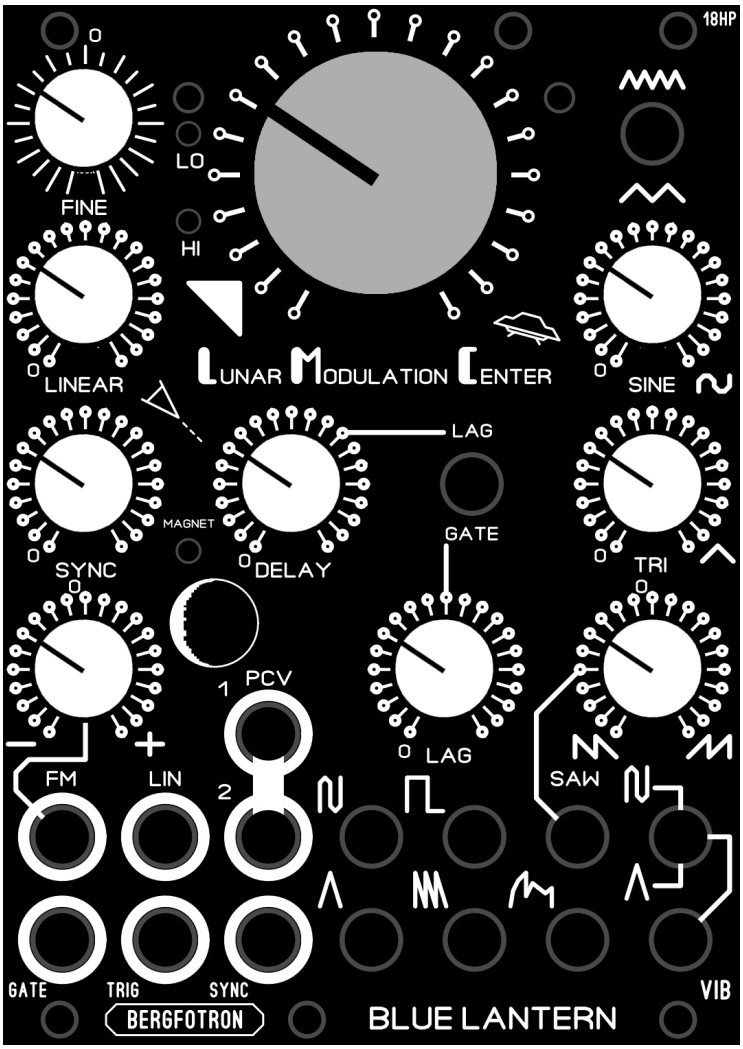
LMC VCO Quick Start & Reference Guide v7 Black Panel

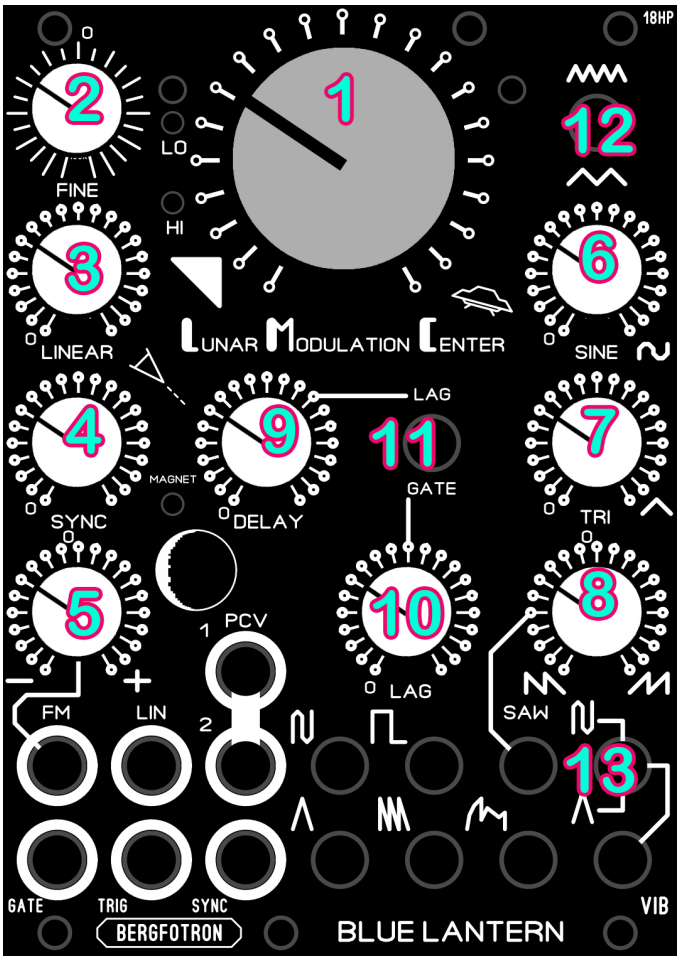
In this quick start manual I will explain all the fun features of this triangle core vco. This is an analog vco conceived by Bergfotron and adapted by me for use in the Euro Format. His website gives clue to the original concept he implemented for use for his personal format :
http://hem.bredband.net/bersyn/VCO/vco_advanced.htm

On my adaptation, I used a more modern exponential converter using an smt matched transistor pair and hi precision 5v Reference Regulator IC's for the main control parameters.

To keep costs down and make this unit affordable I did not implement all the features found on the original Complex VCO. First notable difference this and the original complex vco is that the Lunar Modulation Center is a single VCO.

Here is a picture of the panel to make sure you got the correct start guide. On this version the panel was updated and knob control was moved around a bit.





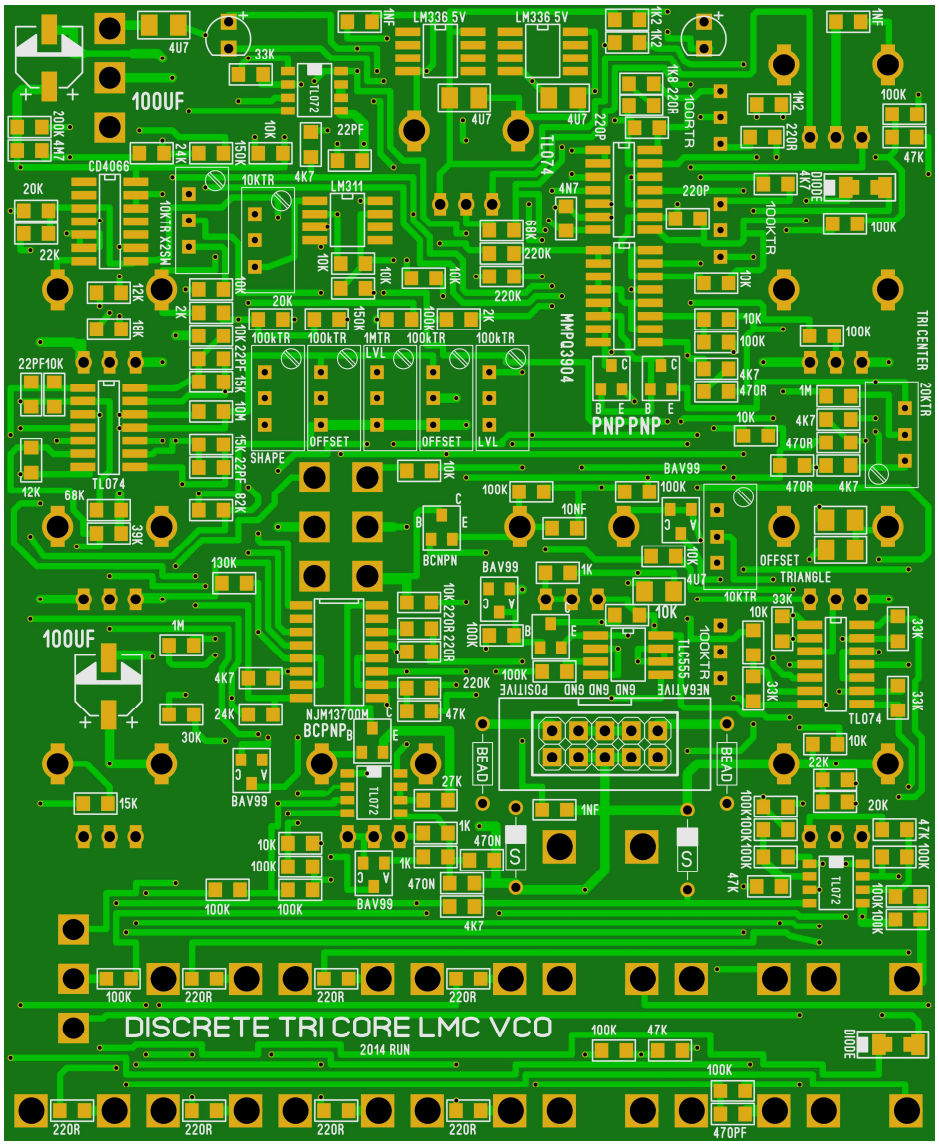
1. Rate Knob: this is used to tune the VCO or determine the rate of the LFO when in LFO mode.
2. Fine Knob: this helps you fine tune or adjust the rate of the LFO when in LFO mode.
3. Linear CV Knob: This is an attenuator for the Linear CV input, used with #18 jack ‘LIN FM’.
4. Sync Knob: this determines the lock strength of the sync circuit. Hard sync would be at full clockwise. The small trimmer adjustment labeled ‘magnet’ will adjust how strong the sync is at maximum setting. There is really no need to adjust this trimmer.
5. FM Knob: the famous ‘bi-polar FM’ I love to use in most of my products. This is used with jack ‘FM IN’. This ‘FM’ knob will inverter or non-invert a control voltage to the VCO frequency. Patch another vco here for some cool sounds.
6. Sine Wave Level Knob: this is a level knob to control the output of the sine wave jack.
7. Triangle Wave Level Knob: this is a level knob to control the output of the triangle wave jack.
8. Saw/Ramp wave Knob: this is a level knob to control if you want saw or ramp for output. It acts as an attenu-inverter.
9. Delay Knob: this is used with ‘Trig’ jack, #11 toggle switch, #13 toggle switch, and ‘VIB’ jack output. The delay knob determines a timed delay when a trigger signal is patches into ‘TRIG’

jack. The toggle switch must be on 'Lag' Mode to hear the effect. You use 'VIB' jack to hear the output. Toggle switch #13 selects a sine wave or triangle wave as the output for jack 'VIB'.

10. Knob #10 'Lag' knob is used to add some smoothness to the fade in of the delay. This side of the circuit uses triggers or 'pings' so that you don't have to hold the gate.
11. Lag & Gate Mode Toggle Switch: this switch is used for the vibrato circuit. When in 'LAG' Mode you must patch a trigger or gate into jack 'TRIG'. When in 'Gate' Mode you use jack 'GATE'. Both modes use the 'vib' jack, to hear the effect. The 'Lag' knob is used for both modes. The Delay Knob only works with 'Lag' Mode.
12. VCO/LFO Toggle switch: this switch determines the overall mode of the module. Use VCO mode for tones, LFO mode to control other modules in a slower rate.
13. Triangle/Sine wave selector switch: this selects the wave for the vibrato jack output, 'VIB'.

*Trig input jack: use this jack to patch a gate or trigger signal to use the 'Lag' Mode side of #13 toggle switch.
*Gate input jack: use the jack to patch a gate signal to use the 'Gate' mode side of #13 toggle switch.
*Sync Input jack: patch another vco signal hear, then use the 'sync knob' #4 to adjust the strength.
*PCV jack input: use this to patch direct Pitch Control Voltages from a midi converter, sequencer, arpeggiator, etc.
*Linear FM input jack: use this for Linear Control Voltage experimenting. The 'Lin' Knob is used to set the level.
*FM input jack: patch a signal from another vco to get some cool frequency modulation. Use the 'FM Knob' #5 to adjust the level.

Trimmers on the back of the module. Starting from the top.



1. 10k & 100R trimmers: these are used to adjust the 1v/octave scaling of the expo converter. In other words ‘tuning’ or calibrating the vco. 100k determines the higher octaves, 100R adjusts the lower octaves. These are found on the front pane.
2. 20K Tri Core Trimmer: this trimmer centers the actual triangle wave generator.
3. 10k Saw Centering trimmer: this trimmer adjust the saw or ramp wave shape. You also use the 20k tri core trimmer to help adjust the saw/ramp wave shape.
4. 100k Sine Shaper trimmer adjusts the top/ bottom curveness of the sinewave.
5. 100k Bias Shaper trimmer adjusts the centering of the Sine wave.
6. 1M Sine Level trimmer adjusts the overall level output of the sine wave.
7. 100k Offset trimmer is to adjust the Vibrato Output offset.
8. 100k Amp trimmer determines the level of the vibrato output jack.

9. 100k Sync Adjust trimmer way located on the front panel determines how hard the sync will magnetize when the sync knob is fully clockwise.