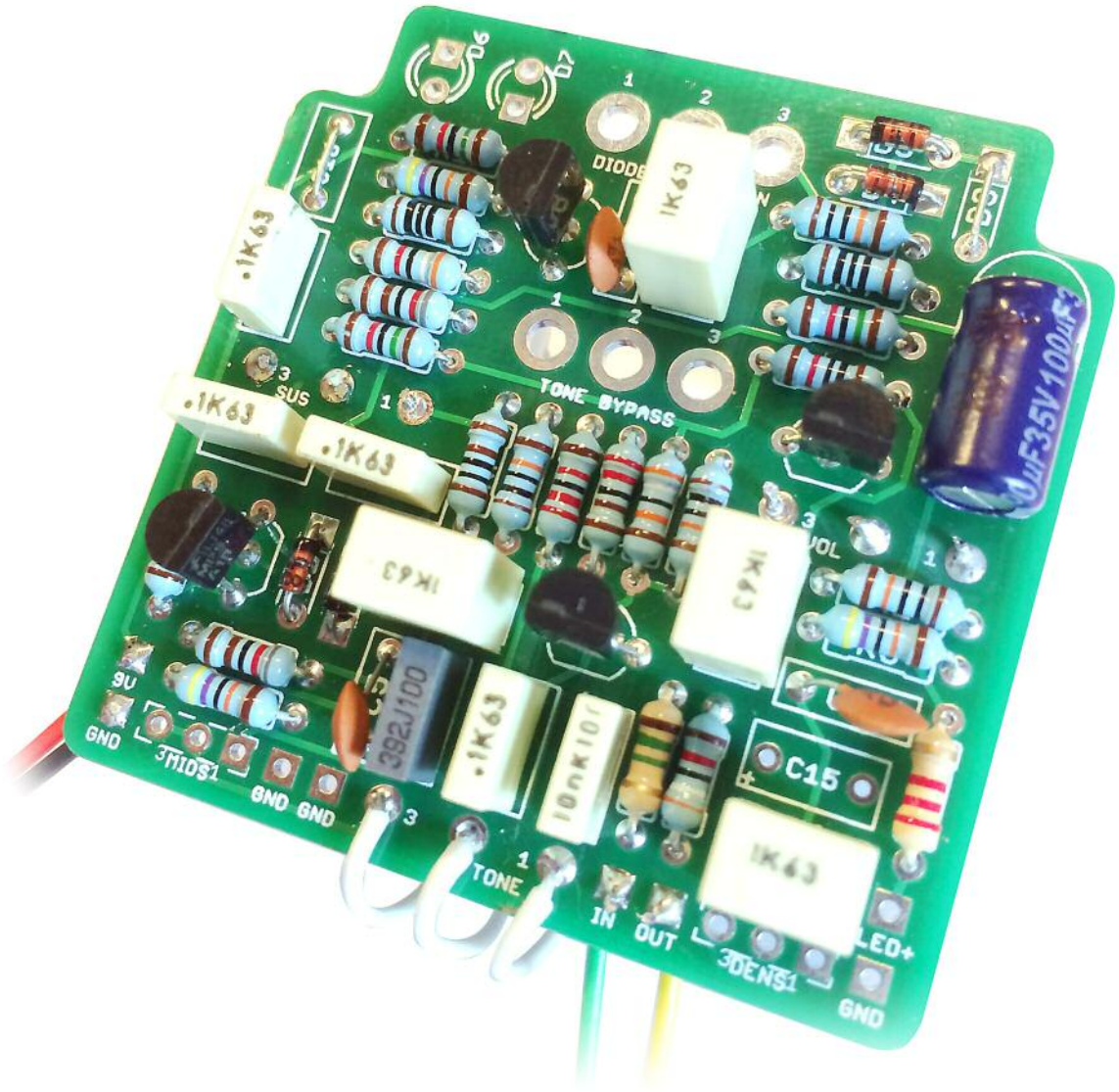
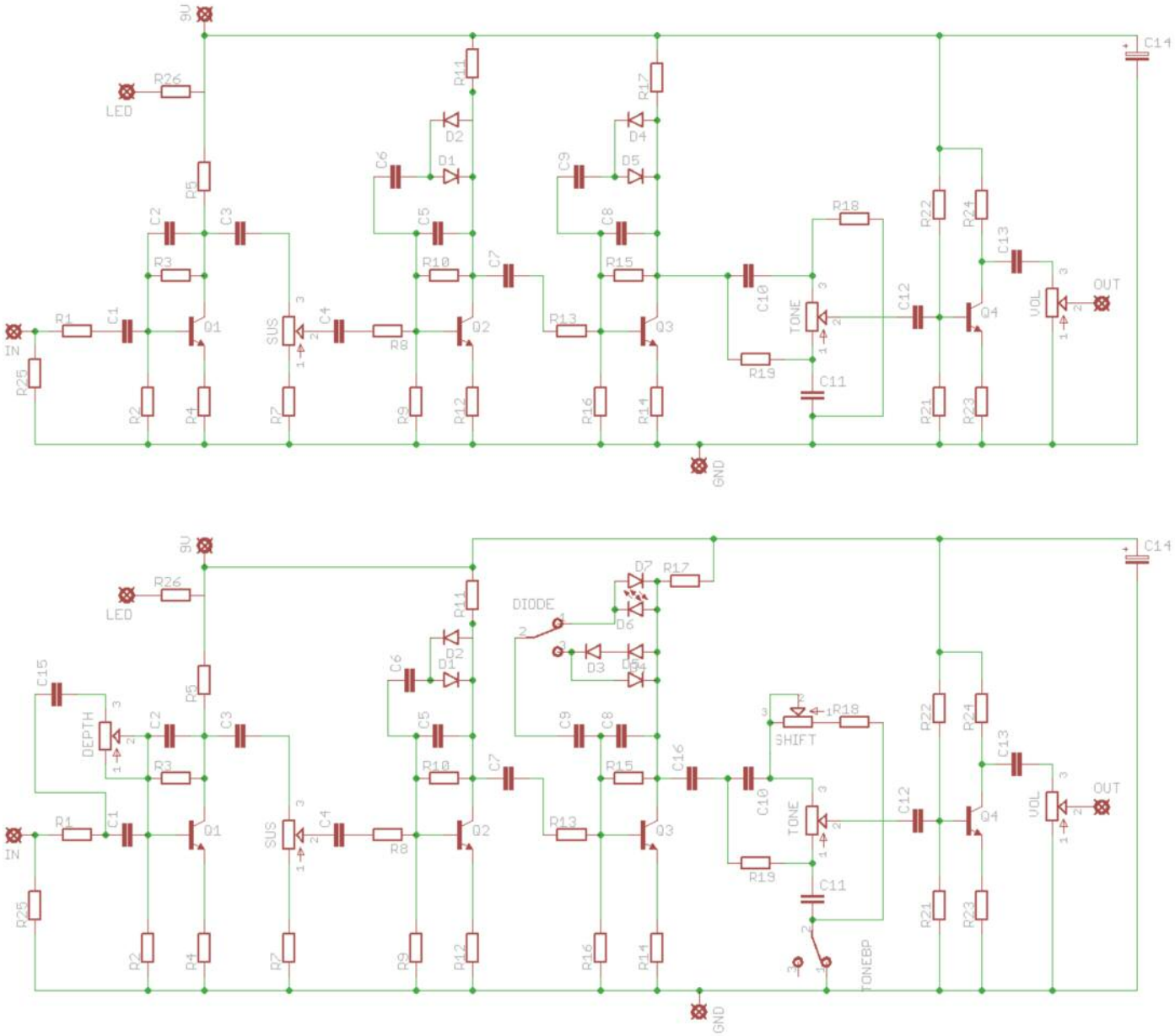


Big Muff Pi

Everyone loves a
big chunk of muff

PedalParts.co.uk

Schematics



The top schematic shows the basic Big Muff Pi schematic used in most of its history.
The bottom schematic shows the full Multi Muff circuitry.

In addition to the basic Muff we also have available:

- Input depth/density pot - control over the input frequency range
- Shift pot - change the characteristics of the tone, based on the AMZ presence control
- Diode selection switch - different options on the second clipping stage
- Tone bypass - actually its a tone flattening control, which makes it sound bypassed.
- C16 - space for an extra cap, used in several BMP derivatives.

All of these are optional, and can be added to most versions of the BMP.

Not sure what to make? Check out **Kit Rae's bigmuffpage.com** - this guy knows more about all things Muff than Mike Matthews himself. Astounding work.

Important notes

Please read these before starting your build!

SHIFT/MIDS

If you are NOT using this control you must place a jumper wire between pads 1 and 2.

TONE BYPASS/FLATTENING

If you are NOT using this switch you must place a jumper between pads 2 and 3.

SECOND CLIPPING STAGE

There's a space for an extra diode (D3) in this clipping stage if you want to experiment with asymetrical clipping options. If going for standard clipping you must place a jumper across D3.

If you aren't using a clipping selection switch, place a jumper across pads 2 and 3 of the Diode Selection.

C16

In almost all builds you must place a jumper across C16.

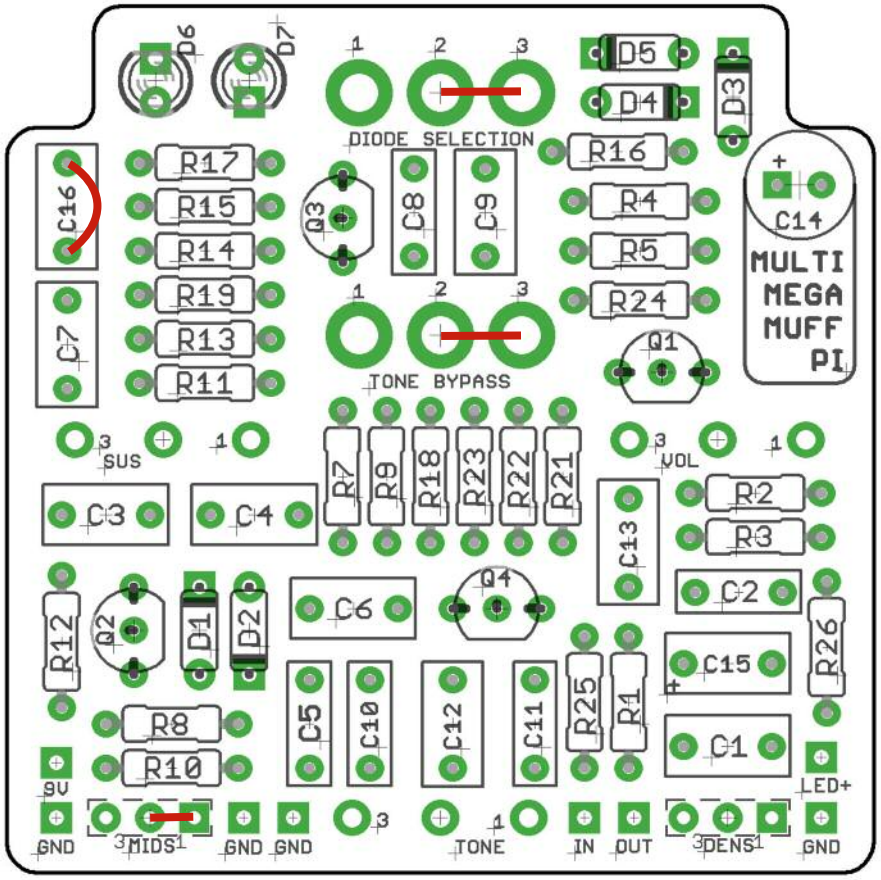
C14

The PCB has been designed so C14 can lay flat to save on height. Though the value of this cap has changed throughout the life of the BMP, 100u is supplied with all kits.

D6-7

These are for adding a second set of clipping diodes, and are not listed on any of the BOMs. Experiment.

There are additional notes regarding individual circuits later in the document. Please check them before starting your build.



Important notes

THAT SCOOPED MID-RANGE - NO THANKS!

The Big Muff Pi has a distinctive scooped mid-range. In most cases this can be flattened out if desired. For the six BMP variations listed in the first BOM page, this can be achieved by changing R18 and R19 to 39K, and C10 to 0.01u.

FATTEN ME UP

If you want to let more bass frequency in there you can increase the value of C1, 3, 4, 7 & 13.

BASSIFY ME

As this document grows there may be bass-specific versions available. To make a more bass-friendly version of a 'normal' BMP, use a Green Russian, Black Russian or Civil War as a starting point. Increase the caps as above to between 220n - 470n. Take the first diode clipping stage out altogether by replacing D1 with a jumper wire and leaving D2 empty. Flatten the mid range as detailed above.

MOJO

Many different transistors have been used across the history of the BMP, some of which are long gone. All six of the 'stock' muffs listed on the first BOM page are supplied with 2N5088.

While these may not always be the vintage-correct parts, they have been found to be the best commonly-available all-rounder in a BMP.

TONE FLATTENING (PSEUDO TONE BYPASS)

SPDT ON-ON swich. This lifts the Tone section from GND and flattens the response.

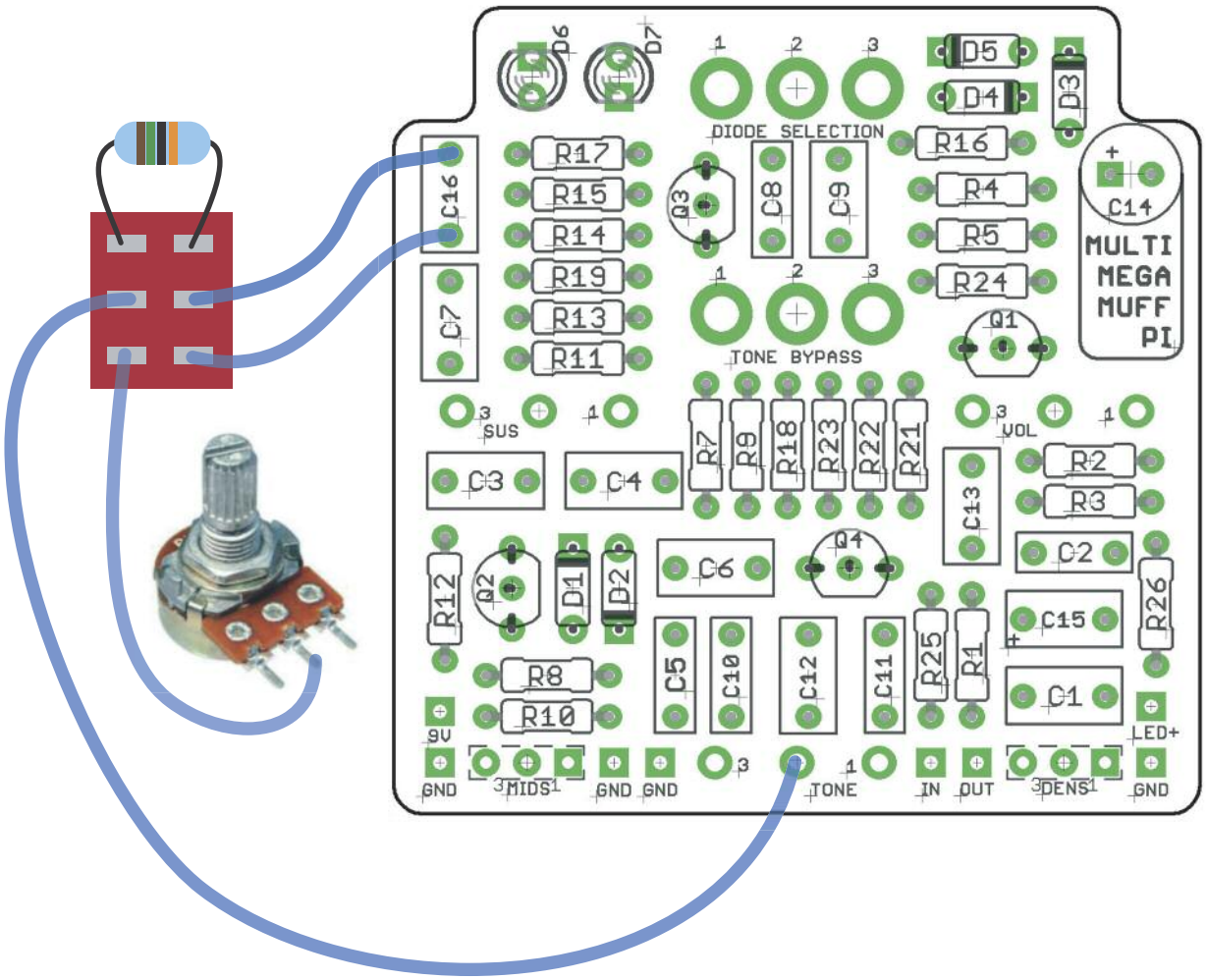
DIODE SELECTION

Experiment with different clipping diodes in D3-5 and D6-7. A SPDT ON-ON toggle will switch between them. If you want to go mad you can use a SPDT ON-OFF-ON and have no clipping in effect in the middle position. Or you can leave one set of diode spots empty to get the same effect with an ON-ON.

There are additional notes regarding individual circuits later in the document. Please check them before starting your build.

True Tone-Bypass Hack

If you want your BMP to lose that all-important tonal character, go ahead. This is an easy way add an off-board true tone-bypass switch.



You'll need a DPDT ON-ON switch and a 150K resistor. Wire as shown.

Pins 1 & 3 of the TONE pot connect to the board as normal.

BOM	3rd (70s)	Green Russian	Black Russian	Civil War Russian	Triangle	Ram Head	Violet Ram Head	NYC Reissue
R1	39K	39K	39K	39K	3K3	39K	33K	39K
R2	100K	100K	100K	100K	82K	47K	100K	100K
R3	470K	470K	470K	470K	390K	470K	470K	510K
R4	100R	390R	390R	390R	820R	120R	100R	100R
R5	15K	12K	12K	12K	22K	10K	12K	10K
R7	1K	1K	1K	1K	1K	1K	560R	1K8
R8	8K2	10K	10K	10K	8K2	10K	8K2	10K
R9	100K	100K	100K	100K	82K	100K	100K	100K
R10	470K	470K	470K	470K	390K	470K	470K	470K
R11	15K	12K	12K	12K	12K	10K	12K	10K
R12	100R	390R	390R	390R	150R	150R	100R	390R
R13	8K2	10K	10K	10K	8K2	10K	8K2	10K
R14	100R	390R	390R	390R	820R	150R	100R	390R
R15	470K	470K	470K	470K	390K	470K	470K	470K
R16	100K	100K	100K	100K	82K	100K	100K	100K
R17	15K	12K	12K	12K	22K	15K	12K	10K
R18	100K	22K	22K	22K	39K	22K	33K	22K
R19	39K	20K	22K	20K	39K	39K	33K	22K
R21	100K	100K	100K	100K	100K	100K	100K	100K
R22	390K	470K	470K	470K	380K	430K	470K	470K
R23	2K2	2K	2K7	2K7	2K7	3K3	2K7	2K
R24	10K	10K	10K	10K	12K	15K	12K	10K
R25	1M	1M	1M	1M	1M	1M	1M	1M
R26	2K2	2K2	2K2	2K2	2K2	2K2	2K2	2K2
C1	100n	100n	100n	100n	100n	10u elec	100n	1u
C2	470p	470p	470p	560p	560p	560p	470p	470p
C3	1u	100n	100n	100n	100n	100n	100n	1u
C4	1u	100n	100n	100n	100n	100n	100n	1u
C5	470p	470p	470p	560p	560p	560p	470p	470p
C6	100n	47n	47n	47n	47n	100n	100n	1u
C7	1u	100n	100n	100n	100n	100n	100n	1u
C8	470p	470p	470p	560p	560p	560p	470p	470p
C9	100n	47n	47n	47n	47n	1u elec	100n	1u
C10	3n9	3n9	3n9	3n9	3n9	3n9	3n9	3n9
C11	10n	10n	10n	10n	10n	10n	10n	10n
C12	100n	100n	100n	100n	100n	100n	100n	1u
C13	100n	100n	100n	100n	100n	1u elec	100n	1u
C14	100u	100u	100u	100u	100u	100u	100u	100u
C15	empty	empty	empty	empty	empty	empty	empty	empty
C16	jumper	jumper	jumper	jumper	jumper	jumper	jumper	jumper
Q1	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088
Q2	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088
Q3	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088
Q4	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088	2N5088
D1	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148
D2	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148
D3	jumper	jumper	jumper	jumper	jumper	jumper	jumper	jumper
D4	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148
D5	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148	1N4148
SUSTAIN	100KA	100KA	100KA	100KA	100KA	100KA	100KA	100KA
TONE	100KB	100KB	100KB	100KB	100KB	100KB	100KB	100KB
VOLUME	100KA	100KA	100KA	100KA	100KA	100KA	100KA	100KA
MIDS	----------Place jumper across pads 1 and 2----------							
DENSITY	empty	empty	empty	empty	empty	empty	empty	empty

Note: 1u non polar caps work better than the electrolytics in C1, 9 & 13 in the Ram's Head. Up to you...

V3 79#2 - J Mascis

Based on what is supposedly one of J Mascis' favourite Muffs. The original has true tone bypass which can be 'hacked' as detailed later in the document.

C1	1u*
C2	470p
C3	1u*
C4	1u*
C5	470p
C6	1u*
C7	0.1u
C8	470p
C9	1u*
C10	3n9
C11	0.01u
C12	0.1u
C13	1u*
C14	100u
C15	empty
C16	jumper

Q1	MPSA18
Q2	MPSA18
Q3	MPSA18
Q4	MPSA18
D1	1N4148/1N914
D2	1N4148/1N914
D3	jumper
D4	1N4148/1N914
D5	1N4148/1N914
SUSTAIN	100kA
TONE	100kB
VOLUME	100kA
MIDS	Jumper 1&2
DENSITY	empty

R1	39k
R2	100K
R3	470K
R4	100R
R5	15K
R7	1K
R8	8K2
R9	100K
R10	470K
R11	15K
R12	100R
R13	8K2
R14	100R
R15	470K
R16	100K
R17	15K
R18	22K
R19	39K
R21	100K
R22	390K
R23	2K2
R24	10K
R25	1M
R26	2K2 (CLR)

Tall Font Green Russian

Bass players' favourite. The feedback caps in the original are two 1nf in series, but that's the same as 500pf.

C1	100n
C2	500p
C3	100n
C4	100n
C5	500p
C6	47n
C7	100n
C8	500p
C9	47n
C10	3n9
C11	10n
C12	100n
C13	100n
C14	100u
C15	empty
C16	jumper

Q1	2N5089
Q2	2N5089
Q3	2N5089
Q4	2N5089
D1	1N4148/1N914
D2	1N4148/1N914
D3	jumper
D4	1N4148/1N914
D5	1N4148/1N914
SUSTAIN	100kA
TONE	100kB
VOLUME	100kA
MIDS	Jumper 1&2
DENSITY	empty

R1	39k
R2	100K
R3	470K
R4	390R
R5	12K
R7	1K
R8	10K
R9	100K
R10	470K
R11	12K
R12	390R
R13	10K
R14	390R
R15	470K
R16	100K
R17	12K
R18	22K
R19	20K
R21	100K
R22	470K
R23	2K7
R24	10K
R25	1M
R26	2K2 (CLR)

Csnd Supa Tonebender

'73 UK interpretation. The first clipping stage is removed which changes the sound to a mix of Tonebender-meets-Muff. Heavy! Transistor pinout is reversed so flip them.

C1	100n
C2	470p
C3	100n
C4	100n
C5	470p
C6	empty
C7	100n
C8	470p
C9	47n
C10	4n7
C11	10n
C12	100n
C13	100n
C14	100u
C15	empty
C16	100n

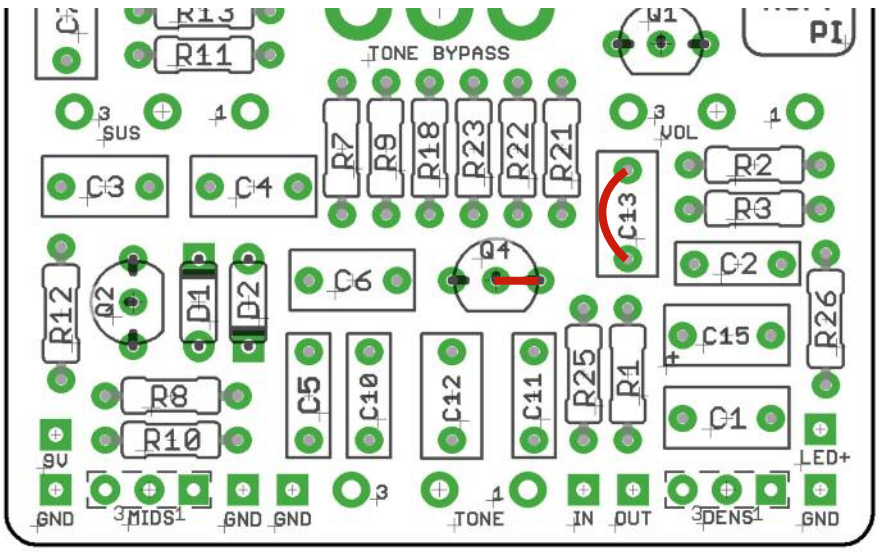
Q1	BC184
Q2	BC184
Q3	BC184
Q4	BC184
D1	empty
D2	empty
D3	jumper
D4	1N4148
D5	1N4148
SUSTAIN	100kA
TONE	100kA
VOLUME	100kA
MIDS	Jumper 1&2
DENSITY	empty

R1	33k
R2	100K
R3	470K
R4	100R
R5	15K
R7	820R
R8	8K2
R9	100K
R10	470K
R11	10K
R12	100R
R13	8K2
R14	100R
R15	470K
R16	100K
R17	15K
R18	33K
R19	33K
R21	100K
R22	390K
R23	2K7
R24	10K
R25	1M
R26	2K2 (CLR)

Csnd Jumbo Tonebender

Based on the Supa, but the final gain recovery stage was removed giving this much less gain and output level than its older brother. It has heavy hints of BMP but has its own character. Great on bass. BOM as above but changes as shown below.

C10	4n7
C11	10n
C12	100n
C13	jumper
TONE	100kB
R7	1K
R18	39K
R19	39K
R21-24	empty
Q4	No transistor - jumper the base and collector pads as shown



Collider

Heavy interpretation of the BMP. Due to the limitations of the PCB (can't accommodate every version of every circuit) the mids control isn't the same as the original. Anode pad for C15 is marked with +

C1	4n7
C2	470p
C3	100n
C4	100n
C5	470p
C6	47n
C7	100n
C8	470p
C9	47n
C10	10n
C11	10n
C12	100n
C13	100n
C14	100u
C15	10u
C16	jumper

Q1	MPSA18
Q2	2N5089
Q3	2N5089
Q4	2N5089
D1	1N4148/1N914
D2	1N4148/1N914
D3	jumper
D4	1N4001
D5	1N4001
SUSTAIN	100kA
TONE	100kB
VOLUME	100kA
MIDS	50KB
DENSITY	100KB

R1	2K7
R2	100K
R3	470K
R4	390R
R5	12K
R7	1K
R8	5K1
R9	100K
R10	1M
R11	12K
R12	390R
R13	1M
R14	390R
R15	1M
R16	100K
R17	12K
R18	10K
R19	39K
R21	100K
R22	470K
R23	2K7
R24	10K
R25	1M
R26	2K2 (CLR)

Hooowwf

Nice example of slight modifications to a BMP making a BIG difference to the tone. The germanium cans and LED clipping make this a crunchier, grittier experience - worth checking out even if you already have a BMP. Experiment with NPN Ge cans in Q3-4. Original used 2N1308 - try AC176, AC127. Use pads D6-7 instead of D3-5, and jumper pads 1&2 of Diode Selection instead of 2&3. It will be tight getting the LEDs into D1&2. Use your imagination!

C1	100n
C2	470p
C3	100n
C4	100n
C5	470p
C6	100n
C7	100n
C8	470p
C9	100n
C10	6n8
C11	6n8
C12	100n
C13	100n
C14	100u
C15	empty
C16	jumper

Q1	2N3904
Q2	NPN Ge
Q3	NPN Ge
Q4	2N3904
D1	5mm red led
D2	5mm red led
D6	5mm red led
D7	5mm red led
SUSTAIN	50KA
TONE	100KB
VOLUME	1MA
MIDS	20KB
DENSITY	empty

R1	39K
R2	100K
R3	470K
R4	100R
R5	15K
R7	2K2
R8	8K2
R9	100K
R10	470K
R11	15K
R12	100R
R13	8K2
R14	100R
R15	470K
R16	100K
R17	15K
R18	2K2
R19	39K
R21	100K
R22	390K
R23	2K2
R24	10K
R25	1M
R26	2K2 (CLR)

B&M Champion Fuzz Unit

Another vintage British interpretation, pretty much identical to the Jumbo Tonebender. BC184C will be hard to come by, so try others. Looking for around 600hFE in Q1 and Q2, 150hFE in Q3.

C1	100n
C2	470p
C3	100n
C4	100n
C5	470p
C6	empty
C7	100n
C8	470p
C9	100n
C10	3n3
C11	10n
C12	100n
C13	jumper
C14	100u
C15	empty
C16	100n

Q1	BC184C
Q2	BC184C
Q3	BC184C
Q4	No transistor - jumper Base & Coll.
D1	empty
D2	empty
D3	jumper
D4	1N4148
D5	1N4148
SUSTAIN	100kB
TONE	100kA
VOLUME	100kA
MIDS	Jumper 1&2
DENSITY	empty

R1	39k
R2	100K
R3	470K
R4	100R
R5	10K
R7	1K
R8	10K
R9	100K
R10	470K
R11	10K
R12	100R
R13	10K
R14	100R
R15	470K
R16	100K
R17	15K
R18	39K
R19	39K
R21-24	empty
R26	2K2 (CLR)

Stoned Cleric

Stoner heaven, based closely around a Ram's Head 74#1 but with different cans and a different emitter resistor in the first gain stage. Awesome stuff.

***BC549C pinout is the opposite to that shown on the PCB, so flip them.**

C1	100n
C2	560p
C3	100n
C4	100n
C5	560p
C6	1u
C7	100n
C8	560p
C9	1u
C10	4n7
C11	10n
C12	100n
C13	100n
C14	100u
C15	empty
C16	jumper

Q1-4	BC549C*
D1-2	1N4148
D3	jumper
D4-5	1N4148
SUSTAIN	100KA
TONE	100KB
VOLUME	100KA
MIDS	Jumper 1&2
DENSITY	empty

R1	33K
R2	100K
R3	470K
R4	470R
R5	10K
R7	1K
R8	10K
R9	100K
R10	470K
R11	10K
R12	150R
R13	10K
R14	150R
R15	470K
R16	100K
R17	10K
R18	33K
R19	33K
R21	100K
R22	470K
R23	2K7
R24	10K
R25	1M
R26	2K2 (CLR)

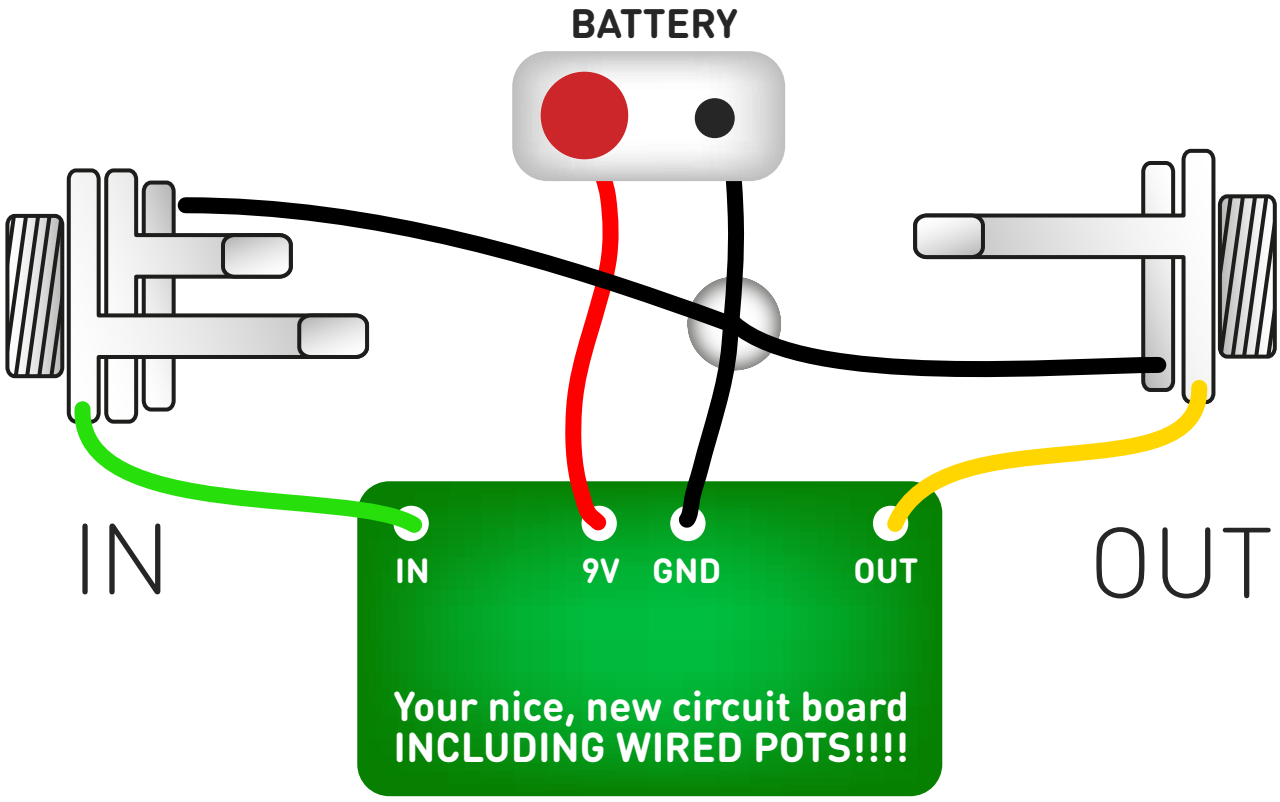
Creamy Dreamer

C1	1u
C2	470p
C3	47n
C4	1u
C5	470p
C6	1u
C7	1u
C8	470p
C9	1u
C10	4n7
C11	10n
C12	100n
C13	100n
C14	100u
C15	empty
C16	Jumper

Q1	2N5089
Q2	2N5089
Q3	2N5089
Q4	2N5089
D1	1N4148
D2	1N4148
D3	Jumper
D4	1N4148
D5	1N4148
SUSTAIN	100kB
TONE	100kA
VOLUME	100kA
MIDS	Jumper 1&2
DENSITY	empty

R1	39k
R2	100K
R3	470K
R4	Jumper
R5	15K
R7	1K
R8	8K2
R9	100K
R10	470K
R11	15K
R12	Jumper
R13	8K2
R14	Jumper
R15	470K
R16	100K
R17	15K
R18	47K
R19	47K
R21	100K
R22	390K
R23	2K2
R24	10K
R26	2K2 (CLR)

Test the board!



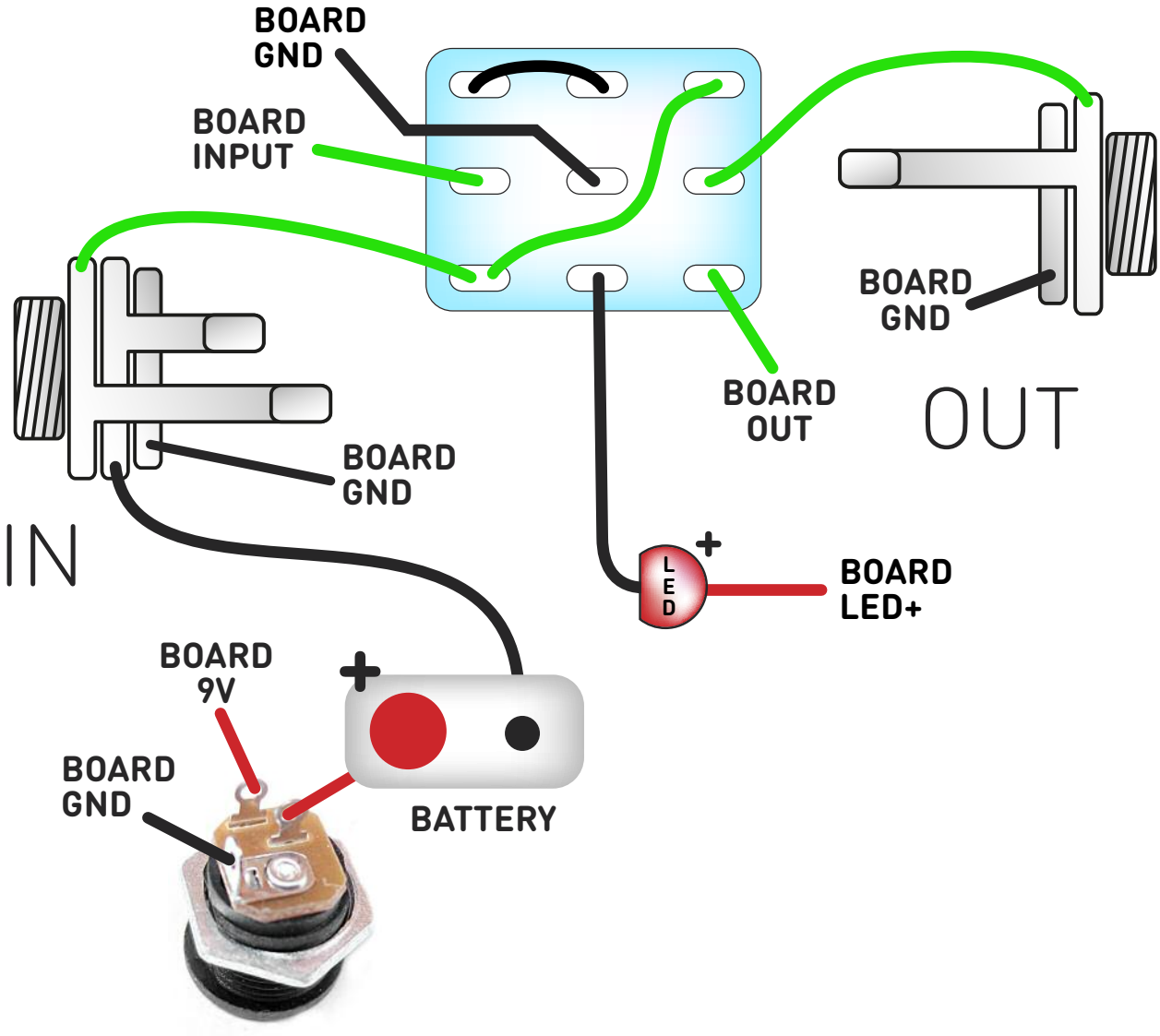
UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.

Once you've finished the circuit it makes sense to test is before starting on the switch and LED wiring. It'll cut down troubleshooting time in the long run. If the circuit works at this stage, but it doesn't once you wire up the switch - guess what? You've probably made a mistake with the switch.

Solder some nice, long lengths of wire to the board connections for 9V, GND, IN and OUT. Connect IN and OUT to the jacks as shown. Connect all the GNDs together (twist them up and add a small amount of solder to tack it). Connect the battery + lead to the 9V wire, same method. Plug in. Go!

If it works, crack on and do your switch wiring. If not... aw man. At least you know the problem is with the circuit. Find out why, get it working, THEN worry about the switch etc.

Wire it up



Wiring shown above will disconnect the battery when you remove the jack plug from the input, and also when a DC plug is inserted.

The Board GND connections don't all have to directly attach to the board. You can run a couple of wires from the DC connector, one to the board, another to the IN jack, then daisy chain that over to the OUT jack.

It doesn't matter how they all connect, as long as they do.

This circuit is standard, Negative GND. Your power supply should be Tip Negative / Sleeve Positive. That's the same as your standard pedals (Boss etc), and you can safely daisy-chain your supply to this pedal. Now... GO GET FUZZY!

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