

Master Phaser

Based on:
Maestro Stage Phaser MP-1
Effect type:
Phaser
Build difficult:
Advanced

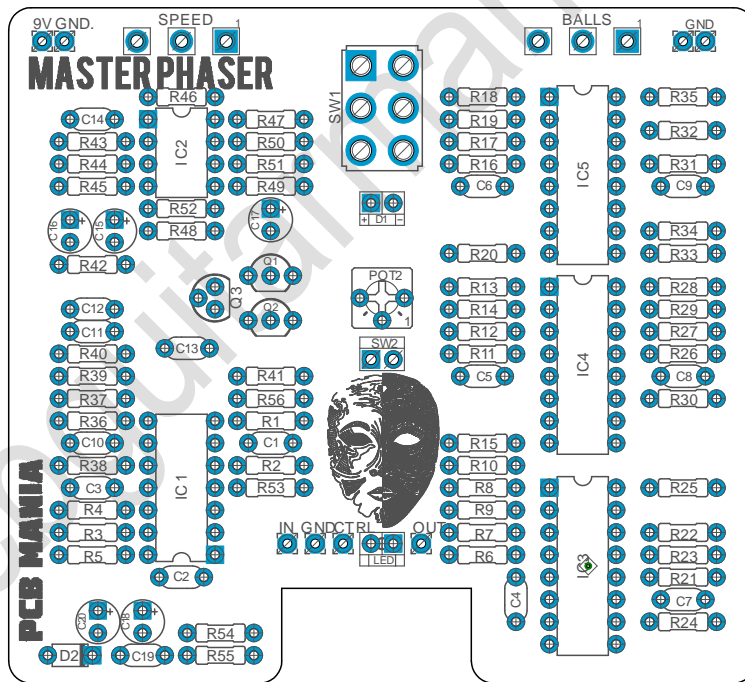
Amount of parts:
High, total 45 components
Technology:
OTA Based Phaser
(Operational Trans conductance
Amplifier)

Enclosure type:
1590bb
Get your board at:
[Master Phaser](#)
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.



Real measures are:

77mm width x 85mm height

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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 place. Since each LM3700 has two transducers on it in, we can choose through the mode toggle to use 5 or 6 phase stages.

Controls

- **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.

Bill of materials

Resistors	
Part	Value
R1	10k
R2	1m
R3	33k
R4	62k
R5	47k
R6	39k
R7	1k5
R8	1k
R9	39k
R10	20k
R11	39k
R12	1k5
R13	1k
R14	39k
R15	20k
R16	39k
R17	1k5
R18	1k
R19	39k
R20	20k
R21	39k
R22	1k5
R23	39k
R24	20k
R25	1k
R26	39k
R27	1k5
R28	1k
R29	39k
R30	20k
R31	39k
R32	1k5
R33	39k
R34	20k
R35	1k
R36	390k
R37	390k
R38	200k

R39	10k
R40	10k
R41	1m
R42	120k
R43	100k
R44	300k
R45	100k
R46	10k
R47	30k
R48	3k
R49	30k
R50	2k
R51	4k7
R52	4k7
R53	4k7
R54	100k
R55	100k
R56	1m

Semiconductors	
Part	Value
IC1	TL074
IC2	TL062
IC3	LM13700N
IC4	LM13700N
IC5	LM13700N
Q1	2N3904
Q2	2N5457
Q3	2N3906
D1	3mm LED
D2	1n5817
LED	3mm LED

Pots	
Part	Value
SW1	DPDT ON-ON
SW2	JUMPER*

Capacitors	
Part	Value
C1	10n
C2	220n
C3	220p
C4	1n
C5	1n
C6	1n
C7	1n
C8	1n
C9	1n
C10	1n
C11	220n
C12	3n3
C13	220n
C14	10n
C15	10u Electro
C16	10u Electro
C17	10u Electro
C18	220u Electro
C19	100n
C20	47u

Pots	
Part	Value
SPEED	1M C
BALLS	1M C
POT2	10k Trimmer

Shopping list

Resistors		
Qty	Value	Parts
4	10k	R1, R39, R40, R46
6	20k	R10, R15, R20, R24, R30, R34
3	1m	R2, R41, R56
1	33k	R3
2	390k	R36, R37
1	200k	R38
1	62k	R4
1	120k	R42
4	100k	R43, R45, R54, R55
1	300k	R44
2	30k	R47, R49
1	3k	R48
1	47k	R5
1	2k	R50
3	4k7	R51, R52, R53
12	39k	R6, R9, R11, R14, R16, R19, R21, R23, R26, R29, R31, R33
6	1k5	R7, R12, R17, R22, R27, R32
6	1k	R8, R13, R18, R25, R28, R35

Capacitors		
Qty	Value	Parts
2	10n	C1, C14
1	3n3	C12
3	10u	C15, C16, C17
1	220u	C18
1	100n	C19
3	220n	C2, C11, C13
1	47u	C20
1	220p	C3
7	1n	C4, C5, C6, C7, C8, C9, C10

Semiconductors		
Qty	Value	Parts
1	TL074	IC1
1	TL062	IC2
3	LM13700N	IC3, IC4, IC5
1	2N3904	Q1
1	2N5457	Q2
1	2N3906	Q3
2	3mm LED	D1, LED
1	1n5817	D2

Pots		
Qty	Value	Parts
2	1M C	BALLS, SPEED
1	10k	POT2

Pots		
Qty	Value	Parts
1	DPDT ON-ON	SW1

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.

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. In order 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	470pf
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 recommend first to experiment just with sockets and swapping the values.

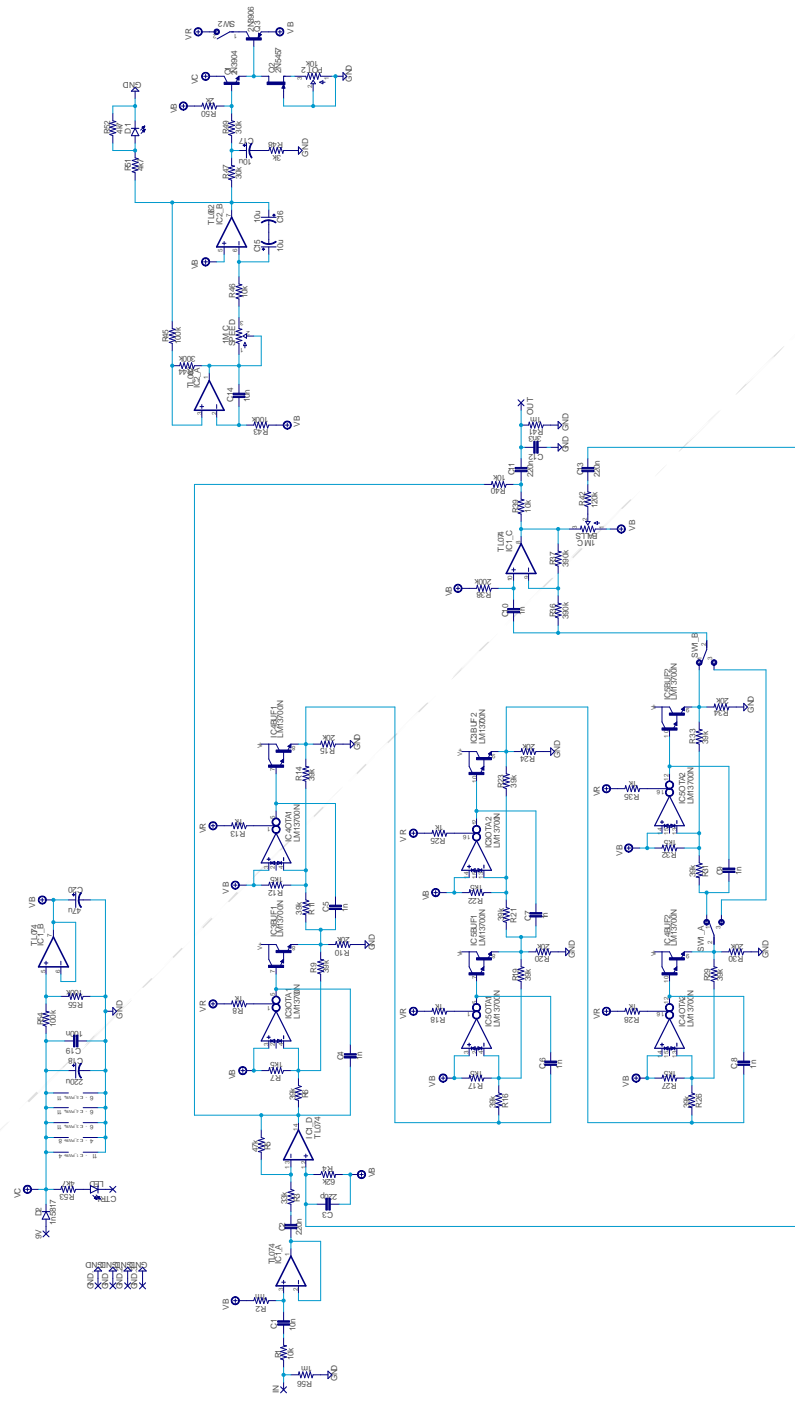
Build Notes

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

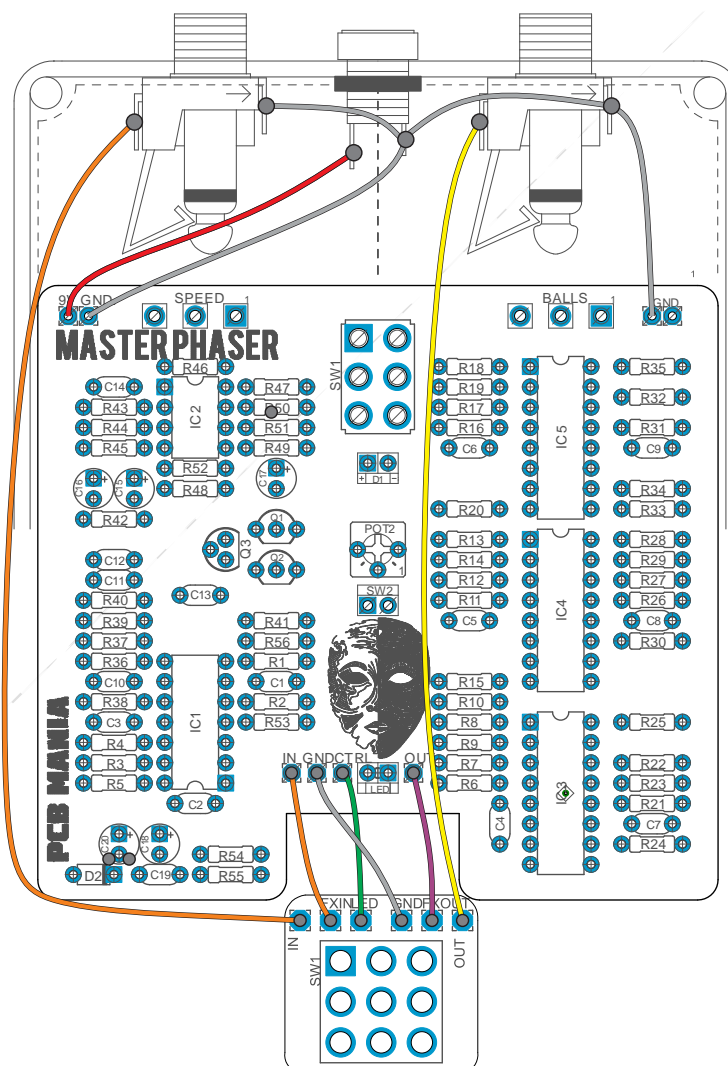


Wiring Diagram

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.

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



Drill Template

This Project has been planned to fit into a 1590B enclosure type (122x67x35mm approx.)

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.

Follow us on [Instagram](#) and [Facebook](#) to stay in tune with the latest projects!