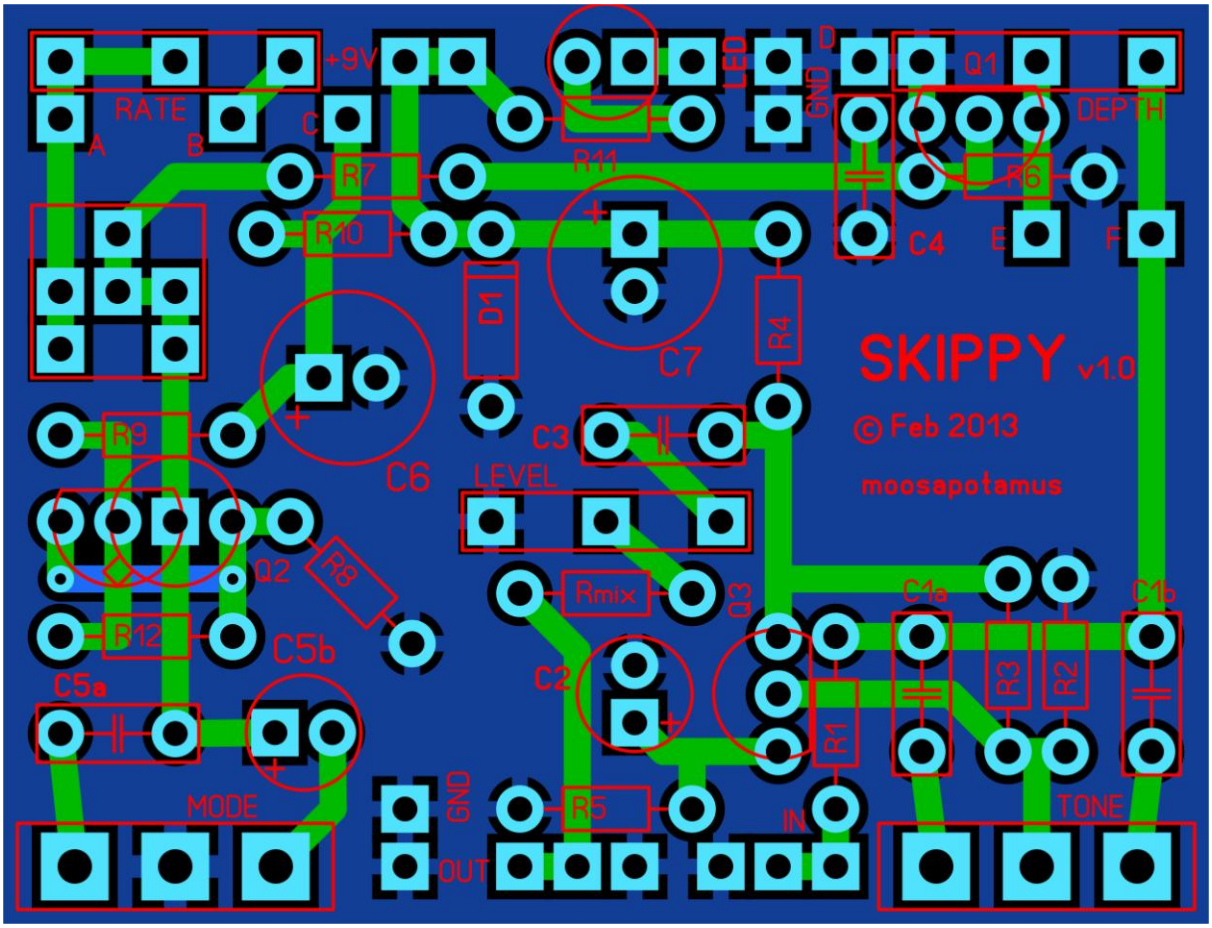
SKIPPY

Tremolo



DESCRIPTION:

SKIPPY is a tremolo effect that is based on the vintage, out-of-production Vox Repeat Percussion effect. The original VRP pedal had only one control for Rate. The VRP was also built into the Vox Beatle Super Reverb amplifiers, which also had an input jack for a control pedal that would enable you to control the speed of the effect with your foot.

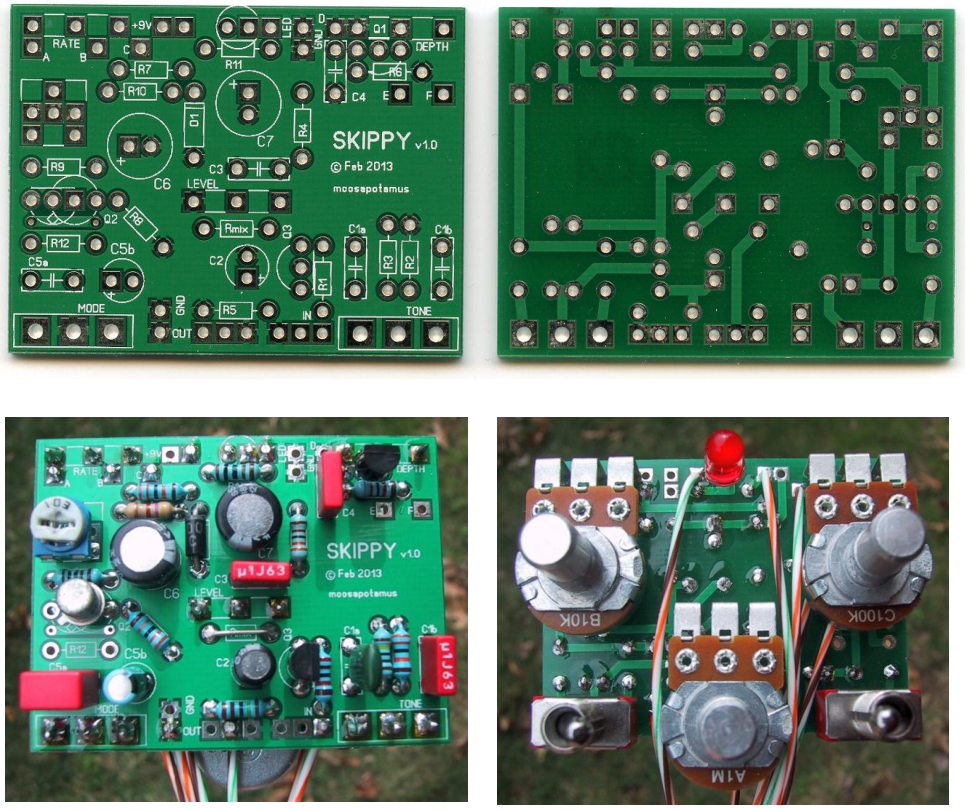
FEATURES:

In addition to the Rate control and pads that allow the addition of a Rate control (expression pedal) input jack, the SKIPPY PCB also provides for the following features…

- Depth control knob.
- Output Level control knob.
- Toggle switch for hi/lo speed range (Mode), as set by the Rate control. Super slow as well as super fast, pseudo ring modulator like sounds are possible.
- Toggle switch for Tone (stock lo cut / full range).
- Universal PCB footprint allows use of either the factory specified 2N2646 (UJT) or the more readily available 2N6027 (PUT) in the oscillator section.
- PCB pads to facilitate addition of a Depth control input jack.

- PCB footprint for output mixing resistor, facilitates construction of a dual tremolo or combination with another effect (i.e. filter or fuzz) in the same enclosure.

NOTES:
The SKIPPY PCB is designed to allow PCB mounted potentiometers and toggle switches to be installed on back/trace side of the PCB. It is also possible to mount the status LED directly to the PCB.



Unfortunately, a single-sided PCB transfer image is not currently available because a top ground plane was used and routing a single ground trace would require significant changes to the current layout.

MODIFICATIONS:
Rmix is not listed in the BOM, below. This is an output mixing resistor that can be installed if you are combining this with another effect, such as a second SKIPPY in order to make a dual tremolo pedal, for example. A value of 10k should be fine for this purpose. Otherwise, be sure to install a jumper in place of Rmix.

The two input capacitors connected to the Tone switch (SW1) can be changed to alter the tone of the output. The original VRP had a single cap (4n7) and no switch. This was effectively a low-cut filter and provided an output with a lot of treble and very little bass. It also reduced the output volume. You can experiment with different values to find what best suits your specific setup. A value of 100n (0.1uF) provides a flatter response with a more natural balance of bass and treble. It also increases the output volume. If desired, the Tone switch can be left out in favor of a single capacitor.

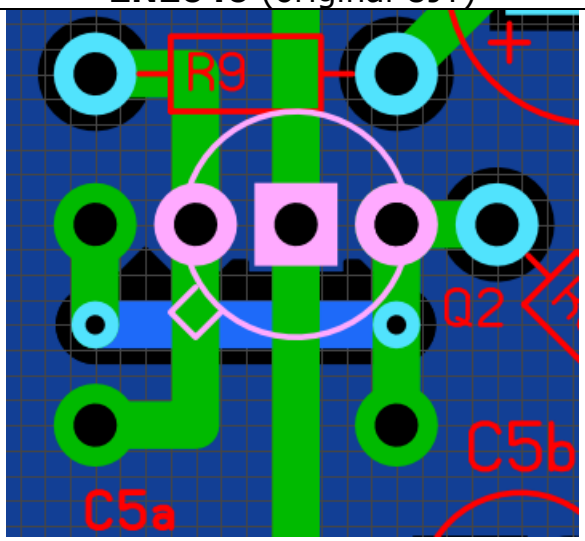
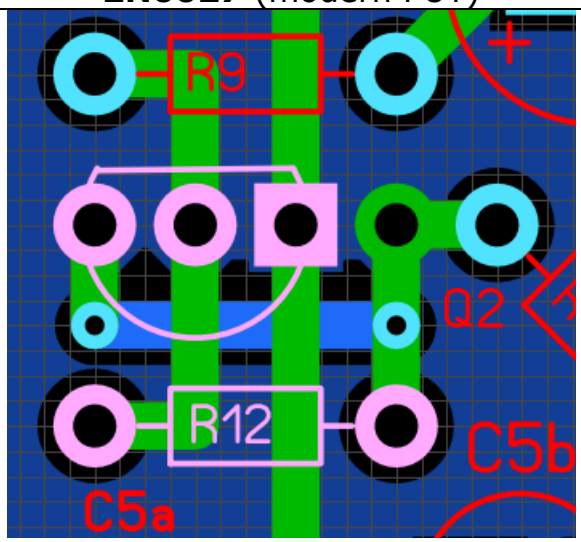
The Mode toggle switch can also be omitted if you have no use for Rate settings outside

of what a typical tremolo can produce. Adding the Mode toggle with a second, smaller capacitor enables the oscillator to leave the LFO range and go up into the audio range. This makes it possible to produce pseudo ring modulator like sounds.

The values for C2/R5 can be changed to alter the available output gain. In the original VRP, R5 was 3k3 and C2 was not present. Decreasing R5 to 1k5 will give an output that is closer to unity. Adding C2 will provide a boosted output that can make the output level appear closer to unity with certain settings of Depth and Rate. Adjusting the values of C2/R5 can also be interactive with the value(s) you select for the input capacitors on the Tone switch (see above). For example, if you choose to omit the Tone switch in favor of just a single 100n input capacitor, you may find that a value of 1k5 for R5 gives you more than enough output volume and allows you to also leave out C2.

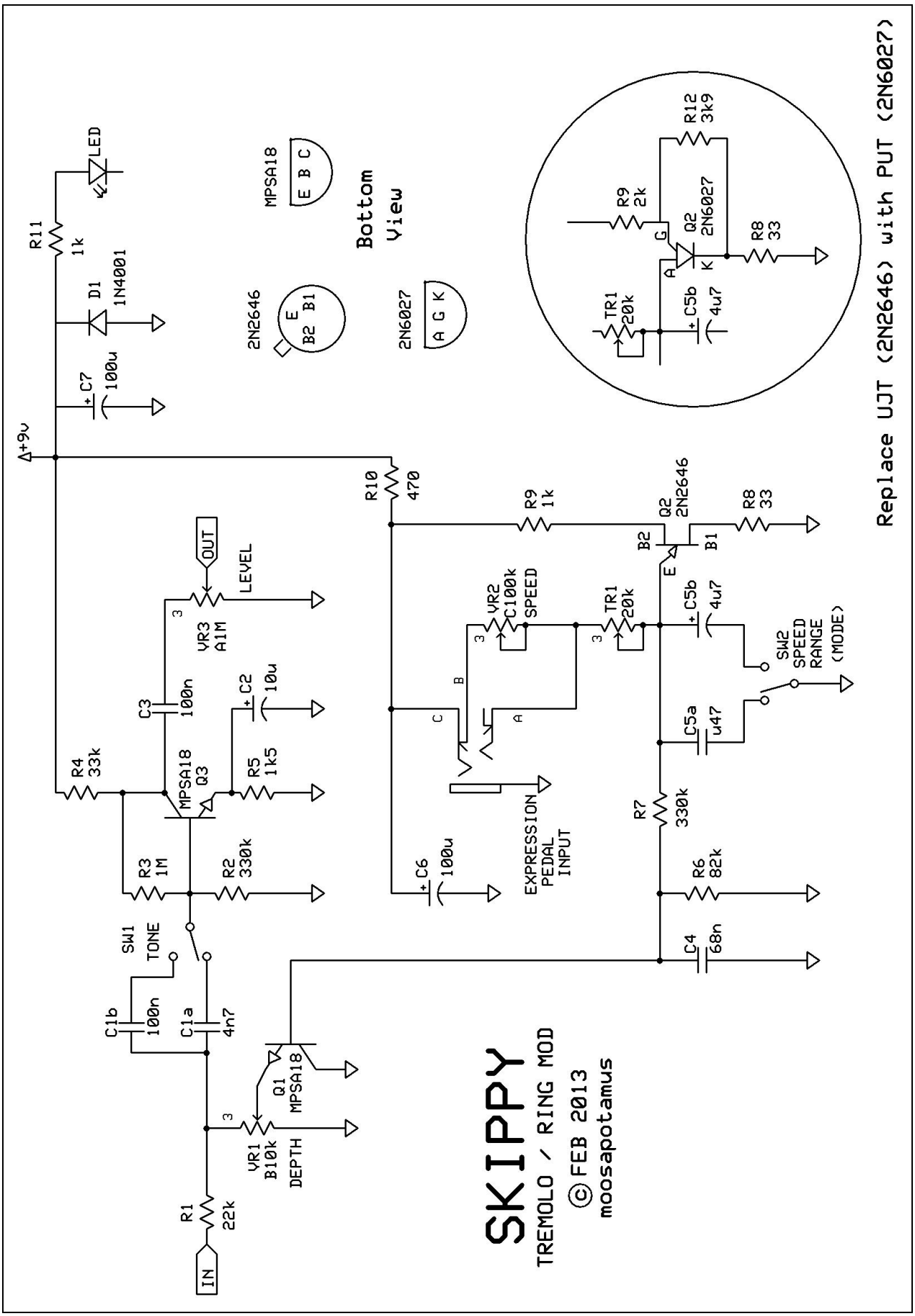
The 20k trim pot can be replaced with a fixed resistor, as in the original VRP, if desired. Original value was 4k7, which may or may not work well with the specific transistor that you use in the oscillator section (2N2646 or 2N6027). If you find that the tremolo effect appears to stop at one or the other extreme setting of the Rate pot, then you simply need to adjust the value of this resistor. Something around the range of 3k3 to 5k1 should get you there. The onboard trim pot just makes this process much easier.

The original VRP used the 2N2646 in its oscillator, an outdated (now out-of-production) unijunction transistor (UJT). These can still be found for $2 or more a piece, but they are technically obsolete and provide no additional mojo. Modern programmable unijunction transistors (PUT) have taken their place. The 2N6027 can be easily programmed with external resistors to behave just like the 2N2646, and the universal footprint on the SKIPPY PCB makes that relatively easy to implement.

2N2646 (original UJT)	**2N6027** (modern PUT)
 (top view of component side)	 (top view of component side)
• Install 2N2646 as shown (pink) • Do not install R12 • R9 = 1k	• Install 2N6027 as shown (pink) • Install R12 as shown (pink) • R9 = 2K

Adding a Rate control input jack can be done with almost any style stereo jack that has sleeve, ring and tip contacts, and a normally closed switch on the ring contact. Below is an example…

This type of jack has two contacts each for the sleeve, ring and tip connections. On one side of the jack (as shown above) each contact has a normally closed switch. When a plug is inserted, the switches are all opened. See schematic and wiring diagram for wiring details. The CV pedal that you use for Rate control should have a cord with a stereo plug. I tried a couple different pedals, one with a 100k pot and one with a 20k pot, and both seemed to work reasonably well.


SKIPPY
TREMOLO / RING MOD
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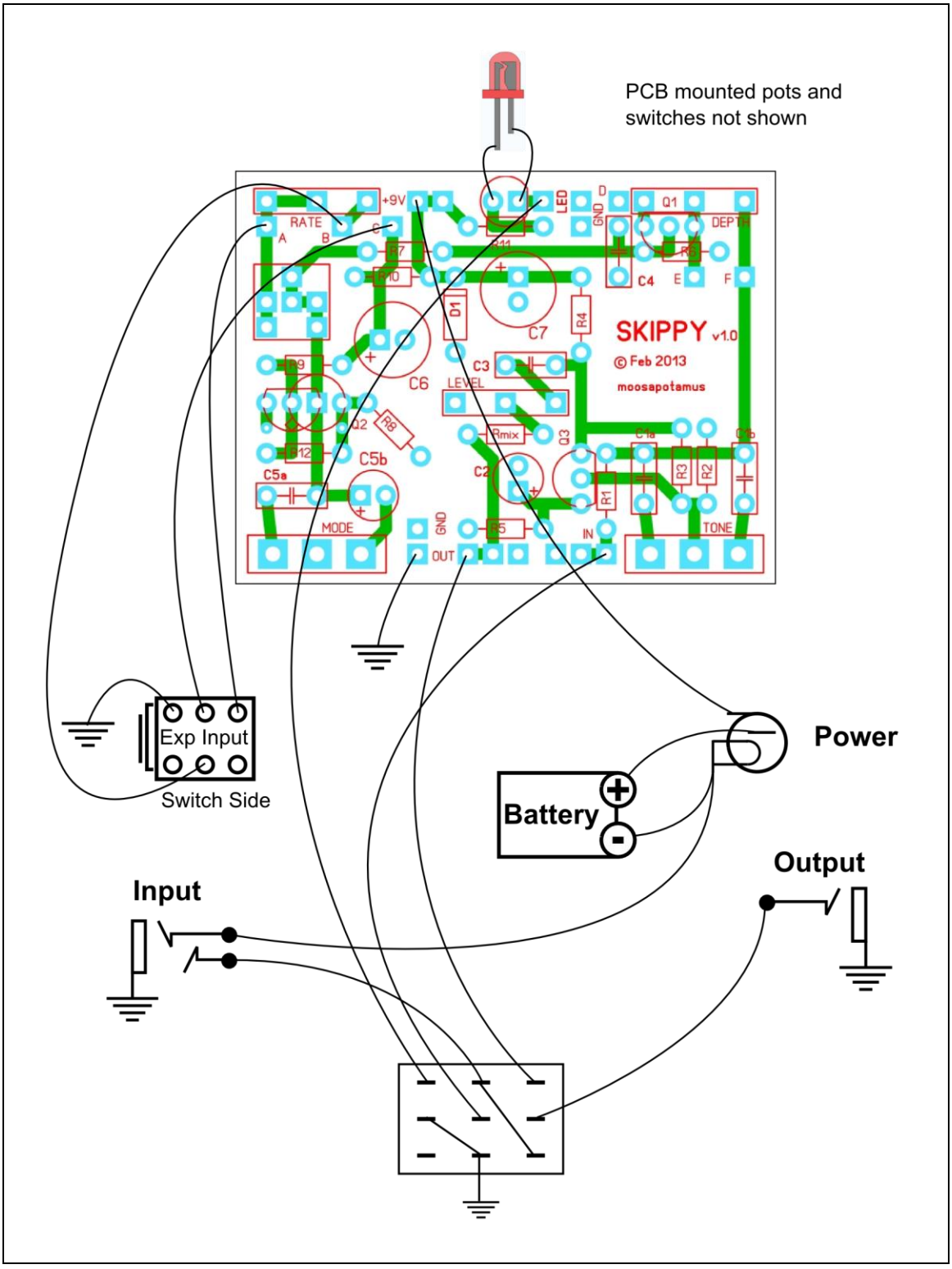
moosapotamus
Replace UJT (2N2646) with PUT (2N6027)
Bottom View
MPSA18
E B C
2N2646
E B2 B1
2N6027
A G K
LED
R11 1k
D1 1N4001
C7 100u
+9v
R10 470
R9 1k
Q2 2N2646
R8 33
B2
B1
E
VR2 C100k SPEED
TR1 20k
C5b 4u7
SW2 SPEED RANGE (MODE)
C5a u47
R7 330k
R6 82k
C4 68n
EXPRESSION PEDAL INPUT
C6 100u
OUT
LEVEL
VR3 A1M
C3 100n
C2 10u
R4 33k
MPSA18 Q3
R5 1k5
R3 1M
R2 330k
SW1 TONE
C1b 100n
C1a 4n7
Q1 MPSA18
VR1 B10k DEPTH
R1 22k
IN
R12 3k9
R9 2k
Q2 2N6027
G
A
K
R8 33
TR1 20k
C5b 4u7

Bill of Materials

Ref	Value	Alt		Qty	Value	Alt	Ref
C1a	4n7			1	4n7		C1a
C1b	100n			1	68n		C4
C2	10u			2	100n		C1b, C3
C3	100n			1	u47		C5a
C4	68n			1	4u7		C5b
C6	100u			1	10u		C2
C7	100u			2	100u		C6, C7
C5a	u47			1	1N4001		D1
C5b	4u7			1	Red		LED
D1	1N4001			2	MPSA18		Q1, Q3
LED	Red			1	2N2646	2N6027	Q2
Q1	MPSA18			1	33		R8
Q2	2N2646	2N6027		1	470		R10
Q3	MPSA18			1	1k	2k	R9
R1	22k			1	1k		R11
R2	330k			1	1k5		R5
R3	1M			1		3k9	R12
R4	33k			1	22k		R1
R5	1k5			1	33k		R4
R6	82k			2	330k		R2, R7
R7	330k			1	82k		R6
R8	33			1	1M		R3
R9	1k	2k		2	SPDT		SW1, SW2
R10	470			1	20k		TR1
R11	1k			1	B10k		VR1
R12		3k9		1	C100k		VR2
SW1	SPDT			1	A1M		VR3
SW2	SPDT						
TR1	20k						
VR1	B10k						
VR2	C100k						
VR3	A1M						


PCB mounted pots and
switches not shown
SKIPPY v1.0
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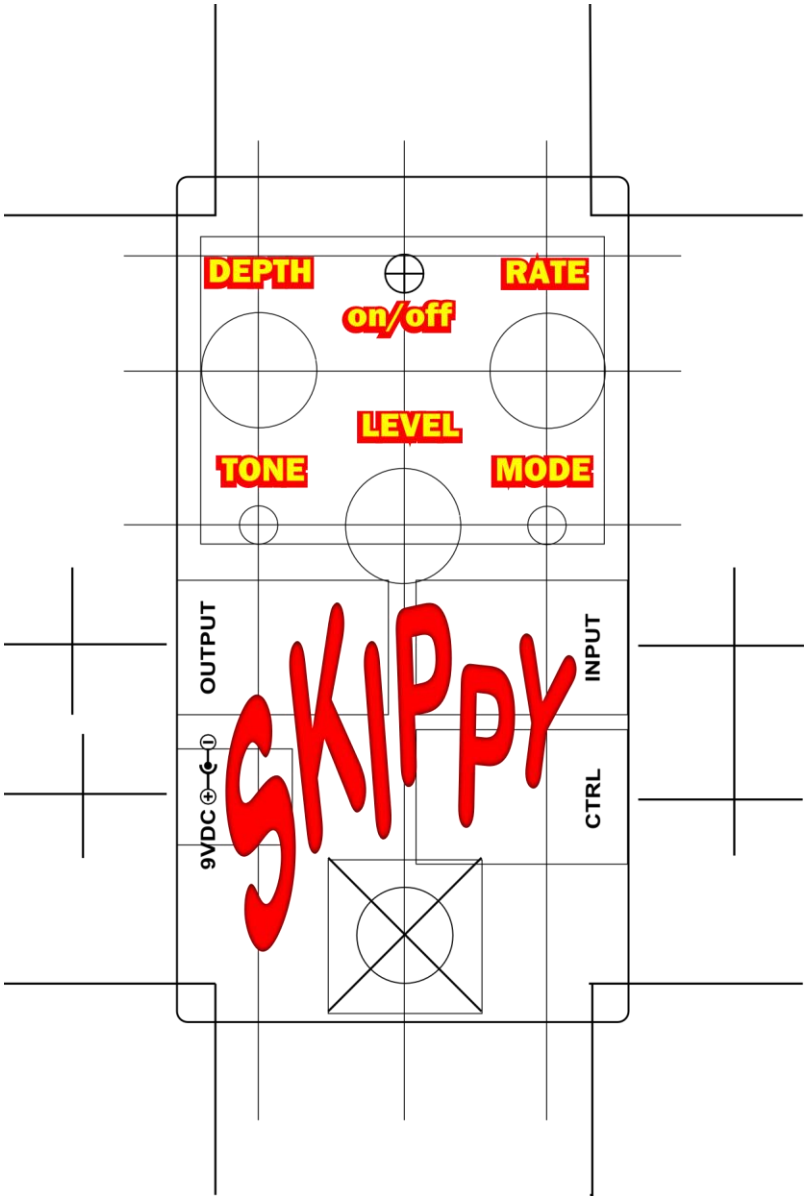
Exp Input
Switch Side
Power
Battery
Input
Output



Please make your own measurements prior to drilling your enclosure.

The above template can be used as a rough guide. As shown, it is sized for a 1590B type enclosure. It's a tight fit, and there is no room for a battery (unless you leave out the Rate control input jack), but it can fit.

Note that if you install PCB mounted components for the Depth, Rate and Level pots, as well as the Tone and Mode toggle switches, their placement will still be the same as in the above template, even if you choose to use a larger enclosure.