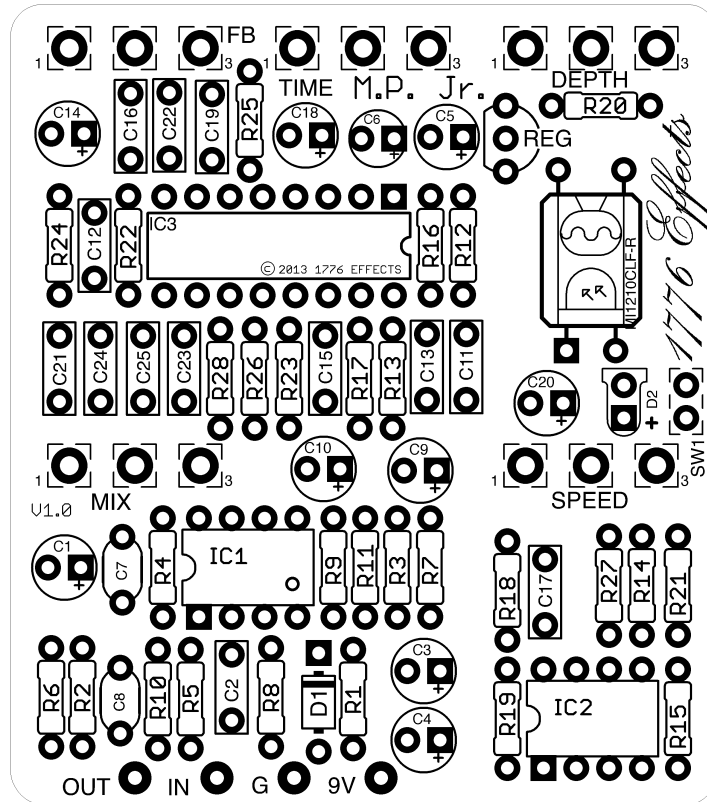# Multiplex Jr.

A 1776 Effects Project

The Multiplex Junior is the Multiplex Echo Machine's little brother. It's based off the EP-3 mode of the Multiplex Echo Machine project. It also includes a very organic modulation that can go from subtle to vibrato like.

What to expect...

This is not a pristine digital delay, some noise will be experienced. Even tape delays have noise, it just adds to the character...

Multiplex Jr. Parts List

Resistors		Capacitors		Diodes	
R1	33R	C1	1 uF	D1	1n4001
R2	1k	C2	22n	D2	LED
R3	10k	C3	47uF	*For Modulation Indicator*	
R4	22k	C4	100uF	Potentiometers	
R5	100k	C5	47uF	TIME	50kB
R6	1M	C6	10uF	FB	50kB
R7	10k	C7	100pF	MIX	50kB
R8	1M	C8	47pF	DEPTH	1 MB
R9	12k	C9	1uF	SPEED	100kB
R10	200k	C10	1uF	IC's	
R11	20k	C11	4n7	IC1	TL072
R12	10k	C12	22n	IC2	TL072
R13	10k	C13	1n	IC3	PT2399
R14	47k	C14	1uF	Switches	
R15	100k	C15	1n	SW1	SPST
R16	5k1	C16	10n	Regulator	
R17	10k	C17	10n	REG	78L05
R18	2.2M	C18	47uF	Misc	
R19	1k	C19	100n	VACTROL	VTL5C3
R20	180k	C20	10uF		
R21	100k	C21	47n		
R22	1k	C22	100n		
R23	20k	C23	100n		
R24	2k	C24	47n		
R25	2k7	C25	100n		
R26	10k				
R27	100k				
R28	10k				

Parts Notes :

- For optimum modulation success a VTL5C3 or equivalent is HIGHLY suggested. I also like the Macron MI1210CLF-R that Small Bear Electronic sells. Make sure it is the F version. The yellow dot is the ANODE (positive) on this part.

- If you construct your own vactrol with an LDR and LED, I suggest using a LDR that is 10 to 20K On, 10 Meg Off and a diffused LED.

- All resistors are standard 1/4 watt.

- Caps - Electrolytic's should be 5 mm Dia. x 11 mm or smaller

- D2 is for the modulation rate/status indicator LED

- The SW1 pads are for connecting a SPDT toggle to turn on or off the modulation. This can be jumpered with a small wire if you're running the modulation all the time (I do!)

- Potentiometers are standard length 16mm PCB mount, but solder lugs can be used.

- Enclosure size
    - This is designed to fit in a 1590B but using a 125B will give just a hair more room to work in without sacrificing more pedalboard space.

- PT2399's
    - With the nature of PT2399's socketing is HIGHLY recommended. Not all PT2399's are created equal. Many exhibit higher noise and you'll also get some that "motorboat". Since we aren't fishing I recommend buying a few from different suppliers and "demoing" which ones sound best. Even with the best PT2399's you will experience some noise at certain settings of delay time and/or repeats. You can increase the filtering but the delay will sound more analog then tape.

Mods

Filtering

Replacing C13 and C15 with a higher value (1n5 or 2n2) will reduce noise but will be less tape like. Socket and adjust to taste if you're indecisive.

Modulation

You can socket R20 to fine tune your modulation taste or if you rolled your own vactrol and need some minor adjustments.

WIRING

3PDT wiring is standard FX wiring as shown in Madbean's wonderful wiring diagram.

http://www.madbeanpedals.com/tutorials/downloads/StandardWiring_MBP.pdf

The SPST toggle is wired to the SW1 pads on the PCB. You can use a footswitch if so desired.

Note: D2 is a visual indicator of the modulation rate/status, it is not an on/off indicator for the effect. It can be PCB mounted. Use the drill guide for proper enclosure drilling. An additional LED is necessary along with a CLR as shown in Madbean's wiring diagram for effect on/off status.

USAGE/SELLING

The Multiplex Jr. can be used for small quantities of commercial pedal building. You may not however, offer PCBs as part of a "kit" or redistribute the PCB's for sale as a commercial endeavor. All PCB artwork is property of 1776 effects.

If using PCB's for commercial building please rename your project so there is no confusion to the end user and it will be clear I offer no official support to those you sold your pedal to :)

Schematic
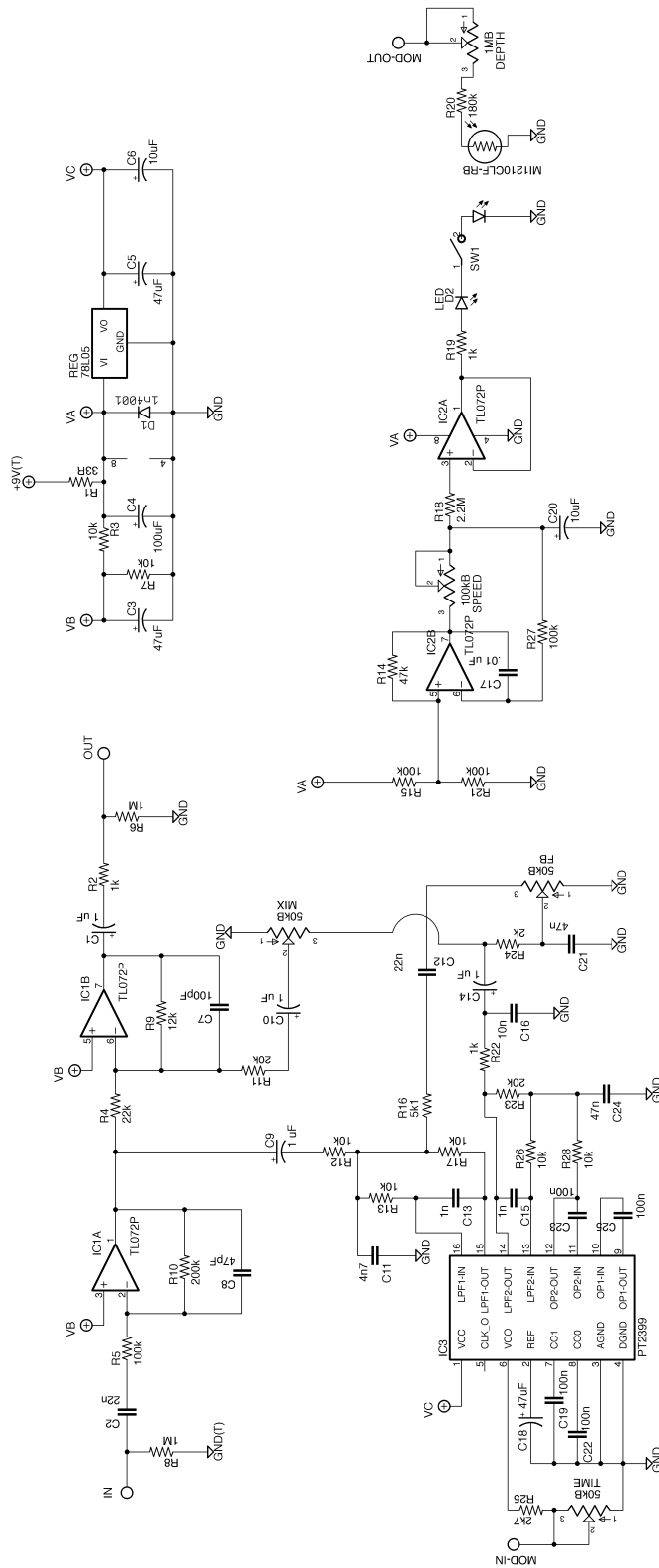
Drill Guide

Print at 100% scale for drilling! If placing in a 1590B make sure to leave clearance next to enclosure screw corners as the PCB is slightly wider. Dry fit the PCB template inside to make sure you have clearance and then place the template on top of the enclosure to center-punch the hole locations.
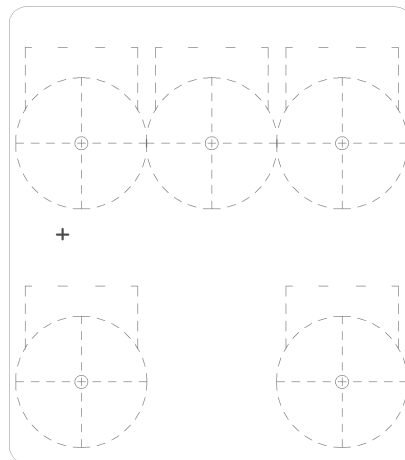
PCB size 2.16 in. x 2.44 in. (55mm x 62mm)