

# SUNKING

2015 edition

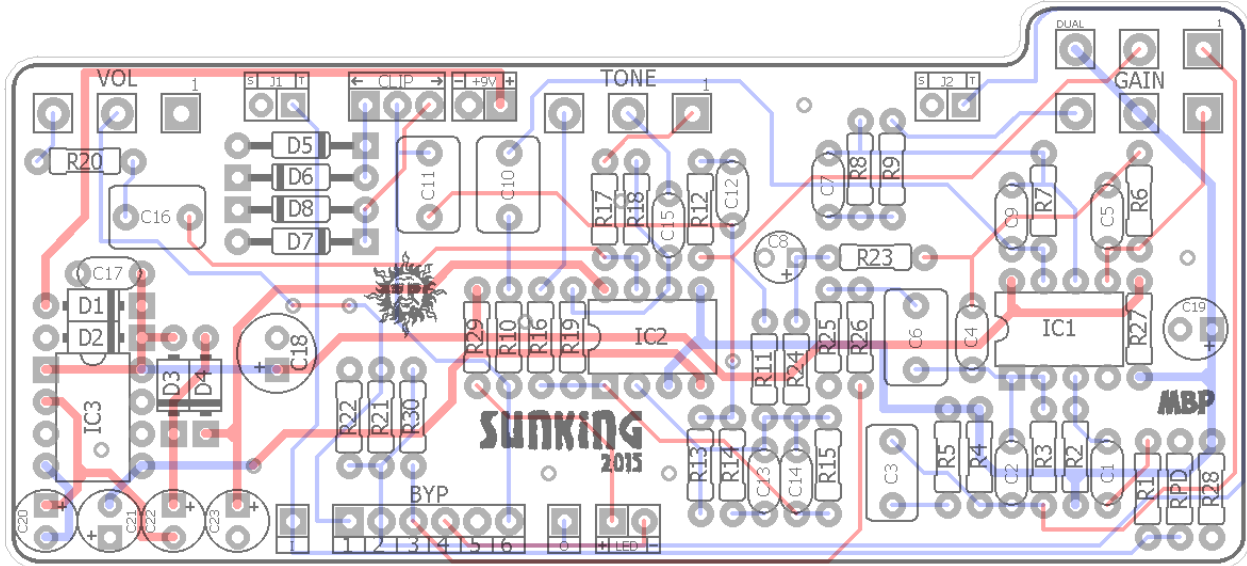
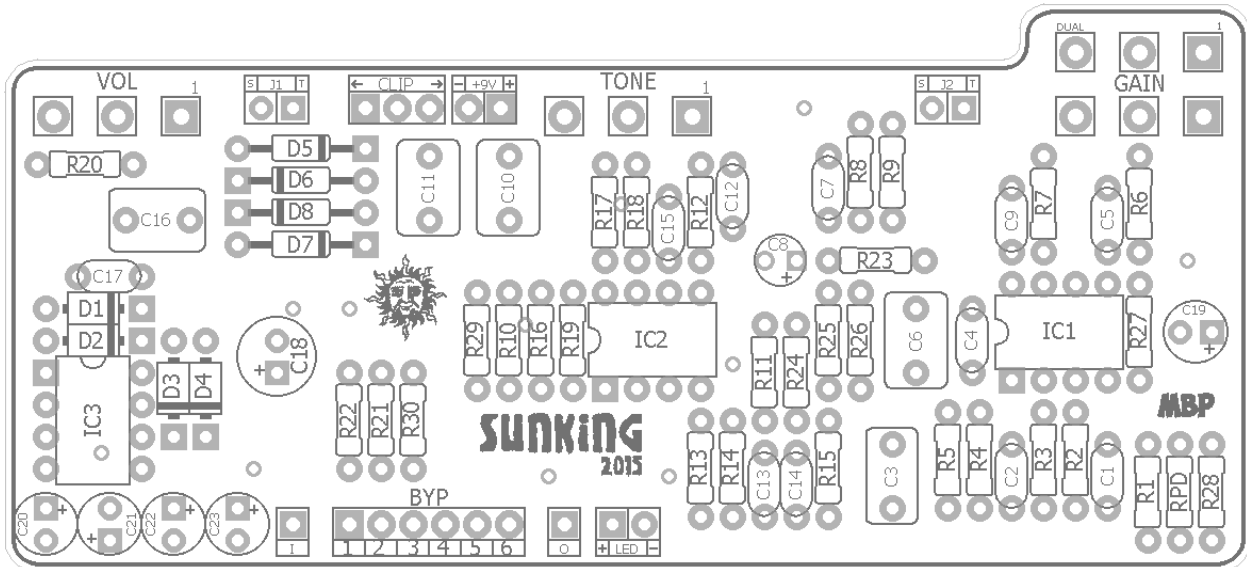
FX Type: **Overdrive**

Based on the Klon® Centaur™

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Previous Version: <http://www.madbeanpedals.com/Sunking/Sunking.zip>

3.9" W x 1.775" H



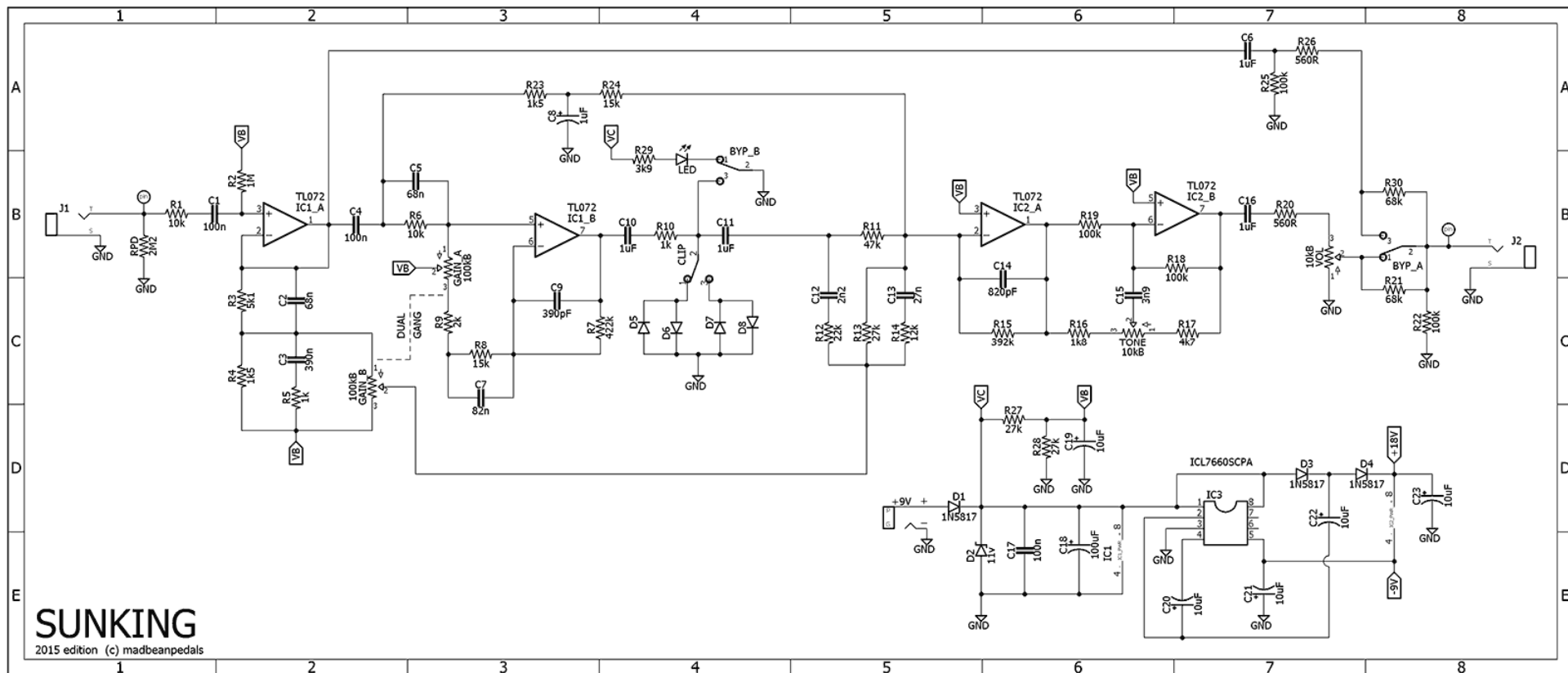
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B.O.M.					
Resistors		Caps		Diodes	
R1	10k	C1	100n	D1	1N5817
R2	1M	C2	68n	D2	11v Zener
R3	5k1	C3	390n	D3	1N5817
R4	1k5	C4	100n	D4	1N5817
R5	1k	C5	68n	D5	germanium
R6	10k	C6	1uF	D6	germanium
R7	422k	C7	82n	D7	your choice
R8	15k	C8	1uF	D8	your choice
R9	2k	C9	390pF	IC	
R10	1k	C10	1uF	IC1	TL072
R11	47k	C11	1uF	IC2	TL072
R12	22k	C12	2n2	IC3	ICL7660SCPA
R13	27k	C13	27n	Switch	
R14	12k	C14	820pF	CLIP	SPDT
R15	392k	C15	3n9	Pots	
R16	1k8	C16	1uF	GAIN	100kB Dual Gang
R17	4k7	C17	100n	TONE	10kB
R18	100k	C18	100uF	VOL	10kB
R19	100k	C19	10uF		
R20	560R	C20	10uF		
R21	68k	C21	10uF		
R22	100k	C22	10uF		
R23	1k5	C23	10uF		
R24	15k				
R25	100k				
R26	560R				
R27	27k				
R28	27k				
R29	3k9				
R30	68k				
RPD	2M2				

Shopping List			
Value	QTY	Type	Rating
560R	2	Metal / Carbon Film	1/4W
1k	2	Metal / Carbon Film	1/4W
1k5	2	Metal / Carbon Film	1/4W
1k8	1	Metal / Carbon Film	1/4W
2k	1	Metal / Carbon Film	1/4W
3k9	1	Metal / Carbon Film	1/4W
4k7	1	Metal / Carbon Film	1/4W
5k1	1	Metal / Carbon Film	1/4W
10k	2	Metal / Carbon Film	1/4W
12k	1	Metal / Carbon Film	1/4W
15k	2	Metal / Carbon Film	1/4W
22k	1	Metal / Carbon Film	1/4W
27k	3	Metal / Carbon Film	1/4W
47k	1	Metal / Carbon Film	1/4W
68k	2	Metal / Carbon Film	1/4W
100k	4	Metal / Carbon Film	1/4W
392k	1	Metal / Carbon Film	1/4W
422k	1	Metal / Carbon Film	1/4W
1M	1	Metal / Carbon Film	1/4W
2M2	1	Metal / Carbon Film	1/4W
390pF	1	Ceramic, Film, Mica	25v min.
820pF	1	Ceramic, Film, Mica	25v min.
2n2	1	Film	25v min.
3n9	1	Film	25v min.
27n	1	Film	25v min.
68n	2	Film	25v min.
82n	1	Film	25v min.
100n	3	Film	25v min.
390n	1	Film	25v min.
1uF	4	Film	25v min.
1uF	1	Electrolytic or Tantalum	25v min.
10uF	5	Electrolytic	25v min.
100uF	1	Electrolytic	25v min.
1N5817	3		
11v Zener	1		1/2 or 1W
germanium	2	1n34a, 1n270, D9E	
your choice	2	1n914, 1N4001, BAT41, LED	
TL072	2		
ICL7660SCPA	1	or, MAX1044CPA, TC1044SCPA	
SPDT	1	Solder Lug, On/On	
100kB Dual Gang	1	PCB Right Angle	16mm
10kB	2	PCB Right Angle	16mm

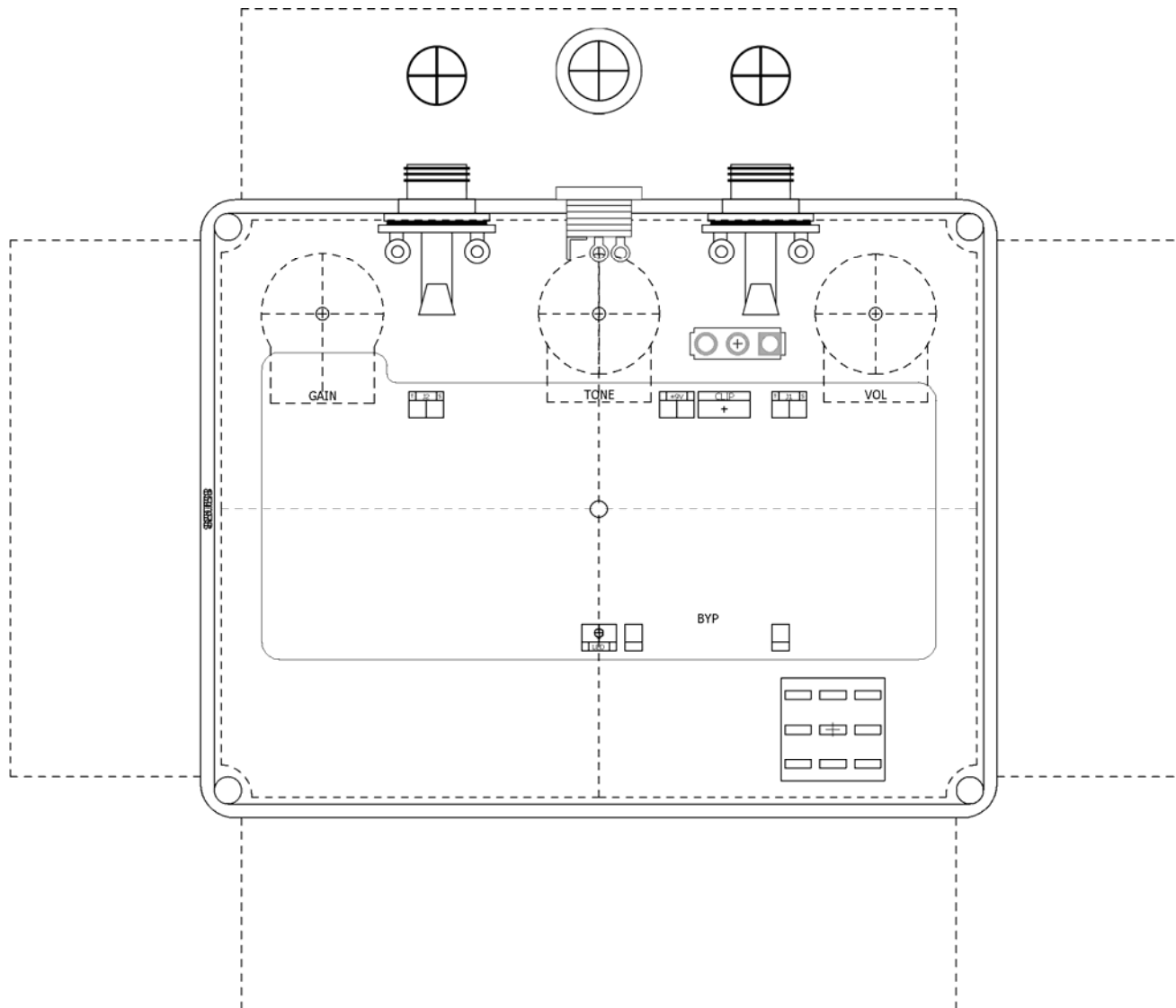
**If subbing for the ICL7660SCPA, use either the TC1044SCPA or MAX1044CPA.**

The 11v Zener is to protect the charge pump from being damaged if you plug in an power supply higher than 9v. The circuit will work without it but be careful plugging in power supplies if you omit it!



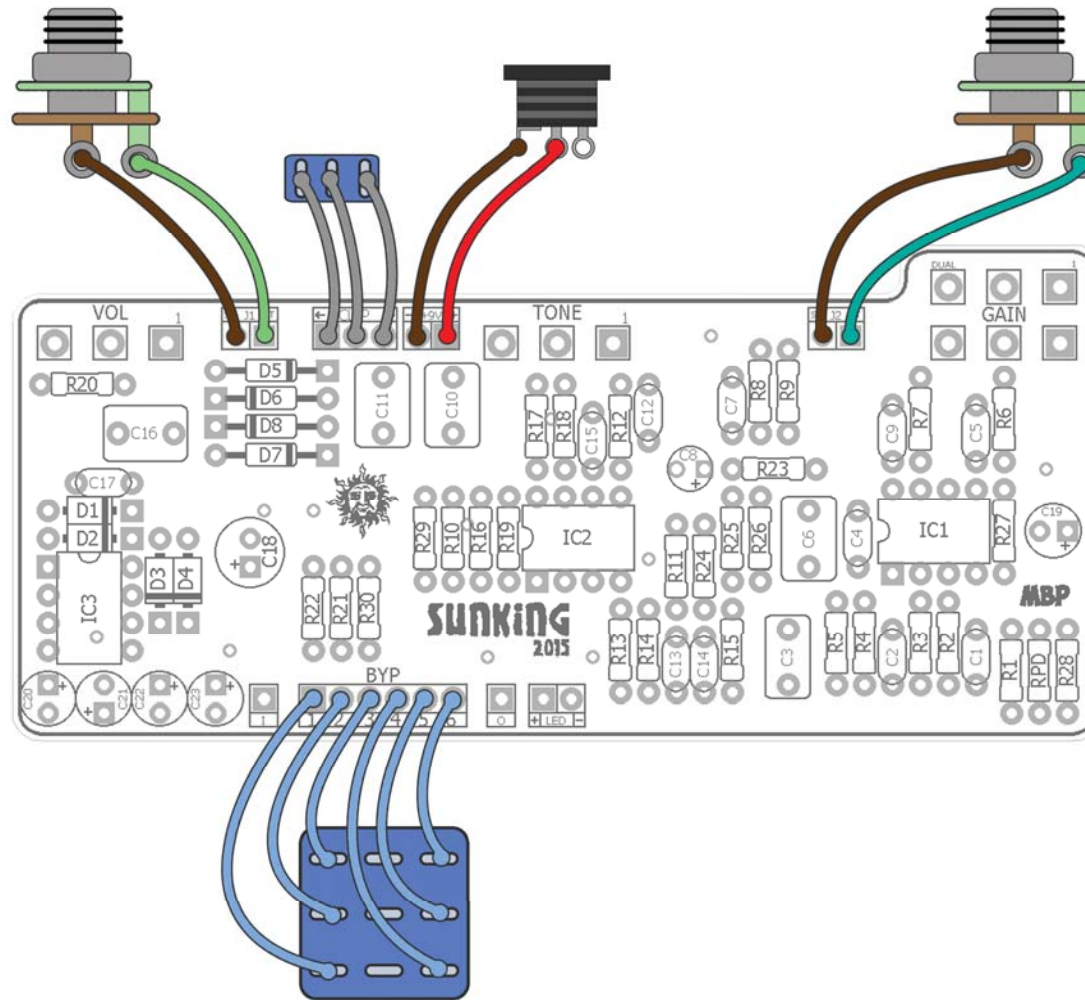
## 1590BB Drill Guide

6.82" W x 5.81" H



Photoshop file: [http://www.madbeanpedals.com/projects/Sunking/Sunking\\_DRILL.zip](http://www.madbeanpedals.com/projects/Sunking/Sunking_DRILL.zip)

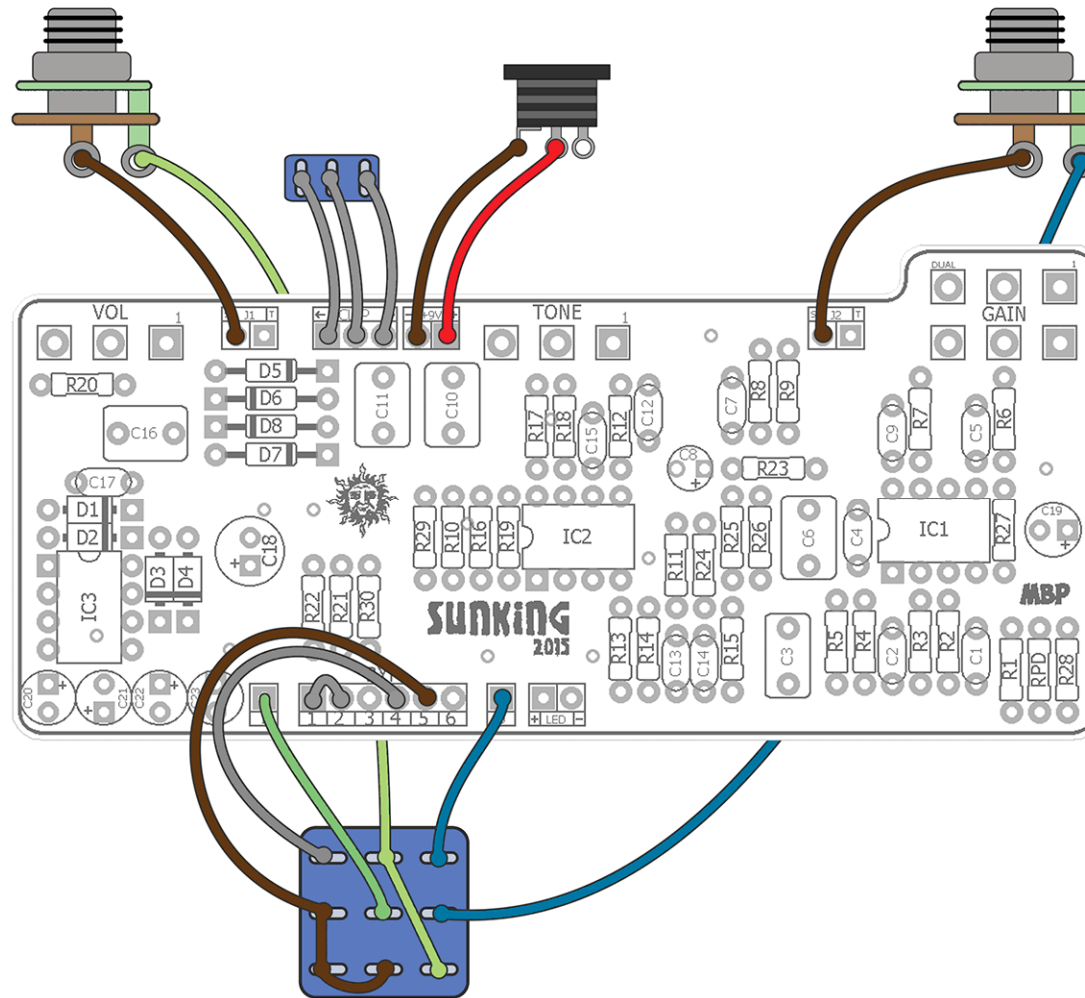
## Buffered Wiring Guide



- Omit the "RPD" 2M2 resistor
- The indicator LED can be soldered directly to the PCB

**09/12 - Buffered wiring diagram corrected (pads 4 and 6 were originally shown reversed).**

## True Bypass Wiring Guide



- Install the "RPD" 2M2 resistor
- Omit C6, R25, R26, R30 and R21 (buffer circuitry)
- Be sure to jumper pads 1 and 2 together on the Bypass Switch area of the PCB
- The indicator LED can be soldered directly to the PCB

## 2015 Edition Changes

- Eliminated the BS250 reverse polarity protection scheme in favor of the simpler D1 diode due to limited availability of the BS250 for some builders.
- Eliminated Thick and Fat mods based on customer feedback.
- Reduced PCB foot-print for an easier fit in the 1590BB enclosure

## Controls

**VOL** – Passive output control. Turn this up when the GAIN is down to make the Sunking2 a boost.

**TONE** – An active tone control. Stock it is mostly a treble boost, but if you use my suggested parts sub, it opens up the tone control further by having less extreme treble boost and a fair amount of tone cut over the range of the pot.

**GAIN** – The dual-ganged gain pot blends between the overdrive and clean signal paths. The overdrive section is done via germanium diodes set up as hard clippers.

**CLIP** – This optional mod lets you switch between two sets of clipping diodes.

## Notes

The **Sunking** can be built in either buffered or true bypass modes. With the True Bypass wiring, the circuit is completely removed when bypassed and the circuit input is grounded. The Buffered wiring buffers your bypass guitar signal when the effect is off.

Why choose buffered over true bypass? True bypass, despite what you may have read, is not the be-all end-all of guitar effects. There is one supposed advantage to true bypass: no loading down or tone alteration of your guitar signal. However, this is not always the case. Capacitance on your guitar cables over long distances will load your guitar signal and thus create some signal loss in the high frequency range. Even low-capacitance cable can affect tone *if* you use enough of it or your pedal junkie pedalboard has tons of true bypass effects in series. So, it's best not to assume that true bypass automatically means your guitar signal is completely un-affected because if the other factors are in play it might make your tone *worse*.

Buffered bypass offers a different advantage. It guarantees no signal loss due to cable capacitance or excessive cable lengths. It takes a high impedance input and through just a few parts gives you an extremely low impedance output thus removing any loading down of the signal. People mistakenly think that a buffer brightens your guitar signal, but this is not the case. When you run your guitar through a buffer, you are hearing what the guitar actually sounds like without any (significant) loading. IOW, it's the true sound of your guitar through your amp. Of course, this assumes that you are using a quality buffer that is low noise and well-designed electronically. Luckily, this is the case with the **Sunking** (or, Klon™ since that's what it derives from). My personal preference is buffered bypass for the **Sunking**, but don't take my word for it. Try experimenting with buffers on your own rig and see what you find. You might like it!

## Clip Mod

If you are doing the clip mod, put your germanium diodes in D5 and D6. D7 and D8 are for your choice of diodes. There are tons of things you can try here: symmetrical, asymmetrical, 1n914, 1N4001, BAT41 (maybe two in series on each side), FETs, and LEDs. There is no single “best” choice...it's just a matter of experimentation. Personally I like 1n34a or D9E for the stock clipping and diffused red LEDs for the alternate.

Bonus: If you use an On/Off/On switch instead, the middle position will have no clipping diodes. The result is additional volume gain from the overdrive section that actually sounds pretty good. However, it will only work for about the first half of the Gain pot. **After that, the pedal will start to whine and oscillate. Keep that in mind if you are doing this.**



## Tone Mods

**Change C15 to 5n6 or 6n8:** I'd rank this as an "essential" mod. This will shift the tone control range further down the frequency spectrum. It will give you more high end roll-off when the tone control is down and not be so bright when it is all the way up. I use 5n6 on all my builds.

**"Silver Pony" mod:** The BYOC Silver Pony used a different set of mods. Since it is no longer in production I think is probably okay to mention it here because it is equally useful. Instead of increasing the value of C15, the SP swaps the values for R16 and R17 (Sunking schematic). This ends up having a similar effect on the tone control range although they are obviously not exactly the same. To do this mod, use 4k7 for R16 and 1k8 for R17. I like this mod, but I tend to stick with changing C15 because my ear is used to it.

## Bass Mods

If you want to try and adopt the Sunking for a more bass-friendly overdrive, try the following (caveat - I have not verified or even tried this. These are the values I would start with based on the math involved):

**C1, C2, C4:** 220n

**C5:** 100n

**C9, C14:** 1n

**C7:** 270n or 330n

**C12:** 6n8

**C13:** 56n

**C15:** 10n or 15n

**C3:** 1uF

## Ethical Considerations

When EHX® is "cloning" your pedal (the Klon™, I mean) and *another company* is modding that clone to make it like the second version of the original pedal which is not being produced and the first version is long gone and costs as much as a high-end boutique amplifier then...*n/m I've gone cross-eyed*. The Klon™ is now part of the lexicon of classic overdrive circuits. It will be used, re-used, modified, unmodified, lauded, mocked and loved by generations of players and mojo-minded musical machine manufacturers. But, this is DIY so we can put aside any politics around that situation and concentrate on having fun building something.

However, I will make the following disclaimer: *When mentioning the Klon™ in this document, I am referring to both the circuit design and product itself as a basis of comparison. The Sunking is not a duplicate or clone of the Klon™. Rather, it is a circuit board that lets one build a reasonable facsimile of a the Klon™, which is no longer in production. There are several differences in the electronic design of the Sunking and the Klon™ both in the power section and the included mods. This means that it is not a direct copy of the Klon™ and I do not represent it as such.*

If you want the closest thing to the classic Klon™, then you should buy the KTR™ and support its designer. It is more readily available than ever and there is no reason to doubt that it is anything other than what the Klon is supposed to sound like. But, we are also builders and as such we tend not to buy many commercial pedals. Therefore, if you are building the Sunking then make it your own. Have fun with it, mod and experiment. Make it into what you want it to sound like and ignore all the crazy hoopla that seems endemic to this particular effect.

## Voltages

9.42v Supply					
IC1	TL072	IC2	TL072	IC3	ICL7660CPA
1	4.6	1	4.64	1	9.17
2	4.6	2	4.6	2	5.47
3	3.6	3	4.59	3	0.5mV
4	0.5mV	4	-8.9	4	-3.59
5	4.58	5	4.59	5	-8.9
6	4.6	6	4.6	6	4.49
7	4.6	7	4.55	7	5.7
8	9.17	8	17.7	8	9.17