



Users Guide

Important Notice

Turn your case's power off when installing or removing this module and when plugging or unplugging its connector.

The connector is keyed and must be used in the allowed direction only, otherwise, it may damage the module and the rest of the system.

Use the module only in a safe and controlled indoor environment, far from heat sources, liquids, moisture, and everything that can fall outside the definition of "common sense".

Specifications

All the inputs and outputs are buffered.

Voltage range I/O	0-10 V
Tracking	1.2 V/oct
Audio I/O	10 V _{pp} maximum, depending on the frequency.

I — Overview

The Triple Oscillator consists of three independent oscillators. They are identical in controls but different in range and waveforms.

The three oscillators are labelled 1, 2, and 3, from top to bottom, and they are visually separated by horizontal lines on the panel layout.

The original VCS3 oscillators had a frequency range that extended well below the audible range. This allowed the musician to use them both as sound or modulation sources, especially thanks to the VCS3 matrix, which allowed a flexible and immediate signal routing.

In the 4U format, where sound and modulation are strictly separate, we provided the oscillator with both Tini-Jax and banana sockets.

WAVEFORMS

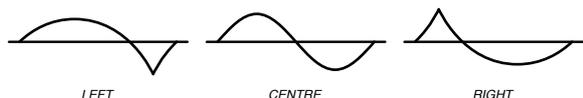
Each oscillator outputs two waveforms simultaneously. Each waveform's amplitude can be set through the respective Level knob, which affects both the audio and the CV output, in the same way.

Some of the waveforms can be altered by the Shape control. This is the major difference between oscillator 1 on one hand and oscillators 2 and 3 on the other. On every oscillator, the Shape parameter can also be controlled via CV through the CV input visually connected to the Shape knob.

Oscillator 1 outputs a sine wave from the top outputs and a sawtooth wave from the bottom ones.

The Shape control modifies the wave shape of the sine only, leaving the sawtooth always unaltered. The default Shape knob position is at 5, where the timbre is a pure sine wave. This is the "simplest" sound that the Triple Oscillator can generate because it contains only one harmonic: the fundamental.

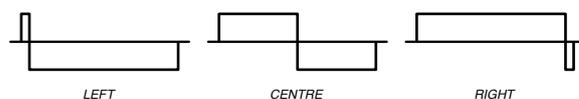
When rotated to the left, it makes the waveform almost logarithmic; when rotated to the right, it becomes almost exponential.



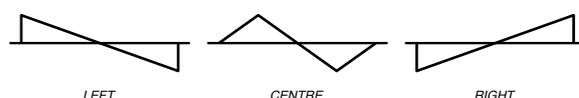
Oscillators 2 and 3 output a square wave and a triangle wave. As opposed to oscillator 1, the Shape knob affects both waveforms.

In the case of the square wave, it changes its pulse width: when the knob is at 5, the duty cycle is 50%, producing an actual square wave;

when rotated towards 1, the duty cycle percentage decreases, thus creating a pulse wave with a shorter positive side; when rotated towards 10, the duty cycle increases and produces a pulse wave with a longer positive side.



In the case of the triangle wave, the nominal waveform is available with the knob at 5. Rotating the knob to the left "spreads" the positive and negative peaks until the waveform becomes a negative-ramp sawtooth; rotating it to the right narrows the two peaks until the waveform becomes a positive-ramp sawtooth.



FREQUENCY MODULATION

It is possible to control each oscillator's frequency in three ways:

1. Through the main Frequency knob;
2. Through the Frequency CV input;
3. Through the FM input and knob.

The Frequency knob defines the base frequency of each oscillator: rotate it clockwise to increase the frequency and counterclockwise to decrease it.

Oscillator 3 has a switch labelled LFO/VCO that allows expanding the frequency well below the audio rate. This feature recalls the original VCS3 design, where the third oscillator was only in LFO mode as stock.

Set the switch to the top to use oscillator 3 as a low-frequency oscillator, and to the bottom to use it like the other two.

In both cases, every control of oscillator 3 will work as expected on frequency, shape, and sync.

The three frequency CV inputs accept unipolar voltages and track according to the 1.2 V/oct standard.

The F.M. Tini-Jax input and knob allow audio-rate frequency modulation. Patch any audio signal to the F.M. input and use the F.M. knob to define the modulation amount. When at 0, the frequency modulation amount will be absent; when at 10, it will be at its maximum.

SYNC

The Sync circuit is a popular "mod" of the classic EMS instruments and allows to

synchronize any oscillator to an external audio signal patched to the Tini-Jax input. The Sync knob allows to vary the synchronization strength, from a soft sync to a hard sync when set up to 10.

II — Inputs and Outputs

The inputs are described from left to right and from top to bottom. When not specified, the input or output has the same function for all three oscillator sections.

Frequency inputs (banana) These inputs accept 1.2 V/oct signals to melodically control the oscillators' pitch.

Sync inputs (Tini-Jax) Any signal patched to these inputs will act as a master oscillator for soft or hard sync.

F.M. inputs (Tini-Jax) Any signal patched to these inputs will work as an FM carrier.

Shape input (banana) CV input to control the oscillators' Shape control.

Sine output (banana and Tini-Jax) Only for oscillator 1. These outputs provide a shaped sine-wave both as an audio and modulation signal.

Saw output (banana and Tini-Jax) Only for oscillator 1. These outputs provide a sawtooth wave both as an audio and modulation signal.

Pulse output (banana and Tini-Jax) Only for oscillators 2 and 3. These outputs provide a pulse wave with adjustable pulse width.

Triangle output (banana and Tini-Jax) Only for oscillators 2 and 3. These outputs provide a shaped triangle wave both as an audio and modulation signal.

III — Controls

Frequency Adjusts the oscillator's frequency.

Sync Defines the synchronization strength.

F.M. Defines the audio-rate frequency modulation amount.

Shape Defines the shape of the waveforms with a waveshaping circuit (see above, section I).

Level Defines the amplitude of the corresponding banana and Tini-Jax output signal.

LFO/VCO Only for oscillator 3. Scales the oscillator's range into audio or modulation range.