Mad Blue Delay

Based on:
Mad Professor Deep Blue Delay

Effect type:
Pt2399 Delay

Build difficult:
Medium

Amount of parts:
Average, total 53 components

Technology:
Analog voiced PT2399

Power consumption:
32mA (9v)

Enclosure type:
125B

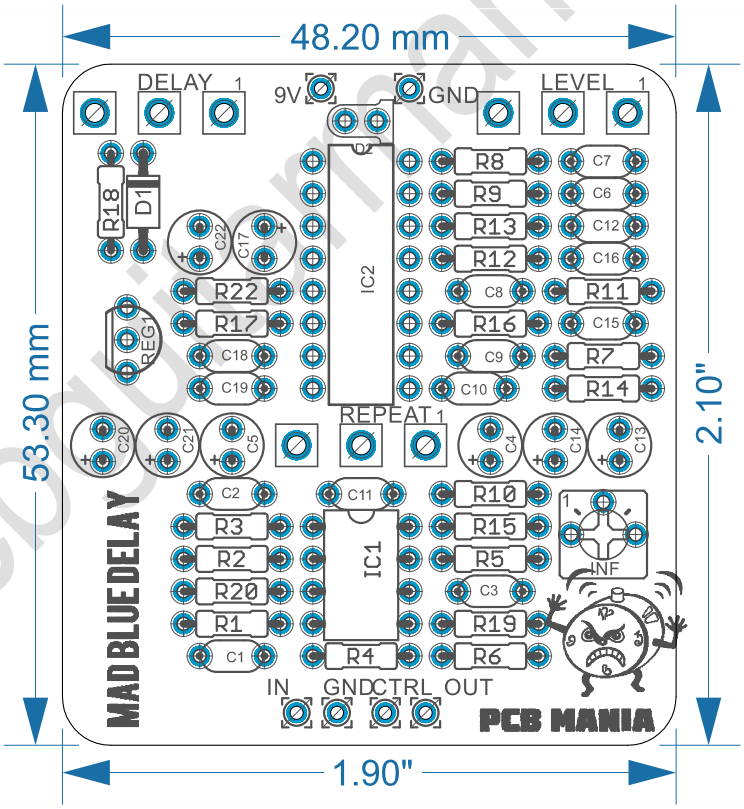
Get your board at:
Mad Blue Delay

Get your kit at:
Das Musikding (Europe)

Project overview:

The Mad Blue Delay is a natural sounding digital/analog delay, with the analog direct signal path. Inspired on the Deep Blue Delay by Mad Professor, this unit has about the same bandwidth as the classic tape echo units, and it can be used in front of an amplifier or in amplifier effects loops.

Featuring an internal Feedback control trimmer, allowing you infinite repeats at the maximum setting.



Index

Introduction

The Mad Blue Delay is an easy delay projects designed for all of the ones who are looking for a warmth analog sounding delay.

Based on Mad professor famous Deep Blue Delay, this circuit has roots on one of the most famous delays on the DIY community, the Rebote by Tonepad as many of others pt2399 based delays nowadays. For the development of this board we took hours analyzing both schematics, and experimenting with different values in order to create the perfect ultimate Blue Delay

This project is powered by a PT2399 a digital delay chip through, but thanks to the analog signal path, it doesn't have the sterile sound characteristics associated with modern digital delays, but is instead much warmer and analog-voiced.

The direct signal path is short and made with analog amplifiers with no filtering. The echo signal has a tuned filtering to allow extreme settings without interference. There should be no distortion or tone coloration as long as input level is in the range below maximum allowed.

The delay is specially designed to work well with distorted tone, as this is the most critical application, where delays often fail.

Definitely the starting point for everyone who want to jump into delays and modulation projects, and totally a must on your board!

Controls

- Level: Sets the level of delayed signal mixed with straight guitar tone, fully CCW there is only straight (un-effected) guitar signal heard and fully CW gives the loudest delay.
- Delay: Controls the delay time from 25ms (fully CCW) to 450ms (fully CW).Filter: Works as tone Control.
- Repeat: Controls the repeats of the delay signal, fully CCW gives one repeat and at fully CW you get infinite feedback.
- An internal infinite repeats trimmer is included to allow you to set the upper end of the feedback range, either allowing infinite repeats at the Feedback knob's highest position or stopping just short of it, depending on your preference.

.

Bill of materials

Resistors	
R1	1m
R2	180k
R3	360k
R4	22k
R5	12k
R6	1k
R7	10k
R8	10k
R9	10k
R10	5k1
R11	20k
R12	10k
R13	1k
R14	2k
R15	20k
R16	10k
R17	2k2
R18	33r
R19	10k
R20	10k
R22	4k7

Potentiometers	
LEVEL	50k B
REPEAT	50k B
DELAY	50k B
INF	**10K trimpot****

Semi conductors	
IC1	Tl072
IC2	**PT2399***
REG1	78L05

Capacitors	
C1	22n
C2	47pf
C3	100pf
C4	1uf electro
C5	1uf electro
C6	4n7
C7	2n2
C8	2n2
C9	100n
C10	100n
C11	22n
C12	10n
C13	1uf electro
C14	1uf electro
C15	47n
C16	15n
C17	47uf electro
C18	100n
C19	100n
C20	100uf electro
C21	47uf electro
C22	47uf electro

Diode	
D1	1n5817
D2	LED3MM

Shopping list

Resistors		
Qty	**Value**	**Parts**
1	1m	R1
1	5k1	R10
2	20k	R11, R15
1	2k	R14
1	2k2	R17
1	33r	R18
1	180k	R2
1	4k7	R22
1	360k	R3
1	22k	R4
1	12k	R5
2	1k	R6, R13
7	10k	R7, R8, R9, R12, R16, R19, R20

Capacitors		
Qty	**Value**	**Parts**
2	22n	C1, C11
1	10n	C12
1	47n	C15
1	15n	C16
3	47uf	C17, C21, C22
1	47pf	C2
1	100uf	C20
1	100pf	C3
4	1uf	C4, C5, C13, C14
1	4n7	C6
2	2n2	C7, C8
4	100n	C9, C10, C18, C19

Semiconductors		
Qty	**Value**	**Parts**
1	TL072	IC1
1	PT2399	IC2
1	78L05	REG1
1	1n5817	D1
1	LED3MM	D2

Potentiometers		
Qty	**Value**	**Parts**
3	50k B	DELAY, LEVEL, REPEAT
1	10K Trimpot	INF

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.

PT2399* Always make sure to get high quality PT2399 from trusted vendors. Bad quality chips and Asian counterfeits will make your build to not to work properly, from short repeats to bad quality distorted audio signal.

INF TRIM** this is an internal trimmer that has to be set up by the user.

We can say that the INF trim is a very good example of one of the biggest differences in between the Deep Blue delay and the Rebote 2.5. An standard DBD is hardwired with the pot fully Counter Clock Wise, this means a low amount of feedback on the repetitions, while the Rebote 2.5 is fully clock wise giving you a much more intense range of feedback.

To calibrate it, turn the Feedback knob all the way up and then adjust the trimmer until you have the range you want.

If you want to you can replace this trimmer by Jumper in between the pads 1 and 2, and you will have the standard Deep Blue Delay configuration.

You can also replace it by an external pot if you want to have easier Access to it. I recommend to use 10K lineal pots for this feature.

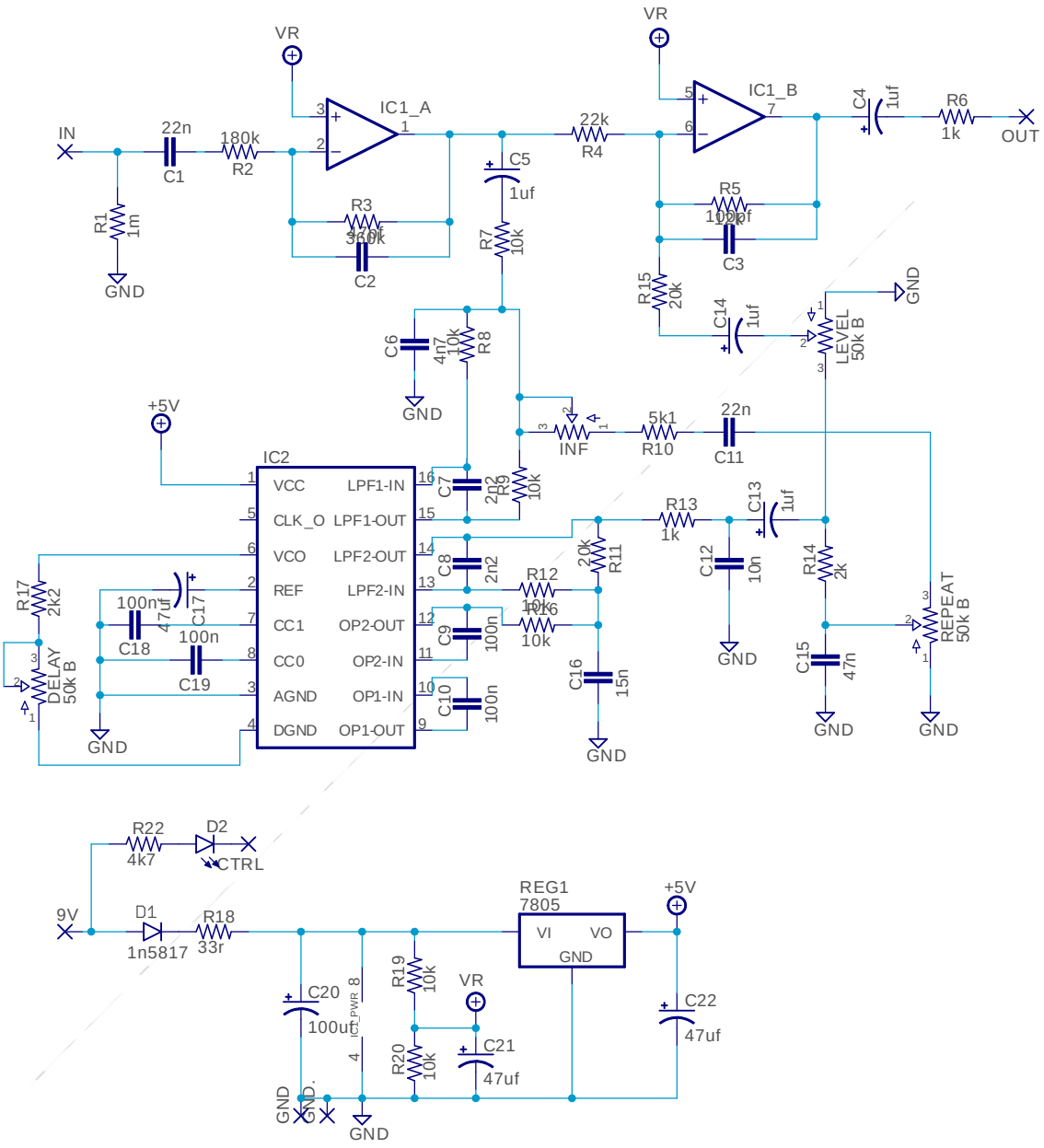
Build Notes

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

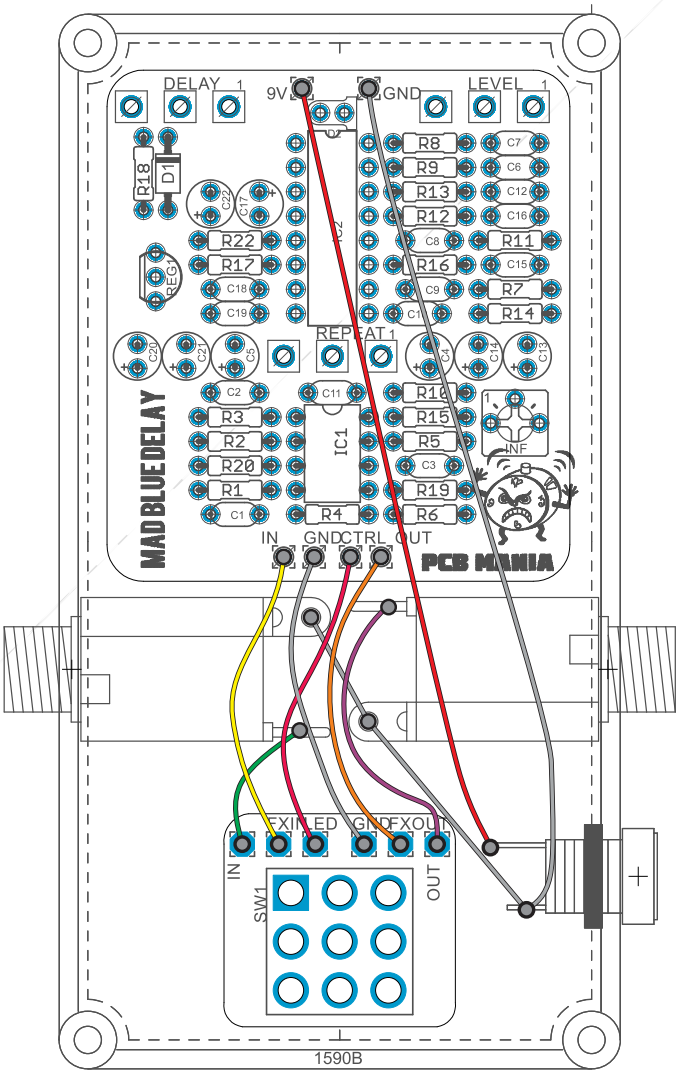

VR
IC1_A
IC1_B
IN
22n
C1
180k
R2
R1
1m
GND
R3
C2
C5
1uf
R7
10k
22k
R4
R5
C3
R15
20k
C4
1uf
R6
1k
OUT
C14
1uf
LEVEL
50k B
C6
4n7
R8
10k
+5V
INF
5k1
R10
22n
C11
IC2
VCC
CLK_O
VCO
REF
CC1
CC0
AGND
DGND
LPF1-IN
LPF1-OUT
LPF2-IN
LPF2-OUT
OP2-OUT
OP2-IN
OP1-IN
OP1-OUT
C7
2n2
R9
10k
C8
2n2
R12
10k
R16
10k
20k
R11
C9
100n
C10
100n
C16
15n
R13
1k
C13
1uf
C12
10n
R14
2k
C15
47n
REPEAT
50k B
R17
2k2
DELAY
50k B
100n
C18
47uf
C17
100n
C19
R22
4k7
D2
CTRL
9V
D1
1n5817
R18
33r
REG1
7805
VI
VO
GND
+5V
C20
100uf
R19
10k
R20
10k
C21
47uf
C22
47uf

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 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.

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