ASM-VCO-Core

Construction Guide

Revision 1.1

PCB Revision V1.6

February 9, 2021

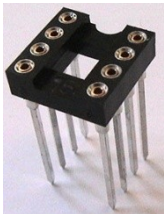
ELBY Designs - Laurie Biddulph
3 Therese Street, Bridport, TAS 7262, Australia
elby-designs@bigpond.com http://www.elby-designs.com

ASM-VCO CORE

This sub-assembly provides you with the basic ASM VCO Core. It has un-buffered inputs for Logarithmic FM, Linear FM, PWM and Sync. It has a single sawtooth output and also provides regulated +/-9V rails for powering supporting peripherals such as a FINE TUNE pot.

Assembly of the module is relatively straight-forward (Component Overlay) although J1, U201 and the TEMPCO will require specific attention (3D Model). Also do not fit R102 or R103 until instructed to during the calibration process.

Modification for U201



A significant improvement in the quality of the Sawtooth output can be achieved by performing the following modification.

1. Cut the leg at the shoulder, of pin 4 of the 8-pin wire-wrap socket for U201 - see image at left
2. Use a small piece of wire offcut and solder a bridge between pin 3 and the shortened pin 4 - see image at right
3. Install the socket on to the PCB ensuring that there is a small gap between pin 4 of the socket and the PCB

Power Supply

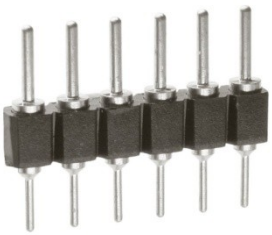
Add a wire link from R303 to the empty pad of R302.
Add an insulated wire link from the right-hand pad of R306 to the right-hand pad of D304.
You can see the positions of these 'links' in the overlay

Installing the TEMPCO

- Fit an 8-way DIP socket in to the position designated Q201 and insert the LS312.
- Form the legs of the 1K TEMPCO resistor so that it sits over, and makes contact with, the LS312. If desired, you can add a small amount of thermal compound to improve the bonding between the IC and the TEMPCO.

Installing J1

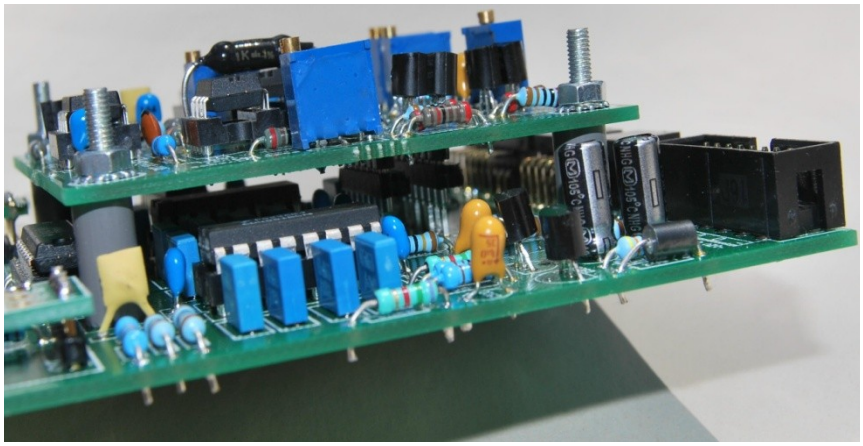
Two 7-pin SIL Headers are included in the kit and these need to be soldered in to the location J1 from the UNDERSIDE of the pcb. Fit the SILs in to the 14-pin wire-wrap socket noting that the shorter/thinner pin goes in to the socket. Insert the assembly in to the board from the underside and then solder in place from the top side of the board.



R113

Fit R113 by soldering its legs to J1_2 & J1_5 as shown in the 3D Model

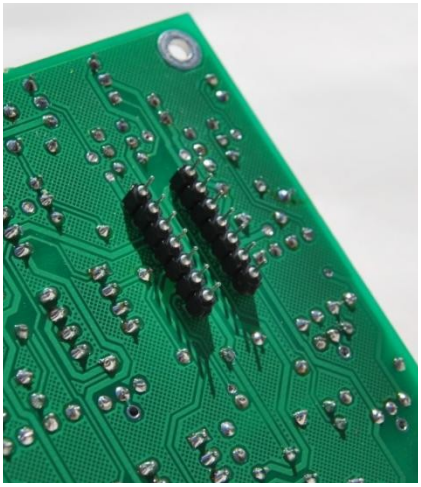
ASM-VCO Core Module

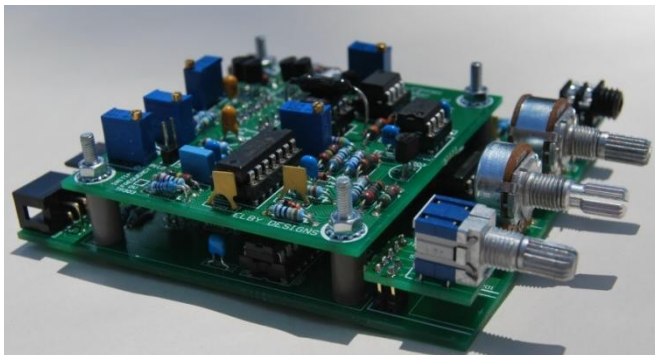


This picture at left shows the ASM-Core installed in a typical unit, in this case the CGS757 Bi-N-Tic Filter Module. The ASM-VCO Core Module is supported on 4 off M3x12mm Spacers which gives adequate clearance underneath for most components.

The connections to the ASM-VCO Core Module are made via a 14-pin connector designed to plug in to a 14-pin DIP IC Socket on the carrier board.

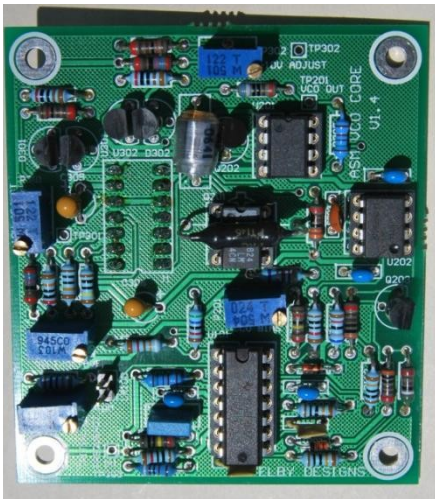
A wire-wrap socket is used on the carrier board so that the socket can be raised to a suitable height to mate with the connector on the underside of the ASM-VCO Core Module.





The picture to the left shows the connector socket J1. The pins are reasonably fragile so care should be made when handling this part and especially when installing or removing the module from its carrier.

The picture to the right shows the overall component placement and the method by which the TEMPCO resistor is mounted.



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

CALIBRATION

The first stage is to set the internal power supply anf reference drive current

1. Remove the jumper on JP100
2. If not already done, remove R102 and R103
3. Adjust P301 for -9.0V at TP1
4. Adjust P302 for +9.0V at TP2
5. Apply 0V to [1V/OCTAVE] (J102)
6. Monitor TP4
7. Adjust P201 for a frequency of 880Hz. This is not a critical adjustment, it simply allows multiple VCO's to be set to the same 'initial operating' conditions

The next stage is to calibrate the Volt/Octave response of the module

1. Fit jumper JP100
2. Apply a voltage of 0.0V to [1V/Octave] (J102)
3. Adjust P100 for a frequency of 110Hz at TP4
4. Apply a voltage of 3.0V to [1V/Octave] (J102)
5. Adjust P101 for a frequency equal to 880Hz
8. Repeat steps (2) to (5) until a 3-octave transpose is achieved

The last stage is to 'tune' the VCO so that it can be used with 1V/Octave controllers such as a MIDI-CV.

1. Fit R102 and r103
2. Set [FINE] to its mid-position '0'
3. Set [COARSE] to minimum
4. Apply a voltage of 5.0V to [1V/OCTAVE] (J102)
5. Adjust P100 for a frequency of ~256Hz

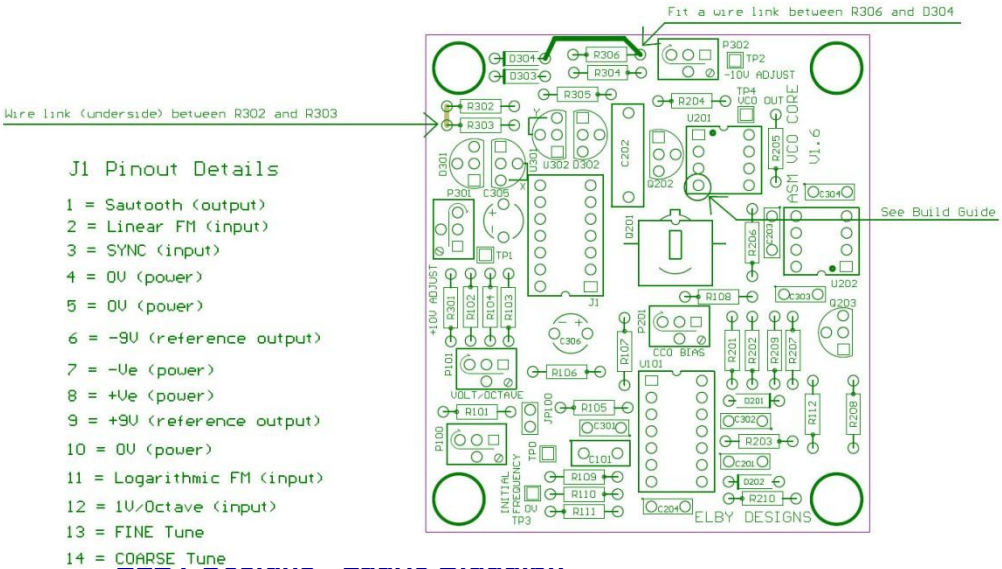
An alternate procedure is to connect the CV output of, say, your MIDI Controller and play Middle C (C4, MIDI Note = 60). Set the [COARSE] and [FINE] pots to your preferred default position and then adjust P100 for an output of 261.63Hz

Technical Information

The ASM-VCO Core can be powered from a +/-12V or +/-15V supply. This supply should be well regulated although the module does include onboard regulators for the more critical power rails.

The +/-9V pins on the J1 connector are intended to be used to provide reference voltages for the panel components such as the FINE TUNE pot and should not be used as power rails for other circuits.

This drawing includes dimensional and pin-out details for the module.



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