Small Time – Echo/Delay
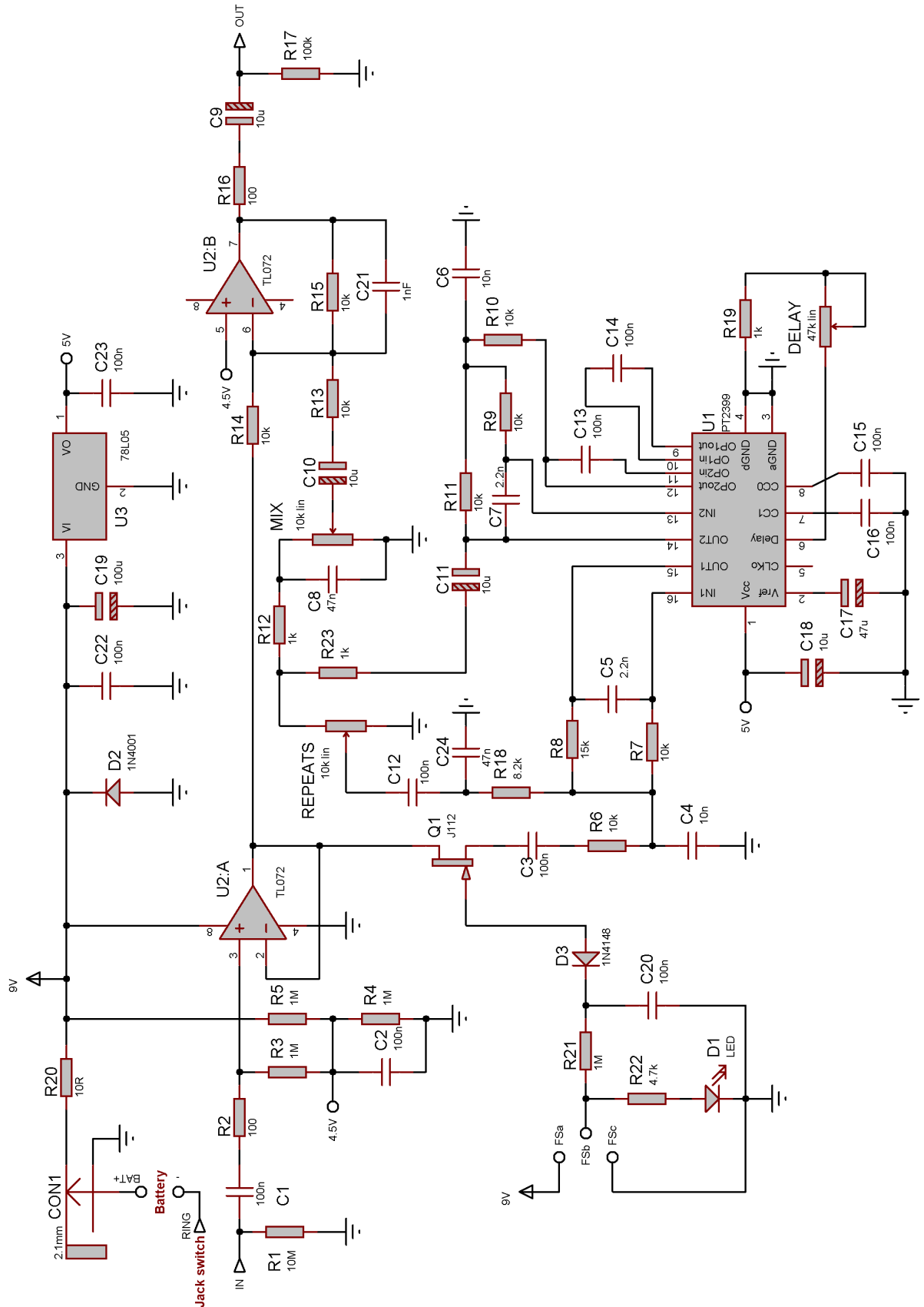## ValveWizard PCB User Guide (Issue 3 PCB)
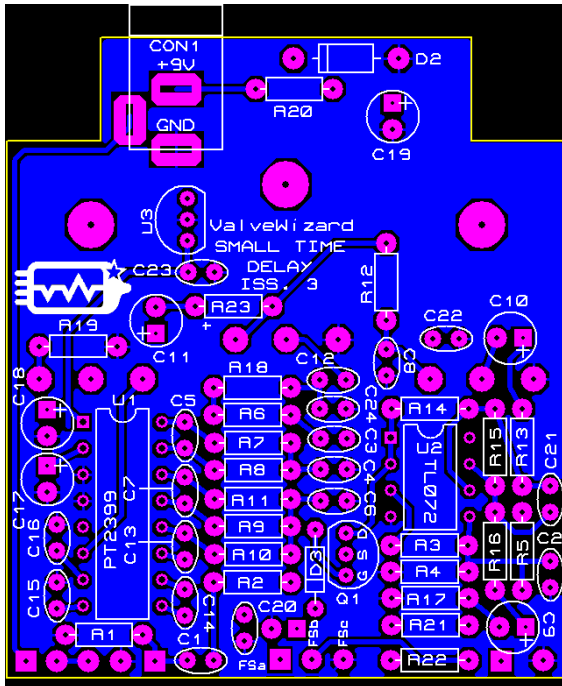

Fig. 1: Circuit schematic
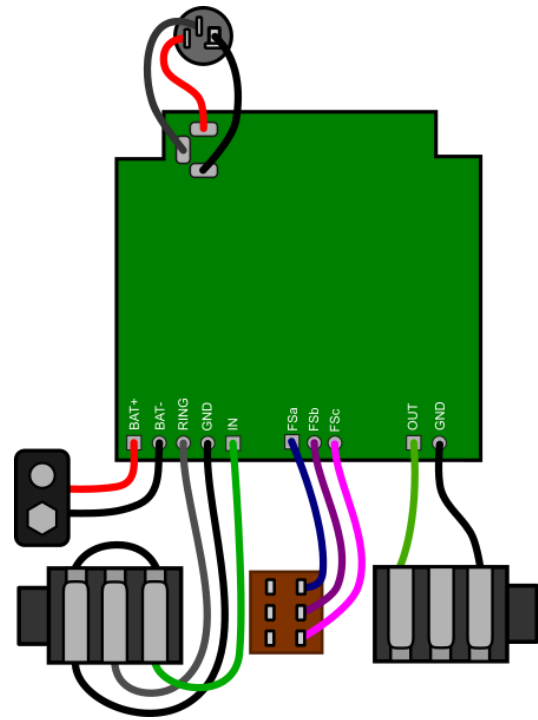
Fig. 2: Component layout

Fig. 3: Wiring diagram

Before populating the PCB you can use it as a drill template by poking a pen through the holes where the pots are.

Populate the smallest components first, e.g. diodes and resistors. Best soldering practice is to tack-solder the component in place so it does not fall out, then snip off the excess leads. Then re-solder the joints properly. This ensures the cut ends will be fully coated in solder. Failure to do this will leave exposed copper that will oxidise over time.

It is recommended that you use IC sockets for the chips.

The square solder pads on LEDs and capacitors indicate the *anodes* (e.g. positive terminal, long lead).

Parts list:

Small Time Iss.3		
	Value	**Notes**
R1	10M	Any value 1M to 10M will do
R2	100R	
R3	1M	
R4	1M	
R5	1M	
R6	10k	
R7	10k	
R8	15k	
R9	10k	
R10	10k	
R11	10k	
R12	1k	
R13	10k	
R14	10k	
R15	10k	
R16	100R	
R17	100k	
R18	8.2k	
R19	1k	
R20	10R	
R21	1M	
R22	4.7k	Adjust for LED brightness

C1	10n	Any value 10n to 100n will do
C2	100n	
C3	100n	
C4	10n	
C5	2.2n	
C6	10n	
C7	2.2n	
C8	47n	
C9	10u	
C10	10u	
C11	10u	
C12	100n	
C13	100n	
C14	100n	
C15	100n	
C16	100n	
C17	47u	
C18	10u	Tantalum preferred
C19	47u	Any value 47u to 220y will do
C20	100n	
C21	1n	
C22	100n	
C23	100n	

C24	47n	

D1	3mm LED	
D2	1N4001	

DELAY	47k lin	
MIX	10k lin	
REPEATS	10k lin	

Q1	J113	Or J112 with Vgs(off) <2V

U1	PT2399	
U2	TL072	Or TL064/TL084/TLE2074
U3	78L05	

CON1	2.1mm DC jack	

Labelled solder pads:

Bat +	Battery '+' terminal
Bat -	Battery '−' terminal
RING	Input jack 'ring' terminal (switches the circuit on when a jack is plugged in)
GND	Ground
IN	Signal input
OUT	Signal output
GND	Ground
Fsa	Footswith outer terminal
Fsb	Footswith centre terminal
Fsc	Footswith other outer terminal

If you use insulated jack sockets like I do then you will need to connect the metal enclosure to circuit ground, such a solder tag connected to a mounting screw.