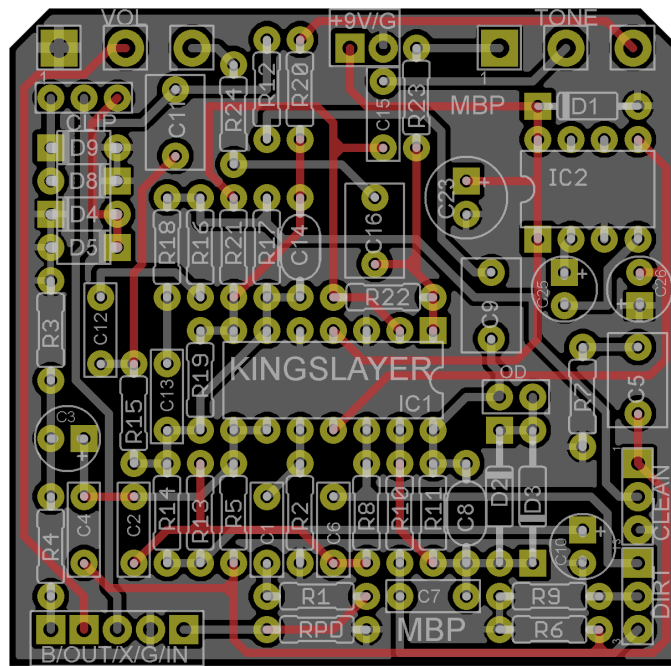
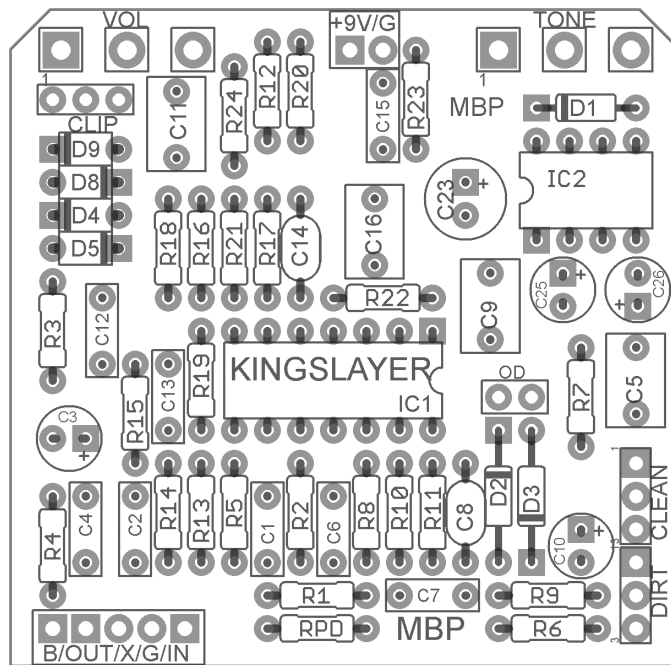


KINGSLAYER

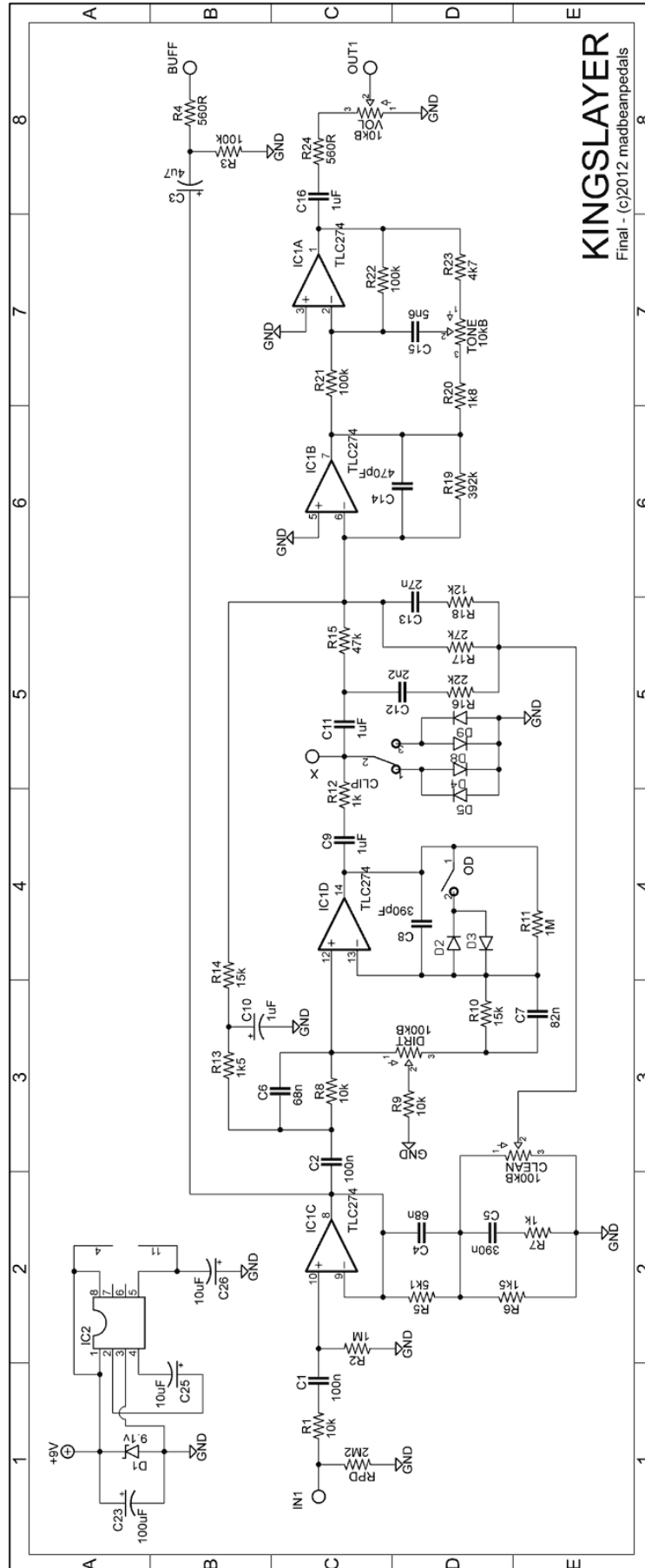
FX Type: Overdrive

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2.02" W x 1.98" H



Schematic



Bill of Materials

Resistors		Caps		Diodes	
R1	10k	C1	100n	D1	9.1v Zener
R2	1M	C2	100n	D2, D3	Your Choice
R3	100k	C3	4u7	D4, D5	1n34a
R4	560R	C4	68n	D8, D9	Your Choice
R5	5k1	C5	390n	ICs	
R6	1k5	C6	68n	IC1	TLC274
R7	1k	C7	82n	IC2	TC1044SCPA
R8	10k	C8	390pF	Switches	
R9	10k	C9	1uF	OD	SPST
R10	15k	C10	1uF	CLIP	SPDT (On/Off/On)
R11	1M	C11	1uF	Pots	
R12	1k	C12	2n2	TONE	10kB
R13	1k5	C13	27n	VOL	10kB
R14	15k	C14	470pF	GAIN	100kB Dual
R15	47k	C15	5n6		
R16	22k	C16	1uF		
R17	27k	C23	100uF		
R18	12k	C25	10uF		
R19	392k	C26	10uF		
R20	1k8				
R21	100k				
R22	100k				
R23	4k7				
R24	560R				
RPD	2M2				

09.17 Update: A couple have people have pointed out that running the Kingslayer at the max gain setting with both the soft and hard clipping diodes lifted caused some motor-boating and/or oscillation. This is due to the higher gain produced by using 1M for R11. For the most part, you do not want to use the max gain setting with no diodes, but it does sound pretty good up to the half-way point (before harsh op-amp clipping sets in). If you want to avoid this situation altogether, socket R11 and try some lower values, something between 470-750k. Keep in mind that this will also reduce the max gain when the clipping diodes are engaged, so it may require testing a couple values to find the best balance for your needs.

Overview

The **Kingslayer** overdrive is a highly modified version of the Klon® Centaur™. The design goal was to simplify the circuit architecture as much as possible while still retaining the overall character and tones produced by the Klon®. This is accomplished by several key changes:

- 1) The power supply section was simplified to a split rail structure. This retains much of the voltage spread of the Klon® and eliminates the need for a separate biasing voltage for the ICs, which are instead referenced to ground.
- 2) Unlike the Klon®, the entire audio path of the Kingslayer is run off the higher voltage spread. This allows for a slightly larger amount of headroom.
- 3) The two audio path ICs which are responsible for all the gain and filtering have been combined into one quad, with a specific IC suggested for the best performance and tone.
- 4) Extra clipping choices are available with two switches. One switch toggles soft clipping in the feedback path of the IC, and the second switch allows you to switch between two sets of hard clipping, or no clipping.
- 5) A few value changes were made in both the gain and tone sections. These changes add back

Controls

a little extra gain lost to the higher headroom, and push the tone control range a little bit further down the spectrum.

The end result of the modifications produces much of the Klon® sound but with a little “extra”, IMO. The addition of clipping switches increases the range of tones and the simplification of the circuit allows for an easy 1590B build.

Vol: Overall output volume.

Tone: Active treble boost.

Gain: This dual pot controls the amount of clean and dirt signals simultaneously. As the control is turned up, the clean path signal is reduced while the overall gain is increased through the gain path.

Clip: This SPDT (On/Off/On) lets you choose between one set of clipping diodes, no diodes, and a second set of diodes.

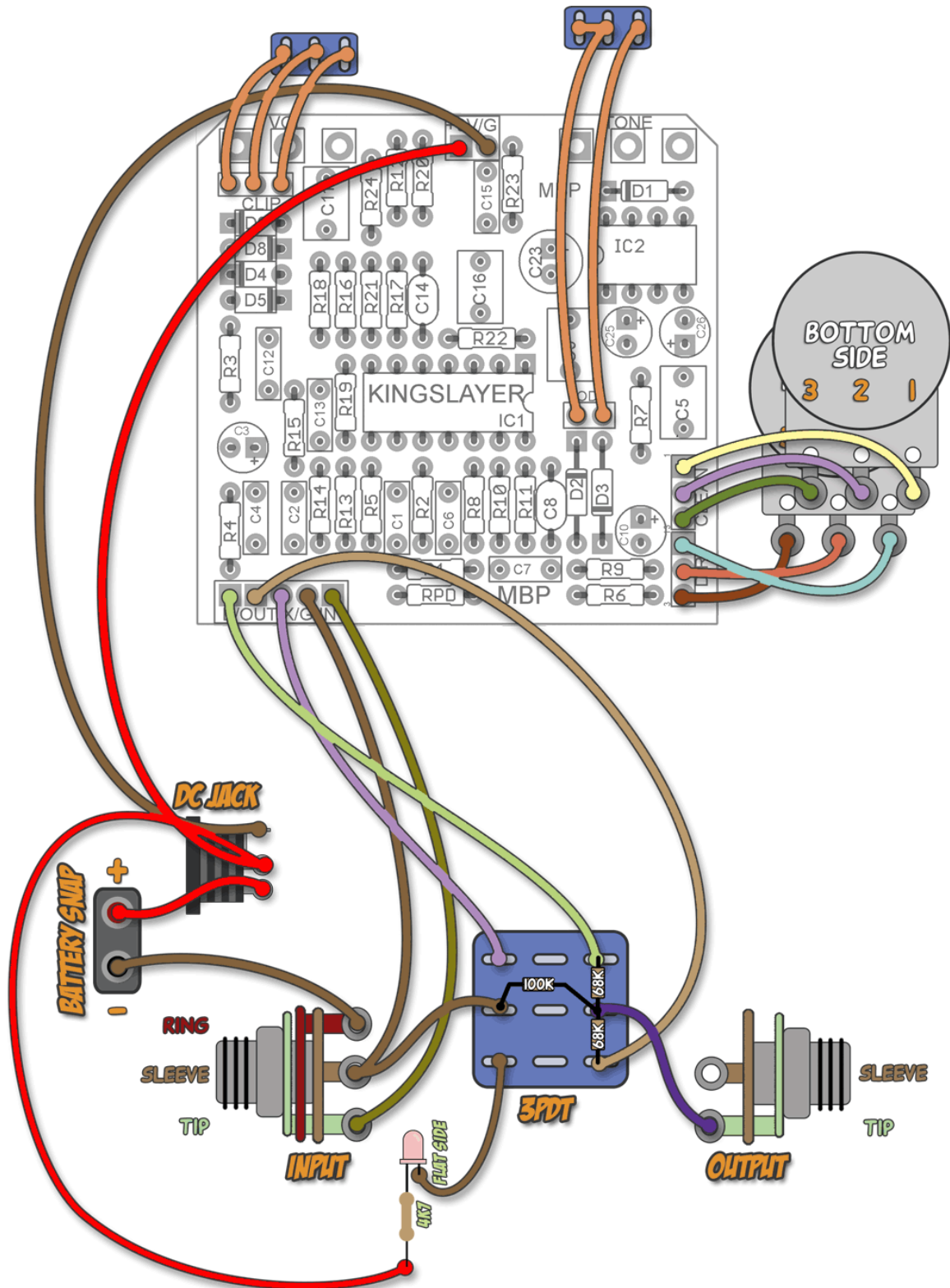
Notes

OD: This SPST (or On/On SPDT) lets you turn on soft clipping diodes in the feedback path of the gain stage. It can be used on its own (by selecting the middle position of the Clip switch) or in conjunction with one of the two sets of hard clipping diodes on the Clip switch.

- C5, C11 and C16 are spaced for poly film type caps. C10 is tantalum in the Klon®, but electrolytic will work just as well.
- Higher values, such as 100n or 120n for C7 will yield a little more bass content.
- A TLC274 is highly recommended for this project. Other ICs that will work well: TL074 and LM347.
<http://www.mouser.com/ProductDetail/Texas-Instruments/TLC274BCNE4/?qs=sGAEpiMZZMtCHixnSjNA6Dh9CQmOfcFckc/oEj30LNU=>
- 5n6 for C15 yielded the best overall tone control results to my ears/gear. Other values may suit you: 3n9, 4n7 or 6n8.
- 1n34a is believed to be the closest match for the original Klon® diodes and should be used for D4, D5.
- D2, D3 and D8,D9 are your choice. The soft clippers (D2, D3) should not be too low or too high in forward voltage, so I suggest staying away from germanium and LEDs. I found BAT46 to work very nice here in either asymmetrical (two on one side, one on the other) or paired up (two in series on each side. 1n914 are another good choice. For D8, D9, I really like two red, diffused 3mm LEDs.
- The **Kingslayer** can be wired in either buffer or true bypass mode. In buffer mode, the circuit is always connected and will provide some clean up to the guitar signal. Many people like the Klon® buffer, and I suggest using the **Kingslayer** the same way. If you do not want to buffer your guitar signal, then use the true bypass wiring as pictured below.
- You can use either the TC1044SCPA or MAX1044SCPA for IC2, the charge pump. You **MUST** use the SCPA designation, not the CPA. Failure to use the correct type will result in a noticeable whine in the audio path.
- The Dirt and Gain labeling on the PCB comprise the dual Gain control – this is the 100kB dual ganged pot. You can use 16mm short-pin PCB mounted pots for the Vol and Tone pots. These are available from Smallbear.
- If you are building the **Kingslayer** in a 1590B, you will need to tuck the dual-ganged Gain pot under the PCB, like the Tone and Vol pots. However, the dual-ganged pot is slightly taller than the two single-gang pots. For this reason, you should *GENTLY* bend the top row of lugs flat on the dual-ganged pot before soldering wires to them with a pair of pliers. This will provide the extra space needed between the pot and PCB so that all the pots are level.

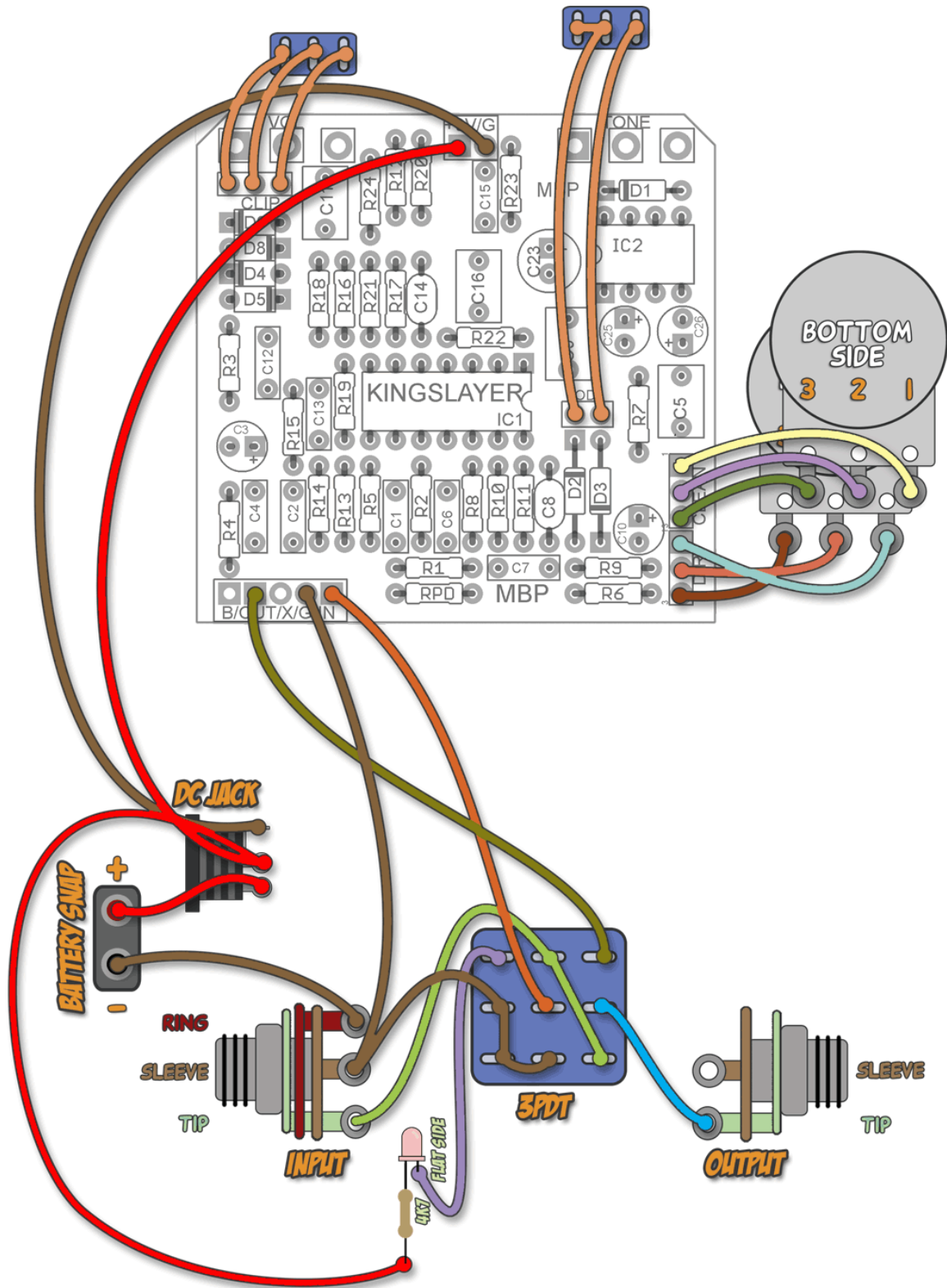
Wiring - Buffered

- RPD is the pull-down resistor. Do not use this for the buffered version—only the true bypass.



The buffered version also requires three resistors (2x68k and 1x100k) soldered to the switch as depicted in the wiring diagram. These resistors are not required for the true bypass version.

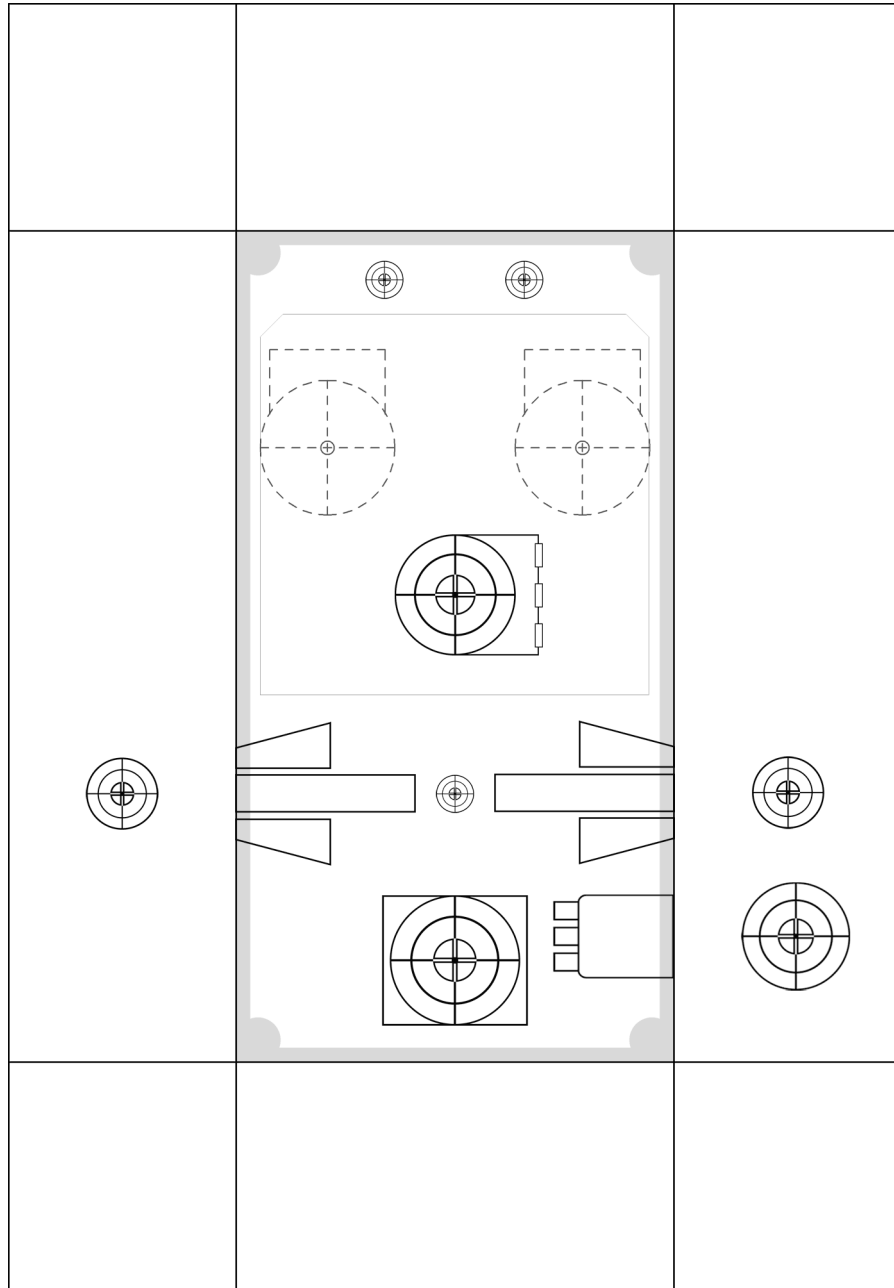
Wiring – True Bypass



1590B Drill Template

4.65" W x 6.70" H

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

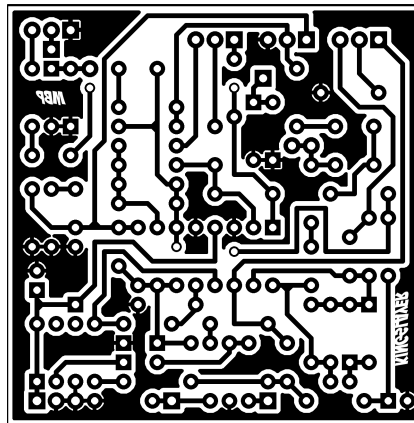
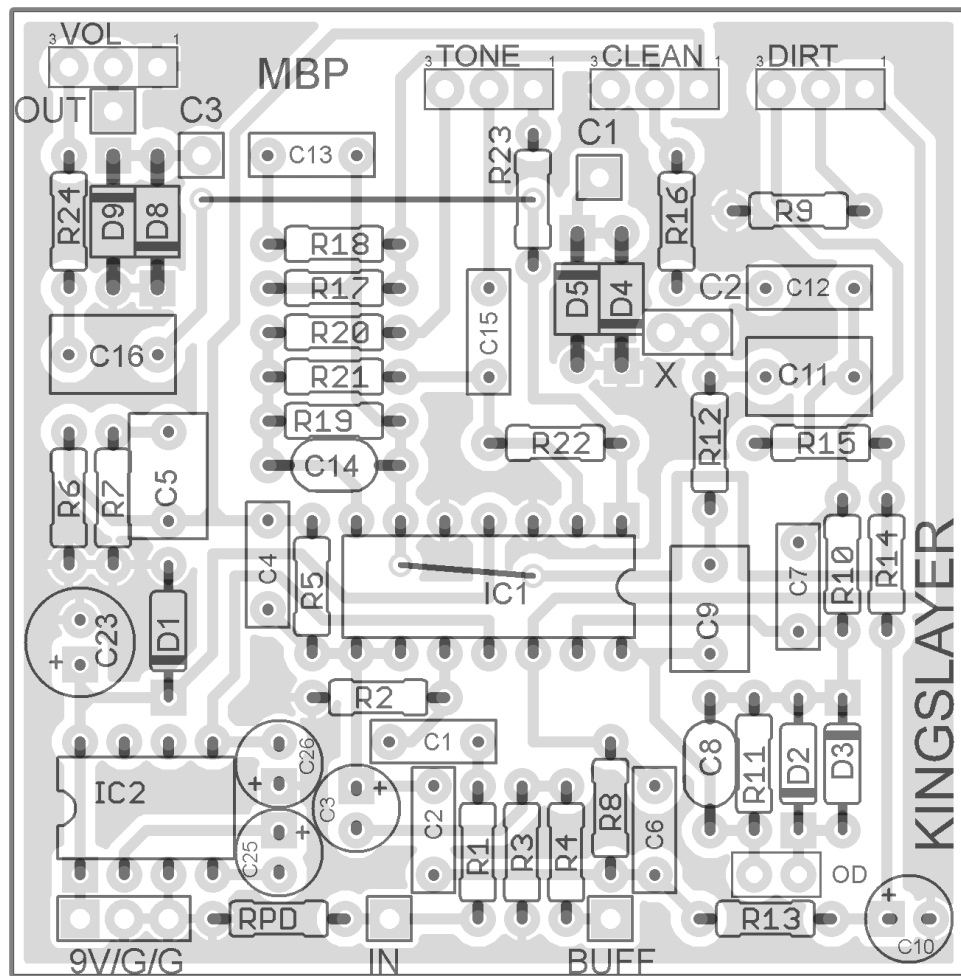


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Single Sided Layout



Note there are two jumpers!
C1, C2, and C3 are for the three lugs on the CLIP switch.