

GASTANK

FX TYPE: Bass Distortion

Based on the Chunk Systems® Brown Dog™

Enclosure Size: 125B

"Softie" compatibility: none

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Overview

The Agent 00Funk and BrownDog were produced by Australia's ChunkSystems and marketed to the bass playing community (Bootsy Collins was apparently a big fan) around the late 00's to early 2010's. I'm not sure if they went completely out of business but the pedals seemed to have been discontinued and only show up on the used market. That makes for ripe DIY projects!

The **GasTank** is based on the BrownDog. It's a hard-edged op-amp distortion with a clean blend. The clean blend is essential for bass drives as it allows one to restore some of the bottom end that sometimes goes away with distortions. The GasTank has minimal tone shaping so you pretty much get your same bass tone out of it with the ability to dial in some pretty sick square wave. The only modification I made to the original circuit was to add a 100R current limiting resistor on the power supply.

Special note: Neither the Agent 00Funk nor the BrownDog were true-bypass. In fact, they are not even buffered bypass being that the only outputs were switched. The GasTank has two options for wiring: true bypass and "envelope bypass", as one might call it. The envelope bypass is only used when building the GasTank with the ENV jack option. This option allows you to connect the clean input of the GasTank to the envelope input of the JunkTrunk and is useful when using both pedals together.

Controls

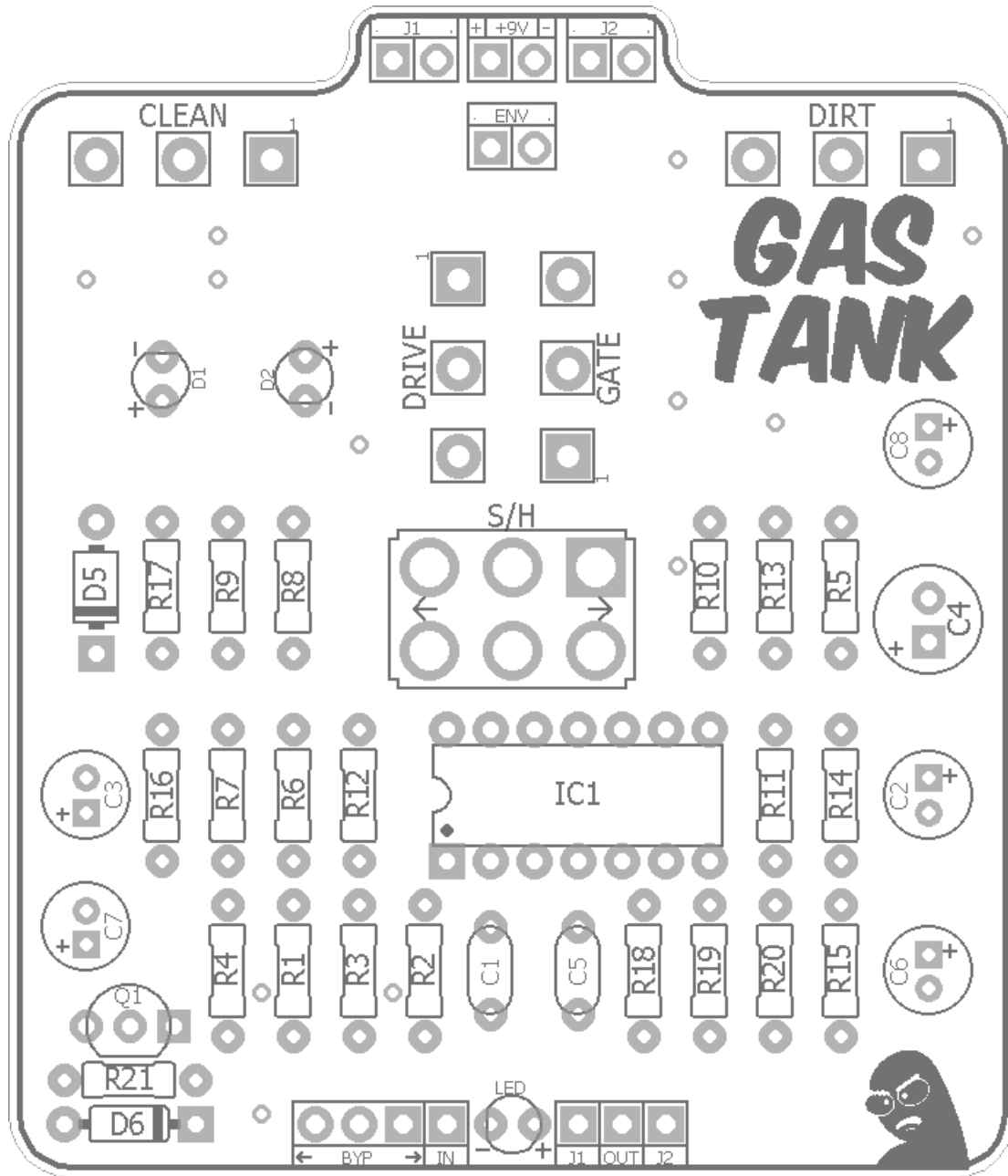
- **DIRT** - Sets the distortion volume at the output.
- **CLEAN** - Sets the clean signal volume at the output.
- **DRIVE** - Total gain, from "warm" to hard-edge distortion.
- **GATE** - This control allows you to dial out noise. CCW - no gate and the distortion is wide open. CW: as you turn it up it will first eliminate hiss and noise at the highest Drive settings. The further up you go it starts squash the dynamics into a highly gated response.
- **S/H** - Left: soft clipping (op-amp distortion). Right: hard clipping (op-amp distortion plus LED clipping).
- **ENV (optional)** - This jack is used to connect to the JunkTrunk (envelope filter) to allow for more dynamic response in the filter when both pedals are used together. More details in the Notes section.

The GasTank and JunkTrunk are primarily bass effects. Whereas the JunkTrunk does have some good settings for guitar, I would recommend *against* building the GasTank if you are looking for guitar distortion. The one exception is if you want some of the synth-type tones you can get when combined with the JunkTrunk. Those are cool sounding. However, the [Edgelord](#) project is probably a better fit as it works equally well on guitar and bass.

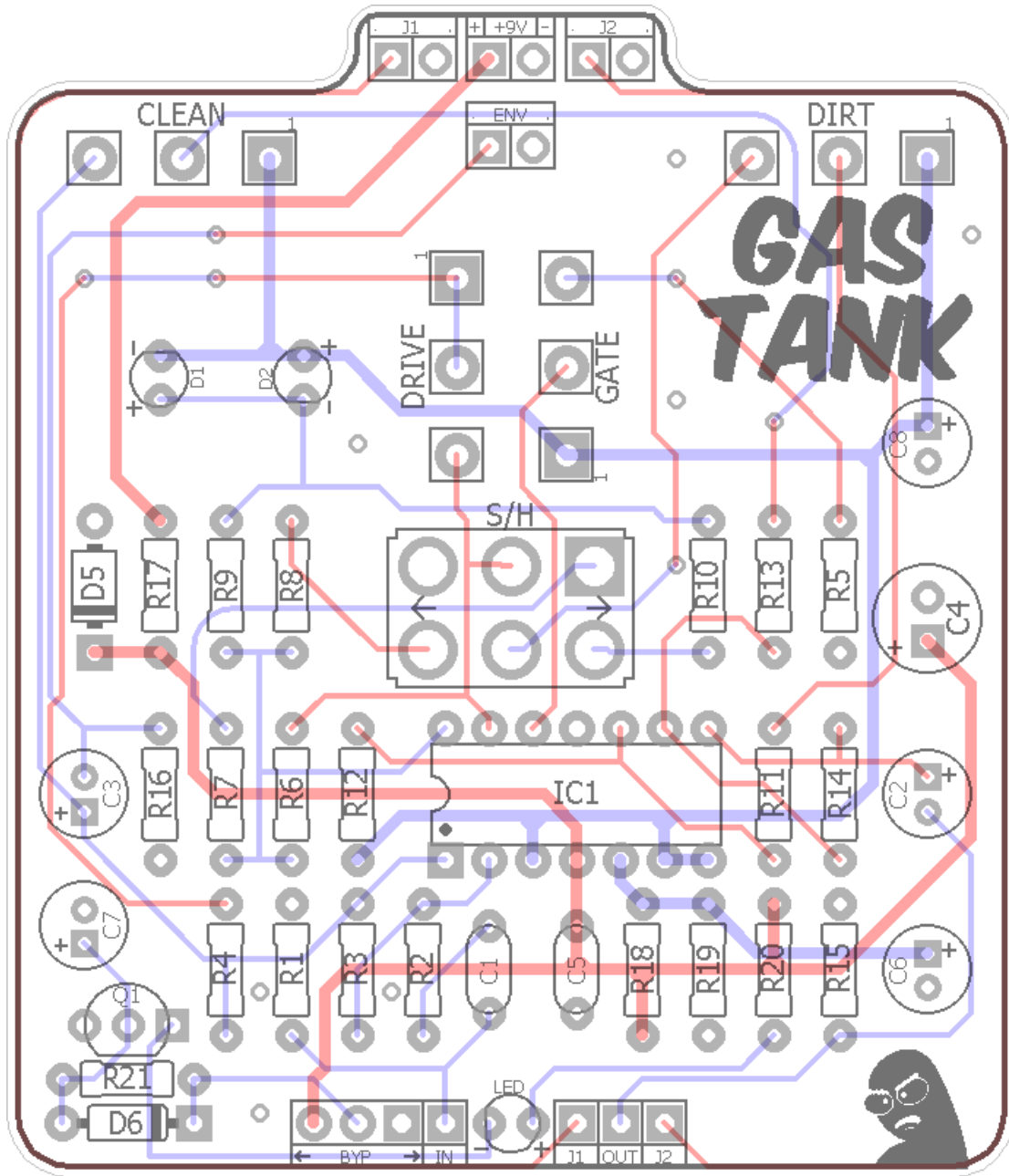
This demo will give you a really good idea of how the Agent 00Funk and BrownDog operate and sound: <https://www.youtube.com/watch?v=OEHMyyiwZMA&t>

Terms of Use: You are free to use purchased **GasTank** circuit boards for both DIY and small commercial operations. You may not offer **GasTank** PCBs for resale or as part of a "kit" in a commercial fashion. Peer to peer re-sale is fine, though.

Technical assistance for your build(s) is available via the [madbeanpedals](http://madbeanpedals.com) forum. Please go there rather than emailing me for assistance on builds. This is because (1) I'm not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates a record from which other members may benefit.



C8 should be left empty. It was put in as extra filtering for the buffered VB rail but it's not needed and actually could create problems in a high gain circuit like this. So, out it goes!



Resistors		Caps		Diodes	
R1	2M2	C1	100n	D1	LED
R2	220k	C2	4u7	D2	LED
R3	1M	C3	4u7	D5	1N4001
R4	1k	C4	100uF	D6	1n914
R5	1M	C5	100n	Transistors	
R6	10M	C6	4u7	Q1	2n3904
R7	2M2	C7	4u7	ICs	
R8	470k	C8	omit	IC1	TL074
R9	1k	Switches			
R10	100k	S/H DPDT			
R11	2M2	Jacks			
R12	2M2	ENV 1/8" jack			
R13	2M2	Pots			
R14	2M2	CLEAN 100kA			
R15	10k	DIRT 100kA			
R16	10k	DRIVE 100kA			
R17	100R	GATE 100kA			
R18	1M				
R19	1M				
R20	4k7				
R21	33k				

Values	QTY	Type	Rating
100R	1	Metal / Carbon Film	1/4W
1k	2	Metal / Carbon Film	1/4W
4k7	1	Metal / Carbon Film	1/4W
10k	2	Metal / Carbon Film	1/4W
33k	1	Metal / Carbon Film	1/4W
100k	1	Metal / Carbon Film	1/4W
220k	1	Metal / Carbon Film	1/4W
470k	1	Metal / Carbon Film	1/4W
1M	4	Metal / Carbon Film	1/4W
2M2	6	Metal / Carbon Film	1/4W
10M	1	Metal / Carbon Film	1/4W
100n	2	Film	16v min.
4u7	4	Electrolytic	16v min.
100uF	1	Electrolytic	16v min.
LED	2	Yellow, Diffused	5mm
1N4001	1		
1n914	1		
2n3904	1		
TL074	1		
DPDT	1	On/On, Solder Lug	
miniJack	1	1/8" (optional)	
100kA	4	PCB Right Angle	16mm

The yellow LEDs are the clipping diodes. For a bypass indicator LED, you can use any of the standard 3 or 5mm diffused types.

TL074:

<http://smallbear-electronics.mybigcommerce.com/ic-tl074/>

DPDT (On/On):

<http://smallbear-electronics.mybigcommerce.com/dpdt-on-on-solder-term/>

16mm PCB Right Angle Pots (100kA):

smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/

Thinline DC Jack:

<http://smallbear-electronics.mybigcommerce.com/dc-power-jack-all-plastic-unswitched-2-1-mm/>

Open-Frame Mono (recommended for this build):

<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-nys229/>

Optional

1/8" MiniJack:

<http://smallbear-electronics.mybigcommerce.com/1-8-mono-pc-mount/>

When using the miniJack option, you will need a 1/8" plug to connect the JunkTrunk and GasTank. You can actually use a standard TRS headphone type cable for this. Even though it is stereo, it will connect to the linked jacks as if it were mono.

Something like this will work:

https://www.amazon.com/gp/product/B00NO73IN2/ref=ox_sc_act_title_1?smid=ATVPDKIKX0DER&psc=1

You can also construct your own 1/8" plugs with a couple of these:

<http://smallbear-electronics.mybigcommerce.com/1-8-mono-straight/>

The ENV jack allows you to connect the input section of the GasTank directly to the envelope detector circuit in the JunkTrunk. As a standalone effect, the Junk Trunk's envelope follower is keyed off its buffered input section (actually, it's a low gain amplifier rather than buffer but that's not important here). With a clean signal going in, the envelope tracks very well to player dynamics. If you run the GasTank in series with the JunkTrunk, you'll get a massive squared up fuzz feeding the JunkTrunk's envelope follower instead. So, it will be less responsive to those same playing dynamics due to the compressed nature of the fuzz.

The ENV jack let's you fix that by feeding the input section of the GasTank directly to the envelope follower of the JunkTrunk. So, you still have the fuzz going into the JunkTrunk, but the envelope reacts as if it's being fed a clean signal. Neat, huh?

The ENV jack is optional. It's only used if you are planning on building both the Gas Tank *and* JunkTrunk. If you are not building the JunkTrunk do not install the jack in the GasTank. Or, you can choose to build both projects without the envelope jack. They will work together without it. I think it's well worth the few added dollars to include it since it adds another dimension to the fuzz/envelope combo.

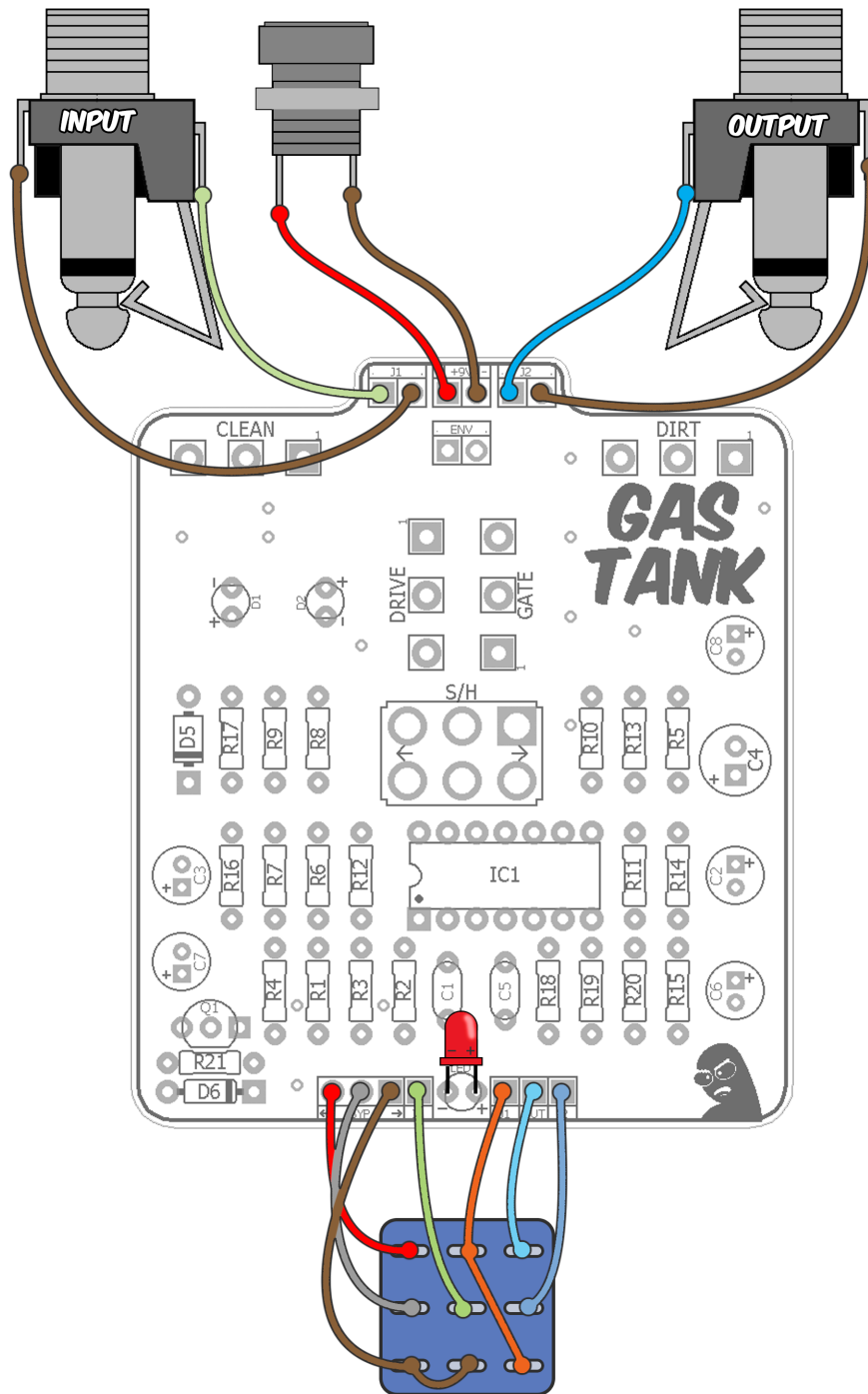
The miniJack "Breadbuddy" PCB is included with both the JunkTrunk and GasTank. This makes the wiring easier.

Additional Notes

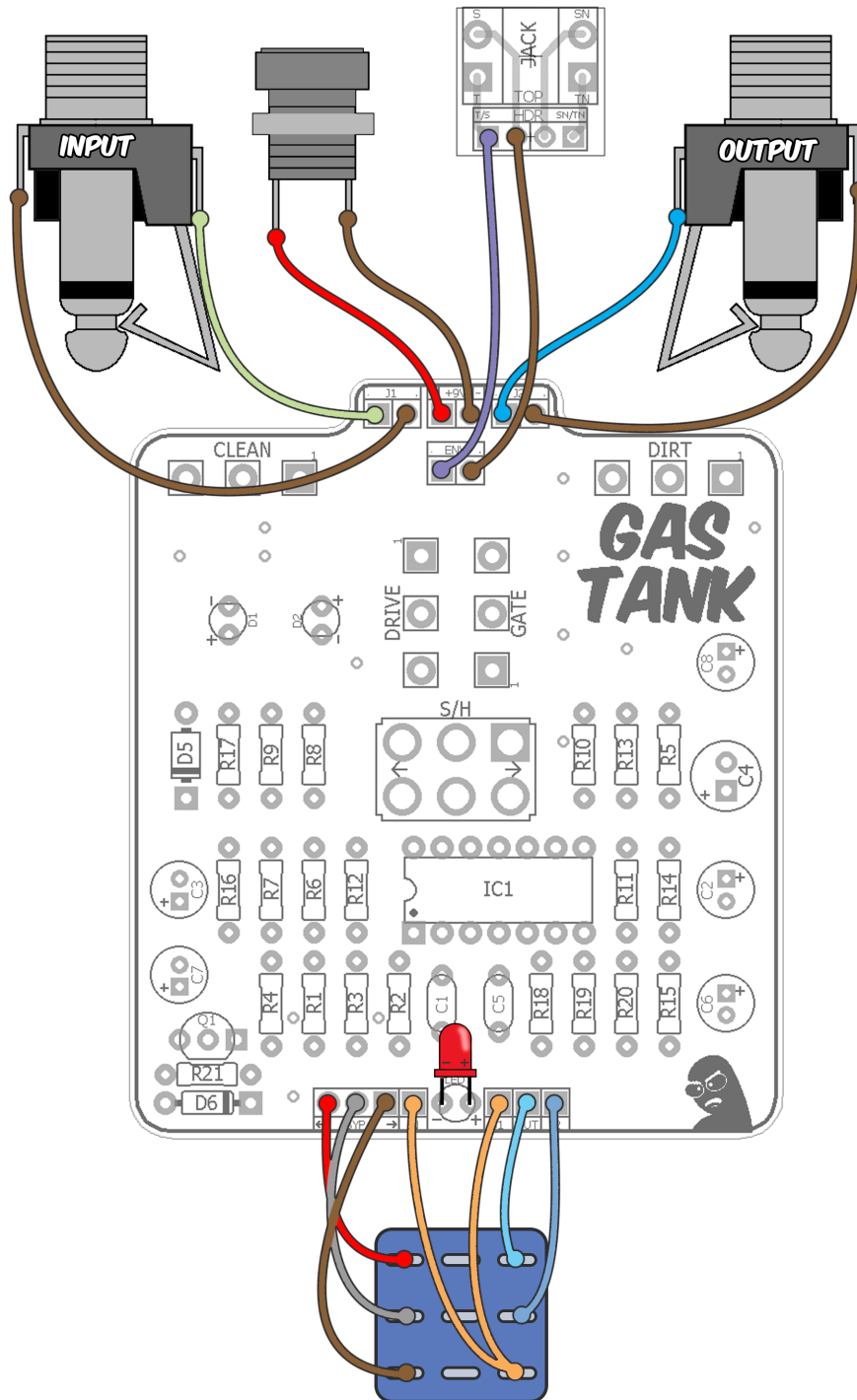
- If you have the Drive control set near max and the Dirt control all the way down, you may still hear some distorted signal passing to the output. This seems to be the nature of the design. Possibly because the Drive and Clean volume controls are connected to VB instead of ground. It's not a big deal because the purpose of this effect is to output distortion with the option of adding clean signal in, not the other way around.
- Unboxed and on a testing rig, you may get some feedback or oscillation with the Drive at max and Gate at min. This seemed to pretty much go away in my build once it was boxed up. Just keep in mind once you have the Drive setting 3/4 to max you are going to need to dial in a little bit of the Gate control to get rid of noise. It works really well so you don't need to turn the Gate control up very far to have an effect.
- At some settings the yellow LED clippers may light up somewhat asymmetrically. They tend to get more symmetrical when the Gate control is turned up.

PS: It may be possible to use a 1/4" jack in place of the 1/8" one and just use a standard pedal patch cable. You'll need to alter the drilling diagram later on in this doc to do so. Best bet is to put the third 1/4" jack near the spot on the drilling diagram where the DC jack is, and then move the DC jack between the input and output. You'll need to use a switched jack like this: smallbear-electronics.mybigcommerce.com/1-4-mono-enclosed-nmj4hcd2/

Spend some time to get the drill spots correct so everything fits. Good luck!

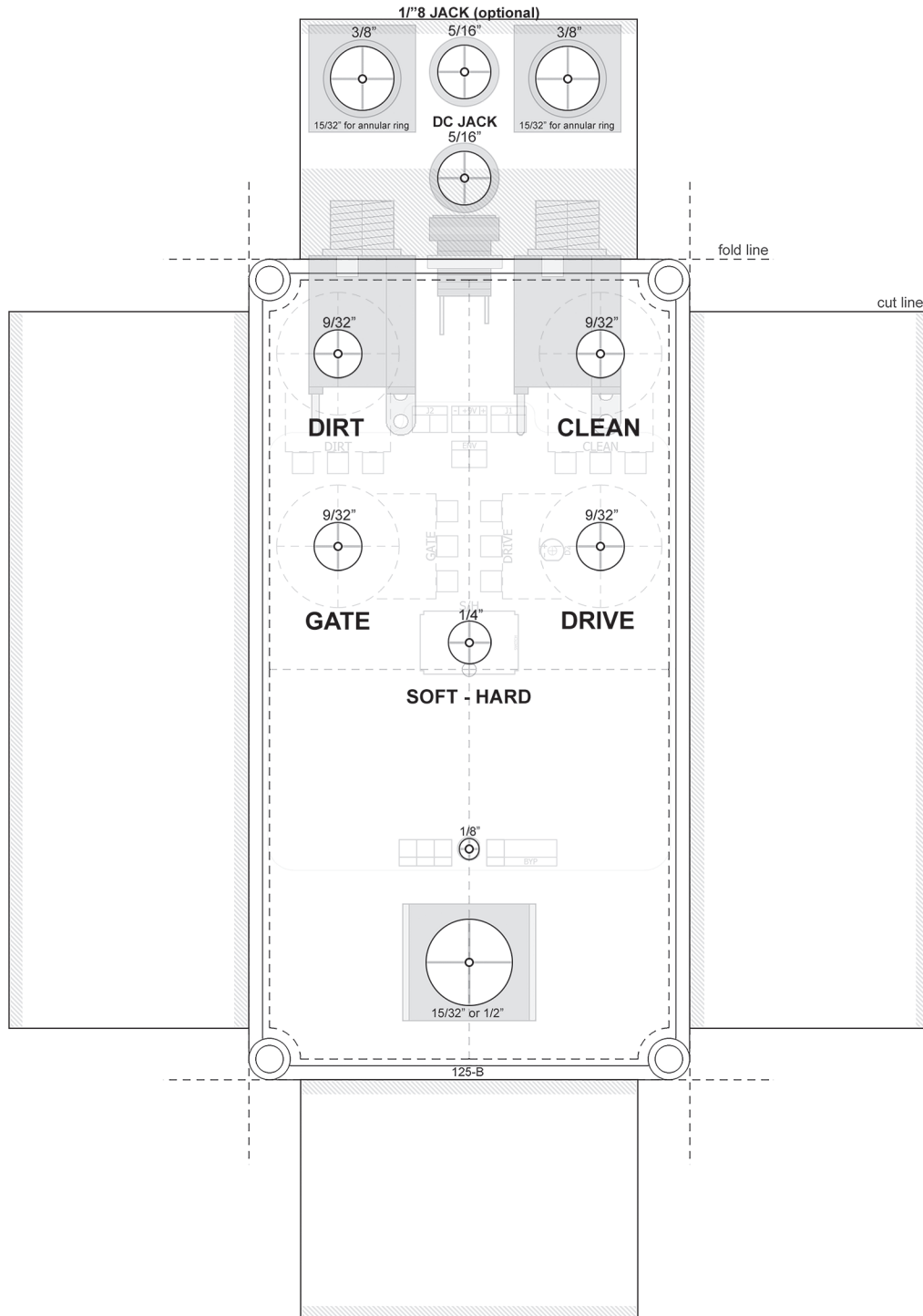


- Use this wiring for true-bypass operation. This wiring will not work if you are using the ENV jack option to connect to the JunkTrunk.
- Leave the ENV pads unconnected.



- Use this wiring for non true-bypass operation. Only use this wiring if you are including the ENV jack option to connect the GasTank to the JunkTrunk envelope.

Note: Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.



- Although this template shows enclosed jacks I recommend open frame jacks like the Neutriks for this build. When installing the PCB in the enclosure, first wire the DC jack. Then mount the 1/8" jack to the enclosure. Finish by mounting the 1/4" jacks. It's a close fit (four different jacks at the top!) but goes together smoothly if you do it in that order.

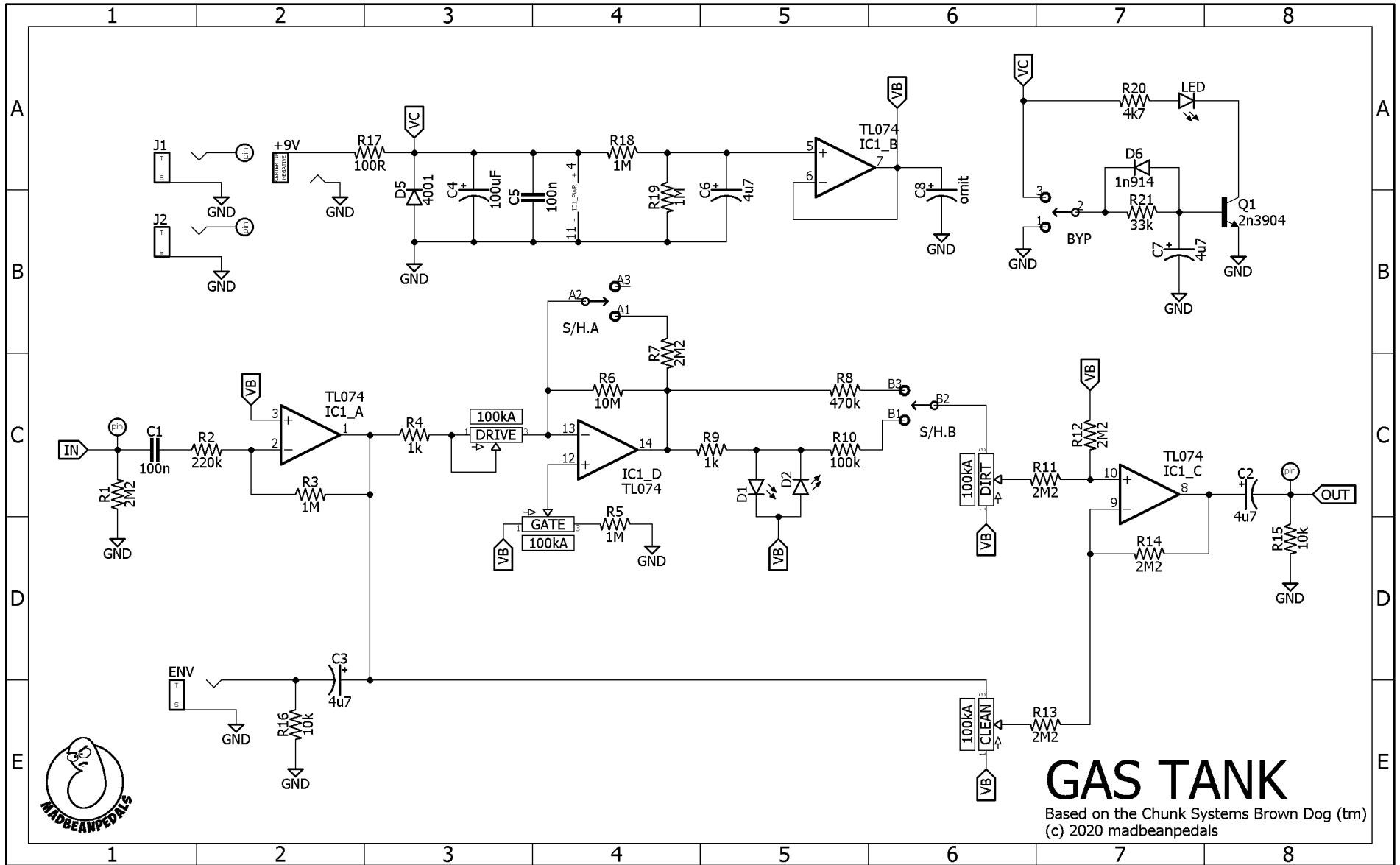
IC1	TL074
1	4.35
2	4.35
3	4.35
4	8.73
5	4.2
6	4.35
7	4.35
8	4.28
9	4.35
10	3.91
11	0
12	4.29
13	4.31
14	1.71

- 9.42vDC One Spot
- Current Draw: ~6mA
- Testing conditions: pots 1/2up, toggle switch left side.
- GATE setting will change some readings.



With ENV jack.

This shows C8 populated. I removed it some time after taking this pic.



GAS TANK
 Based on the Chunk Systems Brown Dog (tm)
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