Behringer Neutron Ctrlr panel documentation and instructions

V2.2 – 2024-04-28

Sunny Synths

Introduction

Hi! Thanks for having purchased this Ctrlr Behringer Neutron panel!

In comparison to the Sunny Synths' Model D and Grandmother panels, this Neutron panel is offering much more possibilities of exchange between the synth and your PC or your controller thanks to the addition of the OS 2.0. However, still not all parameters are covered.

The panel is thus also not a full patch loader/saver as the Behringer Neutron does not support the load/save of programs or the manipulation of all its program parameters by Midi NRPN/CC/Sysex messages except for about 40 of them (documented on p27 and 28 of the Neutron synthesizer manual). It can thus also be called as "advanced patch mapper".

It will support you in saving and retrieving Neutron 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 philosophy has been respected but in this case the panel background is based on the Red overlay provided by Heinakroon (https://www.heinakroon.net/category/neutron-overlays). If you like this panel and would like to have a similar look on your synth then this is the place to go !

Of course it would also 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, to draw patch cables on the panel, 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 Neutron and have fun!

Dominique *(Sunny Synths)*

About this v2.2 version

The following changes have been made in this 2.2 version:
- Correction: patch cables 10-15 were not well reset prior loading an old patch file (< v1.4)
- Correction: double I/O were not well restored in patch sheet
- Correction: Removed endless loop when double I/O were used. Was causing high CPU load
- Remembers last file saved path and name
- Added 2 I/O patch points with free label
- Added Midi settings button"
- Welcome message is now in LCD
- Removed 'Welcome message' button
- Load confirmation message is now in LCD
- Removed 'Load OK Confirm' button

The version 2.x brought:
- Correction: patch cables were not saved correctly (since v2.0)
- Correction of the "Empty program" data that is used internally in the case the user did a Save without previously performing an Init program or loading a preset
- Setting the root of the File browser is now working in all cases
- The File browser directory is kept between sessions
- The previous Author is now kept when loading a new Init program
- Added a Welcome message display switch
- Added a Load OK Confirm switch
- Added the ability to play AAC, MP3 and AIF files on MacOs
- Possibility to set Cables transparency. 0% transparency is plain
- Patch cables are now restored at panel opening when the user selects No load at panel load
- 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 ☺
- Parameters exported to VST have been renumbered to appear first in automation lists in DAW
- Patch cables drawing directly on main panel
- Ability to switch between full cables or cable plugs
- Support for double inputs / double outputs

Important information for the existing users

Due to the addition of the extra patch points, you need to perform a manual operation:
- **Windows**: delete the temporary "Behringer Neutron" folder in your C:\Users*your_username*\AppData\Roaming hidden folder
- **MacOS**: delete the "Behringer Neutron" folder in your personal Library/Preferences folder. It is also a hidden folder that you can see/reach by using the Finder and clicking on Go while pressing the Option (Alt) key.
- Copy then use the provided .exe file as usual. It will recreate the temporary folder and its content
- You have then to re-specify the Midi settings

Table of Contents

Installation and features

Installation of the Ctrlr panel

The panel is provided as a compressed .zip file containing:
–   the Behringer Neutron panel as an .exe file on Windows PC
–   the Behringer Neutron panel as an .app file on Mac OS (zip folder to be uncompressed)
–   the Behringer Neutron panel as VST 32 bits and 64 bits for Windows PC
–   the Behringer Neutron panel as VST and AU plugin for Mac OS
–   this manual as PDF
–   a folder containing programs from the Neutron user manual and the *Patch Library* web site
–   an Advanced mode template to pilot the parameters from a Novation SL MkII keyboard/controller

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

On Mac you may also do either *chmod +x Contents/MacOS/** on the package contents or need to go to System Preferences then Security and Privacy and to click on the Open anyway button to have the package/plugin saved as an exception in the security settings.

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

⚠ The panel will most probably not be responding after the initial installation. Simply close the program and restart it to solve the issue.

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

Features

You will find the following features in the Behringer Neutron panel:

– Behringer Neutron interface with similar way of working as actual synthesizer.
– Panel background adapted based on "Red" overlay from Heinakroon (see appendix)
– Top row of support "screens" with old look
– Visual feedback by using "LED" ring buttons and indication of the value (on change or on click)
– "Intelligent" display following parameters selection: OSC and LFO shape blending, LFO shape order change with or without blend
– All "hidden" OS 2.0 functions available for easy visualization and tweaking
– Envelopes graphs handled by mouse or classical ADSR rotary encoders
– Load / Save programs from individual .syx files
– Global settings management
– Easy program renaming
– Display and export of program parameters as text file
– Ability to describe 15 input/output colored patch cables with different sources/destinations
– Patch cables drawing on main panel
– Ability to display full cables or cable plugs
– 16 extra input / output patch points of external gear (synths, sequencers, FX chain, others)
– 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 Neutron and other gear (external synths, sequencers, FX chain)
– 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)
– All buttons associated to a Midi CC controller number so you can adjust them from a hardware controller (still no impact on the synth of course and unfortunately)

Under analysis:

– Bi-directional behavior when using the synth or a controller (only for parameters indicated in p27 and 28 of the Neutron synthesizer manual)

Communication with your Neutron synth

💡 If your Neutron 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 Behringer Neutron does not support the load/save of programs or the manipulation of all program parameters by Midi NRPN/CC/Sysex messages.

It does however offer the possibility to control about 40 parameters (as documented on p27 and 28 of the Neutron synthesizer manual) and to exchange them between the synth and your PC or your controller since the addition of the OS 2.0.

Some examples of connection setup

You can connect your Neutron, a master controller/keyboard and your computer in different ways. The Midi settings in the panel will be different according to the setup you choose.

Configuration 1: full USB
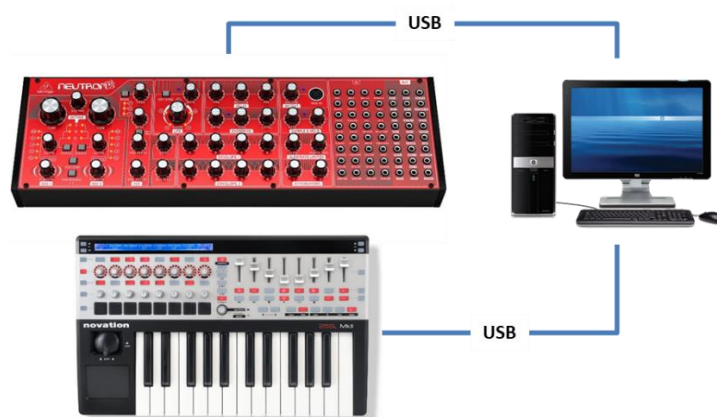
- Connect the Neutron to the computer by USB
- Connect your master controller/keyboard to the computer by USB (connecting the master controller/keyboard by USB to the computer gives you the possibility to use it for the Neutron but also for VST plugins or other soft synths)
- Power the Neutron On
- Start the Neutron panel
- In the **Midi** menu, select **Input** – **Device** *Neutron*
- In the **Midi** menu, select **Input** – **Channel** *1* (set this to the Midi channel of your Neutron). This is done to receive parameters and global settings changes from the Neutron
- In the **Midi** menu, select **Controller** – **Device** *your_controller*
- In the **Midi** menu, select **Controller** – **Channel** *0 (all) or the channel of your controller*
- In the **Midi** menu, select **Output** – **Device** *Neutron*
- In the **Midi** menu, select **Output** – **Channel** *1* (set this to the Midi channel of your Neutron). This is done to send parameters, global settings and notes to the Neutron

–   In the **Midi** menu, select **Midi Thru – Input Device -> Output Device**. This is done to send the received parameters changes and notes from your master controller/keyboard to the synth

Configuration 2: USB and Midi DINs

–   Connect the Neutron to the computer by USB
–   Connect your master controller/keyboard by Midi DIN to the Neutron. Notes will come from this connection (and also parameter changes if you are using a controller as the Novation SL MkII with the template provided). However, parameter changes will not be reflected in the panel unless you connect the Neutron Midi Thru DIN to your PC
–   Power the Neutron On. The master controller/keyboard will be dedicated to the Neutron.
–   Start the Neutron panel
–   In the **Midi** menu, select **Input** – **Device** *Neutron*
–   In the **Midi** menu, select **Input** – **Channel** *1* (set this to the Midi channel of your Neutron). This is done to receive parameters and global settings changes from the Neutron
–   In the **Midi** menu, select **Output** – **Device** *Neutron*
–   In the **Midi** menu, select **Output** – **Channel** *1* (set this to the Midi channel of your Neutron). This is done to send parameter changes and global settings from the panel to the Neutron

Testing the Midi connection

Don't forget to close and restart the application if you just installed it for the first time.

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 (see picture on next page)
- Play a note on your master keyboard/controller to hear the sound. If you don't hear anything check the **Midi Thru – Input Device -> Output Device** setting
- Modify the **Osc1 Octave** on the panel from 32' to 16'. The message RAW:[f0 00 20 32 28 00 0a 26 01 f7] should appear in the Midi Output monitor (red area) and it should also be changed on the synth. Play some note to hear it.
- As the panel is bidirectional, modify the **Osc1 Octave** on the synth back to 32'. This time, the message RAW:[f0 00 20 32 28 00 0a 26 00 f7] should appear in the Midi Input monitor (green area) and it should also be changed on the panel.
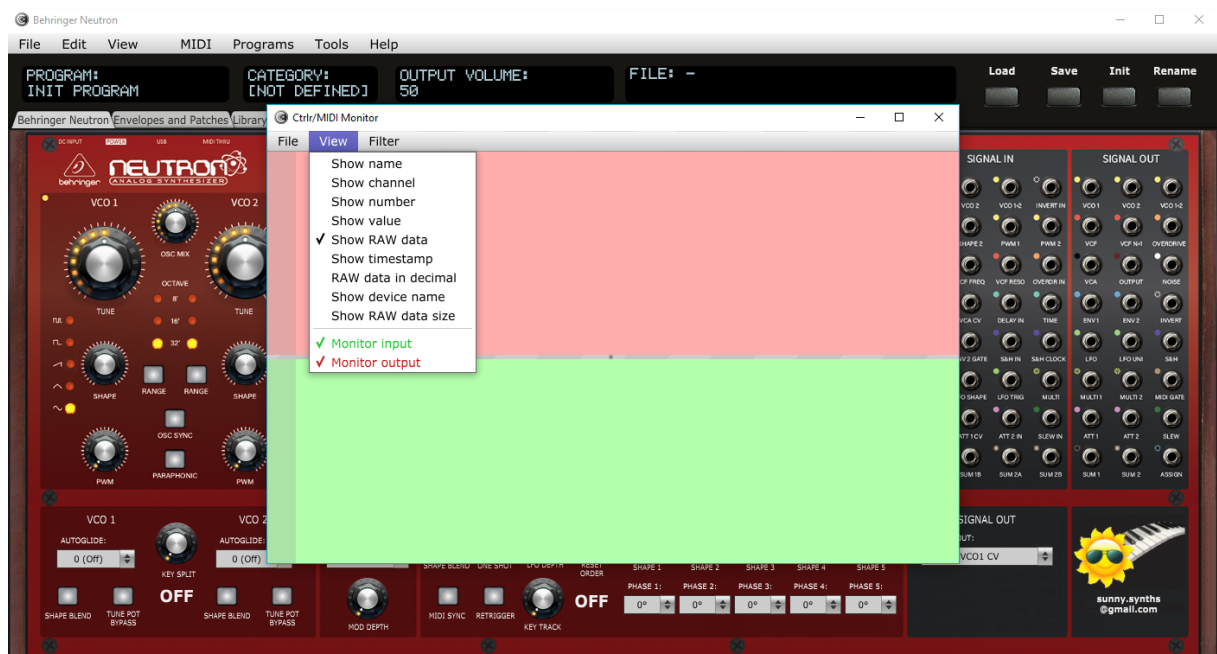
- Set **Osc1 Shape** to Sine wave on the synth and in the panel (no communication for that parameter)
- Activate **Osc1 Shape blend** on the panel. The message RAW:[f0 00 20 32 28 00 0a 20 01 f7] should appear in the Midi Output monitor and it should be changed on the synth but you will not notice it
- Modify thus the **Osc1 shape** on the synth and it should show the Sine and Triangle led highlighted after you quit the pure Sine wave

Way of working

As you will discover by yourself, the usage of the panel is 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 hovering the mouse on the button then using the mouse scroll wheel.

Permanent toggle buttons are activated by simply clicking on them (what a surprise…). They will stay highlighted until the next click. The labels of some buttons have been adapted to reflect their behavior (when the Shape Blend OFF button is ON it means that Shape Blend is OFF)

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

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.

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).

When no file is found, the Init program is loaded (in the same way as when loading the panel for the first time (unless the button **No program load at panel load** in the Envelopes and Patches tab is ON).

When the last saved file is found, the panel is restored so you can continue your work where you saved it (unless the button **No program load at panel load** in the Envelopes and Patches tab is ON).
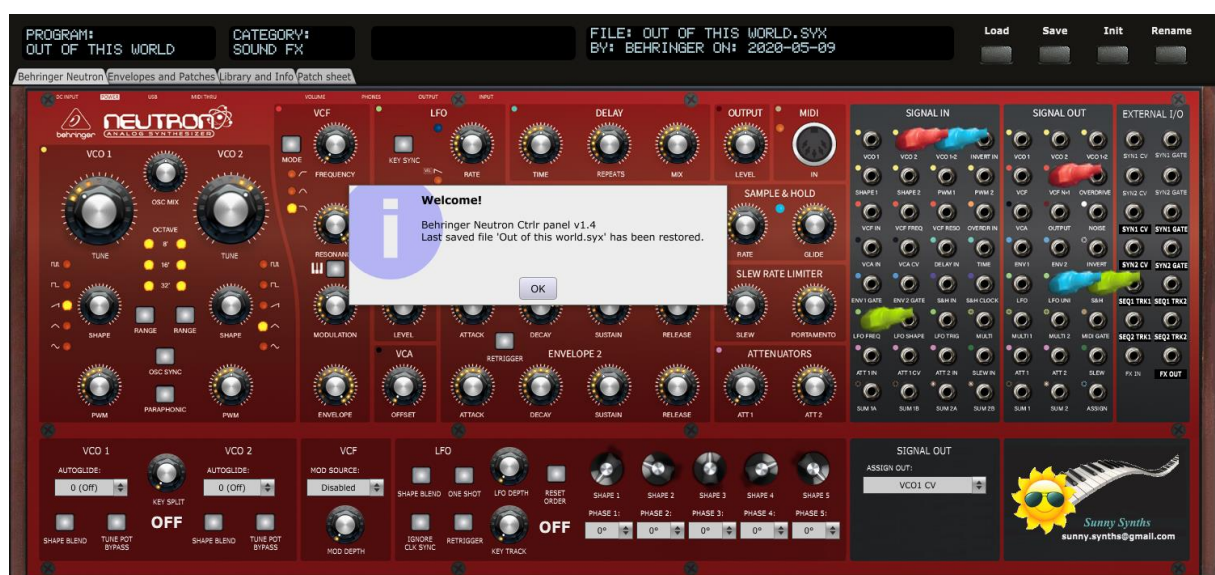
The same is done with the root folder of the File browser (see Library and Info tab on p20).

Top panel area

In the top panel area you find 4 feedback "screens", 4 buttons and 4 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 **Behringer Neutron** tab displays the synth main panel

– The **Envelopes and Patches** tab displays the envelopes as graphs, allows the registration of 15 different input/output patches, the identification of two external synths, one FX chain and allows modifying the Category, the Author and the Description of the current program. It is also in that tab that you can modify some Global settings and request the display of the software version of your synthesizer

– 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 Behringer Neutron patch sheet with all parameter values (as in the manual) but with the addition of author, date, external synths names and 14 external input/output connections

Loading a Behringer Neutron program

The panel loads and saves the program parameters as a 530 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 Behringer Neutron 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.
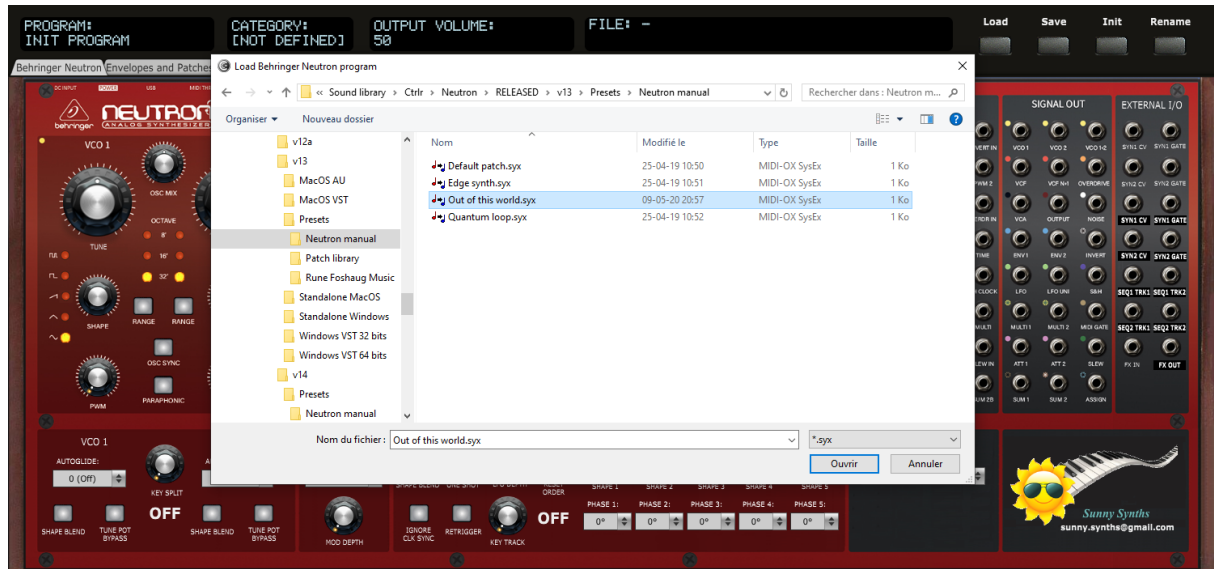
Saving a Behringer Neutron program

The panel loads and saves the program parameters as a 530 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 *Envelopes 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.
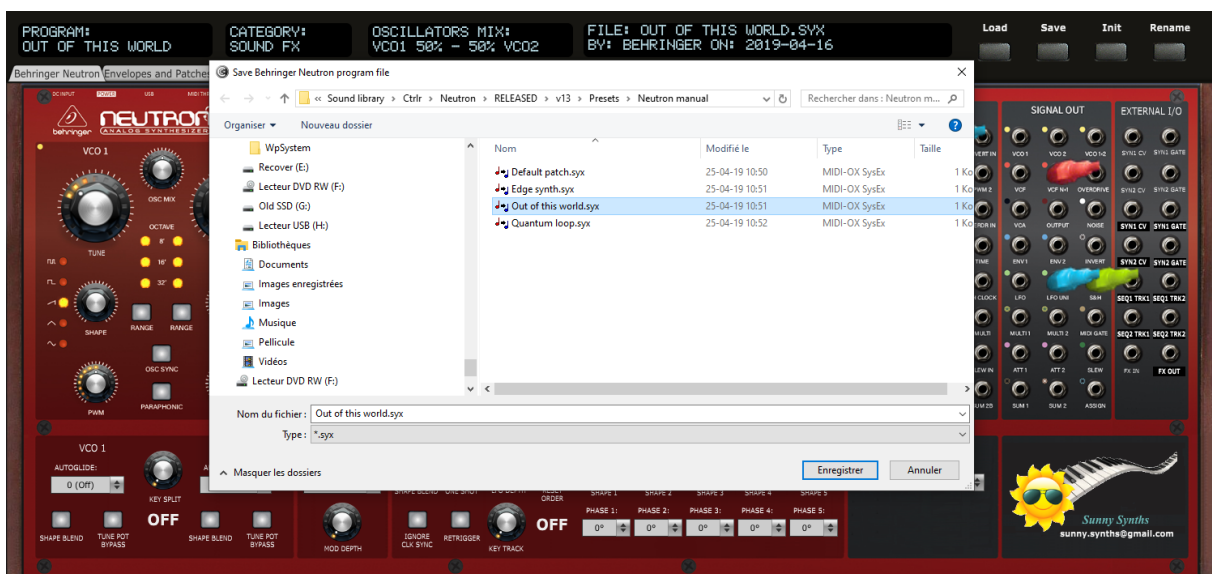
Program Init

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

– Global settings at their default value
  - Key priority: LOW
  - Pitch bend range: +/- 2 semitones
  - Min Midi Note: C0 (wrong in manual p13; set as in Neutron app)
  - Max Midi Note: C6 (wrong in manual p13; set as in Neutron app)
– All parameters at 0 or OFF except
  - OSC Mix: 50%-50%
  - Osc1 and Osc2 Tune = 50
  - Output level = 50

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.

Behringer Neutron tab

In the **Behringer Neutron** tab, you have access to the same parameters as on the actual synthesizer plus all the "hidden" parameters available from Neutron OS 2.0.

Please refer to the Behringer Neutron user manual (https://mediadl.musictribe.com/media/PLM/data/docs/P0CM5/NEUTRON_M_EN.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.

The displayed value can also depend on the setting of other parameters. This is the case for the shape blend of the oscillators and LFO for example. It is even more remarkable when modifying the LFO shape order with LFO shape blend activated.

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 of the envelopes is setting identical encoders/buttons in the Envelopes and Patches tab and adapting the corresponding envelope graph accordingly.

> The panel should work in a bidirectional way for the parameters of the lower part (the "hidden" parameters available from Neutron OS 2.0) and for Osc sync, Paraphonic mode, Osc1 and Osc2 range, Envelope retrigger.
>
> Unfortunately this is not the case yet but it is under investigation.

External I/O

On this main panel, you can also see patch points from/to external gear (2 different synthesizers CV/Gate ins and outs, 2 tracks from 2 sequencers, one FX chain in and out, 2 freely assignable I/O).

You can give names to those external gears in the Envelopes and Patches tab.

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 Envelopes and Patches tab, either full cables (**Cables** button ON) or cable plugs (**Cables** button OFF) will be displayed.

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 Envelopes 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 Envelopes and Patches tab you can also adjust the transparency level of the cables.

Envelopes and Patches tab

In the **Envelopes and Patches** tab, you can:
–   adjust the envelopes either with encoders or by moving the anchors of the graphs
–   set/indicate up to 15 from/to patches
–   delete a single patch cable or all at once
–   switch between the display of patch cables or just cable plugs
–   set the cables transparency level
–   adapt the name of the external synths and FX that could be connected to your Neutron
–   adapt the name of 2 external I/O patch points
–   adapt the current program category, author and description (click on the current description to edit it)
–   manage the Device ID and 4 Global settings
–   request the display of your Neutron synthesizer software version
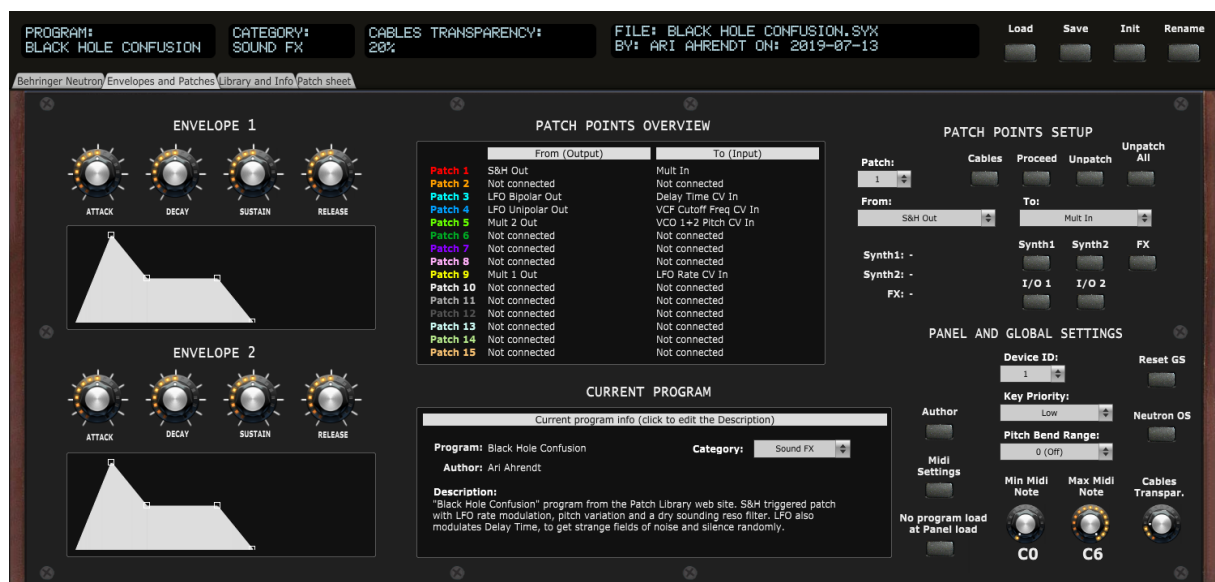

Envelope shapes

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 will be displayed in the screen of the top panel area.

Patch points

Besides drawing the patch cables directly on the front panel, you can also modify the from/to patches as follows:
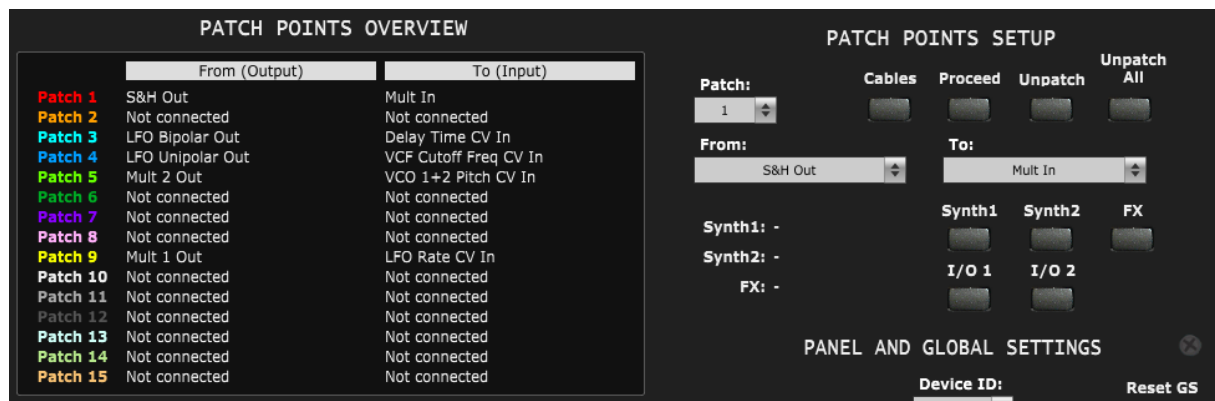
Clicking anywhere on a patch line (label, input, output, blank space) will select the patch to be modified and display its values in the pull-downs. You modify the "From" source and/or "To" destination and press the Proceed button to make the change.

You can also directly select a patch 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 15 and have a color assigned to them. When a from/to patch is set in the Envelopes and Patches tab, corresponding patch cables are displayed on the main Neutron 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", "VCO1 output", "VCO2 output", "Osc Mix Output", "VCF 1 output", "VCF 2 Alt output", "Overdrive", "VCA output", "Main output", "Noise output", "Envelope 1 output", "Envelope 2 output", "Invert output", "LFO Bipolar output", "LFO Unipolar output", "S&H output", "Mult1 output", "Mult2 output", "Midi Gate", "Attenuator 1 output", "Attenuator 2 output", "Slew output", "SUM1 output", "SUM2 output", "Assignable output", "Synth1 CV output", "Synth2 CV output", "Synth1 Gate output", "Synth2 Gate output", "Sequencer1 track 1", "Sequencer1 track 2", "Sequencer2 track 1", "Sequencer2 track 2", "FX Out"

Available "To" destinations are the input patch points of the synthesizer plus a few additional external ones: "Not connected", "VCO1 pitch CV", "VCO2 pitch CV", "VCO1 and 2 pitch CV", "Invert input", "VCO1 Shape CV", "VCO2 Shape CV", "VCO1 PW CV", "VCO2 PW CV", "VCF Signal input", "VCF Cutoff Freq CV", "VCF Resonance CV", "Overdrive input", "VCA input", "VCA CV", "Delay input", "Delay Time CV", "Envelope 1 gate", "Envelope 2 gate", "S&H Signal input", "S&H Clock", "LFO Rate CV", "LFO Shape CV", "LFO Trigger", "Mult", "Attenuator 1 input", "Attenuator 1 CV", "Attenuator 2 input", "Slew Signal input", "SUM1 (A)", "SUM1 (B)", "SUM2 (A)", "SUM2 (B)", "Synth1 CV input", "Synth2 CV input", "Synth1 Gate input", "Synth2 Gate input", "FX In"

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.

Clicking the **Synth1 / Synth2** buttons opens a popup window where you can modify the name of a the synths connected to your Neutron. The name should be 11 characters long at max (will be truncated if longer). If you leave the Synth1/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 Neutron. The name should be 11 characters long at max (will be truncated if longer). If you leave the FX name empty then a "-" is displayed.

Clicking the **I/O 1 I/O 2** buttons opens a popup window where you can modify the name of 2 patch points. The name should be 7 characters long at max (will be truncated if longer). If you leave I/O 1 I/O 2 name empty then a "-" is displayed.
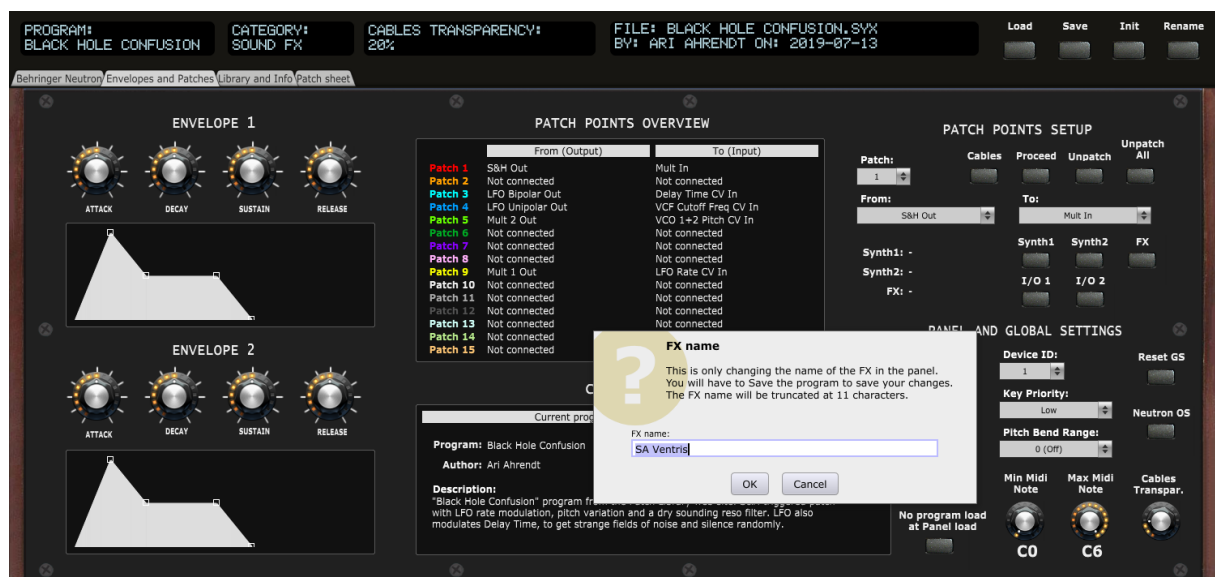
Panel and Global settings

You can manage five Neutron global settings:
– Device ID
– Key priority
– Pitch bend range
– Min Midi Note
– Max Midi Note

The settings (except Device ID) are saved in each program sysex file and thus loaded with them.

You can restore those 4 last Global settings to their default values by pressing the **Reset GS** button.

⚠️ Pay attention when modifying the Device ID as this will affect all the transfer and data to the synthesizer. The change of Device ID is immediate.

Neutron OS

Clicking on the Neutron OS button requests the Neutron Software Version to the synth and displays it in a popup.

Panel settings

No program load at panel load: By default (button **No program 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 program load at panel load** button to ON will prevent this load and thus the send and changes to the synthesizer.

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
–   the 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-Neutron 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 Neutron .syx file will make the corresponding .wav file play automatically as well (if a wav file with the same name as the Neutron .syx file is found)
–   **Double-click** on a file to load it (Neutron .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 (the folder is kept when quitting the panel and re-opening it)
–   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

Wav file play settings

💡   WAV files can be played on Windows and MacOS
   AIF, AAC and MP3 can only be played on MacOS
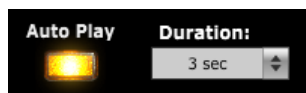
The audio files will be played for the duration set in the **Duration** pulldown (3s, 5s, 10s or Full).

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 Neutron .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 maybe not other characters.

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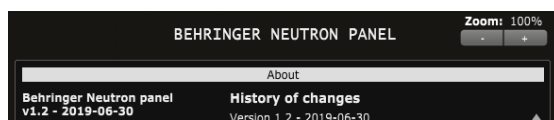
The panel can be zoomed by using the Ctrl + or Ctrl – keys combinations. This is also available from the **View** menu.

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 Ctrlr + / Ctrlr – 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** button to just display the differences in comparison with the Init program
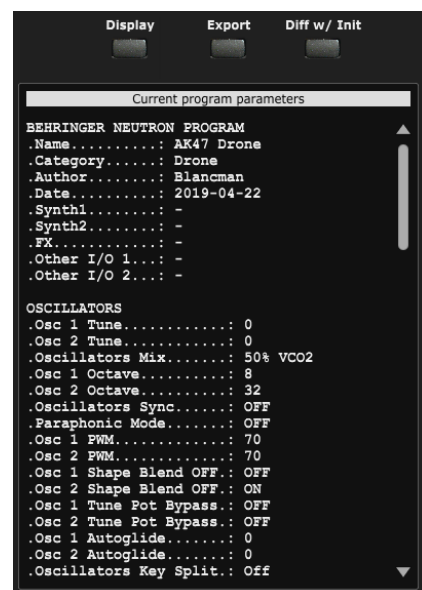
Patch sheet tab

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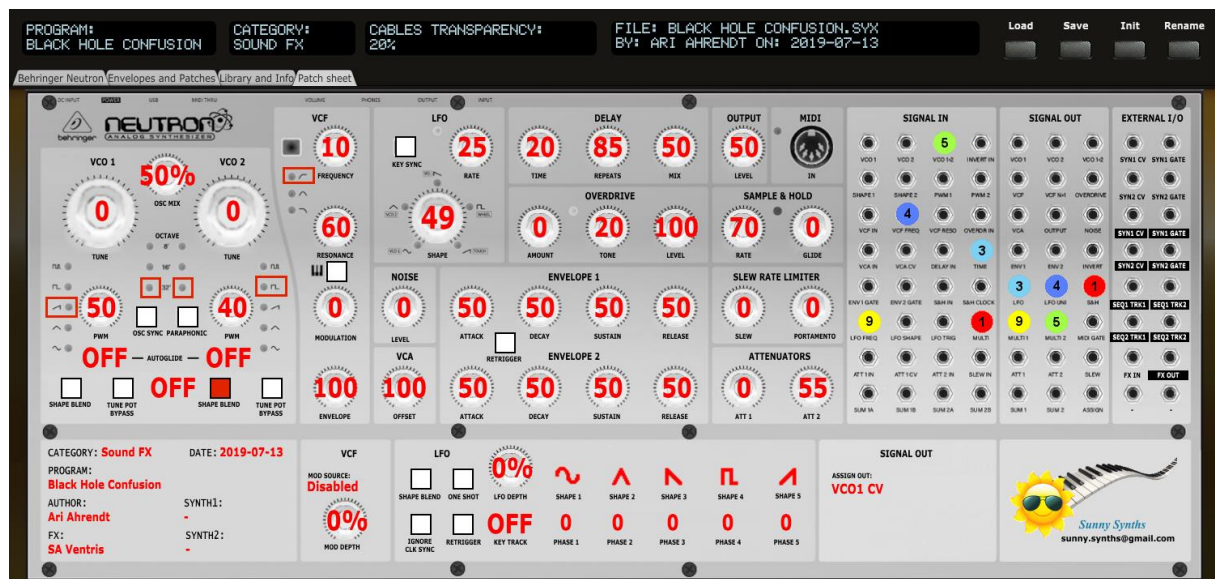
The content of this tab is adapted automatically. Directly ready for a screenshot!

Installing and using the Neutron 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 **Behringer Neutron.dll** file from the Windows VST 64 bits directory to your 64 bits plugins directory and/or the **Behringer Neutron.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 **Behringer Neutron.vst** file from the MacOS VST directory to your VST plugin directory (/Library/Audio/Plug-ins/VST) and copy **Behringer Neutron.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.

Other specific MacOS commands that may be needed to enable the plugin in any OS from Catalina are listed in the Appendix.

Start your DAW and check that the plugin directory is rescanned and that the **Behringer Neutron** 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):
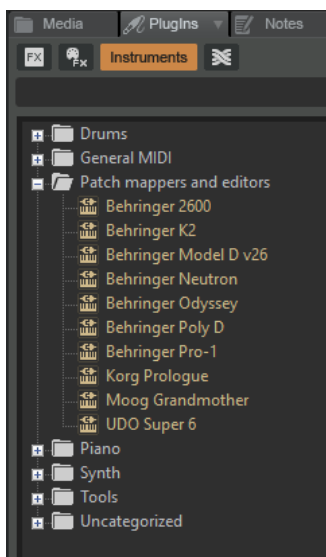
Tests and identified limitations

Different DAWs have been tested or are under tests.

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 preset 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. This can also be 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 v2.1 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 preset in track	✓	✓	✓	✓	✓	✓

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 Behringer Neutron VST. Click on the Instrument button to display the panel and use it as you would do for the standalone version.
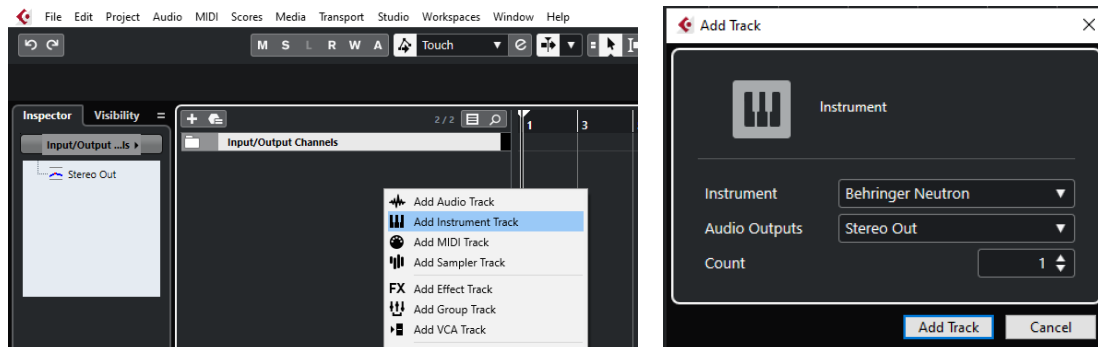
…or by dragging and dropping from the VSTi panel (easier).

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 Neutron 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 downs triangle buttons.
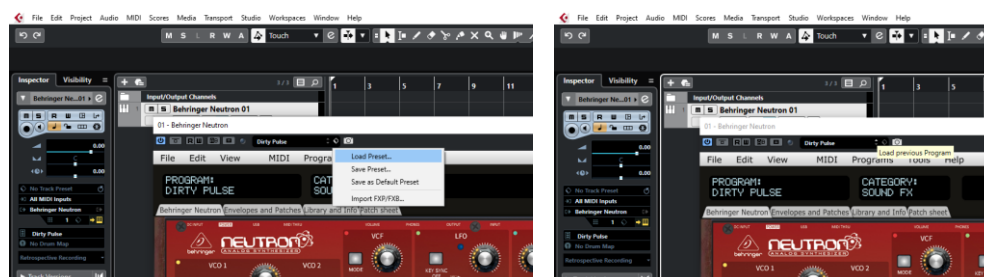
To save as Cubase track preset, select Save track preset when right clicking on a track.

> When closing the panel after Saving the track preset, be sure to set the button **No program load at panel load** to OFF and to close the panel with the upper right red cross to have your buttons positions saved in memory.
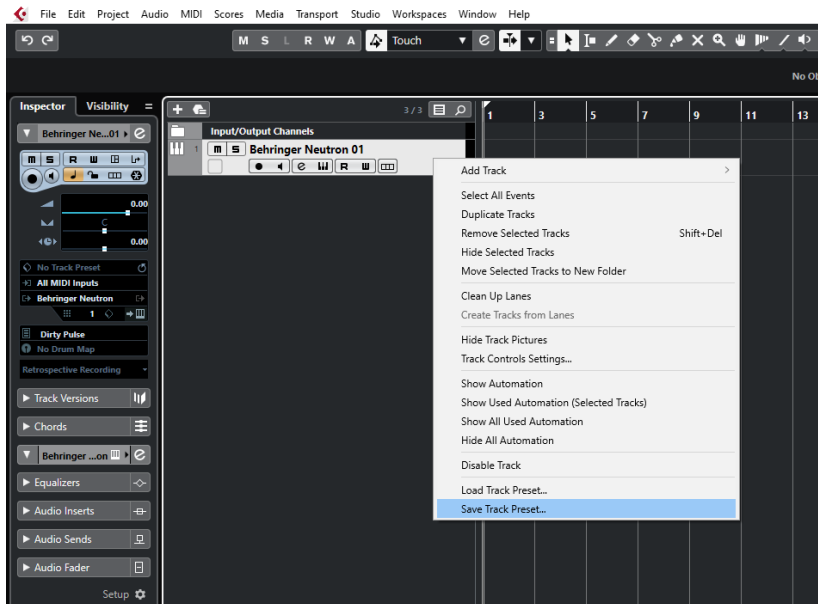
Later on, the content of the panel as is can be restored directly in a new empty track without the need of a Load from the panel by selecting Load track preset when right clicking on a track.
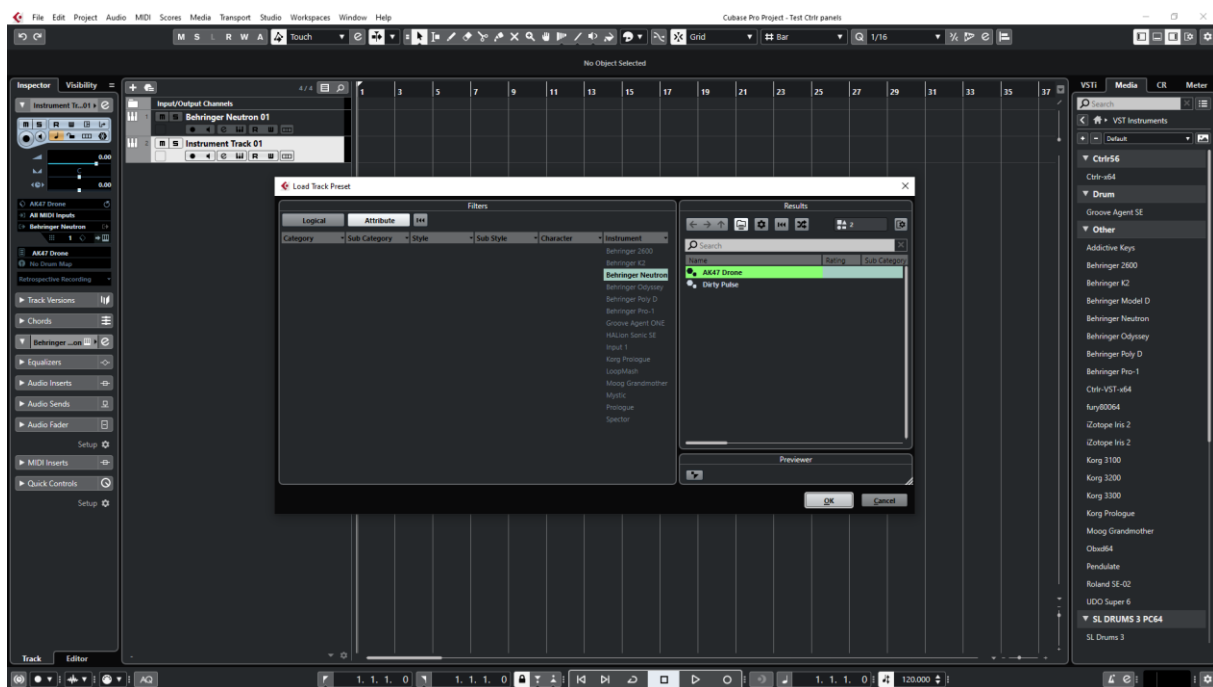
Creating a new track from a Cubase preset

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
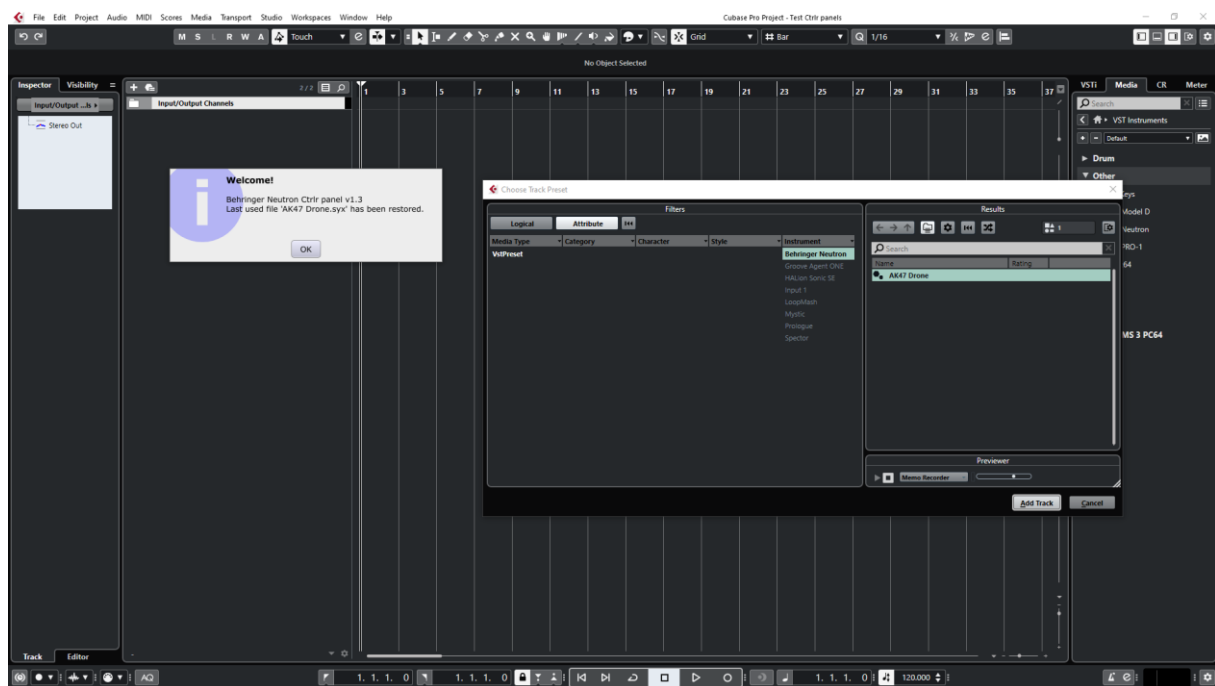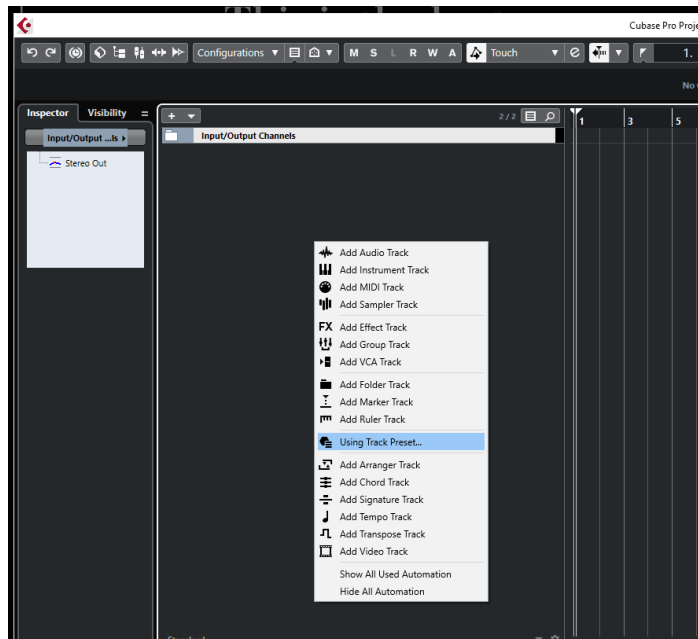
Replacing the preset on an existing track by another preset

This is now working fully fine since version 2.1. Just select another previously saved preset at the top left of the plugin window. All buttons will be positioned according to the newly loaded presets.

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

Cakewalk by Bandlab

Creating a new track

Drag the Neutron 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 Neutron 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 "AK47 Drone") then clicking on the Save button.
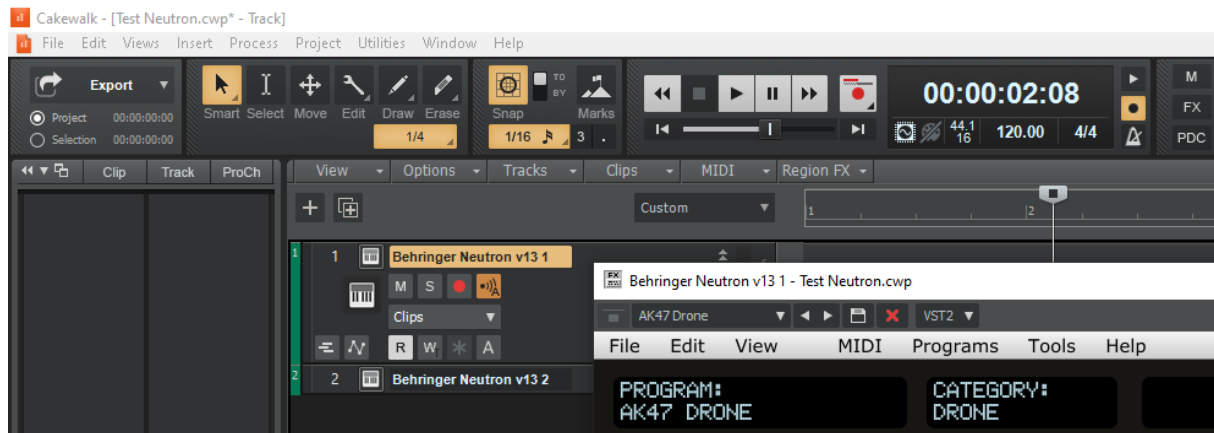

It is also possible to save a complete mixer channel as track template (right click on a track and select Save as Track Template).

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".
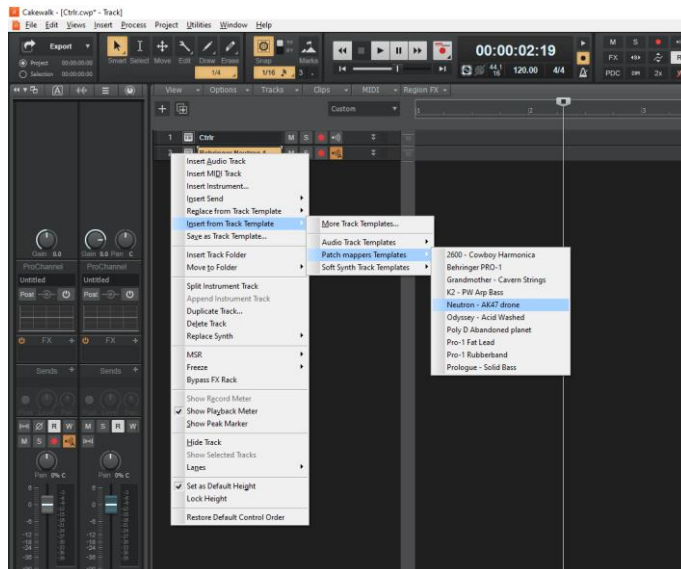
Replacing the preset on an existing track by another preset

This is now working fully fine since version 2.3. Just select another previously saved preset at the top left of the plugin window. All buttons will be positioned according to the newly loaded presets.

Reaper

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 Behringer Neutron VST from the VSTi category
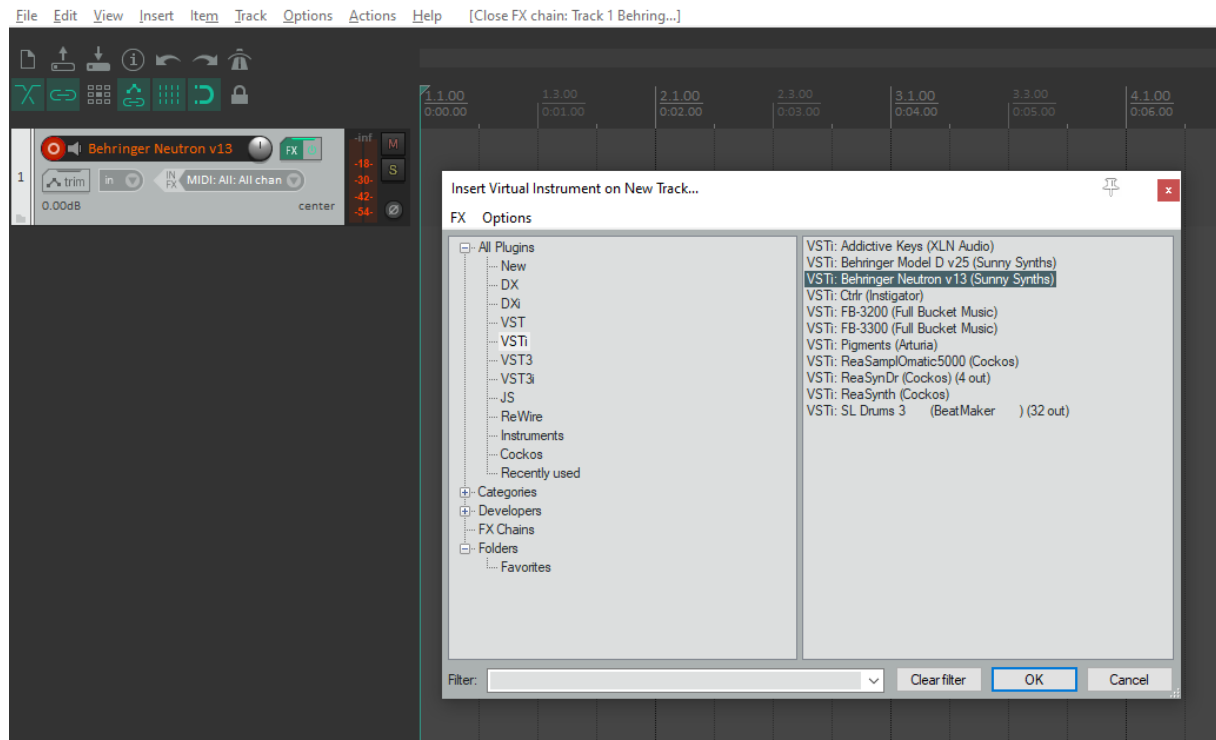
Click on the FX button to display the panel and use it as you would do for the standalone version (right-clicking instead of direct click gives only the plugin window without the blank side area)

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 Neutron 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
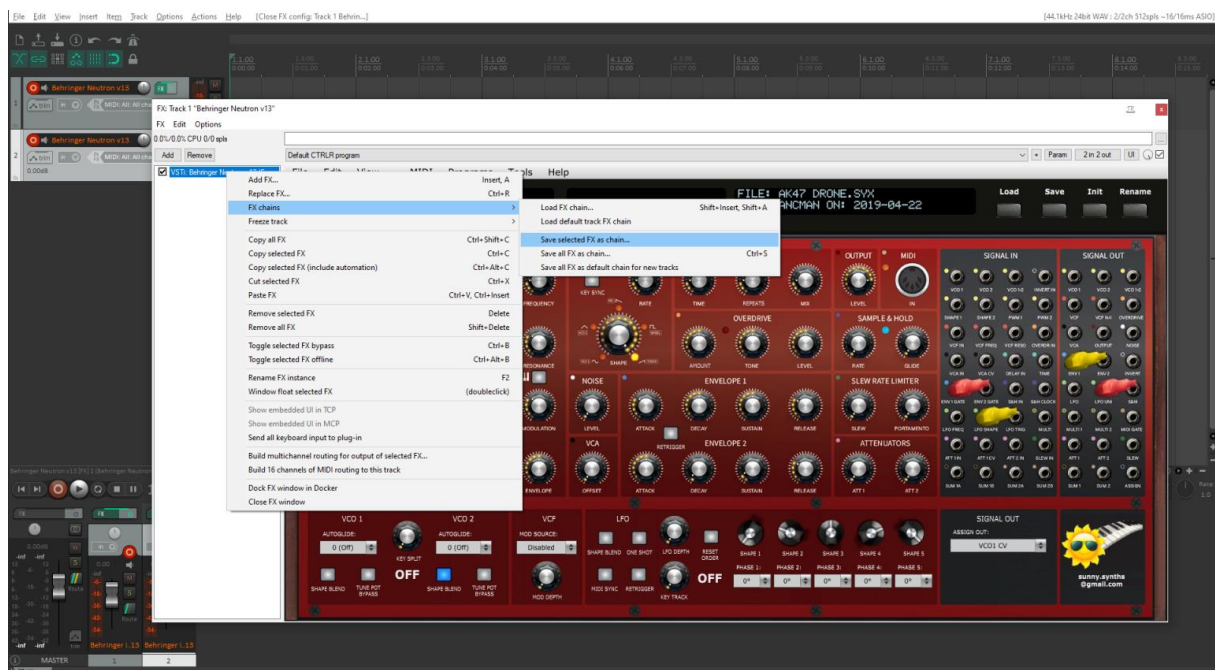
Presets are appearing under User presets
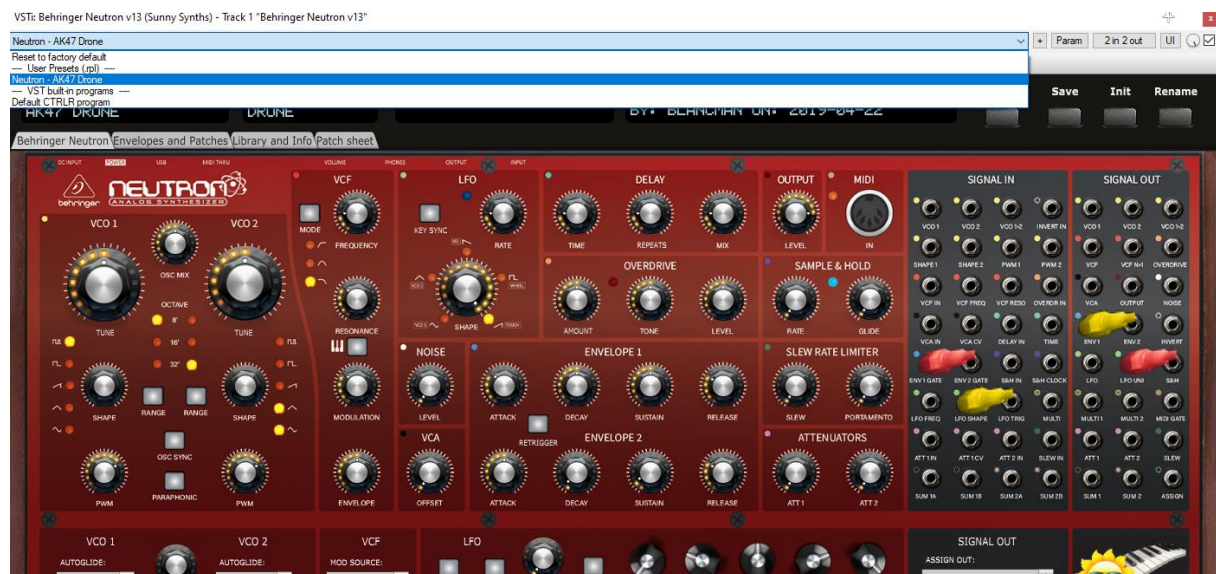
Creating a new track from a Reaper FX chain preset

Create an empty track then right click on grey FX button to select a saved FX chain
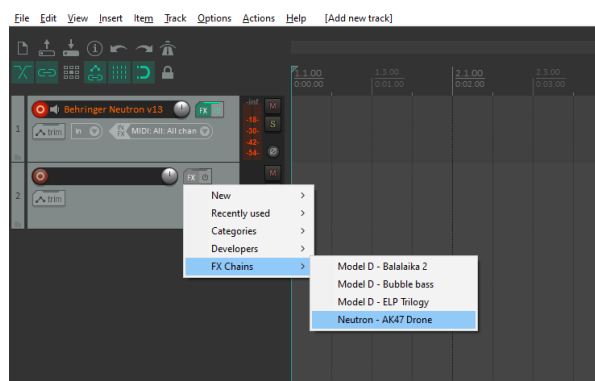
Creating a new track from a Reaper preset

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 Neutron plugin and select a saved preset under Presets
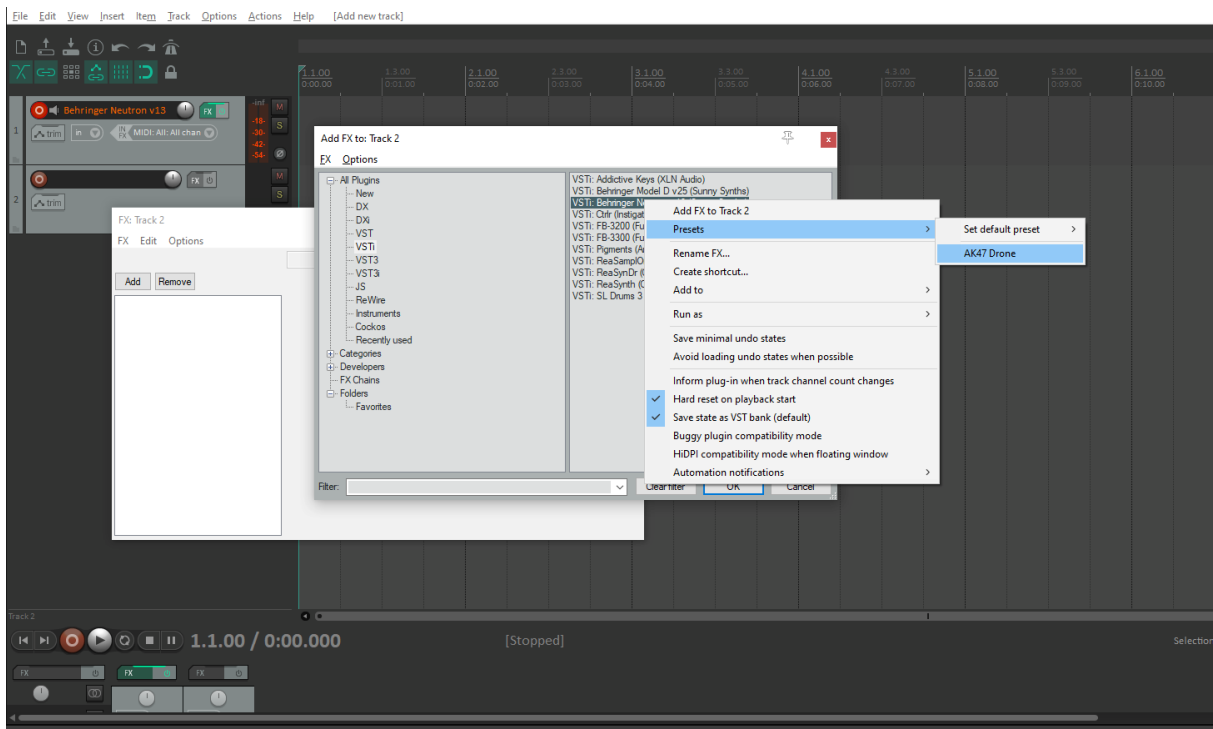
Replacing the preset on an existing track by another preset

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.

Specific remark

In Windows, it is needed to set the main Midi ports of the Matriarch synth to OFF in Preferences and to set the Midi devices and channels in the panel to allow the communication with the synth for the few parameters that can be exchanged.

This is not required on MacOS that can handle multiport communication.

Creating a new track

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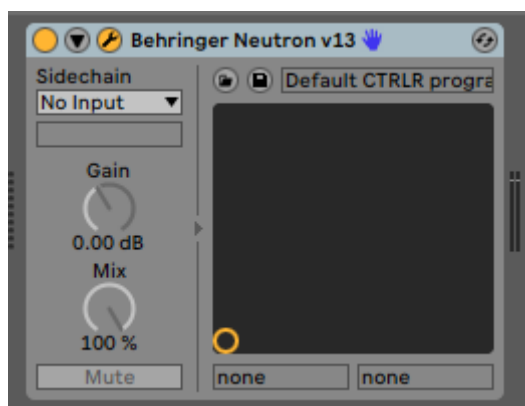
Creating a new track from an Ableton preset
Not found… It seems it is always needed to first create a track with the instrument plugin and then to select a preset (but this doesn't work – see next paragraph).

Replacing the preset on an existing track by another preset
This is now working fully fine since version 2.1. Just select another previously saved preset at the top left of the plugin window. All buttons will be positioned according to the newly loaded presets.

Studio One

Status: This has been tested in Studio One 3.5 32 bits and it is expected to work in the same way in the Studio One 4.x 64 bits version.

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

Creating a new track

Drag the Neutron 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 Model D tracks at once

Works fine. The instrument editor is showing one tab by track:
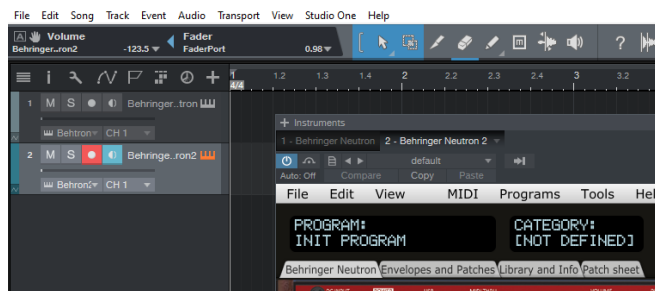
Saving a patch as a Neutron Studio One preset

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 Neutron VST name in the Instruments tab or in the Files tab
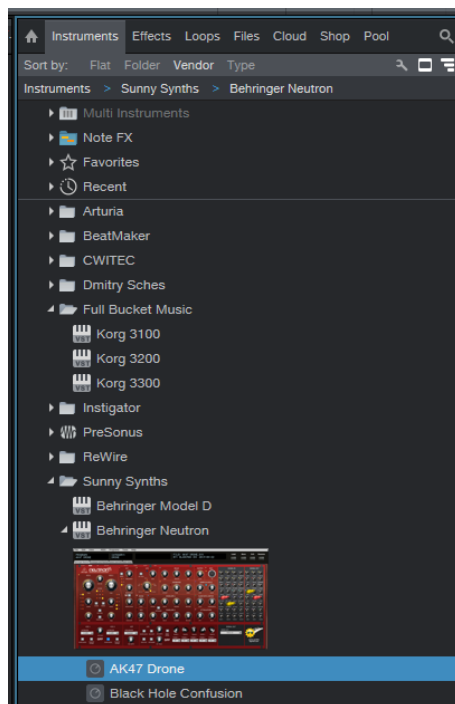
Replacing the preset on an existing track by another preset

This is now working fully fine since version 2.1. Just select another previously saved preset at the top left of the plugin window or with Load preset file. All buttons will be positioned according to the newly loaded presets.

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 Behringer Neutron.component plugin file in your AU plugin directory.

Creating a new first track

Create a new instrument track and select the Behringer Neutron plugin for it (under AU instruments) by clicking on the small Instrument editor icon on the right side of the track Input.
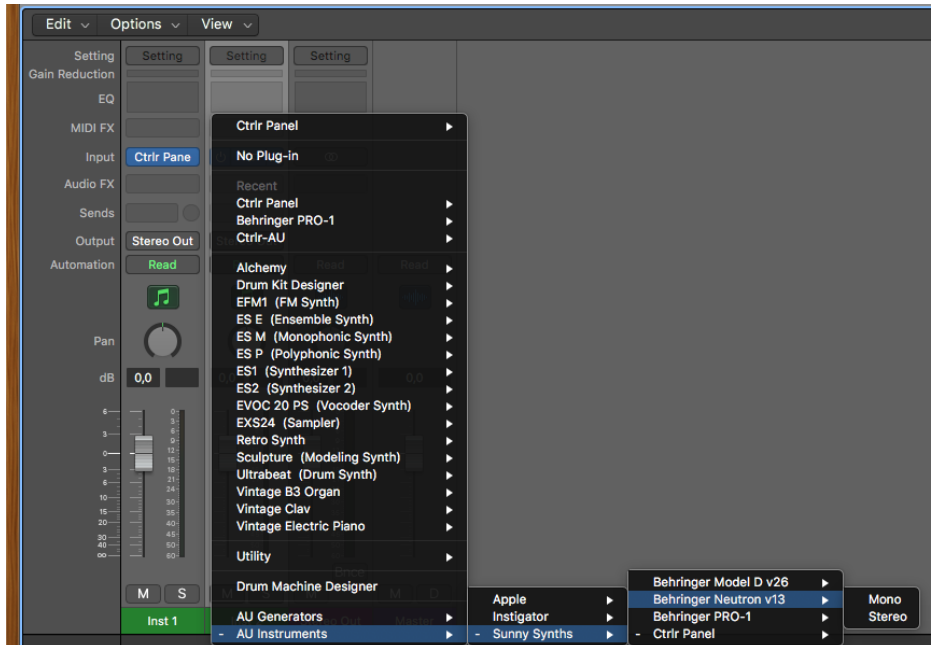
Click in the middle of the track Input to open the panel.

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 Neutron tracks at once
Works fine but needs a work around.
- Secure that you have a project with the Neutron plugin present on only one track. Press the Init button to load the Init patch
- 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…
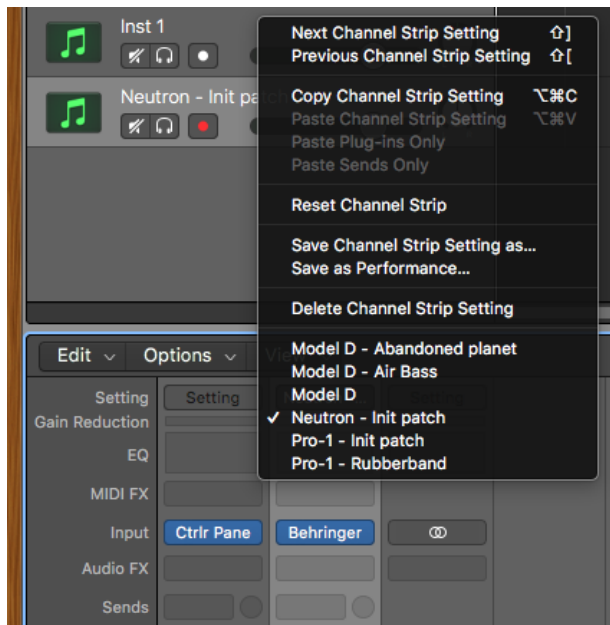
- New tracks will be created based on that Init channel strip and can then be changed afterwards to other patches with the Load button

Saving a patch as a Neutron 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 Neutron 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 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.
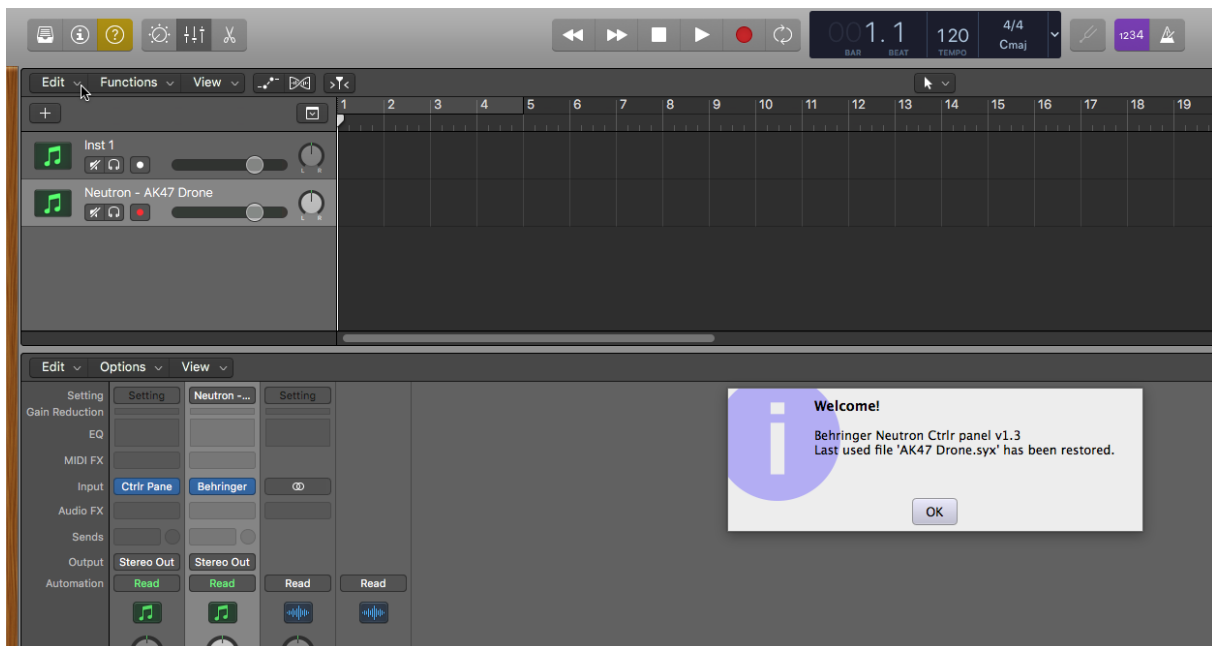
Using a controller to move the buttons

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

As indicated in the preliminary info, the panel offers the possibility to control about 40 parameters (as documented on p27 and 28 of the Neutron synthesizer manual) and to exchange them between the synth and your PC or your controller since the addition of the Neutron OS 2.0. This is achieved by mapping the controls to the sysex commands provided in the Neutron manual.

The other buttons, while not exchanging values with the neutron, can also be manipulated from your controller. This is achieved by assigning Midi CC controller numbers to all those knobs.

Of course, as nothing is changed in the hardware, moving the knobs from your controller will not affect the sound as such.

Connect your controller for example as in Configuration 1 presented on page 6
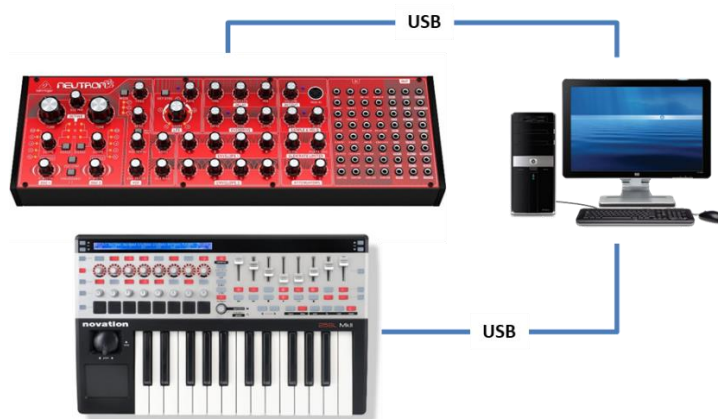
Controller numbers are the following:
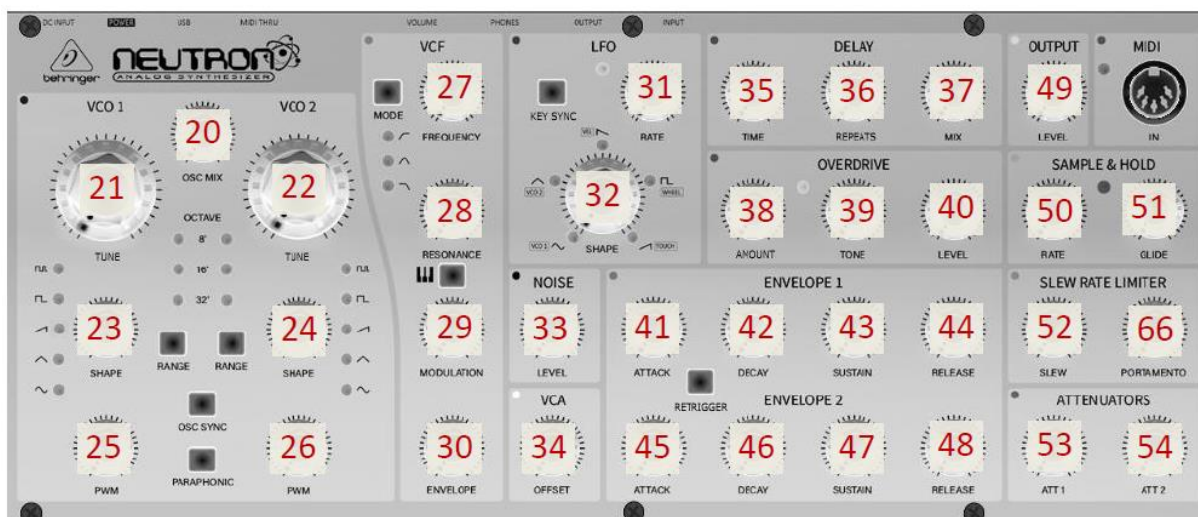
The main Ctrlr menus

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 Neutron as Output Midi device and to set its Midi channel; to set the Midi Thru (Input->Output)…
– **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
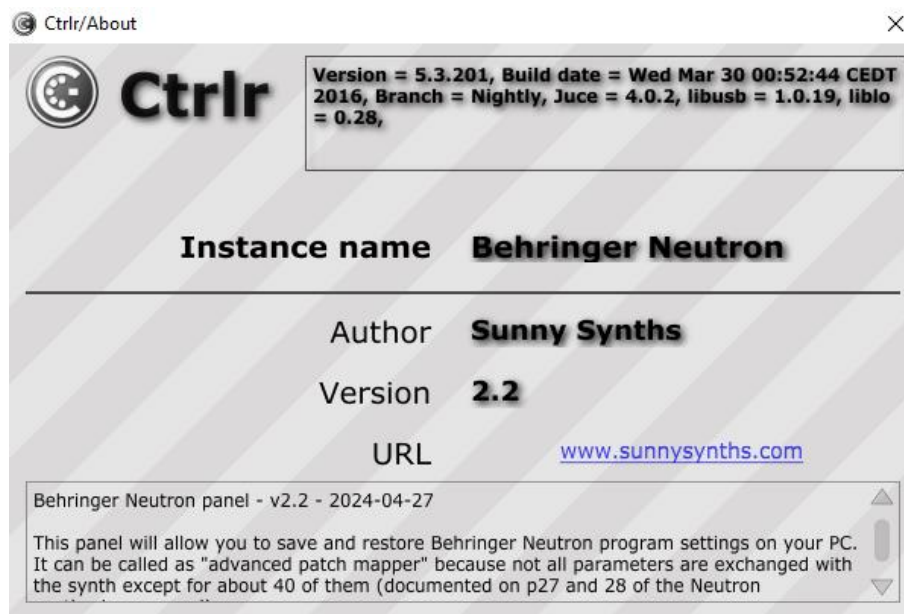
Appendix

Version history

Date	Version	Description	By
2019-04-28	1.0	First version of this manual	Sunny Synths
2019-07-14	1.2	Added documentation on playing wav files (1.1 was only bug correction, no change in the manual)	Sunny Synths
2020-03-15	1.3	Added description and usage of VST version in different DAWs. Added CC mapping	Sunny Synths
2020-05-11	1.4	Adapted due to miscellaneous changes whereof 15 patch cables instead of 9. Neutron OS display. Most pictures updated due to external gear patches on main panel	Sunny Synths
2021-03-27	1.5	Warning about no bidirectional behavior. Some corrections. Possibility to replace presets in DAW. Added Diff w/Init in Display info.	Sunny Synths
2021-06-20	1.6	Modified Diff w/Init. Patch info in LCD. Tune Pot Bypass vs 10 Octaves mode	Sunny Synths
2021-07-22	2.0	Added patch cable drawing on main panel	Sunny Synths
2022-12-19	2.1	Several enhancements (panel settings switches). Changing presets in DAW is now working fine.	Sunny Synths
2022-12-24	2.1a	Added correction for patch cables save	Sunny Synths
2024-04-28	2.2	Extra free patch points. Removed Welcome message button. Removed Load OK confirm button	Sunny Synths

Neutron information

The Behringer Neutron product page:

https://www.behringer.com/product.html?modelCode=0718-AAB

Patch Library web site

This web site allows people to map patches on a Neutron panel and share them:

https://patch-library.net/

Neutron overlays

The panel is based on the Red overlay provided by Heinakroon (https://www.heinakroon.net/category/neutron-overlays) which has unfortunately stopped production in 2024.

Specific MacOS setup issues

Developer cannot be verified

On MacOS you may 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.

For the AU (from a user):

To validate the AU plugin in any OS of Catalina or newer, you'll need to disable System Integrity checking (the system equivalent of ctrl-clicking the app).

This is done by restarting holding down CMD-R, choose terminal from the top bar menu once logged in to the recovery console, and typing the following command:

```
/usr/bin/csrutil disable
```

It will then stop telling you it can't be validated and do you want to put it in the bin!

For the VST (from another user)

Just ran the VST on Monterey OS X and it failed. I took my VST and ran 3 commands:

```
sudo xattr -cr
sudo xattr -r -d com.apple.quarantine
sudo codesign --force --deep --sign -
```

Opened up my Ableton - everything works like a charm.

Sysex file documentation

Here is the documentation of the sysex file used to store the parameters. It is 530 bytes long.

```
-- // Behringer Neutron - Sound data sysex structure - Size=530 bytes v2.2 Added Other IO 1/2
-- // Behringer Neutron - Sound data sysex structure - Size=530 bytes v1.4 //
-- // Behringer Neutron - Sound data sysex structure - Size=500 bytes v1.0 //
--
-- 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 Behringer, just a decision made by me ;-)
-- This data is not transfered by Midi
-- Specific parameters indicated with * can be transferred by Midi via individual sysex


-- 100 = 64
-- 127 = 7F
```

```
--    Offset         | Byte content
-- ------------+--------------------------
--    0000       |    F0              Sysex start
--    0001-03    |    00 20 32        Behringer ID
--    0004       |    28              Neutron ID
--    0005       |    01              Sound data
--    0006-07    |    00-64           Osc Tune
--    0008       |    00-64           Osc Mix
--    0009-10    |    00-64           Osc Shape
--    0011-12    |    00-03           Osc Range
--    0013       |    00-01           Osc Sync
--    0014       |    00-01           Paraphonic Mode
--    0015-16    |    00-64           Osc PWM
--    0017-18    |    00-01           Osc Shape Blend
--    0019-20    |    00-01           Osc Tune Pot Bypass
--    0021-22    |    00-18           Osc Autoglide (-12 12)
--    0023       |    00-3F           Osc Key Split
--    0024       |    00-64           Filter Frequency
--    0025       |    00-02           Filter Mode
--    0026       |    00-64           Filter Resonance
--    0027       |    00-02           Filter Key Tracking
--    0028       |    00-64           Filter Frequency Input Mod Depth
--    0029       |    00-64           Filter Env Depth
--    0030       |    00-03           Filter Mod Source
--    0031       |    00-3F           Filter Mod Depth
--    0032       |    00-64           LFO Shape
--    0033       |    00-64           LFO Rate
--    0034       |    00-01           LFO Key Sync
--    0035       |    00-01           LFO Shape Blend
--    0036       |    00-01           LFO One Shot
--    0037       |    00-01           LFO Midi Sync
--    0038       |    00-01           LFO Retrigger
--    0039       |    00-61           LFO Key Tracking (0-97)
--    0040       |    00-3F           LFO Depth
--    0041-45    |    00-04           LFO Shape Order
--    0046-50    |    00-07           LFO Shape Phase
--    0051       |    00-64           Noise Level
--    0052       |    00-64           VCA Bias
--    0053       |    00-64           Delay Time
--    0054       |    00-64           Delay Repeats
--    0055       |    00-64           Delay Mix
--    0056       |    00-64           Overdrive Amount
--    0057       |    00-64           Overdrive Tone
--    0058       |    00-64           Overdrive Level
--    0059       |    00-64           Envelope 1 Attack
--    0060       |    00-64           Envelope 1 Decay
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--	0061		00-64	Envelope 1 Sustain
--	0062		00-64	Envelope 1 Release
--	0063		00-64	Envelope 2 Attack
--	0064		00-64	Envelope 2 Decay
--	0065		00-64	Envelope 2 Sustain
--	0066		00-64	Envelope 2 Release
--	0067		00-01	Envelope Retrigger
--	0068		00-64	Output Level
--	0069		00-64	S&H Rate
--	0070		00-64	S&H Glide
--	0071		00-64	Slew Limiter
--	0072		00-64	Portamento
--	0073		00-64	Attenuator 1
--	0074		00-64	Attenuator 1
--	0075-83		00-0C	Patch source (1-9)
--	0084-92		00-0B	Patch destination (1-9)
--	0093-112			Name (20 characters)
--	0113		00-10	Category
--	0114-439			Description (326 characters)
--	0440-454			Author (15 characters)
--	0455-464			Date (10 characters for ISO date yyyy-mm-dd)
--	0465-475			Synth1 (11 characters)
--	0476-486			Synth2 (11 characters)
--	0487		00-02	Key Priority
--	0488		00-18	Pitch Bend Range (default 02)
--	0489		00-72	Min Midi Note (default 00 gives 24 = C0)
--	0490		00-72	Max Midi Note (default 72-0x48 gives 96 = C6)
--	0491		00-04	Assign OUT
--	0492-502			FX (11 characters)
--	0503-509			Label Other IO 1
--	0510-511			Label Other IO 2 (2 first characters)
--	0512-517		00-0C	Patch source (10-15)
--	0518-523		00-0B	Patch destination (10-15)
--	0524-528			Label Other IO 2 (5 last characters)
--	0529		F7	End of sysex