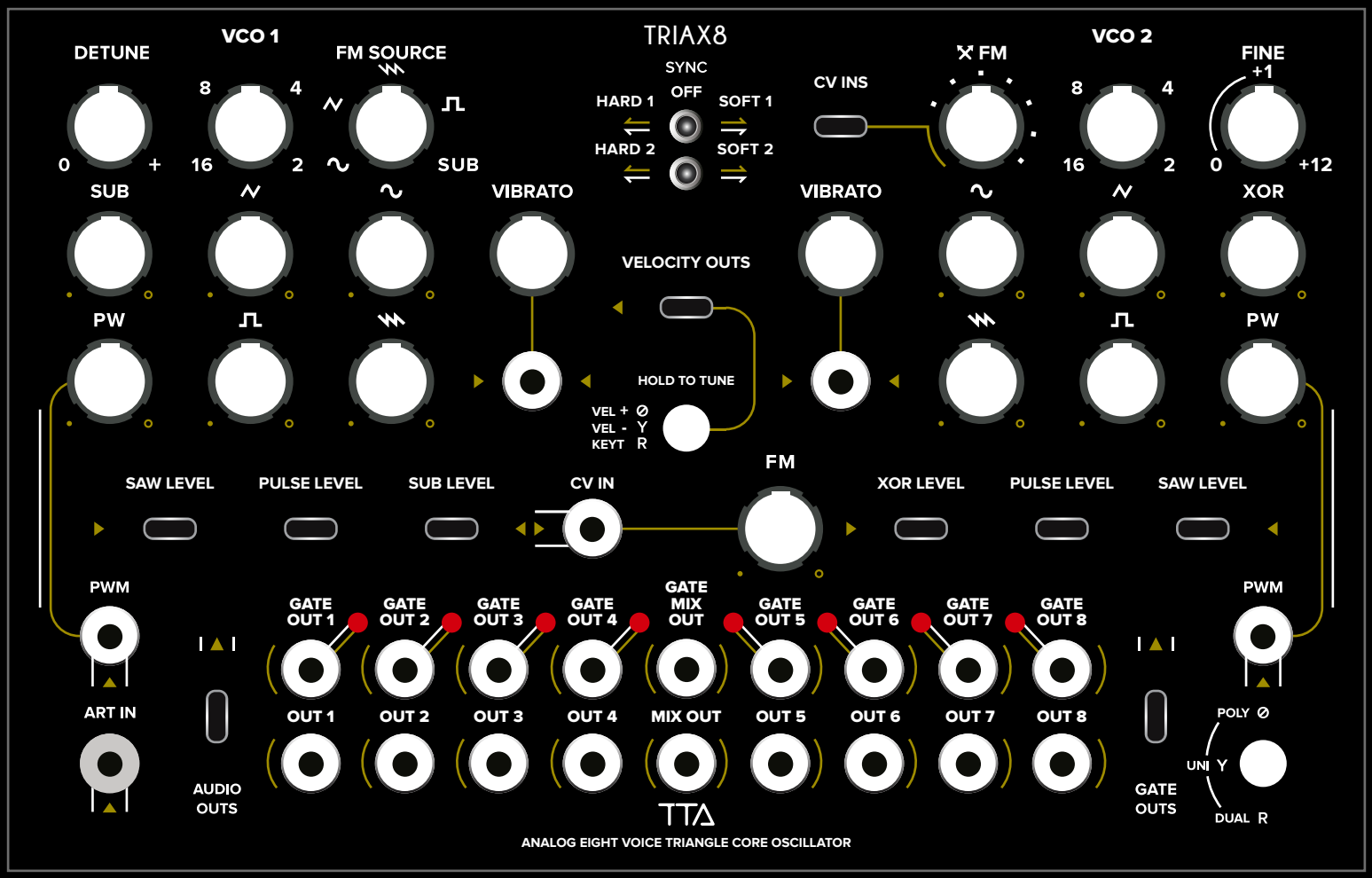
TRIAX8

ANALOG EIGHT VOICE TRIANGLE CORE OSCILLATOR



The Triax8, powerful as it is, remains very easy to use. Yet beneath the panel lies one of the most complex analog designs we have ever created. A quick look at the back of the module reveals just how intricate it is. What makes the Triax8 so approachable is its sound—there are sweet spots everywhere. So, let's get started!

Step 1: Installing the Module and Running Initial Tuning

To control the Triax8, we've built a tuning system that calibrates the oscillators, learns the characteristics of the Eurorack case it's in, and adjusts automatically for temperature, voltage changes, and more.

1. Place the Triax8 in your Eurorack case and install all the other modules you plan to use next to it.
2. Power up the system and let it warm up for at least 30 minutes. For larger cases, wait up to 60 minutes.
3. When ready, patch an ART output from any ART controller or sequencer to the Triax8's ART IN.
4. Send the **Initial Tuning** command (`INT TUNE`). The oscillators will begin tuning one by one, and the gate LEDs will light up in sequence as each voice complete.
5. Once all 8 gate LEDs are lit, tuning is complete and the Triax8 is ready to play.

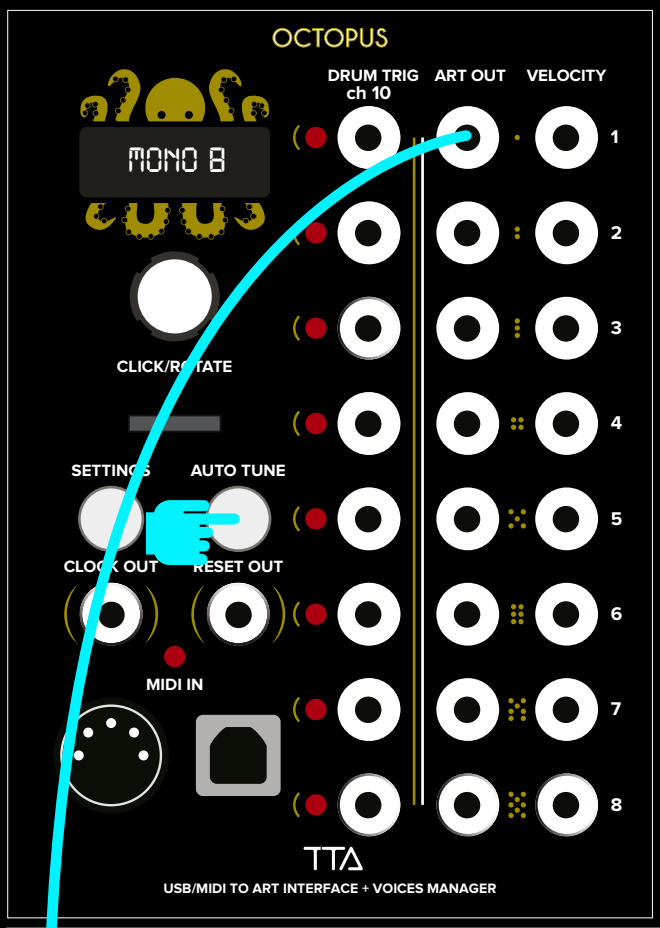
If the module ever drifts out of tune or needs recalibration, simply hold down the Velocity switch to initiate auto tuning or send the **Auto Tune** command from the ART controller.

Good to Know:
The ART protocol includes two tuning commands: Initial Tuning and Auto Tuning.

- **Initial Tuning** sets the baseline calibration and is usually done once when setting up.
- **Auto Tuning** makes small adjustments and can be used occasionally to keep things in tune.

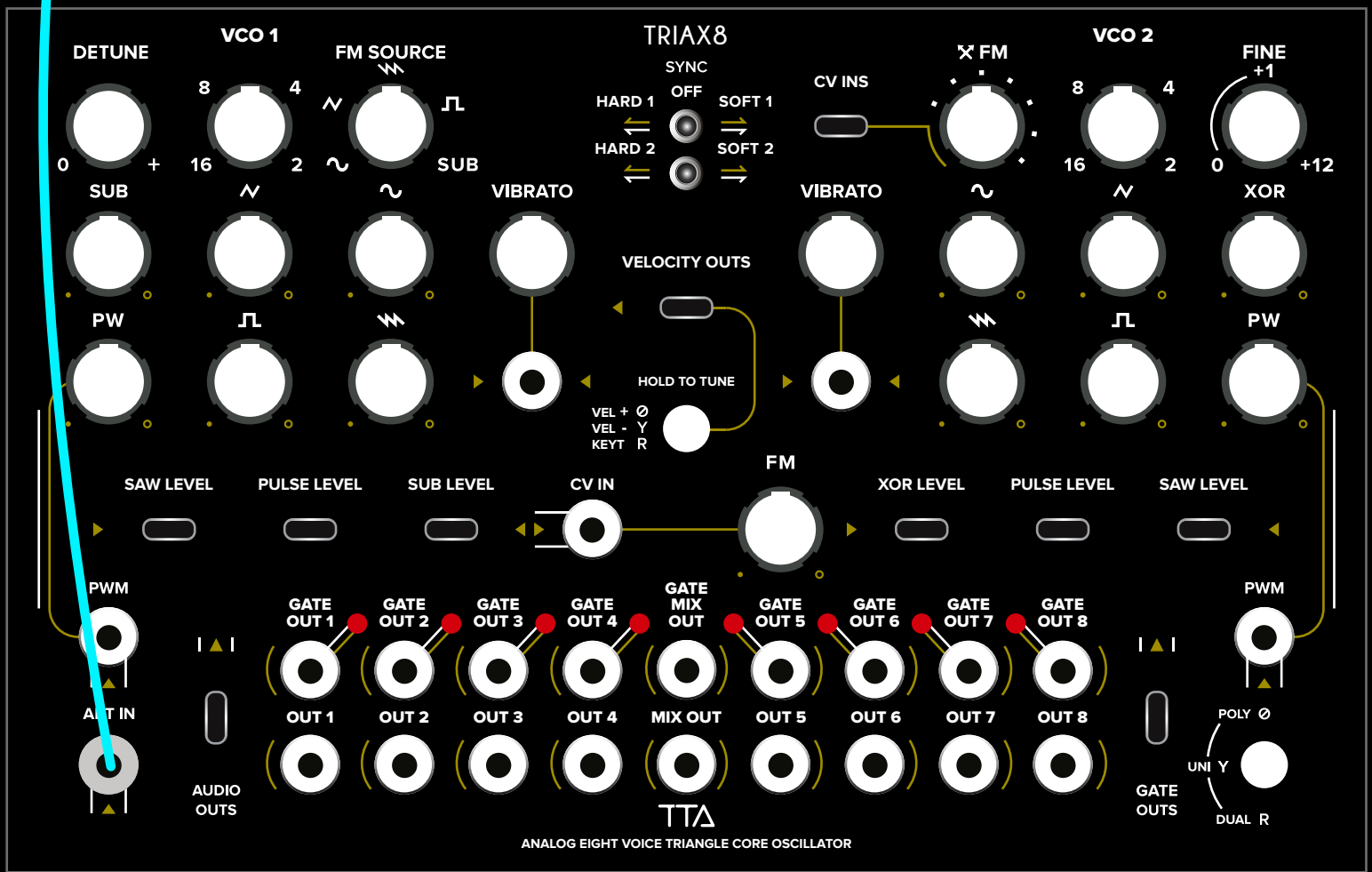
If the module is moved at all, including in the same case, it is highly recommended to do the initial tuning again.

Now that we finish with the tuning we are ready to play. Let's get to know the panel.



Long press for Initial Tuning

Short press for Auto Tuning



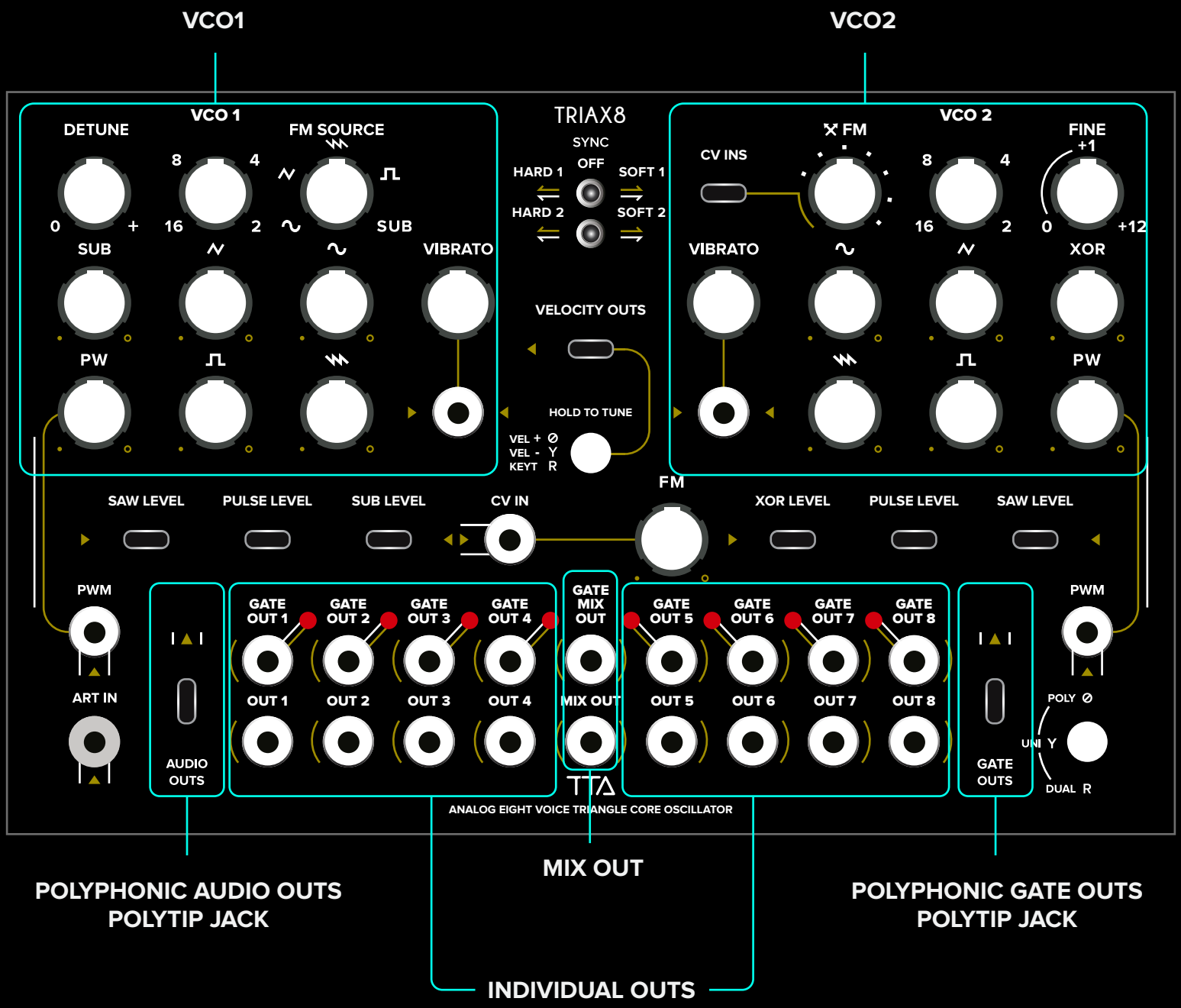
Step 2 - Getting to know the panel layout:

General Layout: Each voice in the Triax8 is made up of two oscillators, **VCO1** and **VCO2**. Each oscillator offers multiple waveforms, and each waveform has its own volume knob, allowing all waveforms from both VCOs to play at the same time.

The sound can be output in two ways:

- **Polyphonically** via the **Audio Out Polytip jack**
- **Individually** through the **1–8 mini jack audio outputs**, along with their corresponding **gate outputs.**

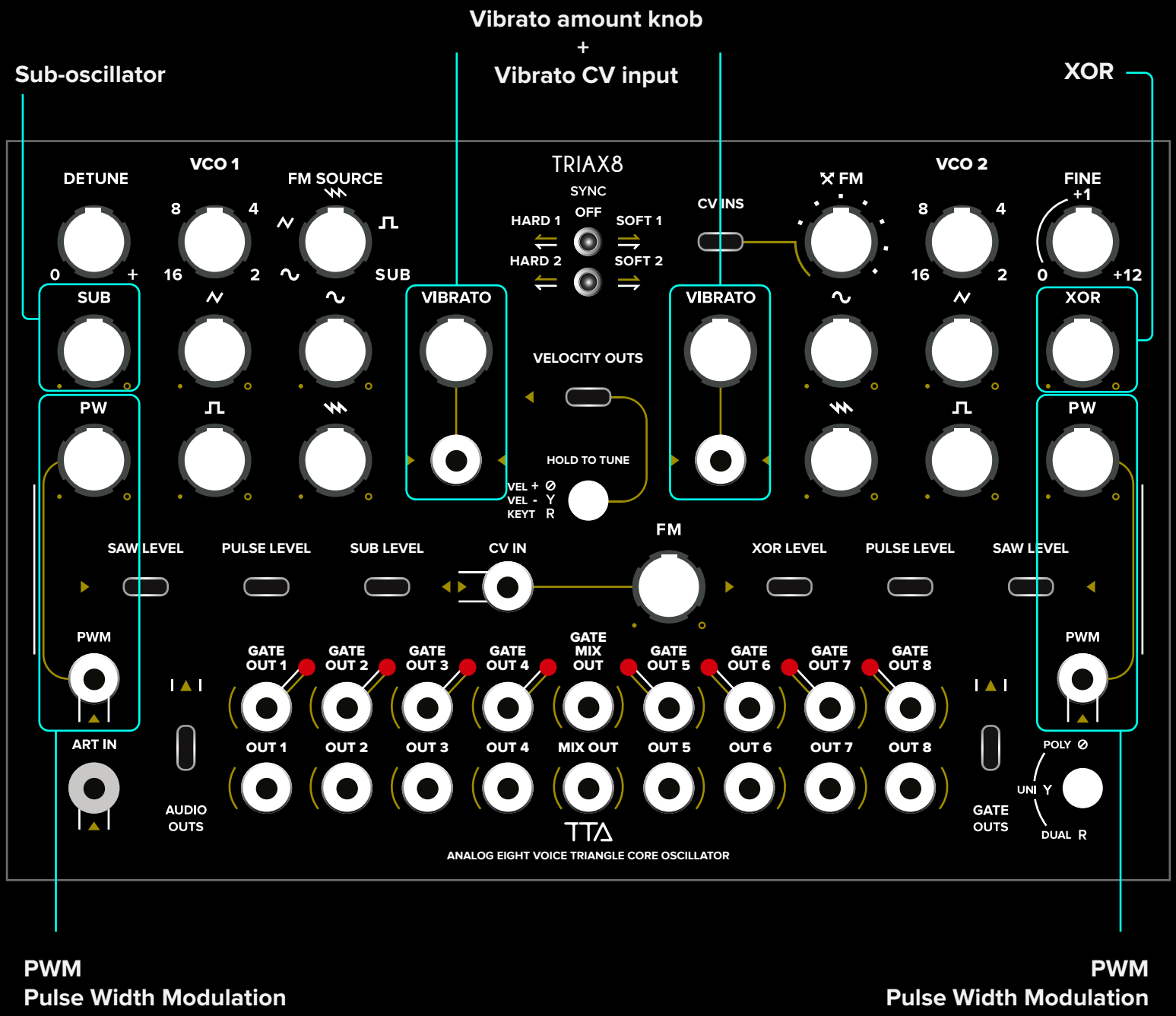
There's also a **mini jack mix out** that combines all voices into a single output. Some waveforms support **polyphonic cv volume control** via the **Polytip jacks** located underneath.



PWM and Vibrato:
Each VCO has a **PWM (Pulse Width Modulation)** knob and CV input, as well as a **Vibrato amount** knob and CV input. Both are typically controlled using an external LFO.

Note: Vibrato is **not** generated internally—patch an LFO into the **Vibrato CV input**, then turn up the knob to hear the effect.

VCO1 includes a **sub-oscillator**, adding harmonics one octave below.
VCO2 features a unique **XOR waveform**, created by combining the pulse waves of VCO1 and VCO2. Adjusting the PWM knobs on both VCOs will change the shape of the XOR waveform.

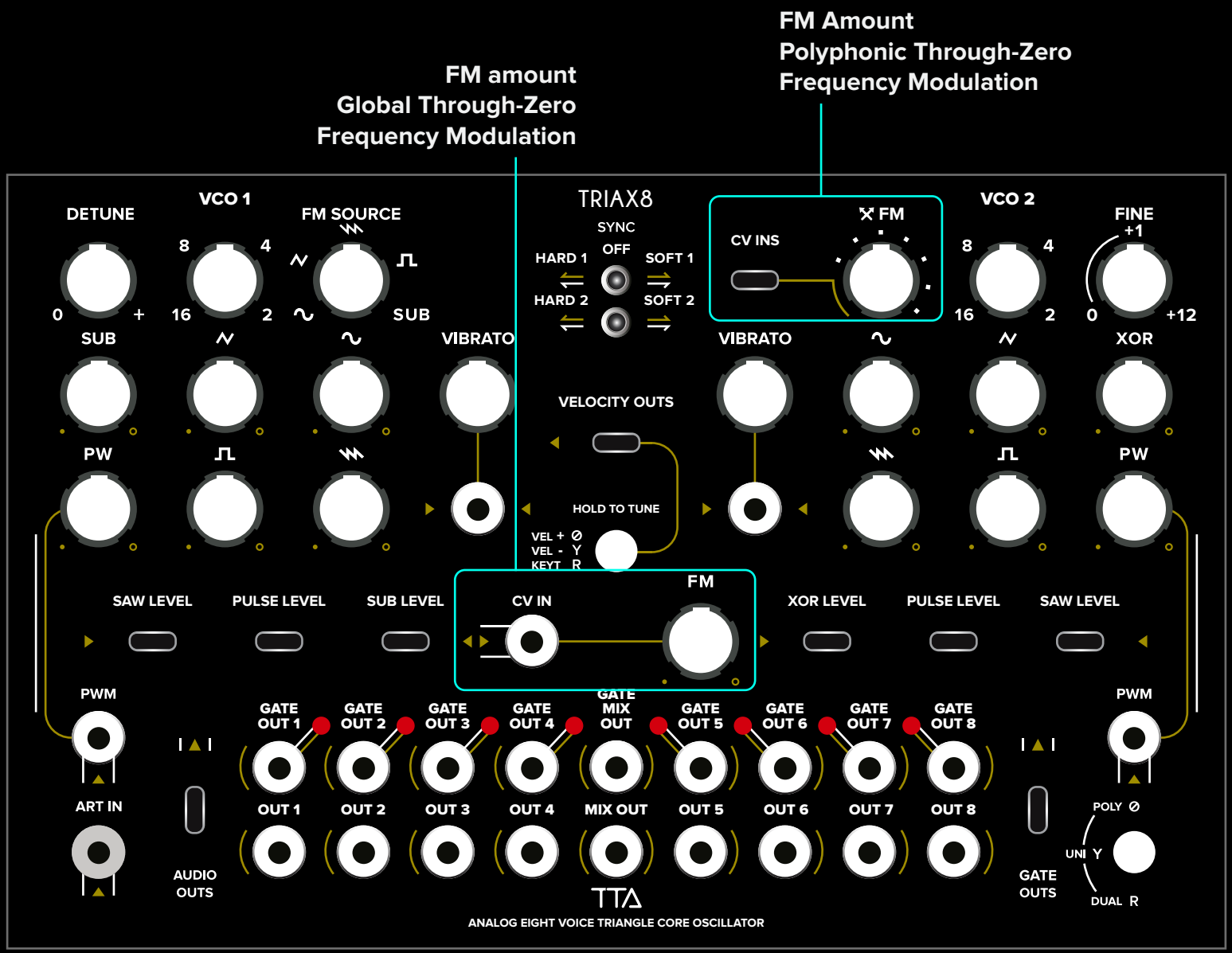


Through-Zero FM:
VCO2 supports **through-zero frequency modulation (FM)** from VCO1.

- The **FM Amount** knob on VCO2 controls how much modulation is applied.
- On VCO1, the **FM Source** knob lets you choose which waveform VCO1 uses to modulate VCO2.

FM depth can be cv controlled in two ways:

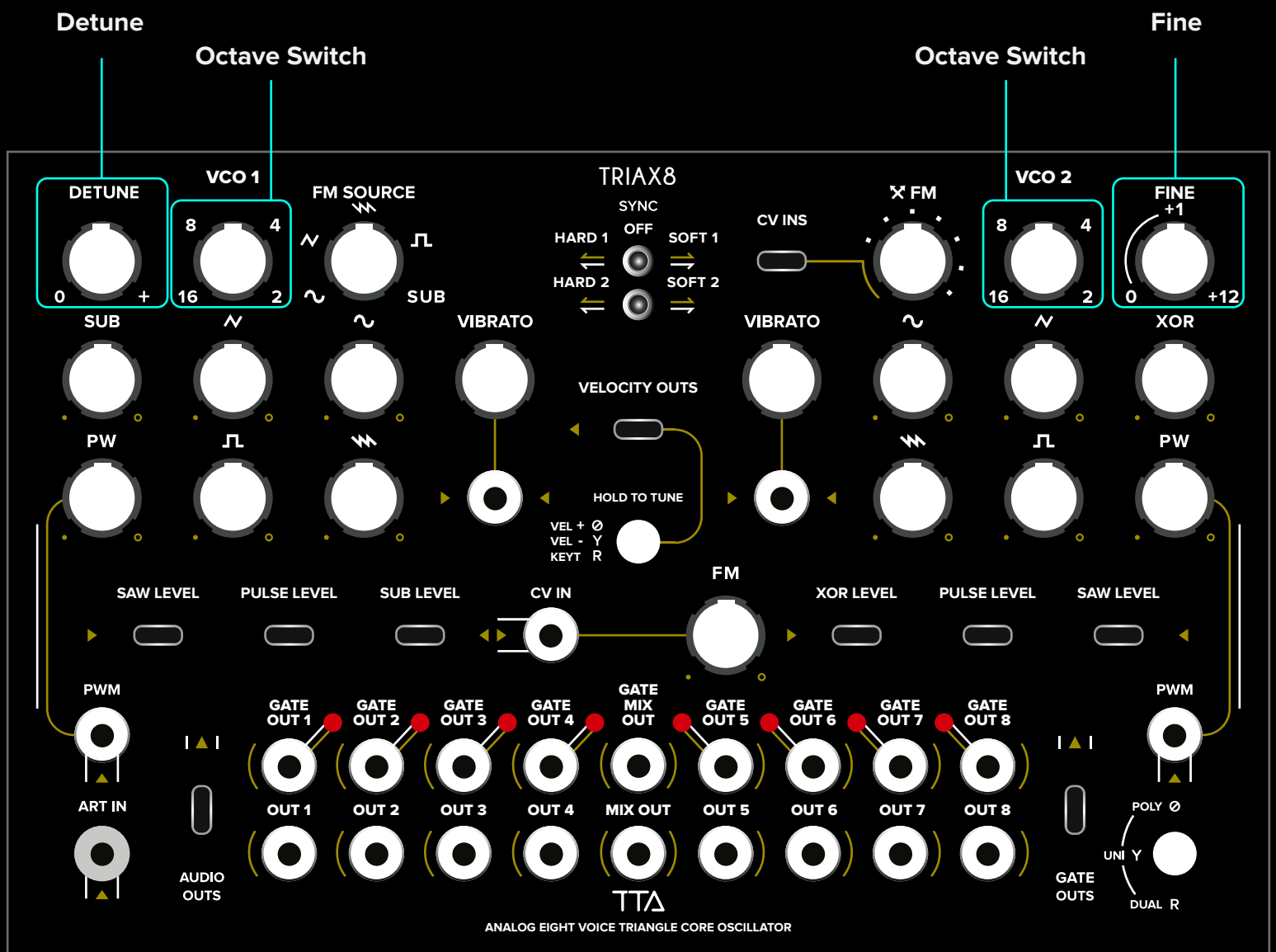
- **Polyphonically** via the **Polytip FM input jack**
- **Globally** using the standard **FM mini jack input** and its **attenuator knob**



Pitch and Frequency Control:
Each VCO has two main controls for pitch and frequency.

- **VCO1:**
  - The **Detune** knob should be set to **0** for accurate pitch. Turning it up slightly detunes VCO1, creating a rich detuned effect when paired with VCO2.
  - The **Octave Switch** lets you change the octave range of VCO1.

- **VCO2:**
  - Also has its own **Octave Switch**.
  - In the upper right corner is the **Fine knob**. Set it to **0** for accurate pitch.
    - Turning it up smoothly increases the frequency up to **+1 semitone**.
    - Beyond that, it shifts pitch in **steps of semitones**, up to o**ne full octave**.



Good to Know:
The **Fine** knob is typically left at 0 to stay in tune. However, when using FM, adjusting the Fine knob changes the **frequency ratio** between VCO1 and VCO2, unlocking a wide range of interesting tones and timbres.

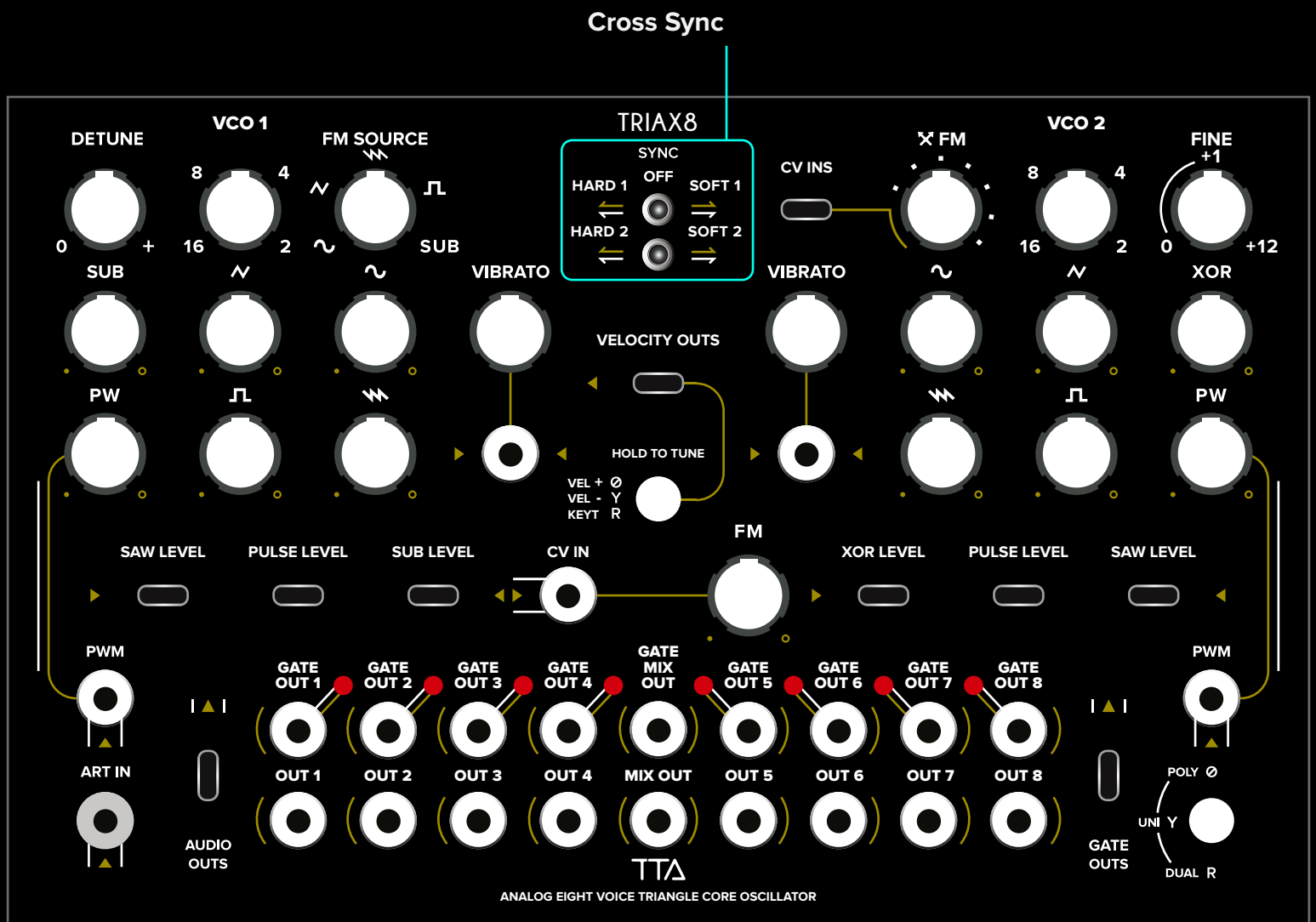
Cross Sync:
There are two switches for oscillator sync:

- The **upper switch** controls sync for **VCO1**
- The **lower switch** controls sync for **VCO2**

Each switch has three modes:

- **Off** – No sync is applied
- **Soft** – Sync occurs based on the waveform's magnitude
- **Hard** – The oscillator resets at the start of the other oscillator's cycle

Both oscillators can be synced simultaneously, allowing for unique and complex cross-sync sounds. For even more sonic variety, try adding **FM** and adjusting the **FINE** knob on VCO2.



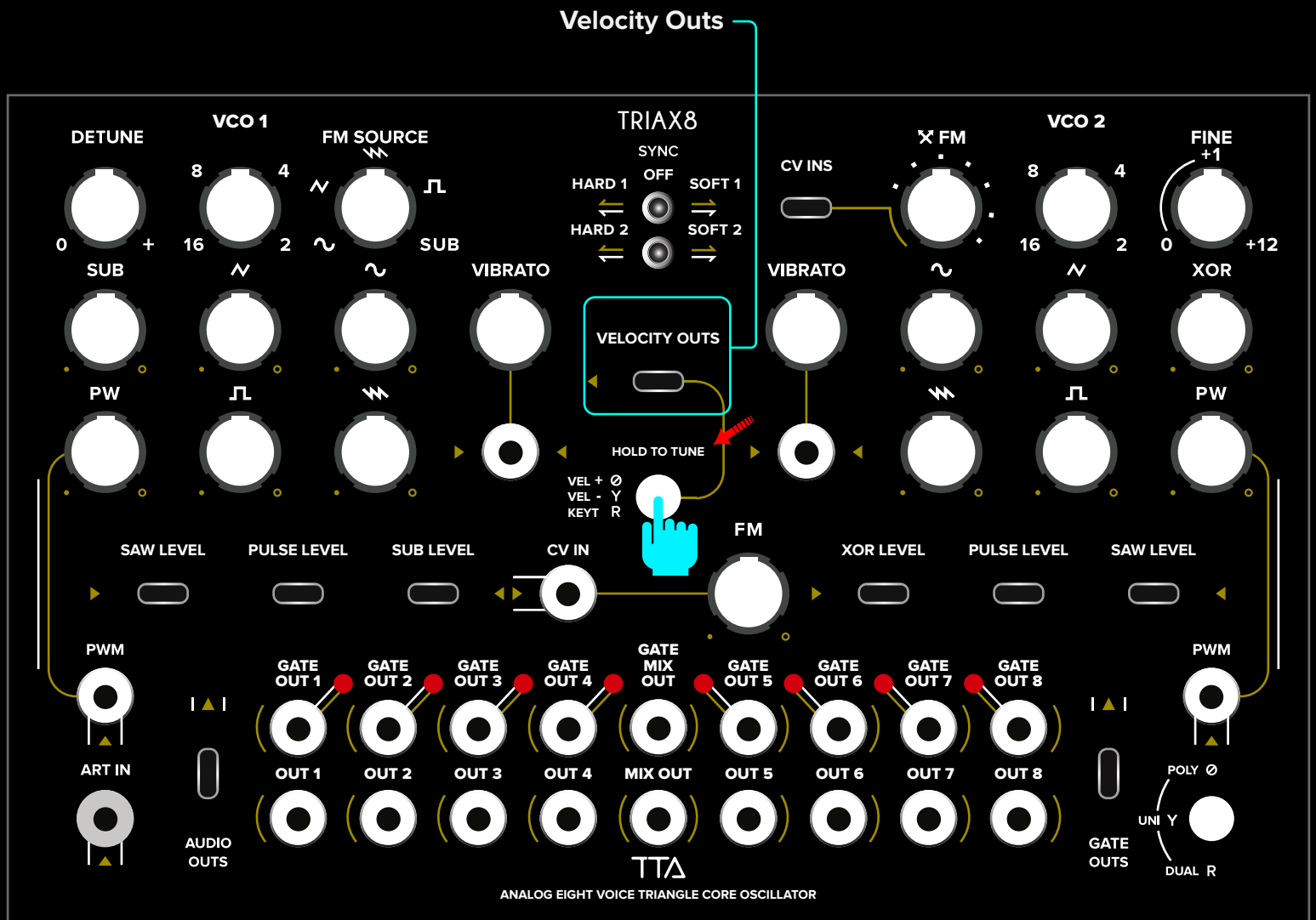
Velocity Outs:

Velocity outputs are available via the **Polytip jack** as 0–5V CV signals.

A **switch below** lets you choose the response mode:

- **+** : Higher velocity (e.g., harder key press) gives higher CV
- **–** : Inverts the response—harder presses give lower CV
- **KEYT** (Key Track): Outputs a CV that rises with the pitch of the note played—higher notes produce higher CV. This is often used to modulate parameters like filter cutoff based on pitch.

The velocity **switch** is also used for AUTO TUNING. Hold down the **Velocity switch** for **2 seconds** to trigger an **Auto Tune**, as described earlier in the manual.

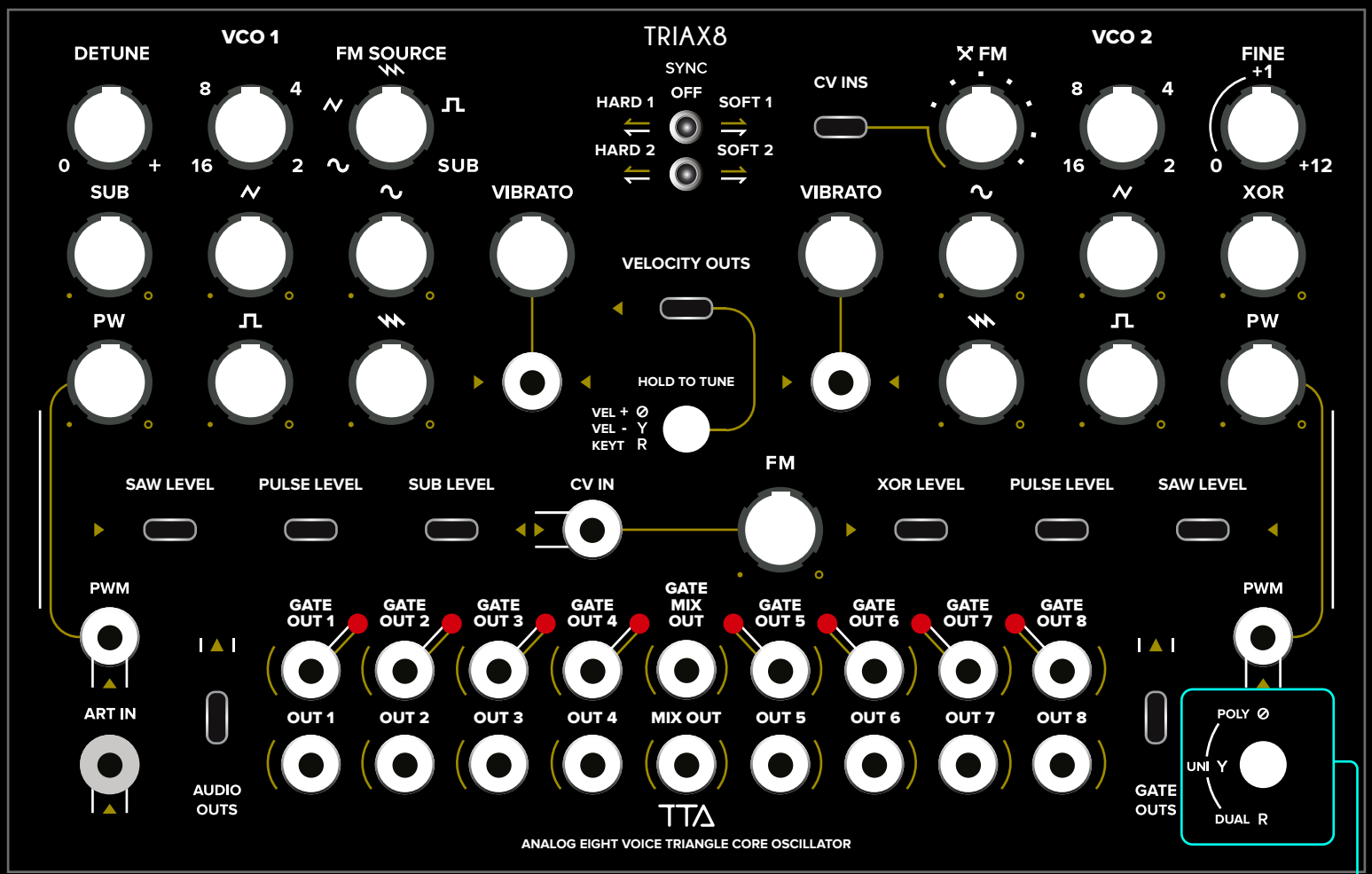


Voicing Switch:

The **Voicing switch** is located in the bottom-right corner and offers three modes:

- **Poly** – Each note is assigned to a separate voice (standard polyphony). Example: When used with something like the Octogain module's Left/Right outputs, voices will pan in a ping-pong sequence.
- **Dual** – Each note uses two voices, creating a fuller sound and when used with a module like Octogain Left/Right outputs each voice is sent to a different output, stereo heaven.
- **UNI (Unison)** – All voices play the same note together, turning the Triax8 into a massive 16-VCO mono synth.

Economical Tip: In UNI mode, try patching the **Gate Mix Out** to a mono envelope and the **Mix Out** to your mono filter.



Voicing Switch

Step 3 – Patch the Beast

1 **Start with a clean setup:**
- Turn **off all waveforms**
- Set **DETUNE** to **0**
- Set **FINE** to **0**
- Set **both octave switches** to **8**
- Set both **SYNC** switches to **OFF**
- Set the **Voicing switch** to **Poly** (no light)

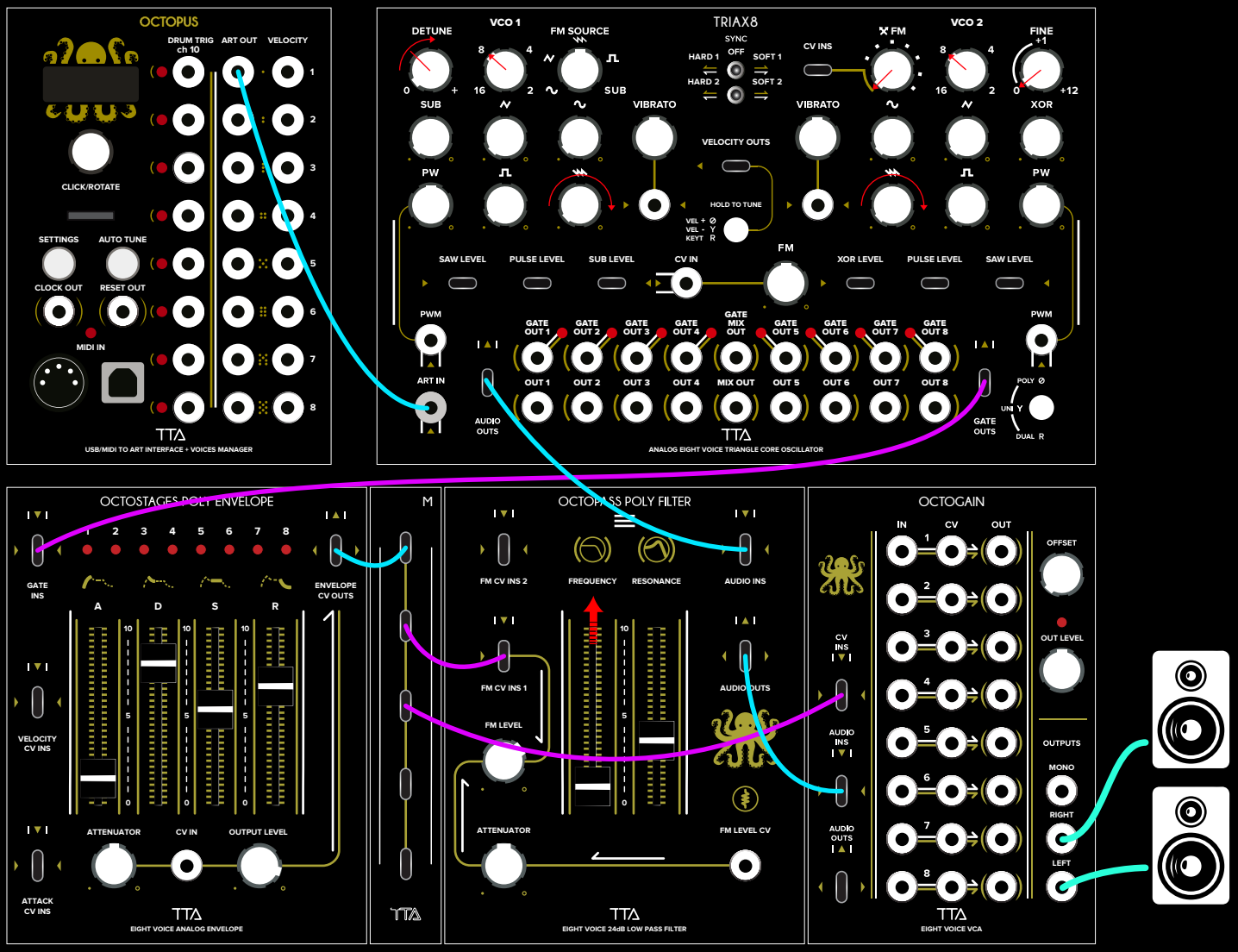
2 **Patch the cables** as shown in the diagram below. In this example, we're using the **Octopus** as the ART controller.

3 **Open the filter**, then turn on the SAW waveform on VCO1.

4 **Play some notes**—you should hear VCO1.

5 Next, **turn on VCO2's SAW waveform** and adjust **VCO1's DETUNE** to around **10 o'clock** to hear the detune effect.

Now you're ready—play some notes and start exploring the sound of your Triax8! Don't forget to take sleep brakes once in a while.



Step 4 – Understanding FM

When both oscillators are set to the same pitch, FM produces a wave shaping effect in tune. In some instances, this might sound like a mild effect, as it affects the timbre without destroying the tuning and adding harshness like most analog FM synths. This special feature helps generate many more waveforms and applies the theory of FM, which is based on the frequency relationship between the two oscillators — the modulator and the carrier, as they are professionally called.

To explore deeper into sound design and away from the base tune, start by adjusting the FINE knob on VCO2. This creates uneven frequency ratios between the oscillators and results in all sorts of beautiful sounds and textures.

To clearly hear the FM effect, turn off all waveforms on VCO1, turn on only the sine wave on VCO2, and then experiment with the FM source knob on VCO1, the FM knob on VCO2, the octave switchers on both VCOs, and the FINE knob on VCO2. Adding CV modulation makes the effect even more dramatic. Sync also has interesting effects in FM.

Firmware Update:
To update the Triax8 firmware, prepare a microSD card formatted as FAT32. Download the firmware file from the Triax8 page on the website.

1 Unzip the downloaded firmware file. It will be named **image.hex**. Copy this file to the microSD card.

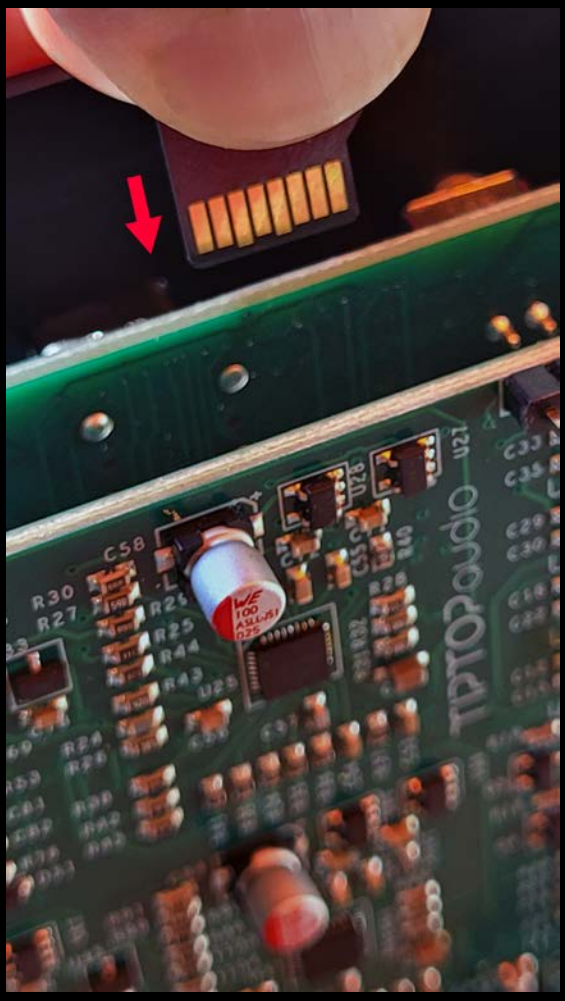
2 Power off the case and unscrew the Triax8 module.

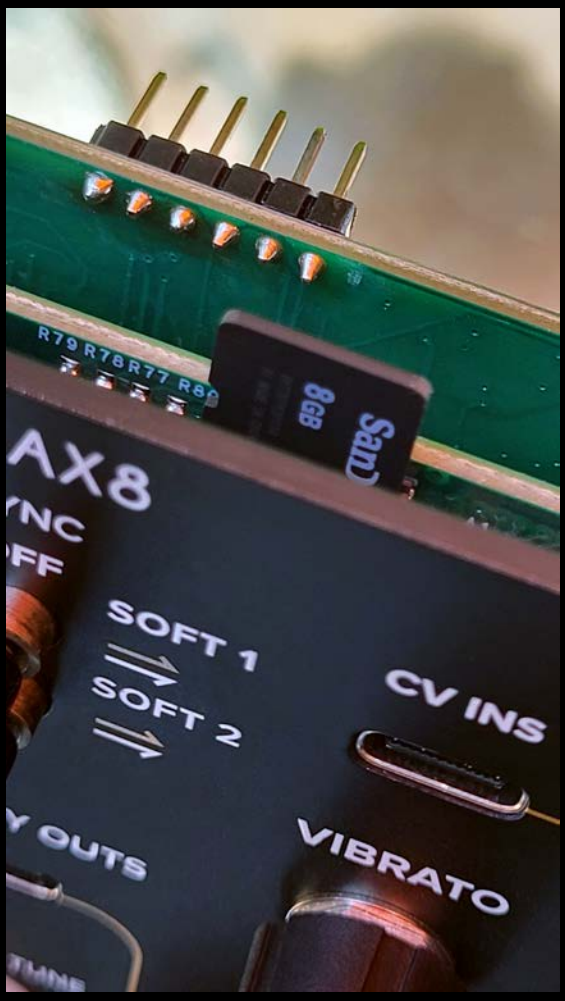
3 The SD card socket is located on the front PCB (see image below). Carefully insert the microSD card with the pins facing down as shown.

4 Hold down the Voicing button and power on the case. The button LEDs will flash, release the button.

5 Once the update completes, the Triax8 will run the updated firmware.

6 Turn off the power, gently remove the microSD card, and reinsert the module into the case.





Specifications

+12V = 335mA
-12V = 170mA

HP = 40

Depth = 40mm / 1.5”

Voice matching - medium to high

Octaves: 8

Oscillators: 16

Control: ART

CV IN: 0-5V

CV IN Vibrato & PWM : +/-5V