VFE_DARKHORSE

FX TYPE: Distortion

Enclosure Size: 1590B, 125B

Overview

From the VFE website:

The DARK HORSE is a hard-edged distortion beast. From bluesy hints of low-gain grit, to face-melting doom in a box, the DARK HORSE distortion pedal defies genre classification. The active Baxandall tone stack adds a huge range of tonal variations: from mid scoop to mid hump, bass boost to treble boost, and any shade between. The unique COMP control lets you control the pedal's dynamics, from long, singing sustain to earth-shaking distortion.

HOW THE DARK HORSE CAME TO BE

The early hand-painted Dark Horse pedals were built from the original DS-1 distortion circuit. The circuit had a great biting edge to the distortion, but was really limited in its bottom end response. I completely overhauled the circuit, from the pre-gain, post-gain, EQ and clipping sections, plus a charge pump for extended headroom, I changed nearly everything in the circuit.

The final design allows the user to fine tune the character of the distortion with the internal FAT trimpot, from tight & punchy to thick & meaty, and from there is an endless array of tonal and compression controls to shape the perfect hard-edge distortion tone.

Controls

LEVEL: Simple output volume control. It's technically a passive attenuator, which means it lets you tame the huge signal inside the pedal. Crank it up to unleash the beast and push your amp way past 11.

GAIN: Sets the gain of the primary gain stage. There is a HUGE amount of gain on tap, but the extended headroom provided by the internal charge pump provides the power to supply the extra gain.

COMP: Sets the amount of compression of the distortion. Turn it back for lead tones with singing sustain, or push it forward for dynamic, ballsy in-your-face distortion tones.

S - L - A: Selects between saturated, sustaining germanium distortion (S), big & ballsy LED crunch (L), and an even harmonic rich asymmetrical combo silicon + LED tone (A)

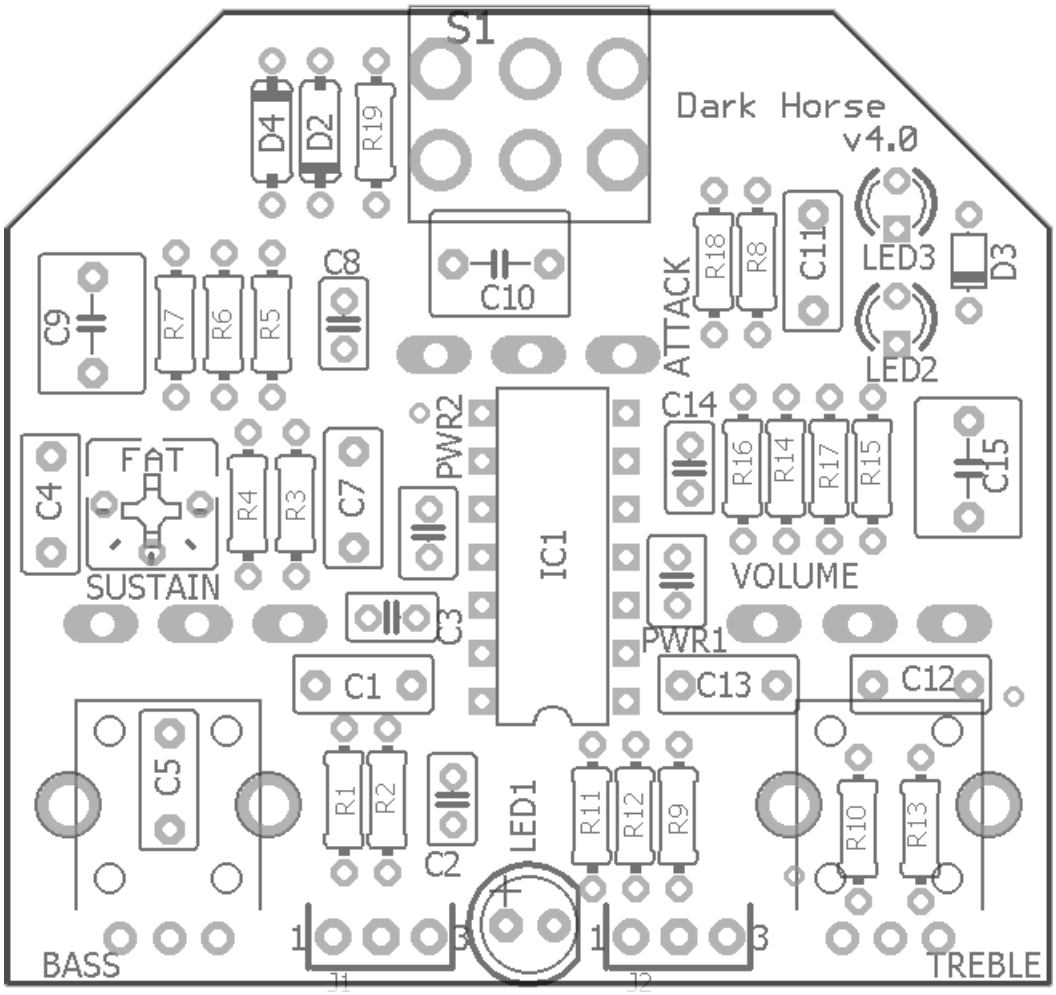
TREBLE: Controls the treble boost/cut. About +/-12dB of range. This control is post-EQ

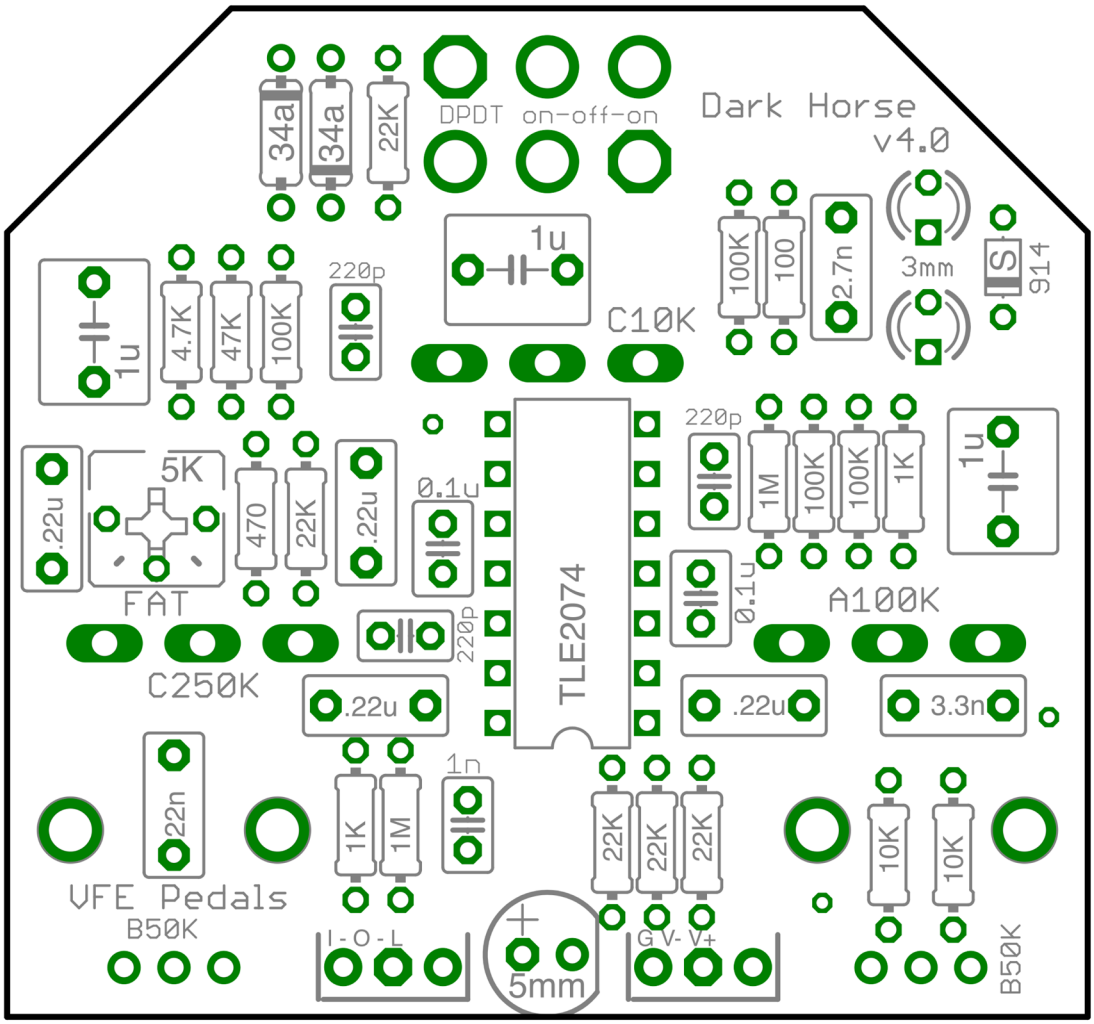
BASS: Controls the bass boost/cut. About +/-12dB of range. This control is post-EQ

NOTE: To scoop the mids, simple boost the treble/bass. To boost mids, cut treble/bass.

FAT: Internal trimmer that works as a pre-gain bass boost.

Technical assistance for your build(s) is available via the madbeanpedals 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.


S1
Dark Horse
v4.0
D4
D2
R19
C10
C8
C9
R7
R6
R5
R18
R8
C11
LED3
D3
LED2
ATTACK
C14
R16
R14
R17
R15
C15
C4
FAT
R4
R3
C7
PWR2
IC1
SUSTAIN
VOLUME
C3
PWR1
C1
C13
C12
C5
R1
R2
C2
LED1
R11
R12
R9
R10
R13
BASS
TREBLE
J1
J2



Axial parts
1 x 1N914
1 x 100
1 x 470
2 x 1K
1 x 4.7K
2 x 10K
5 x 22K
1 x 47K
4 x 100K
2 x 1M
2 x 1N34a

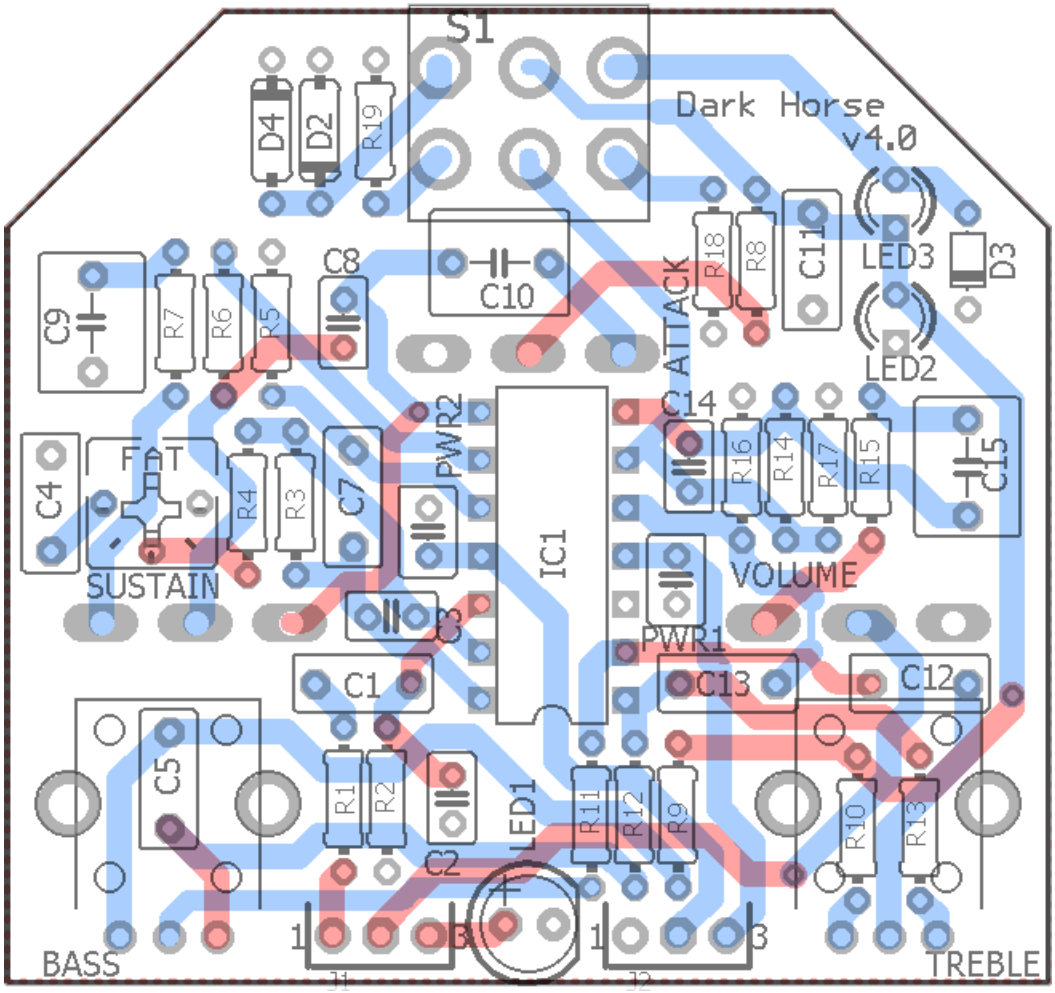
2.5mm caps
3 x 220p
1 x 1n
2 x 0.1u

5mm caps
2 x 2.7n
1 x 22n
4 x .22u
3 x 1u

Other
1 x TLE2074
1 x 5K trim
2 x 3mm LED
(red diffused)

Note: Use the values listed on the image above – not the values indicated on the silk-screen of the PCB. Some values changed over time in the VFE product cycles.

Update 01.21: C12 is shown as 3n3 on the PCB image but listed as 2n7 on the right. I believe 2n7 is the intended value and the image is a misprint.



REMINDER: PETER RUTTER / VFE DOES NOT PROVIDE SUPPORT FOR THESE PROJECTS. PLEASE DO NOT CONTACT HIM FOR QUESTIONS OR TECHNICAL SUPPORT. VISIT THE VFE SECTION OF THE MADBEANPEDALS FORUM FOR QUESTIONS AND ANSWERS!

Resistors		Caps		Diodes	
R1	1K	C1	220n	D2	1n34a
R2	1M	C2	1n	D3	1n914
R3	22K	C3	220pF	D4	1n34a
R4	470R	C4	220n	LED1, 2	RED
R5	100K	C5	22n	IC	
R6	47K	C7	220n	IC1	TLE2074
R7	4.7K	C8	220pF	Switch	
R8	100R	C9	1uF	S1	DPDT
R9	22K	C10	1uF	Trimmer	
R10	10K	C11	2n7	FAT	5K
R11	22K	C12	2n7	Pots	
R12	22K	C13	220n	COMP	10kC
R13	10K	C14	220pF	VOLUME	100kA
R14	100K	C15	1uF	SUSTAIN	250kC
R15	1K	PWR1	100n	BASS	50kB
R16	1M	PWR2	100n	TREBLE	50kB
R17	100K				
R18	100K				
R19	22K				

Value	QTY	Type	Rating
100R	1	Carbon / Metal Film	1/4W
470R	1	Carbon / Metal Film	1/4W
1k	2	Carbon / Metal Film	1/4W
4k7	1	Carbon / Metal Film	1/4W
10k	2	Carbon / Metal Film	1/4W
22k	5	Carbon / Metal Film	1/4W
47k	1	Carbon / Metal Film	1/4W
100k	4	Carbon / Metal Film	1/4W
1M	2	Carbon / Metal Film	1/4W
220pF	3	Ceramic / MLCC	2.5mm
1n	1	Ceramic / MLCC	2.5mm
100n	2	Ceramic / MLCC	2.5mm
2n7	2	Film	5mm
22n	1	Film	5mm
220n	4	Film	5mm
1uF	3	Film	5mm
1n34a	2		
1n914	1		
LED	2	Red, Diffused	3mm
TLE2074	1		
DPDT	1	On/Off/On, Solder Lugs	
5k	1	Boourns 3362p	
10kC	1	PC Mount, Right Angle	16mm
250kC	1	PC Mount, Right Angle	16mm
100kA	1	PC Mount, Right Angle	16mm
50kB	2	PC Mount, Plastic Shaft	9mm

Please see the NOTES section for the suggested clipping mod. It uses a 1N4001 instead of a 1n914.

220pF MLCC (2.5mm):
https://www.mouser.com/ProductDetail/80-C320C221J2G

1n MLCC (2.5mm):
https://www.mouser.com/ProductDetail/80-C320C102J5G

100n MLCC (2.5mm):
https://www.mouser.com/ProductDetail/80-C320C104K5R

1n34a:
http://smallbear-electronics.mybigcommerce.com/diode-nos-germanium/

TLE2074:
https://www.mouser.com/ProductDetail/595-TLE2074CN

DPDT (On/Off/On):
http://smallbear-electronics.mybigcommerce.com/dpdt-center-off-short-lever/

Bourns 3362p (5k):
https://www.mouser.com/ProductDetail/652-3362P-1-502LF
https://www.taydaelectronics.com/potentiometer-variable-resistors/cermet-potentiometers/3362p/5k-ohm-trimmer-potentiometer-cermet-1-turn-3362p.html

16mm Pots (10kC, 100kA, 250kC):
http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-16mm-right-angle-pc-mount/

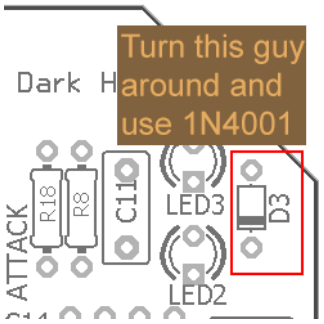
9mm Pot (50kB):
http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-right-angle-pc-mount-w-knurled-plastic-shaft/

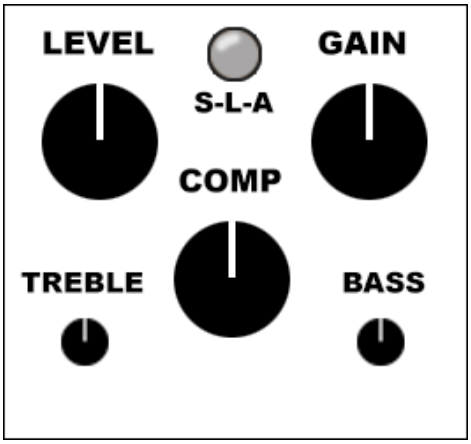
- Wiring and drill diagrams are located in the Switching Doc.

I do not like the stock clipping choices on the Dark Horse. Actually, I don't quite understand them. If you look closely at the schematic, you will see in the middle switch position there are two back to back LEDs, with one LED having a 1n914 forward biased to ground. When the switch is in the right position, one LED is shorted and you are left with the second LED and 1n194, but they are not back to back. This seems to result in only a partially clipped signal and it doesn't sound good to my ears. Pretty ratty and cackly on note decay.

So, I suggest doing an easy mod. Instead of a 1n914, use a 1N4001 and reverse the direction of the diode on the PCB. This results in what the SLA switch is supposed to do - it gives more or less symmetrical LED clipping in the middle position and asymmetrical clipping in the right position. And it sounds much better, IMO. I found once I did this mod I liked the Dark Horse a lot. It's got great saturation and the active tone controls make for a wide range of choices.

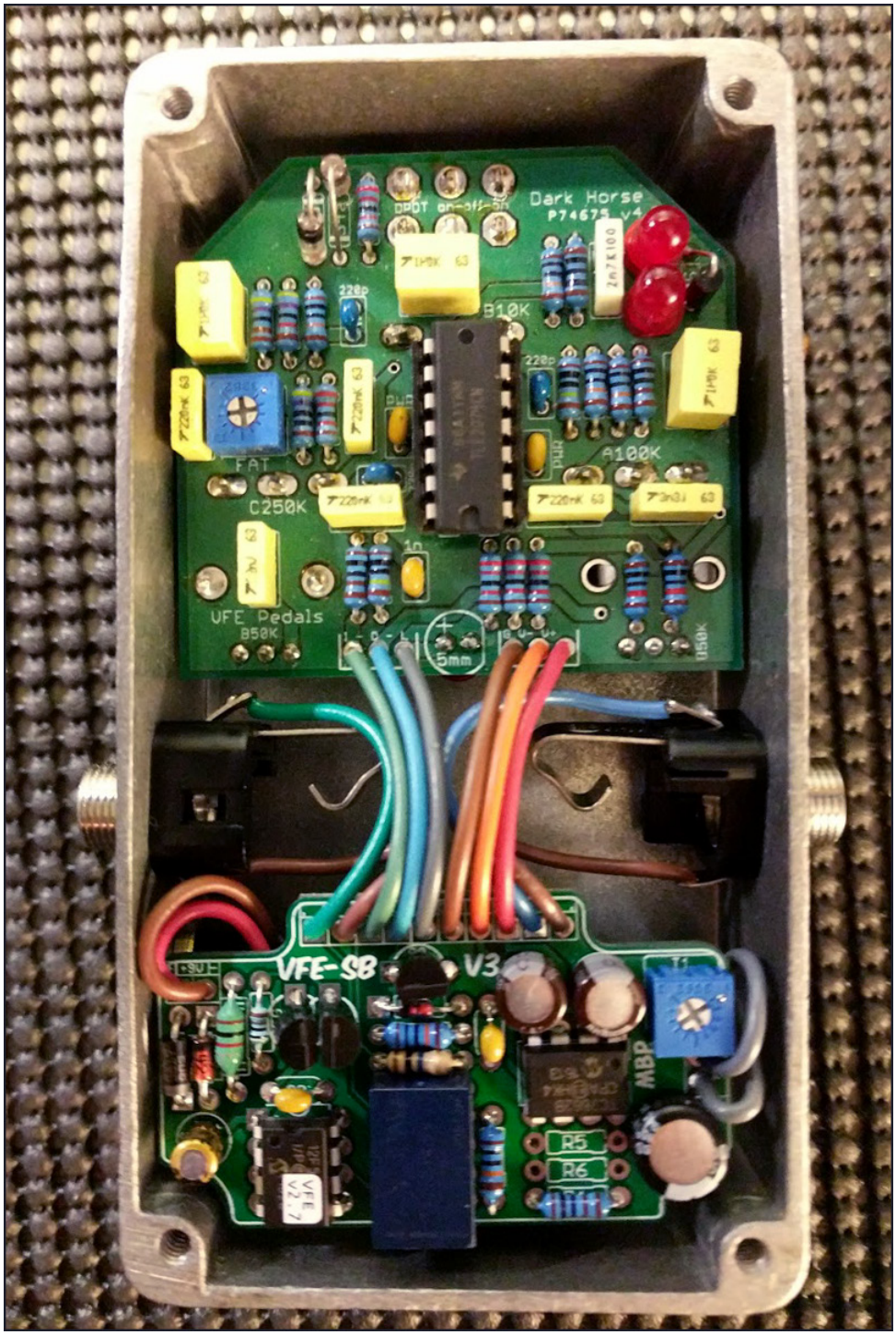
If you want to compare yourself, socket the 1n914 and try it both ways. If you like what I suggested, try the 1n4001 instead of the 1n914. Visually check the LEDs as you play in both cases and you will see the difference with the LED clipping as well as hear it.

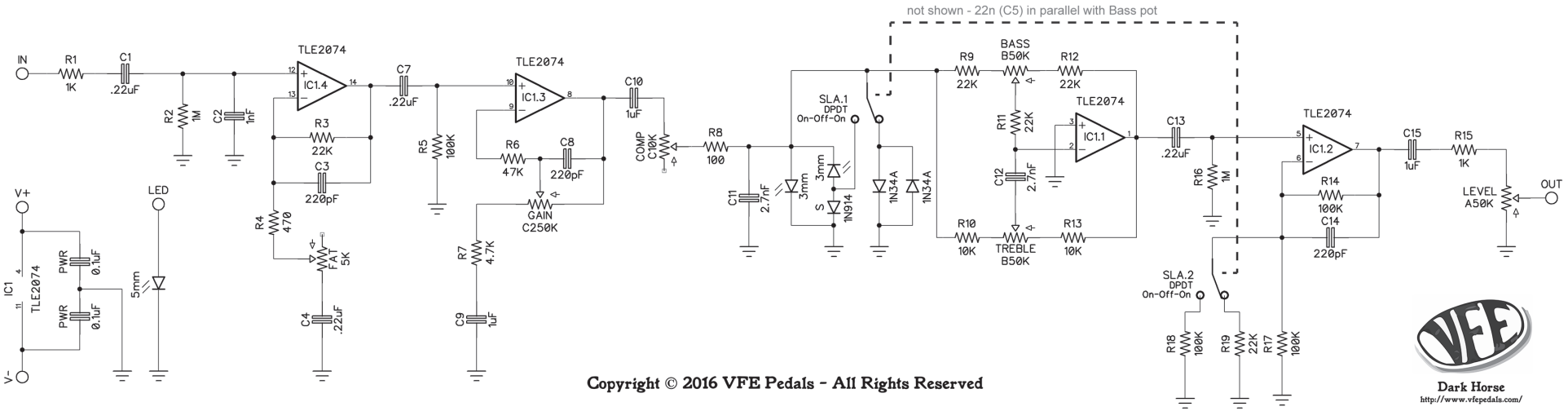




TLE2074	VDC
1	0
2	0
3	0
4	8.82
5	0
6	0
7	0
8	0
9	0
10	0
11	-8.54
12	0
13	0
14	0

Current Draw: ~15mA
DC Supply: 9.42v One Spot


Dark Horse
P7467S v4
B10K
A100K
C250K
VFE Pedals
B50K
5mm
VFE-SB
V3
MBP
R5
R6


not shown - 22n (C5) in parallel with Bass pot
IN
R1
1K
C1
.22uF
R2
1M
C2
1nF
TLE2074
IC1.4
R3
22K
C3
220pF
R4
470
TRIM
5K
C4
.22uF
C7
.22uF
TLE2074
IC1.3
R5
100K
R6
47K
C8
220pF
GAIN
C250K
C10
1uF
COMP
C10K
R8
100
C11
2.7nF
SLA.1
DPDT
On-Off-On
3mm
3mm
S
1N914
1N34A
1N34A
R9
22K
BASS
B50K
R12
22K
R11
22K
TLE2074
IC1.1
C12
2.7nF
R10
10K
TREBLE
B50K
R13
10K
C13
.22uF
R16
1M
TLE2074
IC1.2
R14
100K
C14
220pF
C15
1uF
R15
1K
LEVEL
A50K
OUT
SLA.2
DPDT
On-Off-On
R18
100K
R19
22K
R17
100K
V+
V-
IC1
TLE2074
PWR
0.1uF
PWR
0.1uF
LED
5mm
Copyright © 2016 VFE Pedals - All Rights Reserved
Dark Horse
http://www.vfepedals.com/