

Users' Manual v1.1

Welcome!

Mille is a **standalone 1000 oscillators drone synthesizer** with 8 track recorder and surround spatialisation (2 or 4 channels).

Thanks to its architecture, Mille can create amazing dense and evolving drones. **Mille pushes software sound synthesis to the limits, it is not common to see so many oscillators in a musical instrument, for this reason I suggest you try the software before buying it to see if your computer can handle all the necessary processing.**

The software was written on a Mac Book Pro M1 10 cores.

PLEASE NOTE: MILLE IS NOT A PLUGIN, but it can be connected to any DAW using a virtual audio driver such as **blackhole**.

Please read this manual that will cover all the important informations you will need to start using Mille.

Setting up your audio interface

At the top left of the window of Mille you will find a button called **Audio Settings**, press it and it will open a new window:

The blue I/O button at the left turns on and off the audio scheduler. If you modify some settings it's best to restart the audio processing by turning off and on again this blue button. If it is yellow it means that you need to restart the audio process.

By default this will be ON when you run the application. **Driver:** select here the driver of your audio interface

Output device: select your audio interface. If you want to use a virtual audio interface select here the driver (eg. Blackhole 16ch)

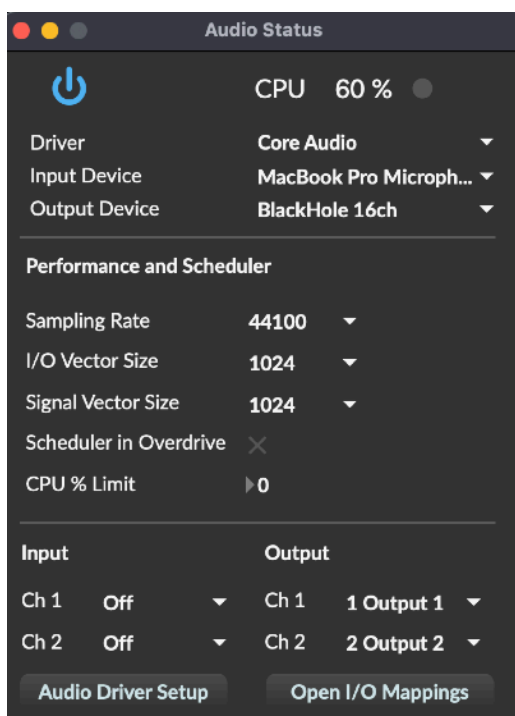
Input Device: not important, there is no audio input in Mille

Sampling Rate: suggested 44.100

I/O and Signal Vector Sizes: these set the number of samples calculated at the I/O of your audio interface and inside the software (Signal Vector Size). **It would be best to keep this number at least at 1024 for both.** If running the software you hear some glitches you must try to rise both I/O and Signal vector sizes.

Scheduler in Overdrive must be OFF

Output CH: you can set the output 1 2 (L_R) BUT:
TO USE SURROUND OPEN I/O MAPPINGS AND route CH1,2,3,4 to 4 channels of your hardware audio interface.



I/O Mappings			
Input Mapping		Output Mapping	
Ch Group		Ch Group	
1-16		1-16	
1	Off	1	1 Output 1
2	Off	2	2 Output 2
3	Off	3	3 Output 3
4	Off	4	4 Output 4



Software Authorization

(THE DEMO RUNS FOR 10 MINUTES THEN IT MUST BE RESTARTED)

Press “Unlock Demo” at the right of the Mille top menu and a window will open.

After purchasing the software on the website you will receive in your PayPal’s account email the serial to unlock the software. The process usually takes **24 to 48 hours** maximum.

Serials are manually generated, so please be patient.

FIRST: Input your PayPal’s account email address

NEXT: Input the serial code you have received, as it is with spaces.

To paste use mouse’s right click > paste

When your software is authorized the red bar will become fully white and you will see SOFTWARE AUTHORIZED instead of SOFTWARE IN DEMO MODE.

Troubleshooting if this does not work, check the following:

- 1) the serial is correctly pasted
- 2) the email is your PayPal’s account email
- 3) you have installed the software in the system HD using the installer

AUTHORIZATION PROCESS (please read carefully)

Step 1) Go to www.giorgiosancristoforo.net and pay for the software with Paypal

Step 2) In 24/48 hrs you will receive an email with your serial number (changes my apply during holydays)

Step 3) Enter your email address (the one you have used for your papyal transaction)

Enter Email

Step 4) Enter your serial number (to paste press CTRL + CLICK > Paste)

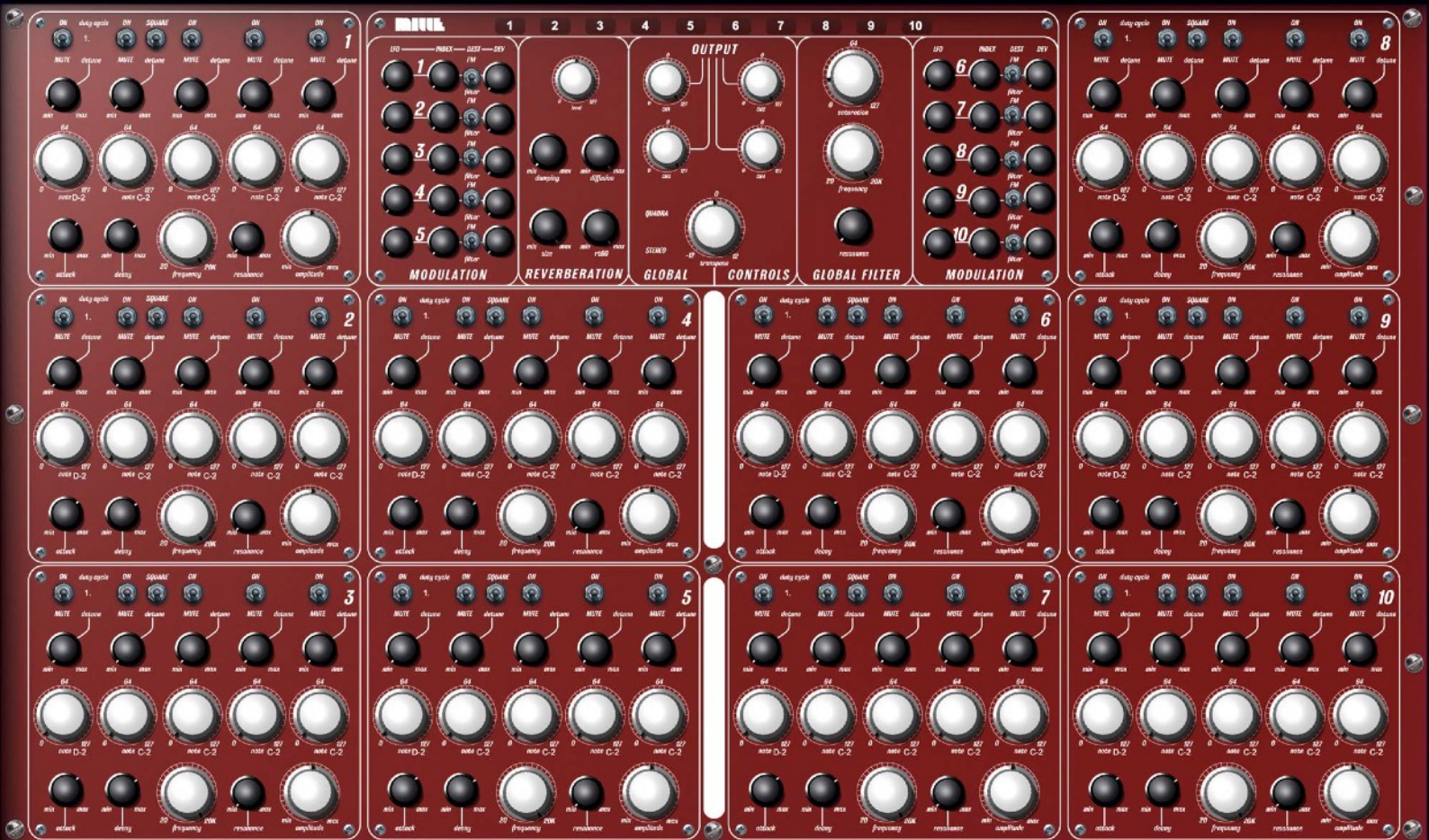
Enter Serial Number

SOFTWARE IN DEMO MODE

In DEMO mode this software will stop after 10 minutes

0 min

10 min



Mille main interface & architecture

Mille's main interface is where you can control all the parameters of the synthesizer. Although it may seem very complicated at first glance, I have actually tried to make it very simple and easy to use and you will find that appearances can be deceiving.

The main interface is divided into two parts: the sections for the oscillators and a global section at the centre, which manages the reverb, a global filter, the LFOs, the trig/gate buttons, volumes and global transposition. Let's talk about the 10 oscillator sections first, then we'll talk about the global controls.

THE OSCILLATOR SECTIONS



There are 10 oscillator sections and they are numbered at the top right of each section.

Each section contains 5 macro-oscillators with their respective mute/on controls, waveform and duty cycle, center frequency (white knobs), detuning (black knobs), attack and release times of the envelope, cutoff frequency a 12dB/Octave filter, resonance, amplitude of the section.

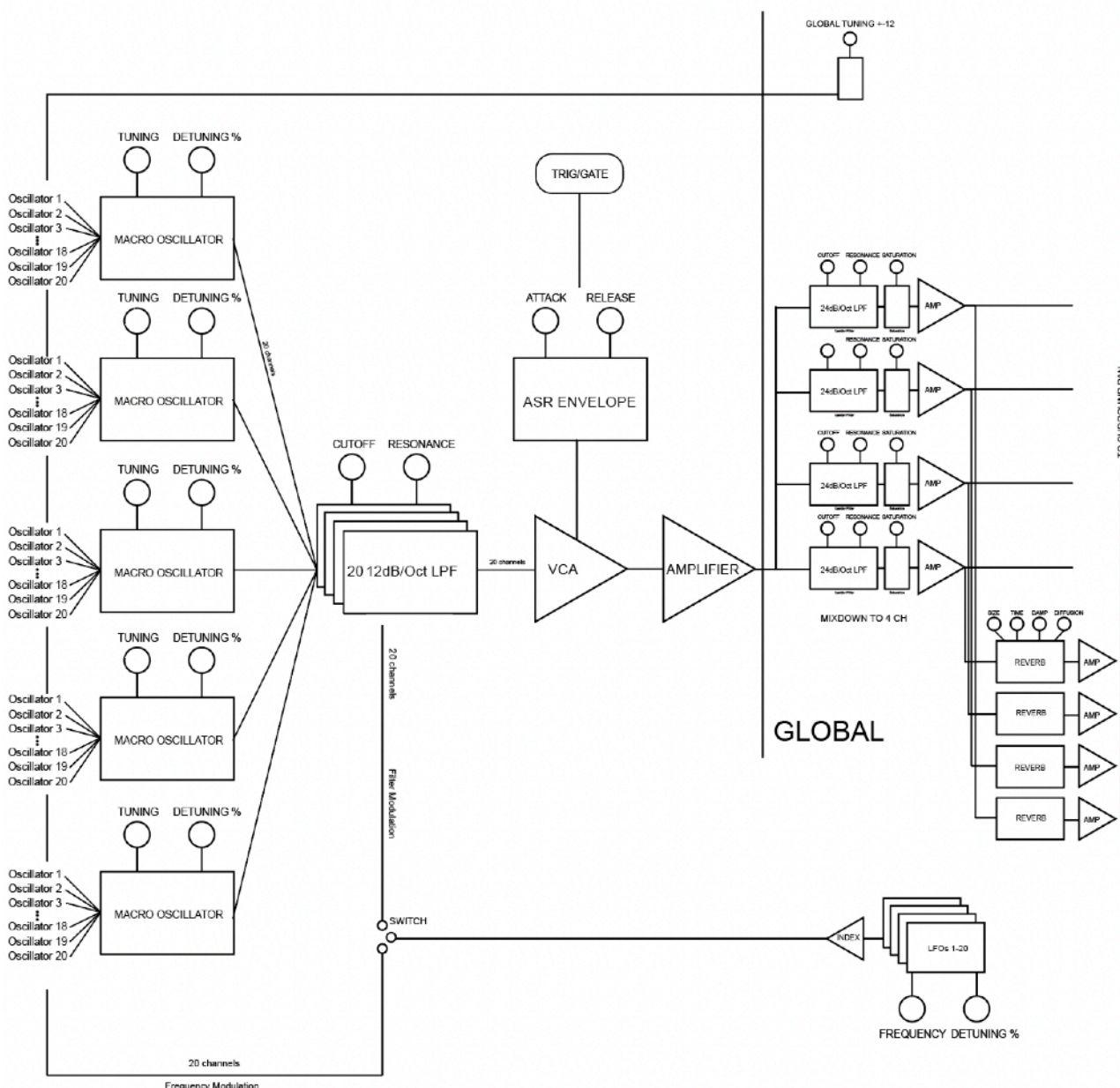
Each macro oscillator has 20 oscillators, so you have 100 oscillators available for each section for a total of one thousand oscillators!

To handle such a large number of oscillators I had to make some radical decisions about how to control all these resources considering I wanted to keep a familiar analog look. A frequency knob is a bit of a trap because you know I have to give a large frequency range. Generally hardware synthesizers have the advantage of being tactile and immediate tools, but the cost of this immediacy is precision. Some synthesizers, such as the Moogs, adopt different frequency ranges through selectors, this makes the intonation more precise (the opposite occurs in the Buchla which are notoriously difficult to tune precisely, especially the 100 series). Given the large number of oscillators, the logical thing to do was to make the macro oscillator controls quantized to MIDI notes (0-127). In this way it is very easy to create a drone on a musical scale, not only can you use the knob, but under it you can notice the midi note in letters, you can use the computer keyboard to enter the desired note and octave, for example example C1 or D-1 or G#4 etc. A non-quantized potentiometer would have made programming such a large number of parameters very frustrating (you have 50 macro oscillators!), instead using a tempered scale quantization it is very easy and fast to tune the oscillators. But that's not all because obviously 20 oscillators for each macro aren't there to make the same frequency, otherwise we wouldn't need them. For this reason, above each center frequency control is an oscillator detuning knob. Detuning shifts the frequency of the 20 oscillators randomly according to a parameter (0-100%) which depends on the central frequency. This means that if we tune a macro oscillator on center A at 440Hz, with 10% detuning, the 20 oscillators will randomly shift their frequency by +-44Hz. With 100% detuning, the 20 oscillators will have (random) a frequency ranging from 0 to 880Hz. This system is quite versatile, because you can create sounds ranging from super saw (or square or triangular), to incredibly dense and chaotic layers and you will find that there is really no need to work on different temperaments or microtones, because the chromatic density generated by 5 macro oscillators is already frighteningly huge.

Each macro oscillator comes out already spatialized on 4 audio channels. Each individual oscillator is assigned to a channel, so using an entire section of 5 macro oscillators will have 25 oscillators per channel. These four audio channels can then be positioned in quadraphonic (or stereophonic) space with the spatialization matrix that you will find in the record and pan window of the software. Here too I had to adopt the most logical and easiest of solutions so that the user doesn't have to go crazy managing thousands of parameters.

Each section has a 12dB/Oct lowpass filter with cutoff and resonance frequency control, but the reality is that underneath appearances there are as many as 20 filters per section and not just one. As you will see, there is an LFO for each section and this can control filters or oscillator frequencies. The LFOs (again) are actually 20 per section and like the audio oscillators they have a frequency and a detuning parameter. If you do not touch the detune parameter these 20 LFOs will act as one LFO, but if you apply detuning, each LFO will modulate the filters or oscillators with a different frequency. In the case of filters, it is thus possible to obtain interesting Phasing effects and at the same time (given the spatialization characteristics) a certain movement of the signal in the stereophonic/quadraphonic space.

Each section is triggered by a button on the global panel, at the top next to the Mille logo. These are buttons mappable with any MIDI controller and (depending on your controller setup) can be momentary or toggle buttons that maintain sustain. I made the envelopes to handle very slow tempos (a similar thing was done on the LFOs). This way you can use the sections to create different drones that you activate and deactivate with the trigs/gates, this makes it possible to play a performance that can evolve (even radically) over time without having to reprogram the sections every time, because each of them is able to create a very complex drone. You can think of the sections as part of one giant drone, or you can think of them as independent drones that you can turn on and off at will with trigs/gates. Using very slow envelopes (up to 2 minutes!) the transition from one drone to another will be totally natural and engaging.



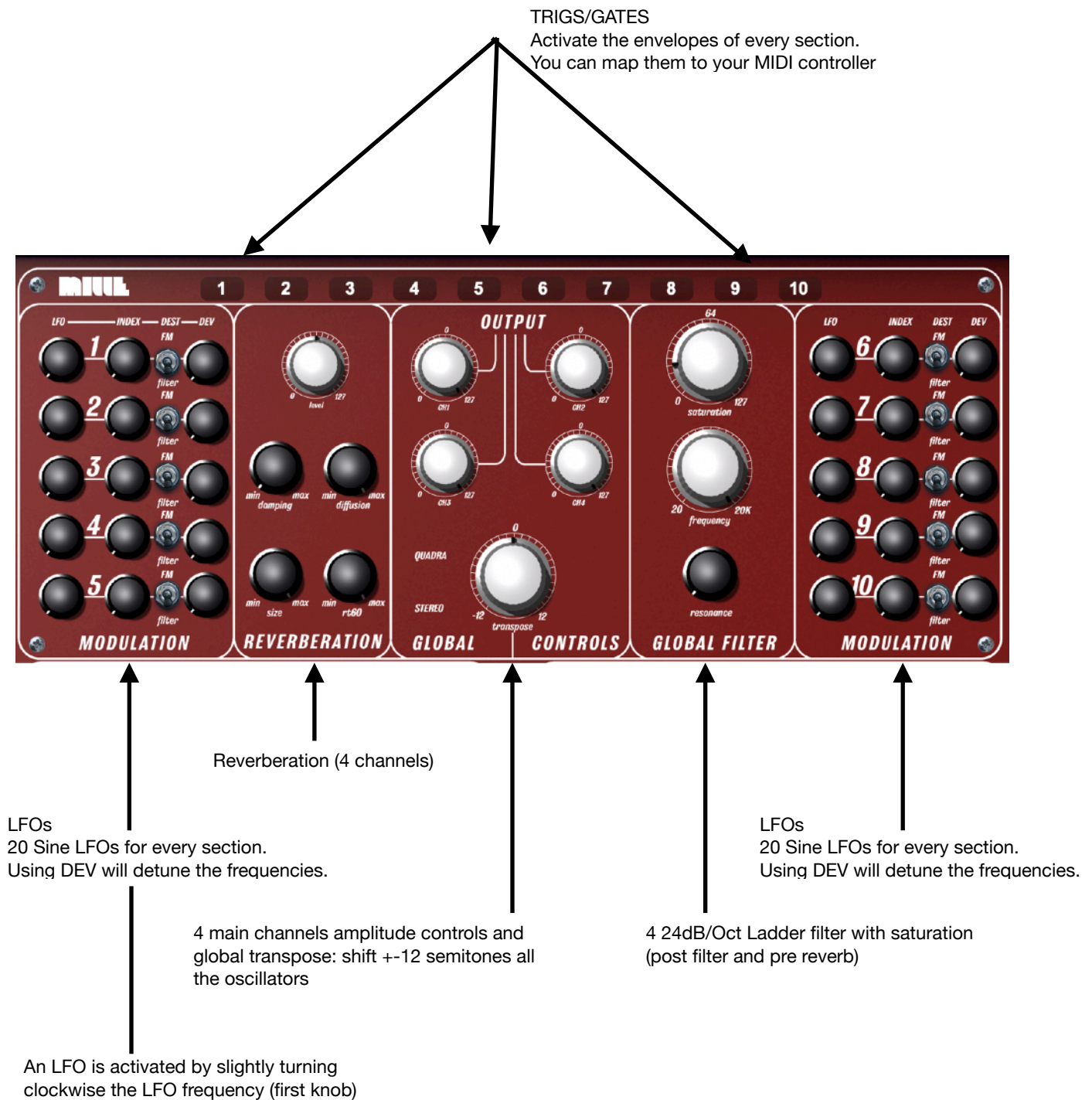
This block diagram illustrates the architecture of one oscillator section.

A last word on the oscillators:

The waveform is triangular or rectangular. Both waveform have duty cycle control ranging from 0 to 1. At the extremes, the triangular waveform acts as a sawtooth (default setting).

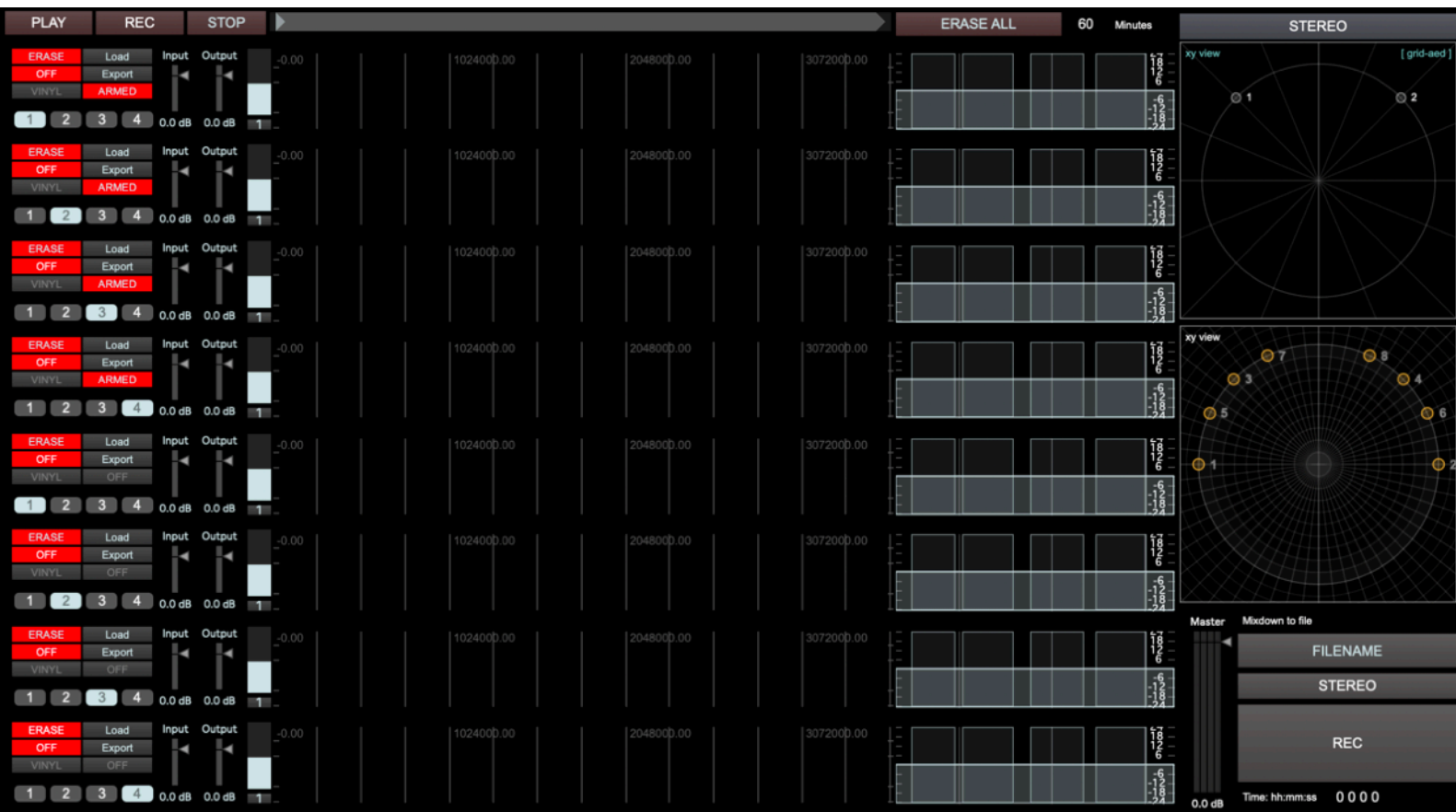
The global panel

At the top of the main interface there is a panel with the LFO and global controls, let's breakdown the functions.



PAN/RECORDER

The PAN/RECORDER button at the top of the main interface will open a new window that contains an 8 track recorder and the surround facilities.



IMPORTANT: in order to hear the sound of the synth you **ALWAYS** need to have **4 tracks armed (1-4 or 5-8)**. By default tracks 1-4 are armed and ready to output the sound to the Ch1-4 of the surround pan.

By default the 8 tracks are 60 minutes long. You can change the length (from 1 to 120 minutes) of the tracks (all of them) using the ERASE ALL and the number at its right. This will ERASE all the tracks and change the buffer length.

TO RECORD SOUND:

Have 4 tracks (1-4 or 5-8) armed and simply press **REC at the top of the window**.

TO PLAY SOUND, UNARM the tracks (this will turn ON the track) and press PLAY at the top of the window. You can set the recording/playback head position on the file using the horizontal slider at the top of the waveforms/tracks

ALWAYS press STOP to STOP recording or PLAYBACK

Every track has I/O volumes, and a SPEED control (a slider at the right of the output fader of the track). If vinyl function is selected the speed control (from 0.1x to 2x the speed) this will change also the pitch. If instead TS is selected (Time Stretch), the speed control will not change the pitch.

You can **export every single track** to **mono** AIFF 24Bit pressing Export.
You can also Load a recorded file back again using Load.

Below every track there are 4 buttons to change the source of the track (ch 1-2-3-4 from the synthesizer). All the track are pre-assigned, you will usually do not have to worry about this.

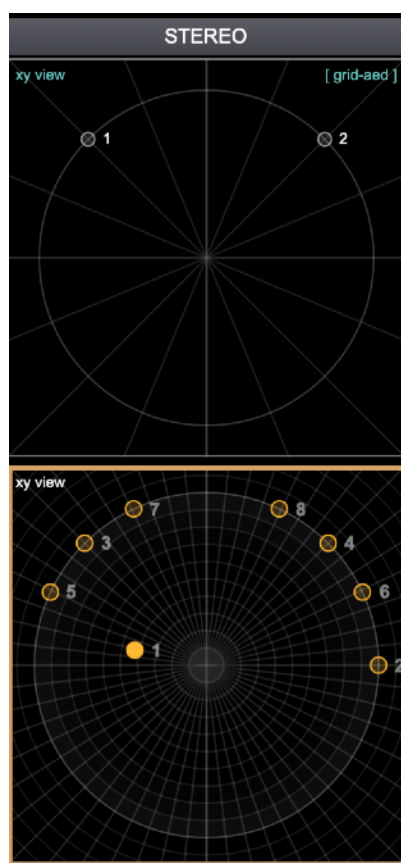
Exporting single tracks can be an option, especially if you want to save recorded material and play over it (so you basically will output the sound of 2000 oscillators!).

Eventually you may want to record an entire performance, and you can do so using the **second audio recorder placed below the surround pan controls**.

Depending by the settings (STEREO OR QUADRAPHONIC) you can record in realtime the sound to stereo file or quadraphonic file (a single 2 or 4 channels 24Bit file). To record a performance **FIRST press FILENAME**, to set a name and location for the file, and **THEN press REC**. When you have finished **PRESS REC AGAIN to stop recording**.

NOTE: you may think that the overall volume of the software is low.

Don't be fooled! Because you can use 1000 (or 2000 adding 4 tracks recorded) oscillators, we need to leave some headroom in order to avoid distortion. Also consider that the surround pan sources position is not near to the center. Putting the sources closer to the center will (of course) rise the overall volume of a channel.



Speakers positions (fixed) NOTE:
PLACE your SPEAKERS IN
CIRCULAR PATTERN 1 2 3 4
clockwise.



Sources positions (you can place
them wherever you want). In stereo
mode only the top half of the circle
is available.

MIDI and KEYBOARD mapping

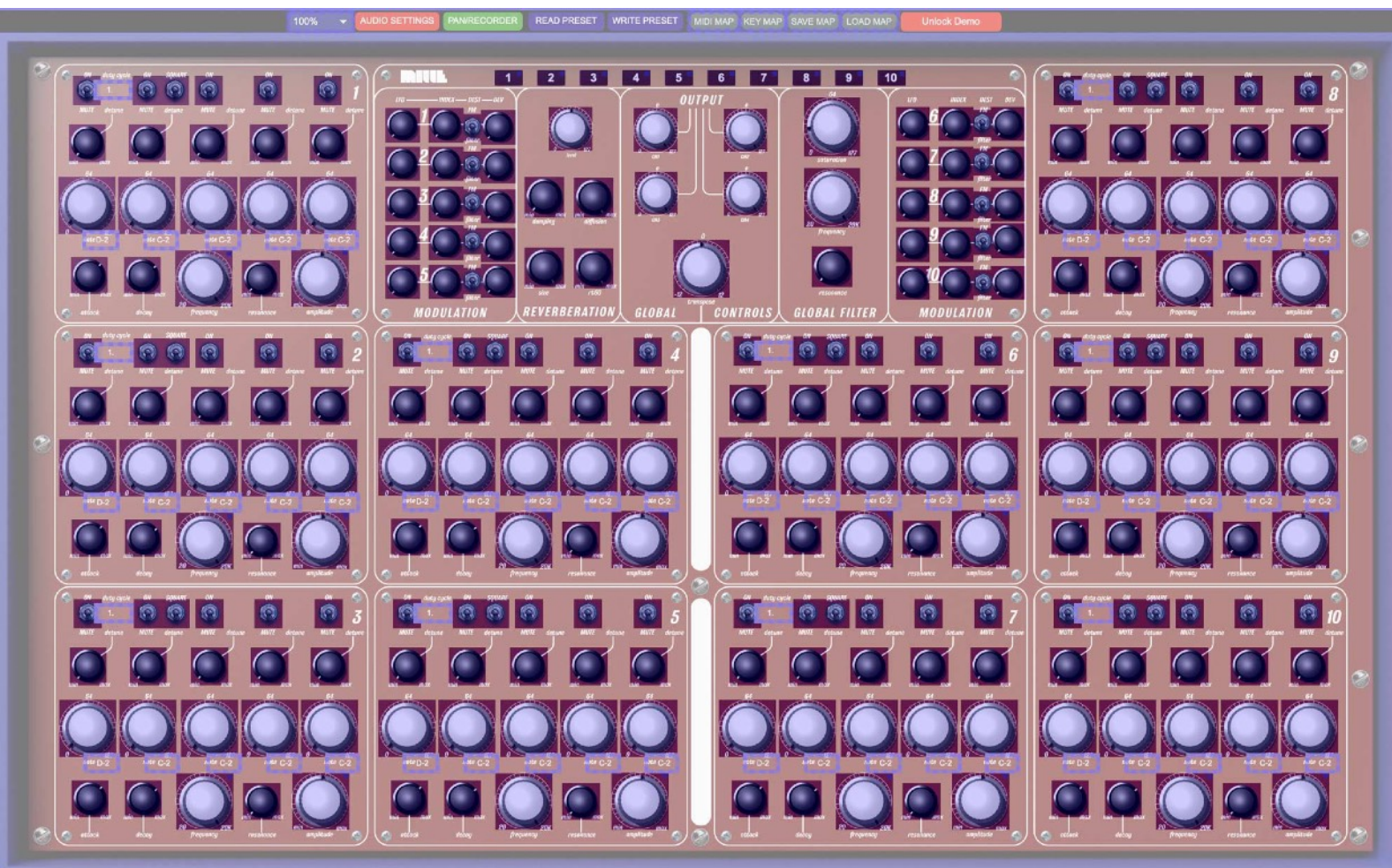
You can assign MIDI CC to the dials and controls of Mille or assign your computer keyboard to buttons.

On the upper window's menu press **MIDI MAP**, now click on one dial and move a dial on your controller, it will be automatically mapped.

To exit from MIDI or KEYBOARD MAPPING press ESC on your keyboard.

Remember to **SAVE** the mapping before quitting the program. The MIDI MAP is not saved in the user presets. KEYBOARD MAP works in a similar way but with computer keyboard instead of MIDI CCs.

MIDI NOTE MESSAGES ARE IGNORED.



STORING AND LOADING PRESETS

Simply press **WRITE PRESET** at the top of the main interface and your patch will be stored into a json file

To load a preset, simply press **READ PRESET** and load the json file you have saved.

PRESETS DO NOT STORE AUDIO FILES RECORDED IN THE 8 TRACKS RECORDER, YOU NEED TO EXPORT AND IMPORT THEM MANUALLY.



