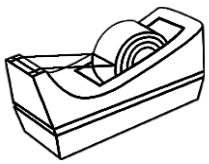
Tape Delay

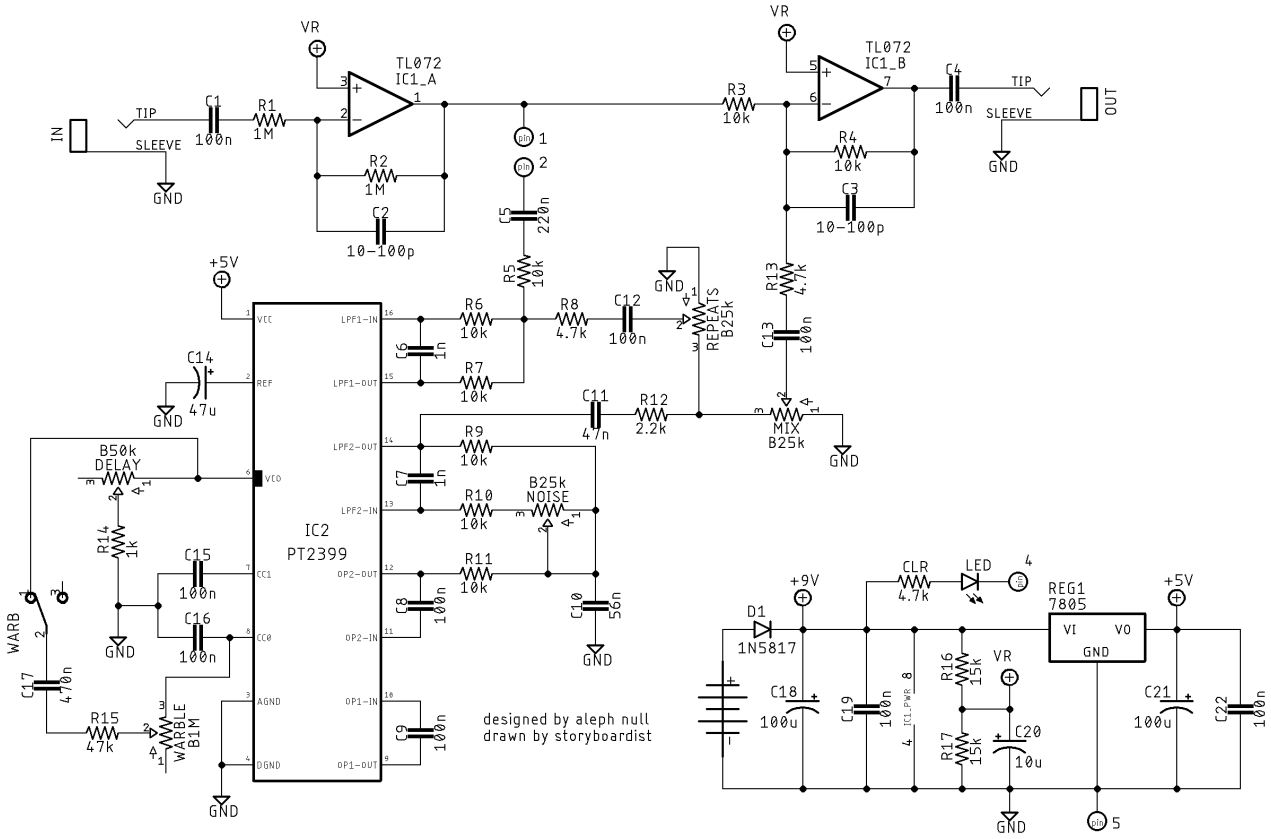


DESCRIPTION

The TAPE DELAY is a PT2399-based delay designed by Aleph Null on the Madbean forum, who was kind enough to let me use his design and share this board. In his words:

> This is an original design that draws a lot of inspiration from Jon Patton's Hamlet Delay. I've implemented a version of Jon's "Noise" control. I've also included DeadAstronaut's envelope modulation. I experimented with resistor and capacitor values in the modulation section and found I like the range I can get. It sounds pretty lush and is capable of pitch bending at higher "Warble" and "Delay" settings. It's not actually intended to sound like tape, but I couldn't resist the pun. Buffered bypass allows for tails.

SCHEMATIC



BOM

Resistors

R1	1M
R2	1M
R3	10k
R4	10k
R5	10k
R6	10k
R7	10k
R8	22k
R9	10k
R10	10k
R11	10k
R12	2.2k
R13	4.7k
R14	1k
R15	47k
R16	15k
R17	15k
CLR	4.7k

Capacitors

C1	100n
C2*	10-100p
C3*	10-100p
C4	100n
C5	220n
C6	1n
C7	1n
C8	100n
C9	100n
C10	82n
C11	47n
C12	100n
C13	100n
C14	47µ
C15	100n
C16	100n
C17	470n
C18	100µ
C19†	100n
C20	10µ
C21	100µ
C22†	100n

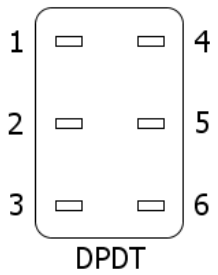
Semiconductors

D1	1N5817
IC1	TL072
IC2	PT2399
LED	3 or 5mm
REG1	78L05

Electromechanical

DELAY	B50k
MIX	B25k
NOISE	B25k
REPEATS	B25k
WARB	SPDT on/on
WARBLE	B1M

Note:
Footswitch should be a DPDT. Wire the FSW pads to the corresponding lugs:



As this is a buffered effect for delay tails, the in/out jacks should be wired directly to the in/out pads. Because the output of the PT2399 is always connected, it might be a good idea to test multiple chips.

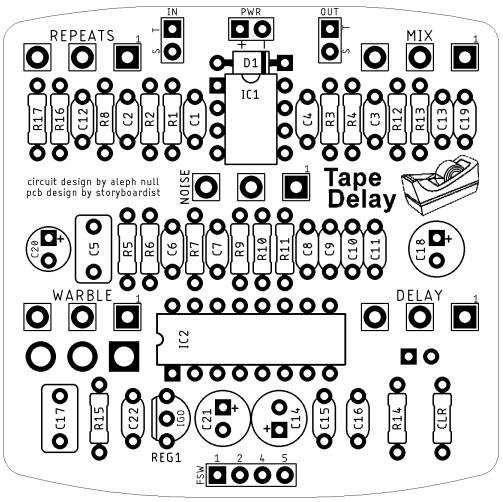
*Added filter caps to the feedback loops of in/out buffers.

†These caps should be ceramic.

SHOPPING LIST

Value	**Type** (suggested)	**Quantity**
1k	¼ watt metal or carbon film	1
2.2k	¼ watt metal or carbon film	1
4.7k	¼ watt metal or carbon film	2
10k	¼ watt metal or carbon film	8
15k	¼ watt metal or carbon film	2
22k	¼ watt metal or carbon film	1
47k	¼ watt metal or carbon film	1
1M	¼ watt metal or carbon film	2
10-100p	Ceramic	2
1n	Film	2
47n	Film	1
82n	Film	1
100n	Ceramic	2
100n	Film	8
220n	Film	1
470n	Film	1
10µ	Electrolytic (25v+)	1
47µ	Electrolytic (25v+)	1
100µ	Electrolytic (25v+)	2
1N5817	Schottky Rectifier diode	1
78L05	5v regulator	1
LED	3 or 5mm	1
PT2399	Echo chip	1
TL072	Dual opamp	1
B1M	16mm right angle PC mount potentiometer	1
B25k	16mm right angle PC mount potentiometer	3
B50k	16mm right angle PC mount potentiometer	1
SPDT	On/on toggle	1

LAYOUT



DRILL TEMPLATE (125B)