Paradox

Dual VCO

User Manual

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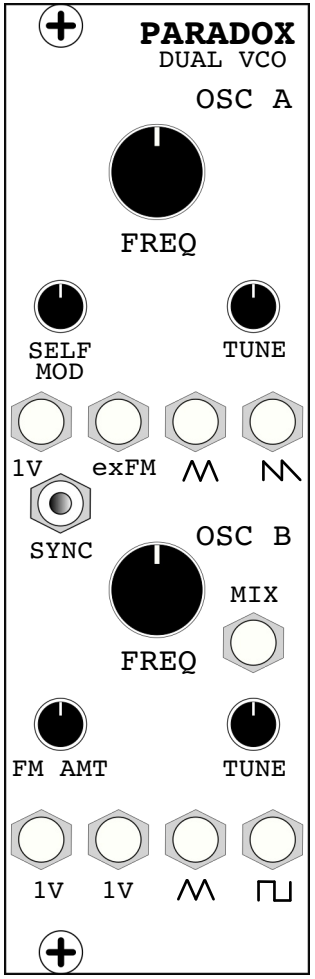


Installation

Make sure your system power is switched off. Carefully attach the floating 16-pin end of the ribbon cable from the module to your power bus. **The red stripe should match up with the -12V side of your power bus.** All Noise Reap modules are reverse voltage protected and will simply not turn on if they are accidentally installed with the opposite polarity. No harm will befall the module or your system.

Tech Specs

- Width 8hp (40.3mm)
- Depth 22mm from back of panel
- Input Impedances ~100K
- Output Impedances ~1K
- All inputs bipolar +/-10V range
- Waveform outputs ~10Vpp

Power

- Reverse Voltage Protected
- Current Draw 25mA @ +12V
- Current Draw 25mA @ -12V

Overview

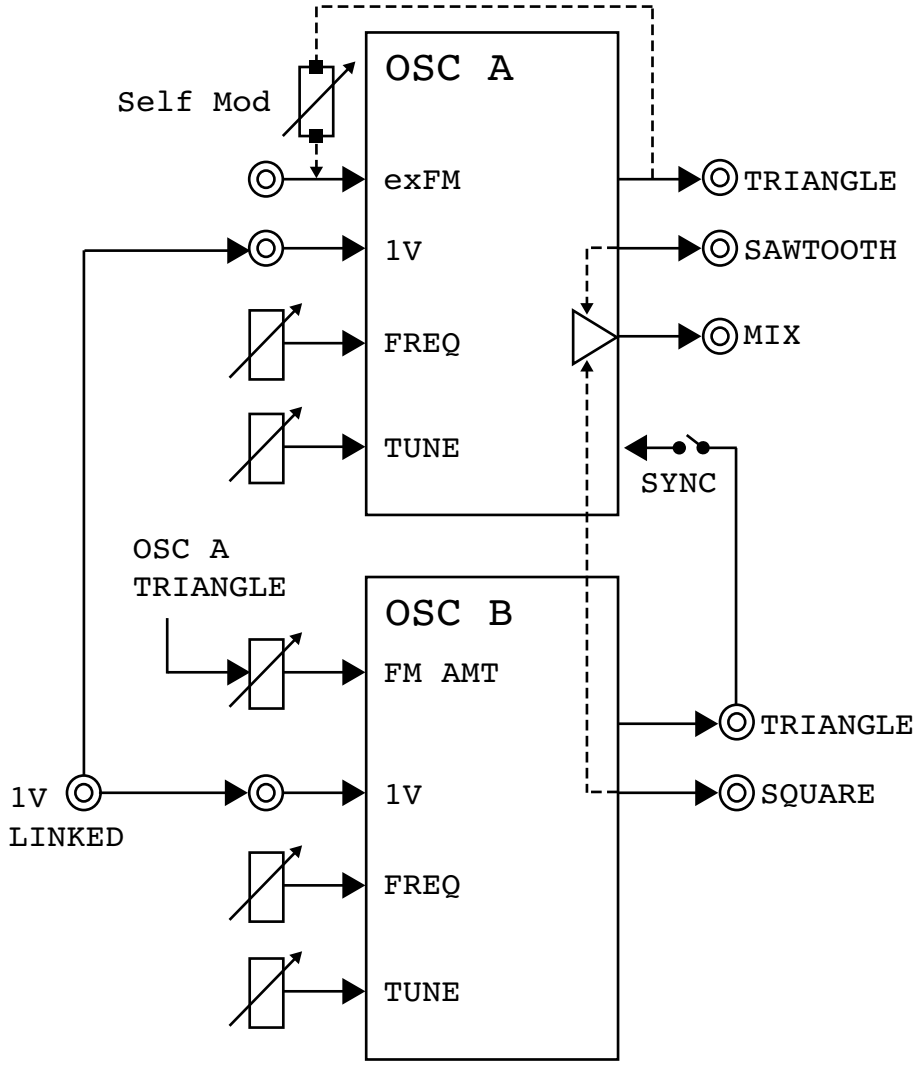
Paradox is a pair of triangle core VCOs. Each has a subsonic to supersonic frequency range.

They can be operated independently. Or, through a diverse set of cross modulation capabilities, work together as a single complex tone generator.

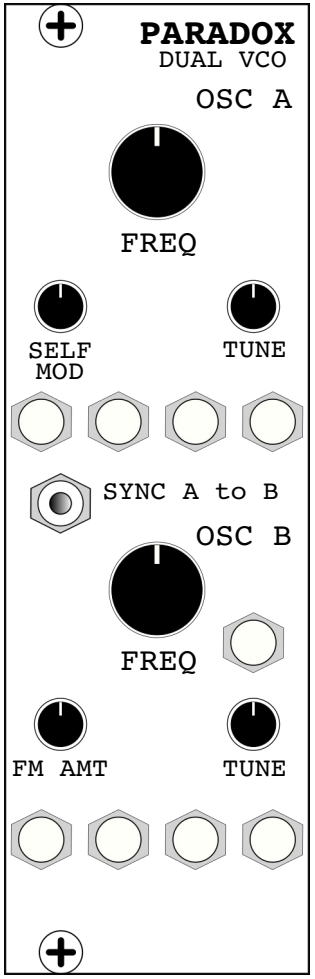
OSC A has simultaneous triangle and sawtooth outputs. These basic shapes can be warped into new harmonic content with the SELF MOD control.

OSC B has simultaneous triangle and square wave outputs.

There is also a MIX output with the saw of OSC A and the square of OSC B.



Controls



FREQ (x2)
Coarse frequency control. Has a musically useful range of roughly 10 to 10,000Hz.

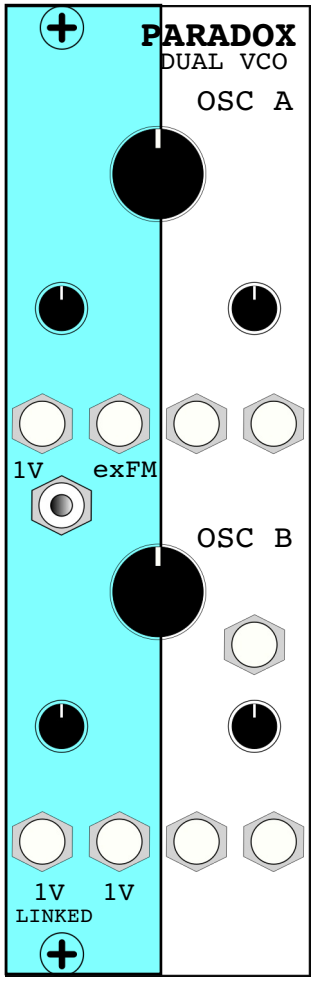
TUNE (x2)
Fine frequency control. Used for precision tuning/detuning. Has a range of about +/-1.5 semitones.

SELF MOD
Self modulation sends a portion of the triangle output back ***into its own core***. This changes the shape (and harmonic content) of OSC A's outputs.

FM AMT
Attenuator for the amount of linear **frequency modulation** routed from OSC A to OSC B. This will create new and complex tones out of OSC B.

SYNC A to B (on/on switch)
Soft syncs the tuning of OSC A to OSC B. Used to track the oscillators together if the notes are similar. Or abused for effect if the frequencies are a disharmonic ratio.

Inputs



1V (x2)
One volt per octave inputs. 1V/oct is the modern standard for matching analog oscillator frequency to a 12 tone scale.

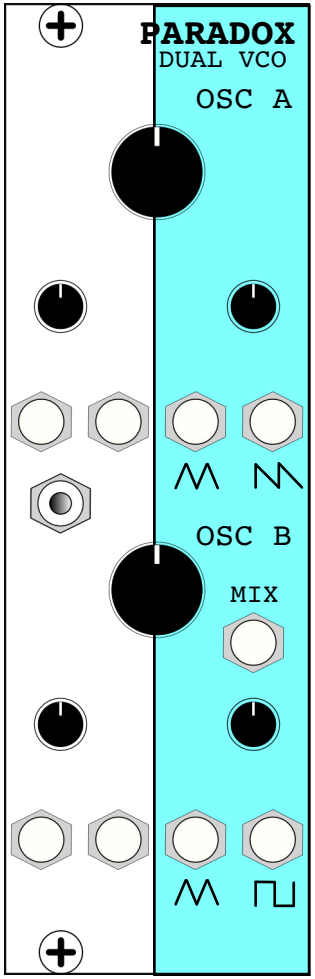
exFM
External linear frequency modulation input for OSC A. This is AC coupled and so will work best with audio rate modulation sources.

1V LINKED
A 1V/oct input that controls both oscillators simultaneously. Used alone or in conjunction with the individual 1V inputs.

Tracking Notes:
Paradox will track great for the first 5 or 6 octaves from around 20 - 2,000Hz. After that, depending on the musical context, you may find it tracks gradually flatter as the frequency increases. This is simply a limitation of the circuitry in the tradeoff required to fit two analog VCOs in 8hp.

Allow 20 minutes for tuning to stabalize 100%.

Outputs



TRIANGLE (x2)
Main oscillator outputs with a mellow sound. Traditionally used to imitate flutes, piccolos, vibes, and other gentle instruments.

SAWTOOTH
Main oscillator output with a rich buzzy sound. It contains both odd and even harmonics. Traditionally used to imitate brass instruments.

SQUARE
Main oscillator output with a rich but hollow sound. Traditionally used to imitate woodwind instruments.

MIX
Contains an equal mix of OSC A's sawtooth and OSC B's square.

Patch Ideas

#1 - Pseudo Resonance Filter Effect

SELF MOD and FM AMT at minimum. Adjust OSC B's FREQ knob to about 10 o'clock. Engage the SYNC switch. Now listen to OSC A's triangle output and sweep its FREQ control from min to max. Now try that again with SELF MOD at about 3 o'clock.

#2 - Super Fat Monosynth Voice

Tune OSC A to a desired bass frequency. Then tune OSC B an octave below. Listen to the MIX output and control both voices simultaneously with the 1V LINKED input. Optionally, use the sync control to track them together. This will cancel out the 'beating' effect, while still maintaining their octave spread.

#3 - Standalone Noisebox A

Engage the SYNC switch and max out SELF MOD and FM AMT. Listen to OSC A's sawtooth output. Now wiggle the main freq knobs for instant noisebox style nonsense. Back off the SELF MOD and FM AMT knobs just a touch for variation.

#4 - Standalone Noisebox B

Patch OSC B's triangle into OSC A's exFM input. Max out FM AMT and DON'T engage the sync switch. Listen to OSC A's triangle output. Take it from there - things get even crazier than Noisebox A.

#5 - Simple(ish) Drum Voice

Tune OSC A to 100Hz and OSC B to 230Hz. Now mix both triangle outputs together with OSC B about half the volume of A. Send this through a VCA modulated by an envelope with no attack and a quick decay. This creates a simple conga/woodblock type sound that can be tuned with the 1V LINKED input.

#6 - Complex Drum Voice

Building on the above idea. Patch a second envelope (triggered simultaneously, heavily attenuated, and with an even faster decay) to OSC A's 1V input. This simulates the initial strike that 'bends' the drum head membrane.

Going even further, route the second envelope to a second VCA passing white or filtered noise. Add just a touch of this to the mix containing both triangle waves. This simulates the disharmonic midtones and helps create a more sophisticated tom or snare sound.