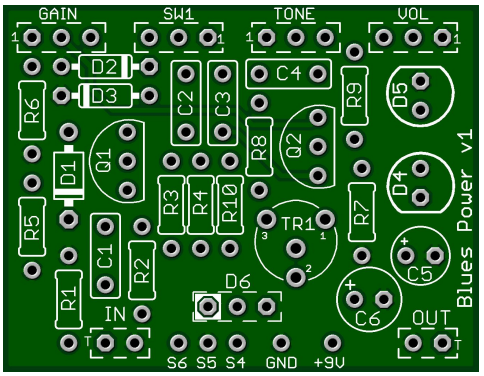
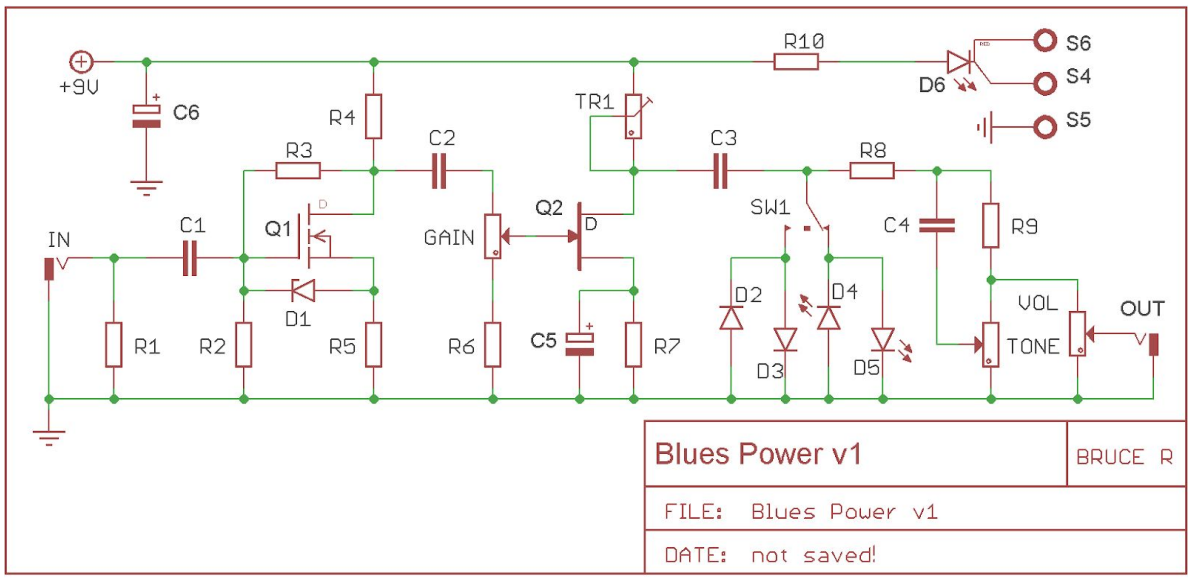
Blues Power v1

Blues Power is unique in that it combines a simple MOSFET boost stage with a JFET “tube” stage. This is based off the ROG Peppermill but with added clipping options to allow the circuit to exhibit more clipping than the original and with LEDs a much warmer tube-style tone. We have also changed a value to allow more bass response. Now besides being used a boost it can also work as an overdrive with Bass or Standard guitar. The tone control is a low pass filter at minimum rotation, but at 65% rotation it changes to a fine high pass filter.

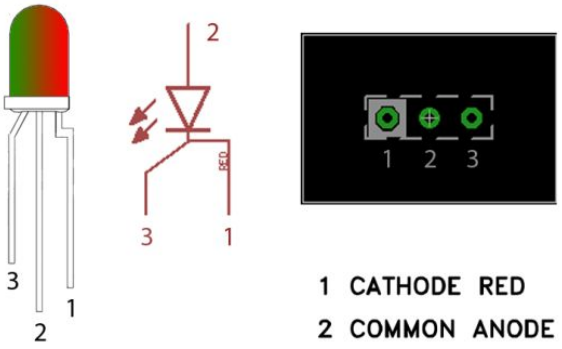


Board Dimensions (W x H) 1.63” x 1.26” ca. 41.3mm x 32 mm



Part	Value	Part	Value	Part	Value
R1	1M	C1	22n	GAIN	A250k
R2	1M	C2	6n8	TONE	B100k
R3	1M	C3	47n	VOL	A100k
R4	4k7	C4	22n		
R5	1k	C5	1µ	D1	9V1 Zener
R6	100k	C6	100µ	D2	1N34A
R7	1k	TR1	50k	D3	1N34A
R8	8k2	Q1	BS170	D4	Green LED
R9	36k	Q2	J201	D5	Green LED
R10	1k8	SW1	SPDT On-Off-On	D6	CA Bi-color LED

D1 is a reverse polarity protection. **D6** is an option to use the main board to hold the Bi-color status LED.
R10 – Current Limiting Resistor for on-board Bi-color LED. This may be adjusted to 4k7 for a dimmer light.



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The diagram above shows the pin-out, schematic symbol and pad connection for a common anode LED.
The pin-out for the bi-color LED is as follows:

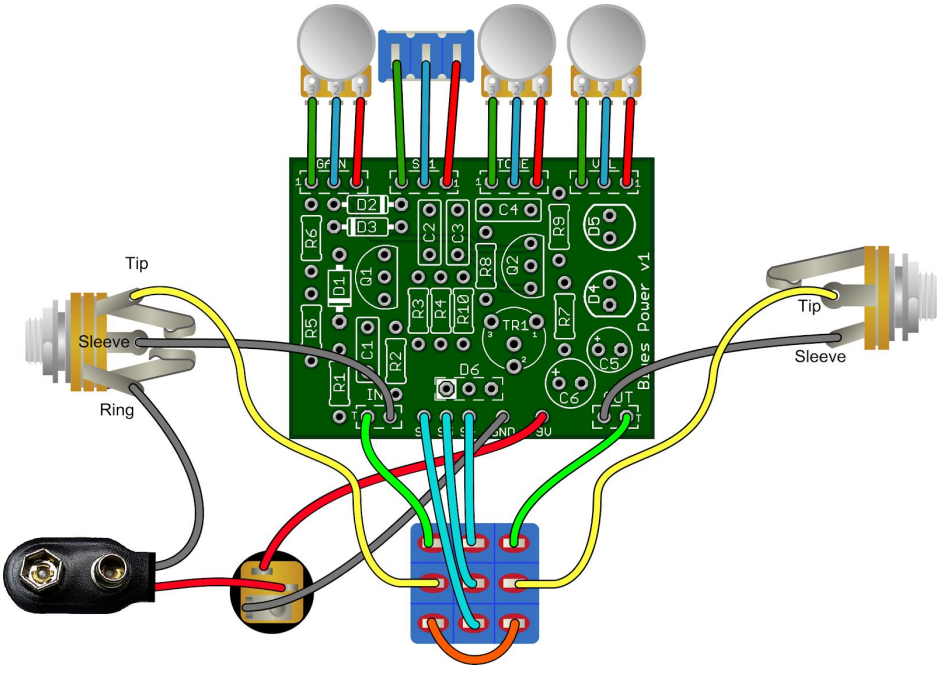
1st Colour Cathode 90 degree bend in the lead
Common Anode Middle lead
2nd Colour Cathode 45 degree bend in the lead

The pad for lead 1 on the circuit board is marked with a white box.
When connected correctly the LED will light red when power is applied and the circuit is in bypass mode. The LED will light green when in effects mode. When choosing a standard LED use center anode and non-white box.
Using a standard LED, connect the anode to the middle pad and the cathode to the right pad to show the circuit in effects mode.

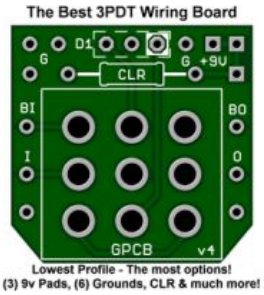
Build Notes and Mods

- Socket both transistors to allow easy replacement or testing. BS170s should be used in Q1, but a variety of JFETs will work in Q2. Be sure to verify the pin-out is the same. Try 2N5457 and MPF102 depending on the tone you want to achieve.
- R10 is the CLR so adjust accordingly to the desired LED color and brightness.
- **Adjust TR1 so that the Drain of Q2 is at 4.5V.** You can do this by placing the "common" lead of your voltmeter to ground and the "positive" lead of your voltmeter on the Drain of Q2 after it has been installed.
- As with all diode clipping circuits, you can experiment with different diodes. BAT41s, 1N4148, Zeners, and many Germanium types sounded good. 1N34A's or BAT41's sounded the best to my ears.
- If you do choose to experiment, I recommend leaving the LED clipping in place (D4 and D5) and adjust D2 and D3 to taste.
- When D2 and D3 are engaged, there is a significant volume drop, (it's normal) but you may not find it optimized for your setup. Experiment with R9 to compensate for volume. Lowering this value may help. Also doubling up the diodes or tying an LED in series will bring the volume up. You can do this mod easily with one of our **DPDT Wiring Boards.**

WIRING



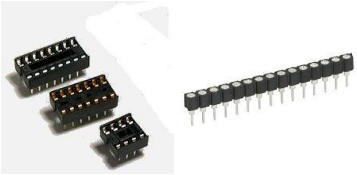
If you are using one of GuitarPCB's 3PDT wiring boards, pads S4, S5, S6 and D6 would be ignored and R10 would not be installed when choosing to mount the status LED on the 3PDT wiring board instead. We like to provide different options for builders.

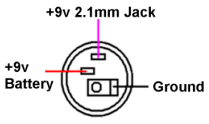


Other important notes:

- Socket your Transistors – You may wish to change them later and makes troubleshooting a lot easier.
- R10 is the current limiting resistor. Brightness is a preference. 1k8 will yield a very bright LED and the higher the resistance the dimmer the light. 3k or even 4.7k has been used. This is your choice.
- A YouTube Demo is available.

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





Soldering Tutorial on Youtube

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