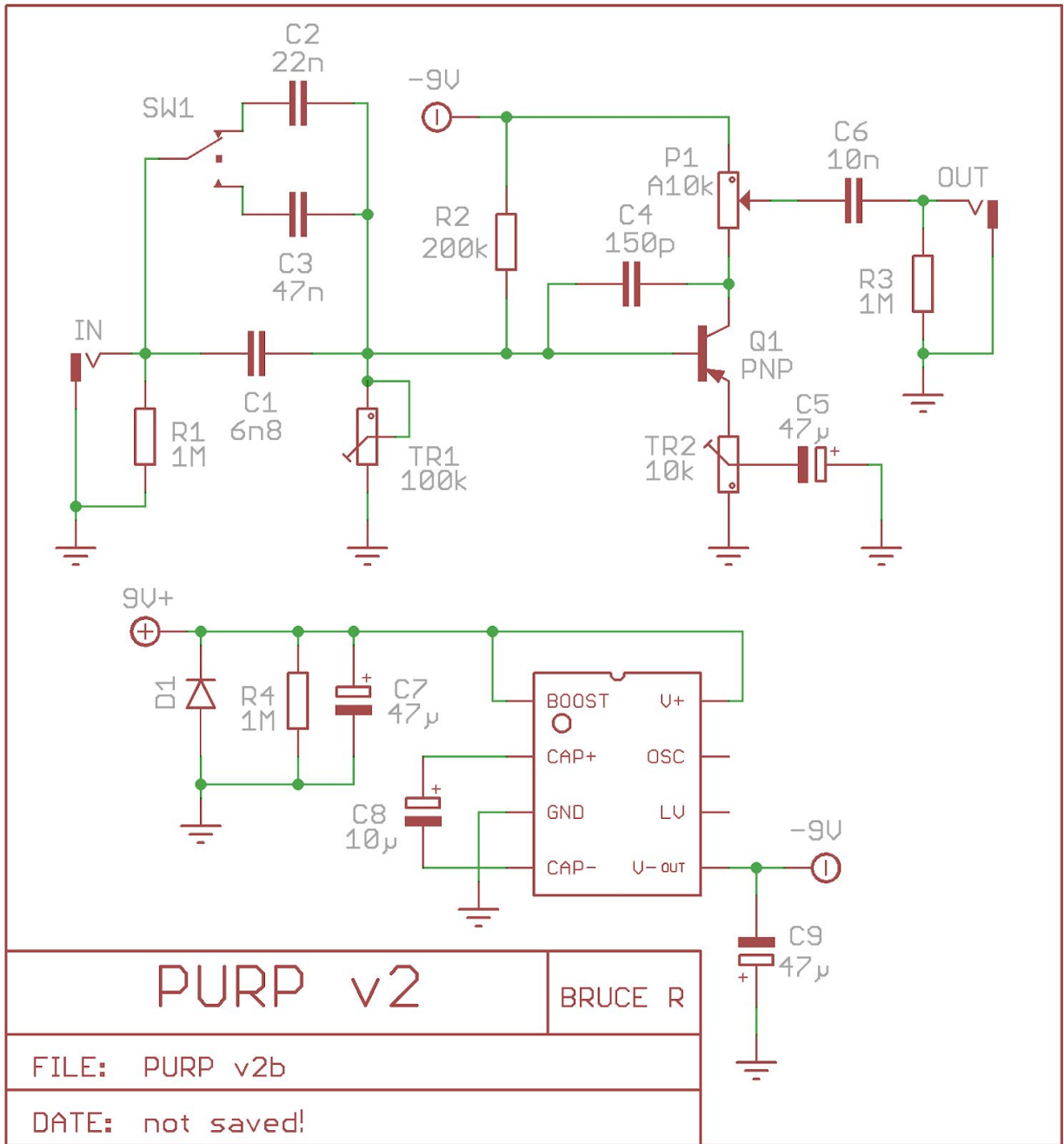
PNP Germanium Transistors are available in the USA at Small Bear at an affordable price.





Use a GuitarPCB handy 3PDT Wiring Board to add an LED and use optional wiring schemes with ease.

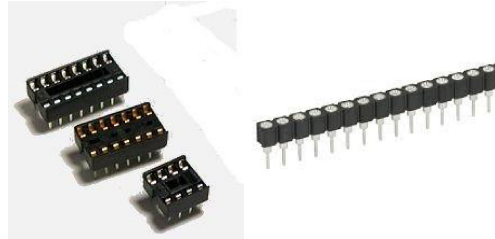




There's some great info [here from RG Keen](#) explaining the circuit and how to tweak it.

IC's and transistors are easily damaged by heat from soldering and should never be directly soldered to the PCB.

For transistors, diodes, and LED's, use SIP (Single inline package) sockets. You simply cut the number of sockets required with an Exacto / Stanley knife or by gripping and rocking with pliers. This allows for easy changes and troubleshooting.



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