CAVEDWELLER2022

FX TYPE: Delay
mbp PT2399 design
Enclosure Size: 1590B

Overview

The very first CaveDweller appeared around 2012 and was one of my early attempts at an “original” project. The idea was to reduce a PT2399 design to the lowest part count possible while remaining serviceable and easy to build. It was really popular in DIY circles for a while. But, there were shortcomings: it was pretty dark sounding even with the dry through signal.

The CaveDweller 2015 attempted to address that shortcoming. The updated version utilized a split JFET buffer/gain stage at the input to brighten the whole thing up. CD2015 was less popular and perhaps had some shortcomings, too (IOW, it probably went *too far* in brightening up the circuit and losing a little of the dark vibe the original had.) The CaveDweller 2019 version which was made available in the Etcher’s Paradise section of the mbp website. This updated a few values from the 2015 version but remained largely the same circuit.

Finally, we arrive at the 2022 version. This new design was inspired by deadastronauts’s discovery of a way to introduce envelope-driven modulation on the PT2399 with a bare minimal of parts. Namely, a single cap a resistor between two pins of the delay chip. Funny enough, this came right when I was working on my own version of a PT2399 delay with dynamic modulation (the Degenerator). Rob’s solution is even more elegant and worth your attention :)

Controls

- **MIX** - Mixes the delay signal with the effect output.
- **DWELL** - Amount of delay repeats from (1) to ‘near infinity’ to “self-oscillation”.
- **DELAY** - Delay time from ~50ms to about 600ms.
- **MOD** - Amount of delay modulation. This is triggered by picking dynamics. CW settings introduce low delay modulation. High settings produce more pronounced modulation and even a ‘ducking’ effect at the highest settings.
- **ENB** - On/Off switch for the modulation.

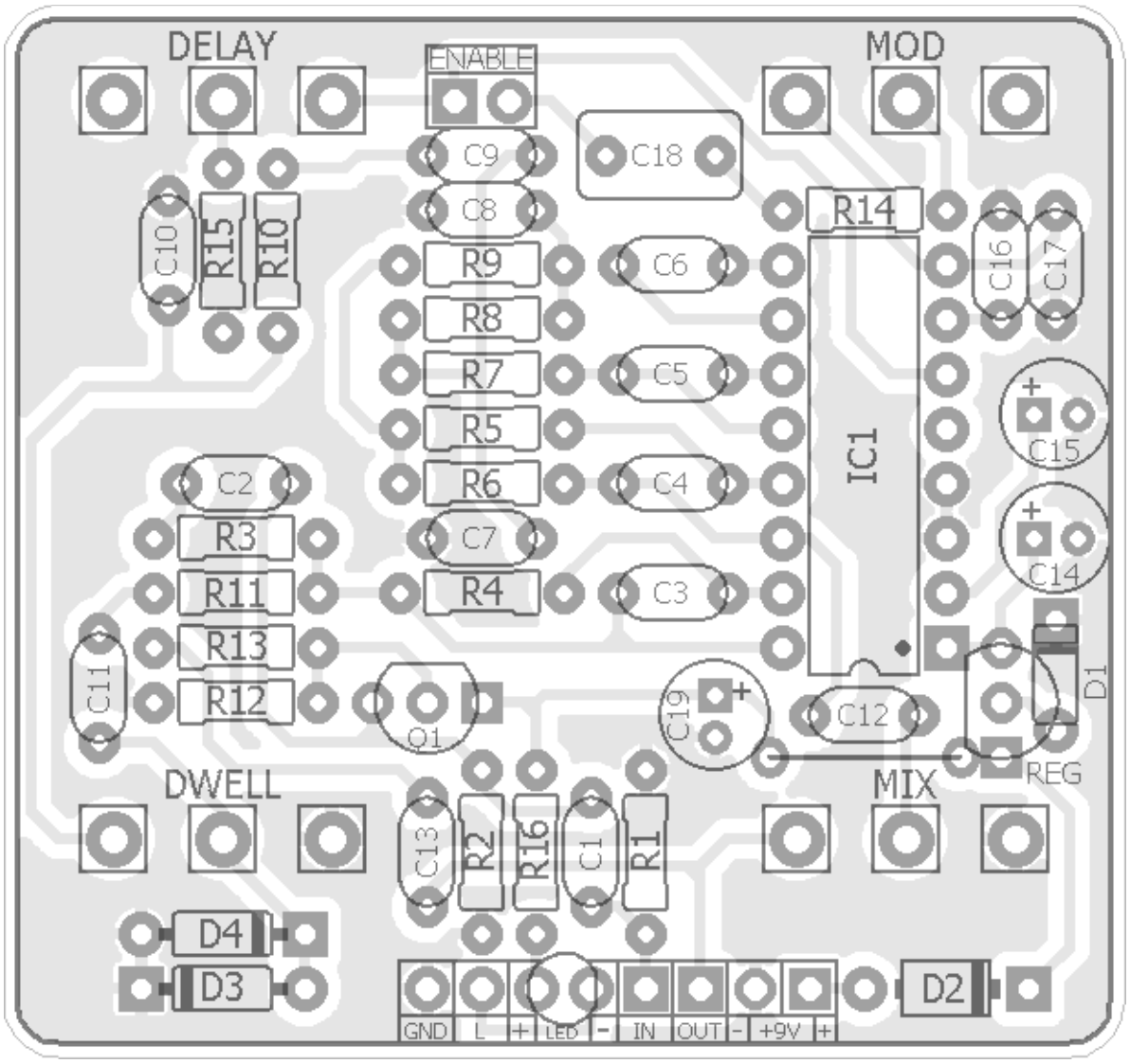
Standard mods

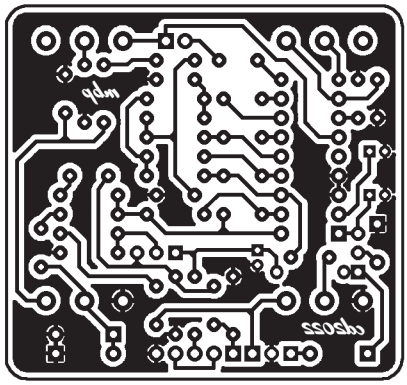
- I’ve listed a few mods in the schematic image for altering the CD2022 according to your preference. Socketing C4, C7 and C10 will let you manipulate the delay tone as much as you want.

Enhancement mods

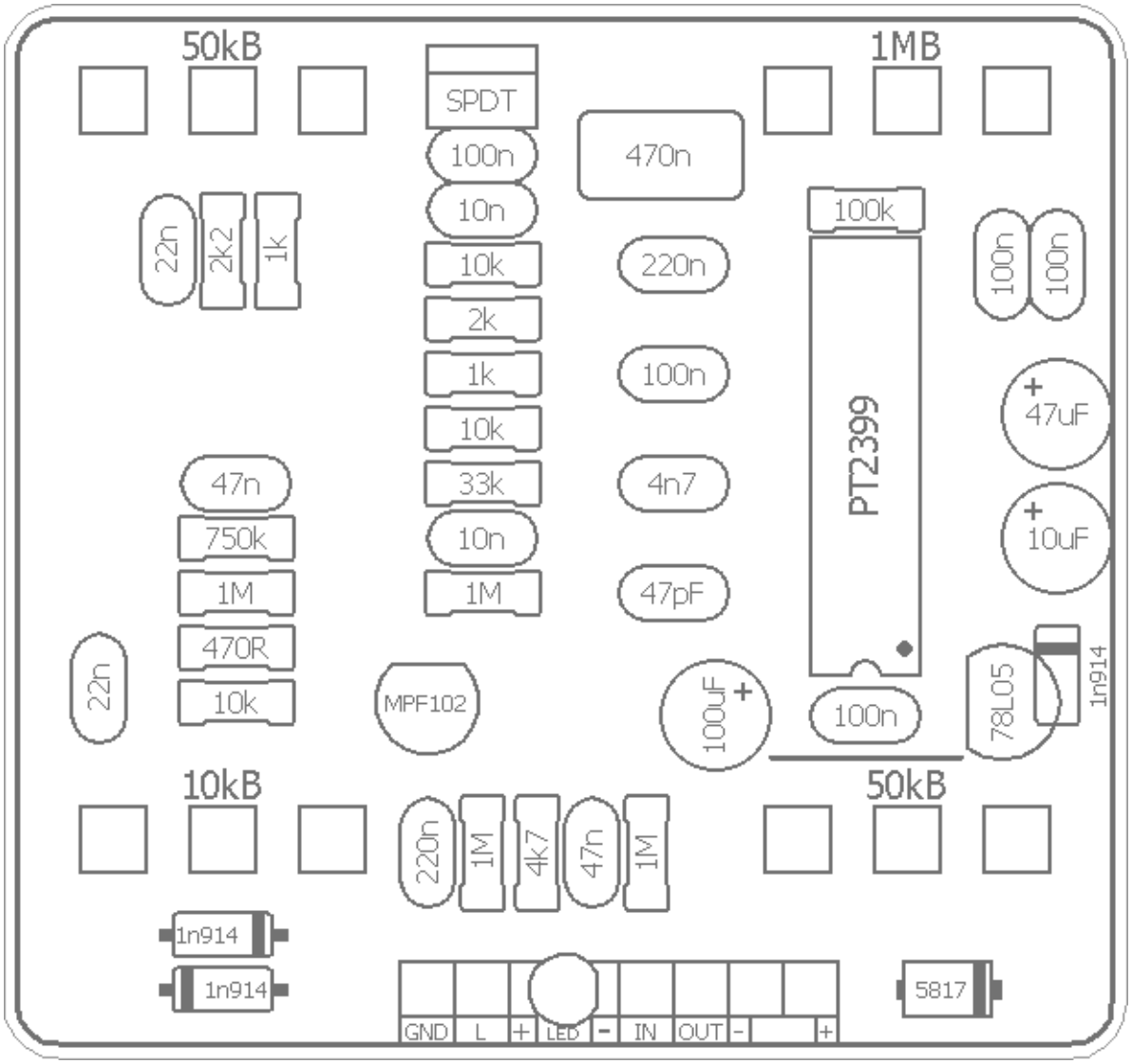
- You can reduce R14 even further (ex. 47k) for more extreme modulation/ducking when the MOD control is full CW.

Technical assistance for your build(s) is available via the madbeanpedals forum. Please go there rather than emailing me for assistance on builds. This is because (1) I’m not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates a record from which other members may benefit.





Do not use any print scaling when transferring image.

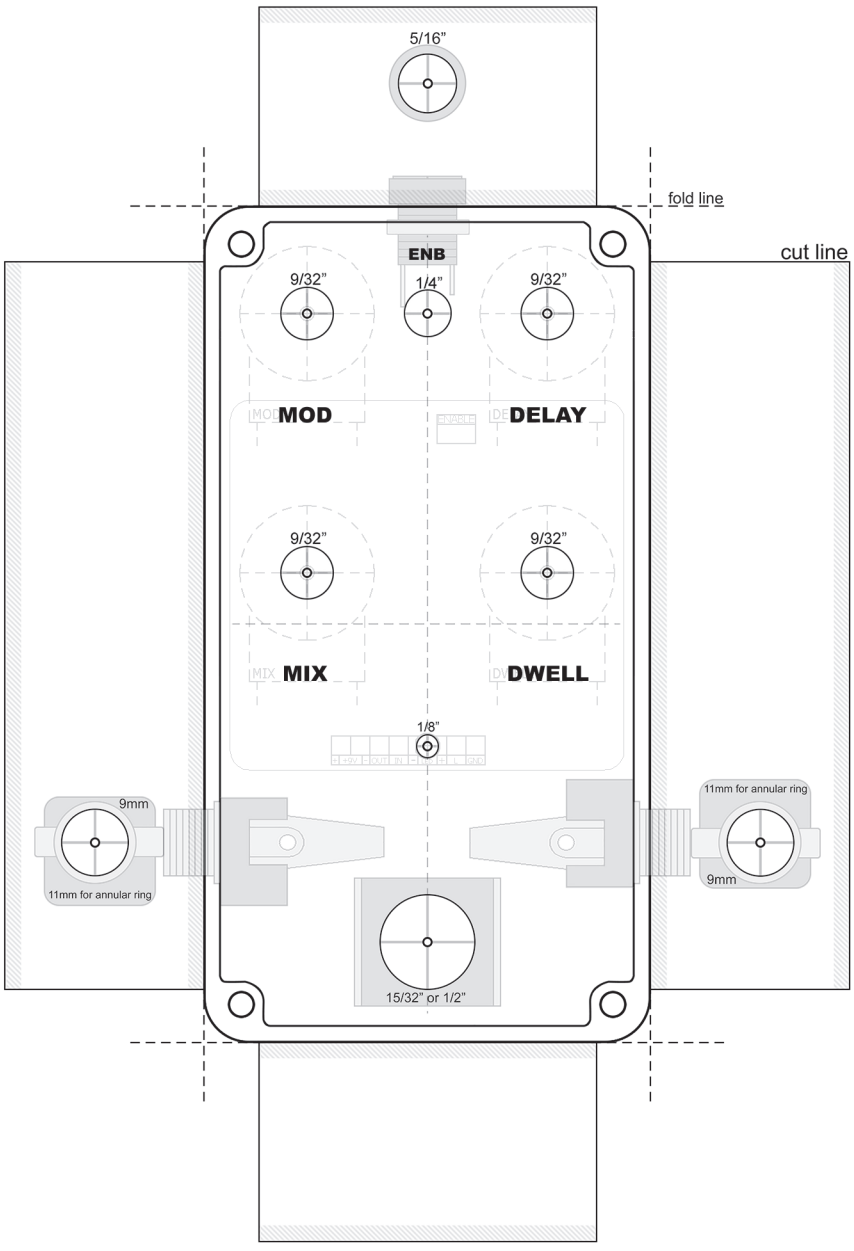


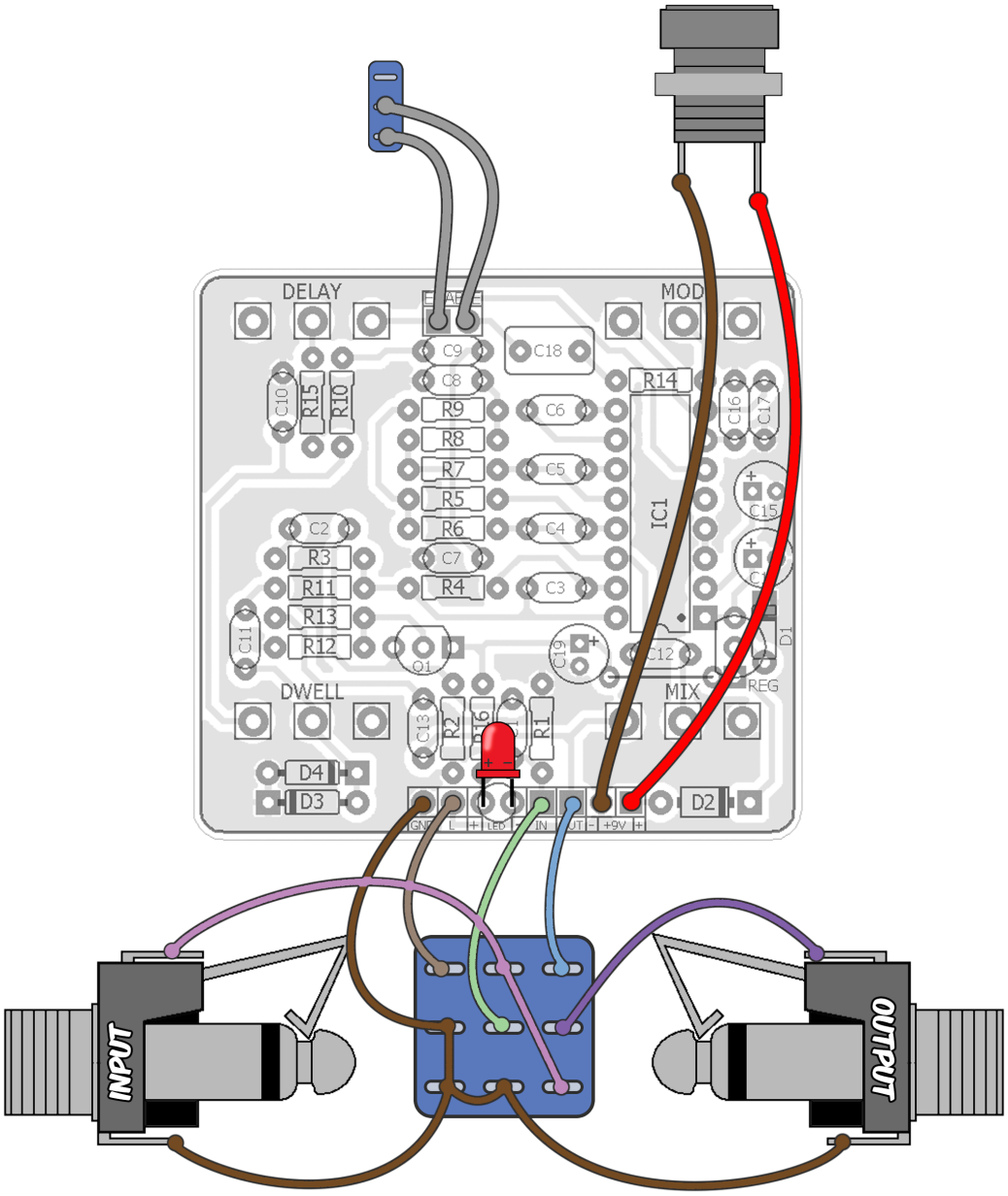
Note: be sure to install the jumper next to the 78L05

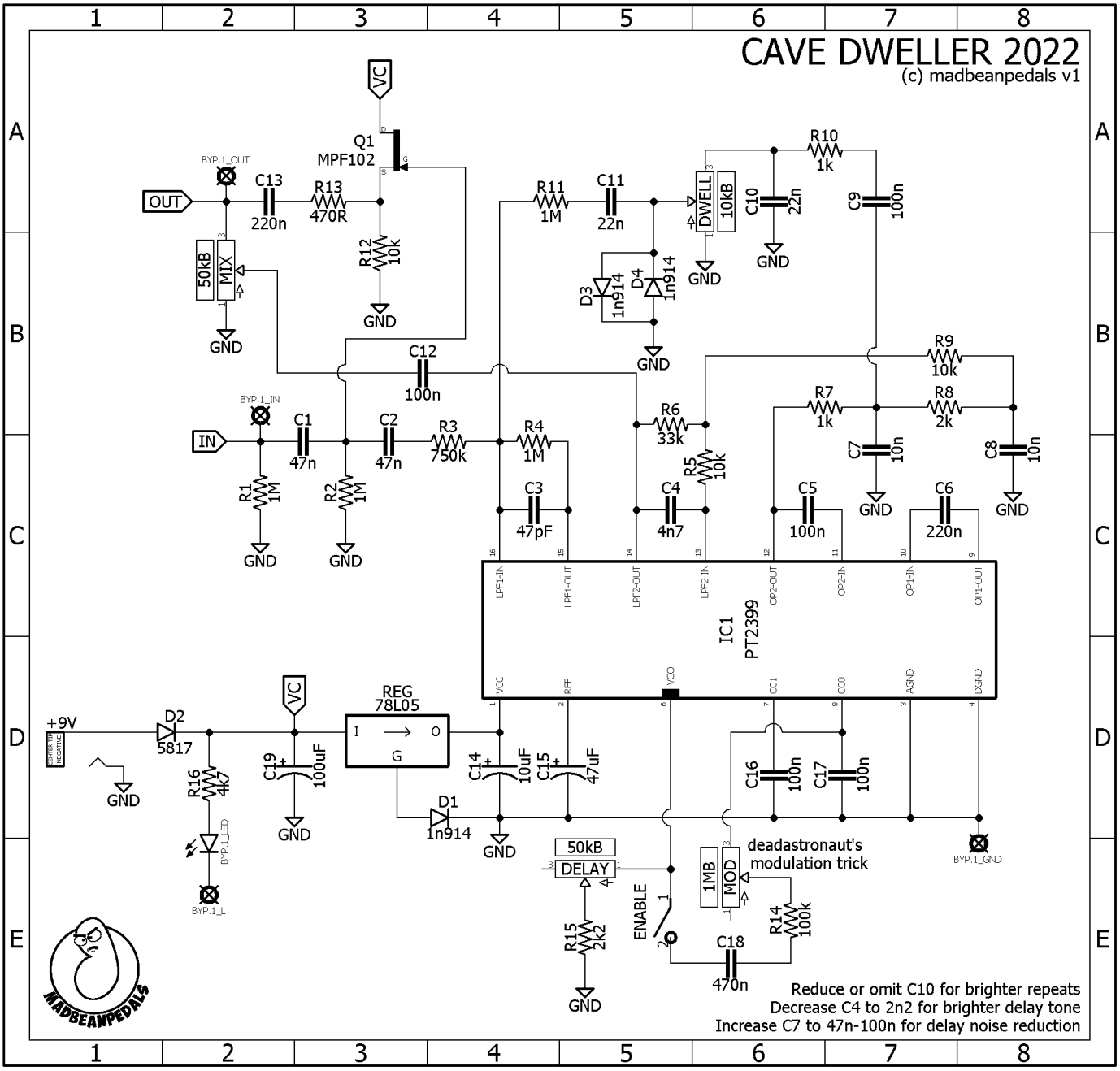
Resistors		Caps		Diodes	
R1	1M	C1	47n	D1	1n914
R2	1M	C2	47n	D2	1n5817
R3	750k	C3	47pF	D3	1n914
R4	1M	C4	4n7	D4	1n914
R5	10k	C5	100n	Transistors	
R6	33k	C6	220n	Q1	MPF102
R7	1k	C7	10n	Regulators	
R8	2k	C8	10n	REG	LM78L05
R9	10k	C9	100n	ICs	
R10	1k	C10	22n	IC1	PT2399
R11	1M	C11	22n	Switches	
R12	10k	C12	100n	ENABLE	SPDT
R13	470R	C13	220n	Pots	
R14	100k	C14	10uF	DWELL	10kB
R15	2k2	C15	47uF	DELAY	50kB
R16	4k7	C16	100n	MIX	50kB
		C17	100n	MOD	1MB
		C18	470n		
		C19	100uF		

Value	QTY	Type	Rating
470R	1	Metal / Carbon Film	1/4W
1k	2	Metal / Carbon Film	1/4W
2k	1	Metal / Carbon Film	1/4W
2k2	1	Metal / Carbon Film	1/4W
4k7	1	Metal / Carbon Film	1/4W
10k	3	Metal / Carbon Film	1/4W
33k	1	Metal / Carbon Film	1/4W
100k	1	Metal / Carbon Film	1/4W
750k	1	Metal / Carbon Film	1/4W
1M	4	Metal / Carbon Film	1/4W
47pF	1	Ceramic / MLCC	16v min.
4n7	1	Film	16v min.
10n	2	Film	16v min.
22n	2	Film	16v min.
47n	2	Film	16v min.
100n	5	Film	16v min.
220n	2	Film	16v min.
470n	1	Film	16v min.
10uF	1	Electrolytic	16v min.
47uF	1	Electrolytic	16v min.
100uF	1	Electrolytic	16v min.
1n914	3		
1n5817	1		
MPF102	1	or, similar JFET	
LM78L05	1		
PT2399	1		
SPDT	1	ON/ON, solder lug	
10kB	1	PCB Right Angle	16mm
50kB	2	PCB Right Angle	16mm
1MB	1	PCB Right Angle	16mm

Note: *Drill Guides are approximate and may require tweaking depending on the types of hardware you use.*




DELAY
MOD
DWELL
MIX
IC1
REG
D1
D2
D3
D4
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C15
C16
C17
C18
C19
Q1
INPUT
OUTPUT


CAVE DWELLER 2022
(c) madbeanpedals v1
Q1
MPF102
VC
OUT
BYP.1_OUT
C13
220n
R13
470R
R12
10k
50kB
MIX
GND
C12
100n
BYP.1_IN
IN
C1
47n
C2
47n
R3
750k
R4
1M
R1
1M
R2
1M
R11
1M
C11
22n
DWELL
10kB
R10
1k
C10
22n
C9
100n
D3
1n914
D4
1n914
R6
33k
R5
10k
R9
10k
R7
1k
R8
2k
C7
10n
C8
10n
C3
47pF
C4
4n7
C5
100n
C6
220n
IC1
PT2399
LPF1-IN
LPF1-OUT
LPF2-OUT
LPF2-IN
OP2-OUT
OP2-IN
OP1-IN
OP1-OUT
VCC
REF
VCO
CC1
CC0
AGND
DGND
+9V
D2
5817
REG
78L05
I
O
G
C19
100uF
C14
10uF
C15
47uF
C16
100n
C17
100n
R16
4k7
BYP.1_LED
BYP.1_L
D1
1n914
50kB
DELAY
ENABLE
1MB
MOD
deadastronaut's
modulation trick
R14
100k
R15
2k2
C18
470n
BYP.1_GND
Reduce or omit C10 for brighter repeats
Decrease C4 to 2n2 for brighter delay tone
Increase C7 to 47n-100n for delay noise reduction
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