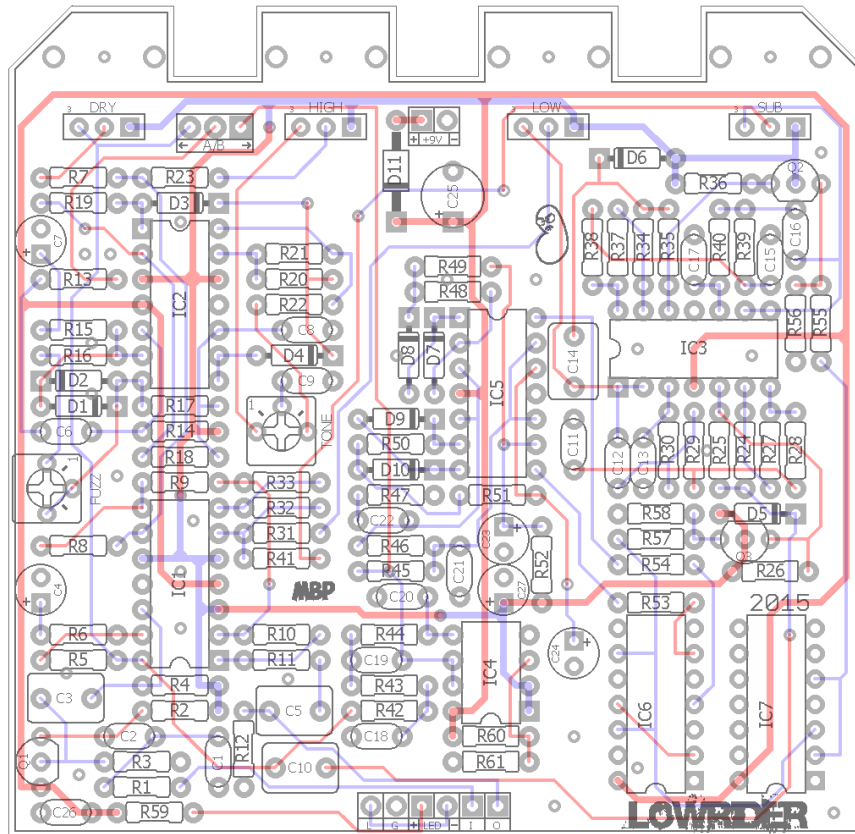
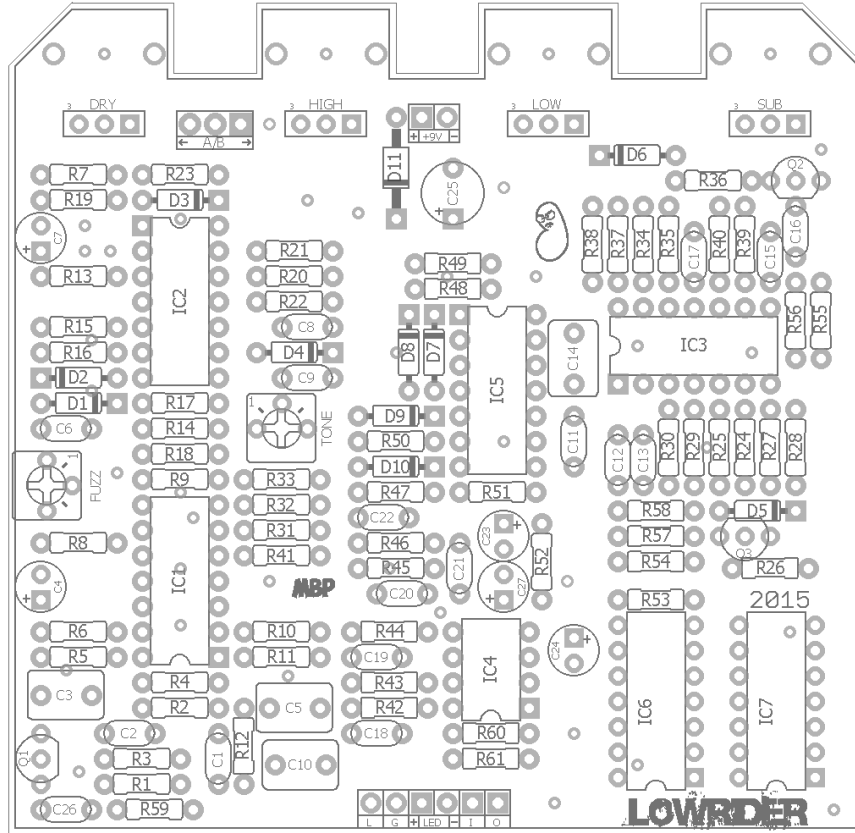


LOWRIDER 2015

FX TYPE: Octaver

© 2015 madbeanpedals

3.375" W x 3.275" H



B.O.M.							
Resistors		Resistors		Caps		Diodes	
R1	1k	R31	100k	C1	330pF	D1	1n914
R2	1M	R32	330k	C2	33n	D2	1n914
R3	10k	R33	10k	C3	1uF	D3	GE
R4	1M	R34	47k	C4	10uF	D4	GE
R5	10k	R35	47k	C5	1uF	D5	GE
R6	2k7	R36	100k	C6	22n	D6	GE
R7	100k	R37	27k	C7	1uF	D7	1n914
R8	100k	R38	22k	C8	4n7	D8	1n914
R9	10k	R39	330k	C9	4n7	D9	1n914
R10	10k	R40	330k	C10	1uF	D10	1n914
R11	1k	R41	100k	C11	22n	D11	1N5817
R12	100k	R42	22k	C12	4n7	IC	
R13	10k	R43	330k	C13	470pF	IC1	TL074
R14	10k	R44	330k	C14	1uF	IC2	TL074
R15	3k3	R45	33k	C15	47n	IC3	TL074
R16	1k	R46	33k	C16	10n	IC4	TL072
R17	33k	R47	68k	C17	1n	IC5	LM324
R18	100k	R48	10k	C18	10n	IC6	CD4013
R19	100k	R49	1k	C19	2n2	IC7	CD4013
R20	47k	R50	10k	C20	220pF	Switch	
R21	330k	R51	1k	C21	330pF	A/B	SPDT
R22	470R	R52	1M	C22	10n	Trimmers	
R23	100k	R53	33k	C23	1uF	FUZZ	100k
R24	47k	R54	33k	C24	1uF	TONE	50k
R25	47k	R55	1M	C25	220uF	Pots	
R26	100k	R56	1M	C26	100n	DRY	100kA
R27	27k	R57	1M	C27	10uF	HIGH	100kA
R28	22k	R58	1M	Transistors		LOW	100kA
R29	330k	R59	4k7	Q1	MPF102	SUB	100kA
R30	330k	R60	10k	Q2	2N5457		
		R61	12k	Q3	2N5457		

PCB mounted pots: <http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-right-angle-pc-mount/>

Mini SPDT switch: <http://smallbear-electronics.mybigcommerce.com/spdt-on-on-mountain-10tc410/>

The mini switch can be soldered directly to the PCB, but make sure to line it up so that the top is flush with the 9mm pots. Alternatively, you can wire the switch and put it in the notch cut-out at the top of the PCB.

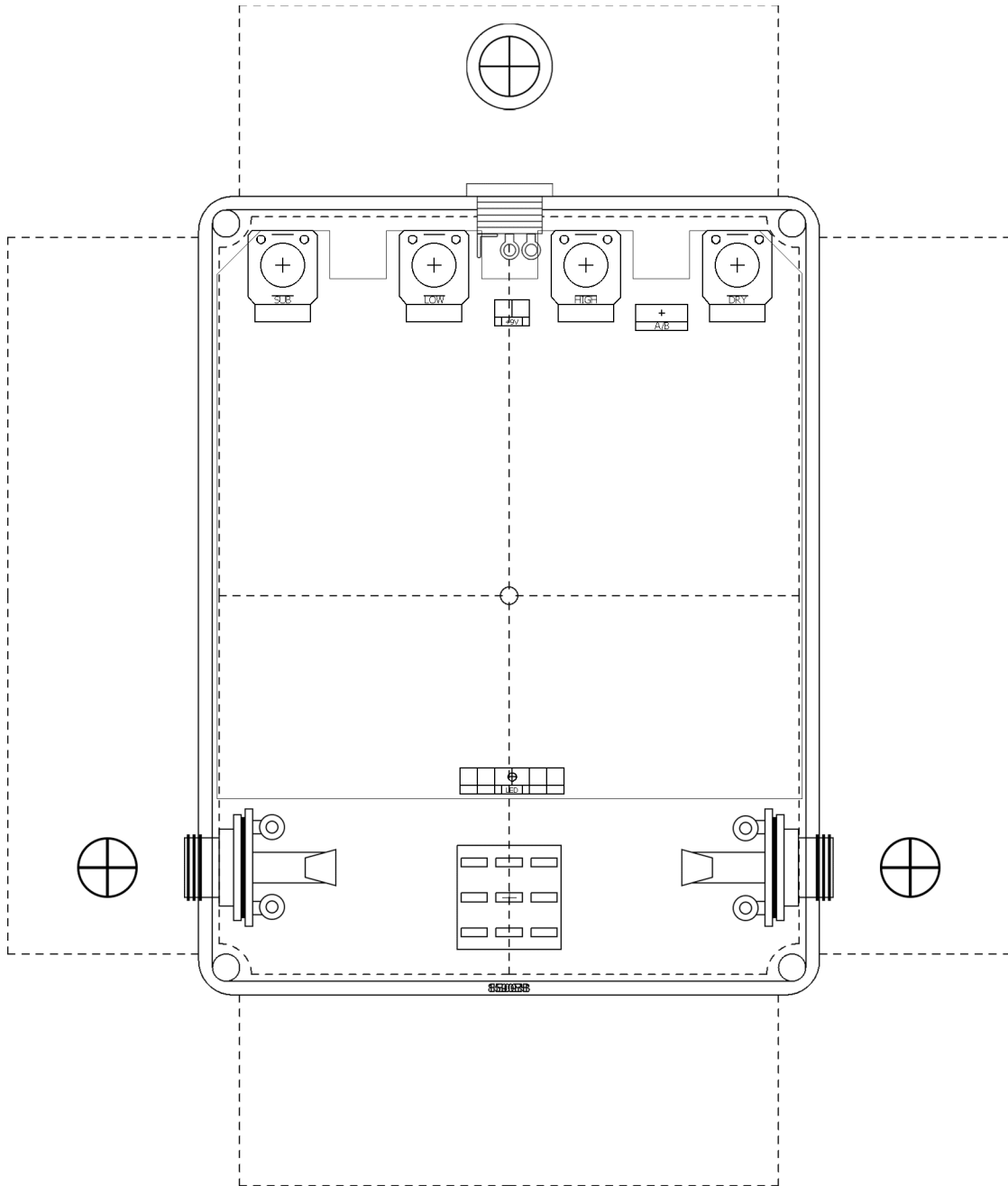
01.16: Corrected Wiring Diagram and Voltages

Shopping List

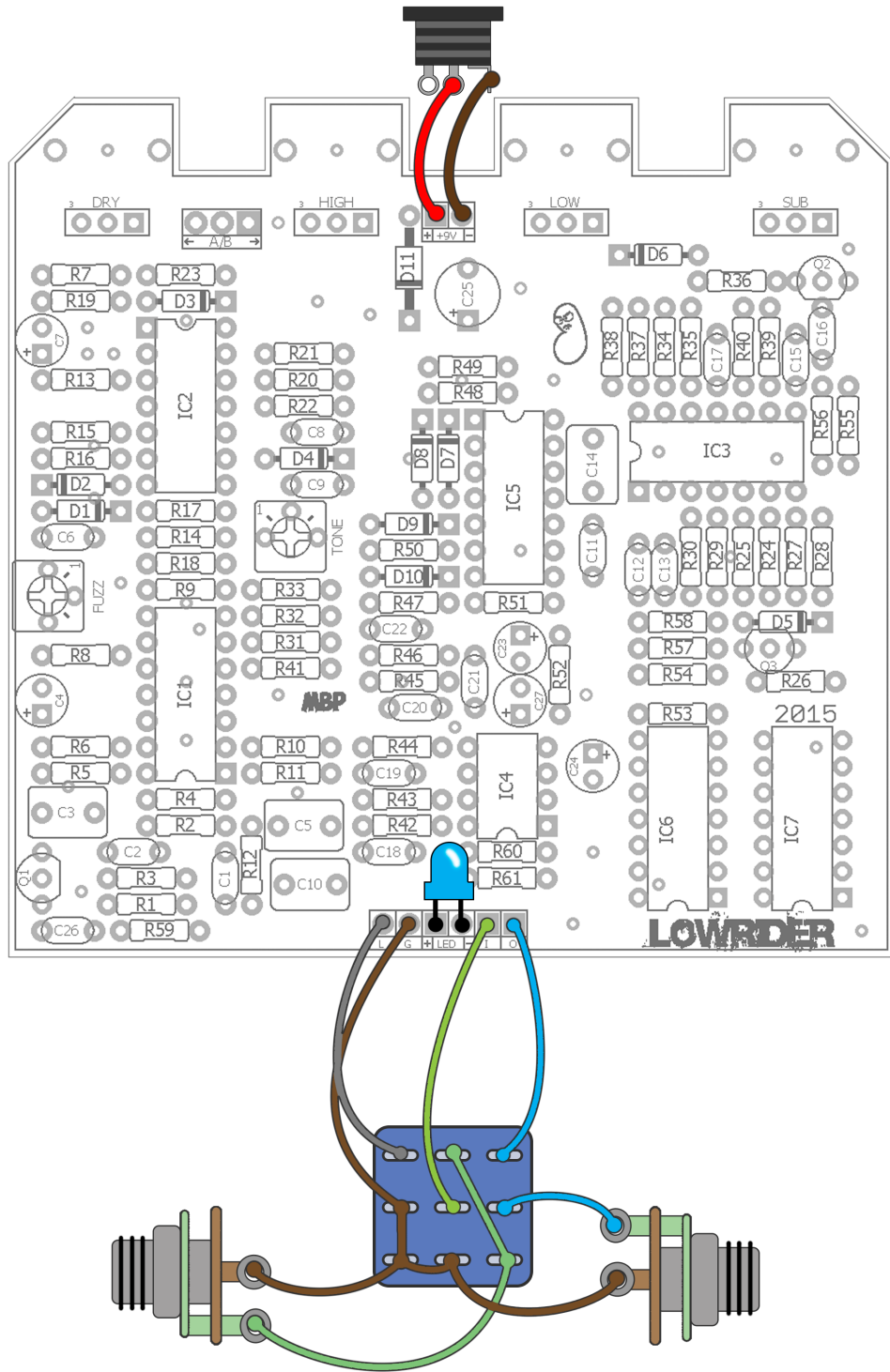
Value	QTY	Type	Rating
470R	1	Metal / Carbon Film	1/4W
1k	5	Metal / Carbon Film	1/4W
2k7	1	Metal / Carbon Film	1/4W
3k3	1	Metal / Carbon Film	1/4W
4k7	1	Metal / Carbon Film	1/4W
10k	10	Metal / Carbon Film	1/4W
12k	1	Metal / Carbon Film	1/4W
22k	3	Metal / Carbon Film	1/4W
27k	2	Metal / Carbon Film	1/4W
33k	5	Metal / Carbon Film	1/4W
47k	5	Metal / Carbon Film	1/4W
68k	1	Metal / Carbon Film	1/4W
100k	10	Metal / Carbon Film	1/4W
330k	8	Metal / Carbon Film	1/4W
1M	7	Metal / Carbon Film	1/4W
220pF	1	Ceramic	16v min.
330pF	2	Ceramic	16v min.
470pF	1	Ceramic	16v min.
1n	1	Film	16v min.
2n2	1	Film	16v min.
4n7	3	Film	16v min.
10n	3	Film	16v min.
22n	2	Film	16v min.
33n	1	Film	16v min.
47n	1	Film	16v min.
100n	1	Film	16v min.
1uF	4	Film	16v min.
1uF	3	Electrolytic	16v min.
10uF	2	Electrolytic	16v min.
220uF	1	Electrolytic	16v min.
MPF102	1		
2N5457	2		
1n914	6		
GE	4	1n34a / 1n270	
1N5817	1		
TL074	3		
TL072	1		
LM324	1		
CD4013	2		
SPDT	1	On/On	
100k	1	Bourms 3362p	
50k	1	Bourms 3362p	
100kA	4	PCB Mount / Right Angle	9mm

1590BB Drilling Template

5.8" W x 6.82" H



Wiring



The indicator LED can be mounted directly to the PCB.

The 2015 edition of the **Lowrider** offers significant changes to the original Pearl Octaver™ clone. It has an entirely new octave up section (based on the Foxrox Octron™) which produces a very prominent octave similar to the Green Ringer or a fuzz octave like the Foxx Tone Machine™. There are some tweaks to resistor values to allow for more output on the lower octave sections, as well. This design can no longer be considered a straight clone. Rather, it is a new mix of the Pearl Octaver™ and the FoxRox Octron™.

Controls

Dry: Unaffected guitar signal.

High: Octave up signal.

Low: Octave down signal.

Sub: Two octave down signal.

Fuzz: The amount of fuzz on the octave up signal (trimmer).

Tone: Tone control for the octave up signal (trimmer).

A/B: Emulates the effect of rolling off your guitar tone control for the octave up signal.

Managing Expectations

Before deciding to build the Lowrider 2015, you should understand what it can and cannot do. The Lowrider is a *monophonic analog octaver*. It uses analog circuitry to produce the upper and lower octaves. As such it has a few pitfalls that digital octavers do not. **It works with single notes only.** You cannot play chords through a monophonic octaver. It also is limited in the amount of pure octave signal you can attain.

Lower octaves are characterized by a certain amount of signal jumping. Most of this occurs on the low end of the guitar range (around the lowest D note on the A string and down). The upper range of the guitar responds much better to low and high octaves and this is the area where you will use it most frequently. On the low end of the spectrum, you will be limited to more staccato playing to avoid the octave jumps. There is no way to avoid this...it is simply the character of every analog octave design (that I know of). If you are okay with this, the Lowrider will work very well for you. If you want an octave pedal with precision response, you should look at purchasing a digital based design like the EHX POG.

The new octave up section is based around the Foxrox Octron™ which includes several useful mods. Additional changes were made to the stock Octron™ circuit to suit my own personal preference for the Lowrider. This portion of the circuit uses a simple feedback gain stage fed into a phase-splitter which then partially rectifies the signal, sums it back up and finally goes through a passive tone control which is then mixed with the High pot. There are two internal trimmers; fuzz and tone. With the fuzz control all the way down, the signal stays relatively clean. As it is turned up, the diodes in the feedback loop start to clip to produce distortion. The tone control here is based on the Simply Wonderful Tone Control.

If you have ever used analog octave up, you know that the octave is most prominent when you play with the neck pickup around the 12th fret and the guitar tone control rolled down. To simulate this the A/B switch gives the option of running the straight guitar signal through an active filter so that you do not have to roll down your tone knob. The octave up works in either switch position – they simply have a different flavor in each.

Mods - You can make the trimmer external pots if you want. You can increase the fuzz amount by changing the value from 100k to 500k or 1M.

The octave and two octave down section are largely the same as the previous version except that there is an additional output mixer and some of the resistor values were tweaked. This allowed for fewer resistor values needed in the build while also creating more output for the two lower octaves.

As far as I can tell, matching the two 2n5457 transistors do not improve the octave generators. I tested three pairs of matched transistors, each pair having a low, medium and high Vgs value. This basic test did not show any substantial differences between the three. Possibly the higher Vgs values made marginal improvements in some of the lower note skipping I mentioned earlier in the doc. But, the test wasn't wide enough to prove that conclusively. If you have a lot of 2n5457 transistors and want to test yourself, I used a pair matched within about 5% of 1.1v for mine. The other two brackets were .4v and .9v, resp. If you don't have a ton of transistors or the patience to test them, don't sweat it. The Lowrider will work with any quality 2n5457 you put in there.

Licensing: *You are free to use Lowrider 2015 PCBs for DIY and small commercial building. You may not sell Lowrider PCBs on your own (selling to fellow DIY'ers through the forums is fine, of course) or re-package them as part of a "kit". These guidelines are simple. Failure to follow them will produce negative vibes and give puppies the flu.*

Voltages

IC1	
Pin	DC
1	5
2	5
3	5
4	9.1
5	5
6	5
7	5
8	5
9	5
10	5
11	0
12	4.6
13	5
14	5

IC2	
Pin	DC
1	5
2	5
3	5
4	9.1
5	5
6	5
7	5
8	5
9	5
10	5
11	0
12	5
13	5
14	5

IC3	
Pin	DC
1	5
2	5
3	4.7
4	9.1
5	5
6	5
7	5
8	5
9	5
10	4.7
11	0
12	5
13	5
14	5

IC4	
Pin	DC
1	5
2	5
3	5
4	0
5	4.7
6	5
7	5
8	9.1

IC5	
Pin	DC
1	4.9
2	5
3	5
4	9.1
5	5
6	5
7	5.1
8	2.2mV
9	5
10	5
11	0
12	5
13	5
14	7.9

IC6	
Pin	DC
1	0
2	9.1
3	0
4	7.9
5	0
6	2.2mV
7	0
8	0
9	0
10	0
11	9.1
12	0
13	9.1
14	9.1

IC7	
Pin	DC
1	0
2	9.1
3	9.1
4	0
5	9.1
6	0
7	0
8	0
9	0
10	0
11	0
12	9.1
13	0
14	9.1

Q1	
D	9.1
G	4.6
S	7.9

Q2	
D	5
G	2.2
S	5

Q3	
D	5
G	2.2
S	5

