CGS348 VCO

(BoCGS BOG version)

Construction Guide

Revision 3.1

PCB Revision V3.0
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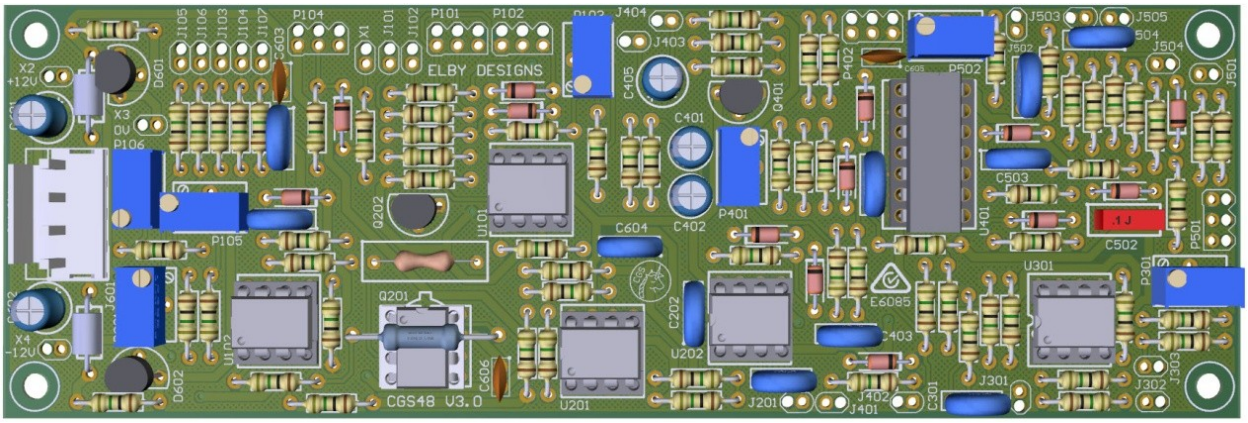
ELBY Designs - Laurie Biddulph
3 Therese Street, Bridport, TAS 7262, Australia
elby-designs@bigpond.com http://www.elby-designs.com

CGS348 VCO



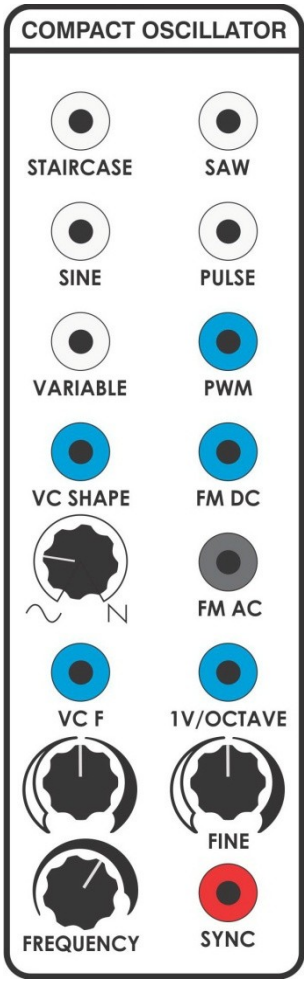
3D Model
Schematics

Constructors should refer to the printed Component Overlay along with the Bill of Materials for the current value of all components and General Construction Notes for general PCB assembly guidelines.

Construction of the CGS348 is pretty straight-forward.

The 1K TEMPCO resistor will be the last component to be fitted. Form the TEMPCO legs and install over the matched transistor Q101. Once all calibration has been completed and the module is ready to be 'locked in' you may wish to apply a small amount of heatsink compond between the TEMPCO and Q101.

Not all of the features of the CGS348 are available in the BoCGS BOG Compact Oscillator but we recommend doing a full install of all the components.



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ADDENDUM

There are 2 track errors which require wire links to be added:-

1. LM3900 power rail correction
   1.a) The track on the topside to U401_7 needs to be cut (all PCBs supplied after May 1st 2020 have this already cut)
   1.b) a wire link should be fitted between U401_7 and the right-hand leg of R412.

2. Serge Shaper input signal correction
   2.a) The track on the topside to P401_3 needs to be cut (all PCBs supplied after May 1st 2020 have this already cut)
   2.b) a wire link should be fitted between the bottom pin of P401_3 and the right-hand pad of R202

NOTE: ALL PCBs supplied after May 1st 2020 have ALREADY been cut, you should not need to perform step (a) in the above procedures

Calibration

There are several trim pots that need to be adjusted.

With no CV inputs connected, and the [FINE] and [FREQUENCY] controls set to their centre position, adjust trim-pot P105 (“ZERO”) until there is 0 volts on U102_1 (the easiest place to connect to this pin is on the left leg of R120).

The next trimmer to adjust is P106 ("SPAN").

1. Apply 0.00V to the [1V/OCTAVE] input
2. Monitor the frequency of the [SAW] output
3. Tweak [FINE] to a round number).
4. Apply 1.00 volts into the [1V/OCTAVE] input
5. Adjust [P106] until the output of the oscillator is exactly one octave higher (double the original frequency reading)
6. Apply 3.00V to the [1V/OCATVE] input
7. The frequency output should now be 8x the original frequency reading, fine tune P106 if needed.
8. Repeat this process until the desired accuracy is achieved

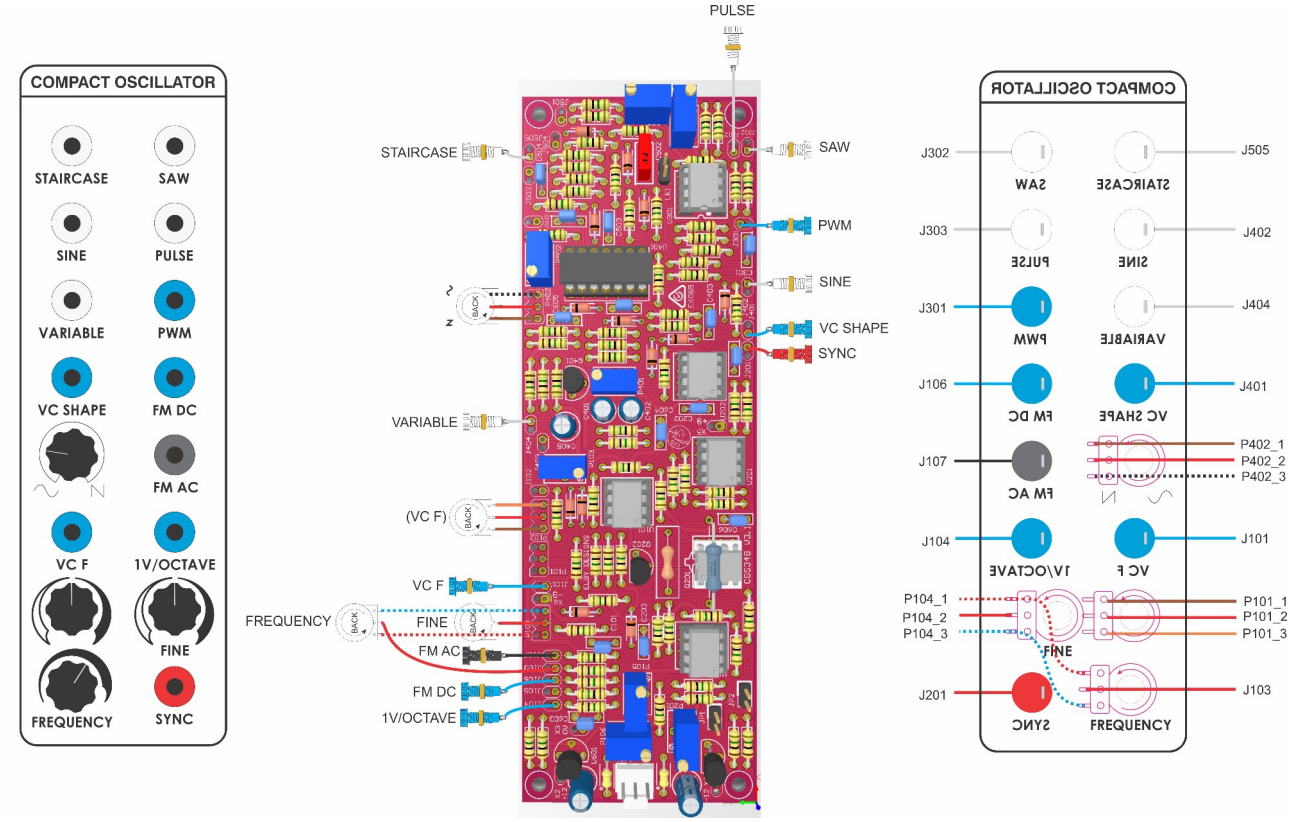
1. Set [FINE] to its mid-position and [FREQUENCY] fully counterclockwise
2. Adjust P105 (ZERO) for a frequency of approximately 8Hz

1. Once the oscillator is correctly tuned, connect 0.00V to the [VC F] input
2. Monitor the frequency of the [SAW] output and adjust [FREQUENCY] and [FINE] for a reading of 220Hz
3. Set the [VC F] pot fully clockwise
4. Apply 1.00V to the [VC F] input
5. Adjust P103 ("PRO SP") until the oscillator runs 1 octave higher (440Hz)
6. Turn the [VC F] pot fully anti-clockwise should result in an output frequency one octave lower(110Hz)
7. Tweak P103 if necessary to bring the reading closer.
8. Repeat steps (3) to (7) until the swing is as close as possible

P401 ("WS TRIM") should be adjusted so that output J403 (“TSO”) varies between a sawtooth and a sine wave as the [SHAPE] control (P402) is adjusted. A simpler alternative is to adjust this trimmer until the best sine wave possible is achieved at output J402 (“SINE”). Don't expect a perfect waveform - it will most likely have a substantial glitch in it at its best setting. Remember - this sine output is simply there to make use of a spare part of the LM3900 - it is not a key feature of the design.

The final adjustment is to P502 ("S TRIM"). Play with it until the sub-oscillator responds the best over the best possible sweep range. Remember this will not follow the oscillator over its entire range. Again, it is simply there to make use of a spare part of the LM3900 - it is not a key feature of the design.

Wiring for BoCGS BOG Compact Oscillator



[CGS348 Compact VCO wiring – click for larger image]

[Panel Bill of Materials]