



Moog Grandmother Ctrlr panel documentation and instructions

V3.0- 2021-11-21



Introduction

Hi! Thanks for having purchased this Ctrlr Moog Grandmother panel!

The panel is only a patch loader/saver on computer as the Moog Grandmother does not support the load/save of programs by sysex dump exchange. It supports the manipulation of some program parameters by Midi CC messages but far from all parameters are covered (only the ones described on page 43 of the Grandmother manual).

Since the new OS 1.1, it is also possible to exchange sysex messages for the Global parameters and this has been added in the panel that offers now the selection of the OS as they don't provide the same possibilities.

The panel will thus allow you to save and retrieve Grandmother patches on your PC but gives you also the possibility to exchange them with other users as they are stored as sysex files.

The look and feel is respected (as well as the selection between the classical colored and dark series layout) but of course it would be stupid to not benefit of the computer possibilities. Therefore, you also get a display of the current parameters value, a graphic display of the envelopes, the ability to store and indicate the input/output patches, etc...

Despite careful testing it is possible that some bugs remain. Please contact sunny.synths@gmail.com if you find one so they can be corrected as soon as possible.

In the same spirit, contact sunny.synths@gmail.com as well if you would like some enhancement on the panel.

By that, please have a look on this manual to have an idea of the way of using it and its features. Enjoy making music with your Moog Grandmother and have fun!

Sunny Synths

About this v3.0 version

This 3.0 version provides the following changes to the panel:

- Patch cables drawing with transparency setting
- Ability to switch between full cables or cable plugs
- Support for double inputs / double outputs
- Added the display of Patch From and To changes in the LCD
- Remembers the last file saved path and name so it is used by default at next Save
- The previous Author is now kept when loading a new Init program
- Added **Load OK Confirm** switch
- Added **Welcome message display** switch
- Added ability to play AAC, MP3 and AIF files on MacOS
- Replaced Seq2 Tracks Out by FX I/O
- Added ability to indicate the name of your FX
- All labels (Name, LCDs, Synth1/2, FX...) are now restored when user selects No load at panel load
- Consequence of this correction/adaptation: you can now change presets in DAW with correct Name, Description, LCDs, cables... which was not working previously 😊

Information for the users of a previous version

As some images have been replaced by new ones in v3.0, **you need to delete the existing temporary “Moog Grandmother” folder so that it will be replaced by the new one.**

You may have to redo your Midi settings so take note of them before deleting the folder (or copy the Moog Grandmother.settings file to a safe place and put it back when the temp directory is recreated).

On Windows, the temporary folder **Moog Grandmother** is located in the normally hidden directory **C:\Users\your_username\AppData\Roaming**. You can display the AppData folder by selecting to display the hidden elements in the Windows Explorer ribbon under Display.

On MacOS, the temporary folder **Moog Grandmother** is located in your personal Library/Preferences folder. This is also a hidden folder that you can see/reach by using the Finder and clicking on Go while pressing the Option (Alt) key.



Due to some internal change related to the changes mentioned above, you will most probably get an error about ReadStateData the first time you start this v3.0. Just close the panel and restart it. The new ReadStateData will be fine.

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Installation and features

Installation of the Ctrlr panel

The panel is provided as a compressed .zip file containing:

- the Moog Grandmother panel as an .exe file on Windows PC
- the Moog Grandmother panel as an .app file on Mac OS (zip folder to be uncompressed)
- the Moog Grandmother panel as VST 32 bits and 64 bits for Windows PC
- the Moog Grandmother panel as VST and AU plugins for Mac OS
- this manual as PDF
- a folder containing programs from the Moog Grandmother user manual

For the PC standalone version, decompress the zip file anywhere on your PC then copy the **Moog Grandmother.exe** file in some directory and launch it. The file may be scanned by your antivirus program (Avast on my computer) and should return no issue. If any, they are false and probably due to the fact that the program is not officially referenced.

For the Mac OS standalone version, decompress the zip file anywhere on your Mac then decompress the Moog Grandmother.app.zip. You may have to open the **Moog Grandmother.app** file using Ctrl+click as it may not be recognized by the OS.

The program will directly display the Ctrlr window with the Moog Grandmother panel displaying its main tab.



It is possible that the top row buttons are not responding after the initial installation. Simply close the program and restart it. The issue should be solved.

For the installation of the plugins, please refer to Installing and using the Grandmother panel as plugin on page 30 further in this manual.

Features

You will find the following features in the Moog Grandmother panel:

- Moog Grandmother interface with same look as actual synthesizer
- Button to switch the layout between the colored and the Dark editions
- Bidirectional communication with actual Grandmother synthesizer for all parameters supporting CC# Midi communication (see p43 of the Grandmother synth manual, p2 of the different OS 1.1.x updates)
- Top row of support “screens” with old look
- Visual feedback by using “LED” ring buttons and indication of the parameter value
- Envelope graph handled by mouse or classical ADSR rotary encoders
- Selection of the Grandmother OS with impact on the panel controls
- Global parameters management (receive all then individual update)
- Load / Save programs from individual .syx files
- Load / Save as DAW presets
- Automatic change of all CC# parameters on actual synthesizer at program load
- Easy program renaming
- Display and export of program parameters as text file
- Ability to describe 9 input/output colored patch cables with different sources/destinations
- Patch cables drawing directly on main panel with adjustable transparency level
- Ability to display full cables or cable plugs
- Extra input/output patch points from/to external synths, sequencer and FX chain
- Programs have a name, author, save date and description. They can be associated to a category
- Browser of the files on the disk
- Patch sheet tab with patch sheet for Grandmother and other gear
- Automatic reading of wav/aif*/aac*/mp3* files associated to a patch (*MacOS only)
- Manual/Automatic reading of any wav/aif*/aac*/mp3* file (*MacOS only)
- Extras Midi CC controller number for the buttons without a Moog assigned number so you can adjust them from a hardware controller (still no impact on the synth of course and unfortunately).

Communication with your Moog Grandmother synth



If you don't want to manage the parameters manageable by Midi CC# or if your Moog Grandmother is not connected by USB or Midi to your PC then you can skip this section.

Preliminary info

As mentioned in the introduction of this manual, the Moog Grandmother does not support the load/save of programs by sysex messages but allows the manipulation of some program parameters by Midi CC messages.

The panel is working in a bidirectional fashion for those parameters managed by CC#: modifying a knob on the panel changes the corresponding parameter value on the synth while changing on the synth is making the corresponding button turn on the panel with the associated value displayed.

Since the OS 1.1 you can also manage all global parameters by sysex. This has now been included in the panel and you will need to setup the bidirectional communication to get that possibility.

Setting the Midi connection

You will access the Midi settings by going to the Midi menu where you will have to set the Midi Input and Midi Output channels:

- Connect the Moog Grandmother by USB to your PC or Midi Din (Output from your interface to Input on the Moog Grandmother AND Input from your interface to Output on the Moog Grandmother)
- Power the Moog Grandmother On
- Start the Moog Grandmother panel
- In the **Midi** menu, select **Input – Device Moog Grandmother**
- In the **Midi** menu, select **Input – Channel 1** (set this to the Midi channel of your Moog Grandmother)
- In the **Midi** menu, **Controller – Device** should normally stay to -- None
- In the **Midi** menu, select **Output – Device Moog Grandmother**
- In the **Midi** menu, select **Output – Channel 1** (set this to the Midi channel of your Moog Grandmother)



Testing the Midi connection



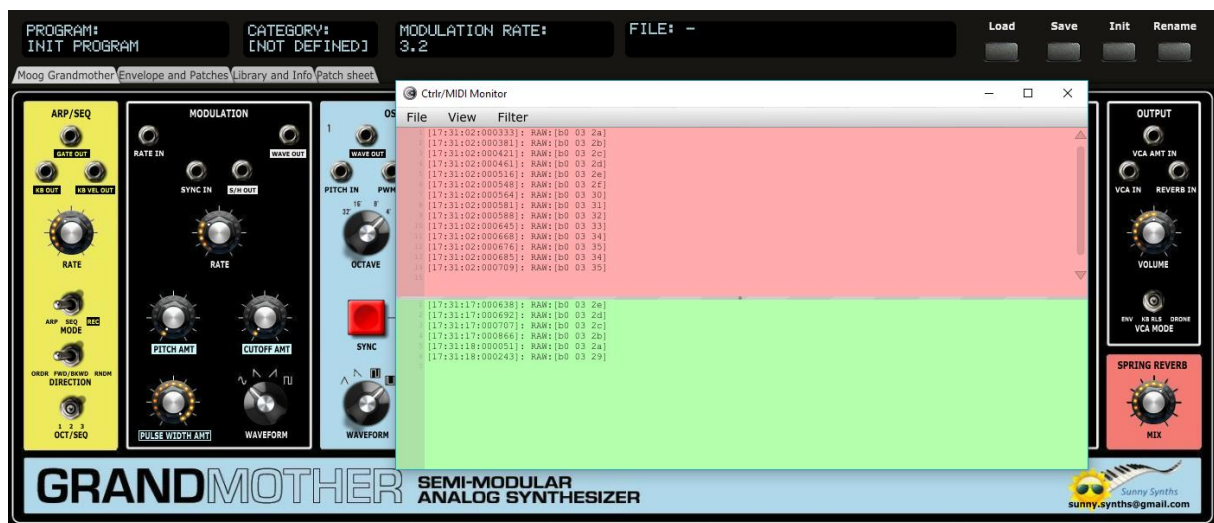
To secure a good bidirectional communication between the synth and the panel, **always start your Moog Grandmother first** then open Ctrlr and the panel. If issues, close Ctrlr completely and restart it. Simply closing the panel might not solve the issue.

We can now test the Midi connection:

- In the **Tools** menu, select **Midi monitor** and in the new monitor popup check **On Monitor input** and **Monitor Output** in the **View** menu



- Play a note on the synth to hear the sound
- Turn the Modulation Rate or Oscillator 2 Frequency buttons on the panel and listen how it affects the sound. You can also turn Arp/Seq Rate but then with a running arp or sequence.
- The Midi Monitor panel should show the CC# messages that are exchanged in the top Output part
- Turn the Modulation Rate or Oscillator 2 Frequency buttons on the synthesizer and checks that the corresponding button is turning on the panel and that the top screen shows the value changing
- The Midi Monitor panel should show the CC# messages that are exchanged in the bottom Input part
- You can also try with the triple position switches ☺



Way of working

As you will discover by yourself, the usage of the panel is pretty straightforward but there are anyway different specific things you should know... ☺

Using the buttons and modifying parameters

You modify parameters using rotary encoders by clicking on the button then moving the mouse cursor vertically up or down.



You can also modify any rotary encoder based parameter by doing a mouse hover on the button then using the mouse scroll wheel.



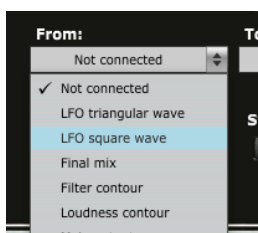
Switches are modified by simply clicking on them. They will go through the three positions as the actual switch on your synth



Momentary push buttons are activated by simply clicking on them (what a surprise...). They will momentary flash.



Permanent toggle buttons are activated by simply clicking on them (what a surprise...). Some are displayed in some kind of recessed way as Legato Glide in this picture; others are just staying lit as the Color button



Parameters presented as pulldowns are modified by opening the pulldown and selecting one of the pull-down items.

Quick reset to default value

Most of the rotary encoders have default values set and you can quickly revert to this preset default value by **double-clicking on the button**. Try with the Arp/Seq Rate encoder for example.

Color and Dark Series layout

In 2020 Moog introduced the Dark Series and thus for the ones of you having only the initial colored version, you can now benefit from it in the virtual world ;-)

To switch layout it is simply needed to toggle the Color button in the upper right side of the panel. The main panel is changed but also the buttons.



Opening and closing the panel

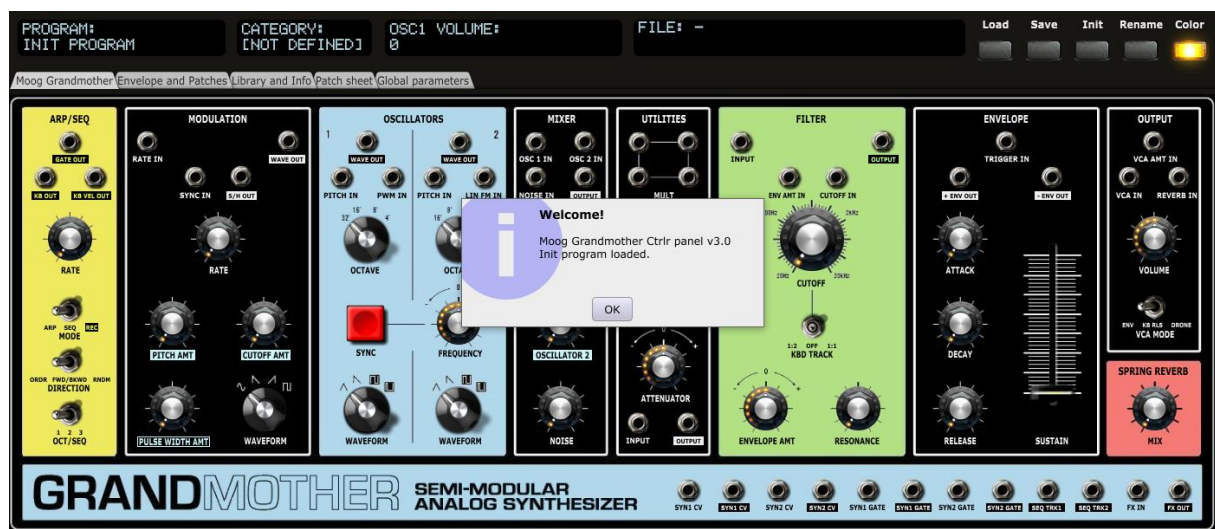
When closing the panel (either by using **File – Quit** or by clicking on the upper right red cross) the file of the last program loaded or saved is stored.

When opening the panel, it is checked if the last file used still exists (could have been renamed or moved or deleted). If not found, the Init program is loaded (in the same way as when loading the panel for the first time). The last program is restored if it is found so you can continue your work where you left it.

This behavior can be prevented by setting the **No load at panel load** button to ON in the [Envelope and Patches](#) tab.

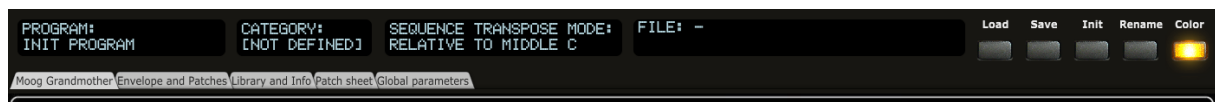


When loading the last program used at panel load, it can be that your Grandmother synth will freeze. It may be due to a problem with the Midi buffer. If this is happening several times, it is better to set the switch ON to not load the last program and use the panel as it was left.



If you want, you can prevent the display of the Welcome message (see [Envelope and Patches](#) tab on p20).

Top panel area



In the top panel area you find 4 feedback “screens”, 5 buttons and 5 tabs:

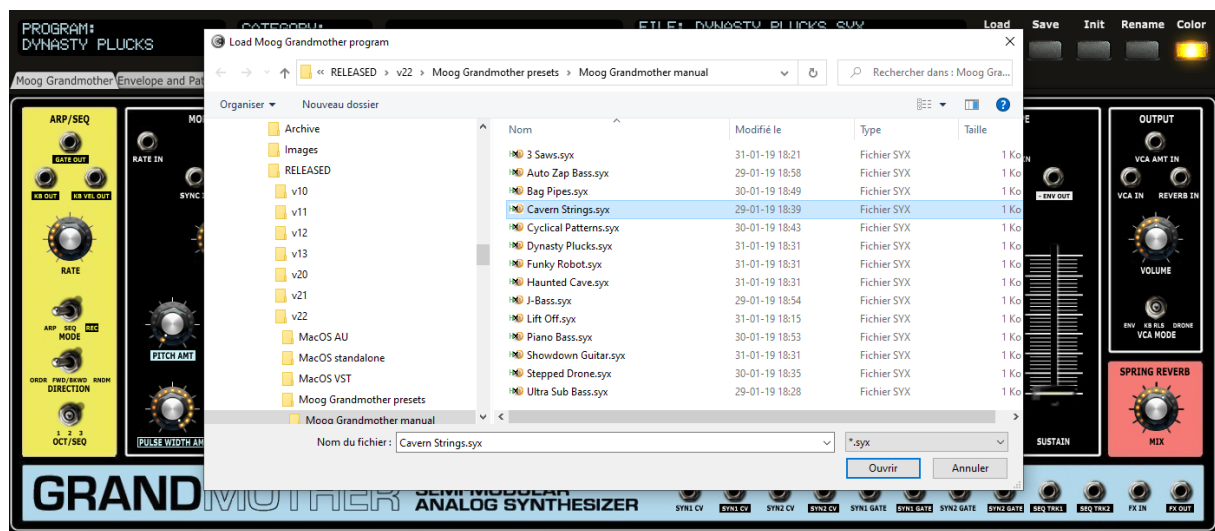
- The first screen displays the **name** of the current program
- The second screen displays the **category** of the current program
- The third one indicates the parameter currently modified and its value
- The fourth one displays the latest sysex file loaded, its author and the save date
- The **Load** button allows loading a sysex file from disk
- The **Save** button saves the current program to a sysex file on disk
- The **Init** button reset all parameters to *a Basic program*
- The **Rename** button allows renaming the current program
- The **Color** button allows switching between the colored and the Dark Series layout
- The **Moog Grandmother** tab displays the synth
- The **Envelope and Patches** tab displays the envelope as graph, the Glide and Arp parameters. It also allows the registration of 9 different input/output patches, the identification of two external synths and allows modifying the Category, the Author and the Description of the current program. You will also be able to modify some panel settings
- The **Library and Info** tab provides the file browser that allows the selection of sysex files or the ability to listen to wav files, the display and the export of the parameters of the current program as text file and gives About info of the panel. It is also here that you will find the manual panel zoom that is memorized
- The **Patch sheet** tab displays automatically the Moog Grandmother patch sheet with all parameter values but with the addition of author, date, external synths names , some Glide parameters and 12 external input/output connections
- The **Global parameters** tab allows the display and the management of all global parameters (receive all and individual update)

Loading a Moog Grandmother program

The panel loads and saves the program parameters as a 410 bytes sysex file (.syx) from/to your computer.

Clicking the **Load** button opens a classical Open file dialog where you can select the file to load. An internal check is done to verify that the file is compatible with the Moog Grandmother panel. The parameters are loaded, the top screen is showing the name of the file, the author and the saved date and a confirmation dialog is shown.

The panel will send the CC# parameters' values to your Moog Grandmother synth at program load. Nothing will happen if your synth is not connected by Midi/USB or if your synth is on another Midi channel than the one set in the MIDI menu of the panel.



If you want, you can prevent the display of the Load confirmation message (see [Envelope and Patches](#) tab on p20).

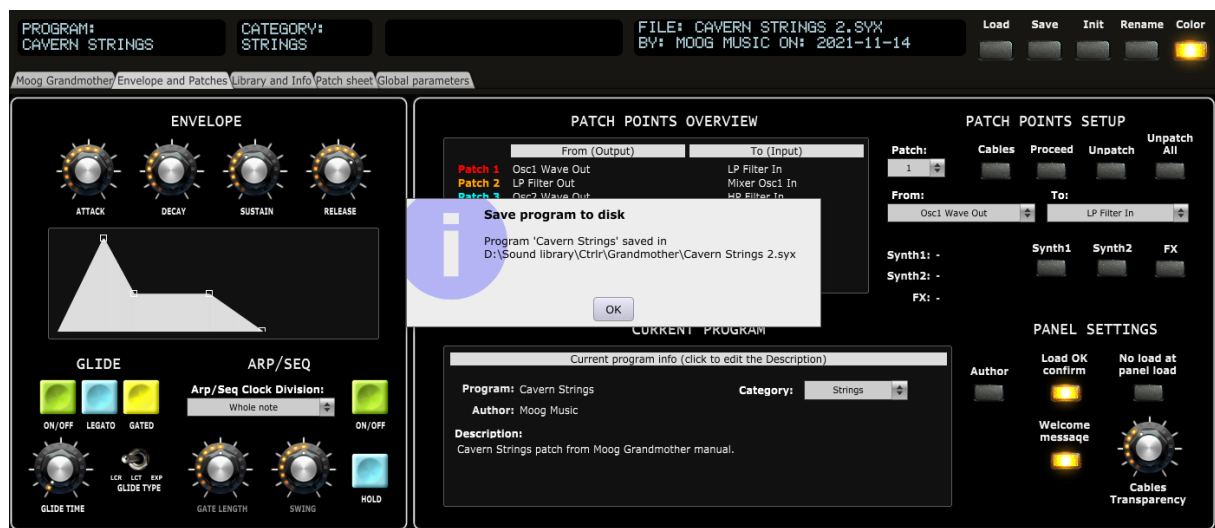
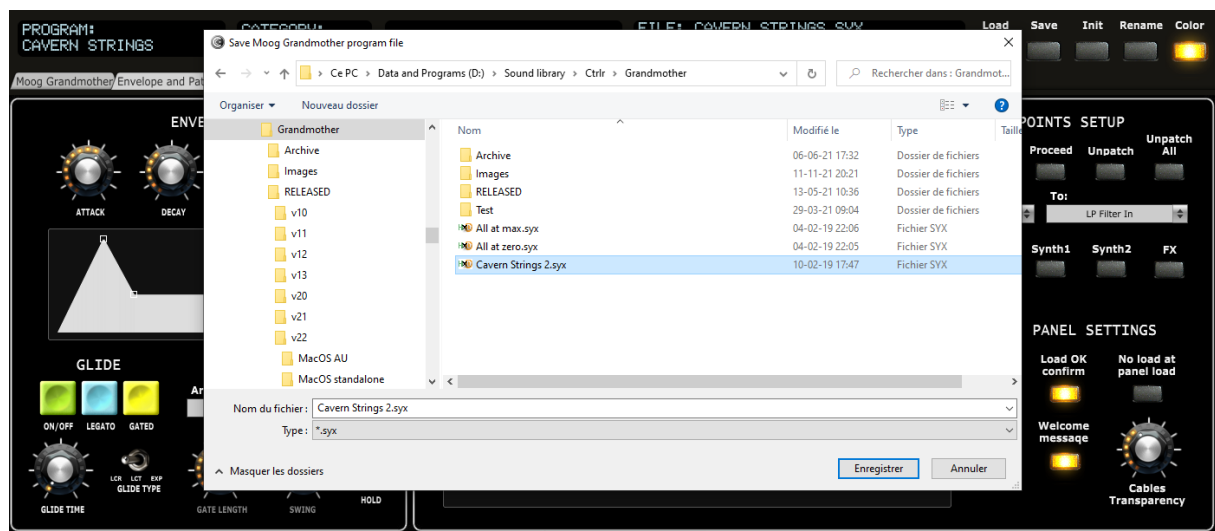
Saving a Moog Grandmother program

The panel loads and saves the program parameters as a 410 bytes sysex file (.syx) from/to your computer.

Clicking the **Save** button opens a classical Save file dialog where you can enter the name of the file to save. At this stage it is needed to select an existing file if you want to overwrite it. In that case, you will get a confirmation message.

Once the parameters are saved, the top of the screen displays the name of the file, the author (as set in the [Envelope and Patches](#) tab) and the saved date (thus, the current date) in ISO format yyyy-mm-dd. A confirmation dialog is also shown.

The panel stays on the current tab after a Save is done.

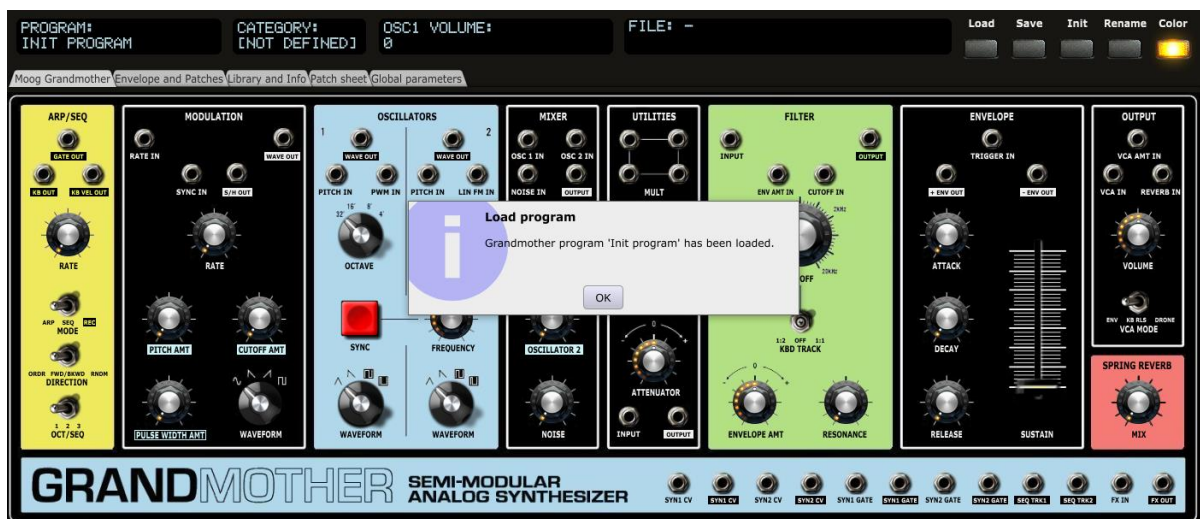


The panel remembers the last file saved path and name so it is used by default at next Save.

Program Init

Clicking the **Init** button loads the parameters for a Basic program that has the following characteristics:

- All parameters at 0 or OFF
- Kbd Track switch = OFF
- Arp/Seq clock division = Whole note
- All other switches positioned to the left
 - Arp/Seq Mode = Arp
 - Arp/Seq Direction = Order
 - Arp/Seq Oct/Seq = 1
 - VCA Mode = Env
 - Glide Type = LCR
- Global settings at their default value
 - Keyboard Octave = 0
 - Keyboard Transpose = OFF
 - Pitch Bend Up Amount = 2 semitones
 - Pitch Bend Down Amount = 2 semitones
 - Multi Trigger = OFF



Program Rename

Clicking the **Rename** button opens a popup window where you can modify the name of the program. The name should be maximum 20 characters long (will be truncated if longer).



Please note that the program name can (of course) be different than the file name the program is saved in.

Moog Grandmother tab

In the **Moog Grandmother tab**, you have access to the same parameters as on the actual synthesizer.

Please refer to the Moog Grandmother user manual

(https://back.moogmusic.com/sites/default/files/2018-08/Grandmother_Manual.pdf) for the explanations of each encoder/button.



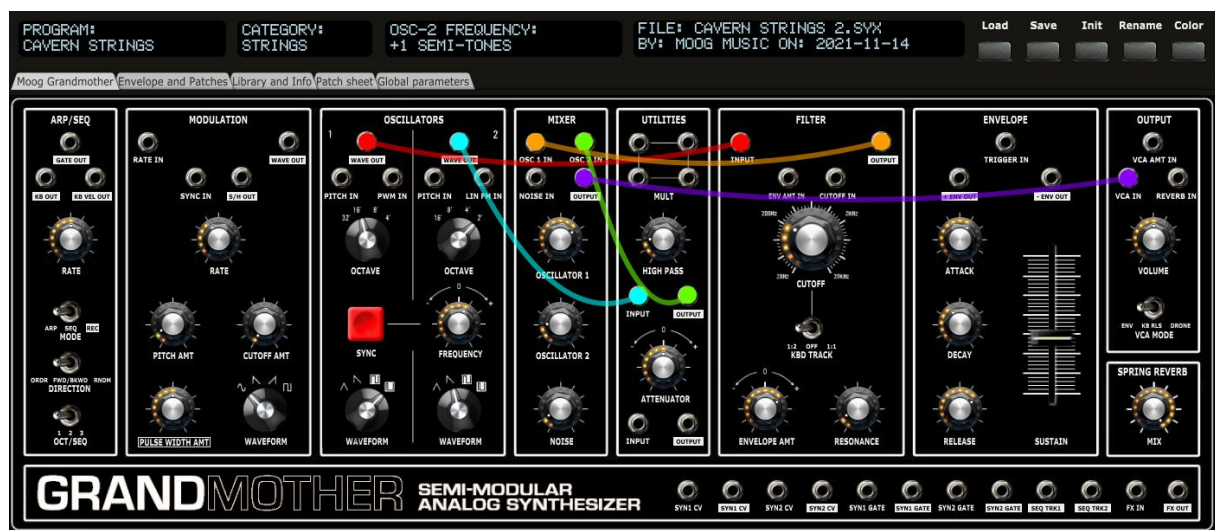
The third top screen is showing the name and the value of the parameter you are modifying.

Doing a single click on any rotary encoder is displaying its name and current value **without that you need to modify it**.

Modifying the ADSR encoders is setting identical encoders/buttons in the **Envelope and Patches** tab and adapting the envelope graph accordingly.

Patch cables drawing

In this tab you can also draw your patch cables.



To draw a patch cable, click on an output patch point, keep the mouse button pressed, drag the cable to a patch input point then release the mouse button.

Depending on the state of **Cables** button in the [Envelope and Patches](#) tab, either full cables (**Cables** button ON) or cable plugs (**Cables** button OFF) will be displayed.

You will find 12 additional input/output patch points (CV/Gate for 2 synthesizers, 2 sequencer tracks and one FX chain). This is allowing you to also indicate when some external gear is also part of a certain patch.



As soon as you are using the same input or the same output twice, the Cables button will be locked ON and only full cables will be displayed.

All the patch cables are listed and can be further managed in the [Envelope and Patches](#) tab.

It is always the next free cable that is selected automatically.

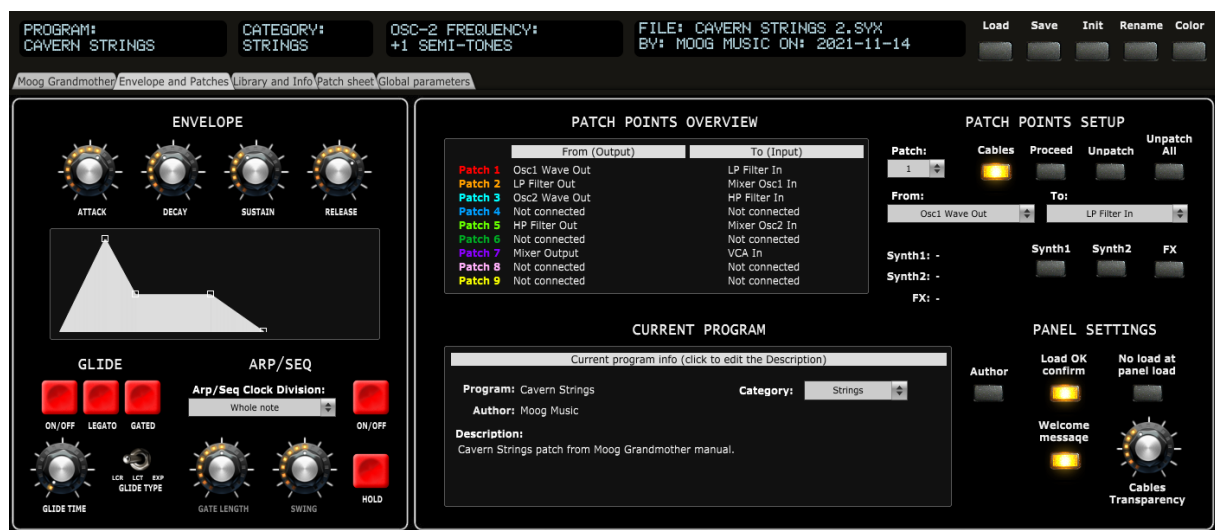
You delete an existing cable simply by re-drawing it from its output to its input.

In the [Envelope and Patches](#) tab you can also adjust the transparency level of the cables.

Envelope and Patches tab

In the **Envelope and Patches** tab, you can:

- adjust the envelope either with encoders or by moving the anchors of the graph
- enable Glide and adjust all Glide parameters
- adjust some extra Arp/Seq parameters
- set/indicate up to 9 from/to patches
- adapt the name of the external synths that could be connected to your Grandmother
- adapt the name of the FX chain that could be connected to your Grandmother
- adapt the current program category, author and description (click on the current description to edit it)
- decide to have the last saved program restored and loaded at next panel load or not
- adjust some panel settings



Envelope shape

You can modify the envelope shape by either turning the ADSR encoders or by using the mouse and moving the anchors on the graphs either vertically or horizontally.



When moving the anchors, the corresponding ADSR encoders will also turn and the parameter name and value be displayed in the screen of the top panel area.

Glide and Arp/Seq settings

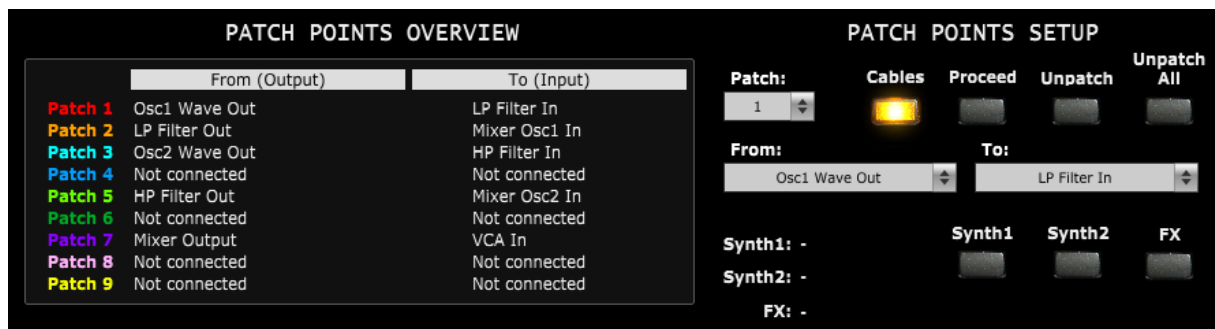
You can also modify some of the less accessible settings for the Glide or Arp/Sequencer.



Other Arp/Seq parameters are available in the **Global parameters** tab.

Patch points

You modify the from/to patches as follows:



Clicking anywhere on a patch line (label, input, output, blank space) will select the patch to be modified and display its values in the pull-downs. You modify the “From” source and/or “To” destination and press the Proceed button to make the change.

You can also directly select a patch cable in the **Patch** pull-down then modify the **From/To** and press **Proceed**.

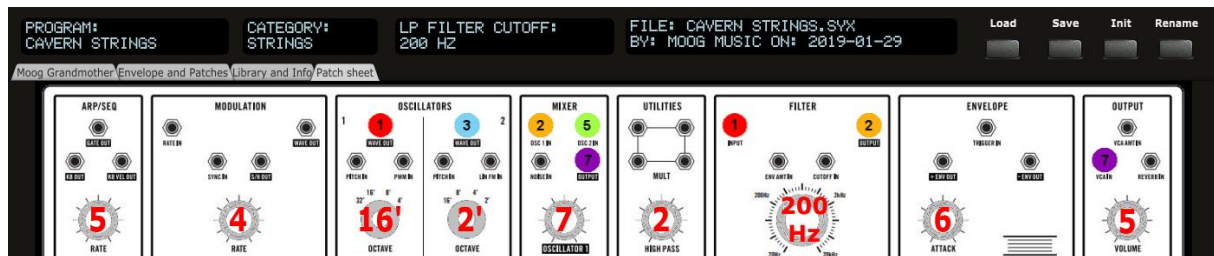
Use the **Unpatch** button to delete a patch cable or the **Unpatch All** button to delete all of them at once.

Use the **Cables** button to switch the display on the main panel between patch cables and just cable plugs. This button will be locked on Cables display as soon as the same input or output is used two times.

Use the **Cables transparency** rotary to set the transparency of the patch cables (not the end plugs).

Patches are numbered 1 to 9 and have a color assigned to them. When a from/to patch is set in the [Envelope and Patches](#) tab, corresponding patch cables are displayed on the main [Moog Grandmother](#) tab and corresponding colored numbered circles are displayed on the patch sheet.





Numbered circles are used to help colorblind people.

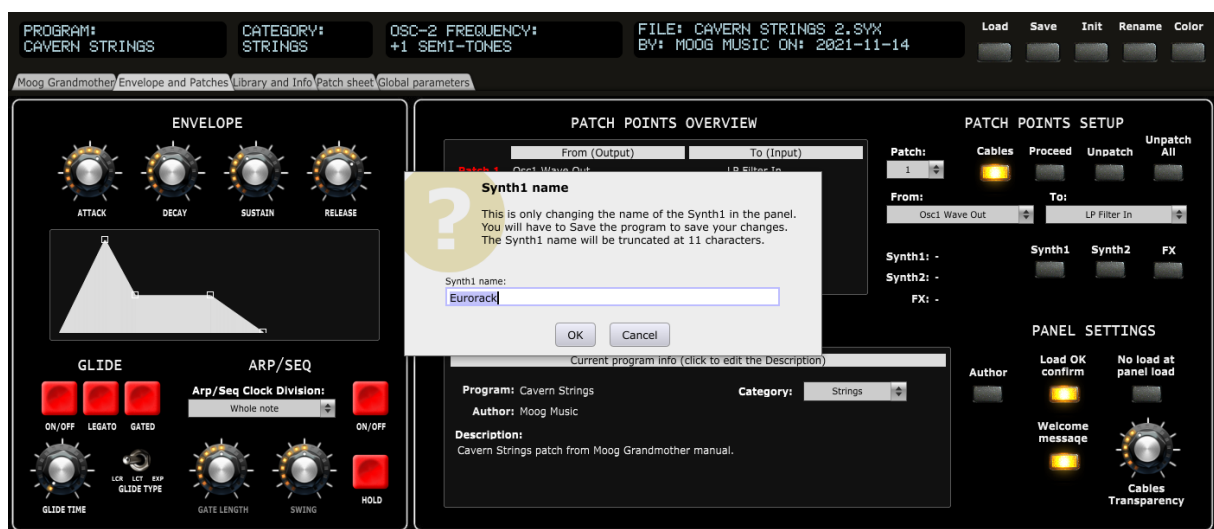
Available “From” sources are the output patch points of the synthesizer plus a few additional external ones: "Not connected", "Arp/Seq Gate Out", "Arp/Seq Key Out", "Arp/Seq Key Velocity Out", "Modulation Wave Out", "Modulation S/H Out", "Osc1 Wave Out", "Osc2 Wave Out", "Mixer Output", "Mult 1", "Mult 2", "Mult 3", "Mult 4", "HP Filter Out", "Attenuator Out", "LP Filter Out", "+Envelope Out", "-Envelope Out", "Synth1 CV output", "Synth2 CV output", "Synth1 Gate output", "Synth2 Gate output", "Sequencer1 track 1", "Sequencer1 track 2", "Sequencer2 track 1", "Sequencer2 track 2"

Available “To” destinations are the input patch points of the synthesizer plus a few additional external ones: "Not connected", "Modulation Rate In", "Modulation Sync In", "Osc1 Pitch In", "Osc1 PWM In", "Osc2 Pitch In", "Osc2 Linear FM In", "Mixer Osc1 In", "Mixer Osc2 In", "Mixer Noise In", "Mult 1", "Mult 2", "Mult 3", "Mult 4", "HP Filter In", "Attenuator In", "LP Filter In", "LP Filter Env Amount In", "LP Filter Cutoff In", "Trigger In", "VCA Amount In", "VCA In", "Reverb In", "Synth1 CV input", "Synth2 CV input", "Synth1 Gate input", "Synth2 Gate input"



As described in the manual, the “Mult x” patches can serve as input or as output.

Clicking the **Synth1** button opens a popup window where you can modify the name of a synth connected to your Moog Grandmother. The name should be maximum 11 characters long (will be truncated if longer). If you leave the Synth1 name empty then a “-” is displayed.



Clicking the **Synth2** button opens a popup window where you can modify the name of a second synth connected to your Moog Grandmother. The name should be maximum 11 characters long (will be truncated if longer). If you leave the Synth2 name empty then a “-” is displayed.

Clicking the **FX** button opens a popup window where you can modify the name of a FX chain connected to your Moog Grandmother. The name should be 6 characters maximum long (will be truncated if longer). If you leave the FX name empty then a “-” is displayed.

Current program

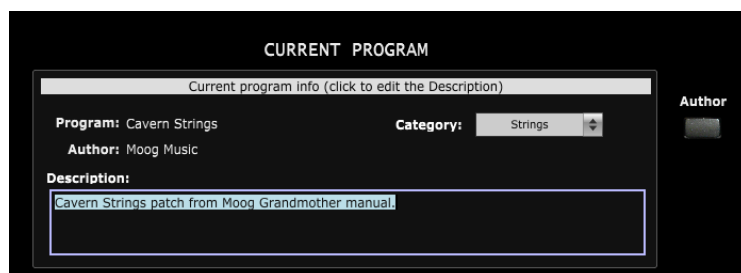
Clicking the **Author** button opens a popup window where you can modify the name of the author of the patch. The name should be maximum 15 characters long (will be truncated if longer). If you leave the Author name empty then a “?” is displayed.

When loading the Init program, the previous Author used is kept.



You modify the Category of the program by using the Category pulldown.

To modify the Description, you need to click on it, modify the text and **not forget to press enter** before clicking outside the text box.



Both Category and Description are also saved in each program's sysex file.

Panel settings

Load OK Confirm: by switching this OFF, there is no confirmation popup shown after loading a program. This avoids clicking on OK.

No load at panel load: by switching this ON, when re-opening the panel, the panel will be left as you closed it in the previous session. By switching this OFF, the last saved file is restored if found (or an Init program loaded if not found).



In other words: when **No load at panel load** is OFF, the panel will load the last program saved (or the Init program if the last program is not found). Loading a program is also sending all sysex based parameters to the synth.

Setting the **No load at panel load** button to ON will prevent this load and thus the send and changes to the synthesizer when opening the panel.

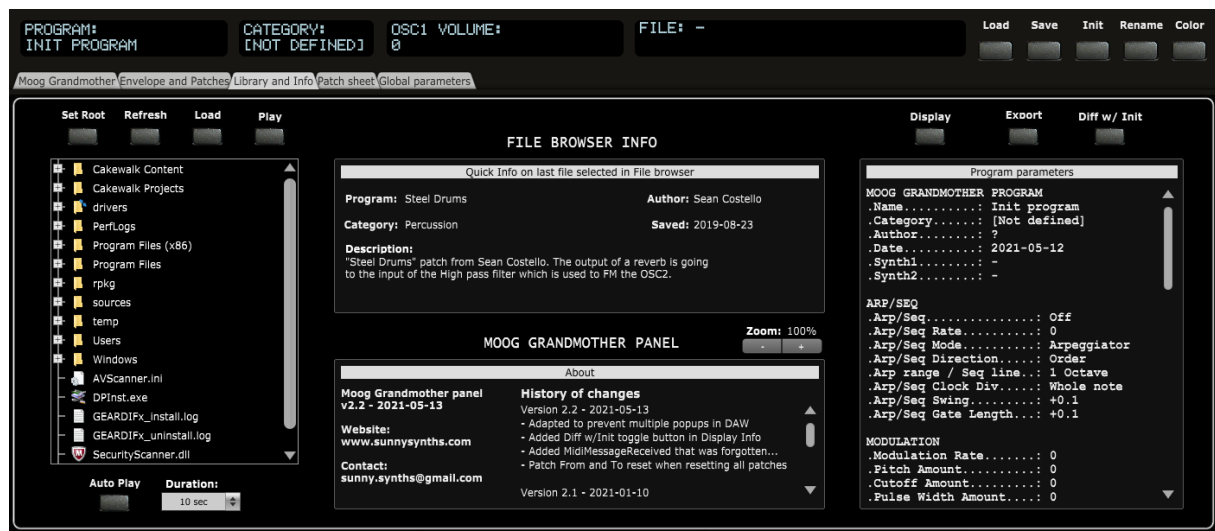
[Welcome message](#): displays the Welcome message or not when opening the panel.

[Cables transparency](#): adjust the transparency level of the patch cables.

Library and Info tab

In the **Library and Info** tab, you have access to:

- a file browser that gives you directly information about the clicked file without having to load it
- the settings when playing a wav file
- an About screen giving you information about the panel version and the history of changes
- Panel zoom buttons keeping the zoom factor in memory till next usage of the panel
- the display of all program parameters as a text file with the possibility to export it



File browser

The **File browser** allows you to navigate on your disk and browse through presets. It works as follows:

- **Click** on any file to display some info (name, category, author, saved date, description) about it in the Quick info window. If you click on a non- Moog Grandmother or .wav file then it will be indicated. When Auto Play is activated, clicking on a .wav file will play it automatically for the chosen duration and clicking on an Moog Grandmother .syx file will make the corresponding .wav file play automatically as well (if a wav file with the same name as the Moog Grandmother .syx file is found)
- **Double-click** on a file to load it (Moog Grandmother .syx file) or play it (.wav file) directly. A popup will be displayed if you do this on a not recognized file type
- Use the **Set Root** button to select the folder where your presets are (at this stage, the patch saver doesn't remember the location after you quit it). Note that you must at least have one file in the selected directory in order to have **Set root** functioning.



Sometimes the Set Root doesn't work (displays nothing or stays on the currently selected root directory). I have still not found the reason (thought it was due to no file being present in the folder; only subfolders but seems not to be always the case).

Temporary workaround: just select one level higher. Sorry...

- Use the **Refresh** button to refresh the list after having saved several files or added files outside the patch save
- Use the **Load** button to load the selected file and display its parameters

- Use the **Play** button to manually start playing a .wav file

Audio file play settings



WAV files can be played on Windows and MacOS
AIF, AAC and MP3 can only be played on MacOS

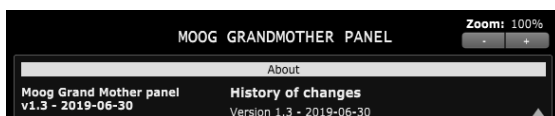
The audio files will be played for the duration set in the **Duration** pulldown (3s, 5s, 10s or Full).

Activating **Auto Play** will automatically trigger the play of the .wav (.aif, .aac, .mp3) files OR trigger playing the .wav file corresponding to the clicked Grandmother .syx file (if found). If there is no corresponding .wav (.aif, .aac, .mp3) file then nothing happens.



If some audio files are playing but not others, check that you are not using special characters in the filename. The panel can handle single quotes but not always other characters.

Panel zoom



The panel can be zoomed by using the Ctrl + or Ctrl – keys combinations. This is also available from the **View** menu.

Using that method is incrementing/decrementing the zoom factor by 10% steps but the main issue (for some users) is that the zoom factor is not memorized and thus at next usage the zoom is back at 100%.

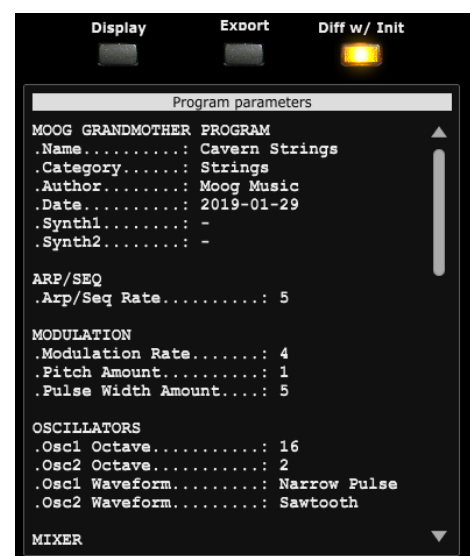
This is the reason of the implementation of this “manual” zoom. Modifying the zoom factor using those buttons is changing the zoom by 5% steps and will make it keep the zoom factor for next usage.

If you are still modifying the zoom using the View menu or the Ctrl + / Ctrl – keys, no worries! The “manual” zoom is reading the current zoom factor on the panel each time one of the main top panel button is used (Load, Save, Init, Rename).

Display and Export info

On the right side of the panel, you have access to Program parameters:

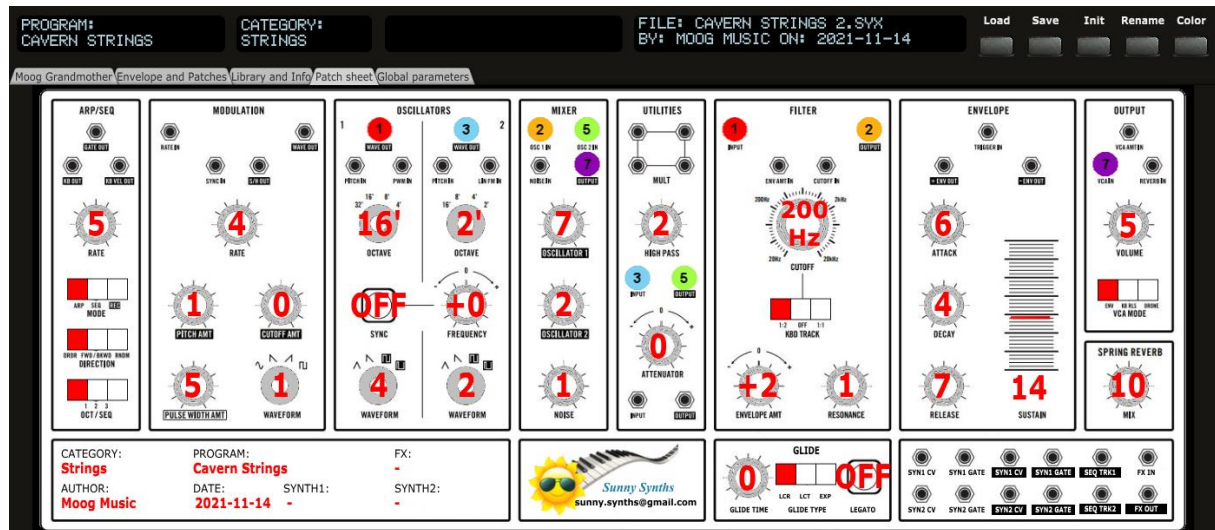
- Use the **Display** button to list the parameters of the current program
- Use the **Export** button to export as a .txt file the parameters of the current program (it is not needed to first display them before exporting)
- Use the **Diff w/Init** switch to limit the display to only the differences with the Init program



Patch sheet tab

In the **Patch sheet** tab, you have access to:

- A one shot view of the values of all parameters, patch cable connections and program info

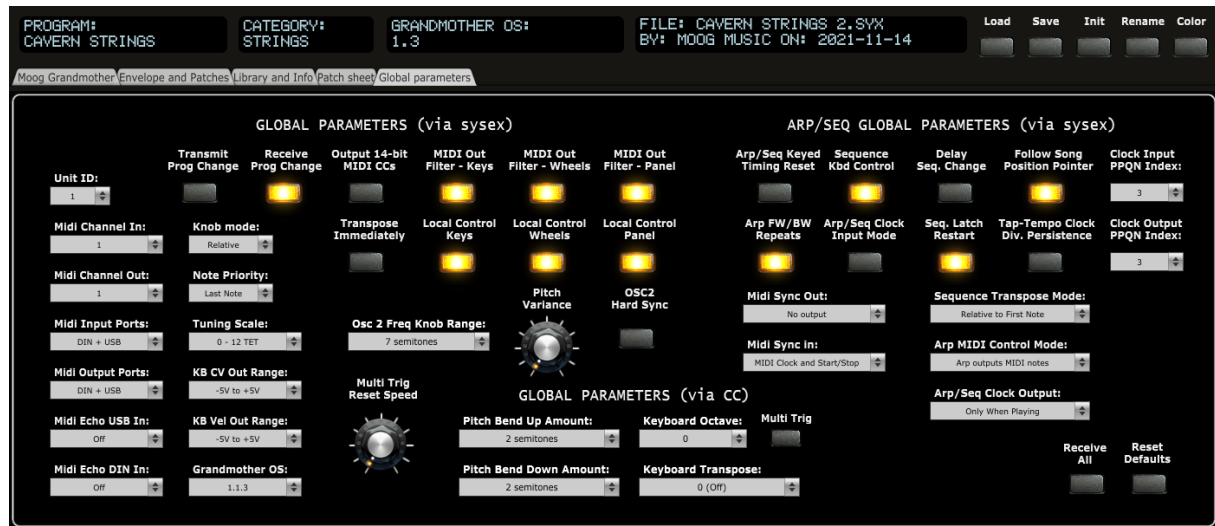


The content of this tab is adapted automatically. Directly ready for a screenshot!

Global parameters tab

In the **Global parameters** tab, you have the ability to:

- Receive the global parameters exchanged by Midi sysex messages from the synthesizer and to manage them
- Manage the 5 parameters that are saved as part of each program and that are handled by CC message



Global parameters exchanged by Midi sysex messages

Set the **Grandmother OS** pulldown to the version of your Grandmother so that only the corresponding switches and pulldowns are activated.

On the synth this is done by (see Grandmother v1.1.x Firmware update notes):

- Hold the highest black key (**A#2**), and while holding it press the next-to-lowest black key (**G#0**).
- Count the number of times the **PLAY**, **HOLD**, and **TAP** buttons blink on/off to read the version number. **PLAY** = major version number, **HOLD** = minor version number, **TAP** = minuscule/bugfix version number.
- Example: this version, v1.1.0: **PLAY** button blinks one time, then **HOLD** button blinks one time, then **TAP** button blinks zero times (does not light at all).

Use the **Receive All** button to request all the global parameters from the Grandmother. A request parameter Midi message is sent for each parameter separately one after the other and each reply interpreted one by one to display the value of the parameter.

From there you can modify the parameters individually one by one.

Use the **Reset Defaults** button to reset all values according to their default values as in the OS 1.1 manual (except Unit ID and the midi channels)



Pay attention when changing the Midi channel as it is not changing the Midi settings of the panel.

You should set the Unit ID to 1 unless you changed it to another value (even if Moog indicates 0 as default value – *confirmation requested to Moog Support but no answer yet*).

Global parameters related to the current program

You can also manage five Moog Grandmother global parameters related to the current program:

- Keyboard Octave (CC 89)
- Multi Trigger (CC 95)
- Keyboard Transpose (CC 119)
- Pitch Bend Up Amount (CC 107)
- Pitch Bend Down Amount (CC 108)

Those parameters are handled by CC messages and are saved in each program sysex file and thus loaded with them.

Installing and using the Grandmother panel as plugin

First of all, thanks to all people that have made some tests and provided feedback from using the plugin with their DAW.

The following paragraphs will provide info on how to install the plugin version of the panel but also describe the way to use it and the known limitations for each DAW.



If your DAW is not listed, please perform some tests as described and send me the equivalent of text and screenshots. I'll add those in the next version of the manual.

Installation

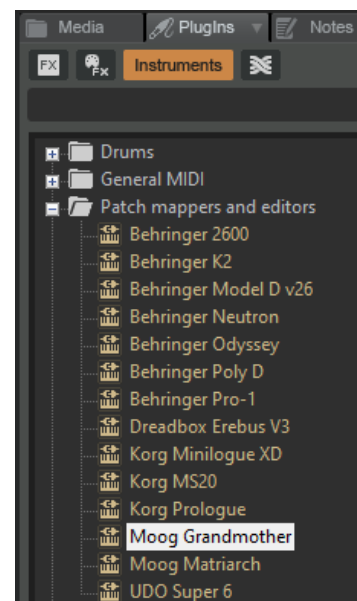
On Windows PC, depending on your DAW version and after unzipping the main file, either copy the **Moog Grandmother.dll** file from the Windows VST 64 bits directory to your 64 bits plugins directory and/or the **Moog Grandmother.dll** file from the Windows VST 32 bits directory to your 32 bits plugins directory (Steinberg hosts often use C:\Program Files\Steinberg\VSTplugins as the default plugin path).

On Mac OS, unzip then copy the **Moog Grandmother.vst** file from the MacOS VST directory to your VST plugin directory (/Library/Audio/Plug-ins/VST) and copy **Moog Grandmother.component** file from the MacOS AU directory to your plugin directory (/Library/Audio/Plug-ins/Component). You will most probably need administrator rights to perform those copies.

On MacOS you may also get the message that the “*Component or VST cannot be opened because the developer cannot be verified*”. Go to [System Preferences](#) then [Security and Privacy](#) and click on the [Open anyway](#) button to have the plugin saved as an exception in the security settings.

Start your DAW and check that the plugin directory is rescanned and that the **Moog Grandmother** panel is visible in your list of plugins.

Here is an example in Cakewalk (a light blue scanning popup is displayed as soon as a file is added or modified in the identified 64 bits VST plugins folder):



Tests and identified limitations

Different DAWs have been tested and some way of working presented here.



Don't hesitate to send a mail to sunny.synths@gmail.com if you see errors or identify ways of doing things in your DAWs. They will be mentioned in the next version of the manual.

The following actions are checked:

- Creating a track using the plugin
- Displaying the instrument and checking all controls are working fine including Load/Save...
- Playing a wav file from the file browser. The DAW is often using ASIO while the wav files are played with the Windows or MacOs native player
- Saving and opening a project in the DAW. This is checking that the last patch saved is restored correctly. As in standalone mode, the last patch used is restored (not the last position of the knobs!)
- Creating a second track with the plugin
- Saving and opening a project in the DAW. This is checking that there can be different tracks using the plugin with each of their last patch saved restored correctly.
- Creating a preset in the DAW. Each DAW has different ways to do this. Creating presets can also be done by saving full channel strips that are including the VST instrument setup (Cakewalk, Reaper, Logic)
- Creating a track by selecting a DAW preset instead of selecting the plugin. Checks if the correct patch is restored. When working, this is done by loading a saved channel strip.
- Replacing a DAW preset by another DAW preset



Replacing the DAW preset in a track by another DAW preset is now working fine in all DAWs from the v3.0 of the panel.

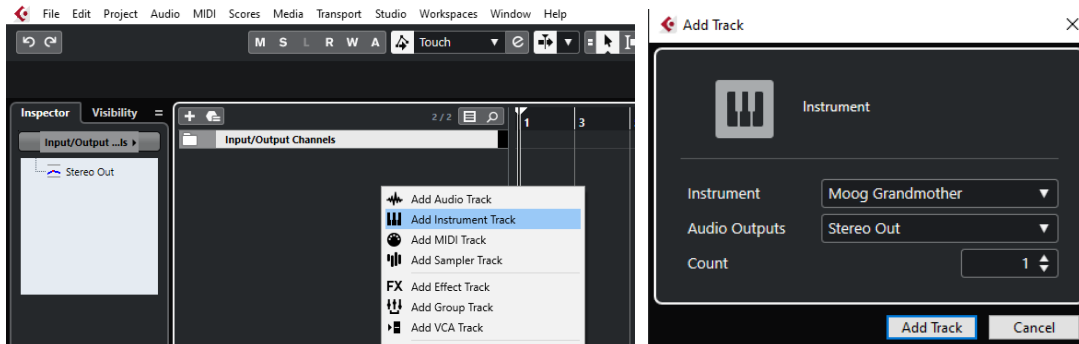
The only remark is that you may get some popups if you directly switch between freshly created presets (just click Cancel in those popups). Creating a new track with the plugin and switching between existing DAW presets works fine and doesn't display the popups.

	Cubase	Cakewalk	Reaper	Ableton	Studio 1	Logic
Create track	✓	✓	✓	✓	✓	✓
Using the plugin	✓	✓	✓	✓	✓	✓
Play wav	✓	✓	✓	✓	✗	✓
Save and restore project in DAW	✓	✓	✓	✓	✓	✓
Save and restore project with 2 tracks	✓	✓	✓	✓	✓	✓
Create DAW preset	✓	✓	✓	✓	✓	✓
Create track based on DAW preset (saved channel strip)	✓	✓	✓	✗	✓	✓
Replace DAW preset by another DAW preset	✓	✓	✓	✓	✓	✓

Cubase

Creating a new track

Add an Instrument track by using the Add track menu displayed when right clicking in the middle of the workspace then select the Moog Grandmother VST. Click on the Instrument button to display the panel and use it as you would do for the standalone version.



...or by dragging and dropping from the VSTi panel (easier).



Listening to wav files associated a patch is also working even if ASIO is used as audio driver for Cubase while the wav file player is Windows.

When saving the Cubase project, the panel is saved as well. It will be restored with the last patch used and saved.

Using several Grandmother tracks at once

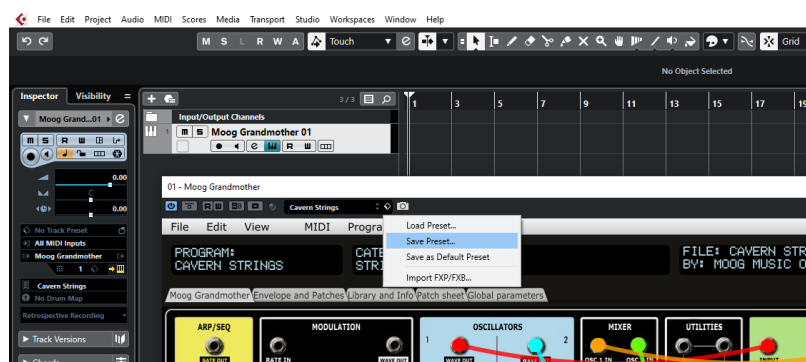
You can associate the panel to several tracks in order to keep track of the different patches used for them



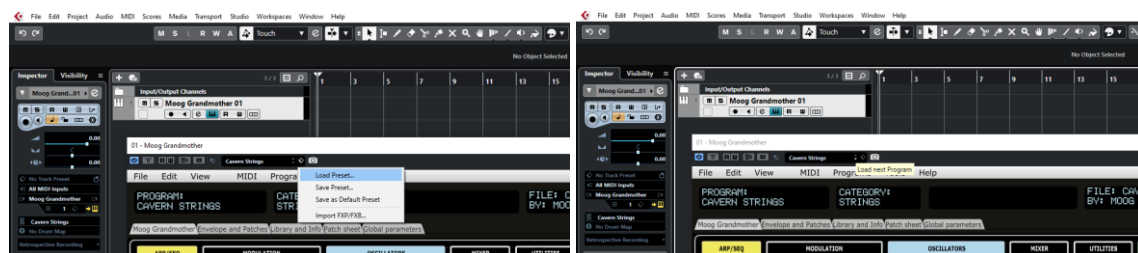
Saving a patch as a Cubase preset

You should save your patches using the Save button **inside** the panel but in addition to that you can also save them as *Cubase preset* or *Cubase track preset*.

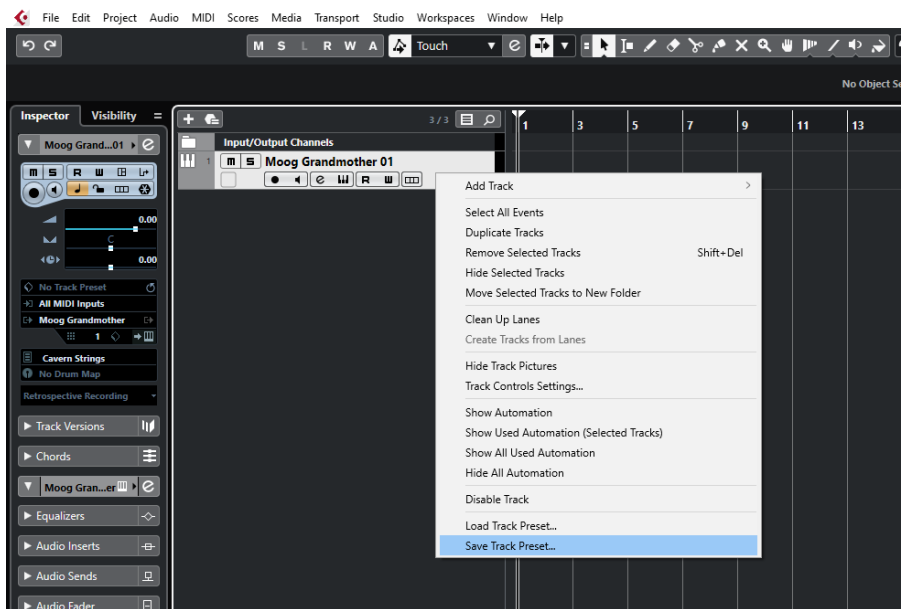
To save as Cubase preset, click on the small diamond to the left of the small camera icon at the top of the plugin window, select **Save preset...** then give a name to your preset.



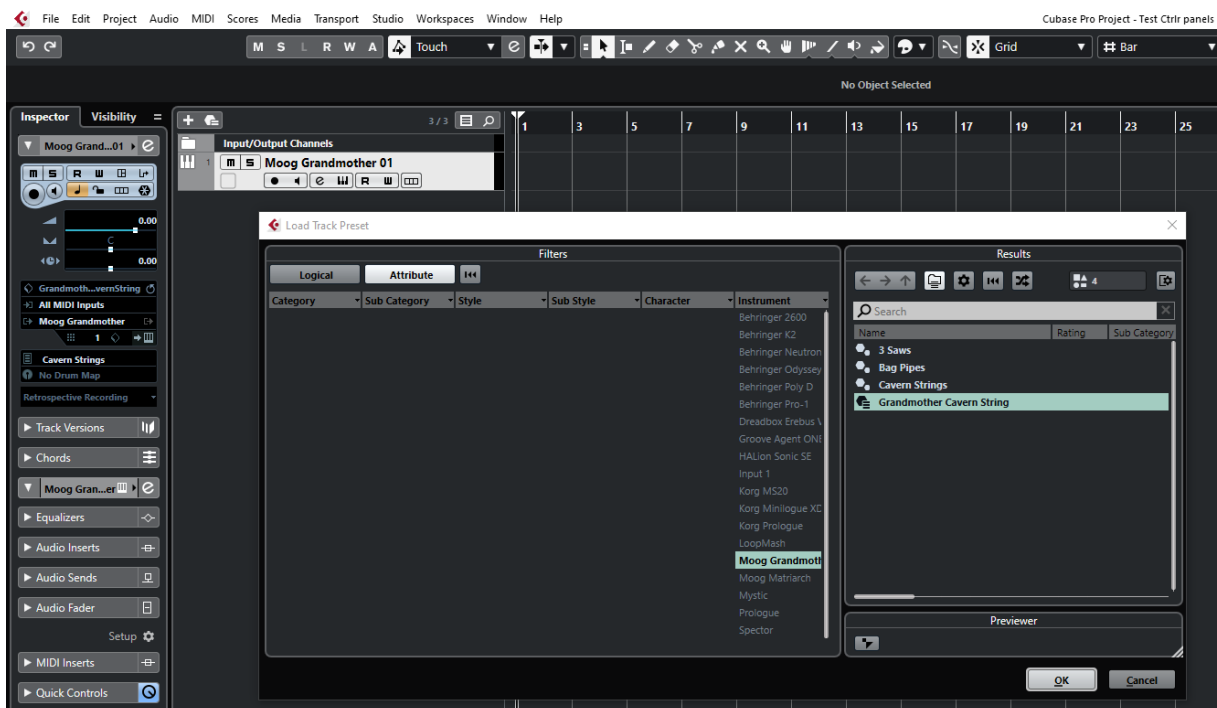
Later on, you can load a preset by using **Load preset** from the same menu or you can navigate through your presets by using the small up and down triangle buttons.



To save as Cubase track preset, select [Save track preset](#) when right clicking on a track.

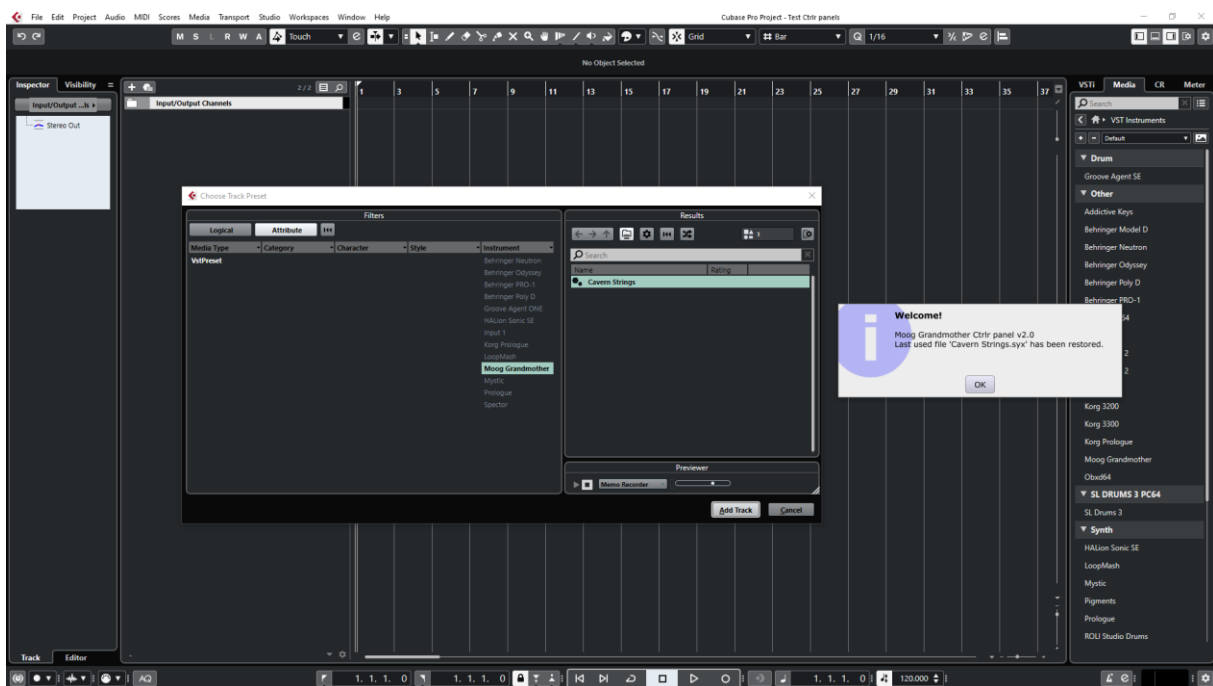
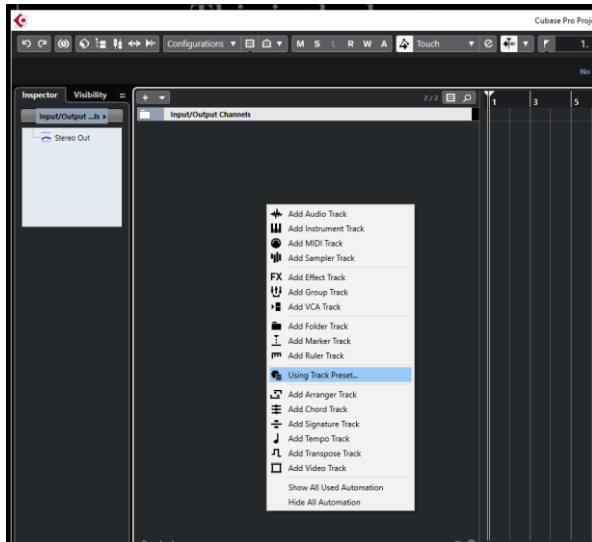


Later on, the content of the panel as is can be restored directly in a new empty track without the need of a Load from the panel by selecting [Load track preset](#) when right clicking on a track.



Creating a new track from a Cubase preset

When creating a new track you can directly pick [Using track preset](#) from the menu. The patch will appear in the panel on a new track without the need of a using Load from the panel



Replacing the preset on an existing track by another preset

Works fine. Just select another previously saved preset at the top left of the plugin window. All buttons will be positioned according to the newly loaded preset; patch cables and all labels will be restored.

You can also scroll through the presets with the small up/down buttons.

Cakewalk by Bandlab

Creating a new track

Drag the Grandmother plugin from the Instruments plugin window (Synths) and drop it on the main window to create a new track.

Click on the instrument icon near the track name to display the panel.



Load a preset from inside the panel and use it as you would do for the standalone version.

Listening to wav files associated a patch is also working even if ASIO is used as audio driver for Cakewalk while the wav file player is Windows or MacOs.

When saving the Cakewalk project, the panel is saved as well. It will be restored with the last patch used and saved.

Using several Grandmother tracks at once

Works fine. To keep several plugin windows opened at once you need to pin them first (pin icon on top right of a plugin window). Patches and windows are restored when re-opening the project.



Saving a patch as a Cakewalk preset

It is possible to save the current patch as a Cakewalk preset by changing the name at the top of the plugin window (here “Cavern Strings”) then clicking on the Save button.



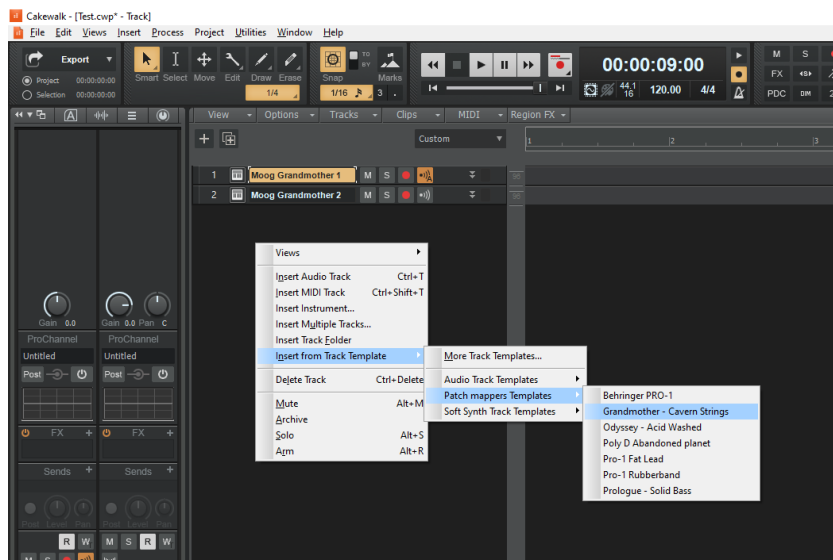
It is also possible to save a complete mixer channel as track template.

Creating a new track from a Cakewalk preset

Not found... It seems it is always needed to first create a track with the instrument plugin and then to select a preset (but this doesn't work – see next paragraph).

Another possibility would be to save each preset as a separate track template then to create the track from those track template “presets”.

Later on, you can directly insert a new track based on that preset by using **Insert from track template** as indicated in this picture:



Replacing the preset on an existing track by another preset

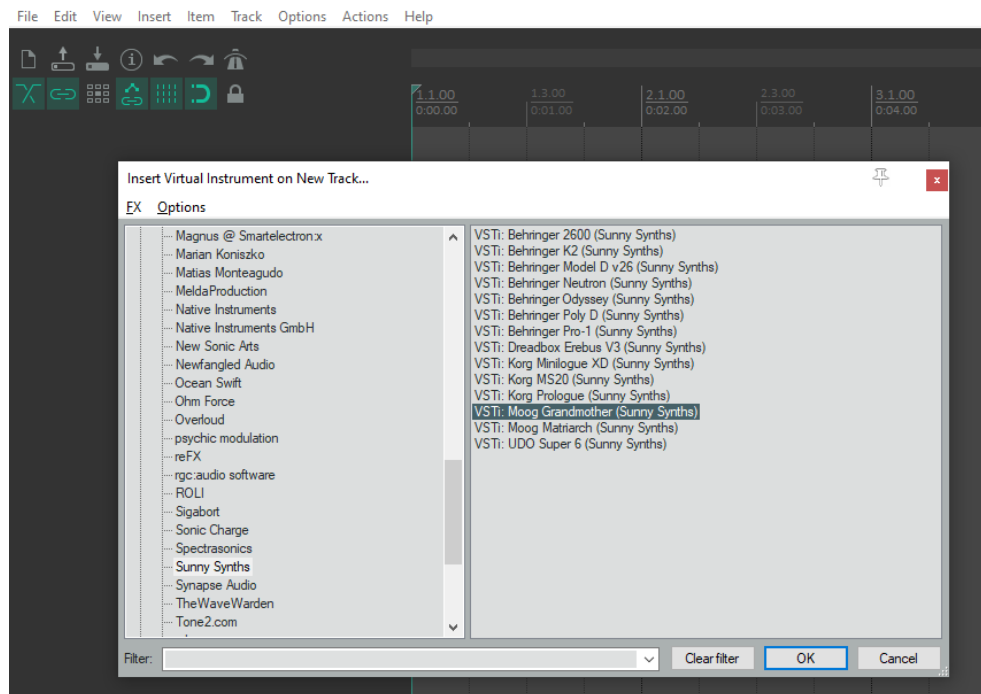
Works fine. Just select another previously saved preset at the top left of the plugin window. All buttons will be positioned according to the newly loaded preset, patch cables and all labels will be restored.

Reaper

Reaper is available on Windows and MacOS. On MacOS, Reaper is supporting both VST and AU plugin versions.

Creating a new track

Select [Insert virtual instrument on new track](#) in the Track menu then select the Moog Grandmother VST from the VSTi category



Click on the [FX button](#) to display the panel and use it as you would do for the standalone version (right-clicking instead of direct click gives only the plugin window without the blank side area)



Listening to wav files associated a patch is also working even if ASIO is used as audio driver for Reaper while the wav file player is Windows or MacOS.

When saving the Reaper project, the panel is saved as well. It will be restored with the last patch used and saved.

Using several Grandmother tracks at once

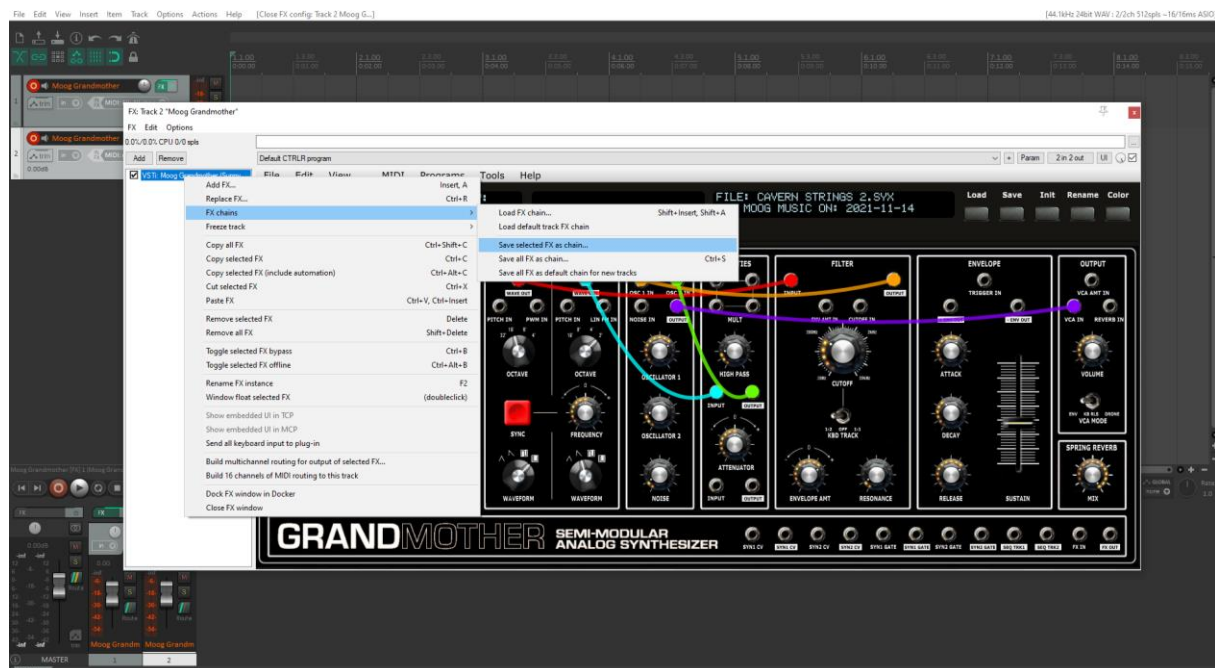
Works fine:



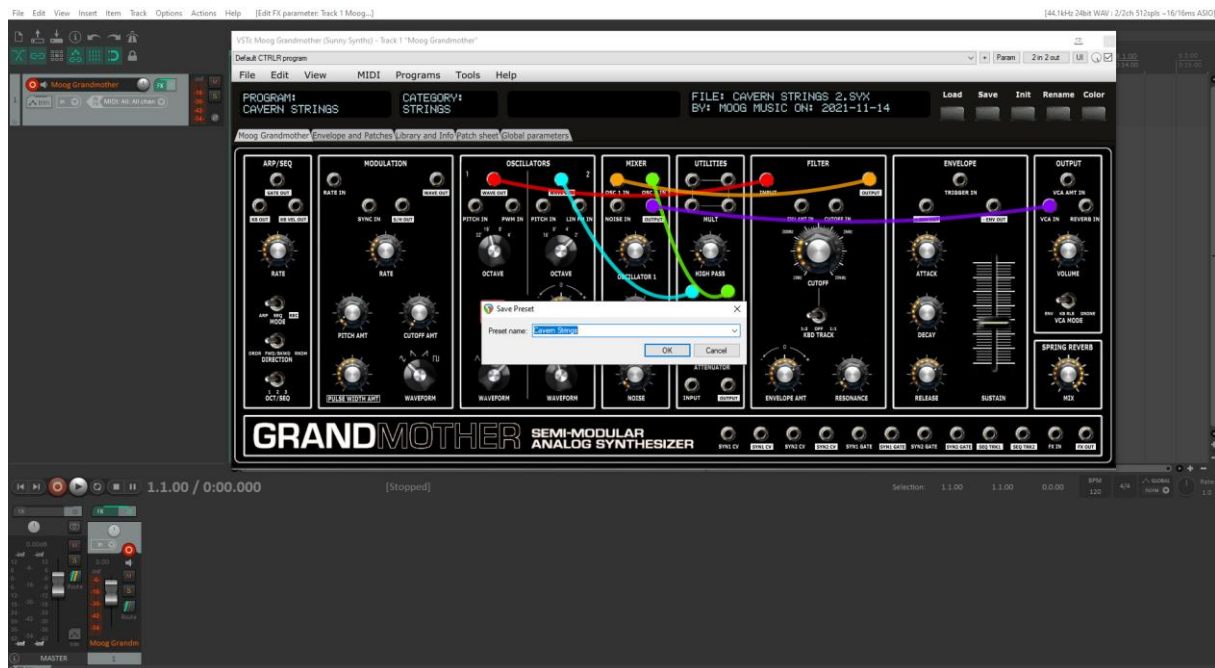
Saving a patch as a Reaper preset

Two different methods are possible:

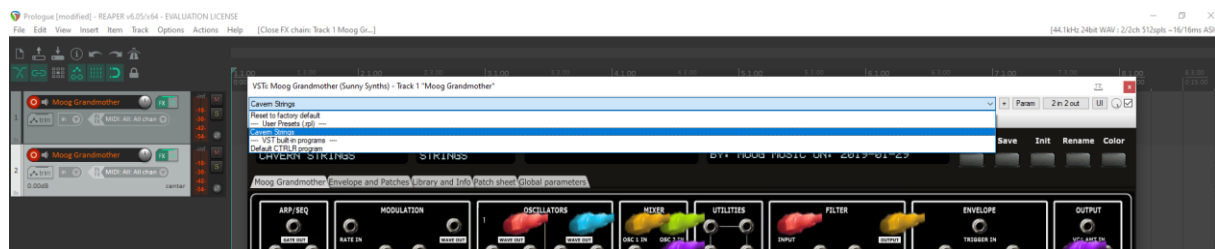
- Save FX chain: Right click on VST name in white area of plugin window then select [FX chain](#)



- Save preset: Click on the **+** button in the plugin window then name the preset

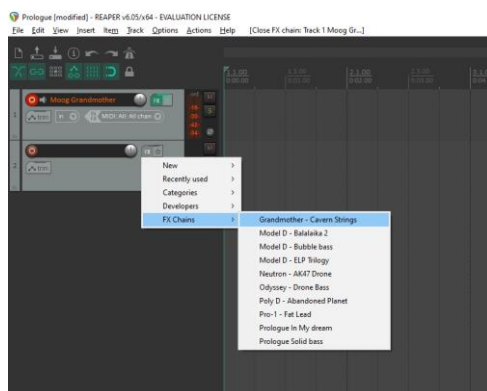


Presets are appearing under User presets



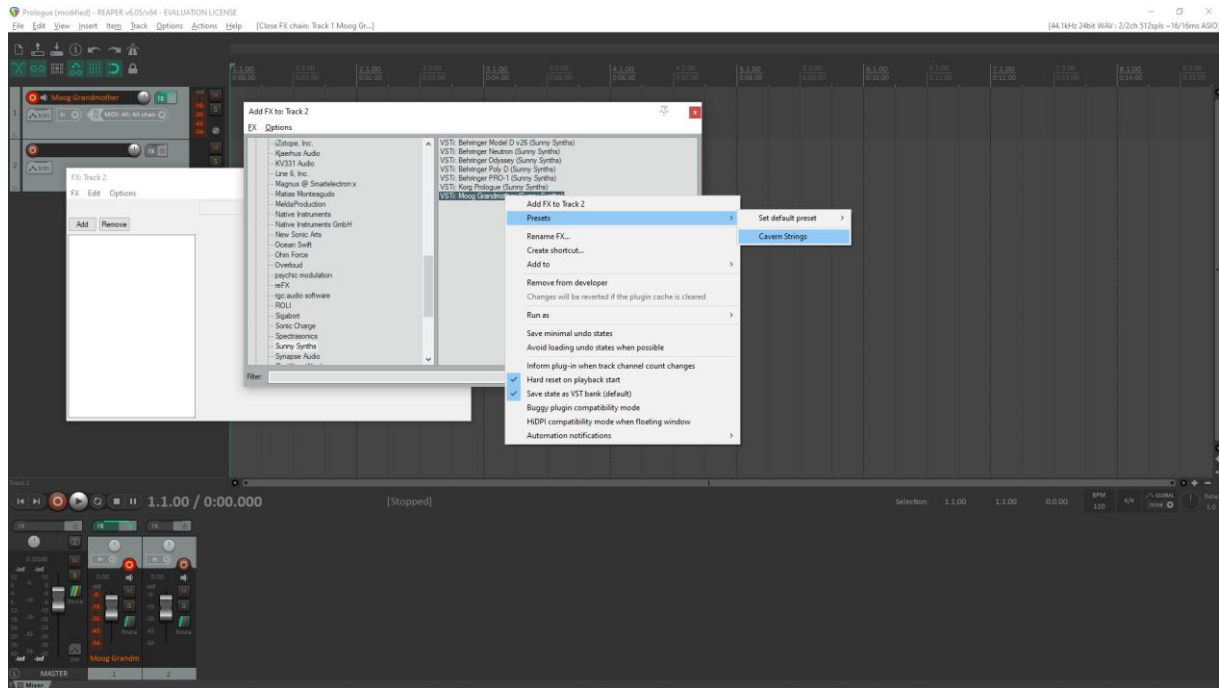
Creating a new track from a Reaper FX chain preset

Create an empty track then right click on grey **FX** button to select a saved FX chain



Creating a new track from a Reaper preset

This is not possible directly but well in two steps. First, create an empty track then click on grey **FX** button to display the Track FX window with the VST plugins list. Then, right click on the Grandmother plugin and select a saved preset under **Presets**



Replacing the preset on an existing track by another preset

Click on the green **FX button** then in the FX track window, select the FX and press the **Remove button**.

Add the new one as described above.

Ableton

Status: This has been tested in Ableton Live Lite 10 and it is thus expected to work fine in the full versions.

Creating a new track

Drag the Grandmother plugin from the plugin browser and drop it on the main window to create a new track.

The panel should open automatically. If not, click on the small wrench icon in the small window at the bottom.



Load a preset from inside the panel and use it as you would do for the standalone version.

Listening to wav files associated a patch is also working even if ASIO is used as audio driver for Ableton while the wav file player is Windows or MacOs.

When saving the Ableton project, the panel is saved as well. It will be restored with the last patch used and saved.

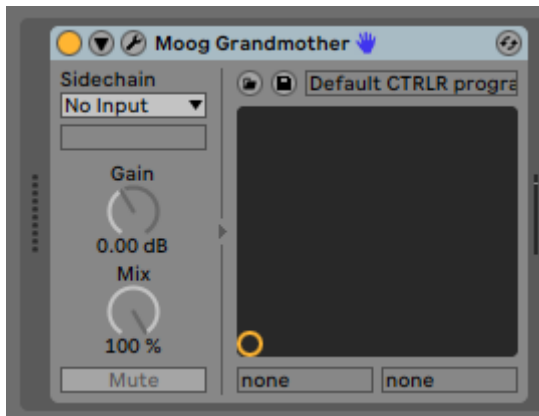
Using several Grandmother tracks at once

Works fine. To keep several plugin windows opened at once you need to change the masking of plugin setup in Preferences. Patches and windows are restored when re-opening the project.



Saving a patch as an Ableton preset

It is possible to save the current patch as an Ableton **.fxp** preset by clicking on the Save button in the small instrument window at the bottom.



Creating a new track from an Ableton preset

Not found... It seems it is always needed to first create a track with the instrument plugin and then to select a preset (but this doesn't work – see next paragraph).

Replacing the preset on an existing track by another preset

Works fine. Just select another previously saved preset by clicking on the [Load](#) button in the small instrument window at the bottom. All buttons will be positioned according to the newly loaded preset, patch cables and all labels will be restored.

Studio One

Status: This has been tested in Studio One 3.5 32 bits and 4.6 64 bits version.

Playing the wav file associated to a patch seems not working.

Creating a new track

Drag the Grandmother plugin from the plugin browser and drop it on the main window to create a new track.

The panel should open automatically. If not, click on the small Instrument editor icon on the right side of the track name.



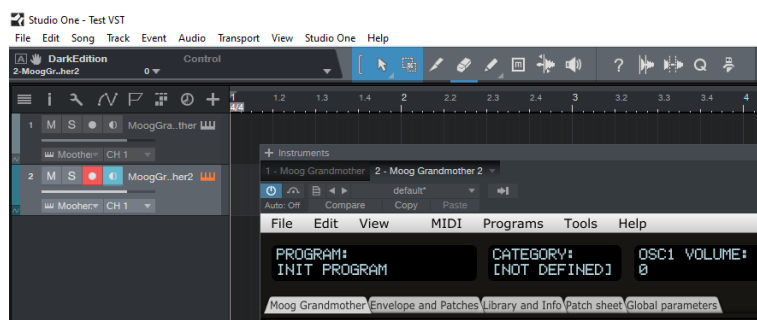
Load a preset from inside the panel and use it as you would do for the standalone version.

Listening to wav files associated a patch is not working even if ASIO is used as audio driver for Studio One while the wav file player is Windows or MacOs.

When saving the Studio One song, the panel is saved as well. It will be restored with the last patch used and saved.

Using several Grandmother tracks at once

Works fine. The instrument editor is showing one tab by track:



Saving a patch as a Grandmother Studio One preset

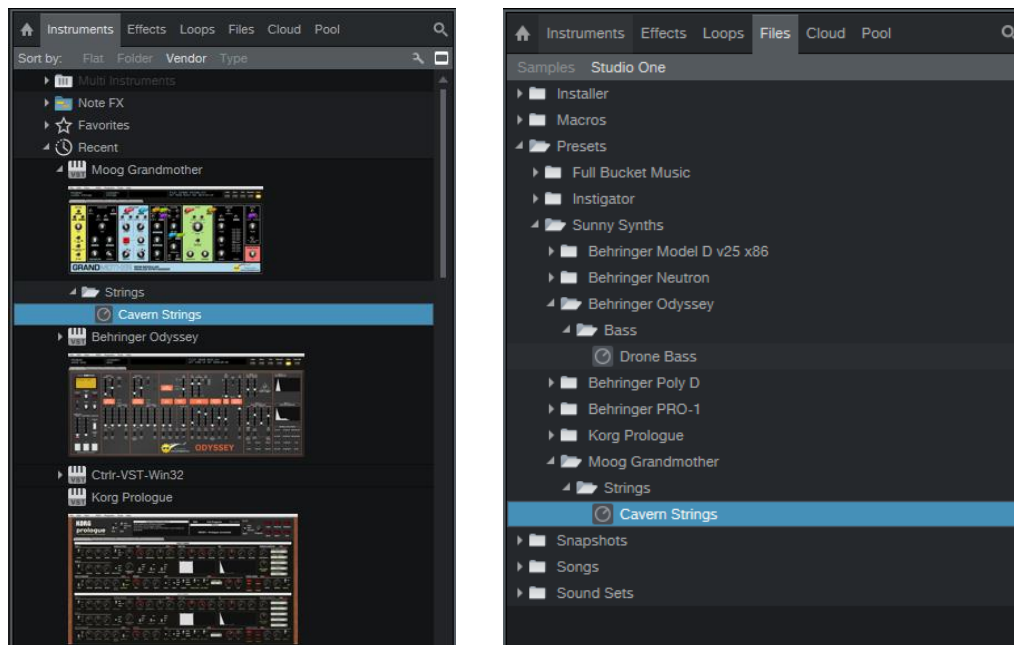
You can save the last patch saved in the panel as a preset in Studio One by selecting Store preset in the plugin window preset menu.

In the popup menu, input the name of a Subfolder corresponding for example to the sound category.



Creating a new track from a Studio One preset

The presets and their subfolders created with the above method are appearing directly in the browser under the Grandmother VST name in the Instruments tab or in the Files tab



Replacing the preset on an existing track by another preset

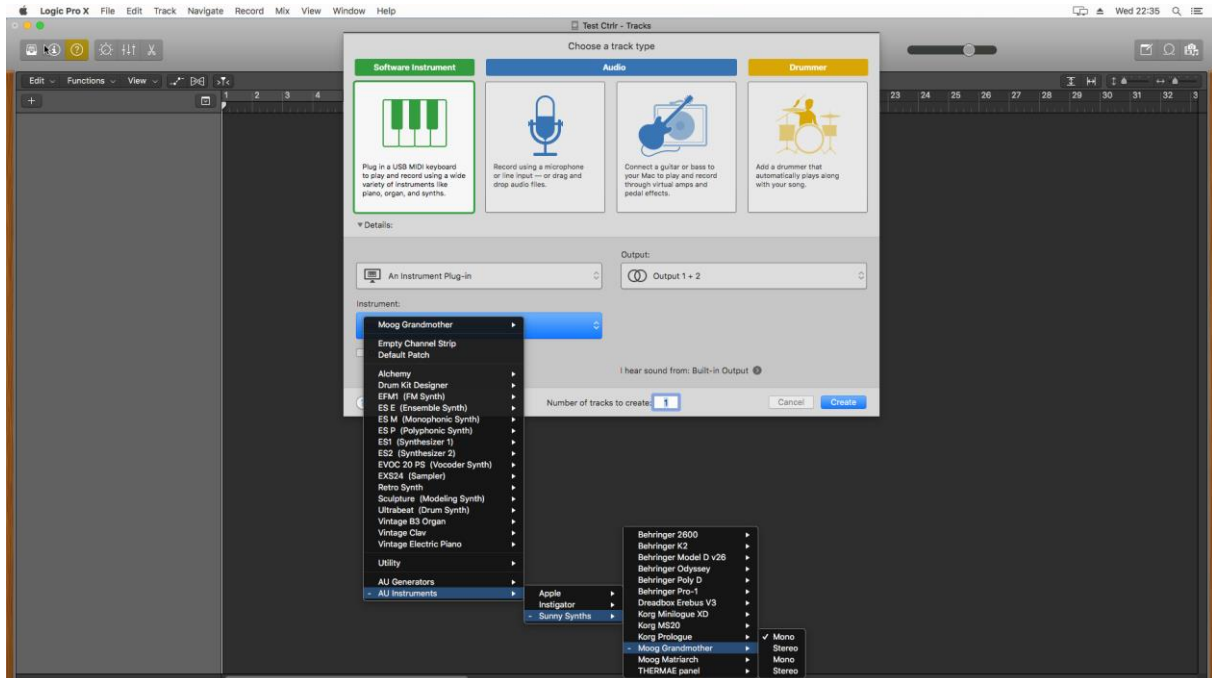
Works fine. Just select another previously saved preset with the pulldown at the top left of the plugin window or with [Load preset file](#). All buttons will be positioned according to the newly loaded preset, patch cables and all labels will be restored.

Logic Pro X

Logic Pro X is only available on MacOS and handles only the AU plugin version so you must secure to have the Moog Grandmother.component plugin file in your AU plugin directory.

Creating a new first track

Create a new instrument track and select the Moog Grandmother plugin for it (under AU instruments):



If the panel doesn't open directly, display the [Mixer](#) then click in the middle of the track [Input](#) to open the panel.



Load a preset from inside the panel and use it as you would do for the standalone version.

Listening to wav files associated a patch is also working even if ASIO is used as audio driver for Logic while the wav file player is MacOs.

When saving the Logic project, the panel is saved as well. It will be restored with the last patch used and saved.

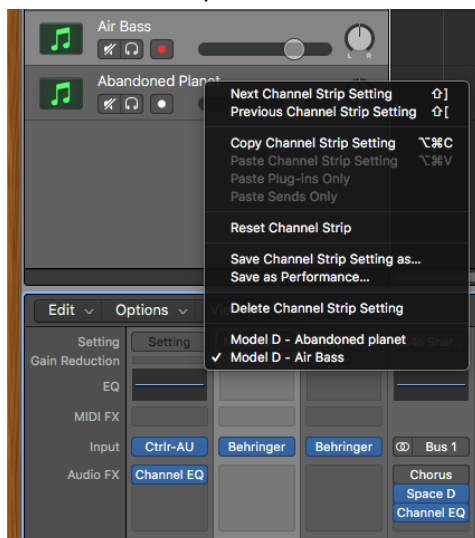
Using several Grandmother tracks at once

Works fine since v2.2 and can be done by simply creating two tracks with the plugin.



If wished, one can also create a channel strip:

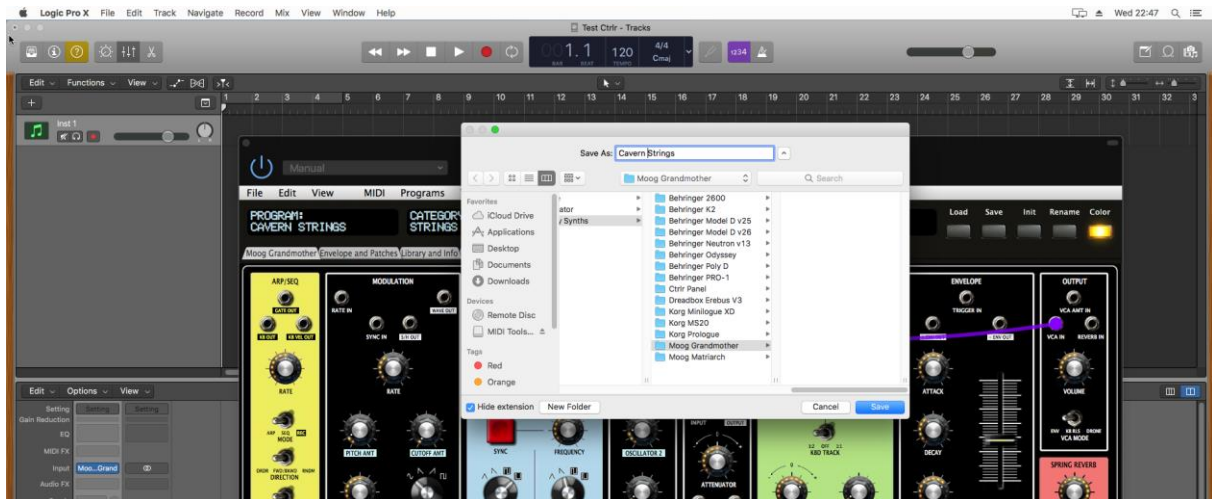
- Save the Init patch as a channel strip preset in Logic by clicking on the [Setting](#) button at the top of the channel strip in the mixer and selecting [Save Channel Strip Setting as...](#)



- New tracks can be created based on that Init channel strip (see after) and can then be changed afterwards to other patches with the Load button

Saving a patch as a Grandmother Logic preset

You can save the last patch saved in the panel as a plugin preset in Logic by selecting [Save As](#) in the pulldown menu of the preset area at the top of the plugin window. An .aupreset file will be created.



Saving a patch as a Grandmother Logic channel strip preset

You can save the last patch saved in the panel as a channel strip preset in Logic by clicking on the [Setting](#) button at the top of the channel strip in the mixer and selecting [Save Channel Strip Setting as...](#). Note that this is different than saving a plugin preset.

Creating a new track from a Logic channel strip setting

This is not possible directly but well in two steps. First, create a new Software Instrument track with an *Empty track channel* then click on the [Setting](#) button at the top of the channel strip in the mixer and select a previously saved channel strip setting.

Replacing the preset on an existing track by another preset

This is working well when selecting a previously saved .aupreset file. Just select another previously saved preset by selecting [Load](#) in the top left menu of the plugin window. All buttons will be positioned according to the newly loaded preset, patch cables and all labels will be restored.



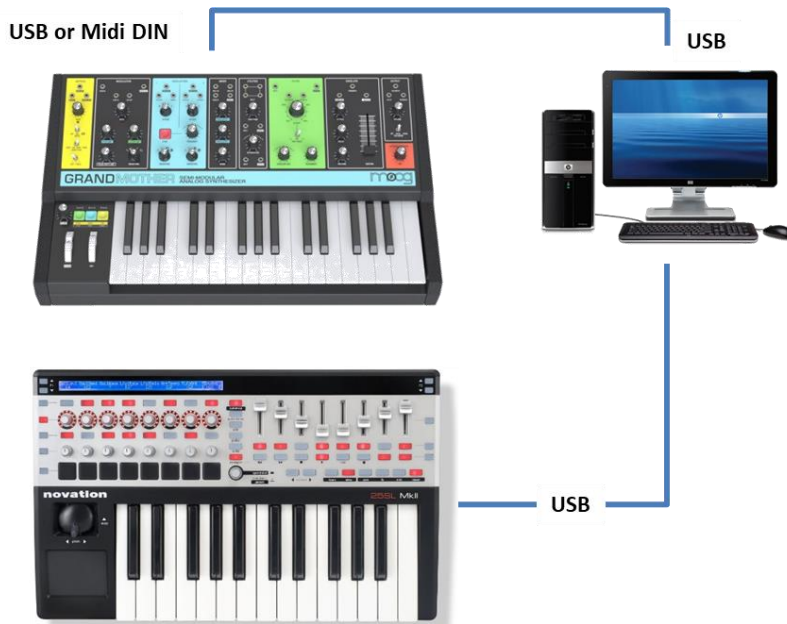
This is also working fine with Channel Strips Settings. When replaced, a popup indicates that the Last file used "xxx" has been restored.

Using a controller to move the buttons

If you connected a controller like the Novation SL MkII then you can benefit from moving all knobs of the panel from your controller.

This has been achieved by assigning extra Midi CC controller numbers to the knobs not assigned by Moog. **Of course**, as nothing is changed in the hardware, moving those knobs from your controller will not affect the sound as such.

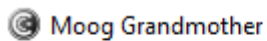
Connect your controller as on following picture:



Controller numbers are the following (in **blue** the ones assigned by Moog and affecting the synthesizer, in **red** the extra ones without effect on the synth and only used to handle the panel):

<div>ARP/SEQ</div> <div><div><div><div><div></div><div>CLD OUT</div></div><div><div></div><div>CLD IN</div></div></div><div><div><div></div><div>CLD OUT</div></div><div><div></div><div>CLD IN</div></div></div></div><div><div>8</div><div>RATE</div></div><div><div>91</div><div>ARP SEQ MODE</div></div><div><div>92</div><div>DRUM 1-4 TRIGGER DIRECTION</div></div><div><div>93</div><div>1 2 3 OCT/SEQ</div></div></div>	<div>MODULATION</div> <div><div><div><div><div></div><div>RATE IN</div></div><div><div></div><div>RATE OUT</div></div></div><div><div><div></div><div>SYNC IN</div></div><div><div></div><div>ENV OUT</div></div></div></div><div><div>3</div><div>RATE</div></div><div><div>20</div><div>PITCH AMT</div></div><div><div>21</div><div>CUTOFF AMT</div></div><div><div>22</div><div>PULSE WIDTH AMT</div></div><div><div>23</div><div>WAVEFORM</div></div></div>	<div>OSCILLATORS</div> <div><div>1</div><div><div><div><div><div></div><div>RATE OUT</div></div><div><div></div><div>PITCH IN</div></div></div><div><div><div></div><div>PITCH IN</div></div><div><div></div><div>PWM IN</div></div></div></div><div><div>74</div><div>OCTAVE</div></div><div><div>77</div><div>SYNC</div></div><div><div>24</div><div>WAVEFORM</div></div></div><div><div>2</div><div><div><div><div><div></div><div>RATE OUT</div></div><div><div></div><div>PITCH IN</div></div></div><div><div><div></div><div>PITCH IN</div></div><div><div></div><div>LFO IN</div></div></div></div><div><div>75</div><div>OCTAVE</div></div><div><div>12</div><div>FREQUENCY</div></div><div><div>25</div><div>WAVEFORM</div></div></div></div></div>	<div>MIXER</div> <div><div><div><div><div></div><div>OSC 1 IN</div></div><div><div></div><div>OSC 2 IN</div></div></div><div><div><div></div><div>MIXER IN</div></div><div><div></div><div>CUTOUT</div></div></div></div><div><div>26</div><div>OSCILLATOR</div></div><div><div>27</div><div>OSCILLATOR</div></div><div><div>28</div><div>NOISE</div></div></div>	<div>UTILITIES</div> <div><div><div><div><div></div><div>MULT</div></div><div><div></div><div>MULT</div></div></div><div><div><div></div><div>INPUT</div></div><div><div></div><div>CUTOFF</div></div></div></div><div><div>29</div><div>HIGH PASS</div></div><div><div>30</div><div>ATTENUATOR</div></div></div>	<div>FILTER</div> <div><div><div><div><div></div><div>ENV AMT IN</div></div><div><div></div><div>CUTOFF IN</div></div></div><div><div><div></div><div>ENV AMT</div></div><div><div></div><div>CUTOFF</div></div></div></div><div><div>31</div><div>CUTOFF</div></div><div><div>32</div><div>KBD TRACK</div></div><div><div>33</div><div>ENVELOPE AMT</div></div><div><div>34</div><div>RESONANCE</div></div></div>	<div>ENVELOPE</div> <div><div><div><div><div></div><div>TRIGGER IN</div></div><div><div></div><div>ENV OUT</div></div></div><div><div><div></div><div>ATTACK</div></div><div><div></div><div>DECAY</div></div></div></div><div><div>35</div><div>ATTACK</div></div><div><div>36</div><div>DECAY</div></div><div><div>37</div><div>RELEASE</div></div><div><div>38</div><div>SUSTAIN</div></div></div>	<div>OUTPUT</div> <div><div><div><div><div></div><div>VCA AMT IN</div></div><div><div></div><div>VCA IN</div></div></div><div><div><div></div><div>VCA IN</div></div><div><div></div><div>REVERB IN</div></div></div></div><div><div>39</div><div>VOLUME</div></div><div><div>40</div><div>DRUM 1-4 TRIGGER VCA MODE</div></div><div><div>41</div><div>SPRING REVERB MIX</div></div></div>
<div><div>Kbd octave</div><div>89</div></div> <div><div>Kbd transpose</div><div>119</div></div>	<div><div>Pitch bend Up Amt</div><div>107</div></div> <div><div>Pitch bend Down Amt</div><div>108</div></div>	<div><div>Multi Trigger</div><div>95</div></div>	<div><div>Glide On/Off</div><div>65</div></div> <div><div>Gated</div><div>103</div></div>	<div><div>Glide Time</div><div>5</div></div> <div><div>Type</div><div>85</div></div> <div><div>Legato</div><div>94</div></div>	<div><div>Arp/Seq Clock div.</div><div>90</div></div> <div><div>On</div><div>73</div></div> <div><div>Off</div><div>73</div></div>	<div><div>Gate Length</div><div>106</div></div> <div><div>Hold</div><div>69</div></div> <div><div>Swing</div><div>14</div></div>	

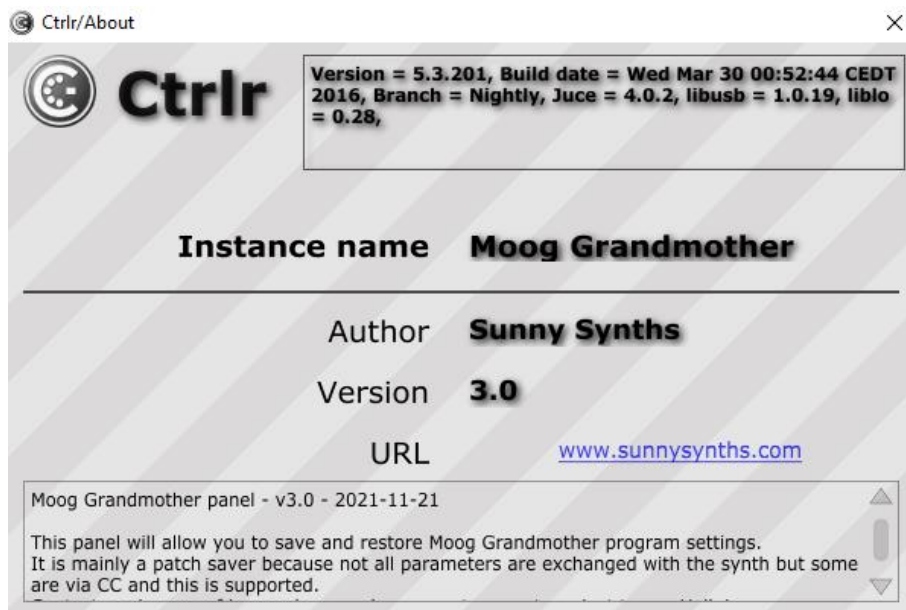
The main Ctrlr menus



Actually, not so much is used from the Ctrlr menus...

What you can use is:

- **File** menu: Quit is the only option
- **View** menu: allows zooming the panel in and out by 10% steps
- **Midi** menu: to select your Moog Grandmother as Input Midi device and as Output Midi device. Sets the Midi channel
- **Tools** menu: use the Midi monitor popup to verify the messages between the panel and the synth
- **Help** menu: displays the About info of the panel



Appendix

Version history

Date	Version	Description	By
2019-02-10	1.0	First version of this manual	Sunny Synths
2019-03-17	1.1	Added "manual" zoom explanation	Sunny Synths
2019-04-28	1.2	Added "Open and close panel" paragraph	Sunny Synths
2019-08-25	1.3	Added documentation on playing wav files	Sunny Synths
2020-11-13	2.0	Color and Dark layout, new Global parameters tab, explanations for VST/AU usage in DAWs	Sunny Synths
2020-12-31	2.1	Selection of Grandmother OS, adaptation to OS 1.1.3	Sunny Synths
2021-06-06	2.2	Possibility to replace presets in DAW. Display Info Diff w/Init switch	Sunny Synths
2021-11-21	3.0	Patch cables drawing on main panel. Welcome message switch. Better DAW presets saving/retrieving	Sunny Synths

Moog Grandmother information

The Moog Grandmother product page: <https://www.moogmusic.com/products/grandmother>

Sysex file documentation

Here is the documentation of the sysex file used to store the parameters. It is 410 bytes long.

```
-- // Moog Grandmother - Sound data sysex structure - Size=410 bytes v1.2 //
```

```
--
```

```
-- Offset is what is displayed with HxD Hexadecimal analyser
```

```
-- getByte() is also using the Offset to retrieve Bytes from sysex dump
```

```
--
```

```
-- This is just a structure used to save the data on the computer
```

```
-- Nothing official or unofficial from Moog, just a decision made by me ;-)
```

```
-- This data is not transferred by Midi
```



```
-- 100 = 64
```

```
-- 127 = 7F
```


Offset	Byte content	
0000	F0	Sysex start
0001	04	Moog Music ID
0002	16	Grandmother (in v1.0 it was "AA", my choice)
0003	01	Sound data
0004	00-01	Glide On/Off
0005	00-64	Glide Time
0006	00-02	Glide Type
0007	00-01	Legato Glide On/Off
0008	00-01	Gated Glide On/Off

--	0009		00-64	Fine Tune (32=0) - At back of Grandmother	***
Not stored atm ***					
--	0010-11		00-03	Osc Octave	
--	0012		00-01	Osc Sync	
--	0013		00-7F	Osc2 Frequency (40=0)	
--	0014-15		00-03	Osc Waveform	
--	0016-18		00-64	Volume (Osc1-2, Noise)	
--	0019		00-64	Filter Cutoff	
--	0020		00-64	Filter Envelope Amount (32=0)	
--	0021		00-64	Filter Resonance	
--	0022		00-02	Keyboard Tracking	
--	0023		00-64	Envelope Attack	
--	0024		00-64	Envelope Decay	
--	0025		00-23	Envelope Sustain (0-35)	
--	0026		00-64	Envelope Release	
--	0027		00-64	Main Volume	
--	0028		00-02	VCA Mode	
--	0029		00-64	Spring Reverb Mix	
--	0030		00-7F	Mod Rate	
--	0031		00-64	Mod Pitch Amount	
--	0032		00-64	Mod Cutoff Amount	
--	0033		00-64	Mod Pulse Width Amount	
--	0034		00-03	Mod Waveform	
--	0035		00-64	HP Filter Cutoff	
--	0036		00-64	Attenuator (32=0)	
--	0037		00-7F	Arp/Seq Rate	
--	0038		00-03	Arp/Seq Mode	
--	0039		00-03	Arp/Seq Direction	
--	0040		00-03	Arp Range / Seq Line	
--	0041		00-17	Arp/Seq Clock Division (24 values)	
--	0042		00-01	Arp/Seq On/Off	
--	0043		00-18	Pitch Bend Up Amount	
--	0044		00-18	Pitch Bend Down Amount	
--	0045		00-18	Keyboard Transpose (-12 12)	
--	0046		00-04	Keyboard Octave	
--	0047		00-01	Multi Trig	
--	0048		00-18	Osc2 Frequency Knob Range	
--	0050-58		00-0C	Patch source (1-9)	
--	0059-67		00-0B	Patch destination (1-9)	
--	0068-87			Name (20 characters)	
--	0088		00-10	Category	
--	0089-344			Description (256 characters)	
--	0345-359			Author (15 characters)	
--	0360-369			Date (10 characters for ISO date yyyy-mm-dd)	
--	0379-389			Synth1 (11 characters)	
--	0390-400			Synth2 (11 characters)	

--	00401		00-7F	Arp/Seq Swing (40 = 50%)
--	00402		00-7F	Arp/Seq Gate Length (40 = 50%)
--	0403-408			FX (6 characters)
--	0409		F7	End of sysex

