

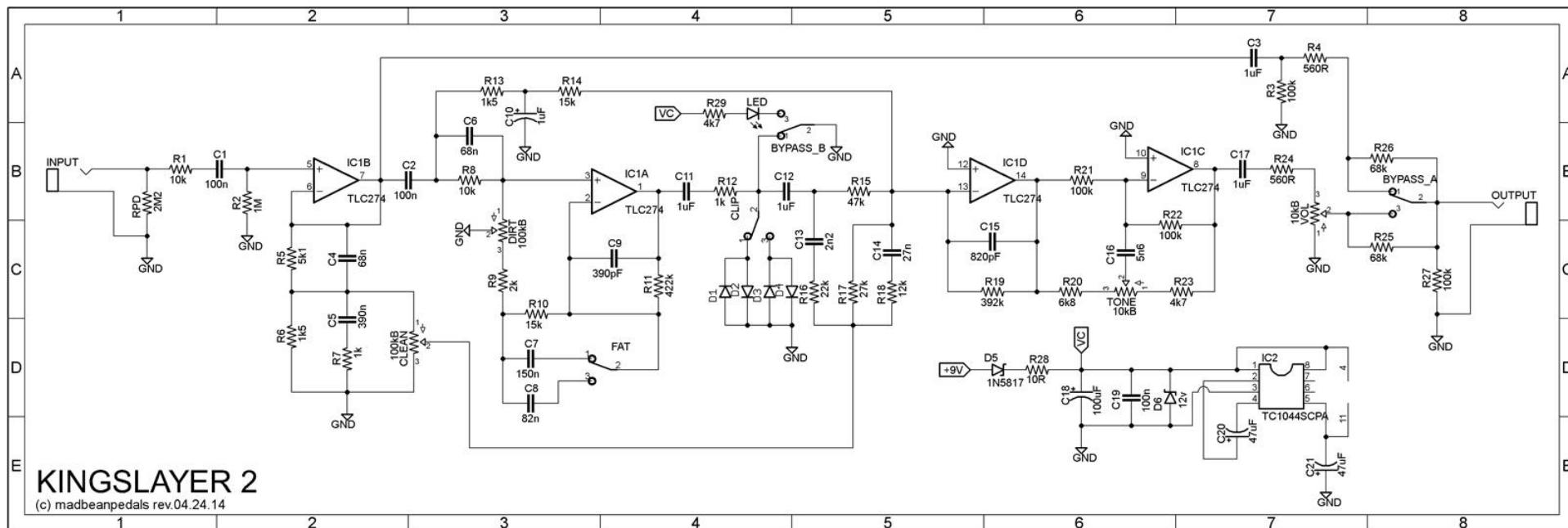
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Resistors		Caps		Diodes	
R1	10k	C1	100n	D1	1n34a
R2	1M	C2	100n	D2	1n34a
R3	100k	C3	1uF	D3	*your choice
R4	560R	C4	68n	D4	*your choice
R5	5k1	C5	390n	D5	1N5817
R6	1k5	C6	68n	D6	12v Zener
R7	1k	C7	150n	IC	
R8	10k	C8	82n	IC1	TLC274
R9	2k	C9	390pF	IC2	TC1044SCPA
R10	15k	C10	1uF	Switches	
R11	422k	C11	1uF	CLIP	SPDT
R12	1k	C12	1uF	FAT	SPDT
R13	1k5	C13	2n2	Pots	
R14	15k	C14	27n	GAIN	100kB Dual-Gang
R15	47k	C15	820pF	TONE	10kB
R16	22k	C16	5n6	VOL	10kB
R17	27k	C17	1uF		
R18	12k	C18	100uF		
R19	392k	C19	100n		
R20	6k8	C20	47uF		
R21	100k	C21	47uF		
R22	100k				
R23	4k7				
R24	560R				
R25	68k				
R26	68k				
R27	100k				
R28	150R				
R29	4k7				
RPD	2M2				

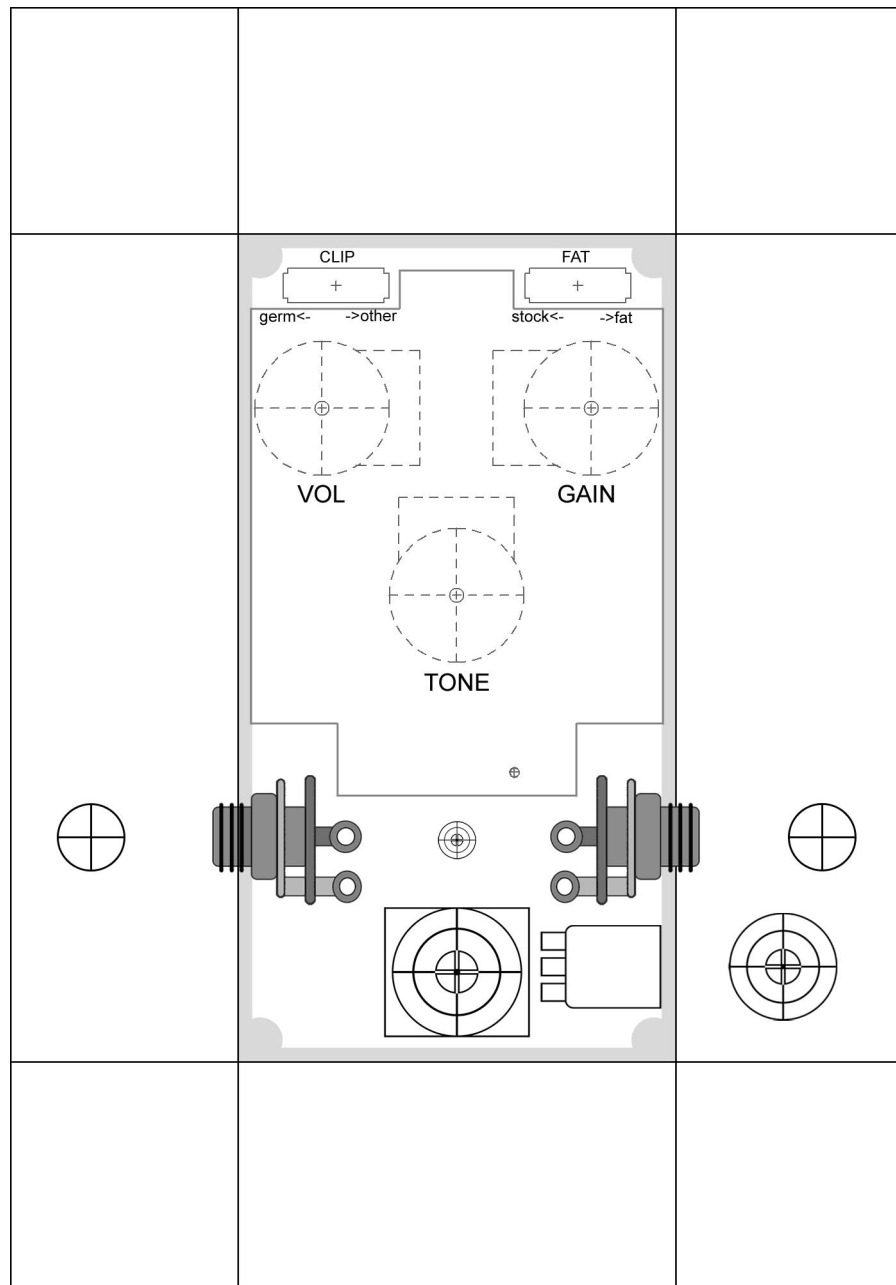
**06.26 Update: Due to some noise issues caused by having the Gain pot all the way down, R28 has been changed from 10R to 150R.**

Shopping List			
Value	QTY	Type	Rating
150R	1	Metal / Carbon	1/4 or 1/2W
560R	2	Metal / Carbon	1/4W
1k	2	Metal / Carbon	1/4W
1k5	2	Metal / Carbon	1/4W
2k	1	Metal / Carbon	1/4W
4k7	2	Metal / Carbon	1/4W
5k1	1	Metal / Carbon	1/4W
6k8	1	Metal / Carbon	1/4W
10k	2	Metal / Carbon	1/4W
12k	1	Metal / Carbon	1/4W
15k	2	Metal / Carbon	1/4W
22k	1	Metal / Carbon	1/4W
27k	1	Metal / Carbon	1/4W
47k	1	Metal / Carbon	1/4W
68k	2	Metal / Carbon	1/4W
100k	4	Metal / Carbon	1/4W
392k	1	Metal / Carbon	1/4W
422k	1	Metal / Carbon	1/4W
1M	1	Metal / Carbon	1/4W
2M2	1	Metal / Carbon	1/4W
390pF	1	Ceramic / Film / Mica	25v or more
820pF	1	Ceramic / Film / Mica	25v or more
2n2	1	Film	25v or more
5n6	1	Film	25v or more
27n	1	Film	25v or more
68n	2	Film	25v or more
82n	1	Film	25v or more
100n	3	Film	25v or more
150n	1	Film	25v or more
390n	1	Film	25v or more
1uF	4	Film	25v or more
1uF	1	Tanatalum	16v or more
47uF	2	Electrolytic	16v or more
100uF	1	Electrolytic	16v or more
1n34a	2	or other germanium diodes	
*your choice	2	1n914, 1N4001, LED, etc.	
1N5817	1		
12v Zener	1		
TLC274	1	or, TL074 or other quad	
TC1044 <b>SCPA</b>	1	or, ICL7660 <b>SCPA</b> , MAX1044 <b>CPA</b>	
SPDT	2	On/On Solder Lug	
100kB Dual-Gang	1	PCB Mount	16mm
10kB	2	PCB Mount	16mm



R28 should be 150R, not 10R.

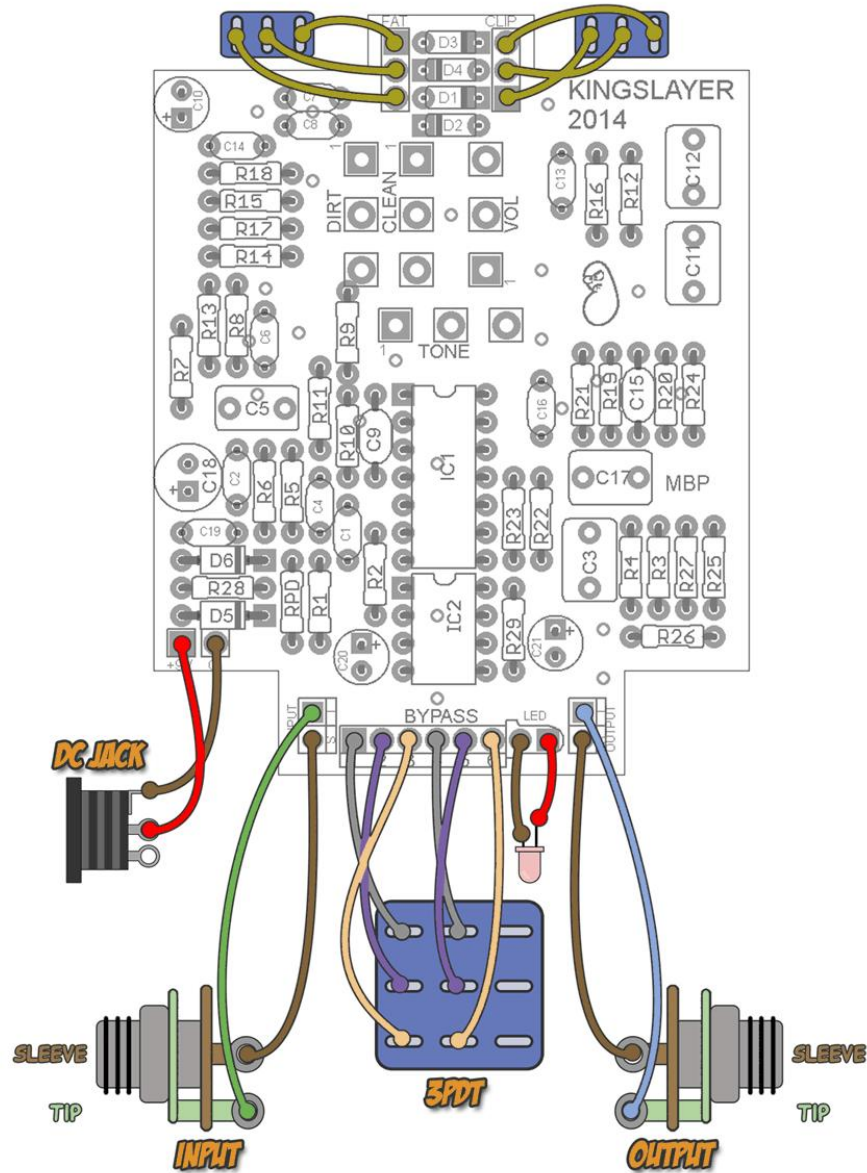
**1590B Enclosure**  
**4.64" W x 6.68" H**



Use open-frame jacks for the Kingslayer 2 such as the Switchcraft or similar. The notches on the bottom of the PCB are to accommodate the tip and sleeve flanges on the jacks.

Download the Photoshop file used to make this drilling template:  
[http://www.madbeanpedals.com/projects/Kingslayer/Kingslayer2\\_DRILL.zip](http://www.madbeanpedals.com/projects/Kingslayer/Kingslayer2_DRILL.zip)

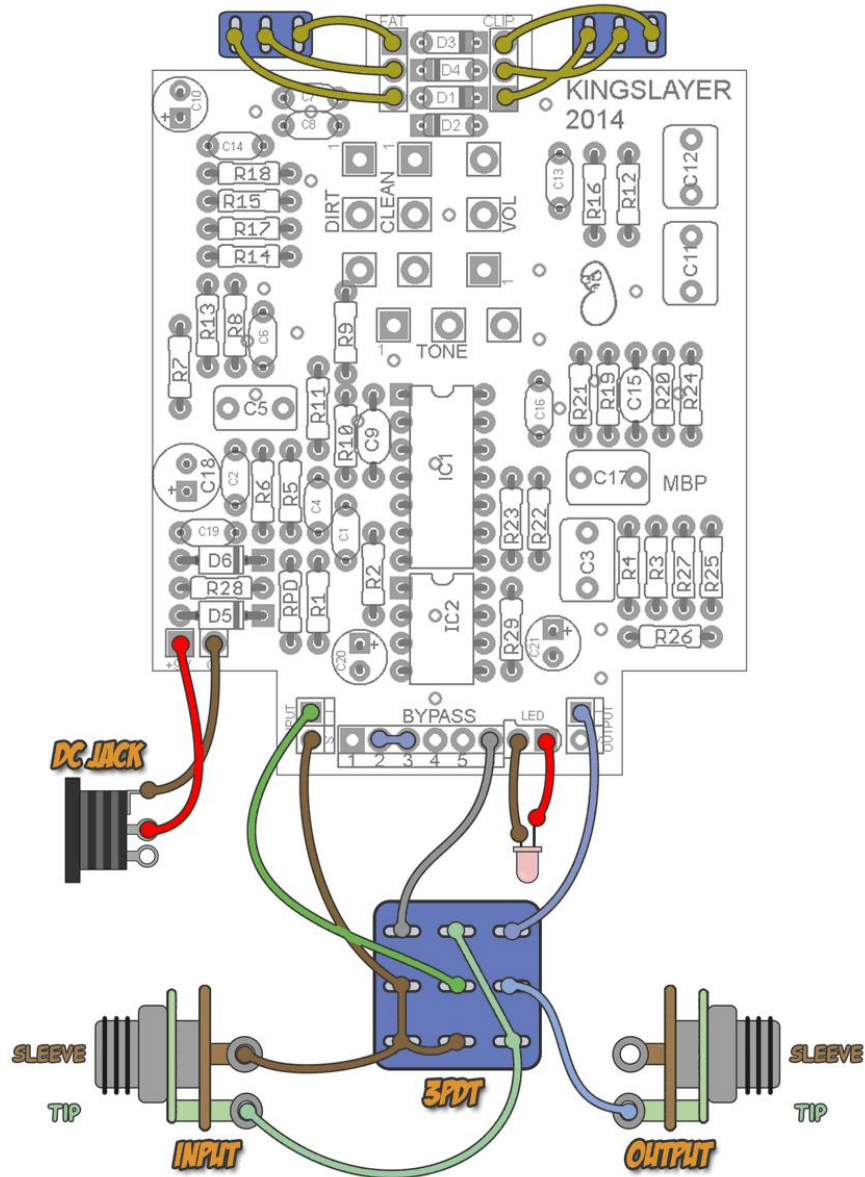
## Buffered Bypass Wiring



- Omit the RPD resistor when wiring for buffered bypass

*Tip: When using the Switchcraft jacks, you only need to ground the sleeve of one jack. It doesn't matter which one. The enclosure will ground the other jack.*

## True Bypass Wiring



- Omit R26, R25, C3, R3, and R4. Install the RPD resistor.
- Be sure to jumper pads 2 and 3 together on the PCB for the bypass switching.

**Kingslayer 2** is a substantial refinement of the first version in both the circuit board layout and design. For the layout, the objective was 1) to simplify the buffered bypass wiring and eliminate the need for mounting resistors on the bypass switch, 2) use a PCB mounted pot for the dual-gang Gain control instead of wired pot, and 3) arrange the controls in the more traditional Vol-Tone-Gain triangle.

On the design side, I wanted to bring the Kingslayer a bit closer to some of the Klon™ values and include a new mod, the bass boost (a popular Klone mod). There are a few ways to do the bass boost and I chose to do it via the clipping frequency method. When the Fat switch is engaged, the corner frequency of the clipped signal is moved downward by about 50% which creates a warmer and thicker overdrive. This gives a nice alternative to the mid-range tone of the stock overdrive.

The new mod created a problem, though. It meant having to drop one of the previous mods in the Kingslayer: the soft clipping option. There was no way to have three switches and meet all the other objectives in the re-design plus fit it in a 1590B, so the soft clipping had to go. Hopefully, this does not prove too controversial a choice for Kingslayer fans. I do feel the Fat switch is a more useful mod overall since the KS2 already has a switch to choose between hard clipping diodes.

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I found one additional mod that improved the tone control a great deal, IMO. R20 was increased from 1k8 to 6k8. This pushes the neutral position of the tone control more toward the center and thus allowed more high frequency cut when the Tone control is turned down. I recommend socketing this resistor and trying both values there to see for yourself. A 10k will also work for R20, but that might prove to be too dark for some users.

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- **GAIN** – This dual-ganged pot blends between the overdrive and clean paths of the audio signal. The first third of the rotation is the “boost” area and beyond that the gain circuit becomes more prominent.
  - **TONE** – This active control boosts or cuts the overall tone no matter how the Gain pot is set.
  - **VOL** – This is a passive volume control. When the GAIN control is turned down, the VOL pot should be turned up to boost your amp into breakup.
  - **FAT** – This switch reduces the corner frequency of the clipped signal in the overdrive portion of the circuit. It has no effect when the Gain control is turned all the way down.
  - **CLIP** – This switch lets you choose between the stock germanium diode clippers and another pair of clipping diodes of your choice. Suggested diodes are 1n914, 1N4001 or diffused LEDs. Socket D3 and D4 to experiment with different combinations.
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The **Kingslayer 2** can be built in either buffered or true bypass modes. With the True Bypass wiring, the circuit is completely removed when bypassed and the circuit input is grounded. The Buffered wiring buffers your bypass guitar signal when the effect is off.

Why choose buffered over true bypass? True bypass, despite what you may have read, is not the be-all end-all of guitar effects. There is one supposed advantage to true bypass: no loading down or tone alteration of your guitar signal. However, this is not always the case. Capacitance on your guitar cables over long distances will load your guitar signal and thus create some signal loss in the high frequency range. Even low-capacitance cable can affect tone *if* you use enough of it or your pedal junkie pedalboard has tons of true bypass effects in series. So, it's best not to assume that true



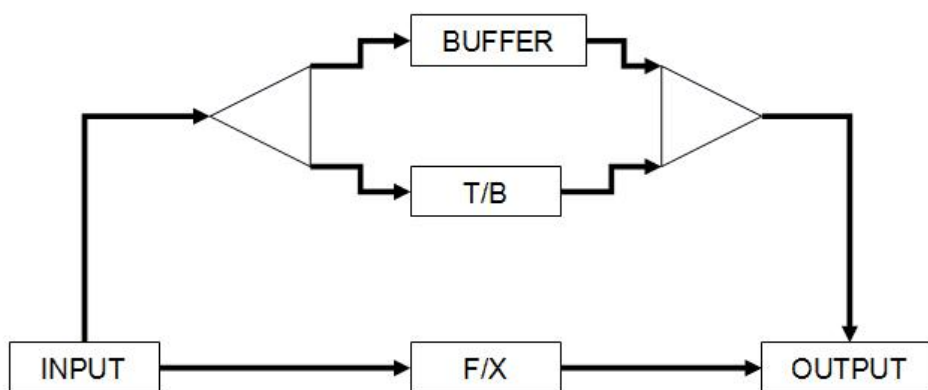
bypass automatically means your guitar signal is completely un-affected because if the other factors are in play it might make your tone *worse*.

Buffered bypass offers a different advantage. It guarantees no signal loss due to cable capacitance or excessive cable lengths. It takes a high impedance input and through just a few parts gives you an extremely low impedance output thus removing any loading down of the signal. People mistakenly think that a buffer brightens your guitar signal, but this is not the case. When you run your guitar through a buffer, you are hearing what the guitar actually sounds like without any (significant) loading. IOW, it's the true sound of your guitar through your amp. Of course, this assumes that you are using a quality buffer that is low noise and well-designed electronically. Luckily, this is the case with the Kingslayer 2 (or, Klon™ since that's what it derives from). The Kingslayer goes one step further than the Klon™ in that the buffer portion of the circuit is run at a higher voltage (18v vs. 9v, resp.) which gives a clean, sparkling output. My personal preference is buffered bypass for the Kingslayer, but don't take my word for it. Try experimenting with buffers on your own rig and see what you find. You might like it!

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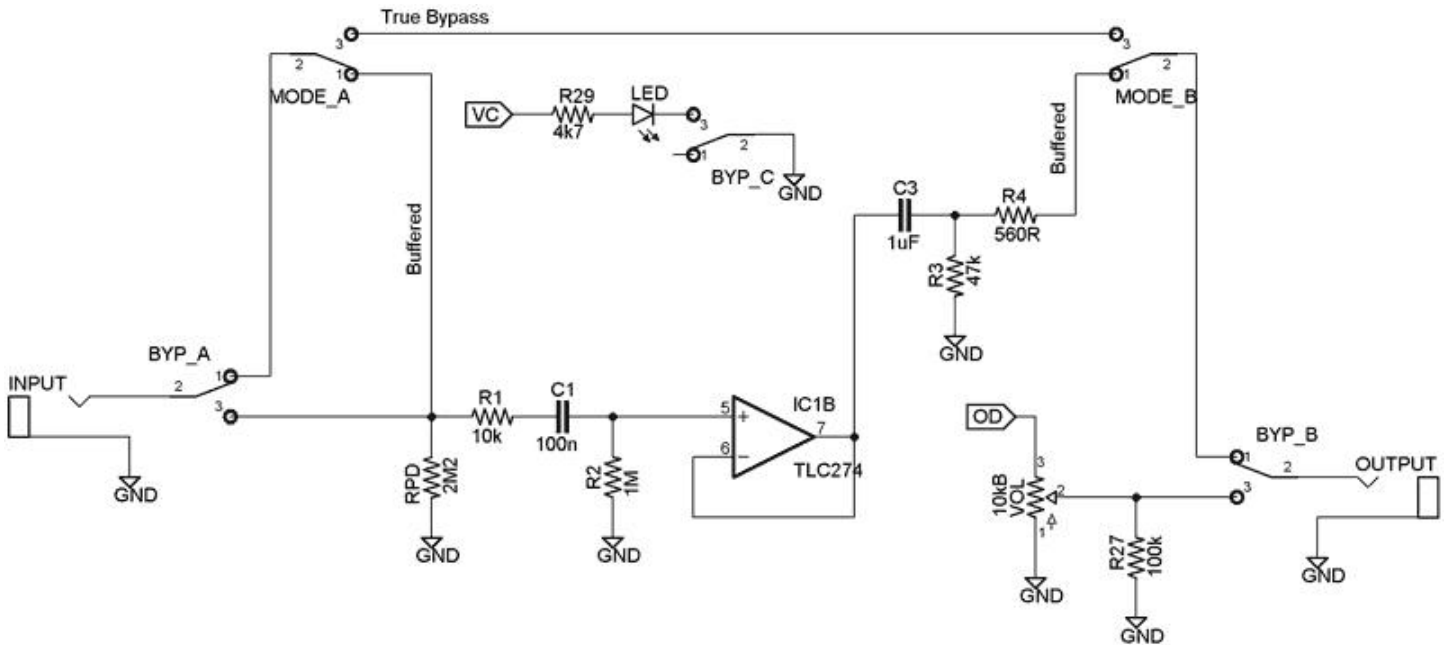
So, how about having both options in one pedal, like the KTR™? Frankly, I'm unsure of how the KTR™ does its buffered/TB switching but I suspect that it does not fully switch between both modes because it requires lifting several components and re-routing I/O simultaneously. However, we can get pretty close to the ideal method by using a DPDT toggle.

Here is a visualization of what we need to accomplish



There are three “states” we have to switch through: the effect, true bypass and buffer bypass. Obviously, this is not possible with a single DPDT or 3PDT so we will introduce a second DPDT switch that allows us to choose what bypass mode we want. We'll call it “Mode”. Or, if you are a purest you can call it “AABAAW” (figure it out).

Here is the translation to the abbreviated schematic

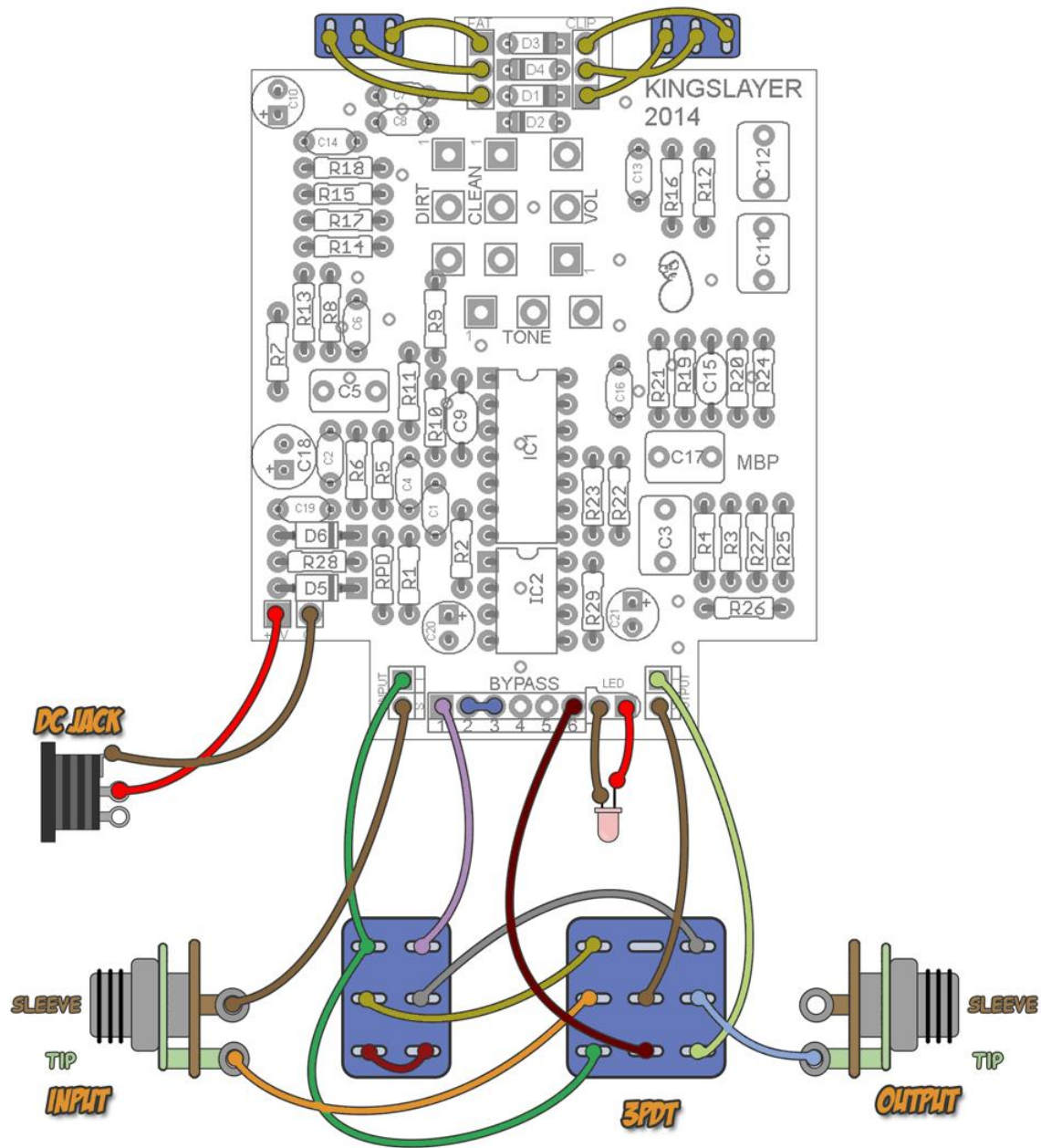


Note that I have removed R25 and R26 to accomplish this particular switching. That's okay: we don't need them. However, you'll also see that I have changed R3 from 100k to 47k. Why do this? In the stock version R3 and R27 are both tied to ground when in buffered mode. With R27 no longer tied to the buffered output, we will lower R3 to get the same approximate result of having the two 100k resistors in parallel on the output. Nifty!

**Remember: you must omit R25 and R26 from the PCB to do this wiring....!!**

.....and so.....

## True Bypass/Buffered Switch Wiring



Well.

That's a friggin' nightmare!

Good luck.