

La Rata v2 (Multiboard)

Based on:

Pro Co Rat

Effect type:

Distortion

Build difficult:

Medium

Amount of parts:

Average, total 41 components

Technology:

Single OpAmp

Power consumption:

9V

Enclosure type:

125b

Get your board at:

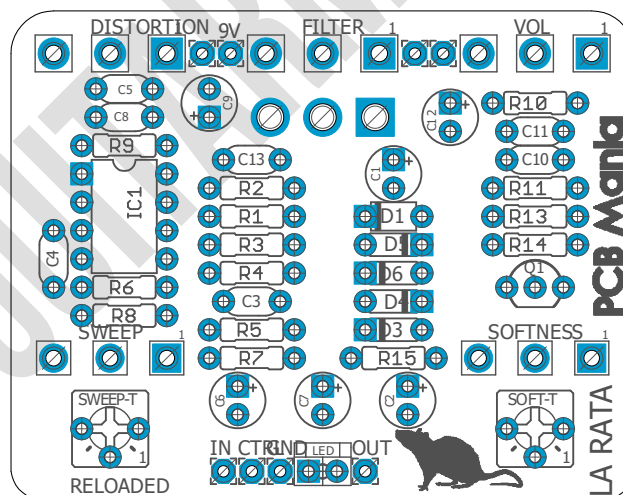
[La rata](#)

Get your kit at:

[Das Musikding \(Europe\)](#)

Project overview:

La Rata takes the maximum advantage of one of the most iconic drives, the Pro co's Rat. This board allows you to build many different versions of this classic drive, from the 1978 original with the LM308 to the ones currently in production. We also added the most popular mods on it, such as diode selector, Sweep control (the famous ruetz mode) and Softness control for the clipping section.



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Introduction

The beauty of La Rata multiboard lies in its versatility. Tonal versatility, and building versatility.

As a pedal for sure you are familiar with this 78' classic distortion that excels at arena rock rhythm tones and soaring leads. As well as a boost for solos and get the extra kick you need from your already driven amp.

La Rata multiboard gathers all the data from 4 of the most iconic versions of this drive and mashes it with some of the most popular mods to take the most juice out of it and create your own custom version of it.

But no worries, if you want to build the classic Rat without any of these mods we got you cover, you can find below all the explanations on how to bypass all this mods and build the classic Rat.

Controls

Filter control: Turn it to the right to roll off brittle high-end frequencies. Having trouble cutting through the mix? Turn it to the left and allow the natural brightness of your instrument to shine through.

Distortion: dials in the perfect amount of gain – from mild overdrive to full out fuzzy assault.

Volume control lets you dial it in just perfectly against your bypassed clean tone.

Sweep, allows you to add some extra bass and smooth's up the signal. Especially good for bass players and lower guitar tunes rhythmic players. As a tradeoff, this will take out a bit of the classic bite the RAT has.

By rolling this knob to 0 you will have it as a default rat, or you can do it by placing a jumper in between pads 1 and 3 of the pots/trimpots.

Softness: Interacts with D4 and D5 adding resistance on the clipping section to regulate how hard you want the clipping to be.

You can bypass this by rolling the knob to 0 or by placing a jumper in between pads 1 and 3 of the pots/trimpots.

Bill of materials

Resistors

	Rat	Rat II	Turbo Rat	You Dirty Rat
R1	47r	47r	47r	47r
R2	100k	100k	100k	100k
R3	100k	100k	100k	100k
R4	1M	2M2	2M2	2M2
R5	1M	2M2	2M2	1M
R6	1K	1K	1K	1K
R7	560R	560R	560R	560R
R8	47R	47R	47R	47R
R9	1K	1K	1K	1K
R10	1K5	1K5	1K5	1K5
R11	1M	1M	1M	1M
R13	10K	10K	10K	10K
R14	Omit	10K	10K	Omit
R15	2k2-4k7	2k2-4k7	2k2-4k7	2k2-4k7

In red you can see the variations of components across the different models.

R15 controls LED brightness, place any resistor in between 2k2 and 4k7, the lower the value, the brighter the LED

Capacitors

(No variations across the different versions)

	Rat	Rat II	Turbo Rat	You Dirty Rat
C1	100uf	100uf	100uf	100uf
C2	1uf	1uf	1uf	1uf
C3	22n	22n	22n	22n
C4	1nf	1nf	1nf	1nf
C5	100pf	100pf	100pf	100pf
C6	2.2uf	2.2uf	2.2uf	2.2uf
C7	4.7uf	4.7uf	4.7uf	4.7uf
C8	30pf	30pf	30pf	30pf
C9	4.7uf	4.7uf	4.7uf	4.7uf
C10	3n3	3n3	3n3	3n3
C11	22n	22n	22n	22n
C12	1uf	10uf	10uf	10uf
C13	10nf	10nf	10nf	10nf

Semi conductors

	Rat	Rat II	Turbo Rat	You Dirty Rat
IC1	LM308N	LM308N	OP07	OP07
Q1	2N5457	2N5457	2N5457	2N5457

Diodes

	Rat	Rat II	Turbo Rat	You Dirty Rat
D1	1n4001	1n4001	1n4001	1n4001
D3	1n914	1n4148	5mm red led	1n34A
D4	1n914	1n4148	5mm red led	1n34A
D5	Your choice	Your choice	Your choice	Your choice
D6	Your choice	Your choice	Your choice	Your choice

As you can see on the previous tables, there isn't much of a difference in between the components of the different rat versions, you can always try assigning diodes from another version on D4 and D5, for example, if you build the RAT II, and assign 5mm red led to the clipping switch, you will have both Rat II and Turbo Rat just at the flick of a switch

Potentiometers and Trim pots

Name	Value	
SOFTNESS	10k B	Potentiometer or trim pot
SWEEP	1K B	Potentiometer or trim pot
VOL	100k A	
DISTORTION	100k A	
FILTER	100k A	
Clipping	SPDT	On-off-on

In this board you can choose whether to use trim pots or external pots for the 'Softness' and 'Sweep' controls. NEVER PLACE BOTH or the pedal will not work correctly.

Shopping list

Resistors

2	47r	R1, R8
1	560R	R7
1	2k2-4k7	R15
2	2M2	R5
2	1M	R4, R11
2	10K	R13
2	1K	R6, R9
1	1K5	R10
2	100k	R2, R3
1	10K	R14

Capacitors

1	30pf	C8
1	3n3	C10
2	22n	C3, C11
1	1nf	C4
1	100pf	C5
1	10nf	C13

Electrolytics

2	1uf	C2, C12
1	2.2uf	C6
2	4.7uf	C7, C9
1	100uf	C1

Diodes

1	1n4001	D1
2	1n914	D3, D4
2	3mm RED LED	D5, D6
1	5mm Red led	LED

Potentiometers

3	100k A	
1	10k B	
1	1K B	
1	10k trimpot	
1	1K trimpot	

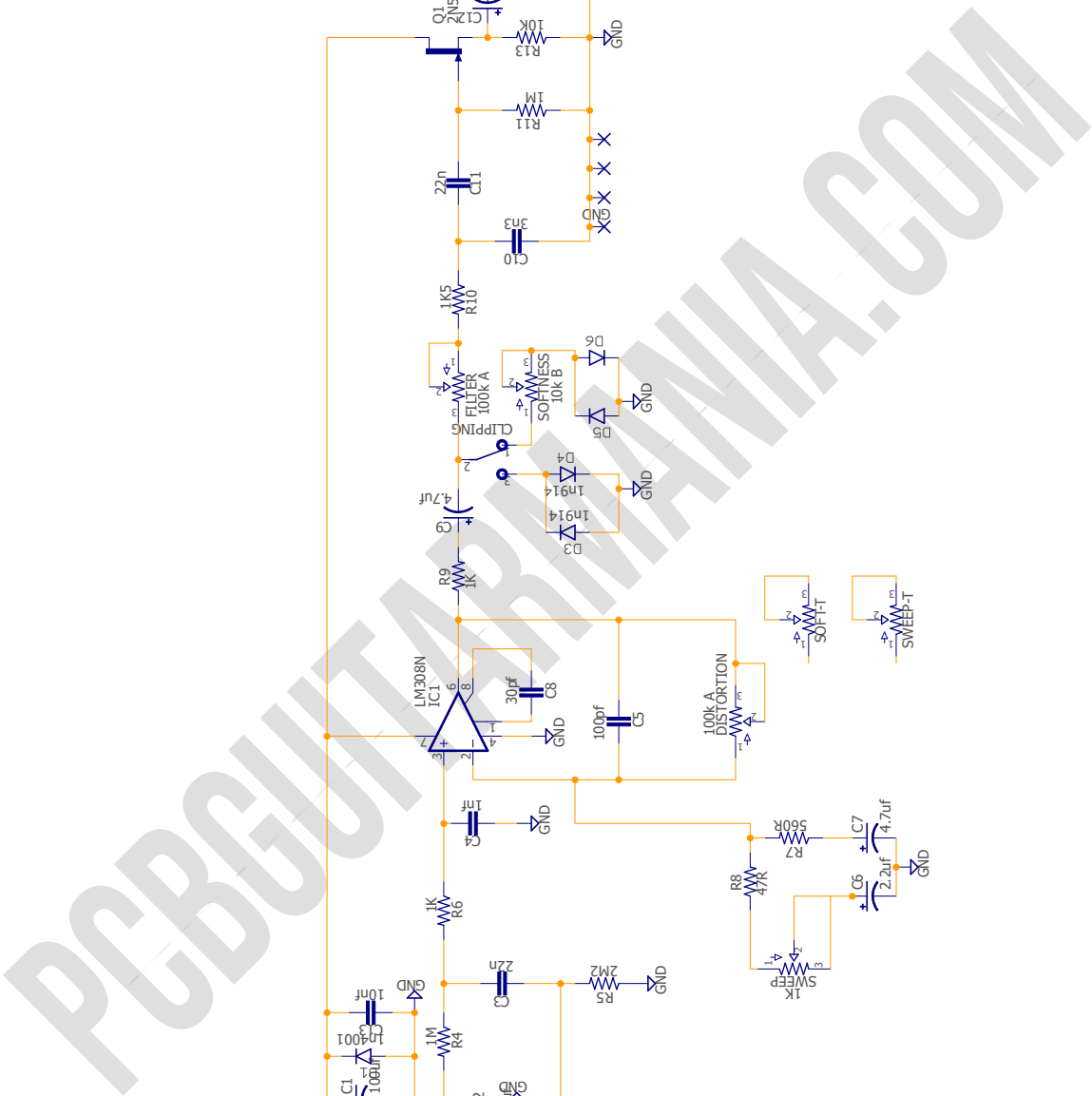
Semi-conductors

1	2N5457	Q1
1	LM308N	IC1
1	OP07	

Switches

1	SPDT ON- OFF-ON	CLIPPING
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This list attempts to include all the necessary components for you to build any of the featured versions.



Components Recommendations

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

This board has been tested using Film box capacitors for most of the values over 1nf, and ceramics discs for the ones 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 exclusively 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 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

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.

This board has been designed to match our EZ 3PDT PCB check it [here](#) to access to 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 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!