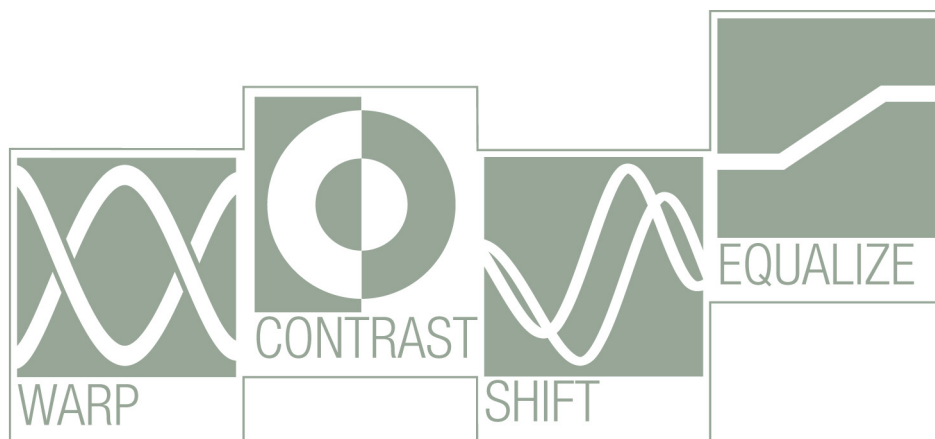


GRM Tools

Spectral Transform

User's Guide



version 3.7

Introduction

GRM Tools Spectral Transform (ST) is a bundle of four plug-ins that provide superb tools for sound enhancement and design. They are available in AAX, Audio Unit and VST (32 & 64 bits) and RTAS (32 bits) formats, and also as Stand-Alone application. Conceived and realized by the Groupe de Recherches Musicales (Musical Research Group) of the National Audiovisual Institute, Paris, France, GRM Tools is the result of numerous years of research and development by composers and sound designers in sound transformation software.

The following pages will take you through the installation and authorization process, describe the innovative interface devices created to make these plug-ins intuitive and musical, and explain the operations of the individual plug-ins.

Installation
Authorization
Universal Controls
Midi Management
Stand-Alone

Contrast
Equalize
Shift
Warp

Installation

Mac OS X

The installer puts the different files in the following folders :

- RTAS : Library\Application Support\Digidesign\Plug-Ins
- AAX : Library\Application Support\Avid\Audio\Plug-Ins
- VST : Library\Audio\Plug-Ins\VST\GRM
- Audio Units : Library\Audio\Plug-Ins\Components
- Stand Alone : Applications\GRM
- Documentation : GRM Tools Documentation

It installs also the Interlok Drivers necessary for authorization of the software.

To launch the installer, double-click on the **GRM Tools ST Installer.pkg** icon and follow the instructions. If you do not want to install all available architectures, select **Customize** in the **Installation Type** dialog and select the desired components.

PC Windows

The installer puts the different files in the following folders :

- RTAS : Program Files\Common Files\Digidesign\DAE\Plug-Ins
- AAX : Program Files\Common Files\Avid\Audio\Plug-Ins
- VST : GRM folder in the default VST folder (usually : Program Files\Steinberg\Plug-Ins\VST) or Program Files\VSTPlugins if the default folder is not defined.
- Stand Alone : Program Files\Ina-GRM\GRM Tools
- Documentation : My Documents\GRM Tools Documentation

It installs also the Interlok Drivers necessary for authorization of the software.

On 64 bits systems, 32 bits plugins and applications are installed in « Program Files (x86) » .

To launch the installer, double-click on the **GRM Tools ST Installer.exe** icon and follow the instructions.

Authorization

Buy GRM Tools ST

When you make your purchase, you will receive a serial number and a link to the iLok.com website enabling you to authorise the plug-in. Take great care of the serial number, as it constitutes proof of your purchase. You will need it to authorize the plug-in and to contact the technical support unit.

Authorize GRM Tools ST

Authorization is carried out through the iLok License Manager application. iLok License Manager is a new application for Mac and PC that allows you to more easily manage your licenses and iLok dongles.

The iLok dongle is no longer required. GRM Tools licenses can be either moved on the computer or on an iLok dongle.

- Create an account on iLok.com
- Download and install the latest iLok License Manager
- Launch iLok License Manager and sign in with your iLok.com ID
- Select « Redeem Activation Code » in « Licenses » menu
- Copy the activation code
- Drag the generated license on a location displayed on the left column (iLok dongle or computer).

Documentation and videos showing details of dongle and license management are available on the *iLok.com* website.

Universal Controls

Every plug-in contains a variety of interactive controls to vary, display, store, recall, and otherwise manipulate parameters. The controls are:

- Sliders
- Elastic String
- Numerical Value Fields
- Buttons
- Presets
- Tempo
- SuperSlider
- Agitation
- Save/Load
- Window resizing

Sliders



To change the value continuously, drag the handle to the left or right.

To jump to a new value, click along the path of the handle.

To reset the default value, click on the handle while pressing the [Alt] key.

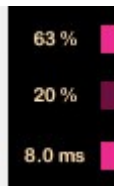
Only for 2DControllers, a click on the handle while pressing the [Shift] key limits movements to vertical or horizontal displacements.

Elastic String



To achieve smooth movement of Sliders, 2DControllers, or the SuperSlider, click on the object and move the mouse while holding down the [Command] key on Mac or [Ctrl] key on PC. Note: In general, the followspeed of the smoothing function depends upon the length of the Elastic String.

Numerical Value Fields



Note that a slider is often associated with a Numerical Value Field that shows the parameter value as a number or other alphanumeric character. You can change the value in a Numerical Value Field directly.

To change the value in a Numerical Value Field, click within the field and drag vertically upwards to increment a value or downwards to decrement a value. To modify the increment of change, drag while pressing the [Command] key on Mac or [Ctrl] key on PC.

Double clicking in a Numerical Value Field opens an editor enabling the direct modification of a parameter value. Clicking outside the field or the [Return] key ends value editing.

Caution: with some host applications, the [Return] key is interpreted as a host command and does not therefore end the editing of the value. In this case, click outside the editable field to end editing.

Buttons



Buttons are used to change a state or start a process.

To change the state of a Button, or to start a process, click on the Button.

Presets



Each plug-in has memorization capacities for all settings, and recall capacities for the memorizations.

Gradual transition from one preset to another is carried out by linear interpolation of

parameter memories. The memorisation zone is at the right of each window. It includes sixteen memorization boxes, an interpolation time control slider and a status field.

- To save your current configuration of parameter settings into any of the 16 Preset locations, click on a location number while holding down the [Command] key on Mac or [Ctrl] key on PC. Note that the Status Field, located under the Preset locations, gives the indication of the last performed operation.
- To call up a configuration of parameter settings from any of the 16 Presets, click on that Preset number. Note that the Status Field indicates 'Load'.
- To reload the factory configuration of parameter values, click while pressing down the [Alt] key. Note that the Status Field indicates 'Reset'.
- Note that the factory default settings for presets 15 and 16 are random values. Preset 15 applies a random variation of about 10% deviation from the current value as set by the user. Preset 16 generates a completely random set of parameter values.

The timing of the change from current values to the recalled Preset values is determined in one of two ways:

- It can be determined by the current position of the vertical Slider located to the right of the Preset numbers. To change the time of interpolation between current parameter values and Preset values, move the vertical Slider up or down to reflect your preferred timing.
- It can be recalled as one of the parameters saved in the Preset. To recall the time of interpolation from a Preset configuration along with other parameters, click on the Interpolation Button **M**, which is just underneath the vertical Slider, to activate it before you click on the Preset.

During interpolation, clicking on a slider or a value field, stops the interpolation of this parameter. The other parameters continue to be interpolated. To completely stop the interpolation, click the Status Field.

A preset content can be copied and pasted into another preset of the same kind. For instance, a Contrast VST preset can be pasted into another Contrast VST or even into a Contrast StandAlone.



A right-click on a preset opens a pop-up menu allowing to copy the preset into the clipboard. When a compatible preset is available, its number is shown and it can be pasted into the chosen preset. This new preset is now loaded.

Tempo

This feature is only available with certain applications such as Cubase SX, ProTools, etc..

Certain parameters, such as the time of interpolation between presets, can be synchronized with variations of tempo in a Pro Tools session. To initiate synchronization, hold down the [Shift] key and click on the Slider or Numerical Value Field associated with the parameter you want to synchronize. The display will indicate in bold characters the figures that represent the possible tempos. The figures and the tempos they represent are:

T/64	64th-note triplets
1/64	64th-notes
T/32	32nd-note triplets
./64	dotted 64th-notes
1/32	32nd-notes
T/16	16th-note triplets
./32	dotted 32nd-notes
1/16	16th-notes
T/8	8th-note triplets
./16	dotted 16th-notes
1/8	8th-notes
T/4	quarter-note triplets
./8	dotted 8th-notes
1/4	quarter-notes
T/2	half-note triplets
./4	dotted quarter-notes
1/2	half-notes
T/1	whole-note triplets
./2	dotted half-notes
1/1	whole-notes
./1	dotted whole-notes
1 bar	measure

Larger numbers are indicated in numbers of measures, as in 3 bar for three measures.

The parameters of each plug-in that can be synchronized are itemized in the sections dealing with the individual plug-ins.

SuperSlider



The horizontal SuperSlider and its associated Numerical Value Fields, located at the bottom of each window, provide a powerful control for interpolating between Presets. Use the SuperSlider to interpolate between any sequence of Presets to find new configurations and create new Presets.


- To select a Preset number in a Numerical Value Field, click in the field and drag vertically upwards or downwards.
- To change continuously from one Preset to another, drag the handle of the SuperSlider to the left or right.
- To disable a Numerical Value Field, click in the field and drag vertically downwards to an 'Off' position.

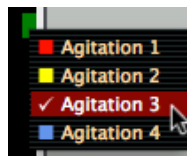
Agitation

This set of controllers enables the adding of random variations to the processing parameters. The left hand rotating potentiometer gives the amplitude (from 0% to 100%) of the random variation. The right hand rotating potentiometer gives the speed of the variations (from 0 to 60 s). The On/Off button under the two rotating potentiometers activates the variations.

Four agitation groups are available:



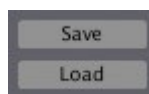
A left click on the coloured button  to the right of each alphanumeric value validates agitation for each individual parameter. A right click on the button opens the agitation group selection menu.



When the button is bright, the parameter is subjected to the variation. When it is dark, the variation has no effect.

Caution : In the default configuration, agitation is de-activated for all parameters.

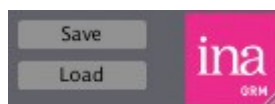
Save/Load



As an alternative to the save / load action in the host application, each plug-in contains Save / Load Buttons located in the bottom of the windows. These buttons allow you to save configurations of your plug-ins in a folder that you choose. They also allow you to exchange configurations of GRM Tools plug-ins in other environments in which GRM Tools is used.

- **Save** opens the file selector to save the complete configuration (current values of the parameters and the 16 presets).
- **Load** opens the file selector to recall a complete configuration (current values of the parameters and the 16 presets).

Window resizing



The plug-in window can be resized by clicking and dragging using the small triangle in the bottom right hand corner of the ina-grm logo.

Caution : Excessively large dimensions may slow down the display of data in the plug-in interface.

Midi management

All the processing parameters can be controlled by MIDI messages.

Important note: Some applications (for example Logic) do not send MIDI messages directly to the processings, but propose other solutions to bind the messages to the parameters.

MIDI messages

The MIDI messages recognized by the processings are the following channel messages:

- Control Change
- Note On
- Pitch Wheel
- Program Change
-

The discrete controls (buttons, menus, Preset) behave differently depending on the messages:

- **Control Change** : the message values (from 0 to 127) are mapped on the parameter variation range. For example, for a button, the values 0 to 63 trigger the “released” state, and the values 64 to 127 trigger the “pressed” state.
- **Pitch Wheel** : similar to the previous control, but with a 14 bit message value range, that is from 0 to 16383.
- **Program Change** : The program numbers correspond to the state of the parameter. For example, **Program Change** 1 and 2 correspond to the “released” and “pressed” state of a button. Alternatively, **Program Changes** from 1 to 16 correspond to the 16 processing presets.
- **Note On** : A basic note is bound to the parameter.
 - For parameters with two states (buttons, or two-choice menus) each sending of the **Note On** message with the same basic note switches the state of the parameter. The other **Note On** messages have no effect, and can therefore be used to control other parameters.
 - For parameters with more than 2 states (Preset, menus, etc.), the basic note corresponds to the first state, and the following note to the second state, etc. For example, if the LA 440 (midi 69) is bound to the Preset parameter, the LA will load preset 1, LA# preset 2, SI preset 3, etc. **Note On** messages outside the parameter variation range (for example, notes below LA440 in the previous example) are not taken into account.

The **Note On** messages can be processed in a special way by certain types of processing (for example, for **Evolution** transposition parameters). Refer to the description of each type of processing for more information on these special cases.

Binding a Midi message to a parameter

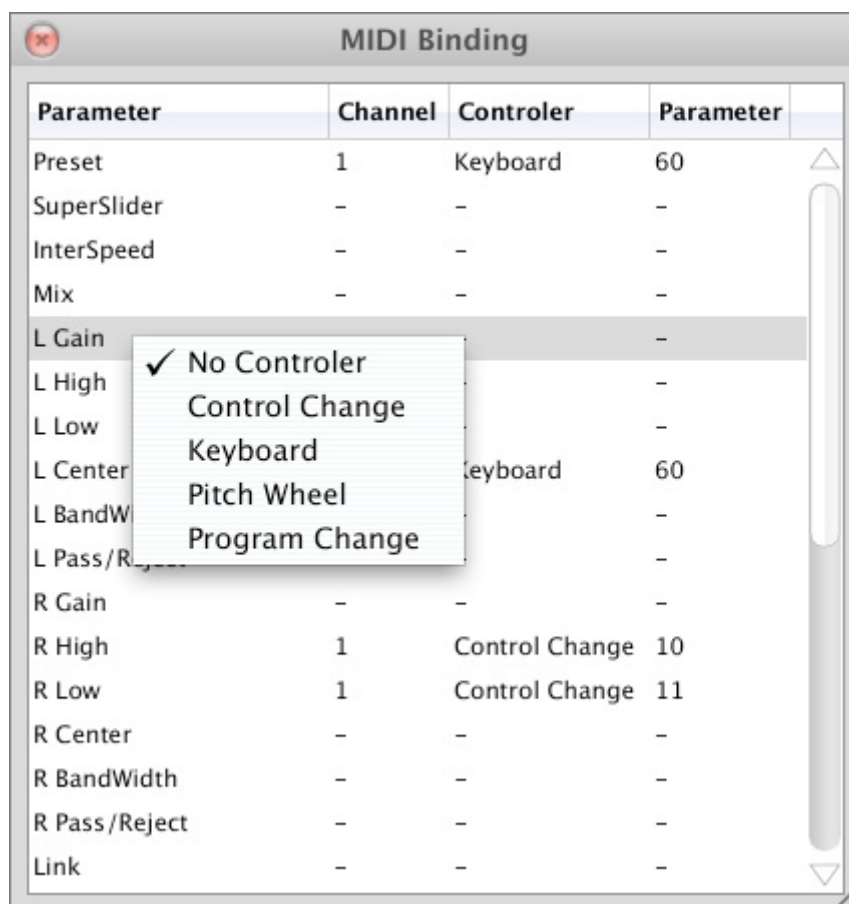


Click on the MIDI button located next to the ina-grm logo, and underneath the **Save** and **Load** buttons. A panel opens to the left of the button. Manipulate the parameter you want to control on the plug-in interface. Its name is displayed on the **Parameter** line. Then send the corresponding Midi message, which is displayed on the **Message** line in the following format:

[channel number][controller name][optional parameter]

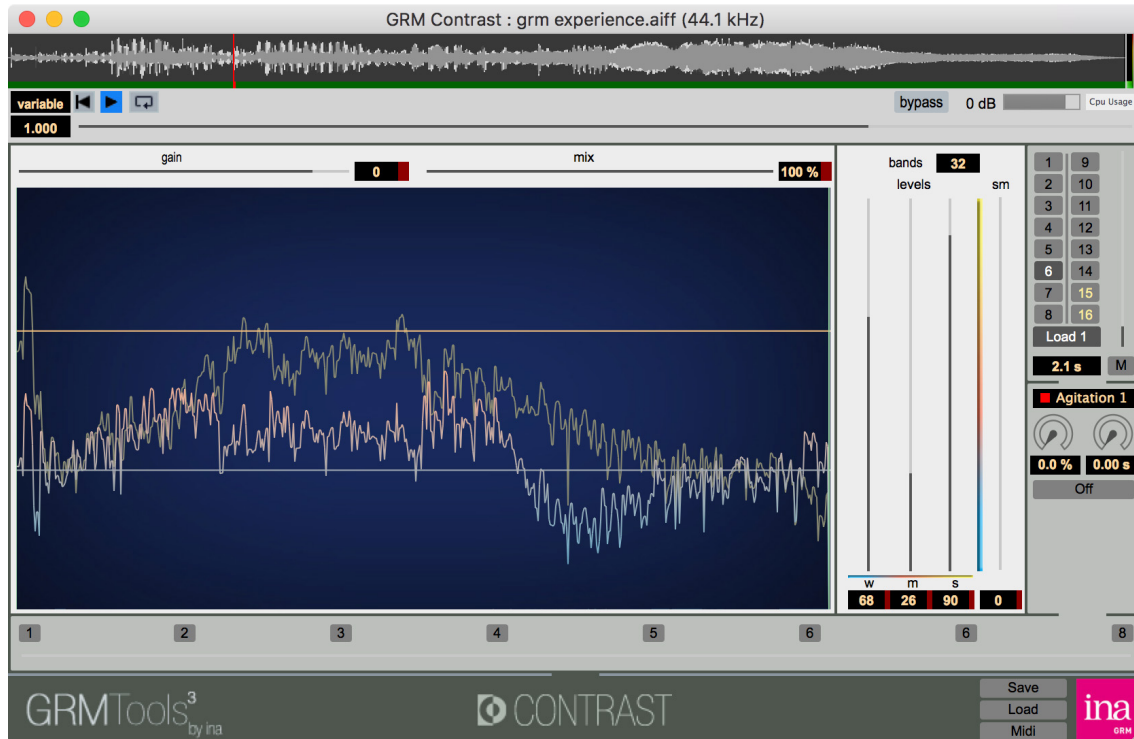
The binding between the Midi message and the parameter is carried out and memorized.

- **Unbind** : cancels the Midi binding of the parameter displayed
- **Close** : closes the panel
- **Reset All** : cancels the Midi binding of all parameters.
- **View** : opens the window shown below, which enables the viewing of all bindings, their modification and the addition of new ones.



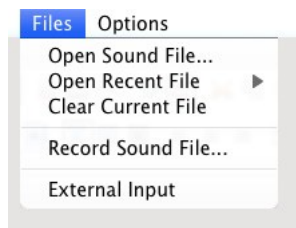
Stand Alone

The following descriptions only concern the stand-alone versions.



In this version, the processing window includes at the top a strip to control the reading and writing of sound files.

To select a sound input:



Select **External Input** in the **Files** menu to process an external sound.

Slide an audio file from a file browser into the horizontal grey zone at the top of the window

Select **Open Sound File...** or **Open Recent Files** in the **Files** menu.

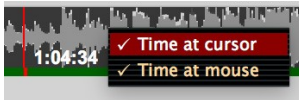
The file is loaded with a selection equal to its total time. To modify the start of the selection, click close to the start and slide the mouse. To modify the end, click close to the end and slide the mouse. Click&Drag inside the selection lets you simultaneously control the start and the end of the selection. A single click moves the cursor under the mouse.


The green bar under the waveform controls the zoom of the display.



The green zone corresponds to the displayed part, the red to the non-displayed. A click in the green zone followed by a vertical drag expands or narrows the zone. A horizontal drag moves the zone in time. A clic in the red zone moves the nearest bound.

A right clic on the waveform shows a contextual menu allowing to display the current time under the mouse and/or under the cursor.



The  buttons control the read cursor. The first button sends the cursor back to the start of the selection, the second starts the reading, or pauses it, and the third one loops reading on to the selection.

Two playing modes are available :



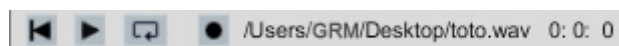
normal and variable. In variable mode, a slider and an alphanumeric field allow to change the playing speed from -2 (double speed backward) to +2 (double speed forward)

To record a sound file:

select **New Output Sound File...** in the **Files** menu.

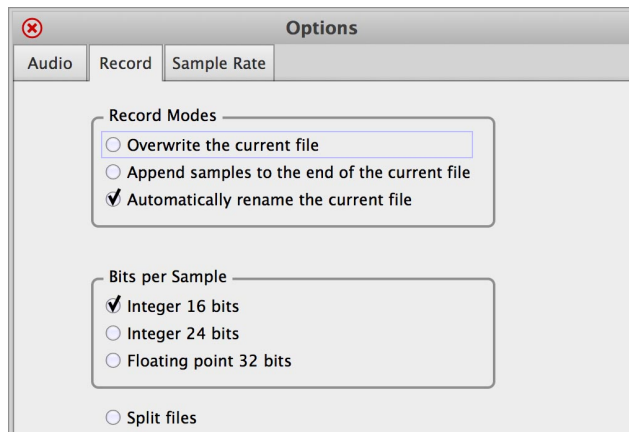
The file will be created in the WAV format. We recommend adding the extension .wav to avoid any confusion at a later stage.

When an output file is open, the appearance of the advance button bar changes:

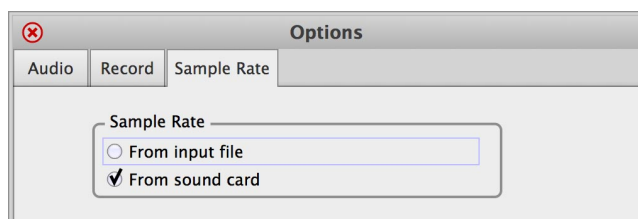


A new button can be used to start and stop recording. The name and the path of the file are indicated, and its time.

Option->Audio & Midi Setting, Record tab allows to choose the file resolution (16, 24 bits integer or 32 bits floating point) and the record mode:



Split File option allows to split the output file in multiple mono files.



Sample Rate option allows to choose the sample rate when the file sample rate and the output sample rate are different:

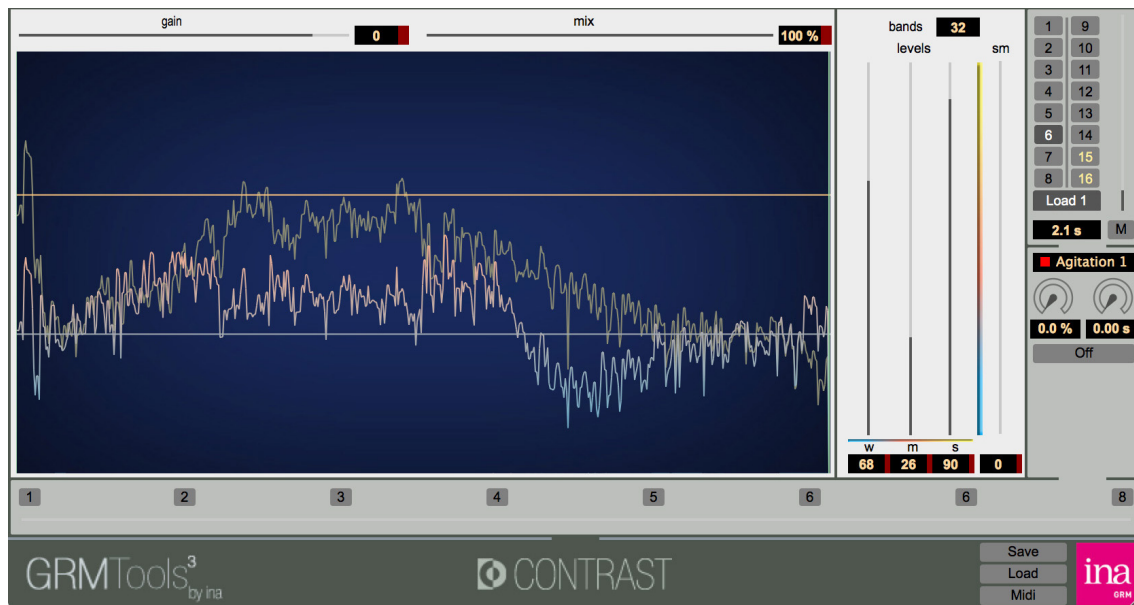
From input file : the output sample rate is set to the file sample rate, if possible.

From sound card : the output sample rate is not modified, and the file is resample to this rate.



Contrast

Use this plug-in to add vibrancy, liveliness, depth, and subtle changes in timbre to sounds in mastering applications. As one user said, "It makes my old tapes come alive again. Better than when they were originally recorded." Contrast can also be used to create a wide range of extreme transformations and effects.



How does it work?

Contrast takes a completely original approach to compression/expansion-type processing technique.

Contrast analyzes a user-defined frequency range within the spectrum of an input sound and groups the frequency components within that range according to the strength of their amplitudes. The groups are frequency components with strong amplitudes, frequency components with medium amplitudes, and frequency components with weak amplitudes. The strength of each of the groups can then be modified independently.

Why do this? Because this approach allows you to redefine the character of a sound in a powerful and original way. If you decrease the strength of the medium and weak amplitudes, thus emphasizing the strong amplitudes, for example, you'll make a sound more mellow. If you strengthen the medium amplitudes relative to the stronger and weaker amplitudes, you'll add vibrancy, liveliness, and depth to a sound. If you strengthen the weak amplitudes relative to the others, you'll make the sound more metallic, harsh, and percussive.

The controls are further explained below in the section called **Reference**.



A quick tutorial

We assume that you are familiar with basic operations, that you know how to record or import a sound into a mono or stereo track and how to access the different windows and insert plug-ins. For this tutorial, use a song or wide-bandwidth percussion track.

The Spectral Window

Start the playback. Notice that two spectrum are displayed in the **Spectral Window**.

The first waveform represents the input sound in yellow, red, and blue, where the yellow segments represent the 'strong amplitude' frequency components, the red segments represent the 'medium amplitude' frequency components, and the blue segments represent the 'weak amplitude' frequency components.

The second waveform, which is gray, represents the transformed sound.

The Line Delimiters

Now find the two horizontal **LineDelimiters** in the Spectral Window. The LineDelimiters are horizontal lines crossing the Spectral Window. The orange LineDelimiter is on top. The gray LineDelimiter is lower than the orange LineDelimiter.

Drag the orange LineDelimiter towards the top of the window.

As you drag the horizontal LineDelimiter upwards, you're decreasing the space of the top segment of the Spectral Window, which is where the 'strong amplitude' frequency components are shown. Note that in the spectrum display, less of the input spectrum is yellow, which is to say that fewer of the frequency components of the input spectrum are considered to be in the 'strong amplitude' category. As you drag the LineDelimiter upwards, you'll hear the sound becoming somewhat muted and more mellow.

Now drag the orange LineDelimiter downwards.

You're increasing the space of the top segment of the Spectral Window and, as the top segment gets larger, more of the input spectrum is yellow, which is to say that more of the frequency components of the input spectrum are considered to be in the 'strong amplitude' category. You'll hear the sound becoming brighter and louder.

Now drag the gray LineDelimiter downwards.

You're changing the number of frequency components that are considered to be in the 'middle amplitude' and 'weak amplitude' categories. Set the horizontal LineDelimiters to positions that you like.

Now find the two vertical LineDelimiters. Look to the extreme left of the Spectral Window and notice a green vertical line just at the left edge of the window. This is the left vertical LineDelimiter. Drag the left vertical LineDelimiter a little bit to the right from its position at the leftmost edge of the Spectral Window. Then look to the extreme right of the Spectral Window and notice another green vertical line just at the right edge of the window. Drag the right vertical LineDelimiter a little bit to the left from its position at the rightmost edge of the Spectral Window.

Low to high frequencies are displayed in the Spectral Window as left to right. The area between the vertical LineDelimiters determines the frequency range



that will be processed.

Hold down the [shift] key, click between the vertical LineDelimiters, and drag them together to the left or right.

Note that the the range of amplitude and frequency that will be processed, as indicated by the gray transformed waveform, appears only between the vertical LineDelimiters.

The levels sliders and bands numerical display

Find the three levels sliders to the right of the Spectral Window. Left to right, the sliders, marked **w**, **m**, and **s**, control 'weak amplitude', 'medium amplitude', and 'strong amplitude' frequency components. Note the numerical displays under the sliders. Drag the slider handles so that all three sliders show a value of '60'.

Now find the **bands** numerical display above the levels sliders. Set the bands numerical display to read '1'.

Move the rightmost levels slider **s** upwards.

The sound becomes fuller and louder while remaining mellow. You are increasing the strength of the frequency components in the 'strong amplitude' category. Note that if the horizontal LineDelimiters encompass all of the frequency components in the 'strong amplitude' category, you will be changing the amplitude of the entire spectrum.

Now move the middle levels slider **m** upwards.

Depending upon the frequency range you have selected with the vertical LineDelimiters, the sound becomes brighter. You are increasing the strength of the frequency components in the 'medium' category. Note that if the horizontal LineDelimiters encompass all of the frequency components in the 'medium amplitude' category, you will be changing the amplitude of the entire spectrum.

Now set the **bands** numerical display to read '32'.

The brightness effect of the left and middle levels sliders will be far more pronounced. By balancing the levels sliders in different ways, you can achieve a wide range of subtle effects.

Now set the **bands** numerical display to read '1024'.

The brightness effect of the left and middle levels sliders will be yet more pronounced. By balancing the levels sliders in different ways, you can achieve a wide range of effects, from subtle enhancements to dramatic transformations.

Summary

The LineDelimiters in the Spectral Window, the bands numerical display, and the levels sliders all affect the sound in different ways.

The LineDelimiters let you define the ranges of the sound that will be processed. Our advice is to start every new session with an equally divided amplitude range and the widest frequency range, and then narrow the ranges as you work.



The bands numerical display gives you a range of possibilities from enhancement to transformation. In general, at a setting of '1' the processed sound will be close to the input sound because the processing is very similar to a classic compressor / expander. As the number of bands increases, the effect of the processing becomes stronger and the processed sound will be increasingly transformed. If your goal is to enhance a sound, start by setting the bands numerical display to '1' and gradually increase the number of bands as you work with the sound. If your goal is timbral transformation, use higher numbers.

The levels sliders control the extent to which a sound is processed. In general, increasing the level of the weak frequency components will produce a more dramatic effect than balancing the strong and medium frequency components.

Store any configuration of the variables in a **Preset** and perform any sequence of Presets with the **SuperSlider**. If you're not familiar with these controls, have a look at the page called **Universal Controls**.

Reference

Spectral Window

This window displays a spectral representation of a sound before and after processing. Frequency is shown from 0 Hz on the left to 22,050 Hz (at 44,100 Hz sampling rate) or 24,000 Hz (at 48,000 Hz sampling rate) on the right. The spectrum of the input sound is shown in color. The spectrum of the processed sound is shown in gray.

The window is divided vertically into top, middle and bottom areas that are defined by the placement of the two horizontal LineDelimiters.

The area above the orange LineDelimiter displays the partials that are considered strong. The area between the orange LineDelimiter and the gray LineDelimiter displays the partials that are considered medium. And the area under the gray LineDelimiter displays the partials that are considered weak. To show this clearly, the spectrum of the input sound is shown in yellow, red, and blue, where yellow represents the strong partials, red represents the medium partials, and blue represents the weak partials.

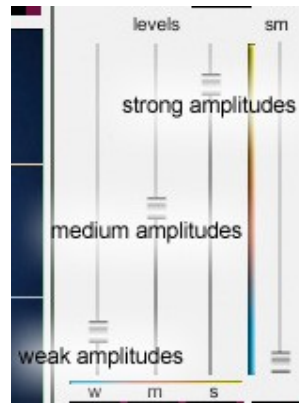
To modify the groups of strong and medium amplitudes, drag the orange LineDelimiter up and down. To modify the groups of medium and weak amplitudes, drag the gray LineDelimiter up and down. Note the changing colors in the spectral display.

There are also two vertical LineDelimiters at default positions at the extreme left and right of the spectral window. These vertical LineDelimiters define the frequency range within which the processing occurs.

To define a target frequency range, drag each of the two vertical LineDelimiters individually from their default positions. To drag the two vertical LineDelimiters together, hold down the [shift] key and move the mouse to the left or right.



levels



Manipulation of these sliders allows you to adjust the level of each group of amplitudes as defined in the **Spectral Window**. The **w** slider at the left controls the weak amplitudes, the **m** slider at the center controls the medium amplitudes, and the **s** slider on the right controls the strong amplitudes.

sm

This is a smoothing function that creates a 'legato' effect between sharp loudness and timbral changes in the transformed sound. When the **sm** slider is moved towards a value of 0, loudness and timbral changes will be the most pronounced. When the **sm** slider is moved towards a value of 100, loudness and timbral changes will be more smoothed. At 100, depending upon the specific sound, there may be a 'freeze' effect of no change. At high numbers, the changes will occur very slowly.

bands

This numerical display controls changes in the way the levels sliders affect the input sound. When **bands** is set to '1', the input sound is processed as one single frequency band, which means that changes in amplitude, as controlled by the levels sliders, are applied to all of the spectral components of the entire sound. When **bands** is set to more than '1', the input sound is analyzed into the specified number of frequency bands, and changes in amplitude, as controlled by the levels sliders, are applied separately to the spectral components of each band.

gain

This slider controls the level of the output signal from -96 to +12 dB.

mix

This slider controls the balance between the input signal and the processed signal. At 100%, you hear only the processed signal. At 0%, you hear only the input.

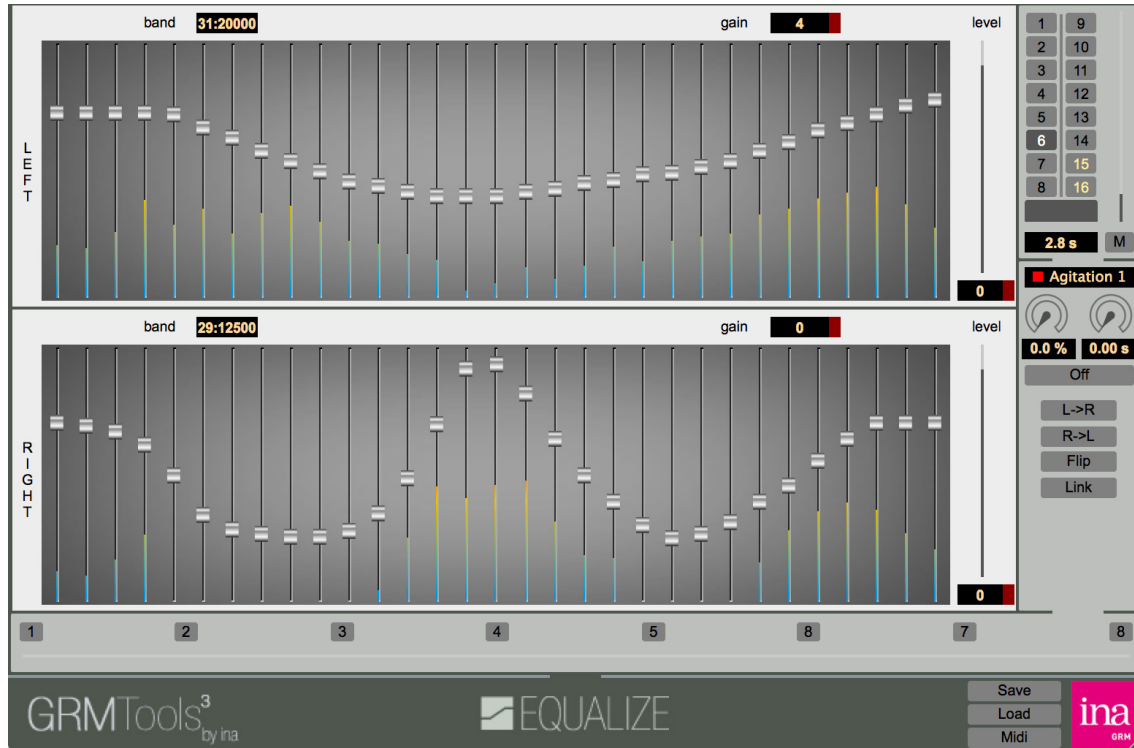
tempo

The interpolation time between presets can be synchronized to tempo. To initiate synchronization, hold down the [Shift] key and click on the Numerical Value Field under the Presets



Equalize

This plug-in gives you powerful and dynamic controls to rebalance the highs, lows, and midrange of a sound. In the stereo version of this plug-in, you can control the equalization curves of left and right channels independently or together.



How does it work?

Equalize is a 31-band graphic equalizer. Each band, controlled by a single slider, is 1/3-octave according to the ISO norm. Intuitive mouse-and-key commands are used to manipulate the slider controls easily and responsively. You can create an equalization curve with simple mouse gestures, for example, or move the curve to higher or lower frequencies, or control any number of sliders as a group. This plug-in turns an equalizer into a performance instrument.

The controls are further explained below in the section called **Reference**.



A quick tutorial

We assume that you are familiar with basic operations, that you know how to record or import a sound into a mono or stereo track and how to access the different windows and insert plug-ins. For this tutorial, use any full-bodied sound.

Start the playback. Move several sliders individually by clicking above or below each slider, or dragging a slider by its handle.

Then reset all of the sliders to unity gain by holding down the [Alt] key and clicking anywhere in the slider panel.

Create an equalization curve with the elastic string. Press the [Command] key on Mac or [Ctrl] key on PC while dragging a slider up and down. An elastic string appears between the mouse and the slider handle. While keeping the mouse horizontally close to the slider, move the mouse up and down on the screen. A few sliders move. Now move the mouse horizontally further away from the slider. Several more sliders move. Note that the elastic string can be an extremely powerful tool in creating a smooth equalization curve.

Move the equalization curve to higher or lower frequencies. Simultaneously press the [Ctrl] key on Mac or [Shift][Ctrl] key on PC and move the mouse horizontally.

You are moving the equalization curve to higher or lower frequencies, depending upon the direction in which you are moving the mouse. Note that the first slider value in either direction will wrap around to become the last slider value as you continue to move the mouse.

Control several sliders as a group. Select several different sliders by holding down the [Shift] key while clicking in their handles.

A yellow light starts to blink in each handle. Drag any yellow blinking slider up or down and note that all of the selected sliders will move together. Shift-click a yellow blinking slider a second time to deselect it. Click a non-selected slider to deselect all of them.

Store any configuration of the variables in a **Preset** and perform any sequence of Presets with the **SuperSlider**. If you're not familiar with these controls, have a look at the page called **Universal Controls**.

Reference

31 sliders

The vertical position of each slider indicates the level, from -96 dB to +12 dB, of a 1/3-octave frequency band. Note: Unity gain is indicated by the horizontal lines at the 2/3-level in the slider panel.

Reset all of the sliders to unity gain. Hold down the [Alt] key and click anywhere in the slider panel.

Control each slider individually. Click under or above a slider, or on a slider's handle and drag it to the desired level.



Control the sliders with a variable global control. Press the [Command] key on Mac or [Ctrl] key on PC and drag the mouse within the area of the fader panel to activate the elastic string. Note that the larger the sideways distance between the mouse and a selected slider, the more sliders will be affected by your movement.

Move all of the sliders horizontally. Hold the [Ctrl] key on Mac or [Shift][Ctrl] key on PC key down while moving the mouse horizontally. Note the wrap-around effect between the last and first slider. In moving the mouse towards the left, for example, the value of each slider will be transferred to the slider before it and the leftmost slider value will be transferred to the rightmost slider value.

Control several sliders together. First select each slider that you want to be a part of the ensemble by holding down the [Shift] key while clicking on the slider handle. Note that a blinking yellow bar will appear in the handle. Then move the group of sliders by dragging one of them to a different level. To cancel the group, click anywhere in the fader panel window.

Level

This slider controls the level of the output signal from -96 dB to 12 dB.

Band

This numerical value field shows the center frequency of the current band.

gain

This numerical value field shows the difference from unity gain in DB in the band displayed in band.

tempo

The interpolation time between presets can be synchronized to tempo. To initiate synchronization, hold down the [Shift] key and click on the Numerical Value Field under the Presets

Equalize Stereo.

In the stereo version of this plug-in, you can control independently or coordinate the equalization curves between left and right channels.

l -> r

Click on this button to copy the equalization curve from the left channel to the right channel.

r -> l

Click on this button to copy the equalization curve from the right channel to the left channel.

flip

Click on this button to cause the equalization curve from one channel to be swapped with the other channel.

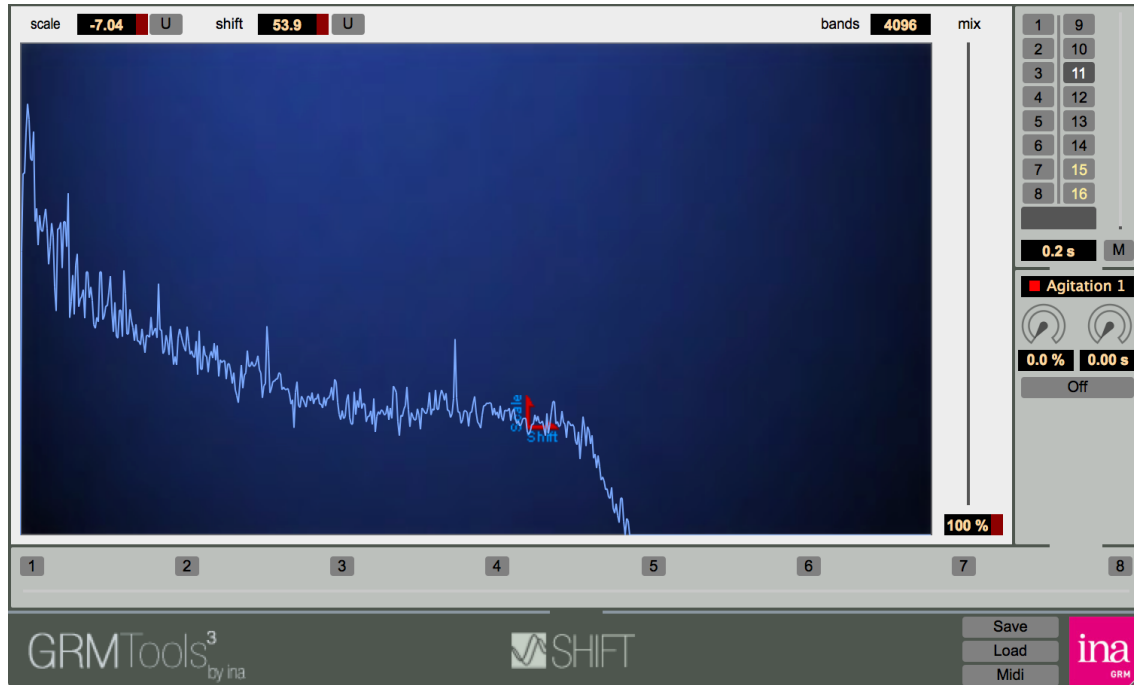
link

Click on this button to control the equalization curves of both channels together.



Shift

Use this plug-in to transpose or transform a sound by any combination of frequency scaling or frequency shifting.



How does it work?

Shift contains two functions that can be used separately or together.

The **scale** function transposes a sound by multiplying each spectral component by a constant frequency.

The **shift** function is a frequency shifter, sometimes referred to as a single-sideband ring modulator, that adds a constant frequency to each spectral component. When you use a frequency shifter, harmonic sounds become inharmonic.

The controls are further explained below in the section called **Reference**.

A quick tutorial

We assume that you are familiar with basic operations, that you know how to record or import a sound into a mono or stereo track and how to access the different windows and insert plug-ins. For this tutorial, use a vocal or melodic sound.



Before beginning this tutorial, do the following:

Click on the **U/L** buttons to the right of **scale** and **shift** to be sure that both buttons are set to **U**, for 'Unlock'.

Then hold down the [Alt] key and click anywhere in the window to reset **scale** to '0' and **shift** to '0'.

Then click on the **U/L** button to the right of **shift** to set it to **L**, for 'Lock'. This will let you change the value for **scale** while **shift** remains unchanged.

Scale

Start the playback. Change the value for **scale** by moving the 2DController, which is the red L-shaped control in the middle of the window, up and down.

You will hear that the sound is transposed as you move the 2DController. Note also that the timbre of the sound will change with the transposition.

Now click on the **U/L** button to the right of **scale** to set it to **L**, for 'Lock'. Then click on the **U/L** button to the right of **shift** to set it to **U**, for 'Unlock'. This will let you change the value for **shift** while **scale** remains unchanged.

Shift

Change the value for **shift** by moving the 2DController left and right.

You will hear transformations of the sound as you move the 2DController. Note also that the sound will be transposed as it is transformed.

Store any configuration of the variables in a **Preset** and perform any sequence of Presets with the **SuperSlider**. If you're not familiar with these controls, have a look at the page called **Universal Controls**.

Reference

scale

This numerical value display lets you select a number between '-12' and '12' that will be used to multiply the frequency of each spectral component of the input sound.

A value of more than '0' will transpose each spectral component higher. A value of '12' will transpose each spectral component to one octave higher.

A value of less than '0' will transpose each spectral component lower. A value of '-12' will transpose each spectral component to one octave lower.

To lock the current value, click on the **U/L** button at the right of the numerical value display to set it to **L**. To allow values to change, set it to **U**.

shift

This numerical control lets you select a number from -4000 to +4000 Hz that will be added to or subtracted from each of the spectral components of the input sound.



To lock the current value, click on the **U/L** button at the right of the numerical value display to set it to **L**. To allow values to change, set it to **U**.

bands

This numerical value display changes the frequency resolution of processing from 128 to 4096 spectral bands.

Use lower numbers for greater precision in the time domain. Lower numbers will produce crisper attacks and sharper changes, but there may be a grainy effect in the sound.

Use higher numbers for greater precision in the frequency domain. Higher numbers will produce finer timbral gradations, but you may hear effects of phasing, short reverberations, and less defined attacks.

2DController

Drag the 2DController vertically to control **scale** and horizontally to control **shift**. To reset **scale** to a value of 0 and **shift** to a value of 0, hold down the [Alt] key and click anywhere in the main part of the window.

mix

This slider controls the balance between the input signal and the processed signal. At 100%, you hear only the processed signal. At 0%, you hear only the input.

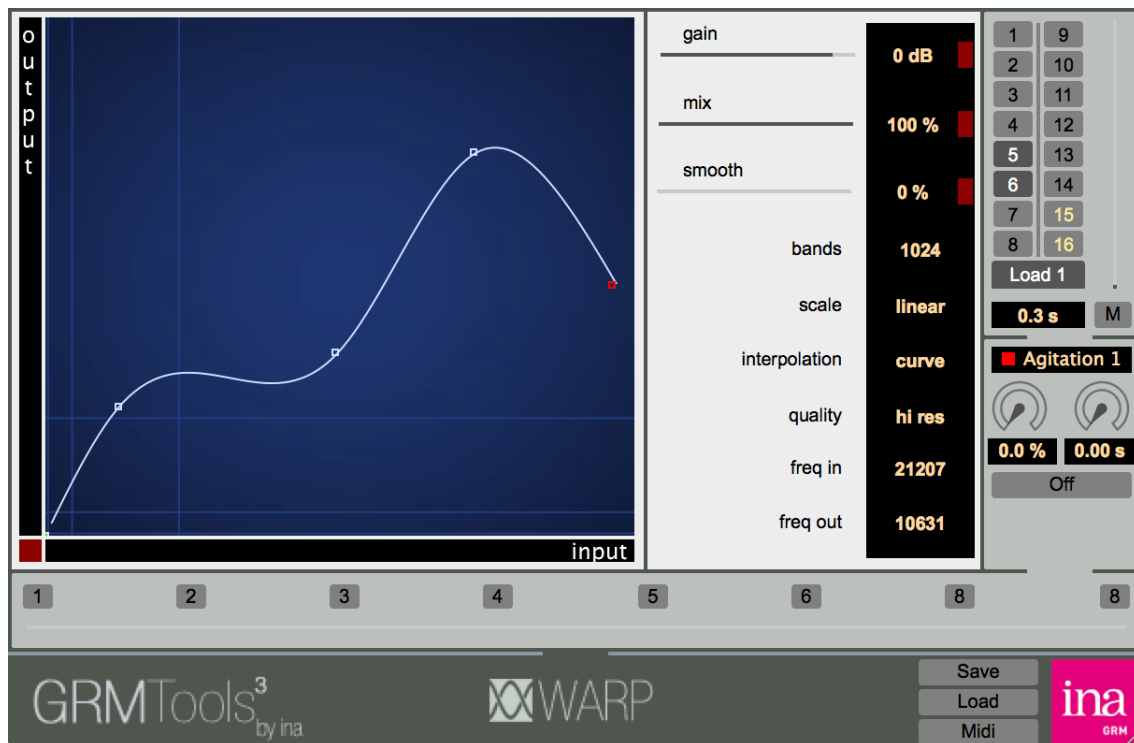
tempo

The interpolation time between presets can be synchronized to tempo. To initiate synchronization, hold down the [Shift] key and click on the Numerical Value Field under the Presets



Warp

Use this plug-in to transform a sound by rearranging its frequency components in a completely free and creative way. One user said, "This is the most far out, the most radical, the most bizarre, powerful, and effective sound transformation tool I have ever seen."



How does it work?

Note in the screenshot above that there is a control window bordered by a horizontal bar beneath it, marked 'input', and a vertical bar to the left, marked 'output'. Note also that there is a diagonal curved line drawn through the window, with segments of the curve marked by a junction point.

The input bar beneath the control window shows a bar display of the frequency components of an input sound, where low-to-high frequencies are represented left to right and the intensity of the frequency components is represented by color. The output bar to the left of the control window shows a bar display of the output sound, where low-to-high frequencies are represented bottom to top and the intensity of the frequency components is represented by color density.

The diagonal line shown in the control window defines the transpositions from input sound to output sound. When the diagonal line is straight from lower left to upper right, the position of any point on the line indicates the same frequency along the input and output bars. When you click on the diagonal line, or anywhere in the control window, you create a junction point at a specific position that represents a source frequency in the input sound and a destination



frequency in the output sound. You are, in effect, transferring a frequency from the input sound to a new position in the output sound, and the output sound will contain a rearrangement of the frequency components of the input sound. This can result in a radical change in timbre.

The controls are further explained below in the section called **Reference**.

A quick tutorial

We assume that you are familiar with basic operations, that you know how to record or import a sound into a mono or stereo track and how to access the different windows and insert plug-ins. For this tutorial, use any wide-bandwidth sound.

As you work through this tutorial, bear in mind that small changes can produce very dramatic results. Before you begin, if the diagonal line, called the 'transfer line', is not straight, hold down the [Alt] key and click anywhere in the control window to reset it to be straight.

Transfer frequencies

Start the playback. Notice that the frequency components of the input and output sounds will be shown in the bar displays and that they will be the same. Position the mouse at any point along the transfer line, or anywhere in the control window, and click.

A junction point will appear.

Look to the right of the control window for the vertical black bar that contains numbers. Note, at the bottom, the numbers for **freq in** and **freq out**.

These numbers indicate the frequency position of the junction point relative to the input sound and output sound.

Now drag the junction point to the left so that the number for **freq in** is lower, and then drag it upwards so that the number for **freq out** is higher.

What you are doing is 'transposing' the frequency from the input sound to another level in the output sound.

Following the same procedure, create several different junction points at different positions. Then erase a junction point by dragging it vertically up or down to a position outside of the control window and releasing the mouse button.

The transfer line will bounce back without the junction point.

Now reinitialize the transfer line by holding down the [Alt] key and clicking anywhere in the control window.

Look at the top right corner at the highest point in the transfer line. You'll see a junction point. Being careful not to create a new junction point, drag that point towards the left.



Notice that the entire transfer line moves to the left and the sound is transposed higher.

Now drag the point downwards along the right edge of the control window.

Notice that the entire transfer line moves downwards and the sound is transposed lower.

Now drag the point towards the center of the control window.

Notice that the effect is of a low-pass filter because the low sounds of the input sound are transferred to the low range of the output.

Other controls

Move the **smooth** slider to the right.

Notice that loudness and frequency changes become smoother and more gradual.

Look at the **bands** numerical display. Change the number of bands from 1024 to 128 by clicking on the number and moving the mouse upwards.

Note that attacks are sharper and the sound is fuzzier. Then change the number of bands back to 1024 and note that the sound is cleaner but that you may hear phasing or short reverberation effects.

Store any configuration of the variables in a **Preset** and perform any sequence of Presets with the **SuperSlider**. If you're not familiar with these controls, have a look at the page called **Universal Controls**.

Reference

transfer line

The transfer line, which takes the form of a segmented line or curve that extends diagonally from bottom left to top right of the control window, defines the way the frequency components of the input sound will be redistributed in the output sound. You can redistribute the frequency components of a sound by changing the positions of 'junction points' anywhere in the transfer line.

Create a new junction point. Click inside the control window at the place you'd like the point to appear. Or click at any place on the transfer line. The last point selected is red.

Reset a junction point. To reset a junction point to a position on the diagonal line, hold down the [Alt] key and click on the junction point.

Move a junction point to another position. Click on the junction point and drag it to its new position. Note: A junction point cannot be moved beyond the position of an adjacent point.



Move a junction point using the numerical value displays. See **freq in** and **freq out** below.

Move a group of junction points. To select a junction point that you will want to be a part of the group, hold down the [Shift] key and click in the point. Note: A little green circle will appear within the point. To move the ensemble of junction points, hold down the [Command] key on Mac or [Ctrl] key on PC and drag the mouse in any direction within the control window.

Note: The group of junction points will follow your mouse movement. To deselect a junction point, hold down the [Shift] key and click in the point. To select or deselect all the points, hold down the [Shift] key and click anywhere in the window.

Position a junction point at 0 Hz or 22.5 kHz in the output sound. Gently drag the point vertically downwards to less than 20 pixels outside of the control window. To place a junction point to represent 22.5 kHz in the output sound, gently drag the point vertically upwards to less than 20 pixels outside of the control window. These values are useful for offsetting the starting and ending positions of the transfer curve.

Erase a junction point. Drag the junction point vertically up or down to beyond 20 pixels outside of the control window and then release the mouse button. The curve will snap back into place without the junction point.

Reset the transfer line to its default position as a straight diagonal line. Hold down the [Alt] key and click anywhere in the control window.

gain

This slider controls the level of the input signal from -96 to +12 dB.

mix

This slider controls the balance between the input signal and the processed signal. At 100%, you hear only the processed signal. At 0%, you hear only the input.

smooth

Creates a 'legato' effect between sharp loudness and timbral changes in the transformed sound. When the **smooth** slider is moved towards a value of 0, loudness and timbral changes will be the most pronounced. When the **smooth** slider is moved towards a value of 100, loudness and timbral changes will be more smoothed. At 100, depending upon the specific sound, there may be a 'freeze' effect of no change. At high numbers, the changes will occur very slowly.

bands

This numerical control changes the frequency resolution of processing from 128 to 4096 spectral bands.

Use lower numbers for greater precision in the time domain. Lower numbers will produce crisper attacks and sharper changes, but there may be a grainy effect in the sound.



Use higher numbers for greater precision in the frequency domain. Higher numbers will produce finer timbral gradations, but you may hear effects of phasing, short reverberations, and less defined attacks.

scale

The range of frequencies represented by the transfer line is from 0 Hz in the lower left corner to 22050 Hz in the upper right corner. **scale** refers to the relationship between a frequency within that range and a position within the transfer curve. Use the grid in the spectrum window as a guide to positions that correspond to 100 Hz, 1000 Hz, and 5000 Hz, depending upon the the scale. The choices of scale are:

linear. Relationships between frequency and position on the transfer line are displayed such that equal differences in frequency are represented by equal distances along the transfer line. Halfway through the frequency range, for example, is represented as halfway along the transfer curve. The center of the control window represents 11025 kHz, which is to say half of the highest frequency.

log A. Relationships between frequency and position on the transfer curve are displayed in a logarithmic relationship. The center of the control window, for example, represents 3675 Hz. Because half of the transfer curve is used to control frequencies less than 3 kHz, this display allows for a better control of bass frequencies.

log B. Relationships between frequency and position on the transfer curve are displayed in a sharp logarithmic curve. The center of the control window, for example, represents 1837 Hz. Because half of the transfer line is used to control frequencies less than 1.8 kHz, this display allows for yet better control of bass frequencies.

interpolation

The type of interpolation between the junction points in the transfer line can be either of the following:

linear. The junction points are connected by straight lines.

curve. The junction points are connected by curves. Attention: Junction points that are very close to each other can result in exaggerated amplitudes at those frequency levels.

quality

This numerical value display lets you control the output resolution of the sound. Use **LowRes** when the demands on your CPU are too great to support **HighRes**. Use **HighRes** for better frequency resolution.

freq in

This numerical value display shows the value of a frequency in the input sound that corresponds to the selected junction point. The frequency shown depends upon the scale and the interpolation settings as explained above. Note: The numerical value display can also be used to change the frequency position of a junction point.

To use this numerical value display to specify a frequency in the input sound, click on the number and move the mouse up or down. Note: The step of increment or decrement may be as small as 1 Hz and too small to see in the position of the junction point, but the change in value, however small, is used in the spectral transformation. To increase the size of the step of increment or decrement to 100 Hz, press the [Command] key on Mac or [Ctrl] key on PC while



moving the mouse.

freq out

This numerical value display shows the value in Hz of a frequency in the output sound that corresponds to the selected junction point. The frequency shown depends upon the scale and the interpolation settings as explained above. Note: The numerical value display can also be used to change the frequency position of a junction point.

To use this numerical value display to specify a frequency in the output sound, click on the number and move the mouse up or down. Note: The step of increment or decrement is 1 Hz and may be too small to see the result in the position of the junction point. To increase the size of the step of increment or decrement to 100 Hz, press the [Command] key on Mac or [Ctrl] key on PC while moving the mouse.

tempo

The interpolation time between presets can be synchronized to tempo. To initiate synchronization, hold down the [Shift] key and click on the Numerical Value Field under the Presets

Credits

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Documentation

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La création et la recherche
dans le domaine du son
et des musiques électroacoustiques