B67 ZEN EditorLib Ver.2 Manual

Editor and librarian for Roland Fantom 6-7-8, 6EX - 7EX - 8EX, 06-07-08, Ax-Edge, Jupiter-X and Jupiter-XM

(updated versions of the manual, videos, sound banks and user guides are available at the following Link)

Operating requirements

- Install the latest available firmware on the synth
- Install the MIDI USB drivers for the Computer-Synth dialog
- Turn on and connect the synth to the computer via USB before starting the software (connection via the MIDI Din 5 pin connectors is not fast enough for using the editor)
- Leave the default value Device ID (Unit Number)= 17h in the synth configurations

Link

Fantom 6 EX https://www.roland.com/global/support/by_product/fantom_6_ex/updates_drivers/
Fantom 7 EX https://www.roland.com/global/support/by_product/fantom_6_ex/updates_drivers/
Fantom 8 EX https://www.roland.com/global/support/by_product/fantom_6_ex/updates_drivers/
Fantom 6 https://www.roland.com/global/support/by_product/fantom_6/updates_drivers/
Fantom 7 https://www.roland.com/global/support/by_product/fantom_7/updates_drivers/
Fantom 8 https://www.roland.com/global/support/by_product/fantom_8/updates_drivers/
Fantom-06 https://www.roland.com/global/support/by_product/fantom-06/updates_drivers/
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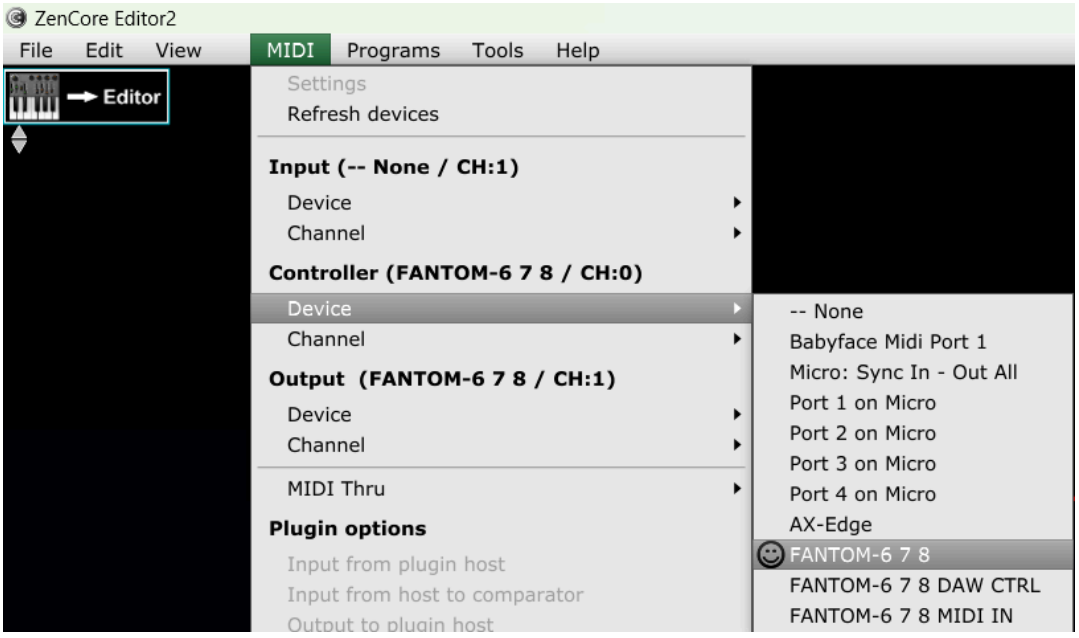
Fantom-08 https://www.roland.com/global/support/by_product/fantom-08/updates_drivers/
AX-Edge https://www.roland.com/global/support/by_product/ax-edge/updates_drivers/
Jupiter-X https://www.roland.com/global/support/by_product/jupiter-x/updates_drivers/
Jupiter-Xm https://www.roland.com/global/support/by_product/jupiter-xm/updates_drivers/

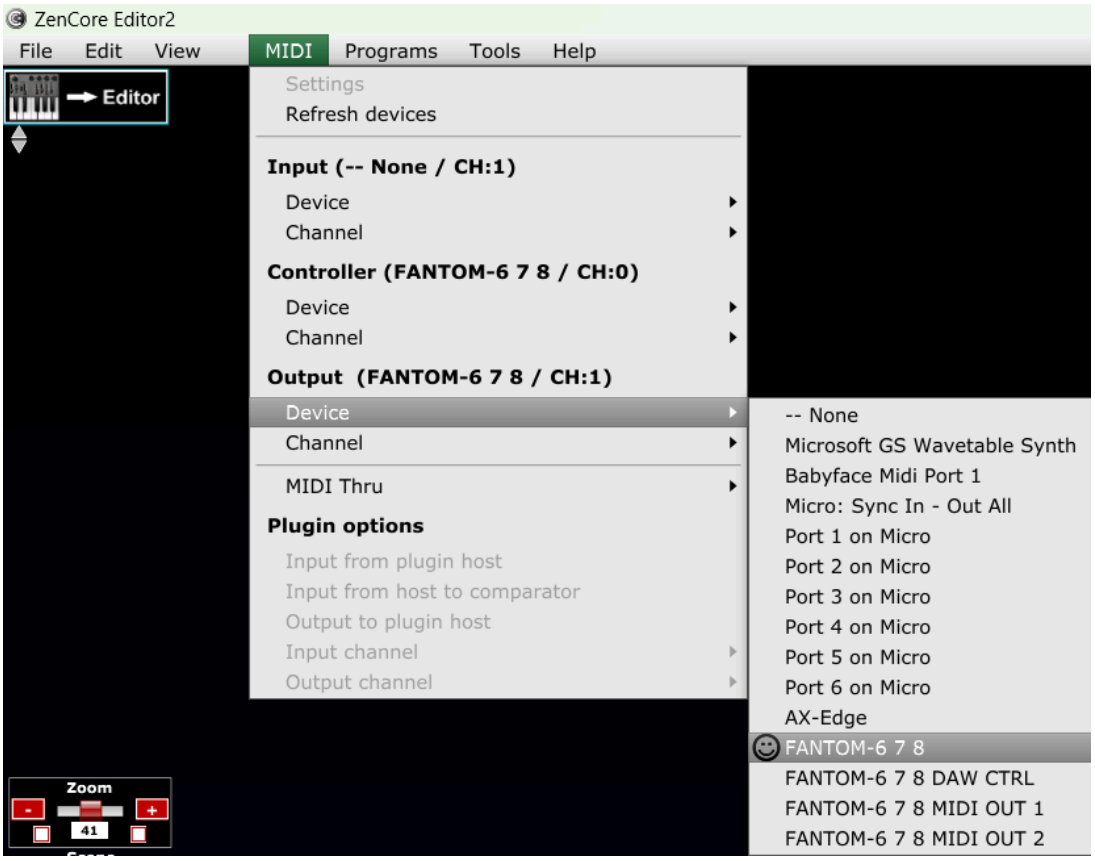
Installation

PC Version

The software is portable: therefore, just copy the **ZENCore_Editor2_XX.exe** file (ZenCore Editor2_JupX - ZenCore Editor2_Fantom or ZenCore Editor2_AXEdge depending on the version you have) in a folder of your choice and execute it by double clicking. **The software opens after 10-20 seconds depending on the speed of your PC**

On the first run, and every time you change the USB port where the synth is connected, you must select the connections between the computer and the synth using the **MIDI menu**: **the devices must be activated in Controller ed Output as indicated in the image**. The software remembers the last configuration used.



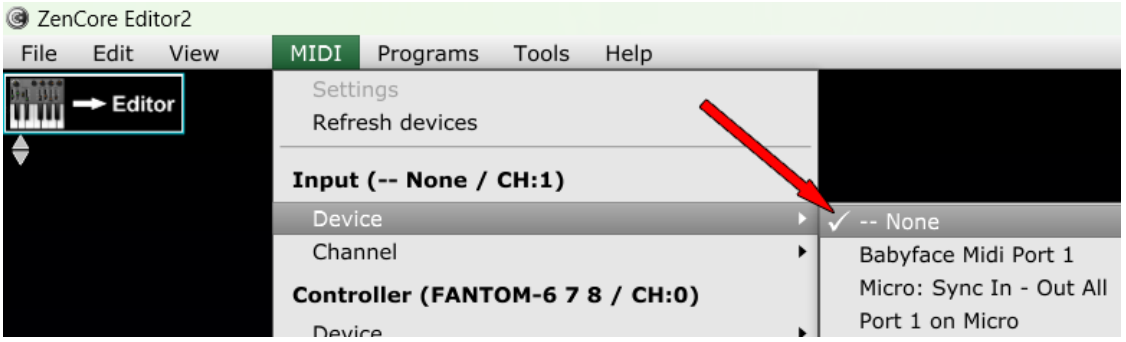


- If in various sessions of using the program the synth is connected to different USB ports, it is important to verify that the name of the driver is the correct one. Depending on the USB port to which the synth is connected, a progressive number may appear in front of the name (1- FANTOM - 6 7 8 , 2- FANTOM - 6 7 8, 3- FANTOM - 6 7 8 , etc).
- The MIDI channel setting (Channel: CH:0, CH:1, etc) is irrelevant as synth and software communicate via MIDI Sysex messages

- If the synth is not connected or the wrong devices are set, the icon appears ☹ : in this case it is necessary to exit the software, restore the USB connection between the computer and the Synth, and re-run the software correctly by selecting the active device.

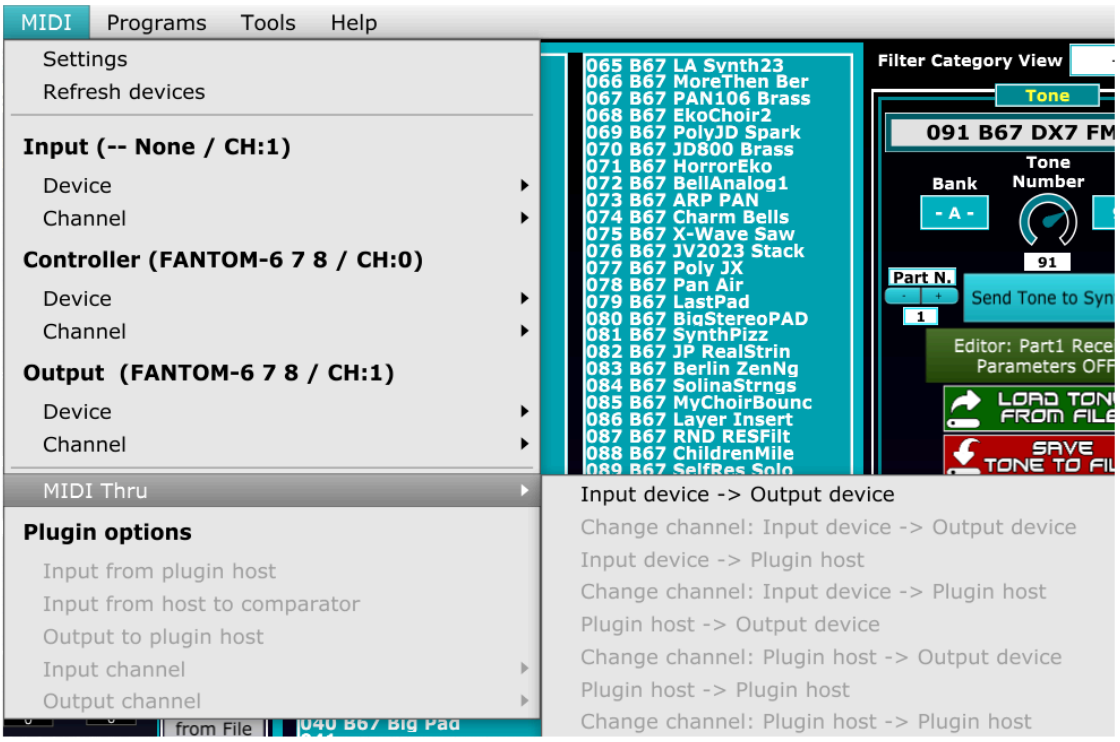
IMPORTANT:

<u>DO NOT Select</u> any synth in Device-Input (you must leave the checkmark on - - None) to avoid double MIDI messages which would make the software unusable



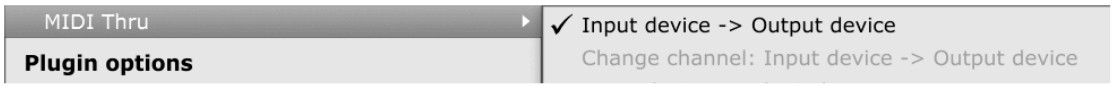
<u>Also you must NOT select</u> the option **MIDI Thru - Input device->Output device**, leaving it unchecked by default.

In summary: the MIDI screen should therefore appear like this, with the synth selected in Controller and Output, no input device (None) and Midi Thru deselected.



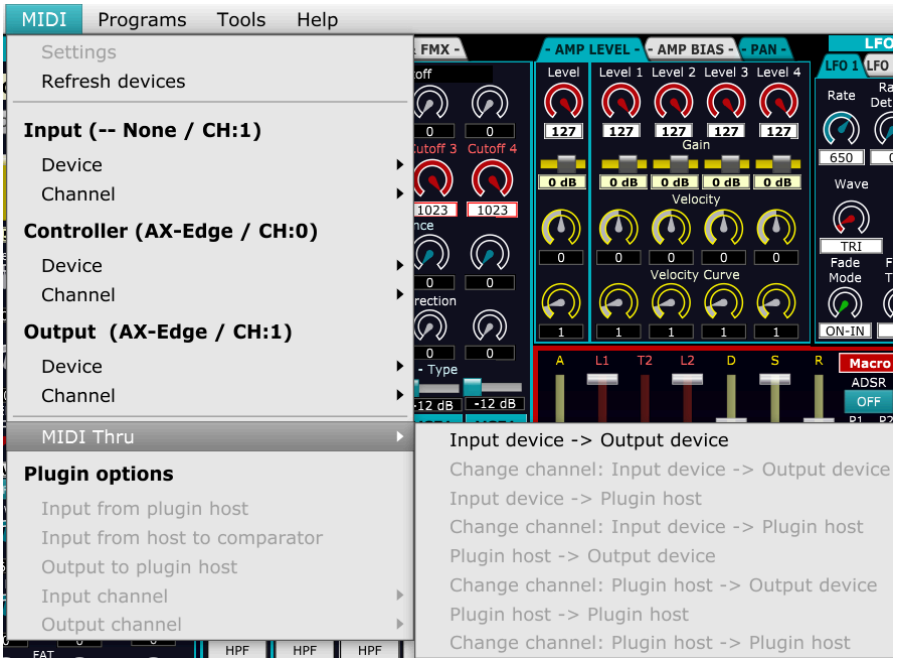
YES

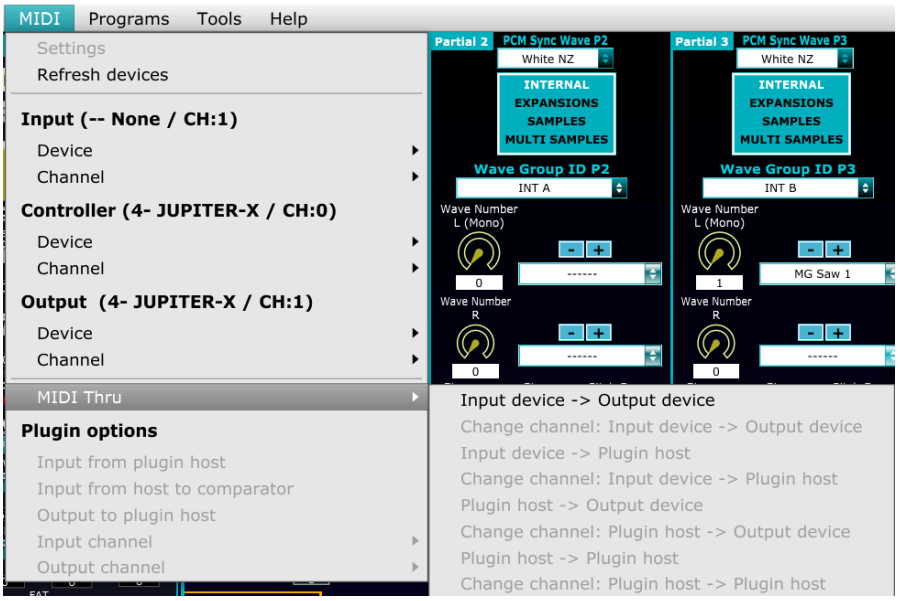
NO



The Fantom and Jupiter-X/Xm Midi drivers allow you to use the synths simultaneously in multiple software: it is therefore possible to run the editor-librarian in parallel with a DAW or any other software that uses the MIDI of these synths.

The similars screens relative to AX-Edge and Jupiter-Xm follow

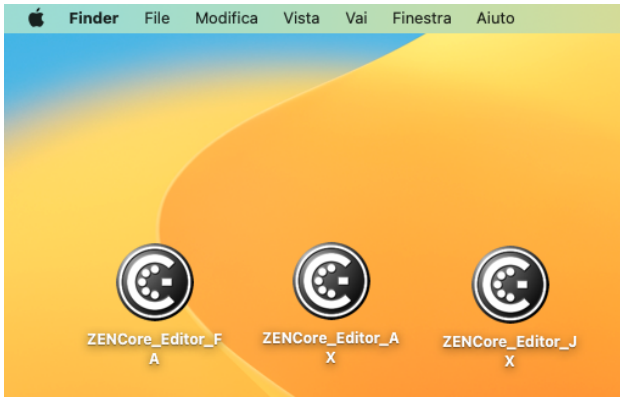




MAC version

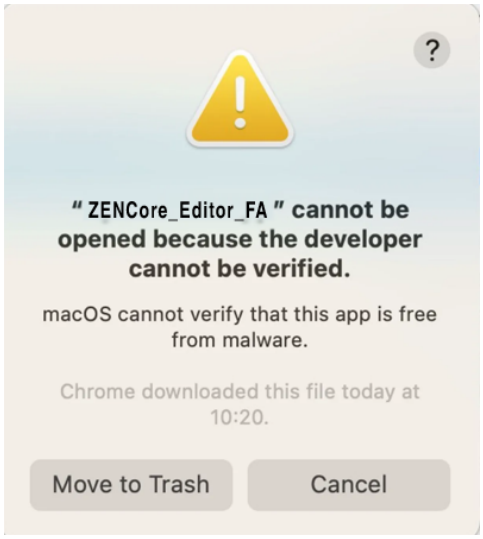
The MacOS version of the editor-librarian requires authorization from the operating system before use. This authorization must be performed the first time the program is run.
Let's see the steps.

- As a first operation, just copy the **ZENCore_Editor2_XX** file to any folder on the MAC (for example the desktop) and run it (double click).



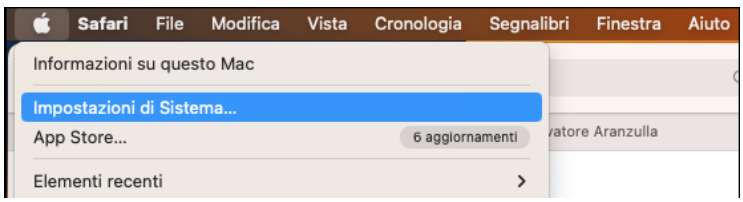
In more recent operating systems, the error message "Cannot open ZENCore_Editor_XX - developer not verified" may appear.
Let's see how to bypass the problem in the case of a more recent operating system (Ventura - MacOS 13.x/14.x) and an older one (High Sierra - MacOS 10.13).

With Ventura - MacOS 13.x the error message is



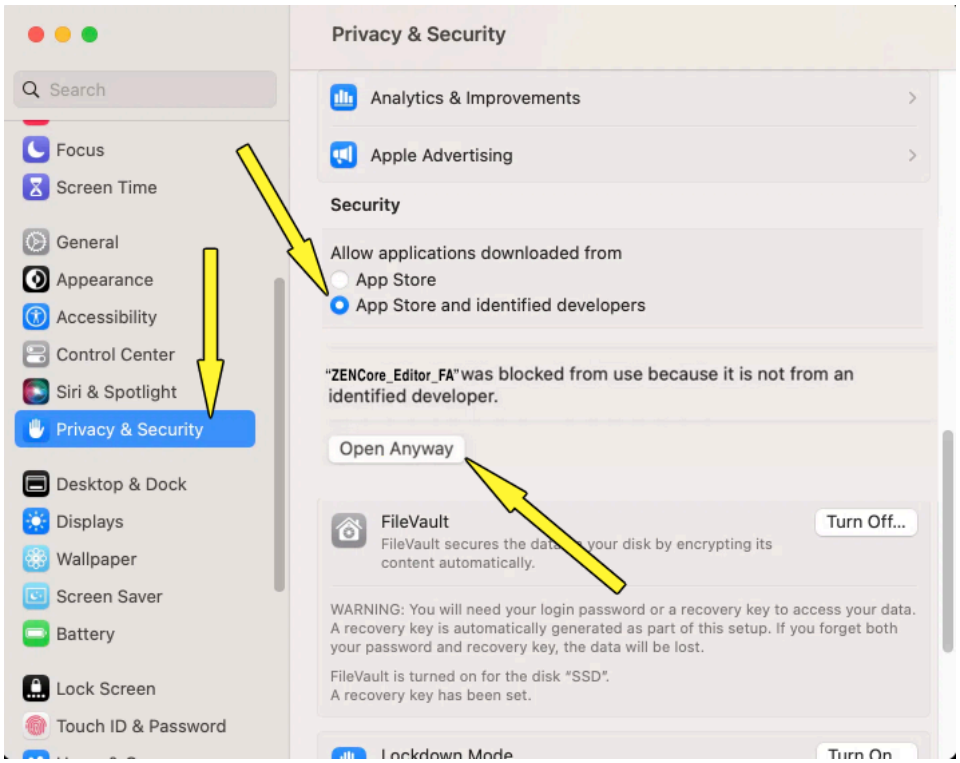
In this case you must
- click on Cancel

- go to the Apple menu > System Settings

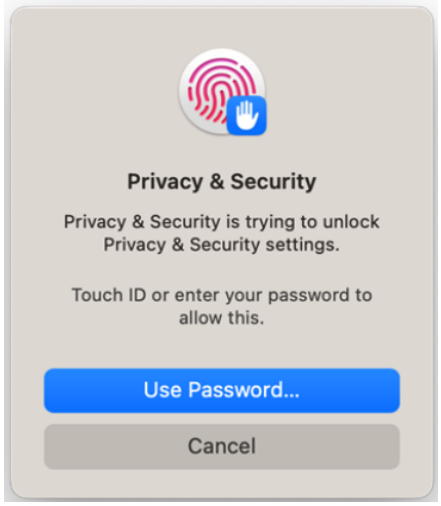


scroll down and click on **“Privacy and Security”**. .

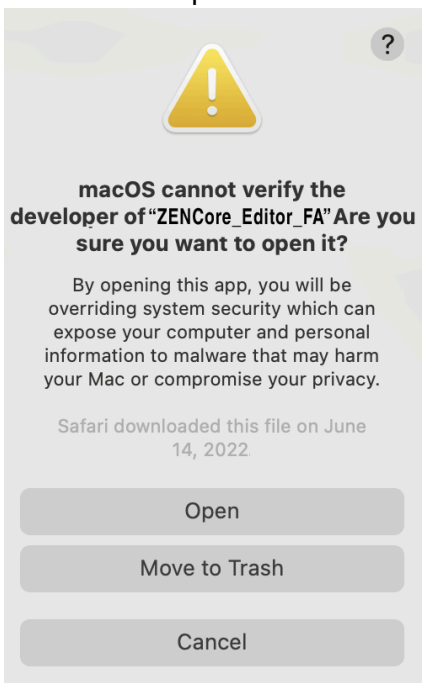
On the right in the **Security** section click on "**allow apps downloaded from - APP Store and identified developers**" and click on **Open anyway**



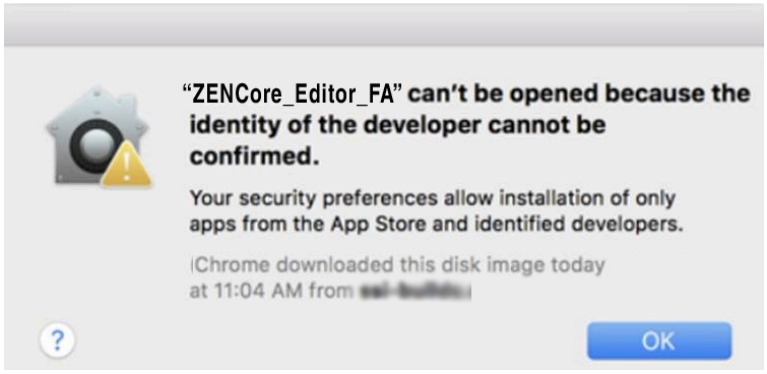
A window will then appear where you can authorize the operation with Password or Touch ID



and as a last operation click on Open

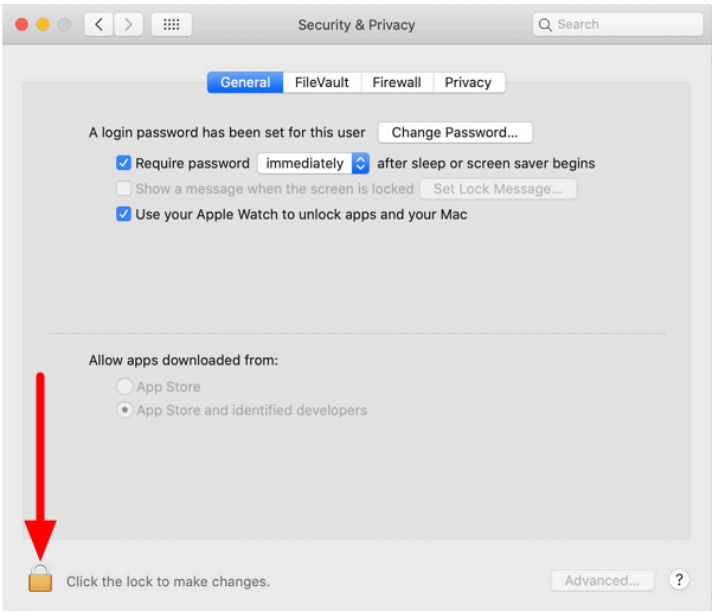


With High Sierra - MacOS 10.13 the error message is

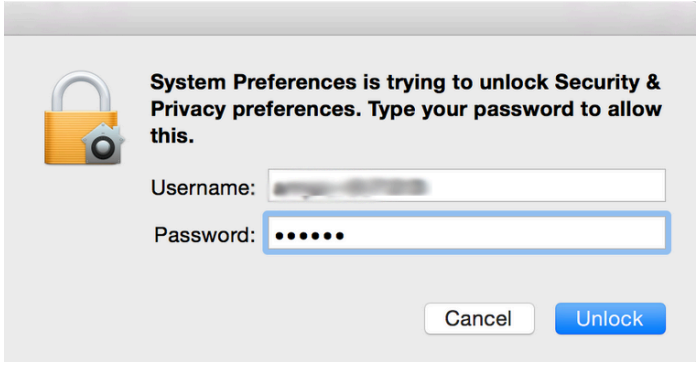


After clicking OK, you need to go to the **Apple menu** > **System Preference: "Security & Privacy"** and **"General"** tab

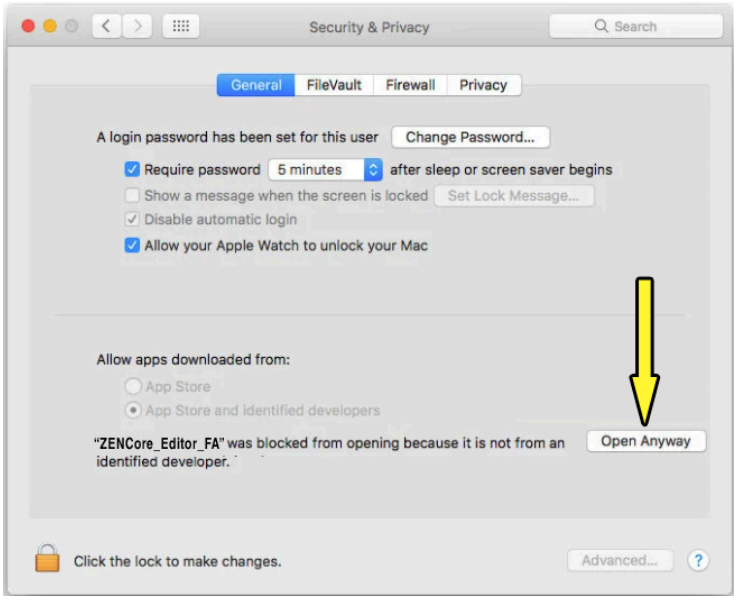
in "General" tab click on "**Click the lock to make changes**"



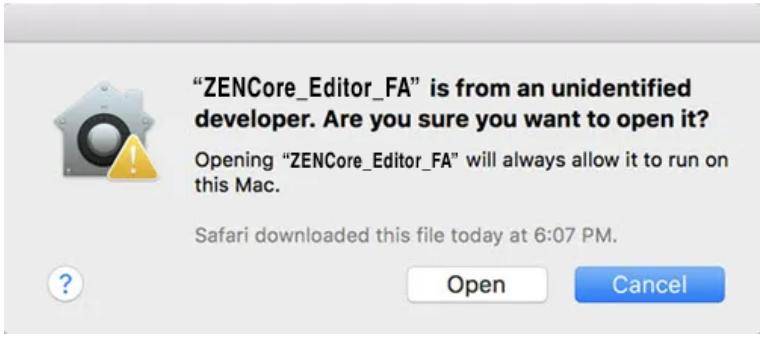
Unlock with your username and password



Click on "**Open Anyway**"



Click on "**Open**"

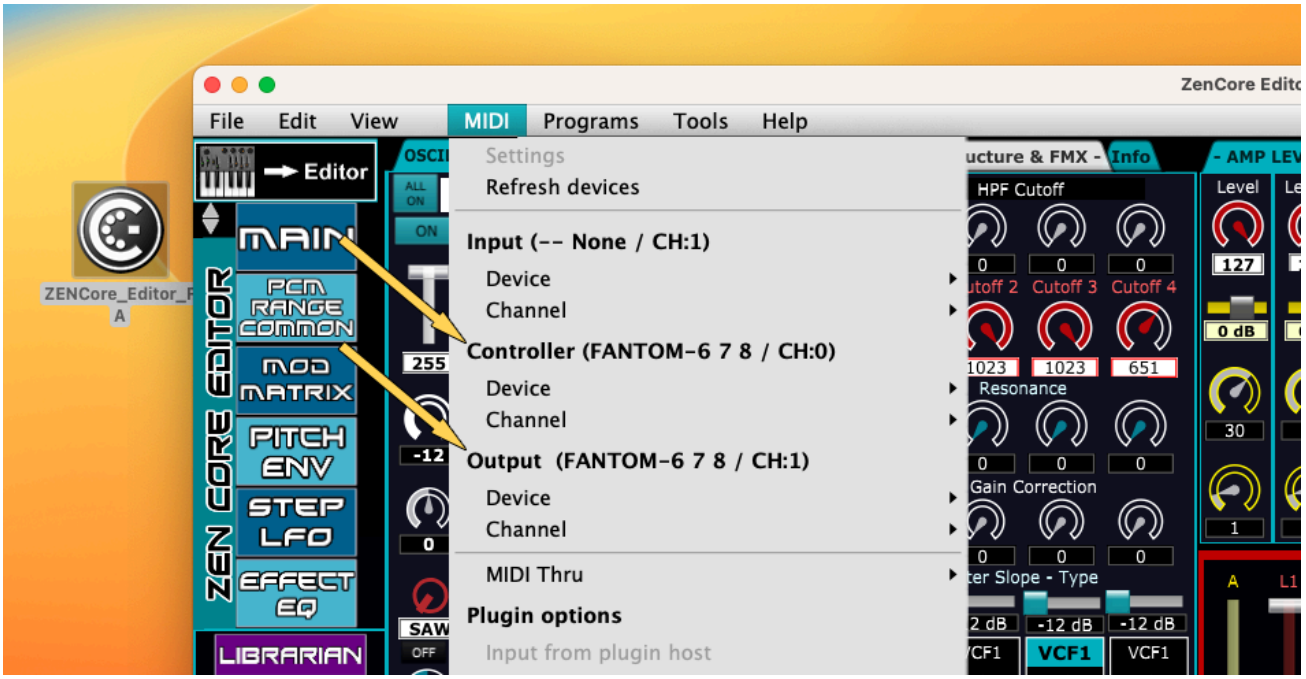


- The software on Apple Chip (M1/M2/M3/M4 family) uses **Rosetta**, which if not present will be automatically installed on Mac. In this case you need to click on Install

- Once the software is launched (double-click), wait 5-10 seconds, and after a few pages automatically refresh, it's ready for use. For computer-synth communication, **set the MIDI ports to the same settings described in the manual's "PC Version Installation" section** (the first chapter of the manual). The MIDI ports will then be remembered for subsequent launches.

  In Fantom, for example, the parameters will be those in the figure.

Input: no device
Controller: Fantom 6-7-8
Output: Fantom 6-7-8
MIDI Thru: input->Output Unchecked



Note: If you close the software, you must wait 20 seconds to use it again: this limit is related to the MIDI-USB drivers for Mac, which need time to deactivate before they can be allocated again.

Basic functionality

The software features can be divided into 4 blocks:

- ## ZEN-Core tone editing

  With the exception of very minor differences in the effects section (for example Phonograph, Exciter and JD Multi are not available for AX-Edge) and the presence of the VA Init Phase parameter recognized only by Jupiter-X/XM, this section is common to the three editor (Fantom, AX-Edge e Jupiter-X/Xm)
  The editor displays and controls all the ZEN-Core parameters required by the standard.
  It is also possible, thanks to the implementation of the MIDI SysEx messages, **to modify, use and store ZEN-Core synthesis parameters that are not directly accessible.**
  Zen-Core and virtual compatible synths (Zenology and ZC-1) use them for sound generation, but are not capable of modifying themselves.
  These hidden parameters are: **VCF Gain Correction - Partial LFO Phase Lock - Pitch Down Depth - Pitch Drift - Pitch Drift Cycle Number - Condition and VA Init Phase**
  With version 2.0 of the editor you can edit ZEN-Core tones on any part (1-4 for AX-Edge and Jupiter-X and 1-16 on Fantom): removed the editing limit on part 1.

- ## ZEN-Core Tone Librarian

  The software manages and uses a database of **16384 ZEN-CoreTones** (all resident in memory) which is structured in **N.8 libraries (Lib1-Lib2,..Lib8)** each composed of **2048 Tones**. Each of the 8 libraries is divided into **16 banks (A-B-C….P)** of **128 toni** each.
  The possible operations within the Tones database are as follows:
  - Load and Save to file the various data structures: entire database (16384 Tones), single library (2048 Tones), single bank (128 Tones) and single Tone.
  - Store the Tones transferred from the synth and modified with the editor.
  - insert and delete Tones
  - move individual banks (128 Tones) with a “Bank Clipboard” using copy and paste functionality
  - copying groups of Tones, from/to the library, with a clipboard of variable size (1-48 Tones), always visible

  The dialogue between Librarian and Synth is in real time and it is possible to transfer each tone to the synth in a fraction of a second thanks to the Synth - Computer communication speed and the ability of the software and its graphical interface to quickly manage MIDI SysEx messages.

- ## Scene Editor (Program in AX-Edge)

  Inside this section, in the software version for AX-Edge and Jupiter-X/Xm, it is possible to edit with the graphical interface the **main scene parameters** (Volume, Pan, selection of sounds, offset of the synthesis parameters, keyboard range and speed..) and of **all the parameters relating to the scene effects (Reverb, Chorus, Delay,..)**. The version of the software for Fantom contains complete editing of scene effects and editing of the main parameters of parts 1-4.
  Starting from version 2.0 of the editor you can use 40 preset reverb effects

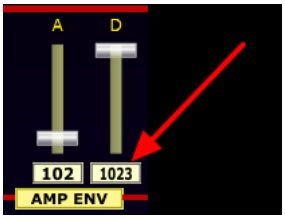
- ## “B67 ZEN FM” synthesis engine: **Editor and Librarian** (4 FM Operators + 4 Wave Shapes).

  New synthesis engine compatible with the ZEN-Core standard with editing, 20 presets, dedicated librarian (2048 tones for the B67 ZEN FM engine divided into 4 LIBs / 8 Banks of 64 tones) and the ability to load and save individual tones, Banks (64 tones), Lib (512 tones), and All Lib (2048 tones) to files.
  The librarian allows you to reload and edit a sound with the **B67 ZEN FM** engine, having access to all its parameters in the graphical interface of the engine editor.

- **AX-Edge Editor: Exclusive Features:**
  - **User Tone:** The AX-Edge software includes a specific section that enables users to **save custom or library-loaded tones directly into the synthesizer's 256 internal User Tone slots.**
  - **Program librarian:** Dedicated Librarian with the ability to save and load individual programs, Bank (32 programs), Lib (320 programs), and All Lib (2560 programs) to files. AX-Edge→Librarian programs can be transferred in groups of 32. 25 Program Presets are available. .

Graphical interface

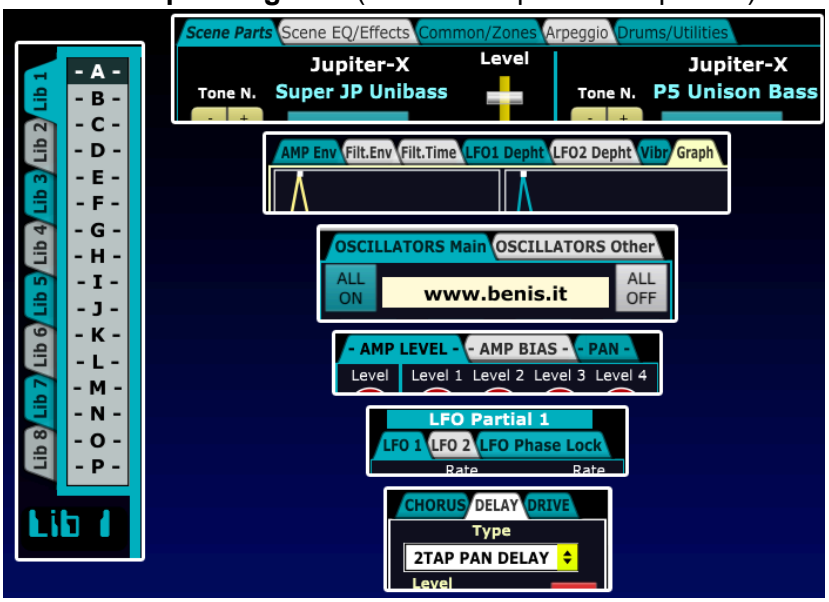
The interface of the software uses vector graphics which are resizable through the control **Zoom**.
Available controls: slider, +, -, preset Zoom=20 (square left) and Zoom=41 (square right)



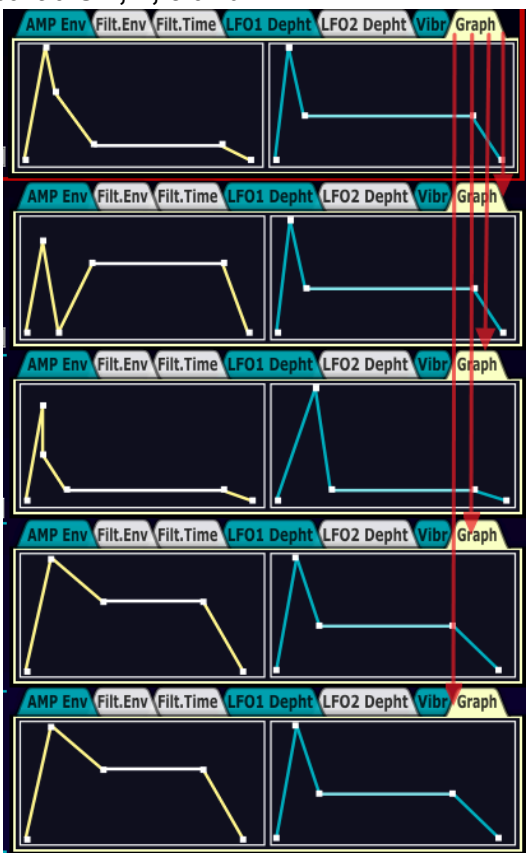
All numeric controls also allow **the value to be entered with keyboard** (type the value + ENTER): the **reset to the default value is obtained by double clicking.**

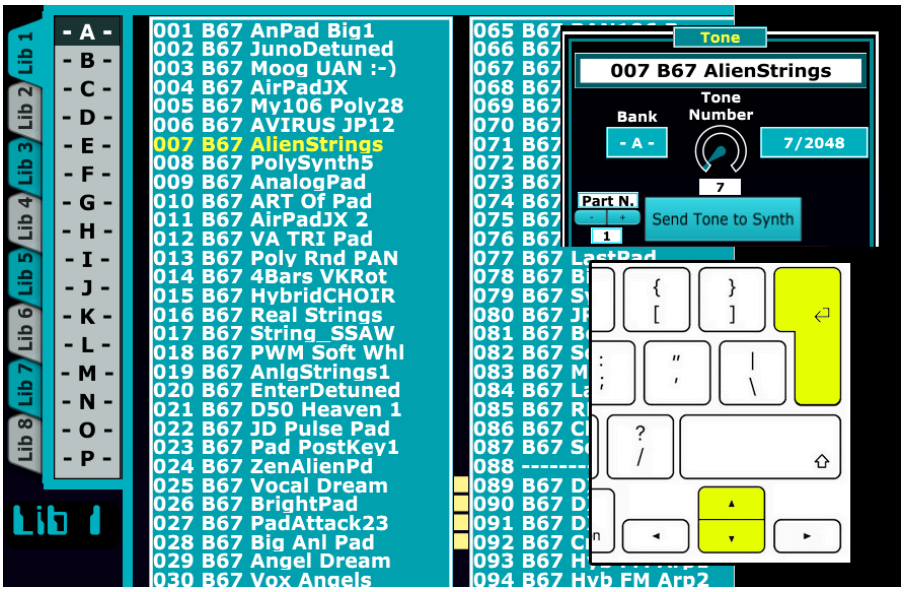
With the scroll wheel of the mouse (scroller), if available, it is possible **to increase and decrease the parameter by unit**. For some controls, where present, it is possible to obtain the same result by clicking on + and -

Numerous windows can be activated by clicking on the **Corresponding TAB** (some examples in the picture)



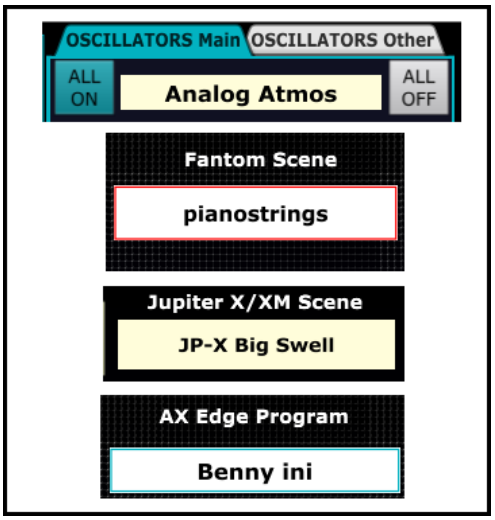
The group of TABs related to the MACRO AMP ENV, Filter ENV,....Graph) **automatically activates the 4 corresponding TABs relating to partials 1, 2, 3 and 4**.





In the lists of sounds present in the librarian section, to speed up their use, it is possible to obtain the same behavior, by operating in different ways.

- **Selection**: single click - “Tone Number” rotary control - Up-Down arrow keys.
- **Sending the tone to the synth**: double click - click on “Send Tone to Synth” - Return button



Tone and scene name editing (16 characters).

- **single click**: the 16 characters including any spaces at the end of the name are highlighted in blue

- **text input + Enter**: change the name and send it to the synth

To enter characters and have up to 16 available (maximum length of the name), it is important to **delete any empty spaces at the end of the name** which are part of the name itself.

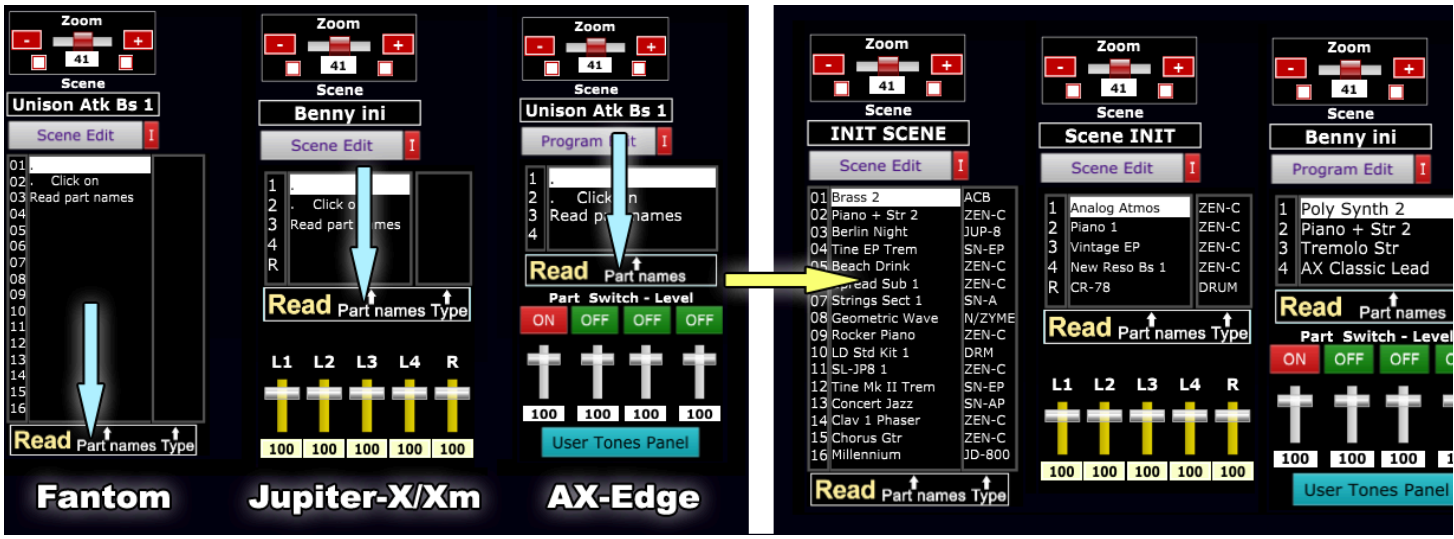
Home screen and operation

Once the software is run, the initial screen appears, summarizing the possible operations to be performed.

In order:

- Select the supported synth in the **MIDI Menu** (the last setting is remembered)
  Input: no device
  Controller: Fantom 6-7-8, AX-Edge or Jupiter-Xm
  Output: Fantom 6-7-8, AX-Edge or Jupiter-X/Xm
  MIDI Thru: input->Output. Deselected.
- Click on the icon 

to update both **the name of the scene** (program for AX-Edge) active on the synth and the **name/type of tone** present on the various parts (ACB, ZEN-Core, SN-EP, SN-A, N/Zyme, JUP-8, JD-800,...)



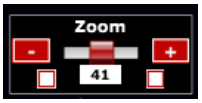
Having access to the **name/type of tone** present on the parts (1-16 in Fantom,1- 5 in JupiterX/Xm, and 1- 4 in AX-Edge), to modify a ZEN-Core tone you need to:

  - **Select the ZEN-Core tone from the list**
  - **Click the icon at the top** 

to access ZEN-Core editing

Note: it is always possible to select a part with a tone having a synthesis different from ZEN-Core (Model, ACB, SN, V-Piano, etc.) and click on Editor. Editing will obviously not be operational.

Edit the Scene (program for AX-Edge) by clicking Select a scene/program INI preset by clicking the I
As an alternative to ZEN-Core editing from the home screen, you can:

- Change the zoom by clicking + and -, the control, or the two white squares (zoom presets) 

- Edit the Scene (program for AX-Edge) by clicking 

- Select a scene/program INI preset by clicking the letter **I** 

Note: every time a new scene (program) is selected on the synth, you need to click on 

to update the name of the scene and the tones.

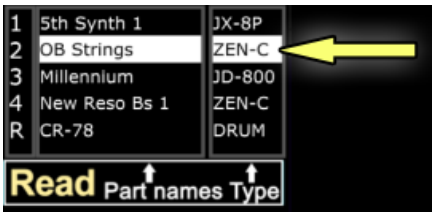
Please note, **the update removes the "Temporary Tones" from the synthesizer and, consequently, loses all ZEN-Core changes**. To avoid losing them, before proceeding, it is essential to save them to the synthesizer's memory and/or save them to a file or in the Librarian.

ZEN-Core tone editing and using MACRO

To edit a ZEN-Core tone, you need to:

- Click the icon 

to update both the **name of the active scene** (program for AX-Edge) on the synth and the **name/type of tone** present on the various parts (1-16 in Fantom, 1-5 in JupiterX/Xm, and 1-4 in AX-Edge). This update obviously makes sense if you change the Synth's Scene/Program.



- Select a ZEN-Core tone, if present, by clicking on the part **or selecting it using the keyboard arrows.** 
- **Click the icon at the top** 

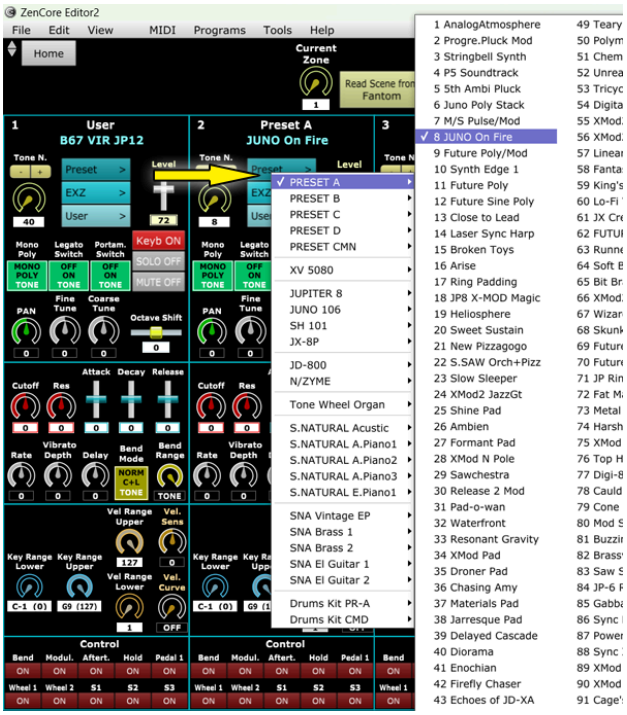
to update the various ZEN-Core synthesis parameters: the various ZEN-Core parameters will be transferred from the synth to the editor, updating all the controls and graphics in real time.

To edit ZEN-Core sounds, it's essential that a ZEN-Core tone already exists in the synth for that part: if a sound uses another synthesis engine (Model Expansion, V-Piano, SuperNatural, etc.), transferring it will have no effect. This doesn't apply to AX-Edge, which only uses that synthesis engine.

To set up a ZEN-Core tone for the desired parts, you can obviously work directly on the synth, then update the parts list with 

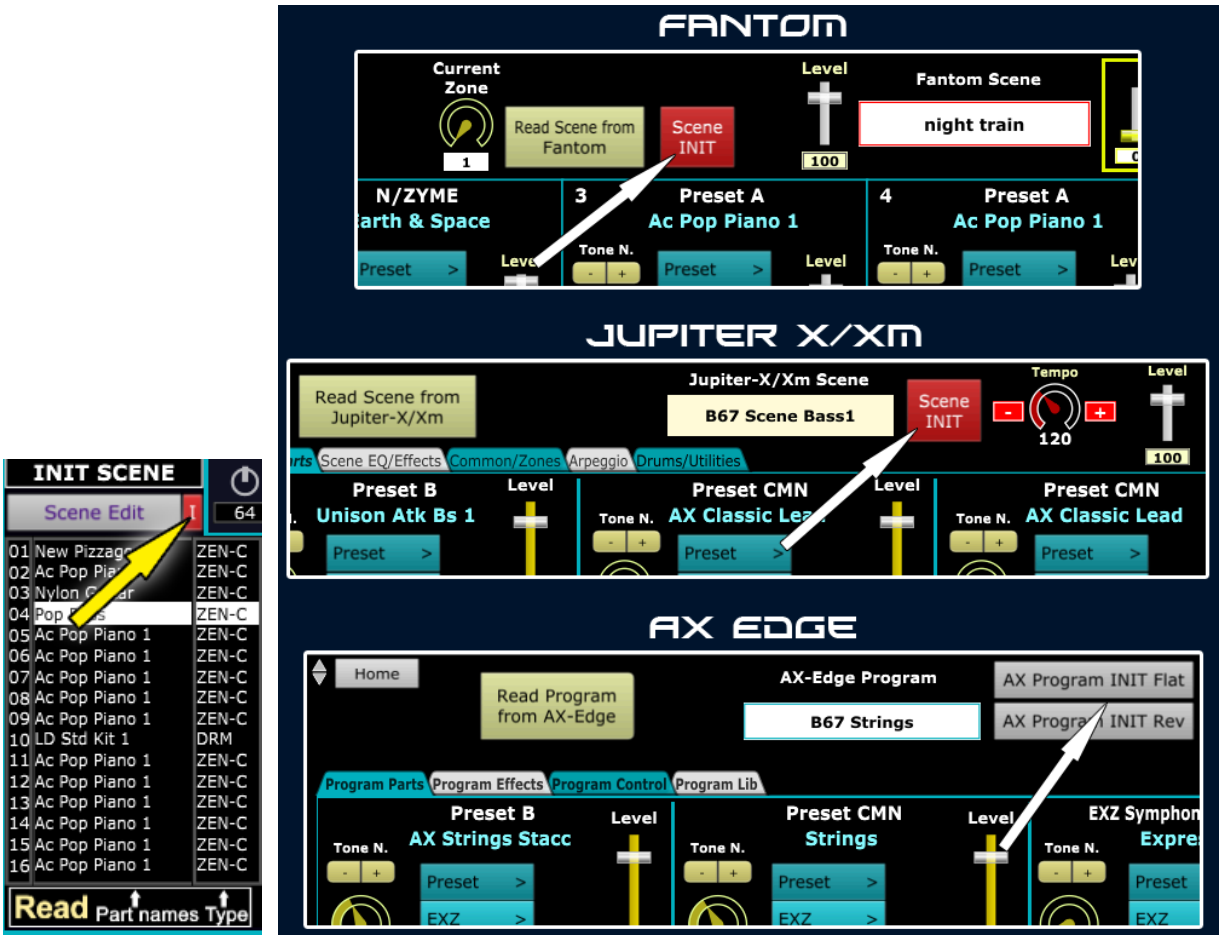
: alternatively, you can do this via the SCENE EDIT 

section of the software, where you can select any of the synth's resident ZEN-Core sounds (in the example, the PRESET A-Juno Poly Stack preset on part 2).



The last possibility is to **recall the SCENE INIT preset with the software**, **where the ZEN-Core Tones are already selected on all parts.**

To do this, you can click **on the small icon in red (I)** in the main menu or alternatively in the SCENE EDIT section (**click su SCENE INIT**)



To start editing the ZEN-Core sound, after selecting the part containing it, click on 

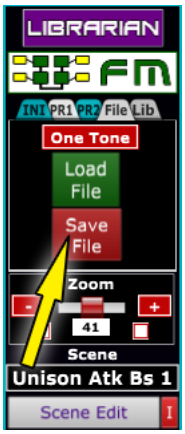
: the various ZEN-Core parameters will be transferred from the synth to the editor, updating all controls and graphics in real time**.**

Subsequently, any changes to the editor parameters will be automatically applied in real time to the synth.

You can always continue editing the ZEN-Core tone with the synth controls: to resynchronize parameters and graphics, and possibly continue editing in the editor, simply click the icon again. 

At the end of sound editing, the ZEN-Core tone can be stored in the synth through its interface: with the software it is possible to store this tone in a library location, operating in the appropriate LIBRARIAN section (click on 

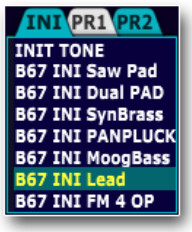
) .



It is possible to save to file the ZEN-Core tone present on the part on which editing is active by clicking on **One Tone - Save file**: the tone will be stored in the MIDI SysEx format (*.syx). If there is a sound with a different synthesis on that part, the file is not stored.

To load a single tone from a file (*.syx), click on the green **One Tone - Load file icon**: the ZEN-CORE tone is loaded from the file, transferred to the synth on the active ZEN-Core part and the tone parameters and graphics are updated in the editor (a sound with ZEN-Core synthesis must already be present on the part).

Presets



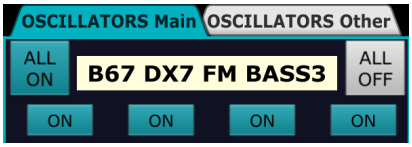
On the main screen, 24 presets are available, divided into 3 tabs.
The transfer of the **ZEN-Core tone → the selected ZEN-Core part** is done, after selection, by **double-clicking** or by using the **Return** key on the keyboard.
In the three TABs there are different types of Zen-Core timbres.

- **INI**: Simple sounds, to be used as a basis for editing.
- **PR1**: some of the sounds from the optional library (sold separately): among these also 3 FM tones with a double pair of operators (2 x carrier-modulator).
- **PR2**: sounds that using the STEP LFO functions and the related template (see below) perform melodic and rhythmic sequences. In the name there is the BPM for which it was designed, a value that must be inserted in the **time** parameter of the scene.

The various parameters of the ZEN-Core tone are divided into 6 screens, which can be activated by clicking on the relative icon:

- **Main**: Filter, Amp, PAN, LFO1, LFO2, Filter ENV e Amp ENV
- **PCM - Range - Common**: PCM Waves, Keyboard e Velocity Range, Parametri Common
- **Mod Matrix**: the modulation matrix
- **Pitch ENV**
- **STEP LFO**: the Step LFO section with activation of the “Note Sequence” template
- **Effect - EQ**: selection and editing of the 93 “Tone MFX” effects and EQ section

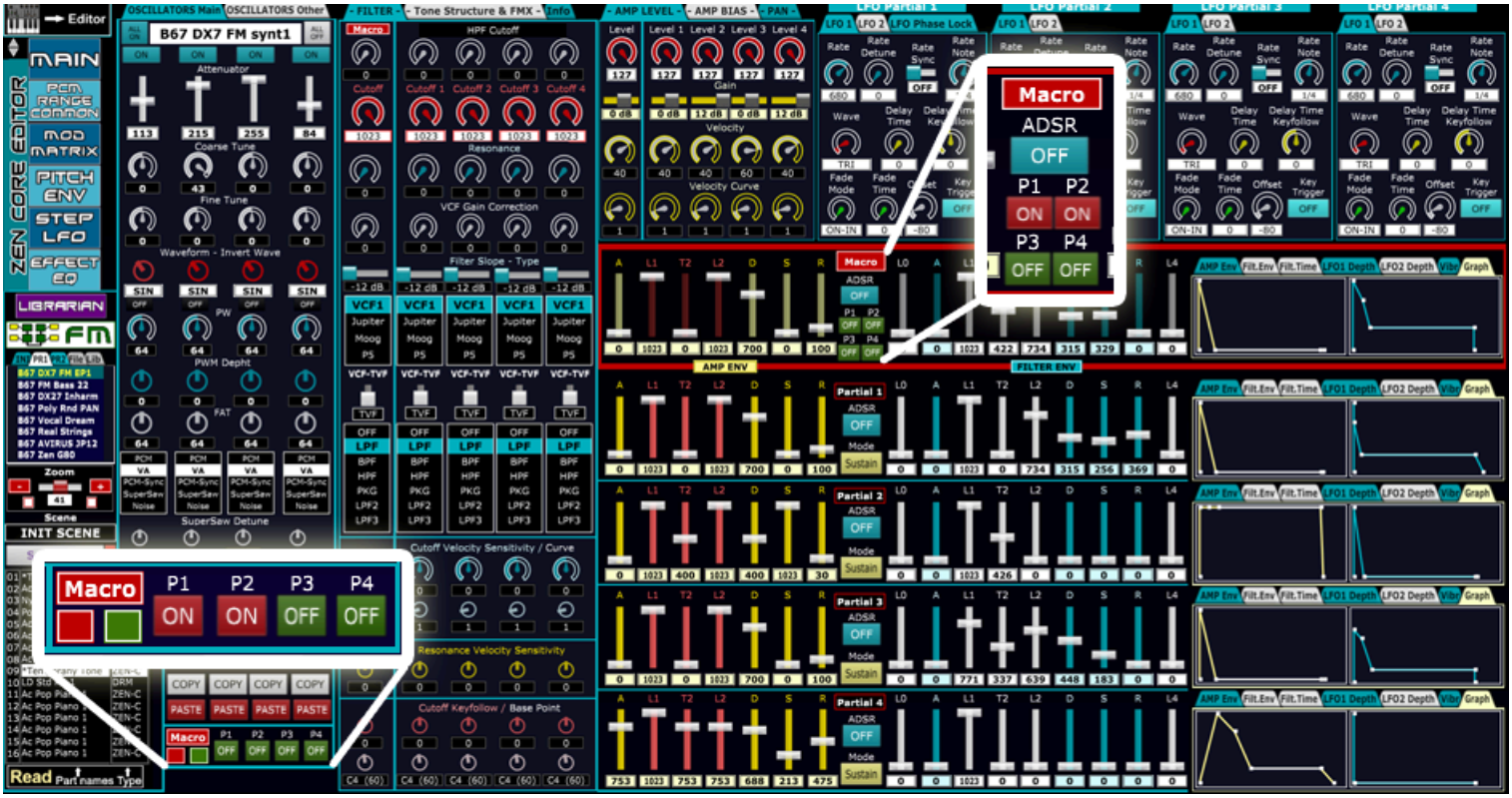
On the left, the section relating to the oscillators (the two Main and Other TABs) and the **Tone Name** are always active.
In the OSCILLATORS Main TAB, among the various parameters, it is also possible **activate and deactivate all partials at the same time** by clicking on the icons above **ALL ON** It is **ALL OFF**



Macro

In order to simplify and speed up the tone editing, for some parameters it is possible to use the **MACRO controls** which allow **the corresponding parameter of any combination of the 4 partials to be controlled in parallel** .
For example, if the Cutoff MACRO parameter is modified, the corresponding Cutoff parameters of the partials 1-2-3-4, for which the MACRO parameter is active, will be modified in parallel.
Real-time graphics make everything intuitive and visible.

To activate parameter operation **MACRO** it is necessary **to select the combination of partials that you wish to control** simultaneously.
This can be done indifferently in the two sections highlighted in the following image, **by clicking on ON-OFF of the 4 partials P1,P2,P3 and P4**: the first of the two sections is always visible and the second is present inside the macro section of the AMP and FILTER ENV. Image follows.



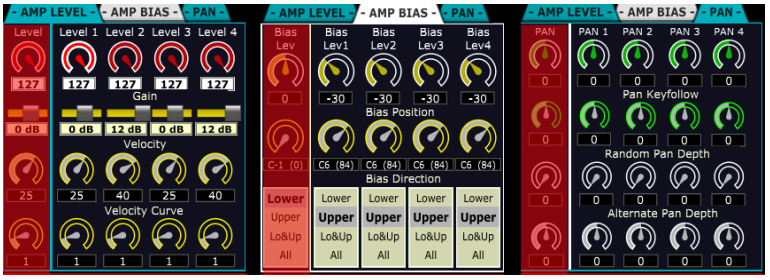
The two sections are synchronized with each other: the one at the bottom left also allows you to activate and deactivate the MACRO functionality on all 4 partials with a single click: to do this, just click on the Red and Green squares 

- **Red**: the macro parameters drive all 4 partials
- **Green**: the macro parameters do not drive any partial

The **MACRO parameters with which, as seen, the selected combination of partials are simultaneously driven**, are those in Red: when a sound for editing is loaded from the synth, their values are set to coincide with those of Partial N. 1.

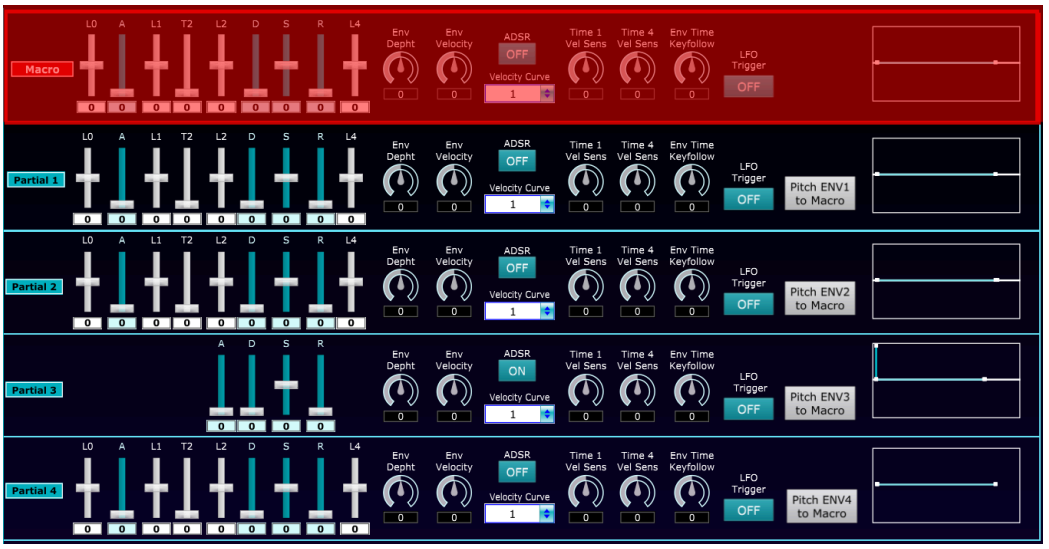
Macros in the Filter, Amp and Env section

Macro with 3 TAB Amp Level, Bias and Pan



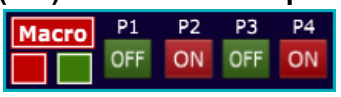
Macro in 7 TAB: Amp Env, Filter Env, Filter time, LFO1 Depth, LFO 2 Depth, Vibrato e Env Graph

Macros in the Pitch Env section



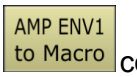
Through the MACROS it is also possible to **copy the AMP, Filter or Pitch envelope to a combination of partials of your choice**.

To do this you need:

- **Select (ON) the destination partial(s).** which will be driven by macros 

(P2 and P4 in the example)

- Click on the icon **xxx ENVx to Macro of the source envelope** that you want to copy

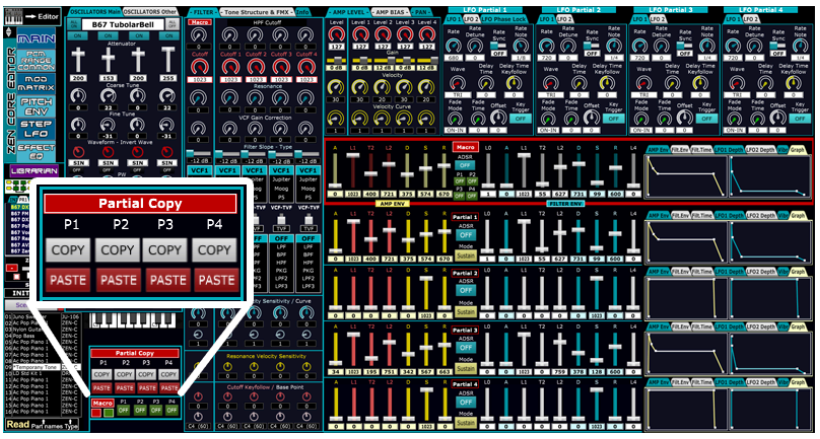
In the example (macro ON on P2 and P4) if you click on 

copy the envelope **AMP of partial 1** on the respective AMP envelopes of partials 2 and 4;

if you click on 

copy the envelope of the **Partial FILTER 3** on the respective FILTER envelopes of partials 2 and 4

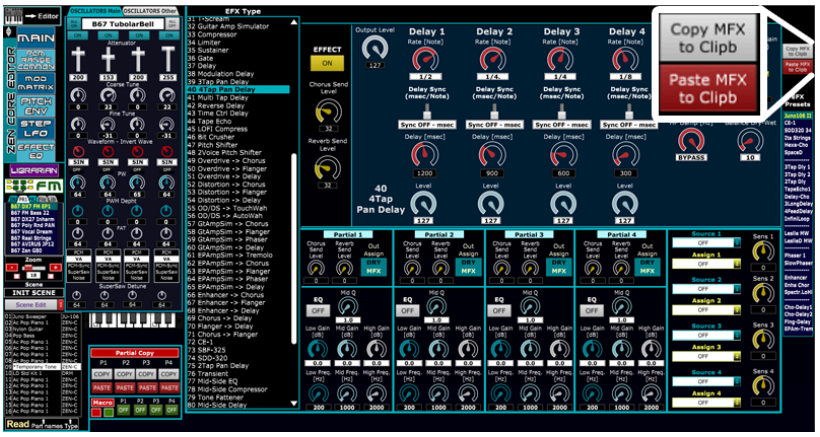
Copy and paste operations for partials and effects



At the bottom left is the section relating to **copy and paste ZEN-Core tone partials** using a clipboard.

The clipboard remains active even after loading a new sound, so as to allow for example the COPY of any partial from a previously edited Tone, and the PASTE in the current one.

The copy and paste operations do not affect the "Common" parameters of the tone (Name, Category, Mono/Poly, Unison, Tone Structure 1-2 / 3-4, Ring, X-Mod 1/2, ..) as they are not related to the single partial.

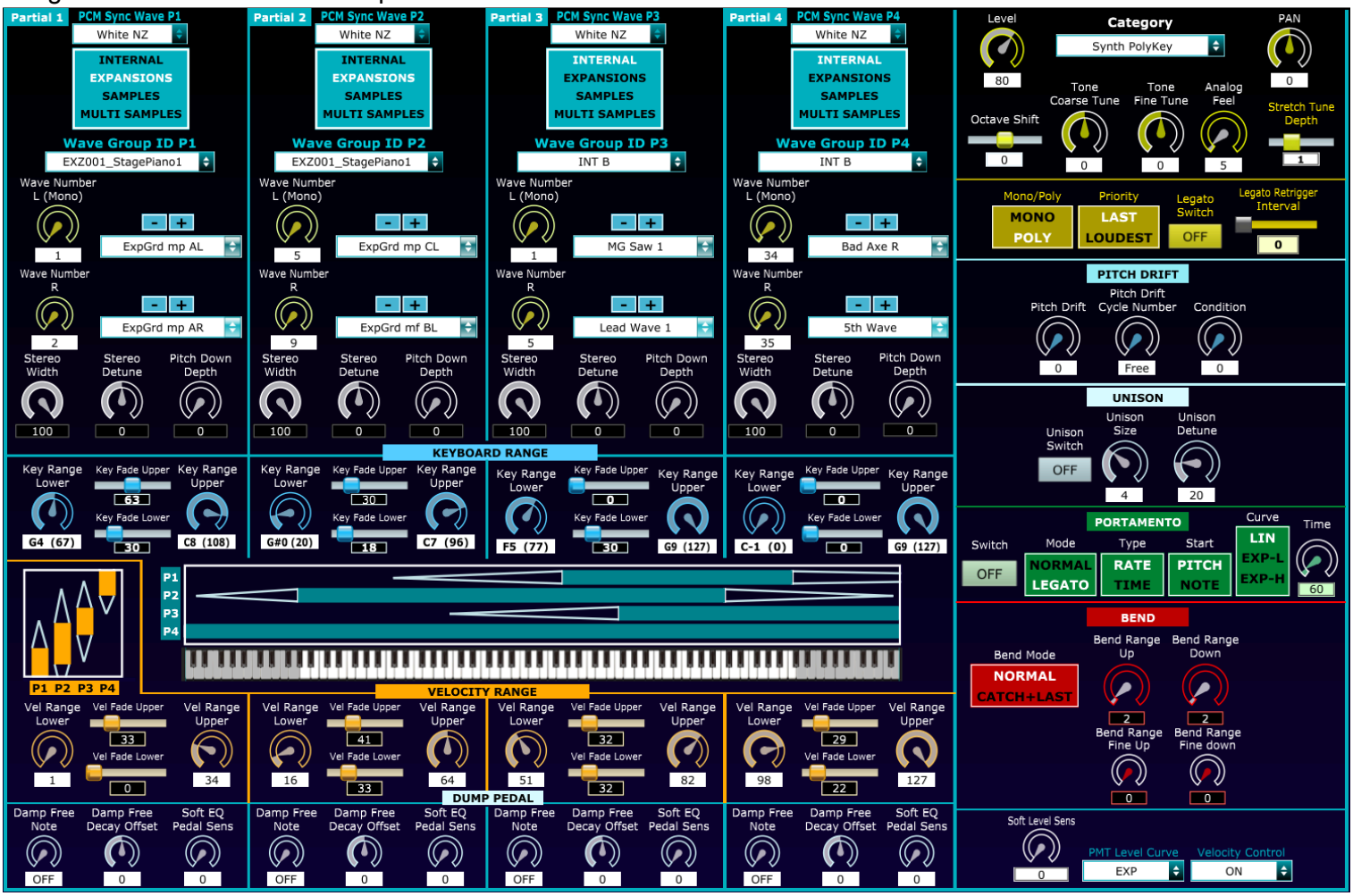


On top right in the Effect-EQ section is available **copy and paste ZEN-Core tone MFX effect.**

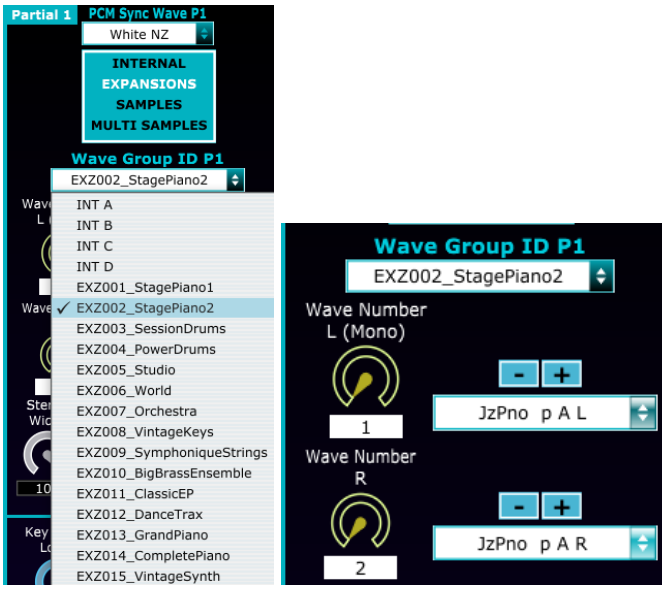
The clipboard remains active even after loading a new sound, so as to allow the COPY of the effect parameters from a previously edited Tone, and the PASTE to the current one.

PCM Section - Range - Common

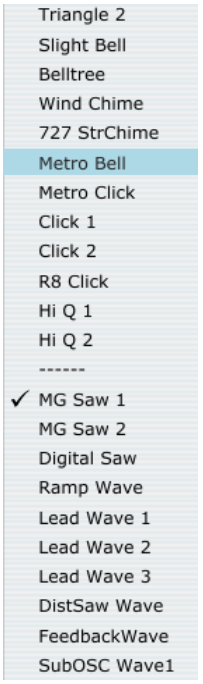
In this section of the editor you can edit the samples for the PCM and PCM Sync Partials, the Keyboard and Velocity Range and the various common parameters.



To choose the PCM samples it is possible to operate by selecting Wave Group (INT A, INT B, INT C, INT D, EXZ001… EXZ 015) and then the sample No.Wave Number L (Mono) and Right which, as for all controls, can also be entered numerically.

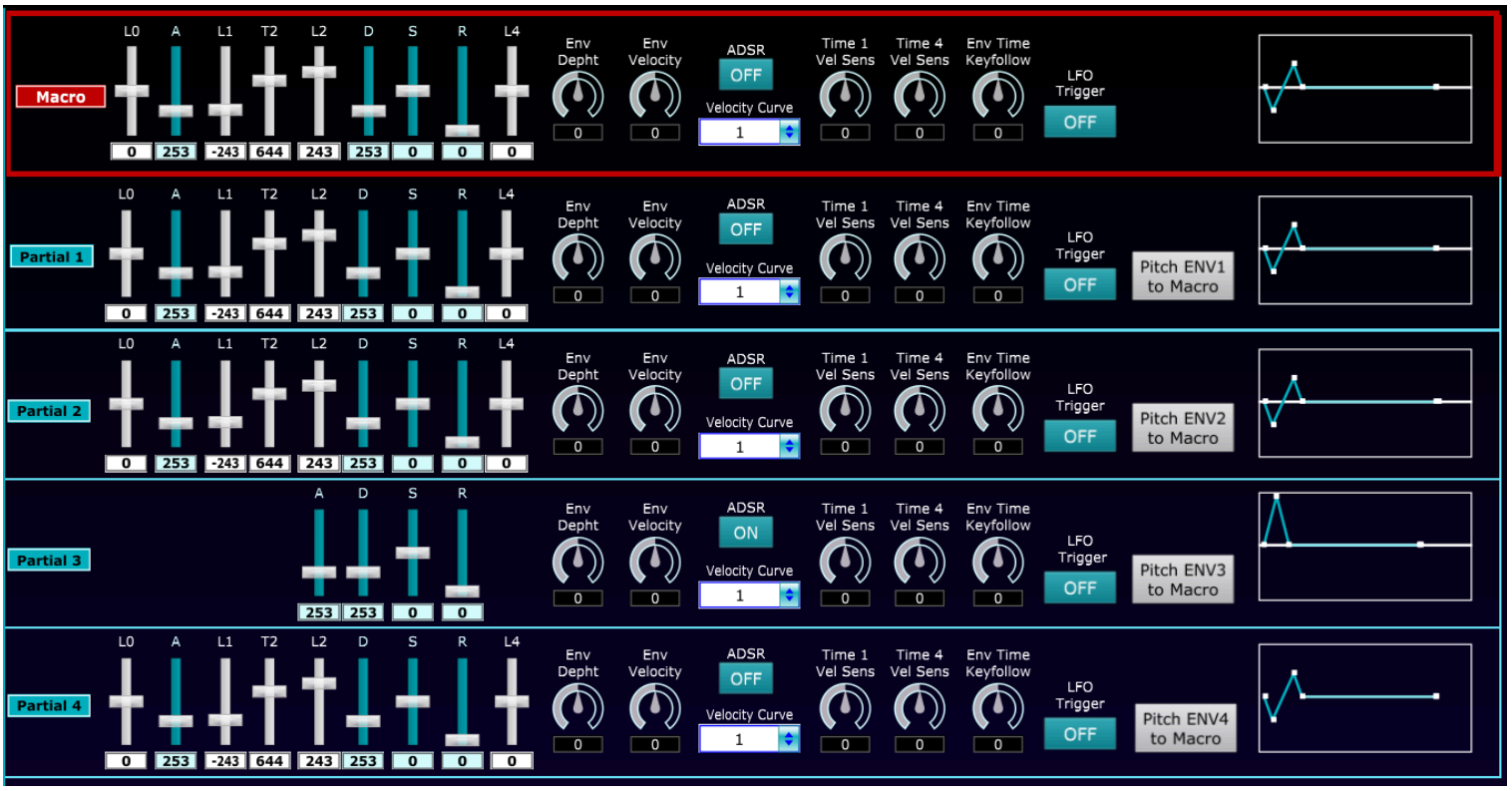


Alternatively, by clicking on the name of the sample, it is possible to scroll through those available continuously, even moving from one group to the next (in the image the last ones of the INT A bank and the first ones of INT B).



Mod Matrix and Pitch Env sections

Below are the images relating to these sections: in the Pitch Env section the 4 Pitch Env has Macro controls as for the Amplifier and Filter envelopes.



Effect- EQ section

In this section it is possible to select and modify the MFX Effects of Zen-Core tone, the EQ of the 4 partials and the modulation matrix of the effect parameters.

On the right there are some presets, divided into types, which can be recalled by double clicking on the name.

At the top right, as seen, there is the section for **copy and paste the effect.**
The clipboard remains active even after loading a new sound, so as to possibly allow the COPY of the effect parameters from a previously edited Tone, and the PASTE in the current one.

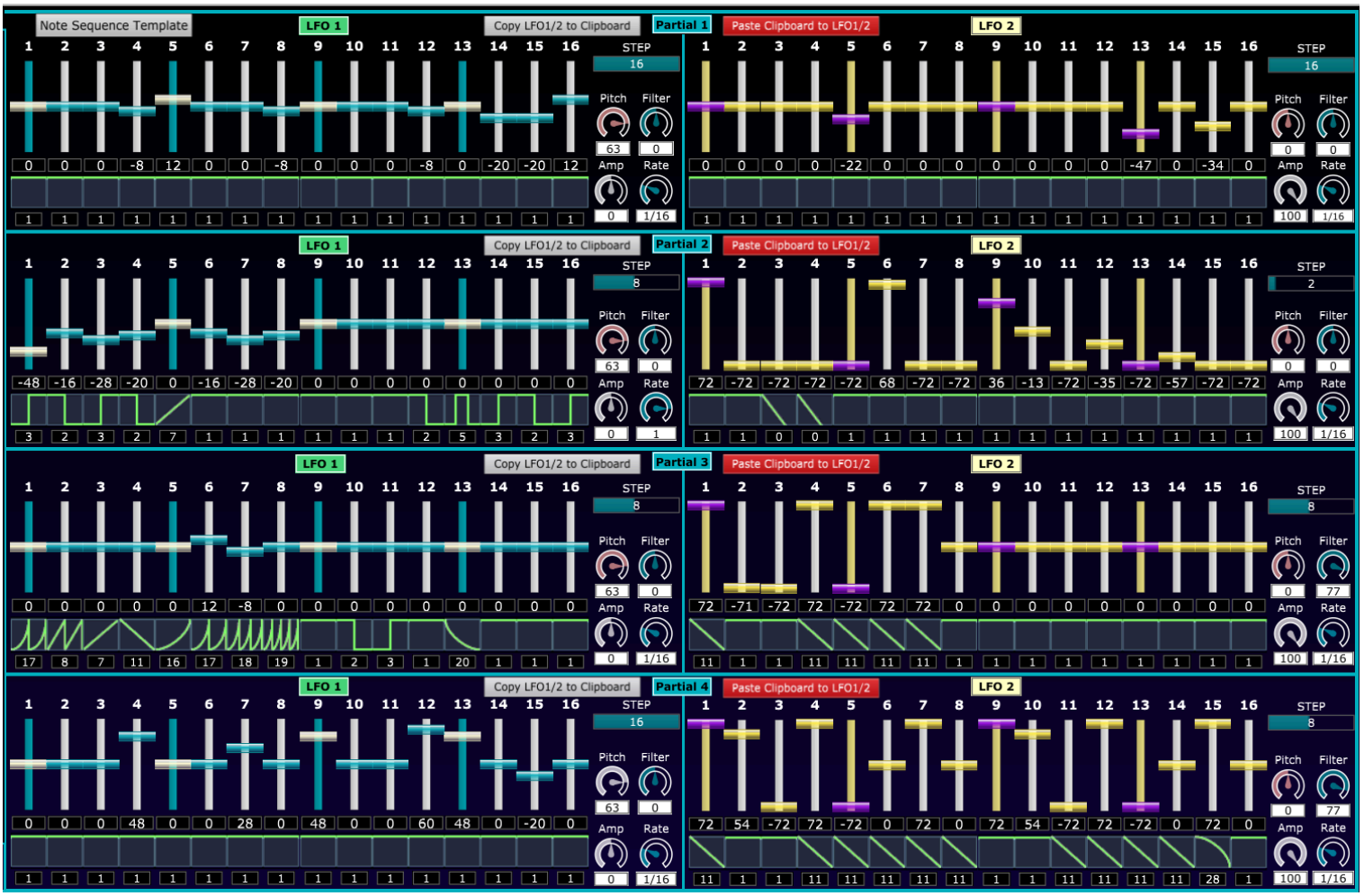
STEP LFO and TEMPLATE section for use as a STEP Sequencer

The editing section 

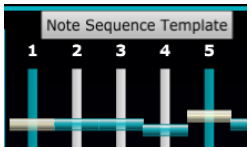
allows complete editing of the 8 STEP LFOs (LFO1 and LFO2 for each of the 4 partials) in a single screen.

The 16 steps are adjustable with the depth faders (-72 +72) and with a graphic control to select, for that step, the curve (0-36) which is represented graphically: to modify it, click on the icon and move the mouse. Alternatively you can use the mouse scroller or enter the value numerically with the computer keyboard**:** by inserting the values in succession with the keyboard, it is possible to proceed quickly as it is not necessary to press Return for confirmation.

Double clicking on each of the 16 steps resets the step depth values (default=0) and/or the step curve (default=1)



Thanks to the flexibility of the 8 STEP LFOs, it is possible to create, with a single Zen-Core tone, melodic tone and/or rhythmic sequences synchronized with the scene BPM, using a series of parameters of the ZEN-Core standard: any of these sound-sequences are available in the library that can be purchased optionally.

To simplify the programming of these sounds, there is a **template** that can be activated by clicking on **"Note sequence Template"** at the top left 

.

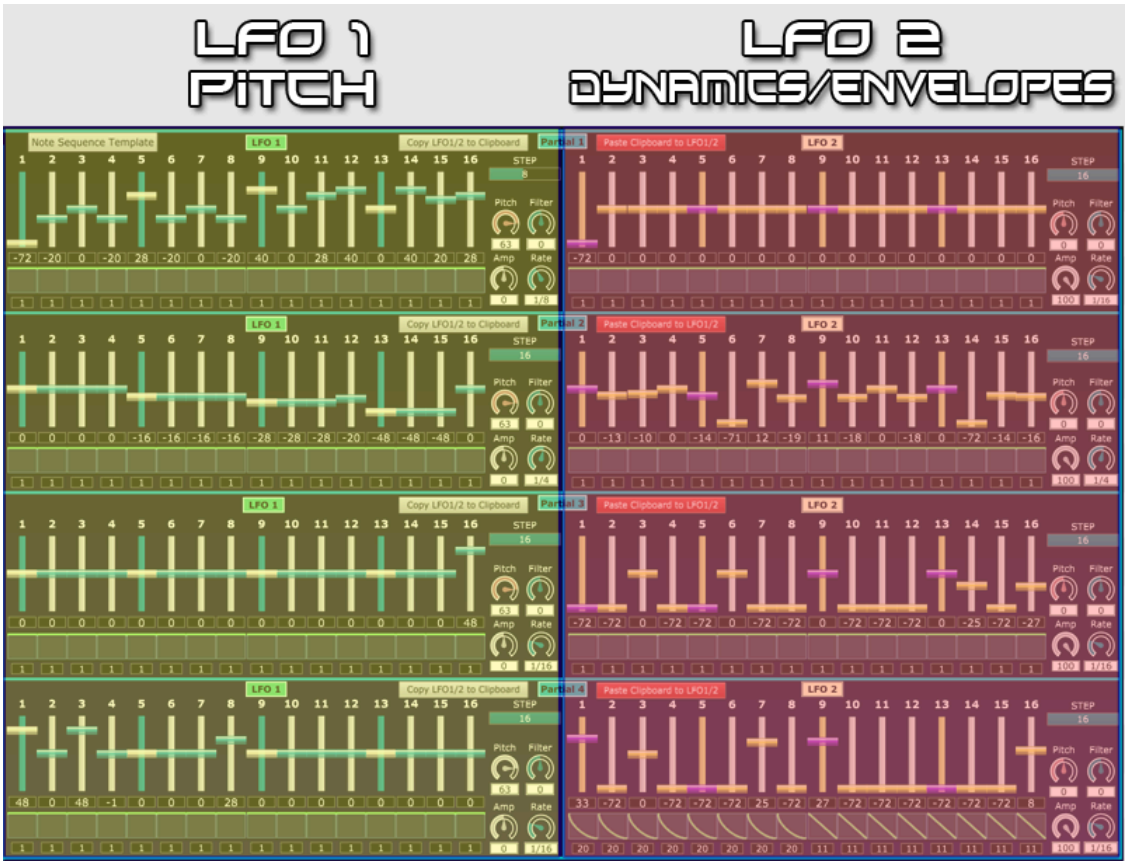
To be able to operate faster by working in a single window, the parameters controls of the modulation intensity

(Pitch, Filter and AMP) and the rate of the STEPS, are present for each LFO (these controls are duplicates of those present in the Main-LFO1-2 Depth and RATE Note section)

<u>The Template sets the parameters that allow the sound to be triggered for each step</u>: among these, on all 8 LFOs, **Wave=STEP** and **LFO Trigger=ON** are set for the Filter and AMP ENVs .

It is important to note that, **if using sampled sounds (PCM partials), the sample is NOT triggered at each step, but only at the beginning of the note**. For this reason, the dynamics of the sound that repeats itself at each step can be obtained using the Amp and Filter ENVs, using the LFO itself (see below) or with both methods in parallel.

The idea behind the template is to use **the STEP LFO1 of the 4 partials (column on the left) to program the notes of the 4 sequences** (one for partial); through **STEP LFO2 of the 4 partials (column on the right), the dynamics and, possibly, the envelopes of each step are programmed**.



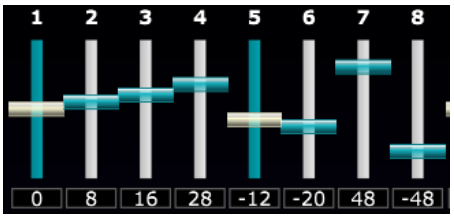
For each of the 8 LFOs, the speed and duration of the loops can be managed by setting the two values:

- **Rate** (range 1/64T - 4)**:** the speed at which the notes repeat is adjusted, in sync with the tempo of the scene (performance in AX-Edge). With multiple ranges (e.g. 1 - ½ - ¼ - ⅛ - 1/16 -1/32) it is possible to sequence, for example, a 8 bars long bass lines (Rate= ½), together with arpeggios of duration equal to one or two beats (Rate=1/32 and 1/16)
- **Step (1-16): the number of steps from which the sequence loop is composed**

To set the intonation (maximum 16 steps for each partial), use the left column: the template places a **Pitch Depth=63** on LFO1 of the 4 partials.

With the value set by the template (Pitch Depth=63) **<u>each increase - decrease of a value equal to 4 in step</u>**

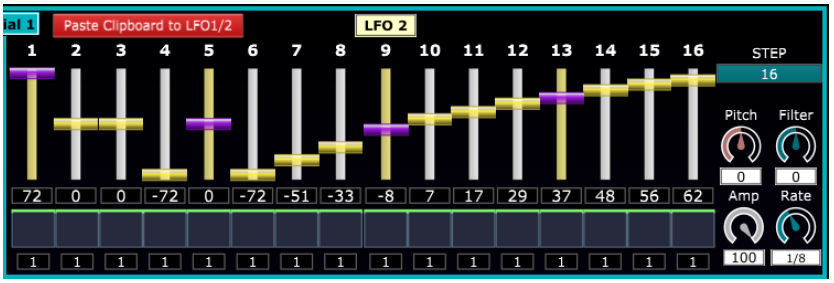
programming corresponds to an increase - decrease of a SEMITONE; the jump of an octave (12 semitones) is therefore equal to set +/- 48 (12*4)

For example, the sequence in the image (0 8 16 28 -12 -20 48 -48) 

corresponds to the note sequence C4 - D4 - E4 - G4 - A3 - G3 - C5 - C3

The combination of notes, rates and steps, all for 4 partials, allows the creation of even very complex sequences: No. of steps that are not multiple of each other (e.g. 6-8-12-16) guarantee interweaving of notes, even particularly complex.

On the right column, as seen, the STEPS of LFO2 are adjusted for the 4 partials**:** the template activates the modulation depths of the amplification equal to the maximum value **(LFO2 AMP Depht=100)**. In this way it is possible to drive the dynamics of the sequence (accents on the single notes): in particular, to silence the note for that step, it is necessary to set the fader that controls the amplitude to a value = -72.

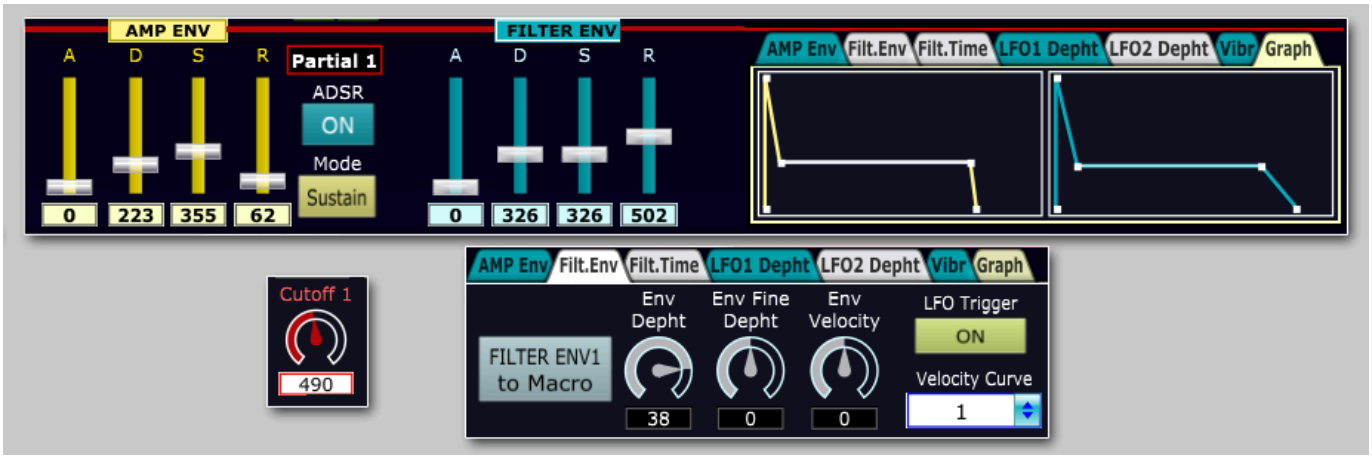


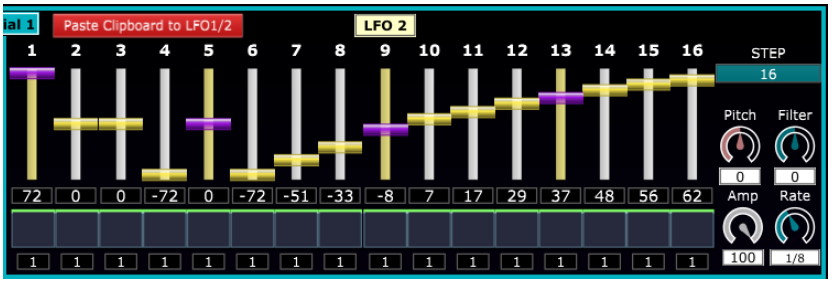
In the example the first note of the loop will be accented; No.4 and No.6 will be silent. From No.7 to No.16 there will be an increase in volume.

For rhythmic sequences with percussive sounds obtained in VA synthesis, the alternation of + - 72 simulates the alternation between Note ON and Note OFF.

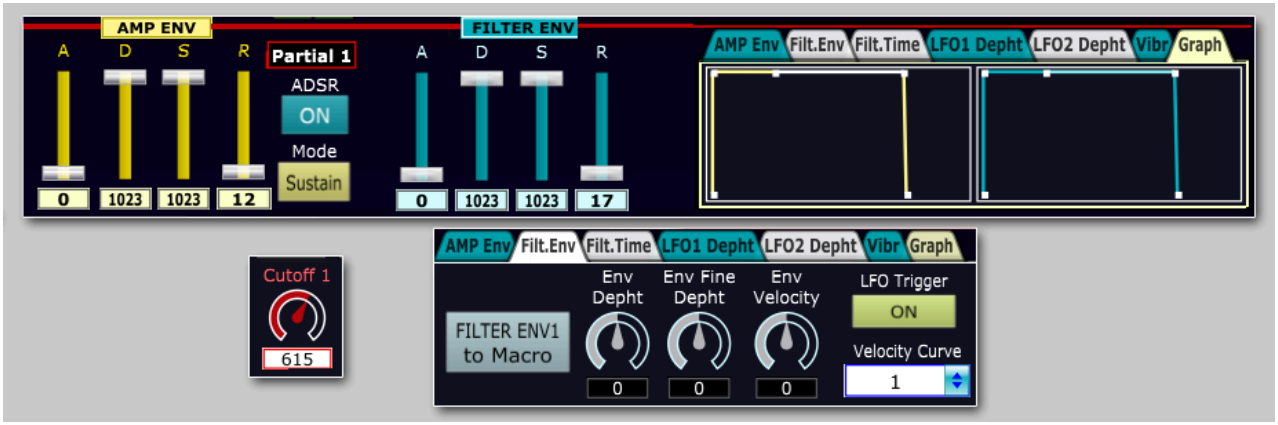
To have a variation of filter and amplitude of the sound at each step, (it is not possible for this purpose to use the dynamics of PCM sounds that are triggered only once), there are mainly two methods.

- **The first method,** the simplest, is to **shape sounds with ZEN-CORE synthesis amplitude and filter envelopes** (here for example the synthesis parameters of a plucked VA sound - with a VA oscillator with SAW waveform)



Then, by setting the faders in the 16 steps of LFO2 (with AMP Depth=100) you adjust the volumes of the sequence 

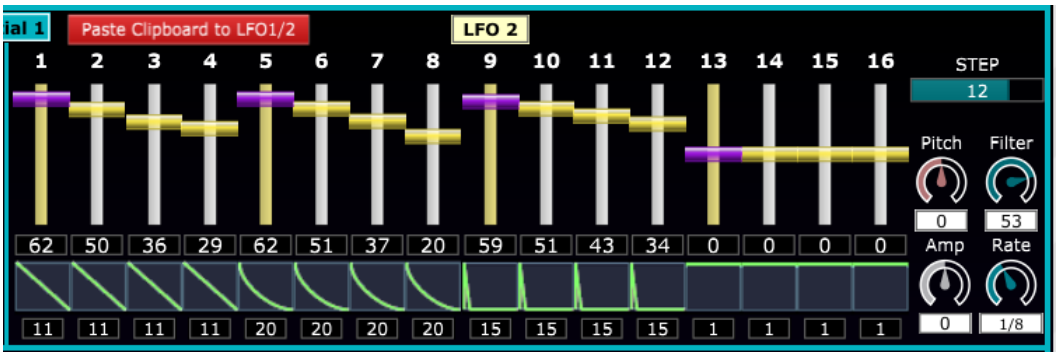
- **The second method** is to use **VA sounds with FLAT AMP and FILTER envelopes (sustain=MAX=1023) and shape the filter and/or AMP at each step using the LFO2 curves.**



To shape the envelopes, at each step, and relative volumes, **the most suitable curves for this purpose are those with values of 11-20 and 15** 

(progressively more percussive curves).
Here is an example (with N. of STEP equal to 12) where the following have been set:
- step 1-4: percussive ENV
- step 5-8: more percussive ENV
- step 9-12: almost impulsive ENV.

The fader values adjust the intensity with which the ENV shapes change the filter cutoff (in the example = 53)



Obviously it is possible to start from the template to obtain more complex modulation sequences and steps, moving away from the distinction set by the template (left column for pitch and right column for dynamics and ENV).

IMPORTANT: due to the structure of the ZEN-Core synthesis, if partials with **sampled sounds (PCM)** are modulated by the STEP LFO, as already seen, the note will NOT be re-triggered at each step, but only the first time. For this reason i**t is not possible to use PCM samples of drums to simulate rhythmic patterns**: it is possible to do so, like in the optional bank and in two presets, synthesizing them with **VA oscillators, noise, filters and env.**

By using multiple Zen-Core Tones with sequences and rhythms in splits or layers (up to 16 parts in Fantom and 4 for Jupiter-X/Xm, Ax-Edge,...), numerous synthesis and performance possibilities can be obtained.

Unless there are particular sequences, **it is advisable to set the tone in monophonic mode.**

It should be noted that the sequence thus obtained, **with sustain pedal=ON, remains active even when the note is released**. (useful for example for improvising, in analogy to a loop station)

Hidden ZEN-Core synthesis parameters

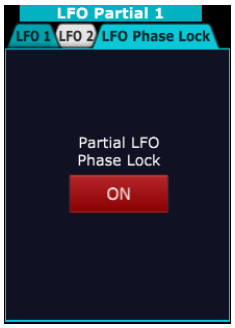
The ZEN-Core synthesis engine uses some hidden synthesis parameters internally: both the ZEN-Core compatible synths and the virtual Zenology do not leave the user the possibility of seeing or modifying them, even if they are used in the same way as all the others.

These parameters are indicated in the various documentation relating to the MIDI Implementation of Fantom, Fantom-0, AX-Edge, Juno-X and Jupiter-X/XM.

Through MIDI System Exclusive messages, the software is able to read them, modify them and make synths use them like all the others.

Here is the list of those available:

VCF Gain Correction (also available as a Macro for the 4 partials): when VCF Resonance >0, the gain reduction is compensated.



Partial LFO Phase Lock (control present in TAB inside LFO Partial 1): all the parameters of LFO1 and LFO2 of partials 2-3 and 4 (Rate, Waveform, Delay Time, Fade,...) are synchronized with those of LFO1 and LFO2 of Partial 1.

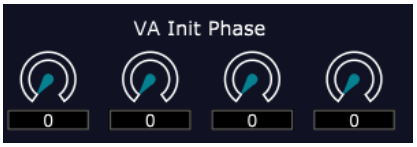
The synthesis engine, with **Partial LFO Phase Lock=ON**, corresponds to that of a 4-partial synth where LFOs 1 and 2 operate identically on all partials.
It is the method used for the emulations in Model Expansions.

Pitch Down Depth (control in the PCM-RANGE-COMMON section): reduces the oscillator frequency up to fractions of Hz.

The main use is to activate it together with the Structure 1-2 (3-4) Sync, Ring, X-Mod and X-Mod2 modes using the intermodulations between the oscillators

Pitch Drift - Pitch Drift Cycle Number - Condition (control in the PCM-RANGE-COMMON section): emulates the imperfections of analog synths.

- **Pitch Drift (0-255):** amount of pseudo-random pitch oscillations
- **Pitch Drift Cycle Number (Free, 1,2…8):** cyclicity with which the voices alternate. Ex. 6= emulation of a 6-voice synth.
- **Condition Drift:** quantity of pseudo-random pitch oscillations, Cutoff and Volume



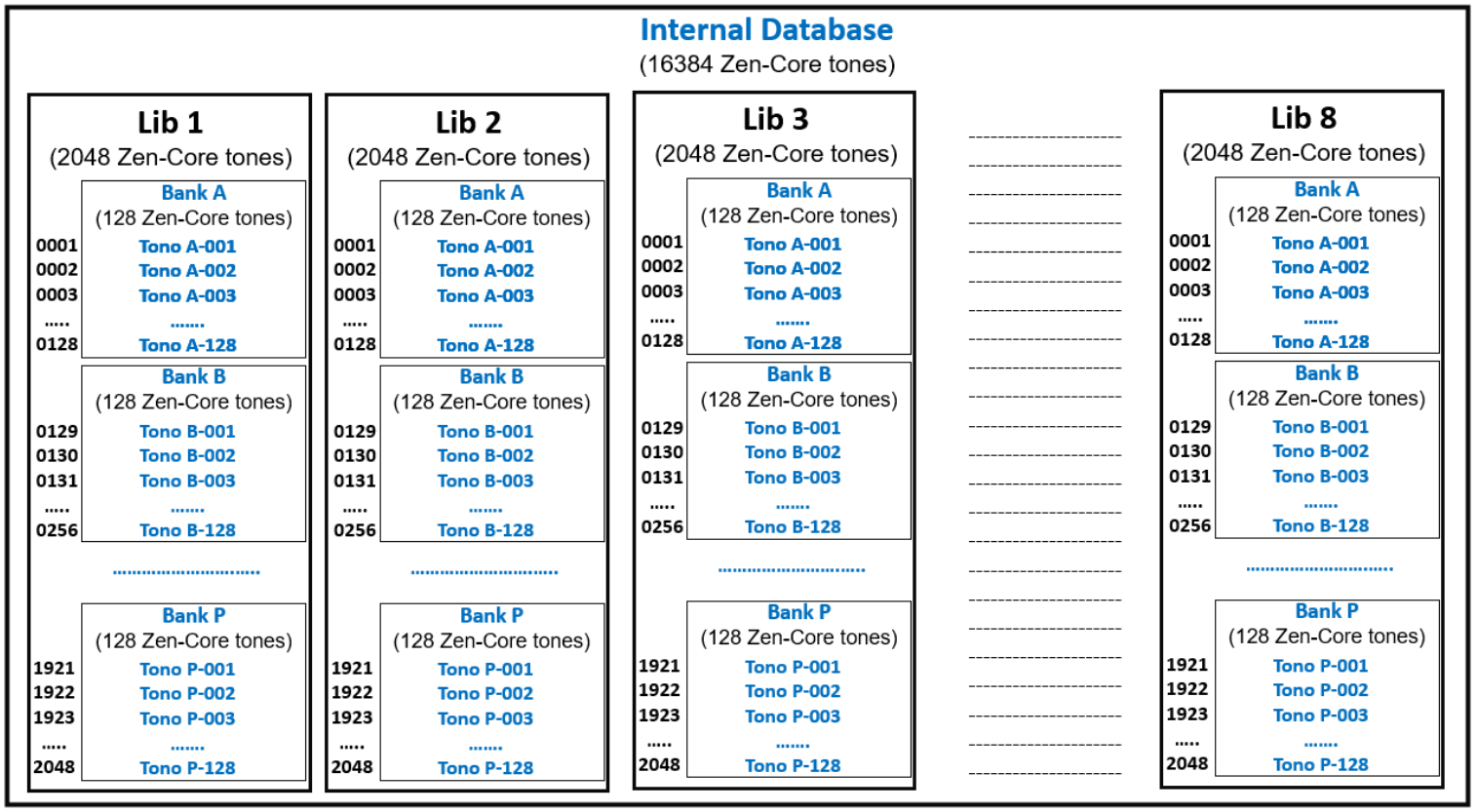
VA Init Phase (only for Jupiter X/Xm - control in Tone Structure and FMX TAB)**:** initial phase of VA oscillators (1-355°)

Librarian

The software manages and uses a **database of 16384 ZEN-Core Tones** (all resident in the software memory) which is made in **N.8 libraries (Lib1-Lib2,..Lib8)** each of **2048 Tones**.
Each of the 8 libraries is divided into **16 banks (A-B-C….P) of 128 tones** each.

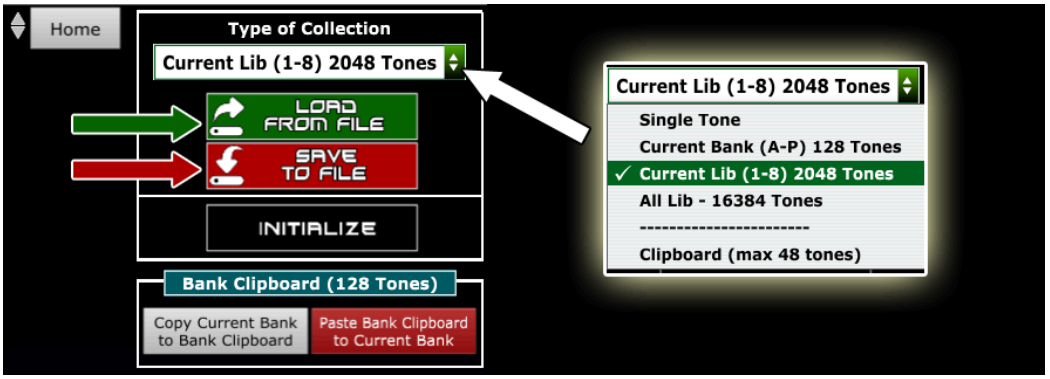
You can access to library management by clicking on the icon 

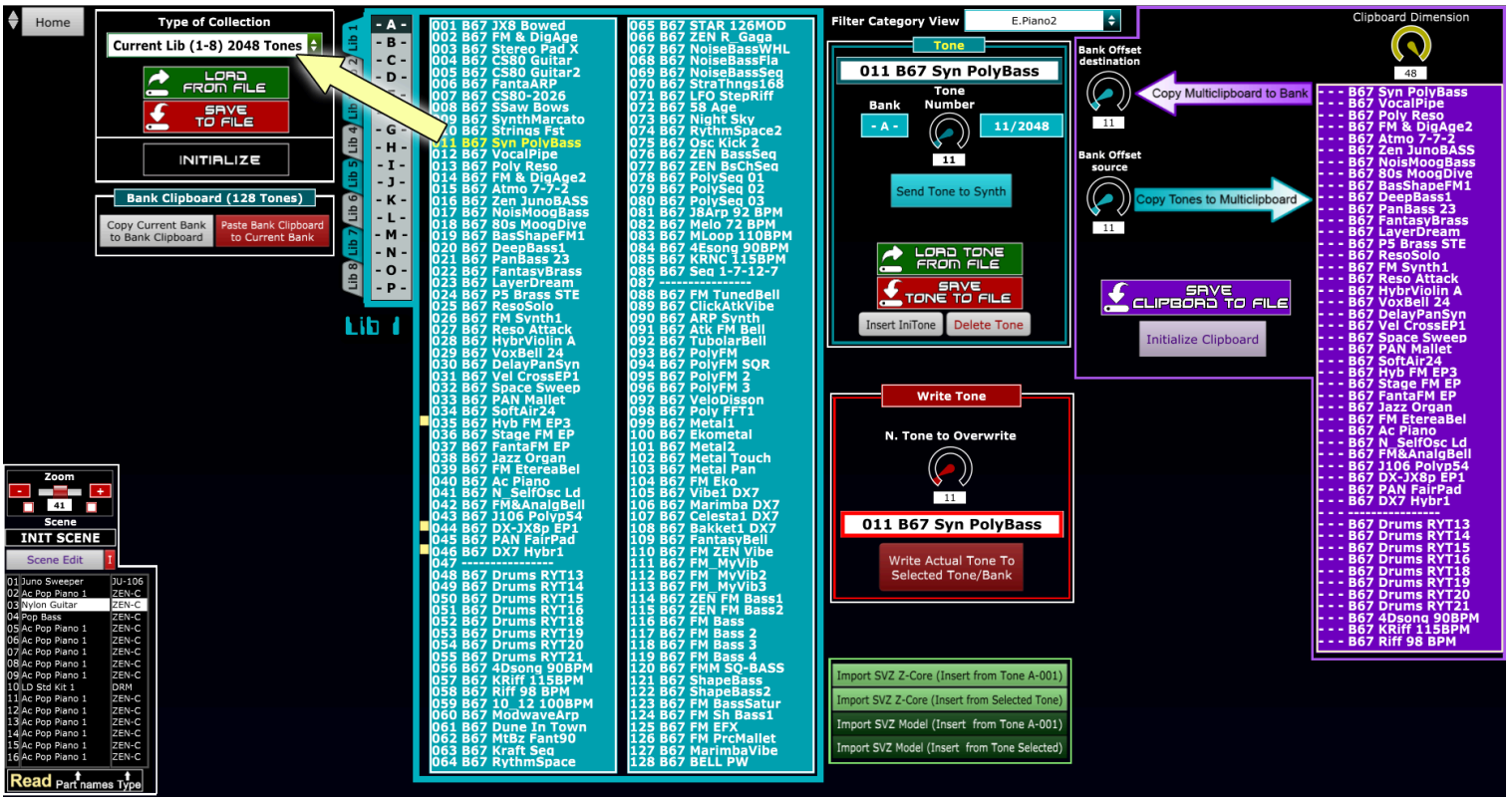
Note: The entire sound database <u>is volatile</u>: at the end of the session it must be stored in a file, so as not to lose the changes.



The 8 libraries (Lib1, Lib2,..Lib 8) and the 16 Banks of each library (Bank A, B, C….P) are selected by clicking on the **Lib X** TABs (libraries) and on **letters A-P** (banks).

It is possible to load and save to file the entire database (16384 ZEN-core tones), a single library (2048 ZEN-core tones) or a single bank (128 ZEN-core tones).
To do this, simply select the "**Type of collection**" and click on **Load from File** or **Save to file**



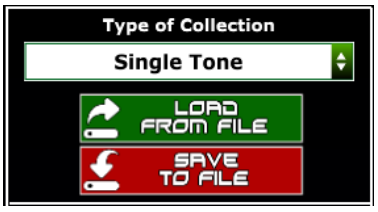


The **Type of Collection** are:

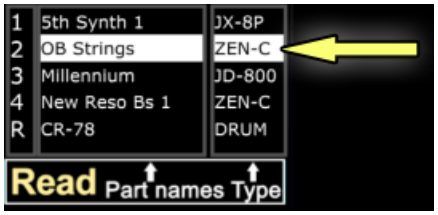
- **All Lib - 16384 Tones** (file extension/size .**L67** / 42.19 MByte)
  - **Load from file**: loads from file (*.L67) the entire database containing the 8 libraries (16384 ZEN-Core Tones) replacing the one present in the editor.
  - **Save to file**: saves to file the entire database containing the 8 libraries (16384 ZEN-Core Tones)

- **Current Lib (1-8) 2048 Tones** (file extension/size **.b67** / 5.3 MB)
  - **Load from file**: load from file the library containing 2048 ZEN-Core Tones **replacing that one** (Lib1, o Lib2, ... o Lib8) currently selected**.**
  - **Save to file**: saves to file the currently selected library (Lib1 or Lib2, … , or Lib8) containing 2048 ZEN-Core Tones

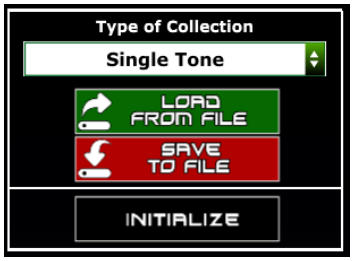
- **Current Bank (A-P) 128 Tones** (file extension/size **.syx** / 337 KB
  - **Load from file**: Loads from a single bank containing 256 ZEN-Core Tones, **the currently selected bank** (A, B, C … P). You can also load a file containing clipboard data (number of tones ranging from 1 to 48); in this case, the first tones (1 to 48 max) of the currently selected bank (A-P) will be replaced.
  - **Save to file**: Saves the currently selected single bank (A, or B, etc., or P) containing 256 ZEN-Core tones to a file.
- **Clipboard (Max 48 tones):** using **Load from file** and **Save to file** you can import and export the contents of the Clipboard to a file (see next chapter)



By selecting "Single Tone," you can import or export a single ZEN-Core tone to or from a file (file extension/size .sys/ 2 KByte)**, an operation that does not involve the library.**
First, select a **ZEN-Core part** at the bottom left.



After selecting "**Type of collection = Single Tone"** proceed with:



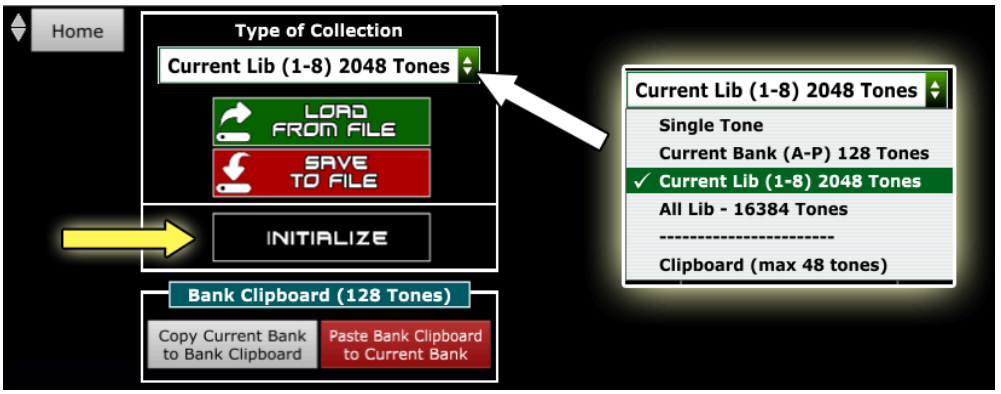
- **Load from file**: the ZEN-CORE tone is loaded from a file and transferred to the selected ZEN-Core part on the synth (bottom left), updating the ZEN-Core parameters in the editor.
- **Save to file**: the ZEN-CORE tone present on the selected ZEN-Core part is stored to file.

If a part containing a sound with a different synthesis is selected, import and export have no effect.
The procedure for saving ZEN-Core sounds in the library is described in the next chapter.

Note: The library contents are resident in the computer's memory and *there are no automatic file saving mechanisms*. To reload the library contents in a subsequent editing session, it must be saved to a file as indicated.

Initialization of the Database and its components

You can initialize tones, banks (128 Tone ZEN-core)**, individual libraries (**2048 Toni ZEN-core)**, the entire library** (16384 ZEN-Core tones) **and the clipboard by selecting the contents and clicking INITIALIZE.**
Their contents are restored with INIT TONE.



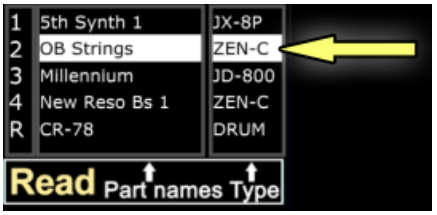
Editing a ZEN-Core Tone and storing it in the library

To edit a ZEN-Core sound and store it in the library, proceed with the following steps:

1) ZEN-Core Tone Editing

- Click on the icon 

to update both the active **scene name** (program for AX-Edge) on the synth and the **name/type** of tone present on the various parts (1-16 in Fantom, 1-5 in JupiterX/Xm and 1-4 in AX-Edge). This update obviously makes sense if you change the synth's Scene/Program.



- Select a ZEN-Core tone, if present, by clicking on the part **or selecting it using the keyboard arrows.** 

- Click the icon at the top 

to update the various ZEN-Core synthesis parameters: these will be transferred from the synth to the editor, updating all controls and graphics in real time.
- **Zen-Core tone editing via a graphical interface divided into 6 screens:** Main, PCM - Range - Common, Mod Matrix, Pitch ENV, STEP LFO, Effect - EQ.

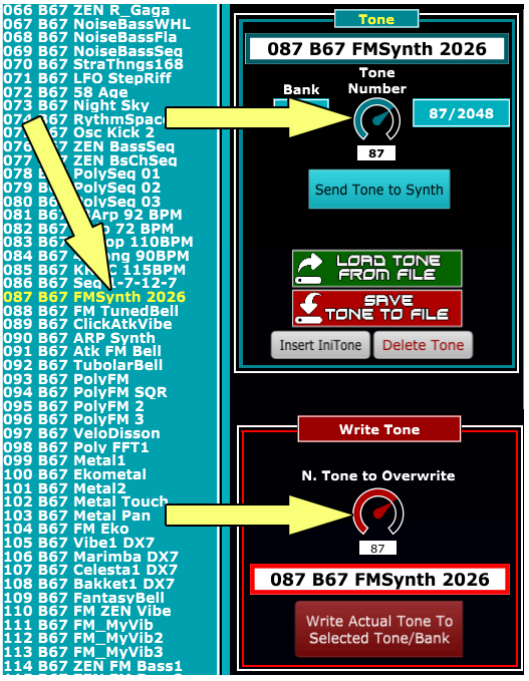
2) Saving ZEN-Core tone to the library

- **Click the librarian icon** 

e and select the library location where you want to save the sound.

This can be done in three different ways:

- Single-click on the tone or using the Up-Down arrow keys on the keyboard  (in the example, Tone N. 87) -



- Using the "**Tone Number**" control

- Using the "**N.Tone to Overwrite**" control

- Click on "**Write Actual Tone To Selected Tone/Bank**" (this operation takes a fraction of a second, during which, obviously, you should not modify the sound on synth)

Transferring a ZEN-Core Tone from the library to Synth

It is possible to transfer a ZEN-core sound from the library to any part of the synth (part 1-4 per Jupiter X/Xm e AX Edge - Part 1-16 per Fantom).

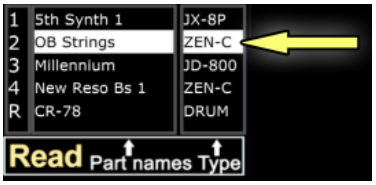
To transfer the sounds (librarian→synth), you need to prepare sounds with ZEN-Core synthesis on the desired parts, possibly activating a SCENE INIT (click on the little red icon "**I**" 

).

1) Selecting the part where to transfer the ZEN-Core Tone

- click on 

- click the icon 

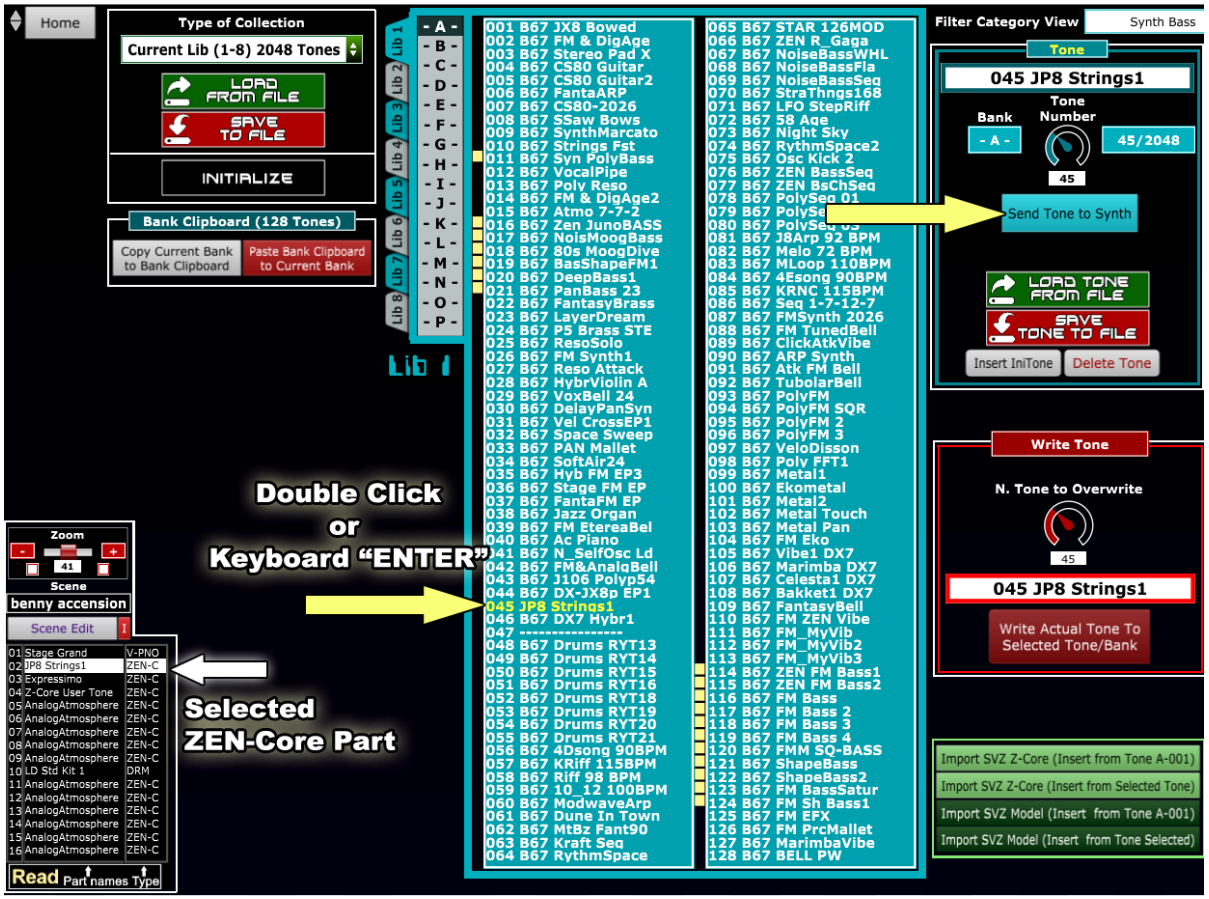
to update both the **name of the active scene** (program for AX-Edge) on the synth and the **name/type** of the tone present on the various parts (1-16 in Fantom, 1-5 in JupiterX/Xm, and 1-4 in AX-Edge). This update obviously makes sense if you change the Scene/Program on the synth.
- Select a ZEN-Core tone, if present, by clicking on the part 

or selecting it using the keyboard arrows  **.**
The tone from the library will be transferred to that part.

2) Transferring the tone from the library to the synth

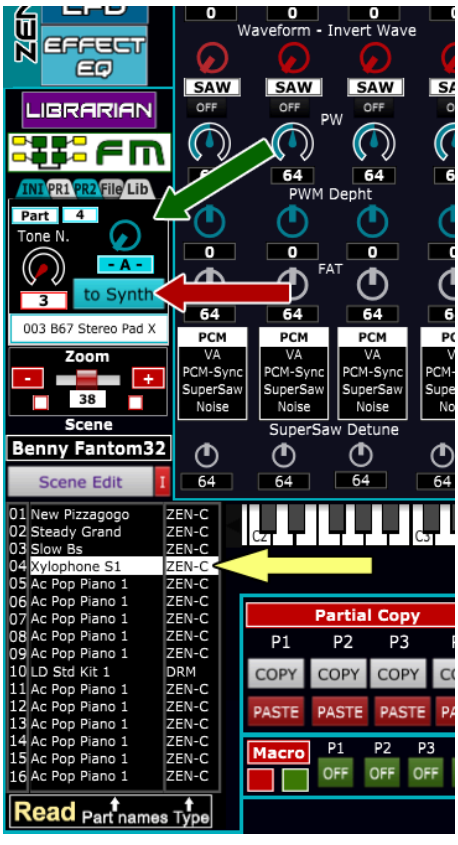
- Select the library (Lib1-Lib8) and the bank (A-P) and use one of the following methods:
  - **Double click on** the tone to be transferred
  - **Select** the tone using the **"Tone Number"** control or the Up-Down arrow keys  and **click** on the **"Send Tone to Synth"** icon 

or the "Enter" key on the keyboard.



You can also transfer a ZEN-Core tone from your library to the synth in the ZEN-Core editing screen.
To do this, go to the **"Lib"** tab on the left, selecting the ZEN-Core section where you want to transfer the tone, the tone number (1-128), and the Bank (A-P) at the bottom

To transfer the tone, click the "t**o Synth**" icon. 



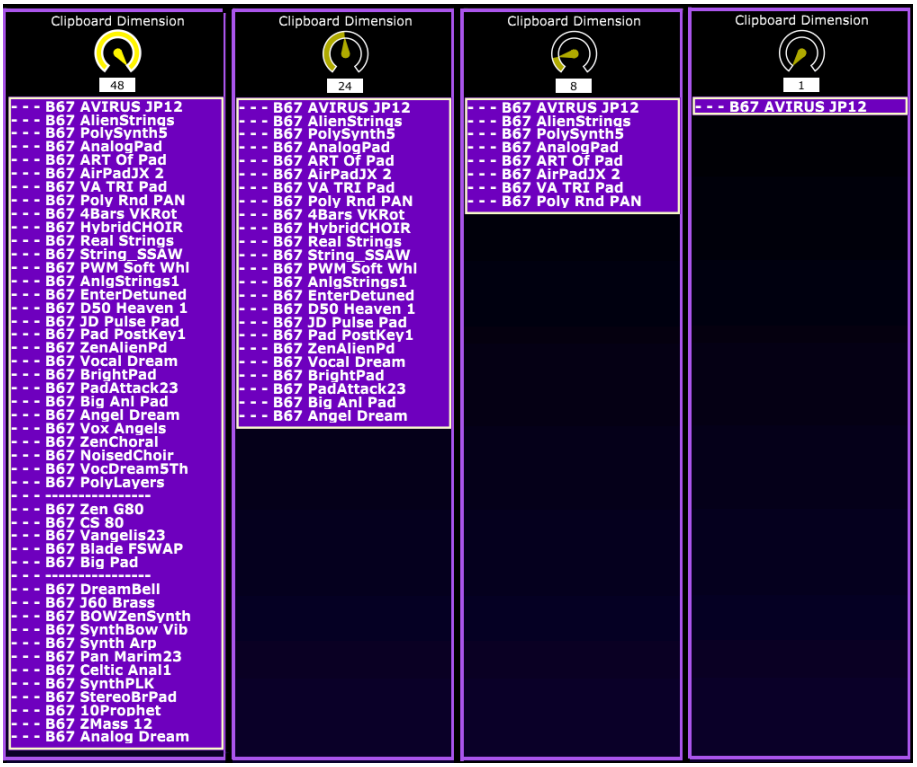
After transferring the tone, you can edit it by clicking the icon at the top 

to update the various ZEN-Core synthesis parameters.

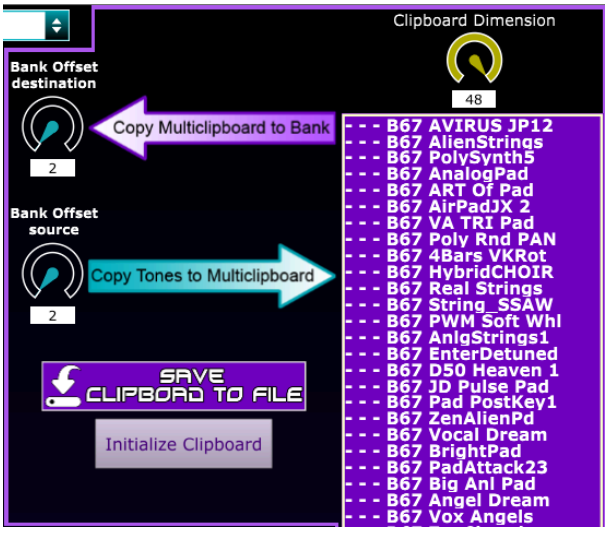
To organize the tones in the library two types of Clipboard can be used: a **Clipboard with variable size** capable of containing up to 48 tones and a **BANK clipboard** having the size of a Bank (128 Tones)

MultiClipboard

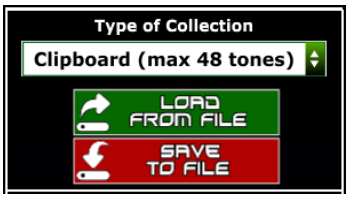
The size is adjustable using the "Clipboard Dimension" control: the names of the tones it contains will be visible accordingly.



The adjustments and operations possible with the Multiclipboard are:



- **Clipboard Dimension**: you adjust the size of the clipboard which can contain from 1 to 48 Tones (in case of resizing any copied tones remain in the clipboard to be used if necessary)
- Click are ⟵ **Copy Multiclipboard to Bank**: the tones of the Clipboard are copied to the library starting from the "**Bank Offset destination**" tone. This offset can be set using the relative control or simply by clicking on the tone in the library.
  Care should be taken as **the entire contents of the clipboard are copied to the library** overwriting the sounds of the selected bank and possibly the subsequent ones present in the following bank. For example, if you copy 8 tones starting from tone 125 of BANK A they will be overwritten in tones 125-128 of that bank and tones 1-4 of BANK B
- Click on ⟶ **Copy Tones to Multiclipboard**: the tones of the library are copied to the Clipboard starting from the "**Bank Offset source**" tone. This offset can be set using the relative control or simply by clicking on the tone of the chosen library.
- **Save Clipboard to File**: the contents of the Clipboard (1-48 ZEN-core Tones depending on the size set) are saved on file (*.syx).
  The same operation, as already seen, can be performed by selecting Collection Type = Clipboard (max 48 tones)



and clicking **“Save to File”** This file can then be loaded into any bank in the library by clicking 

: the file's contents (1-48 max ZEN-Core tones) will be copied starting from location 001 of the active bank.

- **Initialize clipboard**: the clipboard is restored with the default content of 48 INIT TONE

BANK CLIPBOARD

To facilitate the rapid movement of **complete banks** (128 ZEN-Core tones) as an alternative to using the files, it is possible to use the **BANK CLIPBOARD** which, unlike the **MultiClipboard** , does not show the name of the tones and has a fixed size equal to 128 tones (one bank).

Moving operations between a bank (A,B,C…P) and the Bank Clipboard are performed by clicking on the two icons

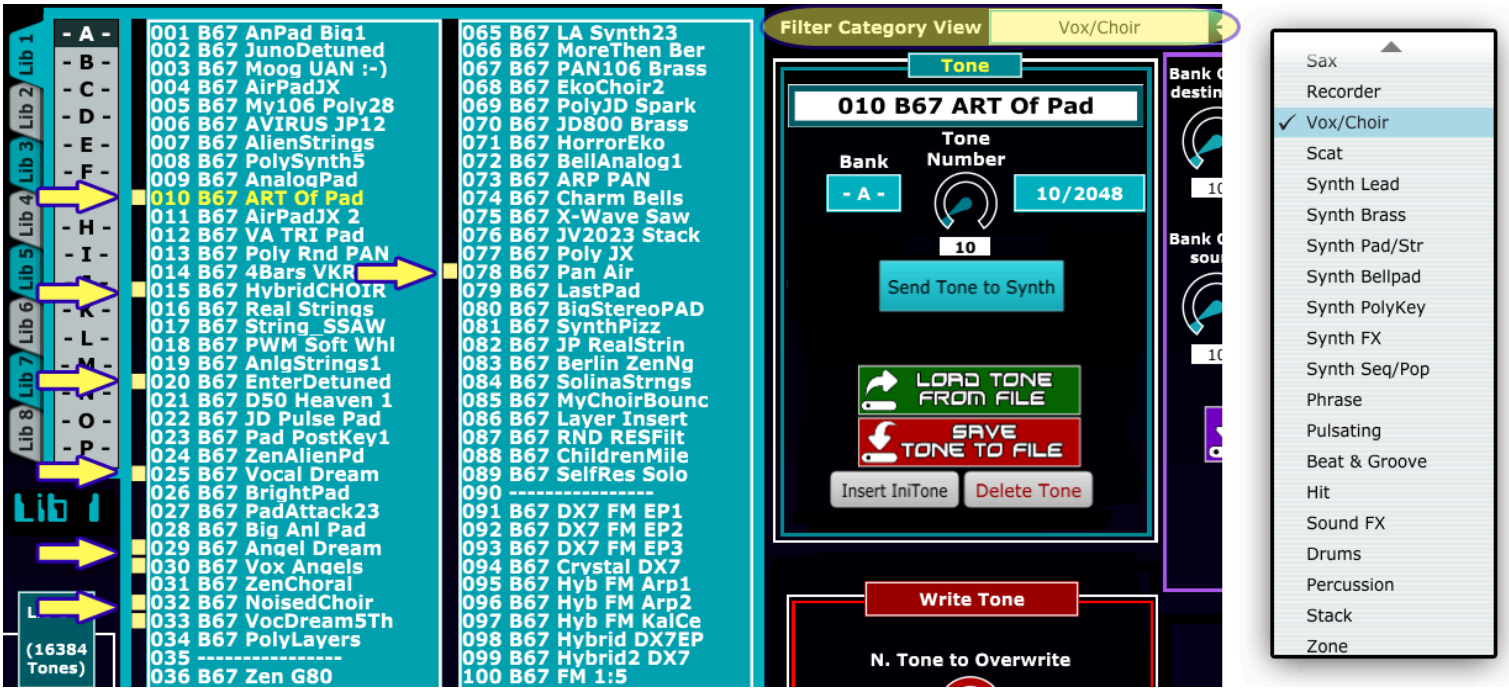
Tone Insert and Delete

For each individual library it is possible to insert and delete tones by clicking on the relative icons.

- **Insert IniTone**: A ZEN-Core INIT tone is inserted starting with the selected tone.
  The operation increases the numbering of all the tones in the library by 1 starting from the insertion point (therefore the list of tones is scrolled downwards): therefore with each insertion the last tone of this library, the N.2048, is lost.
- **Delete Tone:** the selected tone is deleted.
  The operation decreases by 1 the numbering of all the tones in the library starting from the deletion point (therefore there is a scrolling upwards of the list of tones): an INIT tone is therefore added to each delete operation in the last location, N. 2048, of this library.

Filter category

To better identify the sounds in the library, it is possible to select one of the various categories of sounds provided by the ZEN-Core standard through the "Filter Category View" control: a small yellow square will appear next to the sounds belonging to this category.



Library compatibility

The ZEN-Core library sound database uses the native MIDI Sysex format: Fantom, Jupiter-X/Xm, and AX-Edge handle ZEN-core tone data with a syntax that makes the data incompatible with each other.
When loading libraries, the librarian adapts the MIDI exclusive system, ensuring compatibility of the libraries generated by the three versions of the software (JupiterX/Xm, Fantom/EX/0, and AX-Edge)**.**

Importing ZEN-Core tones and conversion of Model Expansions sounds

All synths compatible with the ZEN-Core standard, Roland Zenology Pro software and ZenBeat's ZC1 player, are able to export the **ZEN-Core User Tone** and the **User Tones obtained with the various Model Expansions:** the export of these collections produces files that use the .SVZ format.

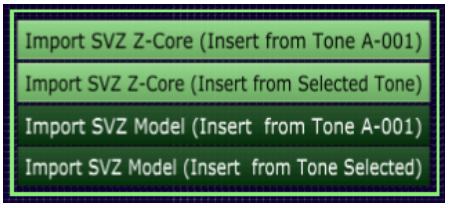
Through a proprietary conversion algorithm it is possible to load and convert the user tones (*.svz files) into the format used by the software which is based on SysEx so as to load entire collections of sounds exported from the synths into the library.
This is possible thanks to a series of **ZEN-Core→MIDI SysEx** Tone conversion routines

For conversion of Model Expansions User Tone→Tone ZEN-Core equivalent, the USER TONES of the following Model Expansions are supported**:**

- **JUNO-106**
- **JX-8P**
- **JUPITER-8**
- **SH-101**
- **Juno-60**
- **JUNO-X engine**
- **JUPITER-X/XM engine**

.svz files containing **collections of up to 2048 tones** can be converted: even files that contain a single tone or a mix of sounds with synthesis are converted without problems **ZEN-Core e Model Expansions.**

<u>IMPORTANT: *.SDZ sound banks (those that can be purchased via Roland Cloud Manager) are NOT supported as they are encrypted and protected by license.</u>



Import ZEN-Core User Tone:

- **Import SVZ Z-Core (Insert from Tone A-001):** the *.svz file containing the ZEN-Core sound bank is loaded and inserted into the current Bank starting from location A001 (the first slot of the bank)
- **Import SVZ Z-Core (Insert from Selected Tone):** the *.svz file containing the ZEN-Core sound bank is loaded and inserted into the current Bank starting from the selected location (Tone Number control or click on the list)

Import User Tones of supported Model Expansions:

- **Import SVZ Model (Insert from Tone A-001):** the *.svz file containing the bank of sounds with Model Expansions synthesis is loaded, converted and inserted in the current Bank starting from location A001 (the first slot of the bank)
- **Import SVZ Model (Insert from Selected Tone):** the *.svz file containing the bank of sounds with Model Expansions synthesis is loaded, converted and inserted in the current Bank starting from the selected location (Tone Number control or click on the list)

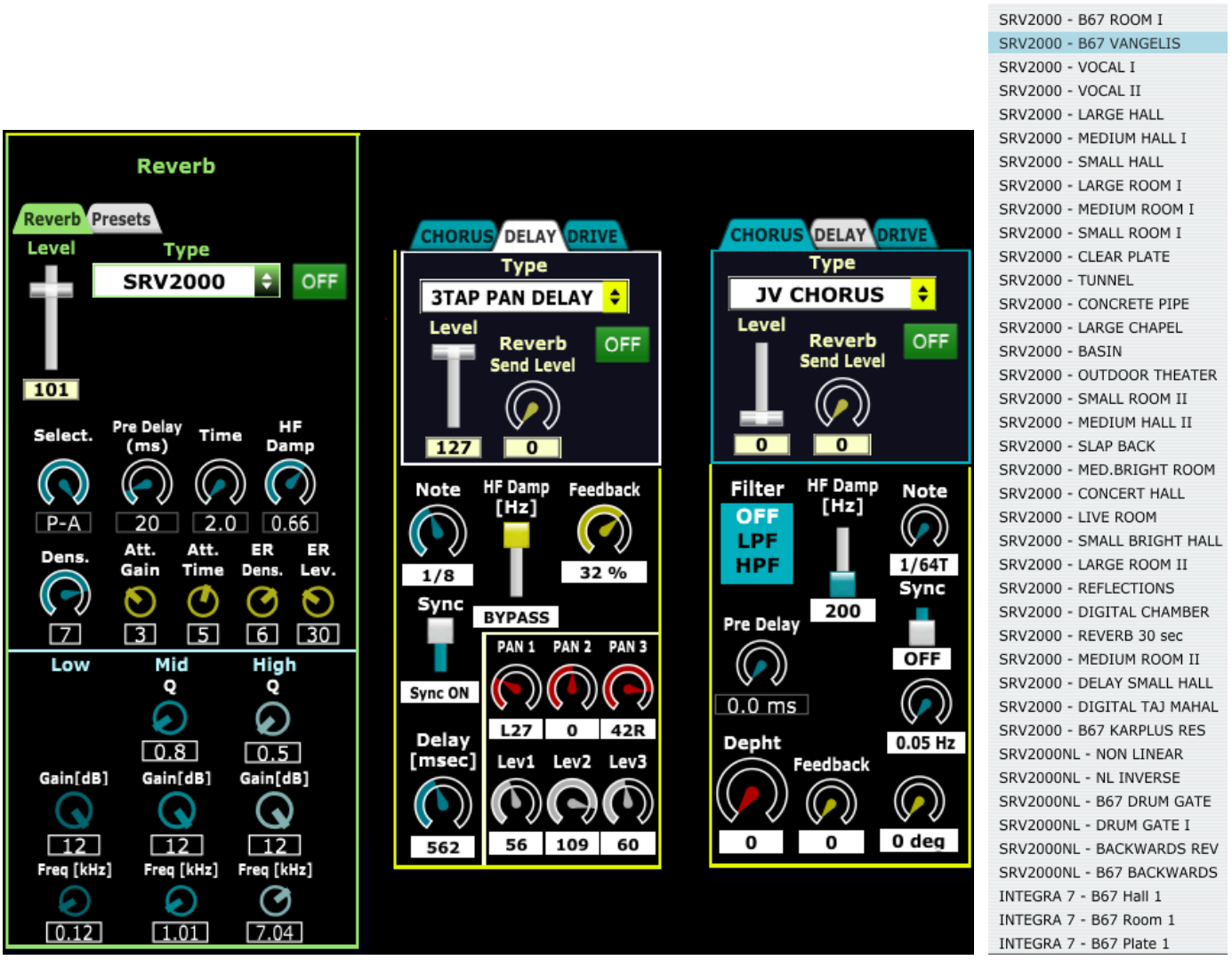
Using **"Import SVZ Model"** with banks that contain a mix between the two types of tones, **will simultaneously convert ZEN-Core user tones and user tones with Model Expansion sounds .**

Scene editing (program in AX-Edge)

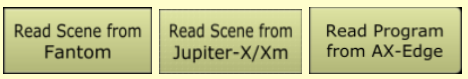
The software, designed primarily as a ZEN-CORE editor and librarian, also has a section dedicated to scene editing.
Unlike the ZEN-CORE tone editing sections, which are identical across all three versions of the software, the scene editing section is customized for the corresponding synth family: Jupiter-X/Xm, AX-Edge, and Fantom/EX/0.
This is due to the many differences in the implementation of scenes in the supported synths.

The scene editor (programs in AX-Edge) **in the version for AX-Edge and Jupiter-X/Xm it is complete and able to manage and modify all the available parameters**

- The version for **Fantom EX/0** allows editing of only a part of the available parameters, ensuring the selection in parts 1-4 of all presets and user tones of all synthesis engines (including the ACBs of Fantom EX).
- In the version for **Jupiter-X/Xm it is not possible to edit the sequencer part while the arpeggio part is complete**
- The version for **AX-Edge** also includes **a program librarian (8 libraries of 320 programs each)** and 24 program **presets**. It also features an **additional page for storing user tones on the synth** ;
- All versions allow **complete editing of all scene effects parameters and contain 40 reverb presets**.



SRV2000 - B67 ROOM I
SRV2000 - B67 VANGELIS
SRV2000 - VOCAL I
SRV2000 - VOCAL II
SRV2000 - LARGE HALL
SRV2000 - MEDIUM HALL I
SRV2000 - SMALL HALL
SRV2000 - LARGE ROOM I
SRV2000 - MEDIUM ROOM I
SRV2000 - SMALL ROOM I
SRV2000 - CLEAR PLATE
SRV2000 - TUNNEL
SRV2000 - CONCRETE PIPE
SRV2000 - LARGE CHAPEL
SRV2000 - BASIN
SRV2000 - OUTDOOR THEATER
SRV2000 - SMALL ROOM II
SRV2000 - MEDIUM HALL II
SRV2000 - SLAP BACK
SRV2000 - MED.BRIGHT ROOM
SRV2000 - CONCERT HALL
SRV2000 - LIVE ROOM
SRV2000 - SMALL BRIGHT HALL
SRV2000 - LARGE ROOM II
SRV2000 - REFLECTIONS
SRV2000 - DIGITAL CHAMBER
SRV2000 - REVERB 30 sec
SRV2000 - MEDIUM ROOM II
SRV2000 - DELAY SMALL HALL
SRV2000 - DIGITAL TAJ MAHAL
SRV2000 - B67 KARPLUS RES
SRV2000NL - NON LINEAR
SRV2000NL - NL INVERSE
SRV2000NL - B67 DRUM GATE
SRV2000NL - DRUM GATE I
SRV2000NL - BACKWARDS REV
SRV2000NL - B67 BACKWARDS
INTEGRA 7 - B67 Hall 1
INTEGRA 7 - B67 Room 1
INTEGRA 7 - B67 Plate 1

It is possible to alternate scene editing between the software and the Synth: every time you work on the synth, to update the editor parameters just click on the relevant icons 

Scene Editor - Fantom

The following section is present only in software **ZenCore Editor2_Fantom that is available for the Fantom 6-7-8, Fantom 06-07-08 and Fantom 6-7-8 EX synths**

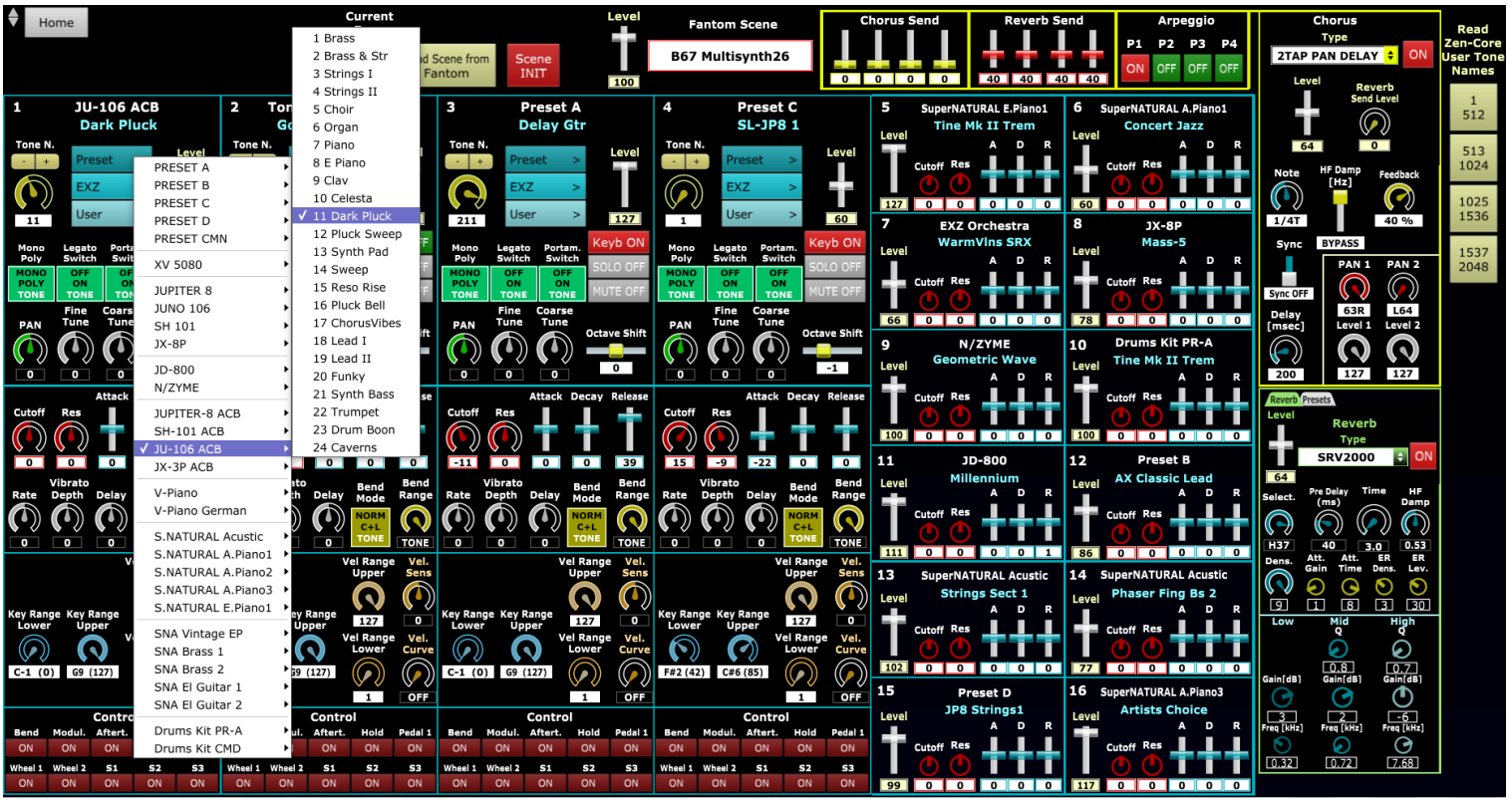
To enter the scene editor section, click on the section on the left 

The current scene of synth can be recalled by clicking on at the top 

:this will recall and update the on-screen parameters of parts 1-4 and the general scene parameters. These include the scene Volume (Level), the "Current Zone" active on Fantom, the send of the 4 parts to the effects and all the parameters of the Chorus and Reverb effects of the scene.

It is possible to switch the scene editing between software and Synth: every time you work on the synth, you need to click on **"Read Scene from Fantom"** to update the editor parameters

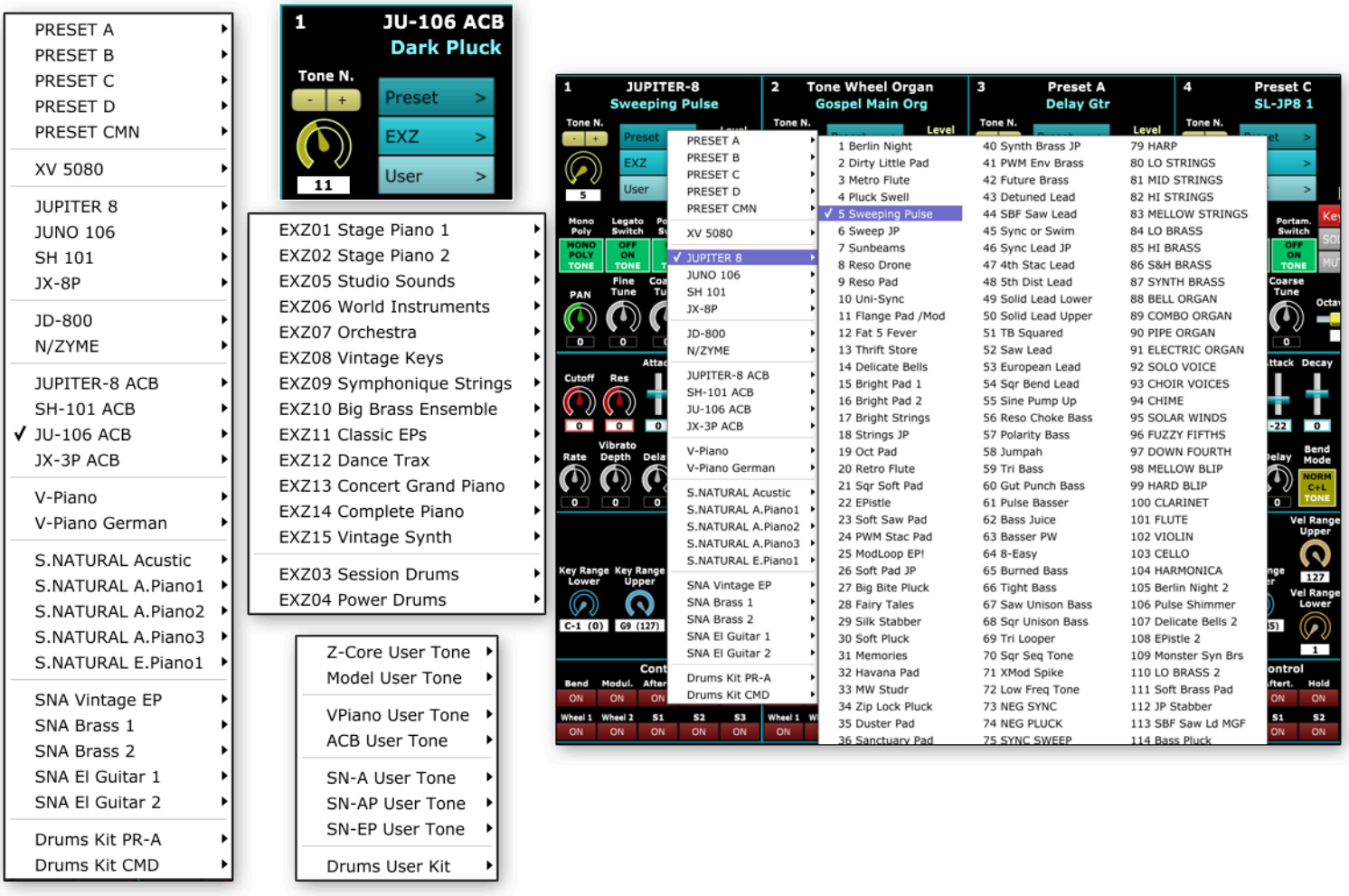
As for the Zen-Core section, it is also possible to edit the name (16 characters) of the scene.



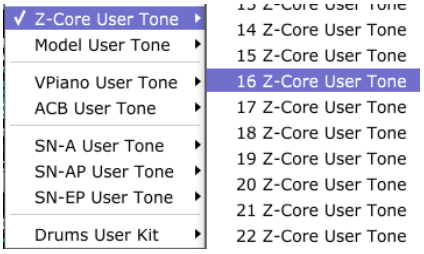
As seen previously by clicking on 

you recall an INIT scene where tones with ZEN-Core synthesis are active on all parts, useful for editing sounds and using the library.

To select the tones of the parts, by clicking on Presets - EXZ or User, you access the list of sounds that can be used in the synth with a menu.
The software does not check the presence or not of the optional expansions (EXZ, N/Zyme,..) which are always accessible. If they are not present on the synth, obviously no sound is produced.
Below is a screen showing the hierarchy in which the sounds are divided, starting from Presets, EXZ and User.

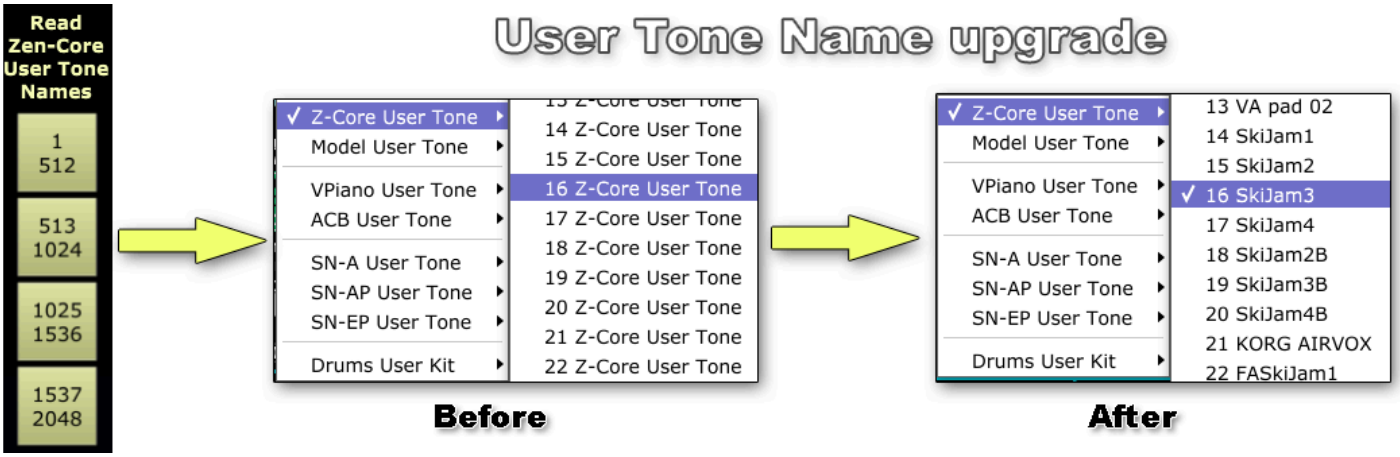


For 2048 ZEN-Core User Tones, the software uses the generic name XXXX Z-Core User Tone at startup



To update the names of the user tones of Fantom, just click on the **4 yellow icons on the right of the screen**: transferring names from the Fantom→ Editor takes about 12 seconds for each of the 4 groups of 512 tones.

Once the update is complete, the names of the 2048 ZEN-Core User Tones of the synth will be displayed. By clicking on Read Scene from Fantom you will get the correct names in the parts where ZEN-Core user tones are used.



It is not possible to get the names of the 1024 Model and ACB user tones, as, with the current firmware, these names are not accessible via MIDI Sysex.

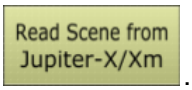
Scene Editor - Jupiter X/Xm

The following section is present only in **ZenCore Editor2_JupiterX** software, the editor-librarian version for the Jupiter-X and Jupiter-Xm synths

To enter the scene editor section, click on the section on the left 

To recall the parameters relating to the current scene within the editor, click on the icon at the top

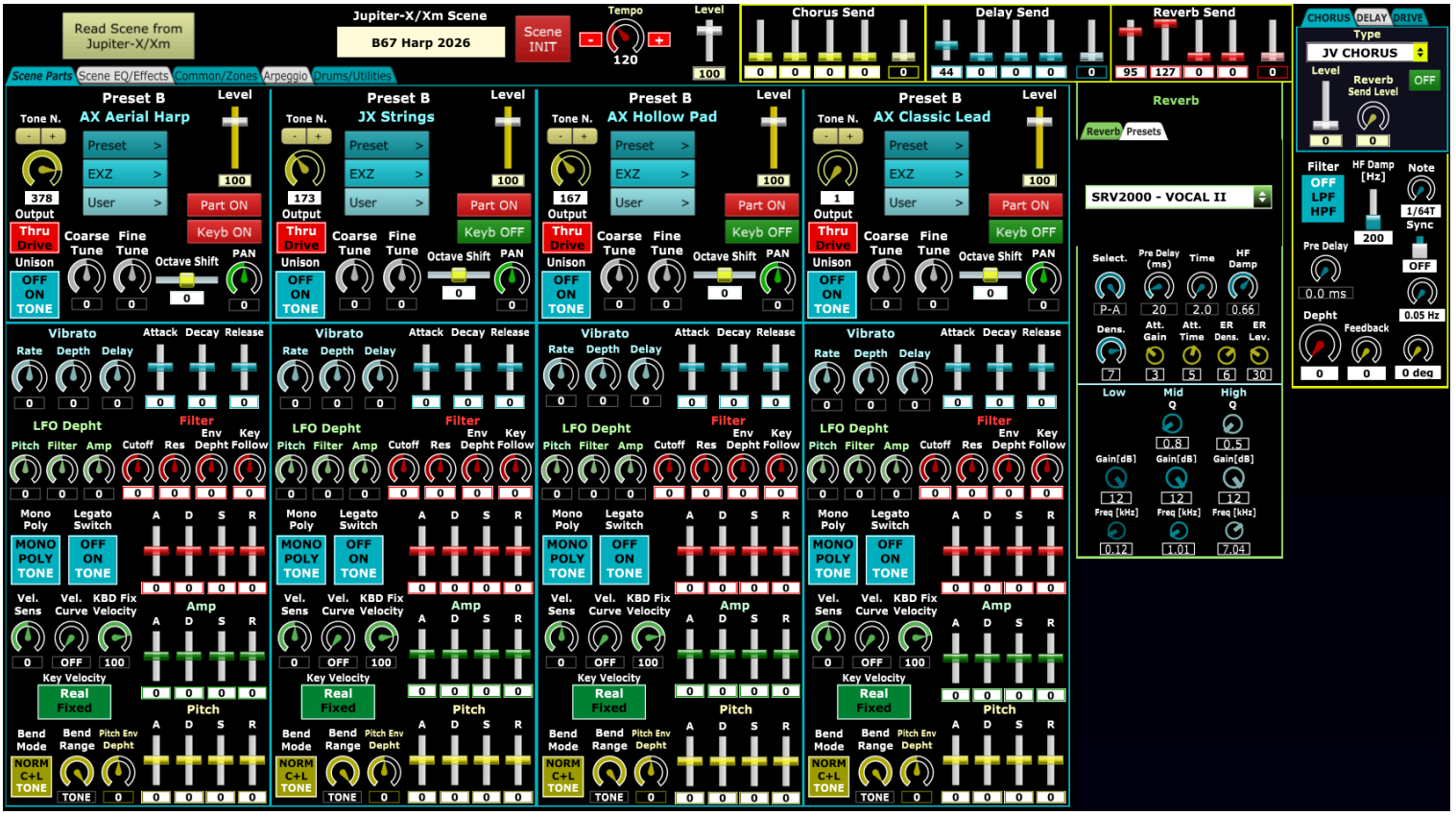
: this will recall and update the parameters present on the screen for parts 1-5, as well as the general scene parameters. These include the scene's volume (**Level**), tempo, sends of the 5 parts to the effects, and all the scene's Chorus, Delay, Reverb, and drive parameters. .

It is possible to alternate scene editing between the software and the Synth: every time you operate on the synth, to update the editor parameters you need to click on **“Read Scene from Jupiter X/Xm”** 

.

As for the Zen-Core section, it is also possible to edit the name (16 characters) of the scene.

Below is an image of the main section (TAB Scene Parts)



As seen previously by clicking on 

you recall an INIT scene where tones with ZEN-Core synthesis are active on all parts, useful for editing sounds and using the library.

For tempo selection, given the possibility of using non-integer BPM values 

there are two icons in red (+ and -) to set the time to the lower or higher integer value (101 and 102 in the example)

To select the tones of the parts, by clicking on Presets - EXZ or User, you access the list of sounds that can be used in the synth with a menu (see the images of the manual section of the analogous section for Fantom).

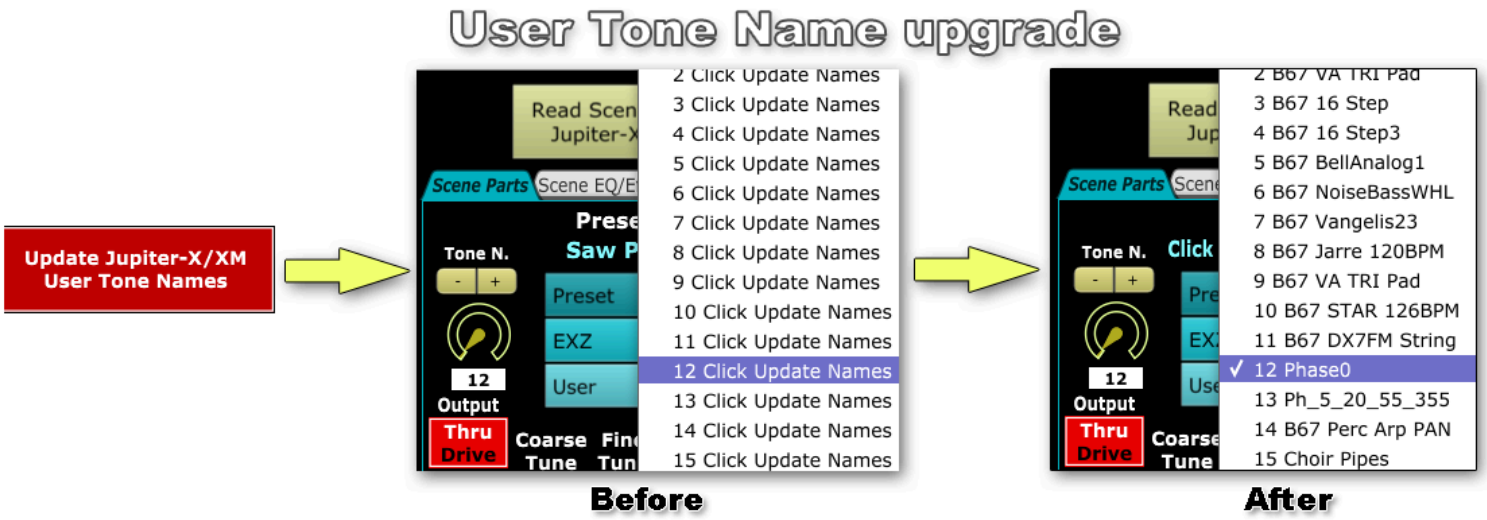
The software does not check the presence or otherwise of the free or paid optional libraries (EXZ, JD-800,..) which are always accessible. If they are not present on the synth, obviously no sound is produced.

For 512 ZEN-Core User Tones, the software used at startup the generic name XXXX Click Update Names

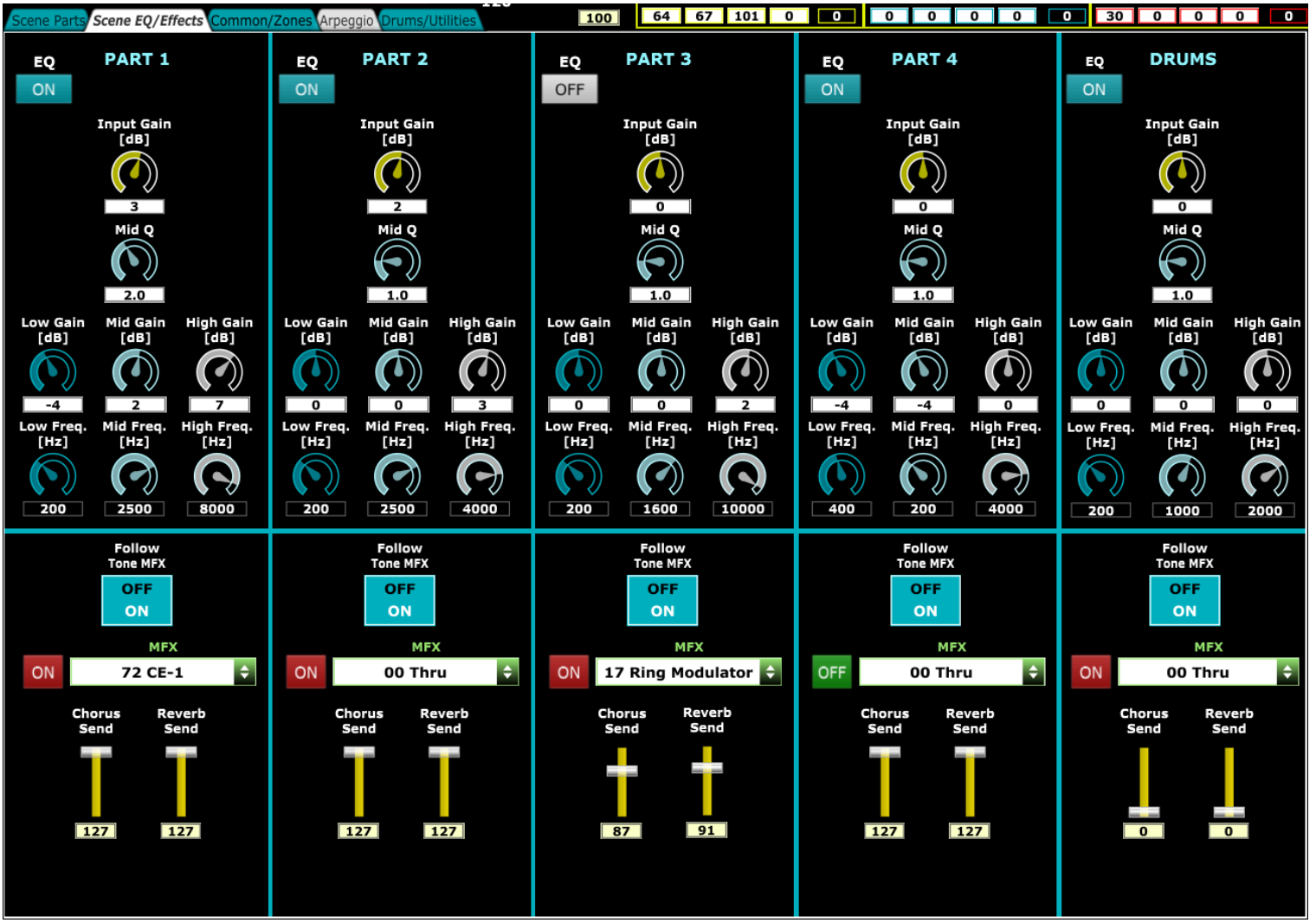
to update with the names of the User Tones of the synth just click in the Drums/Utilities TAB on the relative red icon:

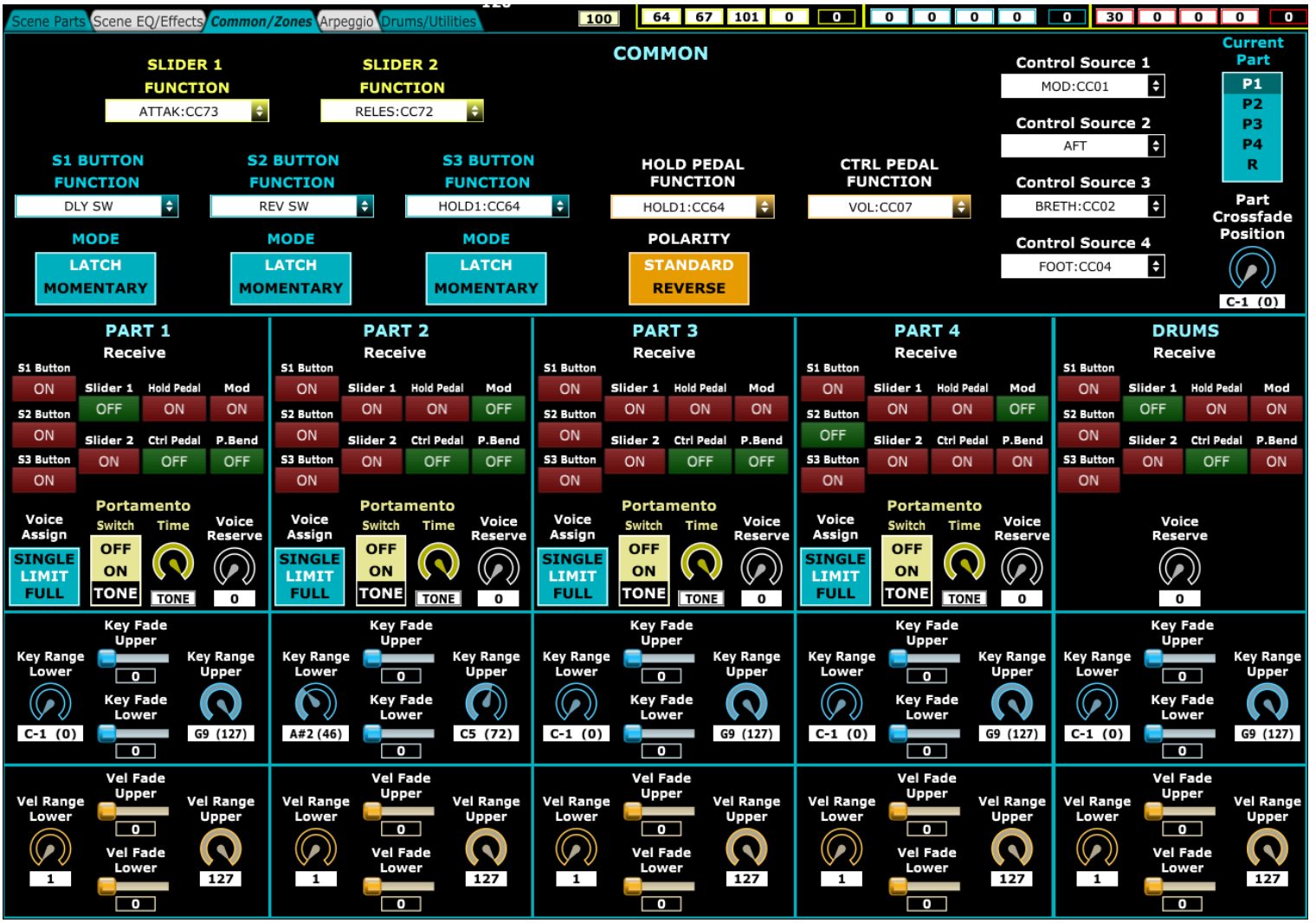
Once the update is complete, the names of the 2048 ZEN-Core User Tones on the synth will be displayed. Clicking the icon at the top 

will display the correct names for the parts where ZEN-Core user tones are used.

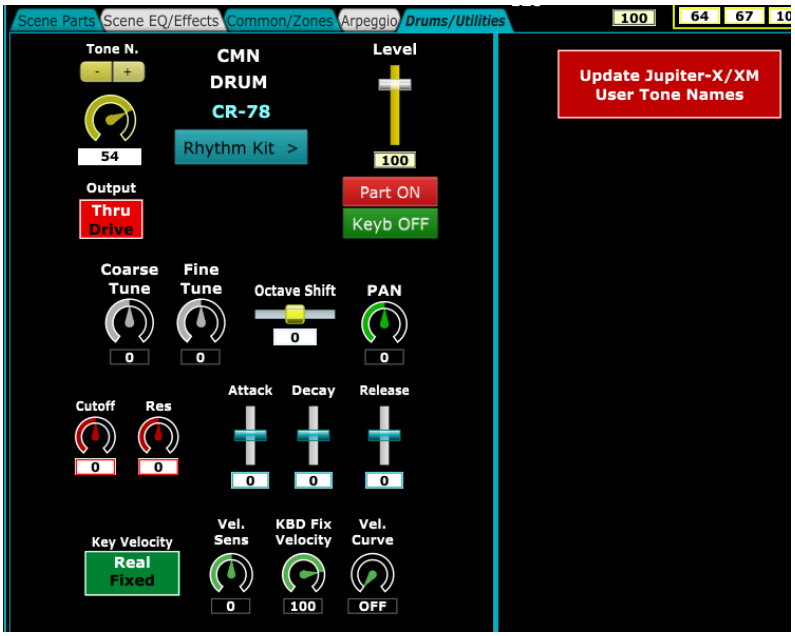


Below are the images relating to the other 4 sections that can be activated via the TABs: Scene EQ/Effects, Common/Zones, Arpeggio, Drums/Utilities


Scene Parts
Scene EQ/Effects
Common/Zones
Arpeggio
Drums/Utilities
100
64 67 101 0 0
0 0 0 0 0
30 0 0 0 0
EQ
ON
PART 1
Input Gain [dB]
3
Mid Q
2.0
Low Gain [dB]
-4
Mid Gain [dB]
2
High Gain [dB]
7
Low Freq. [Hz]
200
Mid Freq. [Hz]
2500
High Freq. [Hz]
8000
Follow Tone MFX
OFF
ON
MFX
ON
72 CE-1
Chorus Send
127
Reverb Send
127
EQ
ON
PART 2
Input Gain [dB]
2
Mid Q
1.0
Low Gain [dB]
0
Mid Gain [dB]
0
High Gain [dB]
3
Low Freq. [Hz]
200
Mid Freq. [Hz]
2500
High Freq. [Hz]
4000
Follow Tone MFX
OFF
ON
MFX
ON
00 Thru
Chorus Send
127
Reverb Send
127
EQ
OFF
PART 3
Input Gain [dB]
0
Mid Q
1.0
Low Gain [dB]
0
Mid Gain [dB]
0
High Gain [dB]
2
Low Freq. [Hz]
200
Mid Freq. [Hz]
1600
High Freq. [Hz]
10000
Follow Tone MFX
OFF
ON
MFX
ON
17 Ring Modulator
Chorus Send
87
Reverb Send
91
EQ
ON
PART 4
Input Gain [dB]
0
Mid Q
1.0
Low Gain [dB]
-4
Mid Gain [dB]
-4
High Gain [dB]
0
Low Freq. [Hz]
400
Mid Freq. [Hz]
200
High Freq. [Hz]
4000
Follow Tone MFX
OFF
ON
MFX
OFF
00 Thru
Chorus Send
127
Reverb Send
127
EQ
ON
DRUMS
Input Gain [dB]
0
Mid Q
1.0
Low Gain [dB]
0
Mid Gain [dB]
0
High Gain [dB]
0
Low Freq. [Hz]
200
Mid Freq. [Hz]
1000
High Freq. [Hz]
2000
Follow Tone MFX
OFF
ON
MFX
ON
00 Thru
Chorus Send
0
Reverb Send
0


Scene Parts
Scene EQ/Effects
Common/Zones
Arpeggio
Drums/Utilities
100
64 67 101 0 0
0 0 0 0 0
30 0 0 0 0
COMMON
SLIDER 1 FUNCTION
ATTAK:CC73
SLIDER 2 FUNCTION
RELES:CC72
S1 BUTTON FUNCTION
DLY SW
S2 BUTTON FUNCTION
REV SW
S3 BUTTON FUNCTION
HOLD1:CC64
HOLD PEDAL FUNCTION
HOLD1:CC64
CTRL PEDAL FUNCTION
VOL:CC07
MODE
LATCH
MOMENTARY
POLARITY
STANDARD
REVERSE
Control Source 1
MOD:CC01
Control Source 2
AFT
Control Source 3
BRETH:CC02
Control Source 4
FOOT:CC04
Current Part
P1
P2
P3
P4
R
Part Crossfade Position
C-1 (0)
PART 1
Receive
S1 Button
ON
Slider 1
OFF
Hold Pedal
ON
Mod
ON
S2 Button
ON
Slider 2
ON
Ctrl Pedal
OFF
P.Bend
OFF
S3 Button
ON
Voice Assign
SINGLE
LIMIT
FULL
Portamento
Switch
OFF
ON
TONE
Time
TONE
Voice Reserve
0
Key Range Lower
C-1 (0)
Key Fade Upper
0
Key Range Upper
G9 (127)
Key Fade Lower
0
Vel Range Lower
1
Vel Fade Upper
0
Vel Range Upper
127
Vel Fade Lower
0
PART 2
Receive
S1 Button
ON
Slider 1
ON
Hold Pedal
ON
Mod
OFF
S2 Button
ON
Slider 2
ON
Ctrl Pedal
OFF
P.Bend
OFF
S3 Button
ON
Voice Assign
SINGLE
LIMIT
FULL
Portamento
Switch
OFF
ON
TONE
Time
TONE
Voice Reserve
0
Key Range Lower
A#2 (46)
Key Fade Upper
0
Key Range Upper
C5 (72)
Key Fade Lower
0
Vel Range Lower
1
Vel Fade Upper
0
Vel Range Upper
127
Vel Fade Lower
0
PART 3
Receive
S1 Button
ON
Slider 1
ON
Hold Pedal
ON
Mod
ON
S2 Button
ON
Slider 2
ON
Ctrl Pedal
OFF
P.Bend
OFF
S3 Button
ON
Voice Assign
SINGLE
LIMIT
FULL
Portamento
Switch
OFF
ON
TONE
Time
TONE
Voice Reserve
0
Key Range Lower
C-1 (0)
Key Fade Upper
0
Key Range Upper
G9 (127)
Key Fade Lower
0
Vel Range Lower
1
Vel Fade Upper
0
Vel Range Upper
127
Vel Fade Lower
0
PART 4
Receive
S1 Button
ON
Slider 1
ON
Hold Pedal
ON
Mod
OFF
S2 Button
OFF
Slider 2
ON
Ctrl Pedal
ON
P.Bend
ON
S3 Button
ON
Voice Assign
SINGLE
LIMIT
FULL
Portamento
Switch
OFF
ON
TONE
Time
TONE
Voice Reserve
0
Key Range Lower
C-1 (0)
Key Fade Upper
0
Key Range Upper
G9 (127)
Key Fade Lower
0
Vel Range Lower
1
Vel Fade Upper
0
Vel Range Upper
127
Vel Fade Lower
0
DRUMS
Receive
S1 Button
ON
Slider 1
OFF
Hold Pedal
ON
Mod
ON
S2 Button
ON
Slider 2
ON
Ctrl Pedal
OFF
P.Bend
ON
S3 Button
ON
Voice Reserve
0
Key Range Lower
C-1 (0)
Key Fade Upper
0
Key Range Upper
G9 (127)
Key Fade Lower
0
Vel Range Lower
1
Vel Fade Upper
0
Vel Range Upper
127
Vel Fade Lower
0

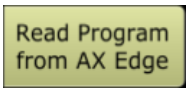

Scene Parts
Scene EQ/Effects
Common/Zones
Arpeggio
Drums/Utilities
100
64 67 101 0 0
0 0 0 0 0
30 0 0 0 0
Arpeggio Common
Arpeggio ON/OFF
ON
Hold
OFF
Keys Detect
Beat Detect
ON
ON
I-Arpeggio Type
1 UP 16th
Rhythm Type
9 I-BEAT [0+3]
Beat Detect Sensibility
5
G-Shuffle Rate
50
Duration (%)
0
Key Range Lower
Key Range Upper
C-1 (0)
G9 (127)
Switch
PART 1
PART 2
PART 3
PART 4
DRUMS
ON
Key Sync
Mode
I-ARP
ARP
STEP
Hold
I-ARP
Style Type
Style Part
PART 1
PART 2
PART 3
PART 4
PART R
Current
Rhythm Type
ARP
Style
001:SIMPLE
Variation
4
1
Motif
UP
DOWN
UP&DOWN
RAMDOM
NOTE ORDER
RHYMT
PHRASE
AUTO
Grid Note
4 TH
8 TH
8 TH_3
16 TH
16 TH_3
32 ND
Durat.%
Transpose
Oct. Range
65
100
0
1
Velocity
Offset Velocity
REAL
Shuffle Resolution
16TH
8TH
Shuffle Rate %
50
Grid Lenght
Grid Sync
Grid Offset
16
64
ON
Probability Style
00:OFF
Manual
Auto
Amount
Key Range Lower
Key Range Octave
C-1 (0)
OFF


Scene Parts
Scene EQ/Effects
Common/Zones
Arpeggio
Drums/Utilities
100
64 67
Tone N.
54
CMN
DRUM
CR-78
Rhythm Kit >
Level
100
Update Jupiter-X/XM
User Tone Names
Output
Thru
Drive
Part ON
Keyb OFF
Coarse Tune
Fine Tune
Octave Shift
PAN
0
Cutoff
Res
Attack
Decay
Release
Key Velocity
Real
Fixed
Vel. Sens
KBD Fix Velocity
Vel. Curve
100
OFF

Program Editor - AX-Edge

The following section is present only in **ZenCore Editor2_AXEdge** software, the editor-librarian version for **AX-Edge**

To enter in the performance editor section, click on the left 

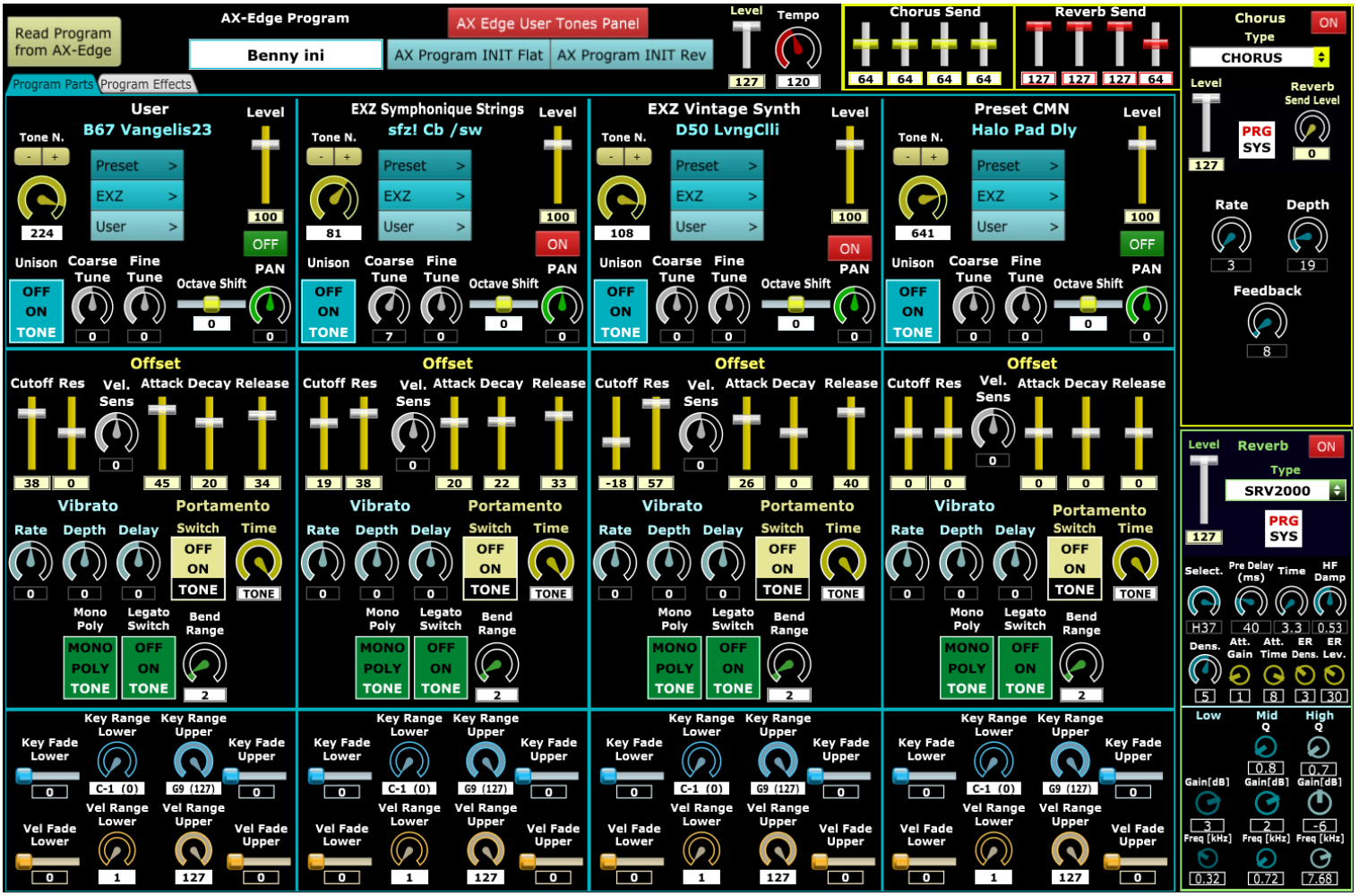
The current program can be recalled by clicking on at the top left 

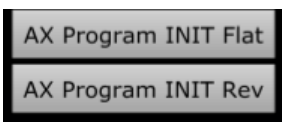
: the on-screen parameters of parts 1-5, and the general program parameters will be recalled and updated. Among these there are Program Volume (Level), Tempo, Send of the 4 parts to the effects and all the Chorus and Reverb parameters of the program.

It is possible to alternate scene editing between the software and the Synth: every time you operate on the synth, to update the editor parameters you need to click on **"Read Program from AX-Edge"**.

As for the Zen-Core section, it is also possible to edit the name (16 characters) of the scene.

Below is an image of the main section (TAB Program Parts)



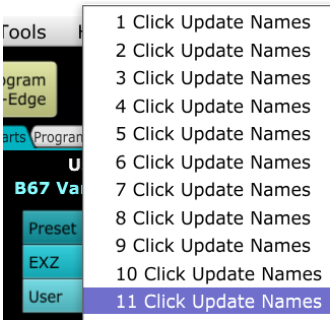
As seen previously by clicking on the icons 

an INIT scene is recalled in the version with and without reverb, where only PART1 is active: this makes editing the sounds and using the library easier.

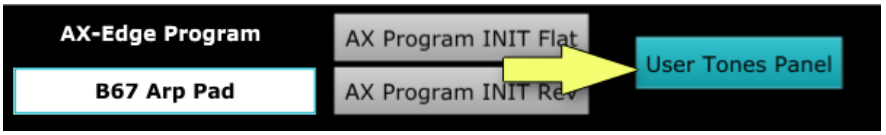
To select the tones of the parts, by clicking on Presets - EXZ or User, you access the list of sounds that can be used in the synth with a menu (see the images of the manual section of the analogous section for Fantom).

The software does not check the presence or otherwise of the EXZ optional libraries which are always accessible. If they are not present on the synth, which can load a maximum of 2, obviously no sound is produced.

For 256 ZEN-Core User Tones, the software uses the generic name XXXX Click Update Names at startup



to update the list with the names of the User Tones of the synth, just click on the icon



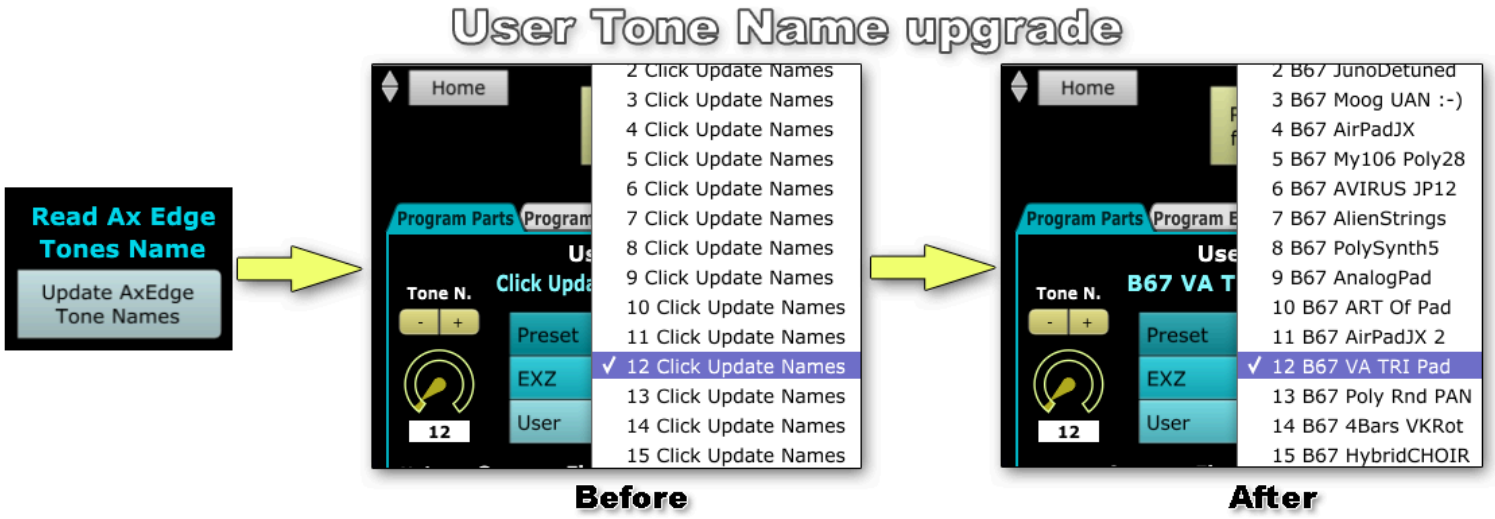
which will open the Zen-Core User Presets section.

In this screen, just click on the top right 

Once the update is complete, the names of the 256 ZEN-Core User Tones on the synth will be displayed. Return to the Program Edit section (click on the bottom left) 

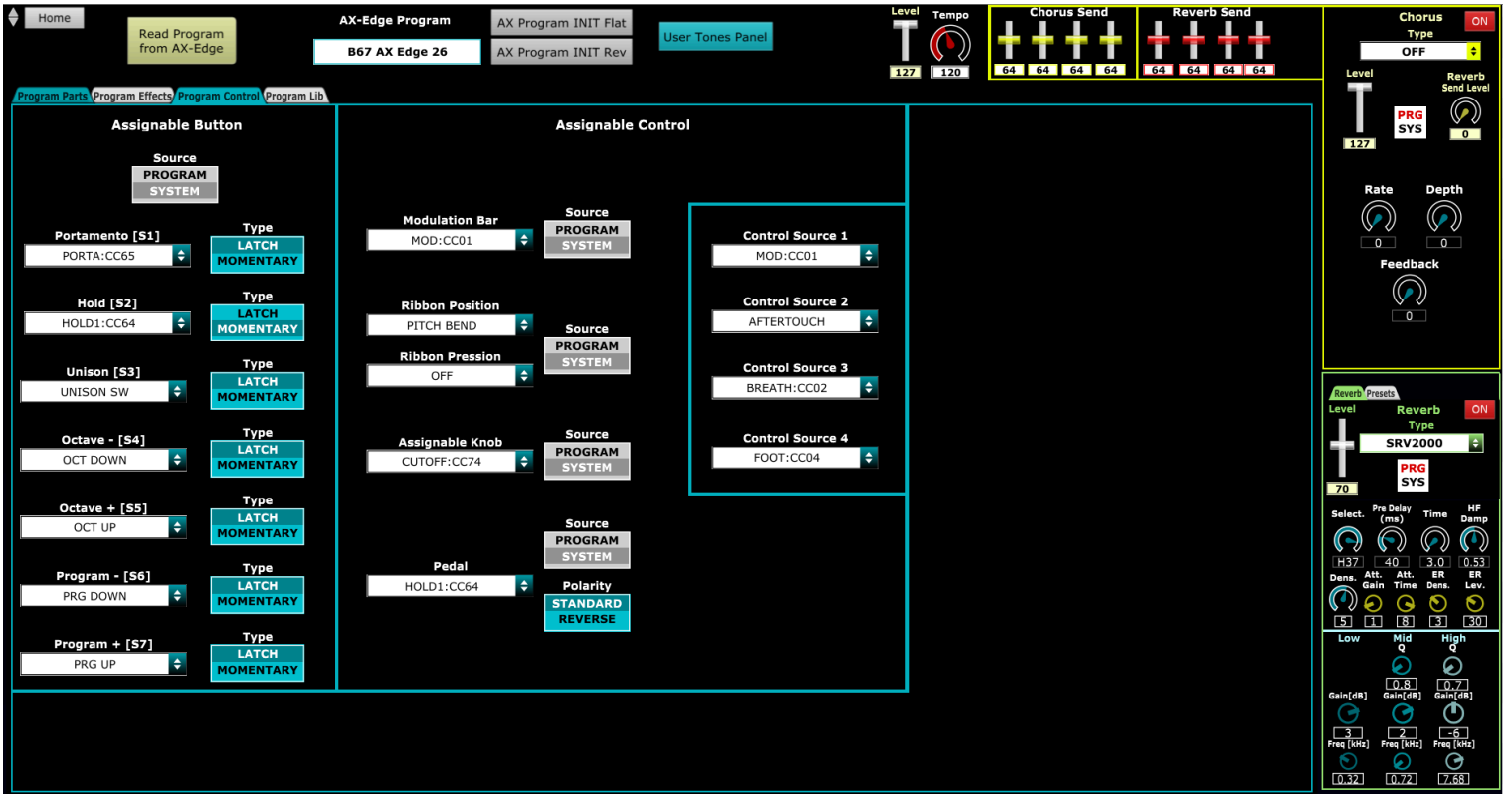
and clicking on the top 

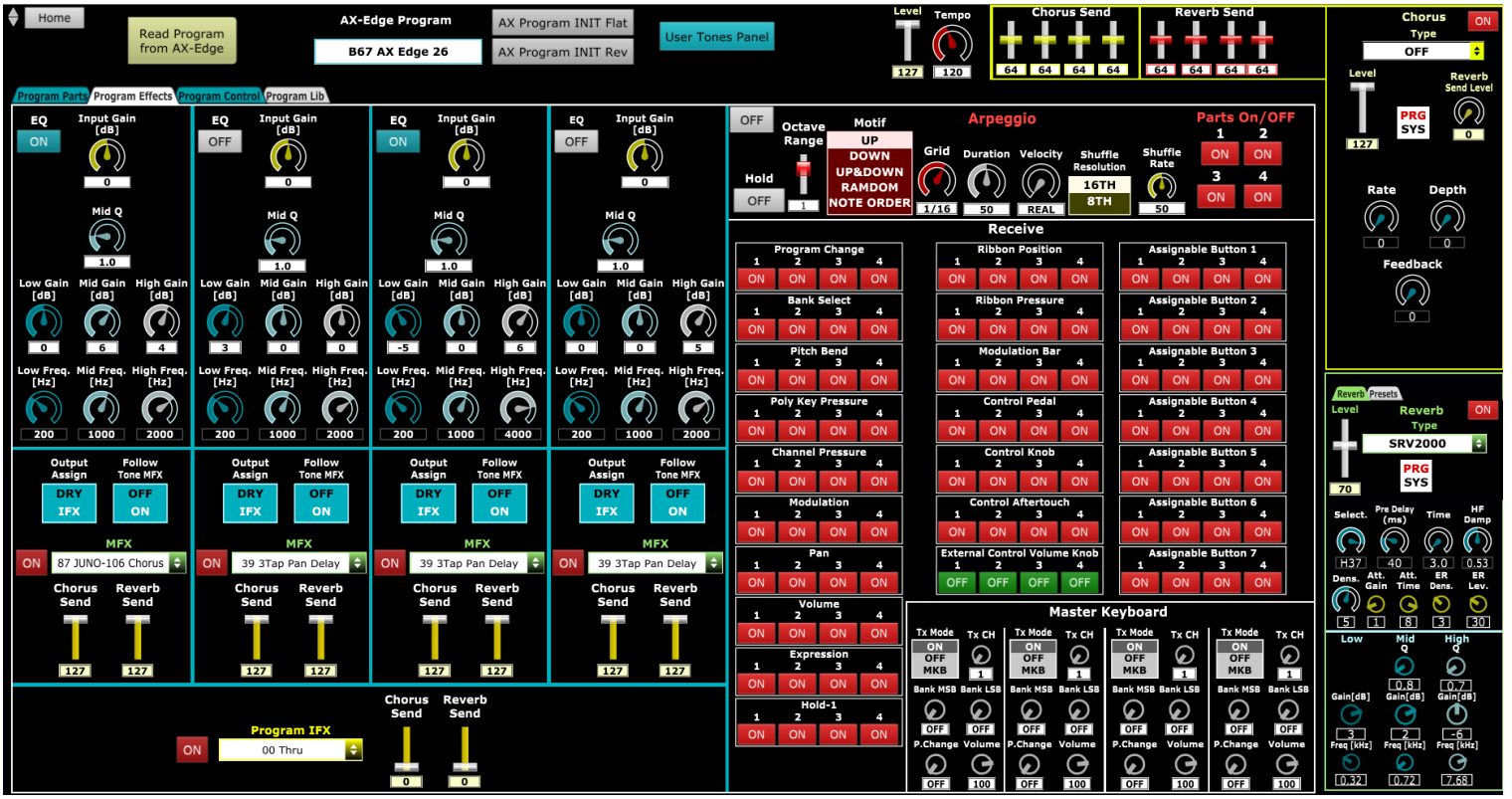
you will get the correct names in the parts where ZEN-Core user tones are used.



The program editing section is divided, as seen, into **4 TABS**: the second tab allows you to program the **EQ**, **MIDI Receive, Master Keyboard**, and **Arpeggio** sections; the third tab allows you to program the **assignable Buttons** and **Controls**. The Program Lib tab manages the program library described in the next chapter.

The image of the different TABS follows.

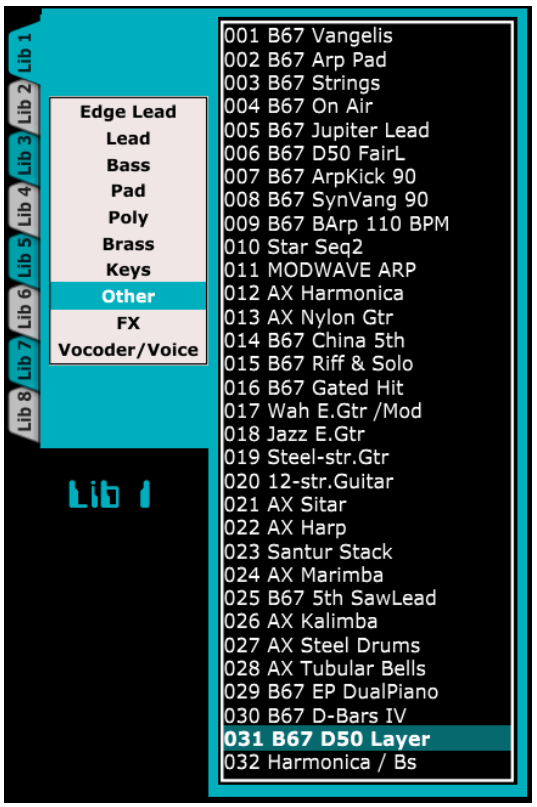

Home
Read Program from AX-Edge
AX-Edge Program
B67 AX Edge 26
AX Program INIT Flat
AX Program INIT Rev
User Tones Panel
Level
127
Tempo
120
Chorus Send
64 64 64 64
Reverb Send
64 64 64 64
Chorus
ON
Type
OFF
Level
127
Reverb Send Level
0
PRG
SYS
Rate
0
Depth
0
Feedback
0
Program Parts
Program Effects
Program Control
Program Lib
Assignable Button
Source
PROGRAM
SYSTEM
Portamento [S1]
PORTA:CC65
Type
LATCH
MOMENTARY
Hold [S2]
HOLD1:CC64
Unison [S3]
UNISON SW
Octave - [S4]
OCT DOWN
Octave + [S5]
OCT UP
Program - [S6]
PRG DOWN
Program + [S7]
PRG UP
Assignable Control
Modulation Bar
MOD:CC01
Ribbon Position
PITCH BEND
Ribbon Pression
OFF
Assignable Knob
CUTOFF:CC74
Pedal
HOLD1:CC64
Polarity
STANDARD
REVERSE
Control Source 1
MOD:CC01
Control Source 2
AFTERTOUCH
Control Source 3
BREATH:CC02
Control Source 4
FOOT:CC04
Reverb
Presets
Level
70
Reverb
ON
Type
SRV2000
PRG
SYS
Select.
Pre Delay (ms)
Time
HF Damp
H37
40
3.0
0.53
Dens.
Att. Gain
Att. Time
ER Dens.
ER Lev.
5
1
8
3
30
Low
Mid Q
High Q
0.8
0.7
Gain[dB]
Freq [kHz]
3
2
-6
0.32
0.72
7.68


Home
Read Program from AX-Edge
AX-Edge Program
B67 AX Edge 26
AX Program INIT Flat
AX Program INIT Rev
User Tones Panel
Level
127
Tempo
120
Chorus Send
64 64 64 64
Reverb Send
64 64 64 64
Program Parts
Program Effects
Program Control
Program Lib
EQ
ON
OFF
Input Gain [dB]
0
Mid Q
1.0
Low Gain [dB]
Mid Gain [dB]
High Gain [dB]
0 6 4
3 0 0
-5 0 6
0 0 5
Low Freq. [Hz]
Mid Freq. [Hz]
High Freq. [Hz]
200 1000 2000
200 1000 4000
Output Assign
DRY
IFX
Follow Tone MFX
OFF
ON
MFX
ON
87 JUNO-106 Chorus
39 3Tap Pan Delay
Chorus Send
Reverb Send
127
Program IFX
00 Thru
0
OFF
Octave Range
1
Motif
UP
DOWN
UP&DOWN
RAMDOM
NOTE ORDER
Arpeggio
Grid
1/16
Duration
50
Velocity
REAL
Shuffle Resolution
16TH
8TH
Shuffle Rate
50
Parts On/OFF
1 2
3 4
Receive
Program Change
Bank Select
Pitch Bend
Poly Key Pressure
Channel Pressure
Modulation
Pan
Volume
Expression
Hold-1
Ribbon Position
Ribbon Pressure
Modulation Bar
Control Pedal
Control Knob
Control Aftertouch
External Control Volume Knob
OFF OFF OFF OFF
Assignable Button 1
Assignable Button 2
Assignable Button 3
Assignable Button 4
Assignable Button 5
Assignable Button 6
Assignable Button 7
Master Keyboard
Tx Mode
ON
OFF
MKB
Tx CH
1
Bank MSB
Bank LSB
P.Change
Volume
100
Reverb
Presets
Level
70
Reverb
ON
Type
SRV2000
PRG
SYS
Select.
Pre Delay (ms)
Time
HF Damp
H37
40
3.0
0.53
Dens.
Att. Gain
Att. Time
ER Dens.
ER Lev.
5
1
8
3
30
Low
Mid Q
High Q
0.8
0.7
Gain[dB]
Freq [kHz]
3
2
-6
0.32
0.72
7.68

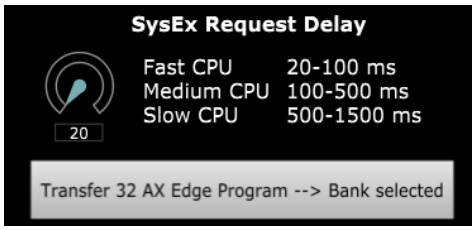
Editor AX-Edge: Program Librarian section

In the AX-Edge editor section (Program Lib tab) you can:

- manage a library of 2560 programs divided into **8 Libraries (Lib 1, Lib 2,...Lib 8)** each containing **320 programs**: each library is divided into **10 Banks of 32 programs,** which for convenience have the same names used by the Keytar: Edge Lead, Lead, Bass,....FX, Vocoder/Voice.
  You can load and save to file individual programs, a Bank (32 programs), a Lib (320 programs) and the entire library (2560 programs)



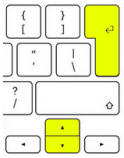
- Store the sounds of the currently used program in the library; alternatively, the library can be filled by directly transferring programs from AX-Edge→the library.



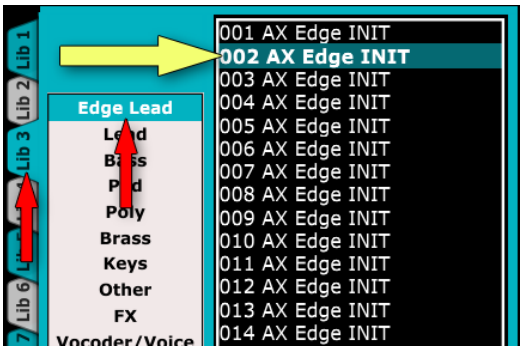
- Use 24 program presets and a clipboard (1-32 programs) for copying and pasting programs between different banks

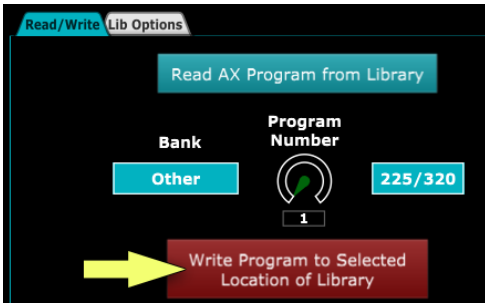
Note: The entire AX-Edge programs library database is volatile: at the end of the session the contents must be saved to a file so as not to lose any changes

Let's look in detail at the various operations that can be performed.

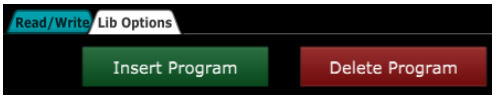
- **Transferring a Liberian Program to AX-Edge: three Equivalent Options**
  - double click on the name of the program in the library
  - selection (click or arrows) + Enter on the keyboard 
  - selection (click or arrows) + click on 

Note: If User ZEN-Core Tones are used in programs, AX-Edge stores the reference to these sounds (n. 1-256 of user tone 1-256) and not their content. In this case, the program will sound different if the user tones are changed.

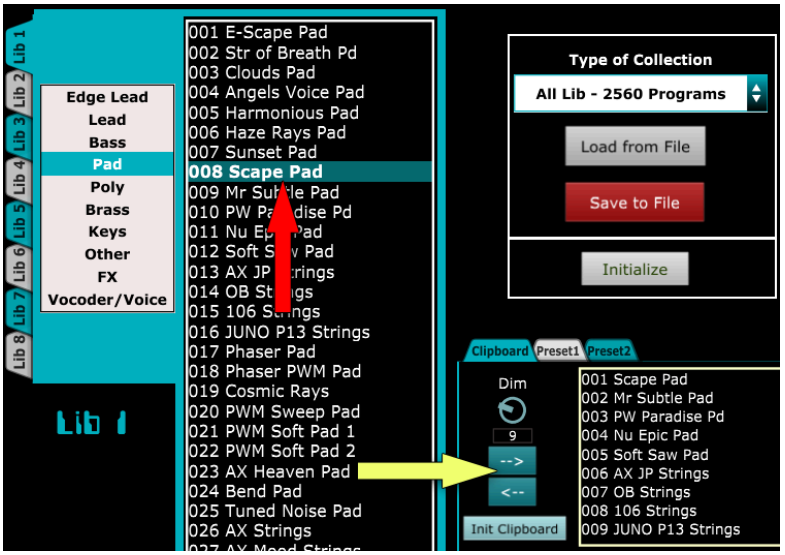
- **Saving the active program on the AX-Edge to a library location:**
  - Select the library location by clicking on LIB (1-8), Bank (Edge Lead, Lead, Bass, etc.), and Program No. 

  - Click "**Write Program to Selected Location of Library**" 

Note: After having edited a program using the editor, to store it in the library you need to proceed as indicated above: to store it on the AX-Edge you need to operate on the synth (Shift/Write and Enter)

- **Insert e Delete**
  Click on **"Insert Program"** to insert an INIT program (AX Edge INIT) into a library location; click on **"Delete Program"** to delete a program 

- **Using the clipboard.**
  To move program blocks between different locations in the library, you can use the clipboard, which has a variable size (1-32) that can be changed using the corresponding control.
  The transfer is done using the → **and** ← buttons**:**

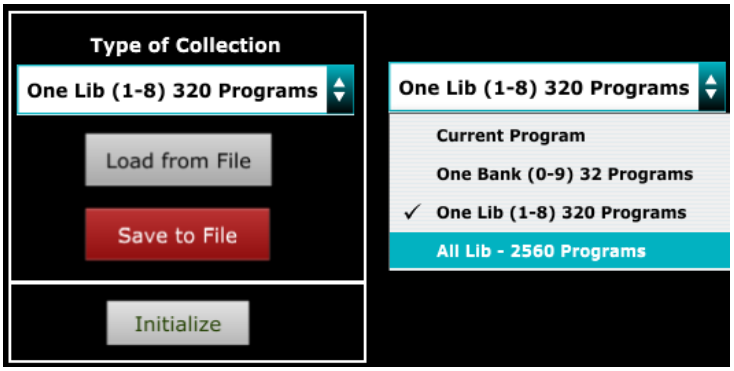
- **click → :** the program block is copied from the library to the clipboard starting from the selected program. 

- **click your ← :**the program block is transferred from the clipboard to the library starting from the selected program.
- You can initialize the clipboard by clicking on the corresponding icon 

- **Load and save library contents to a file.**

  The entire AX-Edge program library database <u>is volatile</u>: at the end of the session its contents must be saved to a file to avoid losing any changes.
  This library can be imported and exported using the "**Type of Collection**" menu and the "**Load from File**" and "**Save to File**" buttons.

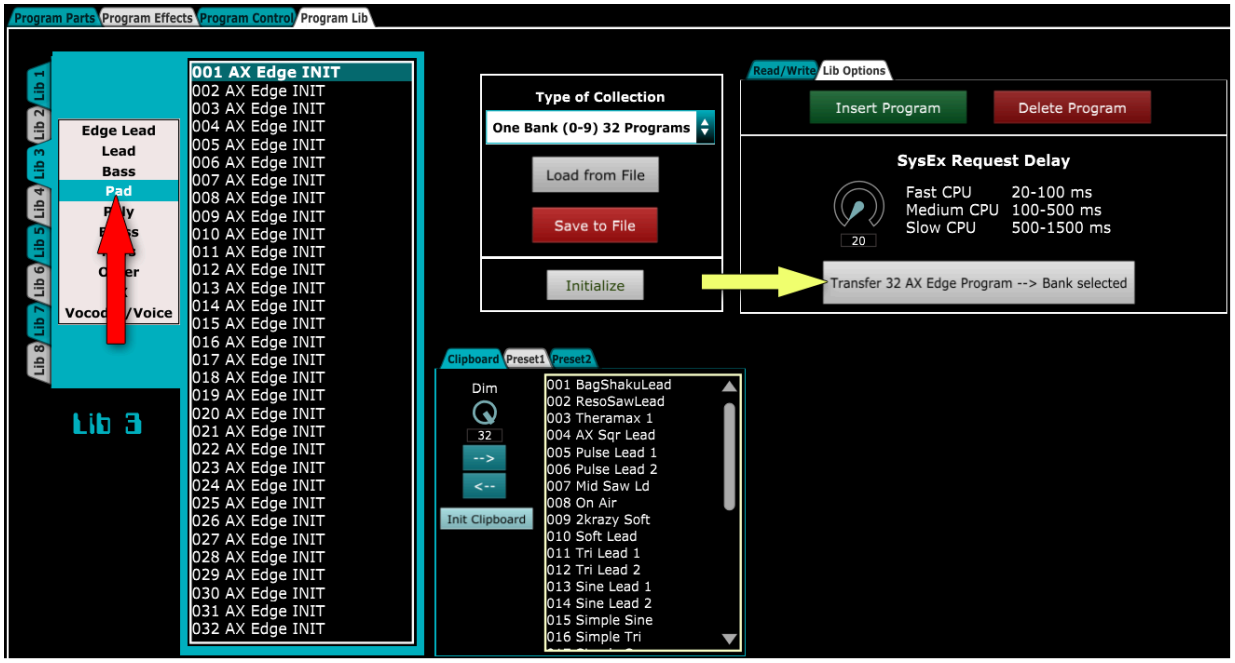
  - **Current Program**: Load and save the programs currently resident on the AX-Edge (the library is not affected).
  - **One Bank (32 programs) - One Lib (320 Programs):**
    - Load from file: the program collection (Bank or single library) is loaded from a file, replacing the currently selected one.
    - Save to file: The currently selected program collection (Bank or single library) is saved to a file
  - **All Lib (2560 programs):** Load and Save the entire library



- **Transferring AX-Edge resident programs to the editor's library.**

  320 AX-Edge resident programs can be transferred to the editor's library in groups of 32; the reverse is not possible .
  TTo store programs on the AX-Edge, you must do so one at a time **by operating the synth** (Shift/Write and Enter).
  For the AX-Edge→Librarian transfer, depending on your computer's speed, you must set a delay in the SysEx requests to ensure proper data transfer .
  If there are problems with the transfer, the program names will be incorrect; in this case, simply increase the Delay and repeat the operation.

The block (Edge Lead, Lead, Bass,....FX, Vocoder/Voice) of the 32 programs to be transferred is determined by selecting the librarian bank; the transfer is activated by clicking the
"**Transfer 32 AX Edge Program →Bank selected**" icon.



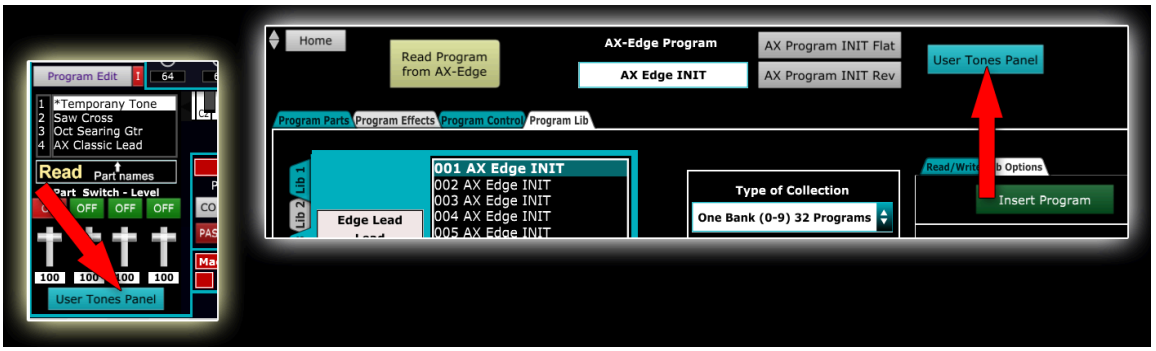
Note. The following files are provided with the editor:

- **AX_Edge_Default_320_Perf.syx** (type of collection: One Lib 320 Programs). 320 AX Edge default programs
- **AX_Edge_Axial_320_Perf.syx** (type of collection: One Lib 320 Programs). 96 AX Edge Axial free programs
- **AX_Edge_2560_Performance.syx** (type of collection: All Lib 2560 Programs). Le due collezioni (320 default + 96 Axial + 24 B67 preset 1 e 2

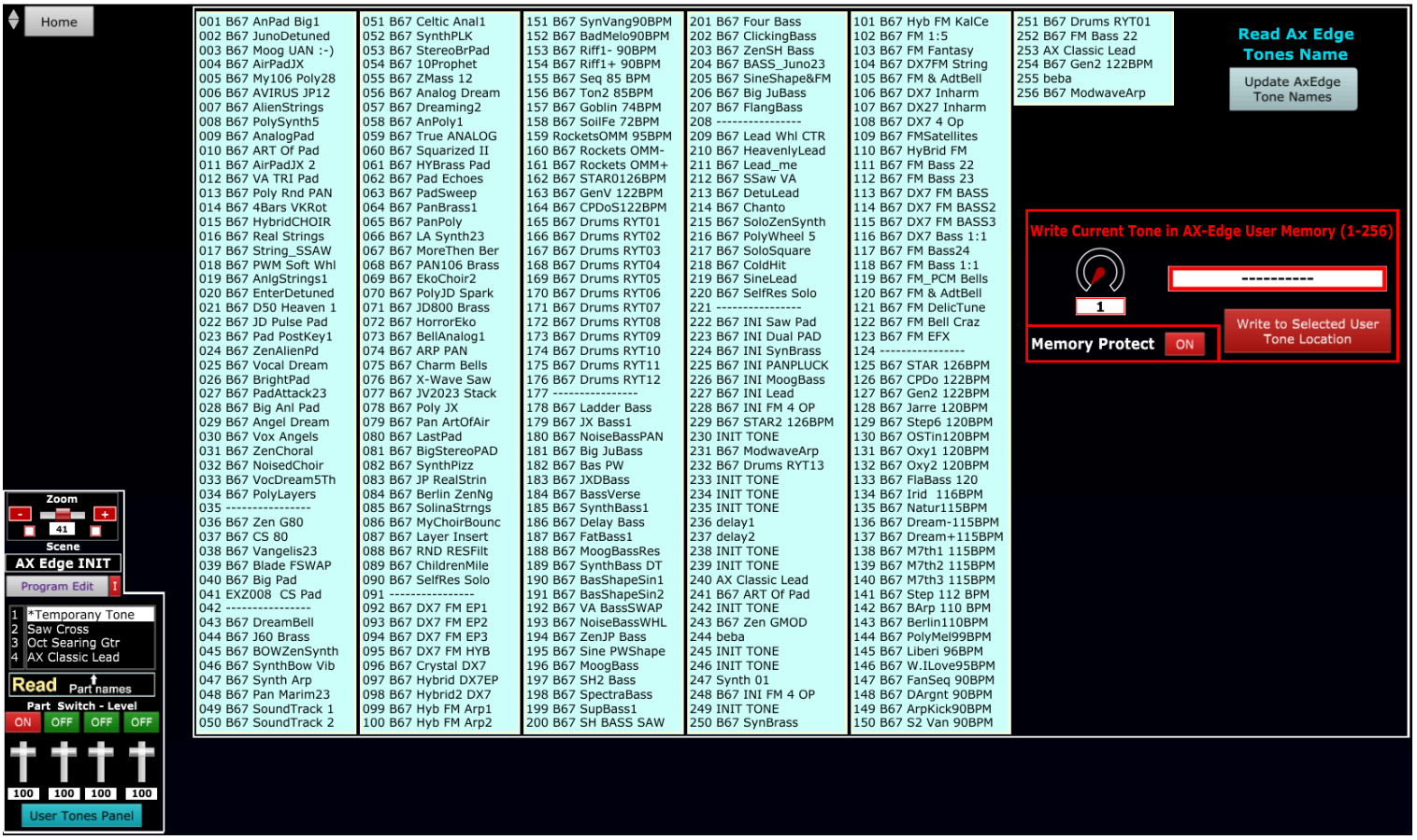
AX-Edge: User Tones Section

The **Ax-Edge editor features a section dedicated to the 256 User Tones**. In addition to displaying their names, you can also save edited Zen-Core tones or those loaded from the library directly to the AX-Edge internal memory.

This screen can be accessed from both the main page and the AX-Edge Program section.

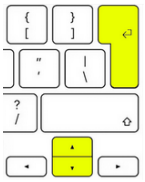


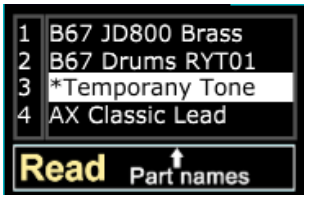
This takes you to the following screen.

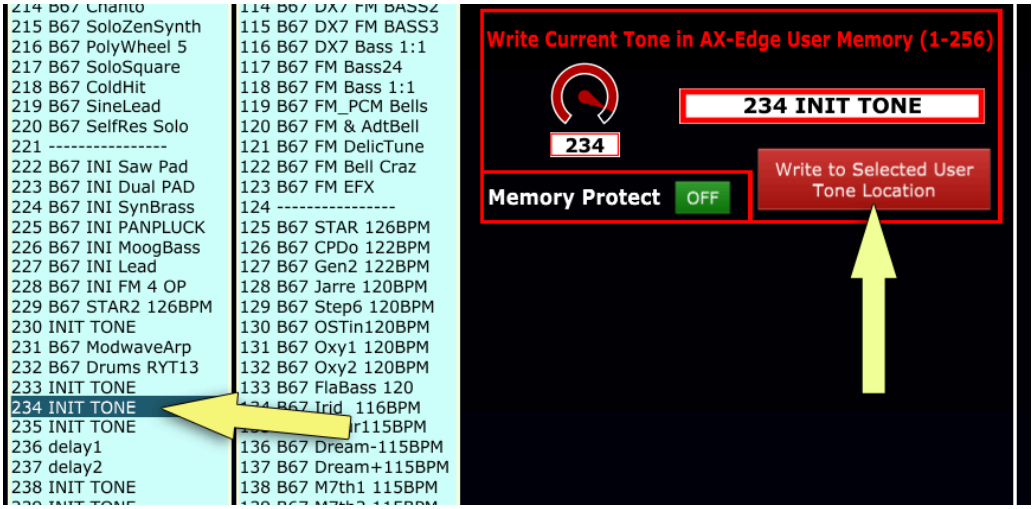


The names of the 256 user tones are visible in the 6 columns: to update them, as seen, just click on

Available operations

- **Selecting a user ZEN-Core tone**: Select the desired part (1-4) in the bottom left corner: **double-click** on the name or use the **Up/Down arrow keys + Enter** on the keyboard.  .
  The sound is changed **using Program Change**.
  <u>Any unsaved tone editing will be lost.</u>

- **Storing the current ZEN-Core tone to an internal memory location on the AX-Edge (1-256).**
  Proceed as follows:
  - Select "**Memory Protect" = OFF** 
  - **Select the sound (part 1-4) you want to save in the bottom left corner** 
    <u>(*Temporary Tone appears for a sound currently being edited)</u>
  - Use the **numeric control**, a **single click**, or the **Up/Down arrow keys** to select the location (1-256) to which you want to save the tone, and click **"Write to Selected User Tone Location".**


214 B67 Chanto
215 B67 SoloZenSynth
216 B67 PolyWheel 5
217 B67 SoloSquare
218 B67 ColdHit
219 B67 SineLead
220 B67 SelfRes Solo
221 ----------
222 B67 INI Saw Pad
223 B67 INI Dual PAD
224 B67 INI SynBrass
225 B67 INI PANPLUCK
226 B67 INI MoogBass
227 B67 INI Lead
228 B67 INI FM 4 OP
229 B67 STAR2 126BPM
230 INIT TONE
231 B67 ModwaveArp
232 B67 Drums RYT13
233 INIT TONE
234 INIT TONE
235 INIT TONE
236 delay1
237 delay2
238 INIT TONE
114 B67 DX7 FM BASS2
115 B67 DX7 FM BASS3
116 B67 DX7 Bass 1:1
117 B67 FM Bass24
118 B67 FM Bass 1:1
119 B67 FM_PCM Bells
120 B67 FM & AdtBell
121 B67 FM DelicTune
122 B67 FM Bell Craz
123 B67 FM EFX
124 ----------
125 B67 STAR 126BPM
126 B67 CPDo 122BPM
127 B67 Gen2 122BPM
128 B67 Jarre 120BPM
129 B67 Step6 120BPM
130 B67 OSTin120BPM
131 B67 Oxy1 120BPM
132 B67 Oxy2 120BPM
133 B67 FlaBass 120
Irid_ 116BPM
r115BPM
136 B67 Dream-115BPM
137 B67 Dream+115BPM
138 B67 M7th1 115BPM
Write Current Tone in AX-Edge User Memory (1-256)
234
234 INIT TONE
Memory Protect
OFF
Write to Selected User Tone Location

“B67 ZEN FM” Engine (4 FM Operators + 4 Wave Shapes)

The new **B67 ZEN FM** synthesis engine is fully implemented with ZEN-Core synthesis, where a graphical editor allows you to modify only a limited number of synthesis parameters, **leaving the others predefined and inaccessible**.
The engine editor simplifies programming through an **optimized graphical** interface that, among other features, implements the ability to set operator frequencies with the **Freq.Ratio** parameter (0.25, 0.5, 0.78, 1, 1.5, 1.57, 1.78, 2, 3, 3.5, 4, 5, etc.), allows **editing and viewing of the 8 ENVs in a single screen (2 carriers, 2 modulators, and 4 shapes)**, and implements convenient **copy and paste operations for ENVs** and operators. Furthermore, 2**0 sound presets, ENV presets, and a dedicated librarian (2,048 sounds)** are always available.

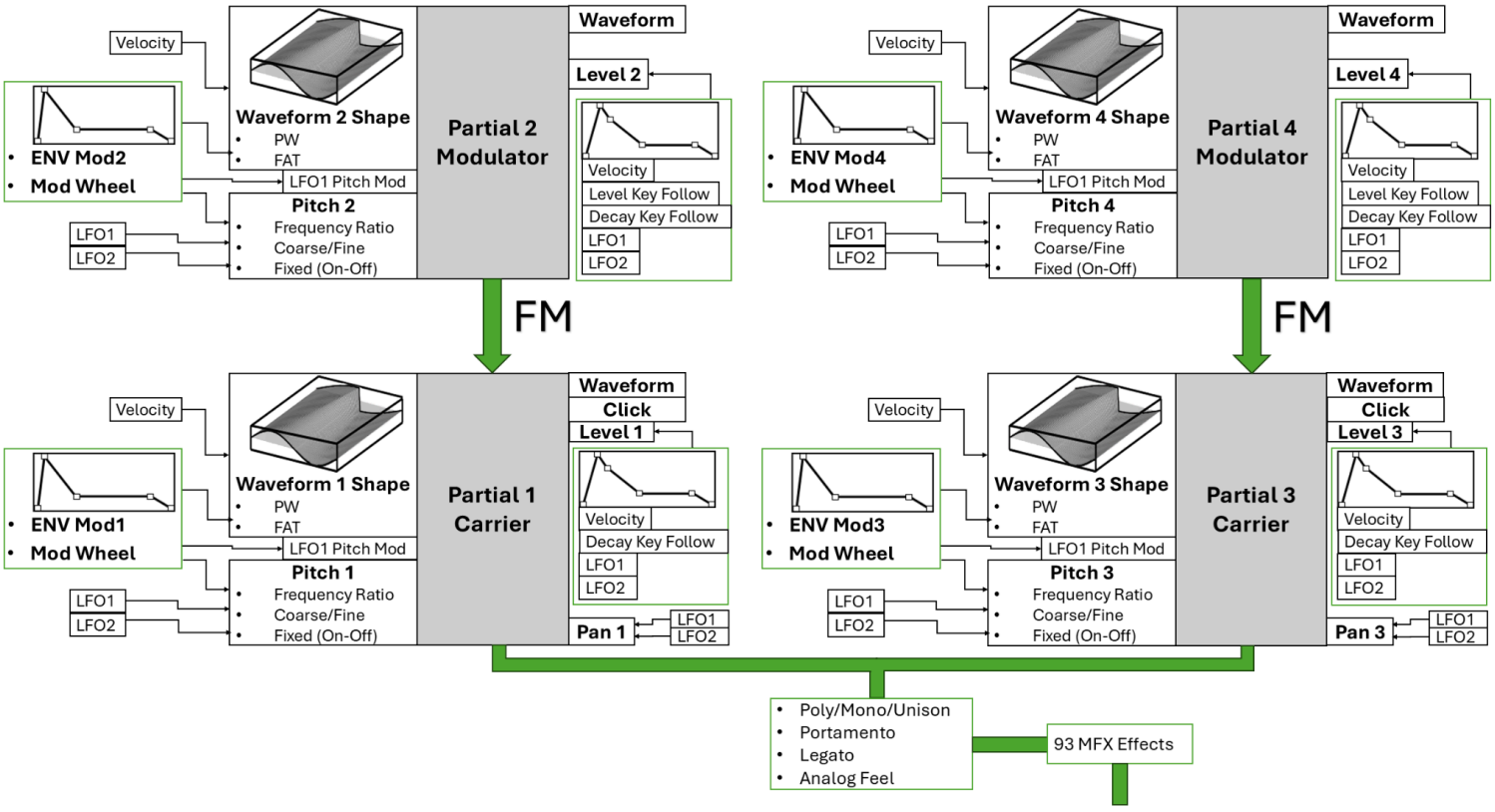
Using the dedicated editor screen, you can obtain a **standard ZEN-Core** tone that can be used on all compatible synths and virtual instruments (Zenology Pro, Zenbeats (ZC-1), FP-E50, RD-88, RD-08, Juno-D, Juno-X, V-Stage, MC-101, MC-707, Verselab MV-1, GM-800, Aerophone AE-20 Pro AE-30, GO:KEYS 5, GO:KEYS 3).
With the **AX-Edge, Jupiter-X/Xm, and Fantom/0/EX,** you can not only play the tones from this engine, but also **program them in the dedicated editor section. Furthermore, the dedicated librarian allows you to save and recall parameters for later editing**.

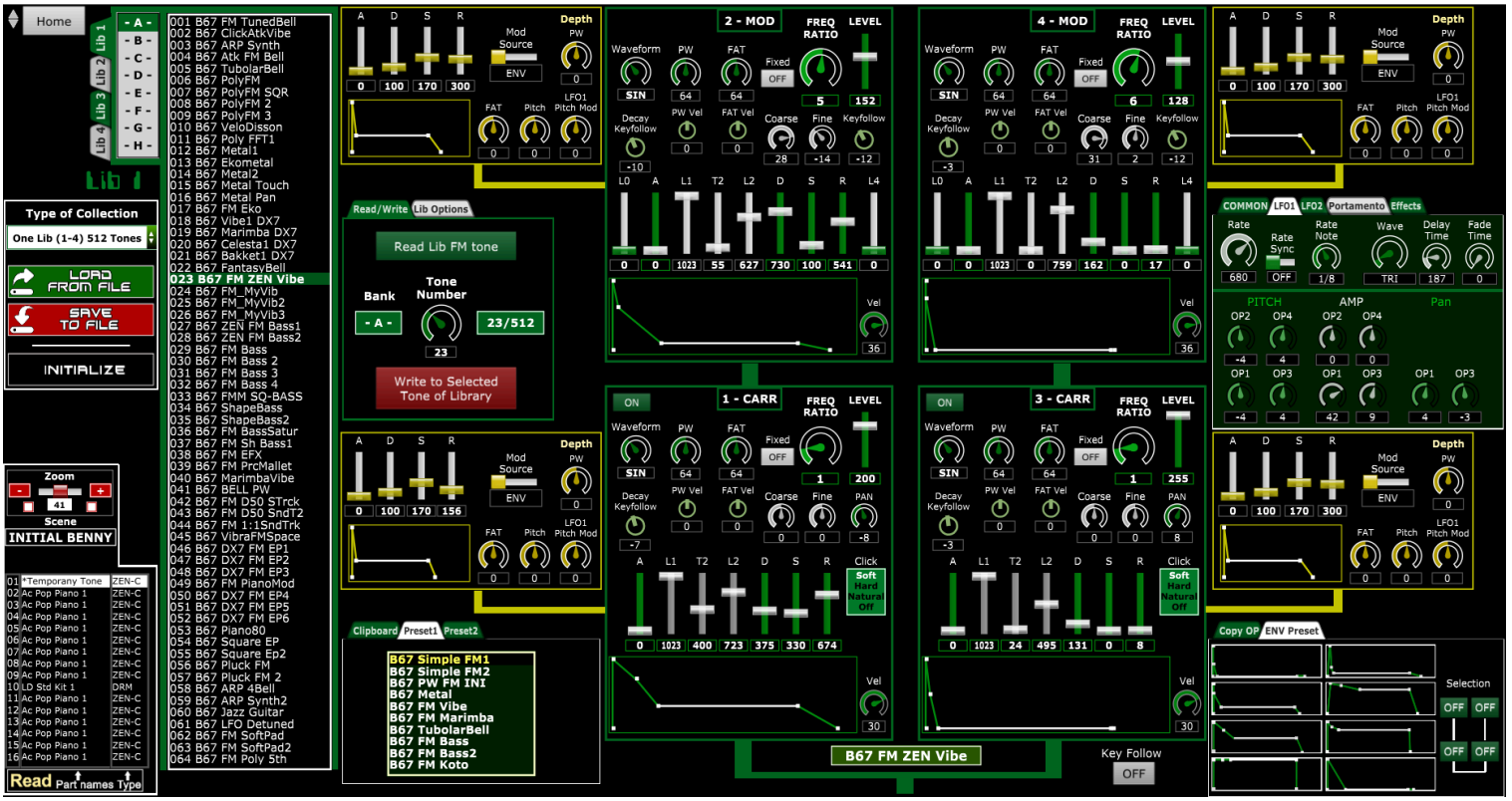
Because the **B67 ZEN FM** engine uses the ZEN-Core standard, the sounds created can be edited on synths like any other tone, thus **freeing oneself from the engine's fixed synthesis**. Obviously, you lose the immediacy of editing, access to the dedicated librarian, and the ability to set the operator frequencies with the **Freq.Ratio** control.

The synthesis engine is stereo with 21-22 voices of polyphony (10-11 in the MC-101/707 and MV-1 grooveboxes). There are numerous parameters not available for editing that characterize the engine's sounds. These include**:**

- Structure 1-2 = XMOD2
- Structure 3-4 = XMOD2
- Partial Oscillators 1,2,3,4 = VA
- Modulation matrix with predefined Source and Destination parameters to ensure correct modulations that operate on the main FM synthesis parameters.

Below is a diagram of the implemented structure.





Synthesis is implemented with a dual pair of carrier/modulators (1-2 and 3-4). The two pairs have identical characteristics: all parameters of pair 1-2 are the same as those of pair 3-4. In classic FM synthesis, well known from historic synths such as the Yamaha DX7, oscillators, called operators, produce sine waves: in a carrier/modulator pair, the timbre is defined by the frequency ratio of the operators and their volume, which is modulated by envelopes. The Frequency Ratio is defined as the ratio between the frequency of the modulator and that of the carrier.

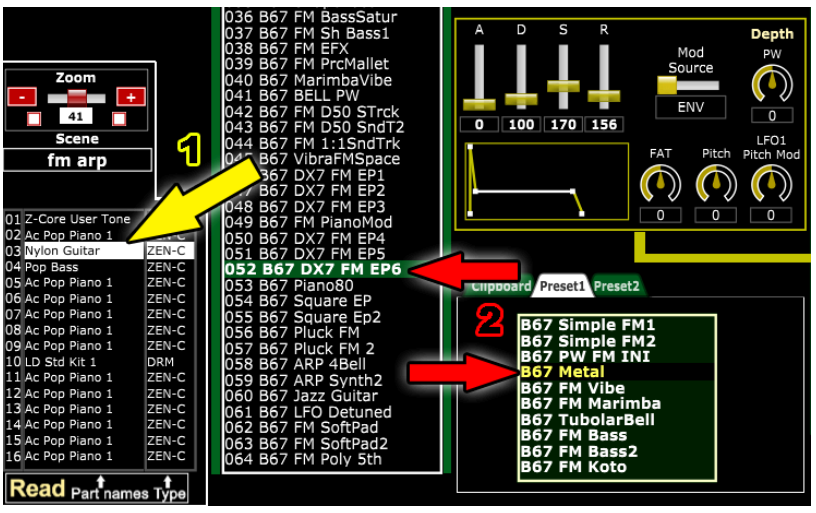
- If the ratio is an integer (e.g., C/M = 1:1, 1:2, 1:3), harmonic sounds are obtained.
- If the ratio is a non-integer (e.g., C/M 1:1.78, 1:3.5, etc.), inharmonic sounds are obtained (metals, membranes, bells, etc.).

The volume of the modulator, which varies over time with its envelope, defines the amount of harmonics in the resulting timbre:

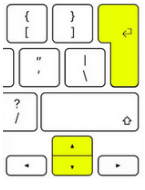
- Modulating Volume = 0 → sound of the modulator/carrier pair = sinusoidal
- Modulating Volume = MAX → sound of the modulator/carrier pair = maximum harmonic content defined by their frequency ratio.

In the implementation of the **B67 ZEN FM** synthesis engine, each carrier/modulator pair is capable of creating more complex sounds than traditional Yamaha synthesis with sinusoidal operators.

To start creating or editing a sound with the **B67 ZEN FM synthesis**, you need to: **:**



- **Select a ZEN-Core tone** by clicking on the desired section at the bottom
- **Double-click on any sound from the librarian or a preset** (alternatively, select using the Up/Down arrow keys + Enter on the keyboard

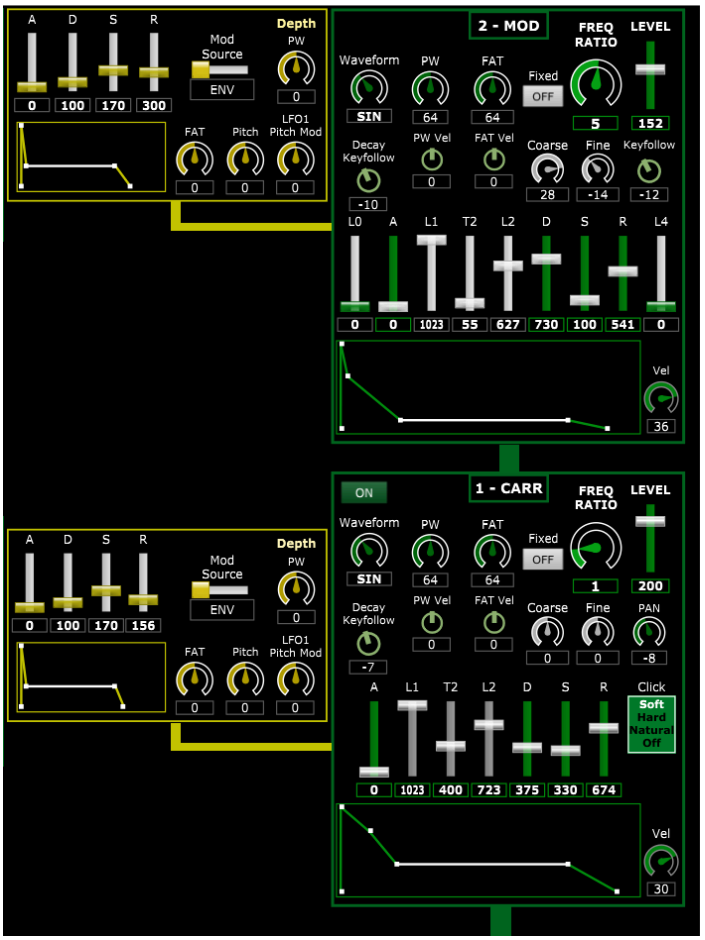


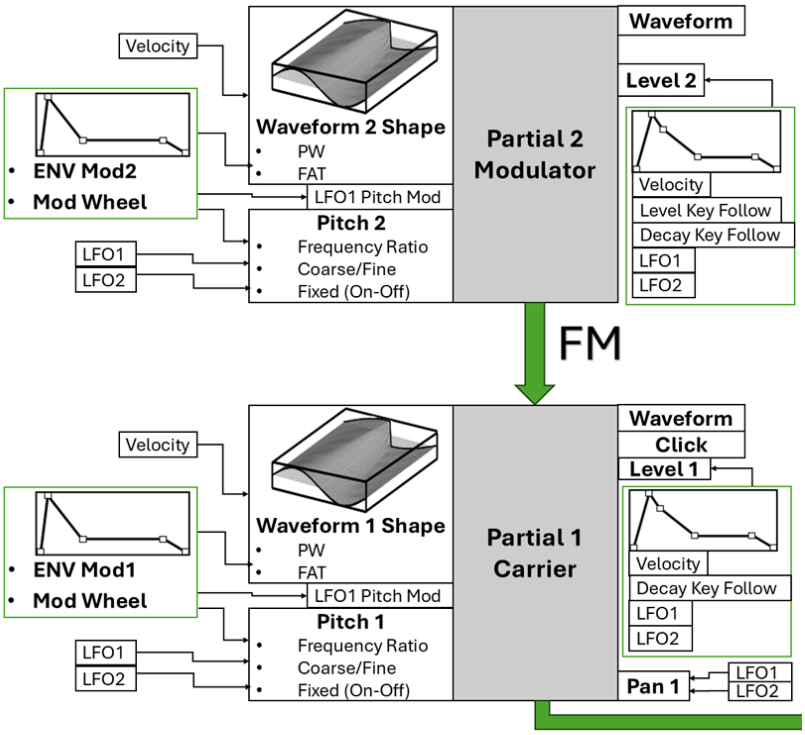
or click your

)

The synthesis structure of the B67 ZEN FM engine

Let's examine the single modulating carrier pair on the left, 2-MOD→1-CAR: the second pair on the right has the same parameters and is therefore identical.

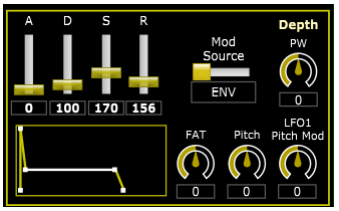


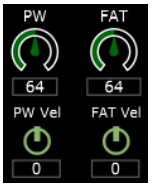


Basic Features

The simplest case is a carrier-modulating pair with sinusoidal oscillators: **the classic FM of the first family of Yamaha synths**.
For each operator, set

- **Waveform= SIN** 

- Depth =0 **for the four parameters** on the left 

- PW, FAT, PW Vel and FAT Vel = 0 

Then proceed with the classic 2-operator FM parameters. .

- **Freq Ratio**: sets the carrier and modulating frequencies (0.25, 0.5, 0.78, 1, 1.5, 1.57, 1.78, 2, 3, 3.5, 4, 5, 16) to characterize the harmonic content
- **Coarse/Fine** (+-48 +-50): Alternatively you can set the frequency with the controls that define the transpose in semitones and cents.
- **Fixed** (ON/OFF). The operator frequency is fixed and corresponds to that set with Freq Ratio and Coarse/Fine
- **Volume** and 4-segment **Env** of the modulator: amplitude of the harmonics.

- **Volume** and 4-segment **Env** of the carrier: output volume
- **Vel**: Key velocity of the carrier and modulator for dynamic response to harmonic content (modulator) and volume (carrier)
- **PAN** of the output audio signal (carrier only)

Two other useful parameters are also available for modifying the decay times and harmonic content on the keyboard .

- **Decay Key Follow**: variation of the **T2** and **Decay times** along the keyboard notes. Selecting **negative values** gradually decreases the times towards the higher notes: a useful feature for simulating the behavior of certain acoustic instruments.
  The parameter present on the carrier and modulator affects the volume and harmonic content, respectively.
- **KeyFollow** (present only on the modulator): variation of the volume and therefore the harmonic content on the keyboard notes. **Selecting negative values causes the harmonic content to gradually decrease towards the higher notes**
- **Click:** Soft, Hard, Natural, OFF: Type of attack click when attack=0

2 MOD→1-CAR : The second pair on the right has the same parameters and is therefore identical.

Note: The two carrier/modulator pairs (2-MOD→1-CAR and 4-MOD→3-CAR) are identical. To activate/deactivate each pair, simply operate the ON-OFF of 1-CARR and 3-CARR

Advanced Features: Waveform Shape

The FM of the first family of Yamaha synths (DX7, DX5, DX21, etc.) used sinusoidal operators. Yamaha later implemented more complex waveforms in its FM synths: from the classic 8 Waves of the TX81Z to the 7 Waves of the Montage family, which feature additional parameters capable of permanently modifying their harmonic content.

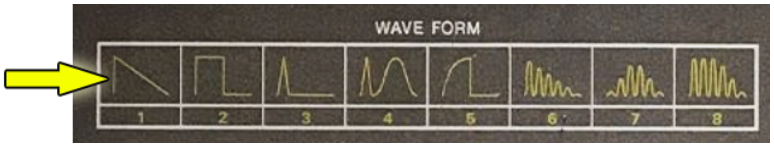
The **B67 ZEN FM engi**ne not only uses the 9 waveforms typical of the ZEN-Core synthesis VA oscillators (SIN, SIN2, TRI, TRI2, TRI3, SAW, SQR, RAMP, JUNO) but also implements the ability to **dynamically modify these waves**.

Each waveform can be modified with the **PW and FAT** parameters not only statically, but also **dynamically** thanks to the ability to modulate PW and FAT with velocity and a **dedicated ADSR envelope** for each operator. Each operator has:

- **Waveform** (SIN, SIN2, TRI, TRI2, TRI3, SAW, SQR, RAMP, JUNO)
- **PW**
- **FAT**
- **PW Velocity**
- **FAT Velocity**
- **ADSR** Dedicated envelope with separate PW and FAT depths

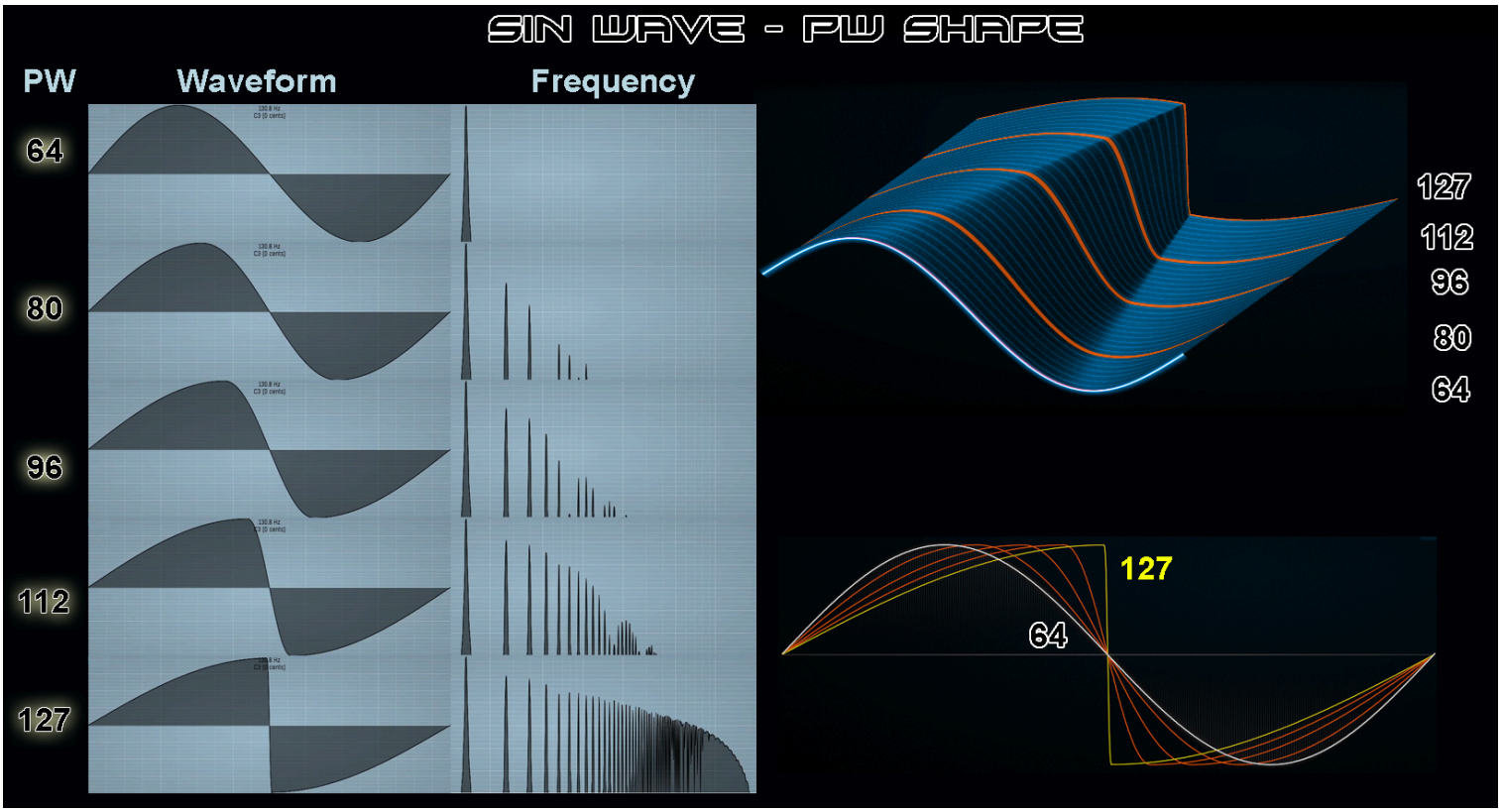
These parameters can be used to modify the waveform in various ways.

One of the particularly useful possibilities comes from the **PW functionality applied to the sinusoidal waveform which distorts (64→127) the wave until it becomes similar to a SAW. It is a process similar to the phase distortion (PD) synthesis famous for the Casio synths of the CZ family** where the phase distortion is modulated inside the DCW (Digital Controlled Wave) section.

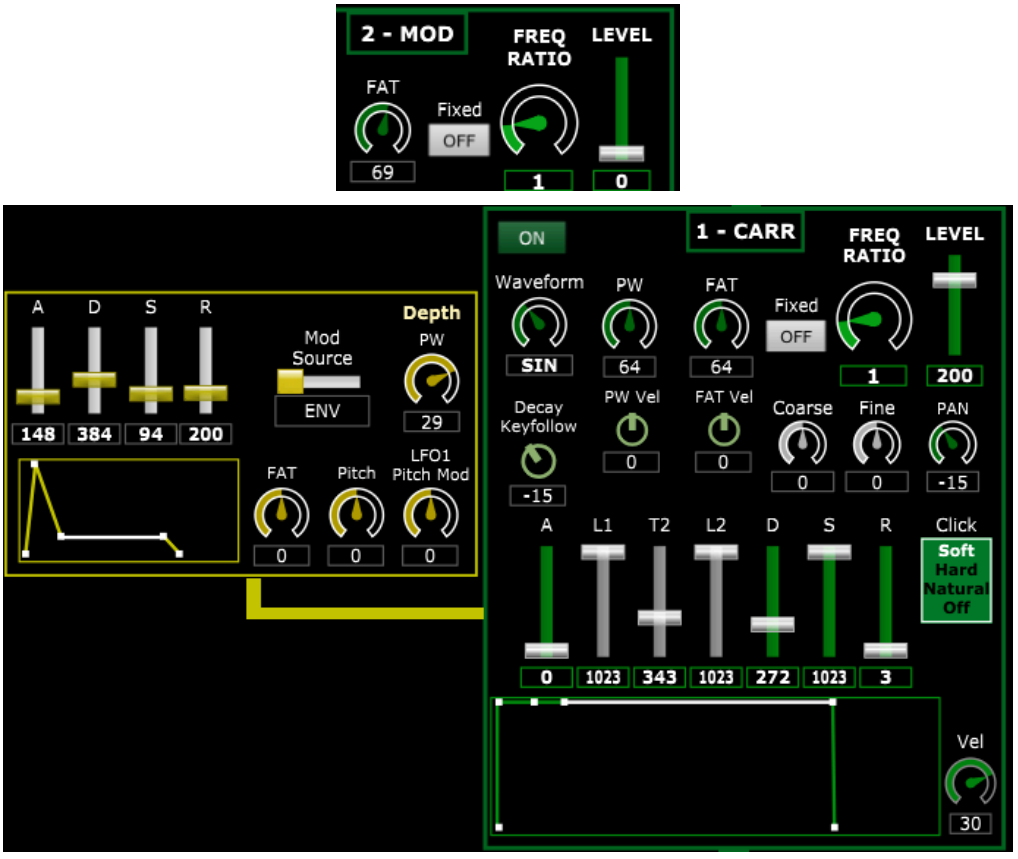


By modulating the **PW with the Key Velocity, a dedicated ADSR ENV, or the Mod Wheel**, you can obtain sounds impossible to achieve with pure FM and, in some cases, similar to PD synthesis.

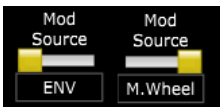
Here you can see the effect of the PW parameter (64→127) on a sine wave: in the time domain, the shape of the sine wave transforms the wave until it resembles a SAW; in the frequency domain, the harmonics increase until they reach the spectrum of a SAW.
Modifying the PW via ENV corresponds to varying the index of the wavetable in the figure: the effect is similar to that of a low-pass filter.



The simplest way to use **Waveform Shape** with the **PW** of a simple sine wave is shown in the following image, where the **PW** is modulated by the **dedicated ENV ADSR**. To hear the result, simply have a single carrier oscillator turned on (1-CARR in the example) and set the volume of the 2-MOD modulator to zero.



The yellow section on the left sets the depths of the various modulations, which can be controlled by the dedicated **ENV ADSR** or alternatively by the **Modulation Wheel**: the selection is made using the switch.

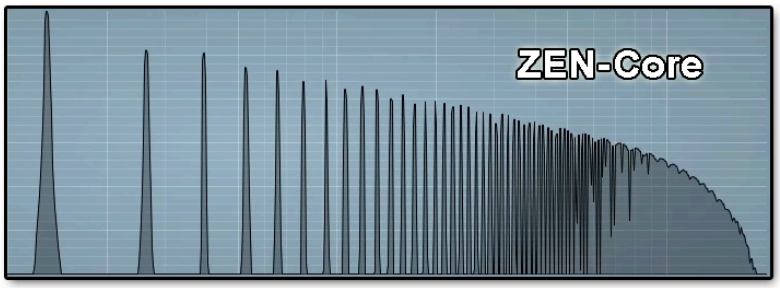


The modulation depth (**Depth**) can be set for:

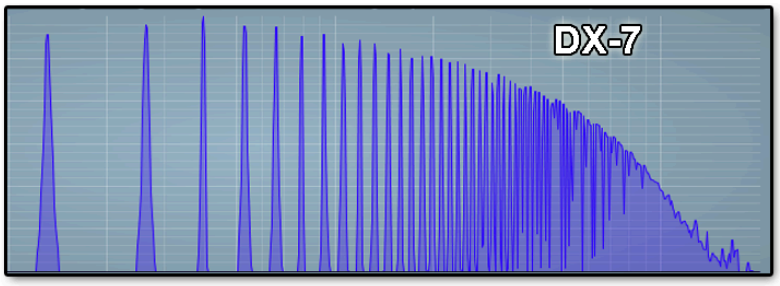
- **PW**
- **FAT** (see later)
- **Pitch**
- **LFO1 Pitch Mod** (the amount of vibrato generated by LFO1)

The Waveform Shape can be used for all available waveforms: obviously, SIN, SIN2, TRI, TRI2, and TRI3 are the most suitable since, with a PW=64, they have low harmonic content and are well suited for the purpose, considering the model's lack of filtering.
When using Waveform Shape in the two modulating waves (2-MOD and 4-MOD), the harmonic content of the waves is enriched, which in turn modulates the corresponding carriers in FM.
Among the **many possible applications** is one that allows the entire sound to be enriched with harmonic content during the attack phase: this can be done using an ADSR with reduced decay times.

If we analyze the simple sinusoidal ZEN-core oscillator with PW=127, as already seen, we find a waveform very similar to the SAW.
A very similar waveform can be obtained using a **DX7** using a carrier-modulator pair, the same frequency (ratio 1:1), **modulator volume = 79 and feedback = 7**.



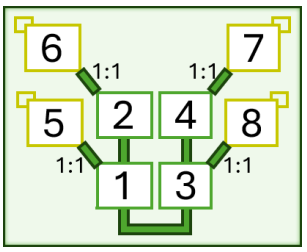
1 Osc - Waveform Sine - PW=127



2 Operators - Ratio 1:1 - Mod.Out=79 - Mod Feedback=7

For this reason, the behavior of a sinusoidal oscillator in the **B67 ZEN FM** engine with a **PW modulated by a dedicated ENV (64 → max 127)** is very similar to that **of a modulating carrier pair with a 1:1 ratio where the modulating volume varies with the same dedicated ENV.**

Therefore, the **B67 ZEN FM engine**, when using sinusoidal oscillators and modulating the PW (Depth 0-63) with the 4 dedicated ADSR ENVs (those in yellow), can be considered similar to the following FM algorithm.

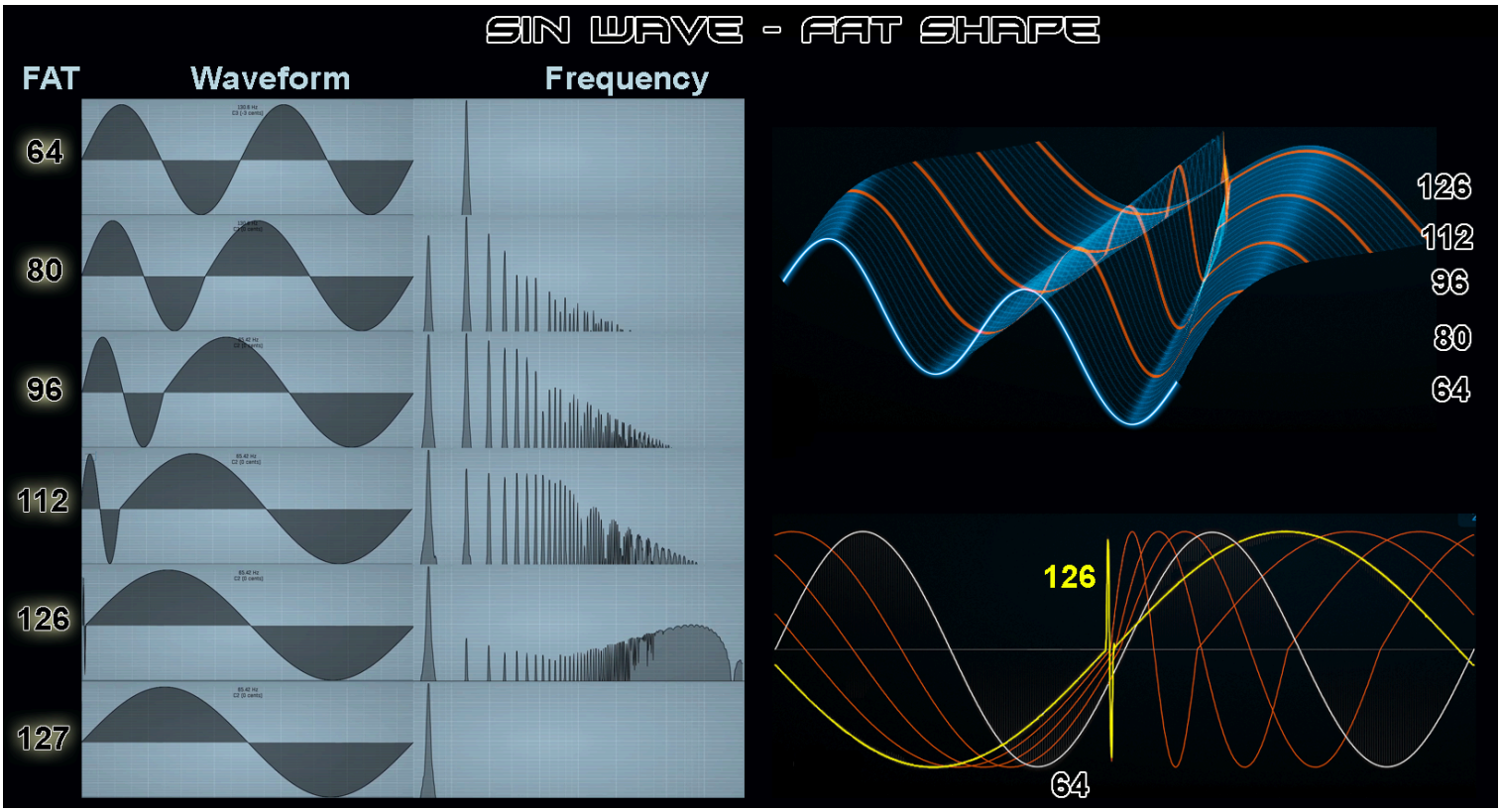


The second waveform shape of the oscillators can be achieved **using the FAT parameter, which duplicates and distorts the wave on the time axis.**

- **FAT= 64:** Raw wave with frequency **F**.
- **FAT between 65 and 126:** A copy of the wave is progressively generated at frequency F/2 and a series of progressively increasing harmonics at high frequencies
- **FAT= 127:** Raw wave with **frequency F/2**.

Using the values 63→0 achieves identical behavior.

The following is a summary graph for the case of **Waveform = Sin**.



Similar to the **PW** shape, you can set: :

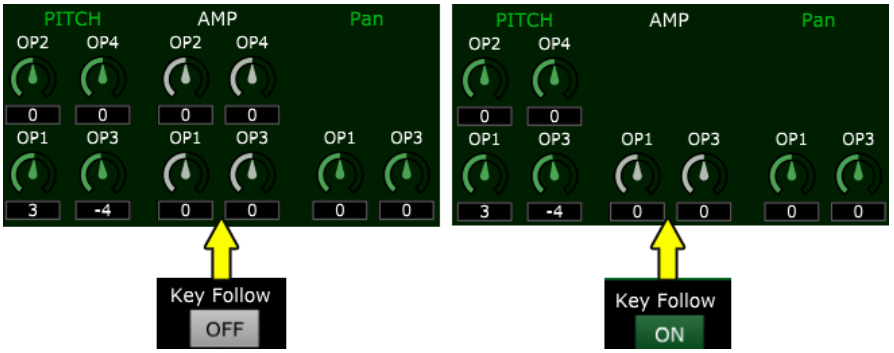
- **FAT**: Initial shape value (64 = no shape)
- **FAT Vel**: Variation with Key Velocity
- **FAT Depth** : Modulation intensity of the dedicated ENV ADSR or alternatively the Modulation Wheel

Other Synthesis Parameters - Copy Operator - ENV Preset - MFX Effects

LFO1 and LFO2

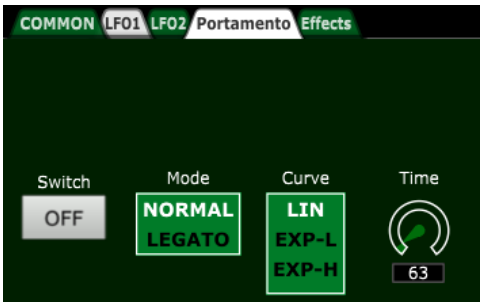
The **B67 ZEN FM** engine features two identical LFOs, whose speed can be synchronized with the tempo, **11 Waveforms**, and **Delay** and **Fade Time**. The modulation amplitudes are adjusted via:

- **Pitch Depth (-100 - +100):** OP1 and OP3 operate on the carrier frequency and have an effect that corresponds to the oscillator vibrato. OP2 and OP4 operate on the modulating frequencies and therefore also affect the harmonic content (timbre).
  To achieve pure vibrato without timbre oscillations, set OP1=OP2 and OP3=OP4 Pitch Depth.
- **AMP Depth (-100 - +100):** By default, only the two carriers OP1 and OP3 (tremolo) can be selected. To operate the two modulators OP2 and OP4 (harmonic content modulation), you must disable the corresponding Keyfollow feature by clicking **KEY Follow** ON/OFF (bottom, to the right of the tone name).



- **Pan Depth (-63 - +63):** LFO pan amount on the two carrier operators OP1 and OP3.

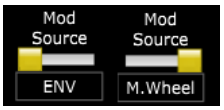
Portamento



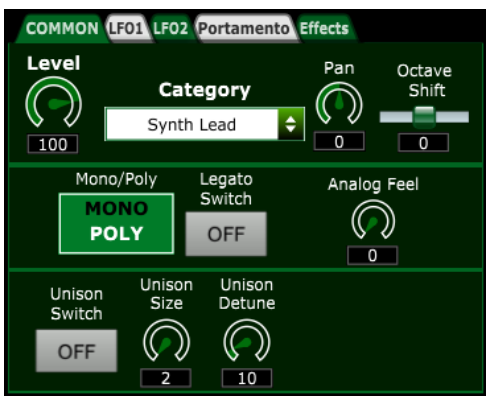
Mode, **Curve**, and **Tempo** are adjustable.

Vibrato e Modulation Wheel.

When choosing which parameters to enable in the **B67 ZEN FM** engine, we were limited by the maximum number of modulations that can be managed within the MOD Matrix of the ZEN-Core synthesis. **Due to these limitations, the vibrato managed by the Modulation Wheel is not active by default**.



To use it in the operators where it is needed, you must set **Mod Source = Modulation Wheel**. This disables the ability to use the **ENV ADSR** as a modulation source.

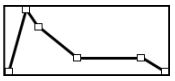


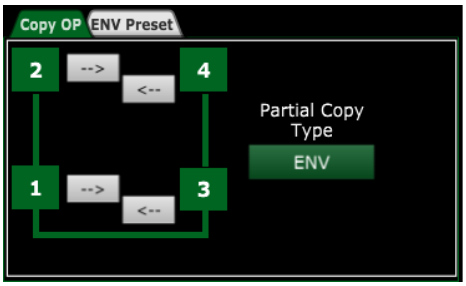
Common

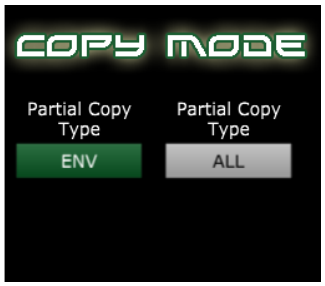
Among the various parameters worth mentioning is the presence of **Analog Feel** (imperfections in intonation and volume/timbre): the use of **Unison** is also available, which reduces the polyphony as the **Unison Size** varies. **.**

Unison	Polifonia
OFF	21-22
2	11
3	7
4	5

Copy Operators

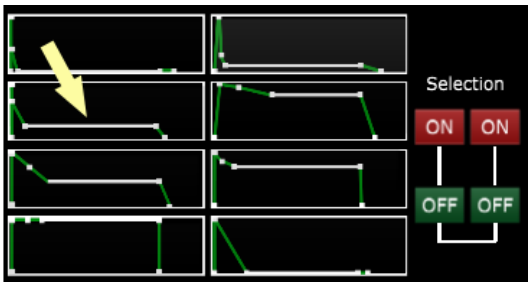
You can copy the 4-step envelopes  of the 4 operators (Carrier 1-3 or Modulator 2-4) or the entire set of parameters (Waveform, Frequency, ENV 4 Step, ENV ADSR, etc.). To select the copy type, click on "**Partial Copy** Type"; the copy is activated **by clicking the → and ← arrows**.





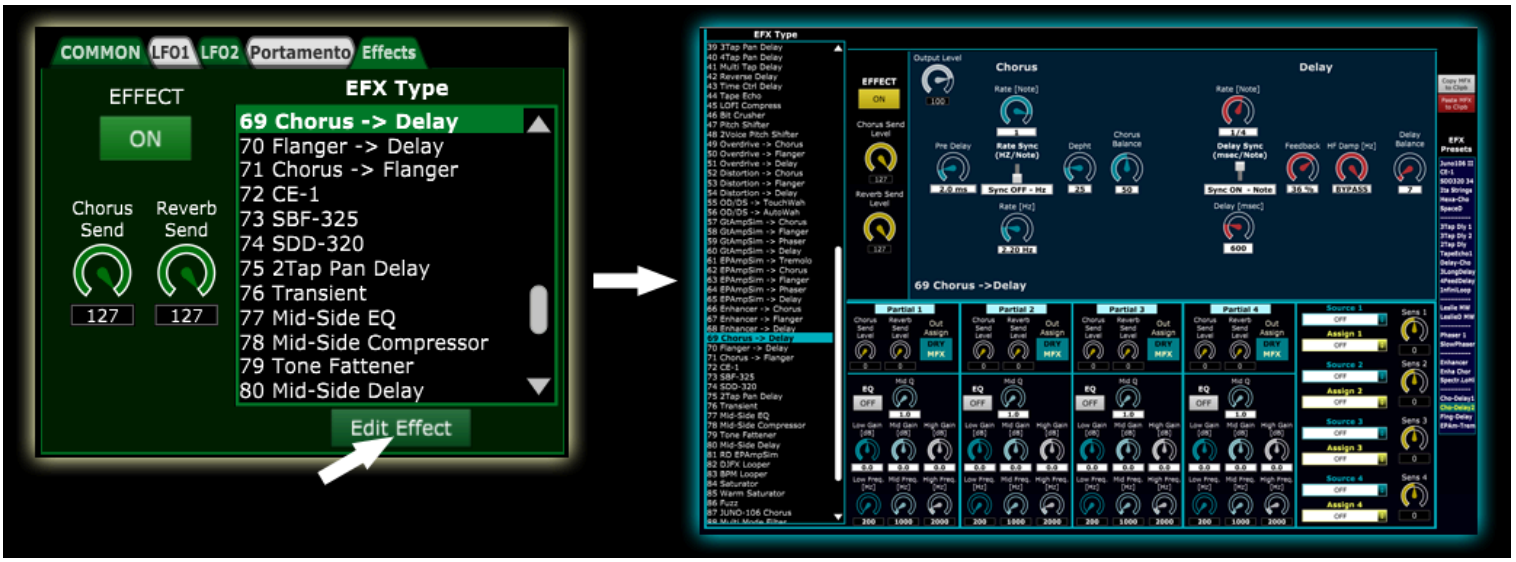
4 STEP ENV Preset

There are 8 ENV presets available for the 4 operators (carriers and/or modulators), containing predefined profiles (Percussion, Brass, Slow Decay, Organ, etc.).
To use them, simply activate the individual or group of operators to which you want to copy the ENV values and click on the desired preset icon.
In the example, the preset will be applied to both modulators.



MFX Effects

The **B67 ZEN FM** engine uses the 93 MFX effects of the ZEN-Core standard: you can select the effect type and edit it in the relevant section (the same as the ZEN-Core editor), which also contains 25 MFX presets.



Tone Name

To change the tone name (max 16 characters), simply double-click at the bottom and proceed with editing.

B67 ZEN FM Librarian

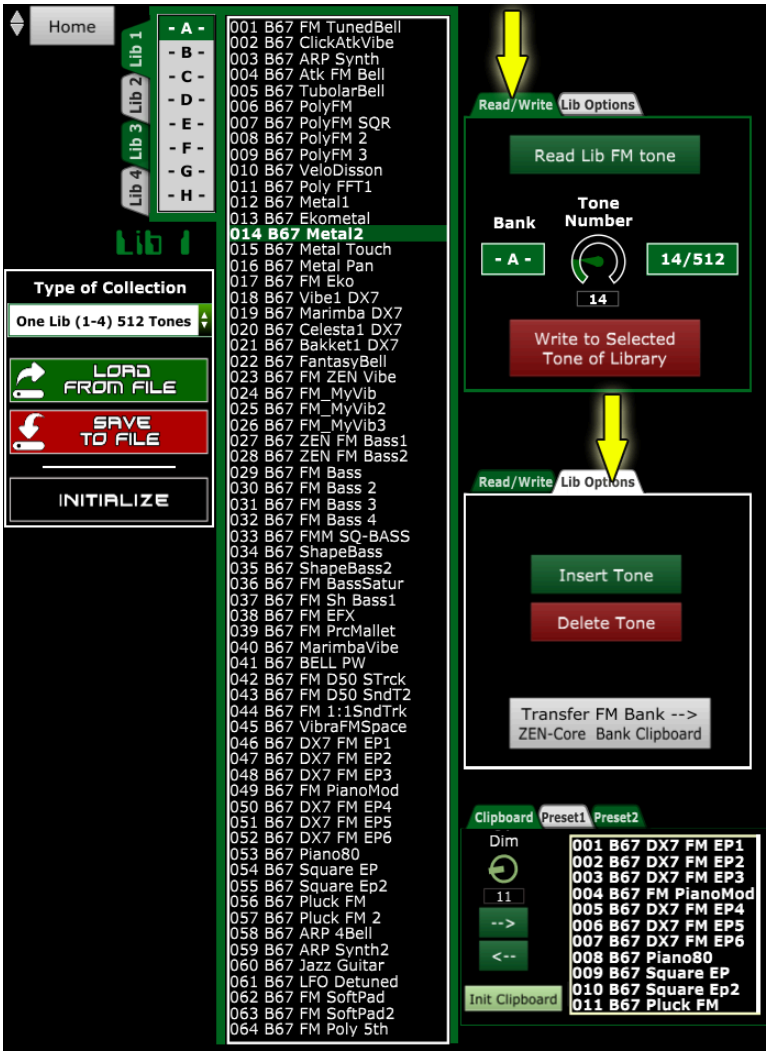
The **B67 ZEN FM** engine features a dedicated library that allows you to import, export, and manage sounds, as well as recall them with access to all their parameters.

The library consists of **2048 tones** divided into **4 LIBs** (**Lib1, Lib2, Lib3, and Lib**4), each of which is further divided into **8 Banks (A, B, C, D, and H) of 64 tones each**.

You can save and load individual tones, the Bank (64 tones), the Lib (512 tones), and the entire database (All Lib - 2,048 tones) to a file.

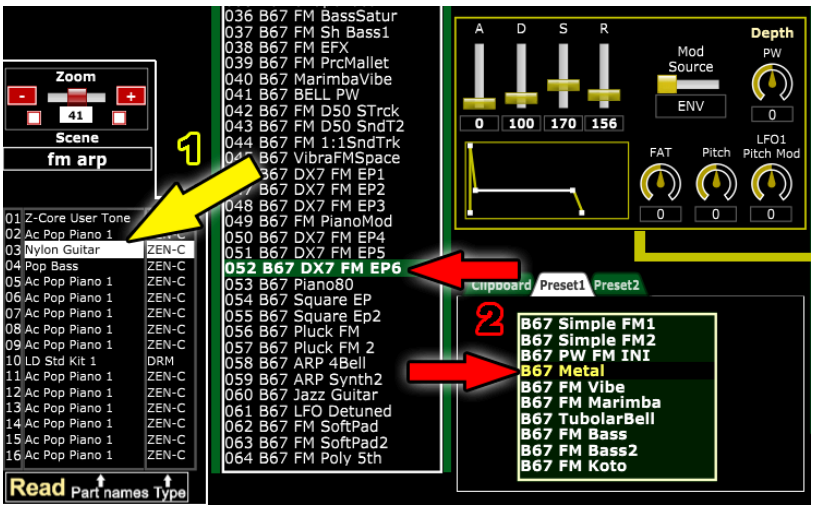
You can also use a clipboard (max 64 tones) to organize sounds and insert/delete tones.

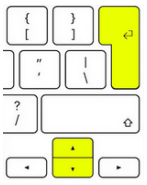
In addition, you can **transfer an entire Bank of 64 tones to the editor's ZEN-core library, allowing you to access and edit the tone in the classic Zen-Core editor**.
This bypasses the limitations imposed by the B67 ZEN FM engine, but obviously loses the ability to proceed with further editing in the relevant section. .



Note: The entire B67 ZEN FM engine library database is volatile: at the end of the session, the contents must be saved to a file to avoid losing any changes.

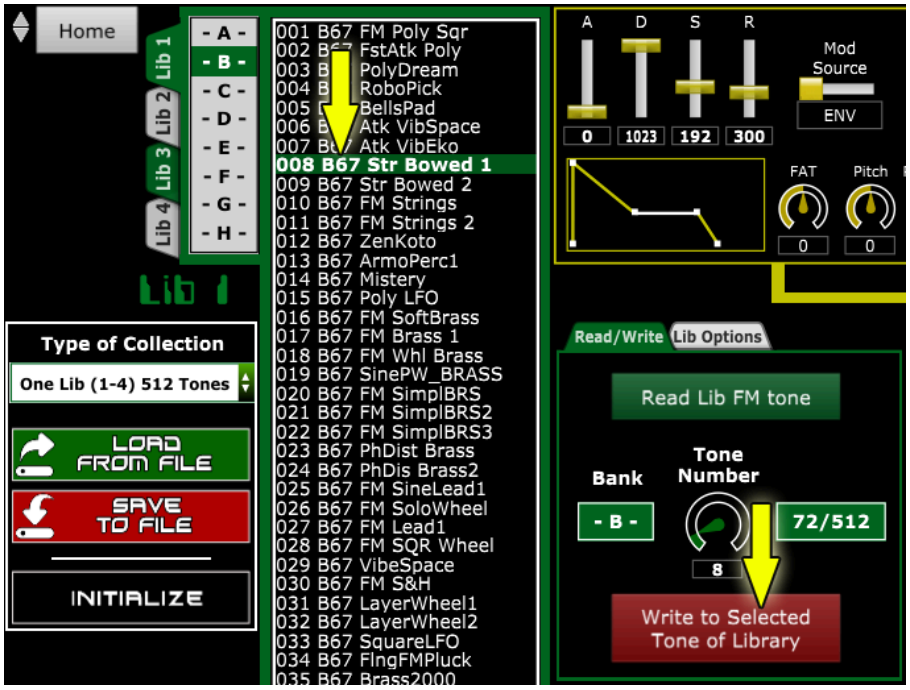
Let's take a detailed look at the various operations you can perform with the librarian.
To start creating or editing a sound with the **B67 ZEN FM** synthesis, as shown, you need to:



- Select a ZEN-Core tone by clicking on the desired section at the bottom.
- **Double-click on any librarian sound or preset.** (Alternatively, select using the Up/Down arrow keys + Enter on the keyboard  , or click on 

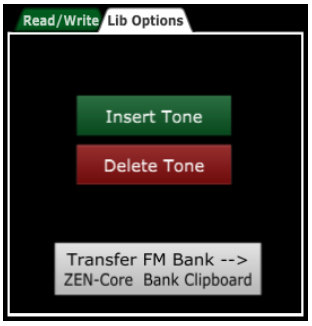
.)
- Edit the tone, possibly changing its name (double-click at the bottom).

- **Save the active tone of the selected part to a library location:**
  - Select the library location by clicking on LIB (1-4), Bank (A, B,...H), and Tone No.
  - Click "**Write to Selected Tone of Library**"



- **Insert and Delete Tone**

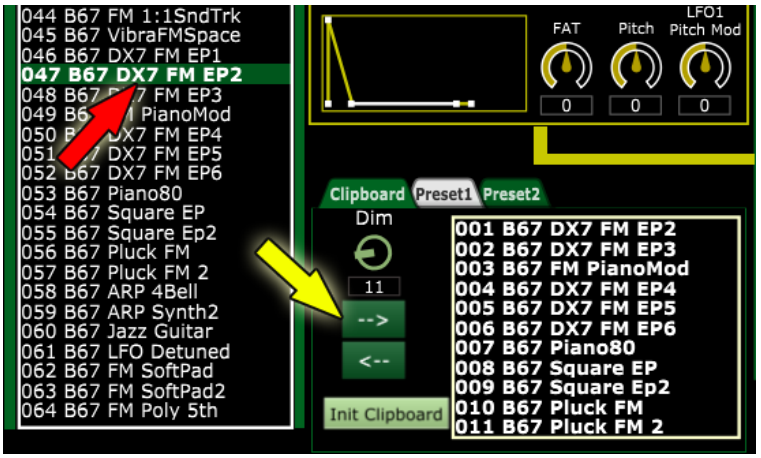
  - Click "Insert Tone" to insert an INIT tone (B67 FM_INIT) into a library location ;
  - Click **"Delete Tone**" to delete the selected tone.



- **Using the clipboard.**

To move tone blocks between different locations in the library, you can use the clipboard, which has a variable size (1-64) that can be adjusted using the corresponding control.
The transfer is done using the → **and** ← **buttons**:

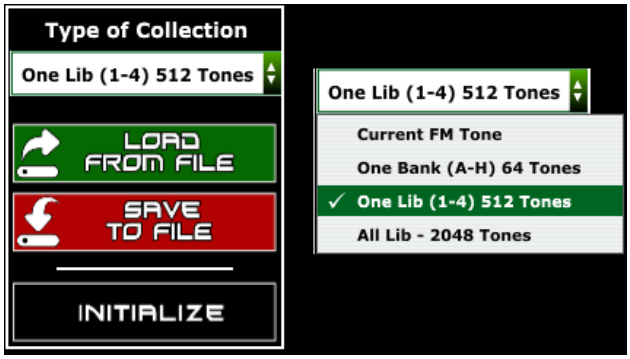
  - **click on → :** the program block is copied from the library to the clipboard, starting with the selected program



  - **click on ← :** the tone block is transferred from the clipboard to the library, starting with the selected tone
  - You can initialize the clipboard by clicking on the clipboard icon 

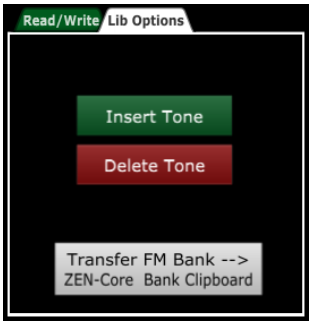
- **Load, save and initialize library contents to file.**

  TThe entire **B67 ZEN FM synthesis tone library database *is volatile***: at the end of the session, its contents must be saved to a file to avoid losing any changes.
  This library can be imported and exported using the "**Type of Collection**" menu and the "**Load from File**" and "**Save to File**" buttons. Clicking "**Initialize**" fills the library contents with the **B67 FM_INIT** tone.
  - **Current FM Tone**:Load and save the tone currently resident on the selected section (the library is not affected).
  - **One Bank (A-H) 64 Tones - One Lib (512 Tones):**
    - Loads the program collection (Bank or single library) from a file, replacing the currently selected one .
    - Save to file: Saves the currently selected program collection (Bank or single library) to a file
  - **All Lib (2048 Tones):** Load and Save the entire library



- **Transfer FM Bank (64 tones) → ZEN-Core Bank Clipboard**

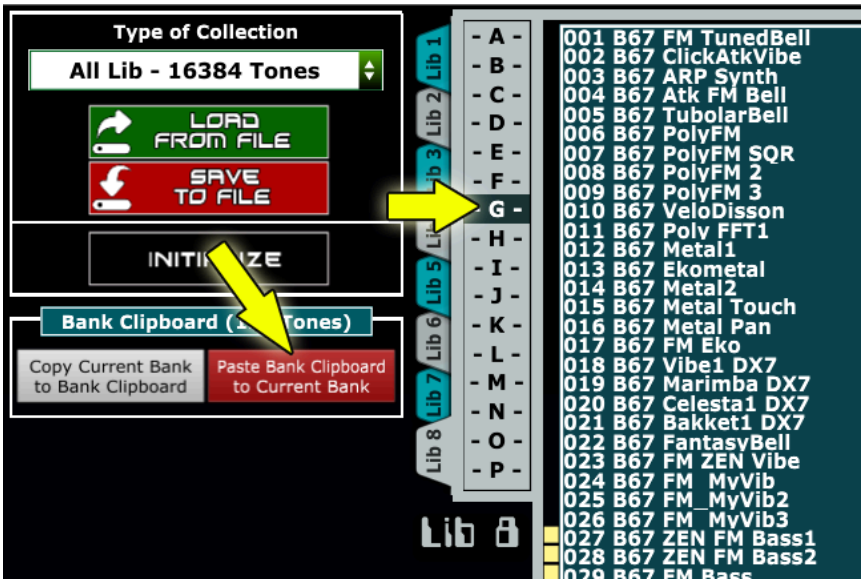
  You can **transfer an entire bank of 64 tones to the editor's ZEN-Core library**, allowing you to access and edit the tone in the classic Zen-Core editor. This **bypasses the limitations imposed by the B67 ZEN FM engine**, but obviously loses the ability to perform further editing in the relevant section.
  The Copy and Paste operation is as follows:
  - To copy the currently selected bank, simply click the icon
    Transfer FM Bank → ZEN-Core Bank Clipboard



    This operation **converts the 64 tones of the B67 ZEN FM synthesis to 64 standard ZEN-Core tones**.
  - To paste into the **ZEN-Core library, exit the B67 ZEN FM synthesis page** (Home at the top 

), click on 

, select the destination bank (A, B,...H), and click "**Paste Bank Clipboard to Current Bank**."
    The 64 tones will be pasted into the first 64 locations of the BANK, which has a size of 128.


Type of Collection
All Lib - 16384 Tones
LOAD FROM FILE
SAVE TO FILE
INITIALIZE
Bank Clipboard (16384 Tones)
Copy Current Bank to Bank Clipboard
Paste Bank Clipboard to Current Bank
Lib 1
Lib 2
Lib 3
Lib 4
Lib 5
Lib 6
Lib 7
Lib 8
- A -
- B -
- C -
- D -
- E -
- F -
- G -
- H -
- I -
- J -
- K -
- L -
- M -
- N -
- O -
- P -
Lib 8
001 B67 FM TunedBell
002 B67 ClickAtkVibe
003 B67 ARP Synth
004 B67 Atk FM Bell
005 B67 TubolarBell
006 B67 PolyFM
007 B67 PolyFM SQR
008 B67 PolyFM 2
009 B67 PolyFM 3
010 B67 VeloDisson
011 B67 Poly FFT1
012 B67 Metal1
013 B67 Ekometal
014 B67 Metal2
015 B67 Metal Touch
016 B67 Metal Pan
017 B67 FM Eko
018 B67 Vibe1 DX7
019 B67 Marimba DX7
020 B67 Celesta1 DX7
021 B67 Bakket1 DX7
022 B67 FantasyBell
023 B67 FM ZEN Vibe
024 B67 FM_MyVib
025 B67 FM_MyVib2
026 B67 FM_MyVib3
027 B67 ZEN FM Bass1
028 B67 ZEN FM Bass2

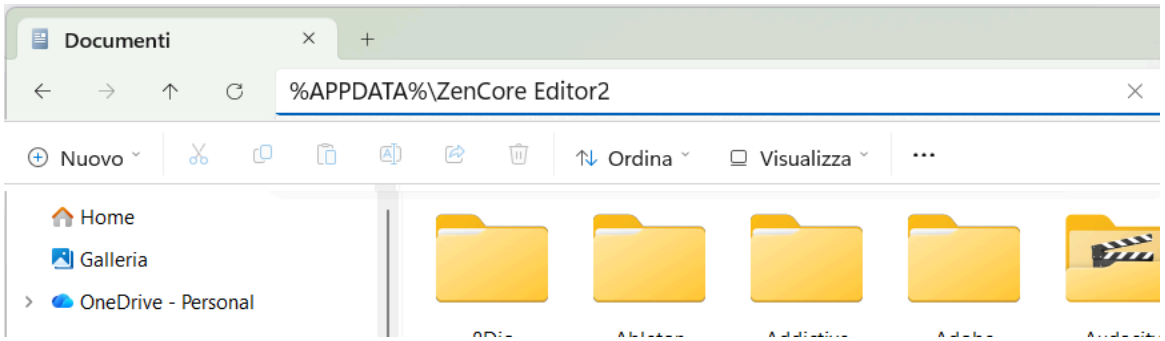
Software reset

The software, as seen, is portable: it can therefore be copied and run (double click) from any folder.
The program always remembers the settings of the previous session and for this feature stores some data in a hidden folder.
If you want to reset the software by deleting the temporary data from the last session, proceed by following the following steps.

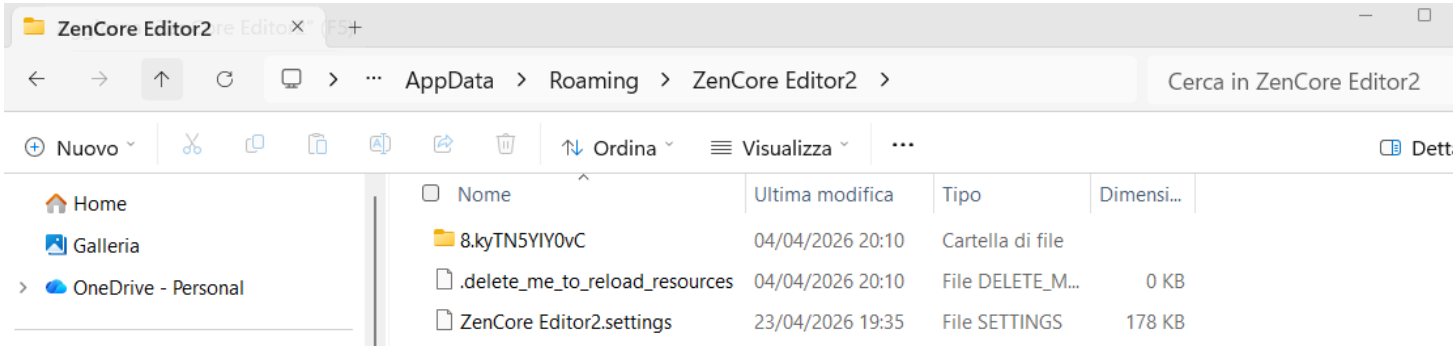
PC Version

The file to be deleted are present in **C:\Users\YOUR_USERNAME\AppData\Roaming\ZenCore Editor2** folder
Proceed with the following steps

- Click on File Explorer 
- Enter **%APPDATA%\ZenCore Editor2**



- delete all files and the **8.kyTN5YIY=vC** Folder (or delete the entire folder ZenCore Editor)



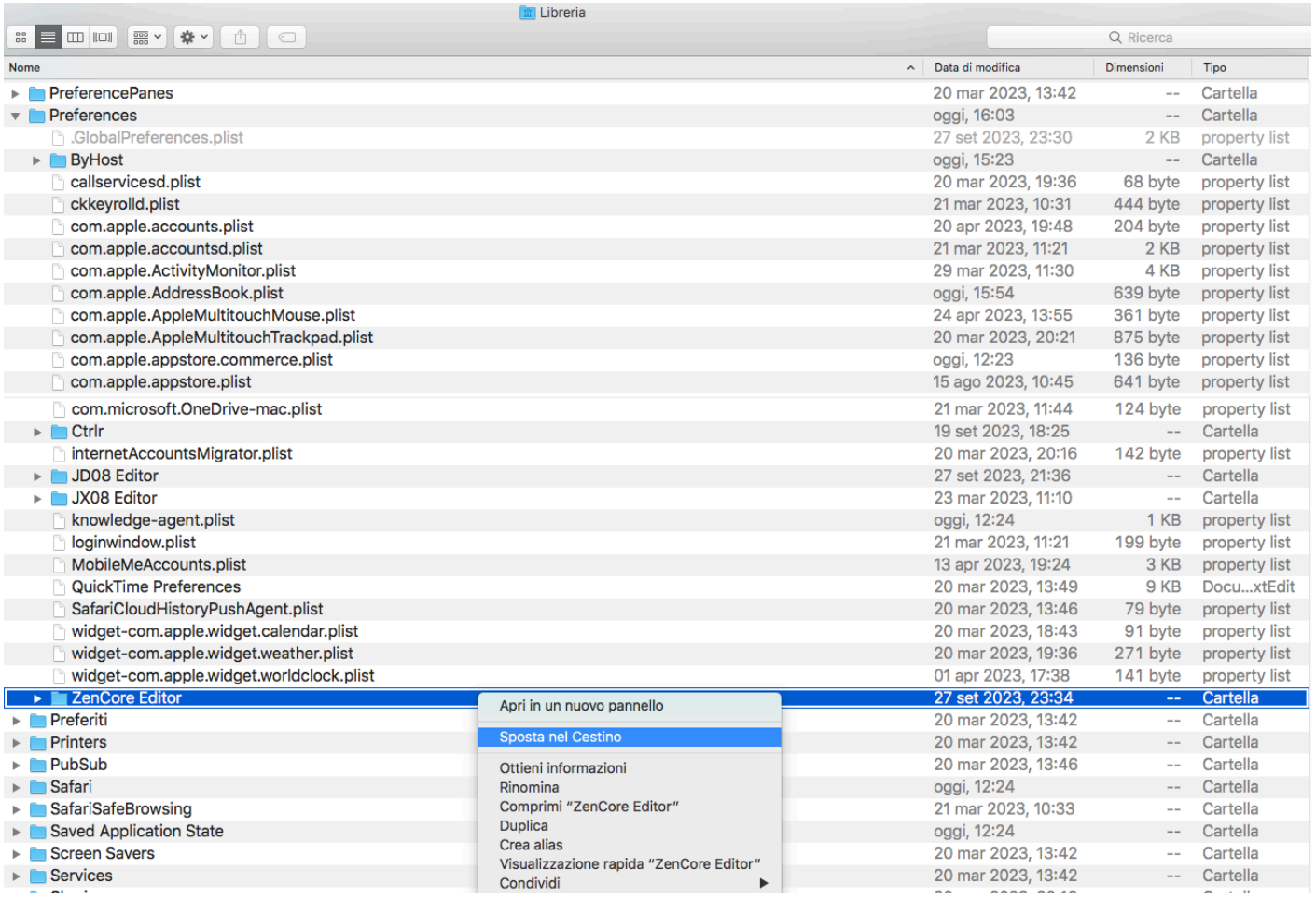
MAC Version

The files to be deleted are present in the **disk:\users\YOUR_USERNAME\Library\Preferences\ZenCore Editor2** folder
Proceed with the following steps.

- Turn on hidden files: Open the Finder Finder and press the keys Command + Shift + . (the period key)

- reach the **disk:\users\YOUR_USERNAME\Libreria\Preferences** folder

- Delete **ZenCore Editor** folder (right click - move to trash)



Changelog Version 2.0

05/05/2026 - Version 2.0

- ZEN-Core editing on any part (1-16 Fantom / 1-4 Jupiter-X/Xm and AX-Edge): removed the editing limit on part 1.
- New **B67 ZEN FM** synthesis engine (4 FM Operators + 4 Wave Shapes) compatible with the ZEN-Core standard with editing, 20 presets, dedicated librarian (2048 tones for the B67 ZEN FM engine divided into 4 LIBs / 8 Banks of 64 tones) and the ability to load and save individual tones, Banks (64 tones), Lib (512 tones), and All Lib (2048 tones) to files.
  The librarian allows you to reload and edit a sound with the **B67 ZEN FM** engine, having access to all its parameters in the graphical interface of the engine editor.
- 40 preset reverb effects (Scene/Program).
- AX-Edge Editor Only
  - Full editing of Program parameters (added 24 Receive, Master Keyboard, Assignable Button, Assignable Control, Partial Reserve, Part Scale Tune Type)
  - 25 Program Presets
  - Program Librarian with the ability to load and save individual Programs, Bank (32 Performances), Lib (320 Performances), All Lib (2048 Tones) to files
  - AX-Edge→Librarian transfer of Programs
- Fantom Editor Only:
  - Fantom EX presets added: Jupiter-8 ACB, SH-101 ACB, JU-106 ACB, JX-3P ACB, SNA Vintage EP, SNA Brass1, SNA Brass2, SNA El guitar 1, SNA El guitar 2, Supernatural A.Piano3 e Supernatural E.Piano1
  - Levels, Cutoff, Res, Attack, Decay, and Release offsets added to parts 5-16.
- Bugfix