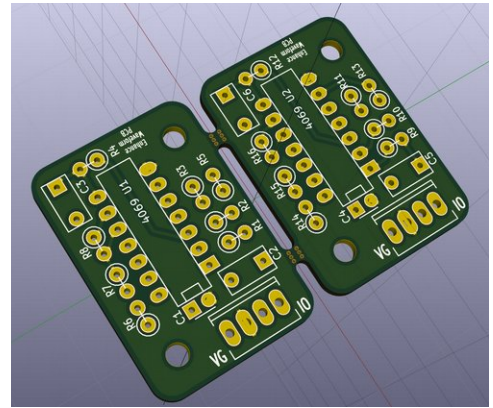


Jasper Synth Enhanced Waveform Mod PCB

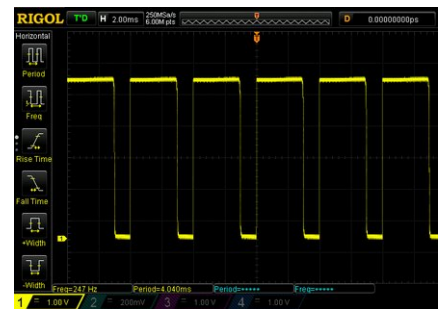
This PCB converts the sawtooth waveform in the Jasper synthesizer (Wasp clone) into a pulse-width modulated square wave. It's a dual PCB to allow both oscillators on the synth to be converted. It uses all parts of a CD4069 to create a low frequency triangle wave oscillator that modulates the pulse-width of a square wave created from the sawtooth wave input. The boards are designed to be separated so they can be stacked or mounted end-on.



The two oscilloscope traces below show the modulated pulse wave output – it transitions from one to the other over a period of about 3 seconds.

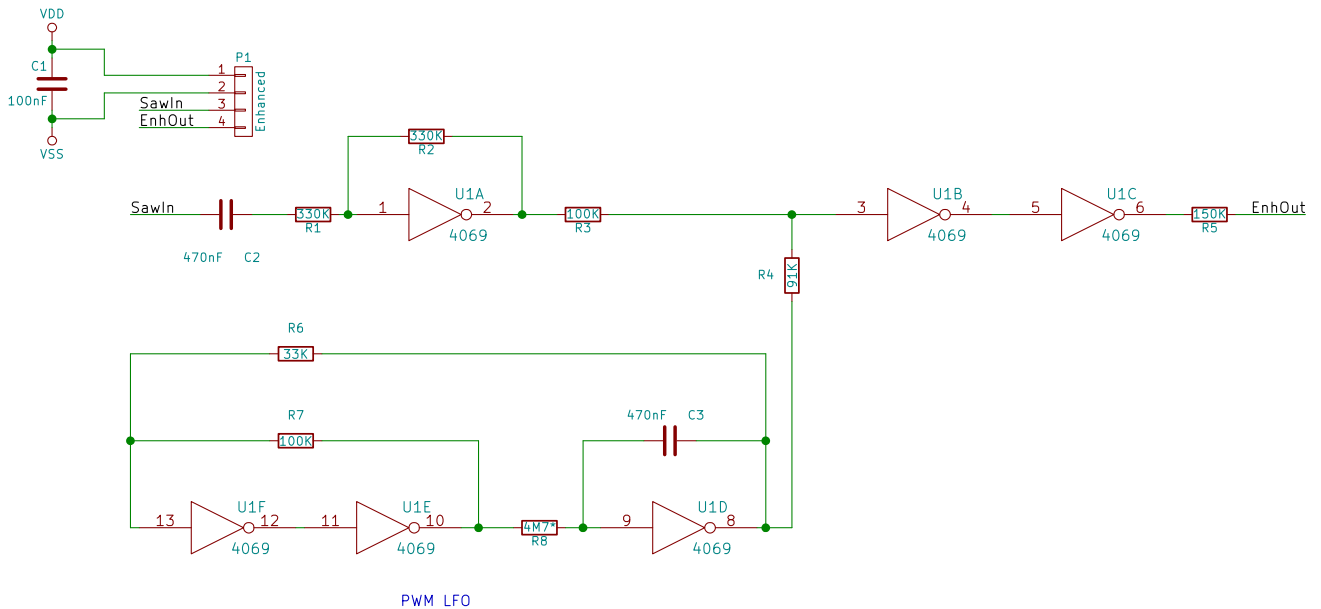
Connector:

1. +5V in (V)
2. GND (G)
3. Signal In (I)
4. Signal Out (O)



Circuit

The circuit is based on the Enhanced waveform section of the EDP Gnat Synthesizer – the circuits on the enhanced mode PCB are identical:



Bill of Materials

R1, R2, R9, R10	330K
R3, R7, R11, R15	100K
R4, R12	91K
R5, R13	150K
R6, R14	33K
R8, R16	4M7 for LFO timing. Use a 5% carbon resistor here, so there is some minor variation in modulation between the two modules.
C1, C4	100nf Ceramic for power decoupling 2.5mm lead pitch
C2, C3, C5, C6	470nF Polyester Film for AC coupling input signal & LFO timing
U1, U2	CD4069UBE (+14 way IC socket)
P1, P2	4way MTA-100 or Molex KK crimp plug to match header on Jasper

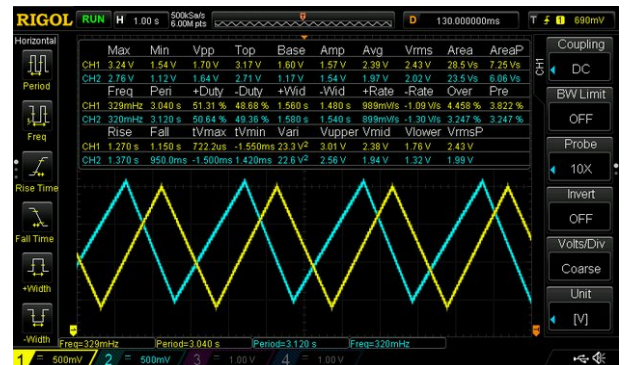
Construction

To keep the PCB as compact as possible while using the same through-hole components as the Jasper synth, the resistors are all mounted end up. Note the orientations of the resistors R1, R2, R3 and R5. Place the body of each resistor where there is a circle on the silkscreen.

For the connecting cable, use 4 hookup wires, or use 4 wired from a ribbon cable. Make sure the wires are long enough to reach the headers on the main PCB. The wires can be directly soldered onto the enhanced mode PCB or you could use a header and socket.

If you have an oscilloscope to hand, test the LFO. Apply 5V power and GND to the V and G pins of the PCB. Put the probe on pin 8 of the IC and you should see a slow moving triangle waveform. It varies between 2V and 4V, at about 0.3Hz. The image left shows both the LFOs of the two circuits simultaneously – they differ slightly because of tolerances in the components.

The PCBs can be split easily with side cutters or kept as one. The fixing holes will take standard M3 screws.



Completed PCB

