

PT2399 TAP TEMPO BOARD V1

rev. 21/10/17

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The PT2399 TTB is a small board to control PT2399 based delays, it is equipped with a pre-programmed ATTINY25 mcu and a MCP4162-503E/P digital potentiometer. You can control the delay by pushing the TAP switch or by turning the DELAY pot.

FIRMWARE Version

Actually there are 2 types of firmware available, they perform the same and do the same function except the following:

- **Doubling switch function firmware:** this version uses a toggle switch. When the switch is set, the tapped time will be halved. Tapping 100ms will result in 50ms.
- **Blinking LED function:** this version uses n LED which blinks in sync with delayed signal. It works both when tapping than with setting the delay through the analog potentiometer.

CONNECTIONS & WIRINGS

TAPSW: momentary normally-opened footswitch connection.

GND: connect to a ground point anywhere in your effect.

9V: use this to supply the pcb from 9V. The 78L05 voltage regulator will provide 5V both for the mcu than digital pot.

DELAY: this is the analog pot connection. You can use your old linear potentiometer or a 10K LIN pot.

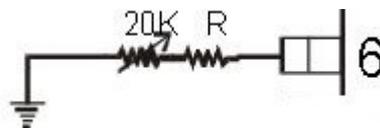
OLDPOT: connect this to the PT2399 pcb where the delay pot is wired. You have to remove the delay pot, its functions will be replaced by the digital pot board.

DBL (DOUBLE): connect a SPST switch. This is an optional feature, with DOUBLE switch you can select between standard TAP timing and doubled TAP timing. Tapping 120bpm (500ms) will give you 240bpm (250ms) delay.

DBL (blinking LED): connect a LED to have a visualization of delayed signal. This is optional too.

SHORTING RESISTOR AT PIN 6

Most of PT2399 based delays have a resistor going from PT2399 IC pin n° 6 to an external pin of the delay potentiometer. This is to prevent the resistance to drop zero when pot is fully CCW and the PT2399 to behave strangely or reset.



With digital pots this is not necessary cause minimum resistance the pot can approach is always some ohms. **Remove the resistor and replace it with a jumper** or just short its pins.

THINGS TO KNOW

- **push footswitch 2 times** to set the delay, keep pushing the footswitch will do average with previous pushes.
- 50K 256 steps digital potentiometer for a 2ms resolution
- at power on the delay time is set by physical pot position
- tapping a time bigger (up to 930ms) than maximum delay time (550ms) will set delay time at max (550ms)
- while moving delay pot or tapping on footswitch, the blinking stops. Blinking restarts short after a new delay time is set

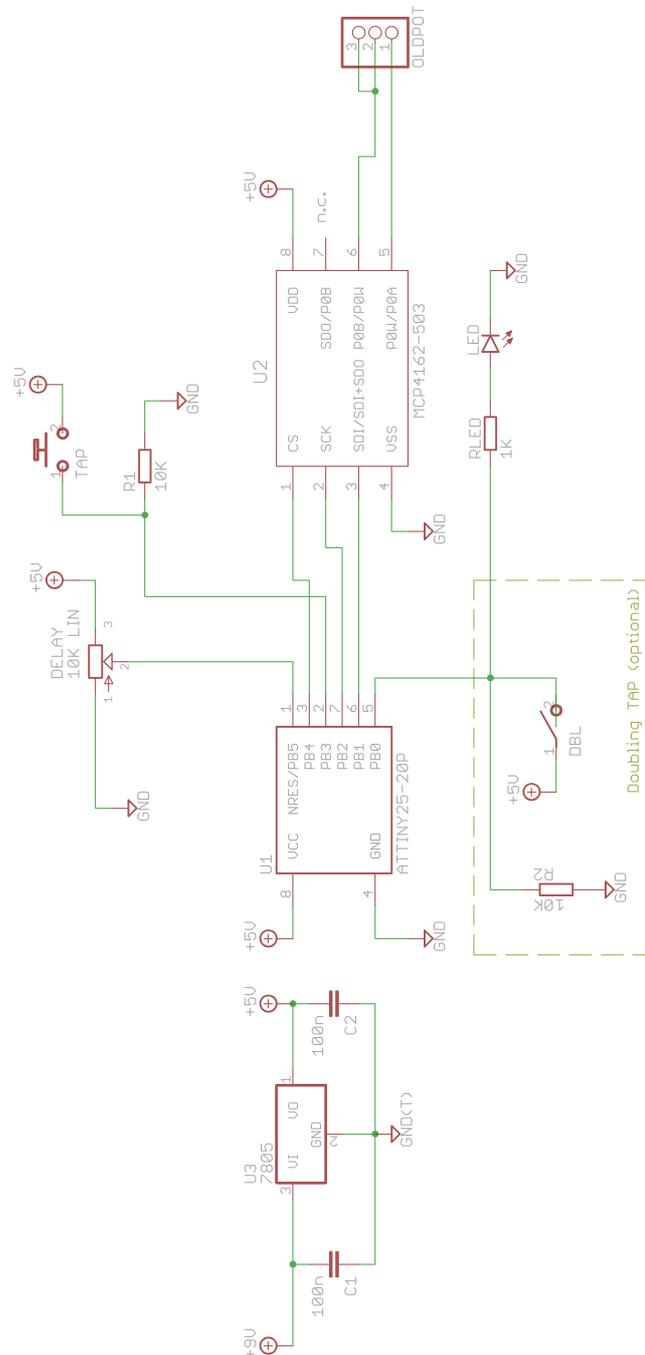
PARTLIST

Qty	Value	Parts	Description
2	100n	C1, C2	CAPACITOR
2	10K	R1, R2	RESISTOR
1	10K LIN	DELAY	POTENTIOMETER
1	78L05	U3	5V 100mA REGULATOR
1	ATTINY25-20P	U1	MCU
1	MCP4162-503	U2	DIGITAL POT
1	SPST OFF(ON)	TAP	MOMENTARY FOOTSWITCH
1	SPST	DBL	TOGGLE SWITCH
1	any color	DBL	LED
1	1K	not on PCB	RESISTOR

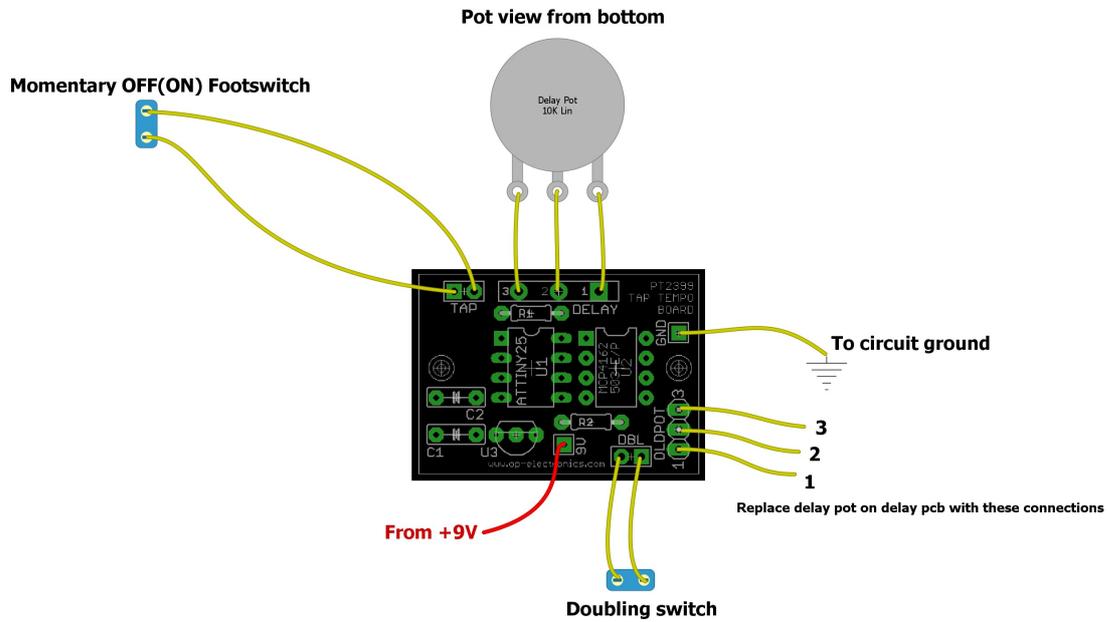
If you got "doubling toggle switch firmware" chip use 10K resistor on R2, if you have "blinking LED firmware" chip leave R2 empty and wire a LED with external resistor. External resistor value depends on LED type and how bright you want it to be.

PT2399 Tap Tempo Board

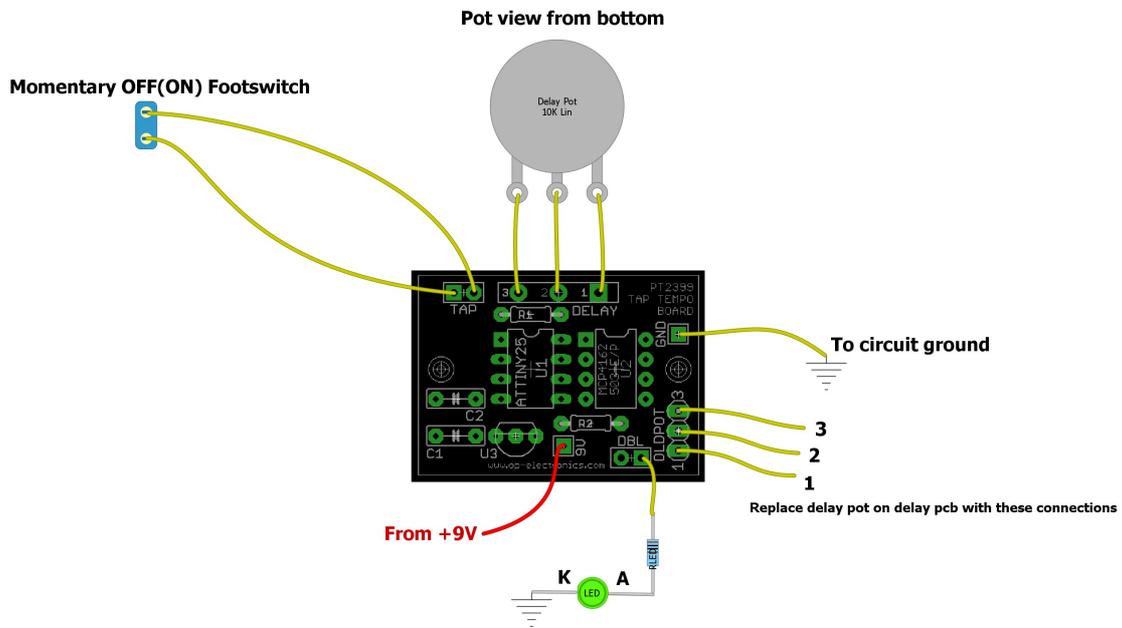
pcb version 090115



Wiring (with doubling switch)



Wiring (with blinking LED)



Blinking LED may introduce noise in the signal path, to avoid this:

- keep LED wire connection at proper distance from audio path
- ground the enclosure

Revision history:

- rev 21/10/17: 2 pushes tap tempo set with moving average
- rev 21/09/17: blinking LED firmware, timer overflow