

# Sea Device

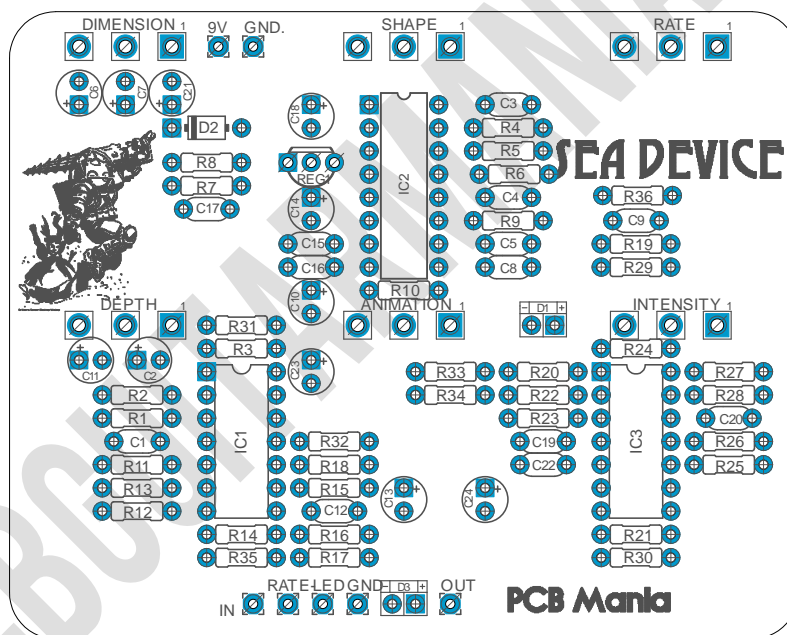
**Based on:**  
EQD Sea Machine  
**Effect type:**  
Ultimate Chorus  
**Build difficult:**  
Advanced

**Amount of parts:**  
High, total 74 components  
**Technology:**  
PT2399 based  
**Power consumption:**  
50mA (9v)

**Enclosure type:**  
1590BB  
**Get your board at:**  
[Sea Device](#)  
**Get your kit at:**  
[Das Musikding \(Europe\)](#)

## Project overview:

PCB Guitar Mania Sea Device is a chorus pedal that gives you an unprecedented measure of control over its parameters. This digital-analog hybrid circuit gives you standout chorusing effects topped off with dramatic shimmer. Based around a PT2399 short digital delay line, with controls for Animation, Dimension, and Depth. From there, knobs for Shape, Rate, and Intensity let you craft and fine-tune your chorus effect to perfection.



Real measures are:

86.30mm width x 68.54mm height

3.40" width x 2.70" height

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## Introduction

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This circuit has been cooked up by the people from Akron, Ohio in order to achieve the ultimate versatile chorus. From subtle, shimmery chorus sounds, to wobbly, seasick, warbly pitch-bent detuning that rocks the boat.

It's Sea Device palette of controls, both standard and proprietary, that makes it unique - and eminently useful for everything from understated warble and classic Leslie effects to roller-coaster pitch bends, condensed arpeggiations, outrageous alien soundscapes, and more!

EarthQuaker Devices designed the original circuit of the Sea Machine to play nicely with the other pedals in your signal chain without distorting, attenuating volume, or inducing mud. At Sweetwater, we tend to prefer it placed after distortion pedals and before signal boosters.

When engaged, Sea device's transparent buffer leaves your dry, all-analog signal crystal clear and untouched!

## Controls

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The controls of the Sea Device might look a bit complicated at the first contact, but actually is much more intuitive than what it looks like.

The delay line (PT2399 LFO) controls Dimension, Animate, and Depth.

- **Rate:** Sets the speed of the LFO. The miniature LED will show the tempo even in bypass mode.
- **Shape:** From soft triangle through hard square wave.
- **Dimension:** Adds a slight slap-back at low levels, reverb-like ambiance at mid levels and an echo-resonance at max.
- **Depth:** How much the LFO modulates the delay time.
- **Animate:** How far the pitch shifted signal swings, lower levels equals a tighter and more focused shift à la traditional chorus. As you increase the control a more wild and animated pitch shift begins to emerge.
- **Intensity:** How much modulated signal is blended in with the dry signal.

# Bill of materials

| Resistors |      |
|-----------|------|
| R1        | 1m   |
| R2        | 1m   |
| R3        | 10k  |
| R4        | 33k  |
| R5        | 10k  |
| R6        | 33k  |
| R7        | 1k   |
| R8        | 8K2  |
| R9        | 33k  |
| R10       | 1k   |
| R11       | 10k  |
| R12       | 10k  |
| R13       | 10k  |
| R14       | 10k  |
| R15       | 10k  |
| R16       | 100k |
| R17       | 470r |
| R18       | 2k2  |
| R19       | 22k  |
| R20       | 47k  |
| R21       | 100k |
| R22       | 100k |
| R23       | 100k |
| R24       | 10k  |
| R25       | 10k  |
| R26       | 10k  |
| R27       | 10k  |
| R28       | 10k  |
| R29       | 33k  |
| R30       | 1k   |
| R31       | 10k  |

|     |      |
|-----|------|
| R32 | 10k  |
| R33 | 100k |
| R34 | 100k |
| R35 | 4k7  |
| R36 | 33k  |

| Capacitors |              |
|------------|--------------|
| C1         | 100n         |
| C2         | 1uf electro  |
| C3         | 470pf        |
| C4         | 470pf        |
| C5         | 100n         |
| C6         | 1uf electro  |
| C7         | 10uf Electro |
| C8         | 100n         |
| C9         | 3n3          |
| C10        | 1uf electro  |
| C11        | 1uf electro  |
| C12        | 100p         |
| C13        | 1uf electro  |
| C14        | 10uf         |
| C15        | 100n         |
| C16        | 100n         |
| C17        | 100n         |
| C18        | 10uf Electro |
| C19        | 47n          |
| C20        | 470n         |
| C21        | 100uf        |
| C22        | 100n         |
| C23        | 10uf Electro |
| C24        | 10uf Electro |

| Potentiometers |        |
|----------------|--------|
| ANIMATION      | 2K B   |
| DEPTH          | 25k B  |
| DIMENSION      | 5k B   |
| INTENSITY      | 50K B  |
| RATE           | 1M C   |
| SHAPE          | 100k A |

| Semiconductors |        |
|----------------|--------|
| IC1            | TL074  |
| IC2            | PT2399 |
| IC3            | LM324  |
| REG1           | L78L05 |

| Diodes |              |
|--------|--------------|
| D1     | 3mm Blue Led |
| D2     | 1n5817       |
| D3     | 3mm Blue Led |

# Shopping list

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## Resistor

| QTY | Value | Position   |
|-----|-------|--|
| 1   | 22k   | R19  |
| 1   | 470r  | R17  |
| 1   | 47k   | R20  |
| 1   | 4k7   | R35  |
| 1   | 8K2   | R8   |
| 3   | 1k    | R7, R10, R30   |
| 2   | 1m    | R1, R2   |
| 1   | 2k2   | R18  |
| 5   | 33k   | R4, R6, R9, R29, R36   |
| 6   | 100k  | R16, R21, R22, R23, R33, R34                                       |
| 14  | 10k   | R3, R5, R11, R12, R13, R14, R15, R24, R25, R26, R27, R28, R31, R32 |

## Capacitors

| Qty | Value | Position                       |
|-----|-------|--------------------------------|
| 1   | 47n   | C19                            |
| 1   | 3n3   | C9                             |
| 1   | 470n  | C20                            |
| 2   | 470pf | C3, C4                         |
| 7   | 100n  | C1, C5, C8, C15, C16, C17, C22 |
| 1   | 100p  | C12                            |

## Electrolytics

| Qty | Value | Position               |
|-----|-------|------------------------|
| 1   | 100uf | C21                    |
| 5   | 1uf   | C2, C6, C10, C11, C13  |
| 5   | 10uf  | C14, C18, C23, C24, C7 |

## Semi Conductors

| Qty                    | Value  | Position |
|------------------------|--------|----------|
| <b>Semi Conductors</b> |        |          |
| 1                      | LM324  | IC3      |
| 1                      | PT2399 | IC2      |
| 1                      | TL074  | IC1      |
| 1                      | L78L05 | REG1     |

## Diodes

| Qty | Value        | Position |
|-----|--------------|----------|
| 2   | 3mm Blue Led | D1, D3   |
| 1   | 1N5817       | D2       |

## Potentiometers

| Qty | Value  | Position  |
|-----|--------|-----------|
| 1   | 50K B  | INTENSITY |
| 1   | 5k B   | DIMENSION |
| 1   | 25k B  | DEPTH     |
| 1   | 2K B   | ANIMATION |
| 1   | 1M C   | RATE      |
| 1   | 100k A | SHAPE     |

# Components Recommendations

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For this project is a must to use **PT2399\*** from a trusted source such as Das Musikding, Small bear, and many other pedal related suppliers. DO NOT trust non verified vendors, as are many counterfeits out there, and they won't work properly on your build.

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.

All the pots are Alpha 16mm. **Rate\*\*\* C 1M**, is anti-logarithmic potentiometer, if you have any issue sourcing it, you could try with a **B 1M** lineal potentiometer for a similar functionality.

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

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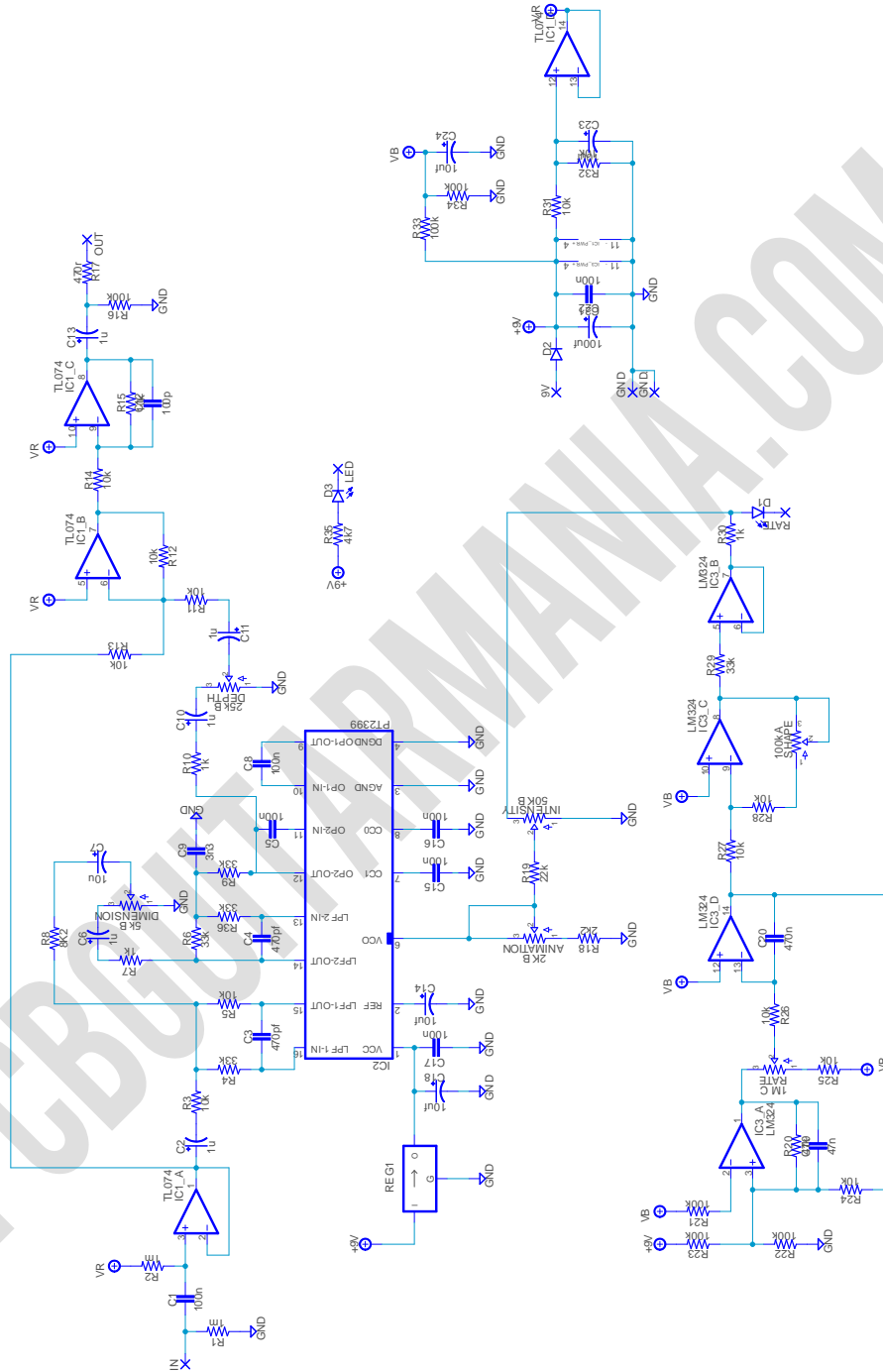
If this is one of your first projects I recommend you to take a look on our [Pedal Building Guide](#)

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

1. SMD Transistors
2. Resistors & diodes
3. Capacitors, starting with the smaller ones and the ceramic ones.
4. Electrolytic capacitors (always check the polarity)
5. Transistors
6. Wires
7. Potentiometers and switches
8. Off board wiring
9. Transistor bias

To bias correctly the transistors you must plug your finished build into the power supply first. With your tester on voltage mode (V20) plug the negative tip into the ground of the project, some alligators could be really helpful. With the positive tip touch the Drain leg of your transistor and it should appear the voltage on your tester screen. Tweak the trim pot till you read 4.5v if you are using a 9v power supply. Do the fine adjustment by ear, in order to bias at your own personal taste.

# Schematic



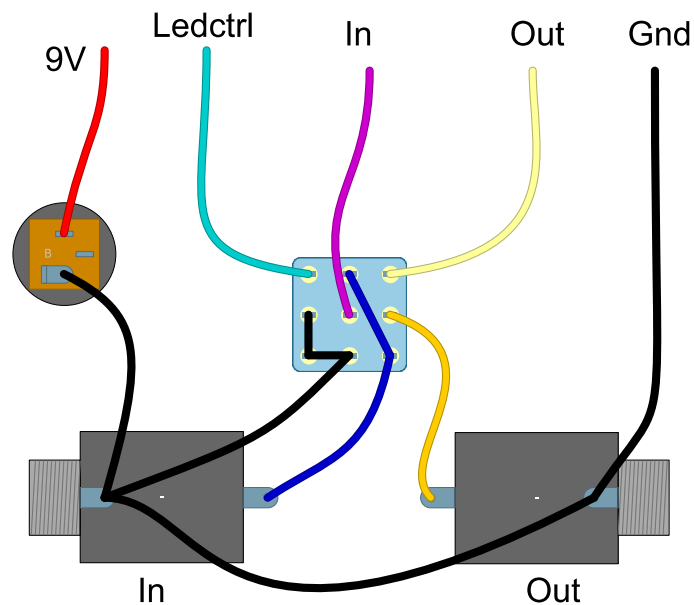
# Wiring Diagram

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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.

You can take a look on the following diagram to understand the general connections. For further information check our [Pedal Wiring guide](#).



# Drill Template

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This Project has been planned to fit into a 1590BB enclosure type (120mm x 94mm x 33mm.)

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

## Licensing and Usage

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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 Grup](#) 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 our 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 its 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!