# Master Phaser SMD

**Based on:**
Maestro Stage Phaser MP-1

**Effect type:**
Phaser

**Build difficult:**
Easy

**Number of parts:**
Low, total 21 components

**Technology:**
OTA Based Phaser (Operational Trans conductance Amplifier)

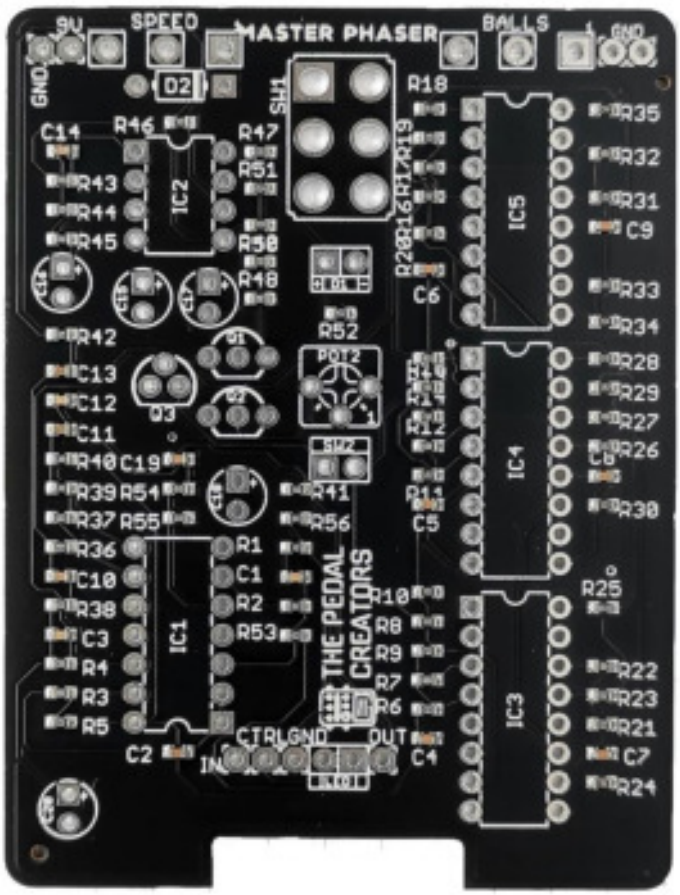
**Power consumption:**
9V

**Enclosure type:**
125b

**Get your board at:**
Master Phaser SMD

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

**Project overview:**
The Master Phaser is a modern approach to the 70's Stage Phaser by Maestro. Ready to build using OTA LM13700 instead of the unobtainable CA3094. This board also features the possibility of turn the Phaser into something closer to an Univibe.



# About The Pedal Creators

**Everyone can build** excellent boutique guitar **pedals**.
Everything **we do** is to make that **experience** more accessible and **user-friendlier.**
The **Pedal Creators** series are the **best and easiest to build PCB**s ever. Including most **resistors** and **capacitors** already **soldered** on board as SMD components, leaving the key values for you to **experiment** and craft **your own tone**.
Now you can **build** a pedal you are **proud** of in **less than an hour** without any previous experience.
What are you waiting for to **become a Pedal Creator?**

### The Pedal creators - key features:

- **Easy to build,** no previous experience required. It's like Lego for musicians.
- **Fast assembly** finish a pedal in less than an hour. Play your favorite record and enjoy the ride along.
- **100% mistake-proof**. Even my grandma can build one while she cooks.
- **Build** your own boutique pedal. Experiment with different values and make the **pedal you always dreamed of.**
- Easy to scale. **Turn your passion into a money-making machine**.



# Index

# Introduction

The Master Phaser is a faithful approach to the original Stage Phaser by Maestro without being strictly a clone.

First, we replace the obsolete CA3094 chips with the most common and Inexpensive LM3700 in its lace. Since each LM13700 has two transducers on it, we can choose through the mode toggle to use 5 or 6 phase stages.

# Controls

*Potentiometers:*

- Speed: Sets the rate of the phase sweep from slow to fast.
- Balls: Sets the amount of feedback (phase output fed back to phase input).
- Pot2: Sets the maximum depth of the LFO.

*Switches:*

- SW1
- SW2

# Bill of materials

| Capacitors Electrolytic | |
|---|---|
| **Part** | **Value** |
| **C15** | 10u |
| **C16** | 10u |
| **C17** | 10u |
| **C18** | 220u |
| **C20** | 47u |

| IC | |
|---|---|
| **Part** | **Value** |
| **IC1** | TL074 |
| **IC2** | TL062 |
| **IC3** | LM13700N |
| **IC4** | LM13700N |
| **IC5** | LM13700N |

| Transistors | |
|---|---|
| **Part** | **Value** |
| **Q1** | 2N3904 |
| **Q2** | 2N5457 |
| **Q3** | 2N3906 |

| Diodes | |
|---|---|
| **Part** | **Value** |
| **D1** | 3mm LED |
| **D2** | 1n5817 |
| **LED** | 3mm LED |

| Switches | |
|---|---|
| **Part** | **Value** |
| **SW1** | DPDT ON-ON |
| **SW2** | **JUMPER*** |
| - | 3PDT Stomp Foot |

| Potentiometers | |
|---|---|
| **Part** | **Value** |
| **SPEED** | 1M C |
| **BALLS** | 1M C |

| Trimmer | |
|---|---|
| **Part** | **Value** |
| **POT2** | 10k |

| | |
|---|---|
| **Part** | **Value** |
| - | DC JACK |
| - | AUDIO JACK1 |
| - | AUDIO JACK2 |

# Shopping list

| Capacitors Electrolytic | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **3** | 10u | C15, C16, C17 |
| **1** | 47u | C20 |
| **1** | 220u | C18 |

| ICs | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **1** | TL074 | IC1 |
| **1** | TL062 | IC2 |
| **3** | LM13700N | IC3, IC4, IC5 |

| Transistors | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **1** | 2N3904 | Q1 |
| **1** | 2N5457 | Q2 |
| **1** | 2N3906 | Q3 |

| Diodes | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **2** | 3mm LED | D1, LED |
| **1** | 1n5817 | D2 |

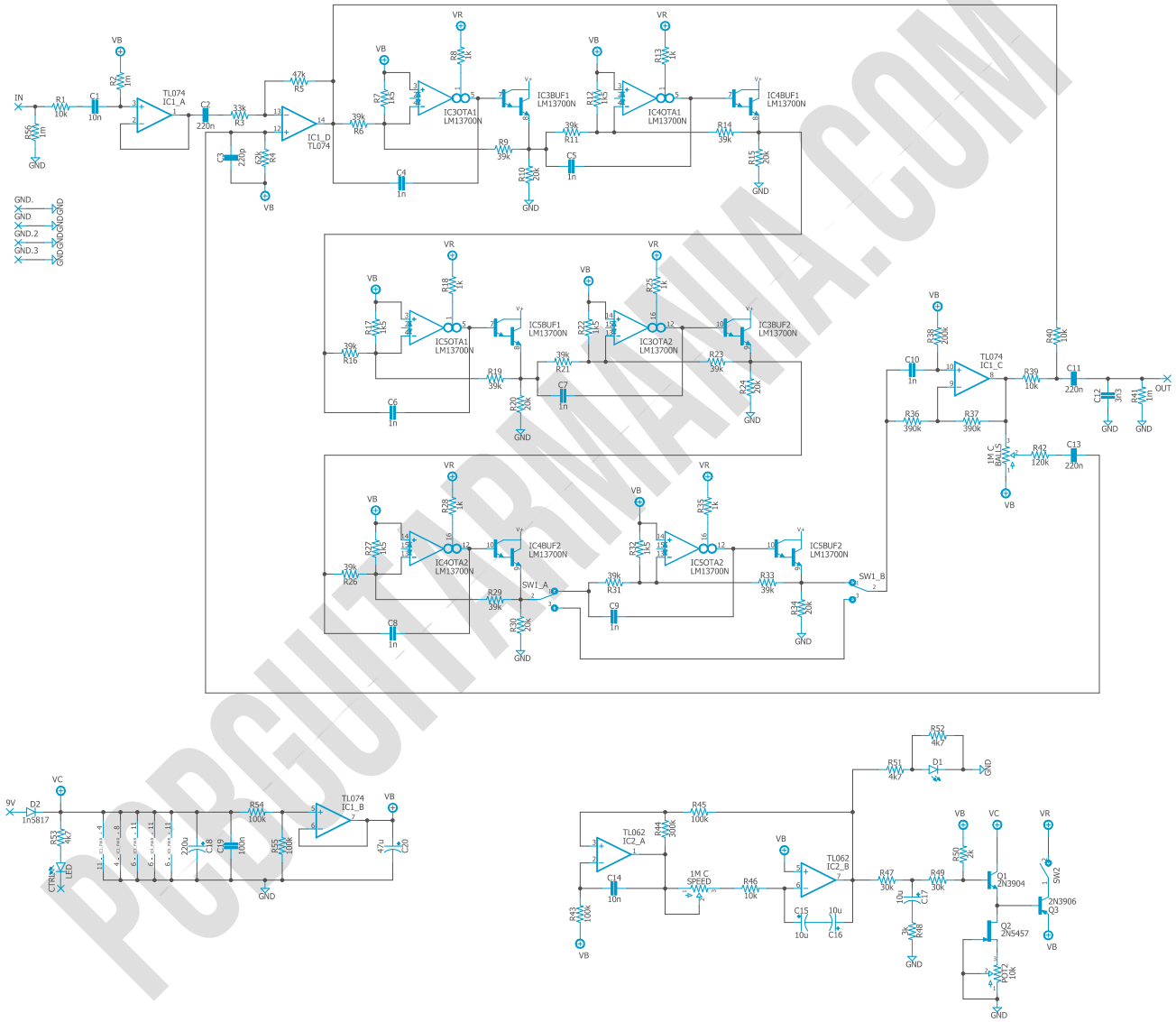
| Switches | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **1** | DPDT ON-ON | SW1 |
| **1** | **JUMPER*** | SW2 |
| **1** | 3PDT Stomp Foot | - |

| Potentiometers | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **2** | 1M C | BALLS, SPEED |

| Trimmer | | |
|---|---|---|
| **Qty** | **Value** | **Parts** |
| **1** | 10k | POT2 |

| 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

**JUMPER SW2***
is a jumper that connects the LFO Section with the rest of the circuit. This part has been conceived with the idea of future expansion to connect external LFO sources.

**POT2 Calibration:**
Pot2 sets the maximum depth of phase. To get the best possible set up for this Project set the Speed control at 12 o'clock and balls all the way up. Adjust POT2 till get the maximum phasing possible without noise or oscillation. It's recommended to make fine adjustments at slower Speed rate. This trimmer is just for the adjustment of the correct performance of the effect, it's not recommended to use it as an external pot.

**Univibe Mod:**
One of the possible mods with this board is to substitute the Univibe phasing sequence in place of four of the six phasing stages. This won't turn your Master Phaser into a Univibe, but will deliver a much more expressive Phaser. To do the Univibe mod, socket or replace the 1n caps with the following:

| | |
|---|---|
| **C5** | 15n |
| **C6** | 220n |
| **C7** | 470p |
| **C8** | 4n7 |

You can place a 4PDT switch to select in between the standard mode and the Univibe.
Take in mind that there's not enough space for the board and a 4pdt inside a 1590BB enclosure.
If you are planning to do this mod you will need a bigger enclosure. It's recommended first to experiment just with sockets and swapping the values.

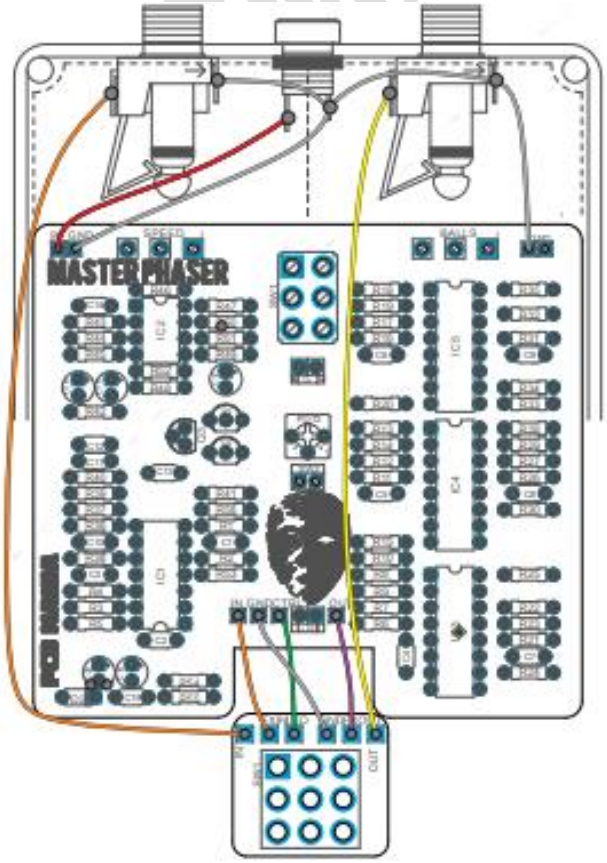
# Wiring Diagram

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.

The wiring is the same as in the following through-hole 1590bb version:



# 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.

Follow us on Instagram and Facebook to stay in tune with the latest projects!