CFH

FX TYPE: Overdrive
Based on the zVex® SHO™
Enclosure Size: 1590A
“Softie” compatibility: none

Overview

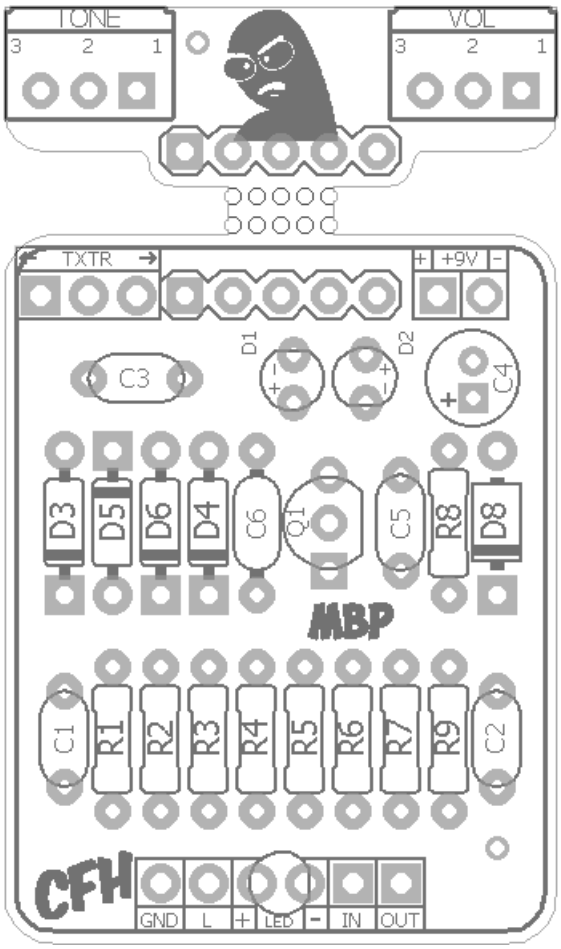
Question: “Hey, bean, how hacky can you be?”
Answer: “Is that a challenge?”

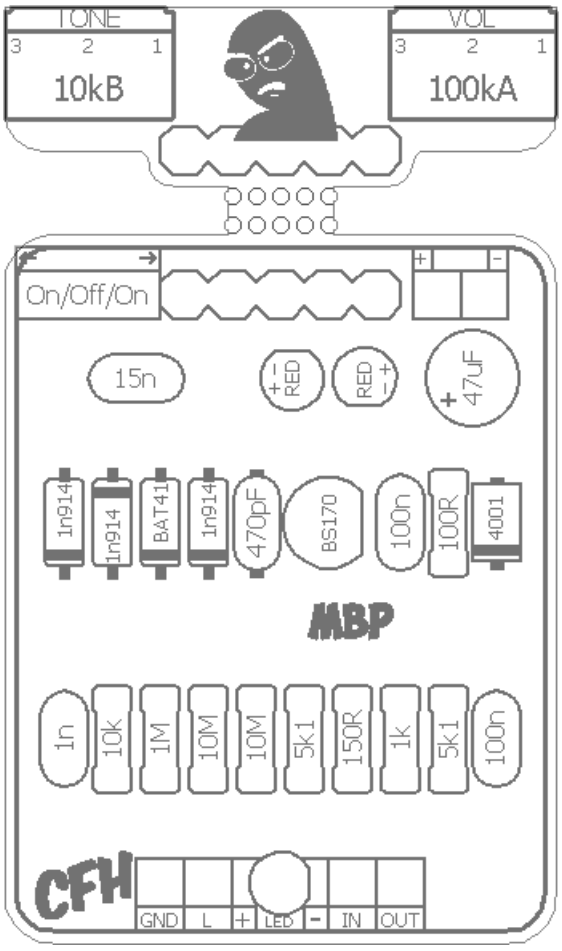
There is nothing radical or creative about the Crotch Fire Hurricane. I took an SHO and put a tone control, volume knob and some clipping diodes on it. That’s pretty low-effort. But, don’t take that to mean it doesn’t sound good! It makes a decent little low gain overdrive. In fact, I used this idea as the basis of the GreaseGun project from several years ago (except in that case is was a single Muff clipping stage instead of just diodes to ground). That design was developed further into the Function F(x) Third Rail overdrive. So, there’s something there :) In any case, it takes 5 minutes to breadboard if you want to find out for yourself.

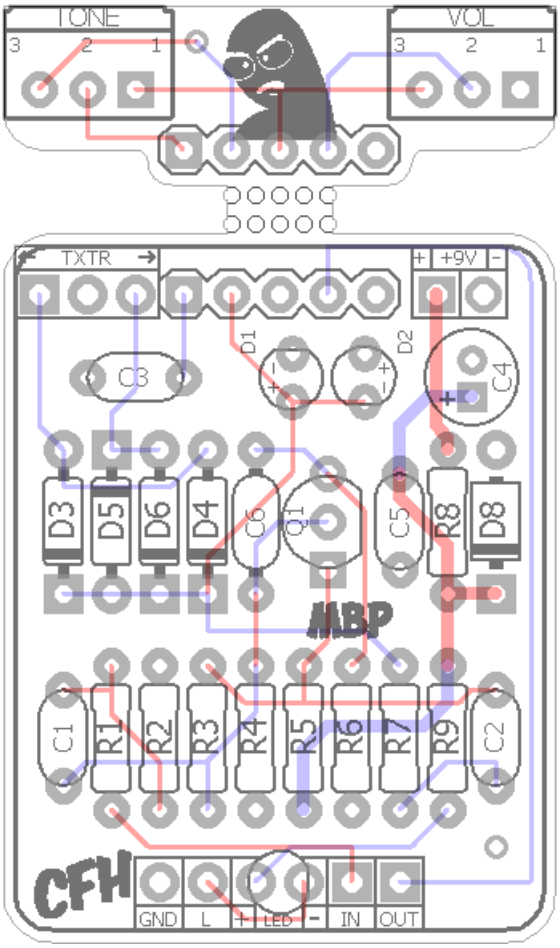
Controls

- **TONE, VOL:** self-explanatory.
- **TXTR:** The Texture switch switches between three clipping diode sets - silicon, LED, asymmetrical (silicon + Schottky).

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.


TONE
3 2 1
VOL
3 2 1
TXTR
+ +9V -
D1
D2
C3
C4
D3
D5
D6
D4
C6
Q1
C5
R8
D8
MBP
C1
R1
R2
R3
R4
R5
R6
R7
R9
C2
CFH
GND
L
+
LED
-
IN
OUT


TONE
3 2 1
10kB
VOL
3 2 1
100kA
On/Off/On
15n
RED
RED
47uF
1n914
1n914
BAT41
1n914
470pF
BS170
100n
100R
4001
MBP
1n
10k
1M
10M
10M
5k1
150R
1k
5k1
100n
CFH
GND
L
+
LED
-
IN
OUT


TONE
3 2 1
VOL
3 2 1
TXTR
+9V
D1
D2
C3
C4
D3
D5
D6
D4
C6
Q1
C5
R8
D8
MBP
C1
R1
R2
R3
R4
R5
R6
R7
R9
C2
CFH
GND
L
LED
IN
OUT

Resistors		Caps		Diodes	
R1	10k	C1	1n	D1, D2	RED
R2	1M	C2	100n	D3 - D5	1n914
R3	10M	C3	15n	D6	BAT41
R4	10M	C4	47uF	D8	1N4001
R5	5k1	C5	100n	**Transistor**	
R6	150R	C6	470pF	Q1	BS170
R7	1k			**Switch**	
R8	100R			TXTR	On/Off/On
R9	5k1			**Pots**	
				TONE	10kB
				VOL	100kA

Value	QTY	Type	Rating
100R	1	Metal / Carbon Film	1/4W
150R	1	Metal / Carbon Film	1/4W
1k	1	Metal / Carbon Film	1/4W
5k1	2	Metal / Carbon Film	1/4W
10k	1	Metal / Carbon Film	1/4W
1M	1	Metal / Carbon Film	1/4W
10M	2	Metal / Carbon Film	1/4W
470pF	1	Ceramic / MLCC	16v Min.
1n	1	Film	16v Min.
15n	1	Film	16v Min.
100n	2	Film	16v Min.
47uF	1	Electrolytic	16v Min.
RED	2	Red, Diffused	3mm
1n914	3		
BAT41	1		
1N4001	1		
BS170	1		
On/Off/On	1	Mini SPDT	
10kB	1	PC Mount	9mm
100kA	1	PC Mount	9mm

Low profile Electrolytic caps:
http://smallbear-electronics.mybigcommerce.com/electrolytic-radial-low-profile-16v-1-f-100-f/

BAT41:
http://smallbear-electronics.mybigcommerce.com/diode-schottky-bat41/

9mm PC Mount pots:
http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-pc-mount/

Mini On/Off/On:
http://smallbear-electronics.mybigcommerce.com/spdt-center-off-sub-mini-short-lever-pc-mount/

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

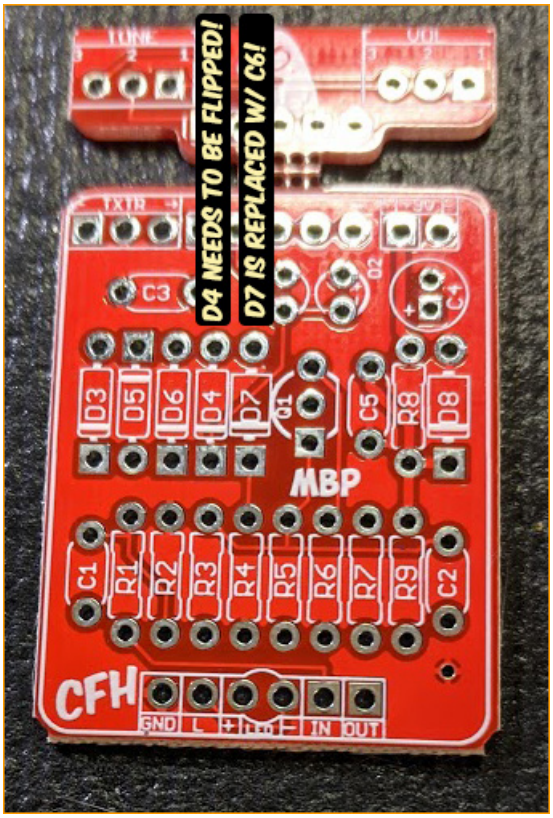
Enclosed Mono:
http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-jack/
http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-switchcraft-111x/

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

There are two minor errors on this PCB you need to work around. Not to worry - they are easy!

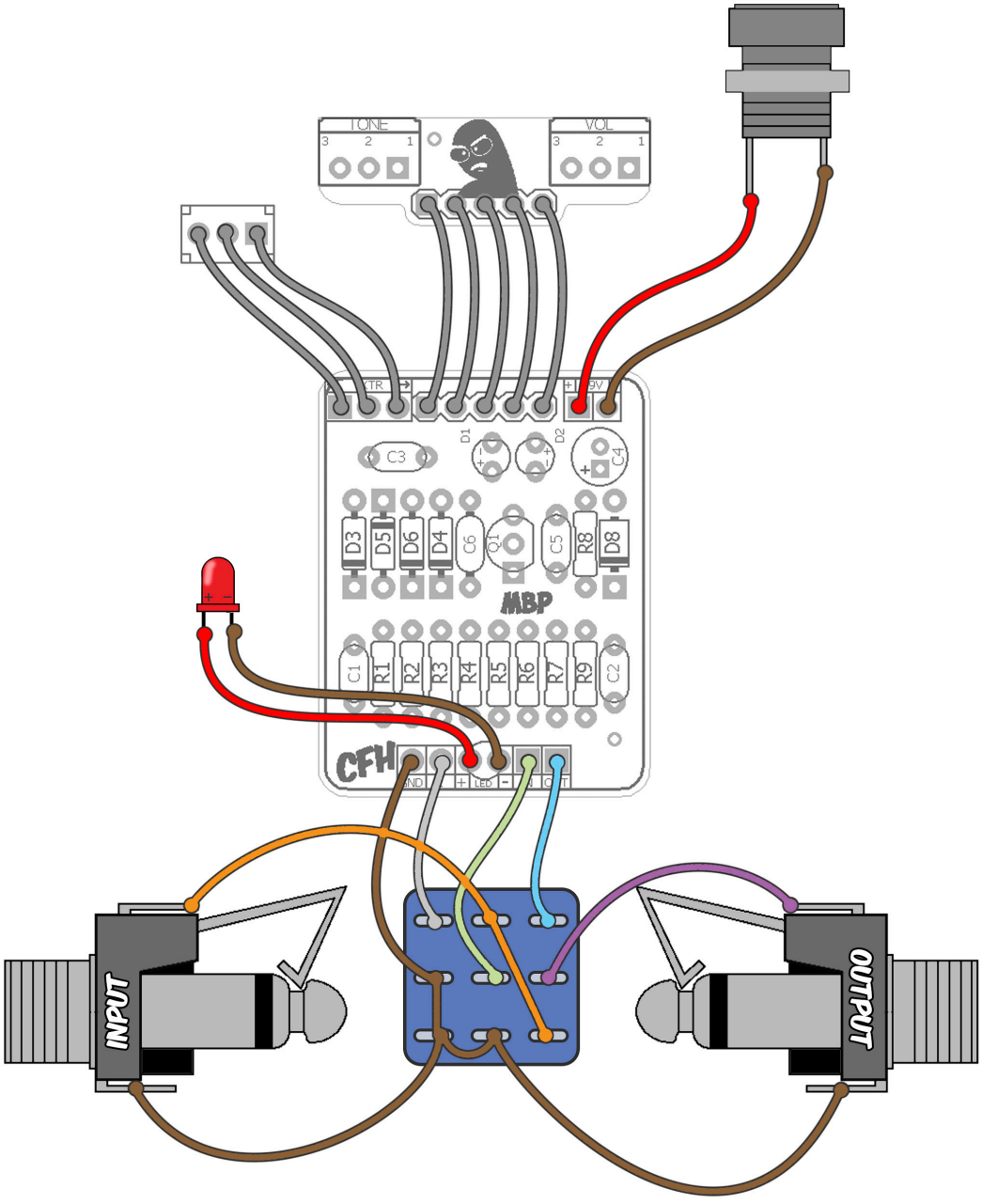
- C6 is shown as D7 on the actual PCB. This is because I decided to switch the Zener diode in that position with a 470pF cap after the fact.

- D4 is facing the wrong way on the PCB. You need to flip it.

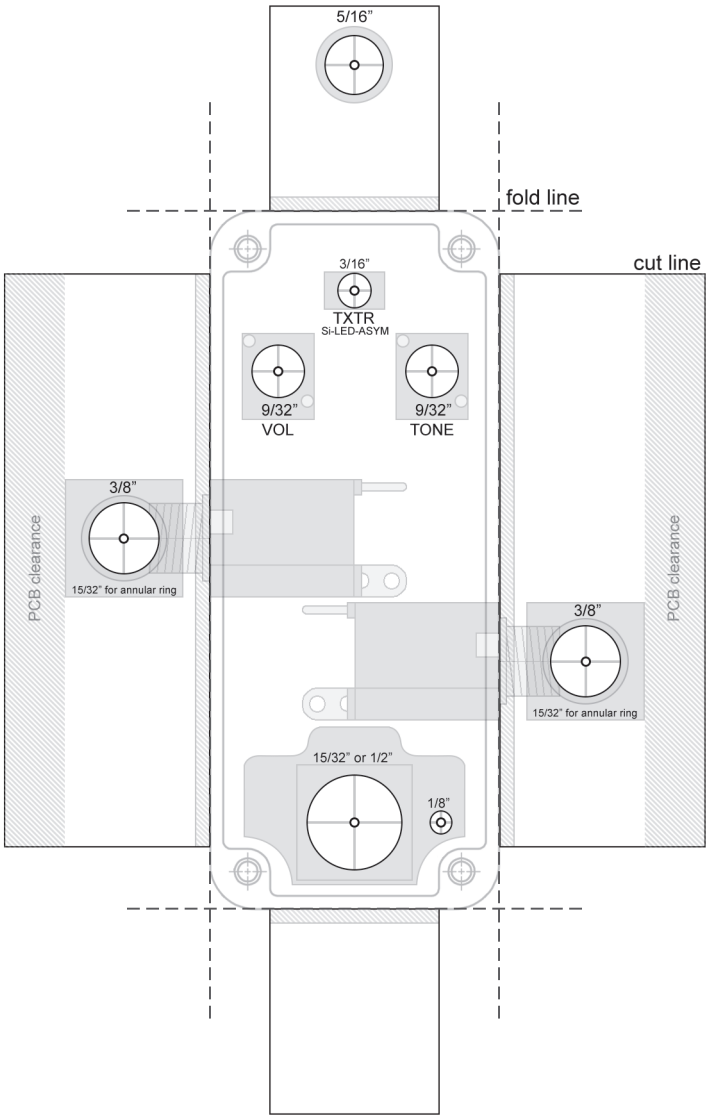


Mod:

- Consider socketing D5. The 1n914/BAT41 combo will sound a bit different (more asymmetrical clipping) than the 1n914x2 but not radically so. You could try a different diode type for more pronounced variety: a 1N4001 for more asymmetry or another BAT41 for more clipping.


TONE
VOL
3 2 1
3 2 1
9V
D1
D2
C3
C4
D3
D5
D6
D4
C6
C1
C5
R8
D8
MBP
C1
R1
R2
R3
R4
R5
R6
R7
R9
C2
CFH
GND
LED
OUT
INPUT
OUTPUT

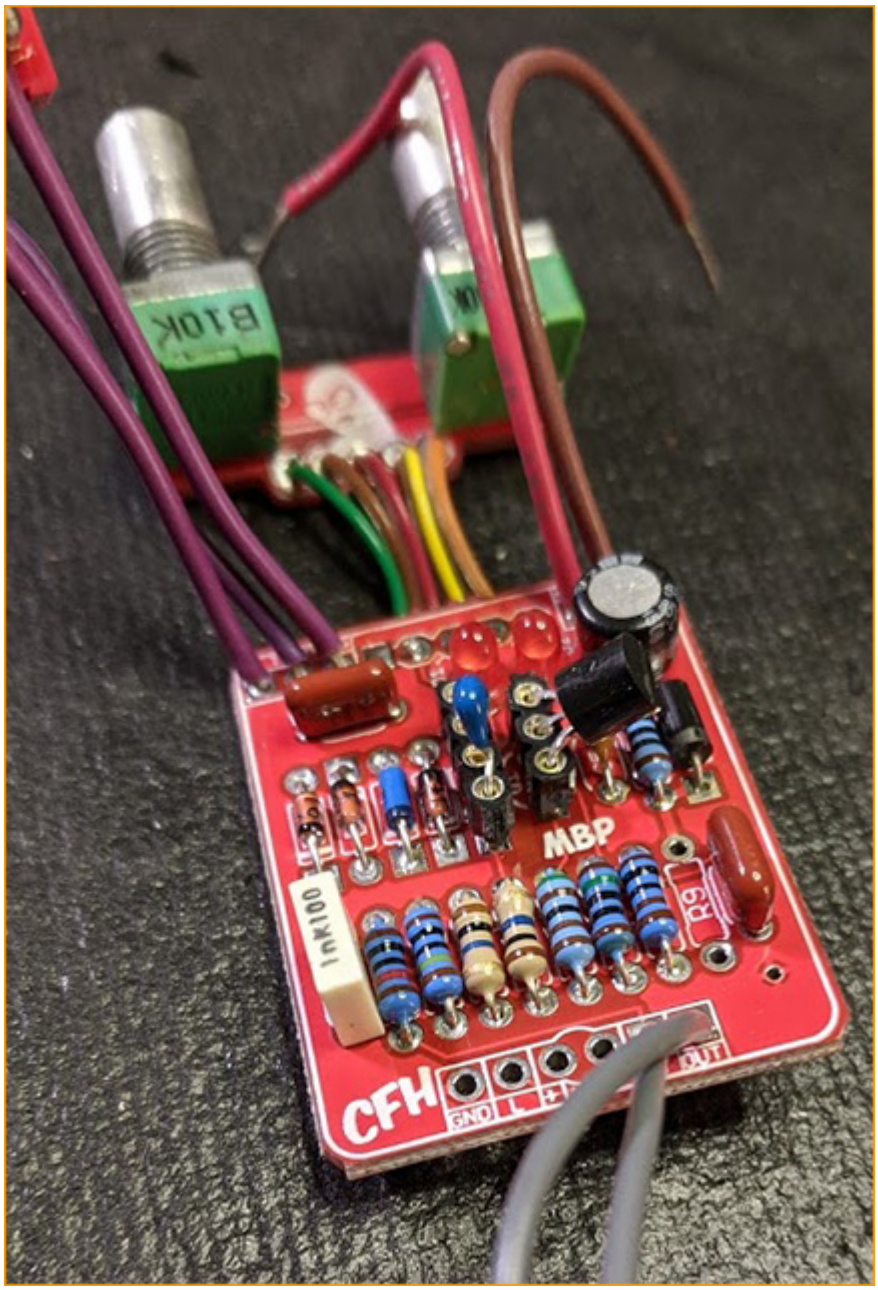
Note: *Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.*



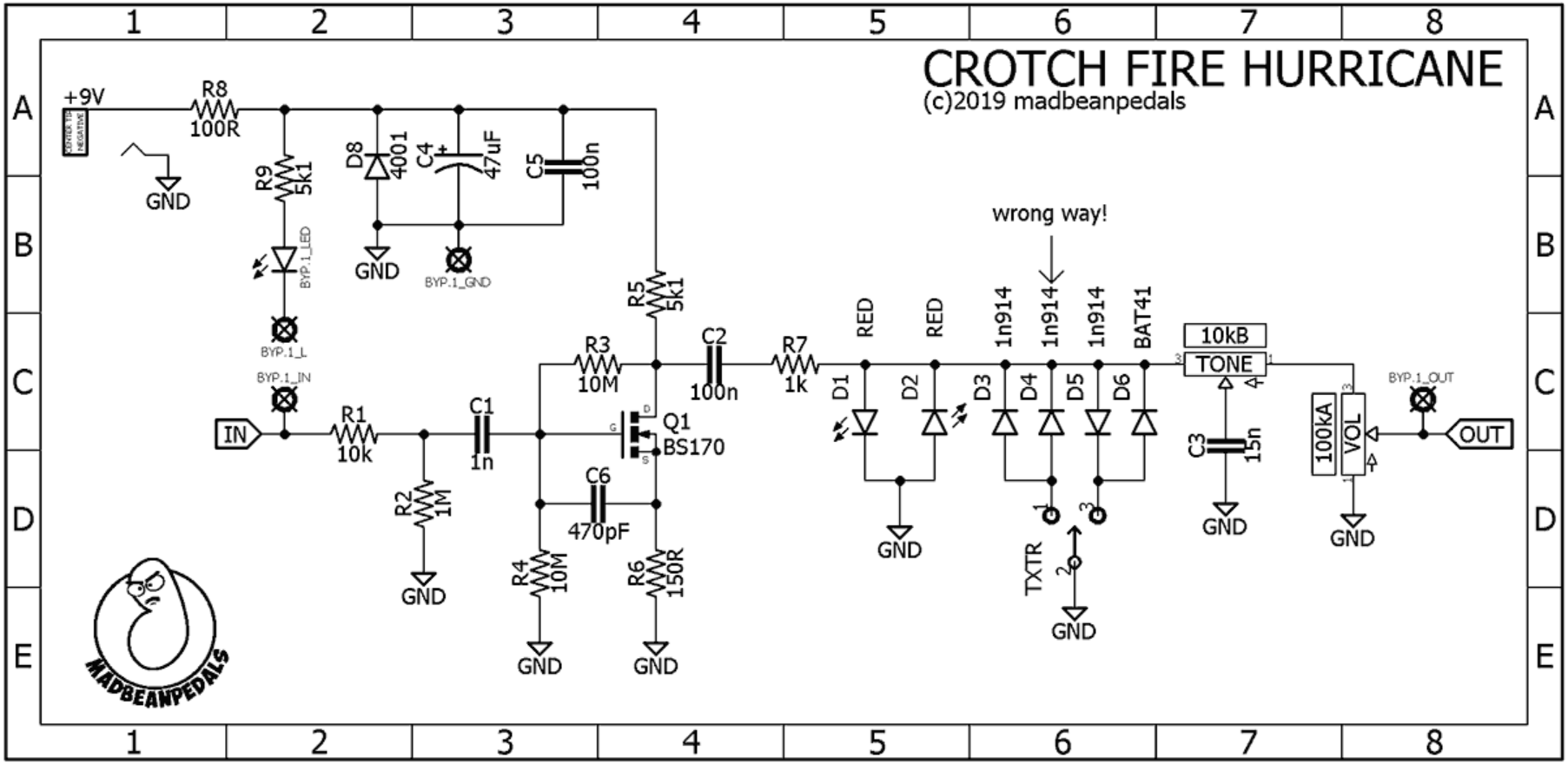
- This template will work for either mono enclosed jacks or the “Lumberg” style.
- It uses the “Thinline” style DC Jack.
- It also shows the 3PDT02 bypass PCB but this is not required. If you are wiring straight to a 3PDT you can use the same LED location on the right side or choose a different spot.

Q1	DC
S	130mV
G	2.28
D	4.68

- 9.42vDC One Spot
- Current Draw: ~ 2mA



Remember to flip D4!


CROTCH FIRE HURRICANE
(c)2019 madbeanpedals
+9V
R8
100R
GND
R9
5k1
BYP.1_LED
BYP.1_L
BYP.1_IN
D8
4001
C4
47uF
C5
100n
GND
BYP.1_GND
R5
5k1
R3
10M
C2
100n
R7
1k
wrong way!
RED
RED
1n914
1n914
1n914
BAT41
D1
D2
D3
D4
D5
D6
10kB
TONE
C3
15n
GND
100kA
VOL
BYP.1_OUT
OUT
GND
IN
R1
10k
C1
1n
Q1
BS170
R2
1M
GND
C6
470pF
R4
10M
GND
R6
150R
GND
TXTR
GND
MADBEANPEDALS