

Magnetic Delay

Based on:
Keeley's Magnetic Echo

Effect type:
Modulated Delay

Build difficult:
Advanced

Amount of parts:
Average, total 67 components

Technology:
PT2399

Power consumption:
9V

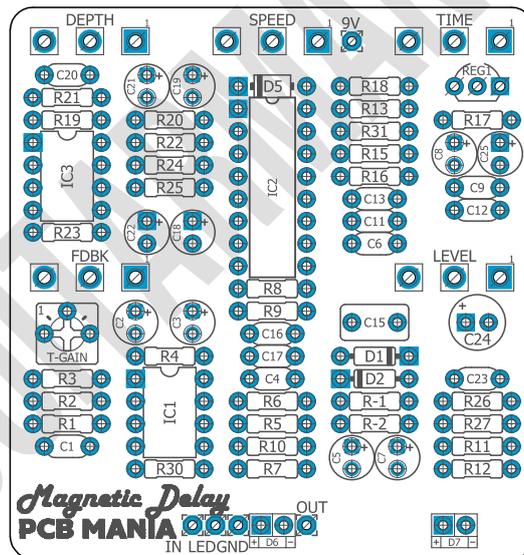
Enclosure type:
125b

Get your board at:
[Magnetic Delay](#)

Get your kit at:
[Das Musikding \(Europe\)](#)

Project overview:

Inspired by Keeley's Magnetic Echo. Featuring the delay circuit PT-2399 and some modulation, this pedal simulates tube tape echo sounds, delivering a warm and guitar and user-friendly type of delay.



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Introduction

Magnetic Delay has a resourceful yet straightforward set of controls that are the key to this pedal's uniqueness. Time, FDBK, and Level regulate the delay, and Depth and Speed give you access to some very vintage or rather distinct tones.

Now let us make a deeper analysis of what each knob has to offer:

With Time control, you will be able to set the repeat length between 40ms and 600ms. This range is perfect for classic, vintage delay sounds; excellent for slap-back or medium-length delay times.

FDBK, this knob lets you set the number of those repeats. Adjust this for a single slap back echo or turn it up for a runaway, self-oscillating, or self-regenerating echoes. You can now go back and play with the Time control to achieve unprecedented results!

The Level control is your mix; establish how loud you want to hear those echoes.

Now let's check the even crazier ones:

Depth gives you access to deeper and deeper chorusing and pitch shifting on your echoes. As you raise the control, the Depth and Rate LED will start to glow, giving you a visual indication of the amount of modulation you are applying to the repeats.

Speed is a slight pitch modulation on your echo! As simple as that, and a good knob to play and have fun with.

Has you can see, Magnetic Delay offers you an excellent way to create unique and very musical delays. If you are into experimental sounds, Rockabilly slap-back echoes, or just want a superior classic rock-sounding echo, this pedal is for you.

Controls

- Depth
- FDBK
- Level
- Speed
- Time

Bill of material

Resistors	
Part	Value
R-1	4K7
R-2	4K7
R1	1M
R2	100K
R3	47K
R4	10K
R5	10K
R6	1K
R7	10K
R8	10K
R9	10K
R10	12K
R11	1K
R12	100K
R13	10K
R15	10K
R16	10K
R17	1K
R18	4K7
R19	220K
R20	4K7
R21	220K
R22	100K
R23	120K
R24	120K
R25	220K
R26	47K
R27	47K
R30	10K

R31	15K
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Capacitors	
Part	Value
C1	100n
C4	47n
C6	2n2
C9	22n
C11	2n2
C12	22n
C13	100n
C15	330n
C16	100n
C17	100n
C20	10n
C23	100n

Electrolytics Capacitors	
Part	Value
C2	1u
C3	1u
C5	1u
C7	1u
C8	1u
C18	47u
C19	4u7
C21	10u
C22	100u

C24	47u
C25	100u

Potentiometers	
Part	Value
DEPTH	B100K
FDBK	A100K
LEVEL	B100K
SPEED	B50K
TIME	B50K

Trim pots	
Part	Value
T-GAIN	100K

IC	
Part	Value
IC1	OPA2134
IC2	PT2399
IC3	LM358N

Diodes	
Part	Value
D1	1n4148
D2	1n4148
D5	1N5817
D6	Status
D7	RATE

Shopping list

Resistors		
Qty	Value	Parts
3	100K	R2, R12, R22
9	10K	R4, R5, R7, R8, R9, R13, R15, R16, R30
2	120K	R23, R24
1	12K	R10
1	15K	R31
3	1K	R6, R11, R17
1	1M	R1
3	220K	R19, R21, R25
3	47K	R3, R26, R27
4	4K7	R-1, R-2, R18, R20

Capacitors		
Qty	Value	Parts
5	100n	C1, C13, C16, C17, C23
1	10n	C20
2	22n	C9, C12
2	2n2	C6, C11
1	330n	C15
1	47n	C4

Electrolytics Capacitors		
Qty	Value	Parts
2	100u	C22, C25
1	10u	C21
5	1u	C2, C3, C5, C7, C8
1	47u	C18

1	47u	C24
1	4u7	C19

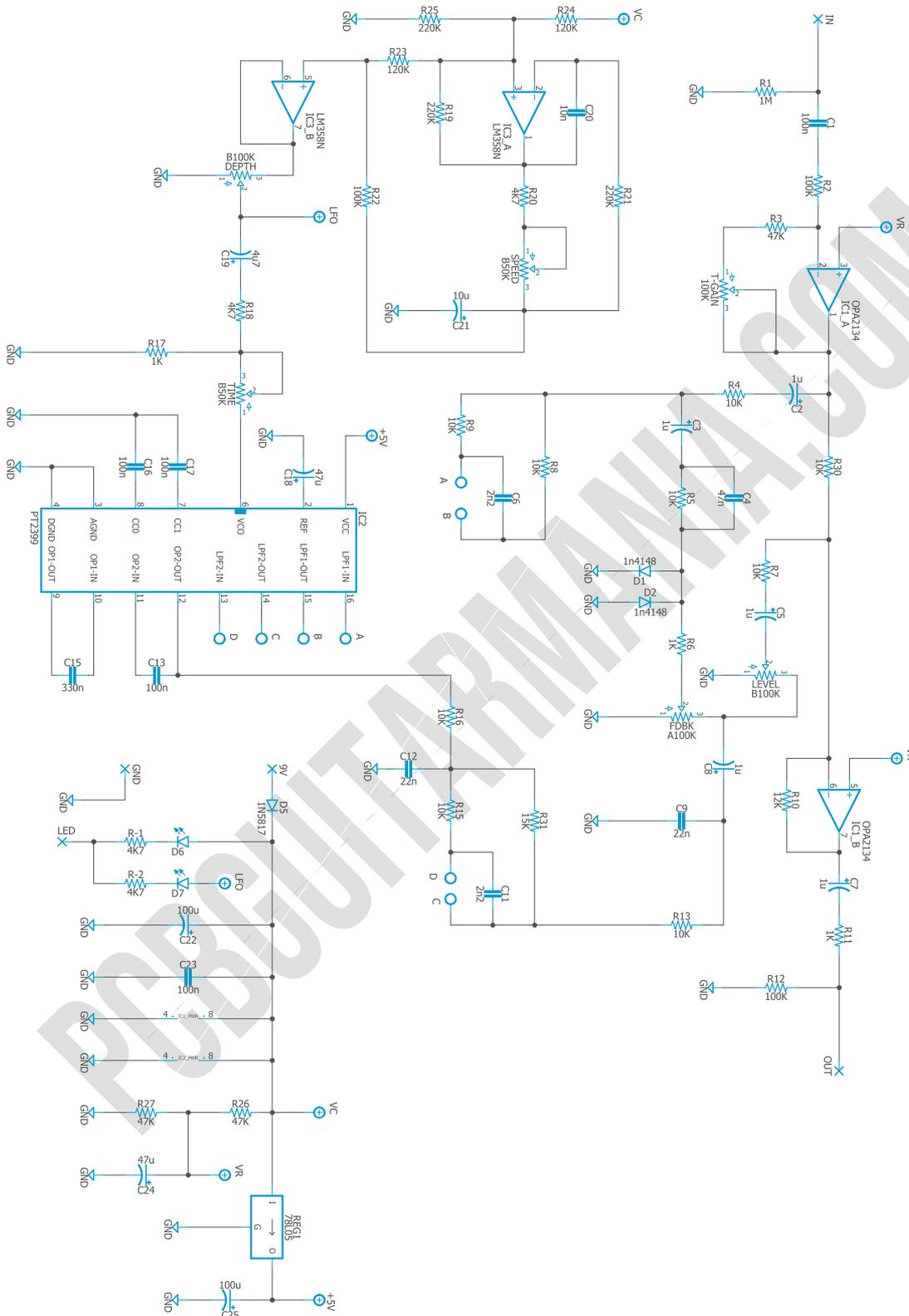
Potentiometers		
Qty	Value	Parts
1	A100K	FDBK
2	B100K	DEPTH, LEVEL
2	B50K	SPEED, TIME

Trim pots		
Qty	Value	Parts
1	100K	T-GAIN

IC		
Qty	Value	Parts
1	LM358N	IC3
1	OPA2134	IC1
1	PT2399	IC2

Diodes		
Qty	Value	Parts
1	1N5817	D5
2	1n4148	D1, D2
1	RATE	D7
1	Status	D6

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

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](#).

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!