Julio

Based on:
Walrus Audio Julia Analog Chorus/Vibrato

Effect type:
Chorus&Vibrato

Build difficult:
Advanced

Number of parts:
High, total 97 components

Technology:
MN3207 / MN 3102

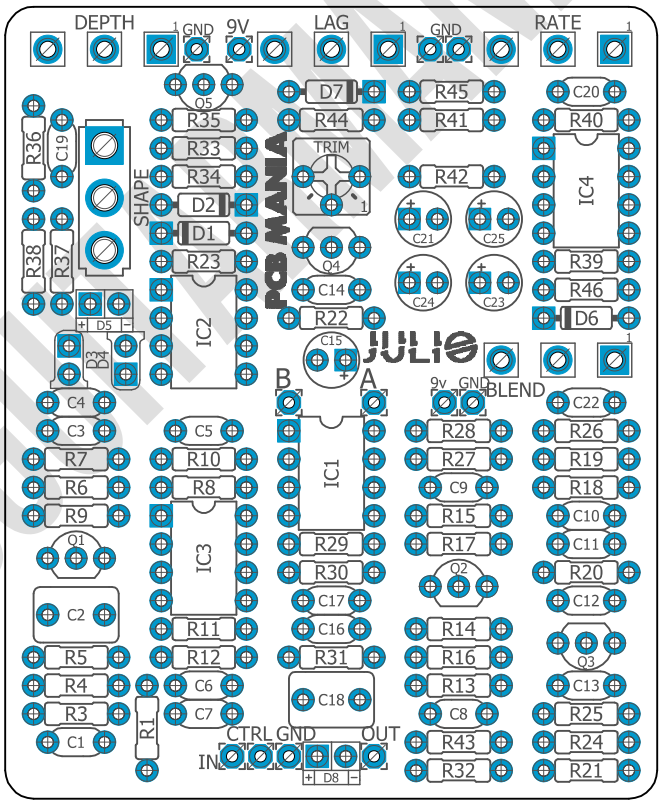
Power consumption:
9V

Enclosure type:
125b

Get your board at:
Julio

Get your kit at:
Das Musikding (Europe)

Project overview:
Julio comes with a myriad of controls that allows you to dial in all types of classic and unique chorus/vibrato sounds that can blend in unusual ways; get mild smooth chorus, seasick vibrato, and everywhere in between. Julio will take you 20000 leagues under the bubbly sea in search of that perfect chorus/vibrato sound you were looking for. Bon voyage!



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Introduction

We all know that the market for boutique wobble boxes is highly saturated; but, from time to time, there is a chance of finding unique pedals that can push musicality as hard as sound quality. Julio is one of those gems, a genuinely innovative circuit created with a think-outside-the-box type of mentality.

With controls like Depth, Rate, Blend, and a Shape switch, you can dial in all types of classic and unique chorus/vibrato waves. Some settings give a familiar feel while others go directly into unknown territory.

A special feature of the Julio is the Lag control. The Lag knob lets you set the center delay time that the LFO effect modulates from. This knob adds a new dimension to the traditional Chorus/Vibrato landscape, from smooth and tight modulation at lower settings to warbling detune at maximum.

If you crave shimmering textures and sensuous motion in your clean tones, Julio is the pedal that will grant you all.

Controls

Potentiometers

- Blend
- Depth
- Lag
- Rate

Switches

- Shape

Bill of materials

Resistors	
Part	**Value**
R1	1m
R3	1k
R4	470k
R5	10k
R6	47k
R7	10k
R8	47k
R9	10k
R10	100k
R11	10k
R12	10k
R13	10k
R14	10k
R15	56k
R16	4k7
R17	330k
R18	10k
R19	10k
R20	10k
R21	10k
R22	33k
R23	2k7
R24	1m
R25	12k
R26	12k
R27	12k
R28	12k
R29	47k
R30	10k
R31	470r
R32	100k
R33	33k
R34	4k7
R35	4k7
R36	47k
R37	22k
R38	6k8
R39	33k
R40	1m
R41	10k
R42	47k
R43	4k7
R44	33r
R45	10k
R46	**leave empty***
R47	10k

Capacitors	
Part	**Value**
C1	47n
C2	1u
C3	6n8
C4	100p
C5	33n
C6	3n3
C7	8n2
C8	470p
C9	33n
C10	3n3
C11	8n2
C12	470p
C13	33n
C14	47p
C16	100p
C17	6n8
C18	1u
C19	10n
C20	47n
C22	100n

Electrolytics Capacitors	
Part	**Value**
C15	10u

C21	100u
C23	47u
C24	220u
C25	10u

Potentiometers	
Part	**Value**
BLEND	10K B
DEPTH	100K B
LAG	250K B
RATE	100K B

Trimpots	
Part	**Value**
TRIM	50K

IC	
Part	**Value**
IC1	**MN3207***
IC2	MN3102
IC3	RC4558
IC4	TL022

Transistors	
Part	**Value**
Q1	2N5088
Q2	2N5088
Q3	2N5088
Q4	2N5088
Q5	2N5088

Switches	
Part	**Value**
SHAPE	SPDT On-On
-	3PDT Stomp foot

Diodes	
Part	**Value**
D1	1n914
D2	1n914
D3	3mm Red LED
D4	3mm Red LED
D5**	3mm Blue LED
D6	**Zener diode 9V1*****
D7	1n5817
D8	3mm Red LED

Jacks	
Part	**Value**
-	DC JACK
-	AUDIO JACK
-	AUDIO JACK

Shopping list

Resistors		
Qty	**Value**	**Parts**
2	100k	R10, R32
15	10k	R5, R7, R9, R11, R12, R13, R14, R18, R19, R20, R21, R30, R41, R45, R47
4	12k	R25, R26, R27, R28
1	1k	R3
3	1m	R1, R24, R40
1	22k	R37
1	2k7	R23
1	330k	R17
3	33k	R22, R33, R39
1	33r	R44
1	470k	R4
1	470r	R31
5	47k	R6, R8, R29, R36, R42
4	4k7	R16, R34, R35, R43
1	56k	R15
1	6k8	R38

Capacitors		
Qty	**Value**	**Parts**
1	100n	C22
2	100p	C4, C16
1	10n	C19
2	1u	C2, C18
3	33n	C5, C9, C13
2	3n3	C6, C10
2	470p	C8, C12
2	47n	C1, C20
1	47p	C14
2	6n8	C3, C17
2	8n2	C7, C11

Electrolytic Capacitors		
Qty	**Value**	**Parts**
1	100u	C21
2	10u	C15, C25
1	220u	C24
1	47u	C23

Potentiometers		
Qty	**Value**	**Parts**
2	100K B	DEPTH, RATE
1	10K B	BLEND
1	250K B	LAG

Trimpots		
Qty	**Value**	**Parts**
1	50K	TRIM

IC		
Qty	**Value**	**Parts**
1	RC4558	IC3
1	TL022	IC4
1	MN3102	IC2
1	**MN3207***	IC1

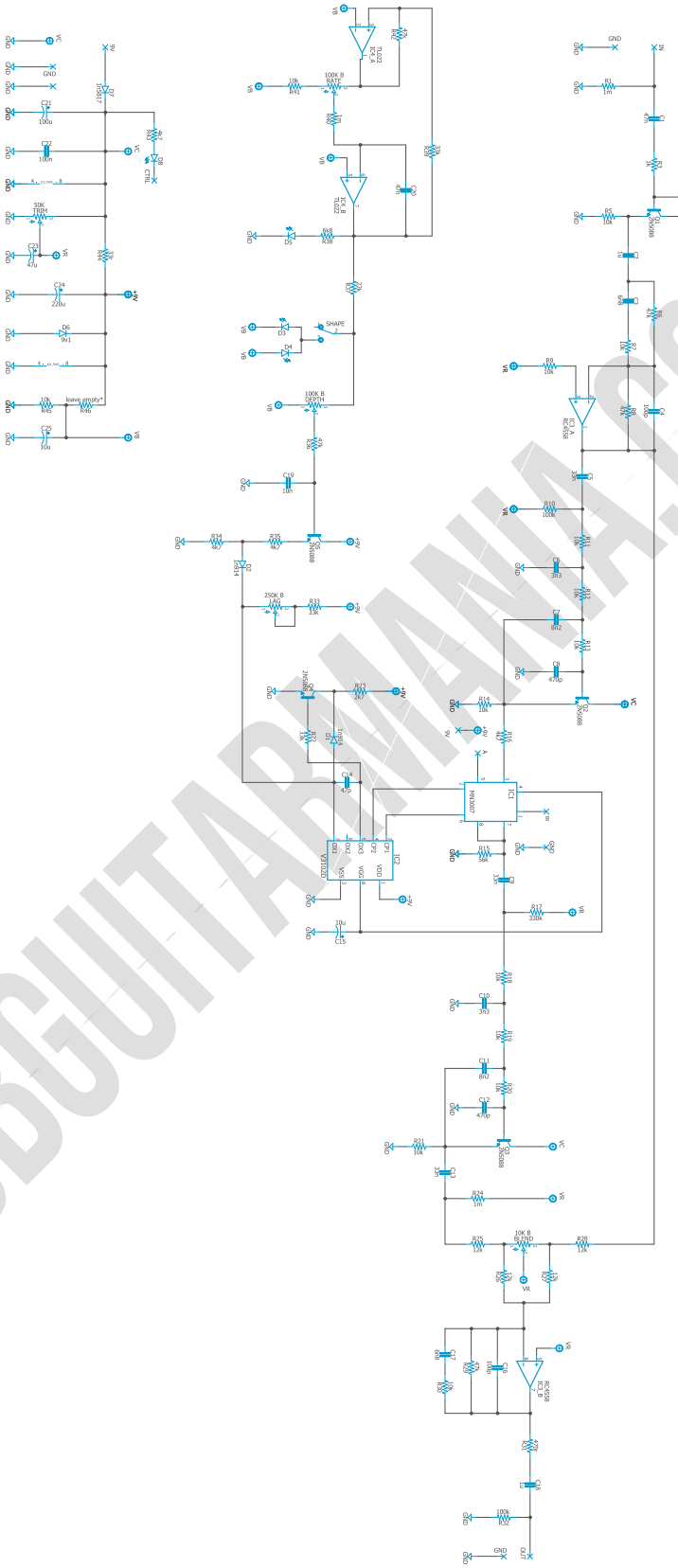
Transistors		
Qty	**Value**	**Parts**
5	2N5088	Q1, Q2, Q3, Q4, Q5

Switches		
Qty	**Value**	**Parts**
1	SPDT On-On	SHAPE
1	3PDT Stomp foot	-

Diodes		
Qty	**Value**	**Parts**
1	1n5817	D7
2	1n914	D1, D2
3	3mm Red LED	D3, D4, D8
1	**Zener diode 9V1*****	D6
1	3mm Blue LED	**D5****

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.

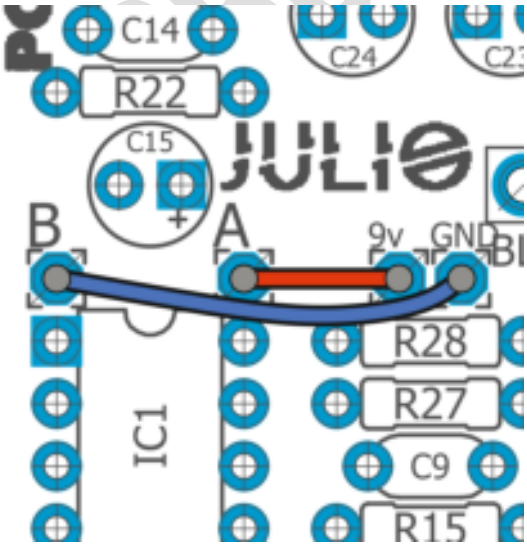
Build Notes

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

MN3207*
You can choose either MN3207 or MN3102.
Place a wire between pad 'A' and 9v and another wire between pad 'B' and GND:



D5**

Pots, switches, D8 & D5 Goes on the other side of the board.

R46

Don´t populate R46, we fixed this issue from 1.1v onwards.

Zener diode 9V1***

This Zener diode limits the voltage to a maximum peak of 9v1.

Europe
https://eu.mouser.com/ProductDetail/Taiwan-Semiconductor/BZX79C9V1-R0G?qs=70cth9uAySeKlSbiVp4%252BVg%3D%3D
Worldwide
https://www.amazon.com/dp/B07L8K75QK/ref=cm_sw_r_apan_glc_i_B17JYZMXWFFTVJ5DBY43?language=en_US

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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