# Sea Lion Compressor

**Based on:**
Walrus Audio's Deep Six Compressor

**Effect type:**
Compressor

**Build difficult:**
Medium-advanced

**Amount of parts:**
High, total 78 components

**Technology:**
Lm13700

**Power consumption:**
9V-18V

**Enclosure type:**
125b

**Get your board at:**
Sea Lion Compressor

**Get your kit at:**
Das Musikding (Europe)

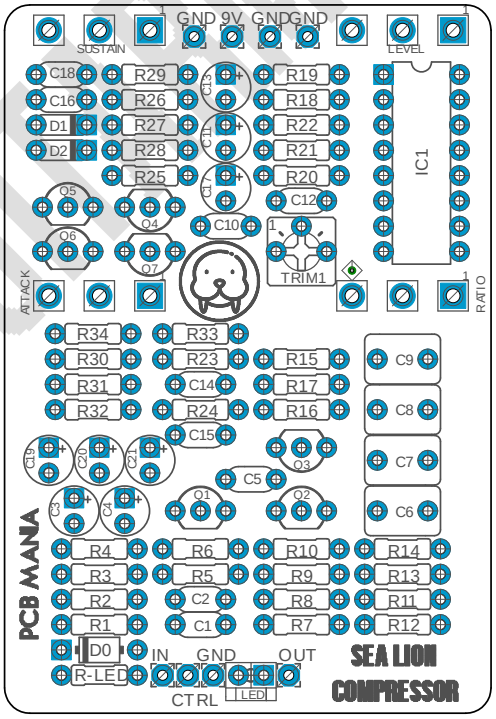
**Project overview:**

Based on Walrus Audio Deep Six Compressor with roots on the DynaComp and Ross Compressor.

This four knobs beast works great for guitar or bass thanks to the internal trimmer that regulates how much of the signal is feed into the IC.

Designed to operate with the IC LM13700 instead of the obsolete CA3080 that most of the compressors use.

It's recommended to operate this circuit at 18v, but remember that all the capacitors should be rated for more than 25V.



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# Introduction

Inspired by the performance of a classic FET leveling amplifier and the simplicity of much-loved vintage compression stomp boxes, Walrus Audio has packed a studio-grade compressor into a guitar pedal.

Fitted with Level, Sustain, Attack, and Blend knobs, the Sea lion delivers tremendous versatility. Active, passive, humbucking, or single-coil; the Sea Lion is ready for all your electric guitars.

The original design by Walrus includes an internal charge pump to make this pedal operates at 18v from a 9v power supply. On this design we choose not to include a charge pump on board in order to keep the layout tidy and tight to fit on a 125B and to give you the option to choose in between plugging it into 9v or 18v from your power supply. Higher voltage will result on more headroom and crystal clear tones.

This design has been optimized for the proper performance with the IC LM13700 instead of the discontinued CA3080 normally associated to compressors from the DynaComp/Ross family.

It's recommended to operate this circuit at 18v, but remember that all the capacitors should be rated for more than 25V.

# Controls

- Attack: lets you optimize compression for either low- or high-output instruments.
- Ratio: Acts as a blend knob, perfect for mixing in a portion of the uncompressed signal for a more natural sound.
- Sustain: Controls the amount of compression. Turn it up to increases the sustain.
- Volume: Controls output of the pedal
- Trim1: attenuates the signal going into the LM13700, originally in this circuit to compensate production differences of the original CA3080, on this build with the LM13700 this trim pot should not have that much importance, just place it at the middle and forget about it.

# Bill of materials

| Resistors | |
|---|---|
| **Part** | **Value** |
| **R1** | 470k |
| **R2** | 10k |
| **R3** | 470k |
| **R4** | 470k |
| **R5** | 10k |
| **R6** | 10k |
| **R7** | 1k |
| **R8** | 56k |
| **R9** | 10k |
| **R10** | 470k |
| **R11** | 10k |
| **R12** | 10k |
| **R13** | 10k |
| **R14** | 10k |
| **R15** | 3k9 |
| **R16** | 1m |
| **R17** | 10k |
| **R18** | 1m |
| **R19** | 1m |
| **R20** | 220k |
| **R21** | 220k |
| **R22** | 15k |
| **R23** | 150k |
| **R24** | 150k |
| **R25** | 10k |
| **R26** | 10k |
| **R27** | 1m |
| **R28** | 1m |
| **R29** | 27k |
| **R30** | 47k |
| **R31** | 56k |
| **R32** | 27k |
| **R33** | 10k |
| **R34** | 10k |
| **R-LED** | 4k7 |

| Capacitors | |
|---|---|
| **Part** | **Value** |
| **C1** | 220pf |
| **C2** | 33n |
| **C3** | 1uf electro |
| **C4** | 10uf electro |
| **C5** | 100n |
| **C6** | 1u |
| **C7** | 1u |
| **C8** | 1u |
| **C9** | 1u |
| **C10** | 100n |
| **C11** | 1u electro |
| **C12** | 10n |
| **C13** | 1u electro |
| **C14** | 1n |
| **C15** | 1n |
| **C16** | 10n |
| **C17** | 10u electro |
| **C18** | 10n |
| **C19** | 100uf electro |
| **C20** | 10uf electro |
| **C21** | 10uf electro |

| Pots | |
|---|---|
| **Part** | **Value** |
| **RATIO** | 10K B |
| **SUSTAIN** | 500K B |
| **LEVEL** | 100K A |
| **ATTACK** | 250K C |
| **TRIM1** | 2k Trimpot |

| Semiconductors | |
|---|---|
| **Part** | **Value** |
| **IC1** | LM13700N |
| **Q1** | MPSA18 |
| **Q2** | MPSA18 |
| **Q3** | 2N5457 |
| **Q4** | MPSA18 |
| **Q5** | MPSA18 |
| **Q6** | MPSA18 |
| **Q7** | MPSA18 |
| **LED** | 3mm LED |
| **D0** | 1N4001 |
| **D1** | 1n4148 |
| **D2** | 1n4148 |

# Shopping list

| Resistors | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **4** | 470k | R1, R3, R4, R10 |
| **1** | 3k9 | R15 |
| **5** | 1m | R16, R18, R19, R27, R28 |
| **2** | 220k | R20, R21 |
| **1** | 15k | R22 |
| **2** | 150k | R23, R24 |
| **2** | 27k | R29, R32 |
| **1** | 47k | R30 |
| **1** | 1k | R7 |
| **2** | 56k | R8, R31 |
| **1** | 4k7 | R-LED |
| **13** | 10k | R2, R5, R6, R9, R11, R12, R13, R14, R17, R25, R26, R33, R34 |

| Capacitors | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **1** | 220pf | C1 |
| **3** | 1u electro | C11, C13, C3 |
| **3** | 10n | C12, C16, C18 |
| **2** | 1n | C14, C15 |
| **1** | 100uf electro | C19 |
| **1** | 33n | C2 |
| **4** | 10uf electro | C4, C20, C21, C17 |
| **2** | 100n | C5, C10 |
| **4** | 1u | C6, C7, C8, C9 |

| Pots | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **1** | 100K A | LEVEL |
| **1** | 10K B | RATIO |
| **1** | 250K C | ATTACK |
| **1** | 500K B | SUSTAIN |
| **1** | 2k | TRIM1 |

| Diodes | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **1** | 1N4001 | D0 |
| **2** | 1n4148 | D1, D2 |
| **1** | LM13700N | IC1 |
| **1** | 3mm LED | LED |

| Semiconductors | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **6** | MPSA18 | Q1, Q2, Q4, Q5, Q6, Q7 |
| **1** | 2N5457 | Q3 |
| **1** | LM13700 | IC1 |

# 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.

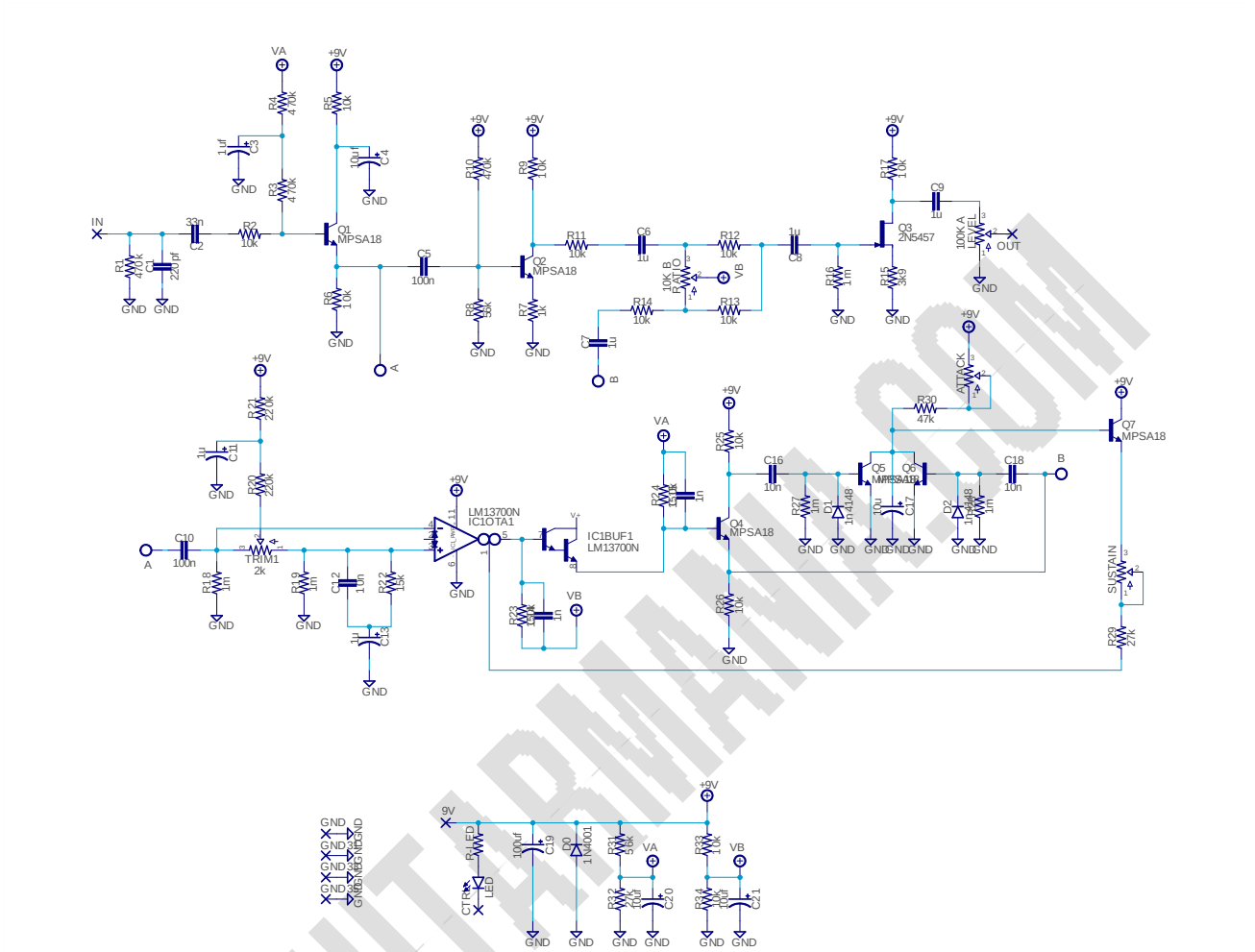
# Build Notes

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

# Schematic



# 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.

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