



The Sound Guy: ReSpatializer

User's Guide



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CAUGUI: © 2002-03 Urs Heckmann, www.u-he.com

VST Plugin Technology by Steinberg

HRTF measurements courtesy of Bill Gardner billg@media.mit.edu and Keith Martin kdm@media.mit.edu, MIT Media Lab Machine Listening Group,
<http://sound.media.mit.edu/index.html>

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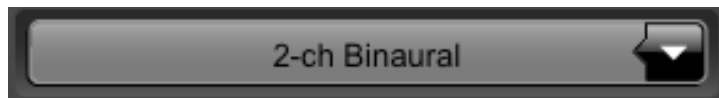
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Chapter 1: Introduction

ReSpatializer is an advanced panning, surround sound and re-spatialization plug-in. Up to eight input channels are supported, and each input can be panned separately.

The panning is presented in an easy-to-follow heads-up display with access to positioning, channel gain, mute/solo selection, and spreading. Other special processing includes variable-rate source rotation that can synchronize to the host tempo, low-frequency effect (LFE) tools for monitoring or bouncing to disk, and a large variety of output speaker formats (up to eight channels, DTS, Dolby, ITU, Film and others).

ReSpatializer also features a simulated surround sound capability over a stereo bus.



This means that after mixing your tracks for various surround formats, you can audition a binaural version of your mix using headphones. The binaural surround simulation is achieved by utilizing precise measurements of the pinnae, head, and torso to realistically localize a sound source through two channels.

If the binaural surround simulator is not desired, then a stereo mixdown can be created instead. The stereo mixdown tool uses on-the-fly mathematical algorithms to accurately represent each source position over two channels using power panning laws.

System Requirements:

ReSpatializer is available in Audio Unit (Macintosh OS X) or VST (Windows or Macintosh OS X) formats.

The Macintosh version is a Universal Binary for PPC- (G3 or above) or Intel-based Macintosh computers running OS X 10.4.0 or later. It requires an Audio Unit or VST 2.x host program.

The Windows version requires Windows98 or higher and a VST 2.x host program.

Some suitable host programs are listed at <http://www.sfxmachine.com/respatializer/requirements.html> .

Chapter 2: Installation and Authorization

Installation

Installation involves two simple steps: running the installer package and authorizing with your license.

To install ReSpatializer:

1. Download the appropriate installer for your Operating System from The Sound Guy's website, <http://www.sfxmachine.com/downloads.html> .
2. Double-click the installer and follow the instructions onscreen to install the plug-in.

The Macintosh OS X version of the installer will create two items:

- The ReSpatializer Audio Unit plug-in
(placed into /Library/Audio/Plug-Ins/Components/)
- The ReSpatializer VST plug-in
(placed into /Library/Audio/Plug-Ins/VST/)

The Windows version of the installer will create one item:

- The ReSpatializer VST plug-in
(placed in your VST host application's VstPlugIns folder)

How to Purchase

Buying ReSpatializer is easy. Just go to <http://www.sfxmachine.com/#respatializer> and click on the "Buy Now" tab. Alternatively, you can launch ReSpatializer and click the "Purchase" button when the "Authorize ReSpatializer" window pops up. This will take you to a web site where you can buy the software.

After purchasing the software, you will receive an e-mail containing your Authorization Code and instructions on how to authorize your software.

Authorization

When you first launch ReSpatializer, you will be prompted to enter an Authorization Code that was provided to you when you purchased the software. If you are evaluating in demo-mode only, you may choose to proceed without entering an Authorization Code. All features will be enabled; however, in demo mode, audio will drop out every 20 seconds.

Type (or copy and paste) your Authorization Code exactly as it appears in your license. Your Authorization Code is bookmarked on the hard disk; therefore, authorization needs to be completed only once.

Customer Support

Technical support is available online. Please e-mail The Sound Guy at:
sfx@sfxmachine.com

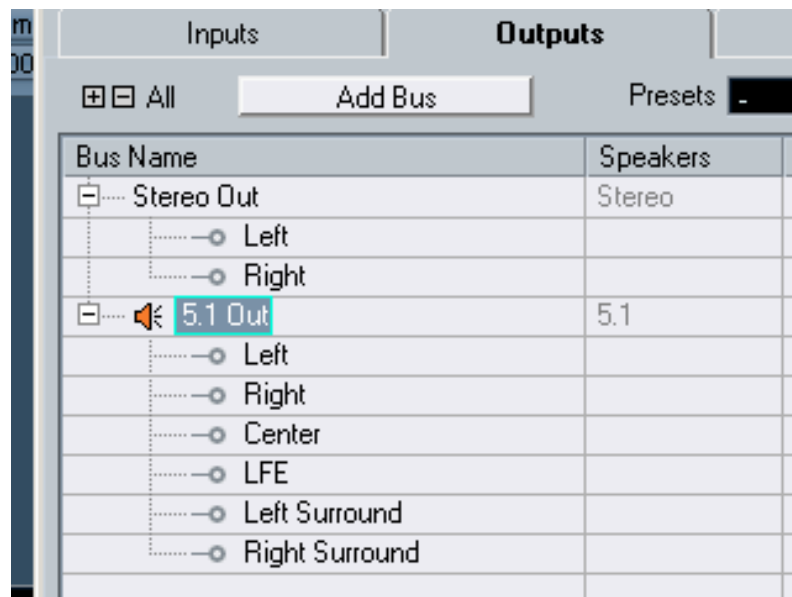
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Chapter 3: Getting Started

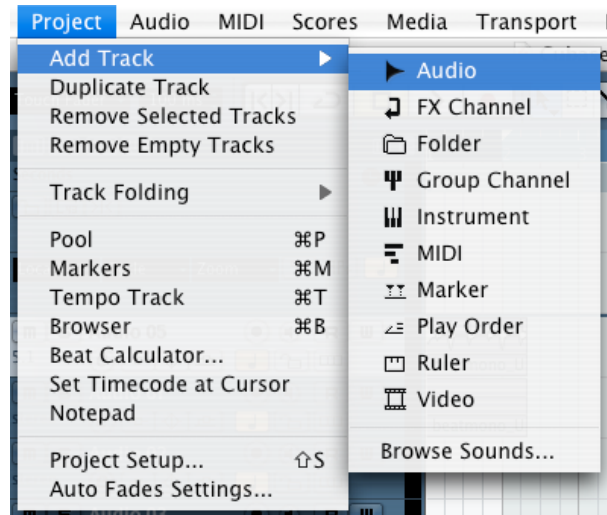
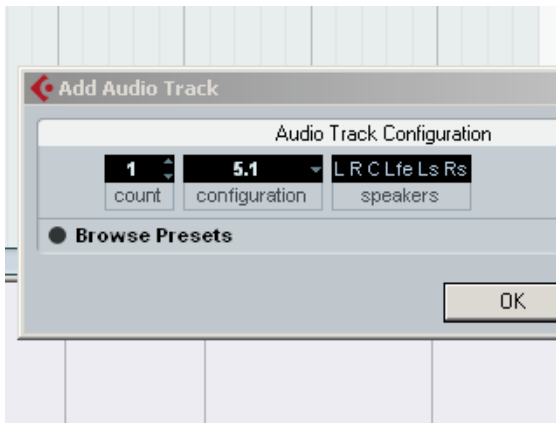
The details of setting up your host editor or sequencer program will vary from one host to the next. Following are the setup instructions for Cubase and Digital Performer. For other hosts, read your program's manual.

ReSpatializer VST for Cubase

1. *Open* Cubase.
2. Under the **"File"** menu, *select* **"New Project"**.
3. *Select* **"Empty"**, *click* **"Okay"**, select a folder to save the project, and *click* **"Okay"**.
4. Under **Devices > VST Connections > Outputs tab**, click **Add Bus** to create an output bus with your desired number of output channels to match your speaker layout (eg. 5.1)



5. Under the **"Project"** menu, *select* **Add Track > Audio**. Change configuration to match your created output bus.
6. With the new track selected, *click* **File > import > Audio File** and choose an audio file to add to the track.



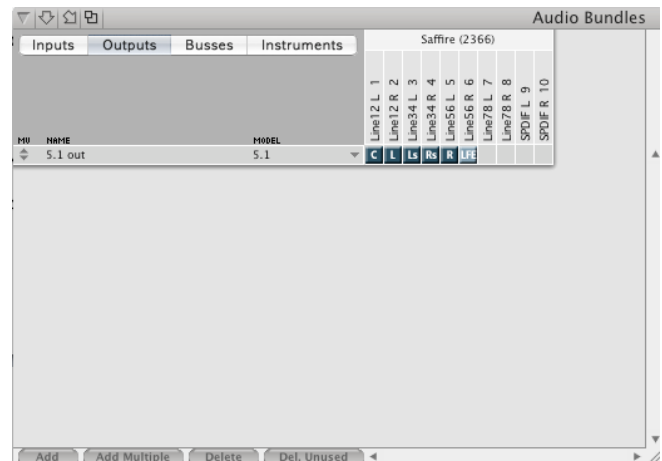
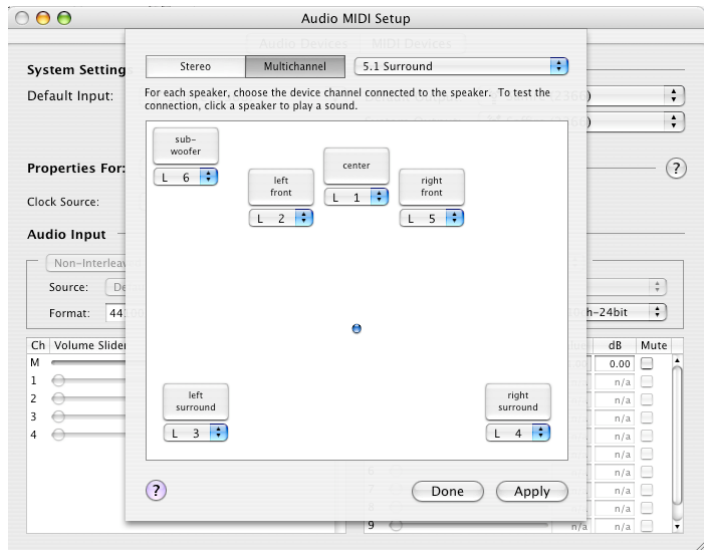
7. Repeat 5 and 6 until you have the desired number of tracks.
8. Click on the **Inserts** tab (on the left) for your audio track and *open* the ReSpatializer VST plug-in (For Cubase 4, it will likely be located under **Earlier VST Plug-ins->Surround**).



9. Select the proper output format in ReSpatializer to match the speaker arrangement of your output bus.
10. The number of Input Sources available depends on the number of channels in your audio track (usually one or two). Up to eight are supported by ReSpatializer.

ReSpatializer AU for Digital Performer

1. *Open* OS X's Audio MIDI Setup
2. *Select* **Configure Speakers > Multichannel** and specify your channel layout
3. *Open* Digital Performer
4. *Create* a new 'Empty' Project
5. *Select* **Setup > Configure Audio System > Configure Audio Driver**
6. *Select* your multi-channel device from this menu and *click* **OK**
7. *Select* **Studio > Audio Bundles>Outputs**
8. *Select* **Add** and name the new output. An example 5.1 layout is shown here
9. *Choose* the layout from the drop-down menu and place the speakers in the same layout as in your Audio MIDI Setup (see step 1)
10. *Drag* an audio file into the **Soundbites** folder
11. *Create* an audio track (**Project > Add Track > Audio Track**) and drag the Soundbite onto the newly created track
12. *Set* the output of the track to the proper output bus. Now you should hear sound when you press 'play'
13. Load **The Sound Guy Inc.: ReSpatializer** plug-in on the audio track you created by first going to the "Mixer" window in DP.
14. Important: Select the proper output format in ReSpatializer to match your layout in the Audio Bundle.

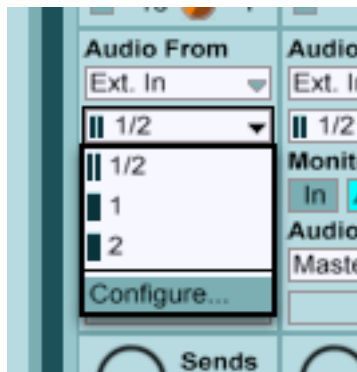


ReSpatializer for Ableton Live

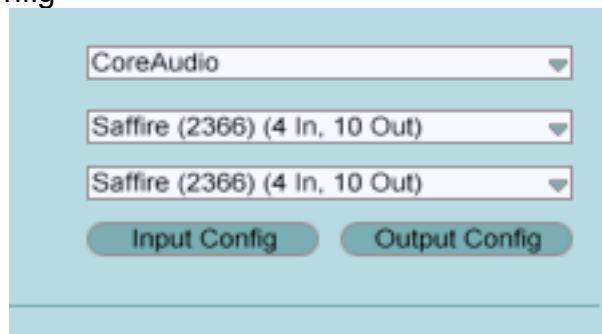
1. After launching Live, add an audio track; simply drag one onto your workspace from anywhere on your computer.



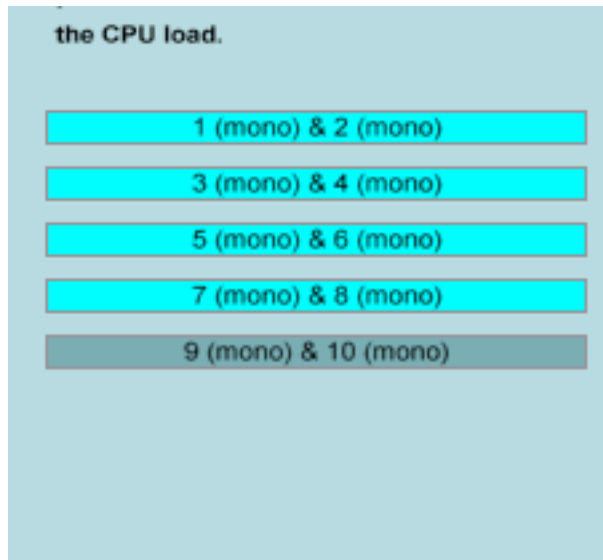
2. Then click on the output bus options at the bottom of the channel strip and select Configure.



3. Select Output Config



and activate as many output busses as you have available from your audio interface device.

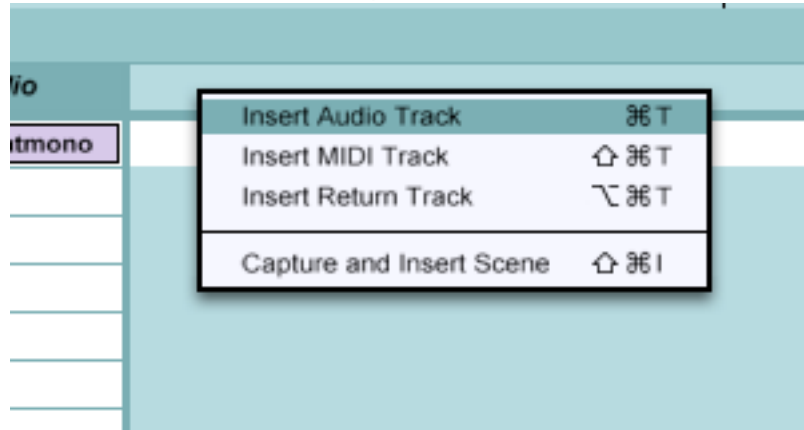


For example, if you have an 8 channel device, select up to 8 channels. (Mono vs. stereo doesn't matter; ReSpatializer only cares that they are there and exist.)

4. Select the plugins tab from from the options menu on the left toolbar and choose The Sound Guy > Respatializer.



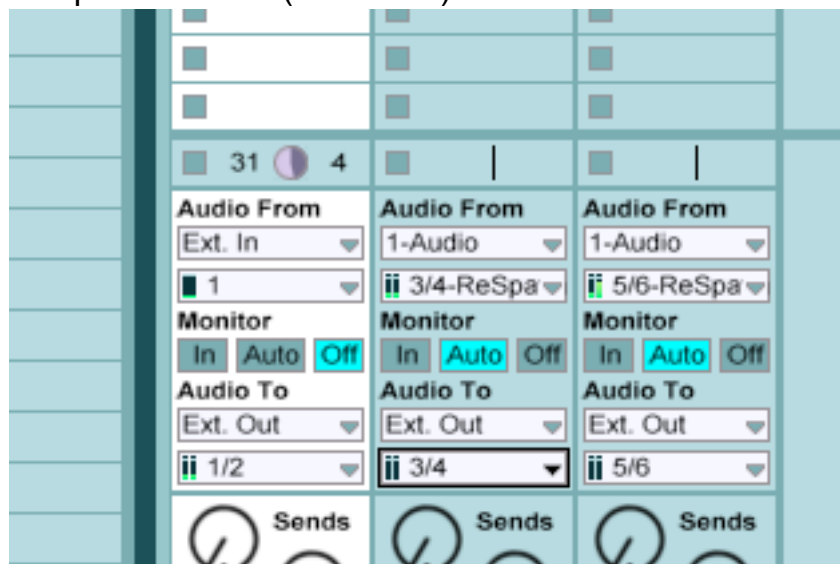
5. Create (number of desired tracks)/2 additional Audio tracks in Live.



6. Select the drop-down menu for Audio From and choose 1-Audio.



7. Select the drop-down menu for Audio To, choose Ext Out and select the appropriate output channels (3/4 or 5/6).



8. In the 2nd drop-down menu for Audio From, change the source to (3/4 or 5/6) ReSpatializer to make it match the previous step.

9. To get started, with the plugin, simply solo one of your input tracks and start playing with the controls.



Chapter 4: Basic Operation

Once you have set up the host program and loaded ReSpatializer, you can start by placing each of the input channels in the desired position, possibly monitoring them one at a time (“Solo” mode). After making any needed adjustments, listen to all channels at once and make any final adjustments.

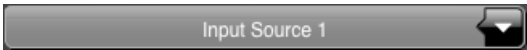
To use ReSpatializer:

1. *Set the desired output mode (Stereo speakers, binaural, 5.1, 7.1, etc.). Make sure this matches your device’s speaker arrangement.*
2. *Select one of the input channels. Solo it if you want.*
3. *Begin playback in your host program, and position the input to the desired Source Angle.*
4. *Adjust the Spread Amount as needed.*
5. *Adjust the Source Gains, Spin parameters, and Subwoofer Controls as needed.*
6. *Repeat steps 2-5 for the other input channels.*
7. *Once you have individually panned each of the input channels to the desired position, listen to all of the input channels together by disabling the Mute and Solo buttons.*
8. *Make any final adjustments to the Source Gains, Source Angles, Spread Amounts, Spin parameters, Subwoofer Controls and Output Gain.*

More information about the use of the controls is available in the next chapter.

Chapter 5: Controls

Input Controls

- *Source Selection:* This parameter switches between your available input audio tracks. If the file is monophonic, then one source will be available; if it is stereophonic, then two sources will be available; and so forth. Some hosts, such as DP5, allow input tracks in a surround format; each of those input tracks (L, R, C, Ls, Rs, etc.) will be individually available for localization. (Ls is the Left Surround track; Rs is Right Surround.)
- *Source Gain:* This slider controls the level of the currently selected Input Source.
- *Mute:* The Mute button mutes the currently selected Input Source.
- *Solo:* The Solo button solos the currently selected Input Source. When Solo is selected, any other inputs not soloed will be silenced.
- *Source Angle:* This parameter controls the apparent location around the head of the selected input source. Directly in front of the listener (looking at the center speaker) is considered 0°, and the angles increment linearly along a polar axis in a counter-clockwise fashion, from 0° to 360° (e.g., the left ear is at 90°, and the right ear is at 270°). Sliding this fader will change the apparent direction of the selected source.
- *Spread Amount:* Sometimes it is desirable to have an omni-present source, as opposed to one that is localized to a precise point in space. The Spread function will leak audio into neighboring speakers, with parametric control over the degree of leakage. The spreading algorithm is very gradual; at a setting of 0.5, audio will just be audible at a speaker location 180° away. At full spreading (1.0), audio will be heard equally in all output speakers (except for a subwoofer that may or may not be present). The Spread amount can be visualized as an arc around the Source Angle control. (The Spread control is not available in Binaural output mode.)
- *Spin Rate:* This parameter will set the source angle into motion around the listener's head. The rate can be set to a fixed speed up to 2 Hz.

This parameter has two additional parameters: *Tempo Sync* and *Clockwise Spin*. When the *Tempo Sync* button

is enabled, ReSpatializer will acquire the tempo from the host; this updates every



few milliseconds, so tempo changes in the master track are supported. When *Tempo Sync* is enabled, the Spin Rate will represent a rate relative to the tempo instead of an absolute rate. For example, a control value of 1.0 will cause a complete rotation over the time of 1 beat. The direction of rotation can be changed to spin clockwise instead of counterclockwise by clicking the Reverse Spin button.

Output Controls

- *Output Format:* The format selection tells ReSpatializer which speaker arrangement will be used. Many formats are available, including DTS, Film Alternative, ITU/AES/SMPTE/DVD, both with and without LFE options. Information about each of the formats is available in the Layouts table below.



- *Output Gain:* This parameter controls the gain on all output speakers, except a subwoofer.



- *LFE Gain:* This parameter controls the output gain of the subwoofer signal. This parameter is only active with an x.1 compatible output format.
- *LFE Cutoff:* This is the cutoff frequency of the subwoofer. Any signal below the cutoff will be routed to the subwoofer, and any frequency above the cutoff will be routed to the appropriate satellite speaker. This parameter is only active with an x.1 compatible output format.



- *Block DC:* This parameter will filter any infrasonic signal content below 20 Hz. It is used to remove any inaudible frequencies to keep the output power on the subwoofer track down. This provides extra headroom for, and extra power to audible frequencies above 20 Hz. This parameter is only active with an x.1 compatible output format.

Chapter 6: Output Formats and Speaker Arrangements

Output Formats

If you are not sure about your output layout, compare your channel manifest to this table; most likely you are using a standardized layout.

Output Format	Channel Layout	Comments
Stereo Mixdown	L R	The mixdown will take any number of output channels, and use a localization algorithm based each source location to create a stereo compatible mix.
2-ch Surround (Binaural)	L R	This uses important frequency and timing cues to simulate surround sound localization over two channels. Meant for use with headphones.
3-ch SMPTE/AES/ITU	L R C	(C)enter
4-ch SMPTE/AES/ITU	L R C Cs	(C)enter (s)urround
4-ch Quadraphonic	L R Lr Rr	(L)eft (r)ear, (R)ight (r)ear
5-ch SMPTE/AES/ITU	L R C Ls Rs	(L)eft (s)urround, (R)ight (s)urround
5-ch Pentaphonic	L R Ls Rs C	
5-ch DTS	L R Ls Rs C	
5-ch Film Alternative	L C R Ls Rs	

Output Format	Channel Layout	Comments
5.1-ch SMPTE/AES/ITU	L R C LFE Ls Rs	(L)ow (F)requency (E)ffects: subwoofer channel
5.1-ch DTS	L R Ls Rs C LFE	
5.1-ch Film Alternative	L C R Ls Rs LFE	
6-ch Hexaphonic	L R Lr Rr C Cs	
6.1-ch SMPTE/AES/ITU	L R C LFE Ls Rs Cs	
7.1-ch SMPTE/AES/ITU	L R C LFE Ls Rs Lr Rr	
8-ch Octaphonic	L R Lr Rr C Cs Ls Rs	

Common Speaker Arrangements

In setting up your speakers, some assumptions based on ISO standards, are made regarding the positioning of your surround speakers. Below are appropriate positioning locations for your satellite speakers and subwoofer. All angles given are oriented for 0° in front of the listener, increasing in the counterclockwise direction.

Speaker Name	Speaker Location
Left	30°
Right	330° or -30°
Center	0°
Left Surround	110°
Right Surround	250° or -110°
Center Surround	180°
Left Rear	145°
Right Rear	215° or -145°
LFE	Anywhere

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