

THE_IMP_V2

FX TYPE: Boost/Overdrive

Based on the Klon® Siberia™

Enclosure Size: 1590A

"Softie" compatibility: none

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Overview

The IMP v1 was a 1590A true bypass version of the Klon® Siberia™ done as a giveaway board in April 2020. Several people voiced their interest in a version with the buffered bypass (IOW, 100% true Klon) and thus the v2 was created. The previous layout remains mostly intact although I did take the unusual step (for mbp, at least) of making the 3pdt switch board mounted. I generally avoid this in PCB designs but it seemed to be the best way to make this layout actually build-able rather than an exercise in frustration.

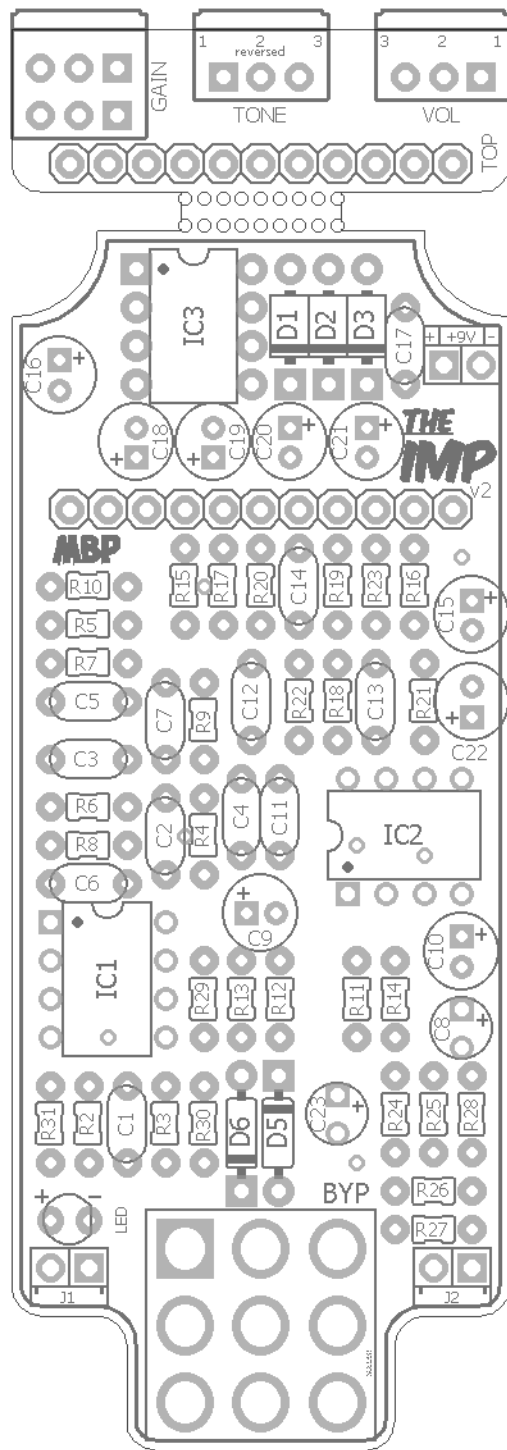
Make no mistake - it's still a challenging build. This is a lot to put in a 1590A and you may be a bit weary of undertaking it as such. However, if you follow the build tips I've created later in this doc it will go long way to putting this together in a fairly straight-forward manner.

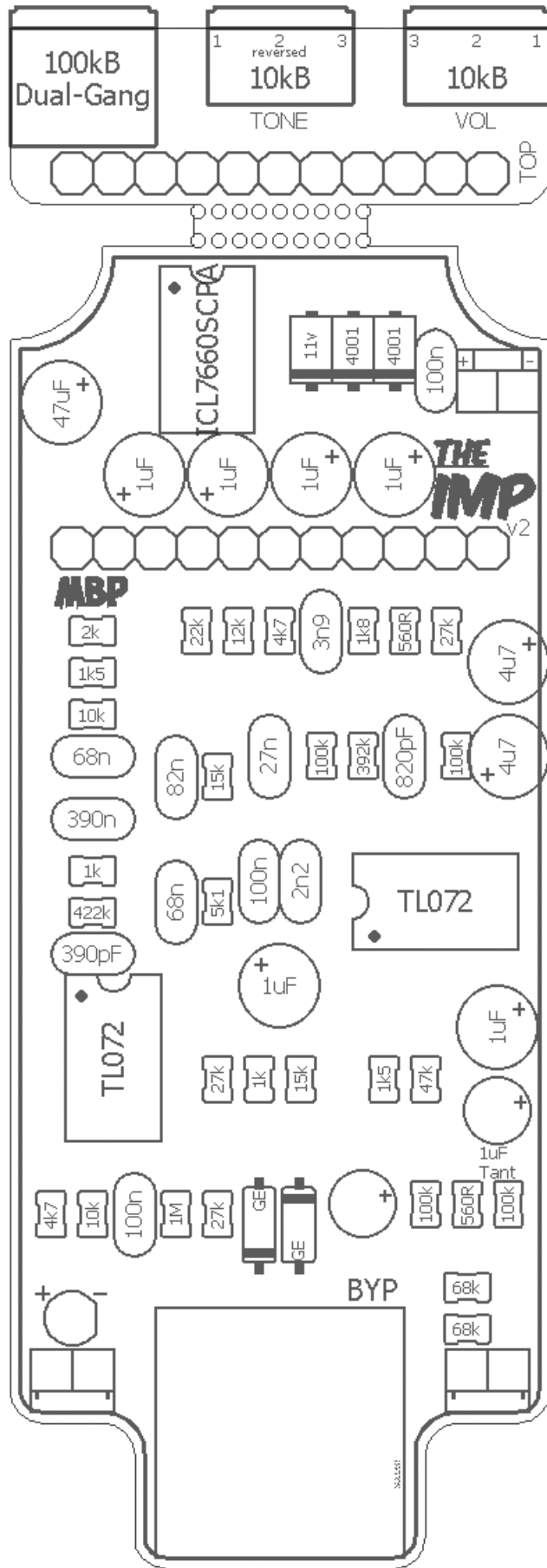
Controls

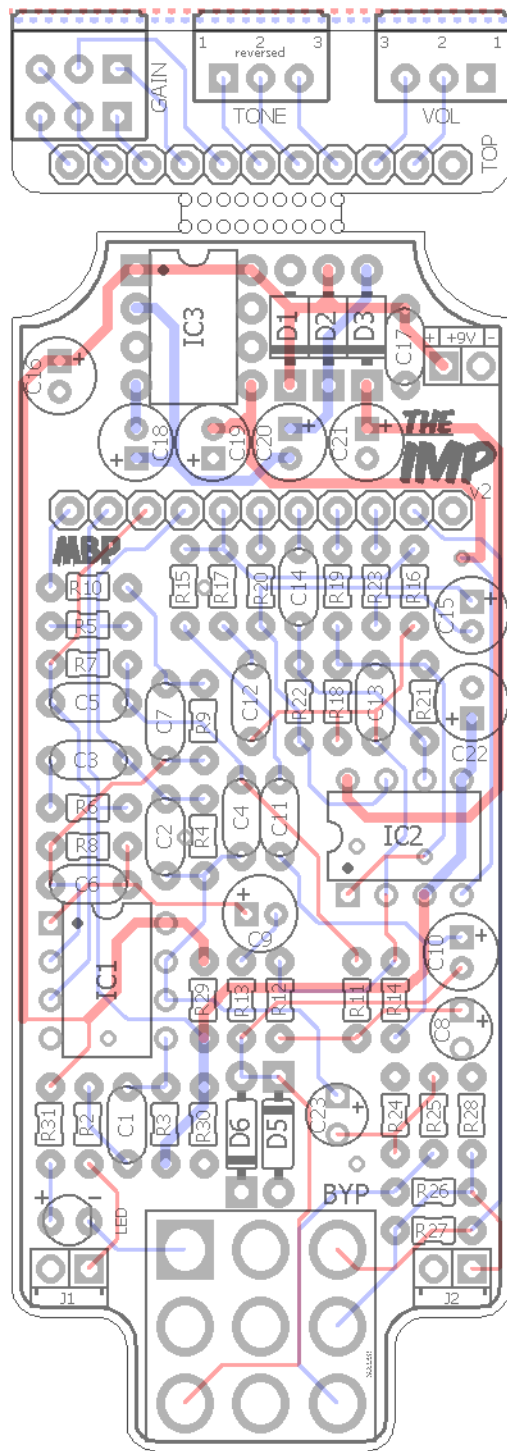
- **VOL** - Total Output.
- **TONE** - Active treble boost.
- **GAIN** - The Gain control blends between two different audio paths. CCW is the clean boost mode. As you turn the control CW, the audio blends through the gain stage and hard clipping. Many players love the sound of the Klon® with the gain set in the first 1/3rd and the Volume boosted to push their tube amps into breakup.

Terms of Use: You are free to use purchased **The_IMP_v2** circuit boards for both DIY and small commercial operations. You may not offer **The_IMP_v2** PCBs for resale or as part of a "kit" in a commercial fashion. Peer to peer re-sale is fine, though.

Technical assistance for your build(s) is available via the [madbeanpedals forum](http://madbeanpedals.com). Please go there rather than emailing me for assistance on [builds](#). This is because (1) I'm not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates a record from which other members may benefit.







Resistors		Caps		Diodes	
R2	10k	C1	100n	D1	11v
R3	1M	C2	68n	D2	IN4001
R4	5k1	C3	390n	D3	1N4001
R5	1k5	C4	100n	D5	GE
R6	1k	C5	68n	D6	GE
R7	10k	C6	390pF	ICs	
R8	422k	C7	82n	IC1	TL072
R9	15k	C8	1uF Tant.	IC2	TL072
R10	2k	C9	1uF	IC3	ICL7660SCPA
R11	1k5	C10	1uF	Pots	
R12	15k	C11	2n2	GAIN	100kB Dual Gang
R13	1k	C12	27n	TONE	10kB
R14	47k	C13	820pF	VOL	10kB
R15	22k	C14	3n9		
R16	27k	C15	4u7		
R17	12k	C16	47uF		
R18	392k	C17	100n		
R19	1k8	C18	1uF		
R20	4k7	C19	1uF		
R21	100k	C20	1uF		
R22	100k	C21	1uF		
R23	560R	C22	4u7		
R24	100k	C23	4u7		
R25	560R				
R26	68k				
R27	68k				
R28	100k				
R29	27k				
R30	27k				
R31	4k7				

Value	QTY	Type	Rating
560R	2	Metal / Carbon Film	1/8W
1k	2	Metal / Carbon Film	1/8W
1k5	2	Metal / Carbon Film	1/8W
1k8	1	Metal / Carbon Film	1/8W
2k	1	Metal / Carbon Film	1/8W
4k7	2	Metal / Carbon Film	1/8W
5k1	1	Metal / Carbon Film	1/8W
10k	2	Metal / Carbon Film	1/8W
12k	1	Metal / Carbon Film	1/8W
15k	2	Metal / Carbon Film	1/8W
22k	1	Metal / Carbon Film	1/8W
27k	3	Metal / Carbon Film	1/8W
47k	1	Metal / Carbon Film	1/8W
68k	2	Metal / Carbon Film	1/8W
100k	4	Metal / Carbon Film	1/8W
392k	1	Metal / Carbon Film	1/8W
422k	1	Metal / Carbon Film	1/8W
1M	1	Metal / Carbon Film	1/8W
390pF	1	Ceramic / MLCC	25v min.
820pF	1	Ceramic / MLCC	25v min.
2n2	1	Film	25v min.
3n9	1	Film	25v min.
27n	1	Film	25v min.
68n	2	Film	25v min.
82n	1	Film	25v min.
100n	3	Film	25v min.
390n	1	Film	25v min.
1uF Tant.	1	Tantalum	25v min.
1uF	6	Electrolytic	25v min.
4u7	3	Electrolytic	25v min.
47uF	1	Electrolytic	25v min.
11v	1	Zener	
1N4001	2		
GE	2	1n34a, 1n270	
TL072	2		
ICL7660SCPA	1		
100kB Dual Gang	1	PC Mount	9mm
10kB	2	PC Mount	9mm

In the v1 doc, I provided a Mouser Project that covered a lot of the parts needed for the IMP. In the interim, Mouser has changed their MOQ so it is no longer possible to buy Xicon resistors in quantities less than 200. That's just not practical for our purposes. Vishay has no MOQ on Mouser, but their 1/8W resistors are actually the same size as 1/4W, so that's not ideal. smallbear has 1/8W resistors but they are limited to a min. quantity of 100.

So, [I'd recommend using Tayda for 1/8W metal film resistors](#). They have them, there's no MOQ, and they are cheap.

For the caps, ICs and diodes I have updated the Mouser project for what's currently in stock (these items are highlighted yellow in the Shopping List):

<https://www.mouser.com/ProjectManager/ProjectDetail.aspx?AccessID=9d286ab084>

So, if you use the Mouser project you'll still need:

Resistors

9mm pots

Germanium Diodes

(and all the other normal stuff like switch, LED, enclosure, jacks).

Germanium Diodes:

<http://smallbear-electronics.mybigcommerce.com/diode-nos-germanium/>

9mm PC Mount Dual Gang pots (100k):

<http://smallbear-electronics.mybigcommerce.com/alpha-dual-gang-9mm-pc-mount/>

9mm PC Mount pots (10k):

<http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-pc-mount/>

Thinline DC Jack:

<http://smallbear-electronics.mybigcommerce.com/dc-power-jack-all-plastic-unswitched-2-1-mm/>

Enclosed Mono:

<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-jack/>

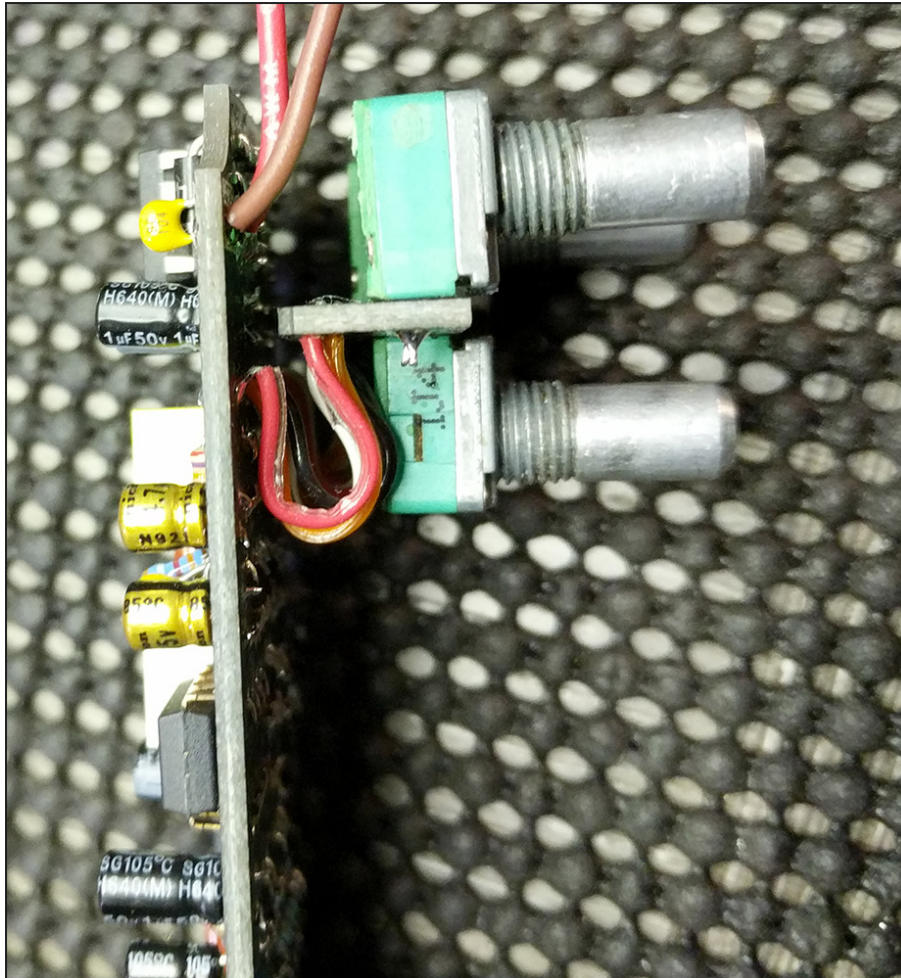
<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-switchcraft-111x/>

Lumberg Mono:

<http://smallbear-electronics.mybigcommerce.com/lumberg-1-4-compact-shrouded-mono-jack/>

Build Tips

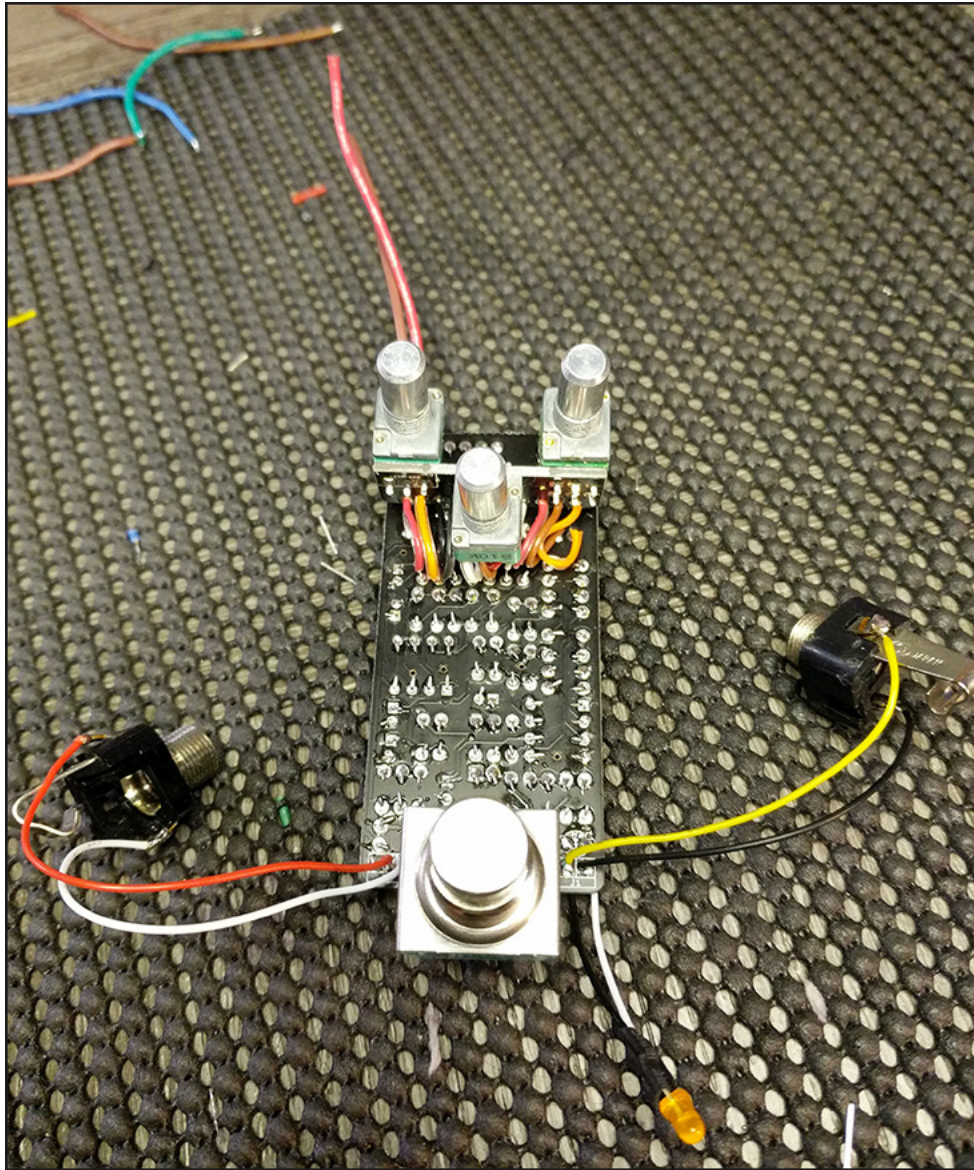
- Be sure to separate the two PCBs from one another before you start populating!
- You can use alternate charge pumps depending on availability. The MAX1044**CPA** and TC1044**SCPA** will work fine for the IMP.
- You can use BAT46 in place of the GE diodes. Their forward voltage is comparable. The original Klon used 1n34a although who and when they were made is unknown.



Solder your components to the main PCB as normal and whatever order is comfortable for you. **Do not solder the 3pdt OR C14.**

Solder the pots to the daughter board. Remember the Tone control goes on the bottom of the daughter board. Use small diameter wire if you can. I used some ribbon wire that is 26AWG. 24AWG is probably fine but I would not recommend 22AWG. Leave enough length so the PCB can be tucked under the main board. 1.5" - 2" should be just right.

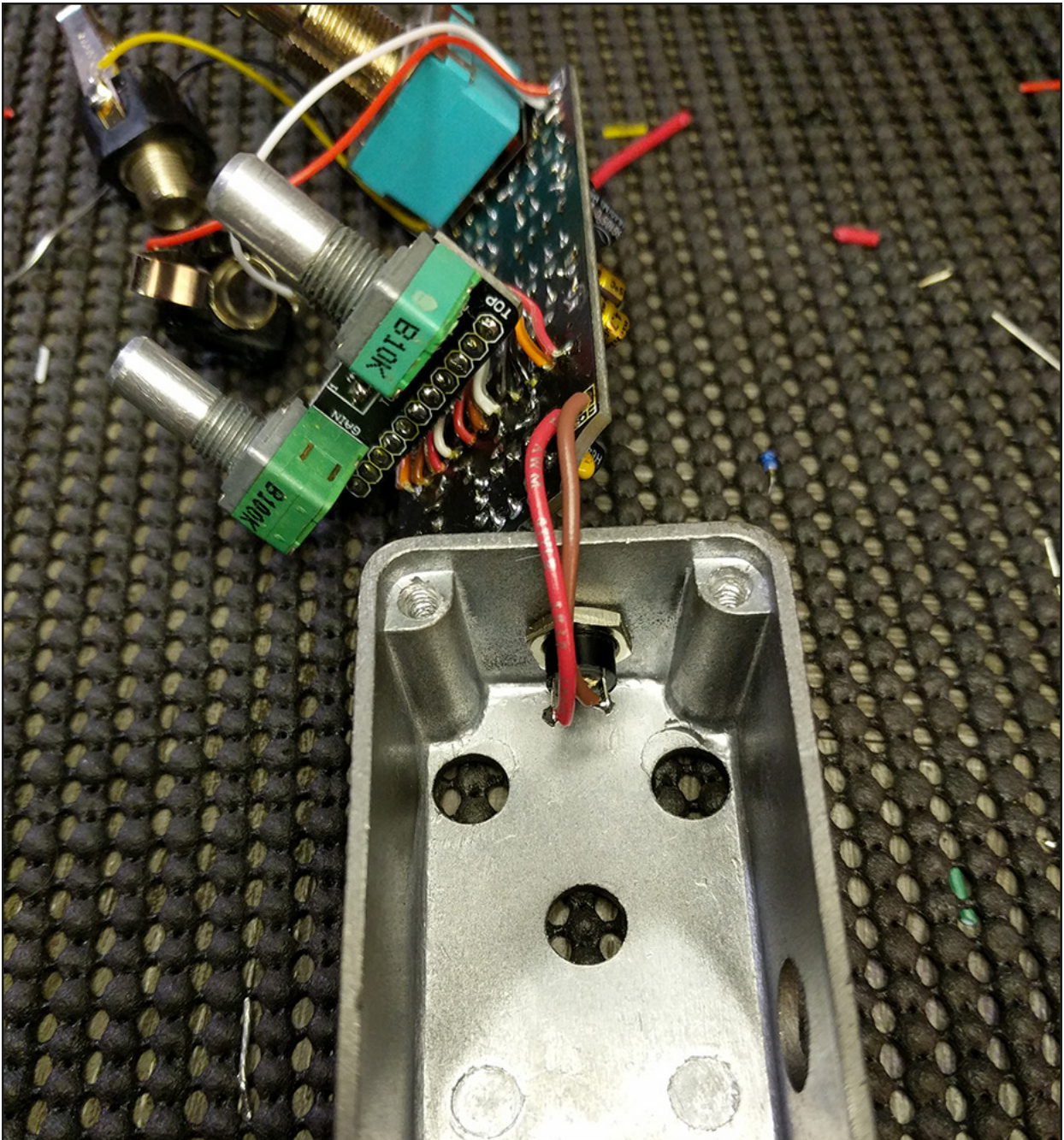
After you have joined the two boards, solder in C14 on the main board.



Complete the build by soldering your wires for the jacks. These wires should go on bottom of the main PCB. Leave plenty of length for the jacks. We'll need that for mounting the board in the enclosure.

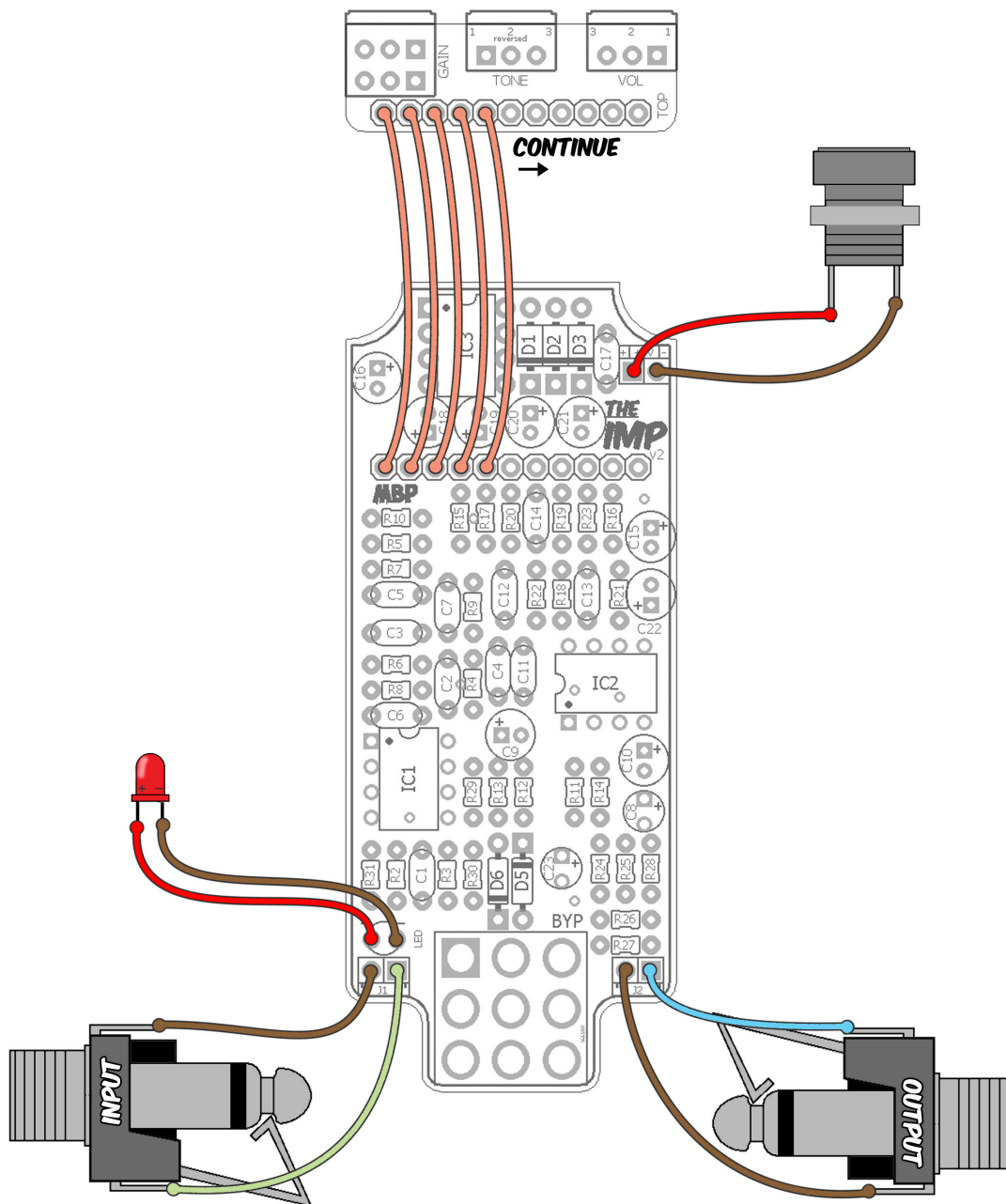
For the 3PDT, if you have already drilled your enclosure, temporarily mount the 3pdt to hold it secure, place the IMP board and solder. I suggest soldering one lug first then make sure the PCB is sitting FLAT on the 3pdt. Then solder the rest of the lugs.

For the LED, you can actually just install it loose then solder in place once everything is in the enclosure. I had to wire mine because my drill hole was in the wrong location.



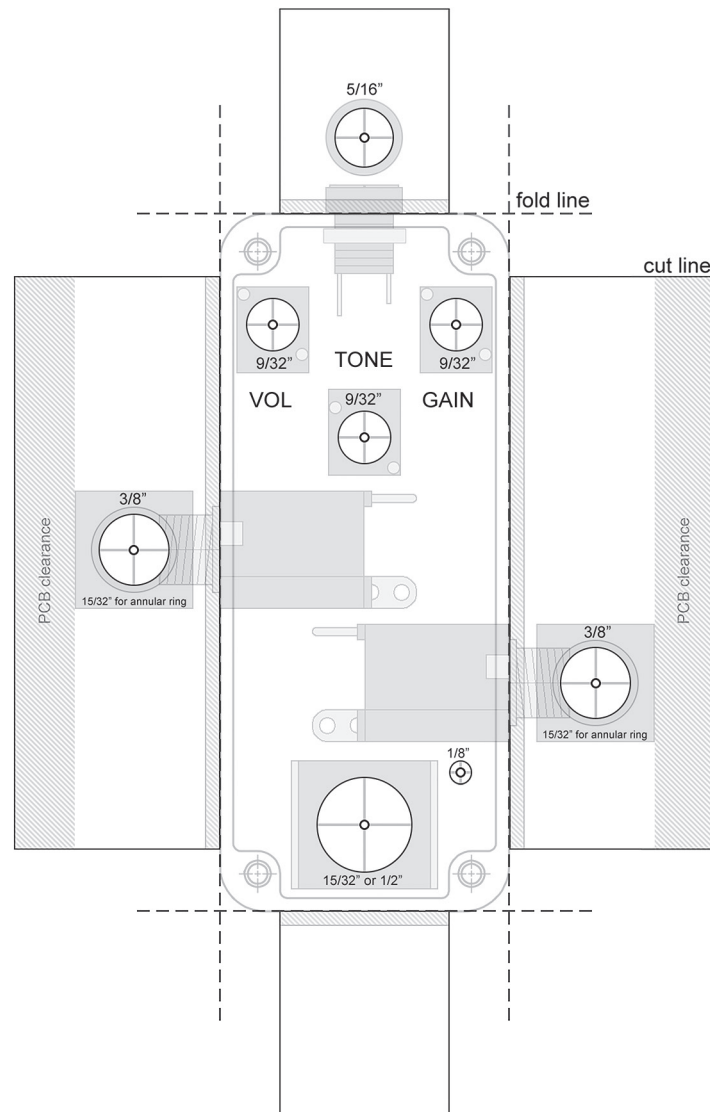
Before final assembly, it's a good idea to test your build out. It should be pretty easy here - plug in your jacks and temporarily connect your DC jacks to a power supply via a breadboard. If everything is working you are ready to finish up.

Thread and install your DC jack. Solder the power and ground wires to the jack as shown. Then simply fold everything into the enclosure and lock it all down. If you are mounting your LED directly to the main PCB, be sure you solder it in after everything is mounted in the enclosure.



- Although the wiring is shown on the top of the two PCBs, I recommend placing your wires underneath both boards. This will make it much easier to mount in the 1590A. I also recommend using either 24 or 26AWG for the wires connecting the two boards.
- Make sure you install the pots the right way! The top of the daughter board has the Tone pot labeled “reverse” (IOW, put it on the bottom of the board).

Note: Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.



- This template will work for either mono enclosed jacks or the “Lumberg” style.
- It uses the “Thinline” style DC Jack. The jack is located near the enclosure top so the main board can overlap it.

IC1	TL072	IC2	TL072	IC3	7660
1	4.79	1	4.76	1	9.4
2	4.71	2	4.71	2	4.8
3	4.7	3	4.71	3	0
4	0	4	-8.74	4	-4.3
5	3.65	5	4.71	5	-8.74
6	4.7	6	4.71	6	4.45
7	4.7	7	4.65	7	5.88
8	9.4	8	16.71	8	9.4

- 9.42vDC One Spot
- Current Draw: ~ 15mA



I used a low profile 8-pin socket for the charge pump. For the 1uF electros, I only had low profile 7mm ones at the time of this build. Made for a hard fit. The ones linked in the Mouser Project are 5mm high which are perfect for this build.

My LED was wired due to drilling the LED hole in the wrong spot on the enclosure!

