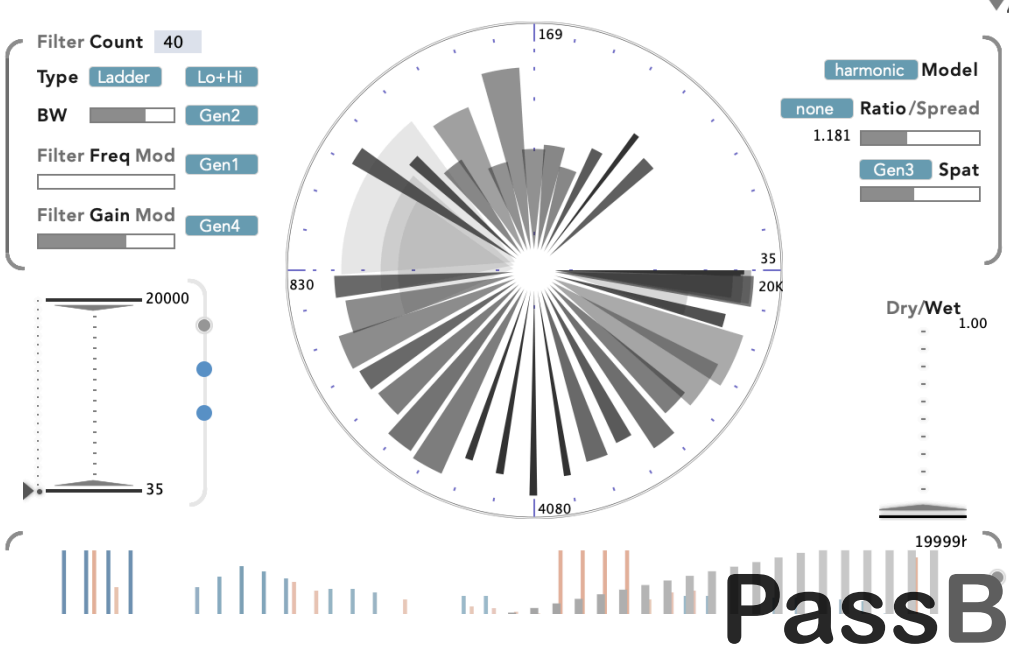


PassBot v2.1

PassBot is conceived, designed & programmed by Sinan Bökesoy

in VST3/AU programming platform: *C++ / JUCE ,*

sonicLAB

www.sonic-lab.com

---

installation of the PassBot :

PassBot is an effect plugin.

Please unzip the downloaded files and keep a copy of it.

(For the OSX version)

- ***PassBot.component*** files : ideally should be copied to your system **/Library/Audio/Plug-Ins/Components** directory in your system harddisk. For example */Volumes/OSX-Main/Library/Audio/Plug-Ins/*
- ***PassBot.vst3*** file : ideally should be copied to **/Library/Audio/Plug-Ins/VST3** directory in your hardisk. For example */Users/sinanbokesoy/Library/Audio/Plug-Ins/VST3*

You can install these files also to custom directories, however you will have to set this directory in your DAW so that it knows where to look for them. You can use custom directories to locate your preset banks.

(For the Windows version)

- Put the directory **PassBotPluginPC** in **Program Files / Common Files / VST3** directory of your system hard disk.

!!Do not install just the .dll file but the whole directory into your VST3Plugins directory.

For both operating systems, you can use custom directories for installing these files and put your sounds or preset banks anywhere you want. Just you have to arrange it that your DAW knows where to find the component of VST file.

- PassBot registered version works with iLOK licencing and can be registered on the iLOK USB key , iLOK Cloud or the host computer.

- If you don't have an iLOK account, you can get it for free at www.ilok.com

- You are responsible of managing your licence and move it when needed to different computers with the help of the iLOK Licence Manager software. We suggest to use the iLOK Cloud authorisation for your software as it is very eash to handle moving the licences. Likewise the licence will remain forever on your account no matter what happens to your computer.

some important issues :

- PassBot uses high precision calculation needed to control in real time all these parameters. This means a presicion with less then 1ms as control rate and parameters update applied to the filters on a 44K sampling rate.

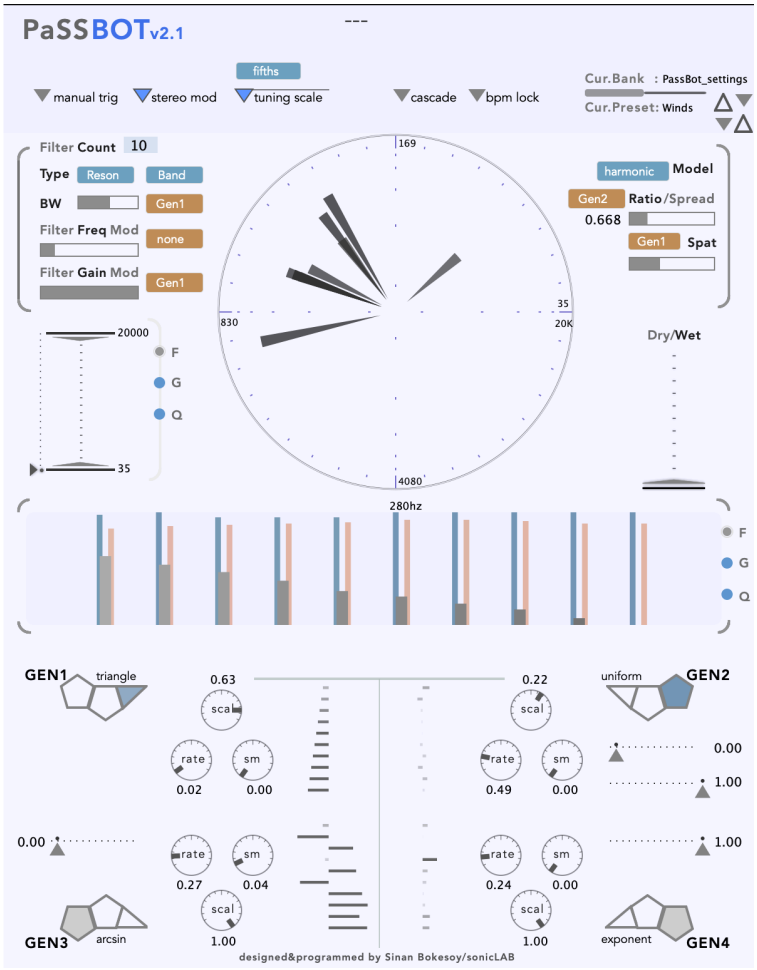
- Using a buffer size of 128 or higher will save lots of CPU and creates economy for vector based DSP calculations (especially recomemended for the iOS version). However this will not sacrifice the internal precision of PaSSBot. They are fixed to a vector size of 32 for delivering the high precision mentioned above.

- IIR Biquad filters are in nature not recommended for fast modulation. In general, audible artifacs will happen related your choices made on filter type, count and settings such as gain and resonance. Since this is not an analogue system, we recommend you to be careful with the extreme settings and hence learn the behavior by testing the results.

- It is quite easy to clip the resonator filters with high resonance , and high frequencies with hot signals. Please pay attention not to accumulate multiples of them at those high frequencies.

- It is recommended not to drive the PassBOT with a very hot signal, this will increase chances to create digital distortion.

The "**c**" key will let you change the color map of the visualization circle elements.



What is PaSSBot ?

Thank you again for your purchase. PaSSBot is the sound designers chisel.

PassBot is an audio plugin, a super filter bank of which parameters can be modulated with powerful continuous and discrete types of probability distributions, standard waveforms etc. Up to 64 filters of type IIR Biquad, SVF, Ladder and Resonator with selectable behavior of bandpass, lowpass+hipass and notch filtering.

Each filter gain, resonance, center frequency, stereo spatialization are assignable by you and can be modulated via independent GEN modulators at the same time, which construct the stochastic modulation of your choice. Filters can be distributed with harmonic relation and custom ratio setttings, and then can be modulated further.

PassBOT can also read .scala file format and generate scales to tune the filters.

You can trigger different PassBOT instances with BOTTrig plugin and this will trigger independant AR envelopes with random AR duration applied to each filter. This will create a lovely build up of sonic texture and fade out when triggered off.

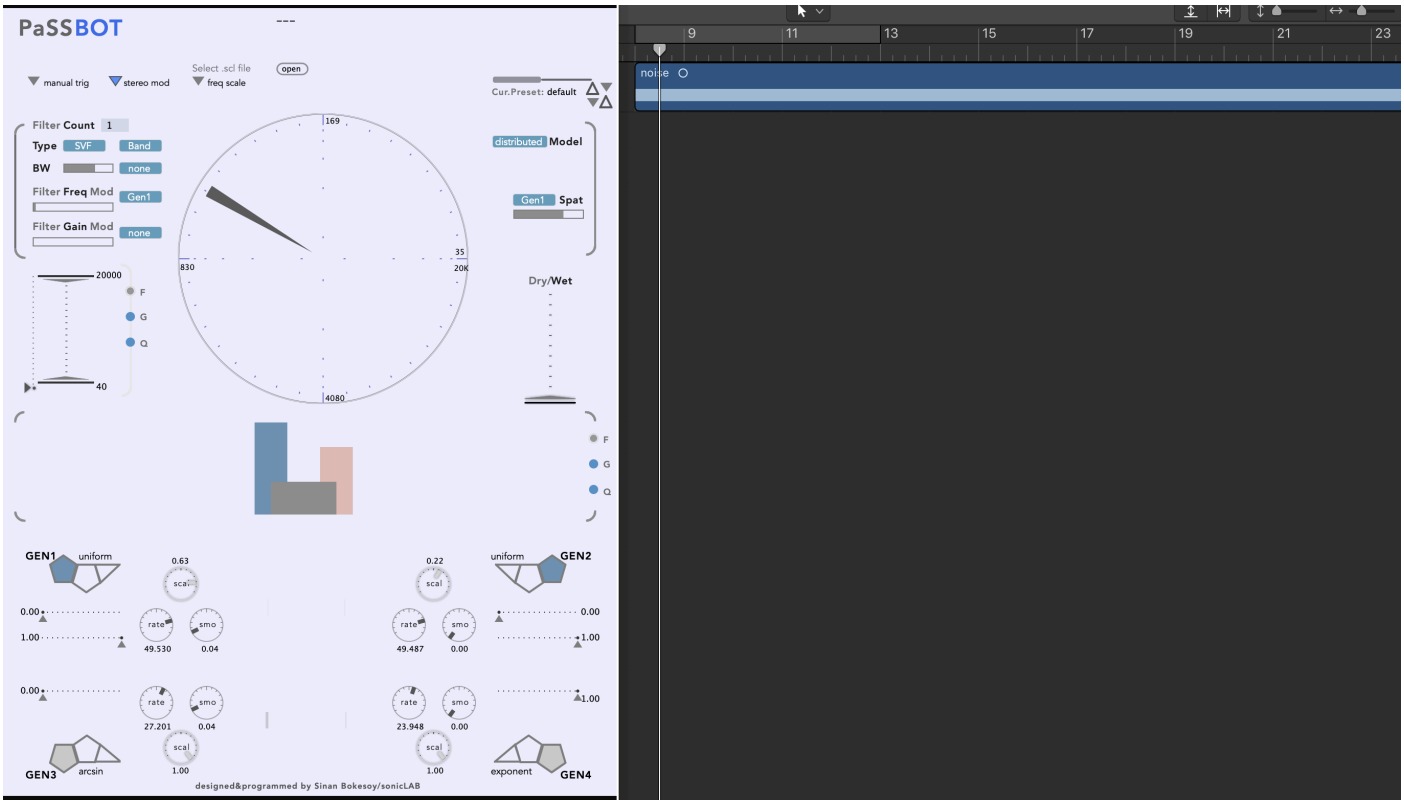
chapters:

Pages

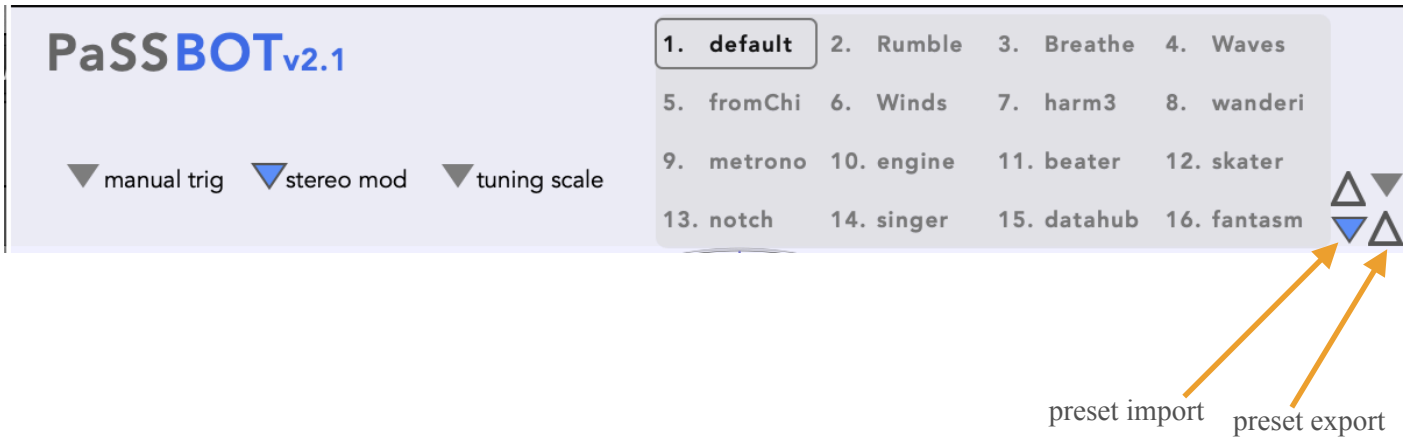
Running and integrating the PaSSBot on the DAW

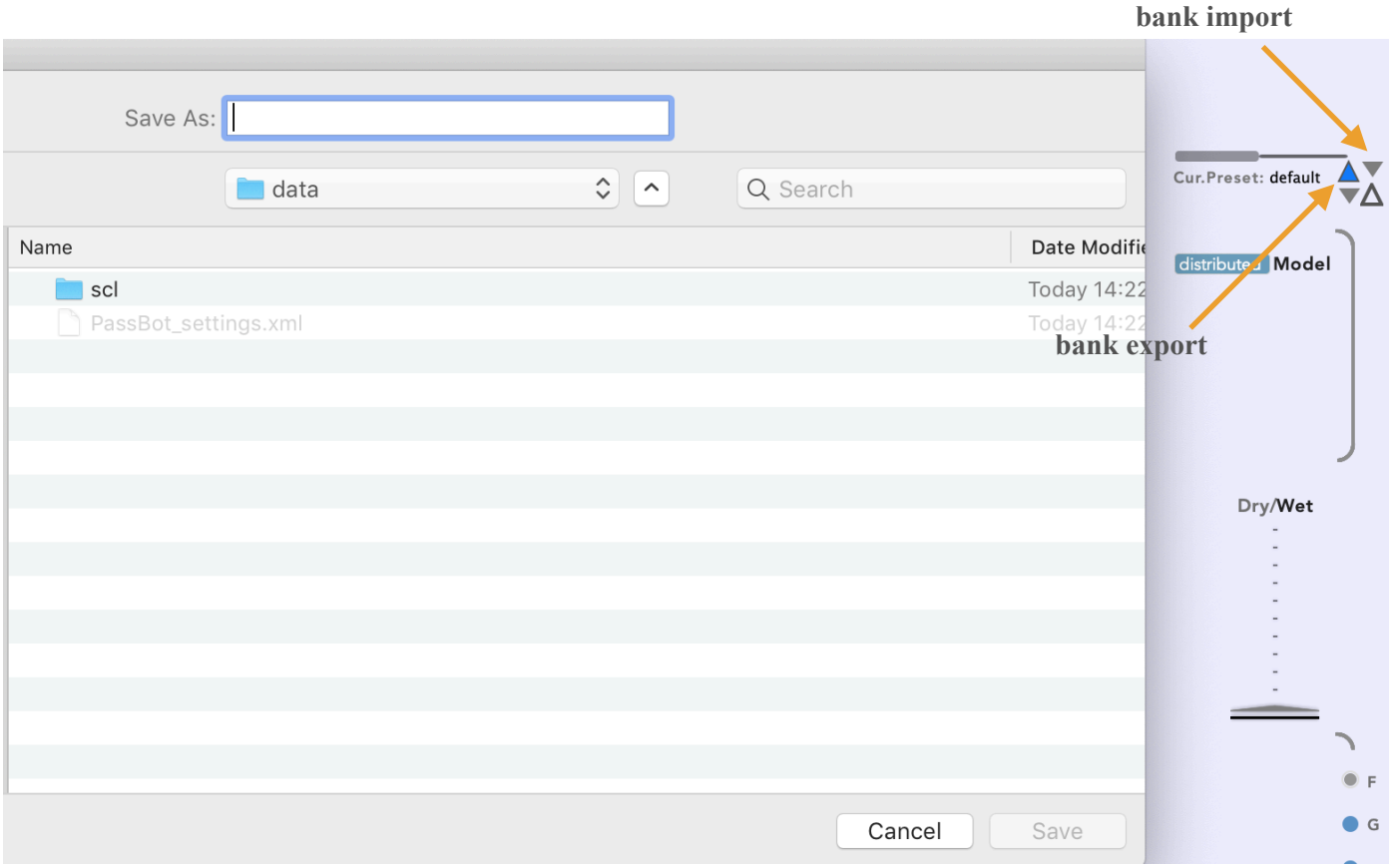
PaSSBOT is a AU/VST3 plugins, so its need a hosting DAW to operate.

When you first time launch it on a DAW, it will load the default preset. All the settings then you apply on the PaSSBot will be saved along with your DAW project and also recalled back.



You can save your ready preset as well and choose one of 16 available slots, which make up a bank of presets. You can save and import these banks as well.





The **PassBot_settings.xml** file is the factory bank of PaSSBot and it is advised to keep a copy of it, since any preset export onto it will change it. If you loose the information on it, you can install the plugin again to access it.

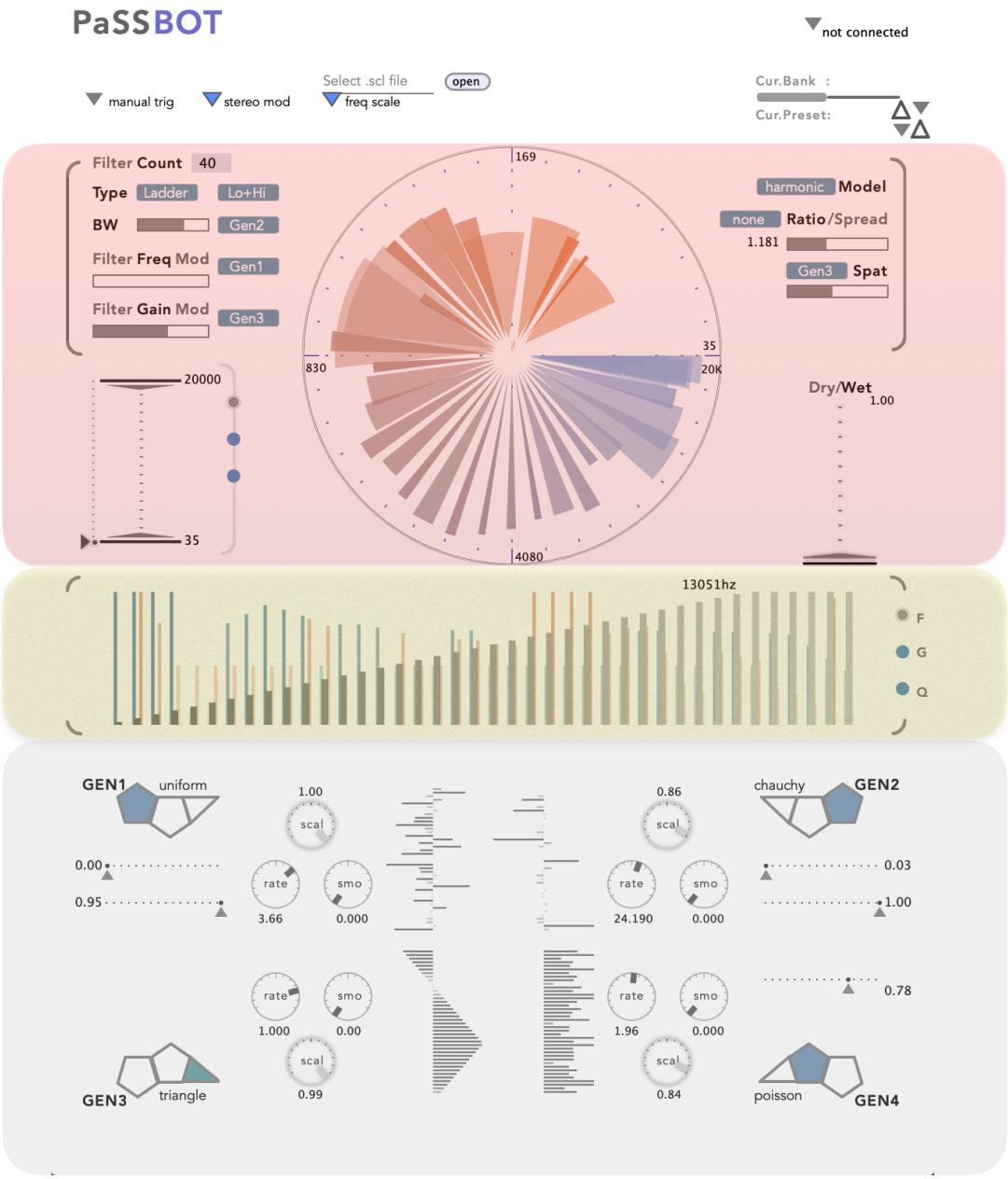
PaSSBot Structure and the controls on the user interface

PassBot UI is divided in 3 parts;

- **Upper section:** The filter bank and modulation destination settings and the visualisation of the filter bank.

- **Middle section**: The user assigned bar chart to set the parameters of each filter gain, resonance and center freq.

- **Lower section:** The 4 GEN generators which construct the complex modulation signals assigned to filter bank parameters.

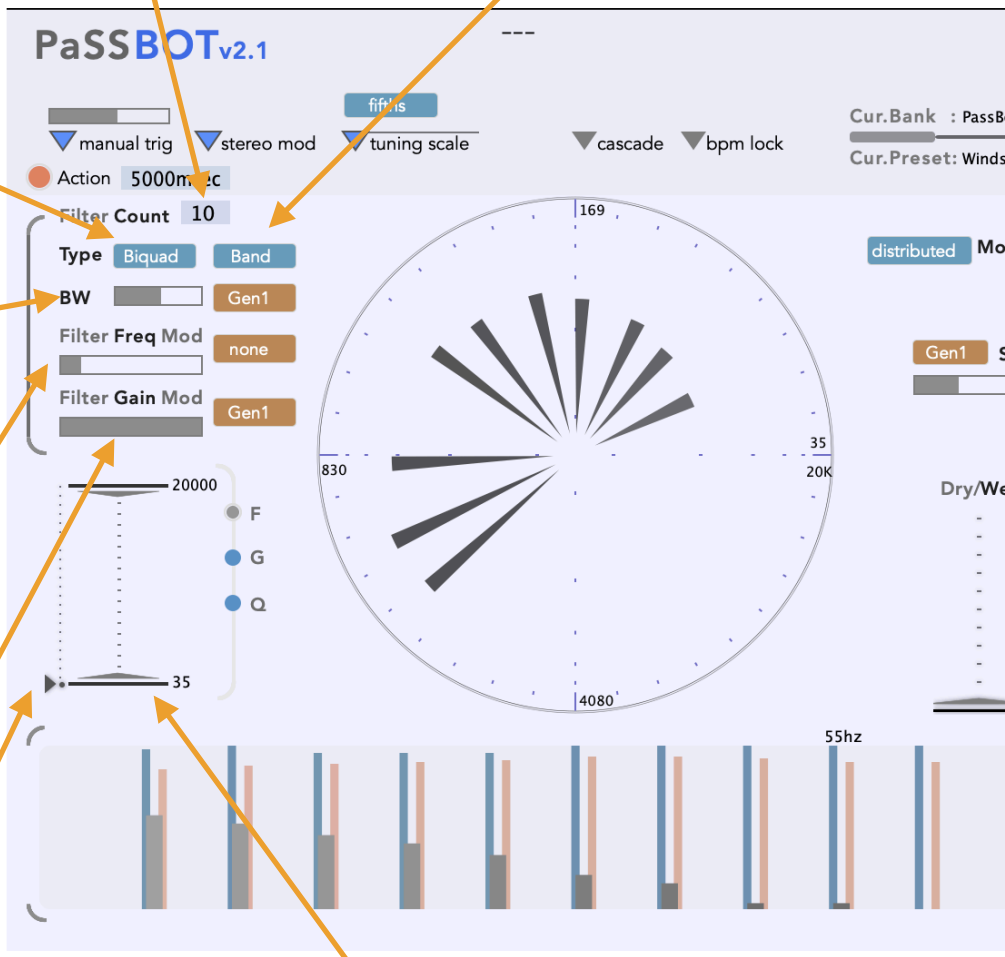


Filter count : You can run up to 64 parallel filters at the same time.

Filter behavior : BandPass, Lo+Hipass and Notch.

Filter type : Filter types available are,

IIR Biquad, SVF, Ladder and Resonator.



Filter resonance mod : Filter Bandwidth modulation range and source selection (via GENs)

Filter Freq mod : Filter center frequency modulation range and source selection (via GENs)

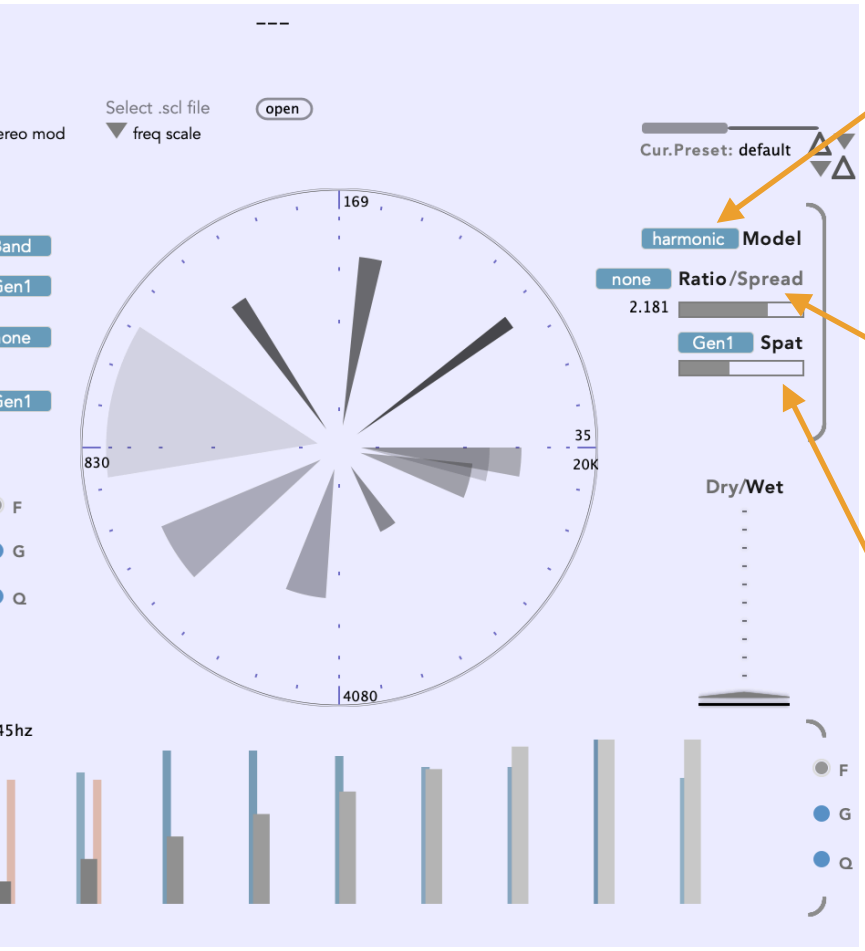
Filter Gain mod : Filter gain modulation range and source selection (via GENs)

Transparency : Threshold of random transparency setting. Higher amounts, will increase the chance of letting the values pass through the barriers.

Lo / Hi Barriers : Low / High barriers limit the freq, gain and resonance values of filters after calculating the rmodulation applied to them. You can set different barriers for each parameter.

Each filter has center frequency, gain and resonance value set by the user. In addition to these values modulation sources (GENs) with a modulation range setting will be applied. After this phase, the relevant barriers will alter the calculated value.

For instance if the value is higher then the Hi Barrier setting, then the value will be bounced back inside the barrier range. Or if the value is lower then the Low Barrier setting, then the value will be bounced around the low barrier setting.



Distribution model : Filter center frequencies can be set by the user individually and modulated with GEN's, but the distribution can related harmonically as well regarding the first filter freq setting.

Ratio for the harmonic distribution : For instance, when set to 2 each filter freq has an octave relation to the previous one. Setting between 0.001 and 3 is possible. Change the first filter freq to activate a new distribution with new root frequency. You can also modulate this setting value with GEN's

Stereo Spat for each filter : When the "stereo mod" is on, you can use a modulation source and set its modulation range to pan each filter output continuously in the stereo field.

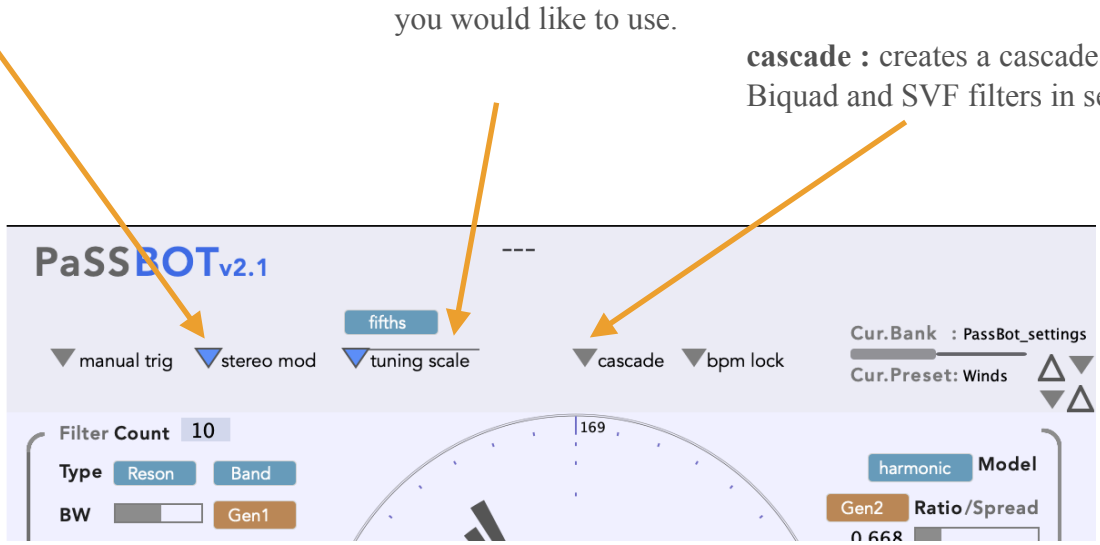
If you apply a stereo input to the PaSSBot, then the left and right channel will be processed in stereo and delivered so to the stereo output of the audio channel.

If the "stereo mod" is on, then the left and right input channels will be added and processed with each filter and then spatialization will be applied on the stereo field, hence the output will be stereo.

stereo mod : Activating the stereo spatialization mode.

Tuning scale : Activating the tuning scale for the filter center frequencies. You can also open a .scala file describing the tuning scale you would like to use.

cascade : creates a cascade copy of Biquad and SVF filters in serial.

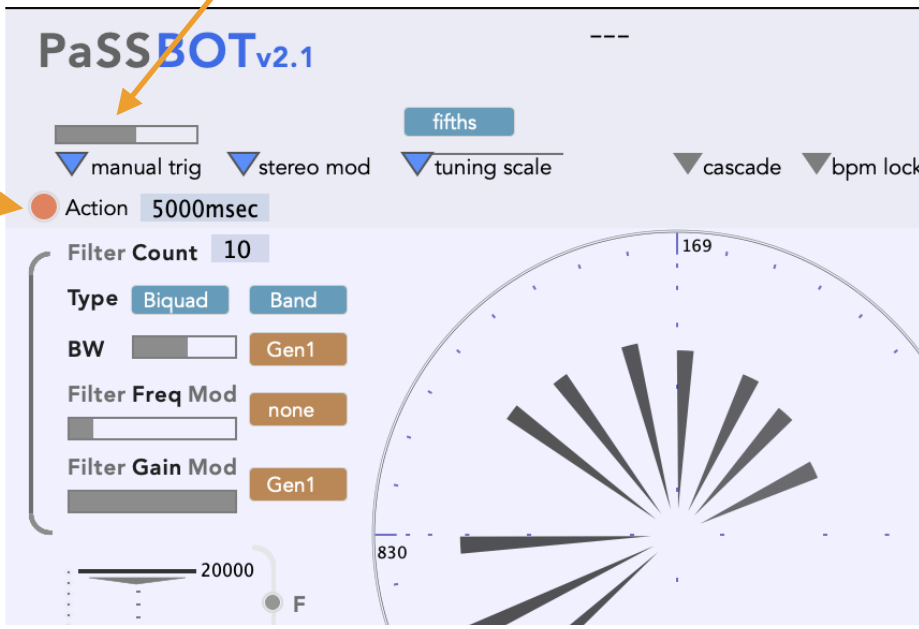


Playmode : PaSSBot run continuously or can be triggered on/off manually. When the manual trig mode is on, additional controls will appear on the UI.

Trigger on/off button : When the manual trig mode is on, this button serves to trigger the PaSSBot on or off. An AR envelope will fade in the filters and fade them out, when triggered off.

Envelope duration : The AR envelope duration applied when triggering on and off the filters. This is like fade in / out time, however this can be also randomized.

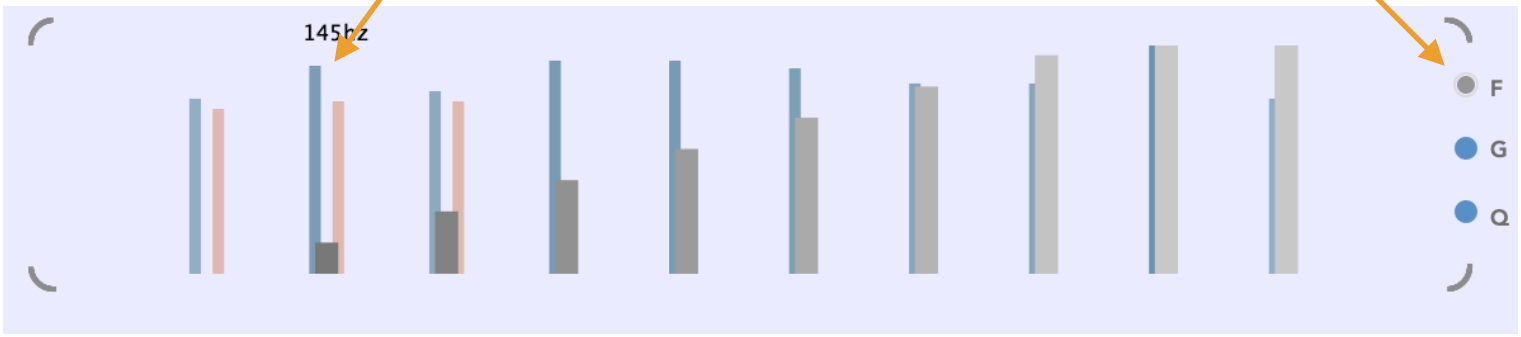
AR envelope randomness : This sets the random range applied on the AR envelope duration. Each filter will have its own AR envelope version.



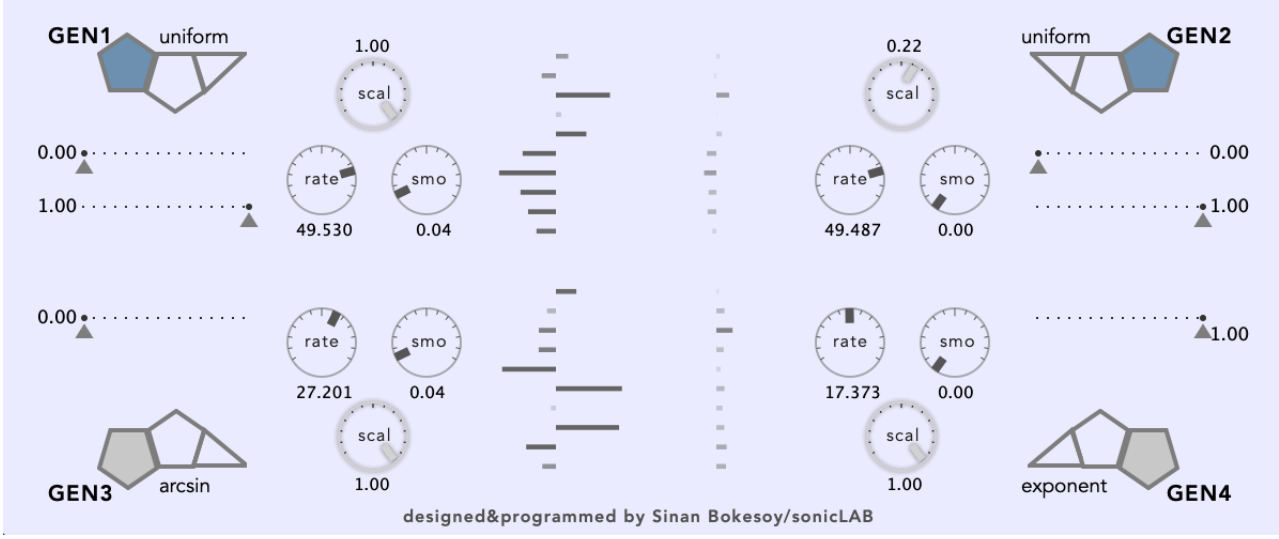
Middle Section : On this section of the UI, you will see each filters center freq, gain and resonance values represented with bars. The number of these bars are dependent on the filter count setting.

By dragging each bar up& down you set the each filter's freq, gain and resonance setting. The relevant parameter value will appear on top of the bar.

Clicking these buttons, you can set which filter parameter is the active one to interact with. The other parameters will be shown thinner on the left and right of the active bar.



GEN modulation generator



As mentioned before, the **PaSSBot** incorporates 4 continuous modulation generators for each filter ! with rich stochastic function possibilities called as **GEN**.

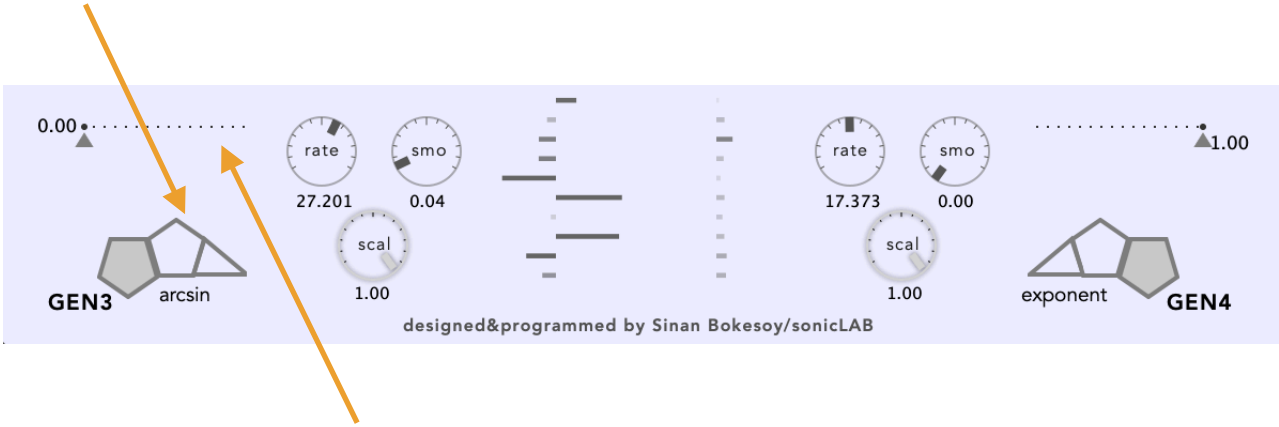
Each GEN offers modulation sources with continuous probabilistic distributions, discrete probabilistic distributions and continuous standard waveform functions as listed below. *

uniform
gausssian
chauchy
exponential
weibull
arcsine
lognormal
chisquare
gamma

poisson
bernoulli
binomial
pascal
geometric

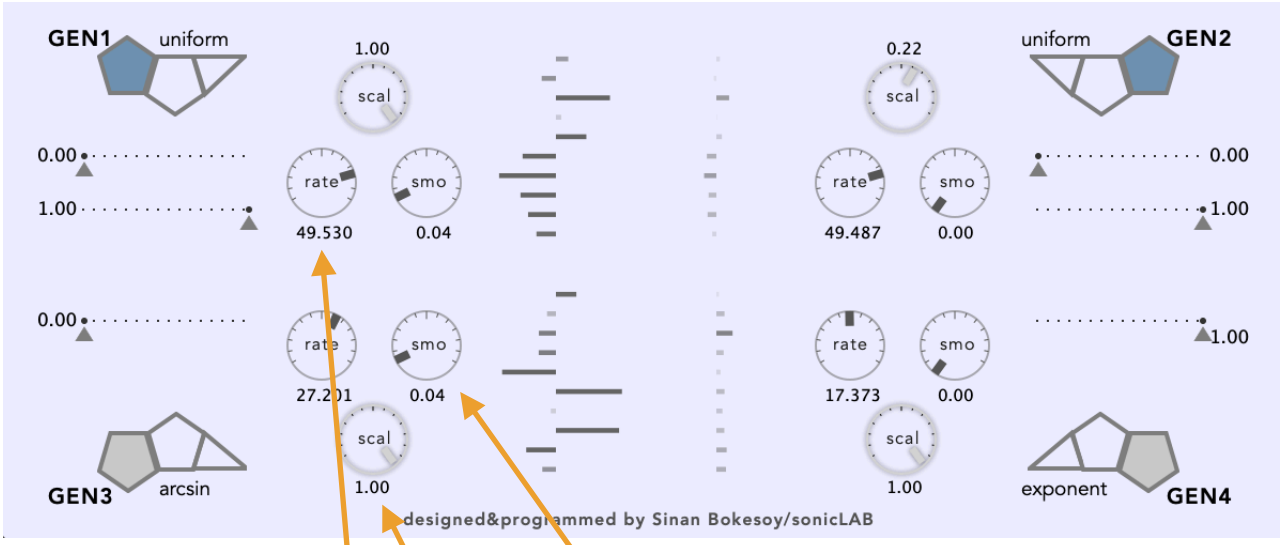
triangle
sine
sawtooth
pulse
exponent
Inenv

Each GEN has relevant button switches to select the desired function category as listed above.

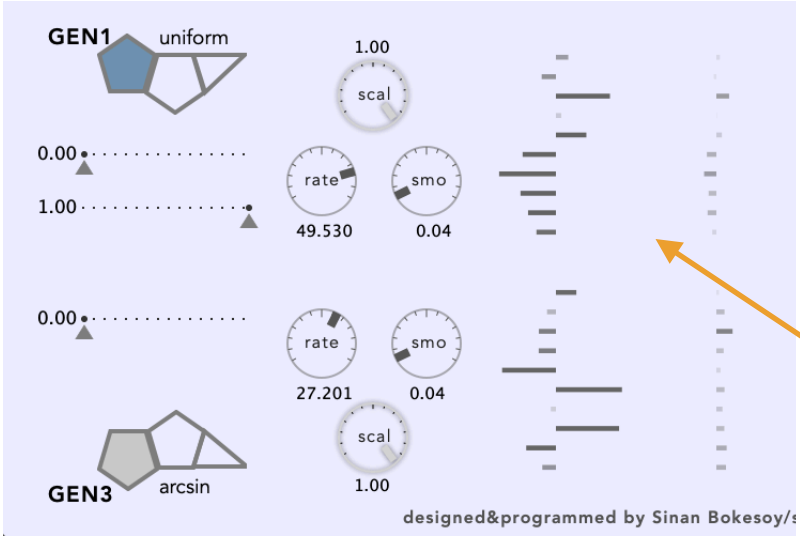


For each function selection the relevant parameter sliders will show up. Some of the functions have one parameter, some two parameters, and some none.

* What are stochastic distributions ? The ending page of this section answers this question.



Each GEN generator has **rate**, **scaling**, and **smoothing** rotary sliders. The **rate** slider defines the speed of the generator (in Hertz) , the scaling slider defines the amplitude of the generator and the **smoothing** slider sets the degree of softening the rapid changes of the generator function. When the **BPM lock** mode is on, the **rate** slider shows the speed as note duration values.



The value displaty of each GEN represents the unique value calculated for each filter. The display updates accordingly to the filter count. The center point represents value 0.

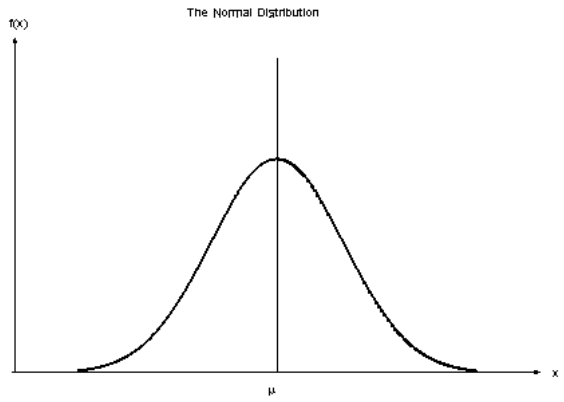
What is a stochastic function / probabilistic distribution ?

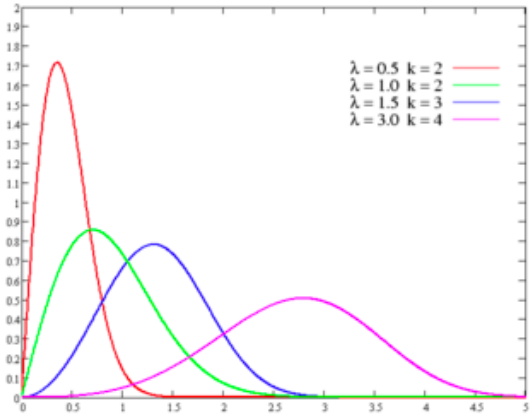
Stochastic processes are widely used as mathematical models of systems and phenomena that appear to vary in a random manner. It is a field of statistics, and the term random **function** is also used to refer to a **stochastic** or random process, because a **stochastic** process can also be interpreted as a random element in a **function** space. A type of random function can be modeled with a probability distribution function showing distinctive behavior when distributing the values as its output.

If you flip a coin, both sides have the same probability of showing up, so this can be modeled with a uniform random distribution. For example, if we have a light bulb which goes on and off randomly due to a cable connection failure / electric spark, this is not a uniform random distribution but can be modeled with a poisson distribution. The movement of a mass of molecules in gaseous spaces can be modeled with brownian motion (a random walk).

Most of the stochastic functions have parameters, a value of certain range to change the behavior of the stochastic function. The reason that the **PaSSBot** offers many types of stochastic functions is to present you different types of 'distribution shapes', which give a distinctive character to the process being used for.

Below, you can see the gaussian / normal distribution and the Weibull distribution shapes (which varies according to its parameters). As you can see, with the normal distribution of events, an x event has a higher possibility to happen towards the centers of the bell shaped cure.





Music is a distribution of events in organized manner and stochastic functions let us control the randomness between order and total disorder. This is applied heavily in 20th century contemporary music and computer music by the composer Iannis Xenakis *.

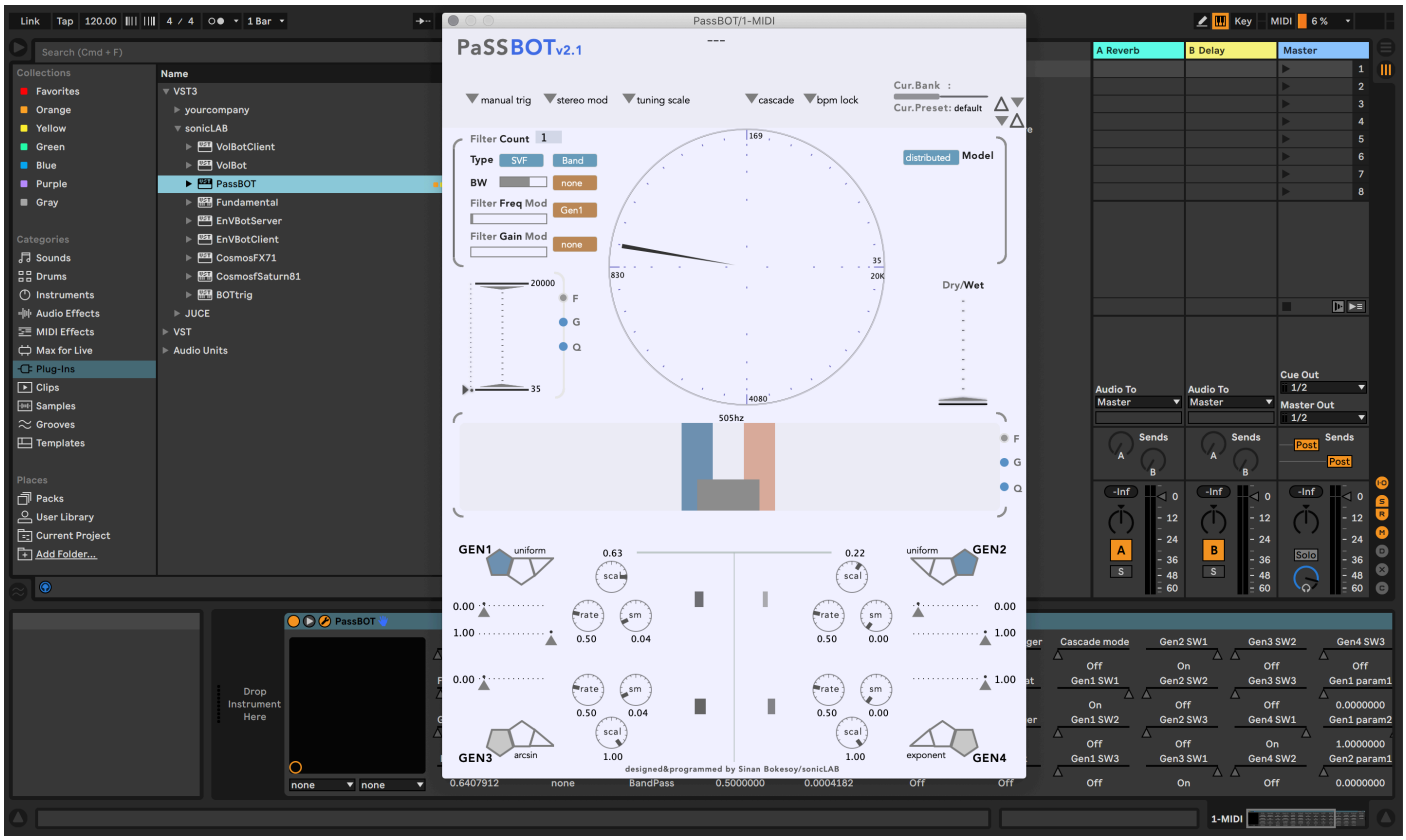
sonicLAB products offer similar mechanisms and inspiration in form of modern tools to todays composer / sound designers. We can assign these distribution characteristics to various musical parameters and sound synthesis parameters at various levels. The GEN modulation sources are themselves LFO's which modulate various parameters of the PaSSBot LFO with a rich palette of stochastic distributions.

* Iannis Xenakis "Formalized Music" Pendragon Press.

Automation in DAW with PaSSBot

DAW's deliver automation editing for plugin parameters on each track. And it is possible to automate each parameter of the PaSSBot. Below is a sample screenshot of Ableton Live.

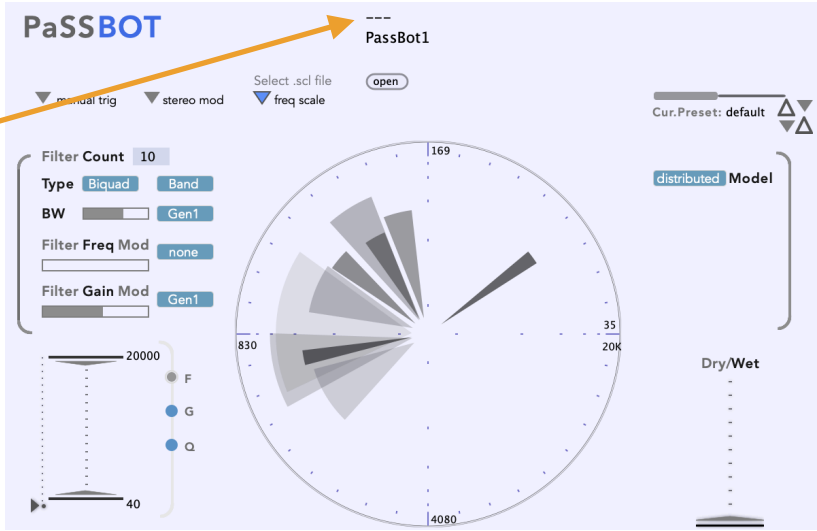
When the PassBOT's get the trigger message from the BOTtrig (they have to be on the manual trig mode each, rather then being in continuous operation) , the AR envelopes will drive in each filter.



It is also possible to assign a MIDI controller to every available parameter. Since this is an Audio FX plugin, keep in mind that every DAW has it is own way to handle the MIDI transfer to the audio fx plugins.

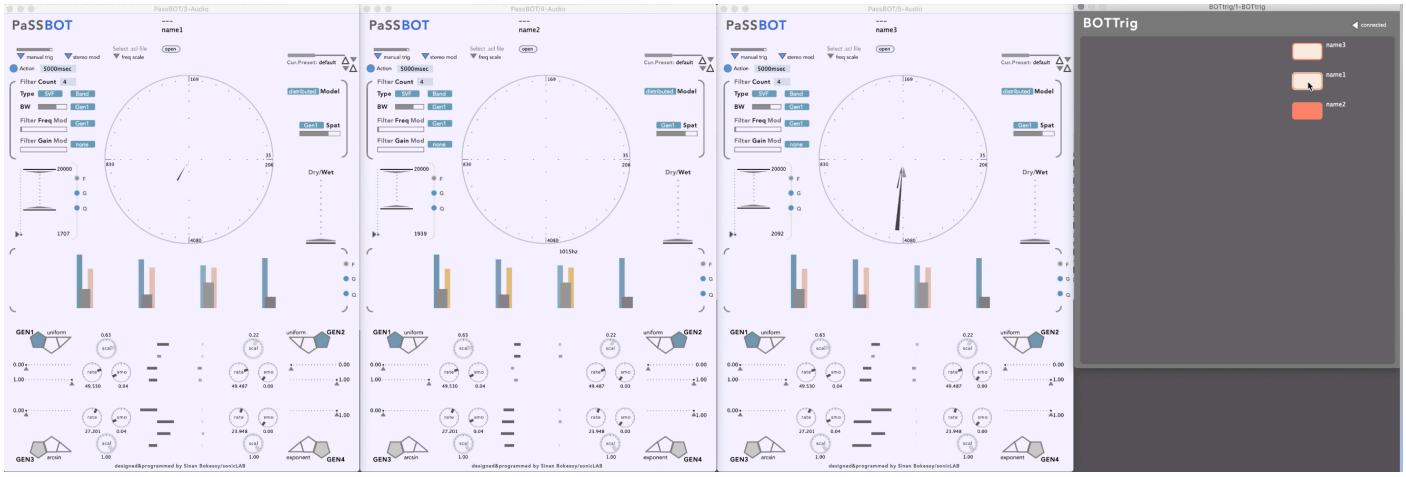
For your convinience sonicLAB has developed the BOTTrig plugin (available free in the All Bots bundle) which lets you trigger all the Bots

Name the PaSSBot instance by typing it on this field.



When you click connect on the BOTTrig, it will see all the availabe PASSBot instances in your DAW and show a button for of them. Next to the button you will see the custom name of the PASSBot instance as you have assigned for it.

When the PassBOT's get the trigger message from the BOTtrig (they have to be on the manual trig mode each, rather then being in continuous operation) , the AR envelopes will drive in each filter.



Installation of the PaSSBot iOS :

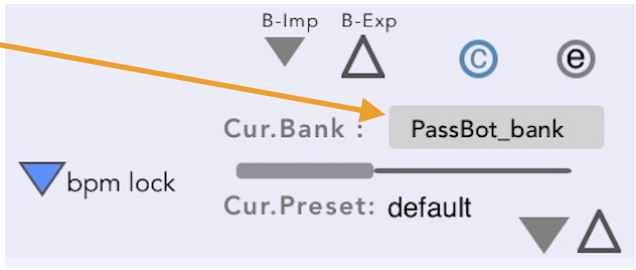
PaSSBot iOS is an audio effect software and can be used as well as standalone app and also as AUv3 version inside a host application. Setting the host DAW buffer size to 128 or higher is recommended.

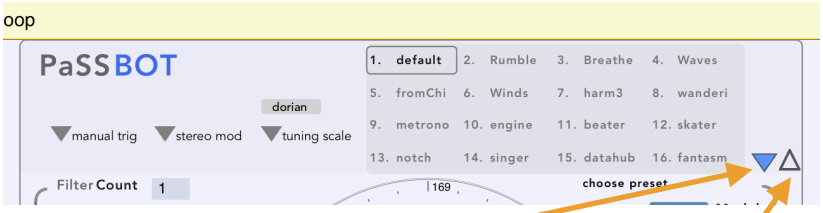
Importing & Exporting Presets : This mechanism on PaSSBot iOS is rather minimally designed. You can save your preset into a bank of 16 slots. But you can export import these banks to outside of App Sandbox only with the standalone version of the app.

So the regarding the bank handling, the AUv3 version has limitations over the standalone app version. Below we will explain the procedure clearly.

The standalone version of PaSSBot :

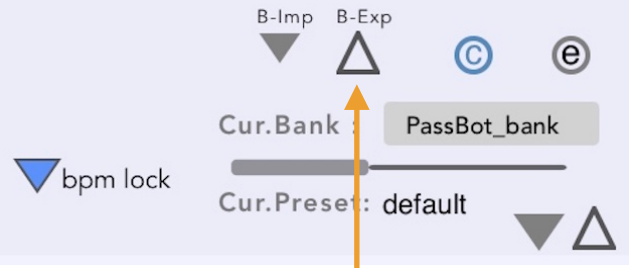
You can select a bank by tapping on the bank name field.





You can select a preset by clicking on the preset import button. Then select the preset from the preset pop-up field slots. You should click on the preset import button again to close the field.

To save a preset, you can give it a unique name by typing on the name field and then click on the preset export button. The preset pop-up field will open and you click on a slot. The preset on that slot will be overridden with the new preset.



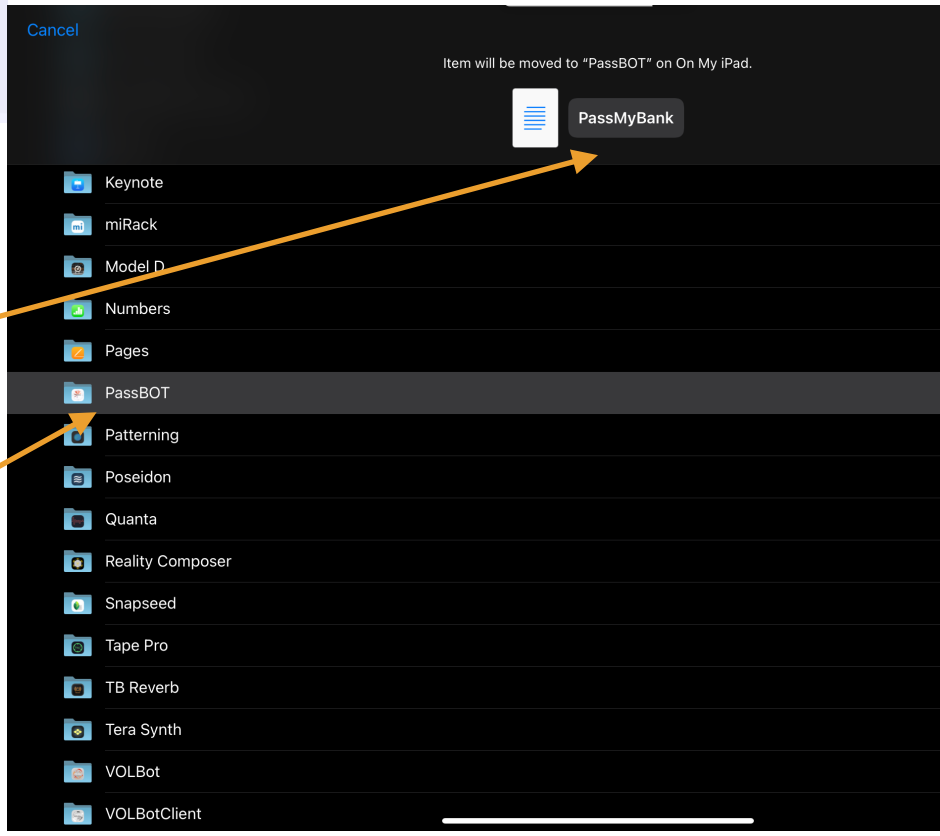
To export a bank click on the bank export button

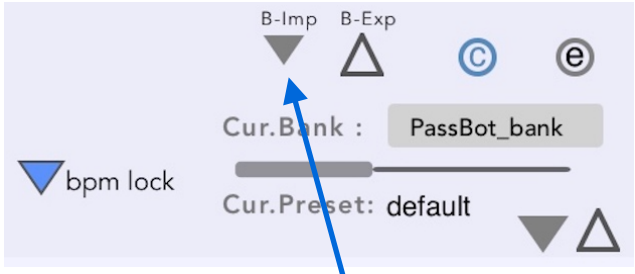
The file folder of iOS will open, give a name to the bankfile.

Select as the destination the PaSSBot folder on your iPAD, and choose preferably the PresetBanks folder.

Then click move, to export your bank as planned.

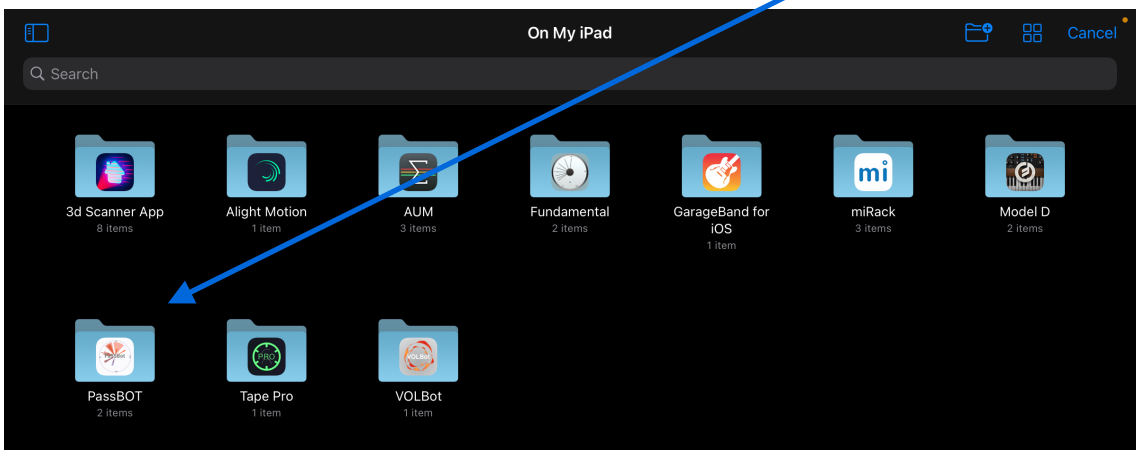
Important : You should backup these files else where you wish to keep them for later use. Because whenever you delete the app from your iPAD, this PaSSBot folder will be erased as well.





To import a bank click, on the bank import button

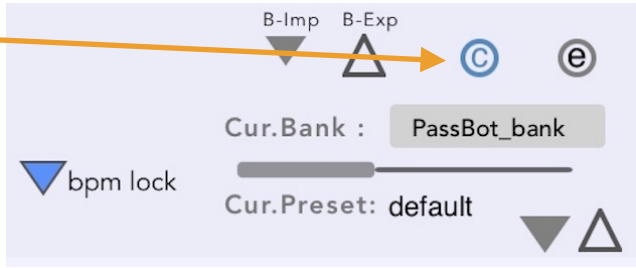
You can choose a bank from the PaSSBot directory on your iPAD.



You can make a copy of the currently selected/loaded bank by pressing on the copy button.

It will ask to press again for confirmation.

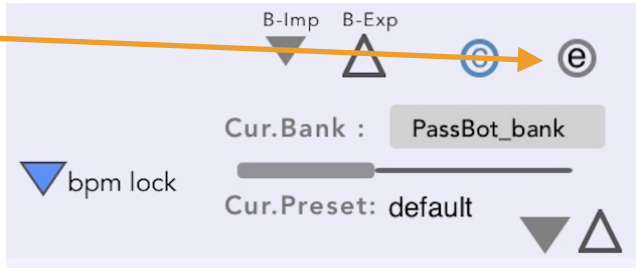
Then a “C” letter to the bank name will be added and the copy will be created.



You can erase the currently selected/loaded bank by pressing on the erase button.

It will ask to press again for confirmation.

Beware, that this operation cannot be undo.



The AUv3 version of PaSSBot :

You can realize preset importing and exporting with the AUv3 version of the PaSSBot.

You can also copy or erase the selected banks, however you cannot import / export banks from the file structure of the iPAD on the AUv3 version of the PaSSBot.