

Spat3D 218X / 236X / 264X

Hello,

This is a simple help for the use of this new series of plugins, currently in beta phase. There are a number of limitations and constraints caused by the alpha stage of Synthedit 1.4, the availability of MacOS-compatible modules and the VST3 format itself, which means that I can not tell when and if functions on which they depend will be modified or introduced.

Its first goal is to initiate the progressive transfer of Acousmodules from 32-bit format to 64-bit, both to ensure compatibility with some hosts that only exist in 64-bit version, to benefit in some cases of better performance and, perhaps most importantly, to make them available to MacOS users ;-)
It is nevertheless likely that a large part of existing plugins will never be available in this form...

Installation

The plugins are available in two formats : VST3 for Windows and Audio Units (components) for MacOS.

Location :

- Windows : / Programs / Common Files / VST3 / or wherever you want...
- MacOS : / Library / Audio / Plug-Ins / Components /
- + Preset files: / User / Library / Audio / Presets /

They are tested with Reaper and Bidule on Windows 7/10 and MacOS 11.11.

They should also work with : Max / Msp, Audition, Ardor (MacOS), Factory (Windows), Pyramix (Windows), Tracktion / Waveform (Windows)

Known Issues (August 2018) :

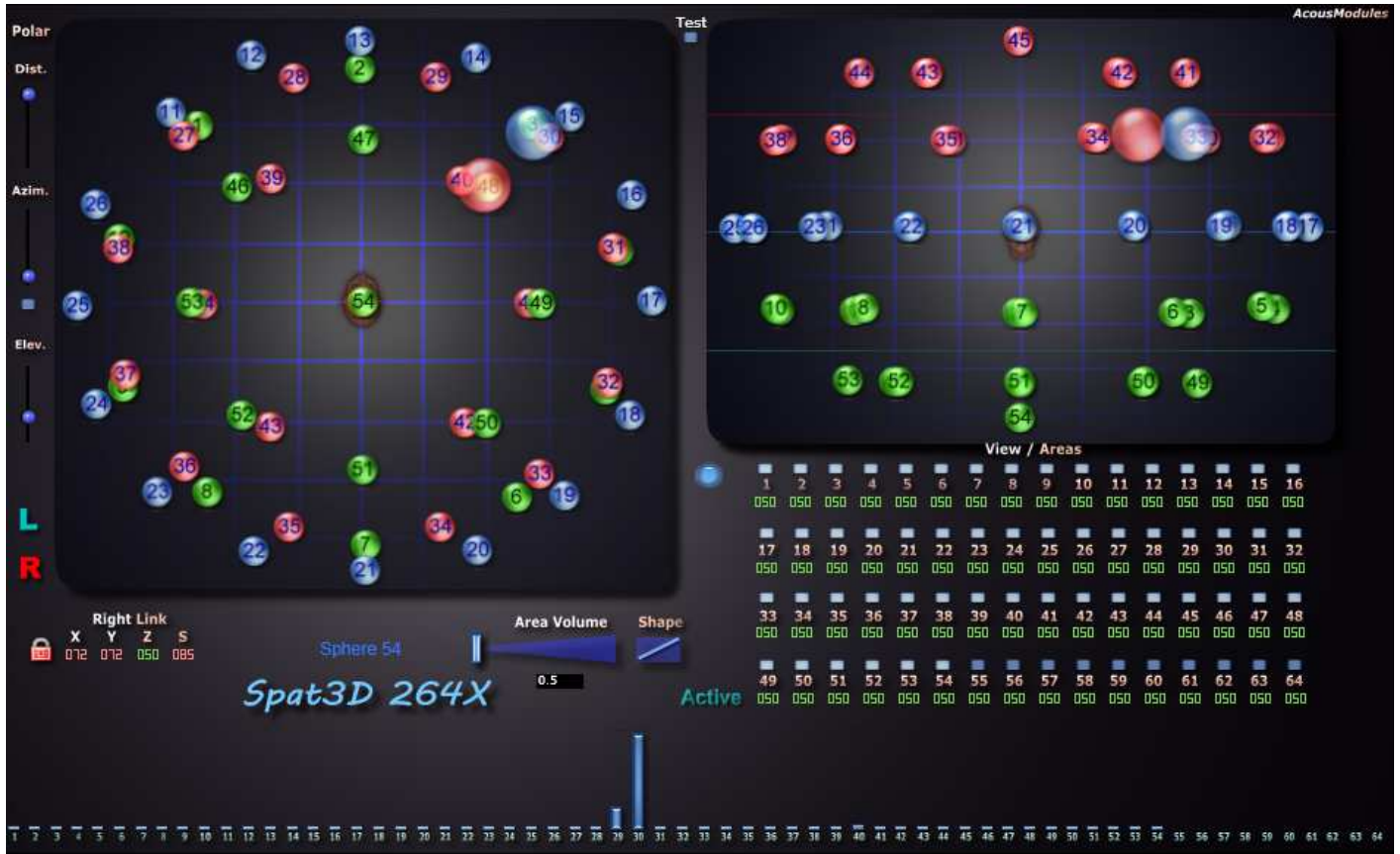
- the recall of the internal presets may not work during the (re) loading of the plugin:
- Controller values may be different from what the GUI displays: move these controllers
- Windows: MIDI inputs do not work, use automation settings instead
- MacOS: the refresh of the graphical interface is slow and the animations more or less jerky
- MacOS: the removal of a plugin while it has automation tracks makes Reaper crash!

Description and use

The "Spat3D" series represents sort of basic brushes with which one can draw and sculpt the *spatial mass* of sounds. It shares with traditional "panners" the ability to place and move the apparent source position of sounds within a loudspeakers space, but its settings and control modes are quite different, both more open for original arrangements, and less simple for "surround" standards.

The three versions presented here treat a mono or stereo input, and differ essentially in the number of their outputs : 18, 36 and 64.

The *Spat3D 836X* and *864X* plugins share the same basic processing but manage the inputs as a group of eight, and the *AnimaSpats* also include animation functions.



Common points

The representation of three-dimensional space is shared in two views : from above (left) and from front (right). They are flat and do not use perspective effects. The view of the front view is compressed vertically but the controlled space remains cubic (this is important for the adjustment of the Areas !).

This mode of visualization is obviously based on its analogy with the three-dimensional physical space of the loudspeakers spaces, so as to facilitate a number of operations and make them, perhaps, more intuitive. But it differs also in many ways :

- it is an amplitude control tool and it never represents the "sound"
- it is not necessary to precisely match the location of the projection points represented with the actual positions of the speakers, and it is often even necessary to treat them differently to obtain the desired result.

The positioning of the outputs (colored balls numbered) and inputs (the two biggest balls) is done directly with the mouse.

Simultaneous pressing of the Control / Command key allows fine movement.

The positions in X (width) performed on the top view are automatically reflected in the front view, which is not reciprocal : it only allows to adjust the elevation values (unlike existing 32-bit versions it is currently not possible to constrain this movement).

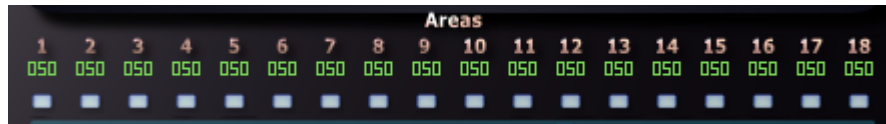
Note on the placement of objects on the vertical axis (front view) : unlike the majority of Acousmodules where the distribution of projection points is fixed on two or three levels of height, the "Spat3D" series allows a free placement also in this dimension. This can bring more flexibility, but also introduces difficulties...

In particular, most loudspeakers arrangements have more points on the horizontal axis than the vertical one, which is in line with our auditory perception and follows our way of inhabiting spaces. But as the technique used by "Spat3D" is based on spherical distances, we must not forget to reproduce this

difference in the placement of the balls on the front view, where their vertical extent will have to be reduced most of the time. The thin horizontal lines (green, blue and red) are a reference for a device with three height levels.

The small buttons below the channel numbers on the right allow to hide the display of the corresponding objects while muting (selector on "Active"), or to change their color between blue, green and red (selector on "Color").

Hiding certain channels makes it easier to edit and adapt the GUI to the spatial format used (this does not change performance very much). The choice of color can help, for example, to identify height levels in the top view.



(note: the 18-channel version has a third row "Hundred" whose utility is disclosed below)

The Areas settings

This is an extremely important element and is sometimes found on traditional "panners". It is similar to the Influence setting in Reaper's *ReaSurround*.

Basically, these settings are used to determine how the amplitude of the incoming signal will vary on each of the outputs according to the 3D distance between them.

To help make these adjustments, the 18-channel version has a display in the form of colored vertical bars (blue for 1 / L input, red for 2 / R input), the 36 and 64-channel versions have only the blue display corresponding to the 1 / L input, sufficient for this operation.



Depending on the value of these settings and the graphical distance between the balls (and the overall value of the next *Area Volume*), it is possible to get up to a the total extent of the system (the source sounds everywhere at the same level) or contrary a "discontinuous" space (there are silences when the entrance passes from one ball to another).

Individual Area settings are supplemented by the *Area Volume* one (or Global Area in other plugins). This setting may look like that of "Spread" found in many spatialization tools, but with a slightly different operation and effect.



This acts as a *master* shifting to the least or most of all the individual Area settings, and also changes the overall volume of the sound : there is no normalization of the amplitudes, so if a larger number important outputs is active the final level will be logically higher.

If you don't wish this, you can use the "Area Volume Compensation" (Vol Comp) setting. Remember that its effect will depend a lot from the interaction between all the other parameters !

Important Note about Aire Values : these "new" Acousmodules use a different method than 32-bit versions to compute distances, so the range of values is different. On the other hand, the Shape or Curve setting of the Area also influences how to make these adjustments. It is quite possible that these will change in future versions, which may change the way existing presets work.

Center compensation

This function ("Center Comp") is only available in the 18- and 36-channel versions. I suppose in fact that beyond 36 speakers, we must certainly be able to place some in the middle ...



The role of this adjustment is indeed to compensate for the absence of projection points placed inside the listening space, as is the case in all the peripheral systems, which can lead to "amplitude holes" if we place a source in these positions.

Other amplitude calculation techniques such as DBAP do not have this disadvantage (but they have others), while others, like ambisonic coding, simply do not allow it (we pass above or below, but not in the center ...). This last solution is also the most logical, because unless you work with a high resolution WFS system, whatever you do, the sound will never be in the center if there is no speaker to make it exist ; -)

However, the *center compensation* setting present in some Acousmodules provides a "space filling" that can simulate it. As it is not an automatic function but a variable parameter, the user can also use it to generate interesting spatial masses, to accompany the sound with respect to what he hears, and it is what matters !

In practice, the values of Aires will be increased or increased according to the proximity of the entries in the center of the represented space.

- **Height** : allows to move the center on the vertical axis, convenient for domes;
- **Width** : determines the spherical area of the central area;
- **Level** : Sets the amount of amplification you want to balance the amount of edge.

It may be necessary to perform a number of round trips between the individual settings, the Area Volume value and this setting before finding the best combination. Knowing that it acts both vertically and horizontally, this can be difficult for some "3D" arrangements.

The 18-channel version has an additional adjustment, making it possible to better respond to the constraints of devices with a low number of speakers for which it is intended. This can be particularly useful for "surround" type devices such as Auro-3D and of course octophony.

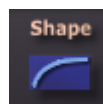
- row of "Cent" buttons : *Center Compensation* only applies to selected channels, for example those of the middle level of a sphere without touching those above and below.

Shape

This parameter influences how the amplitude varies along the Area. It can be linear, logarithmic, exponential or "S". It is not represented in the distance bars display.

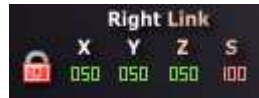
Its use combined with that of the *Volume Area* makes it possible to soften or contrast the passages between the projection points.

The "normal" default shape is logarithmic.



Right Input Link

Both entries can be processed independently or linked. In this case, it is the blue ring (input 1 / L) that is the master, both in the top view than in the front view.



Four settings make it possible to determine how input number 2 follows the number 1 : X controls the difference in width (50 = identical), Y in depth and Z in height. In this case the movements are always parallel.

The adjustment of symmetry (S) makes it possible to obtain other modes of symmetry, such as for example radial or crossed.

See the presets :

Note about automation : even if the control gesture is only performed on the object representing the left input (3 parameters), there will always be 6 automation curves that will fit in a multitrack. It is then possible to deactivate the link and edit the curves for the right input separately.

Polar Controller



There is another way to control the position of the inputs for spherical and circular devices.

The three sliders to the left of the top view move the left input to the polar coordinates of Azimuth and Elevation to 360 °, plus a Distance parameter to adjust its diameter. The small button under Azimut's slider shifts its course by 180 °.

For "stereo" control the right input can be linked to the left in radial symmetry (eg Sym = 90, X and Y = 62).

These three parameters can of course be controlled by MIDI.

Internal presets

Each plugin has a set of presets that should expand gradually. They can be examples of use of the plugin and starting points for some more or less standard provisions.

It is recommended that you then use the host-based backup system.

Throughout the beta phase, it is possible that they do not work properly ...

MIDI controls

If all operations can be done with the mouse, these plugins become even more interesting with a control surface (or other commands of this type).

Currently, Steinberg has removed from the VST3 format the possibility of having a MIDI input, reserving only the "instruments" (VSTi) ... which let them pass the untreated input signal !
Fortunately, Apple's Audio Unit format does not benefit from these "enhancements" and can continue, like the 32-bit Acousmodules, to respond directly to Control Change messages.
However, since for this new series I chose compatibility above all, the user will have to make himself the correspondence between the incoming MIDI messages and the automation parameters of the plugins.
In Reaper this can be done either by the MIDILearn function (with recording of automation curves), or by means of the Automation MIDI Link function (with recording of MIDI sequences).
Warning: if the same controllers are assigned to multiple instances of the same plugin via MIDILearn they will follow the same commands at the same time! This disadvantage does not exist with the MIDI Link.

Test signal

These plugins have an integrated Pink Noise signal generator linked to the left input.
It can be used in place of a test plugin to help to adjust the Areas values and the Shape.

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