

Julio

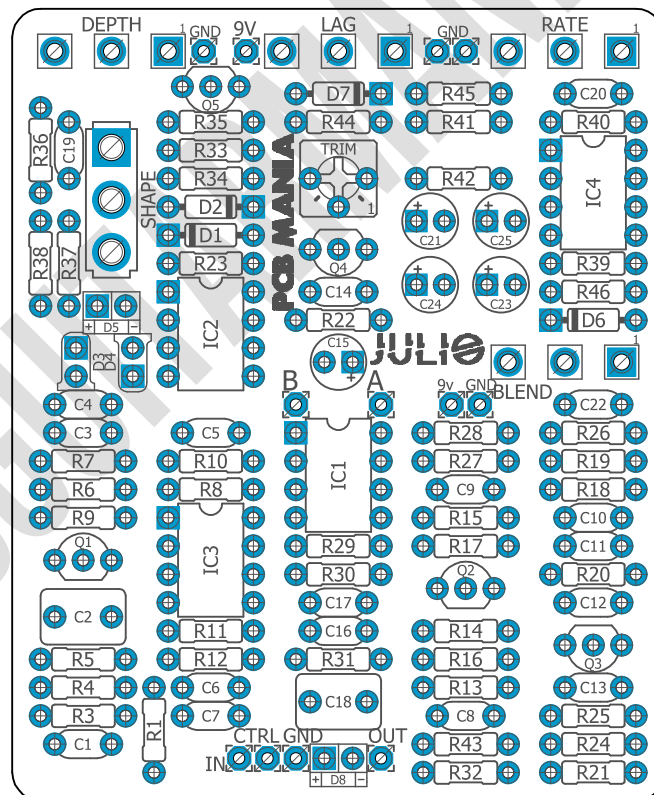
Based on:
Walrus Audio Julia Analog
Chorus/Vibrato
Effect type:
Chorus&Vibrato
Build difficult:
Advanced

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 |

| | |
|-----------|--------|
| Q3 | 2N5088 |
| Q4 | 2N5088 |
| Q5 | 2N5088 |

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

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

| Trim pots | |
|-------------|-------|
| Part | Value |
| TRIM | 50K |

| Diodes | |
|-------------|--------------|
| Part | Value |
| D1 | 1n914 |
| D2 | 1n914 |
| D3 | 3mm Red LED |
| D4 | 3mm Red LED |
| D5** | 3mm Blue LED |
| D6 | 9v1 |
| D7 | 1n5817 |
| D8 | 3mm Red LED |

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

| Jacks | |
|-------|------------|
| Part | Value |
| - | DC JACK |
| - | AUDIO JACK |
| - | AUDIO JACK |

| Transistors | |
|-------------|--------|
| Part | Value |
| Q1 | 2N5088 |
| Q2 | 2N5088 |

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, R46 |
| 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 |

| Electrolytics 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 |

| Trim pots | | |
|-----------|-------|-------|
| Qty | Value | Parts |
| 1 | 50K | TRIM |

| IC | | |
|-----|--------|-------|
| Qty | Value | Parts |
| 1 | RC4558 | IC3 |
| 1 | TL022 | IC4 |
| 1 | MN3102 | IC2 |

| | | |
|---|---------|-----|
| 1 | MN3207* | IC1 |
|---|---------|-----|

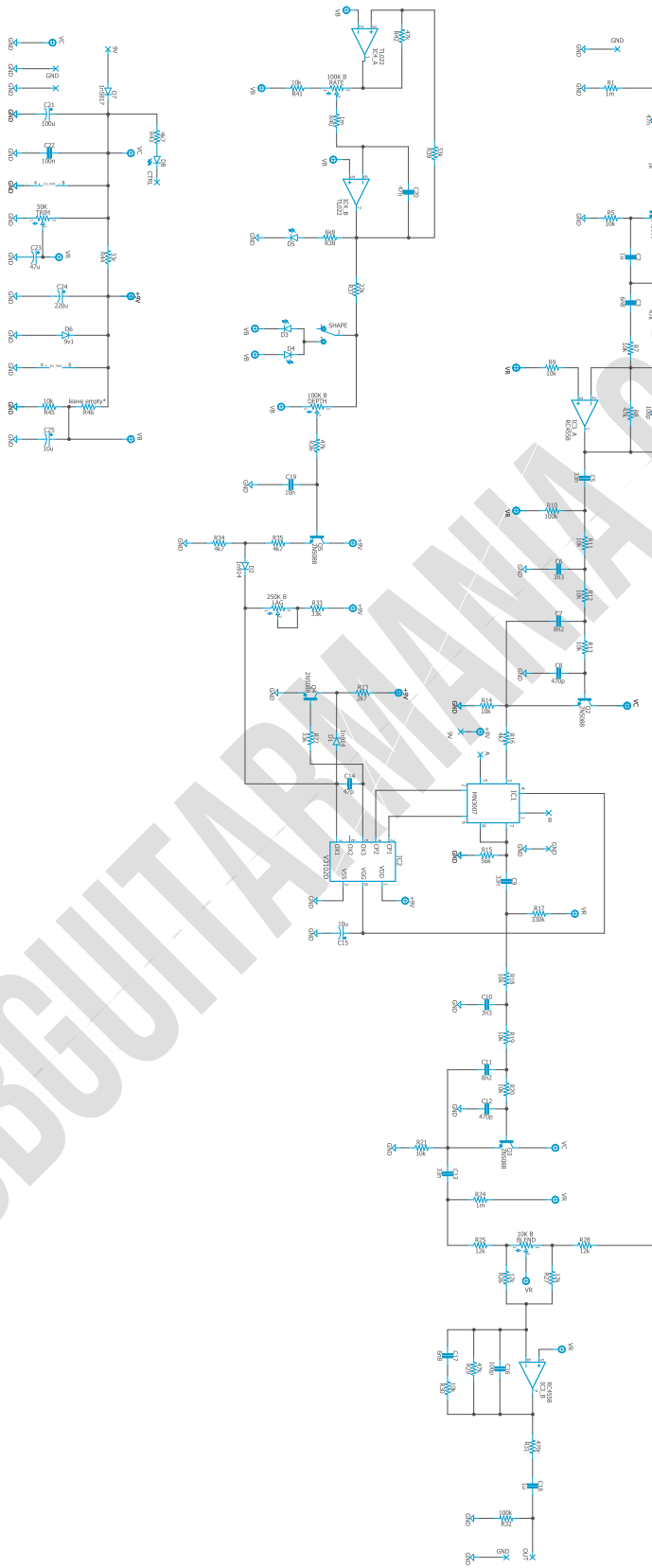
| Transistors | | |
|-------------|--------|--------------------|
| Qty | Value | Parts |
| 5 | 2N5088 | Q1, Q2, Q3, Q4, Q5 |

| 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 | 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](#).

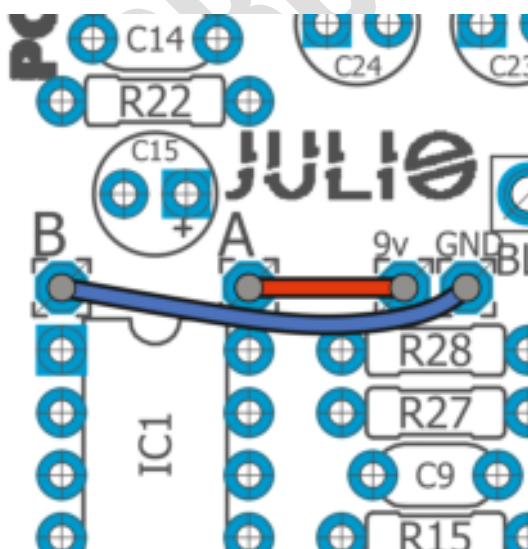
For a successful and tidy build, it's recommended the following order:

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

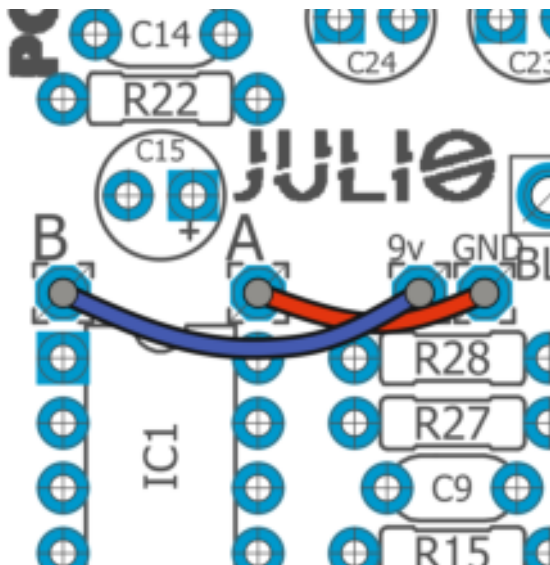
MN3207*

You can choose between MN3207 and MN3007. MN3207 is way easier to find.

If using **MN3207** place a wire between pad 'A' and 9v and another wire between pad 'B' and GND:



If using a **MN3007** pad 'A' goes to GND and 'B' to 9v:



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.

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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