Duke of Tone

Based on:
Analog Man Prince of Tone overdrive

Effect type:
Overdrive / Distortion / Boost

Build difficult:
Easy

Amount of parts:
Low, total 39 components

Technology:
Sum dual operational amplifier

Power consumption:
9V

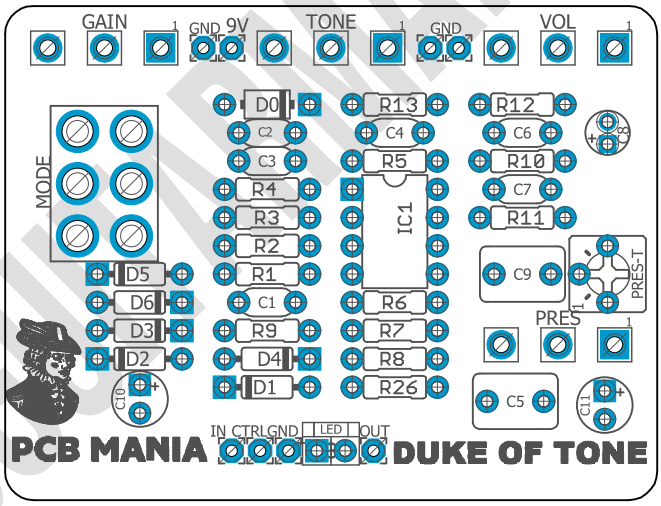
Enclosure type:
125b

Get your board at:
Duke of Tone

Get your kit at:
Das Musikding (Europe)

Project overview:

Prince of Tone is made by the best half of the legendary, and elusive King of Tone pedal. This board will take your clean guitar amp sound, boost it, and add a range of natural tube-sounding drive effects. It's pretty much the same as half of the original, but with an even higher gain delivery!



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Introduction

It is not possible to write about the Duke of Tone without digging into the King of Tone pedal and the history of Analog.Man. Let's dive into it.

Most guitar pedal enthusiasts ask this question sooner or later: Why is the King Of Tone pedal so famous? Is it just hype, or is there a solid reason for the success? After all, Analog Man's King of Tone has gained a reputation as one of the most desirable guitar pedals ever made. The fact is that it has become so popular that I wish you good luck if you are trying to get one. Get ready to waste at least three years on the waiting list!

So it's this pedal so great? It's difficult to claim against the general consensus regarding the King of Tone: a brilliant pedal everyone seems to love, and here are some reasons why.

First, there is the man behind the product: Mike Piera of Analog Man. A guy that gained respect amongst many guitarists due to his superior vintage and high-end effects designs that are resolute in their pursuit of tone.

Second, King of Tone is the master of transparency. As you may notice, most guitar pedals color your tone in one way or another. The King achieves a clean guitar and amp tone like no other and lets you focus on parameters of gain and volume without altering your original sound.

Third, the pedal is tweakable and customizable way beyond any typical dual overdrive pedal; it has many different tone tweaking options that make it stand out far above the average pedal. Plus, the circuit consists of two matching but individual overdrive pedals that you can play independently or stack together. The half with the High Gain option is so good that you can make an excellent pedal on its own; that's our Duke of Tone, and we'll talk about it later.

Fourth, versatility. Combining different tweaking options with the transparent feature provides the pedal with an unprecedented level of adaptability rarely seen in any other stompbox.

These are four of the main reasons why we think King of Tone is in the place it is. They are not the only ones, and I'm sure many of you have your own opinion on this.

Now, another question arises: Is the Prince of Tone (our Duke) as good as the King? This pedal is basically the same as half of the best side of the King of Tone, with an external MODE switch and some welcoming improvements.

It comes with a higher gain option for you to reach the full range of the GAIN knob, featuring even more drive at the top than a normal gain KOT. Also, the distortion mode is a better version of the original that delivers a louder, more robust distortion sound.

The Duke has three knobs for volume, distortion, and tone, along with the three-way toggle switches and mods. The first setting gives you the definitive King of Tone tube screamer sound; the second mode can work as a superior clean boost on low volume and drive or add a bit of overdrive crunch with things turned up. Finally, the third or distortion mode gives you a bit harder overdrive tone, with additional compression.

In conclusion, this pedal lives up to the expectations or even surpasses them with all those improvements over the original circuit. A more straightforward version of the KOT that we are happy to add to our catalog and we are sure will be welcomed by the DIY community.

Controls

Potentiometers

- Gain
- Pres
- Vol
- Tone

Switches

- Mode

Bill of materials

Resistors	
Part	**Value**
R1	1M
R2	1M
R3	10k
R4	33k
R5	27k
R6	10k
R7	220k
R8	6.8k
R9	1k
R10	6.8k
R11	1M
R12	47k
R13	47k
R26	4.7k

Capacitors	
Part	**Value**
C1	10nf
C2	100pf
C3	10nf
C4	10nf
C5	100n
C6	10nf
C7	10nf
C9	1uf

Electrolytic Capacitors	
Part	**Value**
C8	1uf
C10	100uf
C11	220uf

Potentiometers	
Part	**Value**
GAIN	100k B
PRES*	50k A
VOL	100K A
TONE	25K B

Trimmers	
Part	**Value**
PRES-T*	50k

Switches	
Part	**Value**
MODE	DPDT on/off/on

IC	
Part	**Value**
IC1	JRC4580

Switches	
Part	**Value**
D0	1N5817
D1	**1N4148****
D2	**1N4148****
D3	**1N4148****
D4	**1N4148****
D5	**BAT46*****
D6	**BAT46*****

Shopping list

Resistors		
Qty	**Value**	**Parts**
3	1M	R1, R2, R11
2	10k	R3, R6
1	33k	R4
1	27k	R5
1	220k	R7
2	6.8k	R8, R10
1	1k	R9
2	47k	R12, R13
1	4.7k	R26

Capacitors		
Qty	**Value**	**Parts**
5	10nf	C1, C3, C4, C6, C7
1	100pf	C2
1	100n	C5
1	1uf	C9

Electrolytic Capacitors		
Qty	**Value**	**Parts**
1	1uf	C8
1	100uf	C10
1	220uf	C11

Potentiometers		
Qty	**Value**	**Parts**
1	100k B	GAIN
1	50k A	**PRES***
1	100K A	VOL
1	25K B	TONE

Trimmers		
Qty	**Value**	**Parts**
1	50k	**PRES-T***

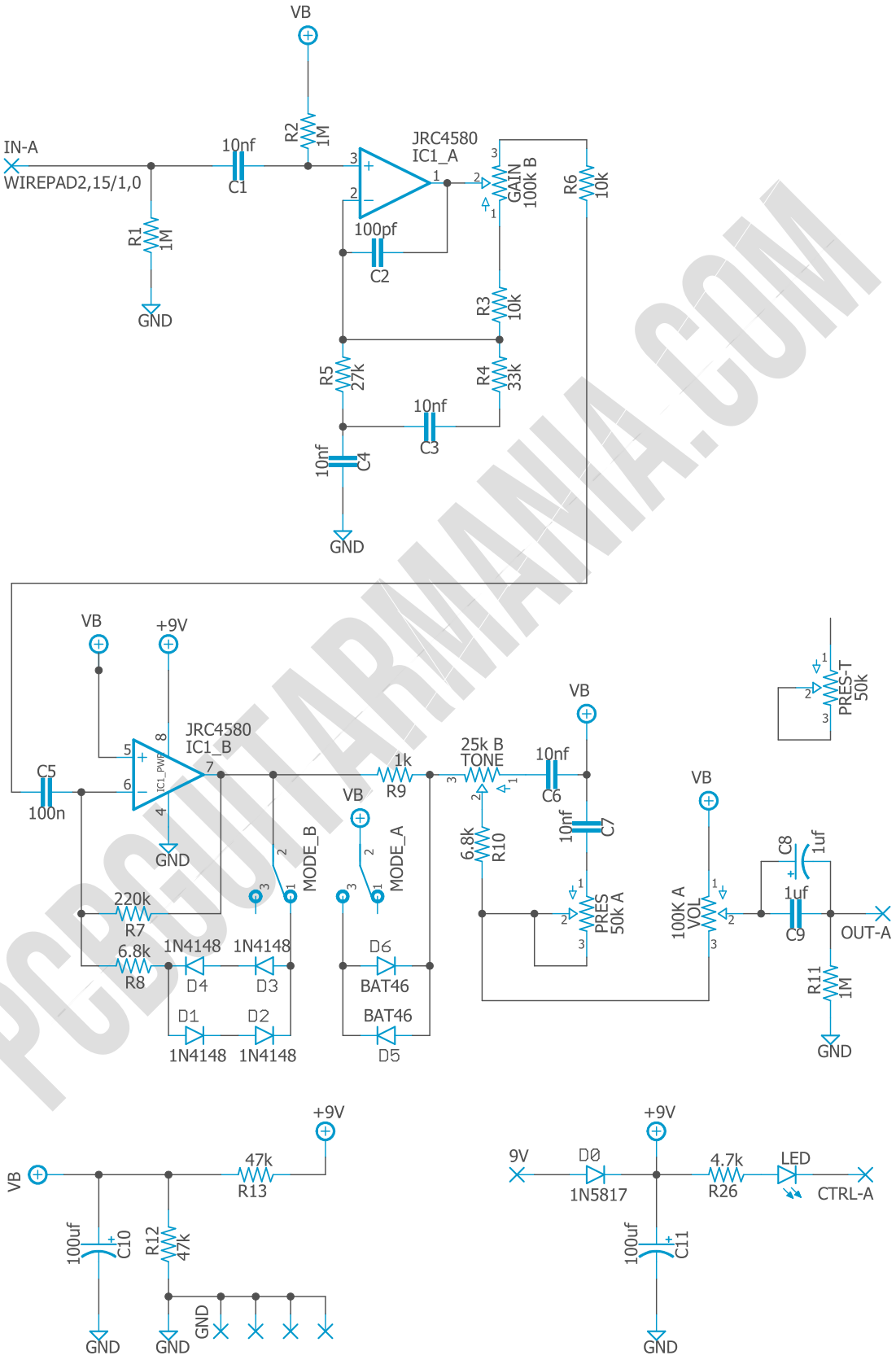
Switches		
Qty	**Value**	**Parts**
1	DPDT on/off/on	MODE

IC		
Qty	**Value**	**Parts**
1	JRC4580	IC1

Diodes		
Qty	**Value**	**Parts**
1	1N5817	D0
4	**1N4148****	D1, D2, D3, D4
2	**BAT46*****	D5, D6

Jacks		
Qty	**Value**	**Parts**
1	DC JACK	-
2	AUDIO JACK	-

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

PRES / PRES-T*

In this circuit, you can choose either an internal trimpot for presence like in the original circuit or the more useful external potentiometer. Choose one.

1N4148**

D1, D2, D3, D4: The original model uses 1S1588 diodes that are almost unobtainable. We chose 1N4148 as the best replacement.

BAT46***

D5, D6: The original model uses MA856 diodes that are almost unobtainable. We chose BAT46 as the best replacement.

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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