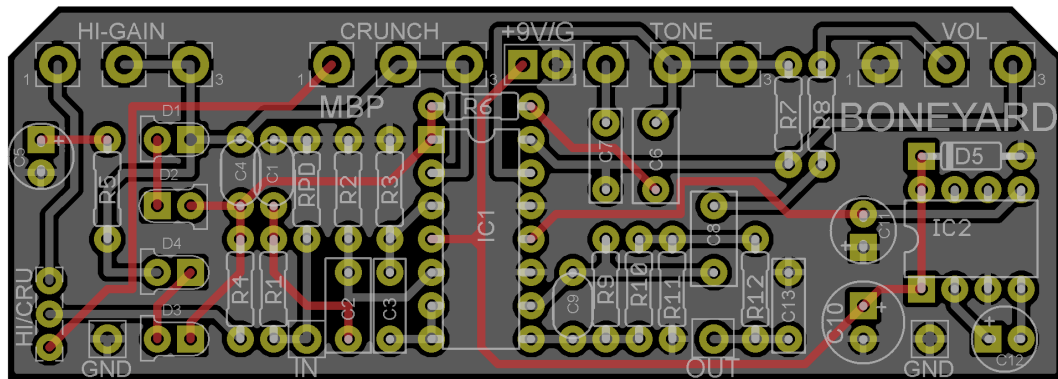
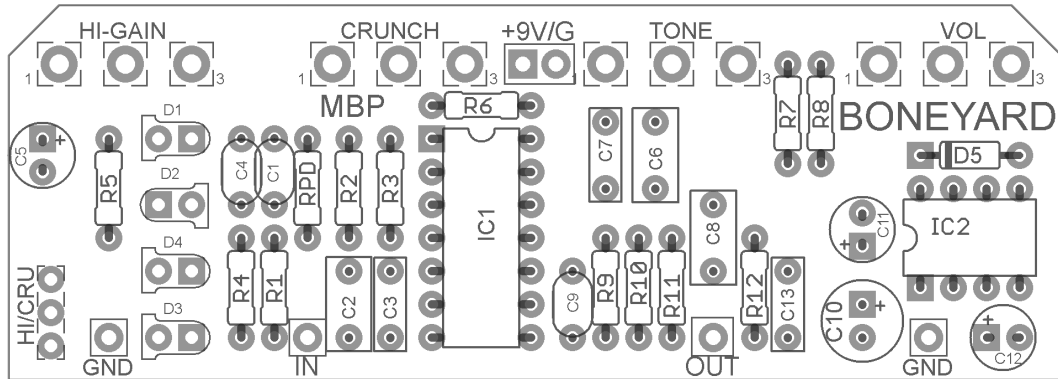


BONEYARD

FX Type: Distortion
© 2012 [madbeanpedals](#)

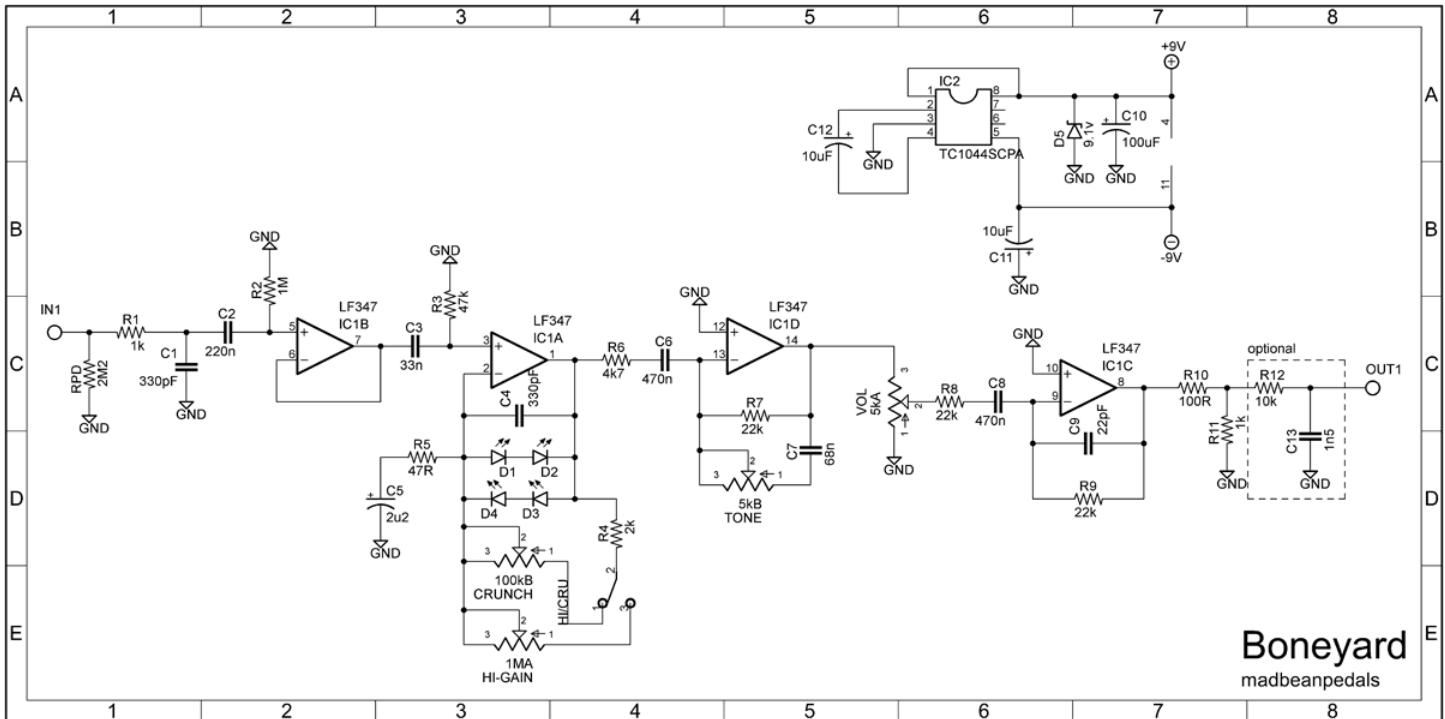
3.175" W x 1.125" H



Resistors		Caps		Diodes	
R1	1k	C1	330pF	D1 – D4	LED
R2	1M	C2	220n	D5	9.1v Zener
R3	47k	C3	33n	ICs	
R4	2k	C4	330pF	IC1	LF347
R5	47R	C5	2u2	IC2	TC1044SCPA
R6	4k7	C6	470n	Switches	
R7	22k	C7	68n	BOOST	SPDT / DPDT
R8	22k	C8	470n	HI/CRU	SPDT / DPDT
R9	22k	C9	22pF	Pots	
R10	100R	C10	100uF	CRUNCH	100kΩ
R11	1k	C11	10uF	HI-GAIN	1MA
R12	10k	C12	10uF	TONE	5kΩ
RPD	2M2	C13	1n5	VOL	5kA

[Download previous version of the Boneyard \(before 03.2012\)](#)

Schematic



Overview

The **Boneyard** is a highly modified Plexitone™, which is a high-gain distortion modeled after the classic 60's Marshall amps identified by their Plexiglass panels. The stock unit is powered by an on-board transformer running at +/- 12v and features volume, tone, two gain controls, a boost, and three footswitches for a wide variety of tonal options. To simplify the design, the **Boneyard** eliminates the transformer and instead uses a voltage inverter to power the effect at +/-9v. The **Boneyard** also eliminates the Boost function and converts the entire circuit to true-bypass. This document will demonstrate several possible configurations for building the **Boneyard**, including one, two and three footswitch options, different enclosure configurations, and a method to wire in a simplified boost function, if desired.

- **Crunch** - This is the normal gain control.
- **Hi-Gain** - A larger pot increases the total amount of gain.
- **Hi/Cru** - This switches between the **Crunch** and **Hi-Gain** modes.
- **Tone** - This is an active tone control.
- **Vol** - A passive volume control before the final output stage.

Notes

LED clipping - The stock version uses red, water-clear 5mm LEDs. 3mm diffused red will also work well here. You can build the **Boneyard** with either symmetrical or asymmetrical clipping. For symmetrical clipping, populate **D1-D4**. For asymmetrical clipping, populate **D1-D3** and jumper the two pads for **D4**.

RPD – The stock version is non-true bypass. As such, no pull-down resistor is required since the input of the circuit is always connected. The **Boneyard** is meant to be wired as true-bypass. For this reason, the **RPD** resistor (resistor pull-down) was added. This is optional and should only be added if you get popping when you toggle the bypass. Either 1M or 2M2 should be sufficient.

Low Pass Filter - The **Boneyard** also adds an optional low pass filter at the output of the effect. This filter will help tame down some of the shrillness produced by turning the **Tone** control at maximum. If you do not wish to use this filter, simply omit **C13** and jumper **R12**.

Volume Control - If you do not have a 5kA for the **Vol** control, use a 10kA and put a 10k resistor across lugs 3&1 of the pot. This will yield approximately 5k.

12vDC Operation - You can use an LT1054 in place of the TC1044SCPA to run the **Boneyard** at +/- 12v with a single 12v power supply adapter (note that the TC1044 should only be used with a 9v supply). *If using the LT1054, you must remove or clip out pin1 of your IC socket. **Make sure that pin1 of the socket (or IC) does not contact the pin1 pad on the PCB when using an LT1054!*** Also, be sure to replace **D5** with a 12v Zener diode instead of the 9.1v listed in the BOM.

Pots - You can use 16mm short pin PCB mounted pots for this build. These are available from Smallbear. They should be mounted underneath the PCB.

Noise / Oscillation – This is an extremely high-gain circuit. This means it will be prone to noise and oscillation. To reduce this risk, use metal film resistors and keep your wiring tidy and short in the enclosure. Use shielded wire, if possible, on the input / output jacks and the effect IN and OUT. You can also reduce the values of both the **Crunch** and **Hi-Gain** pots to deter unwanted feedback. Try subbing 50kΩ for the **Crunch** and 500kΩ for the **Hi-Gain** pots to reduce oscillation.

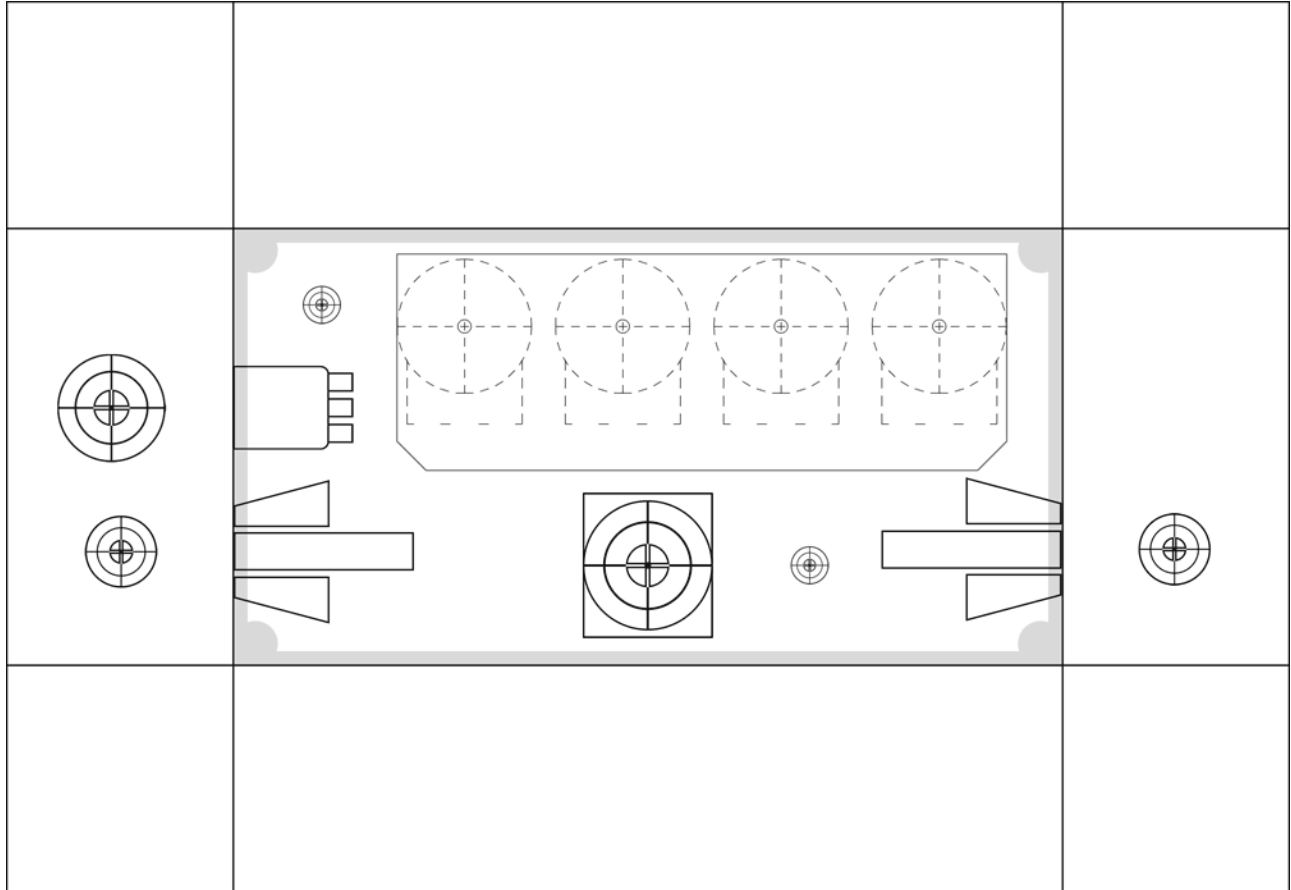
Boost - The stock Plexitone™ takes advantage of its non-true bypass setup to utilize the output section as a toggled boost. While the **Boneyard** has a non-true bypass setup, you can wire in a **Boost** pot if you like. You will not be able to use the **Boost** independent of the drive circuit, however. If you want an independent boost, you can always drop a separate circuit into the enclosure. See below for how to implement the boost mod.

DO NOT, and I repeat, DO NOT box this up until you first test it out on your prototyping/testing rig. Even with PCB mounted pots, there is still a lot of wiring that has to be done. There is no point in doing that unless you know for a fact your circuit is working first. Please, take the time to rock it first. Then box it.

1590B Drill Template

6.69"W x 4.64"H

This template is approximate. Please check carefully before committing to drill.

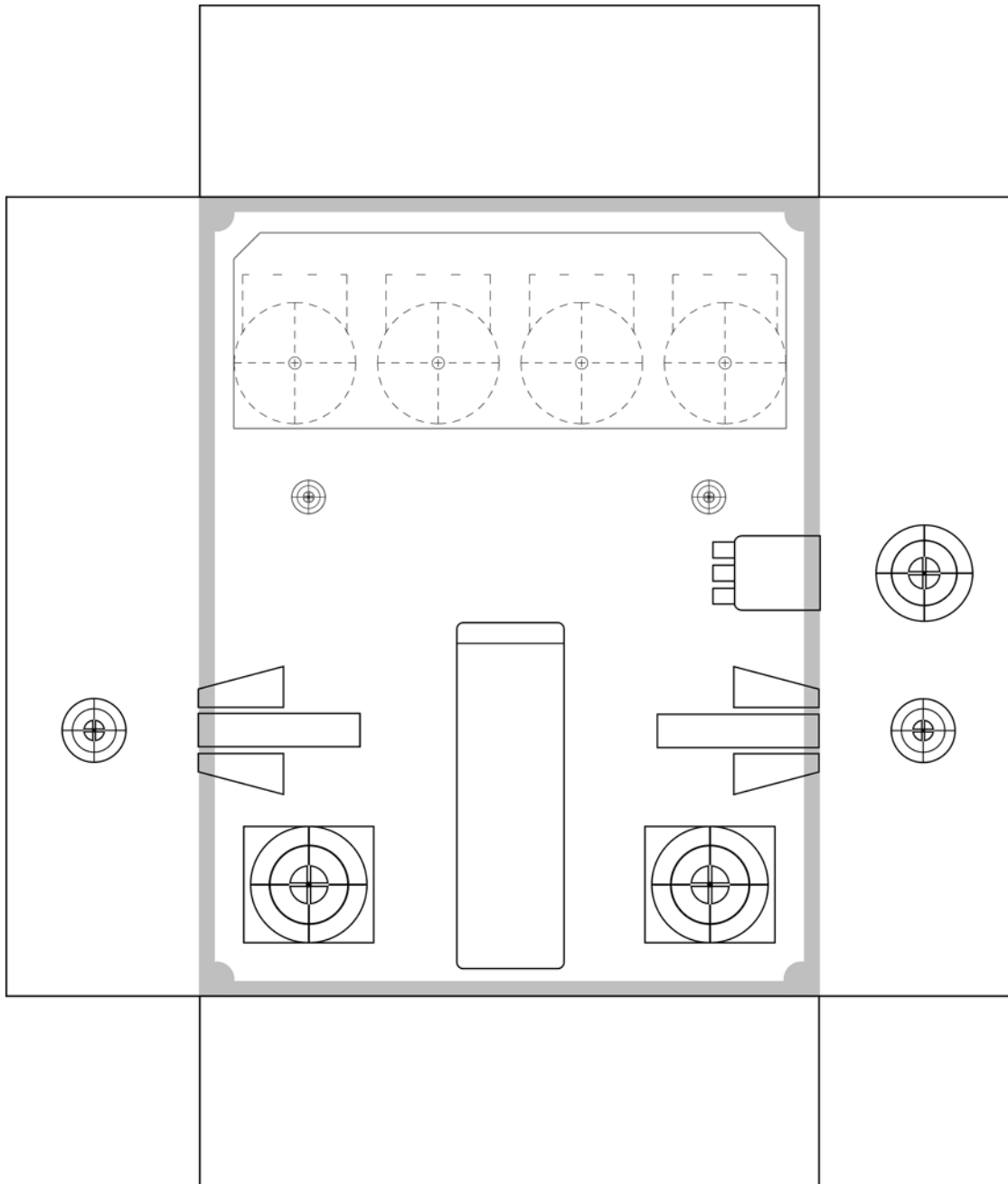


This configuration allows you to put the **Boneyard** in a 1590B enclosure. The footswitch is for bypass, and the **Hi/Cru** switch is an SPDT (located in the upper left above the DC jack. Note that the PCB has been turned 180° to move the pots closer to the top of the enclosure. Keep in mind the drawing is top-down, as if you were looking at the enclosure from the outside. This means the order of controls would be the toggle switch, **Hi-Gain**, **Crunch**, **Tone** and then **Vol**.

1590BB Drill Template A

5.81"W x 6.81"H

This template is approximate. Please check carefully before committing to drill.

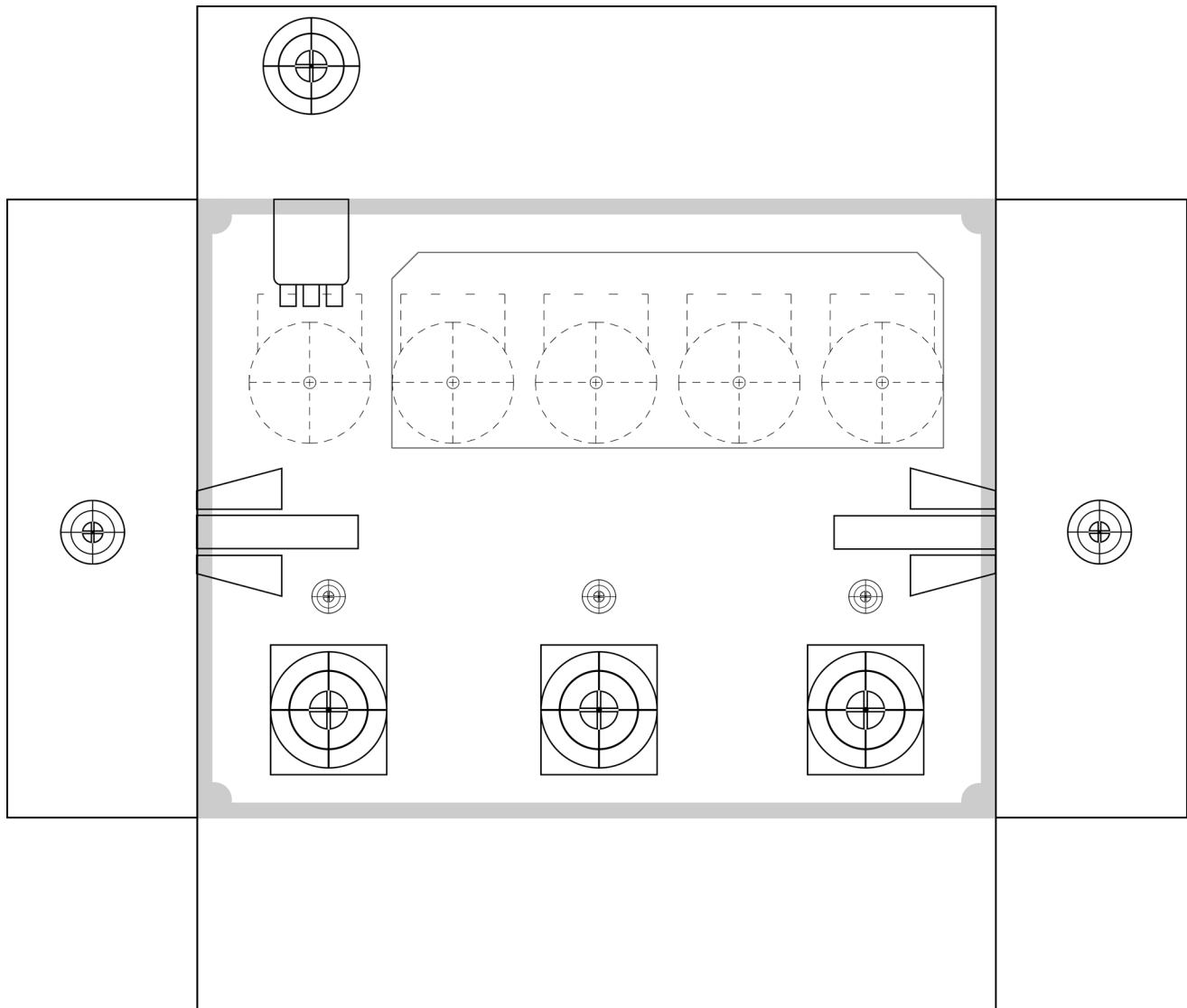


The second configuration is for a 1590BB, and will be the easiest one to build. For this setup, you have the four standard controls, and the **Hi/Cru** is wired to a footswitch. In this case the order (looking top-down) is **Vol**, **Tone**, **Crunch** and **Hi-Gain**. The bypass and **Hi/Cru** switches can be wired on either side depending on your preference.

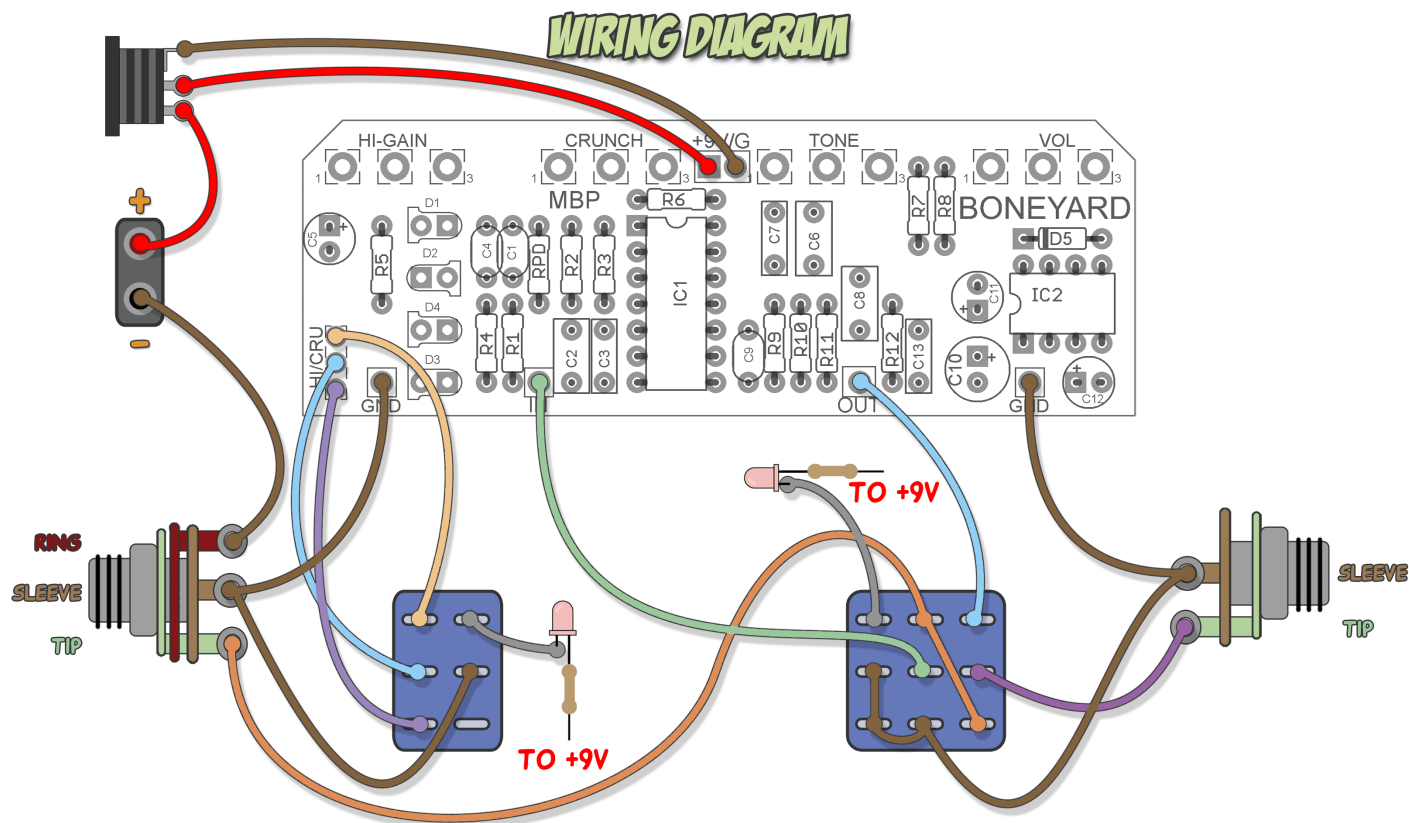
1590BB Drill Template B

5.81"W x 6.81"H

This template is approximate. Please check carefully before committing to drill.



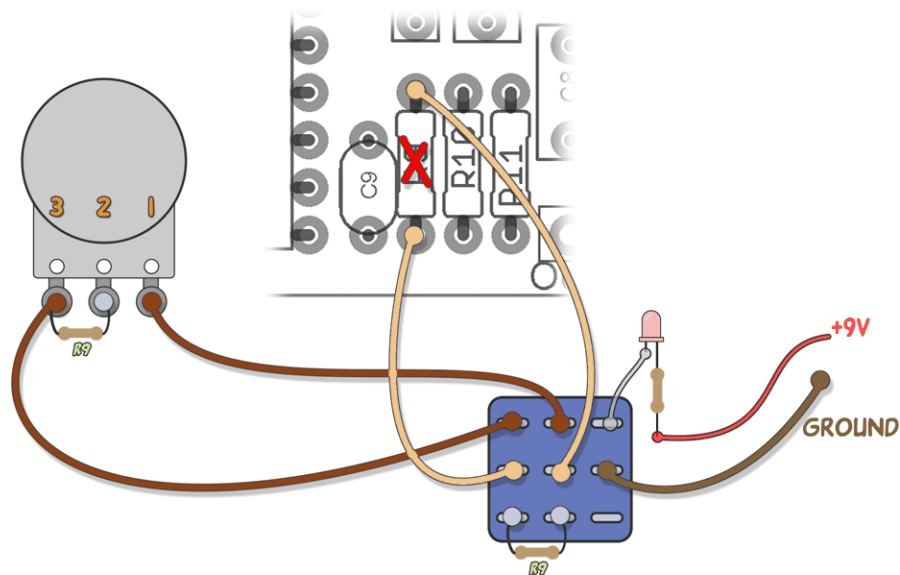
The third configuration is the most full-featured, and also the most difficult to do. In this set up, the order of controls is **Boost, Vol, Tone, Crunch** and **Hi-Gain**. The three footswitches are **Boost, Bypass**, and **Hi/Cru**. You can most likely fit a battery between the input and output jacks, as well.



This diagram demonstrates the basic wiring for all three possible configurations shown above. The **Hi/Cru** switch is the DPDT on the left, and the bypass switch is on the right.

If you choose the 1590B layout, use an SPDT instead of the DPDT for the **Hi/Cru** switch and omit the brown ground wire and LED shown on the second row of lugs.

For the 1590BB (A and B) versions, you can also use a 3PDT in place of the DPDT---just leave the third row of lugs empty.



For the 1590BB “B” version, use this modification to enable the Boost feature.

Omit **R9** from the PCB and use two 22k resistors as shown. One resistor goes on the switch and is for the bypass. The second 22k goes on the pot. This resistor sets the minimum gain when the **Boost** pot is all the way down (in this case, it's unity). The Plexitone™ uses a 500kA pot for the **Boost**. You can also use smaller values to achieve a wide range of boost without the possibility of oscillation. For that reason, 50kA or 100kA may work better.

Licensing

PCBs purchased from madbeanpedals (or etched from the artwork provided) for the **Boneyard** are intended for DIY / non-commercial use only. If you are a commercial pedal builder or “work for hire”, please do not use madbeanpedals materials for your product offerings. Similarly, madbeanpedals PCBs are prohibited from commercial re-distribution including “kits”.

www.madbeanpedals.com
BUILD.SHARE.LEARN

UPDATE: 08.29.2012

A few builders have reported issues with squealing on high-gain/crunch settings. The following modifications seems to have solved the problem:

Change R5 to 100R and C5 to 1uF.

If you are still experiencing a problem try this: remove R4 and place it on the underside of the PCB as depicted in the diagram below. Having R4 next to R1 was a poor design choice on my part (and was a result of a last minute design change I made). Moving away from R1 should prevent any further oscillation issues.

You can also do this modification at the outset, if you are just starting the Boneyard project.

