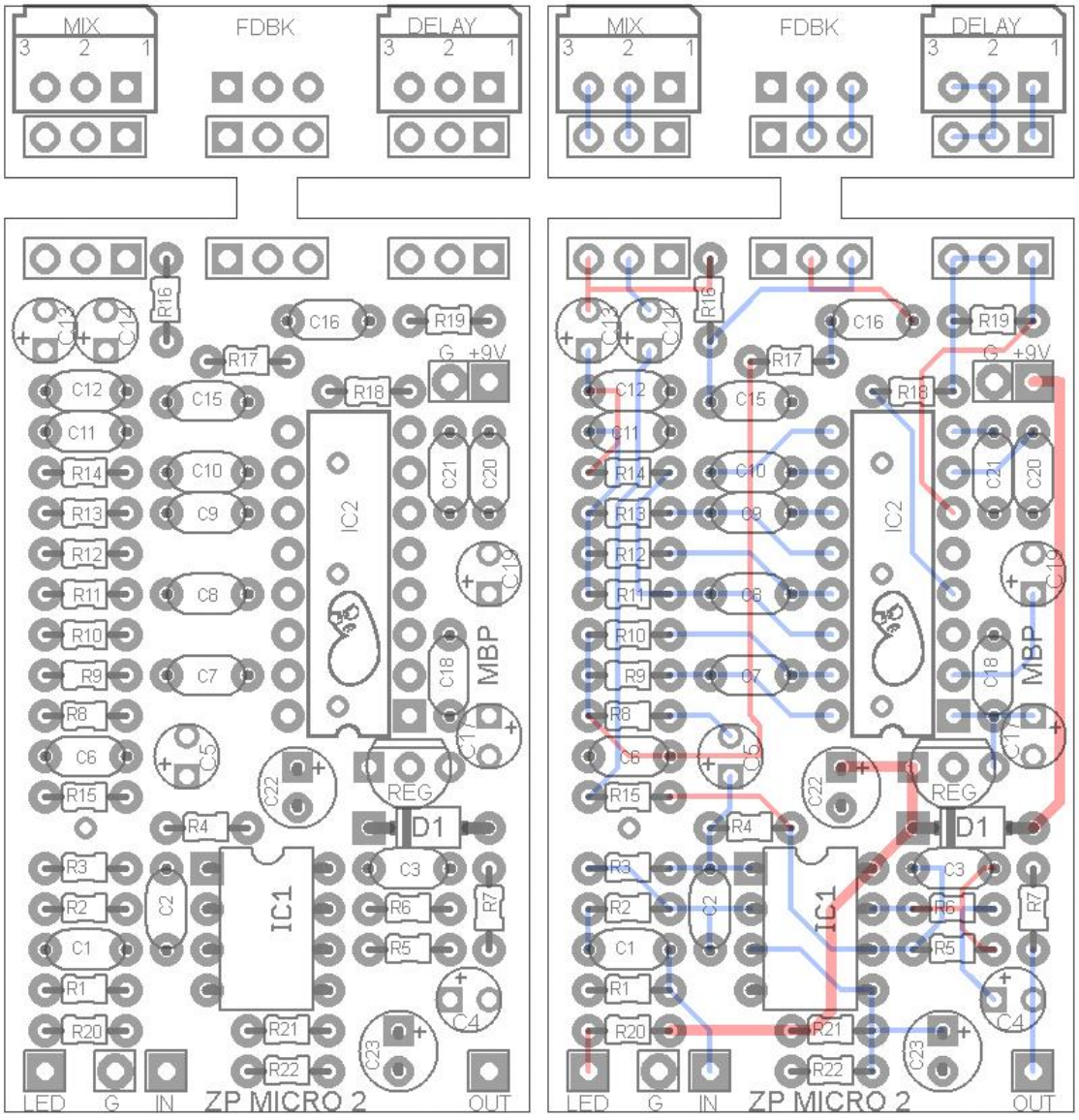
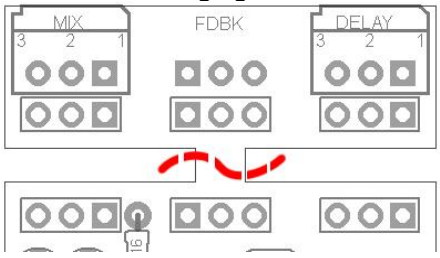
ZERO POINT MICRO 2

FX Type: Delay

2.2” H x 1.3” W (Main Board)
0.425” H x 1.3”W (Daughter Board)

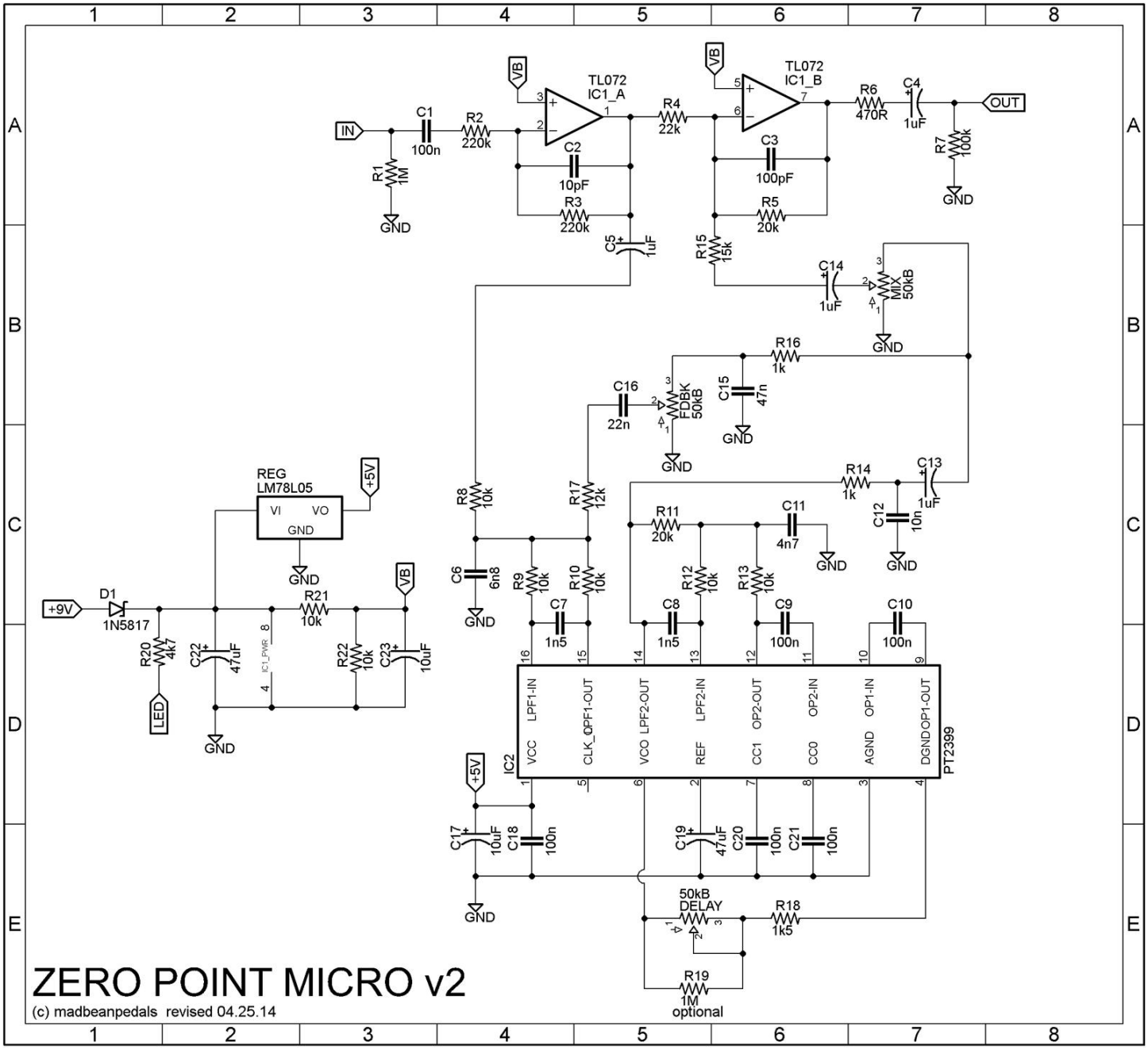


The Zero Point Micro 2 is made up of a main board (for the components) and daughter board (for the potentiometers). These need to be separated before building. Use a utility knife to score the bridge between the two boards and then snap them apart. You should also trim the leftover edges so that they are flush. There is no copper connecting the two boards so it is safe to do this without damaging them.



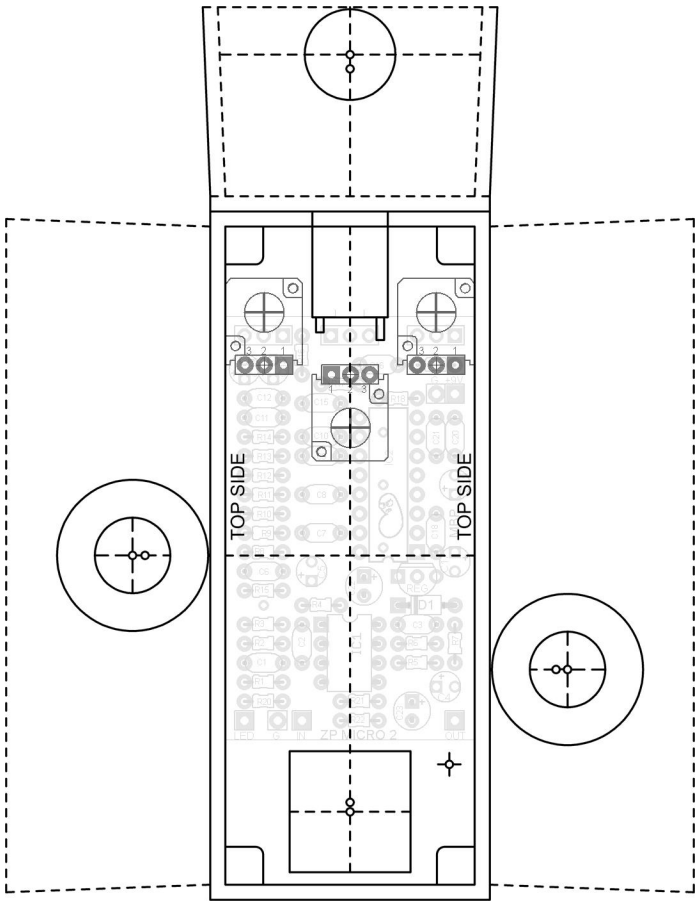
Resistors		Caps		Diodes	
R1	1M	C1	100n	D1	1N5817
R2	220k	C2	10pF	IC	
R3	220k	C3	100pF	IC1	TL072
R4	22k	C4	1uF	IC2	PT2399
R5	20k	C5	1uF	Regulator	
R6	470R	C6	6n8	REG	LM78L05
R7	100k	C7	1n5	Pots	
R8	10k	C8	1n5	DELAY	50kB
R9	10k	C9	100n	FDBK	50kB
R10	10k	C10	100n	MIX	50kB
R11	20k	C11	4n7		
R12	10k	C12	10n		
R13	10k	C13	1uF		
R14	1k	C14	1uF		
R15	15k	C15	47n		
R16	1k	C16	22n		
R17	12k	C17	10uF		
R18	1k5	C18	100n		
R19	1M	C19	47uF		
R20	4k7	C20	100n		
R21	10k	C21	100n		
R22	10k	C22	47uF		
		C23	10uF		

Shopping List			
Value	QTY	Type	Rating
470R	1	Carbon / Metal Film	1/8W
1k	2	Carbon / Metal Film	1/8W
1k5	1	Carbon / Metal Film	1/8W
4k7	1	Carbon / Metal Film	1/8W
10k	7	Carbon / Metal Film	1/8W
12k	1	Carbon / Metal Film	1/8W
15k	1	Carbon / Metal Film	1/8W
20k	2	Carbon / Metal Film	1/8W
22k	1	Carbon / Metal Film	1/8W
100k	1	Carbon / Metal Film	1/8W
220k	2	Carbon / Metal Film	1/8W
1M	2	Carbon / Metal Film	1/8W
10pF	1	Ceramic	16v or more
100pF	1	Ceramic	16v or more
1n5	2	Film / MLCC	16v or more
4n7	1	Film / MLCC	16v or more
6n8	1	Film / MLCC	16v or more
10n	1	Film / MLCC	16v or more
22n	1	Film / MLCC	16v or more
47n	1	Film / MLCC	16v or more
100n	6	Film / MLCC	16v or more
1uF	4	Electrolytic / Tantalum	16v or more
10uF	2	Electrolytic / Tantalum	16v or more
47uF	2	Electrolytic / Tantalum	16v or more
1N5817	1		
TL072	1	DIP	
PT2399	1	DIP	
LM78L05	1	TO-92	
50kB	3	9mm Alpha	


ZERO POINT MICRO v2
(c) madbeanpedals revised 04.25.14
TL072
IC1_A
TL072
IC1_B
VB
IN
OUT
GND
+9V
+5V
D1
1N5817
REG
LM78L05
VI
VO
LED
IC2
PT2399
LPF1-IN
VCC
CLK_OPF1-OUT
LPF2-OUT
VCO
LPF2-IN
REF
OP2-OUT
CC1
OP2-IN
CC0
OP1-IN
AGND
DGNDOP1-OUT
IC1_PWR
50kB
DELAY
optional
MIX
50kB
FDBK
50kB
C1 100n
C2 10pF
C3 100pF
C4 1uF
C5 1uF
C6 6n8
C7 1n5
C8 1n5
C9 100n
C10 100n
C11 4n7
C12 10n
C13 1uF
C14 1uF
C15 47n
C16 22n
C17 10uF
C18 100n
C19 47uF
C20 100n
C21 100n
C22 47uF
C23 10uF
R1 1M
R2 220k
R3 220k
R4 22k
R5 20k
R6 470R
R7 100k
R8 10k
R9 10k
R10 10k
R11 20k
R12 10k
R13 10k
R14 1k
R15 15k
R16 1k
R17 12k
R18 1k5
R19 1M
R20 4k7
R21 10k
R22 10k

Drill Template

3.58”W x 4.65” H



Download the Photoshop Template Here:
http://www.madbeanpedals.com/projects/ZeroPoint/ZPMICRO2_DRILL.zip

Be sure to read the Baby Board Build Guide before beginning. It includes info on what parts to use and general tips on building 1590A pedals:
http://www.madbeanpedals.com/downloads/BabyBoardGuide.pdf

The **Zero Point Micro 2** is a major revision to the first Micro. The original Micro was an attempt to pack as many features as possible into a 1590A enclosure, including modulation. This proved to be a challenge for some builders, and a least a few people experienced some problems getting optimal results. The Micro 2 simplifies the build by dropping the modulation, providing better spacing on the parts layout, and now features a breakout board for mounting the 9mm Alpha pots. The Micro 2 still has all the features and richness of a PT2399 based delay while providing an easier build process. If you are looking for a delay with modulation, check out the new Zero Point Mini project, which is fitted for the 1590B/1550B.

Notes:

R19 is an optional delay limiting resistor. It sits in parallel with the Delay pot and drops its value down to about 47k from 50k. The result is slightly less max delay. The reason for doing this is that the PT2399 is only meant for about 250-300ms of delay time. The Micro 2 pushes this more toward 600ms. As a consequence, the maximum delay settings tend to be quite noisy. Limiting this delay time further “lops off” at least the worst of the noise.

C11 can be increased for more mid-range and tape-like repeats. Suggested values are 15n or 22n. Note that the higher values will increase the noise floor some (a socket is a good idea here)

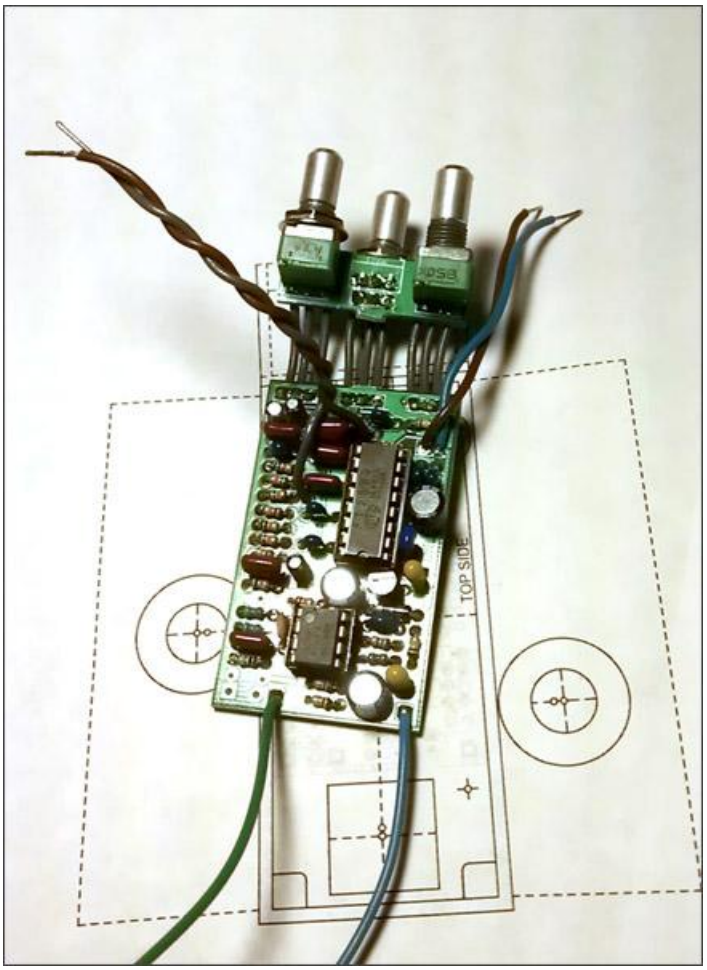
R17 is set so that you can achieve self-oscillation only with the FDBK pot set at maximum. If you wish to change the point at which self-oscillation occurs, lower this value (a socket is a good idea here).

The Zero Point Micro 2 is my personal choice on how to voice a PT2399 delay. However, you can modify it in many ways if you want something different. For example, if you wish to build something closer to the Deep Blue Delay™ it is only a matter of substituting a few values. Here is an example of how to build the DBD:

"Deep Blue" version					
Resistors		Caps		Diodes	
R1	1M	C1	22n	D1	1N5817
R2	180k	C2	47pF	IC	
R3	360k	C3	100pF	IC1	TL072
R4	22k	C4	1uF	IC2	PT2399
R5	12k	C5	1uF	Regulator	
R6	1k	C6	4n7	REG	LM78L05
R7	100k	C7	2n2	Pots	
R8	10k	C8	2n2	DELAY	50kB
R9	10k	C9	100n	FDBK	50kB
R10	10k	C10	100n	MIX	50kB
R11	20k	C11	15n		
R12	10k	C12	10n		
R13	10k	C13	1uF		
R14	1k	C14	1uF		
R15	20k	C15	47n		
R16	2k	C16	22n		
R17	5k1	C17	10uF		
R18	2k7	C18	100n		
R19	omit	C19	47uF		
R20	4k7	C20	100n		
R21	10k	C21	100n		
R22	10k	C22	47uF		
		C23	10uF		

The daughter board is for mounting the 9mm Alpha pots. These are then wired to the main board. The reason for doing this is that it makes wiring the tiny pots much easier since they do not solder lugs for wires. The Mix and Delay pots should be soldered to the top of the daughter board and the FDBK pot to the bottom. The result is a “control triangle” as seen below.

Use these pots for building the ZP Micro 2: http://www.smallbearelec.com/servlet/Detail?no=693



Early prototype for the Zero Point Micro 2