

Power Engel

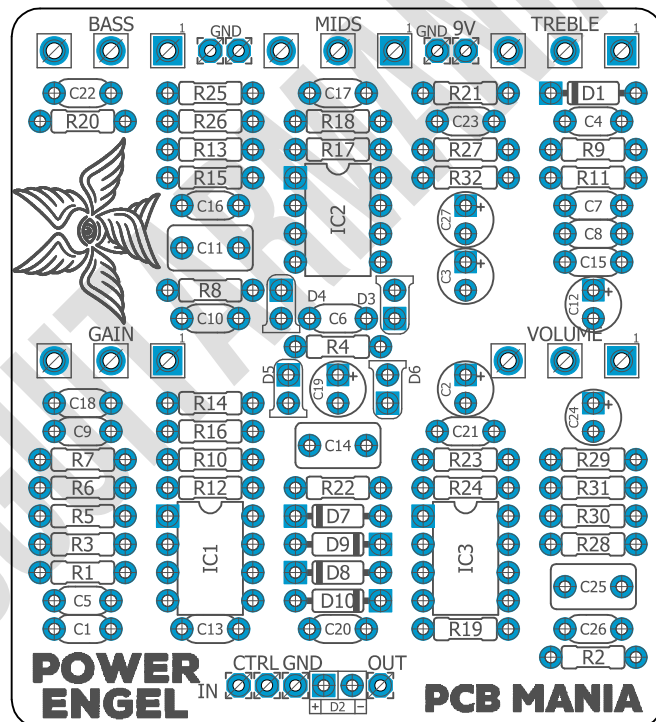
Based on:
Engl Powerball
Effect type:
High Gain Overdrive
Build difficult:
Advanced

Number of parts:
High, total 77 components
Technology:
JFET transistors
Power consumption:
9V

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

Project overview:

A preamp that emulates all the pristine metal tones of the ENGL Powerball amplifier. Voiced for modern metal, this board delivers a full gamut of tones, from crystalline cleans to muscular crunch and paint-peeling high gain.



Index

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

Introduction

The Engl Powerball II is a versatile amplifier capable of great performing for the metal genre and other genres like Rock and Blues. This pedal can reproduce those fantastic crystal-clear Clean tones, crispy Crunch, dense solo sounds, and everything in-between with ease and exactitude. So, get ready for the purest, uncompromising metal toned at the tip of your hands!

Controls

- Bass
- Mids
- Treble
- Gain
- Volume

Bill of materials

Resistors	
Part	Value
R1	1m
R2	4k7
R3	470k
R4	3k3
R5	4k7
R6	47k
R7	56k
R8	3k3
R9	47k
R10	82k
R11	47k
R12	10k
R13	2k2
R14	4k7
R15	100k
R16	4k7
R17	100k
R18	2k2
R19	22k
R20	15k
R21	7k5
R22	100k
R23	22k
R24	47k
R25	15k
R26	10k
R27	7k5
R28	10k
R29	100k
R30	10k
R31	10k

R32	22k
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Capacitors	
Part	Value
C1	100n
C4	100n
C5	1n
C6	10n
C7	100n
C8	100n
C9	6n8
C10	33n
C11	330n
C13	1n
C14	220n
C15	100n
C16	5n6
C17	56n
C18	100p
C20	100n
C21	100p
C22	47n
C23	680p
C25	220n
C26	100p

Electrolytics Capacitors	
Part	Value
C2	1u
C3	100u
C12	47u
C19	1u
C24	1u

C27	1u
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Potentiometers	
Part	Value
BASS	50K B
GAIN	1M A
MIDS	50K B
TREBLE	50K B
VOLUME	50K B

Trimpots	
Part	Value
IC1	TL072
IC2	TL072
IC3	TL072

Diodes	
Part	Value
D1	1N5817
D2	3mm Red LED
D3	3mm Red LED
D4	3mm Red LED
D5	3mm Red LED
D6	3mm Blue LED
D7	BAT41
D8	BAT41
D9	BAT41
D10	BAT41

Shopping list

Resistors		
Qty	Value	Parts
4	100k	R15, R17, R22, R29
5	10k	R12, R26, R28, R30, R31
2	15k	R20, R25
1	1m	R1
3	22k	R19, R23, R32
2	2k2	R13, R18
2	3k3	R4, R8
1	470k	R3
4	47k	R6, R9, R11, R24
4	4k7	R2, R5, R14, R16
1	56k	R7
2	7k5	R21, R27
1	82k	R10

Capacitors		
Qty	Value	Parts
6	100n	C1, C4, C7, C8, C15, C20
3	100p	C18, C21, C26
1	10n	C6
1	1n	C13
1	1n	C5
2	220n	C14, C25
1	330n	C11
1	33n	C10
1	47n	C22
1	56n	C17
1	5n6	C16

1	680p	C23
1	6n8	C9

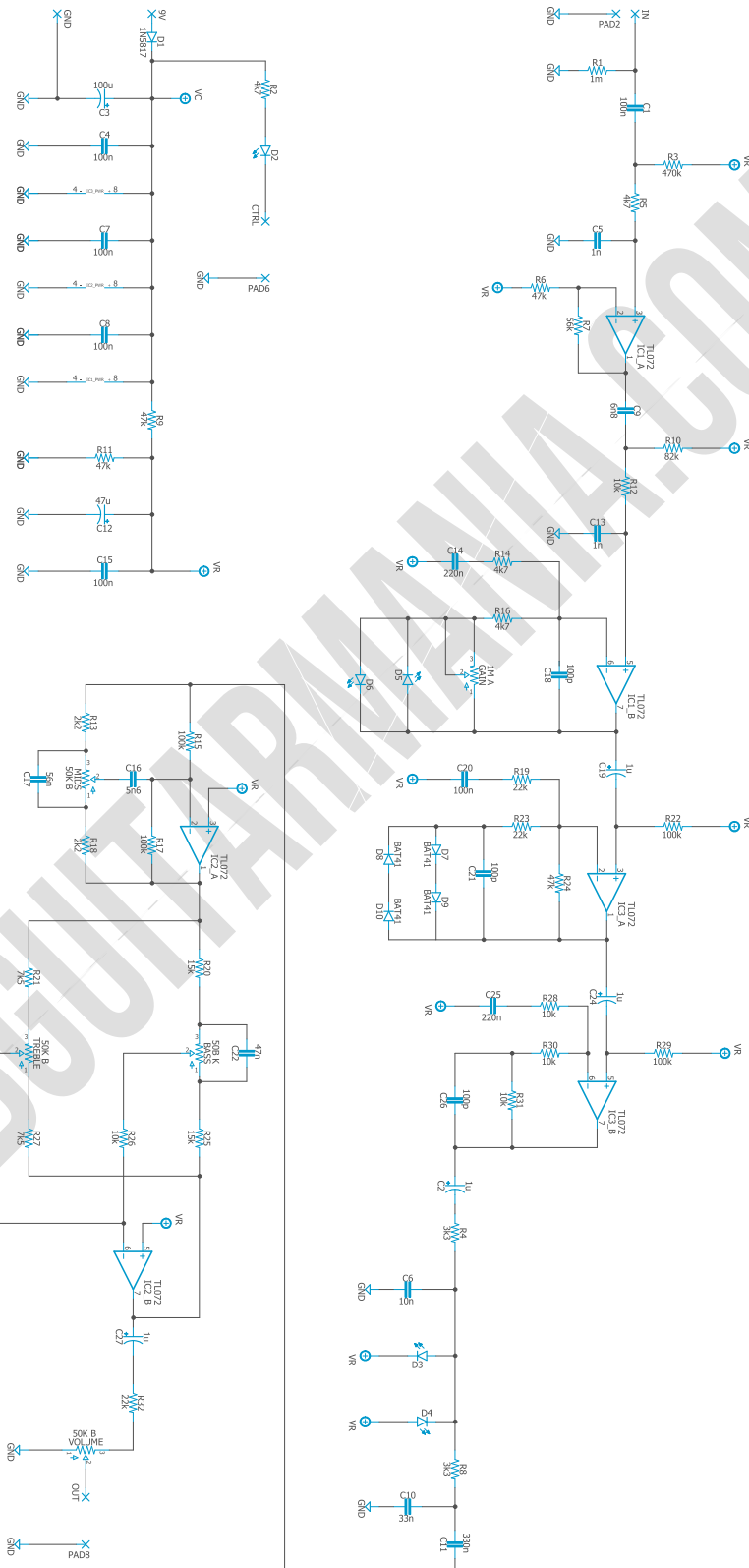
Electrolytics Capacitors		
Qty	Value	Parts
1	100u	C3
3	1u	C2, C24, C27
1	1u	C19
1	47u	C12

Potentiometers		
Qty	Value	Parts
1	1M A	GAIN
1	50K B	BASS
3	50K B	MIDS, TREBLE, VOLUME

IC		
Qty	Value	Parts
3	TL072	IC1, IC2, IC3

Diodes		
Qty	Value	Parts
1	1N5817	D1
1	3mm Blue LED	D6
4	3mm Red LED	D2, D3, D4, D5
4	BAT41	D7, D8, D9, D10

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.

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