Ghost Device

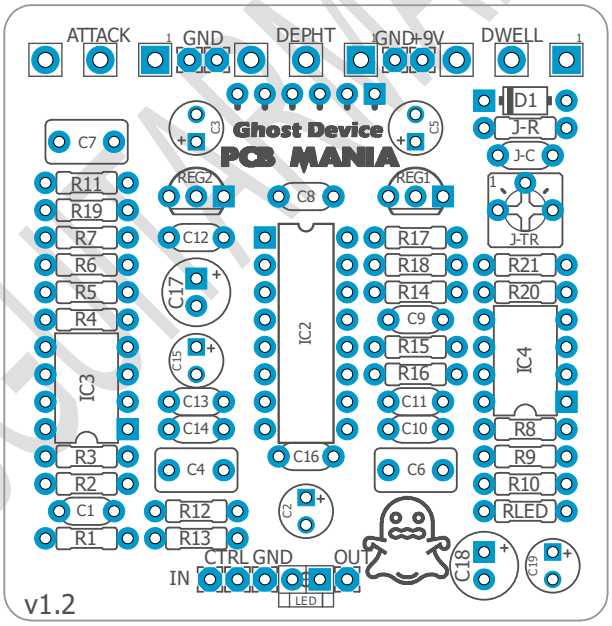
Based on:
EQD Ghost Echo
Effect type:
Vintage Voiced Reverb
Build difficult:
Average

Amount of parts:
Average, total 52 components
Technology:
Belton Brick Reverb + PT2399
Power consumption:
9V(86mA)

Enclosure type:
125b
Get your board at:
Ghost Device
Get your kit at:
Das Musikding (Europe)

Project overview:

Based on the EQD Ghost echo, here comes a reverb design that does not require DSP chips and SMD soldering. Build around a PT2399 Chip and a Belton Brick module all sounds between slight rooms and spooking ambient fit on this still beginner friendly
While you can get subtle and lovely always on sounds out of this little wonder its main business are ambient sounds, volume swells and haunting Room deflections with only three easy to dial in Knobs. Definitely a ghost summoning device!



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Introduction

Before the break out of the FV-1 ICs the Belton brick was without doubt the ultimate resource to build reverb pedals. During the early 2010 we have seen many reverb pedals based on this technology (a Belton brick is basically a group of SMD PT2399 in chain) like Wampler Faux spring reverb, Culture Jam Box of hall and more. Most of these reverbs where aiming to replicate the spring reverb section of traditional amp, to give you that extra wetness on your tone, but EQD took a totally different approach on designing the Ghost Echo. As for sure you are familiarized with EQD designs this guys are always giving an outside the box perspective to each of their creation, and the Ghost Echo is not an exception. This pedal aims to be a standalone atmospheric machine to create dreamy and haunted textures, instead of just emulating a spring reverb.

The key of this design is how the delay from the pt2399 mixes with the Belton brick. After the first Opamp the signal splits in two, dry and wet signal. The wet signal goes into the p2399 and connects with the Dwell pot as well. The modulated from the pt2399 hits the Belton brick, creating in this way this deep dreamy atmospheric sound that transport us to an ethereal dimension!

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Controls

- Attack
- Depth
- Dwell

Bill of materials

Resistors	
Part	**Value**
J-R*	EMPTY
R1	2M2
R2	1M
R3	10K
R4	22K
R5	12K
R6	17K
R7	10K
R8	10K
R9	22K
R10	33K
R11	22K
R12	470R
R13	100K
R14	15K
R15	10K
R16	15K
R17	10K
R18	15K
R19	1K
R20	10K
R21	10K
RLED	4k7

Capacitors	
Part	**Value**
C1	100n
C4	470n
C6	470n
C7	470n
C8	1n
C9	2n2
C10	100n
C11	10n
C12	100n
C13	100n
C14	100n
C16	100n

J-C*	EMPTY

Electrolytics Capacitors	
Part	**Value**
C2	1u
C3	2u2
C5	10u
C15	10u
C17	100u
C18	100u
C19	10u

Potentiometers	
Part	**Value**
ATTACK	B10K
DEPHT	B2K
DWELL	B5K

Trimpots	Value
Part	**Value**
J-TR*	EMPTY

Integrated Circuits	
Part	**Value**
IC1	BTDR-2H (Long)
IC2	PT2399
IC3	TL072
IC4	TL072
Reg1	L78L05
Reg2	L78L05

Diods	
Part	**Value**
D1	1N5817
LED	3mm led

Shopping list

Resistors		
Qty	**Value**	**Parts**
1	xx	J-R
1	100K	R13
8	10K	R3, R7, R8, R15, R17, R20, R21
1	12K	R5
3	15K	R14, R16, R18
1	1K	R19
1	1M	R2
3	22K	R4, R9, R11
1	2M2	R1
1	33K	R10
1	470R	R12
1	4k7	RLED
1	17k	R6

Capacitors		
Qty	**Value**	**Parts**
1	xx	J-C
6	100n	C1, C10, C12, C13, C14, C16
1	10n	C11
1	1n	C8
1	2n2	C9
3	470n	C4, C6, C7

Electrolytics Capacitors		
Qty	**Value**	**Parts**
2	100u	C17, C18
3	10u	C5, C15, C19
1	1u	C2
1	2u2	C3

Potentiometers		
Qty	**Value**	**Parts**
1	B10K	ATTACK
1	B2K	DEPHT
1	B5K	DWELL

Trimpots		
Qty	**Value**	**Parts**
1	xx	J-TR

IC		
Qty	**Value**	**Parts**
1	BTDR-2H (Long)	IC1
1	PT2399	IC2
2	TL072	IC3, IC4
2	L78L05	Reg1, Reg2

Diods		
Qty	**Value**	**Parts**
1	1N5817	D1
1	B2K	DEPHT
1	B5K	DWELL

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.

J-R, J-C, J-TR* This components are part of a future mod that we are currently experimenting with. It will be upload on the next update of this documents, for now should remain empty. If you are brave go ahead an experiment with it!

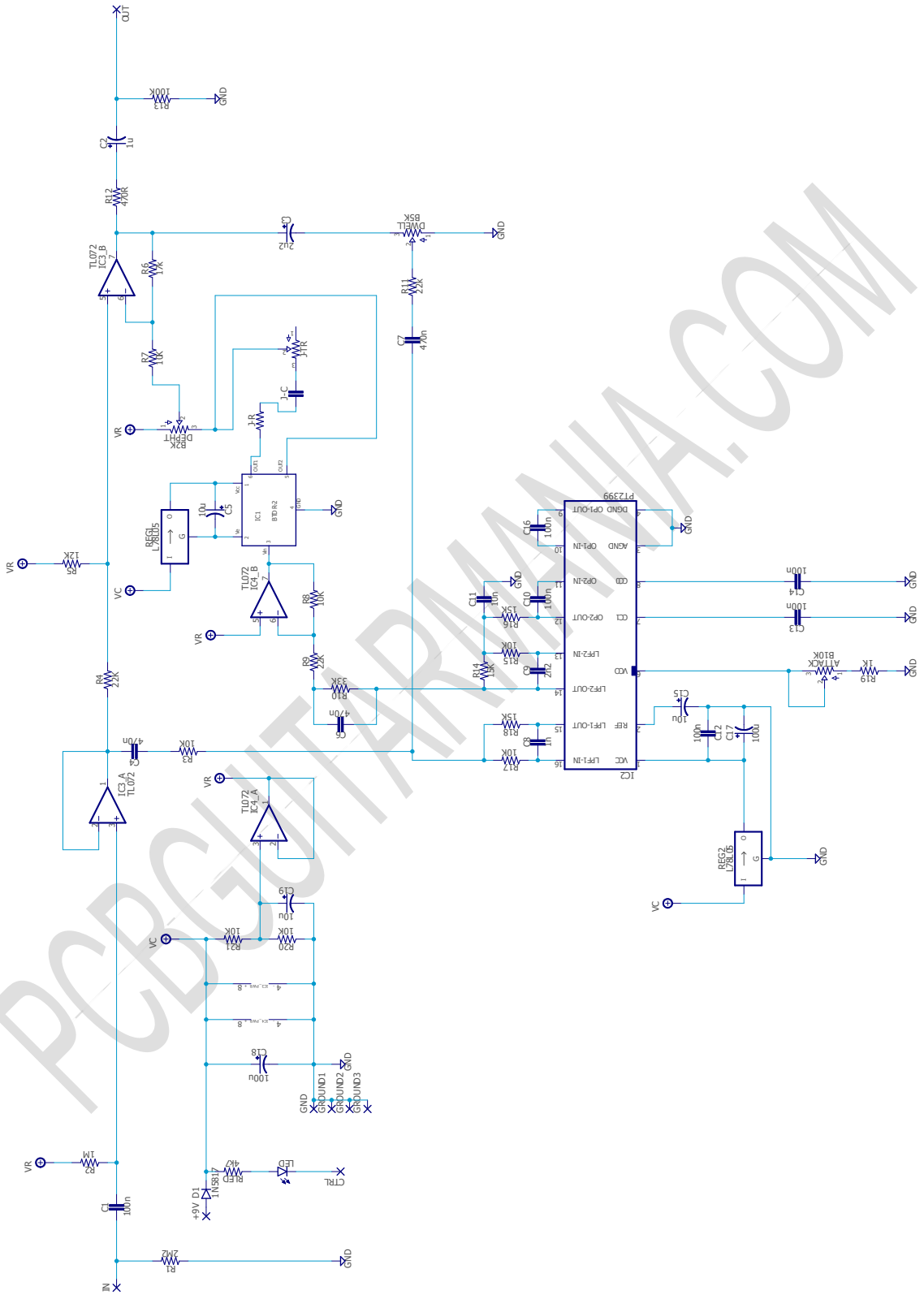
Build Notes

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 here to access to our Pedal Wiring Guide

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 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.

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