

COSMOPOLITAN

FX TYPE: Fuzz

Based on the Skreddy® Screwdriver™

Enclosure Size: 125B

Softie compatibility: Softie3

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Overview

The **Cosmopolitan** is a project that was last offered around 2011. Beginning in 2012, mbp made a change in direction and the Cosmo got the axe along with most of the “boutique” clone projects I had been doing up to that point. The idea was to broaden the range of projects on madbeanpedals, as well as start incorporating some original design offerings.

So why bring it back? Because it's just so damn good! A decade on and the Cosmopolitan remains one of my favorite fuzz/overdrive style dirt pedals. It's been the main dirt on my pedalboard for the last year and a half. And, unlike some overdrives and fuzz it plays very well with the Strymon Iridium. This has been an essential part of my sound since most of my jamming these days is done remotely over the internet with my musical buddies.

The circuit combines a mosfet boost on the front end, followed by fuzz face style circuit which mixes NPN silicon and germanium transistors. A very cool combo indeed. It offers anywhere from smooth/creamy overdrive with excellent touch sensitivity up to squared fuzz. A large part of the fun is in dialing in the interactive controls. The Screwdriver™ has been offered as both three knob and five knob versions. The Cosmopolitan corresponds to the five knob one.

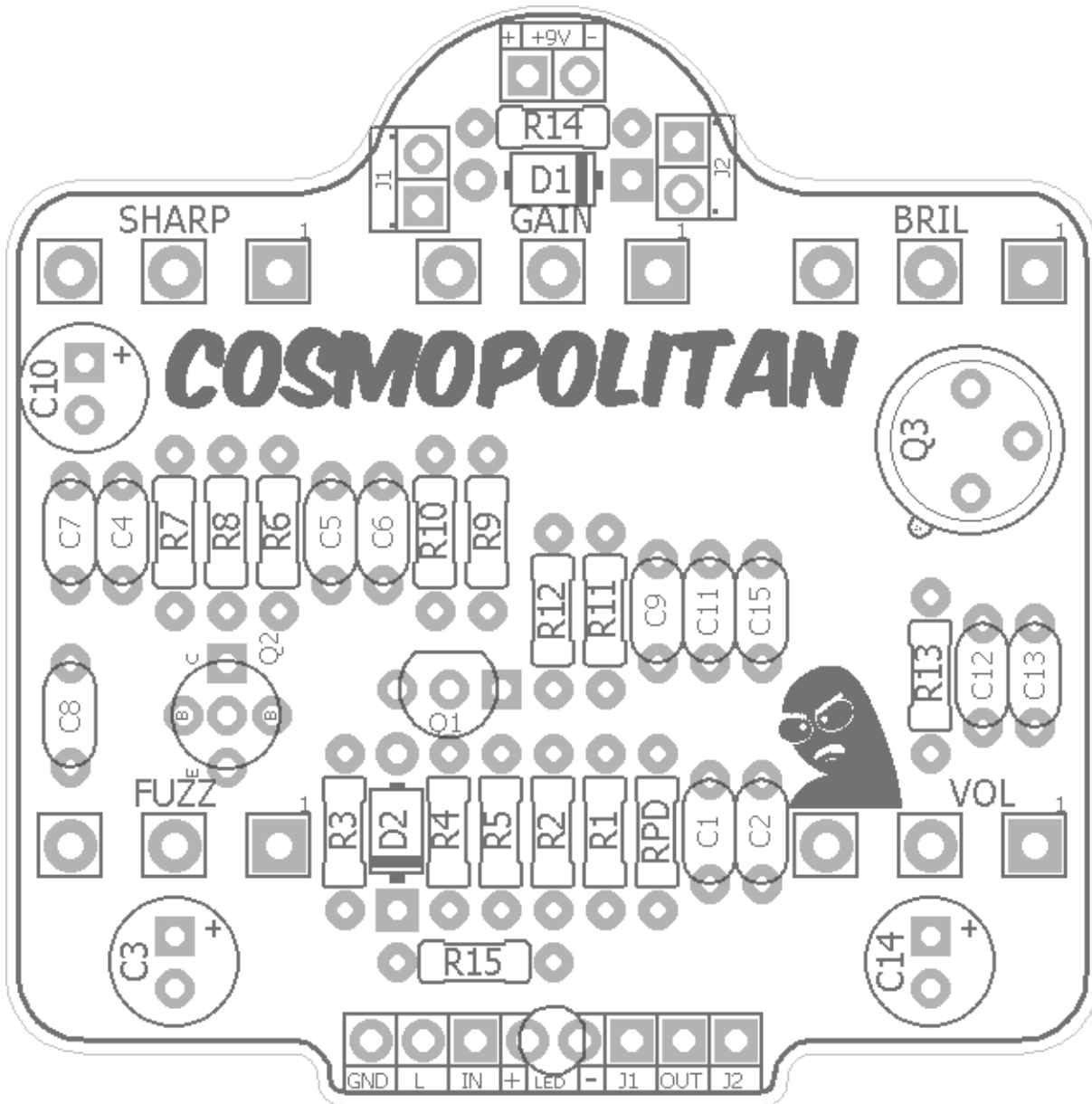
One important note: it may be hard to source the AC127 NPN germanium. smallbear does have one that is a little out of spec for this project but may work okay. Other NPN germaniums may work. See Notes for the spec.

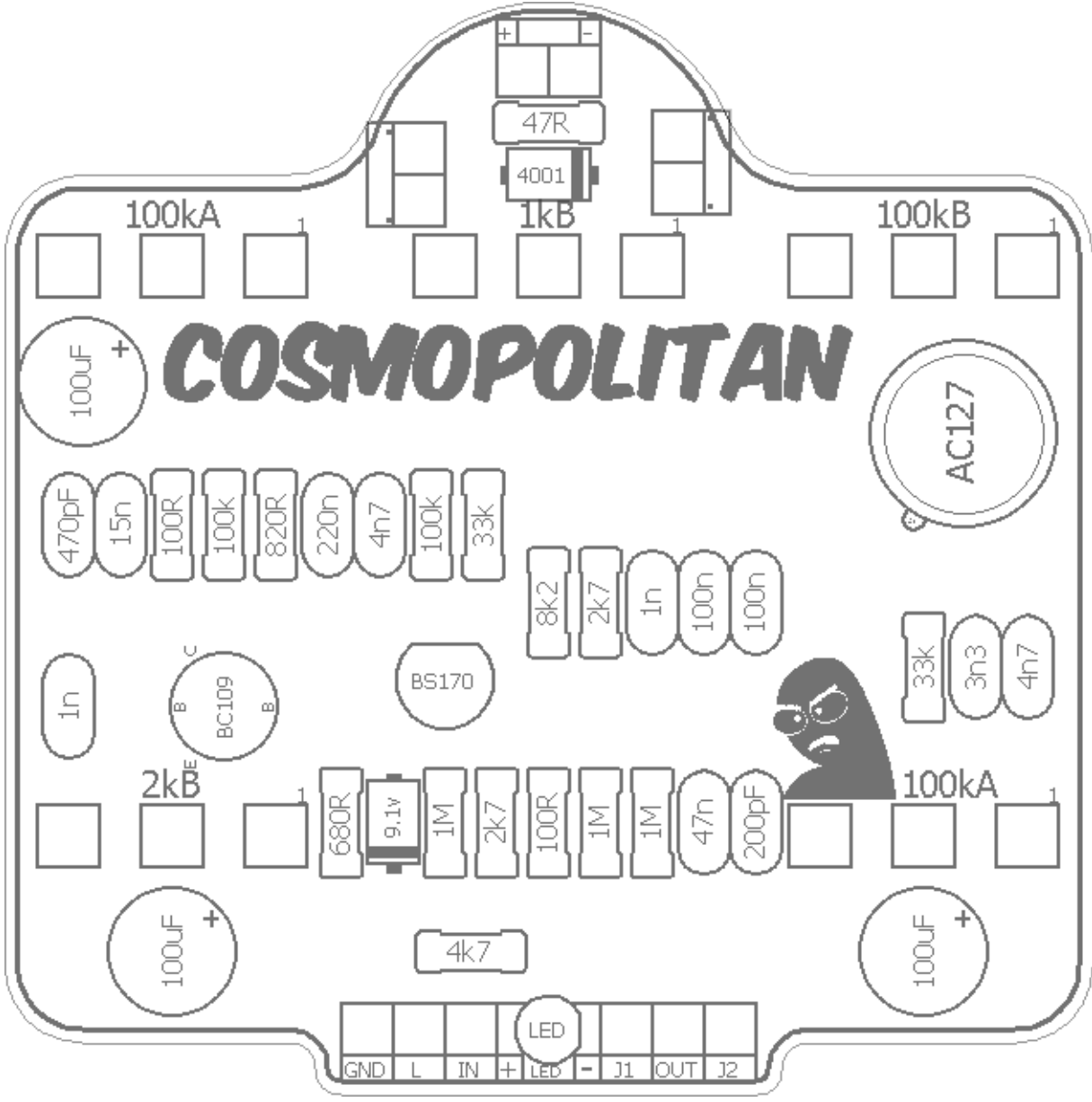
Controls

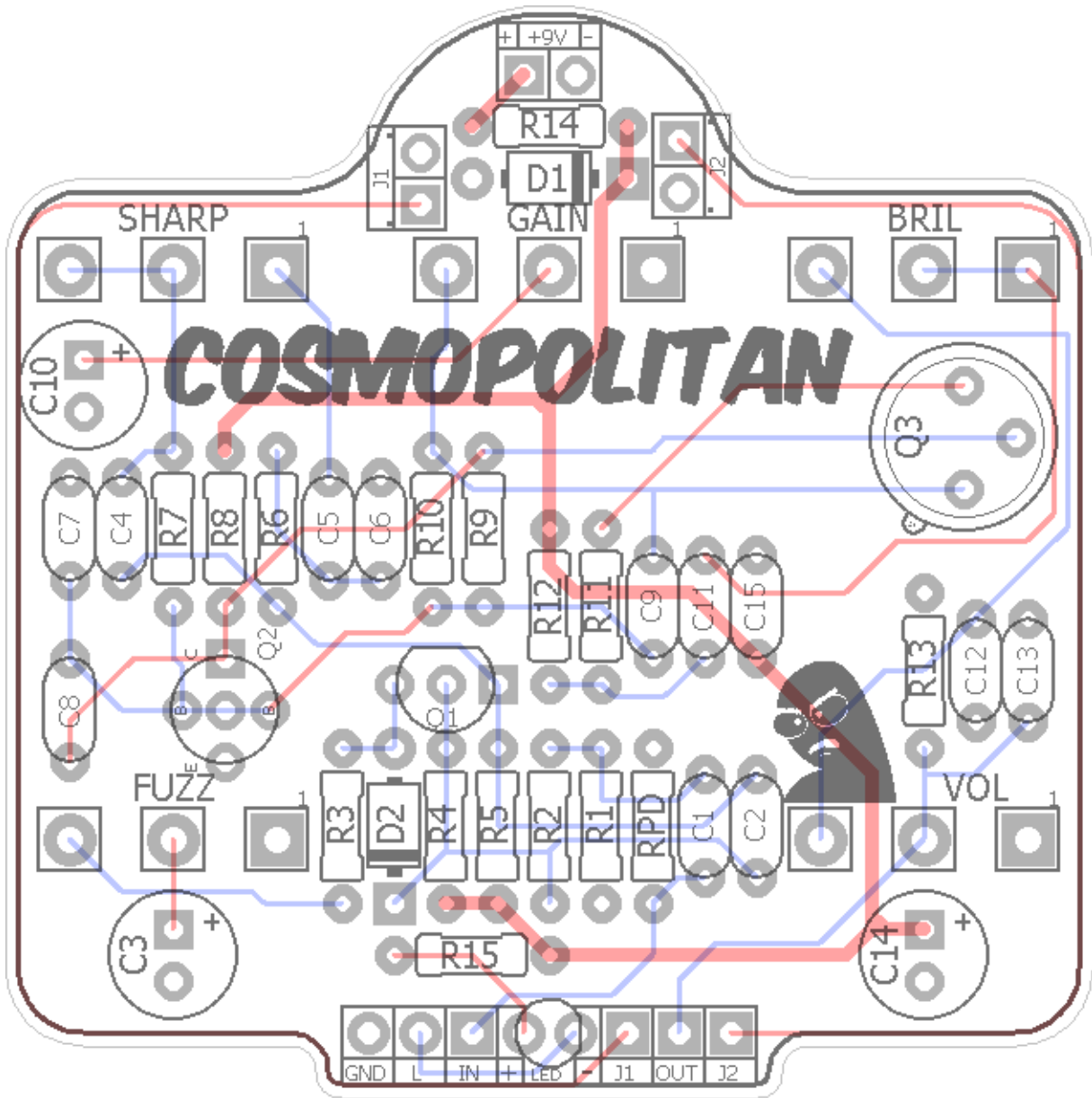
- **BRIL** - Brilliance is a low pass filter tone control.
- **GAIN** - The gain control is really just a fuzz amount control but less prone to the woofiness you get at lower settings like in a traditional fuzz.
- **SHARP** - Controls how much bass is sent from the pre-amp stage to the fuzz circuit. CCW: lots of subs and pretty wooly sounding. CW: it cleans up, reduces gain and takes out most of the low end.
- **VOL** - Effect output level.
- **FUZZ** - **This should be called “PRE”** like the original but I forgot to change it before making the PCBs. It sets the gain amount of the mosfet pre-amp stage. This is a “crackle ok” type control - you may hear some scratchiness when turned. That's normal. When turned CW it will slam the front end of the fuzz circuit.

Terms of Use: You are free to use purchased **Cosmopolitan** circuit boards for both DIY and small commercial operations. You may not offer **Cosmopolitan** 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/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.







Resistors		Caps		Diodes	
R1	1M	C1	47n	D1	1N4001
R2	100R	C2	200pF	D2	9.1v Zener
R3	680R	C3	100uF	Transistors	
R4	1M	C4	15n	Q1	BS170
R5	2k7	C5	220n	Q2	BC109C
R6	820R	C6	4n7	Q3	AC127
R7	100R	C7	470pF	Pots	
R8	100k	C8	1n	GAIN	1kB
R9	33k	C9	1n	FUZZ	2kB
R10	100k	C10	100uF	SHARP	100kA
R11	2k7	C11	100n	VOL	100kA
R12	8k2	C12	3n3	BRIL	100kB
R13	33k	C13	4n7		
R14	47R	C14	100uF		
R15	4k7	C15	100n		
RPD	1M				

Values	QTY	Type	Rating
47R	1	Metal / Carbon Film	1/4W
100R	2	Metal / Carbon Film	1/4W
680R	1	Metal / Carbon Film	1/4W
820R	1	Metal / Carbon Film	1/4W
2k7	2	Metal / Carbon Film	1/4W
4k7	1	Metal / Carbon Film	1/4W
8k2	1	Metal / Carbon Film	1/4W
33k	2	Metal / Carbon Film	1/4W
100k	2	Metal / Carbon Film	1/4W
1M	3	Metal / Carbon Film	1/4W
200pF	1	Ceramic / MLCC	16v min.
470pF	1	Ceramic / MLCC	16v min.
1n	2	Film	16v min.
3n3	1	Film	16v min.
4n7	2	Film	16v min.
15n	1	Film	16v min.
47n	1	Film	16v min.
100n	2	Film	16v min.
220n	1	Film	16v min.
100uF	3	Electrolytic	16v min.
1N4001	1		
9.1v	1	1W Zener	
BS170	1		
BC109C	1		
AC127	1		
1kB	1	PCB Right Angle	
2kB	1	PCB Right Angle	
100kA	2	PCB Right Angle	
100kB	1	PCB Right Angle	

9.1v Zener:

<https://smallbear-electronics.mybigcommerce.com/diode-zener-1n4739a/>

BS170:

<https://smallbear-electronics.mybigcommerce.com/transistor-fet-bs170/>

<https://stompboxparts.com/semiconductors/bs170-mosfet-transistor/>

BC109C:

<https://smallbear-electronics.mybigcommerce.com/bc109c-sgs/>

AC127:

smallbear does currently have an AC127 (the one with a built in heatsink) in stock but with a higher gain range than what's reportedly used with the Screwdriver™ (which is 50-80 hFE). These are 100+ gains. They may work fine, but I have not tested them in this circuit.

<https://smallbear-electronics.mybigcommerce.com/ac127-w-heat-sink/>

TO-5 socket (optional, but recommended):

<https://smallbear-electronics.mybigcommerce.com/to-5-transistor-socket-mill-max/>

16mm pots:

<https://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/>

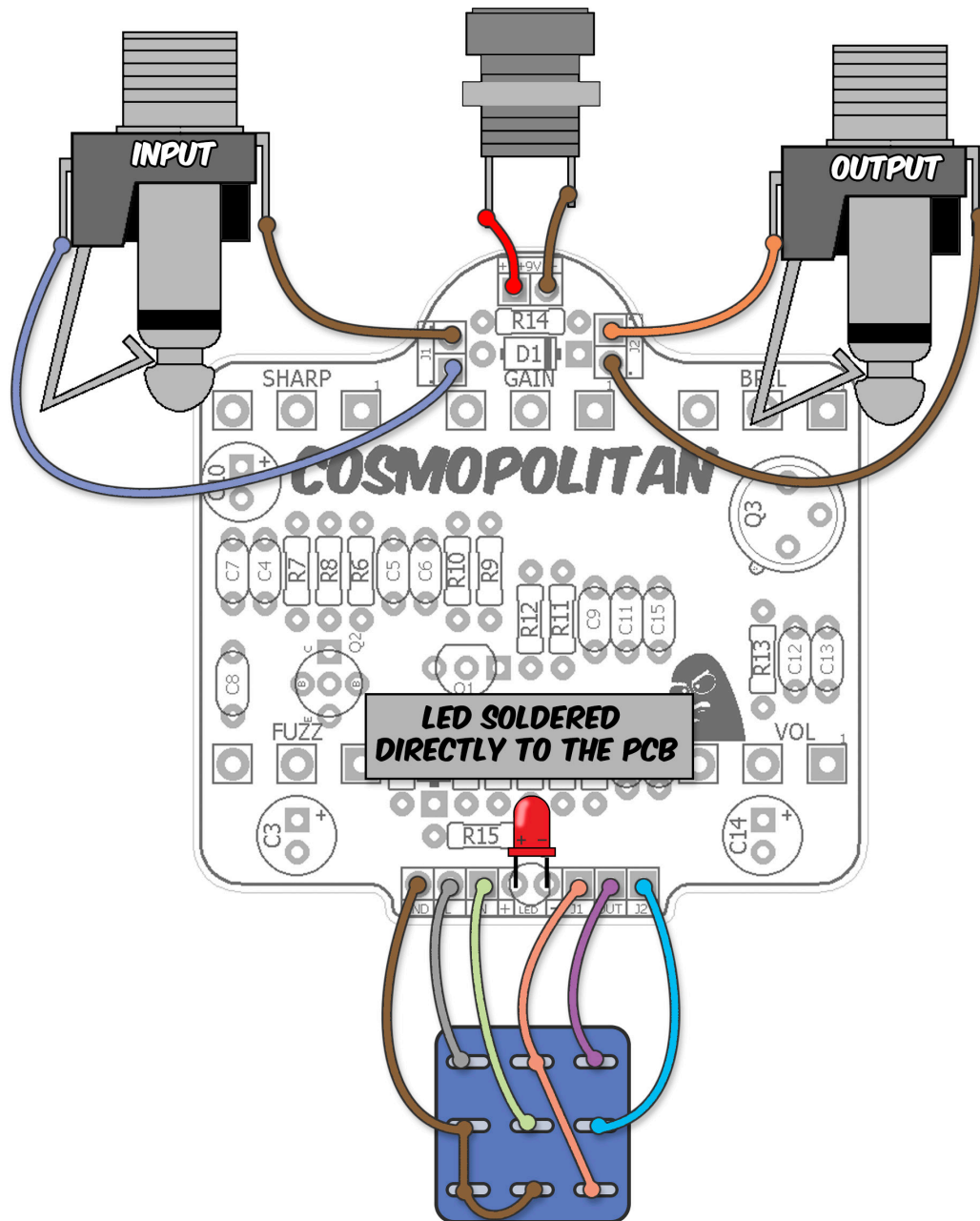
Mono Jacks:

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

<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-nys229/>

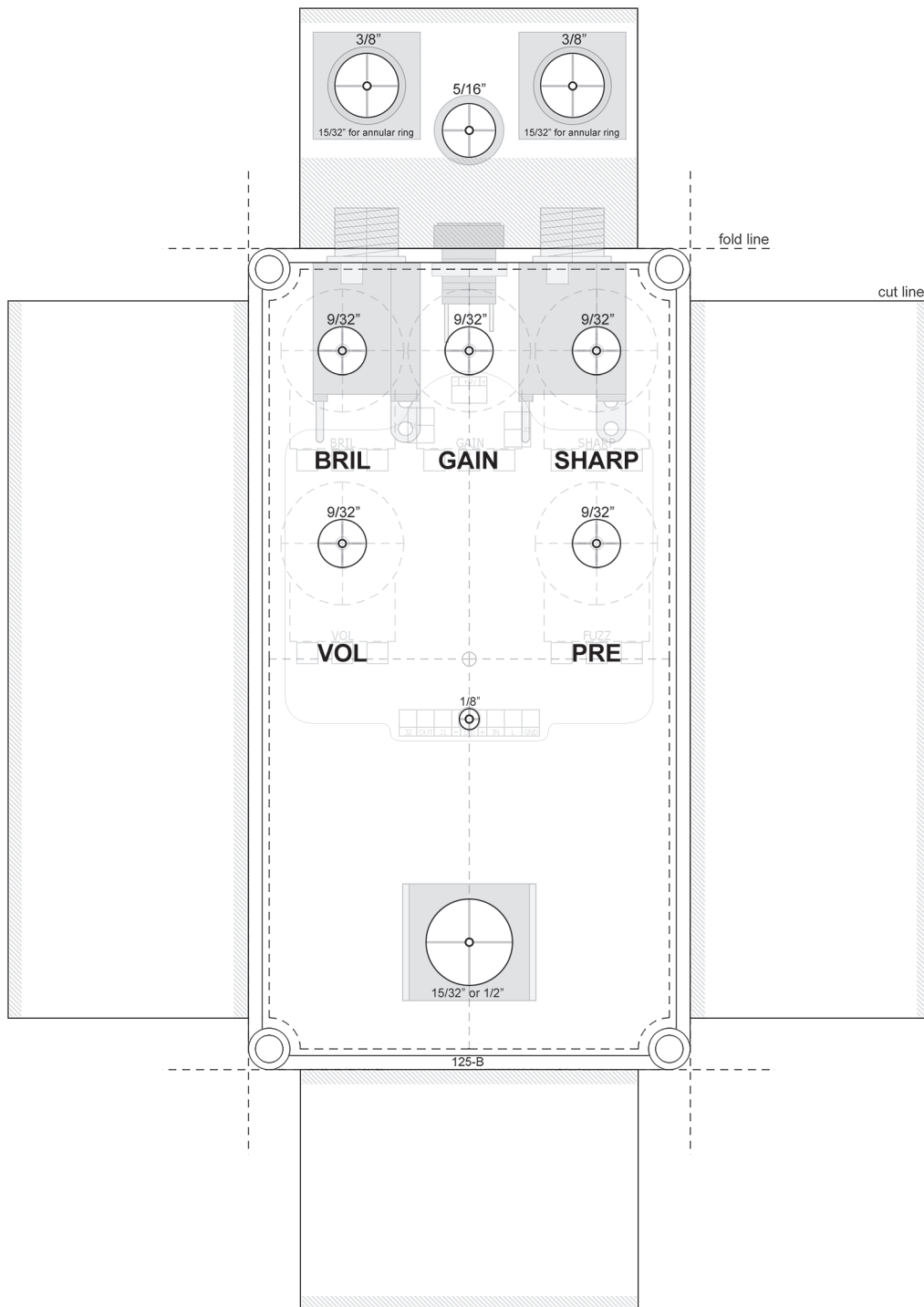
<https://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-switchcraft-111x/>

- The input pulldown resistor (RPD) is optional. It is not used in the stock circuit. You only need to use it if you have a noticeable “pop” when using a 3PDT bypass switch.
- For the BC109C, the small tab on the transistor casing indicates the emitter. Make sure you put the transistor in the right way!
- The flexibility of the Cosmopolitan is in the control interaction. The Fuzz (PRE), Sharp and Gain controls are interdependent and different settings on each can produce a wide variety of tones from creamy OD to a pretty squared up fuzz.
- We are now in a time where supply of many parts has dwindled dramatically and especially for old technology. If you cannot get the AC127, there may be other NPN germaniums that will work. For subs, just stick to the typical low leakage devices and under 100 hFE, if possible. Socketing the transistor will give you the option to test out alternatives, should we see greater supply in the future.
- One other possibility is to just *sub another NPN silicon transistor in place of the AC127*. Another BC109C, perhaps. It may require slight adjustments on R11/R12 to achieve the same bias but there's no reason for it not to work when done properly. Will it sound the same? Probably not. But, that doesn't mean it will sound bad, either. Caveat: I have not tried this.



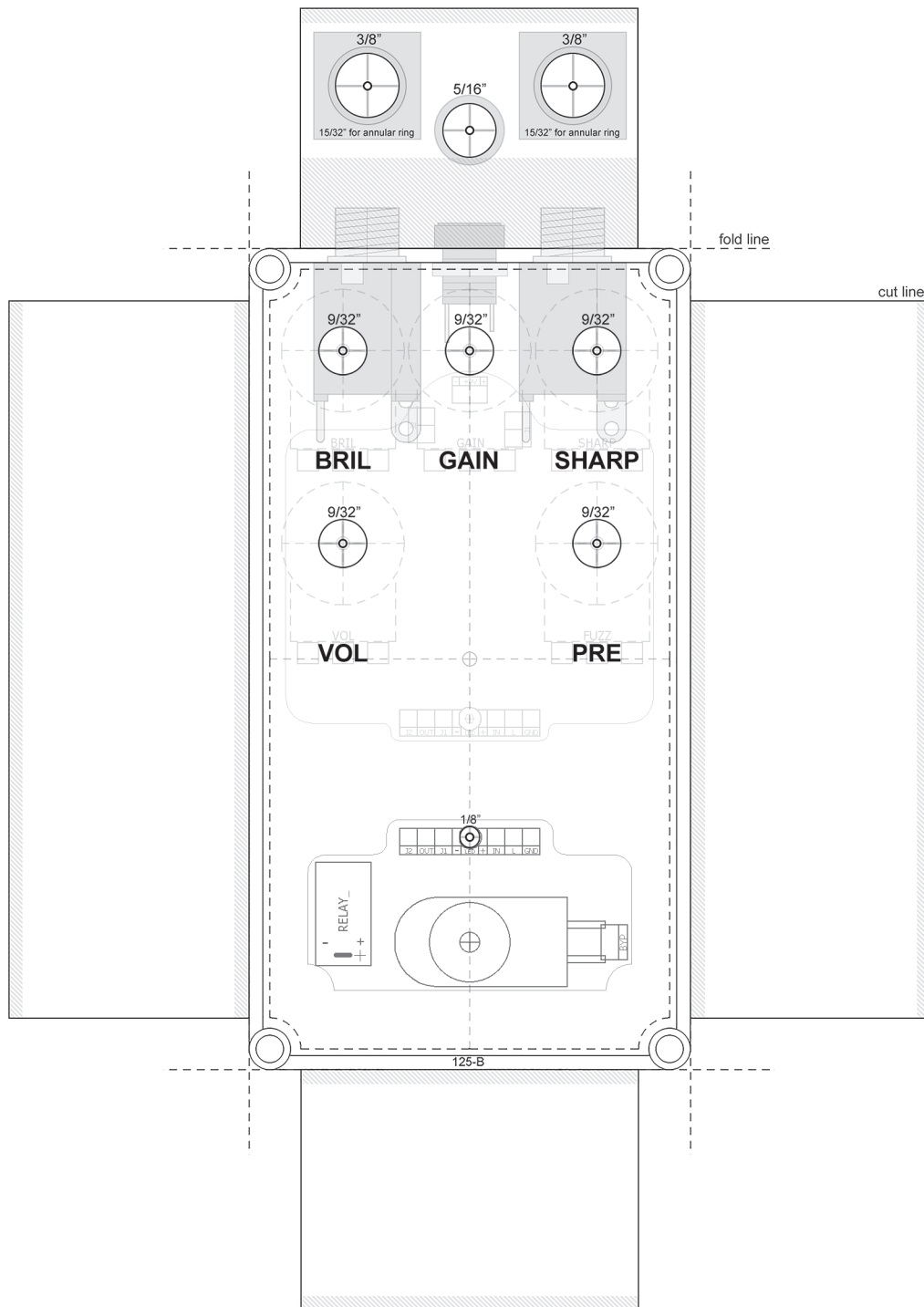
3PDT bypass wiring. If you want to use the Softie3 relay bypass instead (sold separately) please refer to that project documentation for wiring instructions.

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



Use this drill template for regular 3PDT bypass.

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



Use this drill template for Softie3 relay bypass (sold separately).

Q1	BS170
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D	6.82
---	------

S	4.46
---	------

G	2.45
---	------

Q1	BC109C
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C	0.58
---	------

B	0.55
---	------

E	0
---	---

Q1	AC127
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C	4.58
---	------

B	0.58
---	------

E	0.5
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- 9.42vDC One Spot
- Current Draw: 3mA
- Testing conditions:
all controls set to
50%



My 2021 prototype with Softie3 bypass.

