

RoughCut24

F X Type: **COMPRESSION**

Build Level: Intermediate

Based On: Diamond® Compressor™

Last Updated: August 17, 2024 5:38 PM

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The 2024 version of the **RoughCut** has no circuit changes and minor layout tweaks.

Overview

The **Rough Cut** is an amalgamation of the variations/mods of the Diamond Compressor™ for guitar. It's a very clean and articulate optical compressor that has incredibly smooth envelope response. It's a great sounding, modern optical compressor for guitar so if you like the squishy squish this one is for you!

The Rough Cut includes mods featured in different versions which allows one to bypass the EQ circuit altogether or add a bit of high cut. For the 2024 version, this has been made accessible via an inexpensive internal slide switch.

The Rough Cut only has one tweak from the stock design - the EQ bypass switch has been reduced from a DPDT to SPDT. In the stock unit, the DPDT does a full EQ bypass by disconnecting R19 (my schematic). However, this leads to an annoying "pop" when the switch is engaged due to the voltage differences on that side of the switch. Changing this to an SPDT to bypass only the output of the EQ circuit eliminates the pop and there is no difference at all in tone at all by leaving the front end of the EQ circuit active in the bypass mode (at least as far as I can tell).

Controls

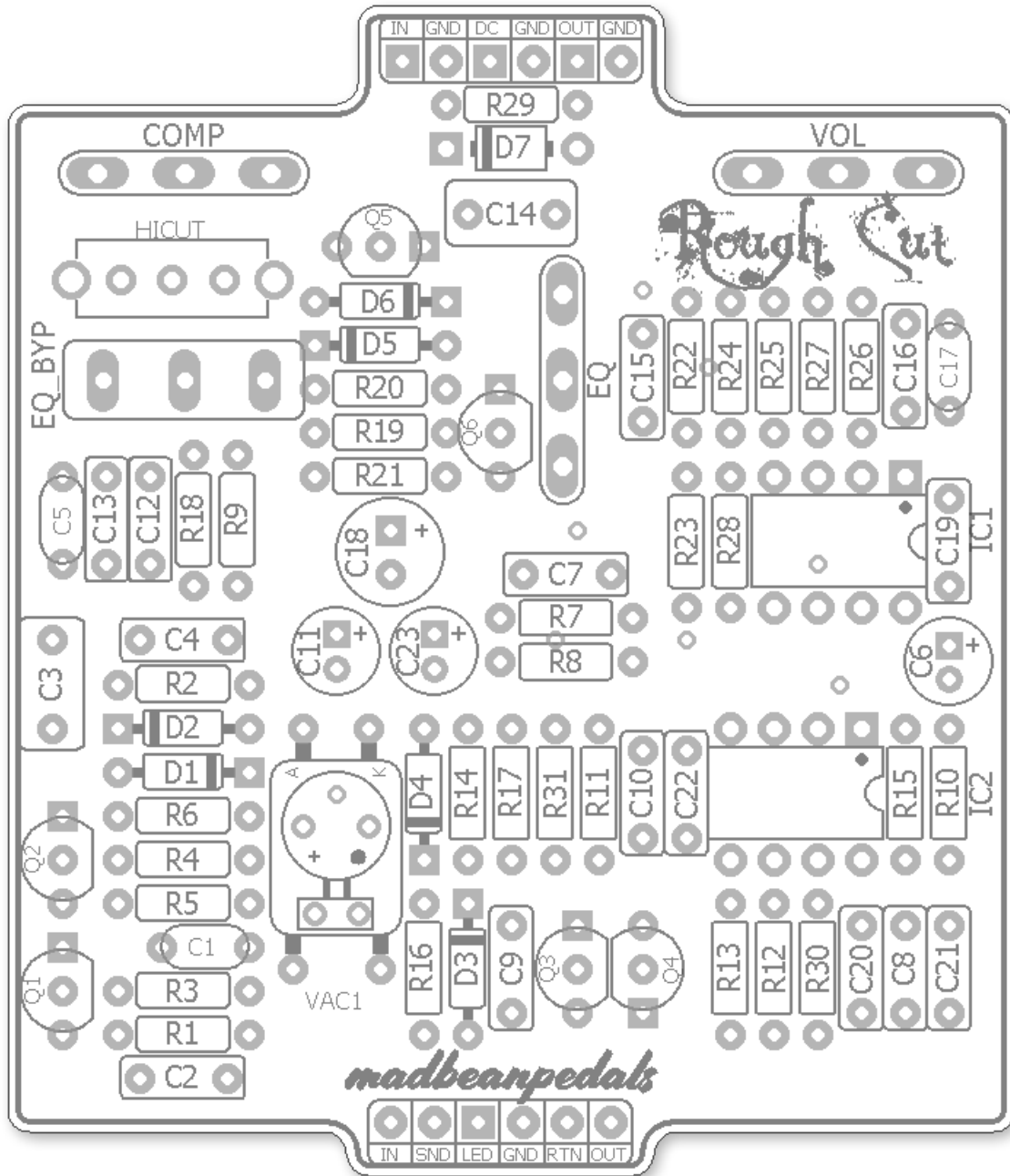
- **VOL:** Total output.
- **COMP:** CCW: least compression, CW: highly compressed.
- **EQ:** CCW: treble cut, CW: treble boost.
- **EQ BYP :** This switch bypasses the EQ circuit.
- **HI CUT:** This switch can be used to cut a bit of treble content (can be used in either EQ or EQ bypass mode). For the 2024 version, it has been made an internal slide switch.

Terms of Use: You are free to use purchased **RoughCut24** circuit boards for both DIY and small commercial operations. You may not offer **RoughCut24** PCBs for resale or as part of a "kit" in a commercial fashion. Peer to peer re-sale is fine, though.

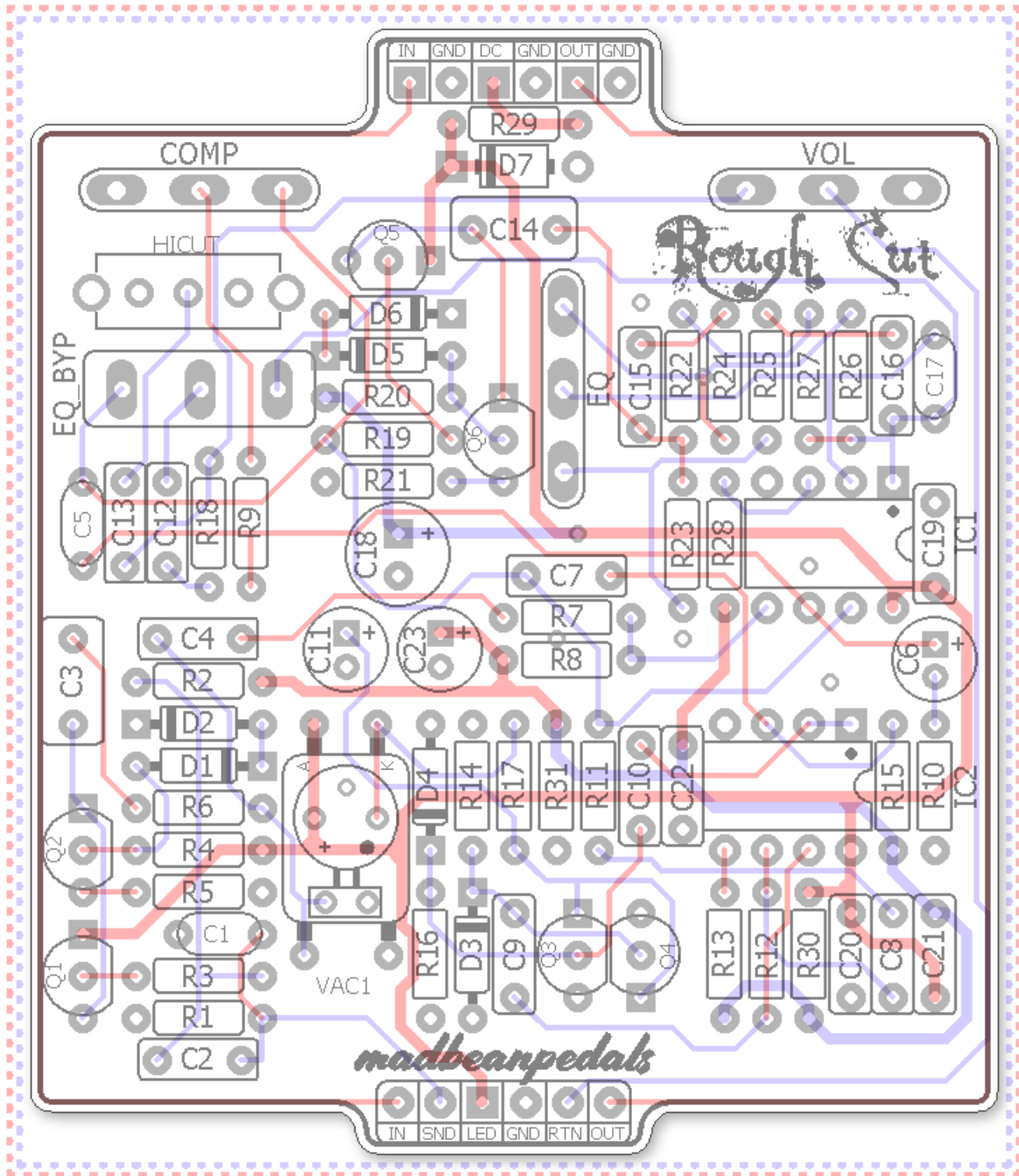
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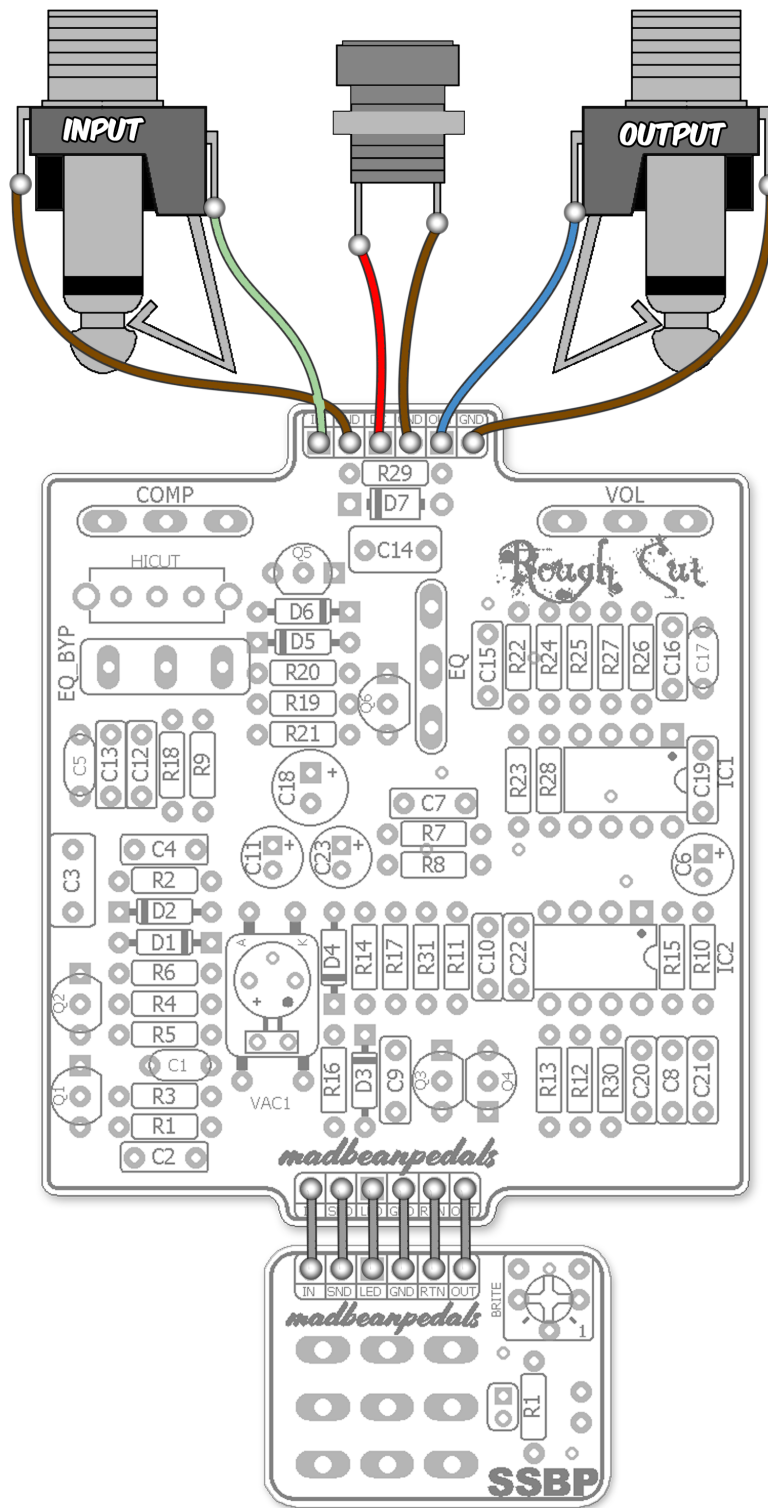
Parts Layout



Trace Layout



Wiring



The RoughCut24 is compatible with both the **SSBP** and **SSABP** bypass boards available at madbeanpedals. The wiring is the same for both.

B.O.M.

Resistors		Caps		Diodes	
R1	1M	C1	100pF	D1 - D6	1n914
R2	475k	C2	100n	D7	1N4001
R3	100R	C3	330n	Transistors	
R4	22k	C4	100n	Q1 - Q6	2n3904
R5	475R	C5	100pF	ICs	
R6	100k	C6	1uF	IC1	OP275
R7	1k	C7	3n3	IC2	LM358
R8	475k	C8	15n	Opto	
R9	6k4	C9	10n	VACT_1	VTL5C3
R10	3k3	C10	10n	Switches	
R11	100k	C11	2u2	EQ_BYP	On/On
R12	100k	C12	100n	HICUT	On/On
R13	475k	C13	3n3	Pots	
R14	220k	C14	330n	EQ	50kB
R15	475k	C15	5n6	VOL	100kA
R16	220k	C16	5n6	COMP	100kB
R17	3k3	C17	100pF		
R18	10k	C18	100uF		
R19	100R	C19	100n		
R20	22k	C20	100n		
R21	475R	C21	100n		
R22	47k5	C22	100n		
R23	47k5	C23	47uF		
R24	15k				
R25	15k				
R26	47k5				
R27	47k5				
R28	475k				
R29	100R				
R30	10k				
R31	10k				

Shopping List

Value	QTY	Type	Rating
100R	3	Metal / Carbon Film	1/4W
475R	2	Metal / Carbon Film	1/4W
1k	1	Metal / Carbon Film	1/4W
3k3	2	Metal / Carbon Film	1/4W
6k4	1	Metal / Carbon Film	1/4W
10k	3	Metal / Carbon Film	1/4W
15k	2	Metal / Carbon Film	1/4W
22k	2	Metal / Carbon Film	1/4W
47k5	4	Metal / Carbon Film	1/4W
100k	3	Metal / Carbon Film	1/4W
220k	2	Metal / Carbon Film	1/4W
475k	5	Metal / Carbon Film	1/4W
1M	1	Metal / Carbon Film	1/4W
100pF	3	Ceramic / MLCC	16v min.
3n3	2	Film	16v min.
5n6	2	Film	16v min.
10n	2	Film	16v min.
15n	1	Film	16v min.
100n	7	Film	16v min.
330n	2	Film	16v min.
1uF	1	Electrolytic	16v min.
2u2	1	Electrolytic	16v min.
47uF	1	Electrolytic	16v min.
100uF	1	Electrolytic	16v min.
1n914	6		
1N4001	1		
2n3904	6		
OP275	1		
LM358	1		
VTL5C3	1		
On/On	1	SPDT - Solder Lug	
On/On	1	slide switch	
100kB	1	PCB Right Angle	16mm
50kB	1	PCB Right Angle	16mm
100kA	1	PCB Right Angle	16mm

Additional Hardware

- (1) 125B enclosure
- (2) 1/4" mono jacks
- (1) Slim 2.1mm DC jack
- (1) Standard 3PDT footswitch
- (1) 5mm LED

Build Notes

Not much to add here. It's a simple build. I did use one of the XVIVE 5C3 repros and it worked perfectly. I do not recommend trying to "roll your own" vactrol with an LED/LDR combo. Stick with what's known to work well for this compressor circuit. I did not try the Cool Audio version of the 5C3 but it may also work fine here.

The slide switch for the Hi Cut mode can be found here: <https://www.taydaelectronics.com/electromechanical/switches-key-pad/slide-switch/slide-switch-1p2t-through-hole-0-5a-50vdc.html>

OP275:

<https://www.mouser.com/ProductDetail/584-OP275GPZ>

If you cannot get the OP275 use a comparable dual op-amp such as the TL072, OPA2134, etc.

LM358:

<http://smallbear-electronics.mybigcommerce.com/ic-lm358/>
<https://www.mouser.com/ProductDetail/926-LM358AN-NOPB>

VTL5C3:

<http://smallbear-electronics.mybigcommerce.com/photocoupler-xvive-vtl5c3-work-alike/>

Circuit Voltages

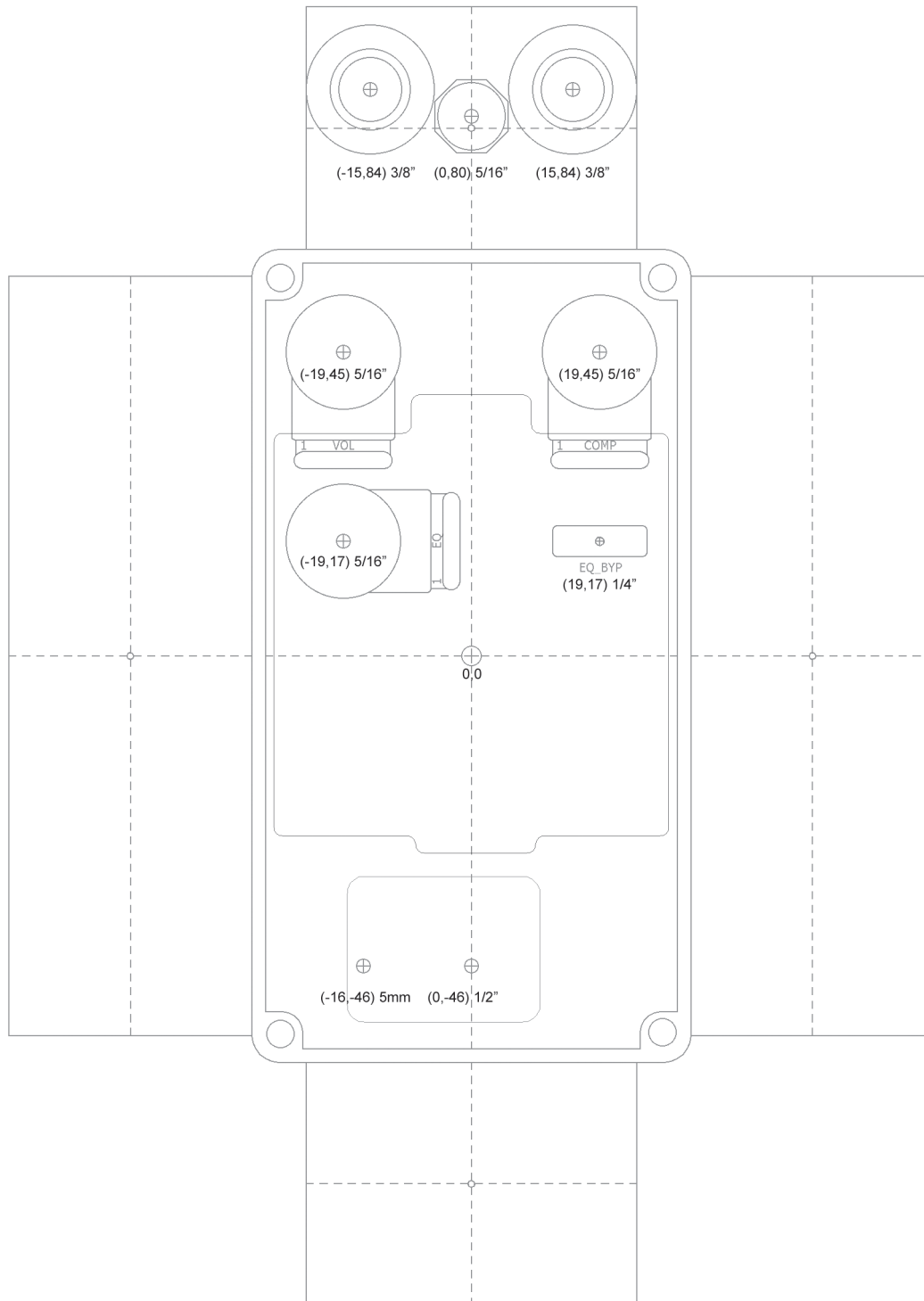
IC1 OP275		IC2 LM358		Q1 2n3904		Q2 2n3904	
1	4.31	1	4.32	C	8.65	C	1.45
2	4.31	2	4.32	B	2.03	B	1.11
3	4.11	3	4.12	E	1.45	E	0.44
4	0	4	0				
5	3.98	5	4.01	Q3 2n3904		Q4 2n3904	
6	4.2	6	4.1	C	7.1	C	7.1
7	4.31	7	4.31	B	0	B	0
8	8.65	8	8.65	E	0	E	0
				Q5 2n3904		Q6 2n3904	
				C	8.65	C	3.66
				B	4.31	B	1.11
				E	3.66	E	0.44

- 9.42vDC One Spot
- Current Draw ~ 11mA

Drill Template

Coordinates are denoted in (X,Y), drill size format starting from the center (0,0) location of the enclosure.

Tayda drill template: https://drill.taydakits.com/box-designs/new?public_key=WkduZVVtb1RMWWVBbnJpeDJK3VKZz09Cg==

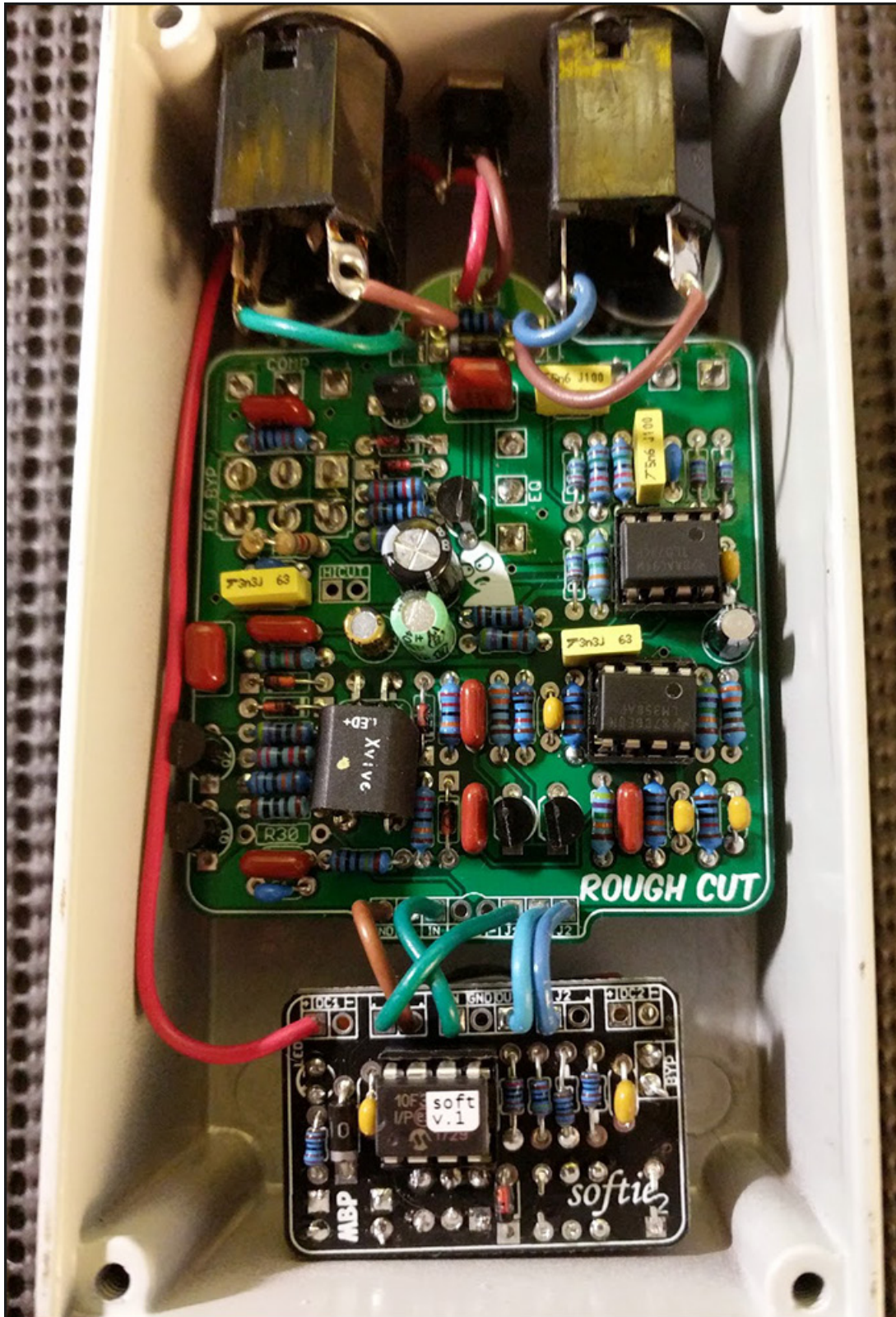


Hardware

125B enclosure
Mono jacks
Slim 2.1mm DC jack
Standard 3PDT footswitch
5mm LED

NOTE: Different 1/4" and DC jack styles may require different sized drill holes.

Build Pic



First prototype build

Schematic

ROUGH CUT
Based on the Diamond® Compressor™
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