

# Rectifier Box

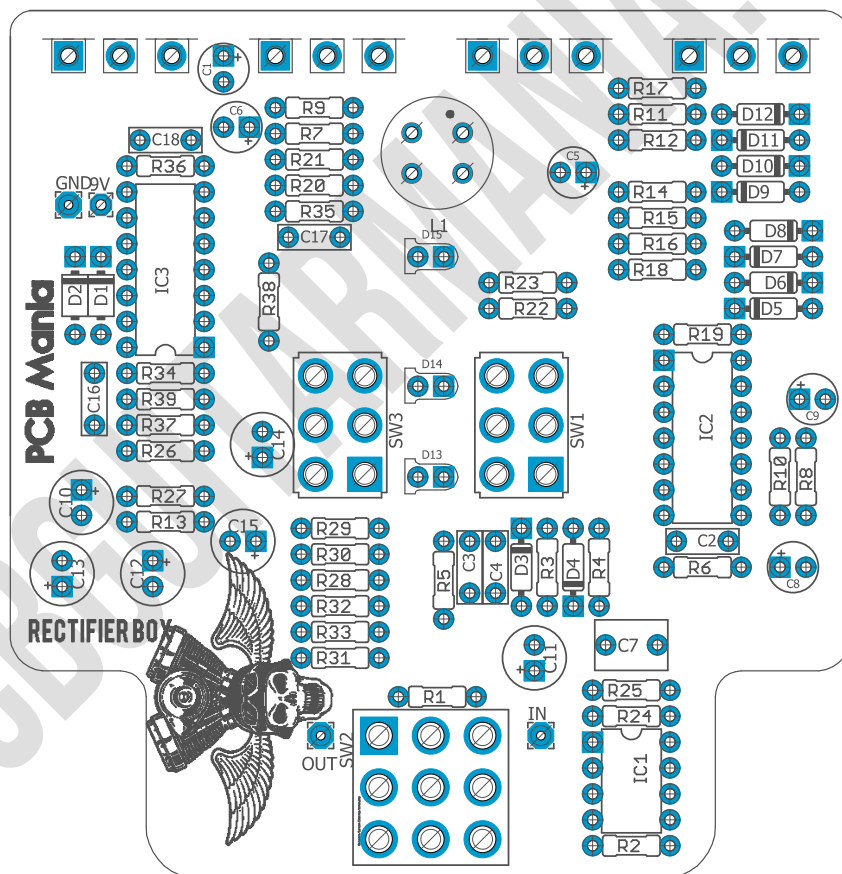
**Based on:**  
Mesa Boogie's Throttle Box  
**Effect type:**  
High Gain Distortion  
**Build difficult:**  
Advanced

**Number of parts:**  
High, total 82 components  
**Technology:**  
JFET Op Amp  
**Power consumption:**  
9V

**Enclosure type:**  
1590bb  
**Get your board at:**  
[Rectifier Box](#)  
**Get your kit at:**  
[Das Musikding \(Europe\)](#)

## Project overview:

The Rectifier Box is my first attempt to capture the essence of the Mesa Boogie's Throttle box, one of the best High gain distortions I ever heard, with a really interesting Mid-cut section.



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## Introduction

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Put the Rectifier Box distortion pedal before your amplifier and get ready for pure aggressiveness and power!

Select the high gain settings and get all the power you need or dial it to lower gain and find a surprising organic-sounding perfect for blues and classic rock.

The Mid-cut control scoops out midrange to give you the signature Boogie V amp sound to serve up all ROCK genres with the perfect mix of cut and aggression.

## Controls

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- Gain
- Mid-Cut
- Tone
- Vol
- 3pdt Switch on board
- 2 DPDT, Input selector and Mid-cut EQ.

# Bill of materials

Capacitors	
Part	Value
C1	680n tantalum***
C2	82n
C3	82n
C4	47p
C5	220n tantalum***
C6	1u tantalum***
C7	1u
C8	220n tantalum***
C9	220n tantalum***
C13	2u2 tantalum***
C14	2u2 tantalum***
C15	470n tantalum***
C16	47n
C17	47n
C18	100n

Electrolytic Capacitors	
Part	Value
C10	47u
C11	47u
C12	10u

Resistors	
Part	Value
R1	1M
R2	470k
R3	390k
R4	47k
R5	4k7
R6	1k5
R7	1k5
R8	330r
R9	220r
R10	1k5

R11	2m34
R12	100k
R13	4k7
R14	3k32
R15	1k
R16	56k2
R17	100r
R18	10k
R19	jumper
R20	11k
R21	11k
R22	1k5
R23	100r
R24	11k
R25	11k
R26	11k
R27	11k
R28	1k
R29	47k
R30	47k
R31	20k
R32	47k
R33	4k7
R34	470r
R35	470r
R36	470r
R37	100k
R38	470r
R39	15k

Inductors	
Part	Value
L1	Inductor 220uH**

ICs	
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Part	Value
IC1	JRC4558
IC2	TL074
IC3	TL074

Switches	
Part	Value
SW1	DPDT On-On
SW2	3PDT On-On
SW3	DPDT On-On

Potentiometers	
Part	Value
Gain	1M A
Mid-Cut	10K A
Tone	20K B
Vol	10K B

Diodes	
Part	Value
D1	1n4007
D2	zener 9v1*
D3	1N4448
D4	1N4448
D5	1N4448
D6	1N4448
D7	1N4448
D8	1N4448
D9	1N4448
D10	1N4448
D11	1N4448
D12	1N4448
D13	3mm LED
D14	3mm LED
D15	3mm LED

# Shopping list

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Resistors		
Quantity	Value	Parts
1	680n	C1
2	82n	C2, C3
1	47p	C4
3	220n	C5, C8, C9
2	1u	C6, C7
2	2u2	C13, C14
1	470n	C15
2	47n	C16, C17
1	100n	C18

Electrolytic Capacitors		
Quantity	Value	Parts
2	47u	C10, C11
1	10u	C12

Resistors		
Quantity	Value	Parts
1	1M	R1
1	470k	R2
1	390k	R3
4	47k	R4, R29, R30, R32
3	4k7	R5, R13, R33
2	1k5	R6, R7
1	330r	R8
1	220r	R9
1	1k5	R10
1	2m34	R11
2	100k	R12, R37
1	3k32	R14
2	1k	R15, R28
1	56k2	R16
2	100r	R17, R23
1	10k	R18
1	jumper	R19

6	11k	R20, R21, R24, R25, R26, R27
1	1k5	R22
4	470r	R34, R35, R36, R38
1	15k	R39
1	20k	R31

Inductors		
Quantity	Value	Parts
1	Inductor 220uH**	L1

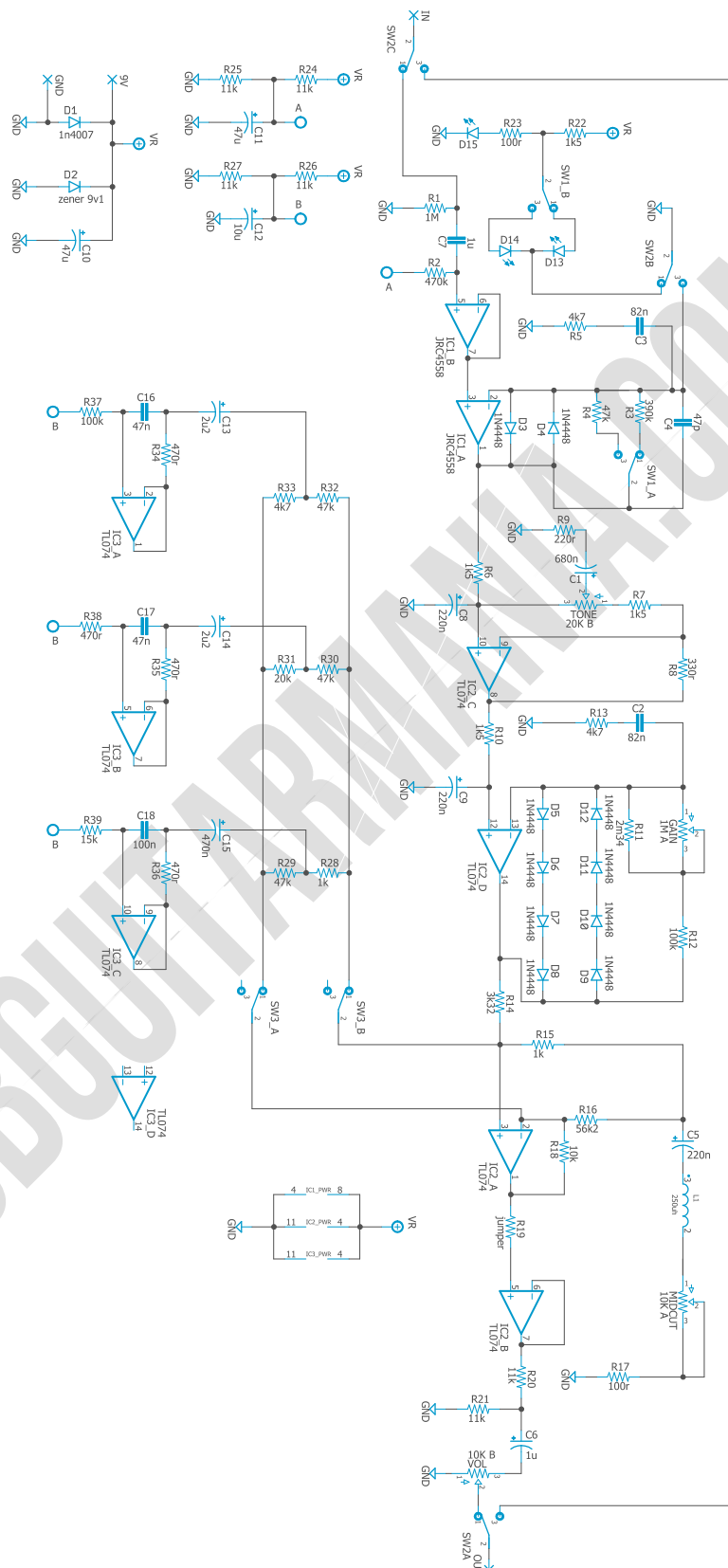
IC		
Quantity	Value	Parts
1	JRC4558	IC1
2	TL074	IC2, IC3

Switches		
Quantity	Value	Parts
2	DPDT On-On	SW3, SW1
1	3PDT On-On	SW2

Potentiometers		
Quantity	Value	Parts
1	1M A	Gain
1	10K A	Mid-Cut
1	20K B	Tone
1	10K B	Vol

Diodes		
Quantity	Value	Parts
1	1n4007	D1
1	zener 9v1*	D2
10	1N4448	D3, D4, D5, D6, D7, D8, D9, D10, D11, D12
3	3mm LED	D13, D14, D15

Rectifier Box by PCB Guitar Mania  
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# Components Recommendations

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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

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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

### **Zener 9v1\***

D2 is power supply protection diode, which I believe is a 9v1, but I never tried it. I left it unpopulated on my build.

### **Inductor 220uH\*\***

The Inductor is 220uH micro henry, not mH. Please notice that it is NOT like those small ones that look like resistors that you could find on Tayda.

Also, take in mind that most of the inductors of this value have four legs, two are actually the ones of the Inductor, and the other ones are just to bring extra support in the build. Find which one is which before soldering it.

[I bought mine in Mouser Electronics.](#)

### **Tantalum Capacitors\*\*\***

This project uses mainly tantalum capacitors as in the original schematic.

# Wiring Diagram

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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

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On this drilling template, I made some changes to make it fit properly in a 1590BB enclosure. It fits super tight, and I replaced the onboard pots for regular ones. For the DC jack, I recommend using the smaller ones.

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

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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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