ROUGHCUT

FX TYPE: Compressor

Based on the Diamond® Compressor™

Enclosure Size: 125B

"Softie" compatibility: Softie1&2

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!

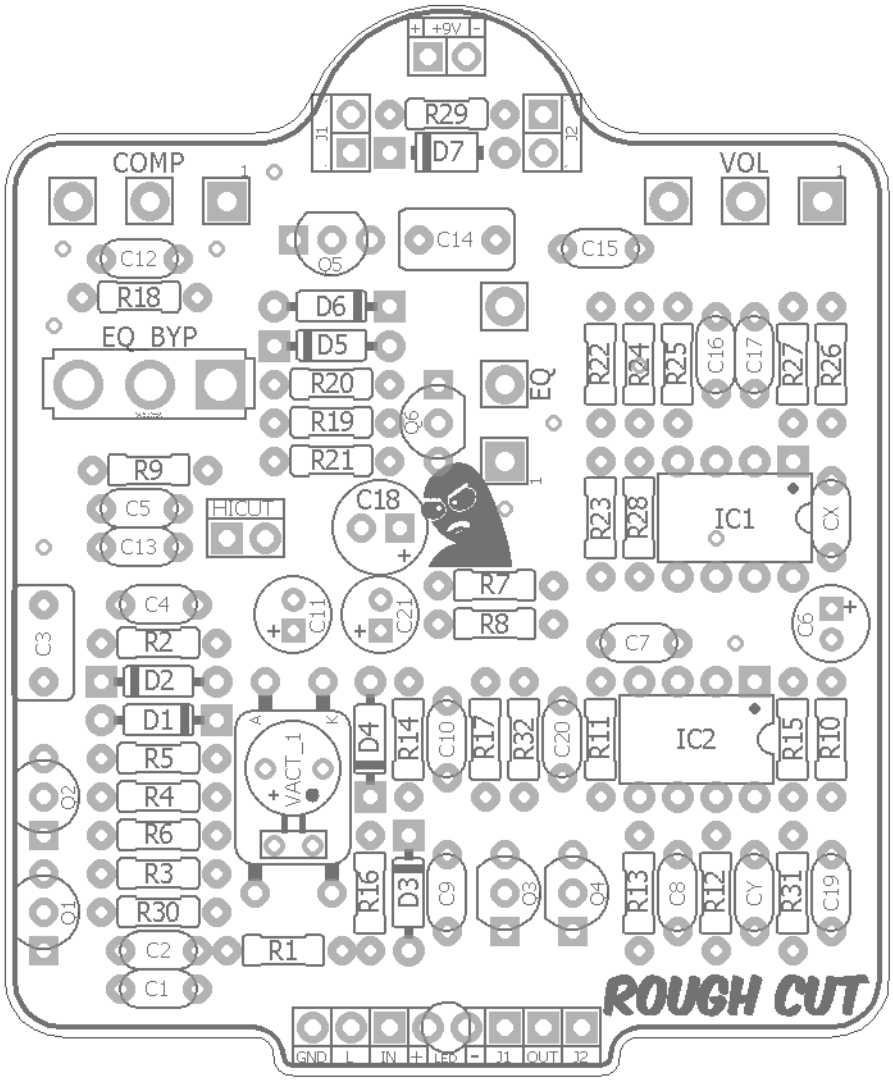
The Rough Cut includes mods featured in different versions which allows one to bypass the EQ circuit altogether or add a bit of high cut. The high cut was accessible as an internal dip switch (AFAIK) but is made external here. IMO, the Hi Cut is not needed but the option is there for you.

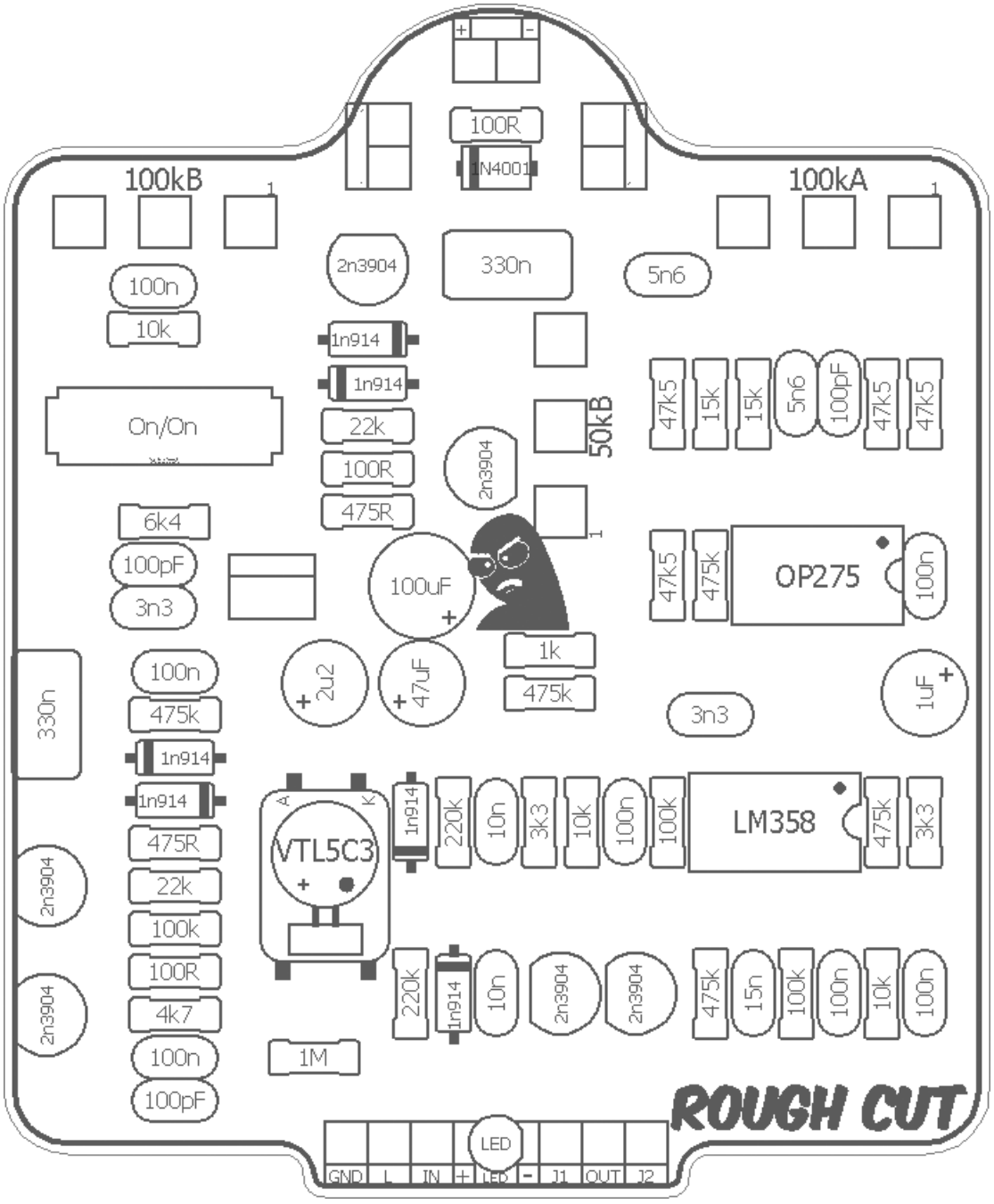
The Rough Cut only has one tweak from the stock design - the EQ bypass switch has been reduced from a DPDT to SPDT. In the stock unit, the DPDT does a full EQ bypass by disconnecting R19 (my schematic). However, this leads to an annoying "pop" when the switch is engaged due to the voltage differences 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).

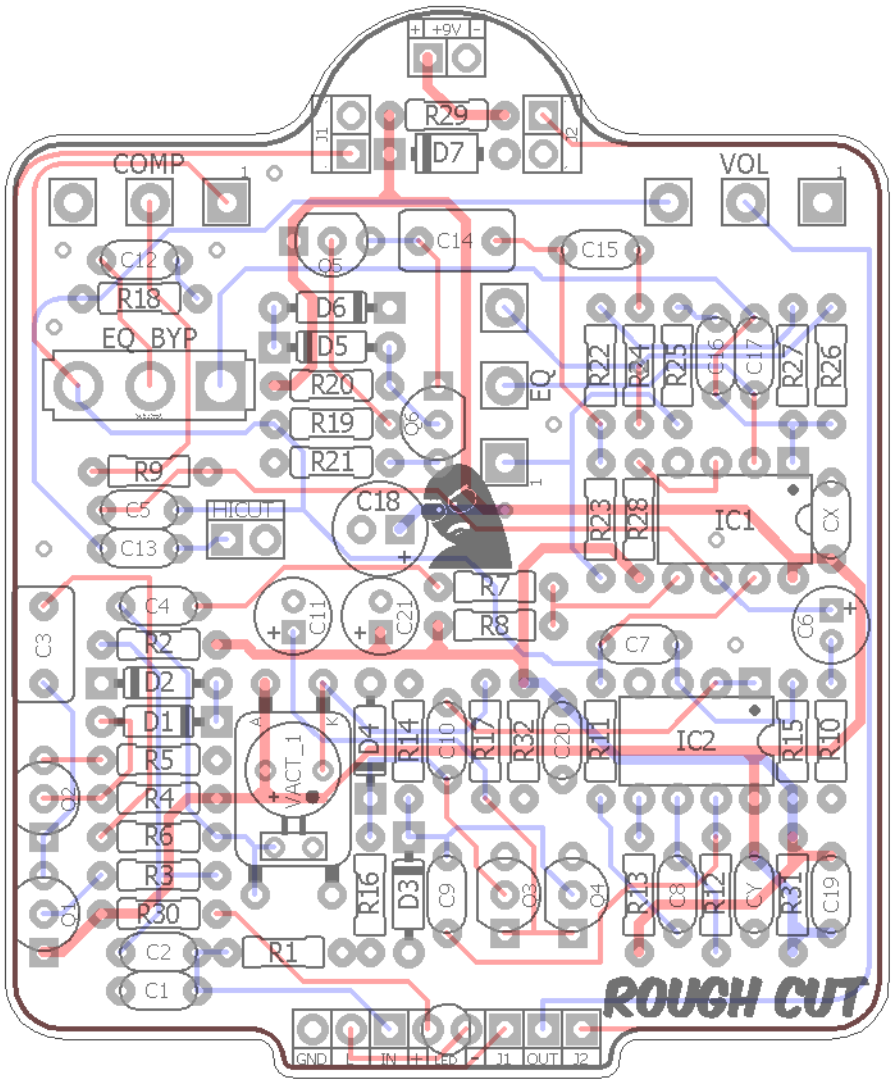
Controls

- **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 optional switch can be used to cut a bit of treble content (can be used in either EQ or EQ bypass mode).

Technical assistance for your build(s) is available via the madbeanpedals forum. 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.


+9V
R29
D7
J1
J2
COMP
VOL
C12
R18
Q5
C14
C15
EQ BYP
D6
D5
R20
R19
R21
EQ
Q6
R9
C5
C13
HICUT
C18
R22
R24
R25
C16
C17
R27
R26
R23
R28
IC1
CX
C6
R7
R8
C11
C21
C4
R2
C3
C7
D2
D1
R5
R4
R6
R3
R30
C2
C1
R1
VACT_1
D4
R14
C10
R17
R32
C20
R11
IC2
R15
R10
Q2
Q1
R16
D3
C9
Q3
Q4
R13
C8
R12
CY
R31
C19
ROUGH CUT
GND
IN
OUT


100kB
100kA
100R
1N4001
2n3904
330n
5n6
100n
10k
1n914
1n914
22k
100R
475R
On/On
50kB
47k5
15k
15k
5n6
100pF
47k5
47k5
6k4
100pF
3n3
100uF
47k5
475k
OP275
100n
1k
475k
2u2
47uF
3n3
1uF
330n
100n
475k
1n914
1n914
475R
22k
100k
100R
4k7
100n
100pF
2n3904
2n3904
VTL5C3
1n914
220k
10n
3k3
10k
100n
100k
LM358
475k
3k3
220k
1n914
10n
2n3904
2n3904
475k
15n
100k
100n
10k
100n
1M
ROUGH CUT
LED
GND
IN
LED
J1
OUT
J2


+9V
R29
D7
COMP
VOL
EQ BYP
R18
C12
C14
C15
Q5
D6
D5
R20
R19
R21
Q6
EQ
R22
R24
R25
C16
C17
R27
R26
R9
C5
C13
HICUT
C18
R7
R8
C11
C21
IC1
R23
R28
CX
C6
C7
C4
R2
D2
D1
R5
R4
R6
R3
R30
C2
C1
R1
C3
Q2
Q1
VACT_1
D4
R14
C10
R17
R32
C20
R11
IC2
R15
R10
R16
D3
C9
Q3
Q4
R13
C8
R12
CY
R31
C19
ROUGH CUT
GND
IN
OUT
J1
J2

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	47uF		
R22	47k5	CX	100n		
R23	47k5	CY	100n		
R24	15k				
R25	15k				
R26	47k5				
R27	47k5				
R28	475k				
R29	100R				
R30	4k7				
R31	10k				
R32	10k				

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
4k7	1	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	Mini SPDT	
100kB	1	PCB Right Angle	16mm
50kB	1	PCB Right Angle	16mm
100kA	1	PCB Right Angle	16mm

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/

SPDT On/On:
http://smallbear-electronics.mybigcommerce.com/spdt-on-on-short-lever/

Mini SPDT:
http://smallbear-electronics.mybigcommerce.com/spdt-sub-mini-short-lever-pc-mount-on-on/

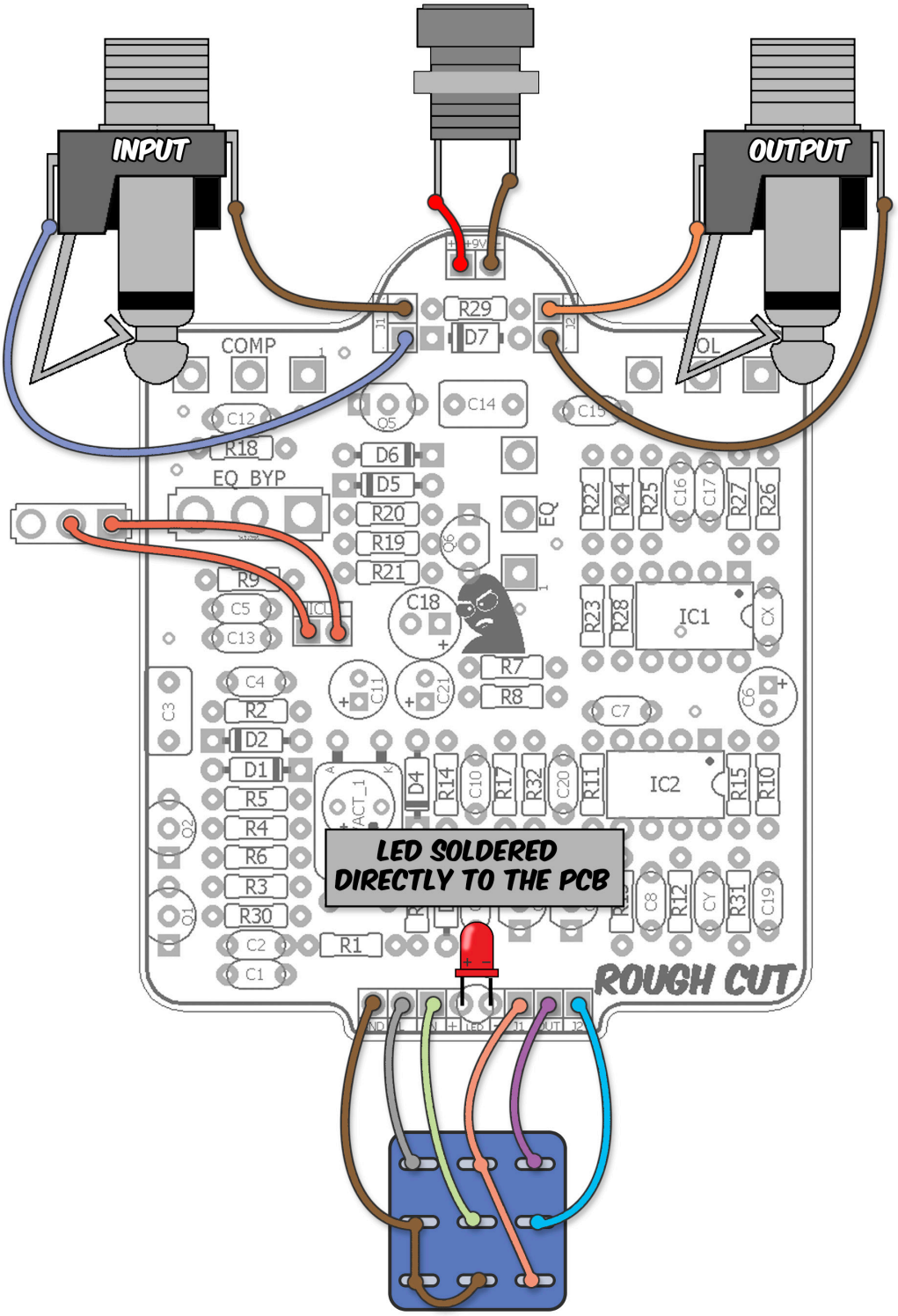
16mm Right Angle Pots (100kB, 50kB, 100kA):
http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/

Thinline DC Jack:
http://smallbear-electronics.mybigcommerce.com/dc-power-jack-all-plastic-unswitched-2-1-mm/

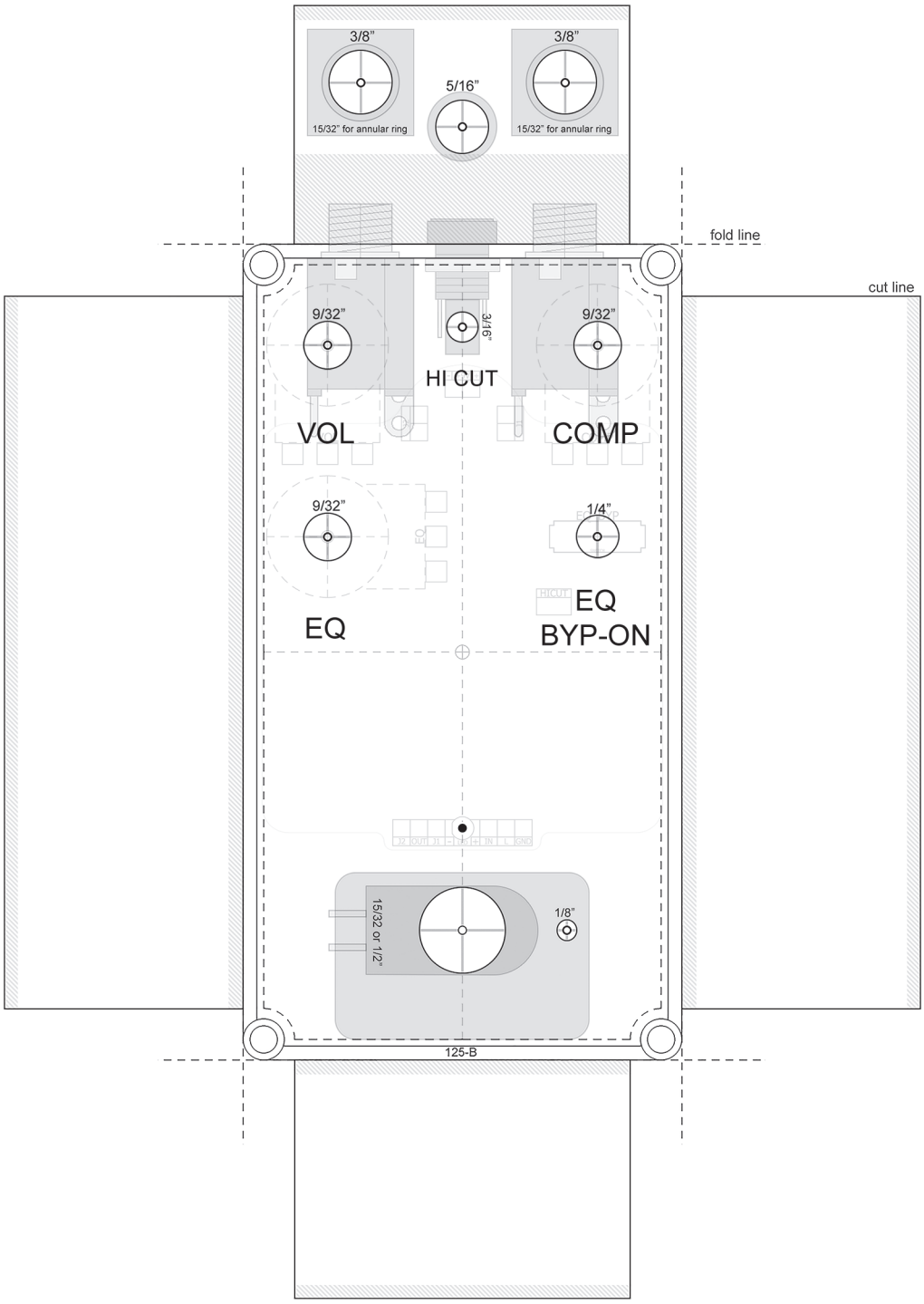
Enclosed Mono:
http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-jack/
http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-switchcraft-111x/

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

- 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.


INPUT
OUTPUT
COMP
VOL
EQ BYP
EQ
LED SOLDERED DIRECTLY TO THE PCB
ROUGH CUT
IC1
IC2

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



- Shown with Softie 2 relay bypass but you can also use the Softie 1 (might want to move the switch location down a bit if using the Softie 1).
- If you are using just a regular 3PDT instead of relay bypass you can use the same drill spot. Be sure to only drill one LED hole! **There are two** shown in the diagram: one for PCB mounting and one for the Softie.
- Enclosed top jacks are used here, but you should also be able to fit open-frame metal jacks or the Lumberg style.

IC1	OP275
1	4.31
2	4.31
3	4.11
4	0
5	3.98
6	4.2
7	4.31
8	8.65

IC2	LM358
1	4.32
2	4.32
3	4.12
4	0
5	4.01
6	4.1
7	4.31
8	8.65

Q1	2n3904
C	8.65
B	2.03
E	1.45

Q2	2n3904
C	1.45
B	1.11
E	0.44

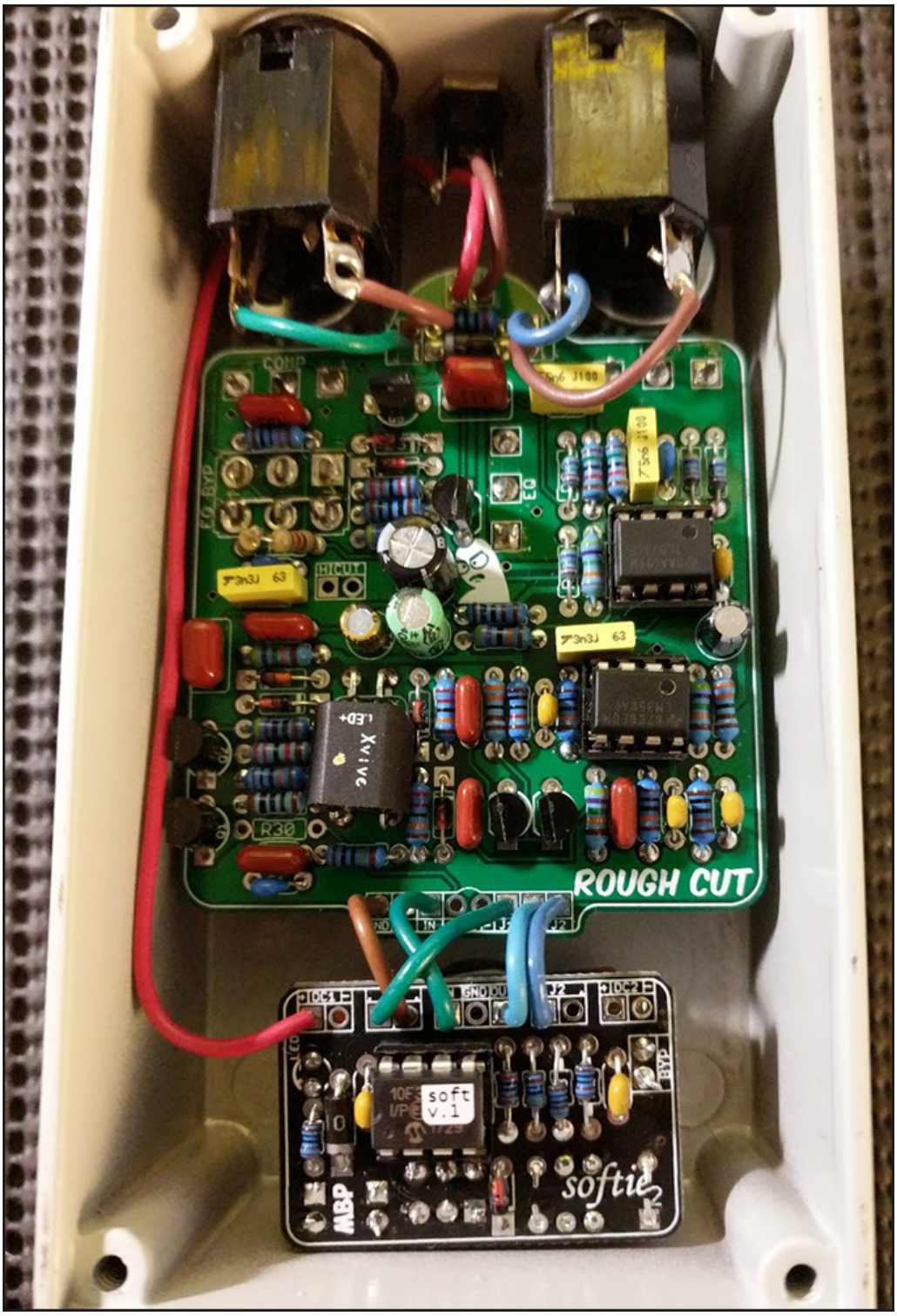
Q3	2n3904
C	7.1
B	0
E	0

Q4	2n3904
C	7.1
B	0
E	0

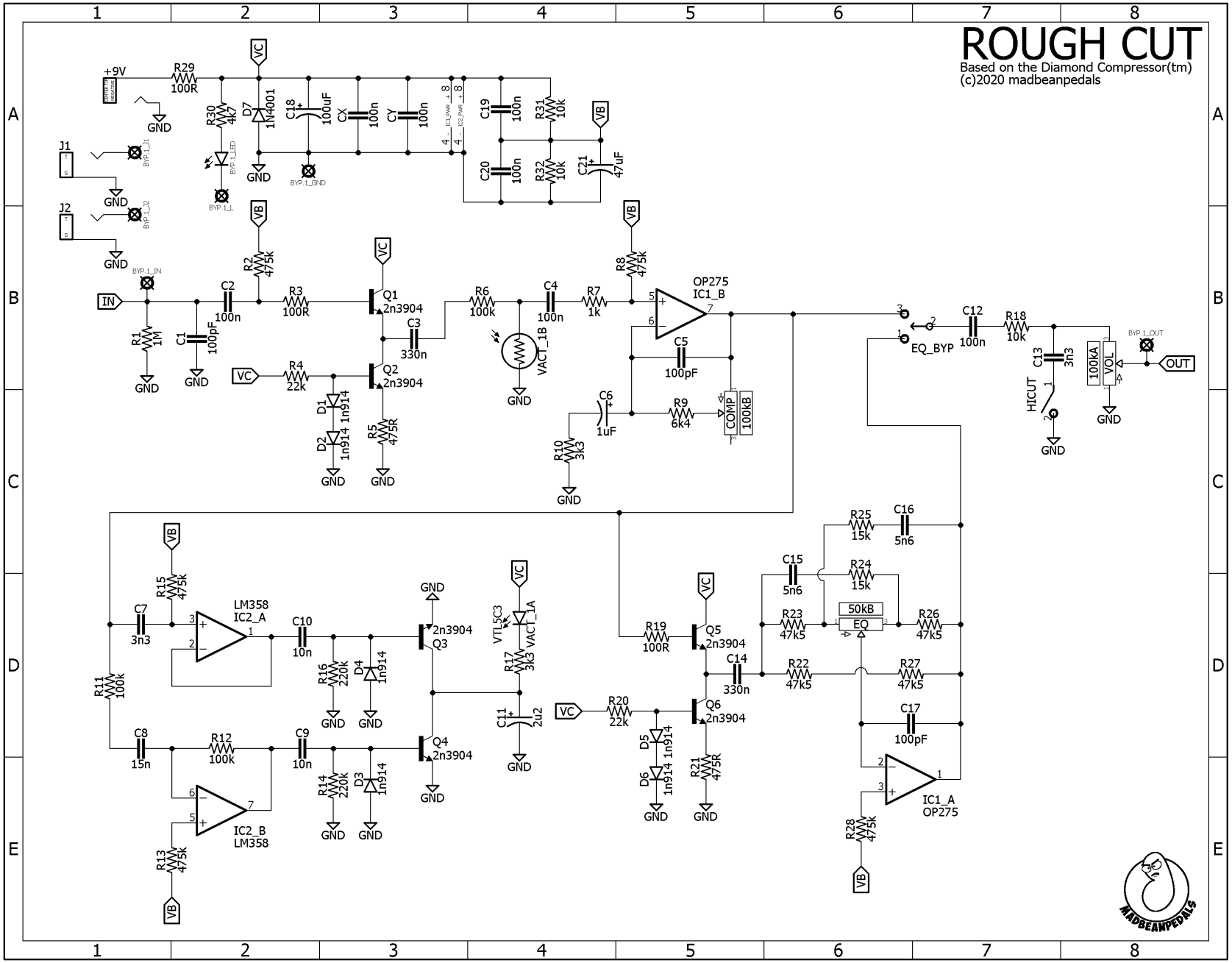
Q5	2n3904
C	8.65
B	4.31
E	3.66

Q6	2n3904
C	3.66
B	1.11
E	0.44

- 9.42vDC One Spot
- Current Draw ~ 11mA



- Prototype board, which originally used a DPDT. Here I've jumpered one half of the switch to make it effectively an SPDT.
- Still waiting to get an OP275 so I used a TL072 for now.


ROUGH CUT
Based on the Diamond Compressor(tm)
(c)2020 madbeanpedals
+9V
R29 100R
VC
VB
GND
R30 4k7
D7 1N4001
C18 100uF
CX 100n
CY 100n
C19 100n
C20 100n
R31 10k
R32 10k
C21 47uF
J1
J2
BYP_1_J1
BYP_1_J2
BYP_1_LED
BYP_1_GND
BYP_1_IN
IN
R1 1M
C1 100pF
C2 100n
R2 475k
R3 100R
Q1 2n3904
C3 330n
R4 22k
Q2 2n3904
D1 1n914
D2 1n914
R5 475k
R6 100k
VACT_1B
C4 100n
R7 1k
R8 475k
OP275 IC1_B
C5 100pF
C6 1uF
R9 6k4
COMP 100kB
R10 3k3
EQ_BYP
C12 100n
R18 10k
C13 3n3
HICUT
100kA VOL
BYP_1_OUT
OUT
R15 475k
LM358 IC2_A
C7 3n3
C10 10n
R16 220k
D4 1n914
Q3 2n3904
VTL5C3 VACT_1A
R17 3k3
C11 2u2
R11 100k
C8 15n
R12 100k
C9 10n
R14 220k
D3 1n914
Q4 2n3904
IC2_B LM358
R13 475k
R19 100R
Q5 2n3904
C14 330n
R20 22k
Q6 2n3904
D5 1n914
D6 1n914
R21 475R
R25 15k
C16 5n6
C15 5n6
R24 15k
50kB EQ
R23 47k5
R26 47k5
R22 47k5
R27 47k5
C17 100pF
IC1_A OP275
R28 475k
MADBEANPEDALS