Rainbow Device

Based on:
Rainbow Machine

Effect type:
Polyphonic harmonizing modulation machine

Build difficult:
Advanced

Number of parts:
High, total 77 components

Technology:
SPIN FV-1

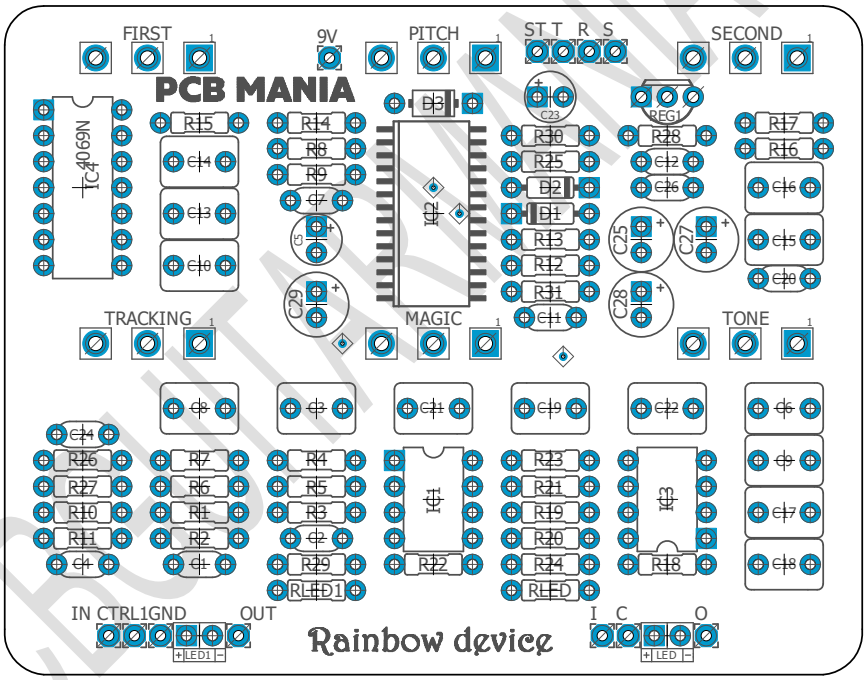
Power consumption:
9V

Enclosure type:
1590bb

Get your board at:
Rainbow Device

Get your kit at:
Das Musikding (Europe)

Project overview:
Inspired by Rainbow Machine. Are you brave enough to jump into the rabbit hole to see how far your sound can go with this polyphonic harmonizing modulation machine?



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Introduction

If you are the type of person who loves to experiment with your waves, you need to have this board. The Rainbow Device will definitively get you further away from the typical guitar sound and expand your possibilities beyond the known.

Once your signal travels to this board, it will put a new twist on your playing by adding polyphonic harmonies, real-time pitch shifting with wild launches and descends, pandemonium chorusing, and large etcetera of transformations before your very ears.

Requires a Spin FV-1, meaning SMD soldering an expensive 28 pin IC. So, we would not recommend this project for beginners. A lot of Flux and taking the time you need helps to get this done. There are also tutorials online that will help you manage this. You need a switchable jack for the expression pedal, or you will have problems with the signal not passing through.

But this pedal is worth every drop of sweat. We still remember when we tried this polyphonic pitch shifting harmonizer for the first time. Hours passed without us noticing the time flying. And while we were having fun, we invoked some alien sang, psychedelic rainbows, pixie dust, and swelling chorus.

Who knows what you will summon with this incredible board?

Controls

Potentiometers

- First
- Magic
- Pitch
- Second
- Tone
- Tracking

Bill of materials

Resistors	
Part	**Value**
R1	1M
R2	1k
R3	1M
R4	10k
R5	4k7
R6	1k
R7	1k
R8	1k
R9	1k
R10	10K
R11	10K
R12	10k
R13	10k
R14	1k
R15	10k
R16	1k
R17	10k
R18	10k
R19	10k
R20	47k
R21	10k
R22	15k
R23	1k
R24	100k
R25	100r
R26	10k
R27	4k7
R28	10k
R29	10k
R30	10k
R31	10k
RLED	4k7
RLED1	4k7

Capacitors	
Part	**Value**
C1	100p
C2	100n
C3	1u
C4	1n
C6	1u
C7	1n
C8	1u
C9	1u
C10	1u
C11	2n2
C12	100n
C13	1u
C14	1u
C15	1u
C16	1u
C17	1n
C18	1u
C19	1u
C20	47n
C21	1u
C22	1u
C24	1n
C26	100n

Elec Capacitors	
Part	**Value**
C5	10u
C23	10u
C25	100u
C27	10u
C28	1u
C29	100u

Potentiometers	
Part	**Value**
FIRST	10k B
MAGIC	25k B
PITCH	50K Btrolytic
SECOND	10k B
TONE	10k B
TRACKING	25k B

IC	
Part	**Value**
IC1	TL072
IC2	FV1
IC3	TL072
IC4	4069n

Voltage regulator	
Part	**Value**
Reg 1	L78L33

Diodes	
Part	**Value**
D1	1n4148
D2	1n4148
D3	1n5817
LED	3mm LED
LED 1	3mm LED

Switches	
Part	**Value**
-	3PDT Stomp foot

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

Shopping list

Resistors		
Qty	**Value**	**Parts**
1	100k	R24
1	100r	R25
15	10k	R4, R10, R11, R12, R13, R15, R17, R18, R19, R21, R26, R28, R29, R30, R31
1	15k	R22
2	1M	R1, R3
8	1k	R2, R6, R7, R8, R9, R14, R16, R23
1	47k	R20
4	4k7	R5, R27, RLED, RLED1

Capacitors		
Qty	**Value**	**Parts**
3	100n	C2, C12, C26
1	100p	C1
4	1n	C4, C7, C17, C24
13	1u	C3, C6, C8, C9, C10, C13, C14, C15, C16, C18, C19, C21, C22
1	2n2	C11
1	47n	C20

Electrolytic Capacitors		
Qty	**Value**	**Parts**
2	100u	C25, C29
3	10u	C5, C23, C27
1	1u	C28

Potentiometers		
Qty	**Value**	**Parts**
3	10k B	FIRST, SECOND, TONE
2	25k B	MAGIC, TRACKING
1	50K B	PITCH

IC		
Qty	**Value**	**Parts**
1	4069n	IC4
2	TL072	IC1, IC3
1	FV1	IC2

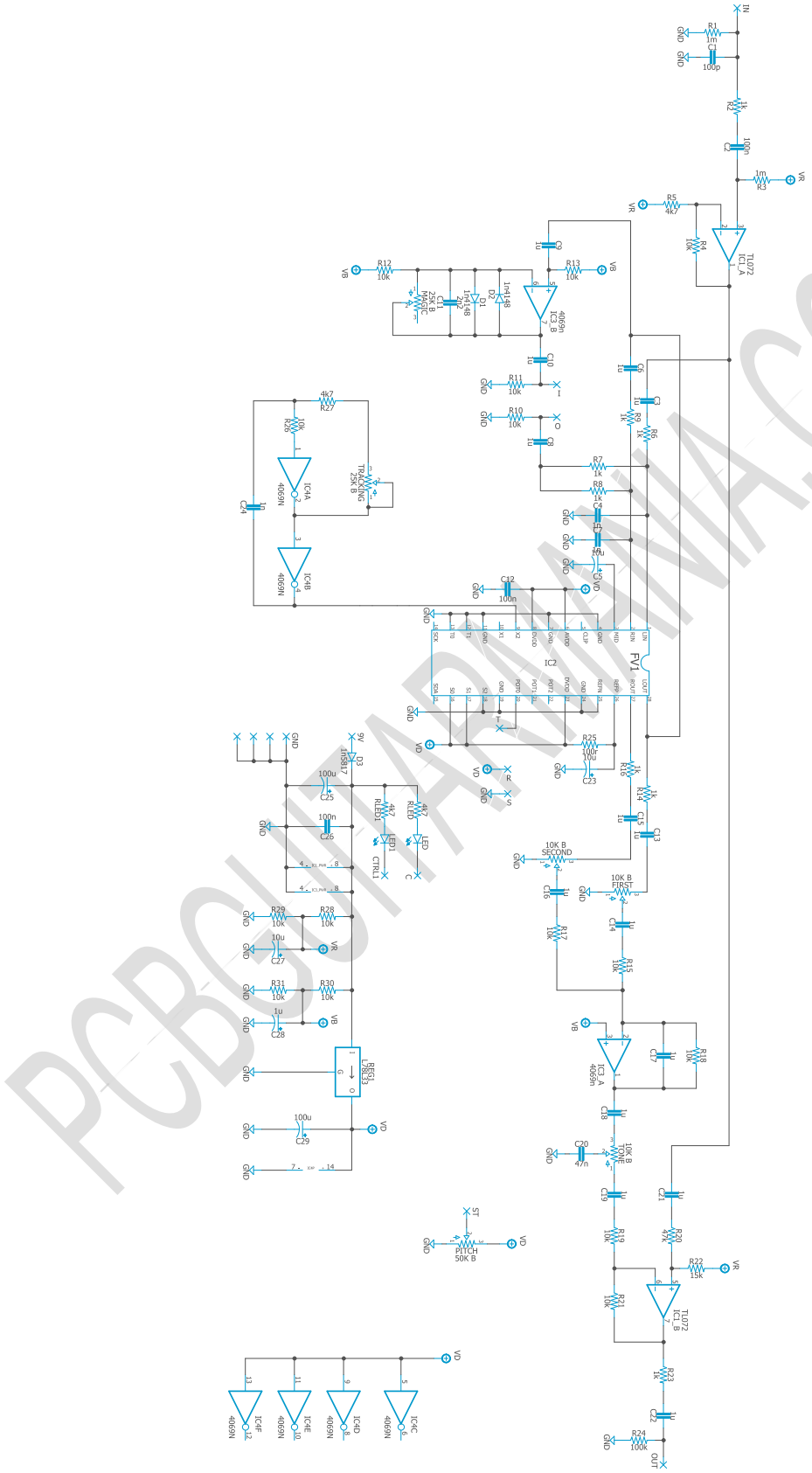
Voltage regulator		
Qty	**Value**	**Parts**
1	L78L33	Reg 1

Diodes		
Qty	**Value**	**Parts**
2	1n4148	D1, D2
1	1n5817	D3
2	3mm LED	LED, LED1

Switches		
Qty	**Value**	**Parts**
1	3PDT Stomp foot	-

Jacks		
Qty	**Value**	**Parts**
1	DC 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 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

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 1590bb enclosure type.

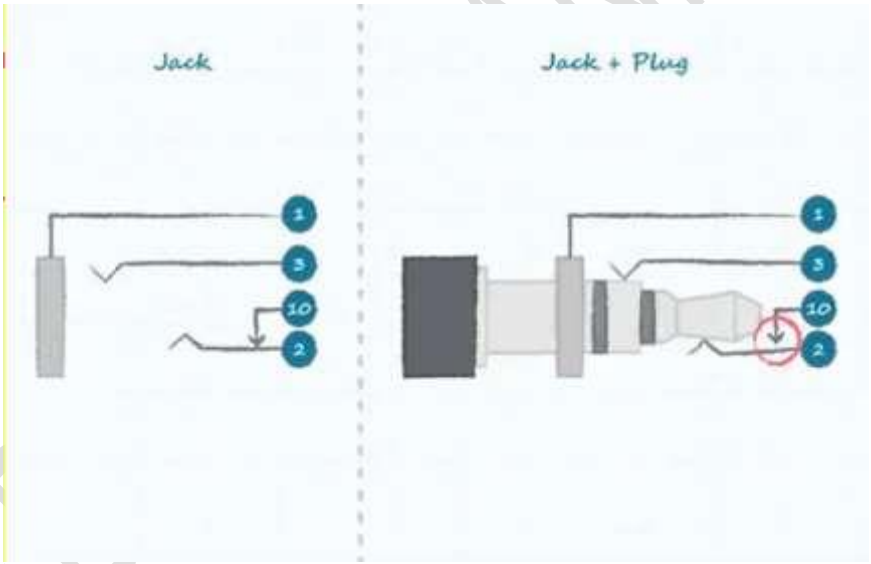
Check the Attached “Drilling templates” to drill the box properly. The files are on Scale 1:1, ready to print on an A4 page.

Wiring the expression pedal

The pedal will replace the function of the Pitch knob once it is connected.

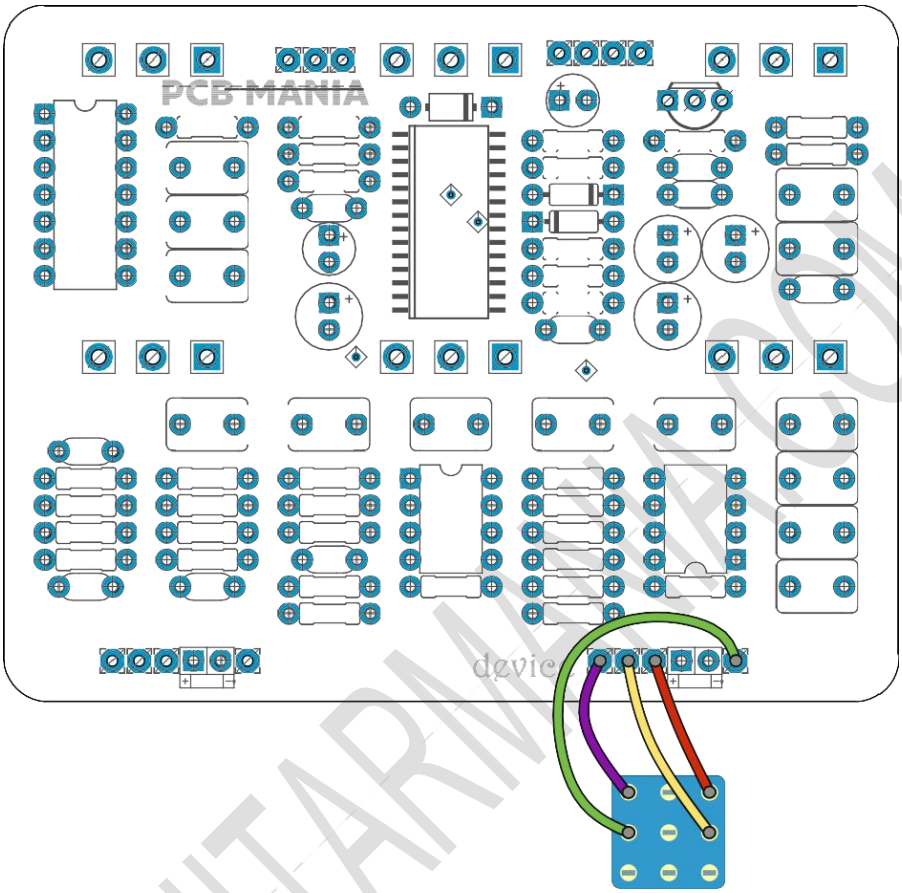
Grab your Switched stereo jack and follow the following diagram to match their respective pads

- ST (Switched Tip) goes to terminal 10.
- T (Tip) goes to terminal 2.
- R (Ring) to terminal 3.
- S (sleeve) to terminal 1.



If you don't want to wire the jack for the expression pedal, simply place jumper pads 'ST' and 'T' pads.

Wiring the magic switch



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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