

Bill Of Materials

Quantity - Part

- **ICs**
 - 1 - Dual opamp (TL072)
 - 1 - Quad opamp (TL074)
 - 1 - Max 1044 (Other charge pump ICs can be used if pinout matches. If using something other than MAX1044, clip pin 1 off or lift it out of the socket.)
- **Transistors**
 - 1 - 2n3906 (PNP)
 - 1 - 2n3904 (NPN)
 - 1 - 2n3819 (N-channel JFET. J113 is confirmed as a working substitute, but mind the different pinout. Pins are marked on board.)
- **Potentiometers**
 - 1 - A10K (Speed)
 - 1 - B10K (Depth)
 - 2 - B100K (Bias and Level. Bias pot may work better as a "C" taper, AKA reverse log)*
 - 2 - B100K Trimpot (Shape and Offset)

*Bias and Level can be board-mounted. If this option is chosen, replace the 2 B100K pots with B100K trimpots.

- **Switches**
 - 1 - DPDT toggle (VCF/VCA)
 - 1 - 3P4T or DP6T rotary (Waveshape. Only 2 poles and 4 throws are needed)
- **Diodes**
 - 2 - 1n4148 (1n43A marked on original schematic, but 1n4148 works fine.)
 - 1 - LED
- **Capacitors**
 - 3 - 10uf**
 - 2 - 100uf
 - 1 - 2N2 (AKA 2200 pf)
 - 1 - 10N (AKA .01uf)
 - 2 - 100N (AKA .1uf)
 - 2 - 6N8 (AKA 6800 pf)
 - 1 - 470NF (AKA .47uf)

** One 10 uf cap is optional: In the upper right of the board. This cap reduces ticking in extreme bias settings, by slightly smoothing out the square wave. This smoothing may make the square wave less choppy, and where this is not desirable, the cap can be omitted or switched out. If omitting the cap, do not jumper its pads; leave them unused.

- **Resistors**
 - 4 - 10k
 - 1 - 56k
 - 10 - 47k
 - 1 - 27k
 - 2 - 180k
 - 1 - 18k
 - 1 - 470 ohm
 - 1 - 6k8

1 - 4k7***
2 - 100k
1 - 1M
1 - 470k

***The 4k7 is the current limiting resistor for the flashing LED. Its value may need to be adjusted depending on the color of LED used and the brightness you prefer.

Tweaking procedure:

- The shape trimpot is used to shape the triangle wave. If you have an oscilloscope, view the waveform and tweak the trimpot until it most closely resembles a triangle wave. If you don't have a scope, turn the speed and depth up high, and tweak the trimpot while playing your instrument. The trimpot should be set at the point that sounds the smoothest.
- The offset trimpot sets the center of the LFO sweep. Set it so that the waveform is centered around 0v. If you don't have a scope, set the speed to medium, the depth high, and set the offset to the point where the effect sweeps through the fullest range of filtering or volume.

Modding ideas:

Please note that these mods have not yet been confirmed as working. No guarantees are made about any mod suggestions until they have been confirmed, so only stray from the suggested build if you know what you're doing. The makers of the PCB are not responsible for any damage done to the PCB or other equipment if you don't follow the suggested build instructions.

- For modular synth uses, the MAX1044 can be left out if you already have a bipolar supply. Pin 5 of the MAX1044 is where -9v originates, so that's where you should inject your negative supply.
- For stompbox use, you will need to add to add bypass switching. There are many variants of this, but a popular one is shown here:
<http://i38.photobucket.com/albums/e101/putzdaddy/offboardwiringfordiy.jpg>. The LED with pads on board is the flashing one. It does not turn off when the effect is bypassed, so you will need to include the bypass LED linked in the above bypass switching if you need bypass indication.
- The positive pad of the optional 10uf de-tick cap is a likely spot from which to take the LFO, if adding an LFO out. Another spot to try would be the center pad of the depth pot. These spots would also be good starting points for adding voltage control inputs.



