Woodshed

FX Type: **FUZZ**
Build Level: Beginner
Based On: Arbiter® Fuzz Face™

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Overview

The Woodshed is a “catch-all” style silicon Fuzz Face™. It delivers stock FF sounds plus a lot more. The extra features include a bass control, “squish” knob for bumblebee fuzz and an external bias control.

Controls

- **VOL:** Total effect output.
- **FUZZ:** Fuzz amount.
- **SUBS:** CCW is the stock Fuzz Face™. Turning SUBS CW will reduce the bass into the circuit for smoother overdrive-like tone.
- **SQUISH:** CCW is the stock setting. Going CW increases the feedback resistance between Q2 and Q1 to squash the fuzz into nothingness, like my soul.
- **BIAS:** This allows you to change the biasing voltage of Q2. At medium settings you can get some EJ style fuzz. High settings will also squish the fuzz sound.
- **BOOST:** This trimmer will increase the volume output as it is turned up.
- **T1:** This trimmer is used to set the range of the BIAS control. See notes.

Further study:
http://www.geofex.com/Article_Folders/fuzzface/fffram.htm
https://www.electrosmash.com/fuzz-face

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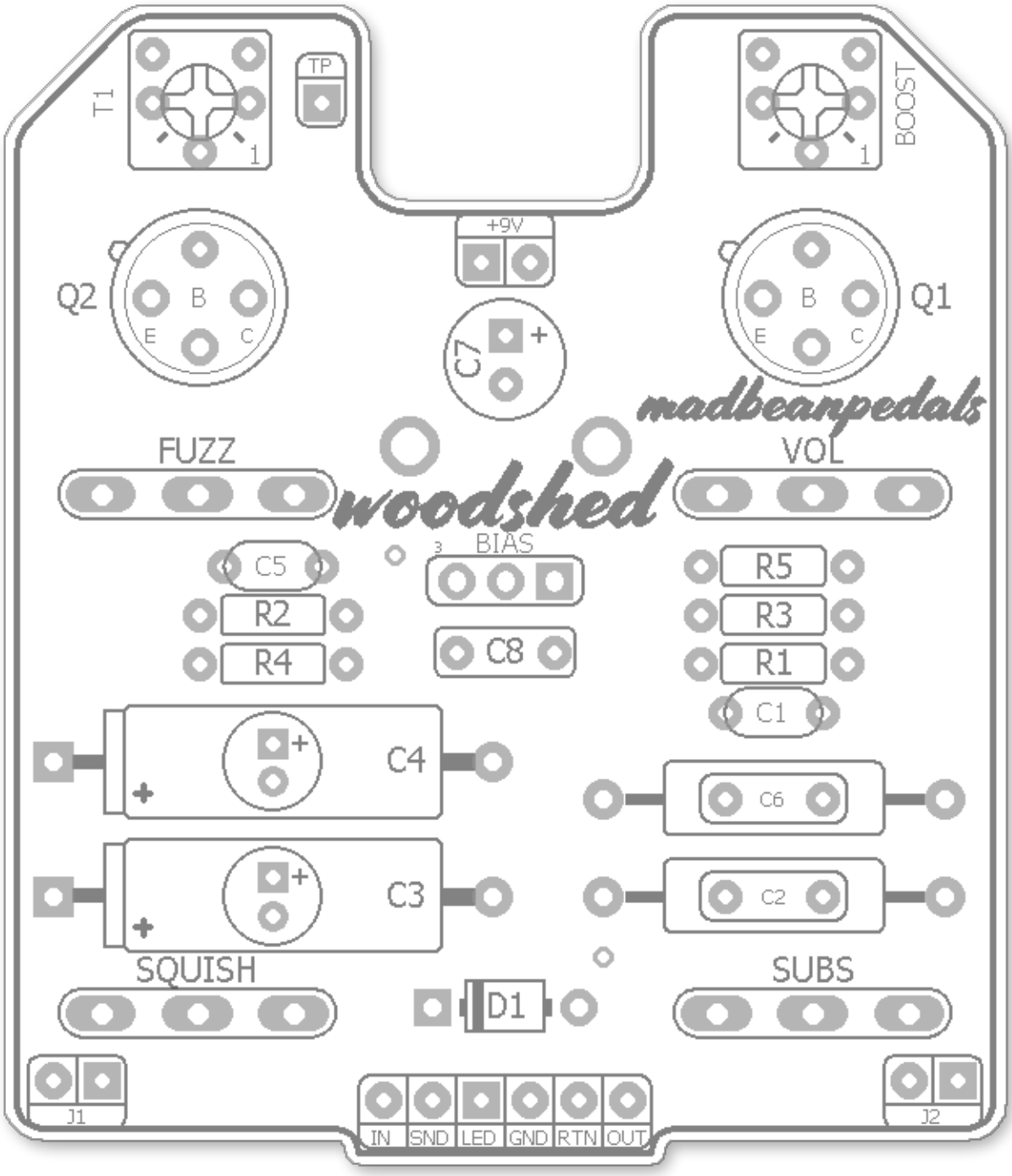
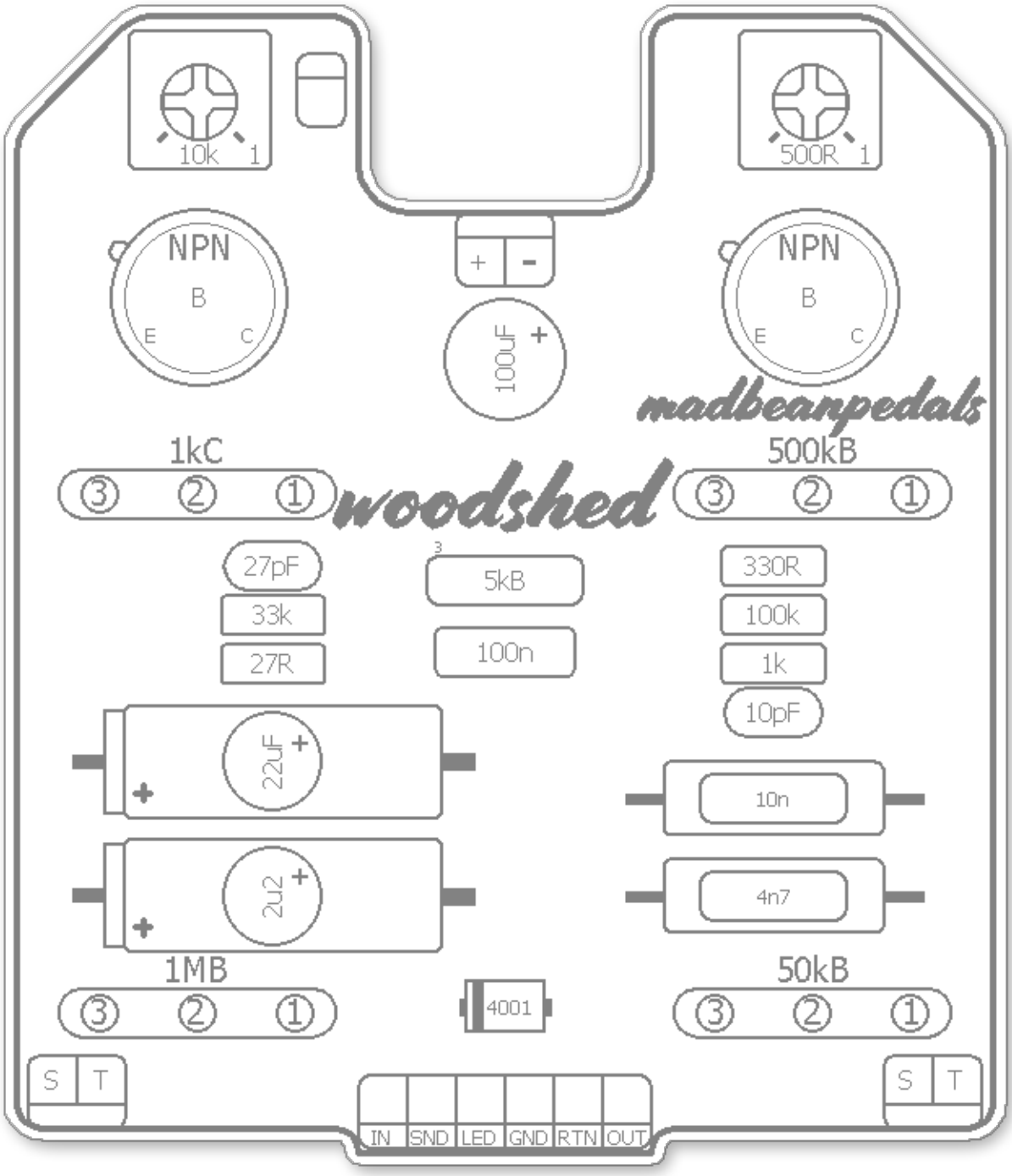
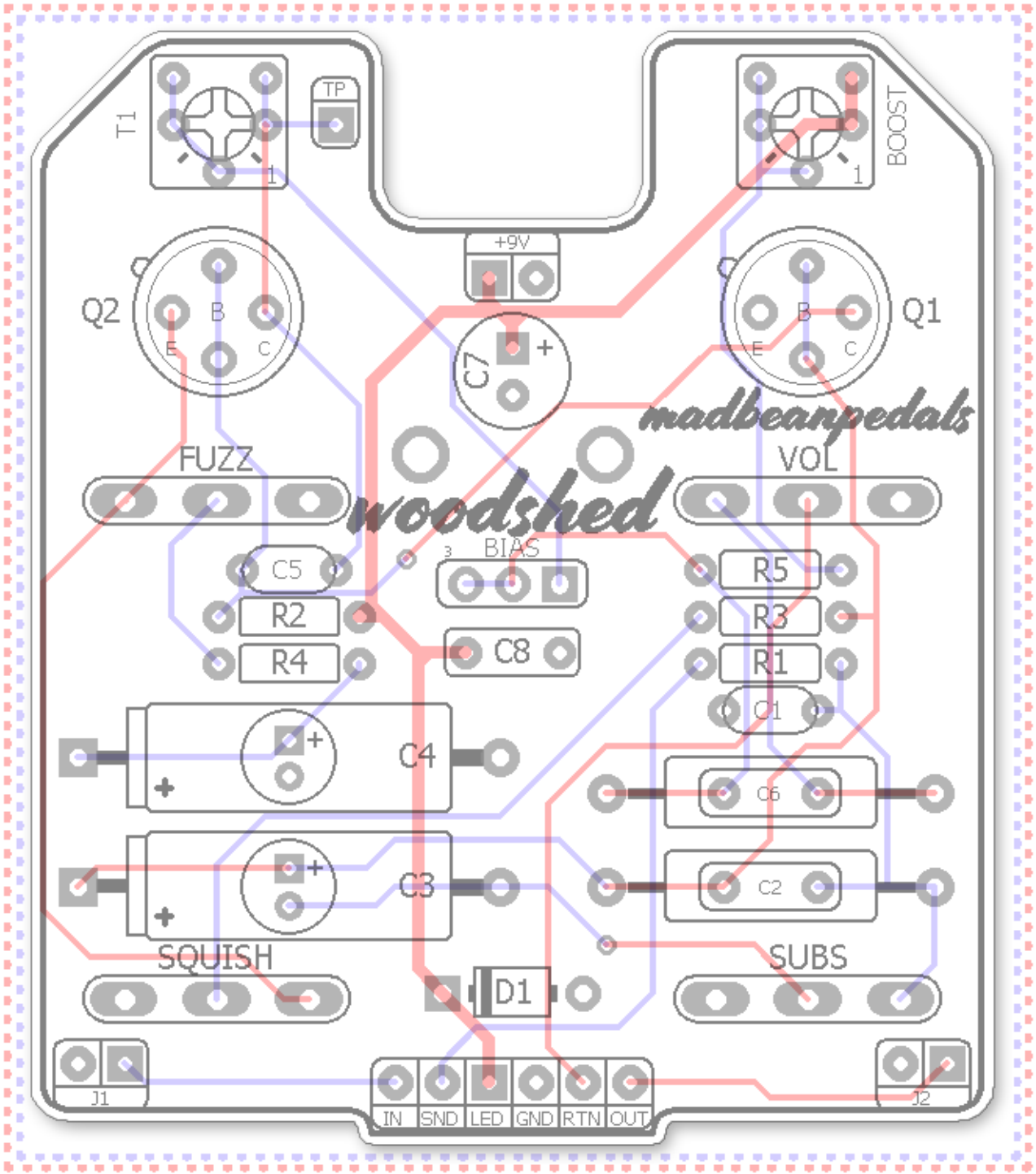
Parts Layout



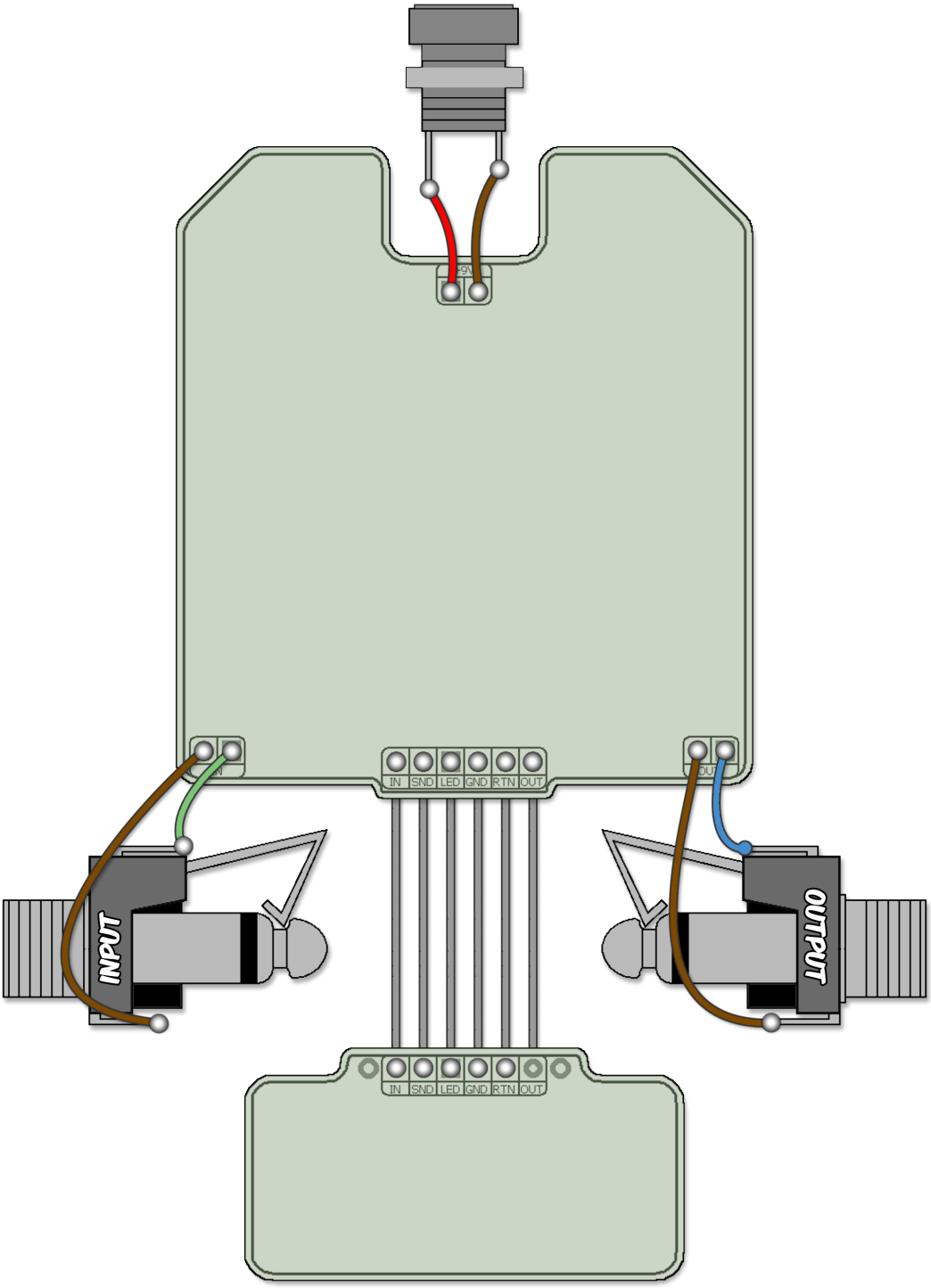
Component Values



Trace Layout



Wiring



Unless otherwise noted, all Standard Series projects have the same wiring regardless of which 3PDT bypass board is used. A 6-pin, 2” ribbon cable is recommended for soldering the connections between the two PCBs.

B.O.M.

Resistors		Caps		Diodes	
R1	1k	C1	10pF	D1	1n4001
R2	33k	C2	4n7	**Transistors**	
R3	100k	C3	2u2	Q1	Si NPN
R4	27R	C4	22uF	Q2	Si NPN
R5	330R	C5	27pF	**Trimmers**	
		C6	10n	BOOST	500R
		C7	100uF	T1	10k
		C8	100n	**Pots**	
				FUZZ	1kC
				BIAS	5kB
				SUBS	50kB
				VOL	500kB
				SQUISH	1MB

Shopping List

Value	QTY	Type	Rating
27R	1	Carbon / Metal Film	1/4W
330R	1	Carbon / Metal Film	1/4W
1k	1	Carbon / Metal Film	1/4W
33k	1	Carbon / Metal Film	1/4W
100k	1	Carbon / Metal Film	1/4W
10pF	1	Ceramic / MLCC	16v min.
27pF	1	Ceramic / MLCC	16v min.
4n7	1	Film (Axial or Radial)	16v min.
10n	1	Film (Axial or Radial)	16v min.
100n	1	Film (Radial)	16v min.
2u2	1	Electrolytic (Axial or Radial)	16v min.
22uF	1	Electrolytic (Axial or Radial)	16v min.
100uF	1	Electrolytic (Radial)	16v min.
1n4001	1		
NPN	2	Si, fuzz appropriate gains	
500R	1	Bourns 3362p or 6mm	
10k	1	Bourns 3362p or 6mm	
5kB	1	PCB Right Angle, Plastic Shaft	9mm
1kC	1	PCB Right Angle	16mm
50kB	1	PCB Right Angle	16mm
500kB	1	PCB Right Angle	16mm

Additional Hardware

(1) 1590B enclosure
(2) Lumberg 1/4” Compact mono jacks
(1) Slim 2.1mm DC jack
(1) Standard 3PDT footswitch
(1) 5mm LED

Build Notes

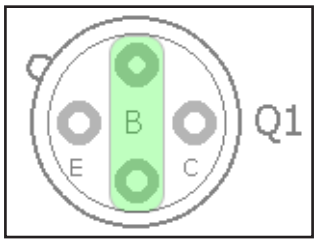
You can use just about any BJT for Q1 and Q2. Even a couple of 2n3904 without regard to gains will work. But, the best results will come from being a bit more careful with transistor selection.

For my build, I used EN1711. I had about 10 on-hand so I used my DCA meter to measure the HFE of each one. I measured gains from 50-130 HFE. Luckily I had one @ 80 and another at 120 which is pretty much perfect for fuzz.

Another good choice would be BC108 or 109. Those are very common for the Si fuzz. Here is the list of BJT available at smallbear: https://smallbear-electronics.mybigcommerce.com/transistors/?TransistorType=BJT&filterPage=1

BTW: you should be able to use NPN germanium in this build, as well. I just did not have any extra on hand to see how well the Woodshed works with them.

Make sure you pay attention to the pinout of the device you select. On the Woodshed, the pinouts are EBC, left to right. There are two pads for the transistor base (as shown in green) for ones that are CBE (like the 2n3904). I did it this way so you can use the super nice TO-5 transistor sockets in either orientation, but they are optional for the build.



You can use either radial or axial caps for C2, C3, C4 and C6. For the extra mojo in my build, I used some leftover Sprague electros (2uF and 25uF, resp.) If you are using radial caps, just put them in the spots embedded in the axial ones.

The **Boost** trimmer is used to increase the volume output. Stock setting is about 1/3rd up and I found that to be plenty in this build. But the option is there if you want it. If you do not have a 500R trimmer, use 1k and make R5 220R instead. This will leave the stock setting at about 1/3rd, as well.

Setting up the **Bias** pot is easy.

- Set Bias, Subs, and Squish to 0 (CCW), Vol to 50% and Fuzz to 100%.
- Connect you multimeter to ground and use the red probe on the TP (test pad) next to the T1 trimmer.
- Adjust T1 until you read about 6.5v. That's it!

Now your Bias control will change the collector voltage of Q2 from 6.5v down to about 1v or less. If you want, turn up the Bias control (not the trimmer) until you read 4.5v. Make a note of that position as it is the "optimal" voltage setting. You can mark that on your enclosure artwork, if you like.

Circuit Voltages

Q1	NPN
C	1.54
B	559mV
E	0.00
Q2	**NPN**
C	6.41
B	1.54
E	0.95

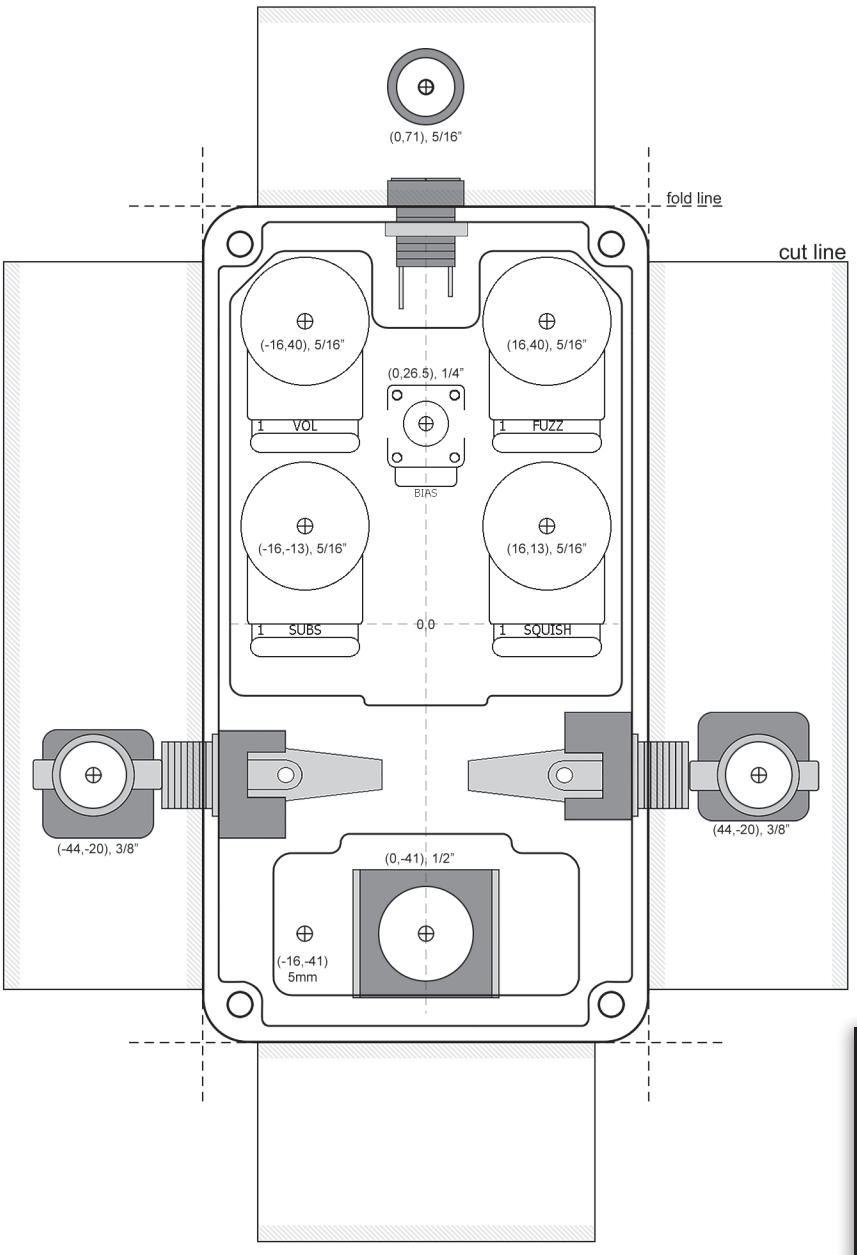
9.44vDC One Spot supply
Current Draw: ~2mA

Testing Conditions
Subs, Squish, Bias: 0
Boost: 33%
Vol: 50%
Fuzz:100%

1590B Drill Template

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

Link to Tayda Standard Series master drill template



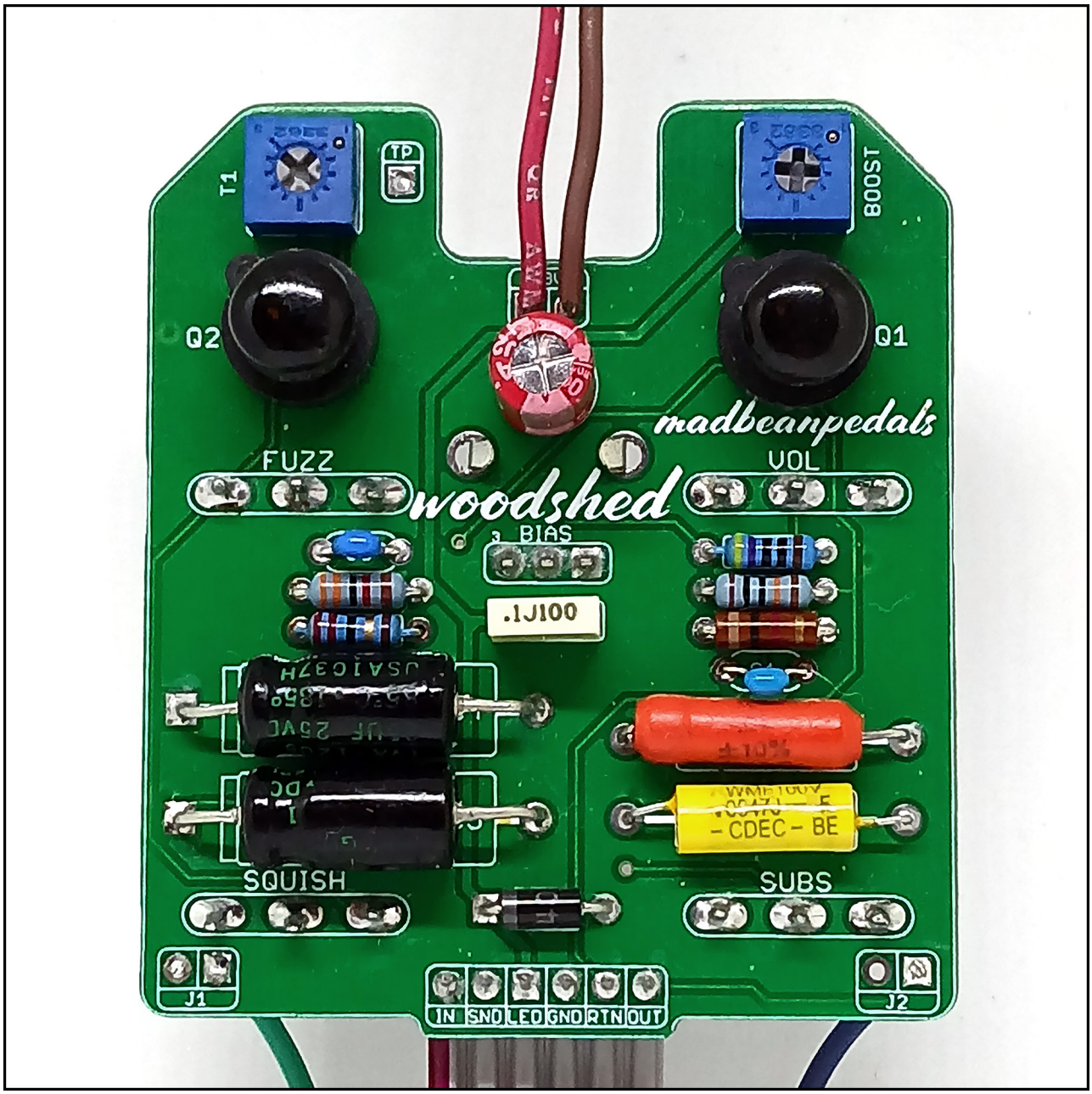
Note: If you want to use a Micro Knob for the 9mm BIAS pot, increase the drill size to 5/16".

Hardware

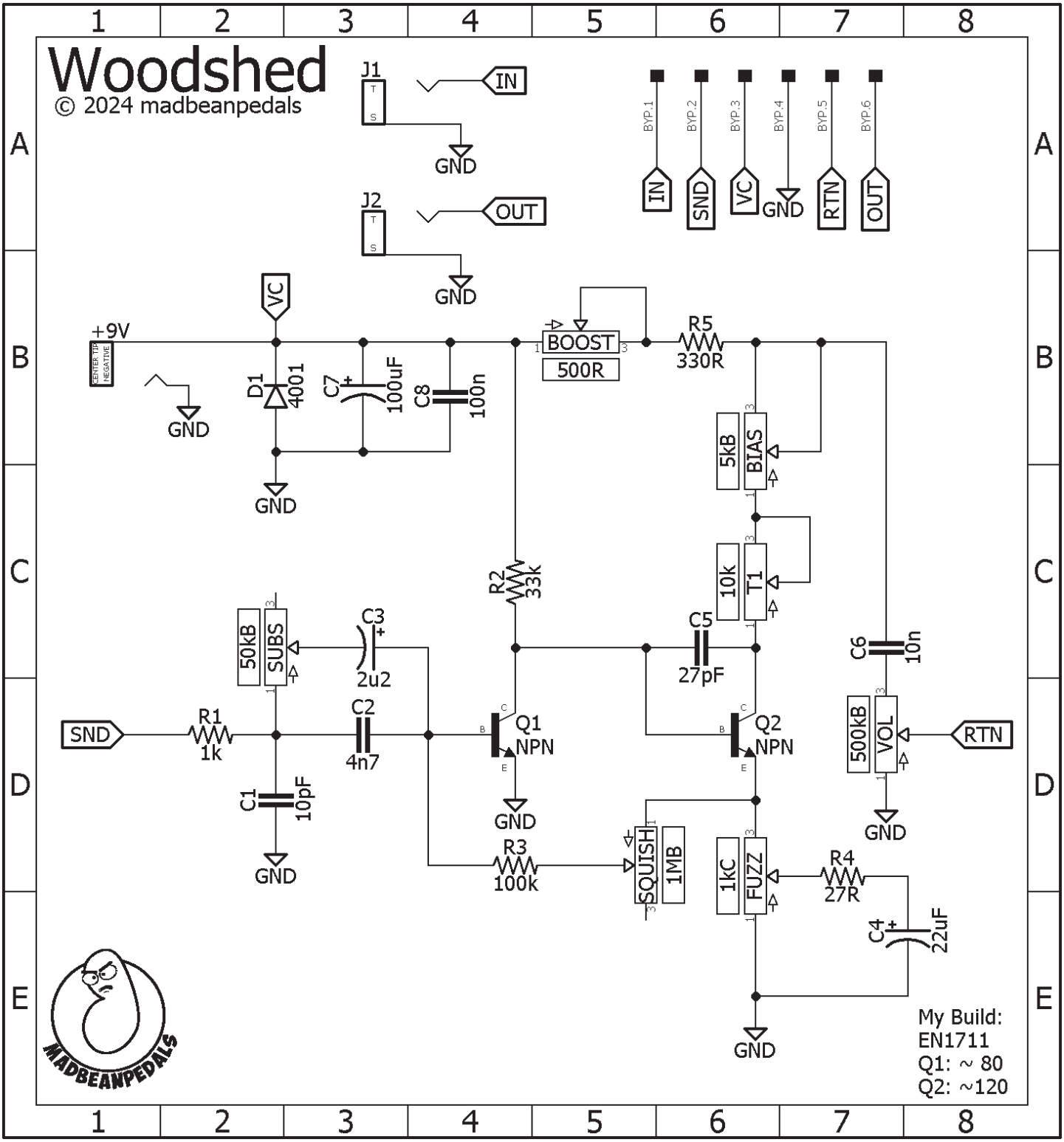
1590B enclosure
16mm pots, 9mm Plastic Shaft pot
Lumberg 1/4" Compact mono jacks
Slim 2.1mm DC jack
Standard 3PDT footswitch
5mm LED

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

Build Pic


T1
TP
BOOST
Q2
Q1
madbeanpedals
FUZZ
woodshed
VOL
BIAS
.1J100
SQUISH
SUBS
J1
J2
IN SND LED GND RTN OUT

Schematic


Woodshed
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J1
IN
GND
J2
OUT
GND
BYP.1
BYP.2
BYP.3
BYP.4
BYP.5
BYP.6
IN
SND
VC
GND
RTN
OUT
VC
+9V
CENTER TIP
NEGATIVE
GND
D1
4001
C7
100uF
C8
100n
GND
BOOST
500R
R5
330R
5kB
BIAS
10k
T1
R2
33k
C5
27pF
C6
10n
50kB
SUBS
C3
2u2
SND
R1
1k
C2
4n7
Q1
NPN
Q2
NPN
500kB
VOL
RTN
C1
10pF
GND
GND
GND
R3
100k
SQUISH
1MB
1kC
FUZZ
R4
27R
C4
22uF
GND
MADBEANPEDALS
My Build:
EN1711
Q1: ~ 80
Q2: ~120