

Build documentation for:

"MODULATION DRUID"

LFO based on the Electric Druid TAPLFO2 PIC16F684

Layouts and documentation by

FREQUENCY CENTRAL

I recommend that you read the TAPLFO2 datasheet before you start to build, as all my work is based on that, (together with "*External 1V/Oct CV inputs*" on the VCLFO9D datasheet page 6).

TAPLFO2 datasheet: <http://www.electricdruid.net/index.php?page=projects.taplfo>

VCLFO9D datasheet: <http://www.electricdruid.net/datasheets/VCLFO9DDatasheet.pdf>

Electric Druid website: <http://www.electricdruid.net/index.php>

Frequency Central website: <http://www.frequencycentral.co.uk/>

Features not implemented on this PCB:

- Level CV. The Level is set to maximum by R5. If you wish to implement CV of Level, remove R5 and build a little daughterboard (on perf maybe?) using the circuit shown in "*External 1V/Oct CV inputs*" on the VCLFO9D datasheet page 6.
- Next Multiplier CV. This is feature is disabled by R6. Probably more useful in an effects pedal implementation that a synth module. Refer to the TAPLFO2 datasheet if you do wish to implement it in your build.

BLUE TRACE

- Jumpered to 5v (orange) trace in the Simple Version
- Jumpered to 12v (red) trace in the Complex Version

DO NOT INSTALL BOTH 5v and 12v JUMPERS! It's either/or.

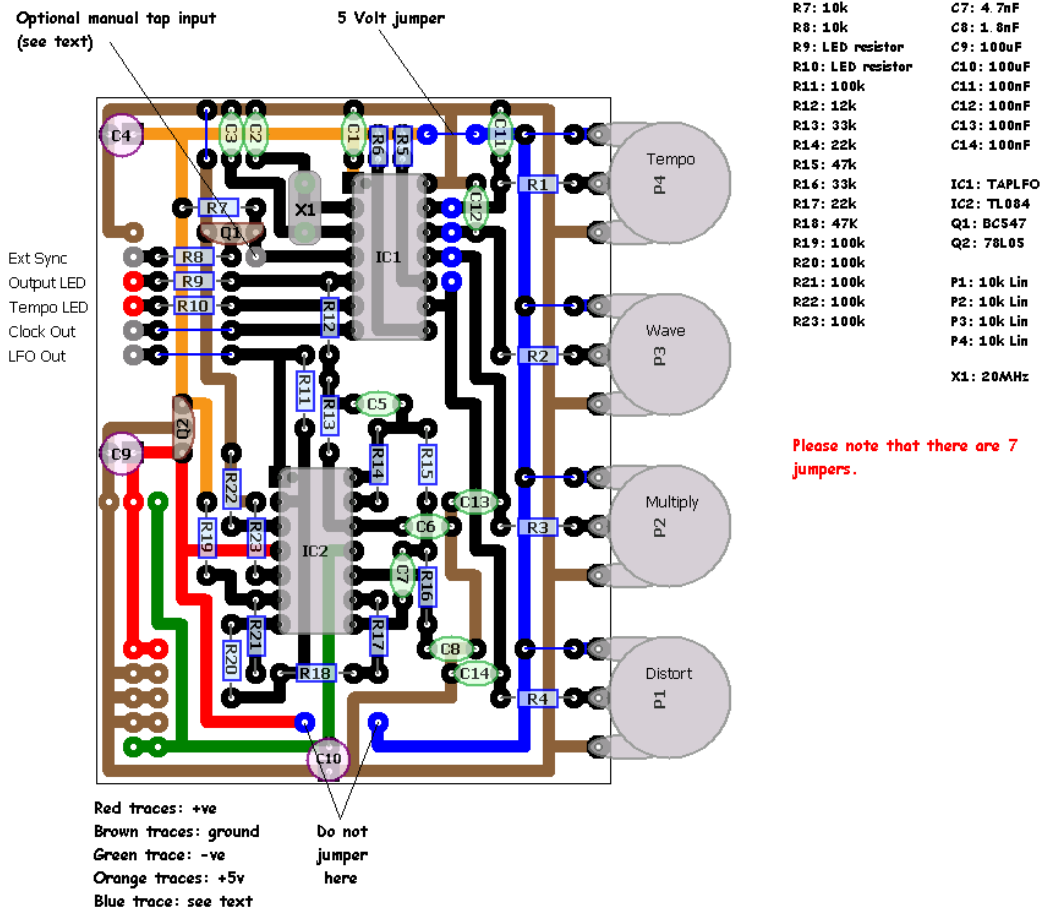
Manual Tap Switch

See the TAPLFO2 datasheet page 5. The tap button shorts the collector of Q1 (BC547) to ground. Just hook up a momentary switch between the 'optional manual tap input' and ground.

Modulation Druid - the Simple version



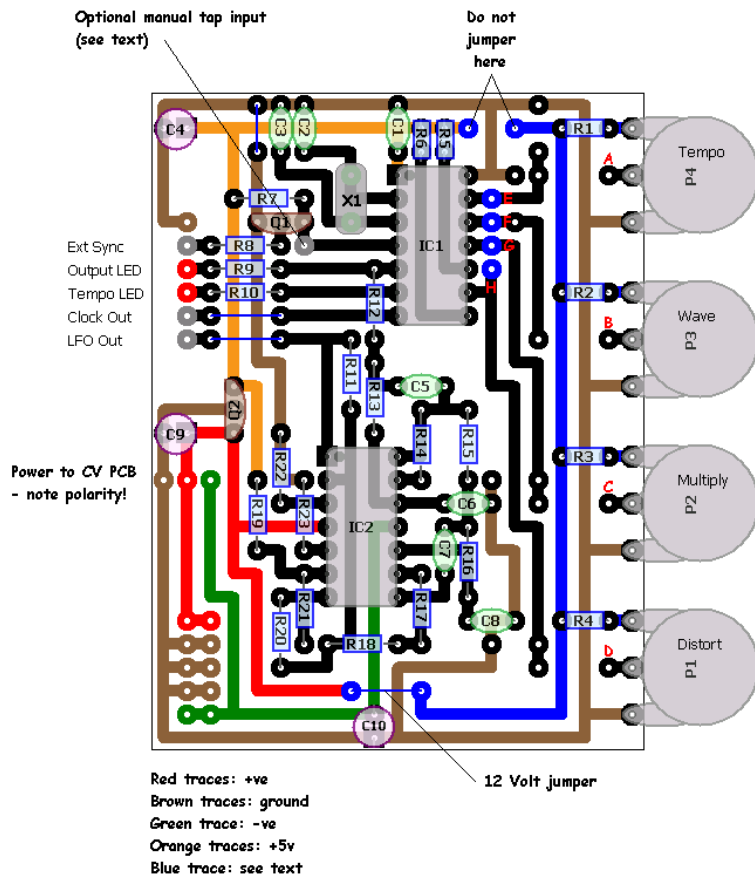
Electric Druid VCLFO Layout by frequencycentral Simple version - the 4 knobber



Modulation Druid - the Complex version



Electric Druid VCLFO Layout by frequencycentral Complex version - the 8 knobber This version also uses the additional CV PCB



- | | |
|-------------------|-------------|
| R1: 4.7K | C1: 100nF |
| R2: 4.7K | C2: 22pF |
| R3: 4.7K | C3: 22pF |
| R4: 4.7K | C4: 47nF |
| R5: 10k | C5: 10nF |
| R6: 10k | C6: 10nF |
| R7: 10k | C7: 4.7nF |
| R8: 10k | C8: 1.8nF |
| R9: LED resistor | C9: 100uF |
| R10: LED resistor | C10: 100uF |
| R11: 100k | |
| R12: 12k | |
| R13: 33k | IC1: TAPLFO |
| R14: 22k | IC2: TL084 |
| R15: 47k | Q1: BCS47 |
| R16: 33k | Q2: 78L05 |
| R17: 22k | |
| R18: 47k | P1: 10k Lin |
| R19: 100k | P2: 10k Lin |
| R20: 100k | P3: 10k Lin |
| R21: 100k | P4: 10k Lin |
| R22: 100k | |
| R23: 100k | X1: 20MHz |

C11: 100nF Not used, pads can be used to add 5v zeners to ground for additional over voltage protection.
C12: 100nF
C13: 100nF
C14: 100nF

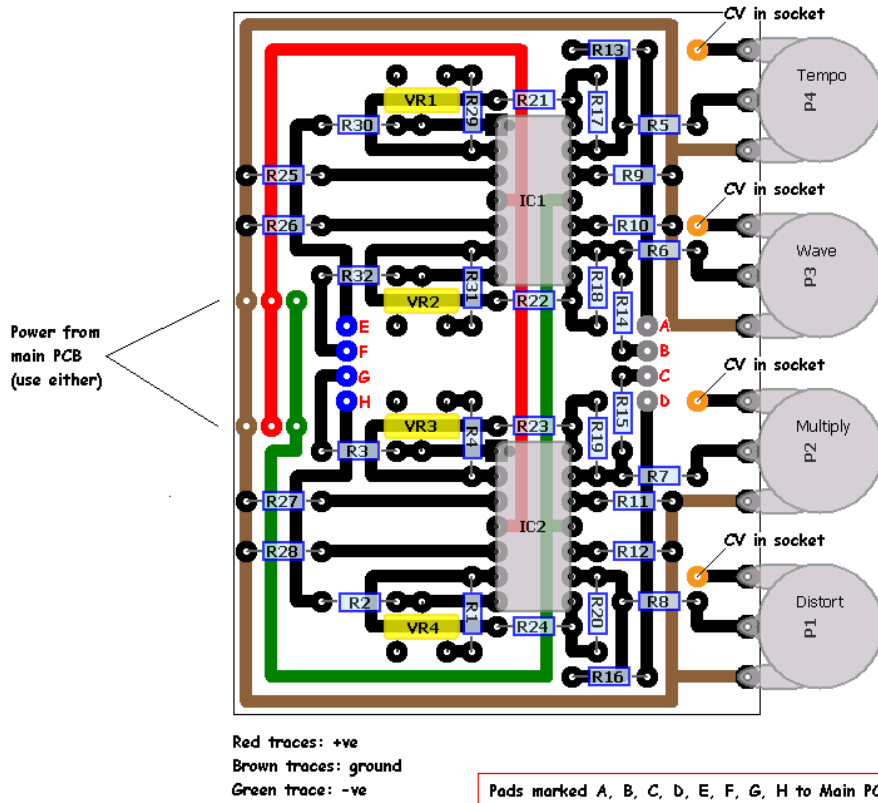
Pads marked A, B, C, D, E, F, G, H to CV PCB

Please note that there are 4 jumpers.

Electric Druid VCLFO

Layout by frequencycentral

CV PCB for complex 8 knob version.



- R1: 43k
- R2: 10k
- R3: 10k
- R4: 43k
- R5: 100k
- R6: 100k
- R7: 100k
- R8: 100k
- R9: 100k
- R10: 100k
- R11: 100k
- R12: 100k
- R13: 100k
- R14: 100k
- R15: 100k
- R16: 100k
- R17: 100k
- R18: 100k
- R19: 100k
- R20: 100k
- R21: 100k
- R22: 100k
- R23: 100k
- R24: 100k
- R25: 100k
- R26: 100k
- R27: 100k
- R28: 100k
- R29: 43k
- R30: 10k
- R31: 43k
- R32: 10k

- VR1: 50k trimmer
- VR2: 50k trimmer
- VR3: 50k trimmer
- VR4: 50k trimmer

IC1: TL084
IC2: TL084

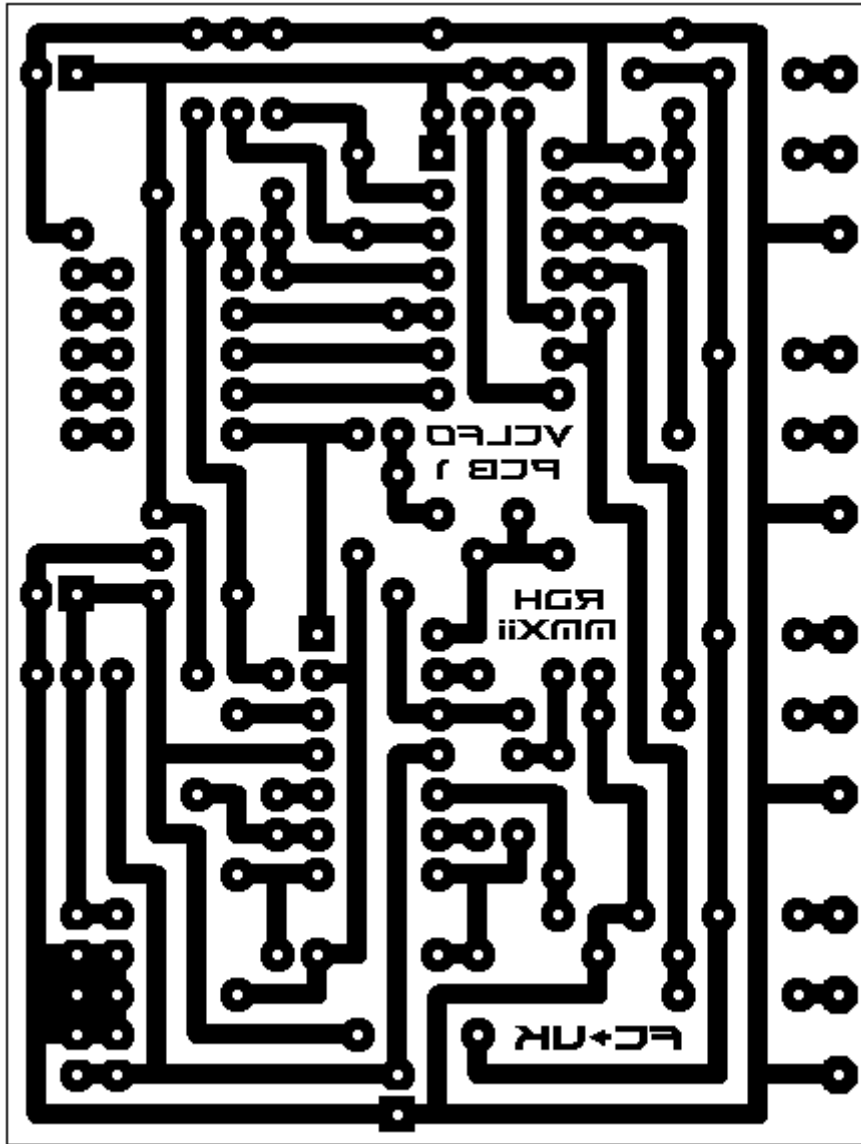
Red traces: +ve
Brown traces: ground
Green trace: -ve

Pads marked A, B, C, D, E, F, G, H to Main PCB

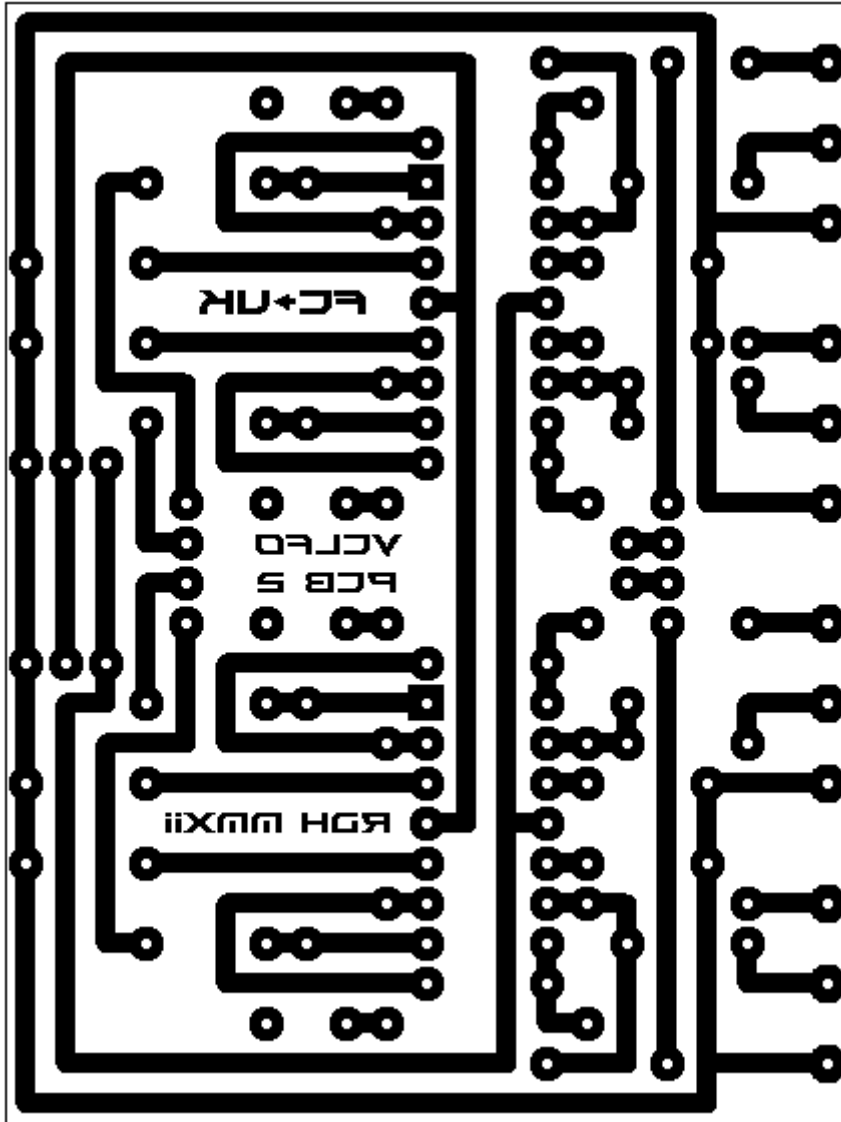
How to calibrate the trimmers

- Set Tempo, Wave, Multiply and Distort pots on the **MAIN PCB** to maximum (fully clockwise).
- With the trimmers in their mid position you'll probably read about 5.5 volts on pads E, F, G and H.
- Adjust trimmers until pads E, F, G and H read exactly 5 volts.

The internal overvoltage protection of the PIC seems robust to me. However, if you are the over cautious type, you may add 5v zener diodes to ground on the **MAIN PCB** using the unused C11, C12, C13 and C14 pads.



Resize to 48% for printing



Resize to 48% for printing