

Benzin VH4

Based on:
Diezel VH4 Pedal
Effect type:
High Gain Pre-amp
Build difficult:
Advanced

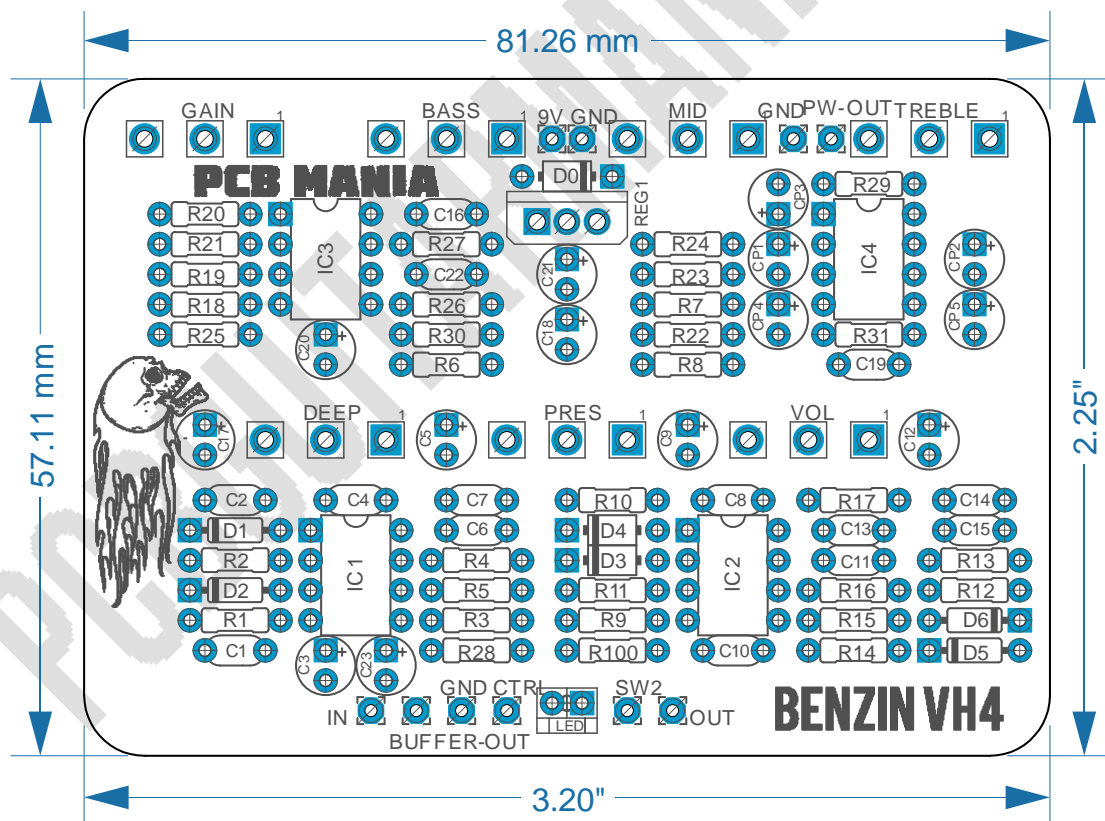
Amount of parts:
High, total 80 components
Technology:
Dual Op-Amp gain stages
Power consumption:
12-18v

Enclosure type:
1590BB
Get your board at:
[Benzin VH4](#)
Get your kit at:
[Das Musikding \(Europe\)](#)

Project overview:

Based on the formidable high-gain tone of the VH4 tube amplifier, the Benzin VH4 Pedal delivers all the high-intensity distortion you can handle. Specifically based on the VH4's Mega channel, the VH4 Pedal starts with wide-ranging controls for Gain, Treble, Middle, and Bass.

Essentially, the Benzin VH4 Pedal puts one of the most revered metal amp channels on your pedal board.



Index

- | | |
|-----------------------------------|-------------------------|
| 1. Project overview | 6. Build Notes |
| 2. Index, Introduction & Controls | 7. Schematic |
| 3. Bills of Materials, BOM | 8. Wiring Diagram |
| 4. Shopping Lists | 9. Drill Template |
| 5. Components Recommendations | 10. Licensing and Usage |

Introduction

Unlike traditional overdrive stomp boxes, the VH4 Pedal is a true preamp which delivers an authentic representation of its namesake – real Diezel tone – not emulated, not modeled, but sincerely reproduced. The entire signal architecture is faithful to the original: Bass, Mid, Treble and variable Deep and Presence controls allow you to tailor the uniquely Diezel Overdrive character. The command found in the Gain control gives a player everything they will ever need with lower gain settings producing the classic Diezel sparkle and chime to saturated mid-gain sounds, to scorching Diezel leads by cranking it all the way up.

As close to the original VH4 preamp, the VH4 pedal can be used as either an overdrive or as a standalone preamp to feed into your amps power section. What players take away by going direct into the power amp is all the dynamic, unfiltered Diezel tone by simply plugging into your amplifiers clean channel. Two outputs are provided with the first intended to connect to the front of a guitar amplifier and the second allows for a connection to a line-level power amp or power section of your amp via the Effects Return.

Controls

- Volume
- Gain
- Bass
- Middle
- Treble
- Presence: The Presence control helps you find just the right amount of bite to cut through a mix without making your signal too harsh.
- Depth: (resonance) control. Active in the final output stage of the pedal, the Deep knob allows you to fine-tune your tone's low-end punch in a way you can't achieve with traditional EQ or tone controls.
- Two outputs to connect to the front of a guitar amplifier or for a connection to a line-level power amp or power section of your amp via the Effects Return

Bill of materials

Resistors	
Part	Value
R1	1M
R2	1M
R3	100k
R4	220k
R5	10k
R6	470k
R7	220k
R8	680k
R9	220k
R10	1M
R11	10k
R12	100k
R13	470k
R14	220k
R15	220k
R16	10k
R17	39k
R18	1M5
R19	100k
R20	10k
R21	4k7
R22	1k
R23	150k
R24	100k
R25	100r
R26	56k
R27	47r
R28	100k
R29	10r
R30	1k
R31	10r
R100	2k2

Capacitors	
Part	Value
C1	22n
C2	100p
C3	1u electro
C4	100p
C5	1u electro
C6	22n
C7	2n2
C8	47p
C9	2u2 electro
C10	4n7
C11	100p
C12	2u2 electro
C13	560p
C14	22n
C15	22n
C16	1n
C17	10u electro
C18	10u electro
C19	2n2
C20	2u2
C21	1u electro
C22	330n
C23	1u electro
CP1	47u electro
CP2	47u electro
CP3	47u electro
CP4	47u electro
CP5	47u electro

Potentiometers	
Part	Value
TREBLE	250K B
VOL	10K A
DEEP	25K C
GAIN	250K A
MID	25K B
PRES	25K C
BASS	1M A

Diodes	
Part	Value
D0	5817
D1	4148
D2	4148
D3	5232
D4	5232
D5	4148
D6	4148
LED	3mm LED

IC	
Part	Value
IC1	OPA2134**
IC2	TL072CP
IC3	TL072CP
IC4	TC1044SCPA*
REG1	LM2940CT-12

Shopping list

Resistors		
Qty	Value	Device
3	1M	R1, R2, R10
1	2k2	R100
1	39k	R17
1	1M5	R18
1	4k7	R21
2	1k	R22, R30
1	150k	R23
1	100r	R25
1	56k	R26
1	47r	R27
2	10r	R29, R31
5	100k	R3, R12, R19, R24, R28
5	220k	R4, R7, R9, R14, R15
4	10k	R5, R11, R16, R20
2	470k	R6, R13
1	680k	R8

Capacitors		
Qty	Value	Device
4	22n	C1, C6, C14, C15
1	4n7	C10
1	560p	C13
1	1n	C16
2	10u electro	C17, C18
3	100p	C2, C4, C11
1	330n	C22
4	1u electro	C3, C5, C21, C23
2	2n2	C7, C19
1	47p	C8
3	2u2 electro	C9, C12, C20
5	47u electro	CP1, CP2, CP3, CP4, CP5

Pots		
Qty	Value	Device
1	250K B	TREBLE
1	10K A	VOL
1	1M A	BASS
1	25K B	MID
2	25K C	DEEP, PRES
1	250K A	GAIN

IC		
Qty	Value	Device
1	OPA2134	IC1
2	TL072CP	IC2, IC3
1	TC1044SCPA	IC4
1	LM2940CT-12	REG1

Diodes		
Qty	Value	Device
1	5817	D0
4	4148	D1, D2, D5, D6
2	5232	D3, D4
1	3mm LED	LED

Components Recommendations

This board has been tested using high quality components such as Wima's Capacitors and Panasonic's electrolytics can deliver a better performance. We strongly recommend to use this type of components for this build in order to avoid any possible noise issue.

All the resistors used for testing this project are 1/4W Metal Film.

Always ensure the max tolerance of your **electrolytic capacitors** is over 25v.

The BOM and Shopping list are exclusively regarding this project. It doesn't include all the hardware like the 3PDT bypass switch, audio/dc jacks, enclosure, etc.

TC1044SCPA* is an upgrade over the 7660s present on the original Diezel.

OPA2134** is a high quality audio grade Dual Op Amp. It's a bit pricey in contrast with a classic TL072 but totally worth for the right performance of this unit. Always ensure to get yours from a trusted supplier and be aware of counterfeits!

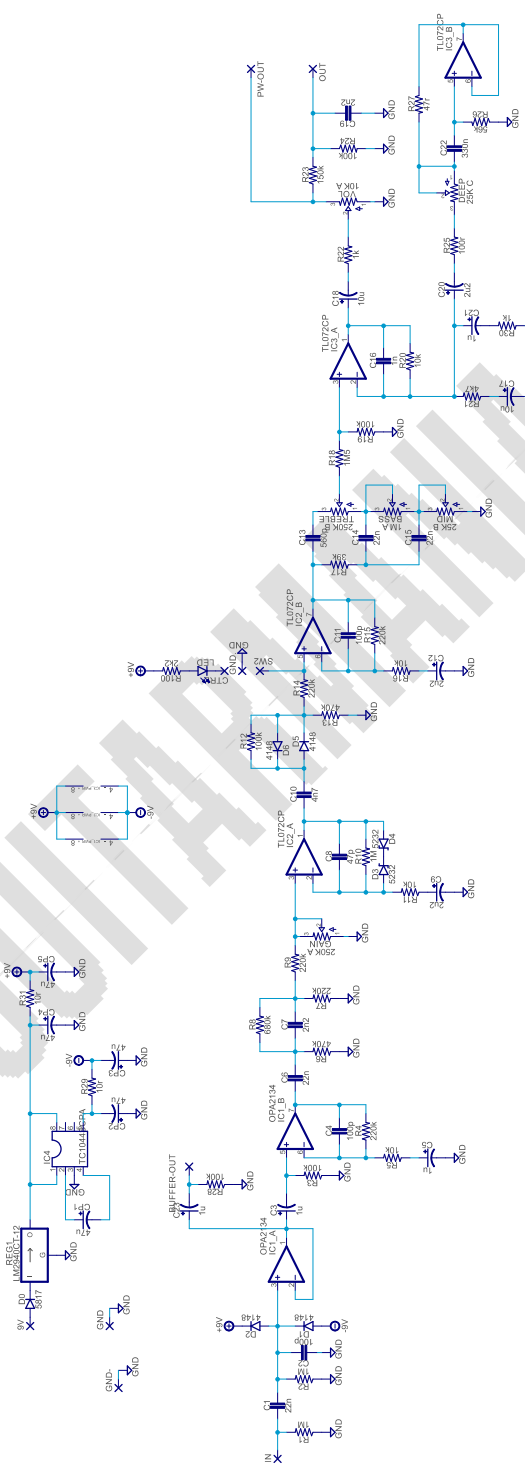
Build Notes

If this is one of your first projects I recommend you to take a look on our [Pedal Building Guide](#)

For a successful and tidy build it's recommended the following order:

1. Resistors & diodes
2. Capacitors, starting with the smaller ones and the ceramic ones.
3. Electrolytic capacitors (always check the polarity)
4. Transistors
5. Wires
6. Potentiometers and switches
7. Off board wiring

Schematic



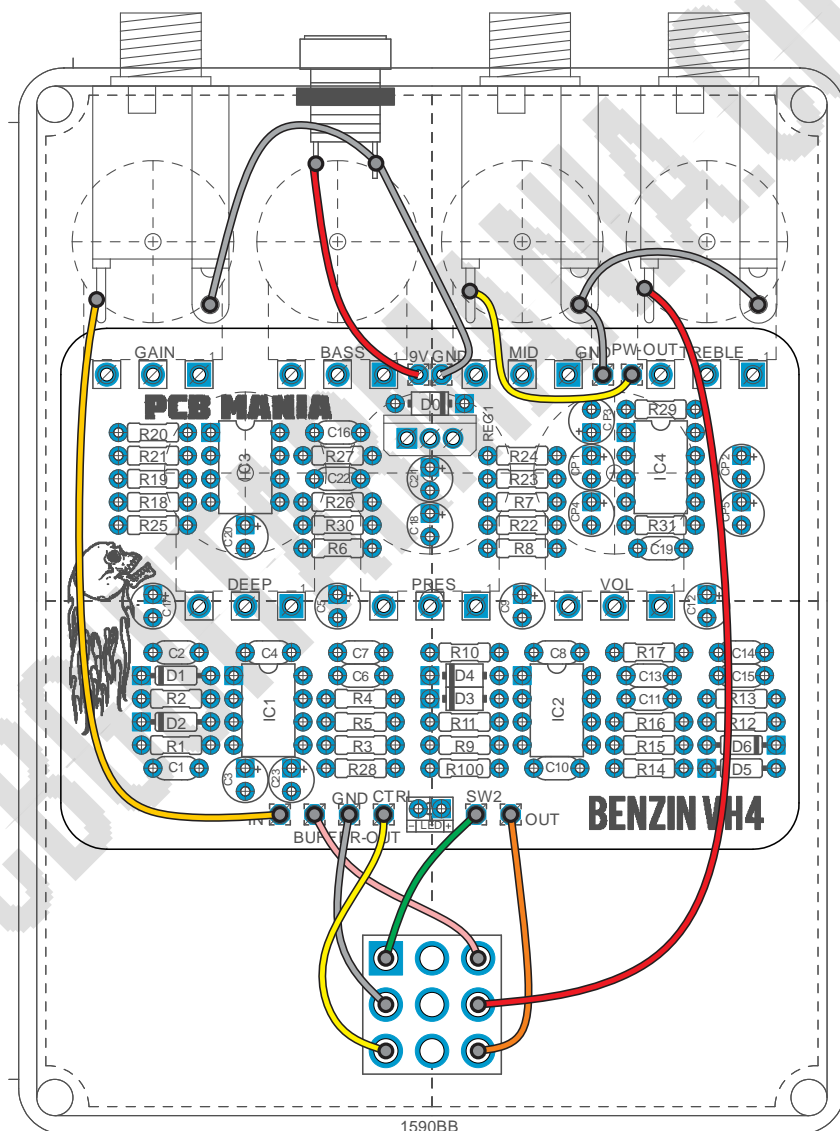
Wiring Diagram

All our projects include a free 3PDT Board to make the wiring easier and tidier. Also all of our PCBs feature the status LED on board.

The pad named "Ctrl" or "LED" is the one that controls the status of the led, wire it to the "LED" pad on the 3PDT board, or in control slug of your 3PDT.

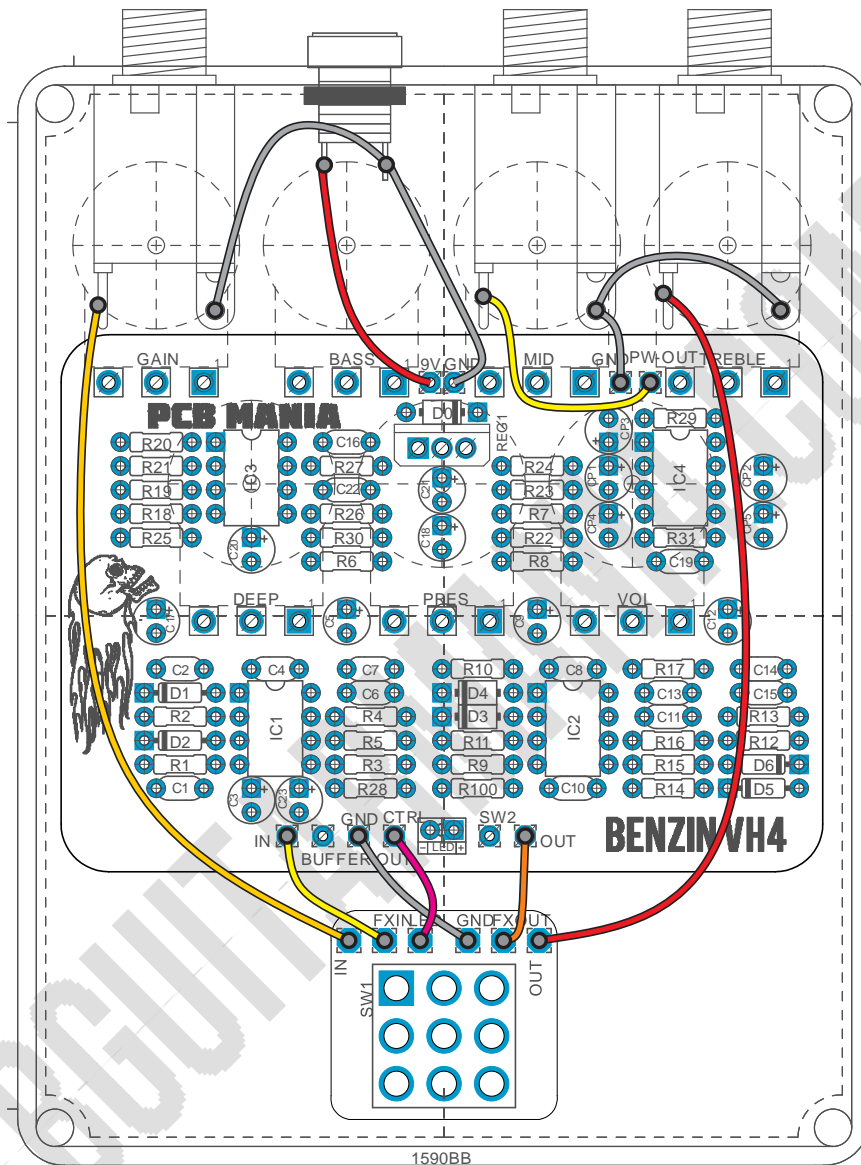
You can take a look on the following diagram to understand the general connections. For further information check our [Pedal Wiring guide](#).

Buffered Bypass (as the original)



True Bypass (yet to be tested!)

As many users were asking on how to make his circuit True Bypass here I made an alternative wiring diagram, however it's yet to be tested!



Drill Template

This Project has been planned to fit into a 1590BB enclosure type.

Check the Attached “Drilling templates” to drill the box properly. The files are on Scale 1:1, ready to print in an A4 page.

Licensing and Usage

We really appreciate your trust and support buying this PCB, as well as your will to dive into the DIY electronics world. That’s why for us is really important that you can make this project work properly and to enjoy not only the building process, but also to experiment and play with it on your rig.

We try to reply to every question we receive on our email or in our social media, but we try to encourage all our customers to join our [PCB Guitar Mania – Builders Group](#) on Facebook, in order to post all your doubts, issues, suggestions or request, as well to share your builds and have some feedback from us and other fellow builders!

All of our projects have been tested following this same guide on their standard configurations. Although, not all of the variations and mods have necessarily been tested. These are suggestions based on the schematic analysis, and on the experiences and opinions of others. Feel free to share with us your opinions and suggestions regarding the mods your own personal experimentation.

These boards may be used for commercial endeavors in any quantity unless specifically noted. No attribution is necessary, though accreditation or a link back is always greatly appreciated.

If you are a builder planning to make your own run of pedals we also offer the service of custom made boards with your brand and logo, design according your specifications.

The only usage restrictions are that, first, you cannot resell the PCB as part of a kit without prior arrangement with us, and second, you cannot scratch off the silk screen, or other way of trying to hide our logos and the source of the PCBs. Like it’s written above, if you want to have your own designs, with your brand and logo we could certainly reach an agreement.

Follow us on [Instagram](#) and [Facebook](#) to stay in tune with the latest projects!