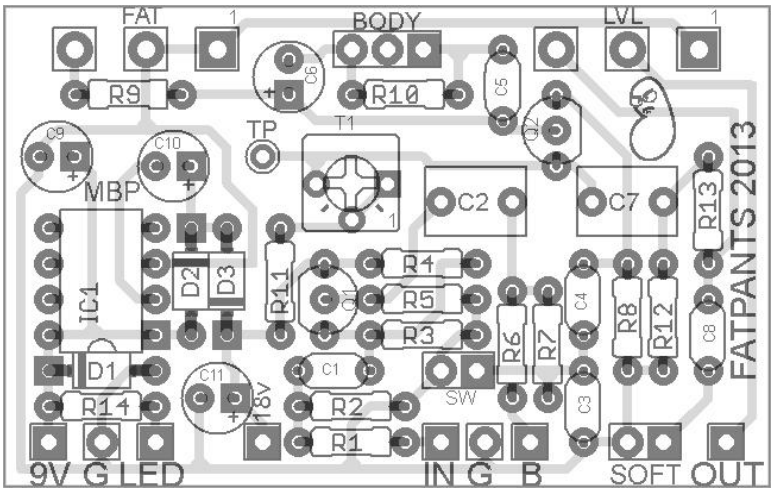
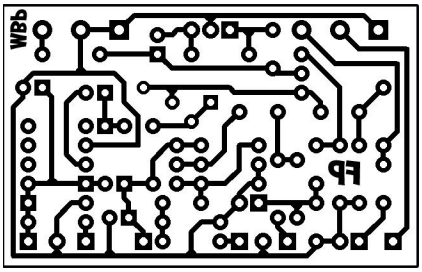
FATPANTS – 2013 ED.

FX Type: Boost



2.17”W x 1.37”H



Resistors		Caps		Diodes	
R1	1k	C1	100n	D1	9.1v Zener
R2	1M	C2	1uF	D2, D3	1N5817
R3	2M2	C3	220pF	**Transistors**	
R4	1M	C4	22n	Q1, Q2	J201
R5	10k	C5	22n	**IC's**	
R6	1k	C6	47uF	IC1	TC1044SCPA
R7	100k	C7	1uF	**Switches**	
R8	1M	C8	3n3	SOFT	SPDT (On/On)
R9	470R	C9	47uF	BODY	SPDT (On/On)
R10	10M	C10	10uF	**Trimmers**	
R11	3k3	C11	47uF	T1	50k
R12	470k			**Pots**	
R13	10k			FAT	5kC
R14	4k7			LVL	500kB

Previous versions of the FatPants documentation can be downloaded here:
http://www.madbeanpedals.com/projects/FatPants/docs/

Shopping List					
100k	1	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-100K-RC/?qs=sGAEpiMZZMu61qfTUdNhG8NgXDhdnsPdRkeci6KEHFY%3d
10k	2	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-10K-RC/?qs=sGAEpiMZZMu61qfTUdNhG%2fNICg4NOtz51bQLKR8aMJE%3d
10M	1	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/291-10M-RC/?qs=sGAEpiMZZMu61qfTUdNhG2ZvKd0YdoZGLMrPwD4RDKI%3d
1k	2	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-1K-RC/?qs=sGAEpiMZZMu3rPAxVilS%252bw2Oxp6am%2fzH
1M	3	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-10M-RC/?qs=sGAEpiMZZMu61qfTUdNhGzoeXLT9qgk%252bNKbLHFAsQsc%3d
2M2	1	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-22M-RC/?qs=sGAEpiMZZMu61qfTUdNhG15Sz3PBOPbZuSk4jhf2RTg%3d
3k3	1	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-33K-RC/?qs=sGAEpiMZZMu61qfTUdNhG%2fJtDnsRrrptaPf%2fpx2qOkY%3d
470k	1	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-470K-RC/?qs=sGAEpiMZZMu61qfTUdNhG1Sr7IGMEIz%252bDmIqmvYBZCQ%3d
470R	1	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-470-RC/?qs=sGAEpiMZZMu61qfTUdNhG8zTzhjuYKP4eg8KQe8i%252bpo%3d
4k7	1	Metal/Carbon	1/4W	7.5mm	http://www.mouser.com/ProductDetail/Xicon/271-47K-RC/?qs=sGAEpiMZZMu61qfTUdNhG9bJ5ty%2flZP2TB8lOZq4lN4%3d
220pF	1	Ceramic/Mica	25v	5mm	http://www.mouser.com/ProductDetail/Cornell-Dubilier/CD15FD221JO3F/?qs=sGAEpiMZZMtLiKaZgV7flaUuJGyUMyGoG%2f0s6sN3Hhk%3d
10uF	1	Electrolytic	25v	2.5mm	http://www.mouser.com/ProductDetail/Lelon/SS100M1EBK-0505P/?qs=sGAEpiMZZMtZ1n0r9vR22fOlMi63Cj6pMjznlzIEUe4%3d
47uF	3	Electrolytic	25v	2.5mm	http://www.mouser.com/ProductDetail/Lelon/SS470M1EBK-0605P/?qs=sGAEpiMZZMtZ1n0r9vR22fOlMi63Cj6p5esCvxgiGgc%3d
100n	1	Film	25v		http://www.mouser.com/ProductDetail/EPCOS/B32529C104J189/?qs=sGAEpiMZZMv1cc3ydrPrF1iYn56hZ3Ymf1xQMBVQv3k%3d
1uF	2	Film	25v		http://www.mouser.com/ProductDetail/EPCOS/B32529C105J/?qs=sGAEpiMZZMv1cc3ydrPrF1iYn56hZ3YmwmBnaXlAM1I%3d
22n	2	Film	25v		http://www.mouser.com/ProductDetail/EPCOS/B32529C223J/?qs=sGAEpiMZZMv1cc3ydrPrF1iYn56hZ3YmsFcVJoxHpkY%3d
3n3	1	Film	25v	5mm	http://www.mouser.com/ProductDetail/EPCOS/B32529C332J/?qs=CveI%2fUwZDBJC3zBa%2fe7pcA%3d%3d
1N4739	1	9.1v Zener	1W	7.5mm	http://www.mouser.com/ProductDetail/Fairchild-Semiconductor/1N4739A/?qs=sGAEpiMZZMtQ8nqTKtFS%2fD313Kx94AdFda9lh9A3PSE%3d
1N5817	2		1W	7.5mm	http://www.mouser.com/ProductDetail/Fairchild-Semiconductor/1N5817/?qs=sGAEpiMZZMtQ8nqTKtFS%2fCJFZUIIOyzjWJhH2RQmKoY%3d
J201	2				http://www.smallbearelec.com/servlet/Detail?no=307
TC1044SCPA	1				http://www.mouser.com/ProductDetail/Microchip-Technology/TC1044SCPA/?qs=sGAEpiMZZMuCocSLMfZw%2f9572jYUh8Cw42A68P5EkeI%3d
SPDT (On/On)	2				http://www.smallbearelec.com/servlet/Detail?no=792
50k	1	Bourns 3362P		6mm	http://www.mouser.com/ProductDetail/Bourns/3362P-1-503LF/?qs=sGAEpiMZZMthiYuEY6QoeVGDRLy7flS1
5kC	1	Reverse Audio		16mm	http://www.smallbearelec.com/servlet/Detail?no=692
500kB	1	Linear		16mm	http://www.smallbearelec.com/servlet/Detail?no=692

If you have trouble with the Mouser links, just copy and paste them into your web browser.

- “Soft” switch can be either SPST or SPDT
- You can sub the MAX1044CPA or ICL7660SCPA for the TC1044SCPA
- You can use 16v rated caps for C9 and C10, but C11 should be 25v
- You can sub 1N4001 for the 9.1v Zener (this will not protect the TC1044SCPA from over-voltage, however).

The **Fatpants** is a simple JFET booster modeled after the input stage of the Echoplex. It runs off a standard 9v DC supply which is then boosted to approximately 18v via a charge pump. The added voltage provides a generous amount of boost which will take you into overdrive territory with certain settings. The Fatpants will add dynamics, headroom and sparkle to your guitar. The Fatpants tends to compliment single coil style guitars the best; however it should work in a wide variety of guitar setups.

The 2013 edition offers a few changes from the previous Fatpants design

- New layout with pot connections moved to the top of the PCB (for those wanting top mounted input/output jacks).
- A re-designed input buffer which should work better with humbucker and other high output guitar pickups.
- An optional buffer bypass for those in need of a buffer in their effects chain.
- A “Soft” switch which reduces the high end for especially bright guitars like the Telecaster.

Controls

LVL – The total volume output of the boost.
FAT – Sets both the total gain and changes the frequency response of the boost as it is turned clockwise.
BODY – This switch saturates the signal into a flatter frequency response and higher amount of gain.
SOFT – This reduces some high end content at the output of the circuit.
T1 – This trimmer sets the bias point of Q2.

Notes

You may encounter some scratchiness with the **Fat** control when the **Body** switch is off. This is normal. Unfortunately, this cannot be eliminated from the design without altering the overall character of the effect. The **Fat** control works in concert with the 22n cap to produce frequency-dependent gain. As the control is turned up, it applies increasing gain to the upward filter. This results in increased pick attack and dynamics. When the control is down, the filter is also lowered, but since the overall gain is lowered at the same time it does not “muddy up” the signal.

R14 is the current limiting resistor for the LED output pad. Connect the Anode of your LED to this pad and the cathode to your 3PDT switch.

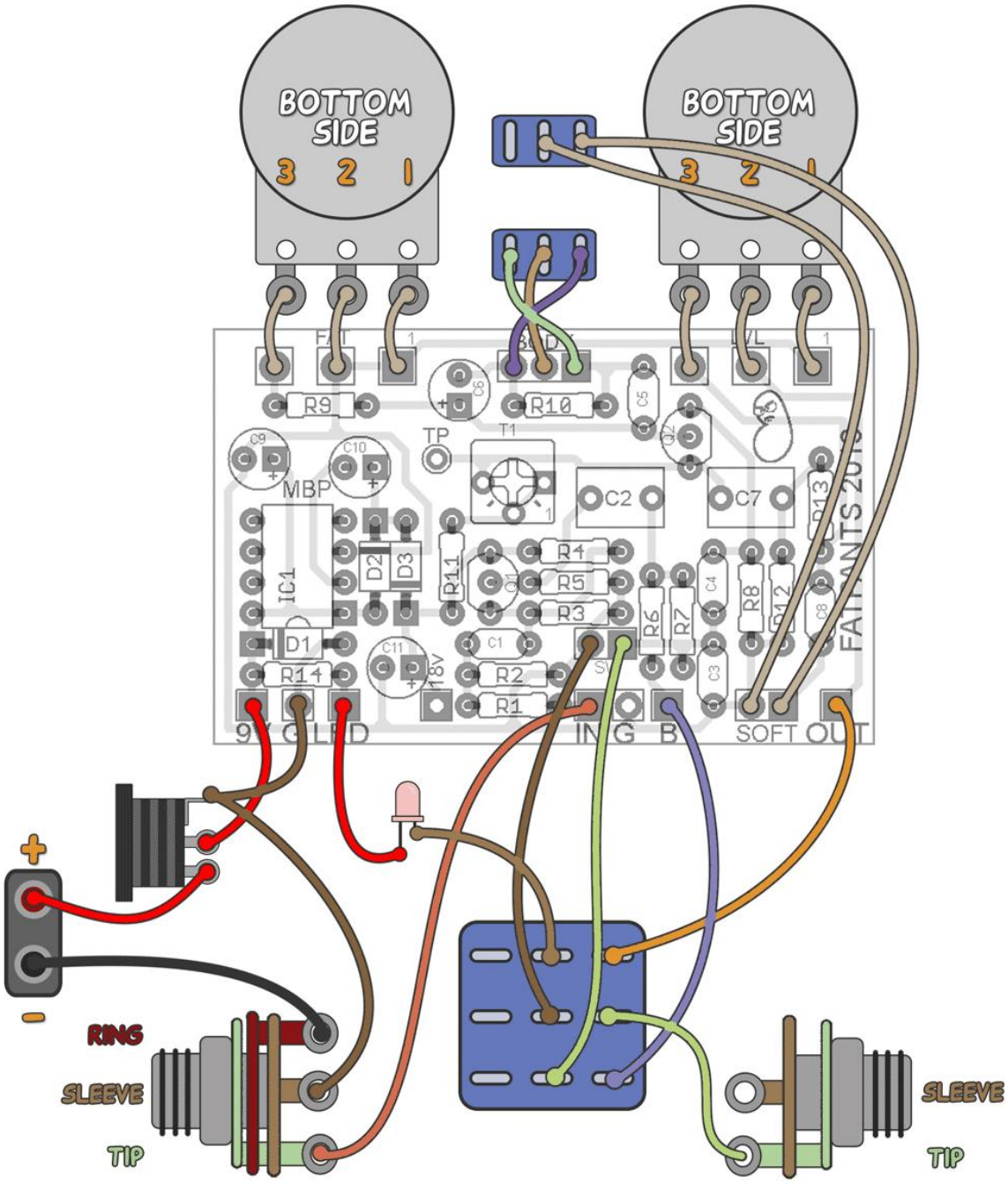
The 18v pad on the PCB is a courtesy 18v DC output. Use this when combining the Fatpants in a dual pedal that you want to run at 18v. Keep in mind the total current output of the charge pump is around 20mA, so this may be a limiting factor in using the 18v pad to supply an additional circuit.

How to set the bias: using you multimeter, touch the red probe to the “TP” pad on the PCB and the black probe to ground. Adjust T1 until it reads approximately 12vDC. This is the starting point. On your testing rig, set the Fat control to fully clockwise. Now make fine adjustment to T1 until you get the maximum amount of gain out of Q2. The final bias voltage will most likely end up between 12v-14vDC.

For true-bypass wiring, refer to the Standard Wiring Diagram:
http://www.madbeanpedals.com/tutorials/downloads/StandardWiring_MBP.pdf

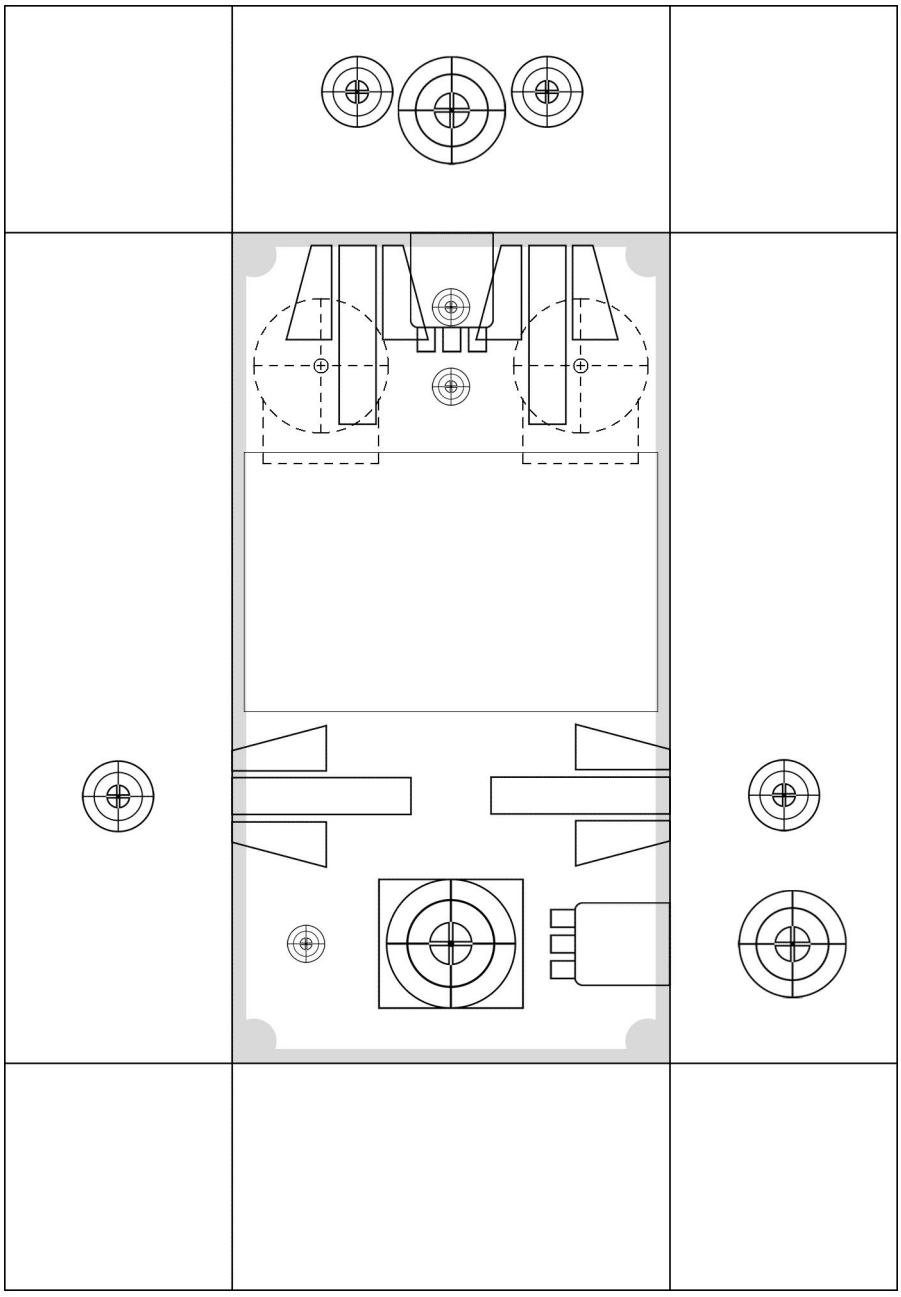
For buffered bypass, refer to the illustration below.

Buffered Bypass Wiring



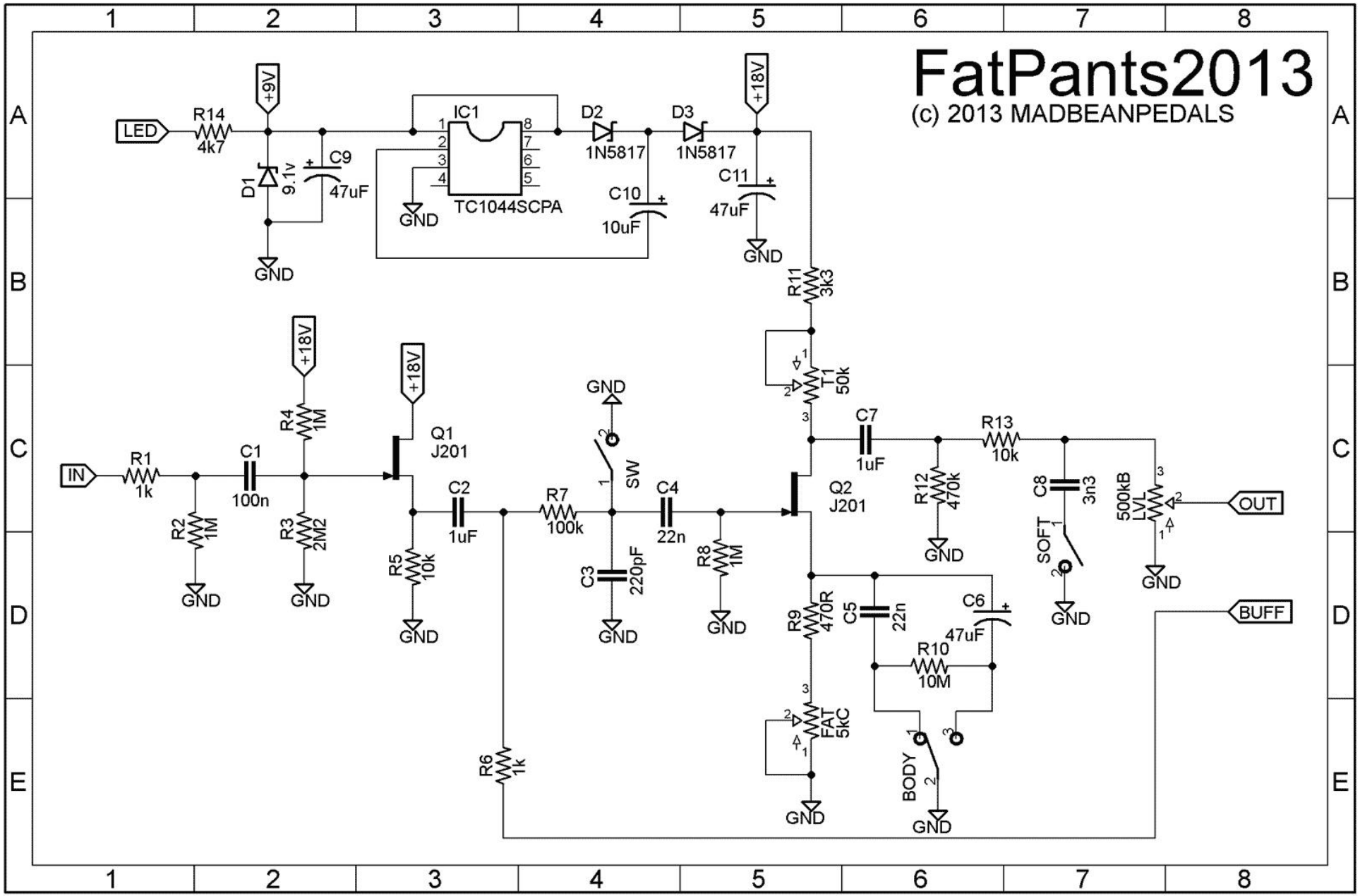
1590B Drill Template

4.64”W x 6.68”H



This template shows two possible layouts:
Top mounted jacks, side mounted DC jack
Side mounted jack, top mounted DC jack

This template is approximate. Be sure to measure carefully before committing to drill.


FatPants2013
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LED
R14
4k7
+9V
D1
9.1v
C9
47uF
GND
IC1
TC1044SCPA
D2
1N5817
D3
1N5817
+18V
C11
47uF
C10
10uF
R11
3k3
T1
50k
IN
R1
1k
C1
100n
R2
1M
R3
2M2
R4
1M
Q1
J201
R5
10k
C2
1uF
R7
100k
SW
C3
220pF
C4
22n
R8
1M
C7
1uF
Q2
J201
R12
470k
R13
10k
C8
3n3
SOFT
500kB
LVL
OUT
BUFF
R9
470R
C5
22n
C6
47uF
R10
10M
FAT
5kC
BODY
R6
1k