

Train Crash

Based on:
Ethos TWE-1
Effect type:
Pre-amp
Build difficult:
Intermediate

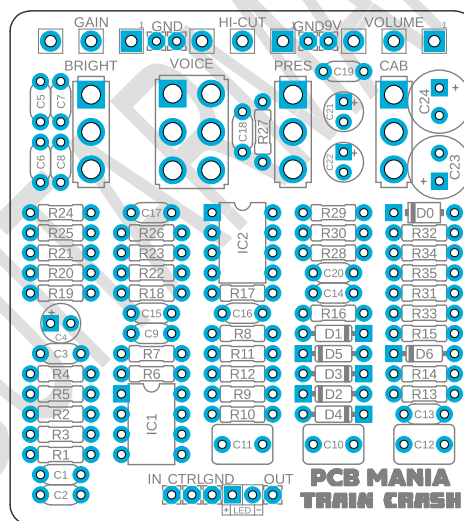
Amount of parts:
Average, total 74 components
Technology:
Dual OpAmp + charge pump
Power consumption:
9V

Enclosure type:
125b
Get your board at:
[Train Crash](#)
Get your kit at:
[Das Musikding \(Europe\)](#)

Project overview:

All aboard! Here comes the Train Crash!

Train Crash is here and it is a magnificent Tranwreck-style overdrive that you can add to your signal chain without the hustle of carrying around another amp. This solid-state analog circuit will be the best friend with the volume control on your guitar, going from quiet whispers to screaming leads and anything in between.



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Introduction

Train Crash allows you to sculpt your tone with three standard knobs (VOLUME, HI-CUT, GAIN) and additional four switches (CAB, PRESENCE, VOICE, BRITE).

Like in your typical overdrive unit, you control the overall loudness with the VOLUME knob. The HI-CUT pot allows you to cut some high frequencies post-overdrive, which works great for amp tuning. The GAIN control lets you set the desired input gain of the pedal.

Now that we are done with the meat and potatoes let's get to the fun part - the switches. You get four of them. The first one is the CAB switch that enables you to choose from a flat response, a mild low-end boost (2x12"), or an extended low-end boost (4x12"). Next in the line is the PRESENCE control, which allows you to select one of three options for your post-overdrive high-frequency response - UP for maximum boost, MIDDLE gives a flat response, DOWN provides the darkest sound that pairs up great with bright sounding amps. After that comes the VOICE switch that lets you choose between traditional voicing (T position) and a more modern British type (M position).

Last but not least comes the 3-way BRITE switch, which controls the pre-overdrive high-frequency boost. The UP position is the maximum boost you can get, and it suits humbucker pickups the best. The MIDDLE position turns off this part of the circuit, leaving the response flat. The DOWN position boosts highs just a little bit, making it the best choice in a situation when you want to add only a tiny bit of sparkle to your tone.

Train Crash is your perfect solution if you are already in possession of an amp that you love but would like to easily add a Trainwreck-style overdrive to your arsenal.

Don't be late; we are departing now!

Controls

- GAIN
- VOLUME
- HI-CUT

Bill of materials

Resistors	
Part	Value
R1	1m
R2	1k
R3	1m
R4	10k
R5	4k7
R6	1m
R7	100k
R8	220r
R9	3k3
R10	100k
R11	10k
R12	13k
R13	10k
R14	13k
R15	4k7
R16	18k
R17	47k
R18	47k
R19	68k
R20	4k7
R21	4m7
R22	2k2
R23	2k2
R24	470r
R25	4k7
R26	2k2
R27	1k
R28	4k7
R29	4k7
R30	2k2
R31	1k
R32	10r
R33	4k7
R34	10k

R35	10k
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Capacitors	
Part	Value
C1	22n
C2	220p
C3	220p
C5	22n
C6	3n3
C7	10n
C8	47n
C9	220p
C10	2u2
C11	2u2
C12	2u2
C13	10n
C14	1n2
C15	47n
C16	47n
C17	220n
C18	100n
C19	12n
C20	220p

Electrolytics Capacitors	
Part	Value
C4	22u
C21	22u
C22	22u

Potentiometers	
Part	Value
GAIN	10k B
HI-CUT	50k B
VOLUME	10k B

IC	
Part	Value
IC1	opa2134
IC2	opa2134

Switches	
Part	Value
SW1	SPDT Toggle (ON/OFF/ON)
SW2	DPDT Toggle (ON/ON)
SW3	SPDT Toggle (ON/OFF/ON)
SW4	SPDT Toggle (ON/OFF/ON)

Diodes	
Part	Value
D0	1n5817
D1	1n4148
D2	1n4148
D3	1v8
D4	1v8
D5	1n4148
D6	1n4148
LED	3mm Red LED

Shopping list

Resistors		
Qty	Value	Parts
2	100k	R7, R10
5	10k	R4, R11, R13, R34, R35
1	10r	R32
2	13k	R12, R14
1	18k	R16
3	1k	R2, R27, R31
3	1m	R1, R3, R6
1	220r	R8
4	2k2	R22, R23, R26, R30
1	3k3	R9
1	470r	R24
2	47k	R17, R18
7	4k7	R5, R15, R20, R25, R28, R29, R33
1	4m7	R21
1	68k	R19

Capacitors		
Qty	Value	Parts
1	100n	C18
2	10n	C7, C13
1	12n	C19
1	1n2	C14
1	220n	C17
4	220p	C2, C3, C9, C20
2	22n	C1, C5
3	2u2	C10, C11, C12
1	3n3	C6
3	47n	C8, C15, C16

Electrolytic Capacitors		
Qty	Value	Parts
3	22u	C4, C21, C22

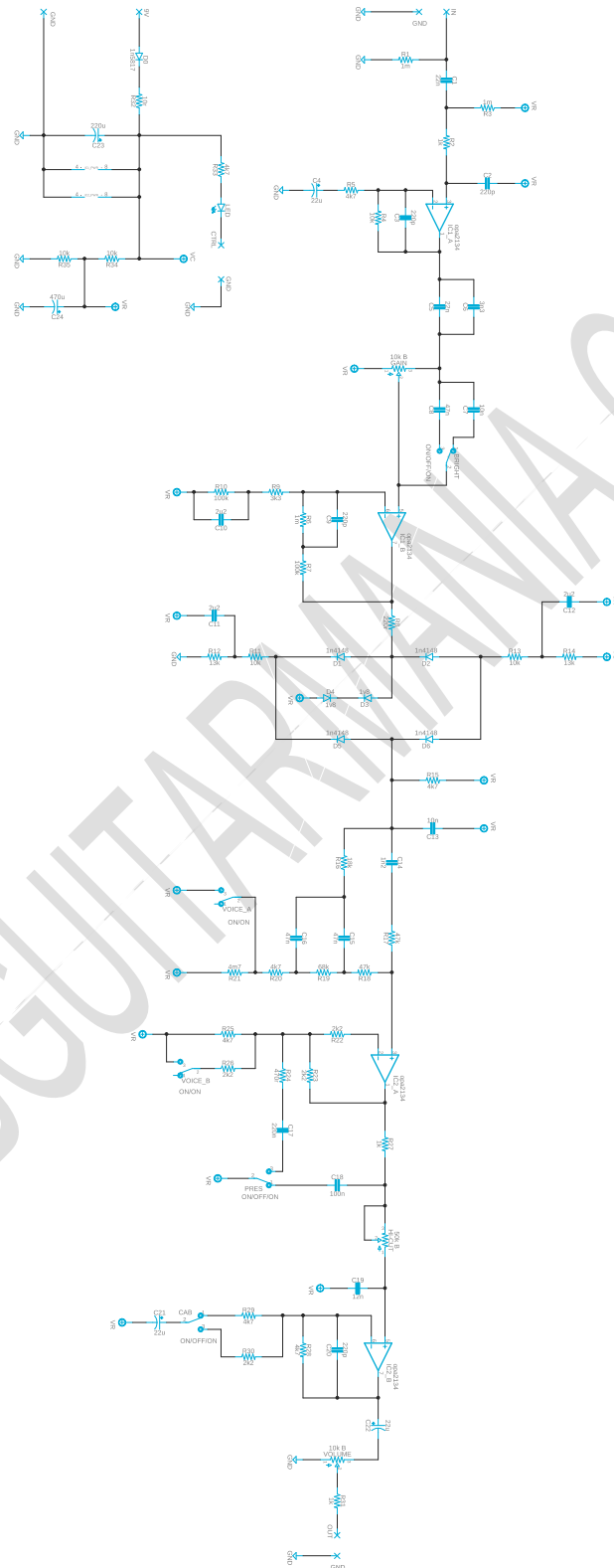
Potentiometers			
Qty		Value	Parts
	2	10k B	GAIN, VOLUME
	1	50k B	HI-CUT

IC		
Qty	Value	Parts
2	opa2134	IC1, IC2

Switches		
Qty	Value	Parts
1	DPDT Toggle (ON/ON)	SW2
3	SPDT Toggle (ON/OFF/ON)	SW1, SW3, SW4

Diodes		
Qty	Value	Parts
4	1n4148	D1, D2, D5, D6
1	1n5817	D0
2	1v8	D3, D4
1	3mm Red LED	LED

Schematic



Components Recommendations

As many people like to experiment with some pedals with higher voltage, always ensure your **electrolytic capacitors'** max tolerance is over 25v.

This board has been tested using Film box capacitors for most of the values over 1nf and ceramics discs for those under 1nf. However, high-quality components such as Wima's Capacitors and Panasonic's electrolytics can deliver a better performance.

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

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

Build Notes

If this is one of your first projects, I recommend you to take a look at 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

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 the control slug of your 3PDT.

This board has been designed to match our EZ 3PDT PCB; check it [here](#) to access our [Pedal Wiring Guide](#).

Drill Template

This Project has been planned to fit into a 125b enclosure type.

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

Licensing and Usage

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

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

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

These boards may be used for commercial endeavors in any quantity unless expressly noted. No attribution is necessary, though accreditation or a link back is always much 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 to 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 silkscreen 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 designs with your brand and logo, we could undoubtedly reach an agreement.

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