Echo Nightmare

Based on: DBA Echo Dream II Effect type: Lo-Fi Delay + Fuzz Build difficult: Advanced Amount of parts: High, total 80 components Technology: Pt2399 Delay controlled by XR2206P's LFO Power consumption: 9V(9mA) Enclosure type: 1590bb Get your board at: Echo Nightmare Get your kit at: Das Musikding (Europe)

Project overview:

The Echo Nightmare is a dream come true for everyone who likes to experiment with lo-fi delays, ambient noises and crazy fuzzes, all in one box. With seven knobs and two switches, we can assure that this is definitely the tweakaholics dream!

This circuit allows you to build such a versatile pedal capable of experimenting with different shape of waveforms, slapback or self-oscillating feedback, you can even use the modulation and fuzz sounds with the delay or on their own, just by flicking the dry switch, making this circuit way more versatile than any other delay pedal.



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Introduction

The circuit of the Echo nightmare is as crazy as the tones it generates, like always, we could not expect less from the people from DBA.

The most interesting part of this circuit is without a doubt the XR2206P IC in charge of changing the shape of the wave, controlling depth and speed of the modulation. Definitely a unique approach for a modulated delay.

Over the original design we included an internal charge pump that privdes the XR2206P with 18v for the right functioning.

Controls

Master: Sets the overall volume.

Fuzz: Sets the amount of gain, from clean to fuzzed-out bliss.

Delay Blend: Blend the volume of the delayed signal.

D Time: Controls the delay time (numbers shown in milliseconds) between 20 ms and 1.2 seconds. Long delay times can create flutter, noise, and distortion.

FeedBack: Controls the feedback of the delays, from slapback to wild runaway oscillation.

Speed: Controls how fast the modulator runs.

Depth: Sets how far the modulator will swing the delay time. At high intervals, the pitch of the repeats will shift several semitones!

Waverform Toggle: Up for a smoother modulator waveform, down for a sharp, square-shaped wave.

Dry Toggle: Up for clean blend, down to kill the dry signal and hear only the repeats.

Bill of materials

Resistors				
Part	Value			
R1	1K			
R2	470K			
R3	470K			
R4	10K			
R5	10K			
R6	10K			
R7	100R			
R8	10K			
R9	10K			
R10	15K			
R11	1K			
R12	10K			
R13	10K			
R14	3K3			
R15	10K			
R16	10K			
R17	10K			
R18	390R			
R19	8K2			
R20	10K			
R21	3K6			
R22	13K			
R23	13K			
R24	82K			
R25	6К8			
R26	6K8			
R27	220R			
R28	680R			
R29	2K7			
R30	10K			
R32	1M			
RLED	4K7			

Diods		
Part	Value	
D2	1N5817	
D3	1N5817	
D4	1N5817	
LED	3mm LED	

Part Value	
C2 470p	
C3 10n	
C5 100n	
C8 100n	
C9 100n	
C10 82n	
C11 47n	
C12 33n	
C13 2n2	
C14 10n	
C16 2n2	
C22 220p	
C26 680n	
C27 100n	
C31 10n	

Electrolytics Capacitors		
Part	Value	
C1	1u	
C4	100u	
C6	100u	
C7	100u	
C15	1u	
C17	1u	
C18	1u	
C19	1u	
C20	1u	
C21	1u	
C23	10u	
C24	1u	
C25	10u	
C28	220u	
C29	100u	
C30	10u	

Potentiometers	
Part	Value
DELAY-	B100K
BLEND	
DELAY-	A100K
TIME	
DEPTH	C100K
FEEDBACK	C100K
FUZZ	A1M
MASTER	A100K
SPEED	A1M

Switches	
Part	Value
Waveform	DPDT ON- ON
Dry-Blend	SPDT ON-ON

IC		
Part	Value	
IC1	MC33172P**	
IC2	PT2399	
IC3	XR2206P*	
IC4	TC1044SCPA	
REG1	Lm78l05	

Shopping list

Resistors		
Qty	Value	Parts
1	100R	R7
12	10K	R4, R5, R6, R8, R9, R12, R13, R15, R16, R17, R20, R30
2	13K	R22, R23
1	15K	R10
2	1K	R1, R11
1	1M	R32
1	220R	R27
1	2K7	R29
1	390R	R18
1	3КЗ	R14
1	3К6	R21
2	470K	R2, R3
1	4K7	RLED
1	680R	R28
2	6K8	R25, R26
1	82K	R24
1	8K2	R19

Switches		
Qty	Value	Part
1	DPDT ON-	Waveform
	ON	
1	SPDT ON-ON	Drv-Blend

Electro	Electrolytics Capacitors		
Qty	Value	Parts	
4	100u	C4, C6, C7, C29	
3	10u	C23, C25, C30	
8	1u	C1, C15, C17, C18, C19, C20, C21, C24	
1	220u	C28	

Potentiometers				
Qty	Value	Parts		
2	A100K	DELAY-TIME, MASTER		
2	A1M	FUZZ, SPEED		
1	B100K	DELAY-BLEND		
2	С100К	DEPTH, FEEDBACK		

Qty		Value	Parts
	4	100n	C5, C8, C9, C27
	3	10n	C3, C14, C31
	1	220p	C22
	2	2n2	C13, C16
	1	33n	C12
	1	470p	C2
	1	47n	C11
	1	680n	C26
	1	82n	C10

Capacitors

IC		
Qty	Value	Parts
1	РТ2399	IC2
1	MC33172P**	IC1
1	TC1044SCPA	IC4
1	XR2206P*	IC3
1	Lm78l05	REG1

Diodes			
Qty	Value	Parts	
3	1N5817	D2, D3, D4	
1	Led	3mm LED	

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.

XR2206P* This is definetley a hard to source IC, with many counterfits around that will give you a total headache at the time of building this pedal. Make sure you are using a legit IC from a trusted source.

MC33172P** This is another unobtainable IC, however could be easily replaced by any other Opamp. In our first build we found that NE5532P works the best. However other classic opamps such as TL072 might do the job.

For the first version of the Give away check the diagram Bellow on how to add a couple of fixes to have it working perfectly!

Leave R1 unpopulated and replace it by a 100n Capacitor in series with a 1K resistor as is shown in the graphic. Their legs must be on the same orientation as on th graphic!





The second thing is to wire a cable from R6 to the Dry-blend Switch.

Follow the graphic on the left and solder the wire together with R6 and with the square PAD of the switch.

In order to have it working properly you MUST do it exactly as it's on the graphic.

The last thing you have to do to update the beta version from the give away to the current 1v2 version is to reverse the legs of the speed potentiometer. If you are using pcb mounted pots, cut the legs of it and wire it on the opposite way, pin 1 with pad 3, pin 3 with pad 1, and pin 2 with pad 2. If you omit this step your speed knob will work backwards.

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 <u>here</u> to access to our <u>Pedal Wiring</u> <u>Guide</u>

Drill Template

This Project has been planned to fit into a 1590bb 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 <u>PCB Guitar Mania – Builders Group</u> 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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