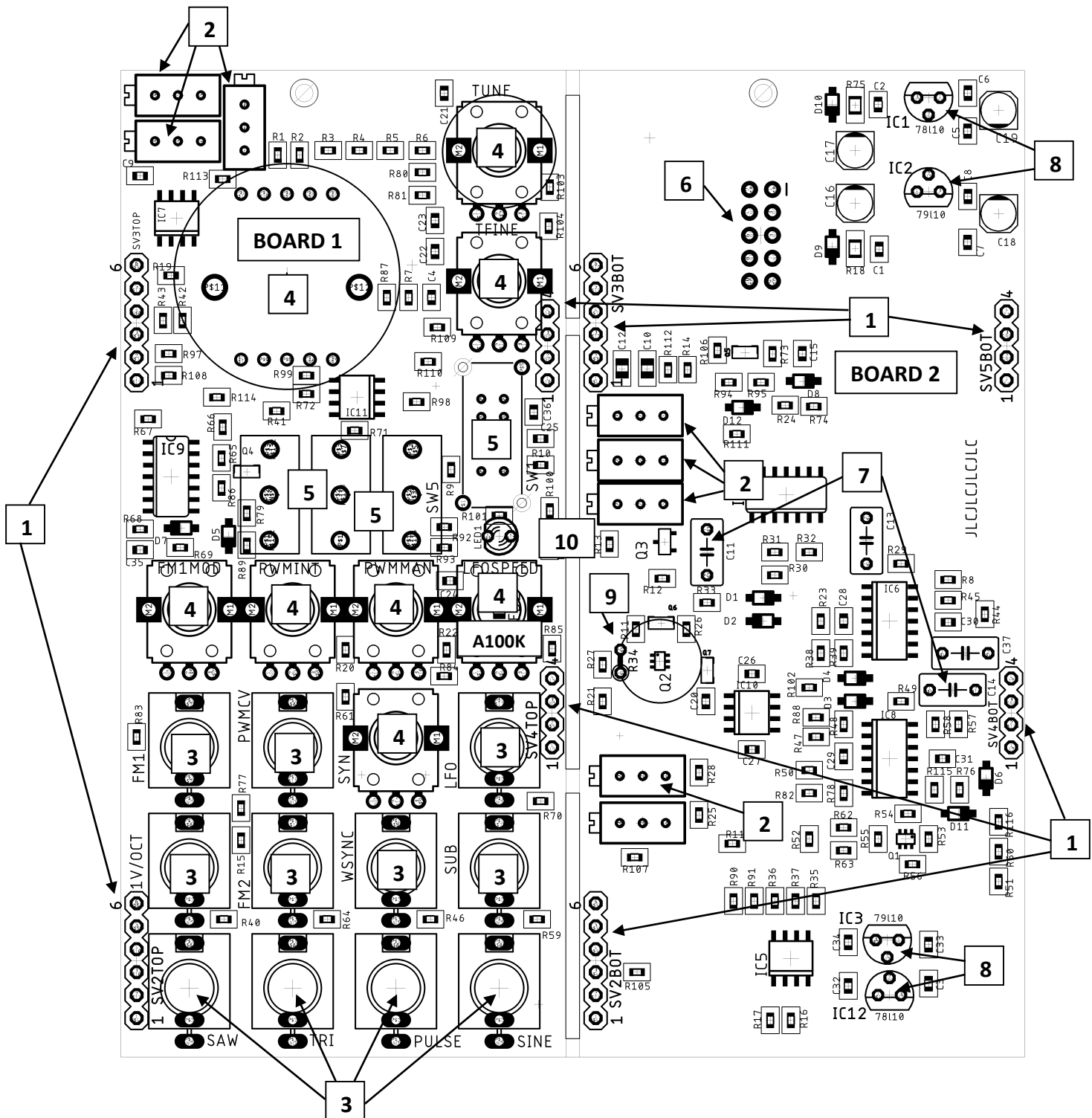


The oscillator module consists of two boards, hereinafter referred to as Board 1 and Board 2. Carefully separate the boards.



1. Install and solder male PIN connectors on the upper board. Install female PIN connectors on the male ones and position the lower board on the female PIN connectors for soldering.
2. Solder the trimmer resistors.

Qty	Value	Code	Name on PCB
2	10K	103	INITTUNE, OCT5V
2	100K	104	HF_UPDOWN, SAWTRIM
2	1K	102	HF_UP, OCT1V
1	200R	201	VOCTTUNE

- Solder the JACK 3.5 connectors.

Qty	Value	Name on PCB
11	Jack 3,5	

- Solder the octave switches and potentiometers.

Attention!: The LFO potentiometer has a logarithmic characteristic and is marked A100K.

Qty	Value	Code	Name on PCB
5	B100K	B104	
1	A100K	A104	LFOSPEED
1	B100K	B104	TUNE

- Install and solder the switches. SS12d switches require attention when positioning; before soldering, make sure they are not too low.

Qty	Value	Name on PCB
3	SS12D	SW3, SW4, SW5
1	SS-23D03	SW1

- Install and solder the power connector.

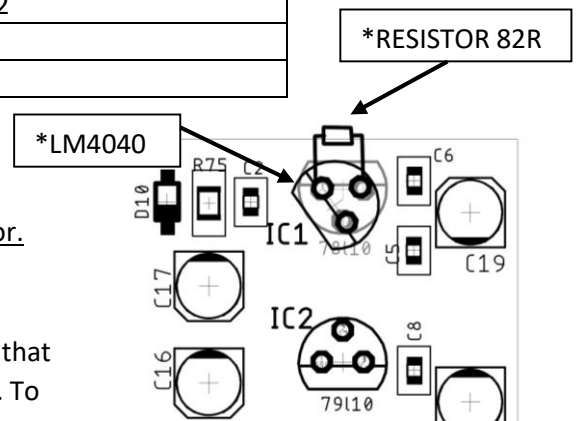
- Solder capacitors C11 and C14. Capacitor C14 is soldered horizontally; its pins are perpendicular to the board.

Qty	Value	Code	Name on PCB
1	2200NF	222	C11
1	1UF	105	C14

- Solder the linear voltage regulator ICs IC1, IC2, IC3, IC12.

Qty	Value	Code	Name on PCB
2	78I10	BOAZ S.R3	IC1, IC12
2	79I10	DOAZ S.P5	IC2, IC3
*	LM4040	LM4040	IC1

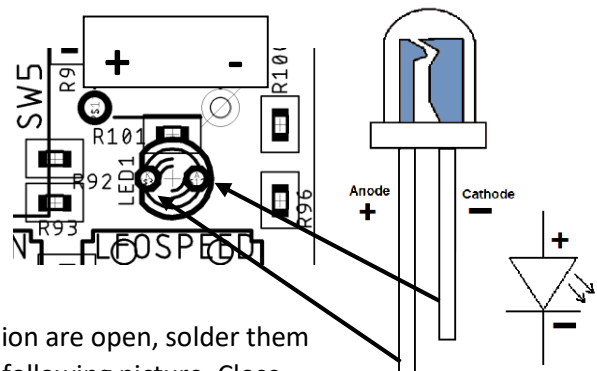
*For more accurate and stable power supply to the oscillator core and octave switch, IC1 78I10 has been replaced with LM4040. Note that it has a different pinout and requires soldering an additional SMD resistor.



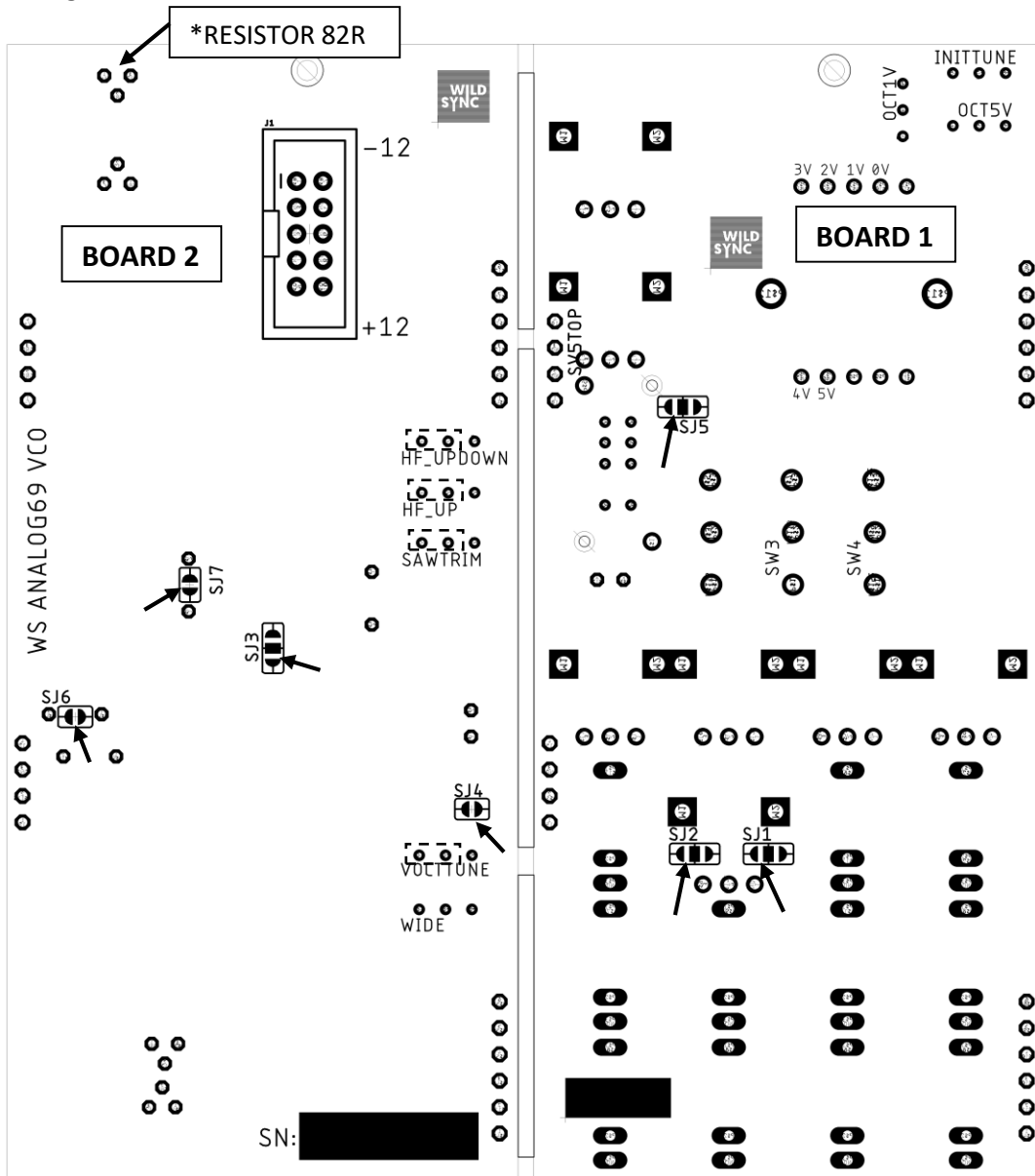
- Install and solder thermistor R34. Position it so that the thermistor is above transistor assembly Q2. To reduce external influence on the thermistor, you can pot it with thermal adhesive.

- Solder the LED.

Attention! The diode has polarity! An error was made in the silkscreen, and you should solder it as shown in this picture.



- If all jumpers SJ1...SJ7 in your DIY kit version are open, solder them on Board 1 and Board 2 according to the following picture. Close the jumper at the point indicated by the arrow.



The module is assembled!

For ease of further tuning, set the following resistance values on the trimmer resistors SAWTRIM, HF_UPDOWN, HF-UP, VOCTTUNE.

Name on PCB	pins		value
HF_UPDOWN	X	X	55K
HF-UP	X	X	207R
SAWTRIM	X	X	65K
VOCTTUNE	X	X	119R

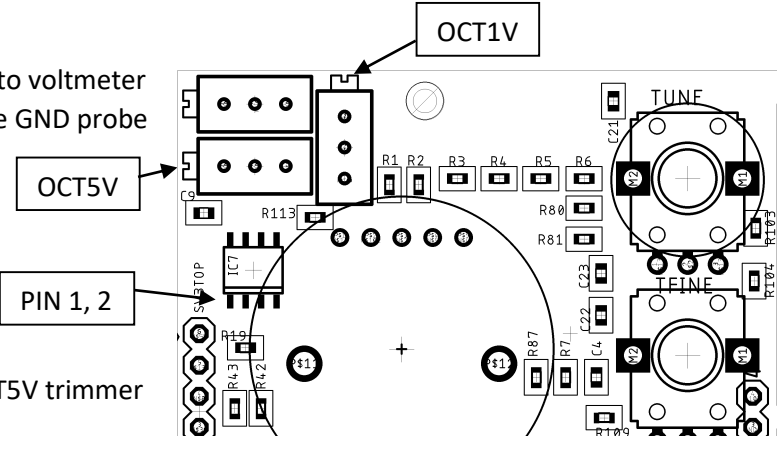
The correctly assembled Analog69 oscillator module will start immediately, but for correct operation, it requires special adjustments and calibration. For this, you will need a multimeter or voltmeter, a tuner or oscilloscope or frequency counter.

Module Calibration:

Before adjusting the VCO, it is recommended to leave the module powered on for 20-40 minutes for warm-up!!!

Octave Switch "RANGE" Calibration (Updated Version)

Calibrating the octave switch involves adjusting the voltages until 1,000V is obtained in the 2' position and 5,000V in the 32' position. Following this, the voltages in the 16', 8', and 4' positions should be set to 2,000V, 3,000V, and 4,000V respectively, with an accuracy of $\pm 0.001V$.

- 
- 1) You will need a multimeter set to voltmeter mode for calibration. Attach the GND probe to any convenient grounding point, and the red probe of the multimeter should touch pins 1 and 2 of IC7 chip.
 - 2) Set the RANGE switch to the 2' position, adjust the voltage to 5.000V using the OCT5V trimmer resistor.
 - 3) Set the RANGE switch to the 32' position, adjust the voltage to 1.000V using the OCT1V trimmer resistor.
 - 4) Repeat steps 2 and 3 until 1,000V is obtained in the 2' position and 5,000V in the 32' position.

After this, the voltages in the positions 32', 16', 8', 4', and 2' should be set to 1,000V, 2,000V, 3,000V, 4,000V, and 5,000V respectively, with an accuracy of $\pm 0.001V$.

WAVESHAPe CONVERTER SETTING:

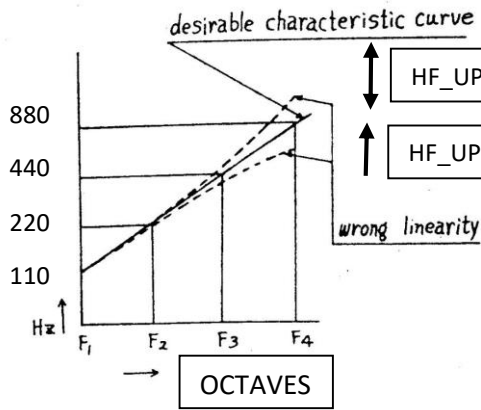
Set the TUNE and FTUNE pot to mid-range position, set the FM1AT, PWM potentiometers to min (counter clockwise position), the PW potentiometer at 0 (mid-range position), and set the RANGE SWITCH to 8" position.

Connect the SAWTOOTH output to the oscilloscope (2V per square). Power-up the circuit. You should observe a sawtooth signal. Adjust the SAWTRIM trimmer in order to balance the sawtooth around the 0V level. The sawtooth should ramp down from +5V to -5V.

V/OCT TRACKING:

1. Connect the CV PITCH source to the 1V/octave input. Set the CV to 0V. Connect the tuner / freq.counter to the SINE output. Adjust the TUNE, TFINE potentiometer such that the tuner displays A1 (55 Hz)
2. Set the CV to 1V, check the pitch/freq, ideally we want it to be A2 or 110Hz. If the pitch is what we expected go to point 4. Otherwise, if the pitch is lower than expected : adjust the VOCTTUNE trimmer in order to lower the pitch/frequency (NOTE this may not seem logical to lower the pitch when it's already too low but that's the way it works !). Conversely if the pitch was higher than expected, adjust the VOCTTRIM trimmer in order to increase the pitch/frequency.

3. Set the CV to 0V, the pitch is either lower or higher than A1/55Hz . Adjust the TUNE,TFINE potentiometer such that the tuner displays A1/55 Hz. Repeat points 2 and 3 until there is a perfect one octave shift when switching the CV from 0V to 1V.
4. Repeat the same procedures but with the following CVs 0V and 2V in order to read A1/55Hz for 0V and A3/220Hz for 2V
5. Apply the same procedure as above for the next voltages/octaves up to A4(440Hz)/A5(880Hz)/A6(1760Hz).



HF_UPDOWN, HF_UP trimmers allow you to bend the 1V/OCT curve and achieve a more precise desired oscillator setting

TUNING:

Disconnect the CV PITCH source from the V/OCT input. Turn the TUNE, FTUNE potentiometer to mid-range position. Turn the RANGE SWITCH to 8" position. Adjust INITTUNE in order to read a frequency of C1 65.4 Hz