TASCAM GigaEditor 4

GigaStudio 4 Instrument Editor

User Manual

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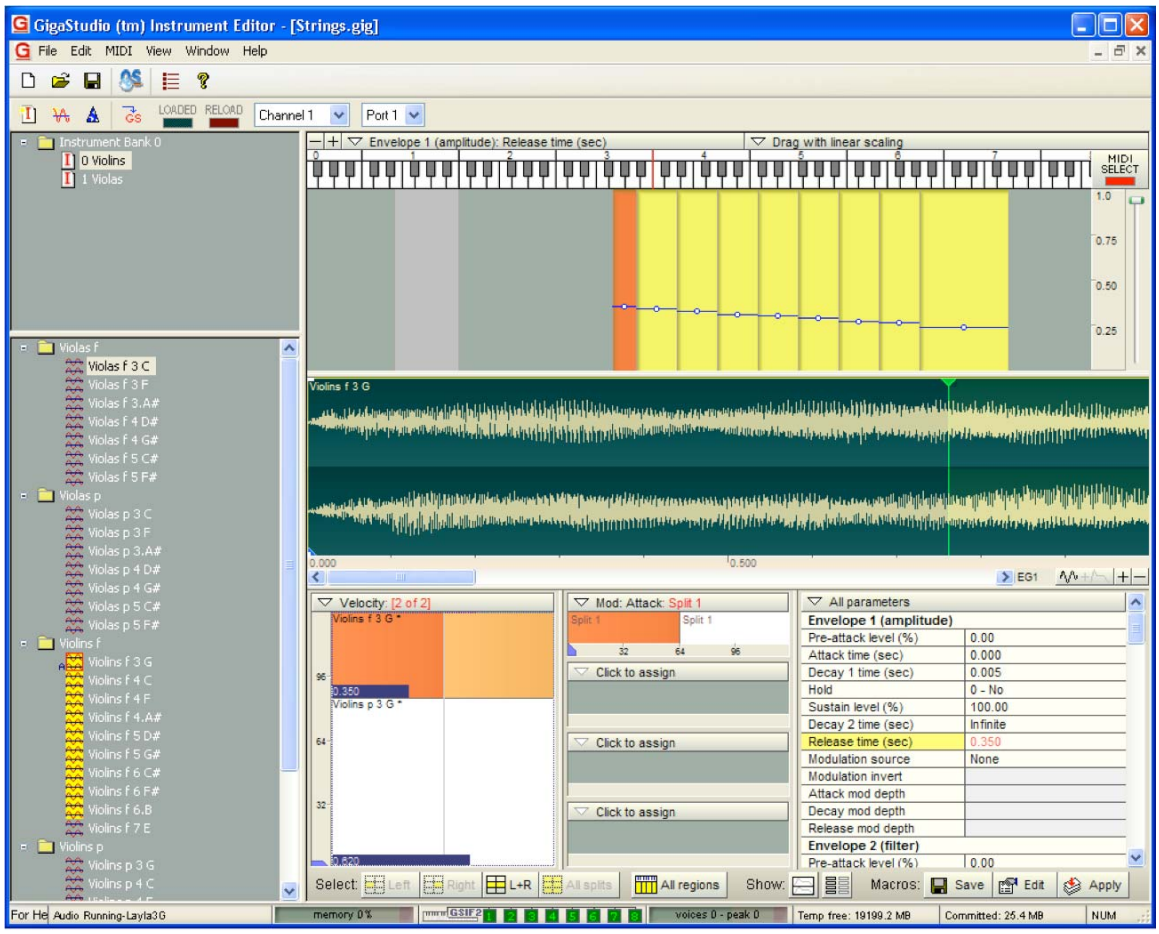
Chapter 1: About the GigaStudio 4.0 Instrument Editor

The GigaStudio Instrument Editor is a separate application that works with GigaStudio. The Editor allows you to create your own instruments or edit existing Giga instruments.

You can run the Editor simultaneously with GigaStudio, but it's not necessary. The Editor itself can load instruments into memory, allowing you to hear your edits by playing an external MIDI controller or by right-clicking the on-screen keyboard.



What's New?

Giga Editor 4.0 includes the following changes from version 3.0:

1. The Dynamic Expression Filter, which in Giga 3 was accessible only through the use of a specially formatted initialization file, is now exposed in the Editor as part of the normal parameter scheme. Some of the DEF parameters are global to an instrument, and are found on a new tab in the Instrument Properties dialog. The DEF coefficients are part of the subregion articulation and are edited with the usual tools (the parameter value list and the "blue ball" graph).

2. The control panel for the Mono Mode iMIDI rule has a new tab with a graphical editor for the Portamento Reshaping Filter, which like the DEF was previously accessible only by editing an initialization file.

3. The wave view has a new mode in which the sample is drawn as if the amplitude envelope has already been applied to it. This mode is toggled by a small button near the zoom and unzoom buttons.

4. Giga 4 supports a unique audition sample for each instrument in a .GIG file (not just a single audition sample for the whole file). Right-click on a sample for options.

5. Right-clicking in the parameter value list (lower right) brings up a new "Copy to all instances" menu option. The value of the selected parameter is copied to all subregions throughout the file that are mapped to the same sample as the current one. For example, if a sample is found to benefit from a fine tuning change, this feature can quickly copy the new tuning to any other splits to which the same sample is asssigned.

6. The right-click menu in the sample list has a new option, "Replace all samples in all folders." This is an expansion of the existing "Replace all samples in folder" command. The editor searches a specified root directory and its subdirectories, replacing any sample if a .wav or .dxl file with a matching name is found. (There is a more selective option for cases where the samples on disk are arranged in subdirectories that mirror the folders in the .gig file. When this option is in effect, samples in a given folder will be replaced only by files found in a subdirectory of the same name as the folder.)

7. The maximum number of layers (splits in a layer dimension) has been increased from 8 to 128.

8. While in the past it's been easy to change the controller assigned to a dimension, velocity has been an exception: once a velocity dimension, always a velocity dimension. Giga Editor 4.0 will now allow a velocity dimension to be changed to any other controller. Note that when this is done, the dimension will move from the dedicated velocity window to one of the unused small dimension windows.

9. An instrument can now cause up to two MIDI controllers to be initialized to specified values whenever it is loaded. The controllers and their desired values are specified in the Instrument Properties. This is for instruments using features like the Dynamic Expression Filter, which might sound best when the controlling CC value is set to something other than the default.

10. A new variant of the "Round Robin" dimension controller has been added. The new controller is called "Round Robin across keyboard", and advances the dimension globally when a key is struck anywhere on the keyboard. The older "Round Robin" (which is still available) advances the dimension only for the region in which the note is played. In the case where the number of splits in this dimension varies across the keyboard, the new rule uses a modulo addressing technique.

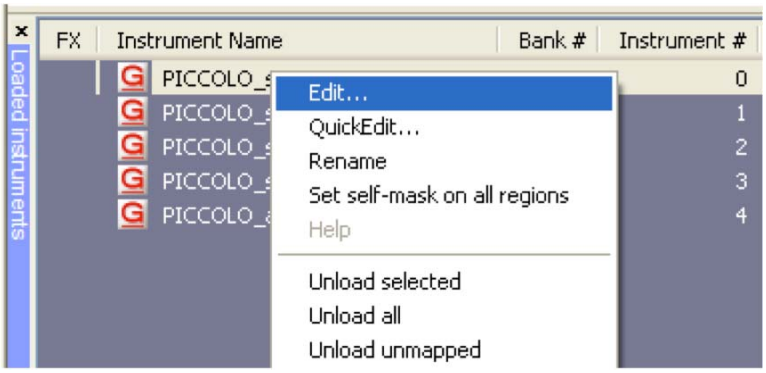
Launching the Instrument Editor

There are several ways to open the Instrument Editor depending on your situation.

Opening the Instrument Editor from GigaStudio

To open the Instrument Editor from GigaStudio, click on the *Launch Giga editor* toolbar button.

If an instrument is already loaded into GigaStudio, you can also launch the Editor from the Loaded Instruments pane. Right-click on the instrument and choose *Edit*.

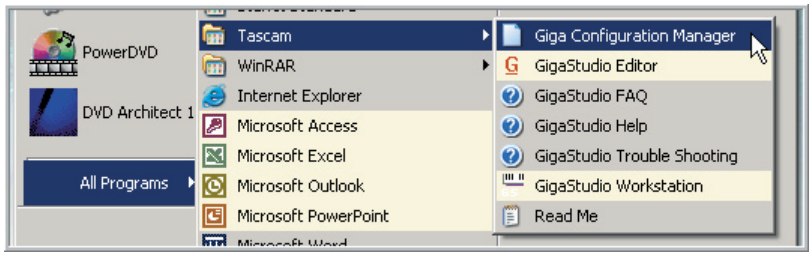


The Editor will open with the selected instrument loaded. This can take a few moments if the instrument is particularly large.

Opening the Instrument Editor from the Windows Desktop

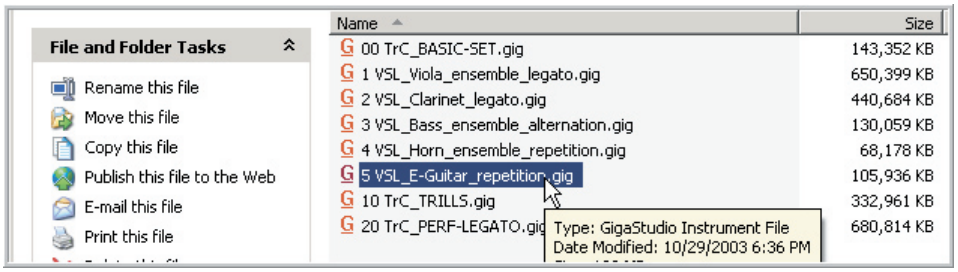
When you're doing intense instrument construction, you may want to run the Editor alone without GigaStudio.

1. You can launch the Editor from the Windows Start Menu.



2. You can launch the Editor by double-clicking a shortcut on the desktop.

3. Last but not least, you can launch the Editor by double-clicking on a .gig file in the Windows Explorer.

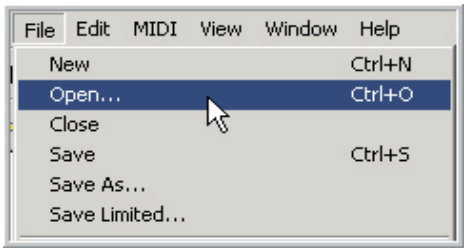


This will launch the editor and open the selected .gig file. You can open multiple .gig files at once by selecting several of them and hitting the Enter key.

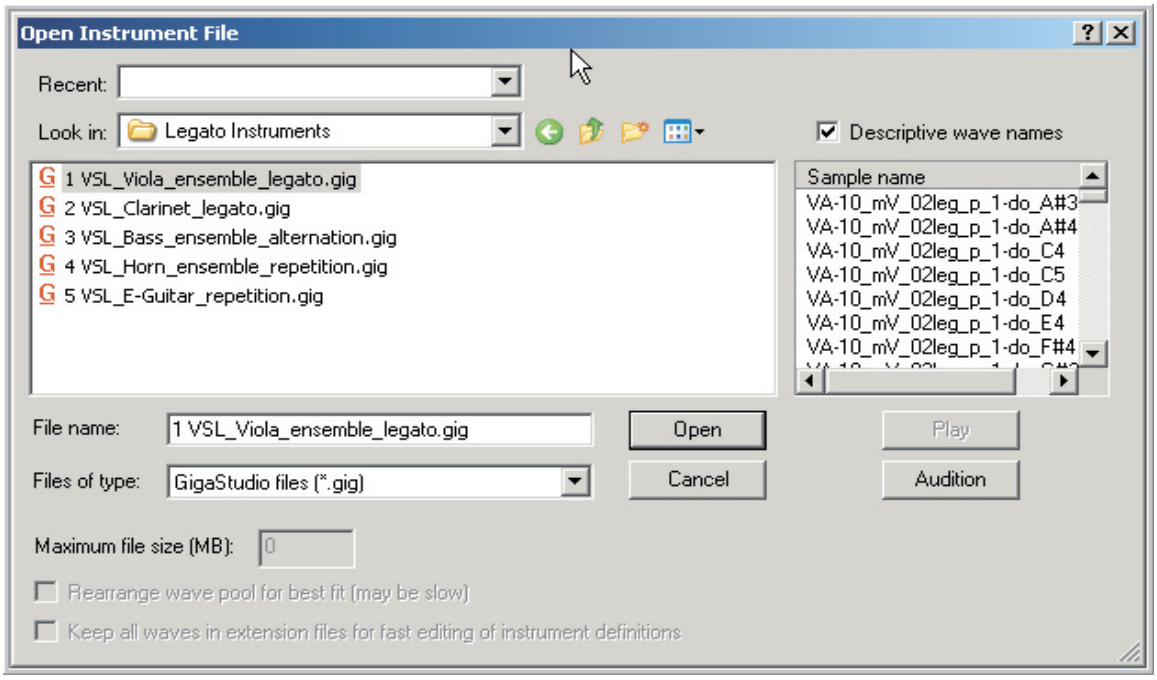
Opening a .GIG file from the Instrument Editor

With the Instrument Editor open, you can open any .gig file using the standard *File-Open* command.

1. Go to the *File* Menu and choose *Open…* [Alt] + [F] + [O] or [Ctrl] + [O]



2. Use the Open Instrument File dialog to navigate to your .gig file.



3. Select the file and click on the Open button.

This window is very similar to the Open dialog in other programs, but there are a few features that are specific to GigaStudio:

The **Recent** dropdown list contains a list of the most recently used folders. Selecting a folder in this list causes the window to jump directly to that folder.

The **Sample name** box lists all of the samples in the currently selected instrument file. Select any sample in this list and click the **Play** button to hear that sample. If you are working with instrument files containing large numbers of samples, the dialog may respond slowly as it reads the sample names out of each file. To work around this problem, uncheck the **Descriptive wave names** box. The names are replaced by simple numeric indexes.

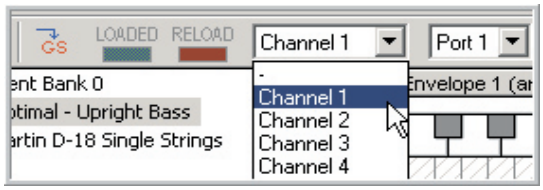
The **Audition** button plays the audition sample for the currently selected file. (The "audition sample" is a sample designated by the instrument developer as being representative of a given instrument. Users of your instrument will hear this sample when using the audition feature of the QuickSound Explorer.)

The **Maximum file size** box, and the checkboxes underneath it, are used when it is necessary to split an instrument into more than one physical file. For details, see the note about large .GIG files on page 99.

Loading a .GIG file into the sampler

After you open a .gig file in the Editor, you must load it into memory if you want to hear it. This is accomplished by pressing the *Load* button on the toolbar:

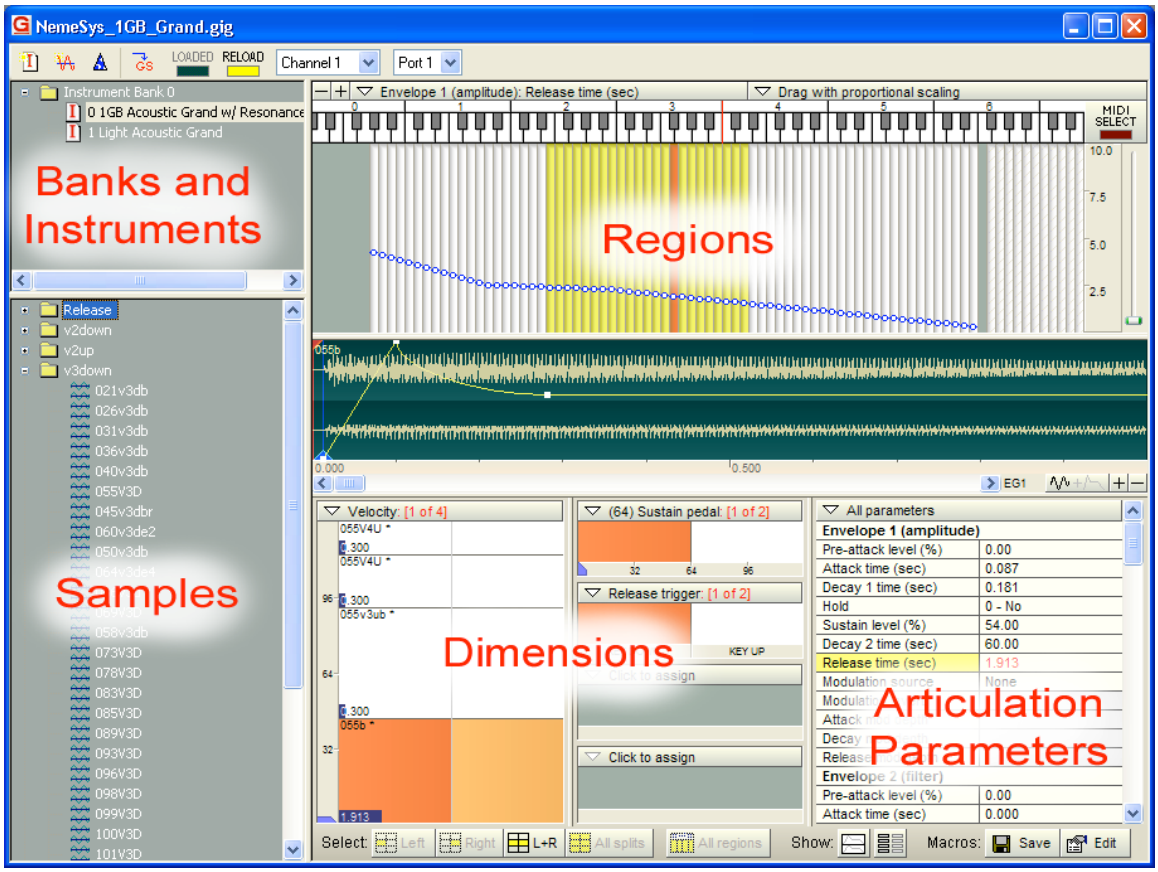
The toolbar also specifies which MIDI port and channel will be assigned to the loaded instrument. By default, the first file you open is assigned to port 1, channel 1, but you can modify these settings using the toolbar.



When the file is loaded, the LOADED indicator turns bright green.

At this point you can play the first instrument in the file either from an external MIDI controller, or by right-clicking in the Region Window keyboard. If there are multiple instruments in the file, you can select a different instrument onto the assigned MIDI channel by clicking its name in the Instrument Window.

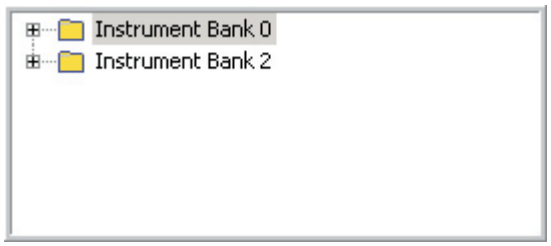
Anatomy of a .GIG File



Above is a graphic representation of the components of a GigaStudio File. Getting familiar with these will make it much easier to know what you are doing when editing and creating GigaStudio Instruments. The basic elements are:

- **Banks.** A bank is a collection of instruments.
- **Instruments.** Instruments are the basic performance object in GigaStudio. An instrument is loaded on a MIDI channel, either alone or as part of a multi-instrument "stack".
- **Regions.** Each instrument can have up to 128 regions. A region defines a zone on the keyboard.
- **Dimensions.** Each region can contain as many as eight dimensions. A dimension can contain up to 128 splits, each mapped to a unique sample. Dimensions and splits allow multiple samples to be mapped to a region, while the performer uses MIDI controllers or other methods to choose which samples are heard at a given moment.
- **Samples.** Each dimension split can be assigned a unique sample to play. Samples are imported from standard .wav files.
- **Parameters.** Each dimension split also contains a unique set of over 100 articulation parameters defining envelopes, filters, and the like.

Banks



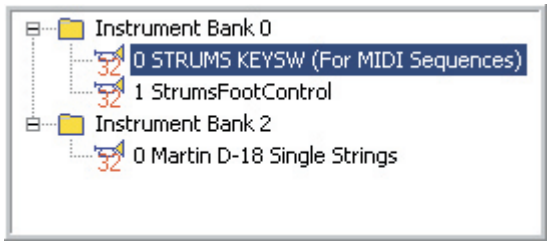
A GigaStudio file can contain up to 128 instruments, each assigned to a bank. By default, all instruments are assigned to bank 0, but banks can be numbered from 0 to 16383.

Bank numbers are used when GigaStudio responds to MIDI bank select messages.

Banks also help to organize instruments within the Instrument Editor. They give you a folder structure to work with when you have a large number of instruments to deal with inside the same .gig file.

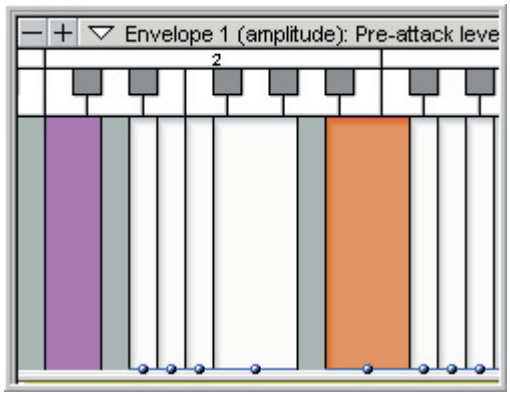
Banks are the top level of the Giga heirarchy.

Instruments



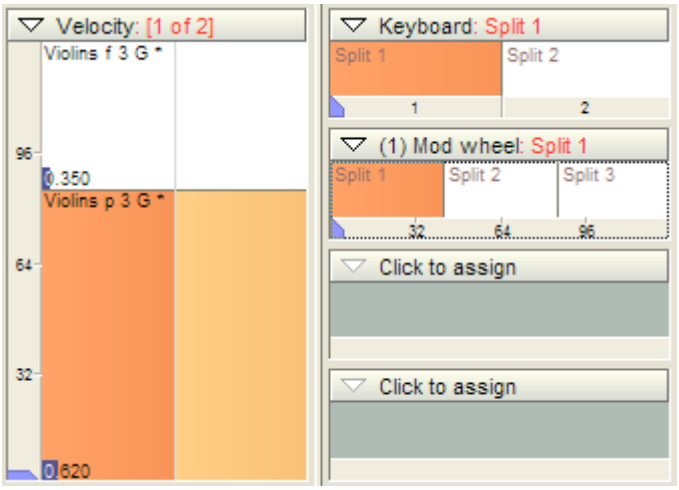
The next level is the instrument. Gig files can have many instruments inside them and these instruments can share common samples without using any extra hard drive space or sample buffering RAM. Each instrument has a discrete bank and patch change number.

Regions



An instrument can contain up to 128 regions, each spanning a single key or a range of contiguous keys. The gray spaces seen here are "empty" notes with no regions assigned to them. The purple region represents the range of the Keyswitch dimension.

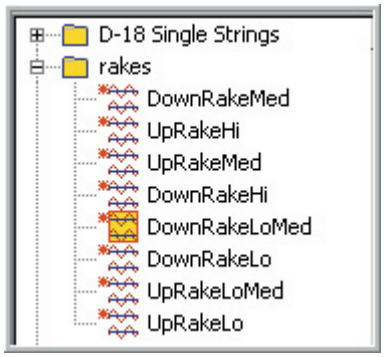
Dimensions



Regions are futher subdivided by dimensions. A dimension can have up to 128 splits each triggering a different sample.

A dimension tells GigaStudio which sample to trigger based on the position of its assigned MIDI controller.

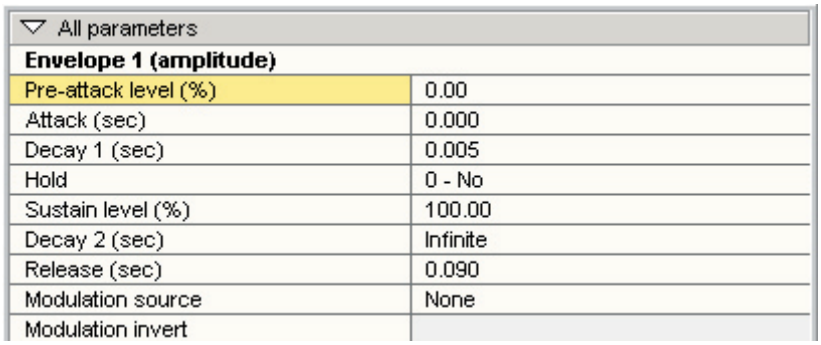
Samples



A .gig file also contains a collection of samples, imported initially from individual .wav files. Each dimension split is assigned a unique sample to play back. (We'll refer to the process of assigning samples to splits as *mapping* the instrument.)

A single sample can be assigned to multiple regions without additional overhead.

Articulation Parameters



In addition to its sample assignment, each dimension split also has its own unique set of over 100 articulation parameters. Many of the parameters define traditional synth functions such as envelopes and filters; others are unique to the Giga architecture. The articulation parameters are described in detail in a later chapter.

Chapter 2: Creating a Giga Instrument

Giga instruments can range from the very simple (an instrument can be made from a single sample) to the extremely complex. In any case, the general procedure for creating an instrument consists of the same basic steps:

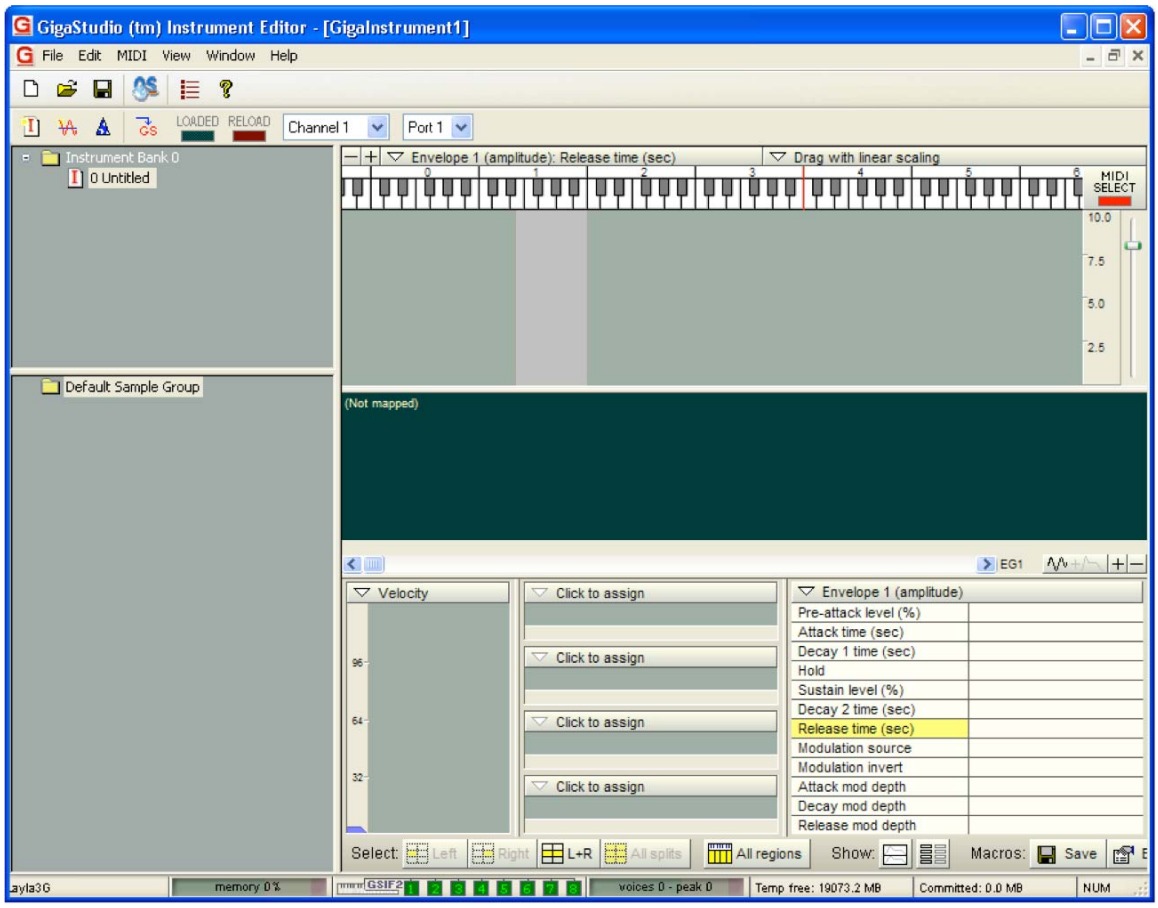
1. Create a new, empty file in the Giga Editor.
2. Import the samples your instrument will use. Samples are imported from individual .wav files. The editor will bundle the samples into the .gig file with the instrument when you save your work.
3. Create the regions on the keyboard to which your samples will be mapped. A region spans one or more contiguous notes.
4. Define dimensions and their splits in the keyboard regions. This is optional, but without dimensions a region can play back only a single sample. Much of the power of the Giga instrument design derives from the fact that many samples (currently up to 256) can be mapped to a single region, while MIDI control and intelligent MIDI rules determine which of those samples will sound at any given moment.
5. Map your samples into the regions you have created.

In practice, the last three steps are often combined into a single action. For example, dragging and dropping a group of samples into the Region Window can automatically create a region for each sample, while simultaneously mapping the samples to the regions. Dropping a second set of samples into the Velocity Window can automatically create a velocity split in each region, while mapping the new samples to the upper or lower portion of the velocity range. For more complex instruments, the Instrument Wizard can be used to create multidimensional instruments and map many sets of samples in a single operation.

For the sake of illustration, this chapter focuses on the simpler and frankly more tedious ways to assemble a Giga instrument. As you gain familiarity with the Editor, you'll learn how to perform many of these tasks in much more efficient ways.

Creating a New File

To create a new, empty .gig file, choose *File-New* on the Editor's main menu. (The first button on the main toolbar does the same thing.) An "empty" file will contain a single empty instrument, with no regions or samples:



Importing Samples

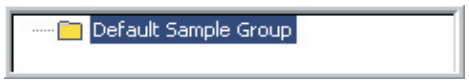
Samples are imported from individual .wav files, in 16 or 24 bit integer, mono or stereo format. As you import samples, they are added to the Sample Window in the lower left portion of the Editor.

Samples are organized into folders, preferably in a way that anticipates how they'll be organized in the instrument you are building. For example, if you've sampled a trumpet at three different dynamic levels and two different attack styles, you might create six folders with names something like this:

Trumpet ff legato
Trumpet mf legato
Trumpet p legato
Trumpet ff staccato
Trumpet mf staccato
Trumpet p staccato

By arranging your samples into folders that match your instrument's splits, you'll be able to use the Editor's more powerful mapping features such as folder drag-and-drop, and the Instrument Wizard.

Creating sample folders

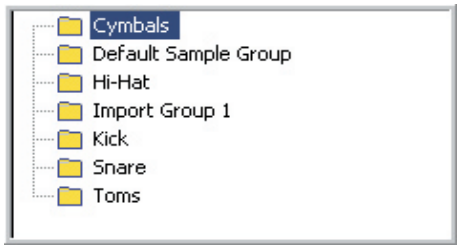


When you create a new .gig file, you will always find a "default" sample folder in the Sample Window. You can rename it if you like.

You can start importing samples into this folder or you can create new folders.

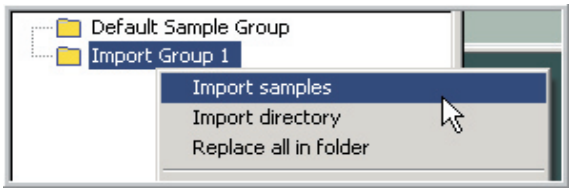
1. To create a new folder, right-click anywhere in the Sample Window and choose *New sample folder*. This will create a new folder ready to be named.

2. You can then give it any name you want.



3. Create as many folders as you need.

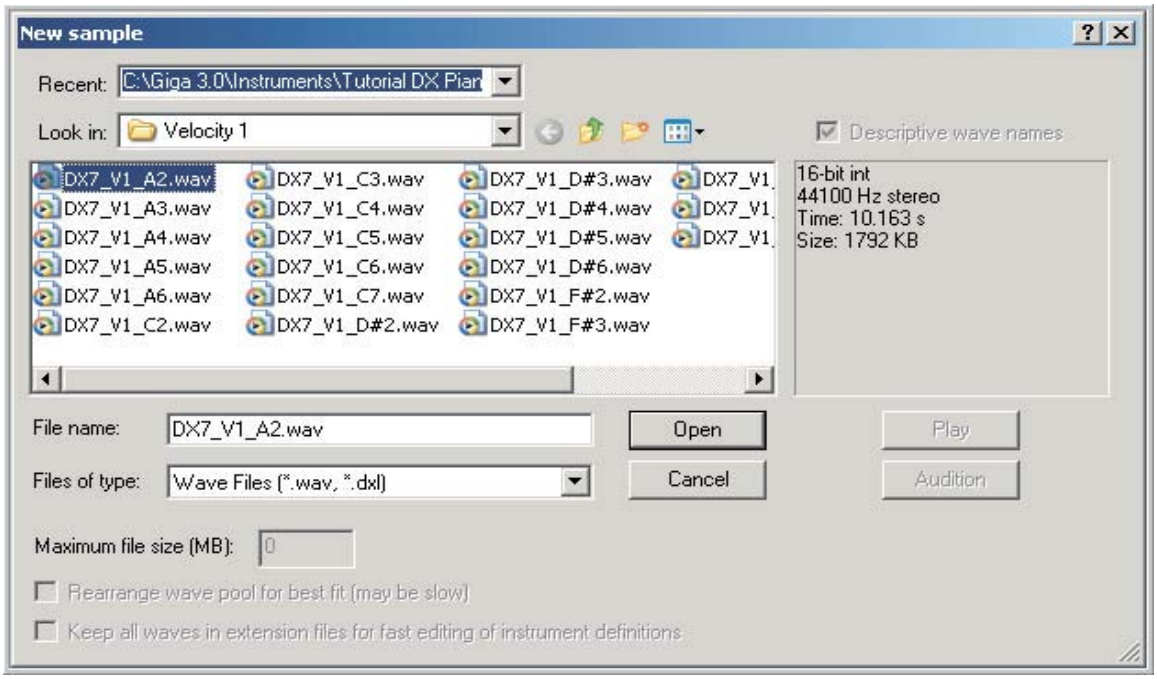
The *Import samples* command

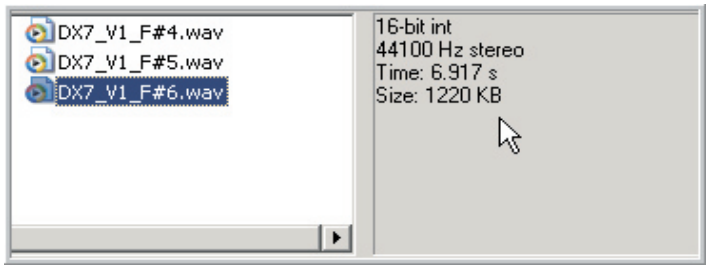


1. To import individual samples into a folder, right-click on the folder and choose *Import samples*.

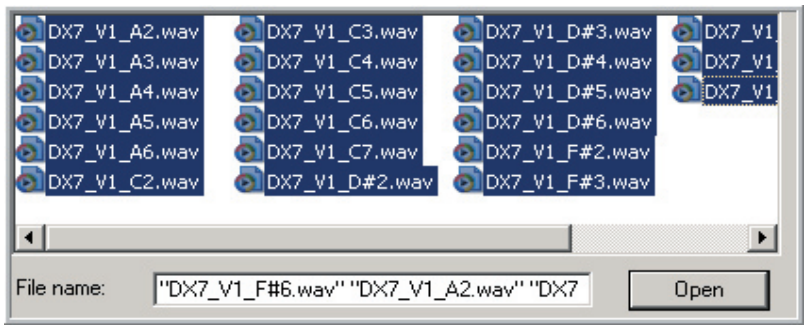
You can right-click anywhere in the Sample Window, but the samples will be imported to the currently selected folder.

2. This will bring up the file browser:

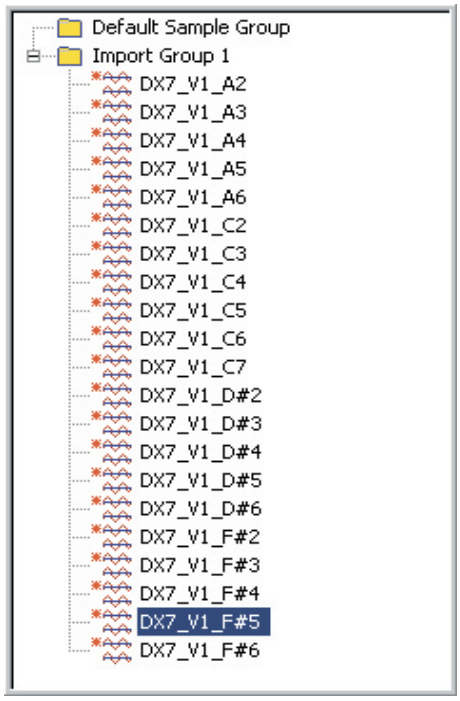




3. When you select a sample, the sample's properties are displayed, including its word size and sample rate, length in seconds, and size in kilobytes.



4. Select a sample or a group of samples and click on the Open button to import the samples into the folder. (To select multiple samples, click while holding down the SHIFT or CTRL keys.)



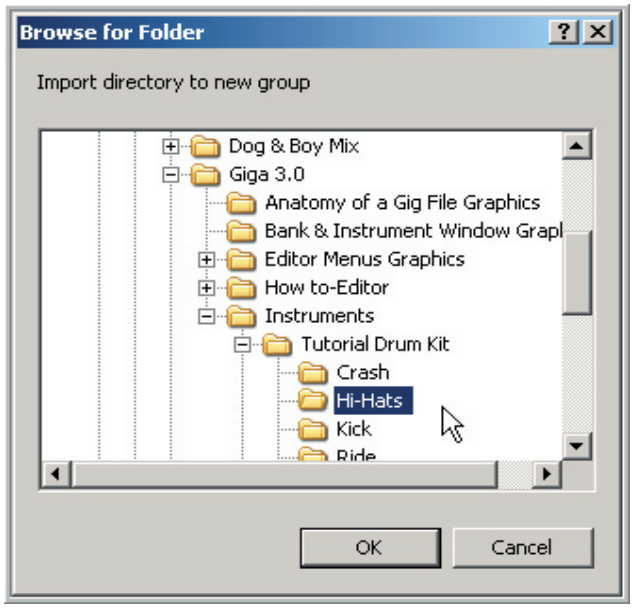
5. The samples will now appear in the Sample Window.

Within a folder, samples can be sorted either alphabetically or by pitch. Right-click in the Sample Window to select the sort option from the context menu.

The asterisk by each sample indicates that these samples have not yet been written into the .gig file. The asterisks will disappear when the .gig file is saved.

The *Import directory* command

This command is used to import an entire directory of .wav files at once. The samples are imported into a new folder named after the source directory.



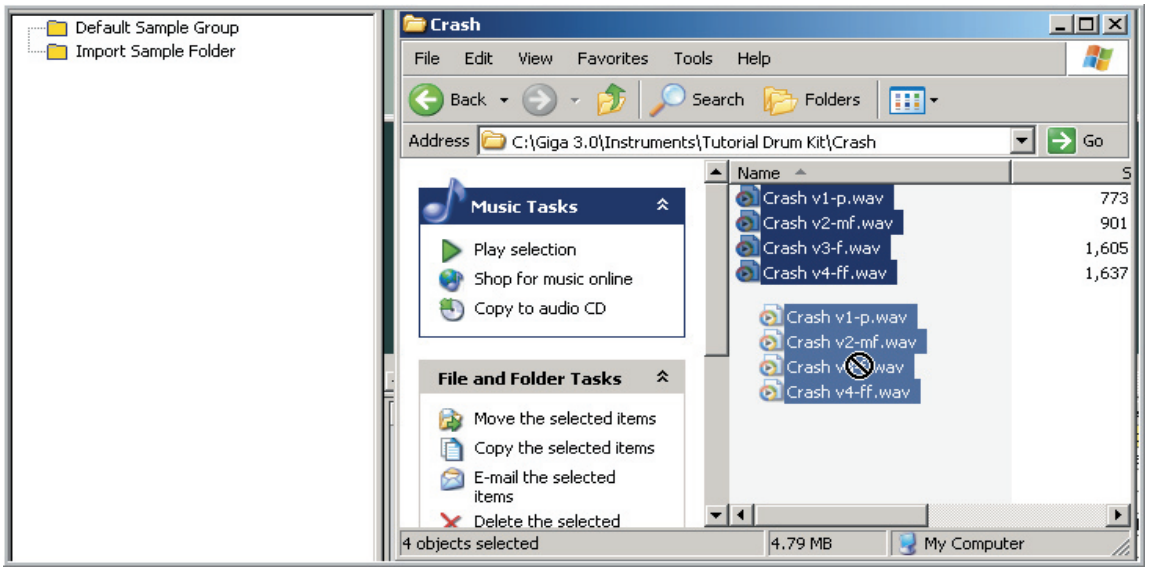
1. Right-click in the Sample Window and choose *Import directory*. This will bring up the folder browser.

2. Select a directory and click OK to import the directory into the Sample Window. Any .wav files in the directory (or .dxl files, which are accelerated Giga samples) will be imported. Other types of files are ignored.

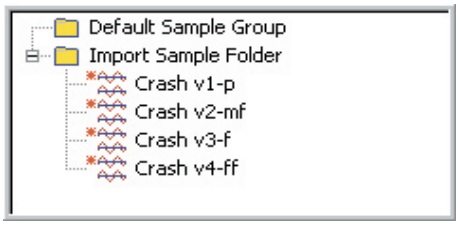
Importing Samples from the Windows Desktop

Often the most convenient way to import directories and samples is to drag and drop them directly from the Windows Explorer into the Sample Window.

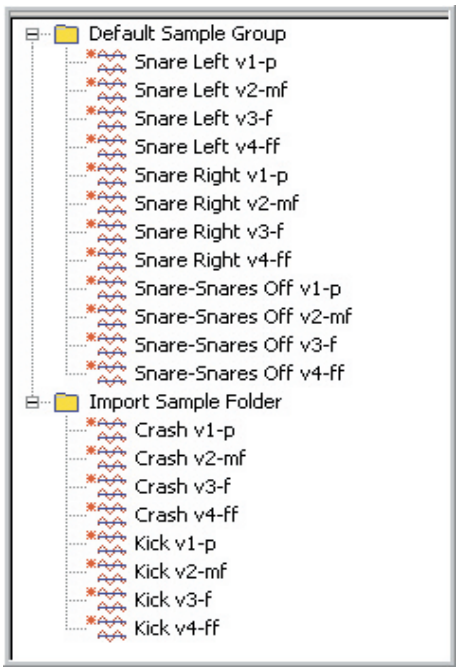
You can drag samples from the Windows Explorer to any folder in the Sample Window:



1. Here we are dragging to the folder named "Import Sample Folder".



2. Now the samples appear in the folder.



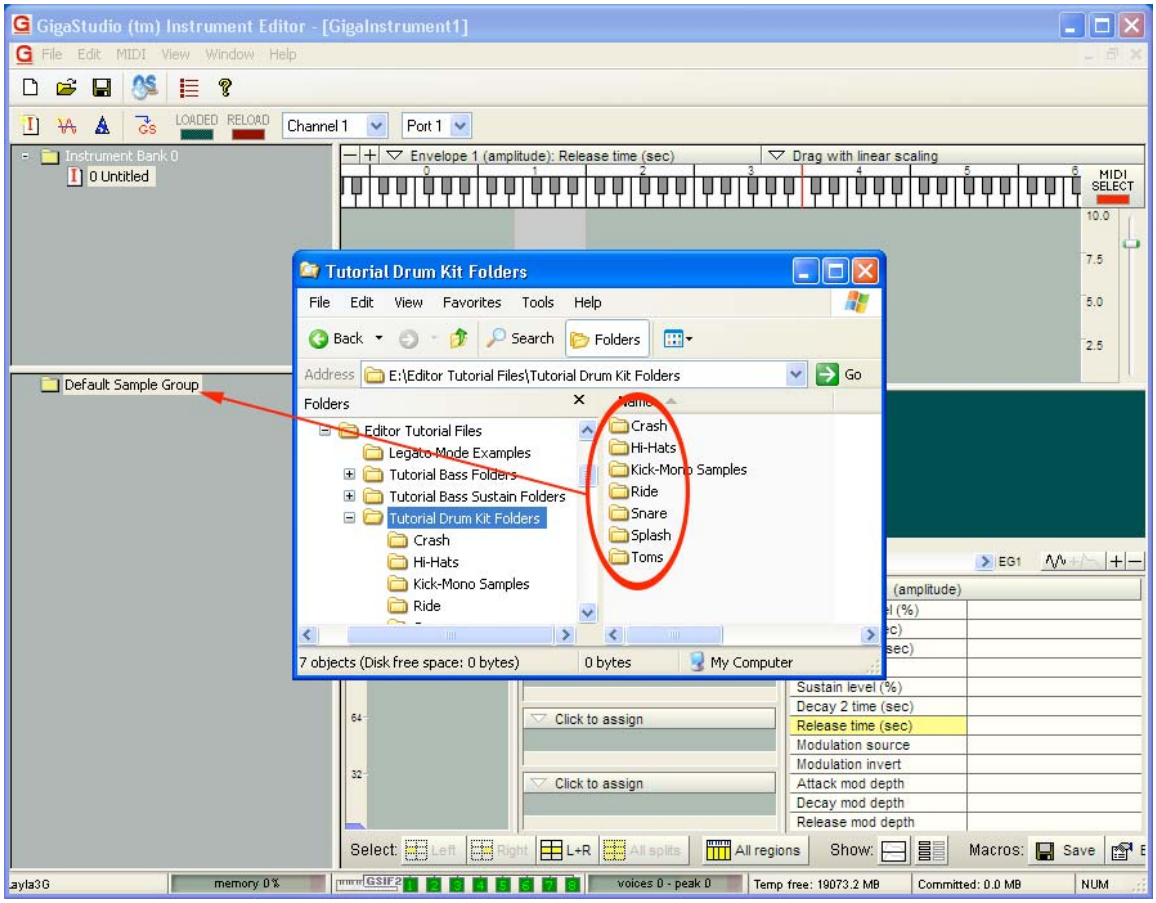
3. You can do this with more samples and put them in any of the folders. In this example, we put some Kick samples in the "Import Sample" folder where the crash samples are. Then we put some Snare samples in the "Default Sample Group" folder.

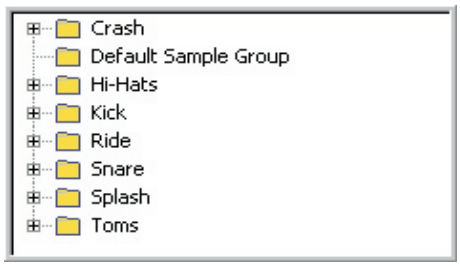
Importing Sample Folders from the Desktop

You can also drag an entire directory, or even multiple directories, from the Windows Explorer into the Sample Window. For each directory that you drop, a corresponding folder is created, and any samples in the directory are imported to that folder.

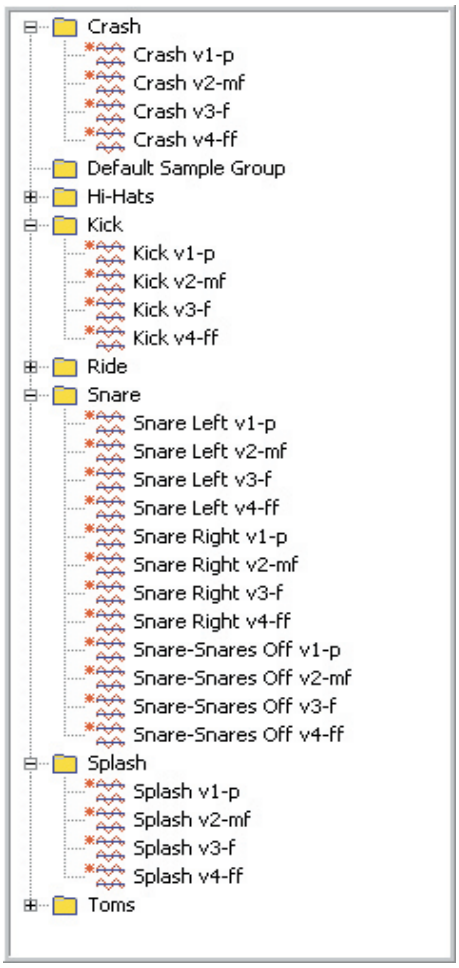
1. To begin, navigate to where you can see several folders that have samples in them.

2. Drag and drop a folder or several folders from the desktop into the Sample Window.





3. All the folders and their samples are now in the Sample Window. This is the fastest way to import a large number of samples at once.



4. Click on the check boxes to open or close the folders to display or hide the samples. Now the samples are imported, organized and ready to be mapped into instruments.

Importing Pitch Information

If you are building a melodic instrument (as opposed to, say, a drum kit) GigaStudio will need to know the root pitch of each sample you import, so that the sample can be transposed appropriately at playback. Pitch information takes the form of two values, the *unity note* (which identifies the point on the keyboard where the sample should play back without transposition) and a *fine tuning* value which is typically used to compensate for small tuning inaccuracies in the original performance.

Unity note and fine tuning are sometimes saved along with the audio data in a standard .wav file. If your samples include this data, the Giga Editor will recognize it when the samples are imported, and retain the information in each sample's properties.

If your .wav files don't include tuning information, you have a couple of options. One is to set the unity note of each sample after you import it, by double-clicking on the sample to bring up the Sample properties dialog. If your sample files are named appropriately, an easier method is to let the editor extract the unity note from the *name* of each .wav file as you import it. This is possible if your file names contain either the MIDI note number or the name of the unity note in a format the Editor can recognize, for example:

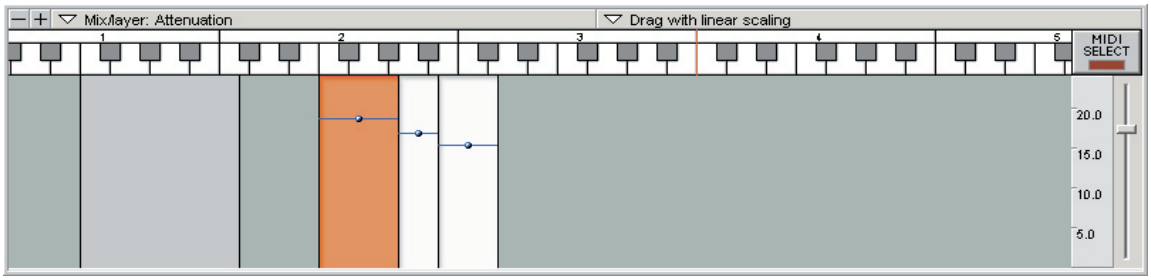
Trumpet legato ff 61. wav
Trumpet legato ff C#4.wav

To use this feature, you must visit the Preferences dialog (*Edit-Preferences* on the main menu) and specify either the note-number or note-name method. You will get the best results when the pitch indication is set off by spaces, and when there are no numbers elsewhere in the sample name. For the note-name method, only sharps ("#") are recognized, not flats.

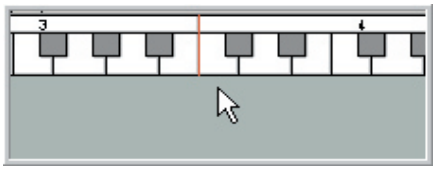
Creating a Region

The next step in creating an instrument is to create some regions. While there are many ways to create regions, in this section we will do it manually. This is the least convenient way to create regions but it is sometimes useful. For example, drum kits often don't lend themselves to the more streamlined ways of creating regions, because each drum (snare, kick, hi hat, etc.) is effectively a different instrument and may require a differently structured region.

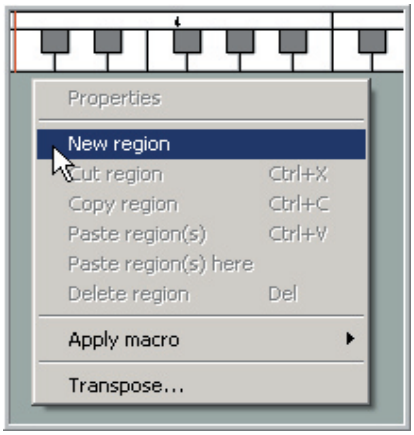
Creating a few regions manually will also help familiarize you with the concept of mapping samples, before we introduce the more advanced ways of mapping like the Instrument Wizard.



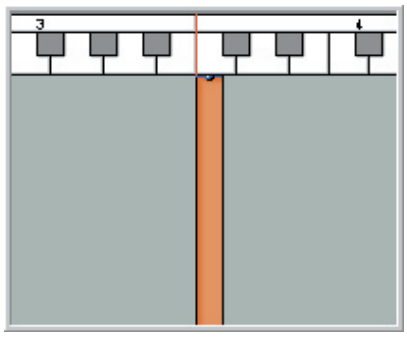
To create our first region we'll use the Region Window, shown above. For a full discussion of this window's features, see page 130.



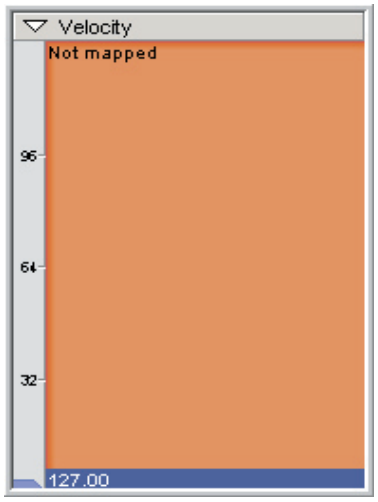
1. Place the mouse under the note where you want to create a region, and right-click. In this example, we'll create a region on Middle C.



2. Choose *New region* from the menu.



3. This will create a new region, which will also be indicated in the Velocity Window below.

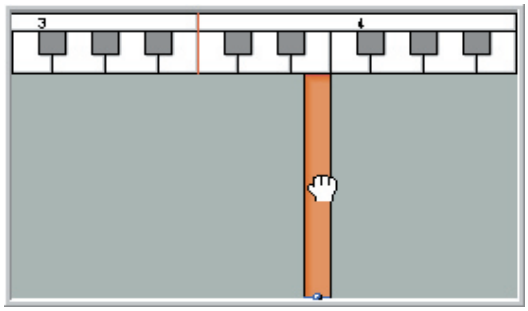


4. In this case, the Velocity Window shows a single solid block of color, and the words “Not mapped” because no sample is yet mapped to the region. (Actually, if a sample is highlighted in the Sample Window, it will be mapped here automatically. Either way, the mapping is easy to change as we’ll see below.)

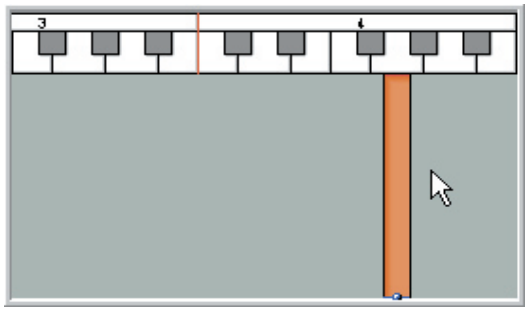
When we create velocity splits later, they’ll appear in this window.

After you’ve created one or more regions, you can resize them or move them around the keyboard.

Moving Regions

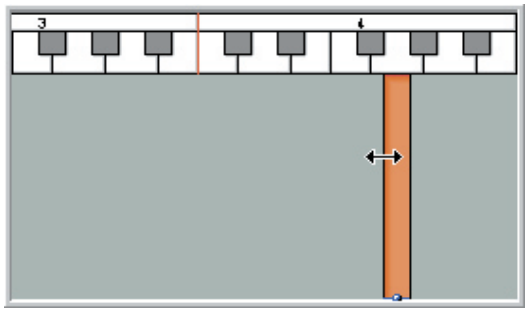


1. To move a region, grab it in the middle so that the mouse turns into a little hand.

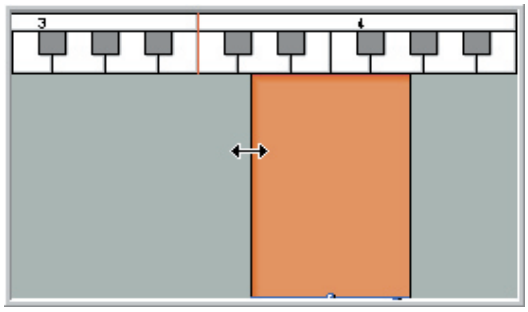


2. Then drag the region to the left or the right.

Resizing Regions

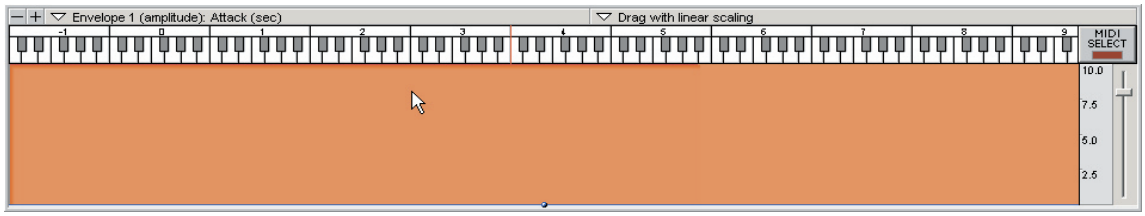


1. To resize a region, grab one of the edges with the mouse so that the mouse turns into a left-right arrow.



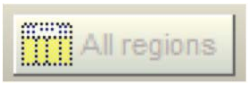
2. Then drag the mouse to stretch the region. You can do this with either side of the region.

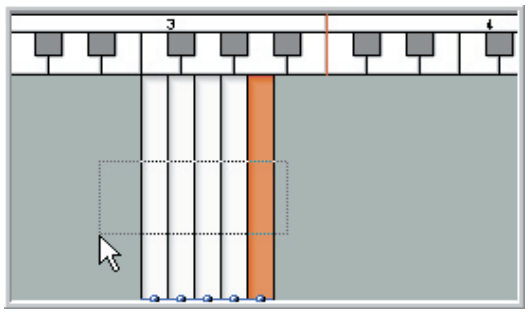
3. A single region can be stretched up to the full range of the MIDI keyboard. (Regions are not allowed to overlap, so a region this large would be the only region in the instrument.)



Selecting and Moving Multiple Regions

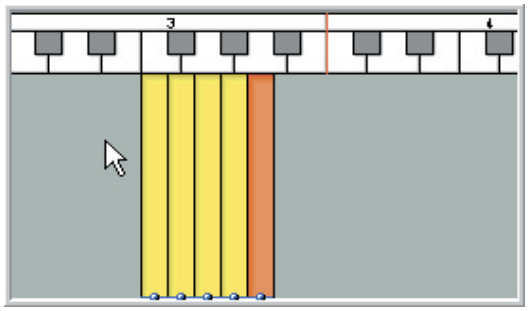
Note: to select individual regions, be sure the "All regions" selection lock button near the bottom of the Editor window is disengaged.



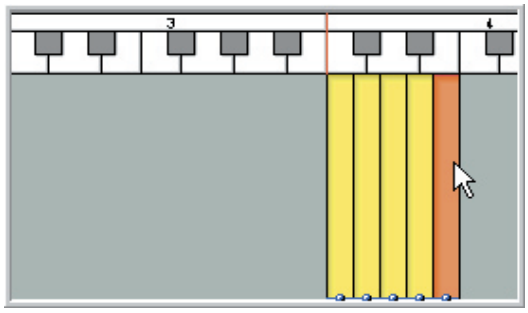


1. To select several regions, hold down the ALT key and drag the mouse to create a "rubber band" effect. If you start your drag in the gray area outside any region, the ALT key is not necessary.

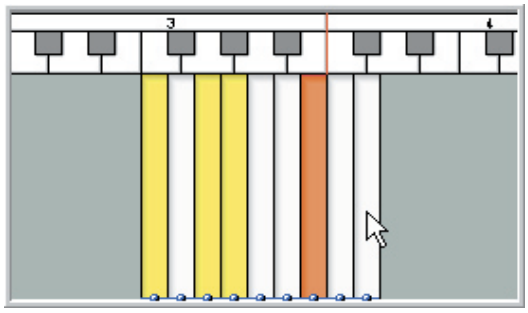
Alternatively, select the first region in the intended range, then click the last region while holding down the SHIFT key.



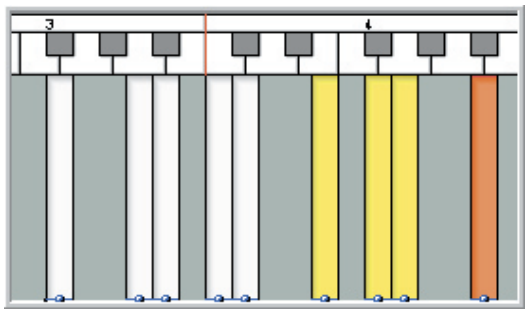
2. The selected regions will now be highlighted in yellow or orange. (The orange region is the "focus" region whose properties are displayed in the editor's other windows. It is always *included* in the selection.)



3. You can then move all these regions at once by dragging on any one of the regions.



4. You can also select non-contiguous regions by holding down the CTRL key while selecting regions with the mouse.



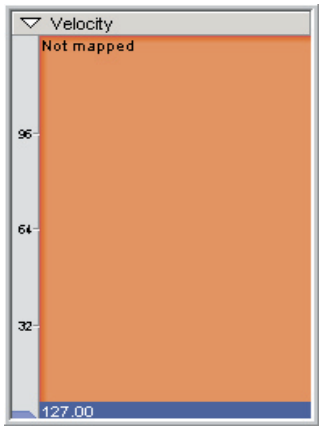
5. These non-contiguous regions can then be moved around the Region Window. They will maintain their relationship with each other wherever you put them.

Again, regions are not allowed to overlap, so the editor will not allow you to drop one region on top of another.

Creating a Dimension

Once we've created some regions, all we need to do to create a playable instrument is map appropriate samples to the regions. And there's a very straightforward way to do that: just drag a sample from the Sample Window and drop it on a region. This would give us an extremely simple region that does nothing more than play a single sample.

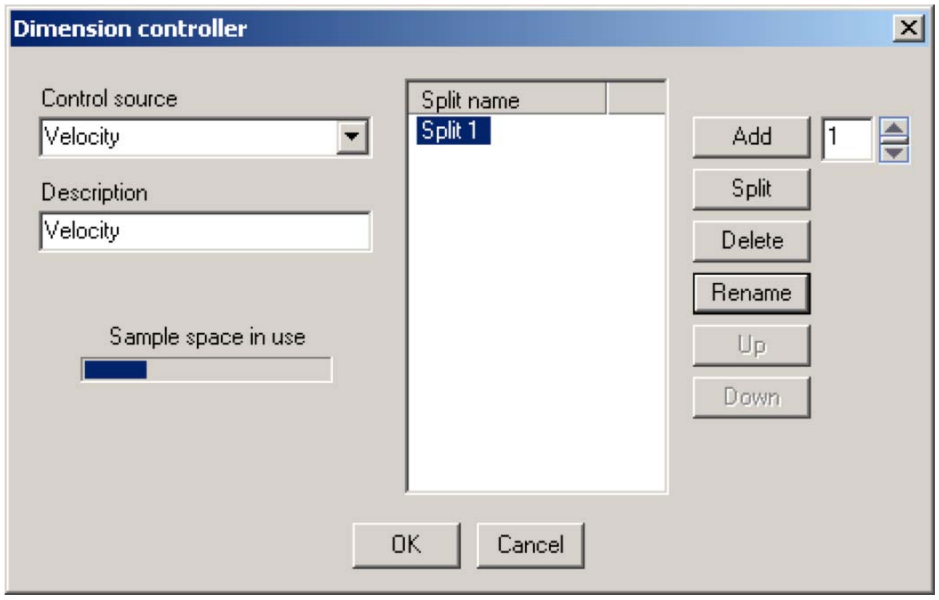
While a region that simple might have its uses, we'll take things a small step further here and give our new region a single dimension, so that we can make it more musically expressive by assigning multiple samples to it. (Remember that a region can have up to eight dimensions, all working simultaneously, so this example will just hint at the possibilities.)



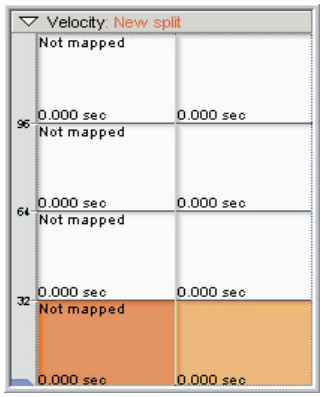
One of the most common dimensions is the Velocity dimension, which will enable us to trigger different samples depending on MIDI velocity. In fact, this type of dimension is used so frequently that the largest of the dimension windows is assigned permanently to Velocity.

In this illustration, the Velocity dimension has no splits and is inactive. To create velocity splits, click on the header bar at the top of the window.

The Dimension Controller dialog appears:



We'll explain this dialog in more detail in the next chapter. For now, just click the Add button a few times. This adds new splits to the Velocity dimension.

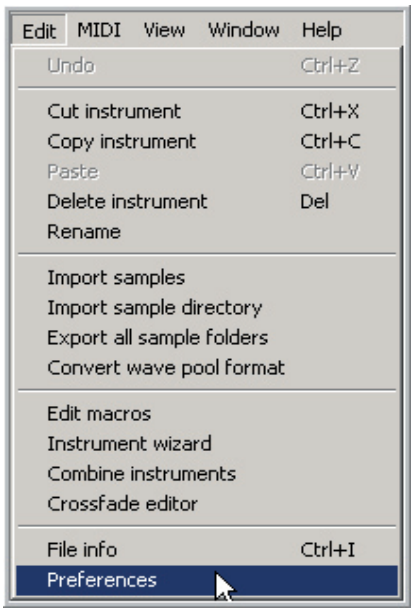


When you click OK, the splits will be visible in the Velocity window. Each split can be mapped to its own sample.

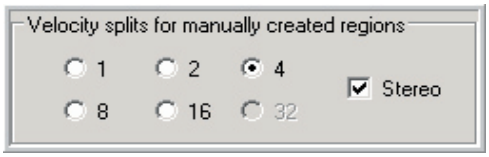
Each split also has its own unique articulation – that is, its own set of envelopes, filters, and other performance parameters.

Velocity splits for manually created regions

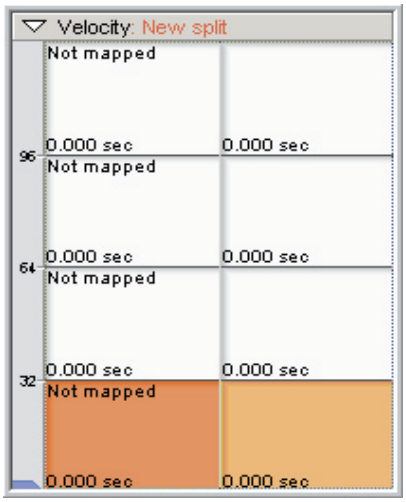
Because velocity splits are such a common feature of sampled instruments, you can tell the Editor to add a certain number of velocity splits automatically whenever you create a region. The setting is in the preferences:



1. Select *Edit-Preferences* from the main menu.



2. In the Preferences dialog, find the section called *Velocity splits for manually created regions*. Select the number of velocity splits you want. You can also check the Stereo box to create stereo regions.



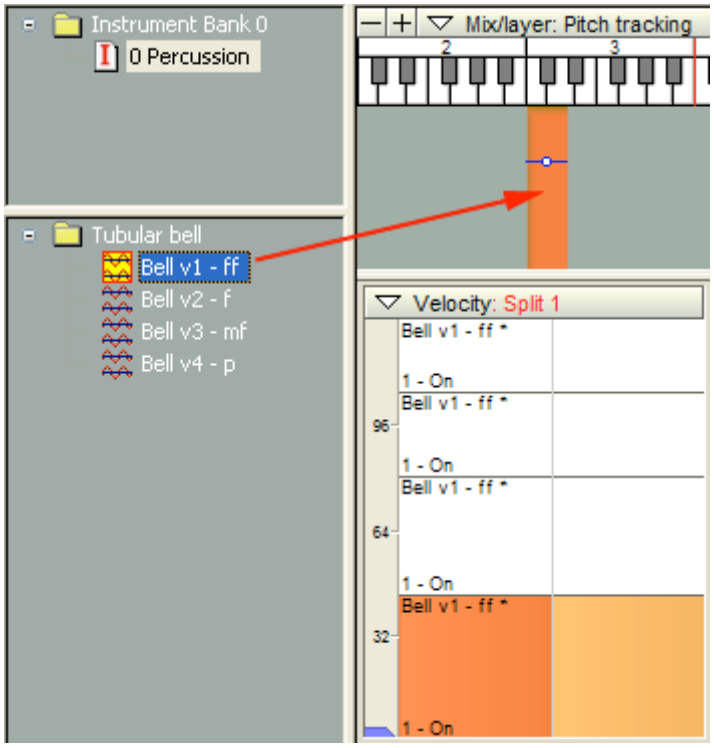
3. With the settings above in effect, any region you create manually will be a stereo region with four velocity splits. The velocity splits appear as horizontal bands in the Velocity Window.

Note that the velocity splits are also divided into left and right halves, indicating that this is a stereo region.

Mapping Samples to a Region

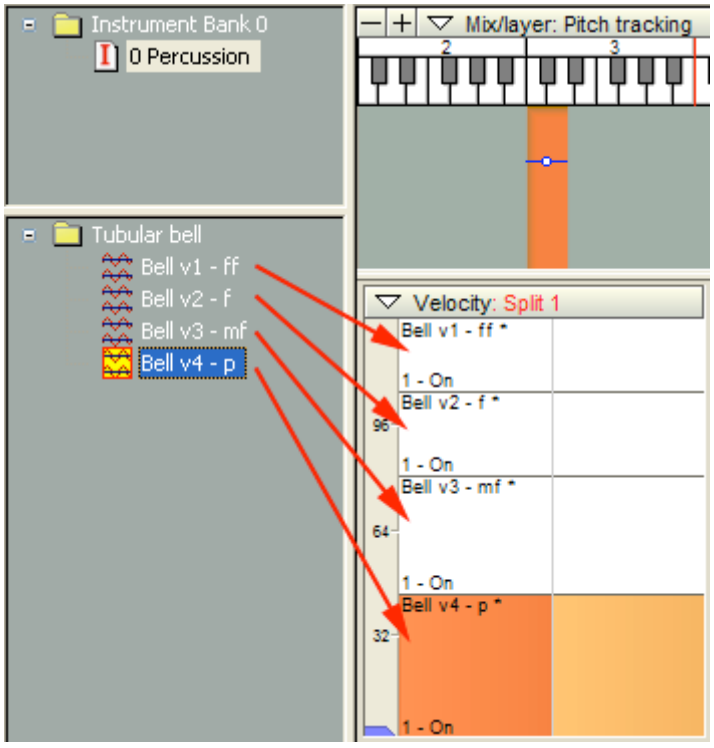
At this point we've created a region and assigned it a simple Velocity dimension. All that remains is to map some samples to the region.

For this example, suppose we've sampled a bell at four different dymanic levels, and imported the four samples as seen below. We want to map the four samples to the four velocity splits we created in the previous step. First, consider what happens if you simply drag the "ff" sample and drop it on the region in the Region Window:



This maps the sample to the region, but unfortunately it maps to the *entire* region, including all four of our velocity splits. (You can see this in the Velocity window, where the "ff" sample is named in all four of the splits.) This isn't exactly what we want.

The solution is to drop each sample directly on its own split, as shown below:



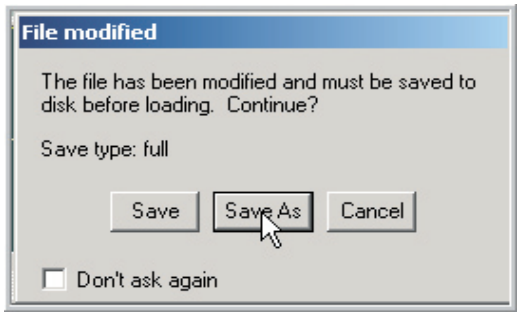
Now each velocity split is mapped to the correct sample.

When mapping unpitched samples such as most drums, use the same technique, but drag the samples with the *right* mouse button. This will automatically turn off pitch tracking in the region, preventing the sample from being pitch-shifted at playback.

Hearing Your Work

At this point we've created the beginnings of a Giga instrument, but we haven't yet heard what it sounds like. To hear your work, press the Download button on the .gig file's toolbar.

You may be prompted to save your work before proceeding. This is because certain major edits to a .gig file require that the file be re-written to disk and reloaded by the sampler.



Since adding instruments, regions, or splits to a file all require a reload, you're more likely to encounter this message in the early stages of constructing an instrument. Minor edits, such as changes to split points and articulation parameters, are communicated directly to the instrument in memory and do not require a file save.

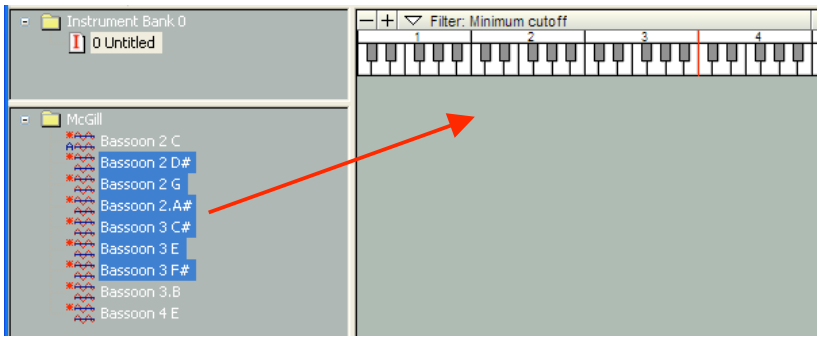
When the instrument is loaded into memory, the LOADED indicator lights green, and the instrument is ready to play.

A Faster Way To Work

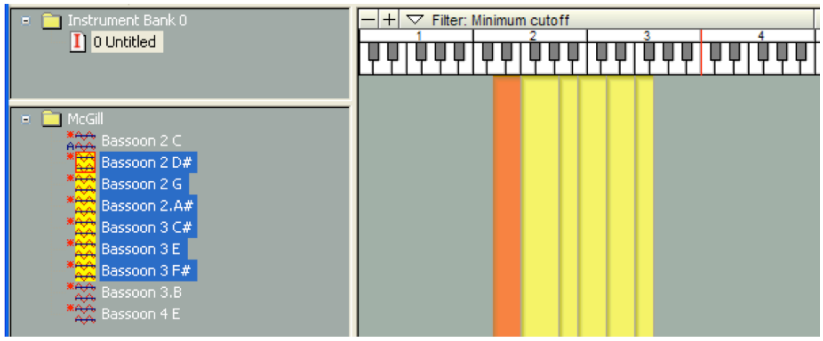
Creating and mapping regions automatically

So far in this chapter we've seen how to create individual regions and map samples to them one by one. While these techniques have their uses, they're too labor-intensive to be suitable for creating a large instrument from scratch. In this section we'll look at a simple technique that can not only create a large number of regions at once, but also map samples at the same time.

1. Grab one or more samples with the mouse and drop them into the Region Window. You can also drop an entire sample folder (which is one reason we encouraged you earlier to organize your samples into folders):



2. The Editor creates a region for each sample you drop, located on the keyboard according to pitch. If necessary, the regions are stretched so that there are no unmapped keys between regions.



If you drop several samples and find that only one region is created, a likely explanation is that the samples do not contain pitch information, and have all defaulted to middle C. Since regions cannot overlap, only one sample can be mapped to any given note. Assign a unique pitch to each sample (in the sample properties) and try again.

3. If you drop samples into the Region Window using the right mouse button, you'll get a slightly different result. In this case the samples are mapped in alphabetical order and pitch tracking is turned off in each region, so that the samples play back at their native pitch. Each region is allocated only a single key.

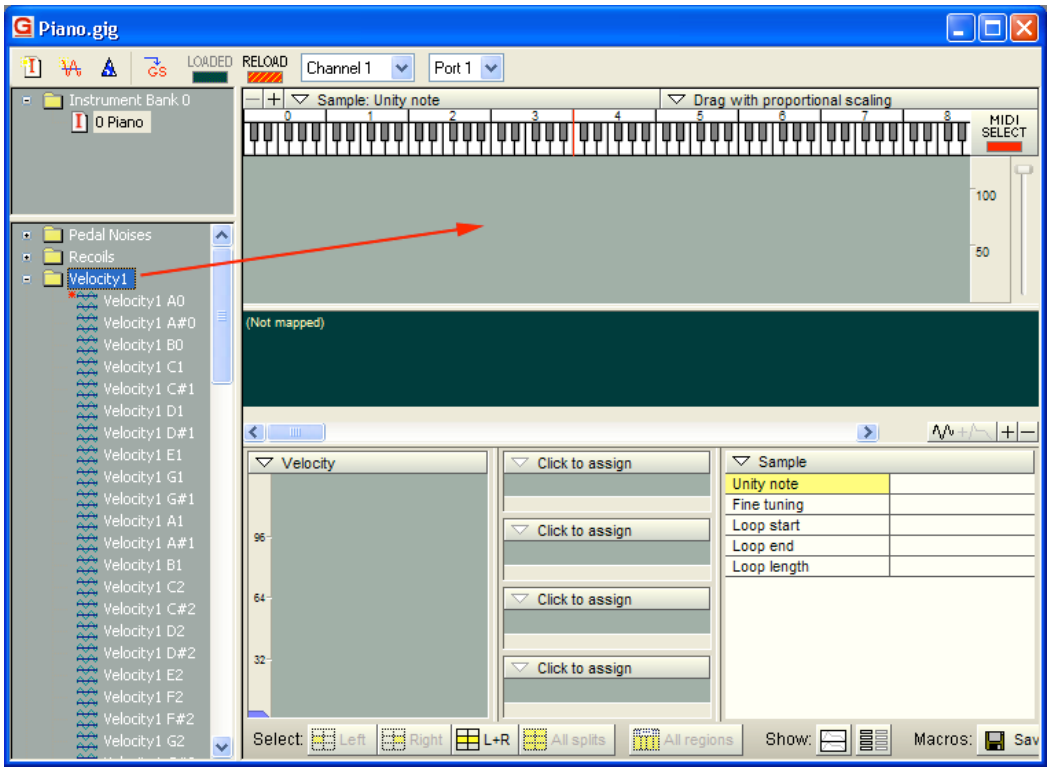
The right-button technique probably won't create a very useful instrument from the bassoon samples shown in the illustration, but it can be a convenient way to quickly audition a large number of samples, particularly unpitched ones such as percussion or sound effects.

Creating and mapping splits automatically

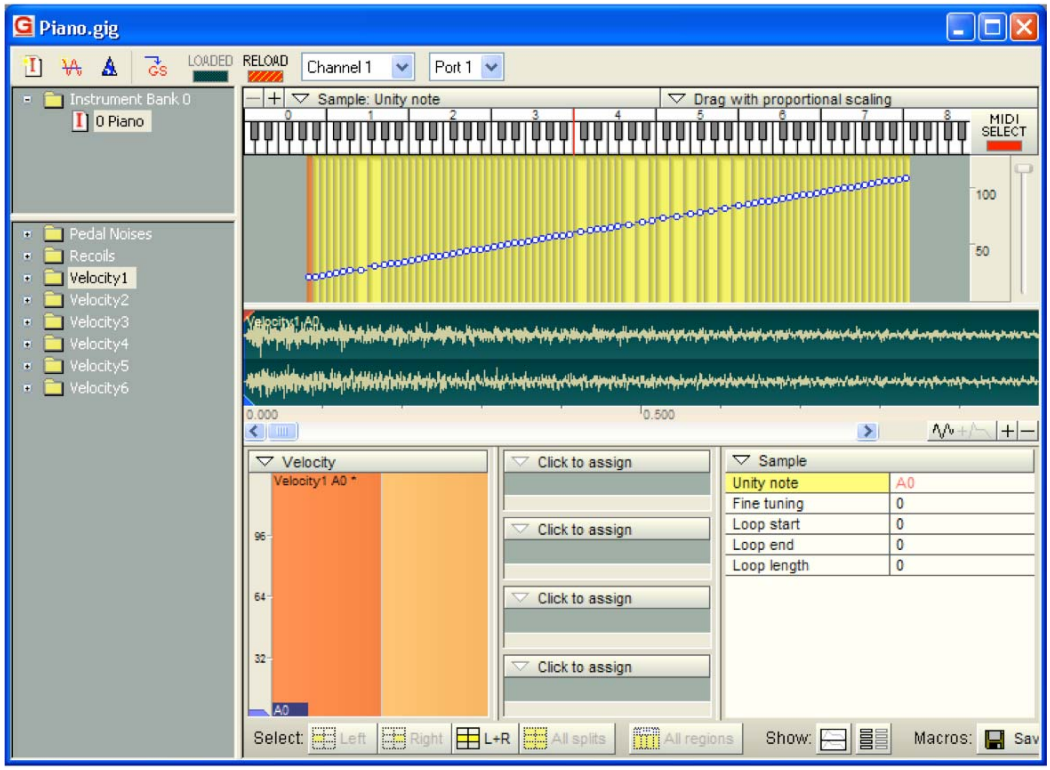
In the example above we created a series of regions by dropping a group of samples in the Region Window. This is a convenient way to create regions, but it creates only the simplest kind of region, mapped to a single sample with no dimensions or splits.

Once the regions are created, however, we can create and map additional splits easily by dropping groups of samples into the dimension windows themselves. Note that the success of this technique depends entirely on how well organized your samples are.

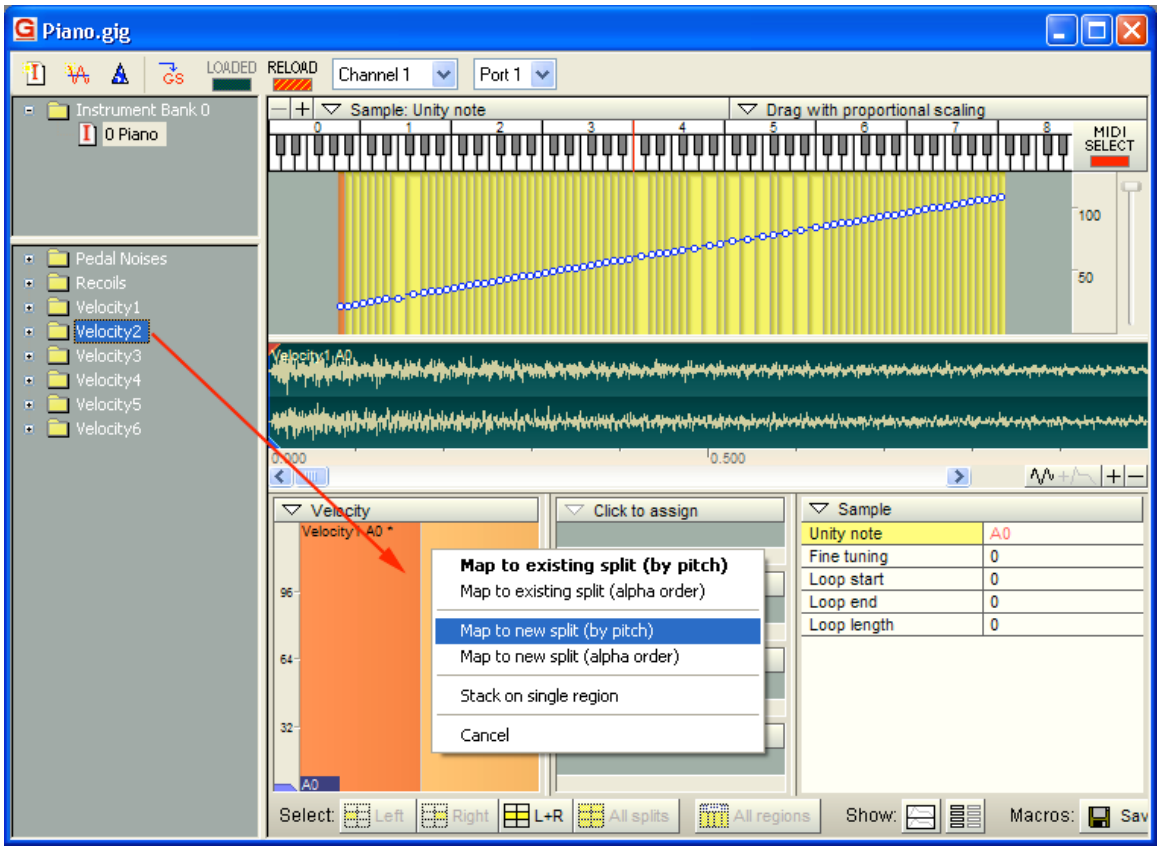
We'll start this example like the previous one, by dragging a folder full of samples into the Region Window of an empty instrument. This time we're building a piano with six velocity layers. The samples for all 88 keys of the softest velocity layer are in folder "Velocity1:"



The drop maps the samples across the keyboard according to their pitches.



Next, we'll map the second velocity layer using the samples in folder "Velocity2". Instead of dropping this folder in the Region Window (which would just replace the existing mappings), we'll drop it on the Velocity Window and use the *right* mouse button. This brings up a context menu at the point of the drop:



The context menu gives several options:

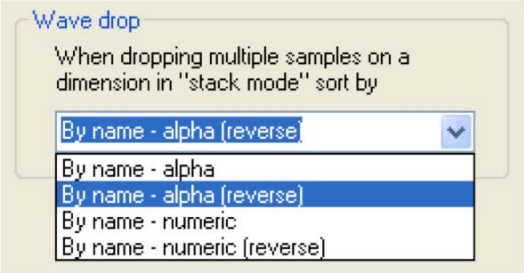
Map to existing split (by pitch). This option would replace the samples in the existing split with samples from the dropped folder, using pitch to decide their placement. Note that this applies not just to a single region, but to *every region across the keyboard* that has the same dimensions and splits as the focus region. (Note that this is the default option – the one that will execute if you drop a folder in this window with the *left* mouse button.)

Map to existing split (alpha order). Replaces the samples in the existing split with samples from the dropped folder, mapping the samples alphabetically by name. The editor assumes you are dropping unpitched samples and turns off pitch tracking in the mapped splits.

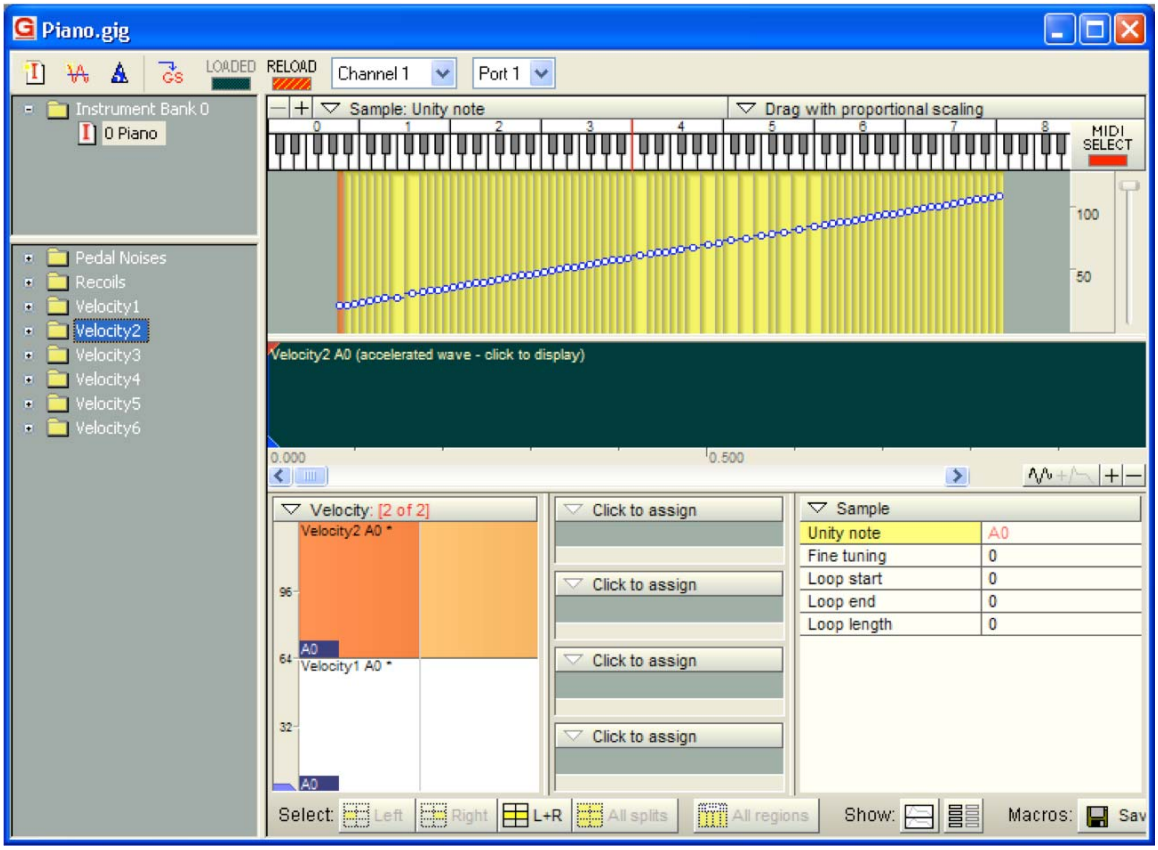
Map to new split (by pitch). Creates a new split at the point where you dropped the folder, and maps the folder's samples into the new split according to pitch. Again, this operation is applied to all possible regions across the keyboard. If you drop in the upper half of an existing split, the new split is created above the existing one. If you drop in the lower half of an existing split, the new split is created below the existing one.

Map to new split (alpha order). Creates a new split at the point where you dropped the folder, and maps the folders into the new split in alphabetical order. The editor assumes you are dropping unpitched samples and turns off pitch tracking in the mapped splits.

Stack on single region. Unlike all of the other options, this modifies only the single focus region (highlighted orange in the Region Window). Enough splits are created within the region to hold the dropped samples (since a dimension can have at most 128 splits, you can drop at most 128 samples). The order in which the samples are mapped, from the first to last split within the region, is based on the names of the samples: the exact method is chosen in the preferences:



Getting back to our piano example, we wanted to create a new velocity split across the keyboard. The option to choose then, is *Map to new split (by pitch).* Since we dropped the folder in the upper part of the existing single velocity split, the new split will be created above the old one. The old split now covers velocities from 1 to 63 and retains the original "Velocity1" sample mappings. The new split covers velocities 64 to 127 and is mapped to the "Velocity2" samples.



Remember that this will split every one of the regions we created in the previous step into upper and lower velocity splits, each automatically mapped to the most appropriate sample. Thanks to the time we invested in organizing the samples into folders, we've just created a complete velocity-layered piano with two drags of the mouse! By repeating the same simple action with the remaining folders, we can quickly create a six-layer instrument.

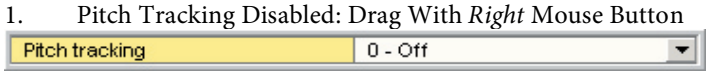
More About Sample Mapping

Before we close this chapter we'll mention a few last topics related to mapping samples.

Pitch Tracking

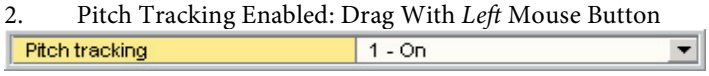
When you map a sample to a split, the Pitch Tracking parameter for that split will be enabled or disabled, depending on which mouse button you use when dragging the samples to the Velocity Map. (To view the Pitch Tracking parameter, click on the Articulation Window's header bar and select the Mix/Layer category. Articulation parameters are explained in detail in a later chapter.)

1. Pitch Tracking Disabled: Drag With *Right* Mouse Button



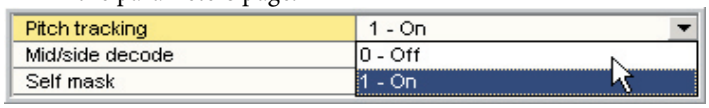
When Pitch Tracking is disabled, the sample will not transpose at all: it will always play at its natural pitch wherever you put it. This is good for drums and percussion or sound effects.

2. Pitch Tracking Enabled: Drag With *Left* Mouse Button



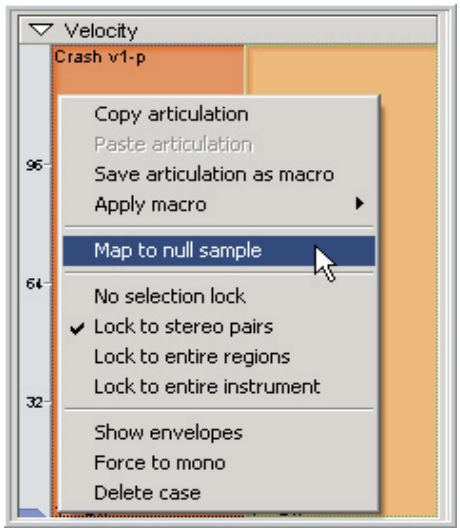
When Pitch Tracking is enabled, the sample will be transposed up or down from its unity note (root note or natural pitch) depending on what unity note is assigned and where it is mapped on the keyboard. This is good for melodic multi-sampled instruments.

3. If you make a mistake or change your mind, you can also change the Pitch Tracking in the parameters page.

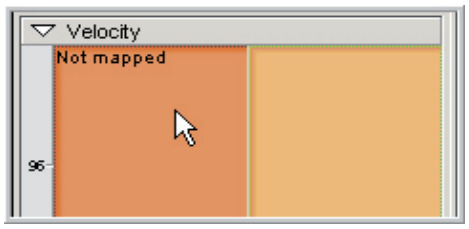


Map to Null Sample

A split can be mapped to the "null sample". This allows you to have the equivalent of a silent sample without having to actually map a silent sample to the region.



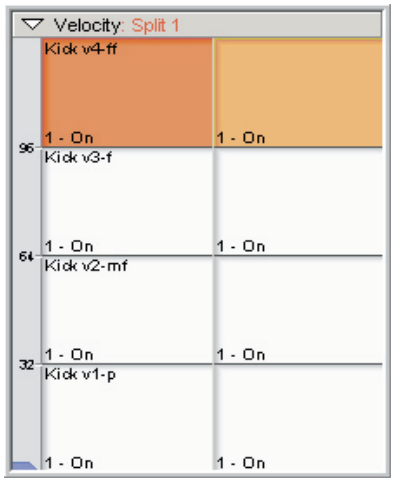
1. Right-click on the Velocity Map and choose "Map to null sample" from the menu.



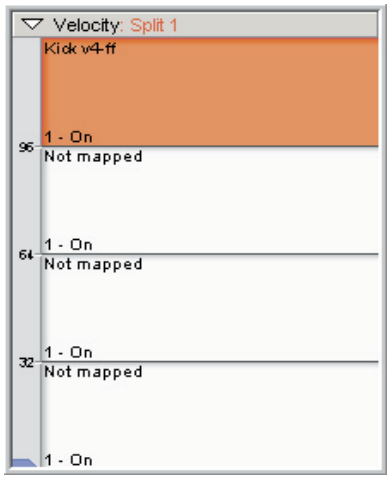
2. This will remove any sample that was mapped to this split, indicated by “Not mapped” where the sample name would ordinarily be.

Mono and Stereo Samples

When you map a sample, the region will automatically change to mono or stereo if necessary to match the properties of the new sample. A region cannot contain a mixture of mono and stereo samples, so any existing mappings will be removed when the switch is made.



1. In this example we have four velocities mapped to four stereo samples.



2. If we drag a mono sample to the top velocity, the whole region is changed to mono and this sample is mapped to the top velocity split as intended.

However, the bottom three samples have been removed. Since this is now a mono region, the splits can only be mapped to mono samples.

This chapter has covered the basics of creating an instrument, but we’ve limited our use of dimensions to a simple velocity split. In the next chapter we’ll take a small step forward by creating a two-dimensional instrument.

Chapter 3: Tutorial: Creating a Multi-Dimensional Instrument

In the simplest possible Giga instrument, each region would be mapped to a single sample, and you would hear that sample whenever one of the region's keys is pressed. However, regions are usually divided further into *dimensions*. The example we've already seen is a velocity dimension, which causes different samples to sound depending on how hard the player is striking the keys. If there are four samples available, each mapped to a different part of the velocity range, we would say that the velocity dimension has four *splits*.

In a Giga instrument, the dimension concept can be multiplied many times over. For example, an instrument sampled at four different velocities might also be sampled using five different playing styles, for a total of twenty unique samples per key. "Playing style" thus becomes a second dimension with five splits. When we assign a MIDI controller to this new dimension – let's say the Mod Wheel – the sampler will now use both velocity and the Mod Wheel to choose among the twenty samples.

In this chapter we'll create a two-dimensional instrument. We'll begin with a simple velocity split then add a second dimension to show how the dimensions interact. In the Giga architecture, going beyond ordinary velocity splits opens up a world of possibilities, so first we'll take a short detour through the full list of dimension types.

Types of dimensions

Every dimension has a control source, which may be a traditional MIDI controller, a simple algorithm, or a complex piece of logic such as an Intelligent MIDI Rule. We list the possible control sources here, starting with the most basic.

Velocity. This is the traditional "velocity switch", typically using the velocity with which the key is struck to select among samples recorded at various dynamic levels.

MIDI continuous controllers. When a MIDI controller is assigned to a dimension, the value of that controller at note-on determines which split will sound. Examples include using the Mod Wheel to switch between closed and open hi-hats, or using the Sustain Pedal to switch between piano samples recorded with and without sustain.

Keyboard. Keyboard (or "Keyswitch") control allows changing from one split to another by striking otherwise unused notes on the MIDI keyboard. This is often used for orchestral instruments that have a large number of articulations, where it would be difficult to switch accurately using a wheel or pedal type controller. The area of the keyboard used for switching is called the keyswitch region, and is defined in the Instrument Properties dialog.

Layer. The Layer dimension is unique in that all of its splits sound simultaneously, instead of just one. Layers are sometimes used in conjunction with MIDI volume control and/or crossfades, to give continuous control over the volume of each layer.

Release trigger. This special type of dimension typically has two splits and is used with sounds that have been divided into separate sustain and release samples. When a note on is received the first split is always played. The sample mapped to the second split is played at note *off*.

Round Robin, Random. These dimensions switch samples automatically each time you play a note. Round Robin progresses through the splits in order, while Random triggers the splits randomly.

Round Robin across keyboard. This variant of the Round Robin dimension advances to the next split when a key is struck in any region. (The basic Round Robin dimension described above advances only when a key is struck in its own region.)

Smart MIDI processor. This special dimension is used in conjunction with Intelligent MIDI (iMIDI) rules such as the Pattern Alternator, Repetition Mode, and Legato Mode. Logic in the iMIDI rule will determine which split plays at any given time. iMIDI rules are explained in a later chapter.

Stereo. Stereo isn't a dimension in the usual sense, but we mention it here because the left and right sides of a stereo sample each have their own articulations (performance data such as envelopes and filters). In this sense, the left and right channels resemble the "splits" in a normal dimension. Stereo also "uses up" one of the eight available Giga dimensions: a stereo region can have a maximum of seven ordinary dimensions.

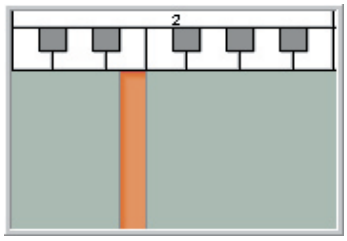
Working with dimensions

The best way to learn about dimensions is to start working with them.

- The next few lessons will start with a simple velocity split and work up to a more advanced multi-dimensional layout of a region.
- For now, we are going to be working with a single note to get to know the concept of working with dimensions (E-2 of an Orchestral Bass Ensemble from the Vienna Symphonic Library).
- Everything will be done with the manual drag-and-drop method so you can see and experience directly what these dimensions do. Once you understand what they do, you will then be better prepared to work with the Instrument Wizard.
- The Instrument Wizard does everything described in these lessons but does it automatically across many regions in a split second. As you will see, it would be a bit tedious to map an entire instrument with this manual method. However, this is the best way to learn about the structure of a region. In the Instrument Wizard chapter, we will recreate some of these examples with the Instrument Wizard using several notes.
- The manual method is still the best method for creating certain instruments that don't benefit from the Instrument Wizard, like some drum kits.
- You need to have the GigaStudio software installed and have your audio and MIDI connections working. Open the Instrument Editor and create a new blank instrument.

Creating the velocity split

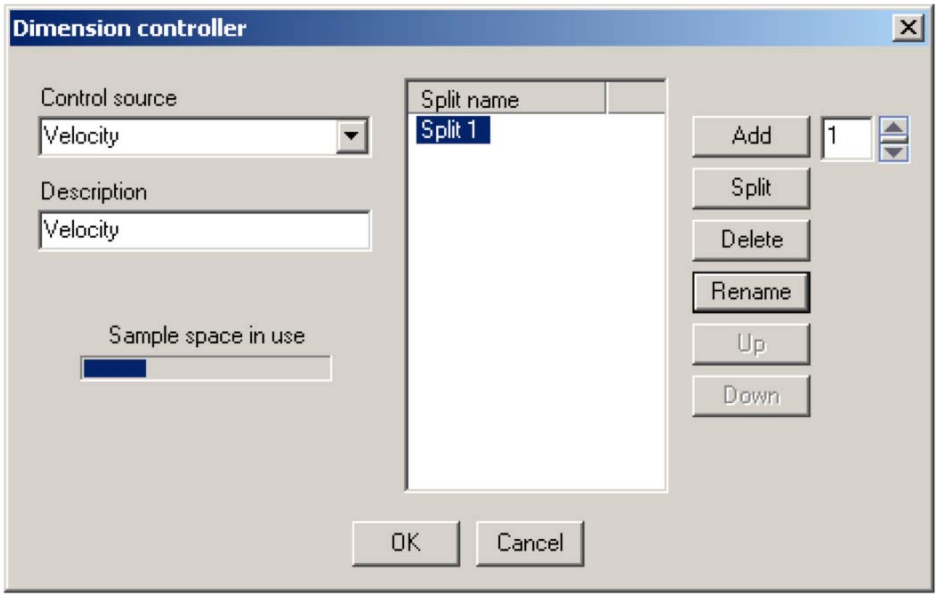
First we will take a region and add some velocity splits to it.



1. Create a region and put it on E2.

2. Click on the header at the top of the Velocity window.

3. The Dimension Controller dialog for the Velocity dimension appears. In the previous chapter, we used this dialog to create velocity splits. You can also use it to name, clone, or delete existing splits, and to change the order of splits within a dimension (even after samples have been mapped to them).



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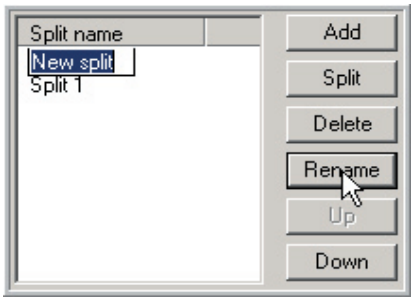
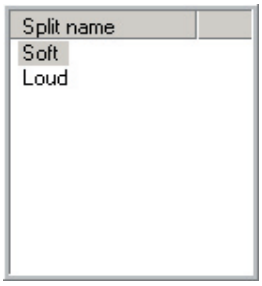
4. Click on the Add button to add a second velocity split. The new split will appear at the top.

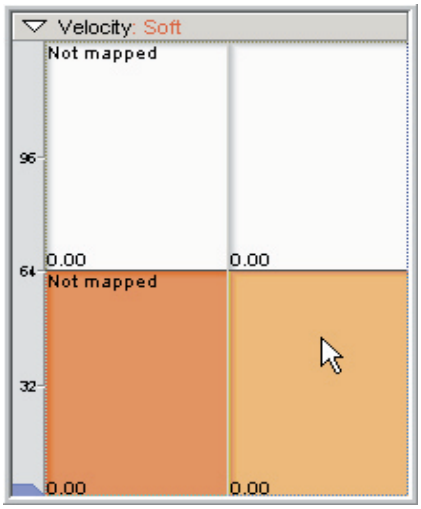
5. Click the Rename button and change the name of each split. Name the first one "Soft" and the second one "Loud" for now. Then click OK to close the Dimension Controller dialog.

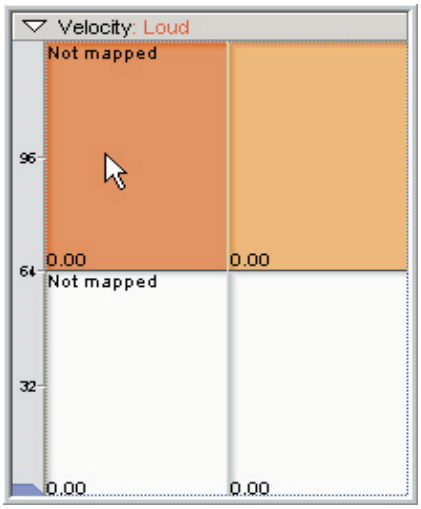




6. Now the Velocity Map is divided horizontally to represent these two velocity splits.

- If you click on the bottom split, it highlights and the name “Soft” appears in the Velocity Window header at the top.
- If you click on the top split, it highlights and the name “Loud” appears in the Velocity header.

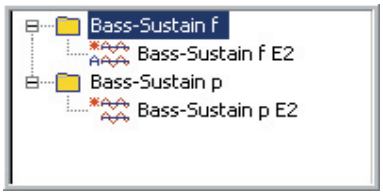




As you can see, naming these dimensions makes it easier to keep up with what is selected. This will become more important as we add more splits and more dimensions. It’s a worthwhile habit to get into if you plan to do a lot of instrument design.

Mapping the Samples

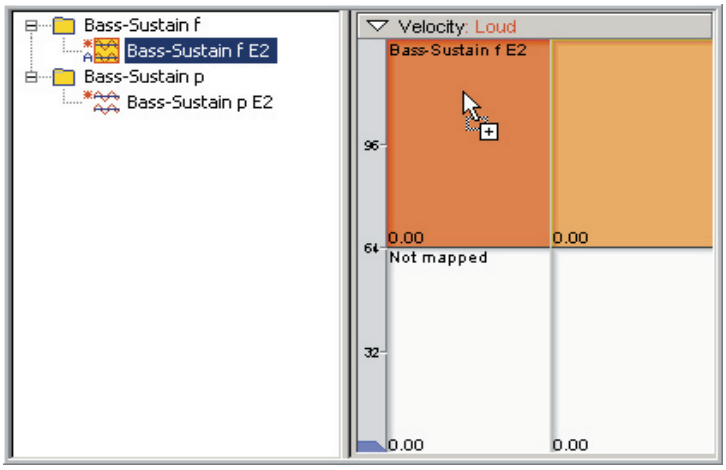
At this point, we have a stereo region with two velocity splits, but without any samples the region will be silent. In this section we’ll complete the job by mapping samples to the region.



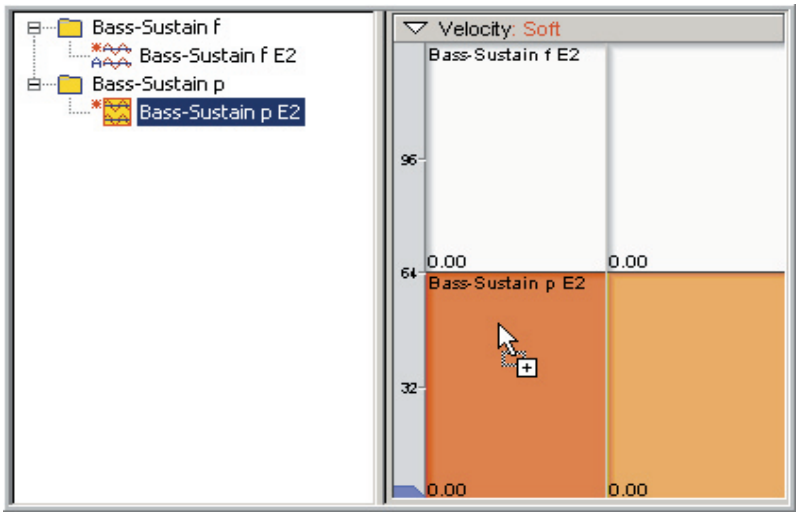
1. Import the two Bass-Sustain folders into the Sample Window.

These are in the “Editor Tutorial Files” directory for this chapter (How To Create Dimensions).

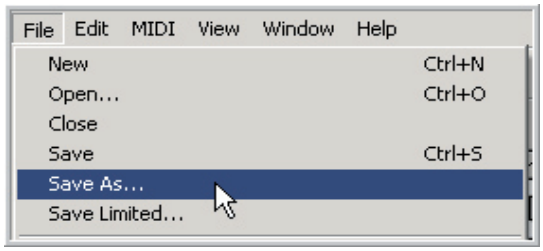
2. Drag and drop the Bass-Sustain f E2 (this is the forte/loud sample) to the top split in the Velocity Map.



3. Drag and drop the Bass-Sustain f E2 (this is the piano/soft sample) to the bottom split in the Velocity Map.



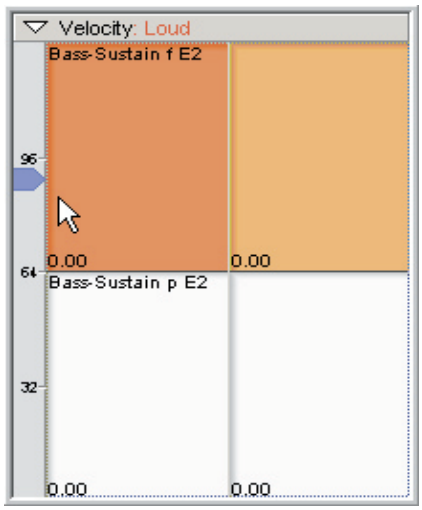
The samples are now mapped to the low and high velocity splits. In order to hear them, we need to save and load this instrument.



4. Choose Save or Save As in the File menu, and save this .gig file to your hard drive.

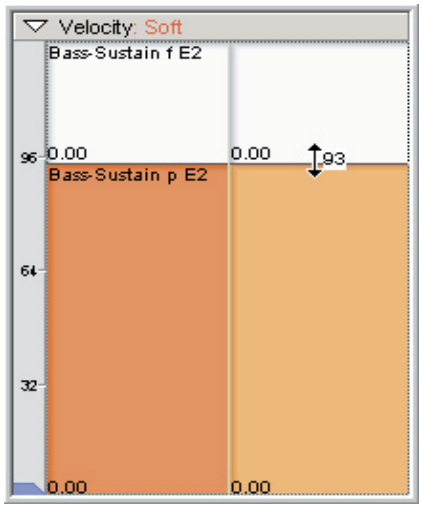
5. Click the Download button on the toolbar to load the instrument.

6. The Load Indicator Light will turn green when the instrument is loaded and ready to play.



7. Play E2 on your MIDI keyboard to hear the results. Play soft and loud and notice how the sample changes depending on how hard you play.

When you cross the halfway point, it switches from the soft to the loud sample. This is indicated visually as well in the Velocity Window. The blue pointer on the left tracks the incoming MIDI velocity level as you play and rests at the last played velocity level.



8. You can set the velocity split point by dragging up and down with the mouse.

The exact value of the split point is displayed next to the cursor as you adjust it. This number represents the highest velocity that will map to the split *below* the line.

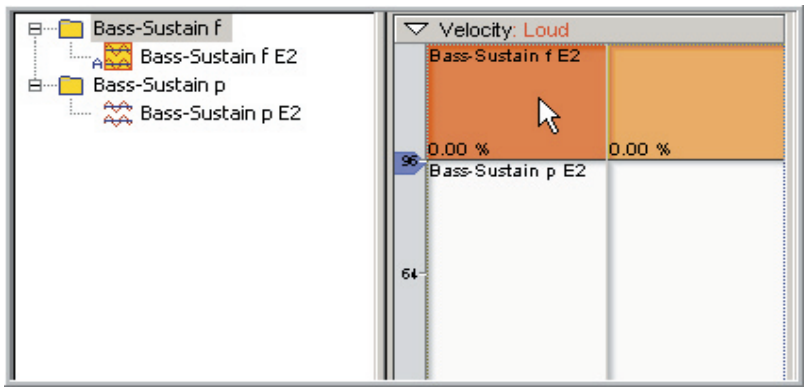
Playback Monitoring

This is a good place to briefly point out the various Playback Monitoring features of the GigaStudio Editor. As you play the keyboard, a variety of real-time things happen on the screen at once, especially if you have the "Jump to Regions" and "MIDI Select" enabled.

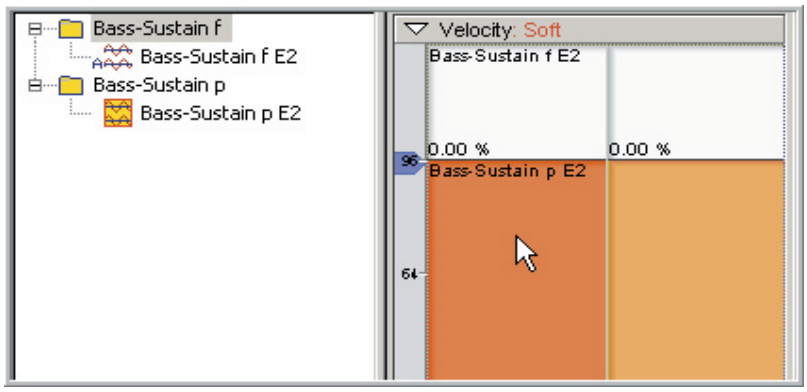
First we will enable the "Jump to Regions" mode:

1. Right-click in the Sample Window and enable *Jump to selected region* at the bottom of the menu (clicking the menu option turns the feature on or off). This feature will highlight any samples which have regions selected.

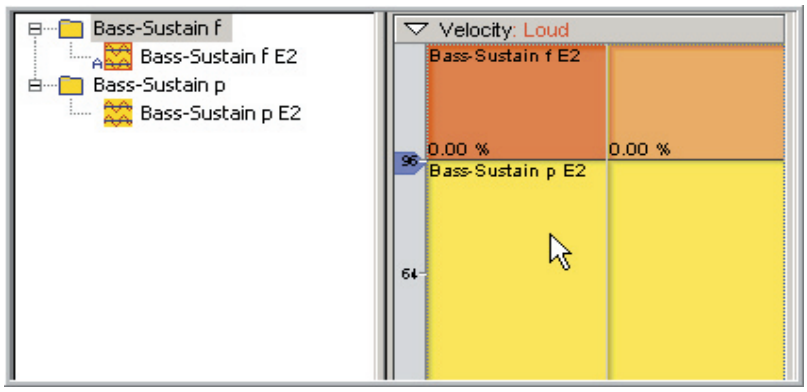
2. To see how this works, alternately select each of the velocity splits by clicking on it. Notice that when you select one, its sample lights up in the Sample Window. It highlights in yellow with an orange border.



3. When you select the other velocity split, its sample then gets highlighted in yellow with the orange border.



4. If you drag-select both velocity splits, both samples will be highlighted in yellow. The sample mapped to the currently focused split (the split highlighted in orange) will have the orange border around its icon:



Now we will enable “MIDI Select” mode.

5. Go to the top right of the Region Window and click on the MIDI Select button to turn this feature on. The button will light up.

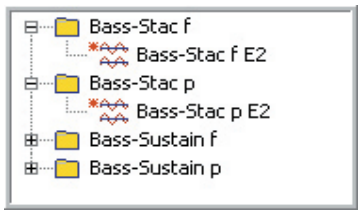
MIDI Select enables regions, dimensions and velocity splits to be automatically selected by incoming MIDI data.

6. Play the bass note again at various velocities. When you play loud, the top velocity is selected and highlighted as if you clicked on it with the mouse. A lower velocity selects the bottom split the same way. Also, the samples light up in the Sample Window. This allows you to instantly locate any region, dimension, velocity split and sample by playing it via MIDI instead of having to hunt and peck for it. This ensures that you are indeed editing the correct sample. As we get to more complex dimensions and more regions, this will be an invaluable tool.

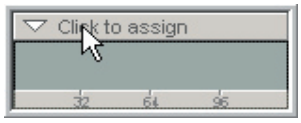
(You will probably want to turn MIDI Select off again when you are tweaking various parameters. For example if you are playing a note in real-time as you adjust a filter on the bottom velocity, you don't want the MIDI Select tool constantly throwing you to the top velocity split every time you play too loud. This is a tool that you will toggle on and off depending on what you are doing.)

Adding a Second Dimension

Now we will add another dimension to the sustaining bass note we have been working on. This will be a Mod Wheel dimension that will allow the Mod Wheel to switch between the sustain samples and some short staccato samples, each with two velocities.

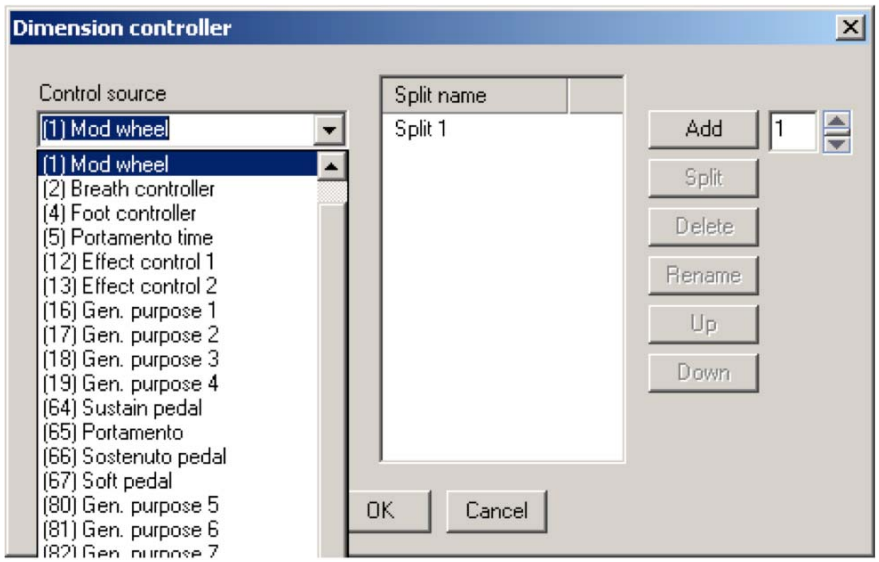


1. Import the two Bass-Staccato folders into the Sample Window (Bass-Stac f and Bass-Stac p).

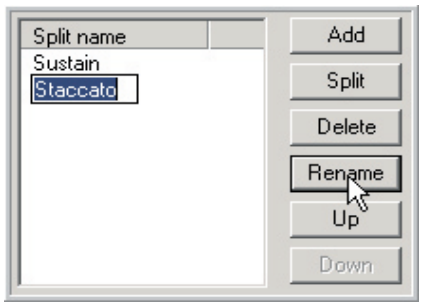


2. Click the header at the top of one of the unused dimension windows. This will bring up the Dimension Controller dialog.

You can use any of the empty dimension windows to the right of the Velocity window, but to keep it simple, use the top one.



3. On the Control Source menu, choose "(1) Mod wheel"

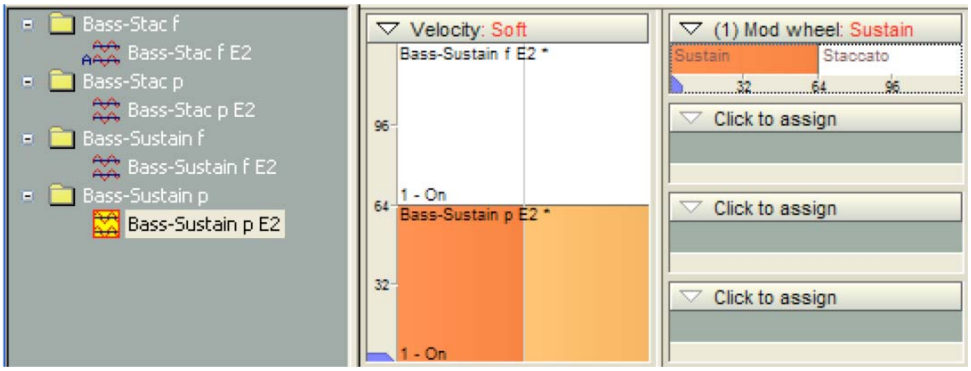


4. That will create a second split in the Split Names section. Rename the splits to “Sustain” and “Staccato” from top to bottom.

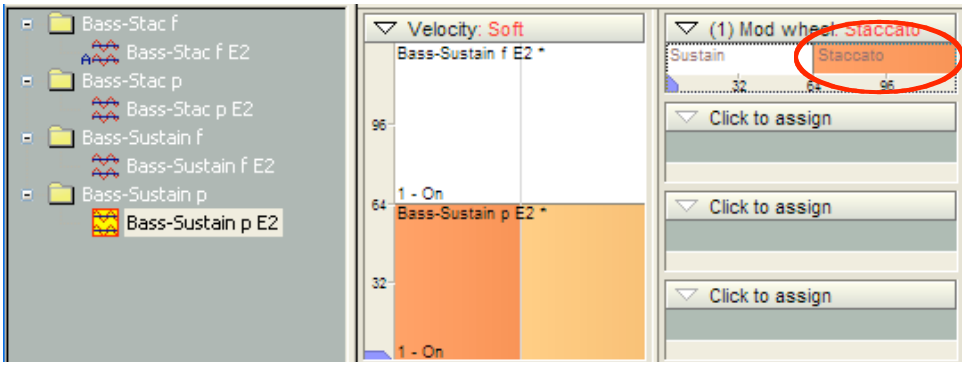
Split names are limited to 12 characters.

Click OK to exit the Dimension Controller dialog.

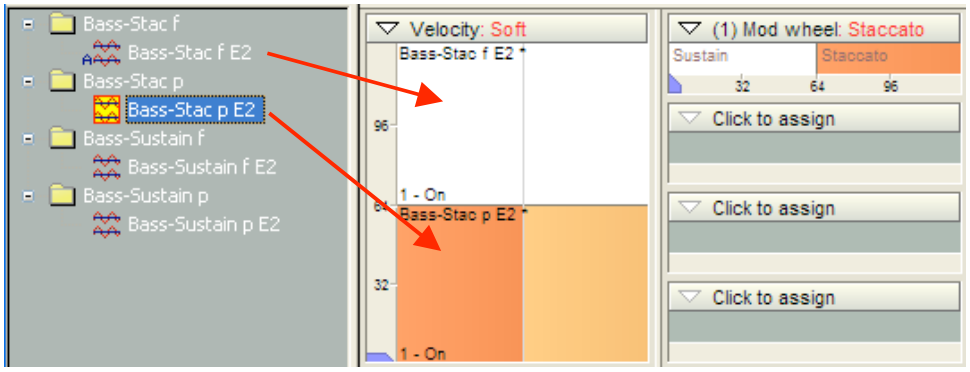
5. Now we have two Mod Wheel splits and two Velocity splits. However, the instrument won’t sound any different yet because we haven’t mapped the new staccato samples.



6. To see which samples are mapped to the upper range of the Mod Wheel, click on the upper Mod Wheel split. The Velocity window shows that the original Sustain samples are still mapped to the upper Mod Wheel split:



7. To make the new Staccato samples sound when the Mod Wheel is pushed up, leave the upper Mod Wheel split selected while dragging the Staccato samples into the appropriate Velocity splits:

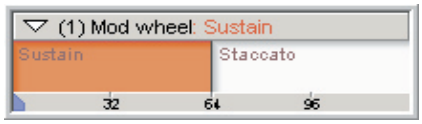


This gives us a fully two-dimensional region. You can switch between the loud and soft samples by playing harder or more softly on the keyboard, and at the same time, you can switch between the Sustain and Staccato samples by moving the Mod Wheel.

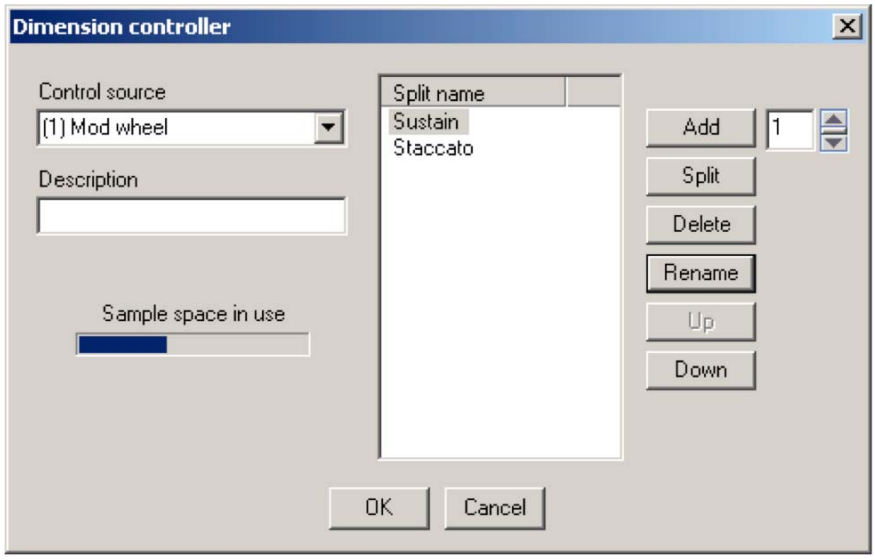
8. To hear the results of this new dimension, click on the Download button again. This will save the new changes and load the instrument.

Changing the Order of Dimension Splits

You might decide that you'd rather hear the Staccato samples, instead of the Sustain samples, when the Mod Wheel is in the lower part of its range. Fortunately, you can easily change the order of the splits in any dimension, even after they have been mapped to samples.

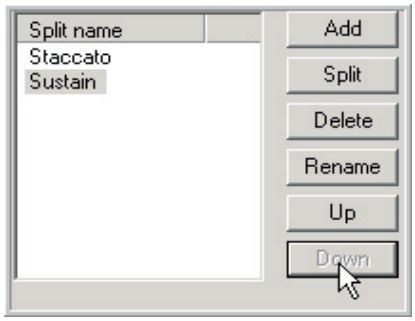


1. Right now, in the Mod Wheel dimension split, the Sustain samples are on the left (Mod Wheel down) and the Staccato samples are on the right (Mod Wheel up).



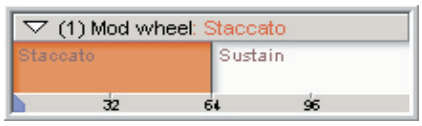
2. Click on the Mod Wheel dimension's header to bring up the Dimension Controller dialog.

Highlight the "Sustain" split.



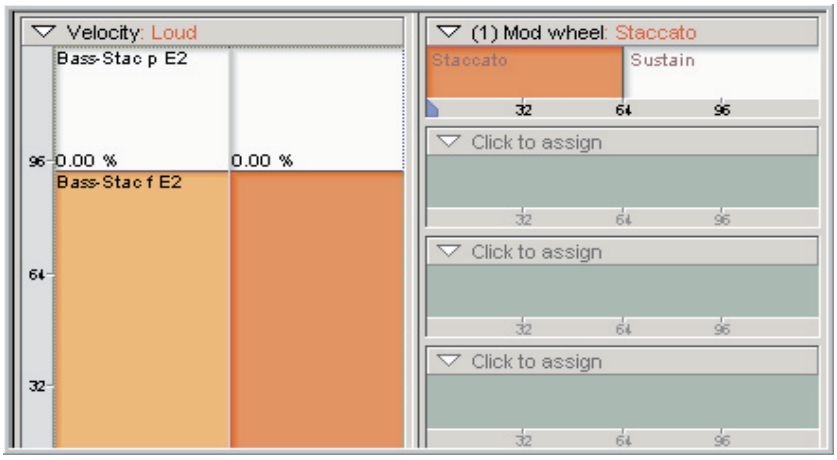
3. Click on the Down button to move the Sustain split below the Staccato split.

Click OK to close the dialog.



4. Now the Staccato samples are on the left (Mod Wheel down) and the Sustain samples are on the right (Mod Wheel up).

5. You can do the same thing with the Velocity splits, by starting the Dimension Controller dialog from the Velocity window. It's a little unusual, but here we've switched the Loud samples to the lower part of the velocity range:

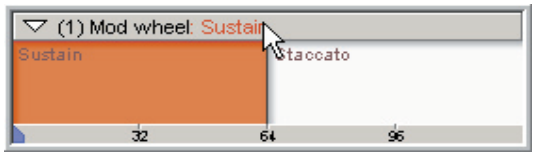


Changing the Dimension Controller

Dimension Controllers can also be changed easily without having to re-map the samples, and this can be done across the whole instrument. If you don't like the controller that has been assigned in a library you have, you can change it to something else. If you are designing your own instrument, the ability to make these changes allows you to change your mind and experiment.

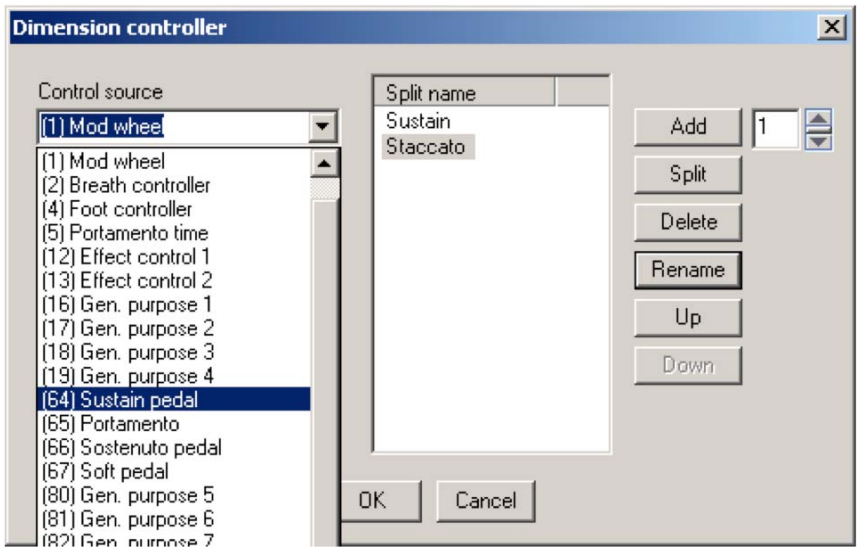
Using the same tutorial instrument, we'll now try switching between the Sustain and Staccato samples using controllers other than the Mod Wheel.

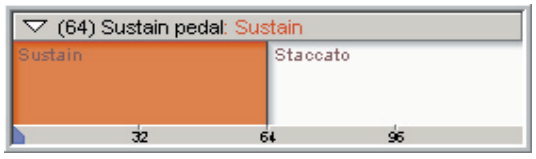
Change to Sustain Pedal



1. Click on the header of the Mod Wheel dimension split to start the Dimension Controller dialog.

2. In the Control Source list, select "(64) Sustain pedal" and click OK.



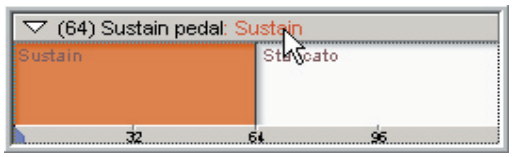


3. The dimension controller is changed to the Sustain Pedal.

4. Now, instead of the Mod Wheel switching between the Sustain and Staccato samples, the Sustain Pedal will change them instead. You will need to re-load the instrument to hear this change.

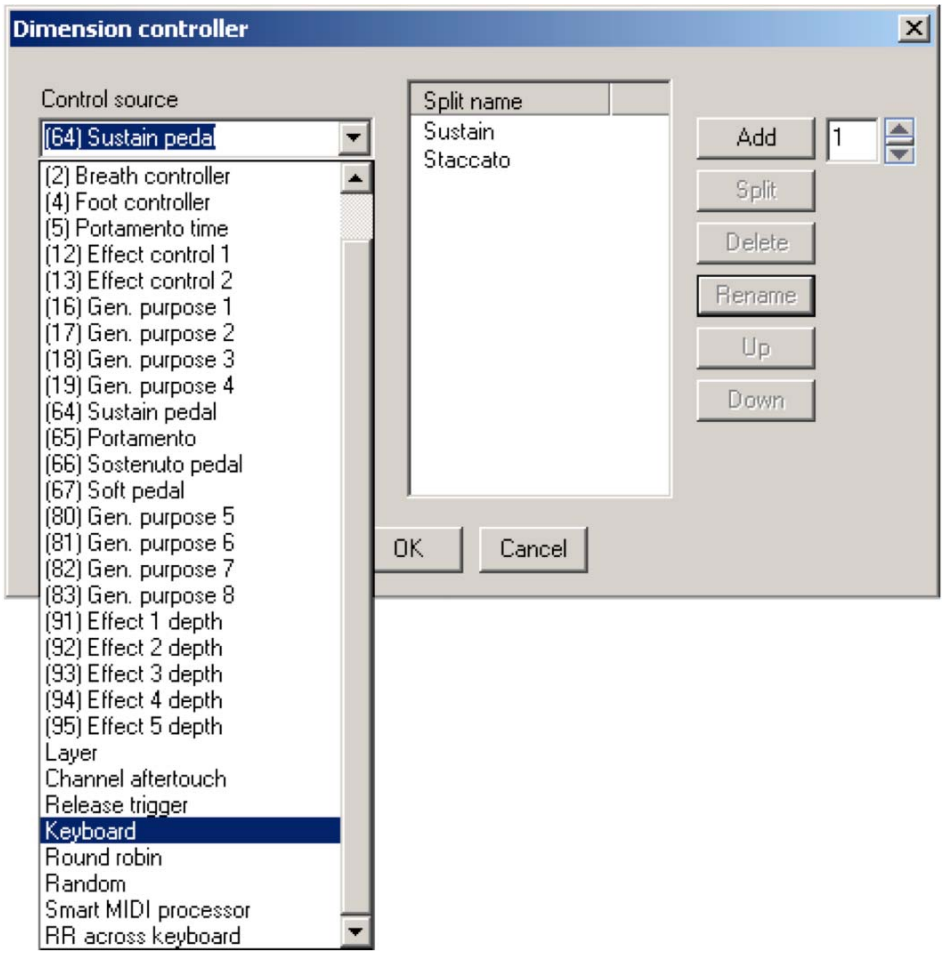
Change to Keyswitch

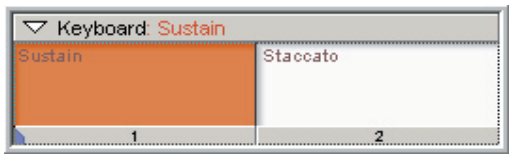
Next we will change this to a Keyswitch dimension. This will allows us to use keys on the MIDI keyboard to change between the Sustain and Staccato samples.



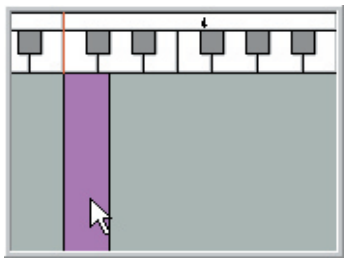
1. Once again, click on the dimension window header to start the Dimension Controller dialog.

2. This time, change the controller to “Keyboard” and click OK.





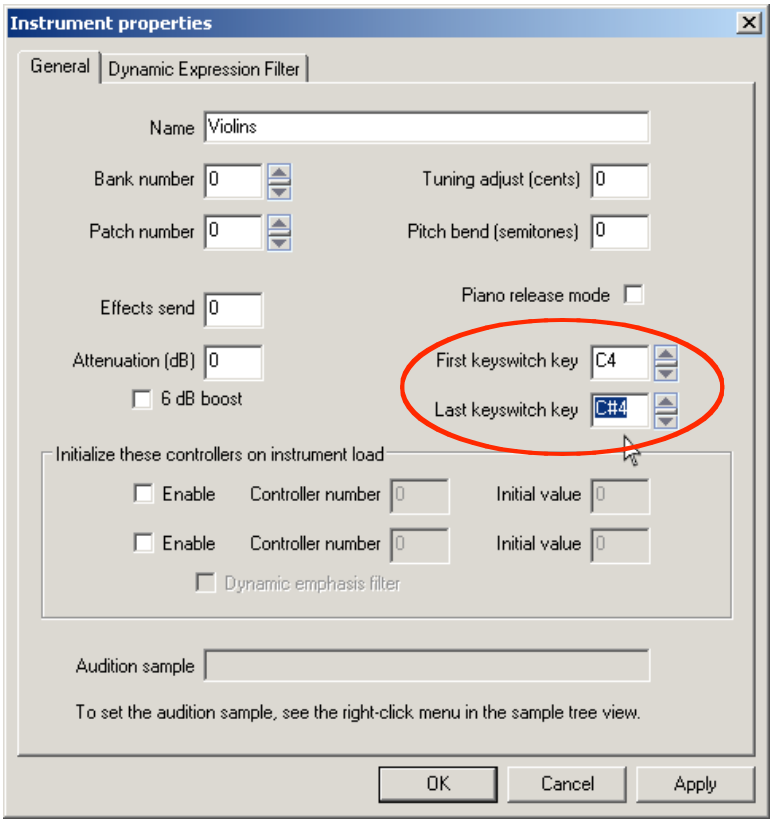
3. Now the dimension has been changed to “Keyboard,” also known as Keyswitch.



4. A Keyswitch dimension works in conjunction with the keyswitch region of the keyboard, which is normally drawn as a gray rectangle. When you create a Keyswitch dimension, the region turns purple to show that it’s now in use.

You can drag the keyswitch region to move or resize it, just like a normal region. Typically, the size of the keyswitch region will depend on the number of splits in your Keyswitch dimension. Since we only have two splits, we’ll set the keyswitch region to span two keys, C4 and C#4.

5. Alternatively, the Keyswitch range can be set numerically in the Instrument Properties window. Double-click on the instrument to get to this window.



6. You will need to reload the instrument to hear this change.

7. Now, triggering C4 will change to the Sustain samples and triggering C#4 will change to the Staccato samples. Play C4 and then play the instrument note to hear the Sustain samples, then play C#4 and play the instrument note again to hear the staccato. This is a two-hand technique: one hand is for playing the keyswitch and the other for playing the notes.

Change to Round Robin

The procedure is the same as in the previous two examples. Change to the Round Robin this time for the dimension controller.

What this will do is automatically change back and forth between the Sustain and Staccato samples every time you play the instrument. Reload the instrument and play the instrument note repeatedly to hear how this works.

Dimensions for alternate articulation parameters

While it's usual for each split within a dimension to be mapped to a different sample, it's also possible to map some or all splits to the same sample. This can be useful because each split will still have its own set of envelopes, filters, and other articulation parameters.

Examples:

- Use a MIDI controller to change between filtered and unfiltered playback of the same sample.
- Change between different envelope settings for amplitude, filter, or pitch.
- Change between different velocity curves or velocity levels.

Load and play the Tutorial Instrument "Bass Note 4-Way Mod.gig"

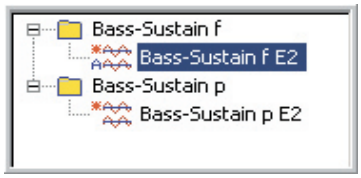
This instrument is a good example of how dimensions can be used to play the same samples with different edit variations. In this instrument, the Mod Wheel will switch four ways between the following options.

Normal Sustain
Filtered Sustain
Slow Attack Sustain
Short Release Sustain

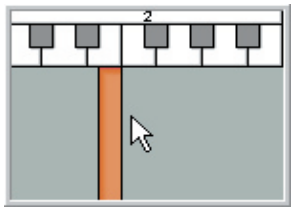
The Layer dimension

So far we have covered basic switching dimensions that use MIDI controllers or Velocity to change the samples that are played back. Another type of dimension is the Layer. This allows you to layer several samples on top of one another to be played back at the same time.

By default, all of the splits in a layer dimension sound simultaneously when a note is played. But you can also control the volume of the individual layers via MIDI, and even do a MIDI controlled crossfade between layers. In this example, we will create a simple two-way layer and put a Mod Wheel crossfade on it.



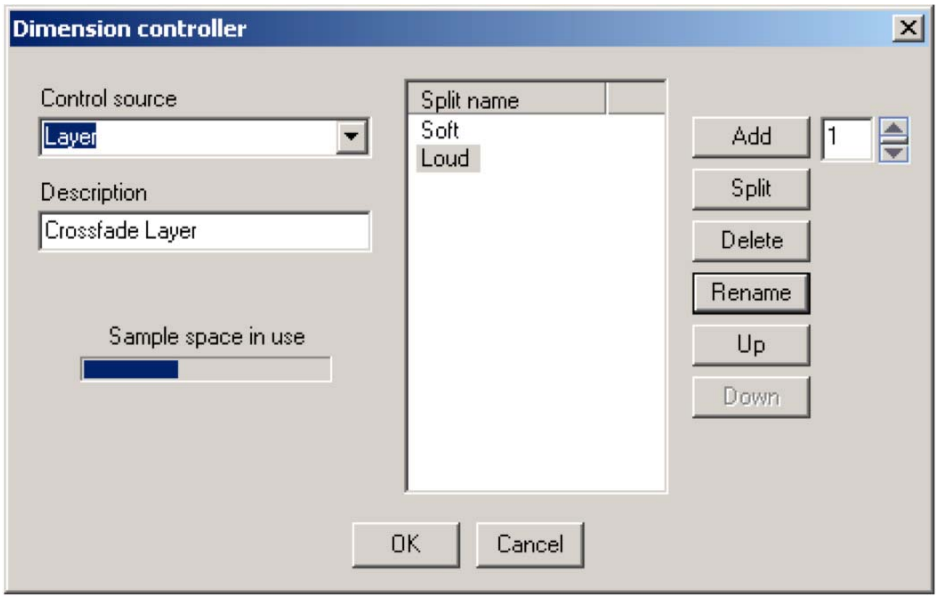
1. Start with a new blank instrument and import the Sustain Sample Bass note directories into the Sample Window.



2. Create a region at E2 again.

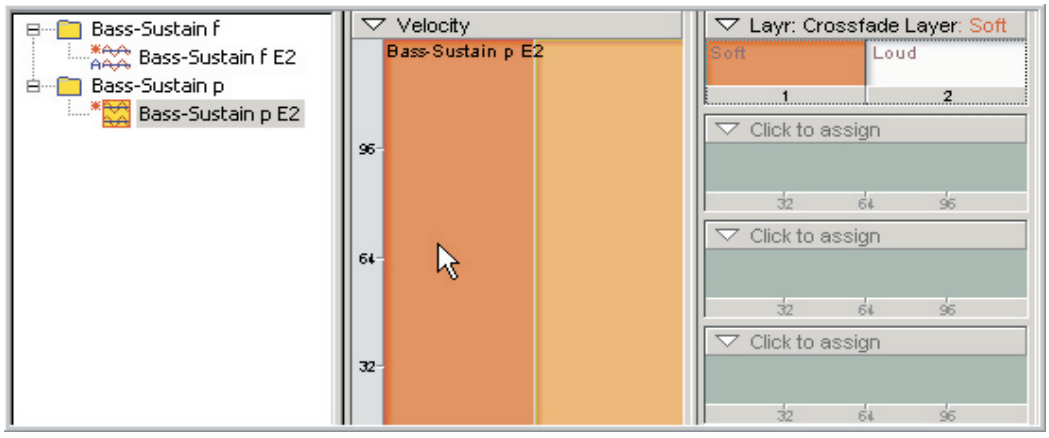
3. Click on the header bar at the top of an empty dimension to bring up the Dimension Controller dialog.

4. Set the Control source to “Layer”. Type in a Description and name the Split names to Soft and Loud. Click OK.

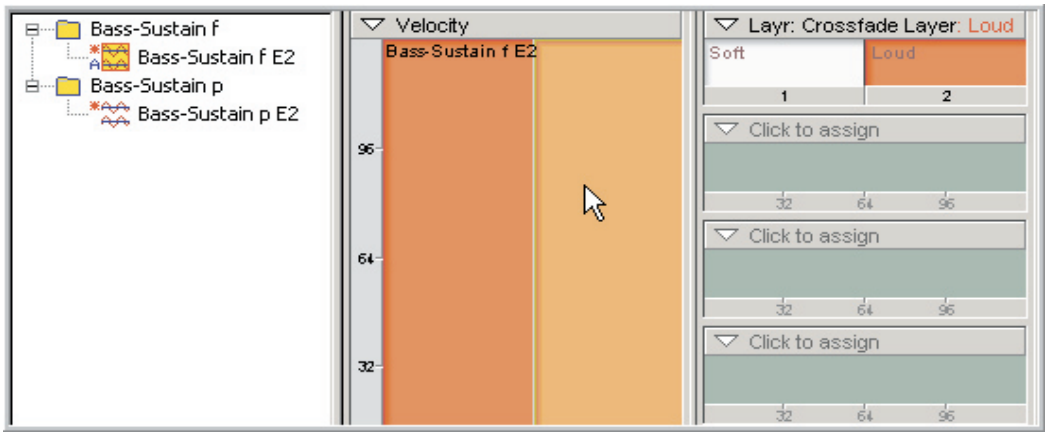


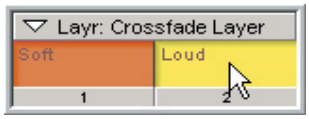
5. Now we have a Layer dimension split with Soft on the left and Loud on the right.

6. Select the Soft dimension split and drag “Bass-Sustain p E2” to the velocity map.



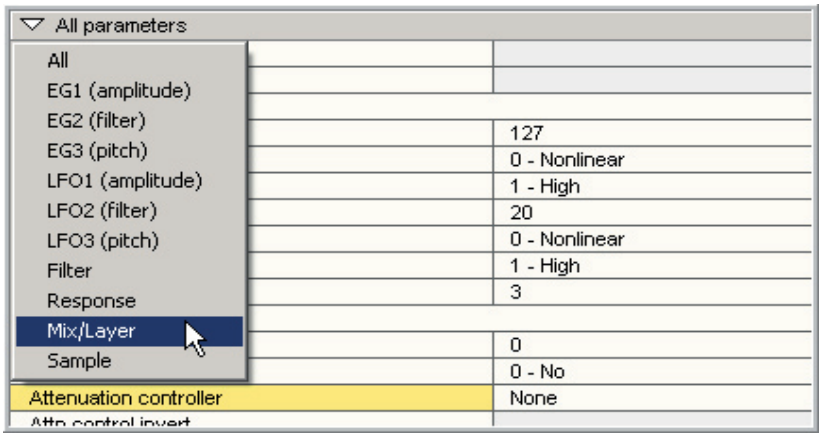
7. Select the Loud dimension split and drag “Bass-Sustain f E2” to the velocity map.



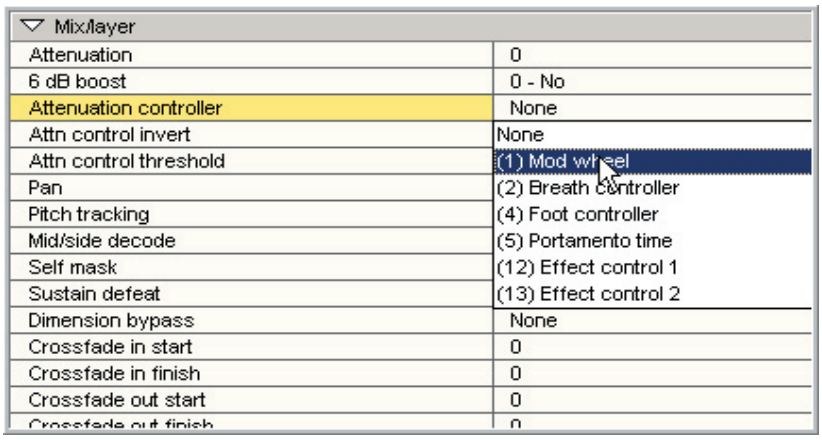


8. Now select both the Layer splits, since we want to apply the following edit to both.

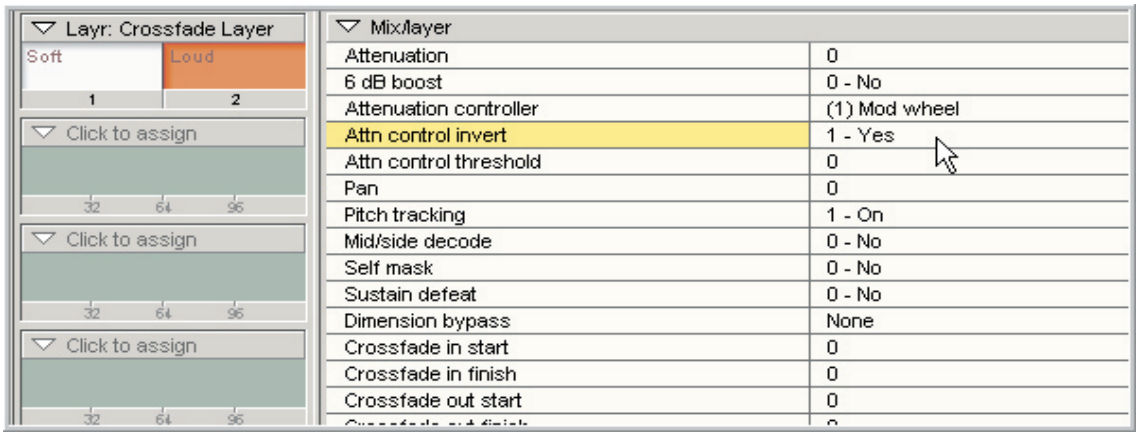
9. Click the header bar in the Articulation Parameters window and choose “Mix/Layer” from the category menu.



10. Click in the value field for “Attenuation controller” to see a menu of options. The default is “None.” Change this to “(1) Mod wheel” because we want the Mod Wheel to continuously control the volume of both layers.



11. Now select the Loud layer dimension only, and change the "Attenuation controller invert" parameter to "Yes". This will reverse the effect of the Mod Wheel on the Loud layer's volume, creating a simple crossfade between the loud and soft layers. As the Mod Wheel moves from 0 to 127, the soft layer will fade out and the loud layer will fade in.



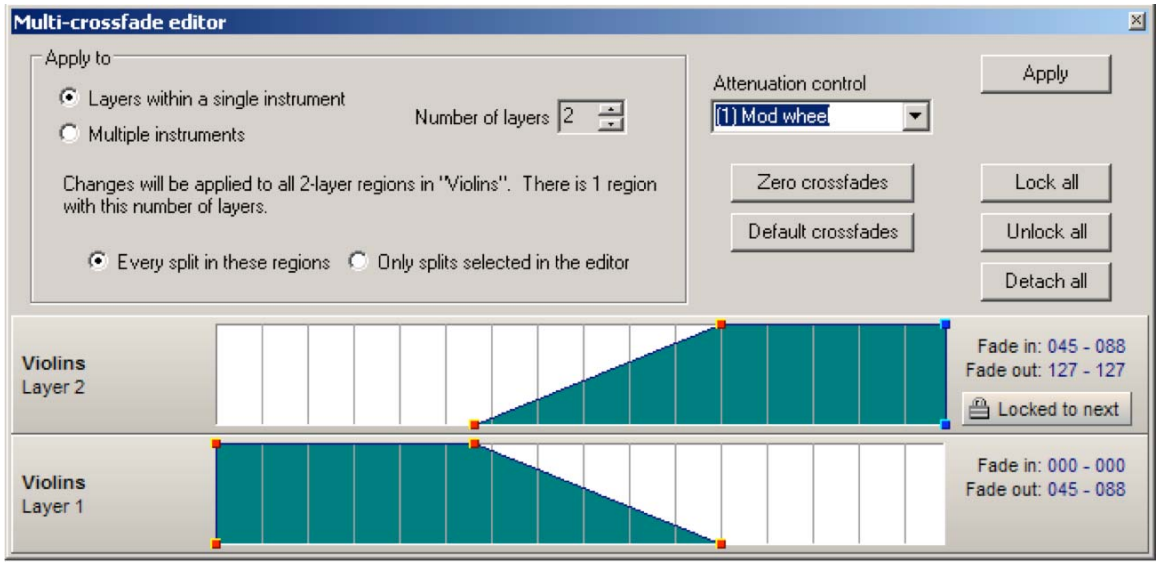
12. Save the instrument and load it to a MIDI channel.

13. Hold down the Note E2 while moving the Mod-Wheel back and forth. You should hear a smooth cross-fade between the soft and loud layer.

You can also do custom in and out points using the Crossfade Editor. This tool can handle any number of layers. When you use this method, leave the "Control invert" parameter set to "No" for all layers. The crossfade is defined instead by a set of four parameters:

Crossfade in start
Crossfade in finish
Crossfade out start
Crossfade out finish

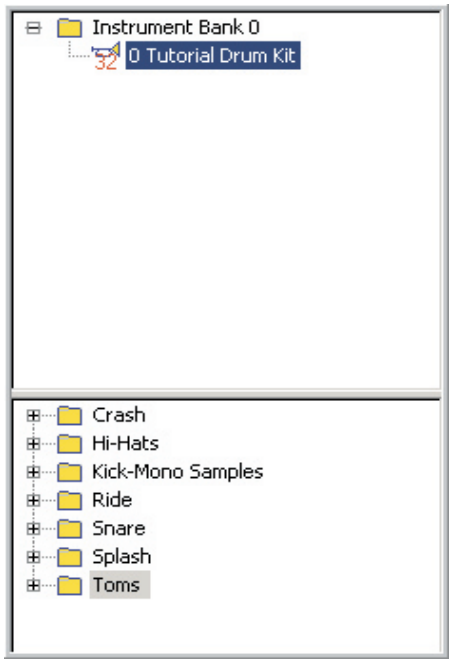
Typically each layer will have its own set of fade points, coordinated with those of the other layers. The Crossfade Editor allows the crossfades for all layers to be visualized and edited graphically. In the example below, Layer 1 will gradually fade to Layer 2 as the Mod Wheel rises through the middle part of its range. Up to 128 layers are supported.


Multi-crossfade editor
Apply to
Layers within a single instrument
Multiple instruments
Number of layers
2
Changes will be applied to all 2-layer regions in "Violins". There is 1 region with this number of layers.
Every split in these regions
Only splits selected in the editor
Attenuation control
(1) Mod whee
Zero crossfades
Default crossfades
Apply
Lock all
Unlock all
Detach all
Violins
Layer 2
Fade in: 045 - 088
Fade out: 127 - 127
Locked to next
Violins
Layer 1
Fade in: 000 - 000
Fade out: 045 - 088

Chapter 4: Tutorial: Advanced Drum Kit

In this lesson, we will create a full drum kit that will utilize many of the Editor's advanced features. Since this is a drum kit, all of the mapping will be "drag and drop" using the *right* mouse button (remember that dragging with the right mouse button disables Pitch Tracking on the samples that you map). The drum kit will illustrate:

- Multiple velocities
- Stereo and mono regions
- A MIDI controller dimension for hi-hat open and close
- A MIDI controller dimension for turning snares on and off
- Self-masking on the cymbals to save polyphony
- Lowpass velocity-controlled filters on the toms and bass drum



The first thing to do is to create a new instrument.

Import all the Tutorial Drum Kit folders into the Sample window. These can found in the "Editor Tutorial Files" directory for this chapter (How To Map Samples: Advanced).

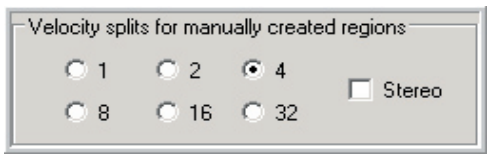
In the Instrument window you can name the instrument to "Tutorial Drum Kit".

You can also delete the "Default Sample" folder to keep the Sample window from getting too cluttered. The final result should look like the screen shot at left.

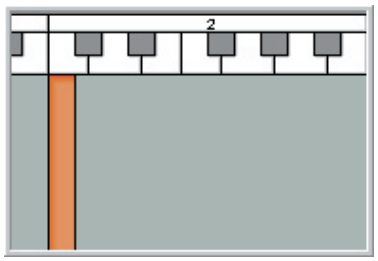
Now we are ready to start creating a drum kit.

Kick Drum

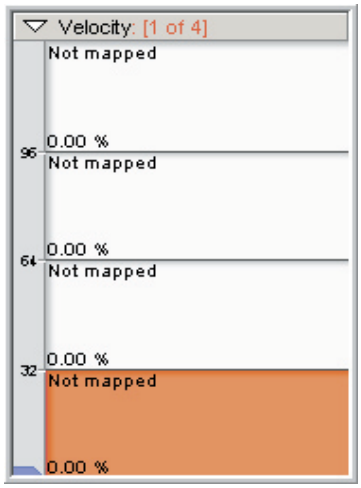
- The Kick Drum has four velocities of mono samples.
- We will create two identical regions of the Kick Drum for a left-right playing style (like a double kick setup). To do this, we will complete the first region and then copy and paste it to create the second one.
- There will also be a low pass filter controlled by velocity so that the tone is dark when played soft and gets brighter the louder it is played. This combined with the four-way velocity split makes for a smooth and realistic transition from soft to loud.
- We will also adjust the Release Time of the Kick Drum.



1. In the Preferences, set the velocity split count for manually created regions to 4.

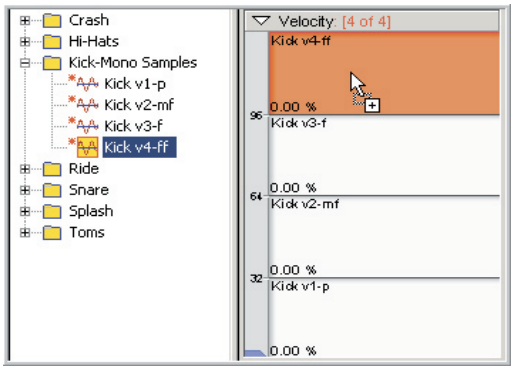


2. Right-click under C2 in the Region Window and choose “New region” from the context menu. This will create a new region at C2.

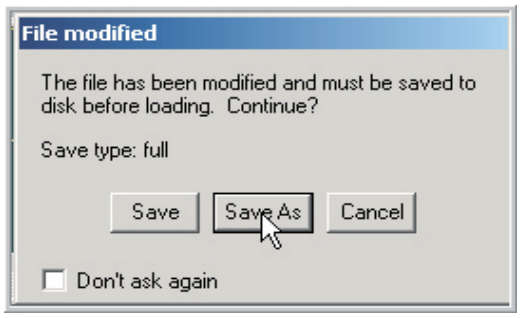


3. The new region will have four mono velocity splits ready to be mapped to Kick Drum samples.

4. Drag and drop the Kick Drum samples to the four velocity splits as shown below. Be sure to use the *right* mouse button to disable pitch tracking. We want all the samples to play at their original pitch.

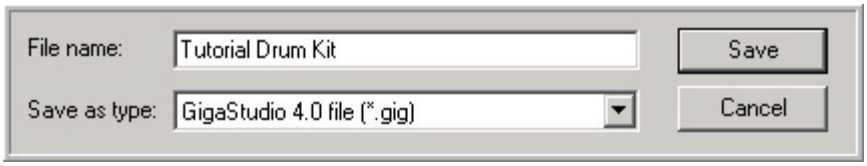


5. At this point it would be nice to hear the results as we edit the Kick drum parameters and velocity split points, so click the Download button.

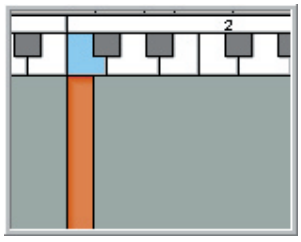


6. Choose the Save As option.

7. Find a place on your Giga Sounds hard drive to save this instrument. Enter a file name and click Save.

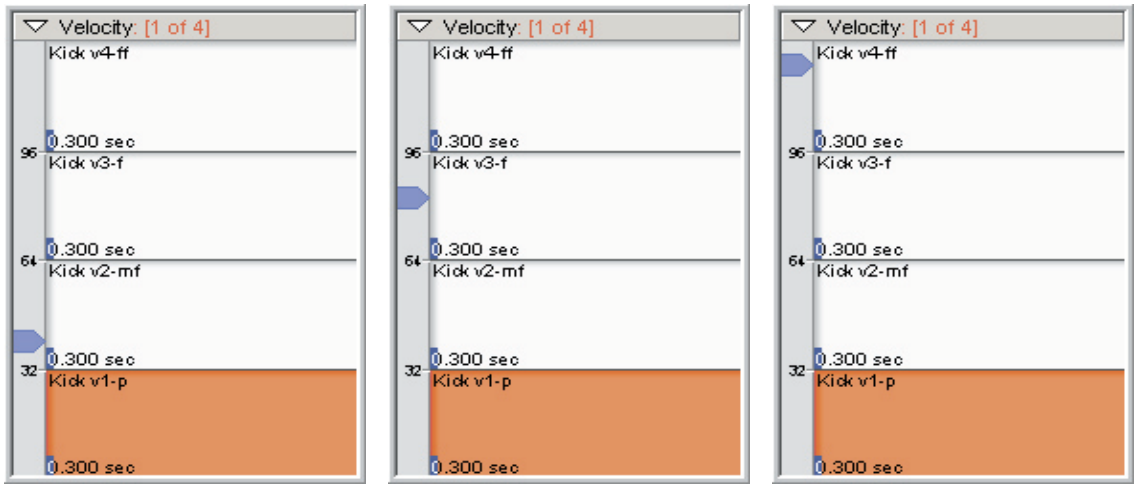


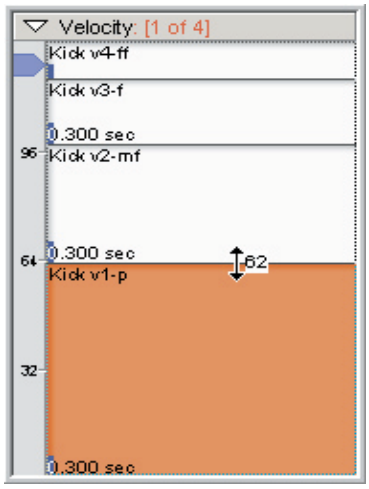
8. Once the instrument is loaded, the LOADED indicator will turn green and you should be able to hear the Kick Drum if you play C2 on the keyboard.



9. The note will also light up in blue on the keyboard when you play.

10. The blue arrow will move to the velocity levels you play in real time. This will help in adjusting the Velocity Split points to be able to see them as you play.

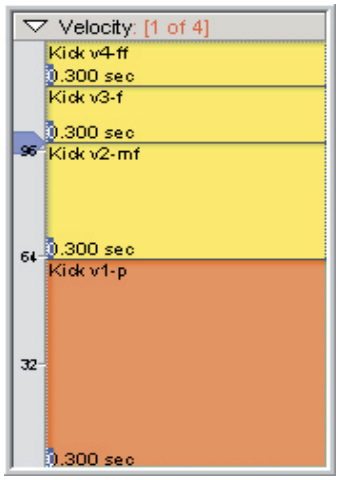




11. Drag the velocity split point to adjust the splits until they sound and feel right. Play the Kick drum and use the blue arrow as a guide as you adjust the split points.

This example shows a popular velocity split setting that works well on percussive instruments. Many keyboards don't reach the very low velocity range so it helps to make the lowest velocity a little larger than the rest so you can hear it. The top velocity has a narrower range so that it only triggers when you really hit the key fairly hard.

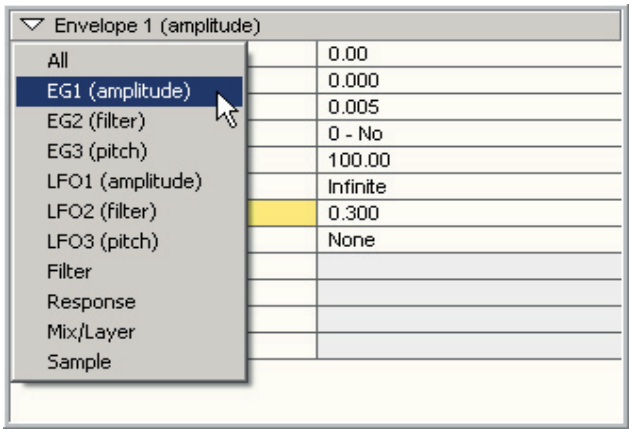
The next step is to put a longer release time on this Kick Drum. The default release time (300 milliseconds) is a bit too short.



12. Select all the velocity splits of the Kick drum so that they are all highlighted.

This way, any edits we perform will apply to all of them at once.

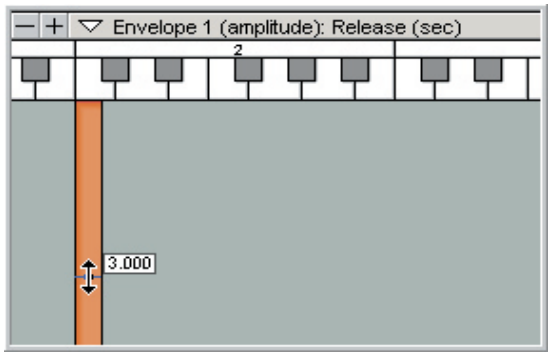
13. In the Parameters Window, click the header bar and choose "EG1 (amplitude)" from the context menu. This will bring up the Amplitude Envelope category of parameters.



14. Change the Release Time with the mouse or with text entry. You can experiment with different settings in real time as you play the Kick Drum to find a good setting. Around 3 seconds will cover the whole decay of the Kick Drum.

Default of 0.300 Sec:

Set to 3 Sec:



15. You will notice in the Region Window's header bar that Envelope 1 Release Time has been selected. The parameter you select in the Parameters Window will be automatically selected here as well.

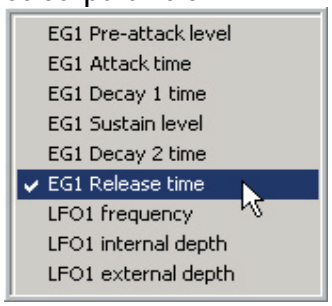
By dragging the blue dot on the Kick Drum region, you can adjust the Release Time here.

This is another option for editing various parameters in addition to the Parameters Window and the Waveform Window. (It will be especially handy for editing multiple regions at once.)

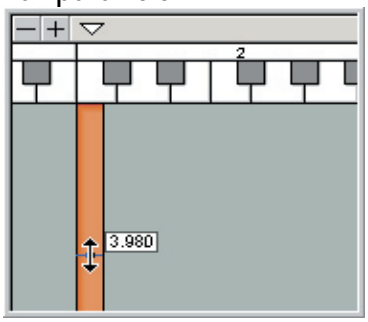
You can also select various parameters by clicking on the left side of the Region Window header bar and choosing the parameter you want to edit from the menu.

Click on header bar

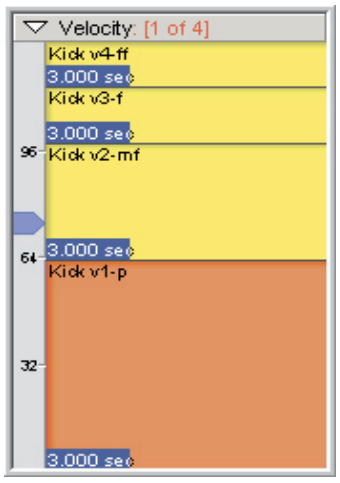
Select parameter



Edit parameter



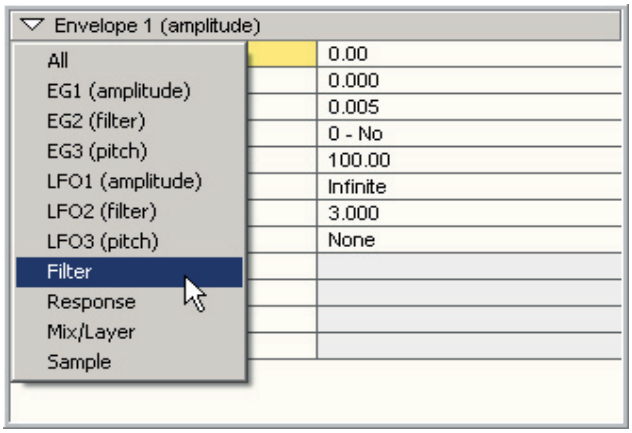
The last thing to apply to this Kick Drum is a simple Lowpass Filter. This will make the tone of the Kick Drum Samples get brighter as you play louder and darker as you play softer.



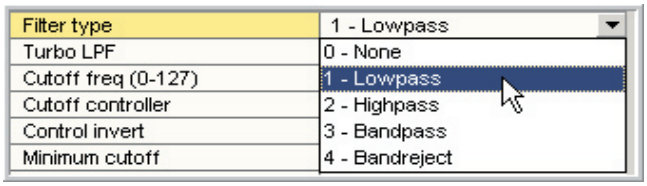
16. Make sure all four velocity splits are still highlighted. This filter will span all four splits. (You can however have individual filter settings for each velocity split if you want.)

Also notice that the Release Time (3.000 sec) is indicated here as well.

17. Go back to the Parameters Window and change to the Filter category.

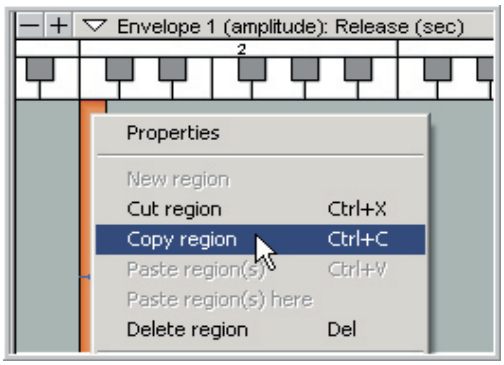


18. Set the Filter Type parameter to Lowpass.

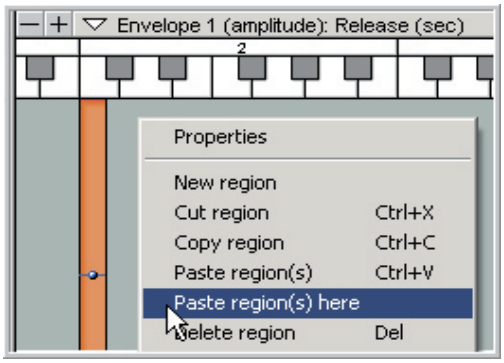


19. Now play the Kick Drum and notice how the tone gets darker or brighter depending on how hard you play. There are two types of tone change happening here at once. One is the sound of the velocity switching between softer and louder recordings of the Kick Drum. The other is the Lowpass Filter. Between these two things, you can get a smooth transition from soft to loud. Feel free to experiment with the other filter settings.

The final step for the Kick Drum is to create a second region so that we have two keys to trigger (like a double kick setup).



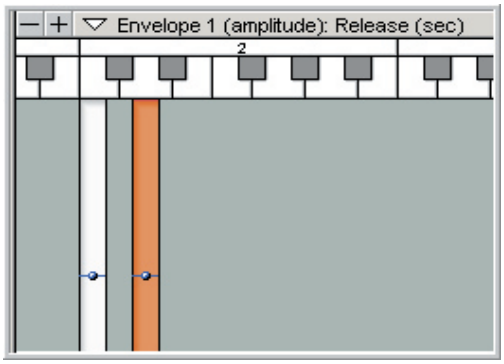
20. Right-click on the Kick Drum region and choose *Copy region* from the context menu.



21. Now, right-click in the empty space under the note D2.

This will bring up the context menu again.

Choose *Paste region(s) here.*



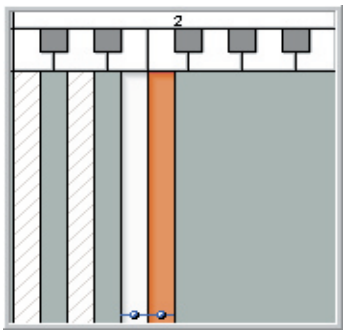
22. Now we have two identical regions of the Kick Drum on C2 and D2.

The new region is an exact copy of the original one, including the sample mappings as well as the parameter edits that we made above.

Snare Drum

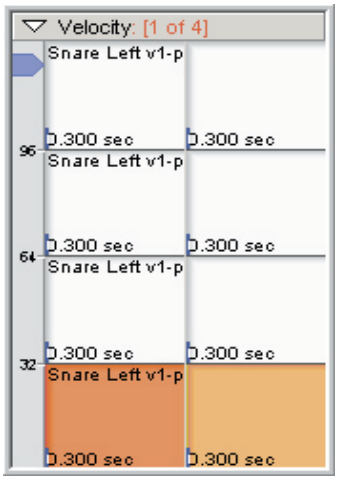
The next part of the drum kit to map out is the Snare Drum.

- This drum will have separate samples for the left and right sticks.
- These samples are stereo with four velocities.
- There's an additional set of four velocity samples with the snares off.

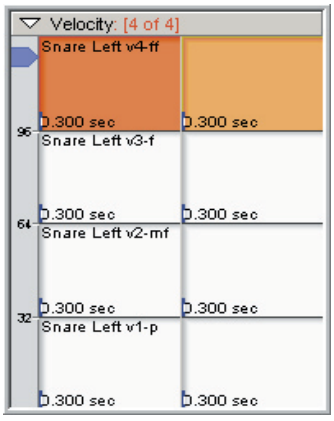


1. Create two new regions at E2 and F2. These will be the Left and Right snare samples.

Notice how these new regions are solid while the Kick Drum regions have diagonal hash marks on them. This differentiation indicates that these regions have differently structured dimensions. In this case the difference is that the Kick regions are mono while the Snare regions are stereo. If you select the Kick drum regions, those will turn solid and these Snare regions will get the hash marks.



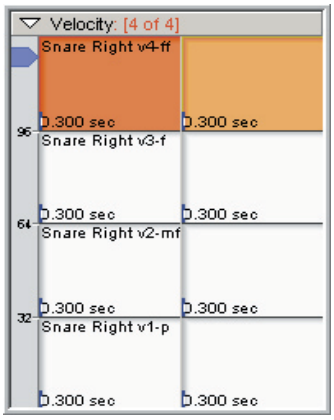
2. The Velocity Map for these new regions shows a Stereo split and four Velocity splits.



3. Select the Left Snare region (E2).

Drag and drop the Left-Hand Snare samples from the Sample Window to the four velocity splits using the *right* mouse button.

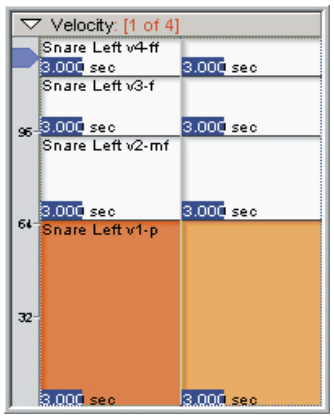
Snare Left v4-ff
Snare Left v3-f
Snare Left v2-mf
Snare Left v1-p



4. Select the Right Snare region (F2).

Drag and drop the Right-Hand Snare samples from the Sample window to the four velocity splits using the *right* mouse button.

Snare Right v4-ff
Snare Right v3-f
Snare Right v2-mf
Snare Right v1-p



5. Adjust the velocity split points and the Release Time of both Snare Drum regions just like with the Kick Drum.

You can also apply the Lowpass Filter at this point.

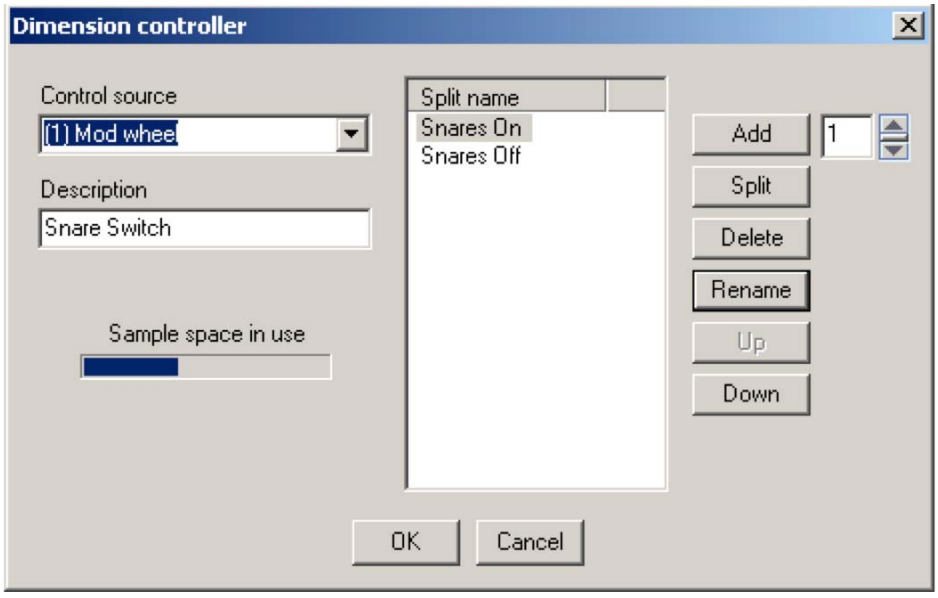
Now we want to add the Snare Off samples in a useful way.

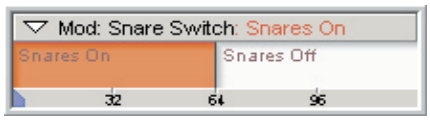
- In this case, we will create a Mod Wheel controlled dimension that will switch the snares on and off so to speak, like a snare drum switch.
- Moving the Mod Wheel forward beyond the halfway point will switch to the "snares off" samples while moving it back will switch back to the "snares on" samples.
- Also, there is only one set of Snare Off samples in these tutorial samples. There are no separate Left and Right hand samples so we will map the same Snare Off samples to both regions.

6. Click on a Dimension header bar.

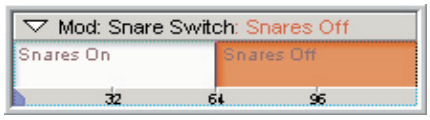
7. In the Dimension Controller dialog:

- Set the Control source to Mod Wheel.
- Enter "Snare Switch" in the Description.
- Rename the Splits to "Snares On" and "Snares Off".
- Click OK.



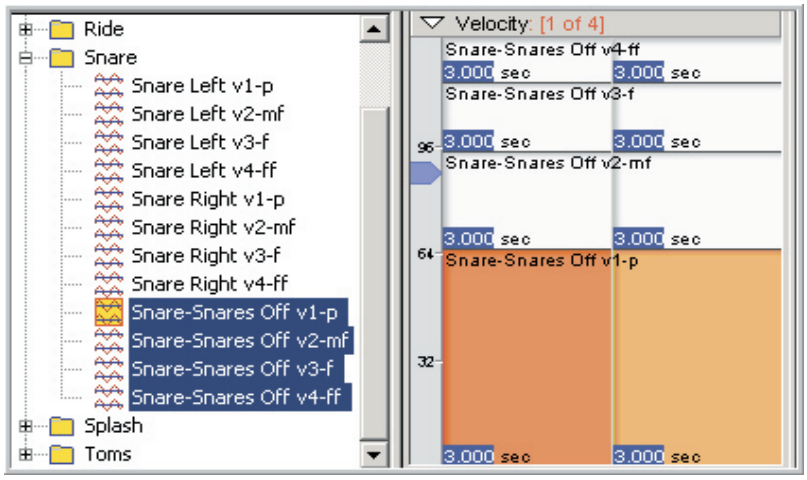


8. The result is a labeled dimension switch.



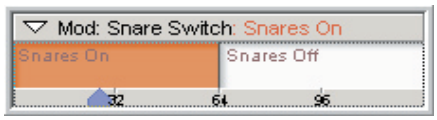
9. Select the Left Snare region and then select the “Snares Off” dimension.

10. Map the four “Snares Off” samples to the velocity map. Repeat this with the Right snare region so that both regions have “Snares Off” samples.

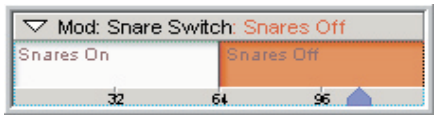


11. Click on the Download button to hear the latest results.

12. Play the Snare samples while moving the Mod Wheel back and forth.



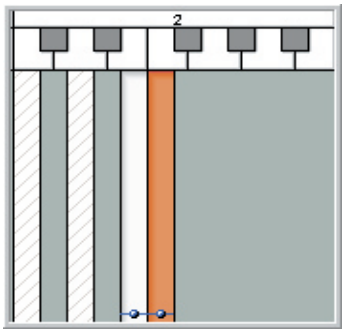
Mod Wheel Back: snares ON



Mod Wheel Forward: snares OFF

A note about dissimilar regions

As a side note, look at the Region Window and notice that the Kick regions are now drawn with diagonal hatching when a Snare region is selected, and vice versa. The hatching indicates regions whose structure is different from the current focus region (in this case, the difference is that the Snare regions have a Mod Wheel dimension, while the Kick regions do not).



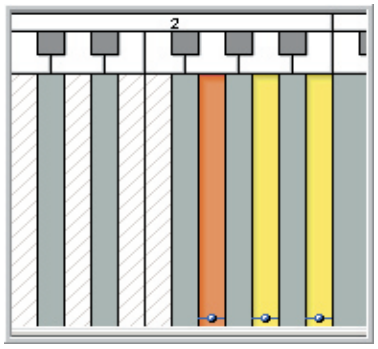
The Editor warns you about dissimilar regions because in most cases, they cannot be included when you perform a multiple-selection edit. To see what we mean, try the following exercise:

- In the Region Window, click on the Right Snare region (F3) to make it the orange focus region.
- Holding down the ALT key, drag the mouse across all four regions to select them. The F3 region remains the focus region.
- In the Velocity Window, drag the mouse to select all four velocity splits.
- In the Mod Wheel dimension window, select only the upper ("snares off") split.
- Change an articulation parameter, such as Release Time.

The result is that the new Release Time will be applied to all of the velocity splits (because you selected them all in the Velocity dimension), but only to the Snares Off versions (because only the Snares Off split is selected in the Mod Wheel dimension). Furthermore, the new release time will be applied to both of the Snare regions (E2 and F2), because they are both selected in the Region Window. However, the edit *cannot* be applied to the Kick regions (C2 and D2). Why not? Because we specified that the edit should apply only to the upper half of the Mod Wheel split, and the Kick regions *don't have Mod Wheel splits*. In the face of this conundrum, the Editor paints the problematic regions with hatch marks, and leaves them unchanged.

Toms

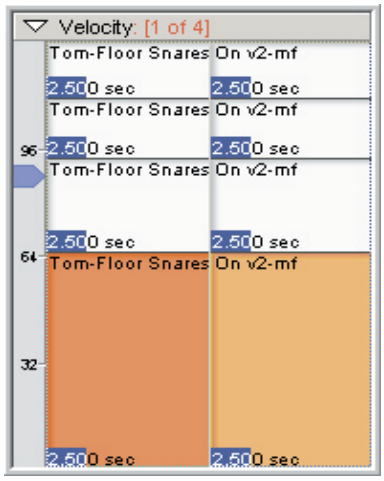
- There are three sets of Tom samples: High, Mid and Floor.
- They are stereo with four velocities.
- There are Snare On and Snare Off samples. With the Snare On samples, the snare drum buzz is heard when the toms are hit.



1. Create three new regions, one for each Tom. Put them on notes G2, A2, and B2.

The regions should automatically have four velocity splits as before with the snares, based on the Preferences setting.

Select all three of the new regions so that the following edits will apply to all of them.



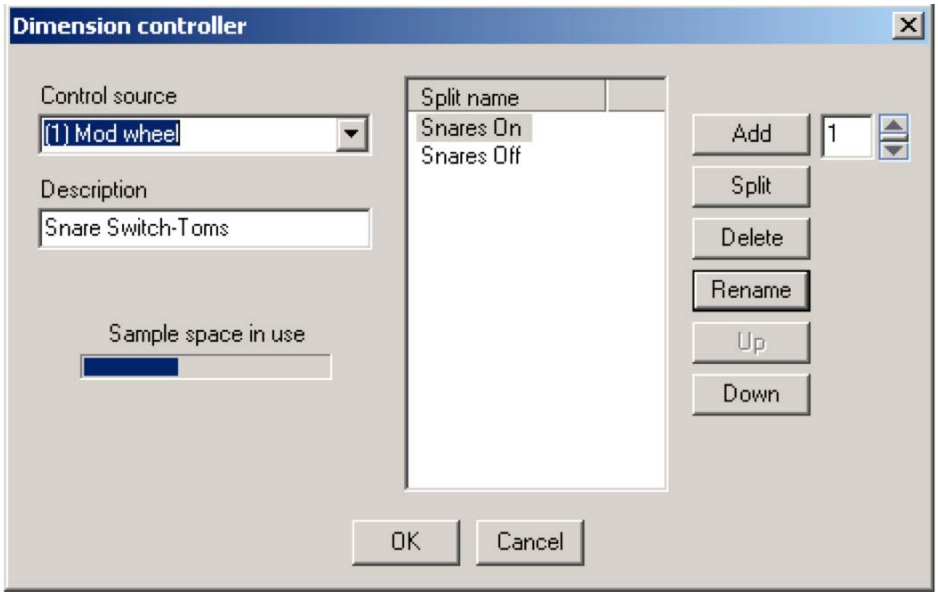
2. Using the same techniques as with the Kick and the Snare, adjust the velocity split points and the Release Time, and add a Lowpass filter.

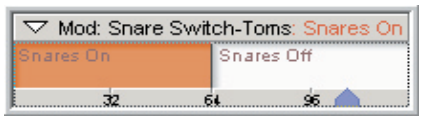
Again, the changes will apply to all three regions at once because they were all selected in the previous step.

3. Click on a Dimension window header.

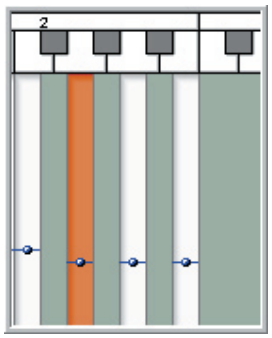
4. Do the same thing we did with the snares:

- Set the Control Source to Mod Wheel.
- Enter “Snare Switch-Toms” in the Description field.
- Rename the Splits to “Snares On” and “Snares Off”.
- Click OK.



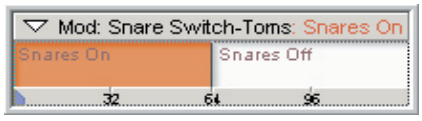


5. Now the Toms have a labeled dimension switch.



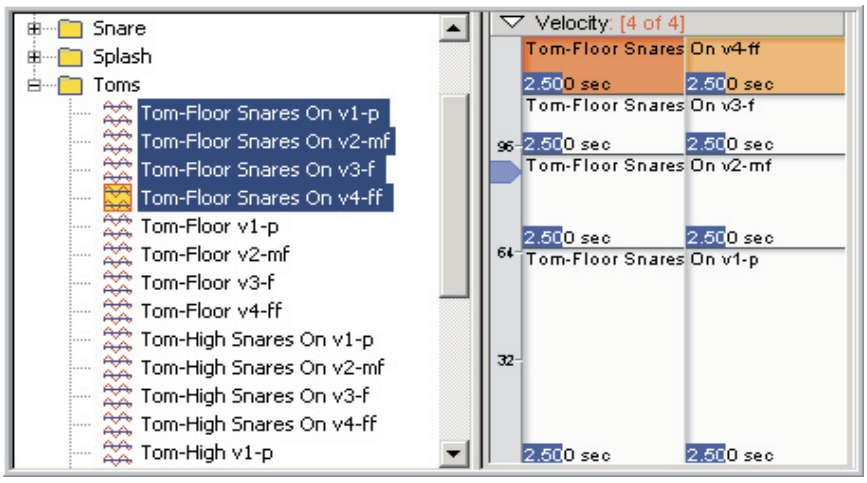
6. Select the G2 region.

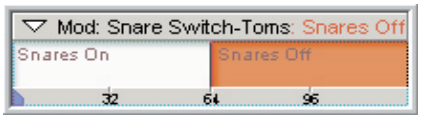
This will be the Floor Tom.



7. Select the “Snares On” dimension.

8. Map the “Tom-Floor Snares On” samples using the *right* mouse button.





9. Select the “Snares Off” dimension.

10. Now map out the “Tom-Floor” Samples using the *right* mouse button. These samples do not have any snare buzz in them.

11. Repeat these steps for the Middle and High Toms.

Mid Tom:

- Select the A2 Region.
- Select the Snares On dimension
- Map the “Tom-Mid Snares On” samples.
- Select the Snares Off dimension.
- Map the “Tom-Mid” samples.

High Tom:

- Select the B2 Region.
- Select the Snares On dimension
- Map the “Tom-High Snares On” samples.
- Select the Snares Off dimension.
- Map the “Tom-High” samples.

12. Click the Download button to save and reload the instrument.

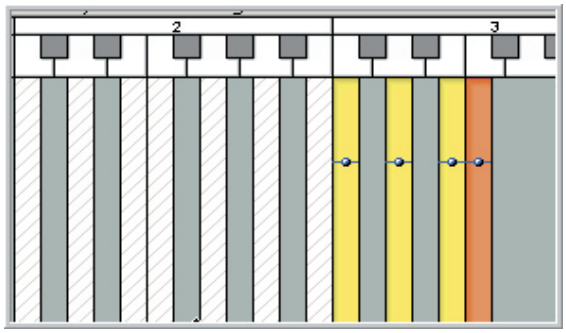
13. Now play the Toms while moving the Mod-Wheel back and forth. You should hear the snares turning off and on.

Cymbals

The Cymbals are fairly straightforward.

- There are four sets of samples: Ride, Ride Bell, Crash, and Splash.
- They are all stereo.

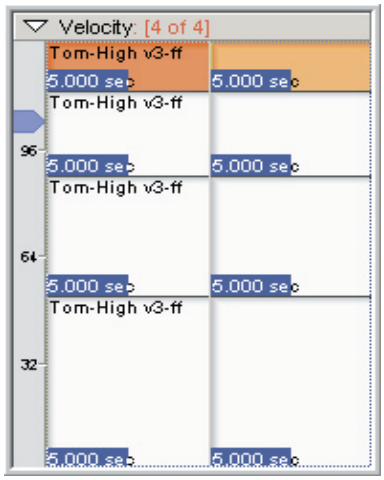
- They all have four velocity splits.
- We will enable “Self Masking” to save polyphony for the long sustain times.



1. Create 4 new regions on C3, D3, E3, and F3.

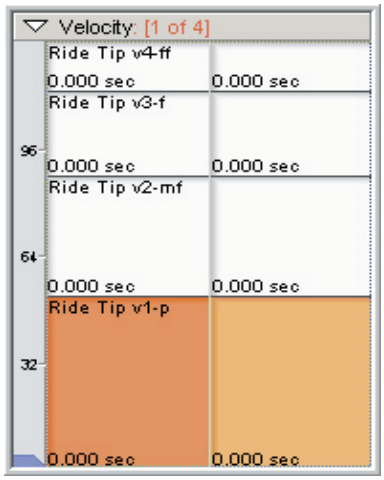
This should create four regions with four Velocity Splits.

Select all four of the regions.



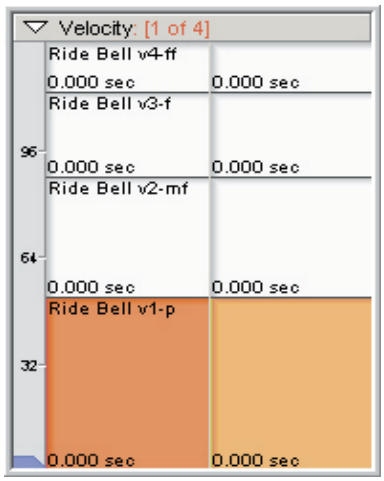
2. Give the velocity split points a rough adjustment as in the past examples.

Set a Release Time of 5 seconds.



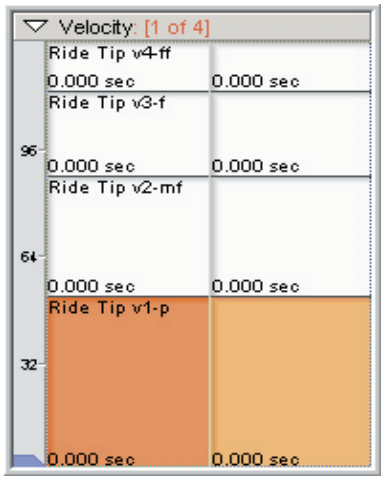
3. Select the C3 region in the Region Window.

Map the “Ride Tip” samples using the *right* mouse button.



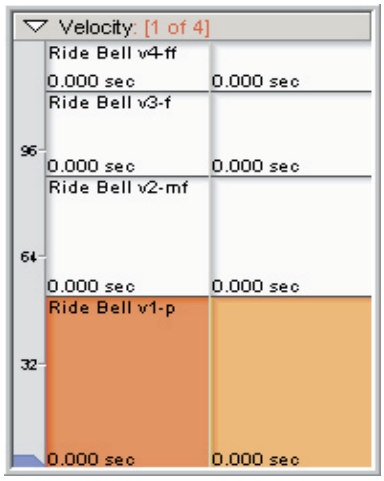
4. Select the D3 region in the Region Window.

Map the “Ride Bell” samples using the right mouse button.



5. Select the E3 region in the Region Window.

Map the “Crash” samples using the right mouse button.



6. Select the F3 region in the Region Window.

Map the “Splash” samples using the right mouse button.

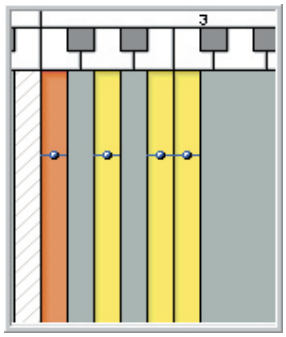
7. Click on the Download button to save the changes and hear the results.

Play the cymbals and tweak the velocity split points and release times if needed.

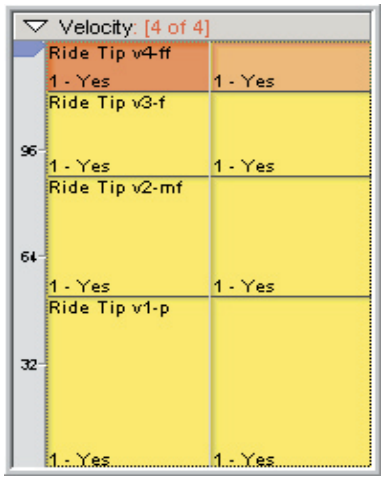
The final thing we will do to the cymbals is enable the "Self Masking" articulation parameter to save polyphony. With Self Masking enabled, playing louder velocities will shut off any sustaining softer velocities on the same region that are still decaying.

For example, these cymbals have several seconds of decay. If you play a soft note, the sample will play to the end of the decay no matter what. You could trigger a louder note while the soft sample is still decaying and drown out the soft sample. However, even though you can't hear the soft sample any longer, it would still be using up polyphony until it is finished decaying. With Self Masking enabled, the louder note will cut off the softer note.

8. Before enabling Self Masking, trigger one of the cymbals several times from soft to loud. Watch the polyphony meter (on the status bar at the bottom of the Editor) and notice how much polyphony it uses.

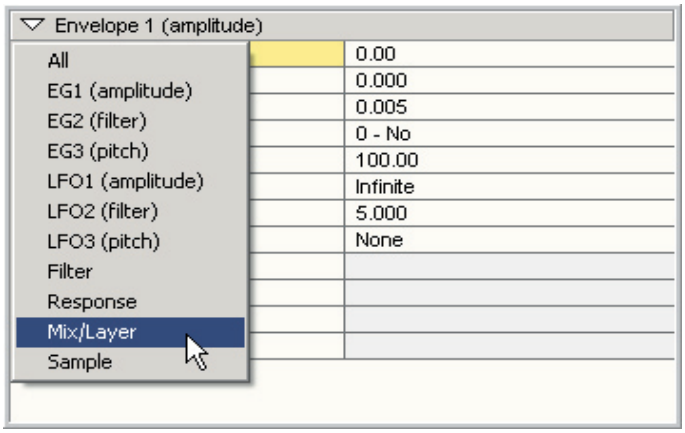


9. Select all four of the cymbal regions.



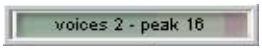
10. Select all the velocity splits. Now when we edit a parameter, the new value will be applied to all of the splits in all of the regions.

11. In the Parameters Window, bring up the Mix/Layer section.



12. Set the Self-Masking parameter to Yes.

13. Now trigger one of the cymbals as before and notice the difference in polyphony.



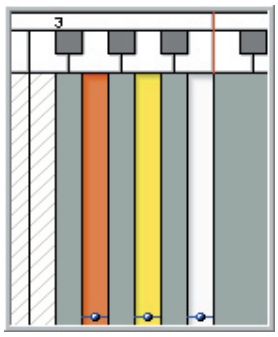
Hi-Hats

Last but not least, we have the Hi-Hats.

- 4 stereo velocities of Tip Closed
- 4 stereo velocities of Tip Open
- 4 stereo velocities of Edge Closed
- 4 stereo velocities of Edge Open
- 4 stereo velocities of Foot Closed

We are going to get fancy with the Hi-Hat. The Sustain Pedal will do several things at once:

- Switch between Open and Closed Tip and Edge Samples
- Trigger one of the Foot Closed Samples
- Cut off the Open Samples using a Key Group assignment



1. Create three more regions at G3, A3, and B3.

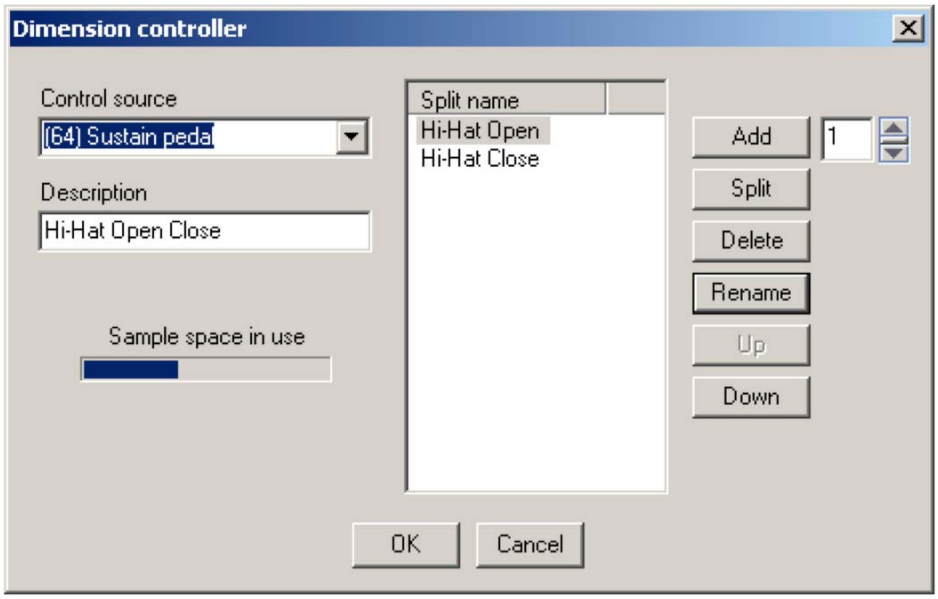
Select the leftmost two regions G3 and A3.

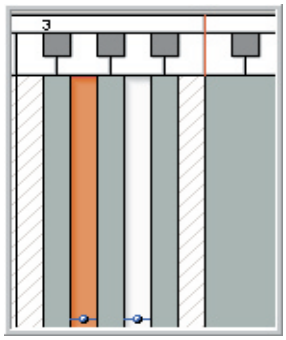
These regions will be the Tip and Edge hits and they will have a Sustain Pedal dimension split that will switch between open and closed samples.

2. Click on a Dimension header bar.

3. Do the same thing we did with the snares:

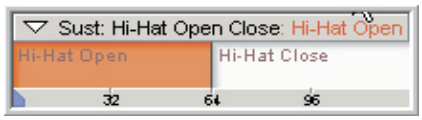
- Set the Control source to Sustain Pedal.
- Enter “Hi-Hat Open Close” in the Description field.
- Rename the Splits to “Hi-Hat Open” and “Hi-Hat Close”.
- Click OK when you are done.





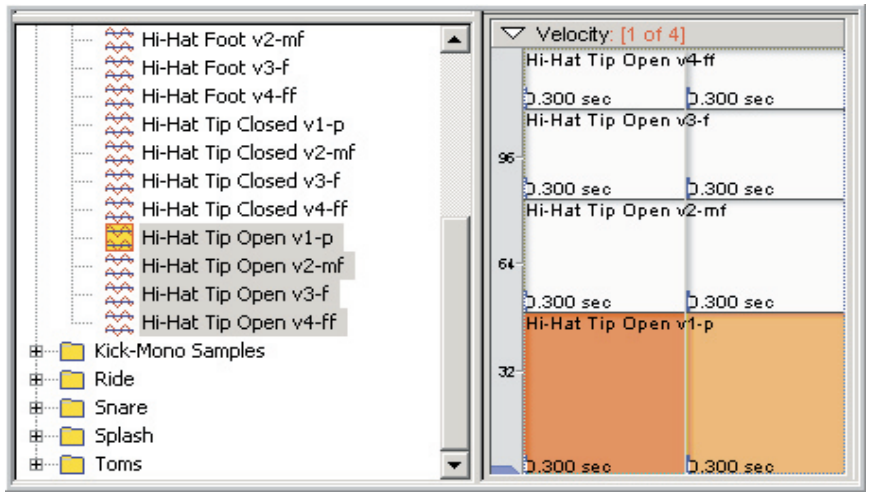
4. Select the G3 region.

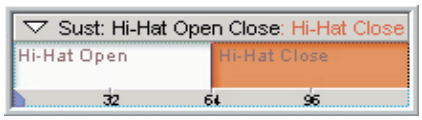
This region will have the Hi-Hat Tip samples.



5. Select the “Hi-Hat Open” Dimension Split.

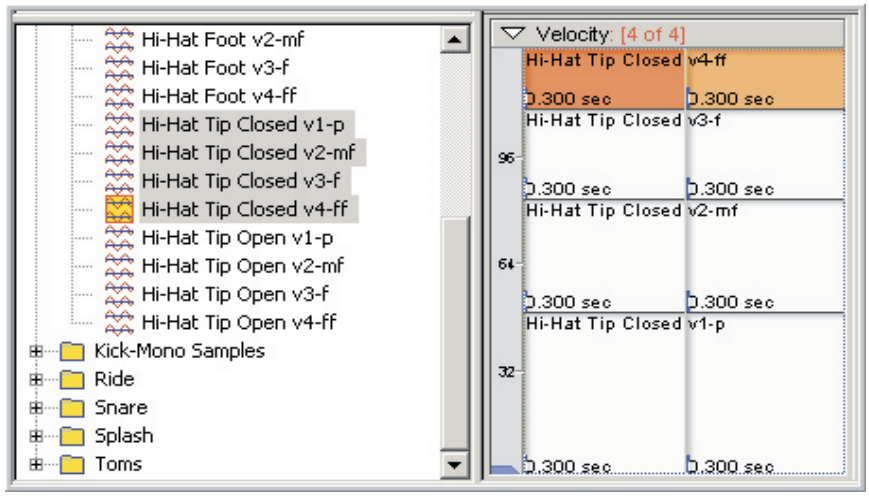
6. Map the “Hi-Hat Tip Open” samples using the *right* mouse button.

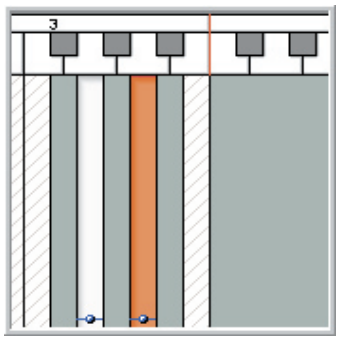




7. Select the “Hi-Hat Close” Dimension Split.

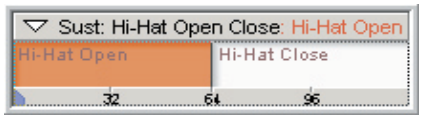
8. Map the “Hi-Hat Tip Closed” samples using the right mouse button.





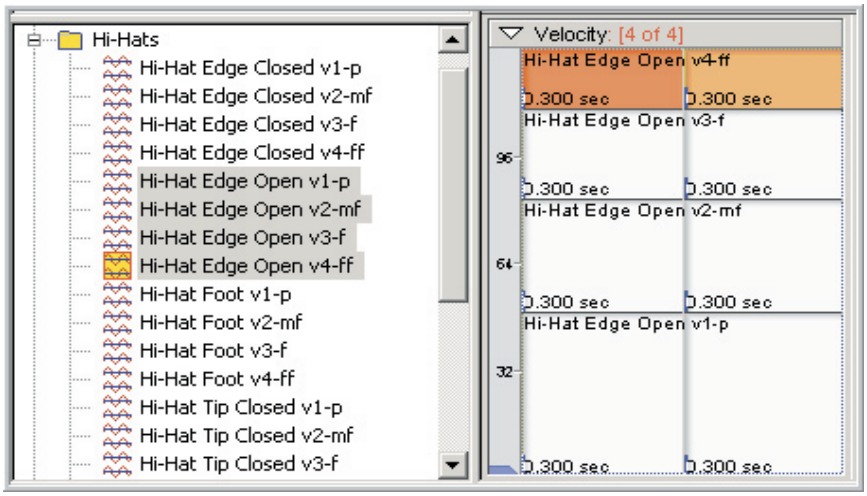
9. Select the A3 region.

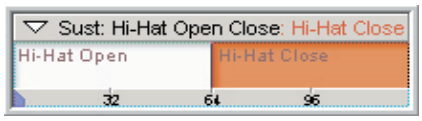
This region will have the Hi-Hat Edge samples.



10. Select the “Hi-Hat Open” Dimension Split.

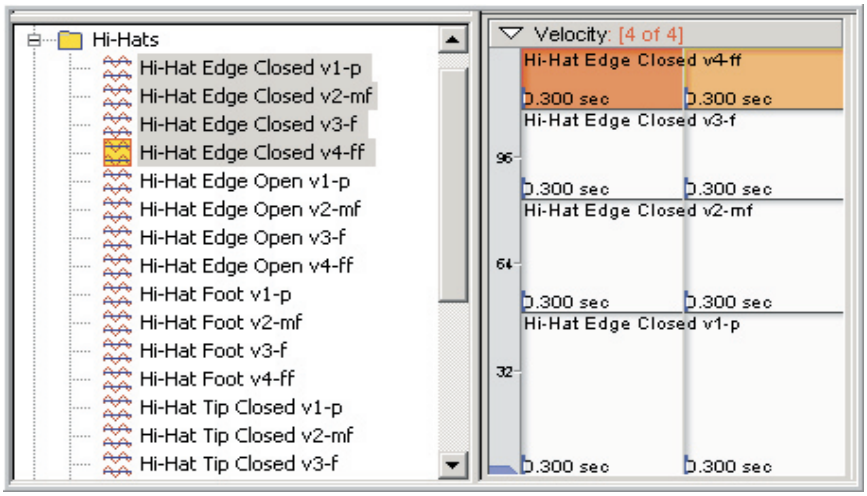
11. Map the “Hi-Hat Edge Open” samples using the right mouse button.



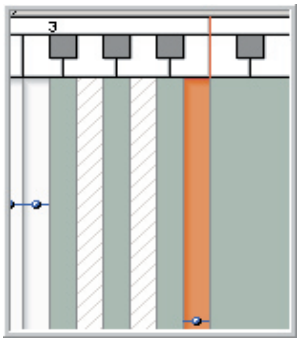


12. Select the “Hi-Hat Close” Dimension Split.

13. Map the “Hi-Hat Edge Close” samples using the right mouse button.



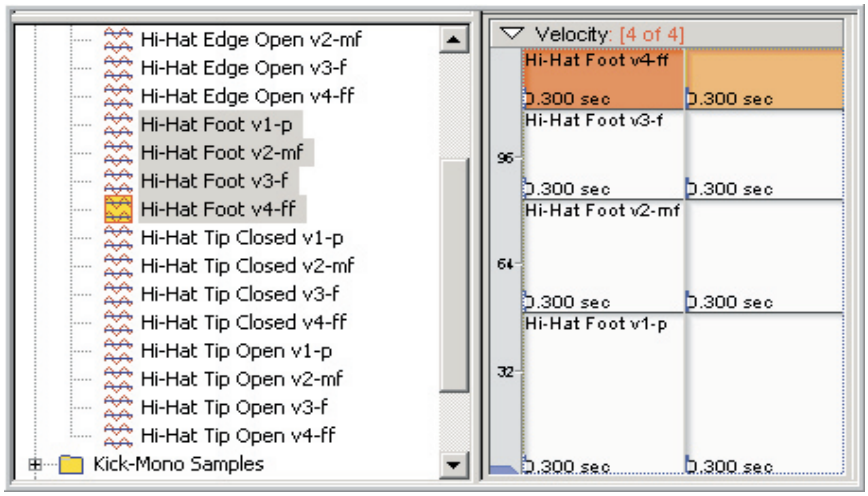
The last thing to map out is the Foot Closed Hi-Hat region.



14. Select the B3 Region.

This will be the Foot Closed Hi-Hat.

15. Map the “Hi-Hat Foot” samples using the right mouse button.



16. Click on the Download button to save the changes and hear the results.

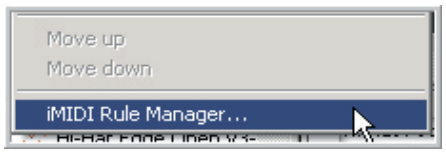
17. Play the Tip and Edge Hi-Hat regions while triggering the Sustain Pedal.

Pressing down on the pedal will change to the Closed Hi-Hat samples, just like the pedal of a real Hi-Hat.

Releasing the pedal will change to the Open Hi-Hat samples, just like the pedal of a real Hi-Hat would do.

However, there is one more thing to add to be even more realistic. When you stomp on a real Hi-Hat pedal, it closes the Hi-Hat cymbals (Foot Closed Samples).

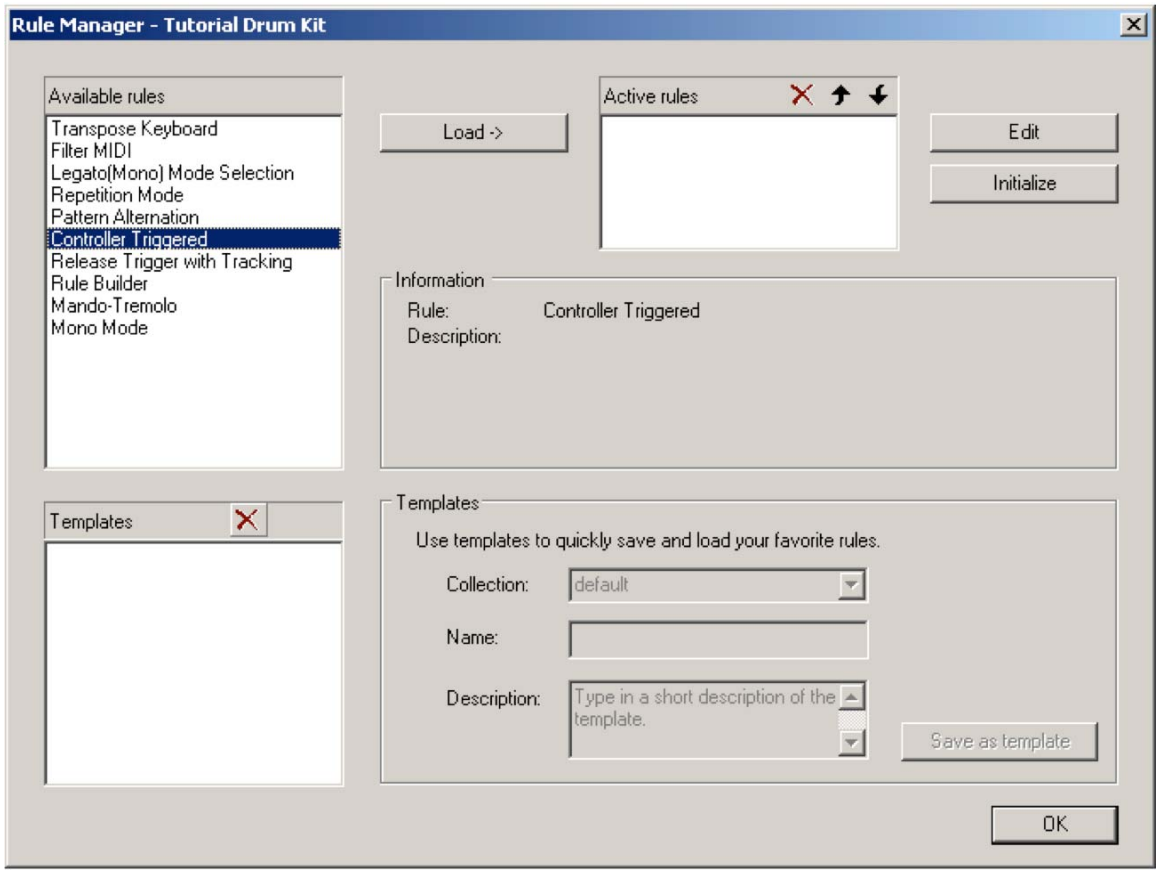
Right now, we can play the Foot Closed Hi-Hat on the keyboard but we also want the Sustain Pedal to trigger one of those samples as well. And we want it to shut off the open Hi-Hat samples when closing, just like the real thing.



18. Right-click in the Instrument Window and choose "iMIDI Rule manager…" from the context menu.

(If this option is grayed out, you need to load the instrument by clicking on the Download button.)

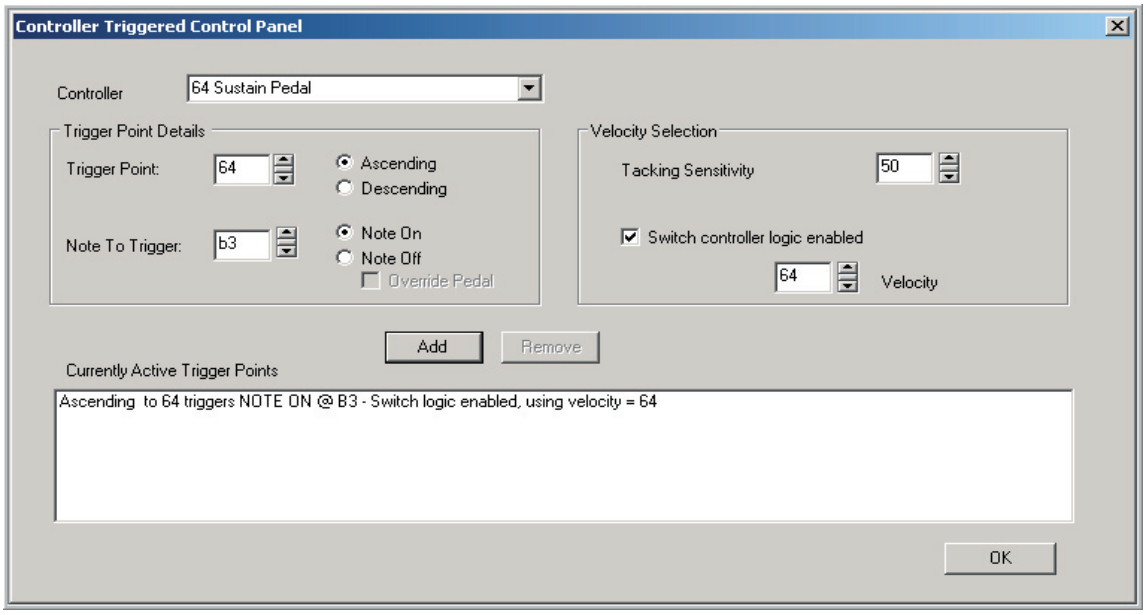
19. This will bring up the iMIDI Rule Manager. iMIDI Rules are discussed more fully in a later chapter. For now, select "Controller Triggered" from the list of available rules, and click the Add button.



20. That will bring up the configuration dialog for the Controller Triggered rule.

- Set the Controller to “64 Sustain Pedal”. This tells the GigaStudio to use the Sustain Pedal to trigger a MIDI event.
- Set Note to Trigger to B3. This tells GigaStudio to trigger the Foot Closed Hi-Hat region, which is mapped to B3.
- Check the Switch controller logic enabled check box, and enter 64 for velocity. This tells GigaStudio to trigger the Foot Closed sample with a velocity of 64.
- Accept the default values for the other settings, and click Add to add this trigger to the rule.

At this point the Controller Triggered dialog should look like this:

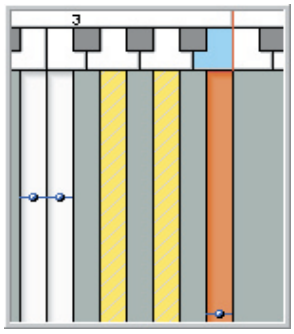


21. Click OK to close the rule dialog, and OK again to close the Rule Manager.

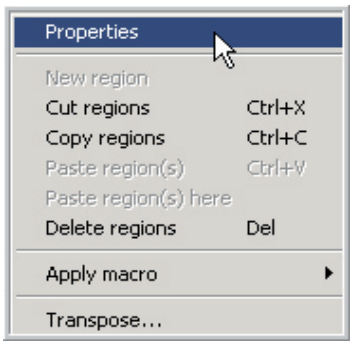
Now, when you step on the Sustain Pedal, it will trigger the “mf Foot Closed” sample on B3 (the mf sample is triggered because it corresponds to the velocity of 64).

The Sustain Pedal also continues to switch the Tip and Edge regions between Open and Closed samples at the same time.

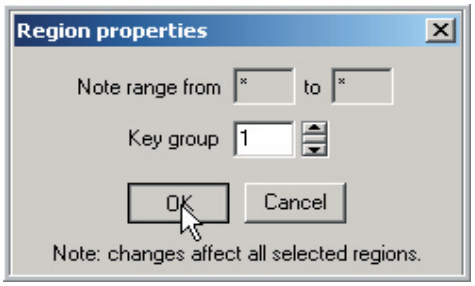
The last step is to assign all the Hi-Hat regions to the same Key Group so that they will cut each other off. This will cause the Sustain Pedal to choke the open samples, just like the real Hi-Hat.



22. Select all three Hi-Hat Regions and then right-click with the mouse.



23. Choose *Properties* from the context menu.



24. Set the Key group to 1, and click OK.

Make sure the instrument is saved and loaded so you can play it.

25. Now, the Hi-Hat regions will cut each other off. The Sustain Pedal will cut off any open sustaining samples while it triggers the Foot Closed sample. This is very similar to the way the real Hi-Hat operates.

This chapter has touched on nearly every section of the Instrument Editor, but we've still confined ourselves to relatively simple regions with no more than two dimensions. Next, we'll look at a tool for creating more complex instruments.

Chapter 5: The Instrument Wizard

Up to this point, everything has been done manually with the drag-and-drop method.

To better understand the Instrument Wizard, you need to be familiar with the manual method of mapping samples and creating dimensions.

Also, certain instruments like Drum Kits will still need to be created with the drag-and-drop method since each region will usually be different from the other and the Instrument Wizard won't work very well for these.

The Instrument Wizard works best on melodic instruments like pianos, guitars and orchestral instruments.

You can imagine that if you had to create a full 88 note piano with 8 velocities and sustain pedal switches, it would take an enormous amount of time to do it manually, note by note. This is where the Instrument Wizard comes in. It allows you to map an entire instrument with multiple dimensions "instantly". Once you have the samples properly named and organized, you are only seconds away from having an instrument mapped out.

Preparing the Samples

As you edit and organize your samples, you need to also be aware of getting them ready for the Instrument Wizard if you plan to use it. This is very simple and will save a lot of time.

Sample Names and Unity Notes

For the Instrument Wizard to work, it needs to know the Unity Note (also known as Root Note) of each sample. This is the note that the pitch is recorded at and assigned to on the keyboard. Even if the samples are not chromatic, the Instrument Wizard can assign them to their root note and then stretch the regions until they meet each other.

The Editor will recognize the unity note of a sample if the sample name indicates the unity note by MIDI note number or by note name. For example, middle C would be note name C4 or MIDI note number 60.

MIDI Note Name Range: C-1 through G9
MIDI Note Number Range: 0 through 127

Just put the Note Name or Note Number in the Sample Name before importing the samples into the Editor. To keep from confusing the Editor, we recommend putting this name or number at the end of the file name with a space separating it from the rest of the characters.

Example:

Piano Velocity-4 C4.wav
Piano Velocity-4 60.wav

The Editor will have no trouble recognizing files that are named like this. On the other hand, naming the samples like this might be confusing for the Editor to figure out the unity note.

Piano Velocity-4C4.wav
Piano Velocity-460.wav

Note: The Instrument Wizard can also simply map the samples out in alphabetical order as well. This works for sound effects, percussion and other non-melodic instruments.

Organizing by Folders

The Instrument Wizard can also map out complex dimension and velocity splits but to do this, the various splits need to be organized into separate folders.

For example, if we have a piano that is 4 velocities with sustain pedal up and down samples, the folder structure would look like this.

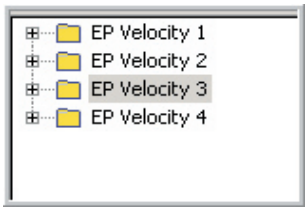
Piano Velocity 1 Pedal Up
Piano Velocity 2 Pedal Up
Piano Velocity 3 Pedal Up
Piano Velocity 4 Pedal Up
Piano Velocity 1 Pedal Down
Piano Velocity 2 Pedal Down
Piano Velocity 3 Pedal Down
Piano Velocity 4 Pedal Down

In the Instrument Wizard, we would be able to assign each of the folders full of properly named samples to the proper dimensions.

Keep in mind that each of these folders could contain up to 88 samples each. That would be 704 samples that would have to be mapped by hand without the Instrument Wizard.

The Instrument Wizard can map these out for you in about a second. So, as a general rule, there needs to be one folder of properly named samples for every single velocity or dimension split.

Using the Instrument Wizard: A Simple Mapping



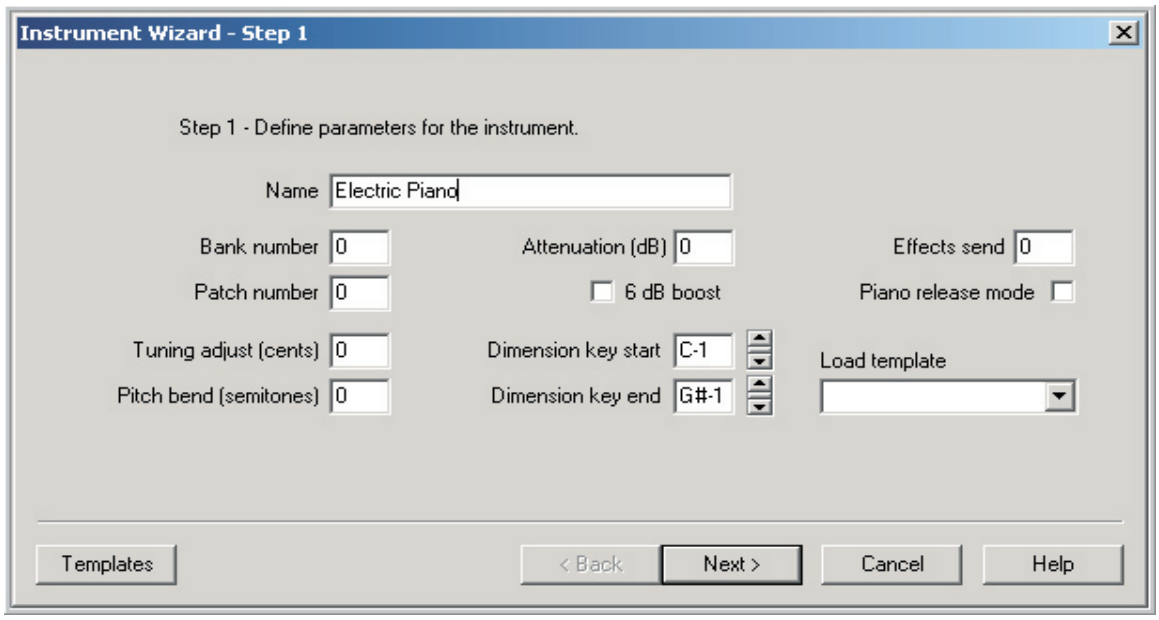
1. Start with a new instrument and import the 4 Tutorial Electric Piano folders into the Sample Window.

   These can be found in the "Editor Tutorial Files" directory for this chapter (How To Use the Wizard Tool folder-EP).

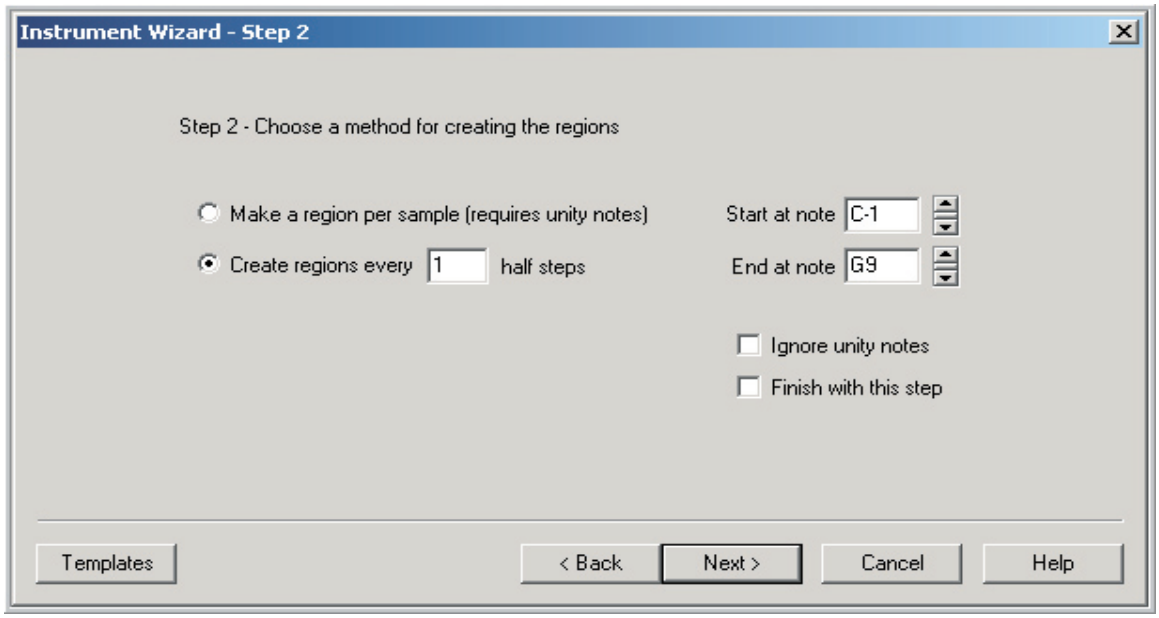
2. Start the Instrument Wizard by clicking on the Wizard button on the tool bar.

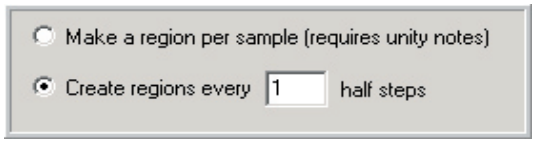
3. This brings up Page 1 of the Instrument Wizard.

   - Most of the items in here are identical with the Instrument Properties window.
   - This gives you the opportunity to fill in all these details if you wish but you can go back and fill them in later in the Instrument Properties window.
   - At the very least, you might want to enter an instrument name.



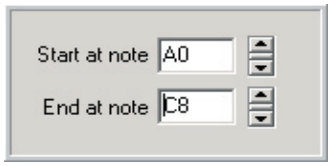
Click the Next button to proceed to the next step.





4. Select the checkbox “Create Regions every” and set it to 1 half step. This will create chromatic regions, one for every note on the keyboard.

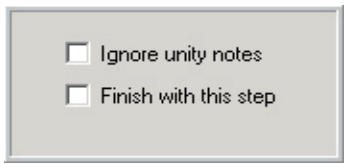
The other option would stretch non-chromatic regions.



5. Set the start note to A0.

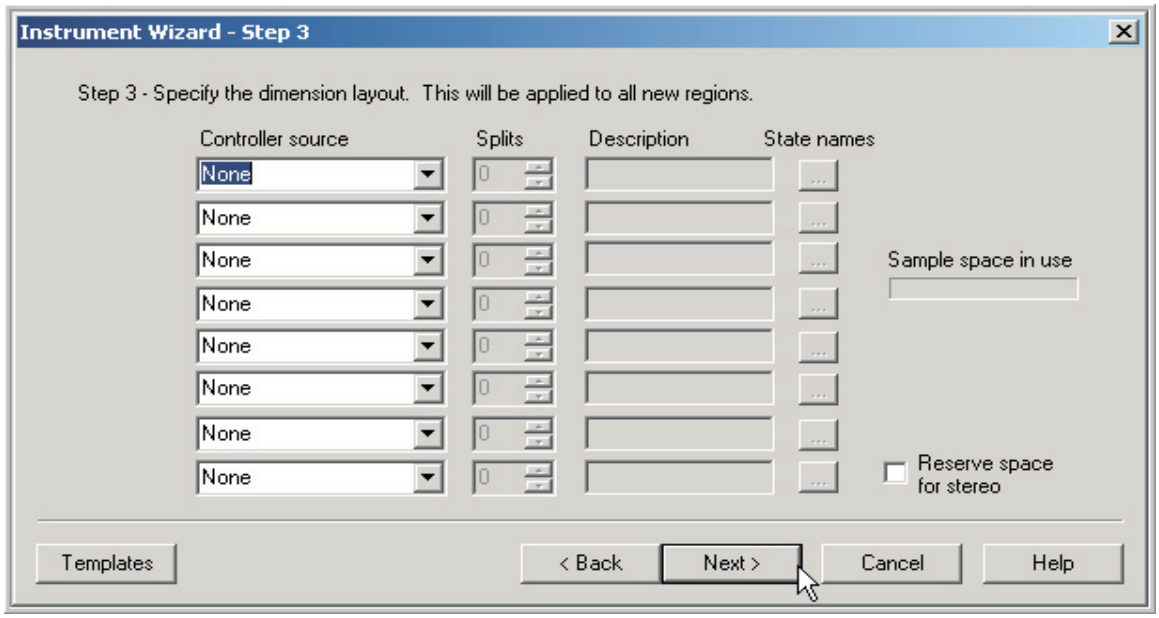
Set the end note to C8.

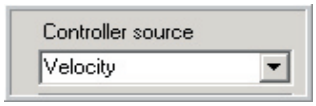
This sets the range to cover an 88-note keyboard.



6. Leave these check boxes blank and click the Next button to move to the next step.

- "Ignore unity notes" is for non-melodic samples like percussion and sound effects. Checking this box will let the Instrument Wizard map the samples alphabetically across the keyboard.
- "Finish with this step" would simply create a series of blank regions across the keyboard.





7. Go to the top Controller Source and choose "Velocity". This will be our velocity split dimension.

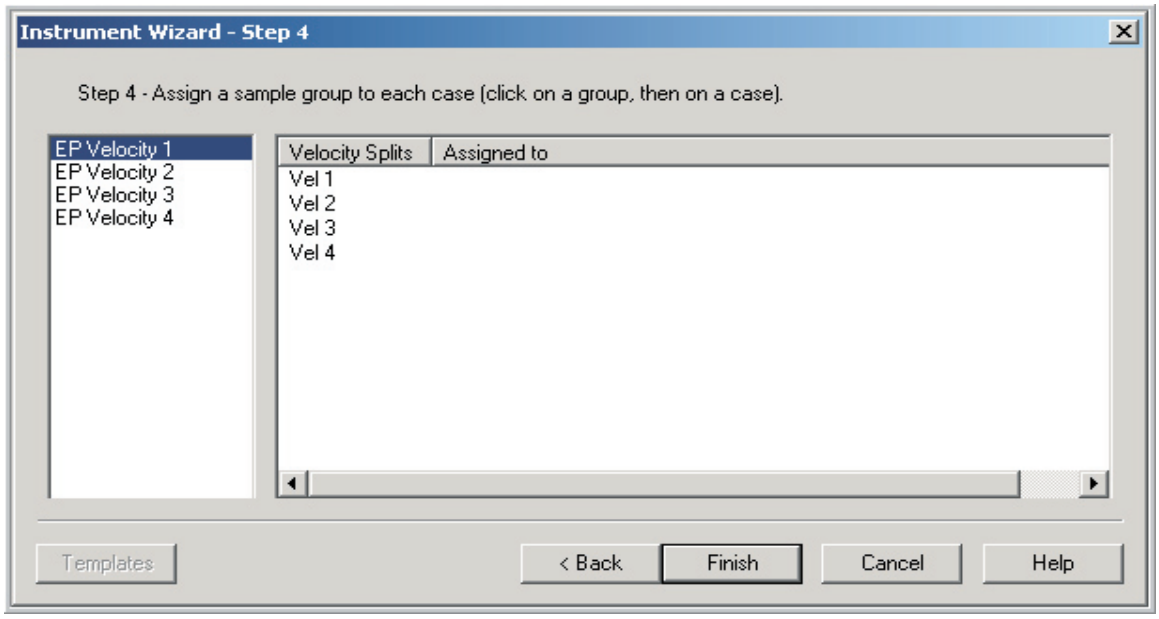
8. Set the Splits number to 4. This will create four velocity splits, one for each folder of samples.

9 Fill in the Description and the Split Names.

These work the same way as the description and split names when manually creating dimension splits. This is a good habit to get into because names can help you keep your bearings when dealing with complex instruments. Also, naming is absolutely essential in the last step of the Instrument Wizard as things get more complex.

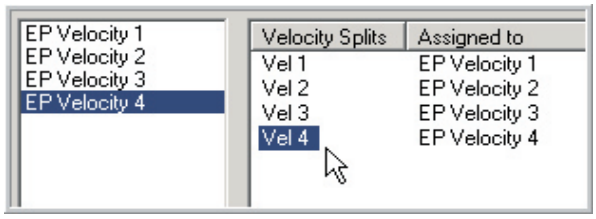
10. Click on the "Reserve space for stereo" checkbox. (Stereo samples use up one of the eight available dimensions in a region.)

Click on the Next button to move to the last step.



This is the final step of the Instrument Wizard. As you can see, the Velocity split state names are in the section on the right. Without the names, they would just be MIDI number ranges, which are much harder to read, especially when we start dealing with more dimensions.

Also notice that the folders of samples are represented in the left section. Mapping the samples out is simply a matter of assigning these folders to the splits in the right section.

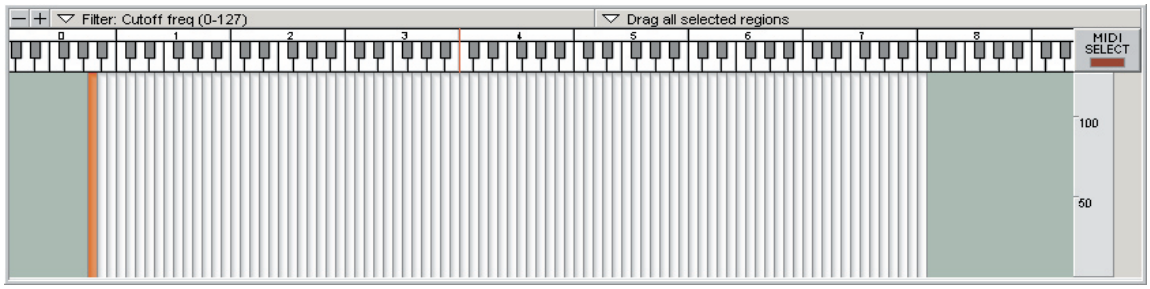


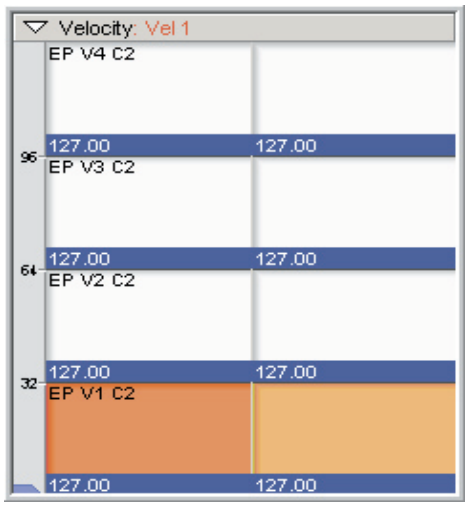
11. Assign the folders on the left (one at a time) to their corresponding velocity split on the right.

To do this, click on a folder and then click on a velocity split name.

Click on the Next button to finish the Instrument Wizard.

12. The Instrument Wizard instantly maps out the whole instrument across the keyboard.





13. Each region has the four velocity splits that were represented by the four folders of samples.

Each sample is mapped by its pitch to the appropriate region on the keyboard.

If we don't have a sample for every half step, samples will be pitch stretched up and down so that every note of the requested keyboard range is covered. (When a "missing" sample is equally distant from both of its neighbors, the higher sample will be stretched down to cover that note.)

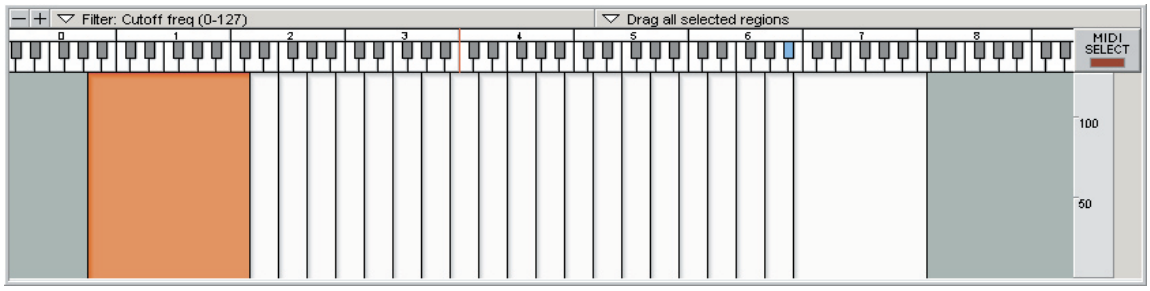
Doing this by hand would have taken at least an hour.

The instrument is now mapped out. Save it and load it to a MIDI channel to hear what it sounds like and start tweaking it.

Chromatic vs. Non-Chromatic mapping

In the example above, we chose to map the notes chromatically even though the samples are not chromatic. (This was the "Create Regions every 1 half step" option on Page 2 of the Wizard.)

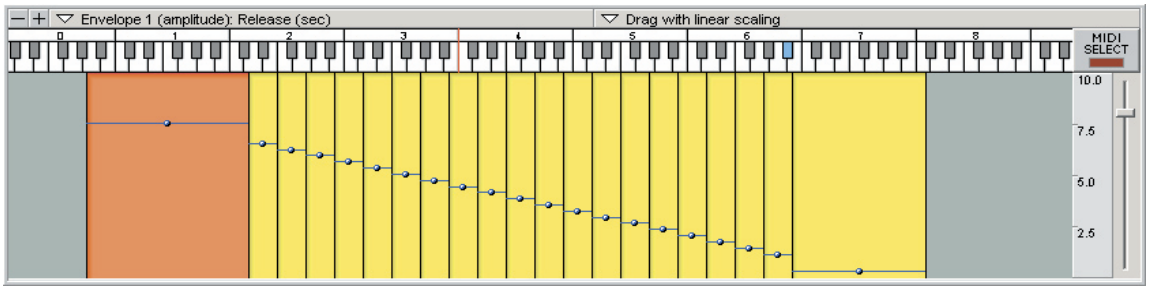
Alternatively we could have created one region per sample to be able to better see where the samples are.



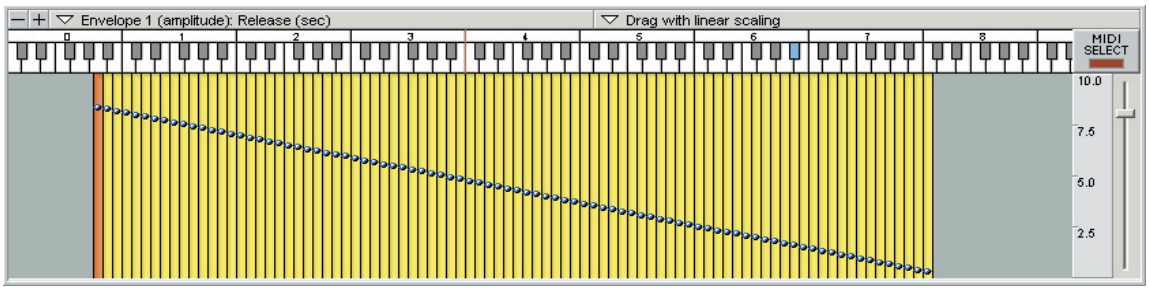
The disadvantage of doing it this way is that it limits the note-by-note parameter tweaking that can be done if the regions are laid out chromatically. The results sound the same initially with either method but the ability to make chromatic edits is limited.

Here is an example using the Region Window. Let's say we want to make the Release Time short at the top of the keyboard and have it gradually get longer toward the lower register.

With the region-per-sample layout, we are limited to one envelope per group of keys:



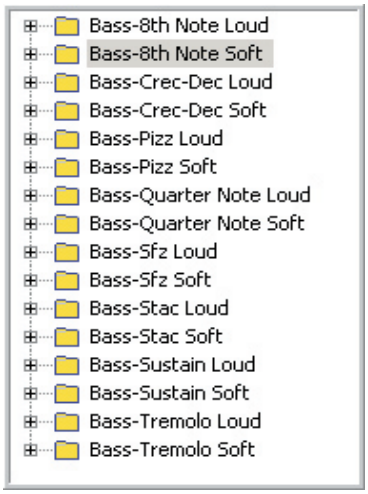
With the chromatic region layout we get one envelope per half step. All of the keys in each region are mapped to the same *samples*, but we can adjust parameters independently for each note.



This is something to keep in mind as you create instrument. If you don't need the editing resolution, the non-chromatic mapping makes it easier to see where the samples are mapped.

Using the Instrument Wizard: A Complex Mapping

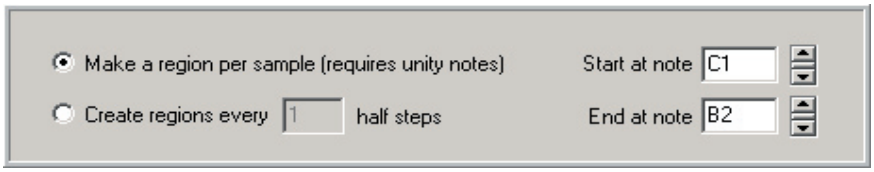
In this example we'll use the Bass Ensemble samples to create a complex keyswitch instrument with two velocity splits. This will demonstrate the need for good labeling of the dimensions and splits.



1. Start again with a new .gig file and import the Tutorial Bass Folders into the Sample Window.

These can be found in the "Editor Tutorial Files" directory for this chapter (How To Use the Wizard Tool folder - Bass).

2. Start the Instrument Wizard and go to Step 2.



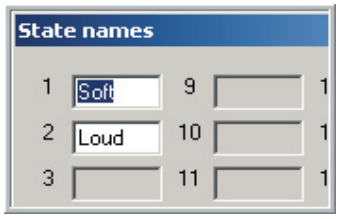
3. This time select the "Make a region per sample" option. This will allow us to see how the samples are mapped and stretched out.

4. Set the Start and End notes to C1 and B2. There are only a few samples included with the bass ensemble tutorial samples so this is a good range that will also stretch the top and bottom notes a bit.

Press Next to move on to Step 3 of the Instrument Wizard.

5. Set the first Controller Source to Velocity and give it 2 splits. Name it "Velocity Splits" in the Description field.

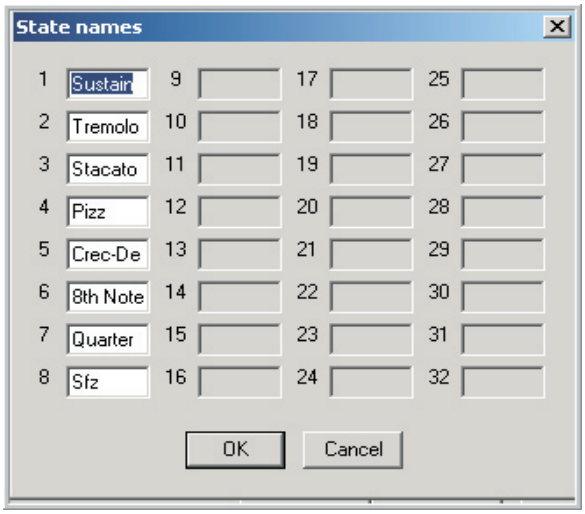
6. Set the second controller to "Keyboard" and give it 8 splits. Name it "Keyswitch" in the Description field.



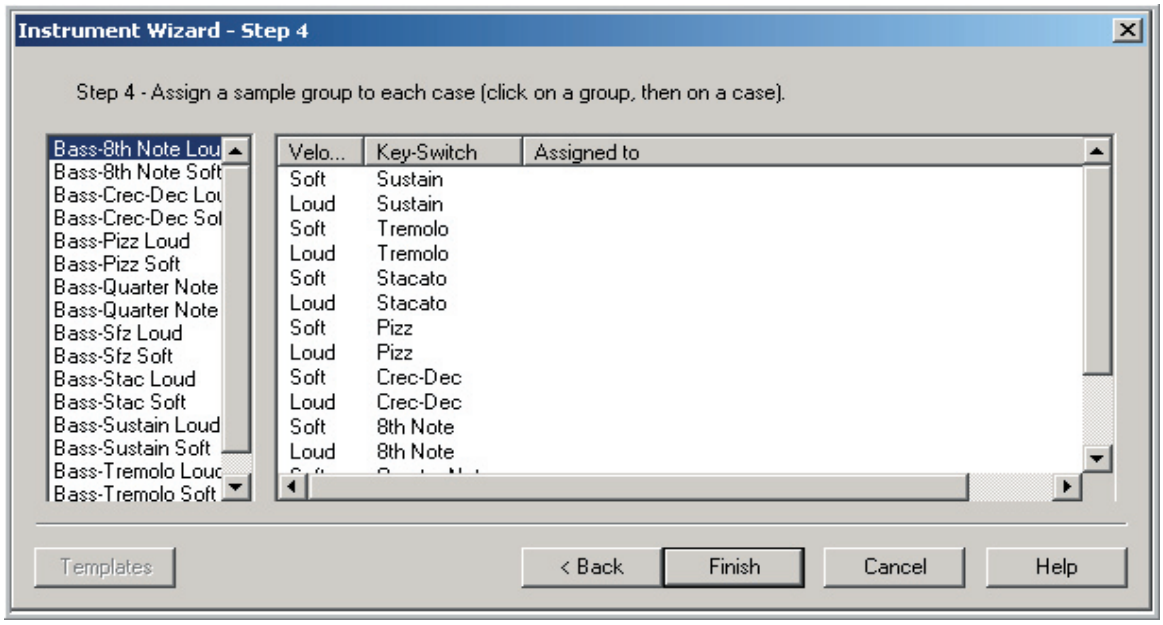
7. Click on the Split Names button for the Velocity dimension, and name the splits as shown.

Click OK when finished.

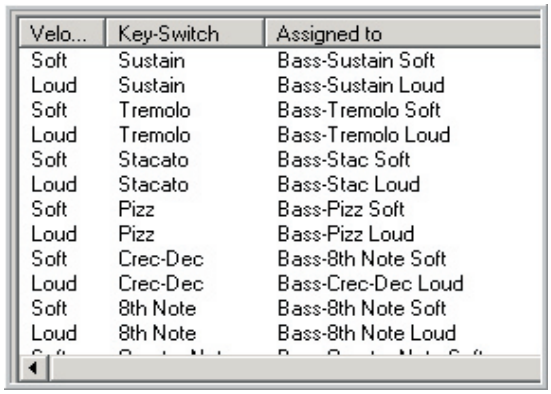
8. Click on the Split Names button for the Keyswitch dimension, and name the splits as shown. These are named for each type of articulation. Click OK when finished.



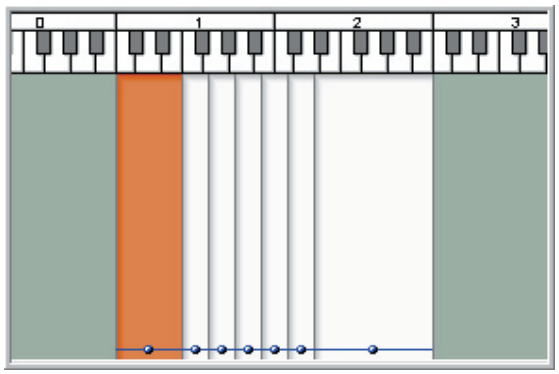
Move on to Step 4 of the Instrument Wizard.



Here is where the naming comes in real handy. This would just be a matrix of numbers otherwise.

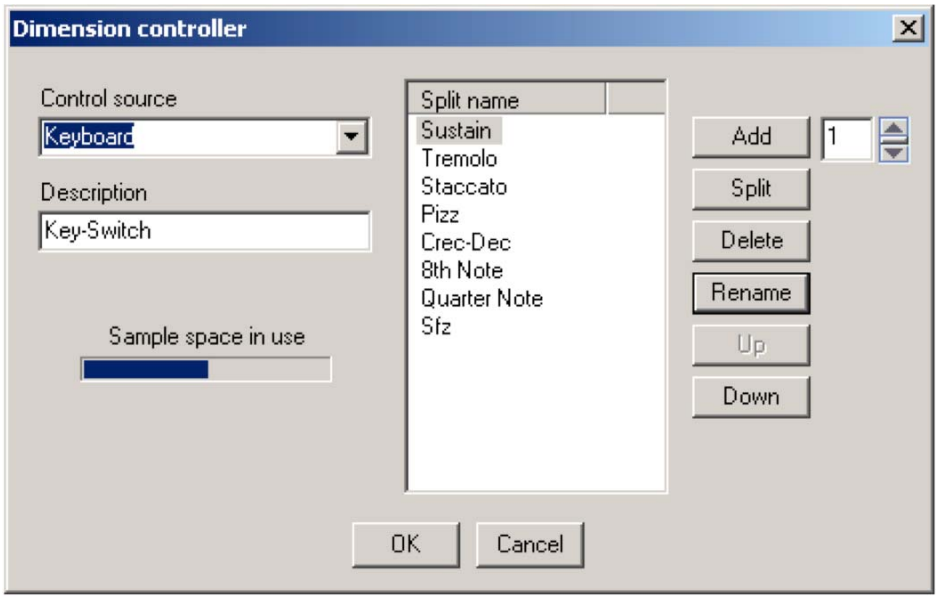


9. Map the folders on the left to the splits on the right. Match the folder names to the split names.



10. The Instrument Wizard maps the regions across the keyboard.

11. The Dimension Control window shows the Keyswitch splits and the descriptive names that were entered in the Instrument Wizard.



12. The Dimension display also shows the descriptive names of the dimension and the individual splits.

The instrument is now mapped. Save it and load it to a MIDI channel to hear what it sounds like and start tweaking it.

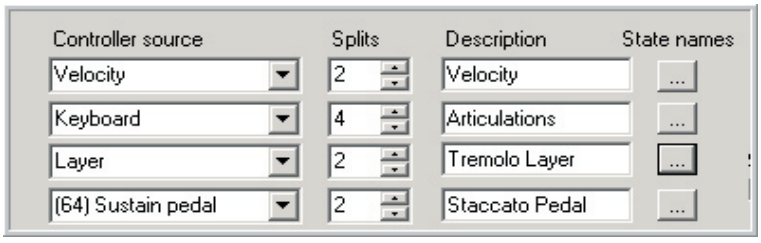
Complex Mapping Example

Here is a brief example of a more complex mapping in the Instrument Wizard.

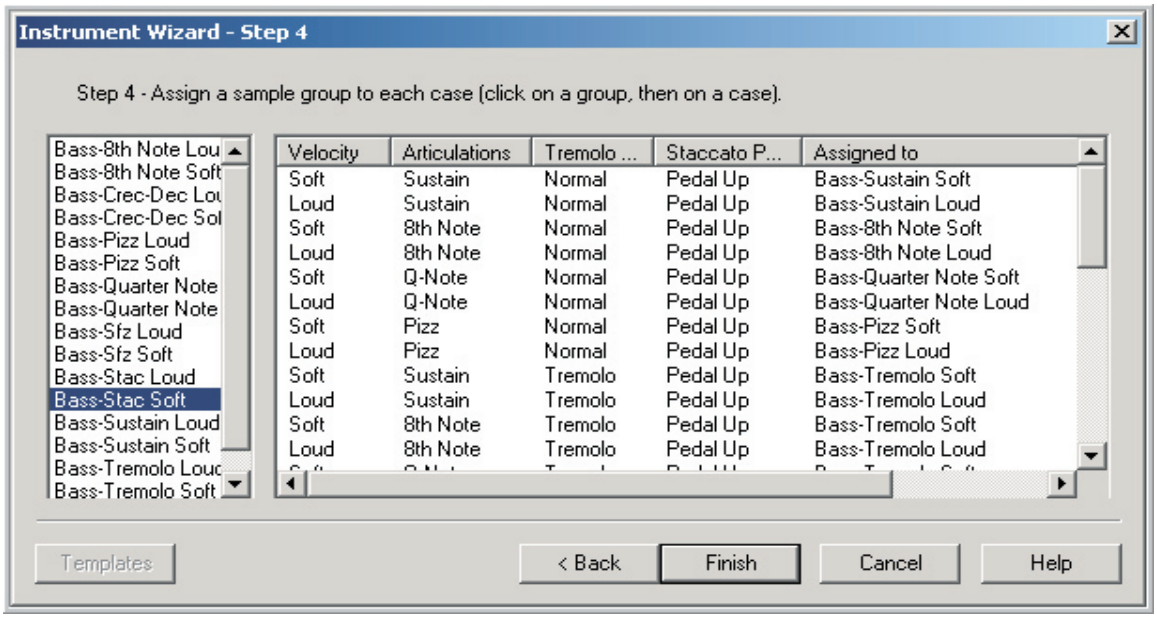
In Step 3 of the Instrument Wizard, we have four dimensions.

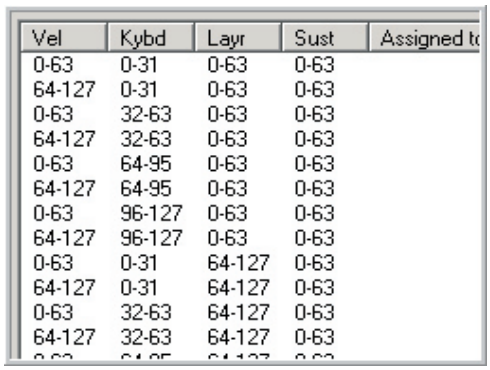
- A Velocity dimension with two splits
- A Keyswitch dimension with four splits, each a different articulation
- A two-way Layer dimension that adds the Tremolo samples
- A two-way Sustain Pedal dimension that changes to the Staccato samples

The Descriptions and Split Names are meticulously labeled.



Here is the final Step showing all the articulations and names.

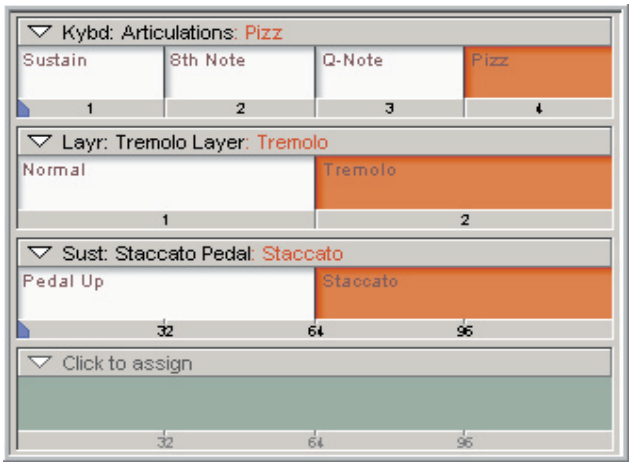




Here is what you would see if you don't enter descriptions and state names.

It would be virtually impossible to figure out what goes where in this matrix of numbers.

Here are the dimensions of the finished instrument:



This will allow a 4-way Keyswitch between Sustain, 8th Note, Quarter Note, and Pizz articulations.

The Layer dimension could use the Mod Wheel to gradually fade in the Tremolo layer.

The Sustain Pedal would switch to Staccato samples.

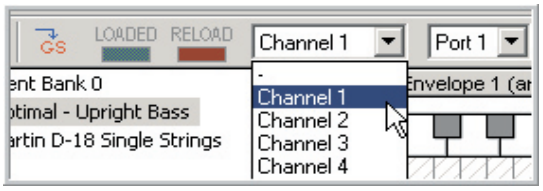
This is just quick hint of the complexity and creativity available when using the Instrument Wizard.

Load Status

The load status of an instrument is very important when you are editing. When the instrument is loaded into the sampler, the LOADED light is green. You can play the instrument while you edit, and you can hear the changes in real time as long as the RELOAD light is not glowing.

Loading Instruments to MIDI channels

Choose a port and MIDI channel.



2. Click the Download button.

3. Make sure your keyboard is sending to the correct channel and connected to the correct port.

4. The entire .gig file will load to the MIDI channel. You know it's loaded properly because the LOADED light is green and the RELOAD light is off.

5. If there are more multiple instruments in the .gig file, select the one you want to hear and play it. This is like making a patch change and happens instantly.

Load Indicator Lights

Not loaded. The .gig file is not loaded. You need to click the Download button to load it to the selected MIDI channel.

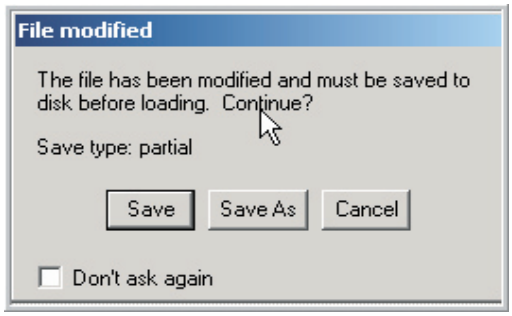
Loaded. The .gig file is loaded. The instrument you hear matches the settings you have made in the Editor.

Save and reload required. The .gig file is loaded, but you have made edits that require the file be saved to disk and reloaded before they can be heard. The instrument you hear may no longer match the settings you have made in the Editor. The yellow RELOAD indicator means that the file can be saved quickly.

Full save and reload required. The red RELOAD indicator means that the instrument has changed so extensively that the file must be completely rewritten, potentially a more time consuming operation.

When the RELOAD indicator is lit, you can continue to edit the instrument, but you will not hear all of your edits until you have done a save/reload cycle:

Click on the Download button.



You can save the file to its original location (Save) or to a new location (Save As).

Note that if you choose Save As, the Editor will always perform a full save.

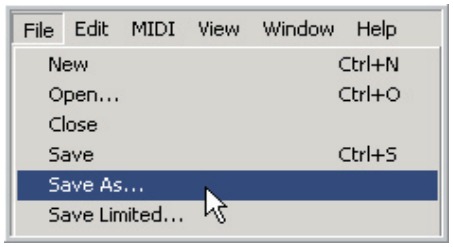
If a full save is required anyway, the Save As option may be faster, because it avoids the necessity of writing an intermediate file in the temp directory.

These are major changes that alter the structure of the .GIG file and require a full save:

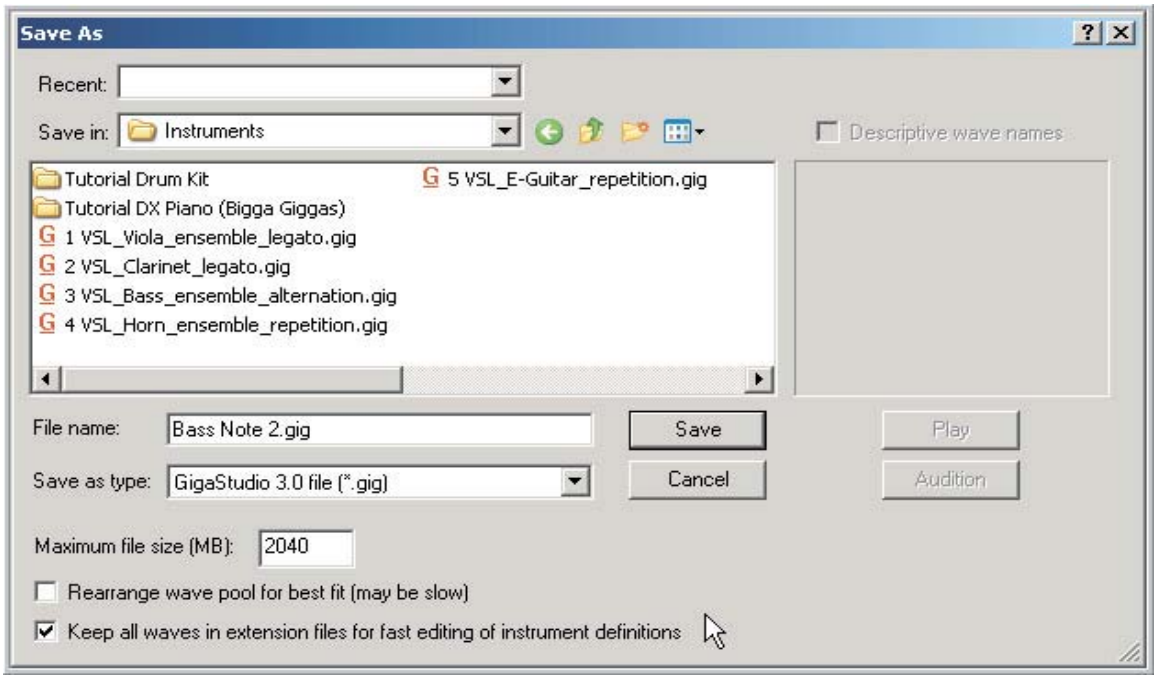
- Adding, deleting, or replacing instruments, regions, or samples.
- Adding, deleting, reordering or changing dimensions and splits.

Separating Parameters from .GIG file

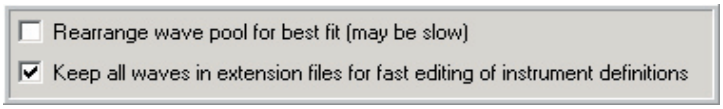
Doing a complete full save can be time consuming if you are dealing with large .gig files. This problem has been solved with the ability to separate the instrument parameters from the samples.



1. Go to the File menu and choose *Save As…*



2. In the GigaStudio Browser screen, look in the lower left for the check box labeled "Keep all waves in extension files for fast editing of instrument definitions"



3. Check that box and then Save the file.

4. This will create two files, a .GIG file (which contains the parameters) and an Extension file (which contains the samples).

5. From here on out, you can make major changes to the file in the Instrument Editor and you will no longer have to wait for the complete .GIG file to save every time.

Things to keep in mind:

- This file will load just fine in the main GigaStudio Interface but you need to make sure that both files are together in the same directory on the hard drive, or this will not work.

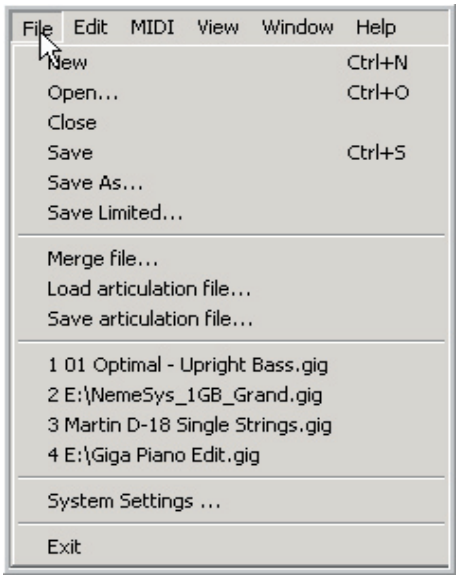
- If you want to simplify things, you can re-save this split file again when you're done editing. Save it again but with the checkbox "un-checked" and it will merge them back together into a single .gig file that contains the parameters and the samples as before. This is something that library developers might want to do to keep everything together and make for a cleaner release.

- This is most useful for large .gig files. It's probably not worth the effort for smaller files, which would reload fairly quickly regardless.

Chapter 6: Main Menu Commands

In this chapter we'll document the Editor's main menu, one item at a time.

File Menu

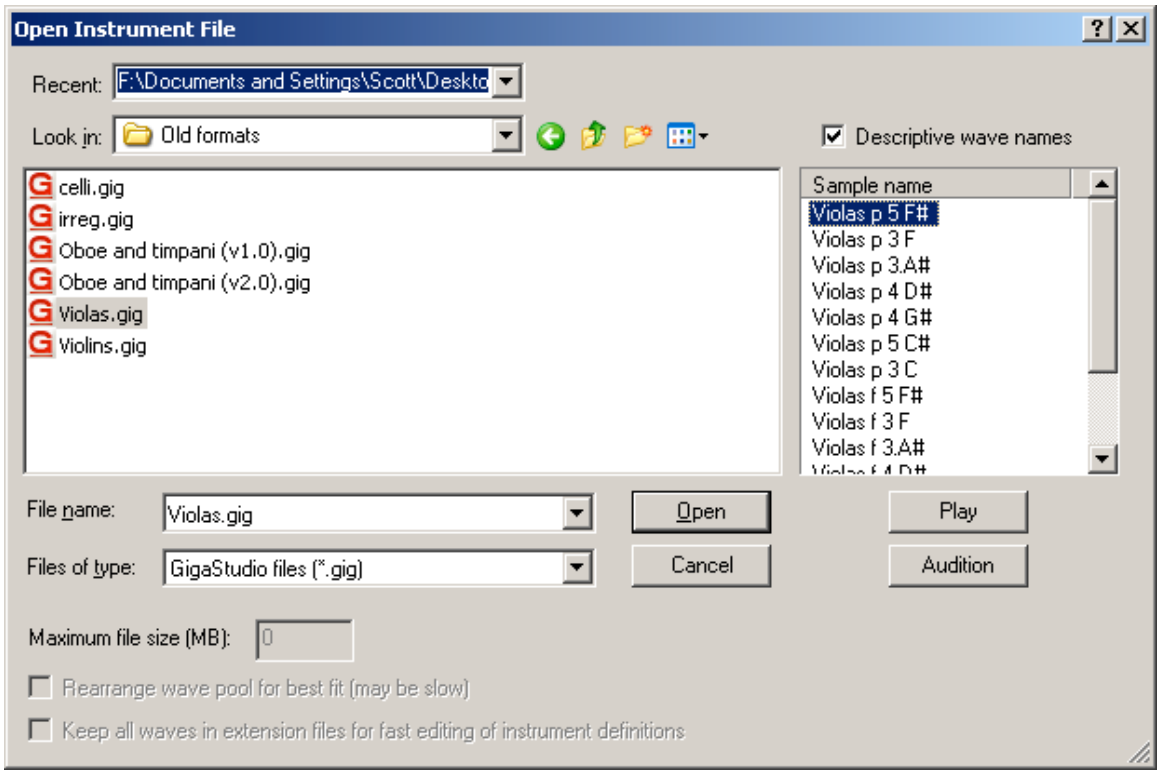


New: [Alt] + [F] + [N] or [Ctrl] + [N]

Creates a new and empty .gig file.

Open…[Alt] + [F] + [O] or [Ctrl] + [O]

Opens an existing .gig file. This command is similar to the *File-Open* command in most Windows applications, but the file dialog has a few special features:



When a .gig file is selected in the large browser window at left, a list of the samples in that file appears in the smaller box to the right. To hear any sample in the list, select it and press the Play button. The Audition button plays the audition sample for the currently selected .gig file.

If you are browsing large files, retrieving the names of every sample can slow down the browser window unacceptably. If this happens, uncheck the *Descriptive wave names* box. The names will be replaced with simple numeric indexes.

For additional features of the Giga Editor file dialog, see **Save As** below.

Save: [Alt] + [F] + [S] or [Ctrl] + [S]

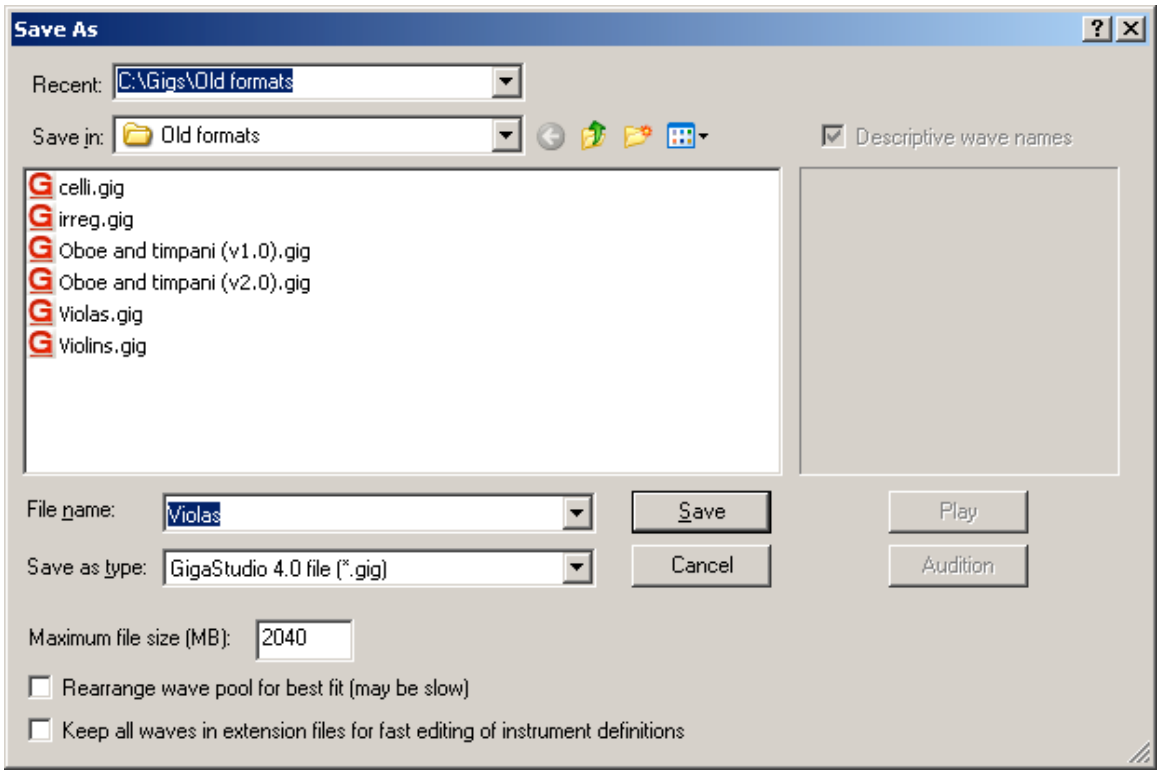
Saves the currently loaded .gig file.

If the file is new and has never been saved before, you will get the "Save As" screen where you can name the file and select where you want it to go on your computer.

If the file has been saved before, it will automatically overwrite the existing file.

Save As… [Alt] + [F] + [A]

Saves the current .gig file to a new location. When you are saving a file, several extra options are enabled toward the bottom of the file dialog. These pertain to saving large .gig files.



A note about large .gig files

Physically, Giga instrument files are limited to 2 GB in size, but Giga instruments can be much larger than this because they can span multiple files. You don't need to be concerned with the 2 GB limit when working in the Editor, because when you save your work the Editor will automatically divide it into multiple files as necessary. When Giga spans files in this way, the first file will have the usual .gig extension, while subsequent files are given the extensions .gx01, .gx02, etc. All of the files in the set will have the same name and reside in the same directory. For example, if you save a 5 GB instrument to a file called "Violin.gig" you'll normally find that the editor has created three files:

C:\MyGigs\Violin.gig
C:\MyGigs\Violin.gx01
C:\MyGigs\Violin.gx02

To open this file set, just open Violin.gig as you normally would. When you open Violin.gig, the "extension" files will automatically be opened along with it.

The Save As dialog contains several options that control the creation of extension files:

Maximum file size. This is the absolute maximum size, in megabytes, of any single output file. It applies to the main .gig file and also to any extension files. The default is a shade under 2 GB, but you can enter a lower value if you need to. For example, suppose you have a 1 GB instrument that you'd like to distribute on a pair of CDs (because a 1 GB file is too large for a single CD). By entering a maximum file size of 500 MB or so, you can save your instrument as a pair of files, each small enough to fit on a CD.

You'll notice that the actual file sizes are usually a bit less than the maximum you specify. This is because the file sizes are adjusted a bit to avoid splitting instruments or samples across file boundaries.

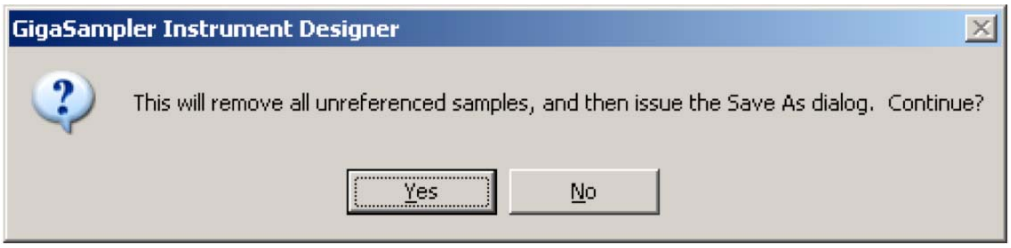
Rearrange wave pool for best fit. When this box is checked, the Editor will try to match the maximum file size as closely as possible. That is, if the maximum size is 2 GB, the Editor will try to find just the right combination of samples to make each file as large as possible without exceeding the 2 GB limit. You may wish to turn this option on when rendering a final version of your instrument for distribution, because it results in the smallest possible number of output files. However, this option can make saving a very slow process. You will probably want to leave it off during development, when you are making frequent changes to the wave pool and the exact file sizes are not important.

Keep all waves in extension files. When this box is checked, the Editor will always save to at least two files. The main .gig file will contain only the instrument definitions and articulations, while any samples are shifted to the .gx01 (and other extension files as necessary).

Why would you use this option? One reason is that it can greatly reduce the time it takes to save your work during editing. Once you have imported all the samples your instrument will use, the wave pool will probably change only rarely, while you continue to make fine adjustments to the instruments. By placing the instrument definitions in a file of their own, the Editor is relieved of the need to save the entire wave pool, even if you make major changes such as adding or deleting new instruments, regions, and dimensions.

Save Limited: [Alt] + [F] + [L]

This is identical to the Save As option, except that the editor will discard all samples that are not mapped to at least one region. Use this option to minimize the size of the output file, but be aware that the discarded samples cannot be recovered.



Merge File… [Alt] + [F] + [M]

This command is only available when a .gig file is already open in the Editor. It allows you to select one or more additional .gig files whose contents will be merged into the current file. All of the instruments from the new file(s) will be added to the current file, with their bank and patch numbers modified if necessary to avoid conflicts. Samples from the new file will also be added to the current file. The Editor compares each sample in the new file with the existing wave pool and removes duplicate samples, remapping instruments as necessary to use the existing copies.

Load Articulation… [Alt] + [F] + [R]

Opens a Giga Articulation file and applies it to the current .gig file.

An articulation file (with the extension .art) contains a set of complete instrument definitions, but no samples. When you load it, the instrument definitions in the current file are replaced by the instruments in the .art file. The original samples remain in place, remapped to the new instruments. For this process to work, of course, the .art file has to have been prepared using the same set of samples as the file you apply it to.

Articulation files provide a compact means of storing variations on a set of instruments, without the need to save multiple copies of the same samples. They also offer a means of long-distance collaboration, and a way for sound developers to distribute updates to customers.

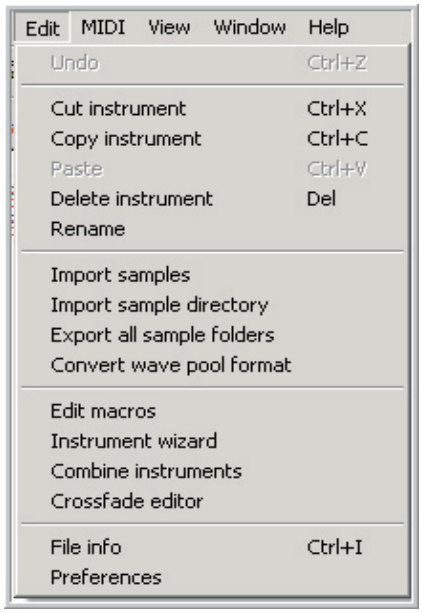
Save Articulation… [Alt] + [F] + [T]

Exports a Giga Articulation file from the currently open .gig file. An articulation file contains the same instrument definitions as a .gig file, but no samples. See "Load Articulation" above for more information.

Exit: [Alt] + [F] + [X]

Shuts down the Giga Editor.

Edit Menu



The Edit Menu is where you will find the various editing commands.

Many of these commands can be accessed with the computer keyboard. These keyboard commands match the standard Windows keyboard shortcuts for the most part.

The Cut, Copy, Paste, and Delete commands on this menu will change to reflect the type of object that is currently selected – instrument, bank, region, sample, etc.

To make an edit, select an item with the mouse and go to the menu with the mouse or with a keyboard shortcut and choose the edit command you want to use.

There are also various short cut keyboard combinations you can use.

- [Ctrl] + [X] to Cut
- [Ctrl] + [C] to Copy
- [Ctrl] + [V] to Paste
- [Delete] key to Delete

Many of these options are also available by right-clicking on the item instead of going up to the menu.

Undo: [Ctrl] + [Z] or [Alt] + [E] + [U]

This will undo your most recent edit.

- Selecting this again will "redo" the edit that was "undone".

- You can toggle back and forth between *Undo* and *Redo* using the mouse or Ctrl+Z.

Cut: [Ctrl] + [X] or [Alt] + [E] + [C]

Deletes the selected item but leaves a copy on the clipboard so that it can be pasted later to another location.

Copy: [Ctrl] + [V] or [Alt] + [E] + [C] + [C]

Makes a copy of the selected item and places it on the clipboard so that it can be pasted later to another location.

- When you copy an instrument or region, any samples mapped to the instrument or region are also copied.

Paste: [Ctrl] + [V] or [Alt] + [E] + [P]

Once you Cut or Copy an item, this command will Paste it where you instruct it to go.

- You can copy or cut items from one .gig file and paste them into a different .gig file. Note that when you copy an instrument or region, any samples mapped to the instrument or region are also copied. If you paste the instrument or region into a different .gig file, the samples are also pasted, but the Editor compares them with the samples in the target file and discards any duplicates.

- There are a variety of ways to paste depending on the item you are working with. For example, regions can be pasted to the same key range or you can specify where to paste them. This will all be covered in detail in each area of the Editor.

- As with the other edit commands, you can right click with the mouse over an item to bring up the Paste command without having to go to the Edit Menu.

Delete: [Delete] Key or [Alt] + [E] + [D]

Deletes the item or items you have selected, without copying them to the clipboard.

Rename: [Alt] + [E] + [N]

This is one of a couple of ways that you can rename a Bank, Instrument, Folder or Sample.

- Select the item you want to rename and choose *Rename* from the Edit menu. This will highlight the name of the item and you can then change the name.

- Another method is to click on the item once with the mouse to highlight it. Then click it a second time to put the name in edit mode (two slow clicks, not a fast double-click).

Import samples: [Alt] + [E] + [S]

This is one of several ways to import samples into a .gig file.

- Select a folder in the Sample Window where you want the imported samples to go and then choose *Import samples*.
- Use the browsing window that comes up to navigate to the .wav files you want to import.
- Select the waves and click on the Open button. They will show up in the folder you selected in the wave pool.

You can also right-click on a folder in the Sample Window and choose to import samples or directories from there as well. Alternatively you can simply drag and drop wave files or folders full of wave files directly from the Windows desktop into the Sample Window.

Import sample directory: [Alt] + [E] + [Y]

This works similarly to the *Import samples* command, but here you choose a folder full of wave files.

Alternatively, you can drag and drop folders full of wave files directly from the Windows desktop into the Sample Window. Using this method, you can import more than one directory at once.

You can also right-click anywhere in the Sample Window and choose *Import directory* from the context menu.

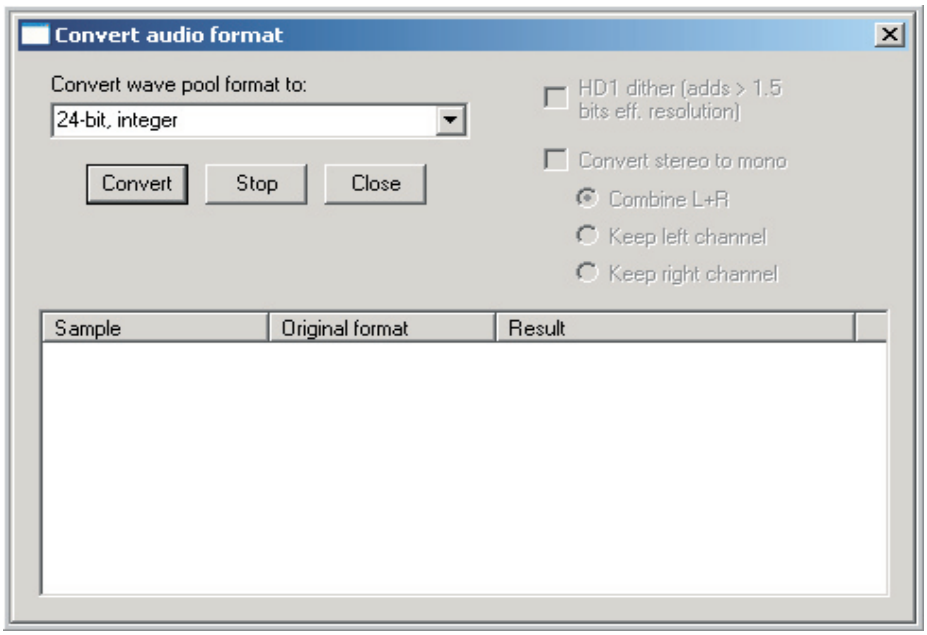
Export all sample folders: [Alt] + [E] + [A]

This will export all the samples in a .gig file to standard wave files on your hard drive. Any loop points in the samples will be exported intact. This is handy if you need to do audio editing of a bunch of the samples in an instrument. You can later use the *Replace All* command to batch replace the samples back into a .gig file.

You should first create an empty folder on the hard drive where you want the samples to go. Then choose *Export all sample folders* and browse to the folder you created. The folders and samples will be named and organized the same way they are in the .gig file.

Convert wave pool format: [Alt] + [E] + [F]

This handy feature allows you to batch convert ALL the samples in a .gig file to various bit rates, compression settings and channel conversion settings.



The options here are:

Convert wave pool format to:

Selects the target format for the conversion.

24-bit, integer. Uncompressed 24 bit samples. This format will of course get less polyphony than 16 bit samples.

24-bit, min. accelerated (preserve 24 bits). Disk acceleration compression with no loss of quality. This improves the polyphony and reduces the file size significantly. The polyphony is similar to uncompressed 16 bit samples with no loss of quality.

24-bit, nom. accelerated (preserve 20+ bits). More disk acceleration compression with 20-bit quality. This offers even more polyphony with a very slight quality loss.

24-bit, max. accelerated (preserve 18+ bits). More disk acceleration compression with 18-bit quality. This offers even more polyphony with a very slight quality loss.

16-bit, integer. Standard uncompressed 16 bit samples.

16-bit, accelerated (preserve 16 bits). Disk acceleration compression with no loss of quality. This improves the polyphony and reduces the file size significantly.

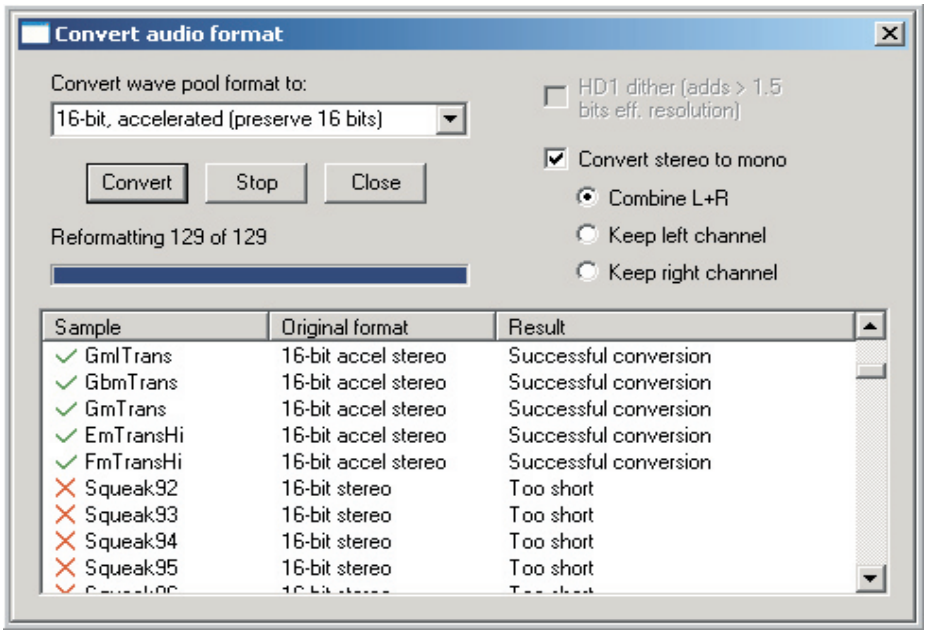
HD1 dither (adds 1.5 bits eff. resolution)

In most cases, this box should be checked when you are converting from 24 bit to 16 bit samples. In the rare case that dither noise has been added to 24 bit samples before importing them into the GigaStudio, you can uncheck this box.

Convert stereo to mono

Converts all stereo samples to mono, in addition to any format conversion specified. You can opt to derive the mono sample from the left, right, or combined channels of the stereo source. Any stereo regions in the file will be reconfigured as mono regions to match the converted samples.

After setting the options, press **Convert** to begin the conversion. The result of the process for each sample is listed in the output window. Some samples may fail the conversion process. For example, samples cannot be converted to the accelerated formats if they contain loops, or if they are too short for the acceleration algorithm to work on. The output looks something like this:



Failed conversions do not mean there is anything wrong with your .gig file. These samples will simply stay in place in their original format.

Edit macros: [Alt] + [E] + [M]

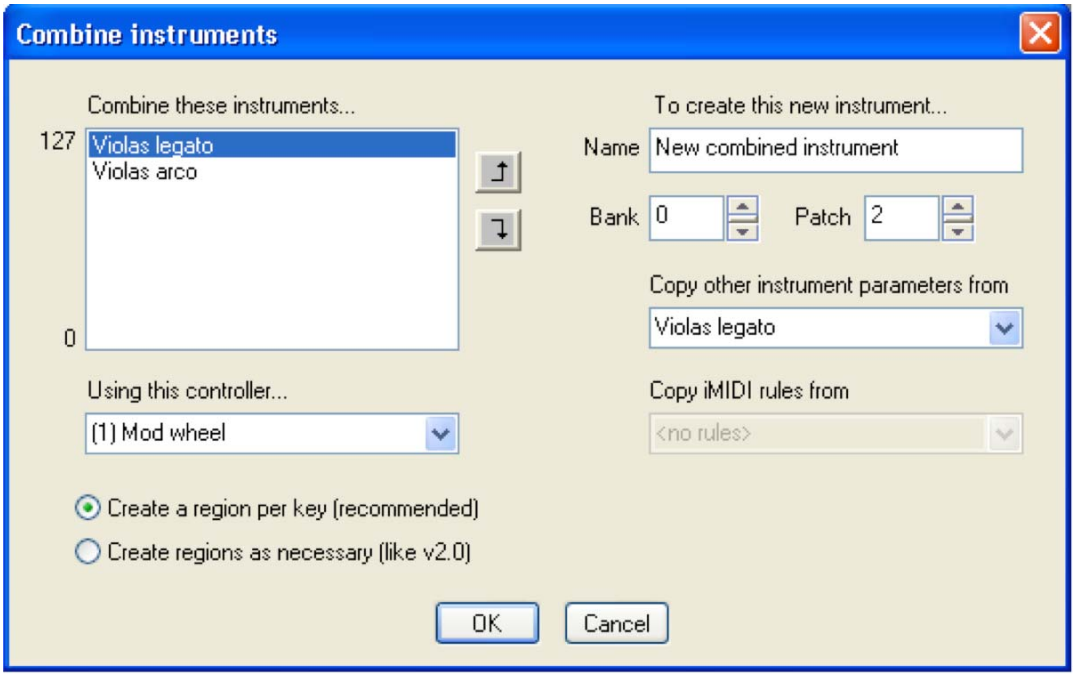
Starts the Edit Macro dialog which allows you to rename, delete, and change the keyboard shortcuts for existing macros. For details, see the "Macros" chapter.

Instrument wizard: [Alt] + [E] + [W]

Starts the great and powerful Instrument Wizard, explained at length in the "Instrument Wizard" chapter.

Combine instruments: [Alt] + [E] + [B]

This powerful feature enables you to combine two or more instruments into a single instrument. The source instruments retain their identities as components of a Giga dimension in the new instrument.

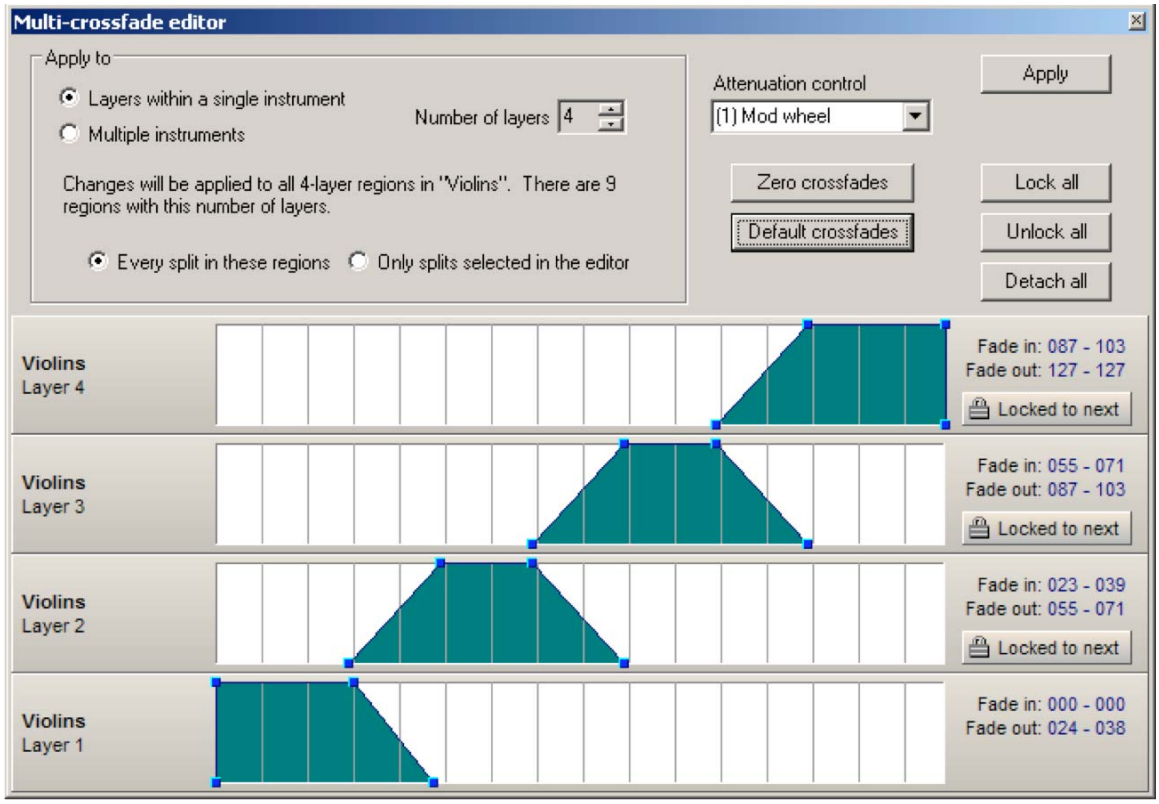


The MIDI controller you specify is assigned to the combining dimension. That is, if you select mod wheel under "Using this controller...", then the mod wheel will select which of the original instruments is playing at any given time in the new, combined instrument. (If the original instruments already contained mod wheel dimensions, then all of the original mod wheel splits will be stacked together in the combined mod wheel dimension.)

Note that this menu command is only enabled when two or more instruments are selected in the instrument window.

Crossfade editor: [Alt] + [E] + [O]

Crossfades are specified in Giga by editing four articulation parameters: the fade-in start and end points and the fade-out start and end points. The Crossfade Editor is a convenient graphical alternative to editing these four parameters numerically.



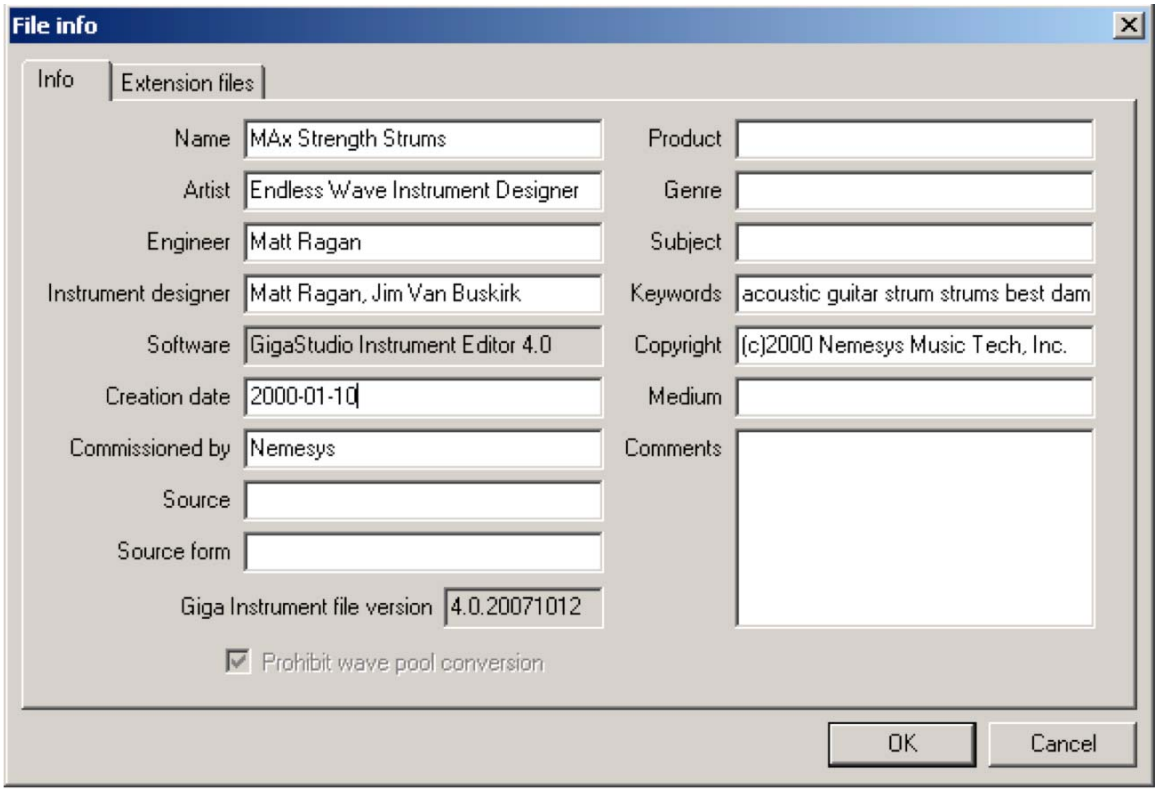
There are two modes of operation, corresponding to the two main ways of using Giga crossfades:

Layers within a single instrument. This mode is used to apply crossfades to a single instrument which contains a *layer dimension*. Normally in a layer dimension, all of the splits sound simultaneously, but when crossfade points are defined, you can use a midi controller to crossfade between layers. Set the "Number of layers" box to match the number of splits in your instrument's layer dimension. The crossfade points you define (and the controller you select under "Attenuation control") will be applied to the instrument when you press Apply.

Multiple instruments. Use this mode when you plan to stack multiple instruments on a single MIDI channel in GigaStudio, and crossfade between one entire instrument and the next using the specified attenuation controller. In this mode, each band in the Crossfade Editor corresponds to an instrument, and you must populate the bands by dragging and dropping instruments from the editor's instrument list. The fade-in and fade-out points for each band will be applied globally to the corresponding instrument.

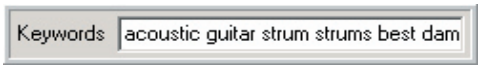
File info: [Alt] + [E] + [I]

This command brings up the File Information Window.



Most of the first tab is self explanatory and obvious. You just fill in any of the fields you see with text. There is even a Comments section to add even more detailed information about the instrument.

An important section to point out is the Keywords section.

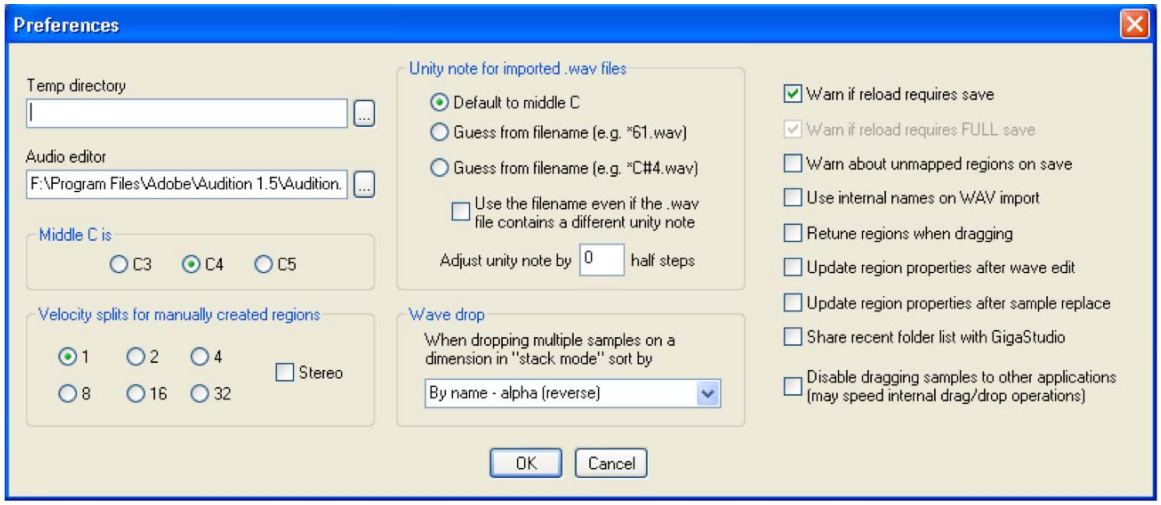


This is where you can enter keywords that the QuickSound Database will recognize when doing complex searches for GigaStudio instruments. The search criteria can also be edited from the QuickSound Explorer and you can do batch keyword entry as well.

The second tab, "Extension files", is empty in the case of a standalone .gig file. For instruments that span multiple files, this tab lists the names of the additional files (usually with the extension .gx01, .gx02, etc.)

Preferences: [Alt] + [E] + [R]

This is where you setup the various preferences for the Editor. It's a very important section to get to know.



Temp directory. The directory where the Editor will save temporary files. For example, if you make extensive edits to a .gig file and then issue the Save command, the file is first assembled in the temp directory and only then moved to its final location. Samples exported for editing are also written to this directory. If you leave this field blank, the Editor will use the default Windows temp folder.

Audio editor. To make changes to the audio of the samples, you need to use an external audio editor. This setting will choose which audio editor to launch when you use the *Edit audio* command on a sample.

Middle C is. Sets the method of numbering octaves everywhere in the editor. By default, middle C (MIDI note 60) is referred to as C4. You can change this to make the editor's numbering agree with your other MIDI software or hardware.

Note that the octave numbering in effect may also effect the "Guess from filename" option when importing samples (see below).

Velocity splits for manually created regions. Defines the initial structure of regions that you create manually by right-clicking in the keyboard display and selecting “Create region”.

Unity note for imported .wav files. Tells the Editor how to set the unity note for imported samples, when no unity note is defined in the .wav file itself. You can choose to simply default such samples to middle C, or you can tell the editor to look for the unity note in the file name, expressed as either a MIDI note number (“Piano ff 61.wav”) or as a note name (“Piano ff C#4.wav”).

The import procedure is fairly clever about interpreting file names, but to avoid confusion you should set the pitch value off by spaces (“Piano G5” not “PianoG5”). When using pitch names with accidentals, note that only sharps are recognized (“Piano G#5” not “Piano Ab5”). Also note that the interpretation of pitch names is influenced by the octave number selected for middle C (see above).

Some wave editors insert a default unity note which may not be correct. If you want the pitch expressed in the file name to override any setting inside the file, check *Use the filename even if the .wav file contains a different unity note.*

Wave drop. The single option in this category controls what happens when you drop two or more samples at once into a dimension window with the *right* mouse button, and then choose *Stack on single region* as the mapping option from the popup menu. As an example, if you right-drop a folder with ten samples into the velocity window and choose this method, the velocity dimension will be set to ten splits, mapped to the ten samples you dropped. The Preferences option controls the order in which the samples will be mapped, and is useful when the name of the samples contains some information about how they should be placed within the dimension. For example, suppose your velocity samples are named with an indication of their relative amplitude:

Cowbell 0 dB
Cowbell –2 dB
Cowbell –4 dB
Etc.

In this case the "reverse numeric" option would cause the loudest sample to be mapped to the highest velocity split.

Warn if reload requires save. When you press the "Load" button to load the .gig file into the sampler, the Editor issues a warning message if the file has been modified in a way that requires it first be saved to disk. Clear this checkbox to suppress the warning.

Warn if reload requires FULL save. If you check this box but not the previous one, warnings will be issued only when the file has been modified so extensively that a time-consuming rewrite of the entire file is necessary.

Warn about unmapped regions on save. When this box is checked, the editor will issue a warning if you attempt to save a file in which any regions are unmapped (i.e. mapped to the null sample). Unmapped regions are perfectly legal, so uncheck this box if you are using them for some deliberate purpose.

Use internal names on WAV import. Tells the Editor to take the names of imported samples from information inside the .wav file, rather than from the .wav file's name. If no internal name is present, the file name will be used anyway.

Retune regions when dragging. Controls whether your samples will be automatically transposed when you drag regions up and down the keyboard. If checked, regions will be retuned when you move them to preserve their original sound.

Update region properties after wave edit. Controls what happens when you edit a sample in an audio editor (by choosing the *Edit audio* option on the right-click menu). If you modify the file's loop points or tuning and this box is checked, the new information will be copied into every region that is currently mapped to that sample. If the box is unchecked, existing regions will not be modified, though the new information will still be attached to the sample itself for use in future mappings.

Update region properties after sample replace. Controls what happens when you use the *Replace sample* feature. If the box is checked, loop points and tuning information from the replacement sample will be applied to every region that is mapped to that sample. If the box is unchecked, existing regions will not be modified, though the new information will still be attached to the sample itself for use in future mappings.

Share recent file list with GigaStudio. This refers to the "Recent" list in the File Open dialog, which lets you jump quickly to a recently used directory. GigaStudio has a similar feature in its Load menu (on the MIDI channel strips). When this box is checked, opening a file in GigaStudio

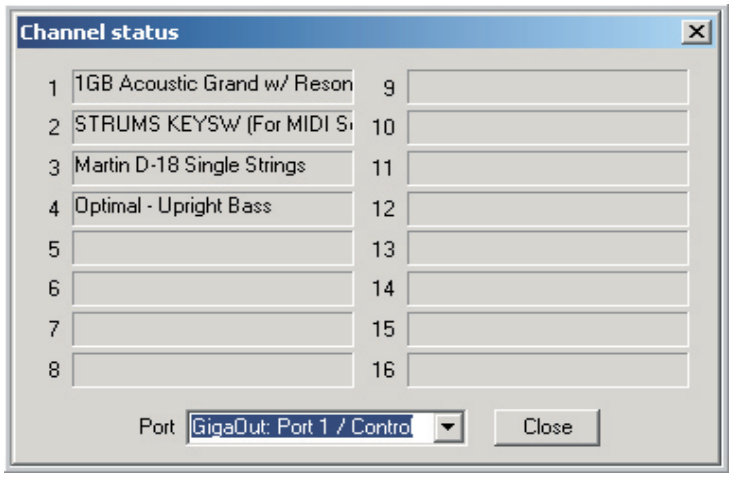
will add that file's directory to the Editor's recent list, and vice versa. When the box is unchecked, the two applications maintain independent lists.

Disable dragging samples to other applications. By default, you can drag samples out of the editor and drop them on the Windows desktop or Explorer, or into another application that accepts .wav files. However, this capability requires some overhead that can slow down drag/drop operations within the Editor itself, particularly for very large samples. If dragging samples causes the Editor to hang temporarily, check this box. You will still be able to drag samples and folders into the other Editor windows for mapping purposes. To export samples as .wav files, right-click on a sample or folder and use the "Export" function, since dragging samples outside the Editor will no longer work.

MIDI Menu

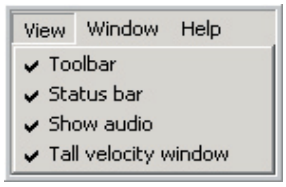
Channel Status: [Alt] + [M] + [C]

This command displays the Channel Status window, which shows you which instruments are currently mapped to every channel and port in GigaStudio.



You can also display this window by pressing the “Channel status” toolbar button. 

View Menu



You can free up screen space by disabling any of these items. Toggle them on and off by clicking on the item in the menu. A checkmark will appear beside enabled items.

Tool Bar: [Alt] + [V] + [T]

This command displays or hides the Toolbar. 

The first three toolbar buttons are shortcuts for the New, Open, and Save commands on the File menu. The remaining buttons are for launching the QuickSound Explorer, and for showing the Channel Status and About windows.

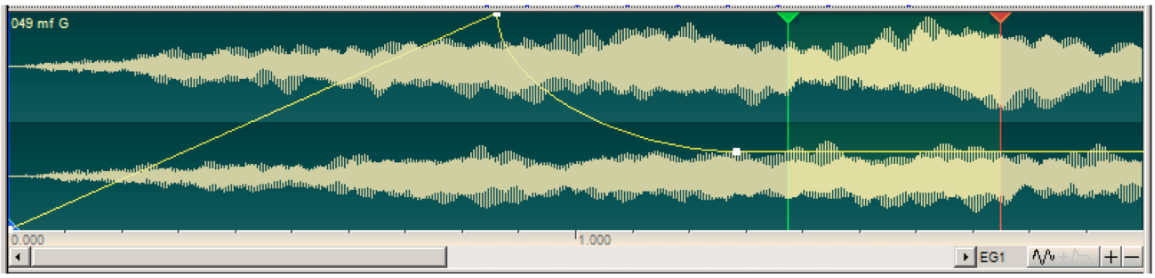
Status Bar: [Alt] + [V] + [S]

This command displays or hides the Status Bar.

The Status Bar shows a variety of information including: (1) the name of the audio interface currently in use, (2) the current and peak number of voices sounding, (3) external MIDI activity, (4) memory usage, (5) the amount of free space currently available to the temp directory, and (6) the "committed" size, which is an estimate of the disk space that will be needed to save all of the files currently open.

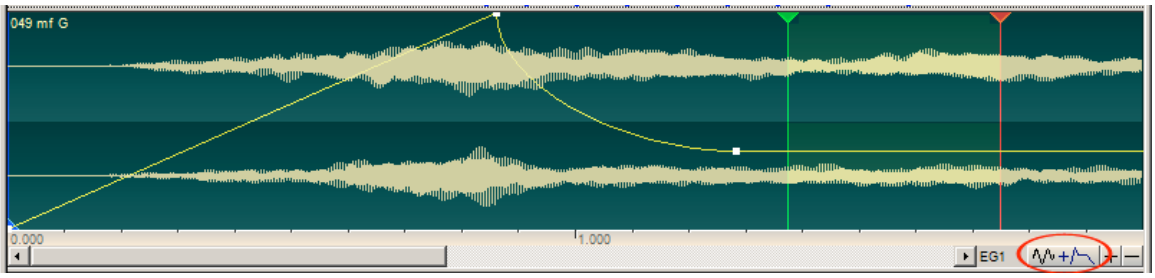
Show Audio: [Alt] + [V] + [A]

This command displays or hides the graphical audio waveform view. The waveform view displays the sample wave and parameters such as ADSR envelopes, LFOs and loop points. This allows you to precisely edit these parameters and see how they will lay on top of the sample.



Note that samples in some instruments may be compressed, and decompressing these samples automatically for display purposes could slow down the Editor unacceptably. In these cases the waveform view displays the message "accelerated wave - click to display". Clicking anywhere in the window will cause the wave to be drawn normally.

When the Envelope Preview button is pressed, the waveform is drawn as if the amplitude envelope (EG1) were already applied to it.

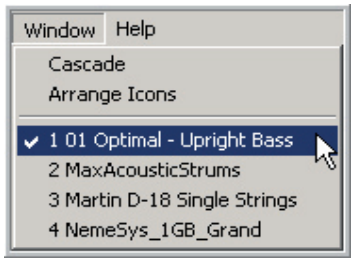


Tall Velocity Window: [Alt] + [V] + [V]

Checking this menu option causes the velocity window to expand to fill the entire height of the Editor window. It's useful when you have a large number of velocity splits.

Window Menu

This is the same as the Window menu seen in many Windows applications, with options for automatically arranging the window layout and for bringing a particular window to the foreground when you have multiple .gig files open.



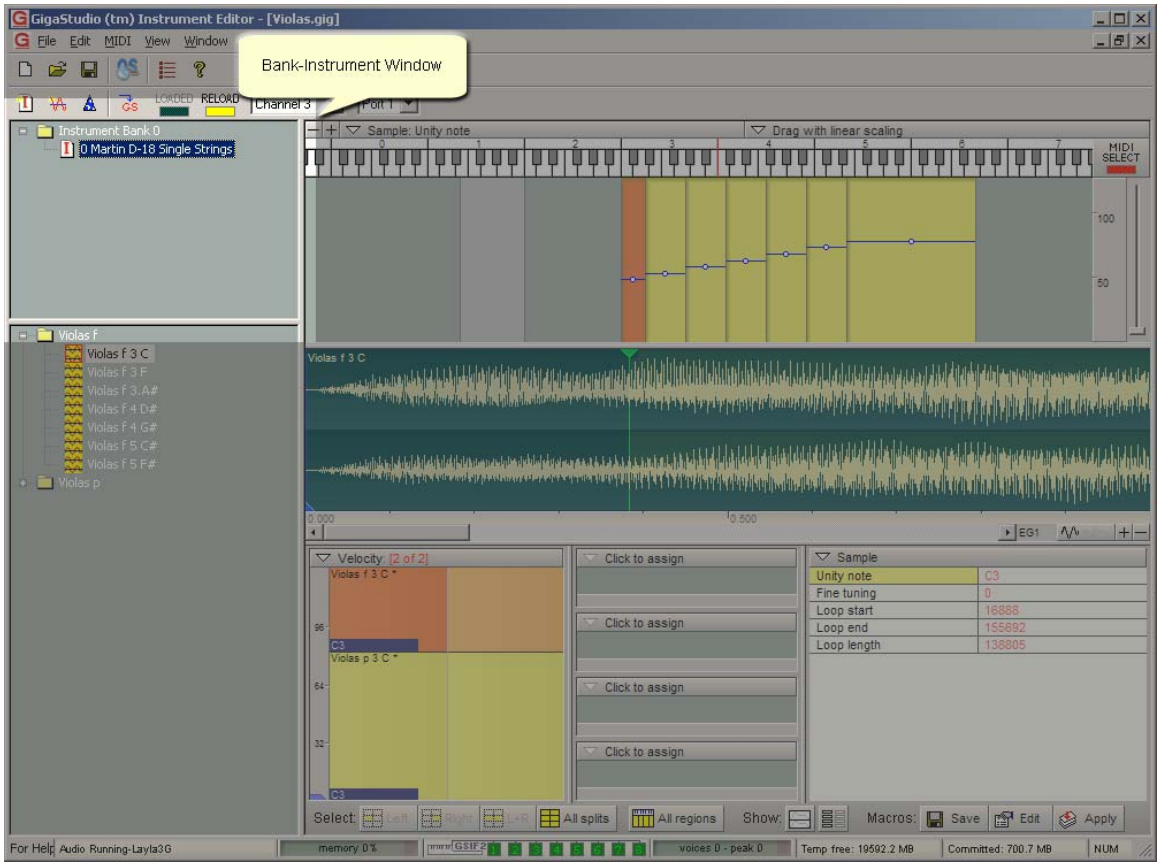
Help Menu

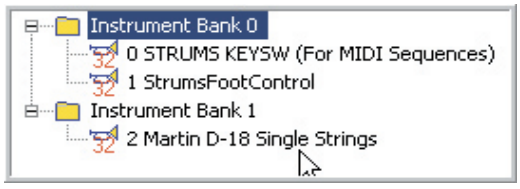
Options on this menu will bring up the Editor's help file, take you to the TASCAM web site, and launch the About box which displays information about the version of the software you are running.

Chapter 7: Editor Windows and Context Menu Commands

This chapter presents a window-by-window tour of the Editor. Many of the Editor's features are available by right-clicking in the various windows to bring up a context menu. The context menus are described in detail as we visit each window.

The Bank/Instrument Window





This is where you manage your Instruments and Instrument Banks. This example shows two banks containing a total of three instruments. A .gig file can contain up to 128 instruments.

Bank and Instrument Facts

- GIG files can have multiple Banks and multiple Instruments.
- These correspond and respond to standard MIDI Bank and Patch/Program Changes.
- This is where you cut, copy, paste and rename instruments and change their bank and patch numbers.
- You can also cut, copy and paste banks as well.
- Banks and instruments can be moved or copied between .gig files.
- This is where you toggle between multiple instruments to move or copy regions between instruments.

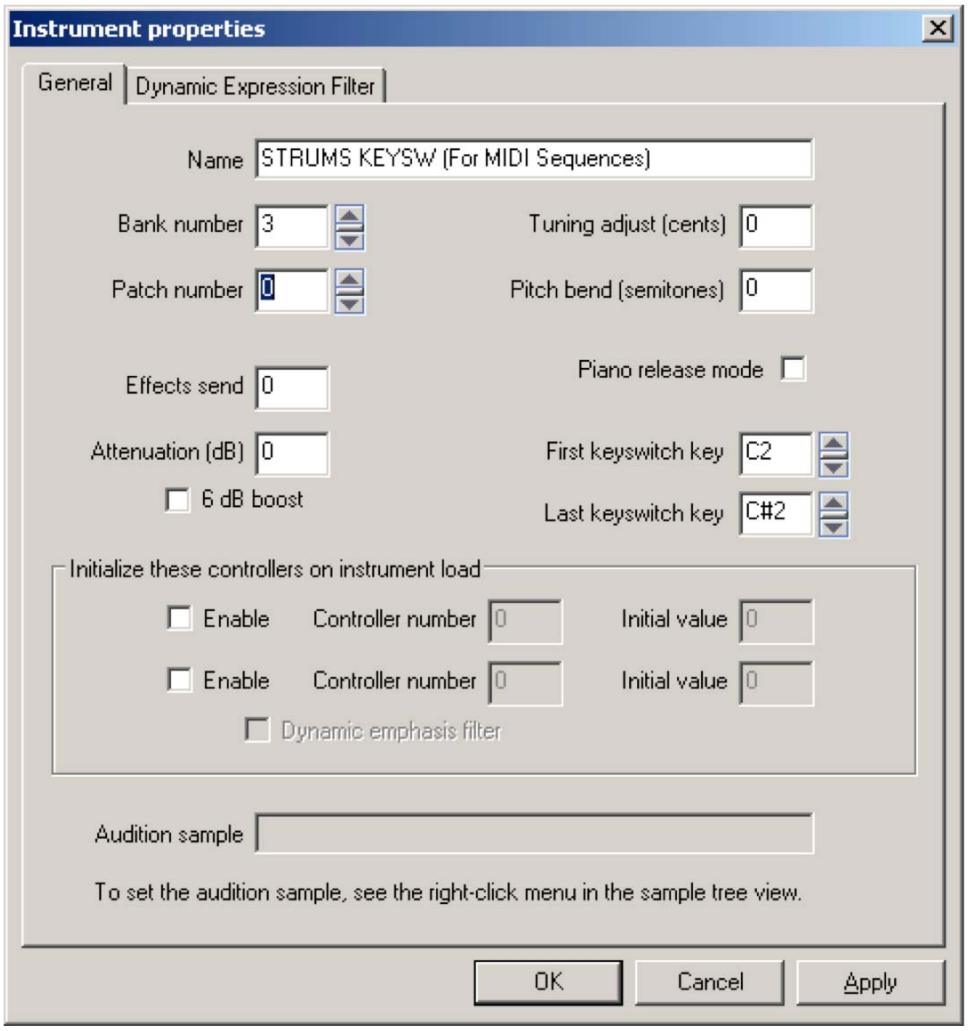
Banks

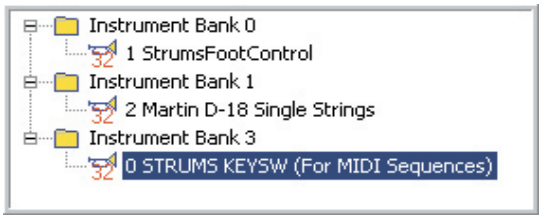
Creating a New Bank

1. Double-click on an instrument to bring up the Instrument Properties.

   You can change the Bank and Patch number here among other things.

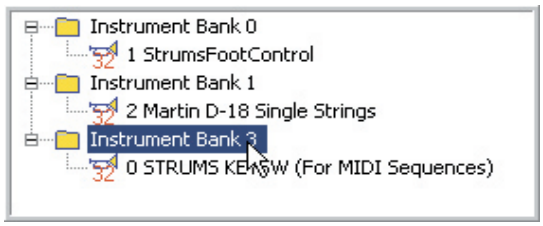
   In this example, we will change this instrument to Bank 3. This will create a new Bank and move the instrument into it. This is how you create new Banks.





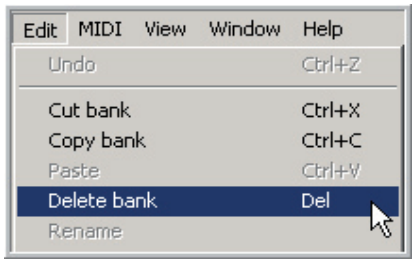
2. Now the instrument is in Bank 3. The new bank is created automatically.

Deleting a Bank

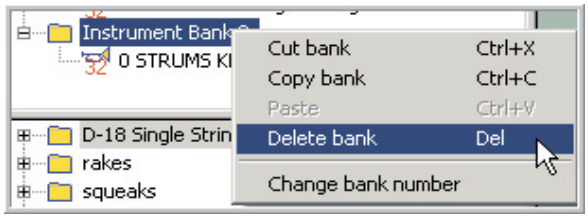


1. To Delete a Bank, select the Bank you wish to delete with the mouse.

Keep in mind that when you delete a Bank, you also delete any Instruments within it.
(The samples are not deleted however.)



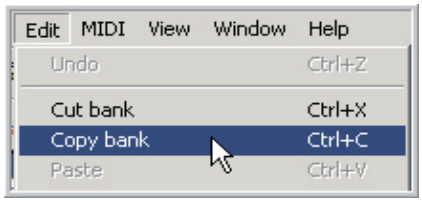
2. Go to the Edit menu and click *Delete bank*.



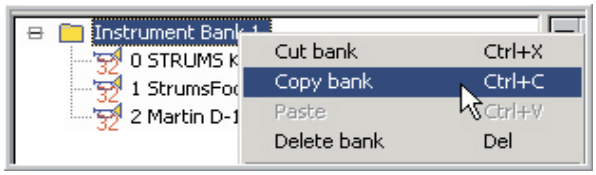
3. Or right-click on the Instrument Bank to bring up the Bank context menu and choose *Delete bank*. You can also press the Delete key on your computer keyboard.

Cut or Copy Bank

1. Select the Bank you want to Copy or Cut with the mouse.



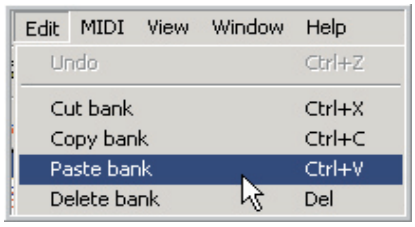
2. From the Edit menu, select *Cut bank* or *Copy bank*. Either command will place a copy of the bank on the clipboard. *Cut* deletes the bank from the file; *Copy* leaves it in place.



3. The same commands are available on the right-click menu.

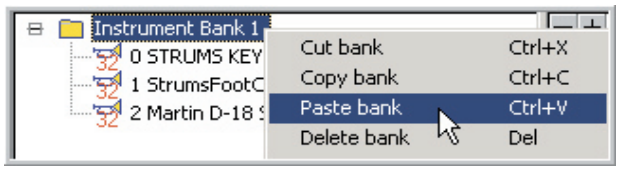
Cutting or copying a large bank can take a significant amount of time, since any samples the band references must also be copied.

Paste Bank



1. Go to the Edit menu and choose *Paste bank*.

You can also use [Ctrl] + [V] on the computer keyboard.



2. Or right-click on the Bank to bring up the Bank context menu and choose *Paste bank*.

3. If the bank already exists in the file you are pasting into, you will get a prompt asking you to pick an unused bank number.

The bank is now copied into its new location with all of its instruments and their samples.

If you copy a bank from one file and paste it into a different file, the samples associated with that bank are merged into the second file's wave pool. When this happens, the Editor will discard any samples which have exact duplicates already in the new pool, remapping regions as necessary to use the existing copies. This operation avoids wasted space in the target file, but it can take some time to complete.

Copy and Paste Banks (Drag and Drop)

Banks can be dragged and dropped bewteen files, combining the Copy and Paste operations into a single action.

Changing the Bank Number

To renumber a bank, right-click on the bank and select *Change bank number*.

Instruments

Example of a bank with three instruments

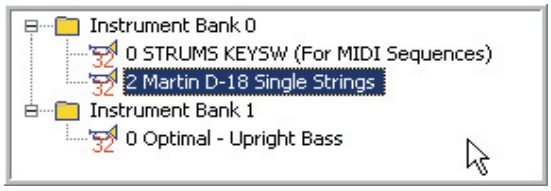
- An Instrument is what loads to a MIDI channel in the GigaStudio.
- GigaStudio files can have many instruments within them.

- The instruments can all be inside a single bank or organized across several banks.
- Instruments respond to standard MIDI Patch (or Program) Changes in real time.

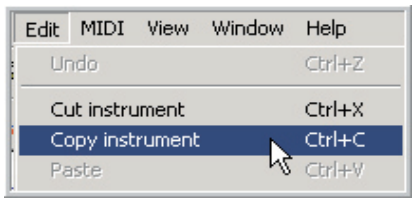
Creating a New Instrument

To create a new instrument, click the "New instrument" toolbar button  or right-click in the instrument window and select *New instrument* from the popup menu.

Cut/Copy Instruments

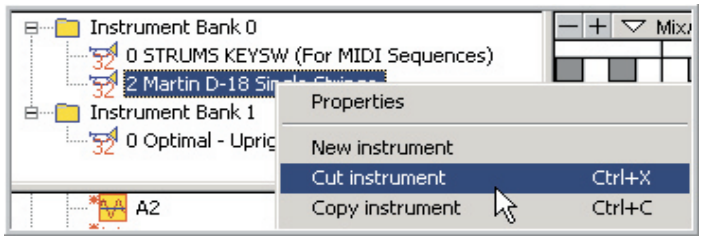


1. Select the Instrument you want to cut or copy with the mouse.

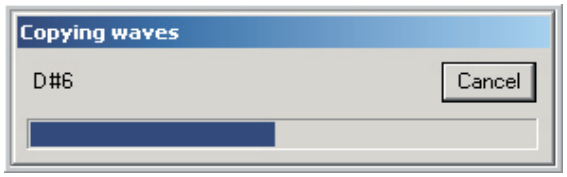


2. Select the *Cut* or *Copy* command from the Edit menu.

You can also use [Ctrl] + [C] for Copy or [Ctrl] + [X] for Paste on the computer keyboard.



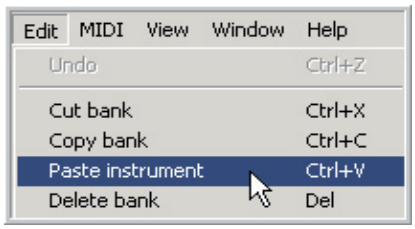
3. Or right-click on the instrument to bring up the Instrument context menu and choose *Cut instrument* or *Copy instrument* with the mouse.



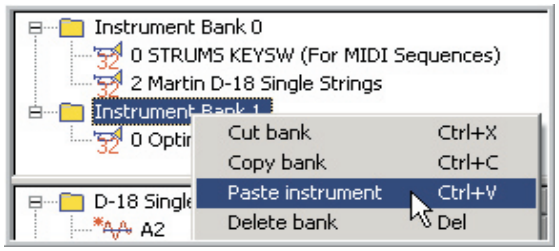
4. A progress window will come up showing that the samples are being copied.

Paste Instruments

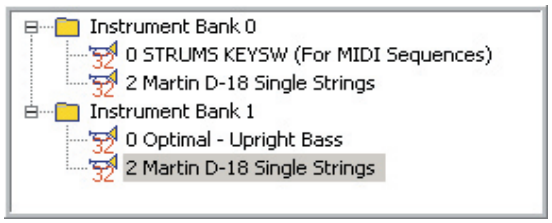
1. Select the bank you wish to paste into with the mouse.



2. Select *Paste instrument* from the Edit menu or use [Ctrl] + [V] on the computer keyboard.



3. Or right-click on the bank and select *Paste instrument.*



4. Now the instrument is copied to the bank. If the copied instrument's bank and patch number are already occupied, you'll be prompted for an alternate location.

If you copy an instrument from one file and paste it into a different file, the samples associated with that instrument are merged into the second file's wave pool. When this happens, the Editor will discard any samples which have exact duplicates already in the new pool, remapping regions as necessary to use the existing copies. This operation avoids wasted space in the target file, but it can take some time to complete.

Copying and Pasting Instruments using Drag/Drop

Instruments can be dragged and dropped like other objects. When you drag and drop an instrument within a file, it is simply moved from one bank to another. When you drag an instrument from one file and drop it into another file, the result is a full Copy and Paste operation.

Renaming an Instrument

To rename an instrument, right-click on the instrument and choose *Rename* from the popup menu. Alternatively, select the instrument and press F2.

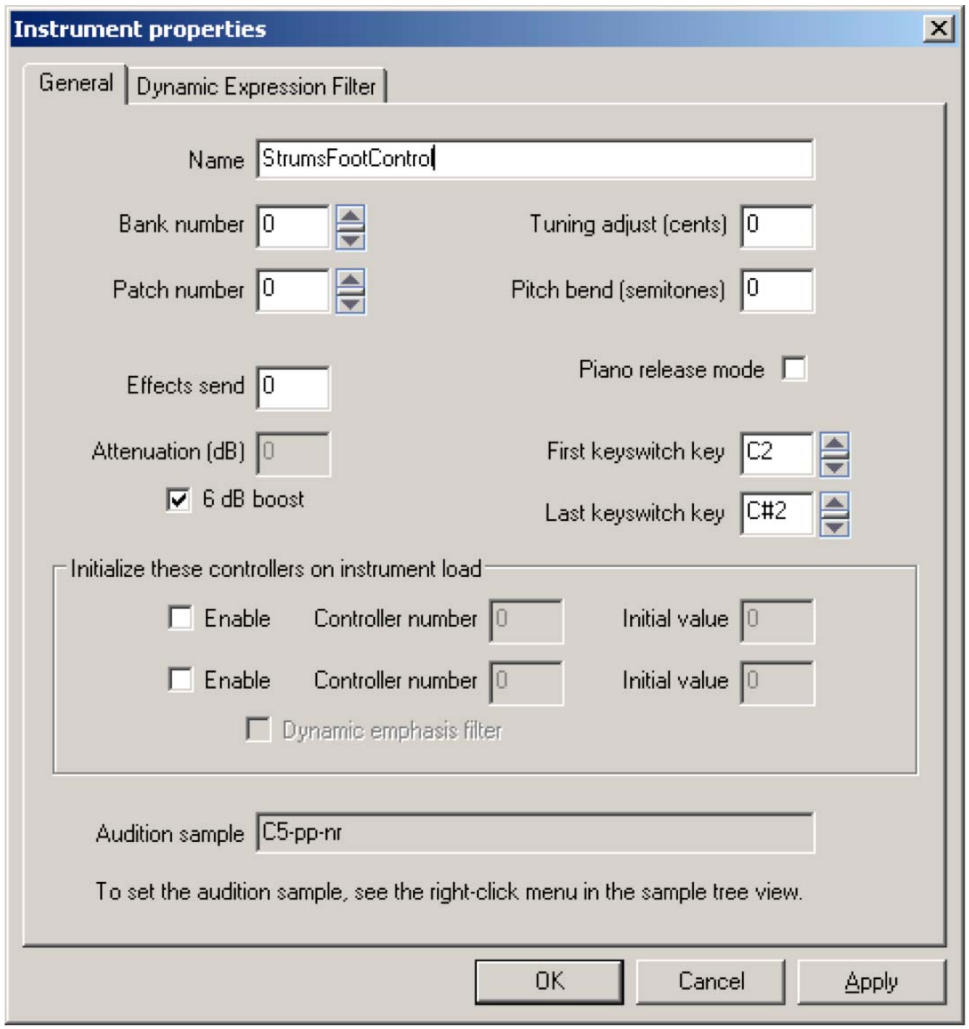
Deleting an Instrument

To delete an instrument, right-click on the instrument and choose *Delete instrument* from the popup menu. Alternatively, select the instrument and press the [Delete] key on your computer keyboard. When an instrument is deleted, its samples are not deleted. (To delete unused samples from a .gig file, use the *File-Save limited* command.)

Instrument Properties

There are two ways to open the Instrument Properties dialog.

- Double-click on an instrument.
- Right-click on an instrument and choose *Properties* from the Instrument context menu.



Name. The instrument name, with a maximum length of 63 characters.

Bank and Patch Numbers. This is where you assign the Bank and Patch (or Program Change) numbers. These settings are what the instruments will respond to when standard MIDI Bank and Patch Change commands are sent from a keyboard or sequencers. Instrument numbers are from 0 to 127; banks from 0 to 16383.

Effects Send. This feature is disabled for the time being.

Attenuation and 6 dB Boost. This allows a global attenuation setting for the whole instrument. If the instrument is prone to distorting or too loud, you can bring the volume down with this setting. Enter a value from 0 to 96 dB. Alternatively, you can boost the overall volume of the instrument by checking the 6 dB boost checkbox. This will cancel out the Attenuation setting. *This also cancels out any 6 dB boost settings on individual regions.*

Tuning Adjust (cents). You can adjust the global tuning of the entire instrument in cents over a range of 7 octaves up or down. Values between –50 and 50 are more likely to be used. This is handy for tuning instruments from different libraries to match each other. Enter a value from –8400 to 8400.

- A quarter tone is 50 cents.
- A half step is 100 cents.
- A whole step is 200 cents.
- An octave is 1200 cents.
- 8400 cents is 7 octaves.

Pitch Bend (semitones). Sets the pitch bend range. Legal values are from 0 to 12 semitones.

Piano Release Mode. This checkbox is for Piano samples. On a real piano, you can step on the sustain pedal very quickly after releasing the notes and you will still get some strings resonance. This checkbox allows the GigaStudio to emulate that when using pedal down samples. (Note that this mode is for use only with piano libraries that use actual pedal down samples. It's not needed when the ambience is supplied by GigaPulse.)

First and Last Keyswitch Key. Sets the region of the keyboard which will be used for any Keyswitch dimensions in this instrument. Note that the keyswitch range appears in the Keyboard window as a gray region (purple if a Keyswitch dimension is present) and can also be moved by dragging its edges with the mouse.

Initialize these controllers on instrument load. Use this section to specify one or two MIDI controllers to be set to the value you specify whenever this instrument is loaded.

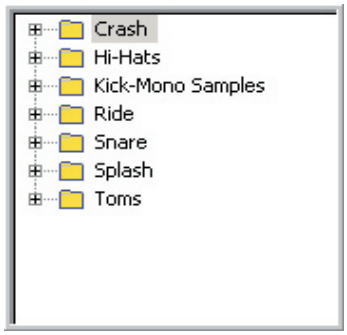
Audition sample. Shows the sample currently designated as the audition sample for this instrument. (The audition sample is played in the QuickSound Explorer when you highlight this instrument and press the Audition button.) To set the audition sample for the current instrument, right-click on a sample in the sample list and choose *Set as audition sample*.

Dynamic Expression Filter. The second tab of the Instrument Properties dialog controls settings for the Dynamic Expression Filter. These settings work in conjunction with the DEF coefficients applied to individual regions within the instrument. See page 168 for an explanation of these settings.

The Sample Window

The Sample Window is the area of the Instrument Editor interface where the instrument samples are imported and organized. Within a .gig file, samples are a shared resource: a sample can be mapped to more than one region and to more than one instrument.

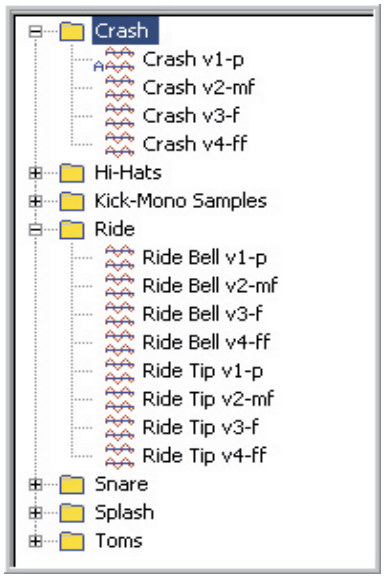
Samples are organized into folders. There will be at least one folder in the Sample Window at all times. By default, a single folder named "Default Sample Group" is created within a new .gig file. This folder can be renamed to whatever is appropriate, and as many folders as are necessary may be added as well.



Here is a view of the wave pool containing several folders.

It is extremely helpful organize the samples into folders for designing and building complex instruments.

Folders should be divided in categories by instruments, velocity splits and dimension splits. This is especially important when working with the Instrument Wizard.



Clicking on the plus sign (+) to the left of a folder opens it up to display the samples inside.

Clicking the plus sign again will close the folder.

Samples are mapped to regions by dragging them from here to the Region Window, the Velocity Window, or any dimension window to which a controller has been assigned.

Sample Icons

The icon beside each sample's name tells you several things about the sample:

A single red wave icon is an ordinary mono sample.

A double wave icon is a stereo sample.

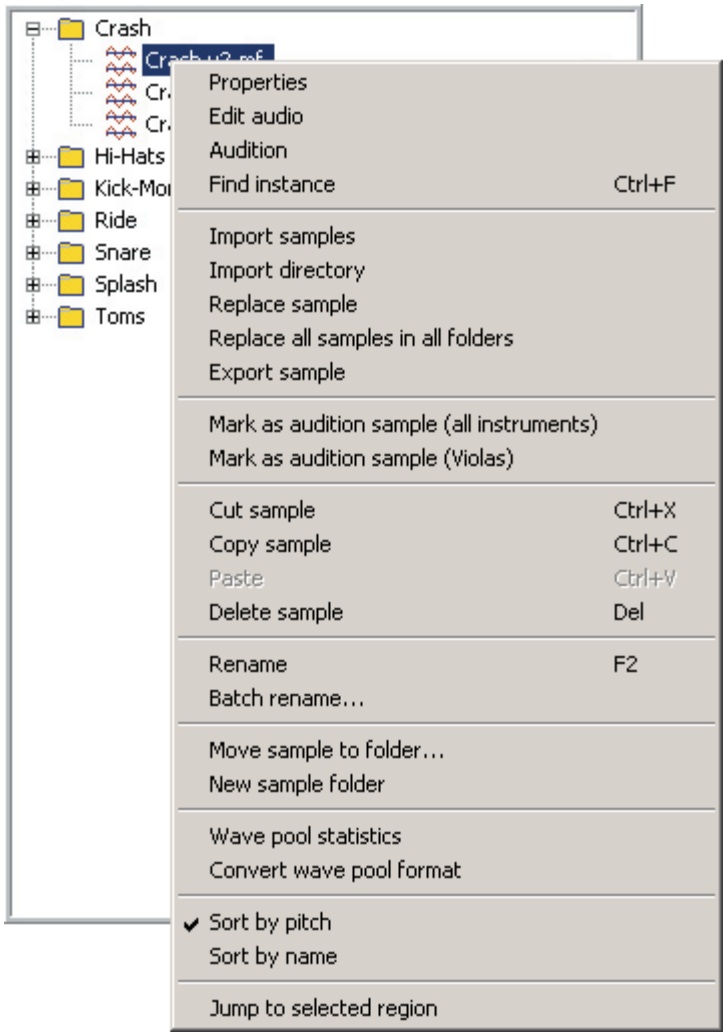
A tiny letter "A" indicates that this is the Audition Sample for the currently selected instrument.

A blue-green wave icon indicates that this sample has been compressed with GigaStudio Disk Acceleration.

A red asterisk indicates a sample that is either freshly imported, or recently edited using an external audio editor. Samples in this state may not play correctly until the .gig file has been saved and reloaded.

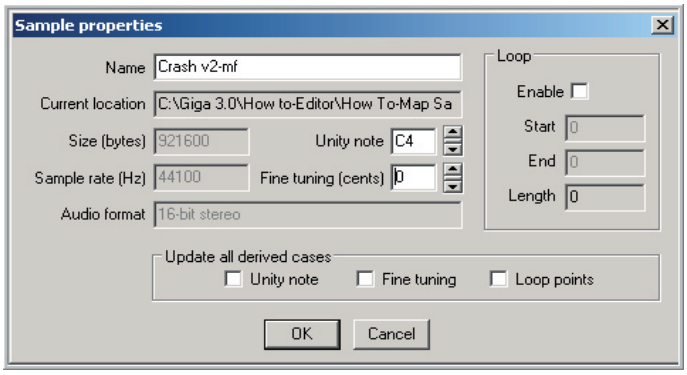
Sample Window Menu Commands

Right-clicking in the Sample Window brings up a context menu. The menu is shown below as it appears when a sample is selected. When a folder is selected, some of the commands will be different as noted in the descriptions below:



Properties (sample only)

Brings up the Sample Properties window shown below. Whenever you map a sample to a region, the unity note, fine tuning, and loop points defined here will be copied into that region's articulation. If you want these values applied to regions to which this sample is *already* mapped, check the corresponding boxes under "Update all derived cases" – otherwise, those regions will continue to sound with their previously assigned values.



Edit audio (sample only)

This command will launch an external audio editor so that you can edit the sample. The audio editor must be specified in the Preferences. The file you will actually be editing is a temporary .wav file, which the editor will delete when it is no longer needed. To hear your edit, first save the file from the audio editor, and then save and reload the .gig file.

Audition (sample only)

Plays the selected sample.

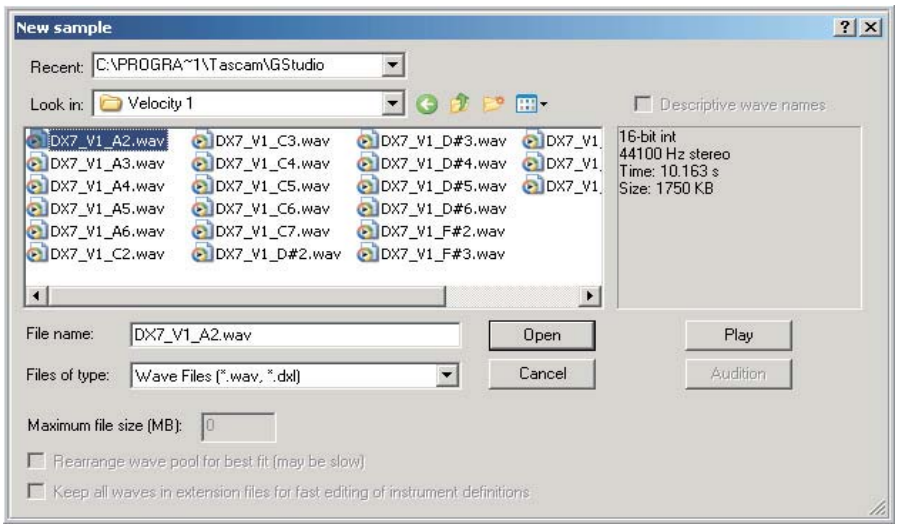
Find instance: [Ctrl] + [F] (sample only)

Locates the first region to which this sample is mapped. The editor brings the region into view, and selects the specific split where the region is mapped. If the sample is mapped to more than one region or split, you can visit them in turn by repeating the command.

Import samples

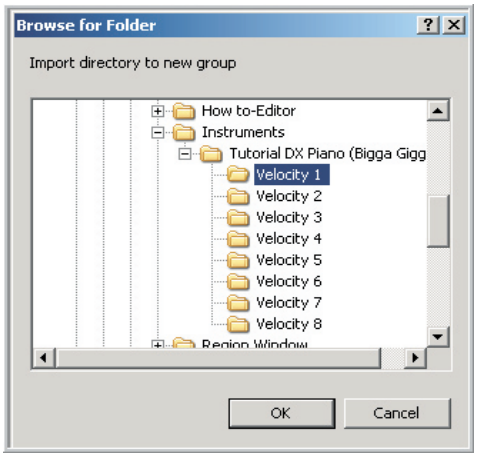
Selecting this option will bring up the file browser shown below.

- Use this window to find and select which samples to import.
- The samples will be imported into the currently selected folder.
- Hold down the [SHIFT] or [CTRL] keys to select multiple samples.
- When you click on a sample, you can see its properties in the window on the right. You can also play any selected sample by clicking the Play button.
- Click Open to import the samples into the Editor.



Import directory

- This command lets you import an entire folder of samples.
- Use this window to find sample folders.
- Only one folder at a time can be imported this way.



Alternatively, you can simply drag and drop a folder from the Windows desktop into the Sample Window. This method allows you to import multiple folders at once.

Replace sample (sample only)

Replaces the selected sample with a new sample from a .wav file. The Sample Open dialog appears so that you can locate the replacement file. Any regions mapped to the sample you replace will be remapped to the new sample.

Replace all samples in folder (folder only)

This command allows you to replace all the current samples in a folder with new versions.

- This is a good option if you have made audio changes to your samples outside GigaStudio after having mapped out the instrument.
- Instead of having to rebuild the whole instrument, you can batch replace the samples from here.
- A common use for this feature is to replace the original samples with noise reduced versions or to replace 16 bit samples with 24 bit versions.
- For this to work properly, it is important that the file names of the new samples match the file names of the original samples as they appear in the Editor.

Replace all samples in all folders

(Note that when a folder is selected, this command changes to “Replace all samples in folder”, above.)

Use this command to perform a wholesale replacement of samples throughout the current .gig file. You'll be asked to specify a root directory to be searched for replacement samples. The replacement works by attempting to match each sample's name (as seen in the sample list) to the name of a file under the root directory. There are two modes of operation:

1. **Match samples by name to .wav/.dxl files anywhere under the root directory.** In this mode, a sample will be replaced if a matching file can be found anywhere in the root directory or in any of its subdirectories.

2. **Match only if the subdirectory name also matches the wave pool folder.** This mode is useful when the sample files are arranged into subdirectories which mirror the folders in your .gig file. The samples in a folder named "Piano" will be replaced only by files found in a \Piano subdirectory of the root directory.

Samples for which no matching file can be found are left unchanged.

When searching for a replacement for an accelerated sample, the Editor looks for files with the extension .dxl (Giga accelerated sample files) and if no match occurs, the search is repeated with the extension .wav. Conversely, non-accelerated samples will be replaced by .dxl files, if the .dxl file exists and no matching .wav exists.

Export sample(s)

This command will export the selected samples (or the samples in the currently selected folder) to the hard drive as standard .wav files.

Export as folder (folder only)

In this case, the whole folder will be exported to the hard drive as a folder of wave files. The folder on disk will have the same name as the folder in the Editor.

Export all sample folders

This command will export all the sample folders in the .gig file to the specified root directory as wave files. Subdirectories are created as necessary and the samples are organized on disk as they are in the .gig file.

Mark as audition sample

For each instrument in a .gig file, there is a designated "audition sample" in the wave pool. This can be a quick demo or even an audio tutorial specific to the instrument. From the QuickSound Explorer, audition samples can be played as a preview before loading an entire instrument.

Two versions of this command are available: one sets the audition sample for the current instrument. The second version of the command makes the selected sample the audition sample for every instrument in the .gig file.

The audition sample for the currently selected instrument will have a tiny letter "A" next to its icon.

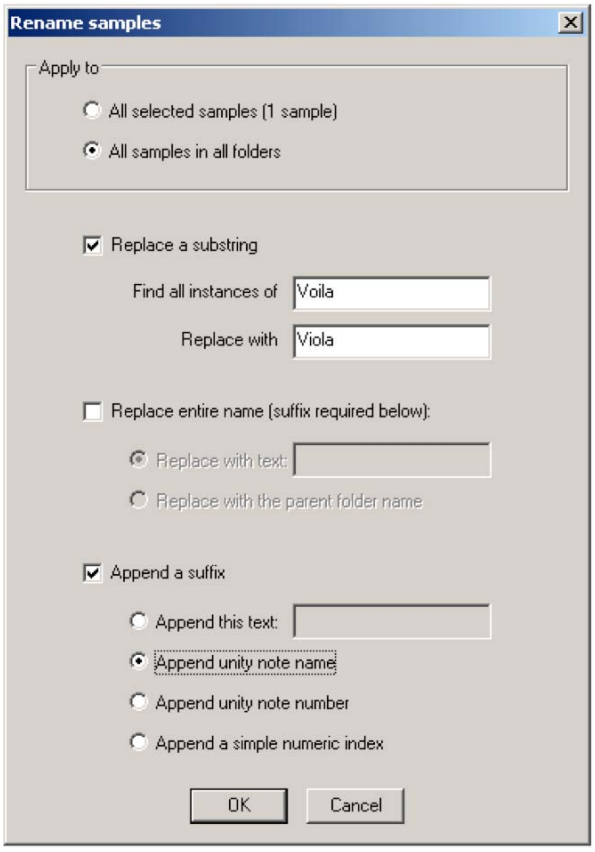
Cut, Copy, Paste, Delete, Rename

These commands are used as in any Windows application.

Note that when you cut or delete a sample, any regions mapped to that sample will be unmapped (will no longer sound).

Batch rename

Use this command to rename some or all of your samples according to rules you specify in the Rename Samples dialog. You can replace all occurrences of one string with another, and/or append an automatically generated suffix based on the sample's unity note or position in the file.



Move sample(s) to folder (sample only)

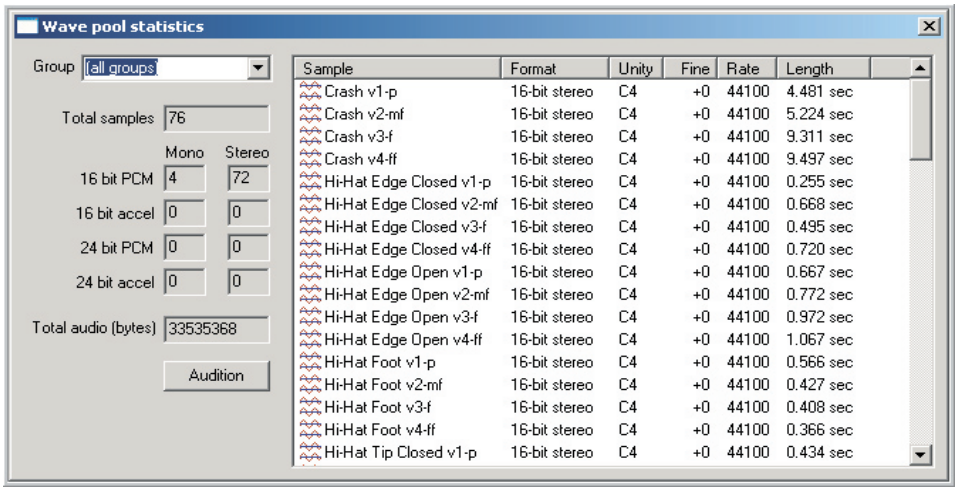
Moves the selected sample to a different folder. Samples may also be dragged and dropped between folders.

New sample folder

Creates a new, empty sample folder.

Wave pool statistics

Clicking on this will bring up the Wave Pool Statistics window. This window allows you to get an overview of all the samples in the .gig file.



Convert Wave Pool Format

- This tool is used to convert the bit rate and apply Disk Acceleration compression to all the samples in the .gig file. You can also convert the whole file to mono.
- This allows a developer to easily generate 24 and 16 bit versions of the library in both mono and stereo.
- This interface is covered in detail in the Edit Menu section.

Sort by pitch
Sort by name

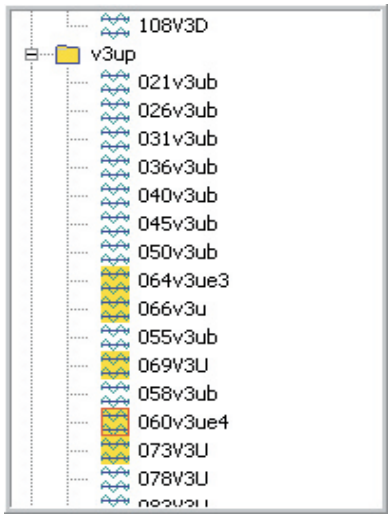
Choose one of these options to specify how samples should be ordered within each folder. The currently selected menu option will display a check mark; checking one option automatically unchecks the other.

When sorting by pitch, both unity note and fine-tuning are considered.

Jump to selected region

Select this menu option to turn the “jump” feature on or off. When the feature is on, the menu option will display a check mark.

When *Jump to selected region* is checked and you select a new region or split, the sample window automatically scrolls so that the sample mapped to the current region/split is in view.



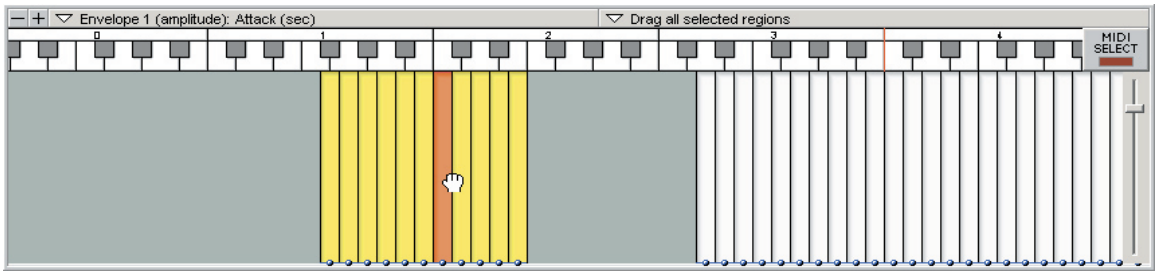
When you change the region selection (in the keyboard window) or the split selection (in any of the dimension windows), the sample view is always updated. The icon beside any sample mapped to the current selection lights up in yellow. If you select multiple regions or splits, then multiple samples may show the yellow highlight.

Even when you have selected multiple regions or splits, a single region and a single split within each dimension will still have the focus, noted by an orange highlight. The single sample at the intersection of all the currently focused splits is drawn with a red border around its icon. This is the sample that will automatically remain in view when *Jump to selected region* is checked.

When the MIDI Select feature is enabled, the region and split selection tracks note-on messages received from your MIDI keyboard. If *Jump to selected region* is also enabled, then you can find any sample quickly just by playing the MIDI keyboard and manipulating MIDI controllers.

The Region Window

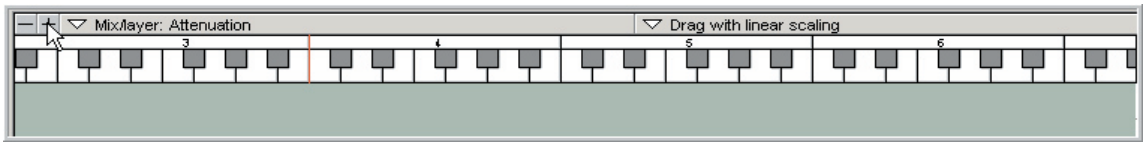
The Region Window shows the locations of regions on the keyboard, and allows you to add, move, and delete regions.



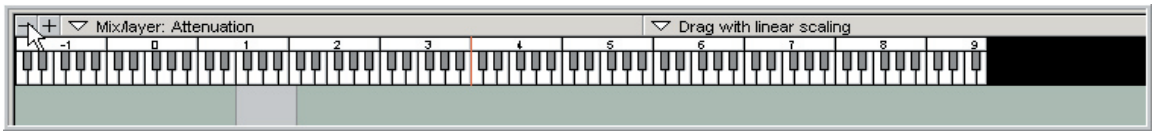
Region Zoom Buttons

Use these buttons to zoom the region window view horizontally. Note that the Region Window has no horizontal scroll bar. When the display is zoomed in too far to see the entire keyboard at once, you can shift the view left or right by dragging the mouse in the keyboard area of the window.

Zoom In: (+)

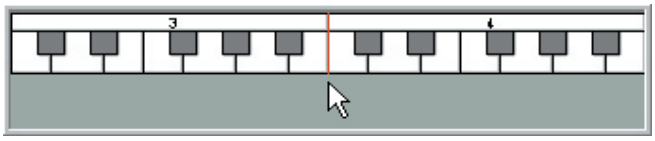


Zoom Out: (-)



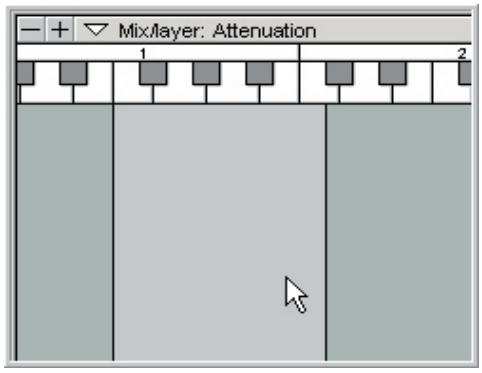
Middle C

This red line indicates where Middle C (MIDI note 60) is. The red line is always just to the left of Middle C.



By default, middle C is named C4. You can choose a different octave numbering system in the Preferences (*Edit-Preferences* on the main menu).

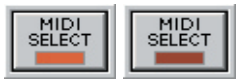
Keyswitch Region



This gray region represents the area of the keyboard reserved for use by the Keyswitch dimension. It should be placed where it will not overlap the instrument's performance range. The Keyswitch region can be moved or resized like any other region.

When a Keyswitch dimension is actually present in the currently selected instrument, the Keyswitch region is drawn in purple to show that it is active.

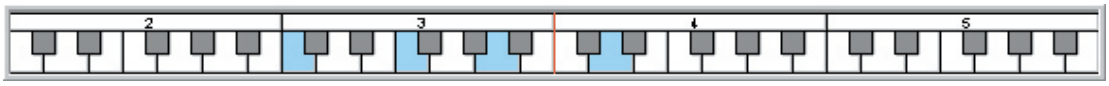
MIDI Select Button



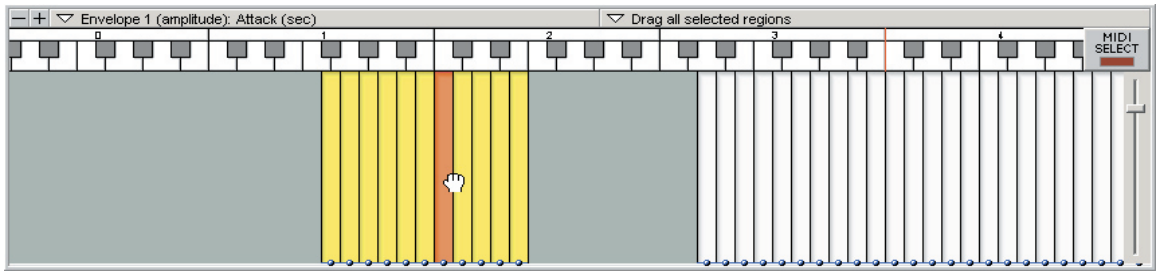
The MIDI Select button allows regions and dimensions to be highlighted and selected by incoming MIDI data. When this option is turned on, for example, you can select a particular velocity split within a region by playing a key in that region at the correct velocity.

MIDI Note Ons

Notes triggered via external MIDI are highlighted in blue.



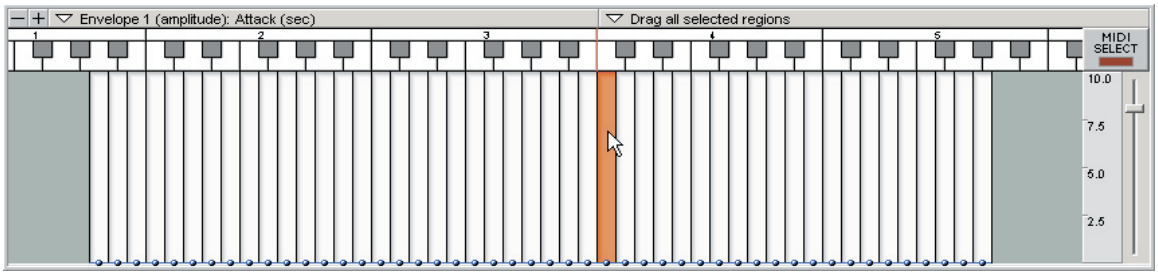
Parameter Editing



The blue lines and circles visible on each region are used to edit Articulation Parameters. Because this is a very powerful feature, and because we haven't discussed articulation parameters yet, well skip over this topic for now. Editing parameters in the Region Window has its own chapter beginning on page 172.

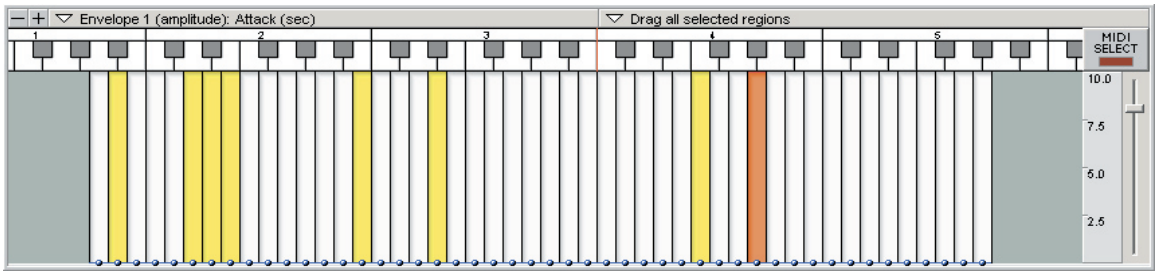
Selecting Regions

To select a single region, simply click that region with the left mouse button. The first region you select turns orange:



To select a range of contiguous regions, select the region at one end of the range, and then hold down the SHIFT key while clicking the region at the other end of the range. You may also drag the mouse to perform a "rubber band" selection of multiple regions by holding down the ALT key (the ALT key is not necessary for this technique if you begin the drag in the empty gray portion of the display).

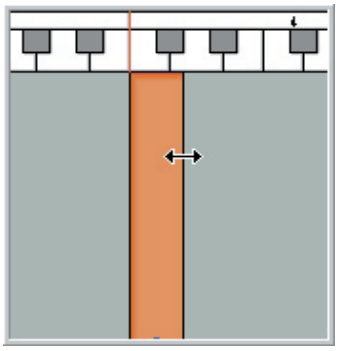
To select a range of regions that are not contiguous, hold down the CTRL key and click with the mouse to add or remove regions from the selection.



Note that the single most recently selected region is colored orange. This region has the focus – the dimension windows and articulation value displays refer to this region.

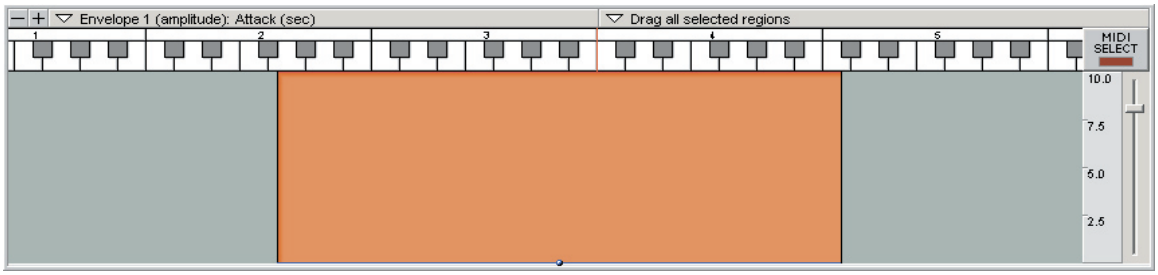
If multiple regions are selected, the additional regions are colored yellow. Editing functions that work with multiple regions, such as Copy or Delete, are applied to both the orange focus region and all of the yellow selected regions.

Stretching and Moving Regions

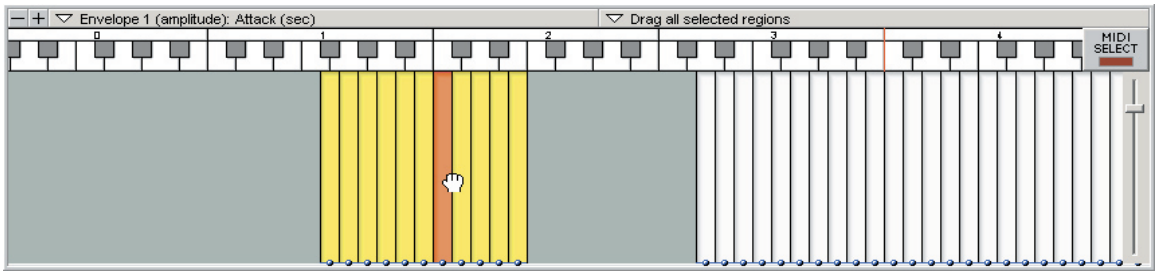


Regions are stretched by grabbing the left or right edge and dragging with the mouse.

By stretching a single chromatic note region both right (upward in pitch) and left (downward in pitch) in range it is possible to cover several octaves with a single region.



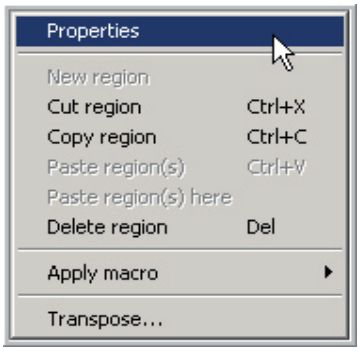
A region can be moved to a different area of the keyboard by clicking in the middle area of the region and dragging left or right. You may also move several regions at once, by selecting the regions you want to move and then dragging any one of the selected regions.



Normally, regions moved in this way are not retuned, meaning that splits for which pitch tracking is in effect will sound higher or lower after being moved. Check the "Retune regions when dragging" box in the Preferences if you wish to preserve the pitch of each note.

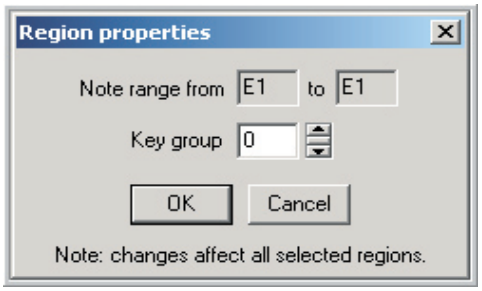
The Region Context Menu

Right-click on a Region and you will be presented with the Region context menu:



Properties

Click on "Properties" in the region menu to bring up the Region Properties window. You may also double-click on a region to bring this window up.



The note range is for information and is not adjustable here (drag the region or its boundaries to change the region's range). The Key Group is an advanced Hi-Hat mode feature: regions assigned to the same key group (other than group 0) cut each other off. You can also create a monophonic instrument by setting all of its regions to the same nonzero group.

Key group zero is the default setting and has no effect.

New region

Creates a new region at the location you clicked on the keyboard. Because regions may not overlap, this command is grayed out if you click on an existing region. Click in the unoccupied gray area below the keyboard to use this command.

The newly created region will span a single key. Drag the region, or its left or right edges, to change the note coverage.

Cut region(s)

Deletes the currently selected region(s) and makes a copy of them on the clipboard. Any samples mapped to the selected regions are also copied (but not deleted from the current file).

Copy region(s)

Makes a copy of the currently selected region(s) and places them on the clipboard. Any samples mapped to the selected regions are also copied.

Paste region(s)

Pastes any regions from the clipboard into the current instrument.

- This option will paste the cut or copied region or group of regions from the clipboard.
- If you are pasting to another instrument, it will try to put the regions on the same note range as they came from.
- If these note ranges are occupied, then the regions will be placed on the closest empty note ranges.
- When pasting to the same instrument that the regions were copied from, the regions will also be placed on the closest empty note ranges.

When regions are pasted, the accompanying samples may also be pasted, but only if they are not already present in the target file.

Paste region(s) here

This is similar to the regular Paste command, but the Editor will attempt to place the regions at the location nearest the mouse position (rather than the location from which the regions were originally copied).

Delete region(s)

Deletes the currently selected regions. This command does not delete any samples mapped to the selected regions.

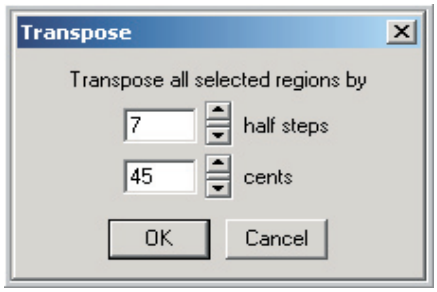
Apply macro

Use this function to perform complex and repetitive editing. This command will apply a Macro to every split in the currently selected region or regions.

This function works only if at least one macro has been previously defined. See the Macros chapter for more information about creating Macros of your own.

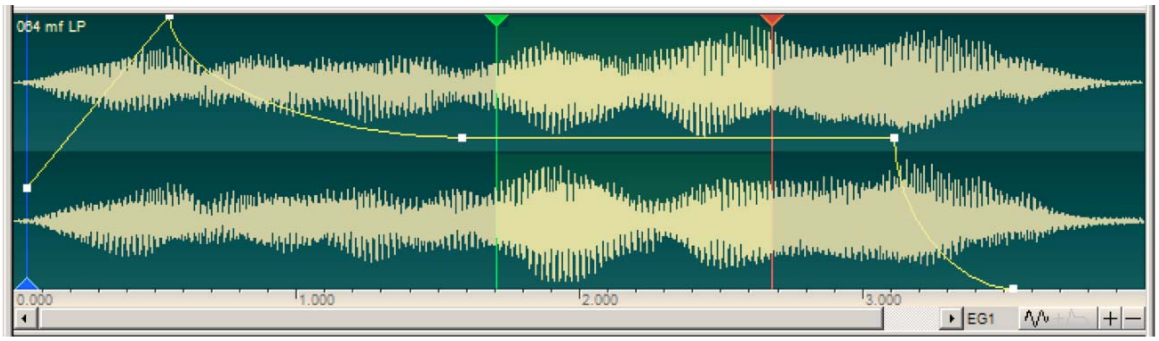
Transpose

Changes the tuning of the selected region(s) by half steps and cents.



This accomplishes the same thing as changing the unity note and the fine tune setting on every split in every selected region. The settings in the Transpose dialog reset to zero each time they are applied, so that you are always transposing and fine tuning from where you left off. The range is +/- 127 half steps and +/- 50 cents.

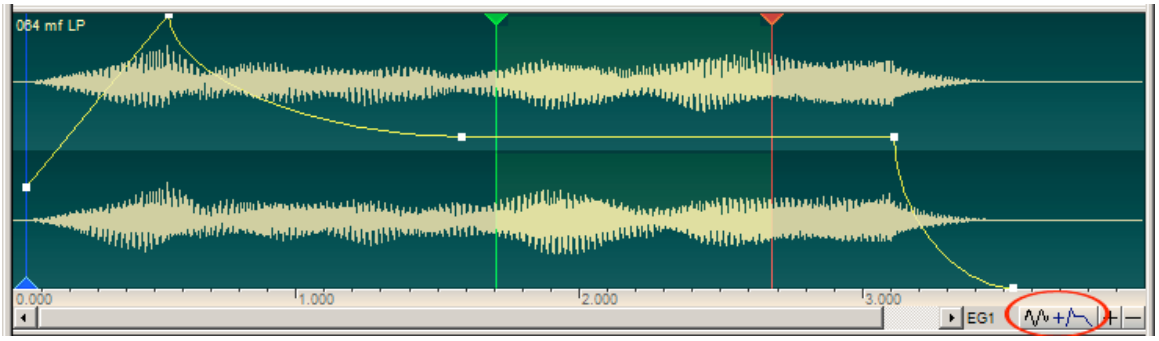
The Waveform Window



This window displays the audio waveform and several of the editing parameters.

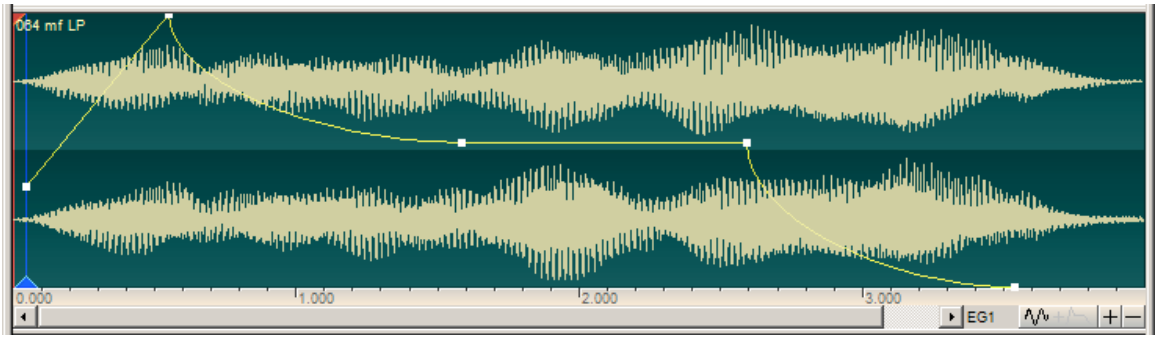
The parameters are accurately aligned on top of the waveform and they can be edited here using the mouse. If changes are made to these parameters elsewhere, the changes will instantly update here and vice versa. This helps you keep a visual overview of the editing process. It allows you to edit three different ways and see the results from three angles in real-time.

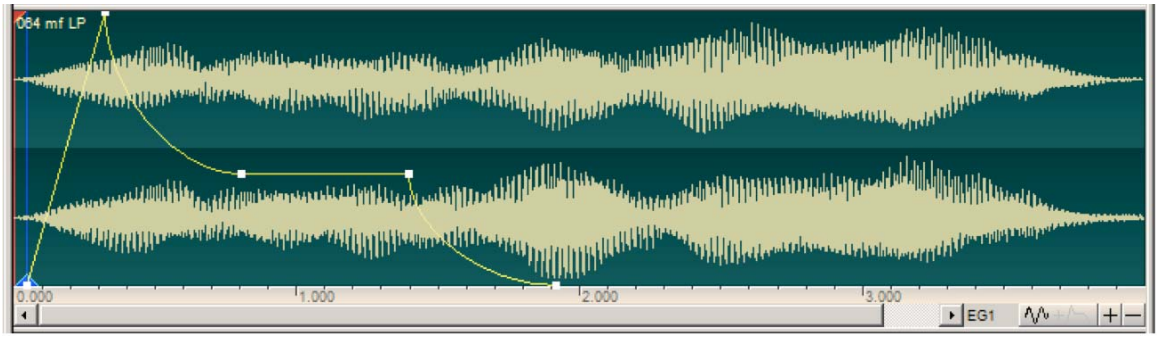
When the "Envelope preview" button is pressed, the waveform is drawn as if the amplitude envelope (EG1) were already applied to it.



Envelopes View

When an envelope parameter is selected in the Parameter Window, the corresponding envelope is drawn in the Waveform Window. You can edit the envelope by dragging its breakpoints with the mouse.



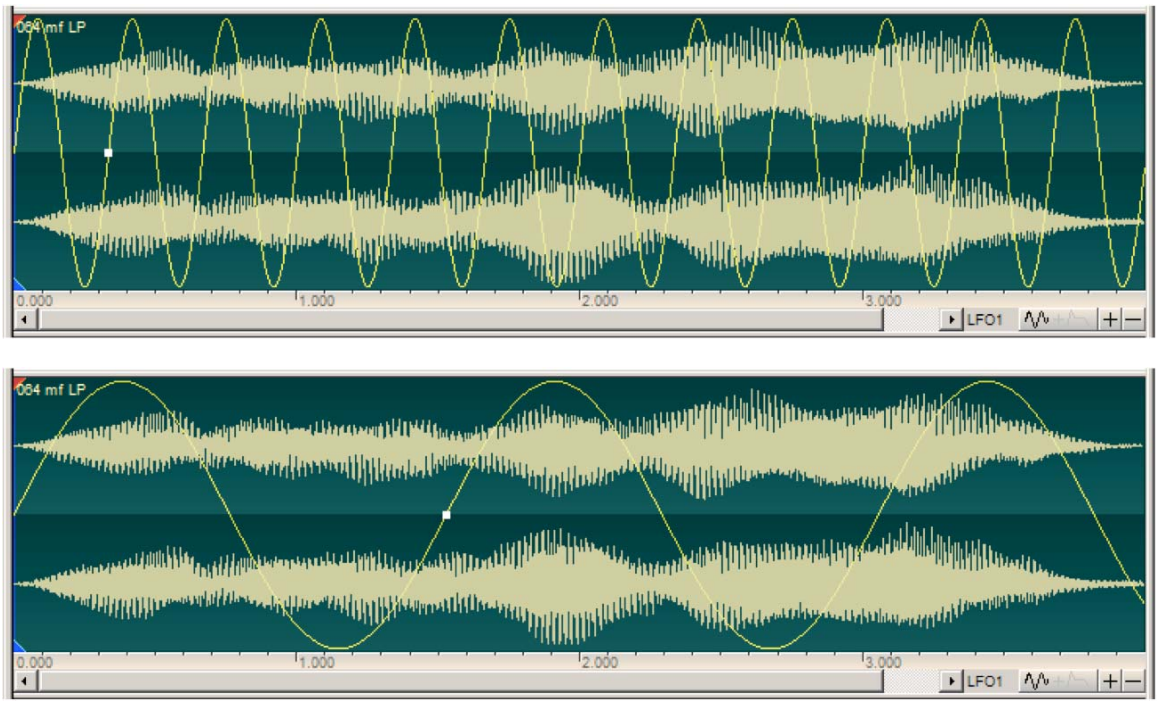


The envelope display is color coded:

- The amplitude envelope is drawn in yellow.
- The filter envelope is drawn in violet.
- The pitch envelope is drawn in blue.

LFO View

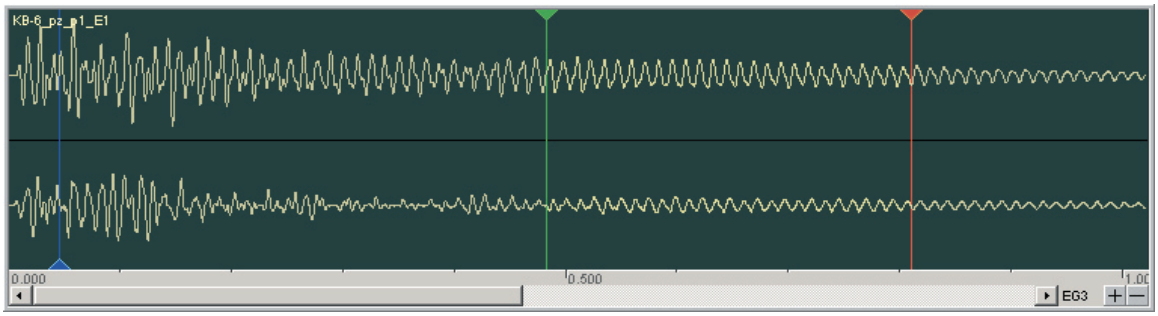
When an LFO parameter is selected in the Parameter Window, the corresponding LFO waveform is drawn in the Waveform Window. You can edit the LFO rate by dragging the breakpoint.



The LFO display is color coded:

- The amplitude LFO is drawn in yellow.
- The filter LFO is drawn in violet.
- The pitch LFO is drawn in blue.

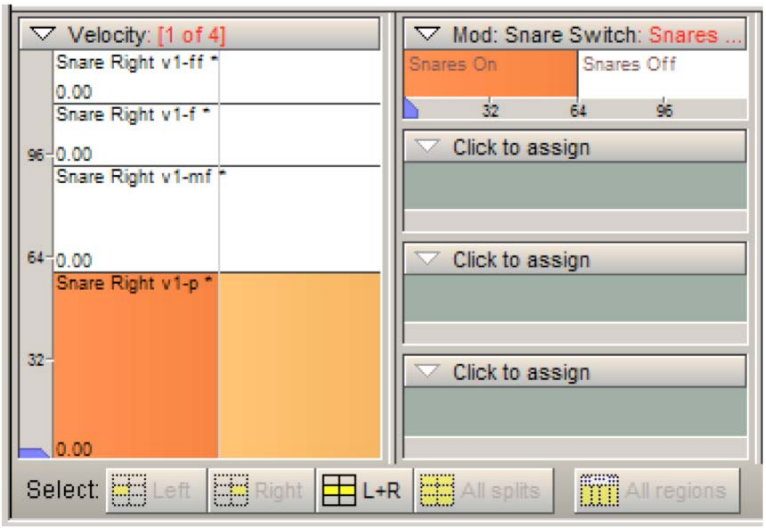
Loop and Start Offset markers



These markers indicate the loop points and start offset for the sample. They can be moved with the mouse by grabbing the triangular handles.

- Sample Start Offset: blue marker
- Loop Start: green marker
- Loop End: red marker

The Dimension Windows

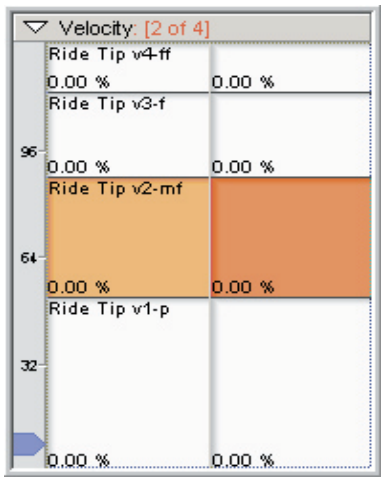


The Dimension Windows are where you set up all the various types of dimension splits. The largest of the windows, at left, is dedicated to velocity. The smaller horizontal windows to the right are used to define additional dimensions which may be governed by regular MIDI controllers (such as the Mod Wheel) or by other program logic (for example, a Round Robin dimension).

Each active dimension window is divided into cells representing its dimension's splits. In the example above you can see four velocity splits and two Mod Wheel splits. Each velocity split displays the name of the sample mapped to it, *subject to the selection in the other dimension windows.* In the example above, we can see the names of the four samples that will sound according to velocity when the Mod Wheel is in the lower half of its range. If we clicked in the right-hand side of the Mod Wheel dimension window, the velocity window would then show the names of the four samples that would sound when the Mod Wheel is in its upper range.

The Velocity Window

While a velocity dimension is not fundamentally different from any other dimension, the Velocity Window acts as a focal point for the dimension display and has a number of special features:

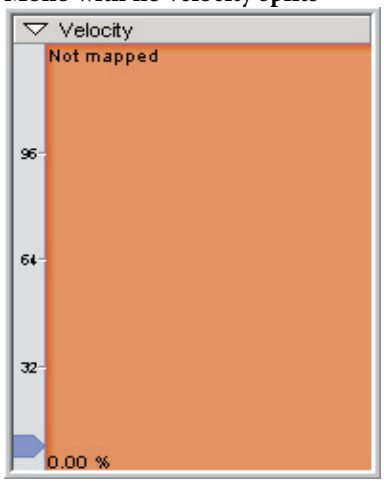


- Samples are mapped here and sample names are displayed here.
- The stereo/mono status is set and displayed here.
- The number of Velocity Splits is set and displayed here.
- Various parameters settings and visuals are displayed here.
- Right-clicking here brings up a context menu with several editing tasks.

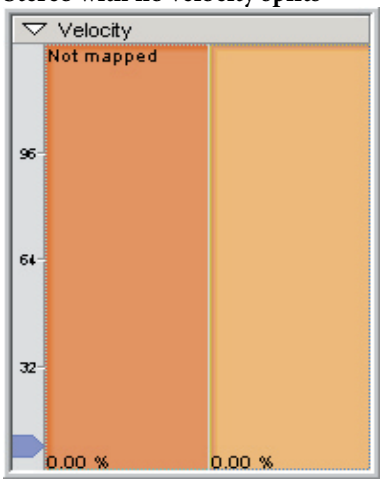
- Each split in the Velocity Window also displays the setting of whatever parameter is being edited at any time. It gives a numerical and graphical bar display.

A vertical divider line in the middle of the velocity window indicates a stereo region. This is true even when there are no velocity splits:

Mono with no velocity splits

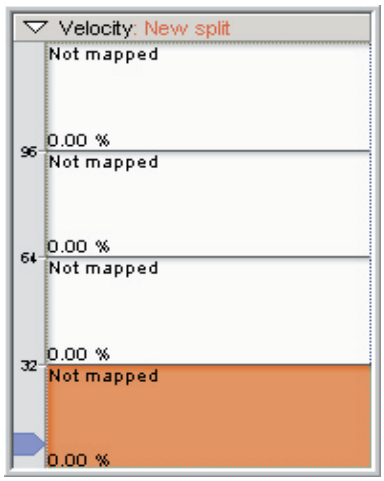


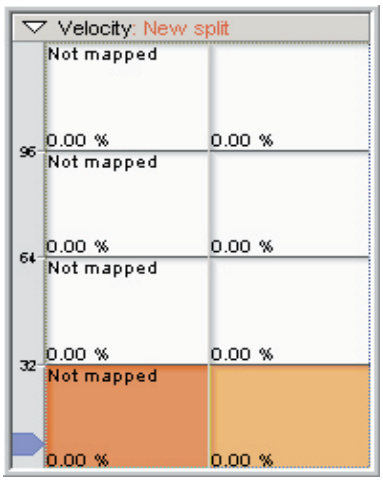
Stereo with no velocity splits



Mono with 4 velocity splits

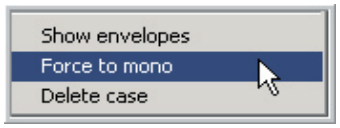
Stereo with 4 velocity splits



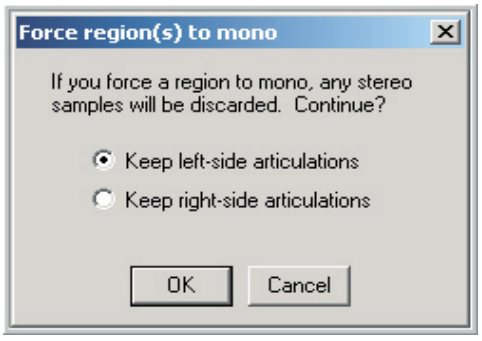


Assigning a Mono sample to the Velocity Map will automatically put it in Mono mode.
Assigning a Stereo sample to the Velocity Map will automatically put it in Stereo mode.

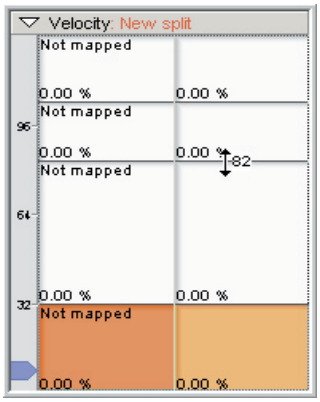
You can also manually change the Stereo or Mono status by right-clicking on the Velocity Map and choosing *Force to mono* or *Force to stereo* in the context menu.



When going from Stereo to Mono, the dialog window will give you the option of which side's articulation to keep (the left and right sides of a stereo sample each have their own articulation).

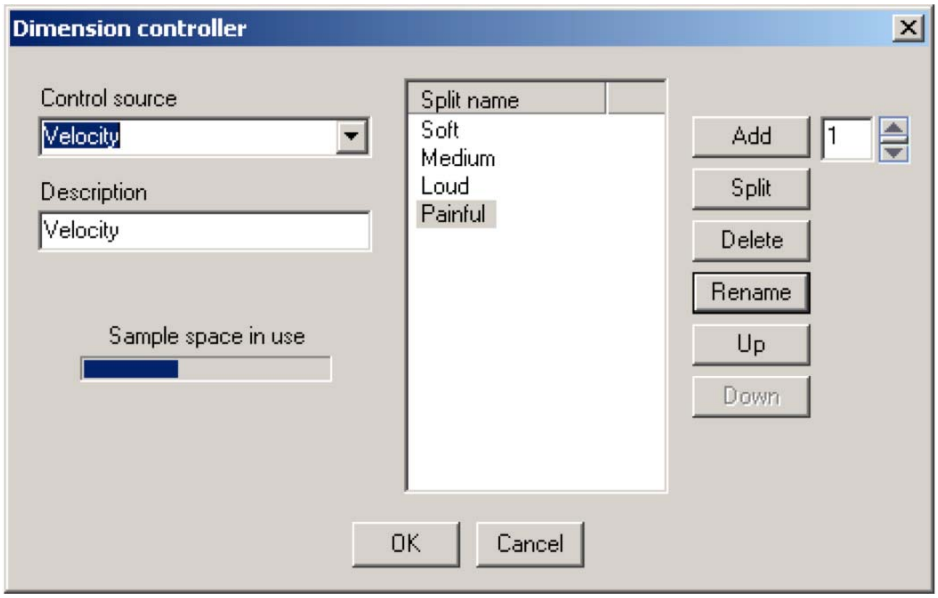


Velocity Split Points



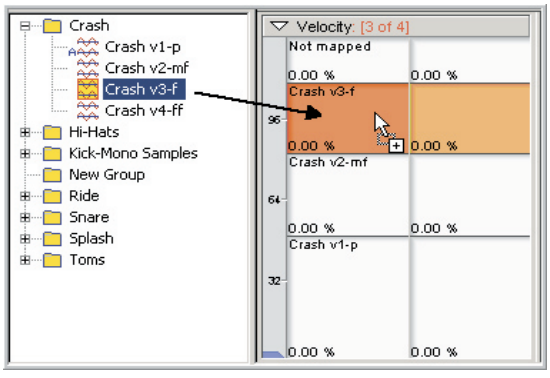
Velocity Split points are displayed by horizontal divider lines. These are adjustable by dragging them with the mouse.

Velocity Splits are created and named in the Dimension Controller window. The Velocity Split order can also be changed here as well. To display the Dimension Controller window, click on the header bar at the top of the Velocity Window:



Assigning Samples

Samples can be assigned (mapped) by dragging them from the Sample Window to a Velocity Split in the Velocity Map.

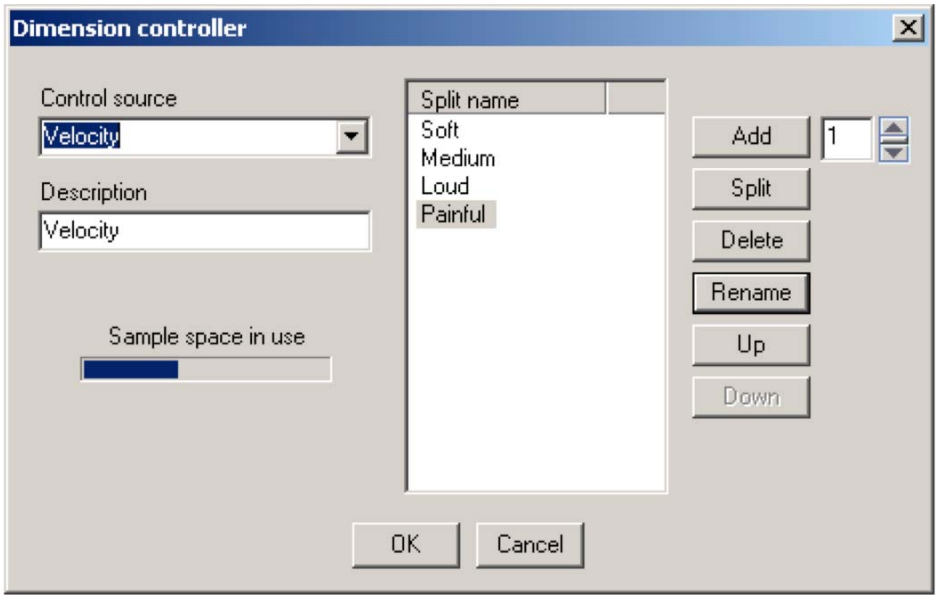


While it's common to map a single sample to a single region in this way, much more powerful mapping operations can be performed by dropping multiple samples or entire folders. The possibilities are listed on the next page:

Action	Result
Drop a single sample onto a velocity split with the **left** mouse button.	The sample is mapped to the velocity split. Note that the selection in any other dimension window is taken into account. For example, if there is a Mod Wheel dimension and you want the same sample mapped to the given velocity split for every position of the Mod Wheel, you must first select all of the Mod Wheel splits.
Drop a single sample onto a velocity split with the **right** mouse button.	This is the same as dragging and dropping with the left button, except that the Pitch Tracking articulation parameter is automatically turned off in every split that receives the new mapping. This is useful for unpitched samples such as most drums.
Drop **multiple** samples (or a folder) onto a velocity split with the **left** mouse button.	The selected splits are remapped in every region across the keyboard. For each region, the sample which most closely matches the region's pitch is used for the mapping.
Drop **multiple** samples (or a folder) onto a velocity split with the **right** mouse button.	The selected splits are remapped in every region across the keyboard. The exact method for mapping the samples is chosen from a popup menu. The menu options are: **Map to existing split (by pitch).** This is the same as simply dropping multiple samples with the left mouse button (see above). **Map to existing split (alpha order).** Maps samples across the keyboard in alphabetical order, repeating the sequence from the beginning if there are more regions than samples. The samples are presumed to be unpitched, so pitch tracking is turned off in the newly mapped splits. **Map to new split (by pitch or alpha order).** These options are like the previous two, except that a new split is created in every selected region to receive the new mappings. The split is created in the position where you clicked the mouse. **Stack on single region.** This option is unique in that it affects only the single region which has the current focus (highlighted in orange). The number of splits in this region is changed to match the number of samples you are dropping, and then each sample is mapped to one of the splits. The order of the mapping is determined by the "Wave drop" option in the Preferences.

The Dimension Controller dialog

Click on the header bar at the top of the Velocity window to open the Dimension Controller dialog. This is where you define the properties of a dimension.



Control source. Specifies the controller that will determine which split in this dimension is sounding at any given moment. (Remember that the large dimension window is dedicated to velocity, so if you change this from Velocity to some other controller, the dimension will move to one of the smaller dimension windows.)

Description. A description of the musical or sonic purpose of the dimension.

Sample space in use. A rough visual indication of the amount of dimension resources available. The meter fills up as you use more dimensions and splits.

Add. Press this button to add a split to the dimension. To add more than one split with a single click, increase the value in the numeric field to the right of the Add button. Splits added in this way are "empty", with no sample mapped and a default articulation.

Split. Divides each selected split into two identical splits. Only those splits selected in the list are affected (click with the SHIFT or CTRL keys to select multiple splits). The new splits inherit the sample mappings and articulations of their "parents."

Delete. Deletes any split selected in the list (click with the SHIFT or CTRL keys to select multiple splits).

Rename. Select a Split and click the Rename button to enter a new name. It is very important to label the various splits and descriptions to keep everything organized and intelligible. These names show up in the Velocity Window header bar when different splits are selected.

Up, Down. Use these buttons to change the order of splits within a dimension.

The Velocity Context Menu

Right click in the Velocity dimension window to bring up the context menu.

Copy articulation

Copies all of the articulation parameters of the selected split to the clipboard, so that you can paste them into another region or split.

Paste articulation

Pastes a previously copied articulation into the selected split.

Save articulation as macro

Saves all of the articulation parameters of the selected split as a macro, which can be applied at a later time to other splits, regions, or even entire instruments. See the chapter on Macros for details.

Apply macro

Applies any available macro to the selected split. See the chapter on Macros for details.

Map to null sample

Clears any sample mapping from the selected split (the split will be silent).

Show envelopes

This menu option displays a check mark when enabled: click the menu command to turn the option on or off. When enabled, a small graphical display is added to each cell of the velocity window showing some aspect of that split's articulation. The display depends on which parameter is selected in the Parameter List. For example, if any parameter related to the amplitude envelope is selected, then the amplitude envelope will be drawn.

Not every parameter has an associated graphic. Also note that when this option is in effect, the velocity cells are forced to a uniform height. This makes the envelope display more intelligible but may mean that velocity splits are not displayed at their true positions.

Force to mono (stereo)

Forces the region to be either mono or stereo. Since mono and stereo samples cannot be mixed within a region, if any incompatible samples are currently mapped to the region, they will be unmapped.

Delete split

Deletes the selected split.

Tall velocity window

Toggles the velocity window between its normal position and a special "tall" configuration that is useful with large numbers of velocity splits.

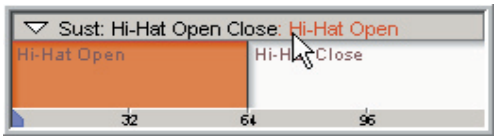
Additional Dimension Windows

As we've seen, the large dimension window to the left of the others is dedicated to velocity. Additional dimensions can be created in any of the smaller horizontal dimension windows. Eight of these windows are available, but you can select a display mode that hides some of the windows if you don't need them all.

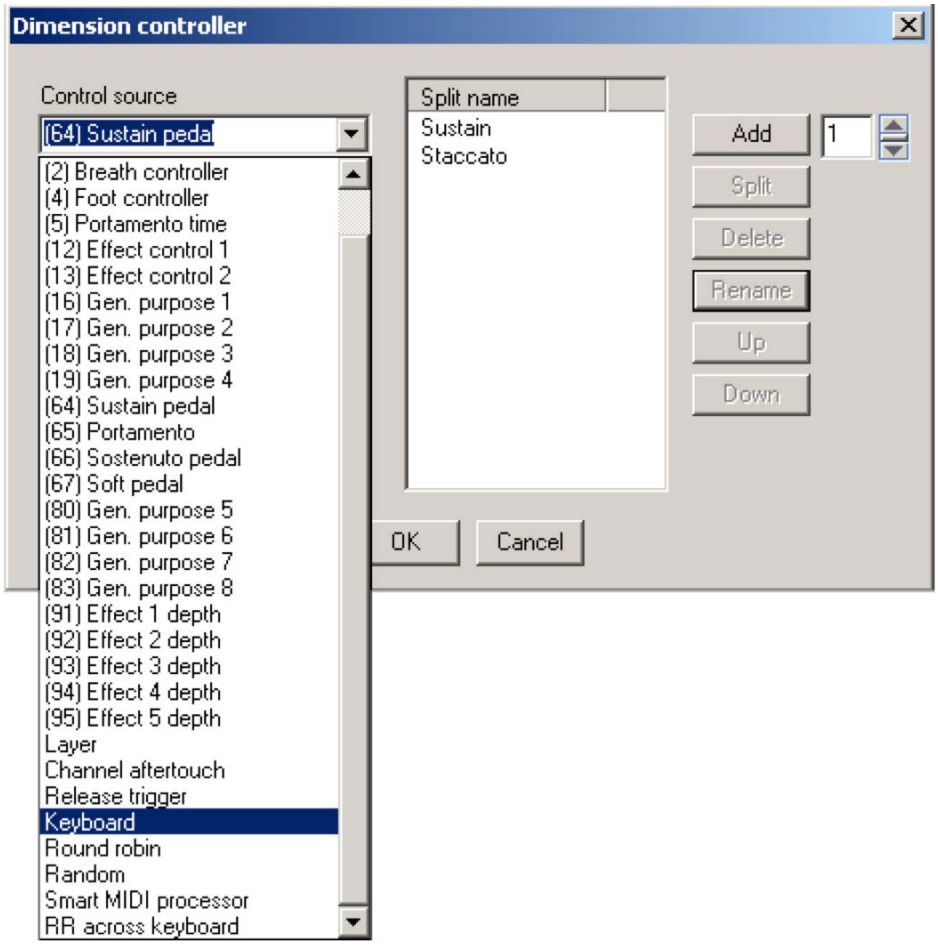
Click the Dimension View button  near the bottom of the Editor window to cycle through the available modes.

The Dimension Controller dialog again

To activate, deactivate, or modify a dimension, click the header bar at the top of a dimension window.



This brings up the Dimension Controller dialog, which we've seen previously in the section on the Velocity Window. Here we'll just note that a long list of controllers other than velocity is available. Apart from that, the dialog works just as it does when launched from the Velocity Window.



Dimension Controllers

Every dimension has a control source which helps determine which sample will play back at any given moment. The available control sources are:

Velocity. This is the traditional "velocity switch", typically using the velocity with which the key is struck to select among samples recorded at various dynamic levels.

MIDI continuous controllers. When a traditional MIDI controller is assigned to a dimension, the value of that controller at note-on determines which split will sound. Examples include using the mod wheel to switch between closed and open hi-hats, or using the sustain pedal to switch between piano samples recorded with and without sustain.

Layer. The Layer dimension is unique in that all of its splits sound simultaneously, instead of just one. Layers are sometimes used in conjunction with MIDI volume control and/or crossfades, to give continuous control over the volume of each layer.

Release trigger. This special type of dimension typically has two splits and is used with sounds that have been divided into separate sustain and release samples. When a note on is received the first split is always played. The sample mapped to the second split is played at note *off*.

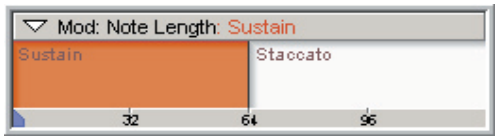
Keyboard. Keyboard (also called keyswitch) control allows changing from one split to another by striking otherwise unused notes on the MIDI keyboard. This is often used for orchestral instruments that have a large number of articulations, when it would be difficult to switch accurately using a wheel or pedal type controller. The area of the keyboard used for switching is defined in the Instrument Properties dialog.

Round Robin, Random. These dimensions switch samples automatically each time you play a note. Round Robin progresses through the splits in order, while Random triggers the splits randomly.

Round Robin across keyboard. This variant of the Round Robin dimension advances to the next split when a key is struck in any region. (The basic Round Robin dimension described above advances only when a key is struck in its own region.) In the case where the number of splits in this dimension varies across the keyboard, the new rule uses a modulo addressing technique.

Smart MIDI processor. This special dimension is used in conjunction with iMIDI rules such as the Pattern Alternator, Repetition Mode, and Legato Mode. Logic in the iMIDI rule will determine which split plays at any given time.

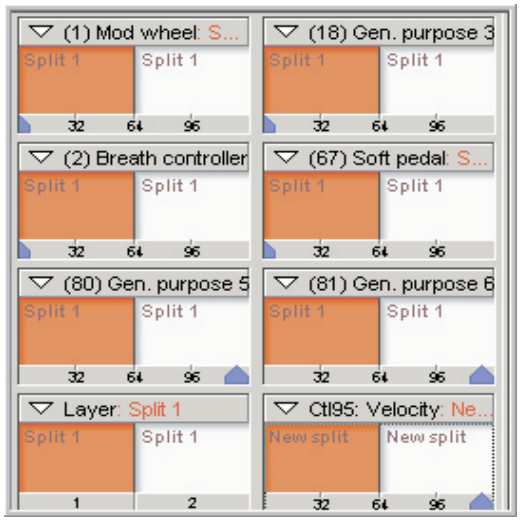
Dimension Split Examples



A two-way mod wheel split.

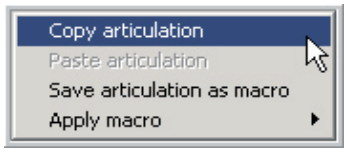
A two-way sustain pedal split.

A four-way keyboard switch split. Playing keys in the keyswitch region will select among the different articulations.



A complex instrument using eight dimensions at once. Since each dimension has two splits, any of 256 different samples may be triggered (2 x 2 x 2 x 2 x 2 x 2 x 2 x 2).

The Dimension Context Menu



Right-click on an active dimension window to bring up the context menu.

Copy articulation

Copies all of the articulation parameters of the selected split to the clipboard, so that you can paste them into another region or split.

Paste articulation

Pastes a previously copied articulation into the selected split.

Save articulation as macro

Saves all of the articulation parameters of the selected split as a macro, which can be applied at a later time to other splits, regions, or even entire instruments. See the chapter on Macros for details.

Apply macro

Applies any available macro to the selected split. See the chapter on Macros for details.

Selection lock buttons

Below the dimension windows is a row of buttons that help control which regions and splits are currently selected for editing. These buttons will be extremely helpful as you proceed to edit articulation parameters in the next section.

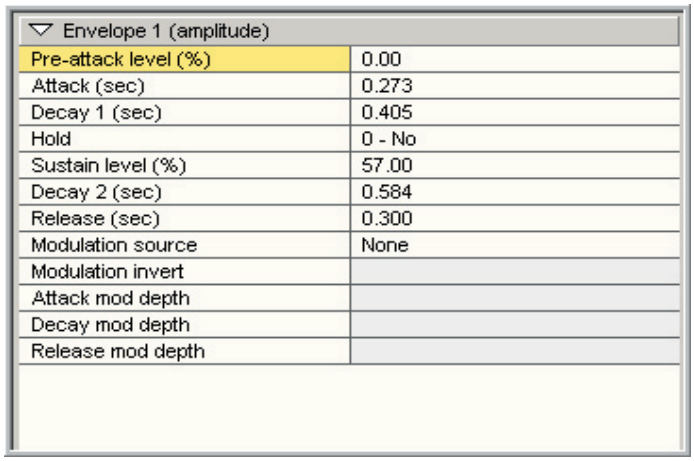
To understand why the region and split selection is important, consider the example of a piano sampled with 88 regions and 10 velocity splits, with an additional dimension dedicated to the sustain pedal. By Giga standards this is a very simple instrument, but it still contains a total of 1760 splits (88 * 10 * 2), and each of these splits has its own set of envelopes, filters, and all the other parameters that make up a Giga articulation. At times, you will want to apply an edit to all 1760 articulations at once; at other times, you will want to single out just one. And frequently you'll want to do something in between: for example, modify the release time for all the splits in the second and third velocity layers, including the pedal-up splits but not the pedal-down ones. You can achieve any of these combinations by highlighting (in orange or yellow) the regions and splits you want to select.

Now back to the selection lock buttons. If you know you'll be making broad edits to your instrument, rather than zeroing in on individual splits, the lock buttons can provide a safety net that relieves you of the need to pay constant attention to the selection state. When the **All Regions** lock is turned on (sticking with our piano example), your edits will always be applied to all 88 keys. When the **All Splits** lock is on, edits will always be applied to every velocity and pedal state. And if both locks are on, you can forget the selection process entirely because every edit will be applied across the entire instrument.

Note that the **All Regions** button stands by itself and is simply either off or on. The **All Splits** button belongs to a group of four, one of which is always highlighted. The reason for this is that in a Giga instrument, not only does every split have its own articulation, but stereo splits actually have separate articulations for the left and right channels. While it's common to perform edits on individual splits, it's fairly unusual to edit just one side of a stereo sample. The **L+R** mode allows you to edit at the individual split level, while ensuring you will never inadvertently apply an edit to just one side of a stereo split. If you do want to make a one-sided edit, the **Left** and **Right** buttons are there when you need them.

The Articulation Window

Each split in a Giga instrument has its own articulation - a set of over 100 parameters that define envelopes, LFOs, filters, and the like. The parameters appear in the lower right portion of the Editor, grouped into categories for easier access. To choose a category, click on the header bar at the top of the list. Parameter values can be edited directly in the list. Depending on the type of value you click on, the list will either allow you to type in a new value, or display a menu with options to choose from.



A small part of a Giga articulation. This shows the parameters that define the amplitude envelope.

Remember that a complex instrument can contain many thousands of unique articulations, but the parameter list can only display one articulation at a time. To understand which split's articulation is currently being displayed, look at the region and dimension windows, each of which will have a single cell highlighted in orange. The split at the intersection of all those orange highlights is the one you're viewing. (If there are additional splits selected in yellow, their parameters may be set to different values from those of the orange split. When this happens, the parameter value is displayed in red.)

When you change a value in the parameter list, the new value is applied to the single region/split designated in orange, *and also to any other regions/splits selected in yellow*. This is a very powerful feature, but it means that whenever you edit a value, you need to be conscious of which regions and splits are selected. The **Selection Lock** buttons (see the previous section) can simplify things here.

The next chapter describes each articulation parameter in detail.

Chapter 8: Articulation Parameters Reference

In the sections that follow, we'll describe the articulation parameters one category at a time.

Amplitude and Filter Envelope Settings

Envelope 1 (amplitude)	
Pre-attack level (%)	0.00
Attack (sec)	0.273
Decay 1 (sec)	0.405
Hold	0 - No
Sustain level (%)	57.00
Decay 2 (sec)	0.584
Release (sec)	0.300
Modulation source	None
Modulation invert	
Attack mod depth	
Decay mod depth	
Release mod depth	

Envelope 2 (filter)	
Pre-attack level (%)	0.00
Attack (sec)	0.000
Decay 1 (sec)	0.005
Sustain level (%)	100.00
Decay 2 (sec)	Infinite
Release (sec)	2.000
Modulation source	None
Modulation invert	
Attack mod depth	
Decay mod depth	
Release mod depth	

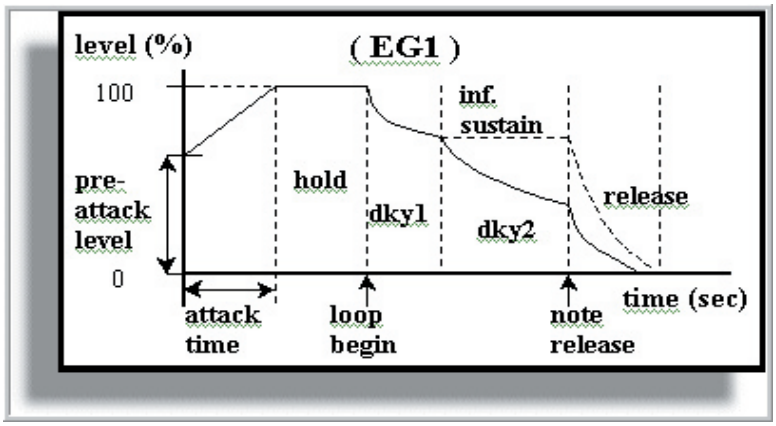
Envelope 1 (amplitude) affects the Volume of playback over time.

Envelope 2 (filter) affects the Filter over time.

The GigaStudio offers the following envelope parameters for the amplitude and filter envelopes:

- Pre-attack level (%)
- Attack Time (sec)
- Decay 1 Time (sec)
- Hold: (Yes/No) (amplitude envelope only)
- Sustain level (%)
- Decay 2 Time (sec) / Infinite
- Release Time (sec)

All of these parameters can be adjusted from the Parameters Window and also by dragging the parameter indicators in the Region Window. Most but not all of them are also viewable and adjustable in the Waveform Window.



An envelope, in its simplest terms, is a representation of a sound's dynamic properties as they change over time. All acoustic sounds have their associated envelopes. The three primary aspects of any given sound that can be quantified in terms that can be manipulated by way of an envelope are amplitude (volume), frequency (pitch), and harmonic content (timbre or filter).

The following explanations of the Envelope Parameters apply to both the Amplitude and the Filter Envelope settings with one exception: the Filter Envelope does not have a Hold setting.

Pre-attack level (%)

The Pre-attack level is adjusted as a percentage of full amplitude (0 to 100). It is the very first point on the ADSR envelope and sets the initial volume level of the attack.

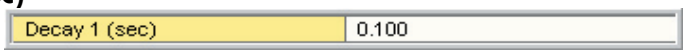
For example, a Pre-attack level of 50.00 sets the beginning of the attack envelope to half the potential volume of the sample. This allows for a sample to begin at any level from silent to full volume.

Attack time (sec)

The attack time is measured in seconds (0.000-10.000).

This parameter sets the amount of time that it takes for the attack to reach its full volume. For most instruments, this time will range from zero to at most a half second for a natural sounding instrument. However extreme settings can be used for special effects to put a slow volume ramp up for each triggered note.

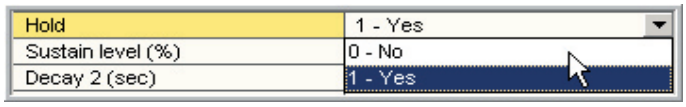
Decay 1 Time (sec)



The Decay 1 Time is measured in seconds (0.000-60.000).

This parameter sets the amount of time for the first decay of the envelope. It decays from the peak level of the attack down to the sustain level.

Hold



If a sample has a loop point, the Hold function will prevent the first decay (Decay 1) from happening until the sample has played through its entire loop one time.

This is handy for natural decaying instruments like Piano or Guitar that have small looped samples. When Hold is set to "Yes" the sample will hold its volume until it plays through the loop. Once it has played through the loop, it will then start the first decay down to the sustain level. This can make for a more realistic envelope for short looped samples. It gives them a little more of a natural personality despite the artificial looping.

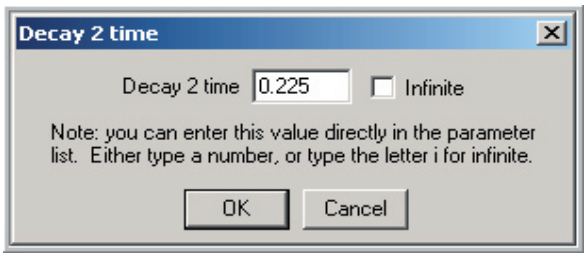
Note: Hold is available on the Amplitude Envelope but not the Filter Envelope.

Sustain level (%)

The Sustain level is adjusted as a percentage of full amplitude (0 to 100).

After the first decay dies down, the sample audio will sustain for a period of time depending on the Decay 2 settings. This setting determines the volume level of this sustaining portion.

Decay 2 Time (sec)



The Decay 2 Time is measured in seconds (0.000-60.000) or is set to "Infinite" which overrides the time setting.

This parameter determines how long the Sustain section of the envelope will last. A Decay 2 Time will cause the sample level to sustain for that amount of time and then go into the release, even without letting go of the note. Checking the "Infinite" check box will cause the sample level to sustain indefinitely until you release the note.

Release time (sec)

The Release Time is measured in seconds (0.000-60.000).

This parameter determines how long it will take for the sample volume to ramp down depending on how Decay 2 is set.

If the Decay 2 is set to "Infinite", the release will kick in when the note is released.

If the Decay 2 is set to a specific amount of time, then the release will kick in after that amount of time or when you release the note, whichever comes first.

Envelope Modulation Settings

The Modulation settings allow real-time MIDI control of the Attack, Decay and Release of the Amplitude and Filter Envelopes.

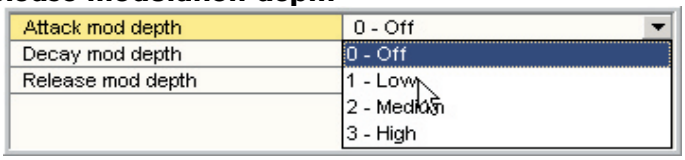
Modulation source

Choose the MIDI controller to use from the list of standard MIDI controllers.

Modulation invert

Reverses the action of the MIDI controller when set to "Yes".

Attack/Decay/Release modulation depth



The response of these individual parameters is set here.

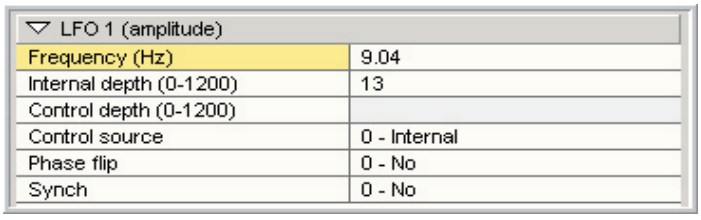
- Off. No response to the MIDI control source.
- Low. Very light response to the MIDI control source.
- Medium. Medium response to the MIDI control source.
- High. More drastic response to the MIDI control source.

This allows the MIDI controller to affect only one, two or all three parameters at once and with varying intensities for each.

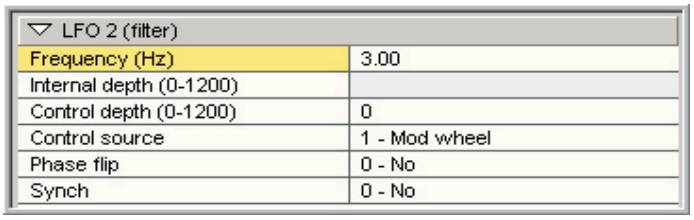
The effect will depend on the actual envelope settings. For example, if the Attack time in the envelope is set to zero, you will not hear any effect of the Mod controller. Once you enter a parameter higher than zero, this controller will then start working. Smaller Attack time settings will result in very light changes with the Mod controller. Larger settings will result in more drastic changes with the Mod controller. This also applies to the Decay and Release settings. A little experimentation will be needed to learn how this works and figure out the settings you need.

Amplitude/Filter/Pitch Low Frequency Oscillators (LFOs)

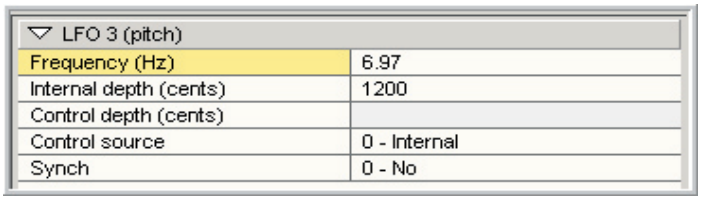
Amplitude LFO



Filter LFO



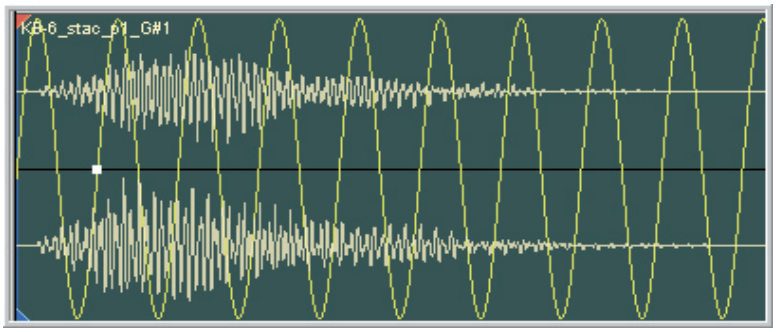
Pitch LFO



Low frequency oscillators are used to control various parameters cyclically, so that continuously repeating changes over time can be automated. For example, applying an LFO to pitch creates the effect known as vibrato. Applying an LFO to amplitude creates a cyclical change in volume known as tremolo. More exotic effects can be created by applying LFOs to filter parameters, for creating repeating changes in harmonic content such as “wah-wah” effects.

GigaStudio includes three discrete LFOs for Amplitude, Filter, and Pitch. The following explanations apply to all three of these with one exception: the Pitch LFO does not have a “Flip Phase” switch.

LFO frequency (Hz)



The Frequency may have any value between 0.1 and 10 Hz and sets the rate at which the LFO oscillates.

Internal depth

Use the internal depth to apply a fixed LFO depth.

- Amp LFO +/- 1200 Volume Oscillation
- Filter LFO +/- 1200 Filter Resonance
- Pitch LFO +/- 1200 Pitch in Cents

Control depth

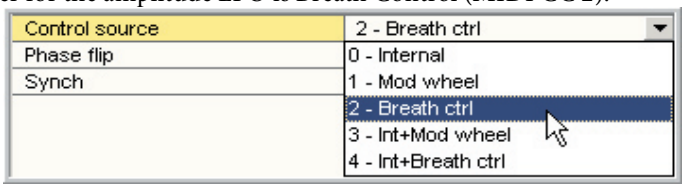
An external continuous controller, such as the Mod Wheel can also be used to apply the LFO settings. This setting works the same way as the Internal depth settings but you won't hear its effect until the assigned MIDI controller is moved forward.

- Amp LFO +/- 1200 Volume Oscillation
- Filter LFO +/- 1200 Filter Resonance
- Pitch LFO +/- 1200 Pitch in Cents

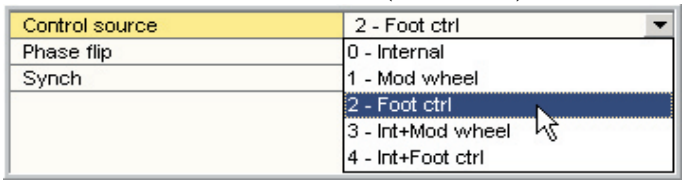
Control source

Selects the modulation source for the LFO depth. The choices include internal (fixed) control, Mod Wheel, and an alternate MIDI controller which is different for each type of LFO. Combinations of internal and MIDI control are also possible.

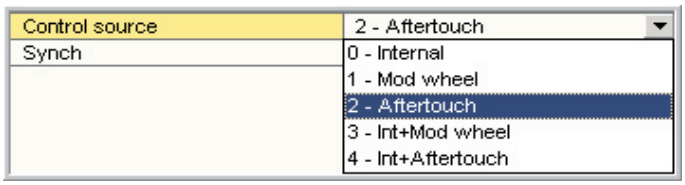
The alternate controller for the amplitude LFO is Breath Control (MIDI CC 2):



The alternate controller for the filter LFO is Foot Control (MIDI CC 4):



The alternate controller for the pitch LFO is Aftertouch:

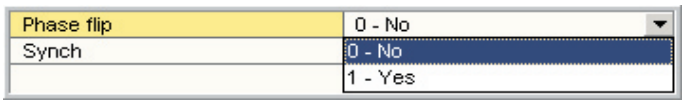


When “Internal” is selected, the LFO depth is fixed at the value specified by the “Internal depth” parameter (above).

When Mod Wheel or the alternate controller is selected, the LFO depth varies according to MIDI control between zero and the value specified by the “External depth” parameter (above).

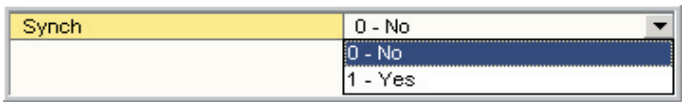
When one of the combined options is selected, the LFO depth is the sum of the internal and the modulated external depths.

Flip phase



Inverts the polarity of the amplitude or filter LFOs. This is not available for the pitch LFO.

Synch

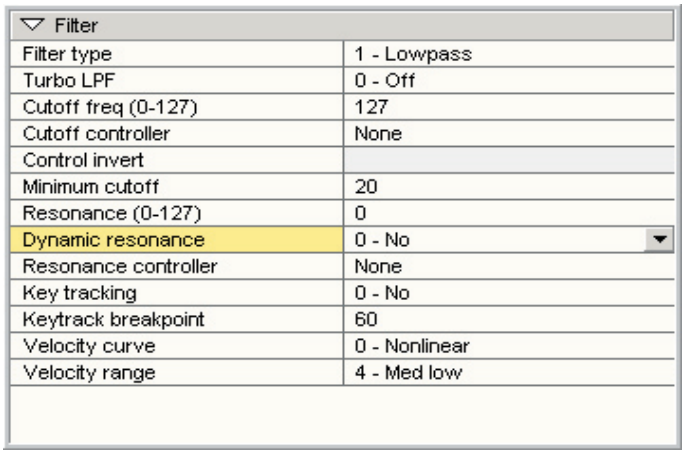


Enables a single synchronized LFO. The LFO will be constant no matter what note is played or when it is struck.

When Synch is not enabled, an LFO begins at the point in time when each note is played. When several notes are sounding, each will have its own cycle that is potentially out of synch with the others.

When Synch is enabled, the LFO cycle will stay in synch for all the notes no matter when they are triggered.

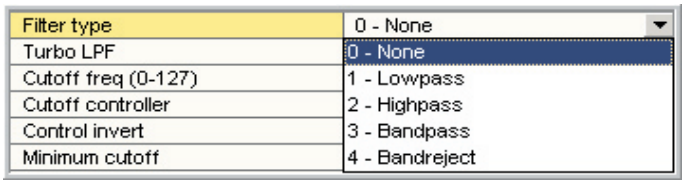
Filter Settings



Filters shape the timbre of a sound by altering (filtering) the amplitude of specific frequency ranges. This can be used to make an instrument's character warm, dull, bright, or thin depending on the type of filter and its settings.

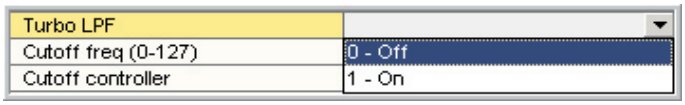
Filters can be used creatively by assigning real-time continuous controllers to various aspects of their envelopes, cutoff frequencies, and resonance thereby allowing for creation of more synthetic textures with electronic characteristics.

Filter type



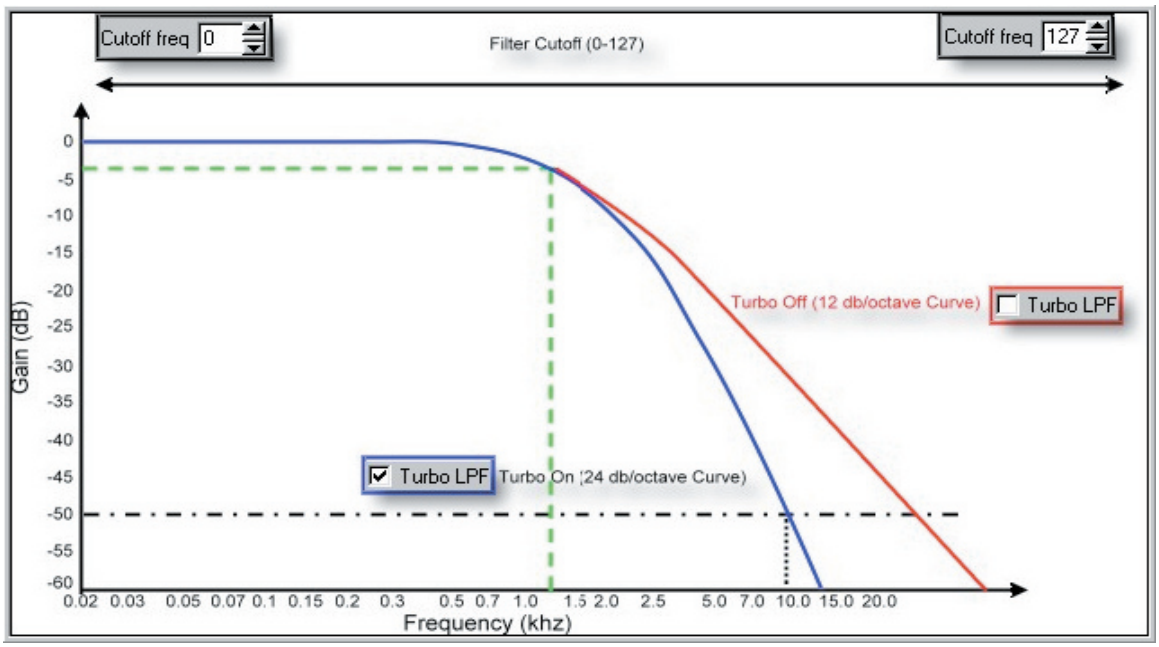
- 0 – None. The filter is bypassed.
- 1 – Lowpass. Filters out high frequencies.
- 2 – Highpass. Filters out low frequencies.
- 3 – Bandpass. Filters both high and low frequencies.
- 4 – Bandreject. Filters out middle frequencies.

Turbo LPF



Adds additional poles of attenuation to the lowpass filter algorithm, creating a more intense analog filter effect. This option is only available when the Filter type parameter is set to "Lowpass."

When used with certain resonance settings, Turbo LPF can generate high amplitude resonant frequency oscillations. Proceed with caution when editing at loud volumes. This could be damaging to your speakers.



Cutoff frequency

Cutoff freq (0-127)	73

This sets the maximum filter cutoff frequency. The range is 0-127.

This parameter is only available if the Cutoff Controller is set to “None”.

Cutoff controller

Cutoff controller	(1) Mod wheel
Control invert	None
Minimum cutoff	(1) Mod wheel
Resonance (0-127)	(2) Breath controller
Dynamic resonance	(4) Foot controller
Resonance controller	(12) Effect control 1
Key tracking	(13) Effect control 2
Keytrack breakpoint	(64) Sustain pedal

Instead of setting a fixed cutoff frequency, this parameter allows you to assign a MIDI controller to the Cutoff Frequency for real-time continuous control. This overrides the Cutoff Frequency setting, which will be disabled once you assign a MIDI controller here.

Control invert

Control invert	1 - Yes
Minimum cutoff	0 - No
Resonance (0-127)	1 - Yes

When set to “Yes”, inverts the response of the Cutoff controller.

Minimum cutoff

Minimum cutoff	20

Places a limit on the lowest filter cutoff frequency when using MIDI cutoff controller. The low range of the MIDI controller will start with this value.

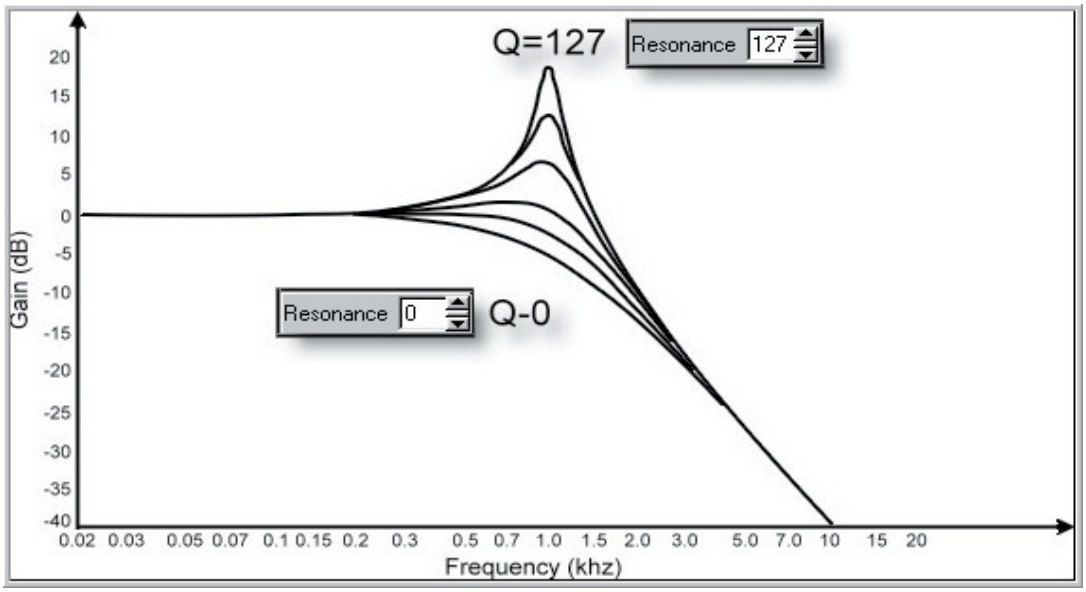
Range is 0-127.

Resonance

Resonance (0-127)	70

Resonance ("Q") creates a peak in amplitude at the specific cutoff frequency, and is used to generate classic analog synth textures. The maximum resonance is set close to the point of self-oscillation, and will resonate according to the frequency content of the waveform that is being filtered.

Range is 0-127.



Dynamic resonance

Dynamic resonance	1 - Yes
Resonance controller	0 - No
Key tracking	1 - Yes

A setting of "Yes" increases the overall resonance by dynamically scaling the Q (in addition to the cutoff frequency of the filter) in accordance with changes of envelope and/or external control.

Resonance controller

Resonance controller	(18) Gen. purpose 3
Key tracking	None
Keytrack breakpoint	(18) Gen. purpose 3
Velocity curve	(19) Gen. purpose 4
Velocity range	(80) Gen. purpose 5
	(81) Gen. purpose 6

Assigns a real-time MIDI controller to Resonance.

Key tracking

Key tracking	1 - Yes
Keytrack breakpoint	0 - No
Velocity curve	1 - Yes

When set to "Yes", scales the cutoff frequency based on key position relative to the assigned Breakpoint value (see next item).

Keytrack breakpoint

Keytrack breakpoint	60

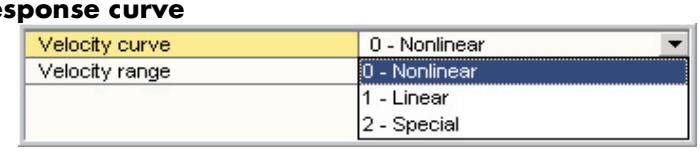
Adjust this value to set the breakpoint for the filter keyboard tracking.

The range is 0-127, with a default value of 60 (middle C).

Velocity scale

This value is used to scale the currently selected velocity curve in order to specify a much larger number of filter velocity responses. For example, if you want the filter to scale from a low cutoff to fully open within the lowest velocity range, the filter response can be scaled to open more quickly by entering values above 20 (up to 127). Values below 20 will cause the filter to open more slowly over velocity yielding a darker response. The range is 0-127 with a default value of 20. This parameter is only available when the Cutoff Controller is set to "None".

Filter velocity response curve

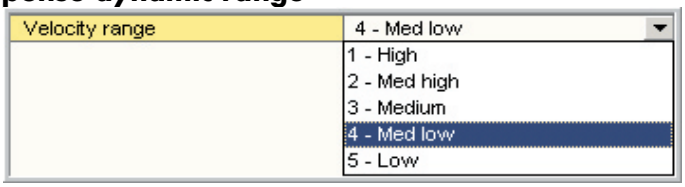


Defines how the filter responds to note-on velocity.

- 0 - Non linear
- 1 - Linear
- 2 - Special

These settings work in conjunction with the *Velocity dynamic range* parameter (see the next item).

Filter velocity response dynamic range

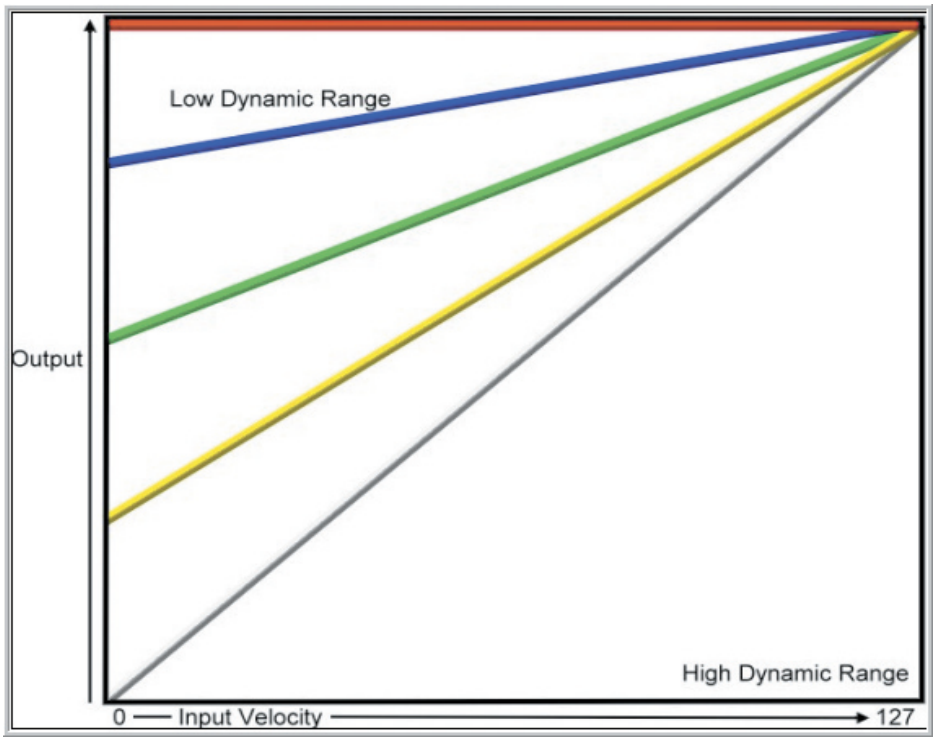


With this setting, you can lower or raise the dynamic range of the velocity response of the filter. There are five response positions:

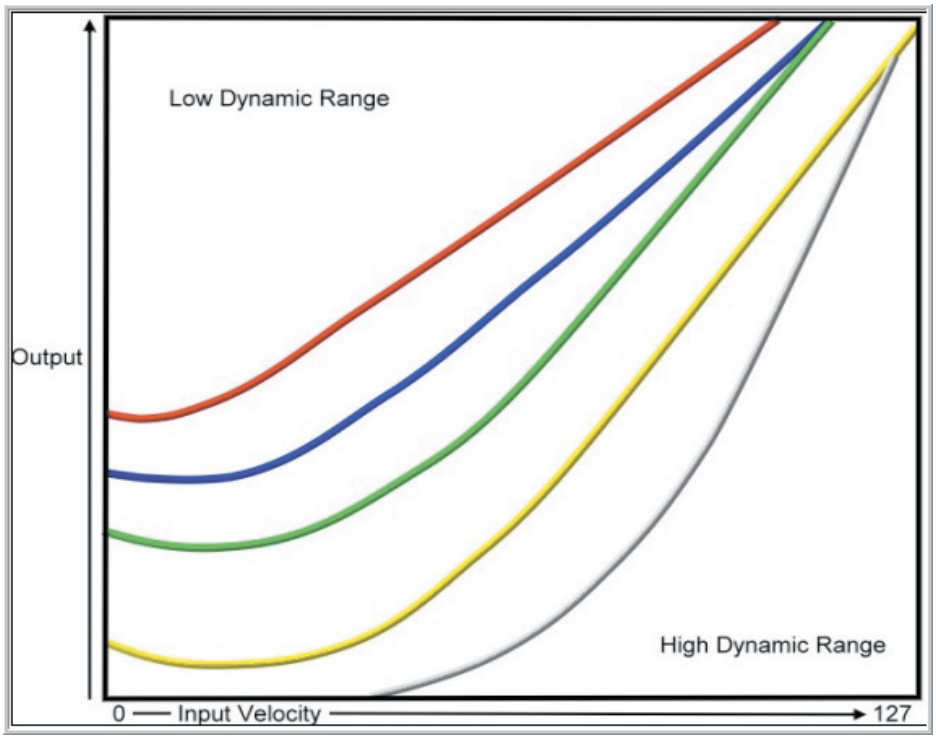
- 1 - High
- 2 - Medium high
- 3 - Medium
- 4 - Medium low
- 5 - Low

This setting works in conjunction with the *Velocity curve* parameter (above) as shown in the following diagrams:

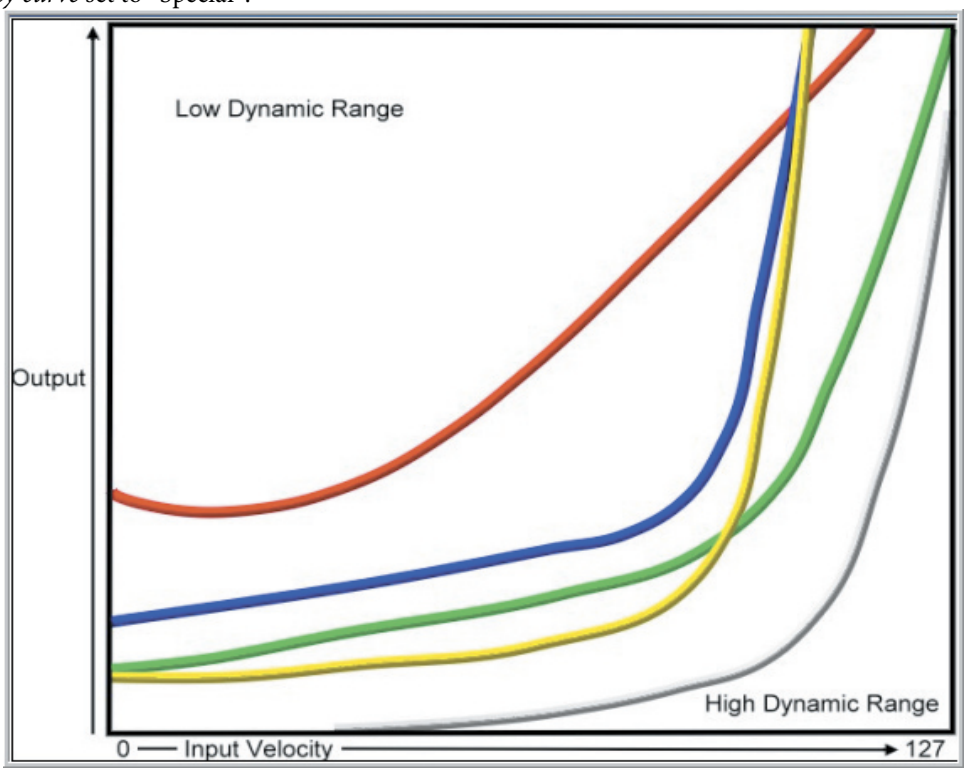
Velocity curve set to “Linear”:



Velocity curve set to “Non-linear”:



Velocity curve set to “Special”:



Response Settings

Response	
Velocity split point	85
Velocity curve	0 - Nonlinear
Velocity curve range	4 - Med low
Velocity curve scaling	0
Release curve	1 - Linear
Release curve range	4 - Med low
Release trigger decay	8 - Slowest

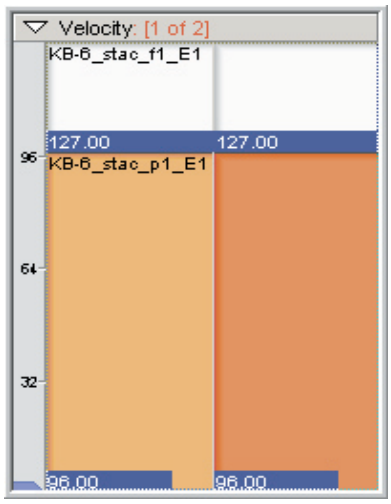
In the Filter section above we described the Filter velocity response curves, which define how the filter responds to changes in MIDI velocity.

The next section is concerned not with the filter, but with the way simple volume responds to keyboard velocity. Use these parameters to adjust the instrument to suit your playing style and the “feel” of your MIDI keyboard.

Velocity split point

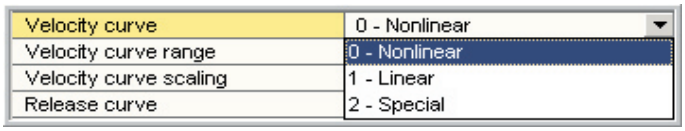
Velocity split point	96

The maximum velocity for which this split will sound.



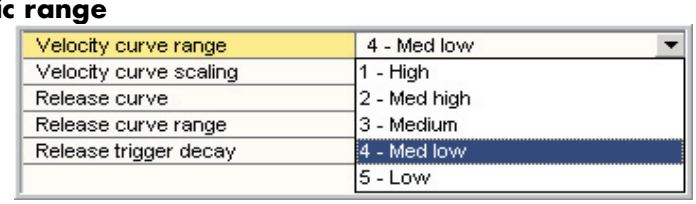
The velocity split point is also visible in the velocity dimension window. Modifying the velocity ranges is one way to adjust the feel of the instrument.

Velocity response curve



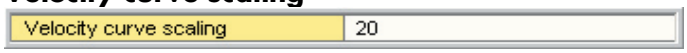
Together with the Velocity curve range, defines the amplitude velocity response. The curves are the same as those shown in the previous section for the filter resposne.

Velocity dynamic range



Together with the Velocity response curve, defines the amplitude velocity response. The curves are the same as those shown in the previous section for the filter response.

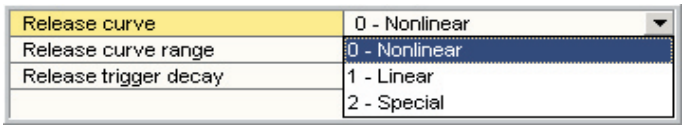
Velocity curve scaling



Works in conjunction with the five Dynamic Range settings to give even finer control over velocity response. Find a Dynamic Range setting that works best, and then use this parameter to fine tune the feel.

Range is 0-127.

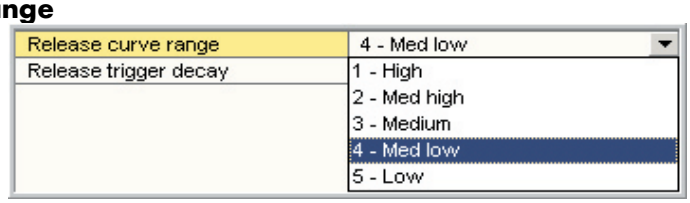
Release response curve



The Release Velocity settings affect the release note decay time based on the Note On velocity. This is more noticeable with longer Amplitude Envelope release times. This feature allows you set longer or shorter release times depending on how hard you hit the note.

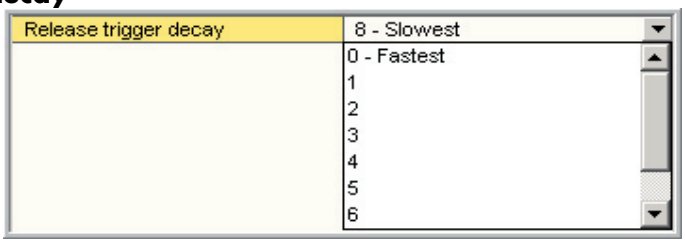
Refer to the previous section for diagrams of the response curves.

Release curve range



Works in conjunction with the *Release response curve*, above. Refer to the previous section for diagrams of the response curves.

Release trigger decay

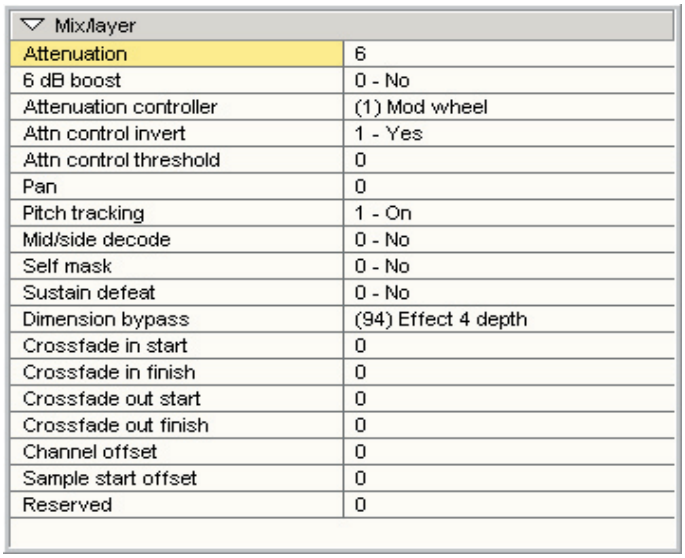


This parameter determines the rate of attenuation for the amplitude of an existing release- triggered sample.

When you are using a Release Trigger dimension, you can control the volume of its playback depending on how long you hold the note. With slower settings, you can hold the note down longer and still get the release trigger sample to play fairly loud. With faster settings, the release trigger will be quiet or even silent unless you let up on the note quickly.

The range is 0 (fastest) to 9 (slowest).

Mix/Layer Settings



This section includes attenuation and crossfade layering settings, and several important miscellaneous parameters.

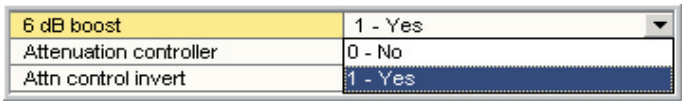
Attenuation

Attenuation is measured in decibels (dB). This parameter is always a positive number, with higher values indicating decreasing output levels.

This field is unavailable when the Attenuation controller is selected. You can use an external controller alongside an attenuation setting but the attenuation needs to be set first before selecting an attenuation controller. If the attenuation controller is already selected, it needs to be reset temporarily to "none" to access the attenuation setting for adjustment.

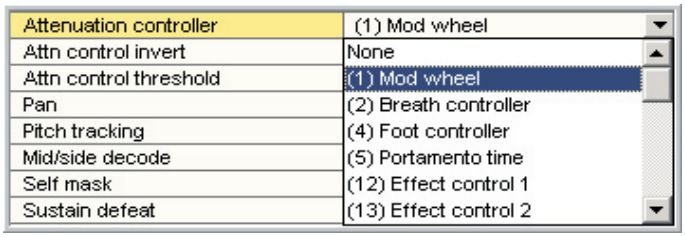
Range is 0 to 96 dB, where zero is full volume.

6 dB boost



A 6 dB increase is available if needed to boost individual samples.

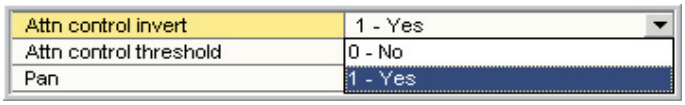
Attenuation controller



Assigns a MIDI continuous controller for real-time attenuation control.

By assigning the same attenuation controller to groups of related notes or samples, a MIDI controlled sub mix capability can be designed into the instrument so that individual sounds can have discrete MIDI volume control.

Attenuation control invert

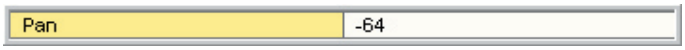


Reverses the response to the Attenuation Controller. This is crucial to creating a simple MIDI controller cross-fade layer. Both layers would be set to the same MIDI controller for attenuation but one would be inverted with this parameter. The result would be a cross-fade.

Attenuation control threshold

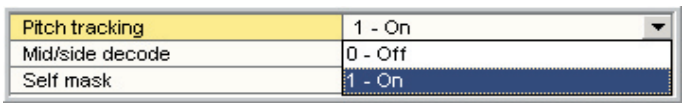
This parameter allows you to assign a minimum threshold to the Attenuation Controller. This is useful for volume crescendo/decrescendo and expressive dynamics. It's very similar to the threshold knob found on controller/volume pedals. For example, this allows a MIDI controller to set the volume from "full volume to soft" instead of "full volume to silent".

Pan



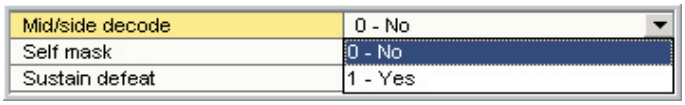
Sets the pan position by a value from -64 (hard left) to +63 (hard right).

Pitch track



This setting enables or disables the Pitch Tracking of samples across the keyboard. It is typically disabled for non-pitched samples such as drums, percussion, loop, and sound effects and enabled for melodic instruments. Pitch tracking will transpose the sample based on its unity note setting.

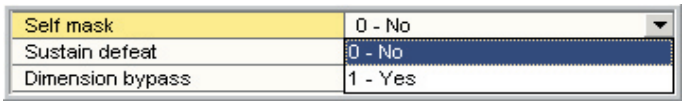
M/S decode



GigaStudio can decode Mid/Side encoded recordings using this checkbox.

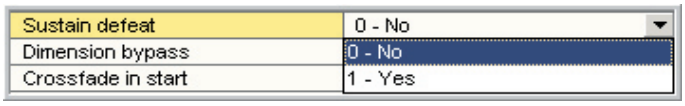
Mid/Side ("M/S") micing is a creative method of recording direct from the source with a cardioid-type microphone on one channel alongside a microphone with a "figure of 8" pattern to capture ambience. Since it is not a true right/left representation of the sound field it must first be decoded to a useable stereo signal. The direct or "Mid" channel recording is panned to the center of the stereo field while the ambient or "Side" channel recording is split to both left and right channels with the phase reversed on one of the channels. The Side level can then be adjusted by attenuation to dial in the preferred amount of "spread" in the stereo image.

Self mask



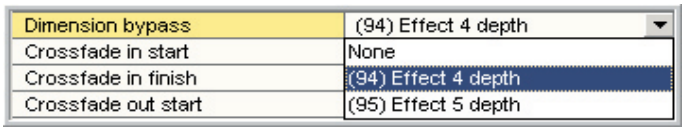
When checked, this causes high velocity notes to shut off lower velocity voices. This feature conserves polyphony and should be tried on all samples with percussive attacks and relatively slow releases (pianos, guitars, cymbals, etc).

Sustain defeat



This setting enables or disables the sustaining action of the sustain pedal. This allows the sustain pedal to be used simply as a dimension switch without sustaining the samples.

Dimension bypass

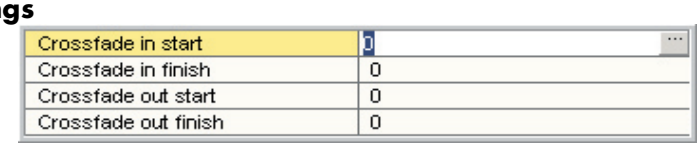


You can bypass the current dimension by assigning one of these two controllers:

- Effect 4 depth (CC 94)
- Effect 5 depth (CC 95)

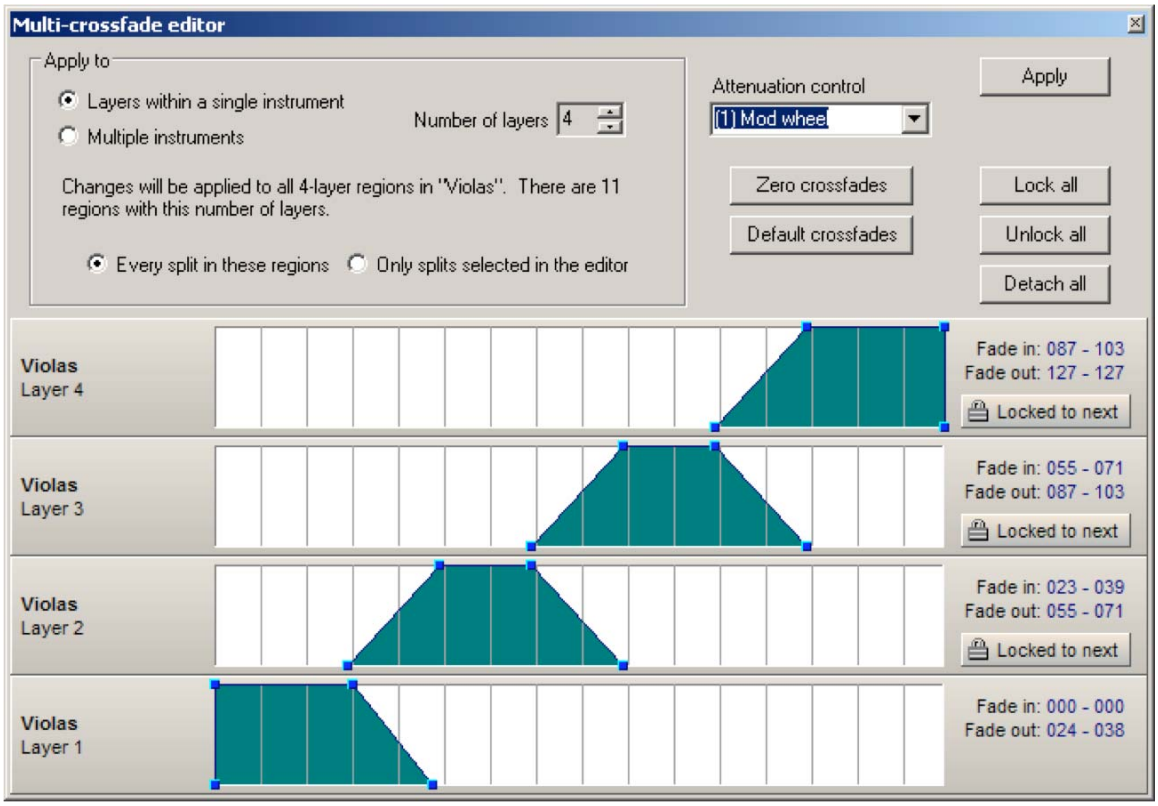
This allows you to turn a dimension on and off in real time using one of these MIDI controllers. This can be useful to override certain characteristics built into an instrument without having to actually edit the instrument.

Crossfade settings



These settings cause the sample to fade in and out at the specified values as the Attenuation Controller (see above) is swept across its range.

Because editing individual crossfade points is tedious and must usually be coordinated with the crossfades in adjacent layers, a graphical Crossfade Editor is provided. You can launch the Crossfade Editor (pictured below) by clicking the "..." button that appears in the parameter value box when any of the crossfade parameters is highlighted.



Channel offset

This setting determines which DSP mixer channel the sample will be routed to when the instrument is loaded in GigaStudio.

For example, when an instrument is assigned to inputs 1-2 in the mixer:

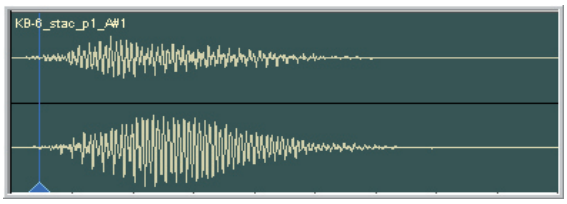
- Samples with an offset of 0 (the default) will be routed to channels 1-2
- Samples with an offset of 2 will be routed to channels 3-4
- Samples with an offset of 3 will be routed to channels 4-5
- Samples with an offset of 4 will be routed to channels 5-6
- Etc.

Sample start offset

The sample offset is used to start playback at a point after the beginning of the sample. The value is measured in samples and has maximum of 2000.

This is useful to soften the attack of a sample or if there is a pop at the beginning of a sample.

The Sample Start Offset is also viewable and adjustable in the Waveform View (the blue marker):



Sample Settings

Sample	
Unity note	A#1
Fine tuning	50
Loop start	75985
Loop end	75985
Loop length	1

This section allows you to override the unity note and fine tuning of individual samples.

There are some special considerations to be aware of when editing this part of the articulation:

- When you change a value in this section, only the single split which has the editing focus is modified. If additional regions or splits are selected (in yellow) they are *not* modified when you change these parameters, because the tuning and loop points appropriate to one sample are rarely appropriate for a different sample.

- Unlike other articulation parameters, these parameters are modified automatically when you map a sample to the region. The sample carries its own copy of these parameters (visible in the Sample properties dialog) and these values are copied to the articulation when the sample is mapped.

Unity note

Unity note	A#1

When Pitch Tracking is enabled, this is the note at which the sample will be played at its original or native pitch. (When Pitch Tracking is disabled, the Unity Note is ignored.)

Fine tuning (cents)

Fine tuning	50

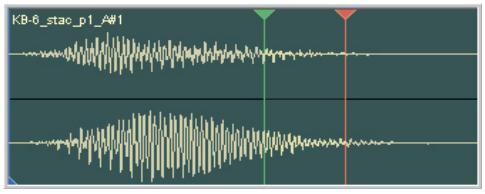
Adjusts the fine tuning of the sample. Expressed in cents with a range of +/- 50.

Loop start, end, length

Loop start	18677
Loop end	24591
Loop length	5915

These parameters set the loop points for the sample. Set them to zero (the default) for unlooped samples.

The loop points are also visible and adjustable in the Waveform View window. The green marker is the loop start and the red marker is the loop end.

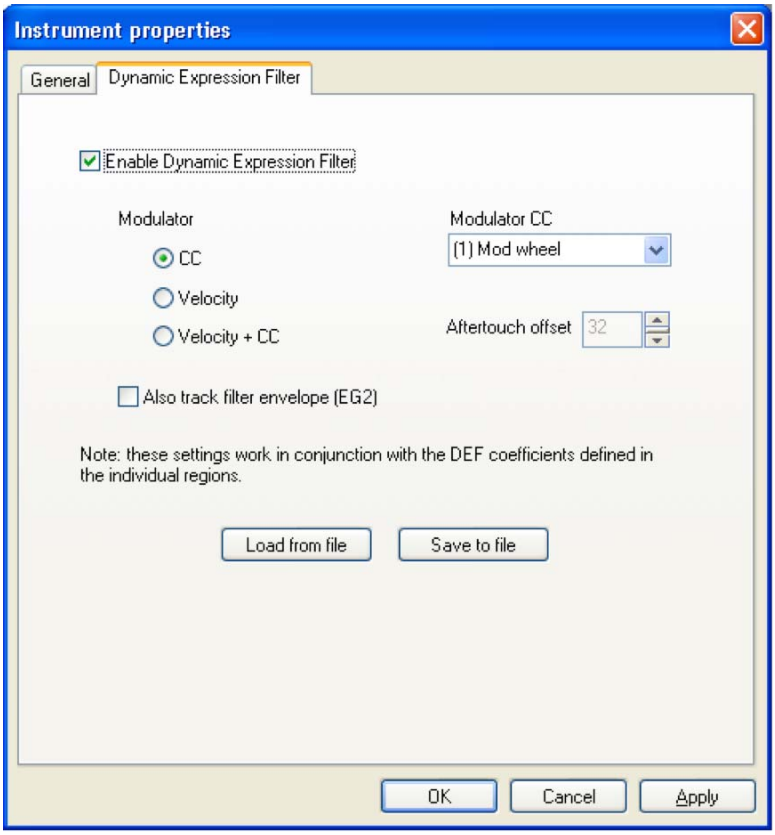


Dynamic Expression Filter (DEF)

The Dynamic Expression Filter (DEF) provides a phase corrected, 7th order, morphing filter for adding expressiveness before and after sustaining note-on events. This filter can accurately and continuously morph frequency responses of velocity dynamics even after note-on events have occurred. The filter is driven by either a standard midi continuous controller such as the Mod Wheel, note velocity, a filter envelope, or a combination of all three. The morphing response coefficients can be unique for each note region and sub-region, making it possible to create extremely detailed filter profiles. In other words, the DEF can make a sample sound as if it were played at different intensities, allowing for real-time crescendos and diminuendos of a sustaining note.

Note: the DEF works with 24-bit samples only

Some of the DEF settings, including enabling and disabling the filter, are defined globally for an instrument. These global DEF settings are found on the 'Dynamic Expression Filter' tab of the Instrument Properties dialog. To open the Instrument Properties dialog, right click on a loaded instrument in the Editor and select 'Properties'.



The Global DEF settings are listed below:

Enable Dynamic Expression Filter
This checkbox enables the filter. The effect may not be audible immediately depending on the settings of the filter coefficients in the region articulations (see *DEF Filter Coefficients* section below).

Modulator
Selects the modulation source for the filter, which may be the MIDI controller selected in the Modulator CC drop-down menu, velocity, or a combination of the two.

Modulator CC
Any MIDI continuous controller can be selected to control the DEF. First select the 'CC' checkbox in the Modulator section then select your desired controller from the drop-down menu located on the right-hand side of the dialog box.

Velocity (Spectral Interpolate Velocity)
Setting the modulator to velocity is also referred to as "Spectral Interpolate Velocity" or "SIV" mode. In this mode, the curve of the DEF filter is controlled by note-on velocity, creating a continuously variable velocity response. SIV mode can dramatically increase the dynamic range of a sample set or instrument, greatly improving, and in some cases eliminating, the typical "stair-step" sound of multi-sampled instruments.

Velocity + CC
By enabling both velocity and CC modulation control, the velocity response can be biased, brighter or darker for instance, by the specified continuous controller. This was added so that users or developers could create a knob for overall tone control of a DEF enabled instrument.

Also track filter envelope
It is possible to modulate the DEF with the EG2 (filter envelope). This is always in addition to the assigned controller for the DEF – the values of the EG2 envelope and MIDI controller are added together.

The normal multimode filters (Lowpass, Highpass, Bandpass, Bandreject) DO NOT have to be running for EG2 to modulate DEF. EG2 values below 50% are subtracted from the runing CC value, and EG2 values above 50% are added to the running CC value. The results of adding the EG2 and CC values is subject to saturation, so the effective value always stays within the standard range of the Continuous Controller.

Example: If the EG2 is at it's peak (100%) value, there is no upward CC modulation possible; If the CC value is increased it will not do anything under this 'saturated' situation. However, decreasing the CC Value in this situation will bring the saturated value back down.

Load from file
This option allows you to load a preset DEF configuration from a file. Several factory preset profiles are installed with GS4 and can be found in the following directory:

C:\Program Files\Common Files\TASCAM\Giga\profiles\Dynamic Expression

Note that DEF preset files store information from the region articulations as well as the instrument global part of the DEF definition.

Save to file
Saves a DEF configuration, including both the global definition and region-level coefficients, to an initialization file that you can then apply to other instruments.

Aftertouch Offset

With Aftertouch chosen as the DEF Modulator source, it is possible to offset the filter curve by a value between 0 and 64. When the minimum Aftertouch Offset value of 0 is used, the incoming aftertouch values utilize the full dynamic range of the DEF filter curves. When the maximum Aftertouch Offset value of 64 is used, the incoming aftertouch values are scaled to morph between only the moderate (mf) and loud (ff) filter curves.

DEF Filter Coefficients
The remainder of the DEF filter settings are stored on a sub-region basis in the articulation data found in the Editor's parameter list:

Dynamic Expression Filter	
Cutoff freq (pp)	127
Q (pp)	40
Q0H (pp)	88
V0 (pp)	64
Cutoff freq (mf)	127
Q (mf)	40
Q0H (mf)	88
V0 (mf)	64
Cutoff freq (f)	127
Q (f)	40
Q0H (f)	88
V0 (f)	64

The PRF and DEF filters were designed to address and emulate the characteristics of samples whose pitch and dynamics have been transposed. For this reason, this musically adapted filter does not behave like a traditional EQ; the settings of one parameter affect the next. Experimentation is encouraged. It might also be helpful to use a Frequency Analysis Plug-in at first to get a feel for each filter parameter.

Giga's morphing filters are composed of four independent parameters that affect the overall shape and volume of the filter: cutoff frequency, Q, Q0H, and V0. Each parameter has a range of 0 to 127. The first three parameters affect the timbre of the filter (frequency and Q) while the fourth parameter (V0) is used for volume compensation.

Cutoff Frequency (Fc)– Determines the initial center frequency for the Q0 Quality factor.

Q – Simultaneously determines gain, Quality (filter width) and a center frequency offset relative to the initial Fc setting.

Q0H – This high frequency quality factor has a fixed center frequency near 7.5 khz and is especially helpful in de-emphasizing the harsh overtones of upwardly transposed samples.

V0 – Initially designed to compensate for any gain attenuation imposed by the filter, V0 can also be used creatively to increase the dynamic range of an instrument, achieving softer pianissimos and bolder fortes.

DEF morphing capability:
There are three "sets" of the four parameters explained above for each of an instruments sub-regions. These three sets of filter parameters (pp, mf, and ff) were designed to correspond to the dynamic range of an instrument and represent the minimum, median, and maximum DEF settings as defined by the filter modulation sources:

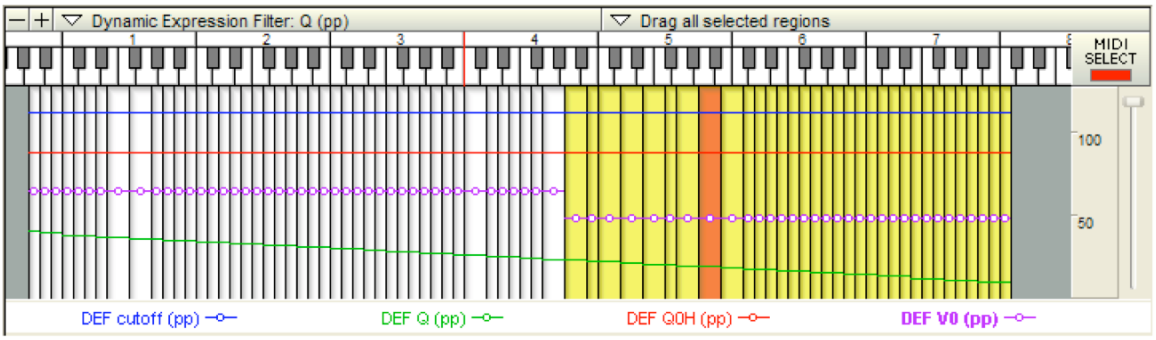
(pp) - quiet or pianissimo (minimum filter setting)

(mf) - moderate or mezzo forte (median filter setting)

(ff) - loud or forte (maximum filter setting)

When the filter modulator is at zero, the set of parameters labeled "pp" is used. The "mf" and "ff" parameters are used when the modulator is at its midpoint (64) and maximum (127) respectively. For all other positions of the modulation source, the parameter values are continuously interpolated or "morphed" between. By morphing between filter coefficients, the DEF filter creates phase accurate real-time crescendos and decrescendos using a single sustaining note, effectively replacing the need for layered crossfade instruments that increase polyphony and introduce phase problems.

Because the four parameters are interrelated, the Region Window plots them in a special way. When any one of the DEF parameters is selected, all of the parameters in that particular filter set (pp, mf, or ff) appear in the Region Window:

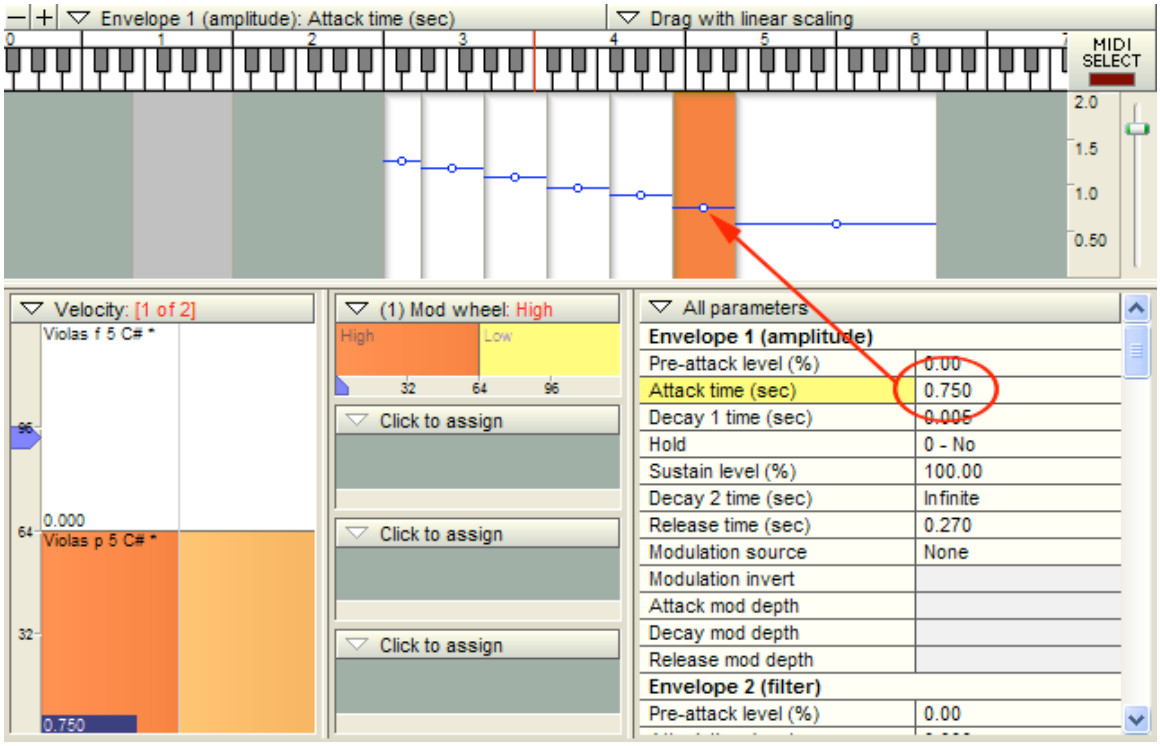


The currently selected parameter appears with draggable handles on each region; the others are indicated by color-coded lines. However, you can change the currently selected parameter by clicking on any of the colored indicators or in the legend area just below the Region Window.

Note: When designing DEF filter profiles, it is best to first isolate the individual filter sets by assigning ONLY a MIDI continuous controller as the modulation source. You can then use that controller to listen to the sound of each of the pp, mf, and ff filter sets by sending a CC value of 0 , 64, and 127 respectively. Once you have effectively dialed in settings for all three sets of filter coefficients, you can then enable other modulation sources in the instrument Properties dialog.

Chapter 9: Editing Parameters in the Region Window

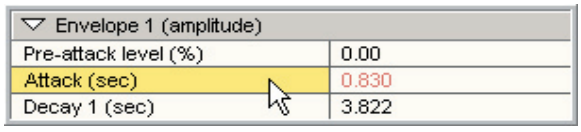
The previous section explained the various articulation parameters and described editing them numerically in the Parameter Window. While that method of editing is useful when you want to be very precise or detailed, there's another way to edit parameters that can be much more powerful. This method uses the blue indicators in the keyboard region view:



The blue lines show the value of the parameter that's currently selected in the Parameter Window. While the Parameter Window shows multiple parameters for a single region, the blue line display shows a single parameter as its value varies from region to region across the keyboard. The parameter can be edited by dragging the blue circles. And as we'll see below, by selecting multiple regions, you can edit the entire instrument, or any portion of it, with a single action.

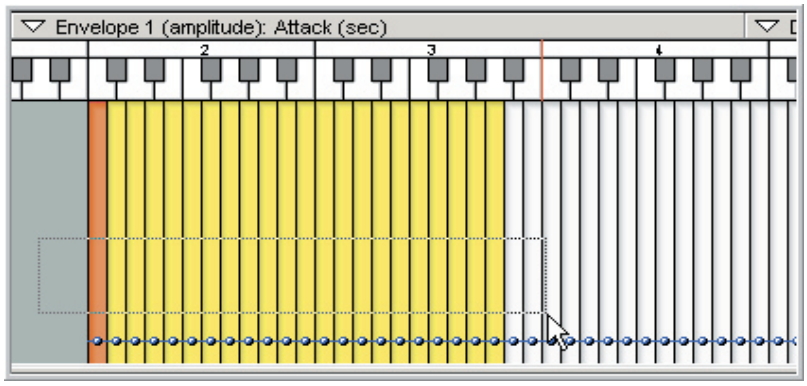
Editing in the Region Window

First, select the parameter to be edited by highlighting it in the Parameter List:

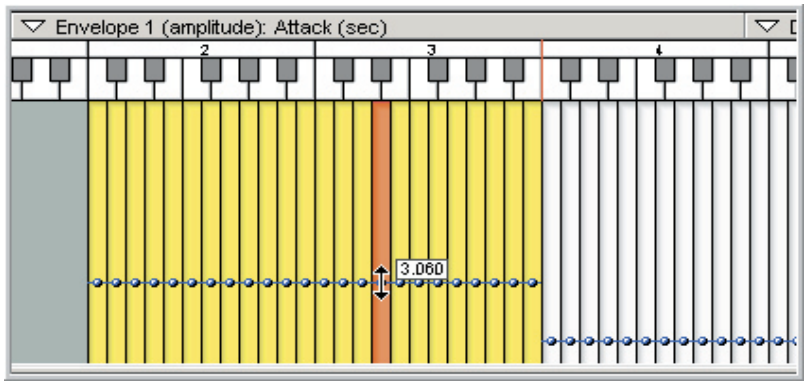


Alternatively, you can select the parameter from the header bar just above the keyboard:

Next, select the region or regions that you want to edit.

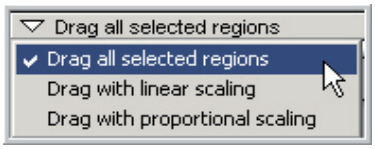


Drag any one of the blue markers to adjust the parameter.



Drag Modes

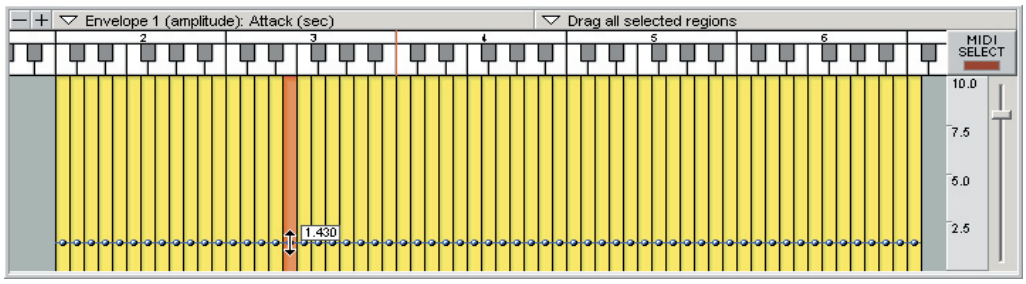
When you drag a parameter in the Region View, it usually affects all of the selected regions. But the exact effect is determined by the current "Drag Mode", which is set via the Drag Mode menu. To see the menu, click on the right-hand portion of the header bar above the keyboard:



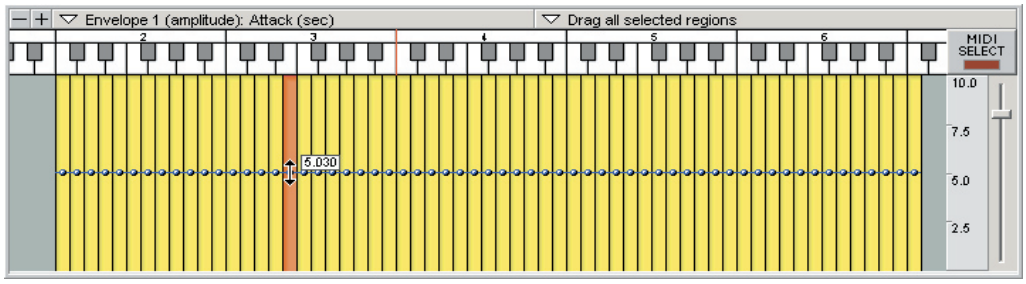
The three drag modes are:

Drag all selected regions

In this mode, the blue markers for all selected regions move in unison, applying a uniform increase or decrease across the keyboard.



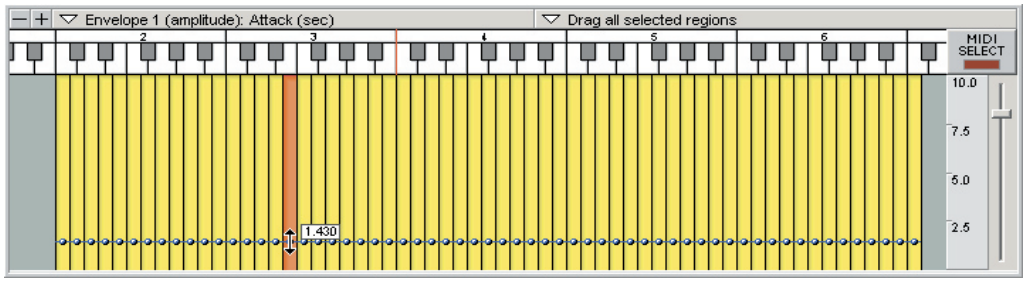
Before



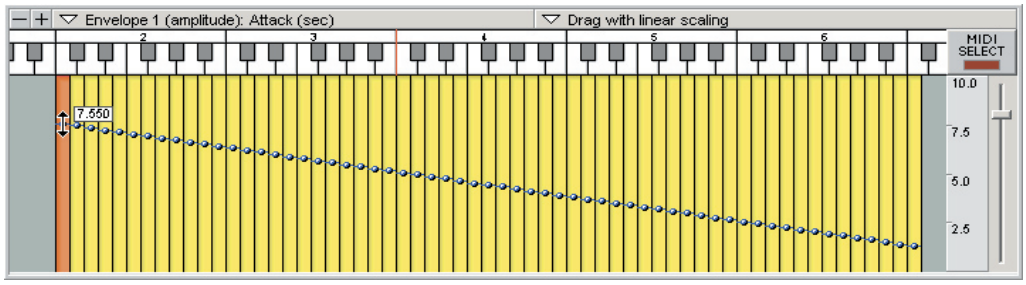
After

Drag with linear scaling

In this mode the parameter is scaled across the keyboard. The lowest or highest region (or both, if you drag a region in the middle) remains fixed while other regions are adjusted proportionally.



Before

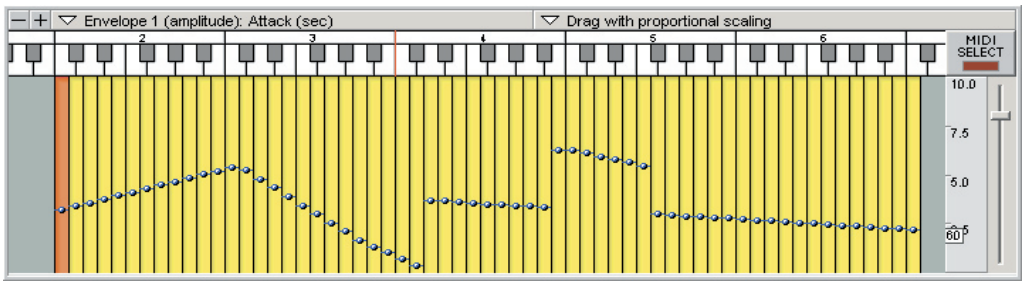


After

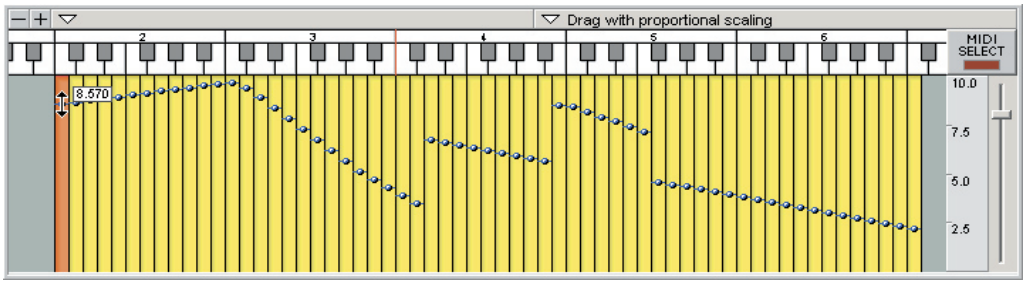
For example, you could use this mode to set an amplitude release time that is short at the top of the keyboard and gets progressively longer in the lower register.

Drag with proportional scaling

This mode preserves the basic shape of the current settings, while applying a "bend" that is centered on the region where the drag occurs. Use this mode to make subtle modifications to an existing keyboard scaling.



Before

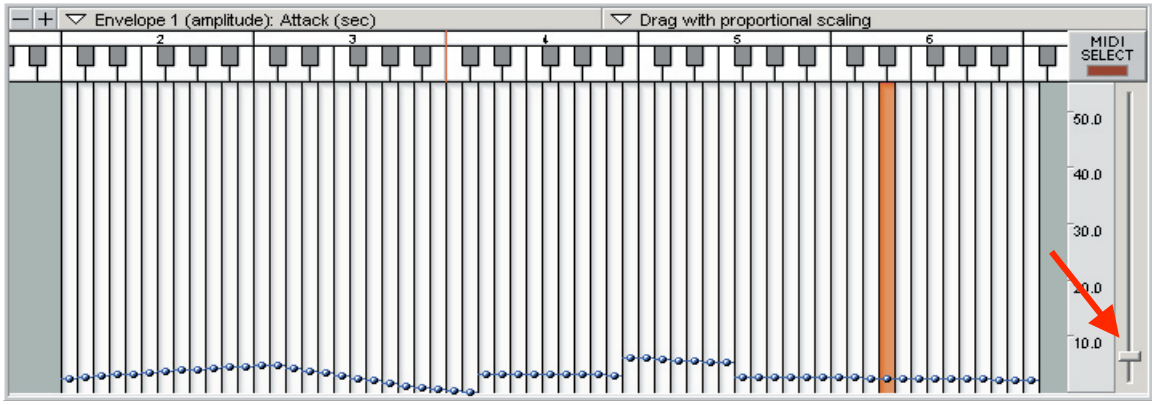


After

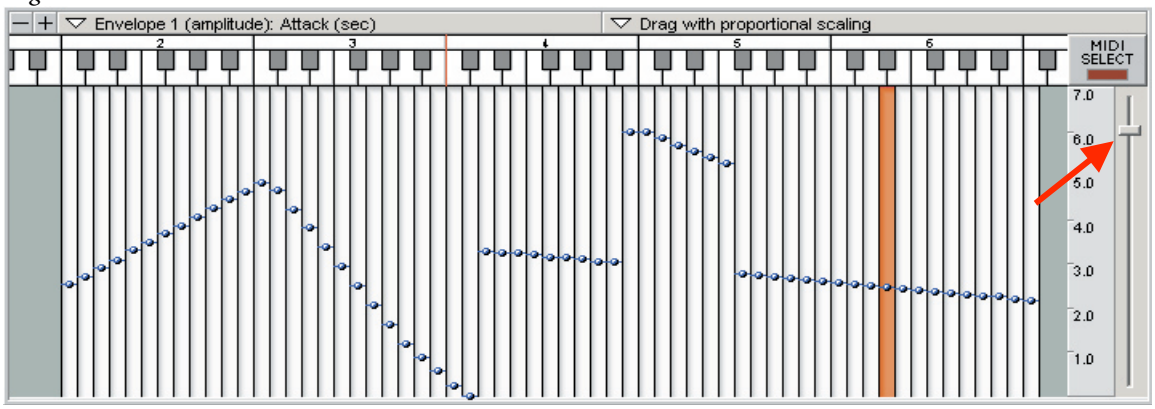
Changing the Vertical Resolution

The scale for the axis is displayed at the right side of the Region View. The scale changes depending on the parameter being displayed. For many parameters, you can change the vertical resolution by moving the slider beside the scale:

Lower resolution



Higher resolution



Some articulation parameters have a very limited range (for example, those that can only be set to “Yes” or “No”). When a parameter like this is selected, rescaling the vertical axis isn’t practical and the slider will be disabled.

Chapter 10: Macros

A Macro is a time saving feature that allows you to save any particular parameter edit or group of edits to be reused later.

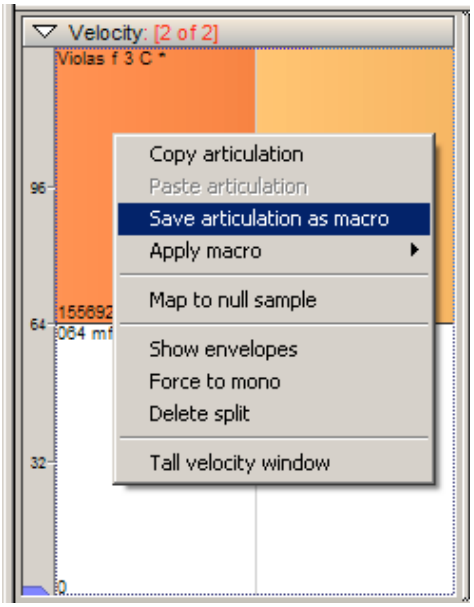
For example, if you have spent a lot of time coming up with the perfect Envelope and Filter settings, you don't want to have to write them all down and recreate them by hand just to use them in another instrument. Instead, you can save the edits as a macro and instantly apply those hard won settings to another instrument. For settings that you use frequently, you can even assign a "hot-key" to any macro. You can also copy your collection of macros to another GigaStudio system.

A Macro can consist of just a single articulation parameter, such as Filter Cutoff, or it can contain multiple parameters or even an entire articulation.

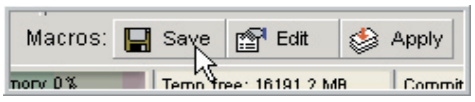
Saving Macros

To save a new Macro, select the split that has the settings you want to save. This will be the split whose parameter values are currently visible in the Parameter Window.

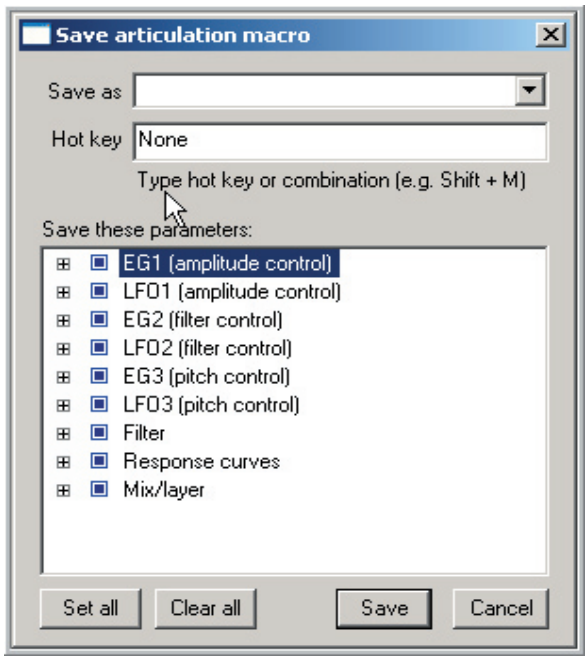
Once you have selected the region, there are two ways to save the settings as a Macro.



1. Right-click on the selected velocity split and choose *Save articulation as macro* from the context menu.



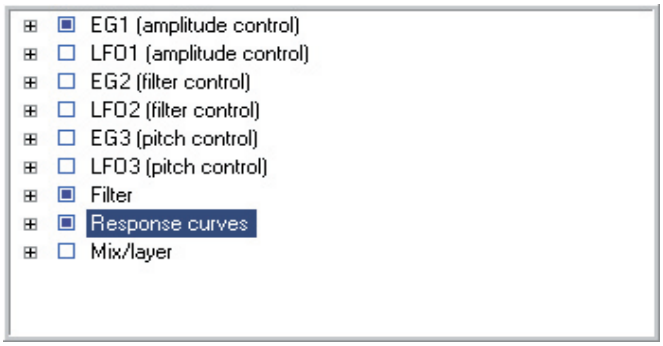
2. Alternatively, click on the Save Macro button at the bottom of the screen.



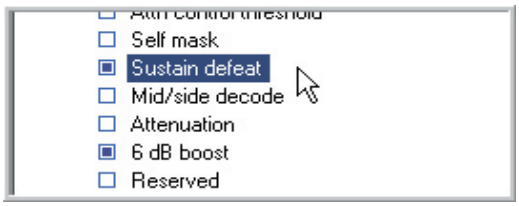
3. The "Save articulation macro" dialog appears. Enter a name for the macro in the **Save as** box.

You can also associate a hot key with the new macro. Click in the **Hot key** box, and then type a key on the computer keyboard. You can also do a combination using the [SHIFT] key combined with any other key. The hot key will instantly apply this macro to any and all regions and splits that are selected in the Editor.

The "Save macro" dialog also displays a list of all the articulation parameters. By checking or unchecking boxes in this list, you control which parameters will be included in the macro. The parameters are arranged by category (these are the same categories used to organize the Parameter Window). A blue square next to a category means that all of the parameters in that category will be included. In the illustration below, the macro is being set up to include the entire amplitude envelope, filter, and response curve categories:



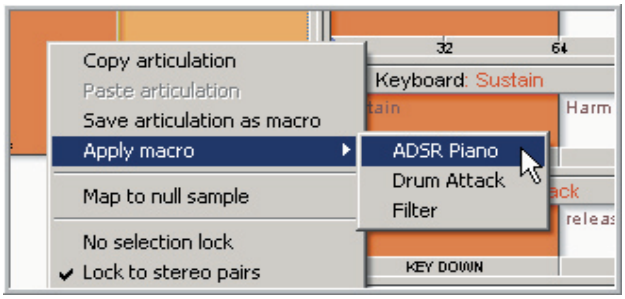
For more detailed control, you can expand the categories (click on the "+" symbol beside each category) and select individual parameters. Here we've expanded the Mix/Layer category and selected just the *Sustain defeat* and *6 dB boost* parameters.



When you're ready, click the Save button.

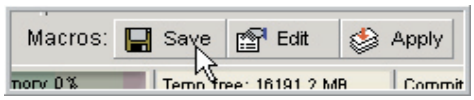
Applying Macros

Once you have saved a macro, you can apply it at any time to the regions and splits that are currently selected. One method is to click on any selected velocity or other dimension split and choose "Apply macro" from the context menu. The menu will list by name all of the macros you have defined.



The macro will be applied to the current selection:

Alternatively, press the "Apply Macro" button at the bottom of the editor window:



Copying Macros to other machines

It is very easy to transfer your collection of macros to another machine. This transfers the whole list and overwrites the existing macros of the machine you are copying them to.

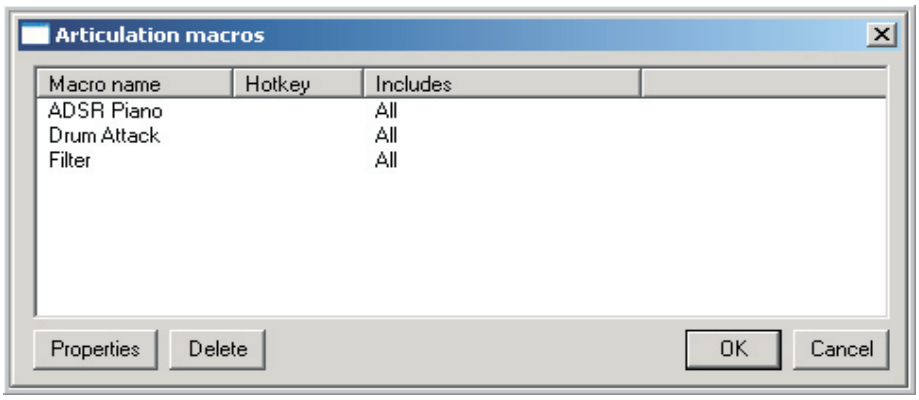
The macro file is named "GsEditMacros" and can be found in the Tascam program files folder, typically c:\Program files\Tascam\GigaStudio 4

To copy your collection of macros to another machine, just copy this file from here and put it in the same folder on the other machine to replace the one that is there. The next time you open the GigaStudio Editor on the new machine, these macros will be waiting for you there.

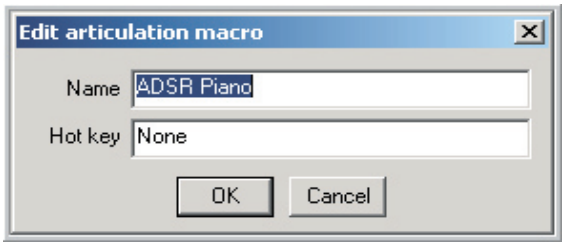
Editing Macros

While you can't actually edit the contents of a macro once it's created, you can change its name or its hot key assignment. Click on the Edit Macros button near the bottom of the editor window:

The Articulation Macros dialog is displayed:



To change a macro's name or hot key, select the macro and press Properties.



Macros may also be deleted using the Articulation macros dialog. Changes and deletions made in this dialog are not applied until you click OK, so if you make any mistakes, click Cancel and your macros will remain in their original state.

Chapter 11: Intelligent MIDI (iMIDI) Rules

iMIDI rules are bits of extra logic which can be added to a Giga instrument. They range from the simple to the very complex. For example, when the Transposition Rule is added to an instrument it simply transposes every note seen by that instrument by a given number of semitones. Other rules work in conjunction with specially defined dimensions to realize sampled legato effects, to trigger rapidly-patterned articulation changes, and so forth. The available iMIDI rules are listed later in this chapter.

iMIDI Rules are added, edited, or deleted via the *iMIDI Rule Manager* in one of two ways:

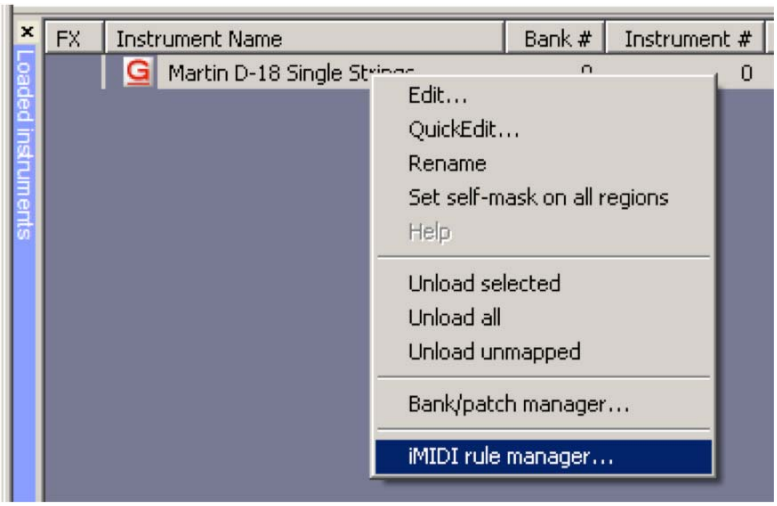
- In GigaStudio, a rule can be added to an instrument and then saved together with the instrument as part of a performance file. The rule will be loaded with the instrument whenever the performance is loaded.

- In the Instrument Editor, a rule added to an instrument will be saved with that instrument in the .gig file. The rule is then applied to the instrument whenever the instrument is loaded.

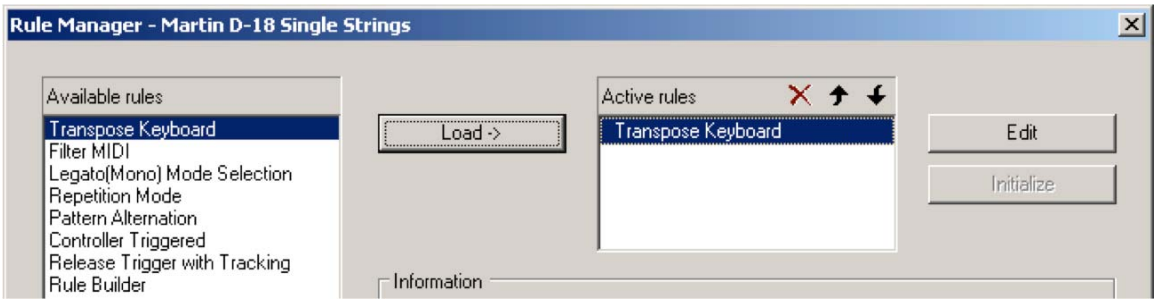
iMIDI Rules in GigaStudio

1. To use iMIDI rules in GigaStudio, first load an instrument:

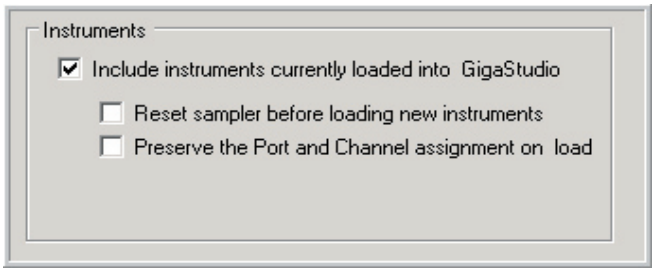
2. In the Loaded Instrument Panel, right-click on the loaded instrument and choose *iMIDI Rule Manager…* from the context menu.



3. Add and edit your iMIDI rule (the current version of GigaStudio supports one rule per instrument). Click OK to apply the rule.



4. Save the instrument as a performance instrument. Use the instrument performance option (.gsi file) or custom performance settings to save just the instrument settings with the performance.

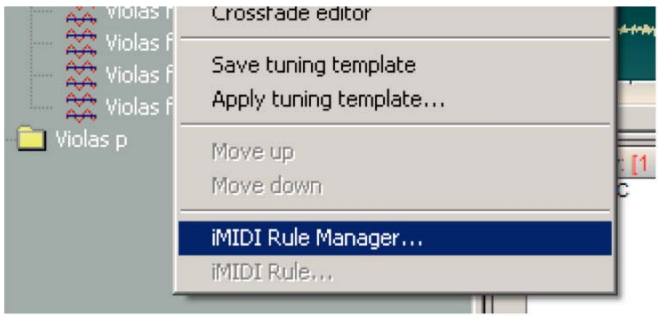


5. In the future, when this performance is loaded, the iMIDI Rules will be loaded along with the instrument. iMIDI Rules applied in this way are part of the performance, not part of the .gig file.

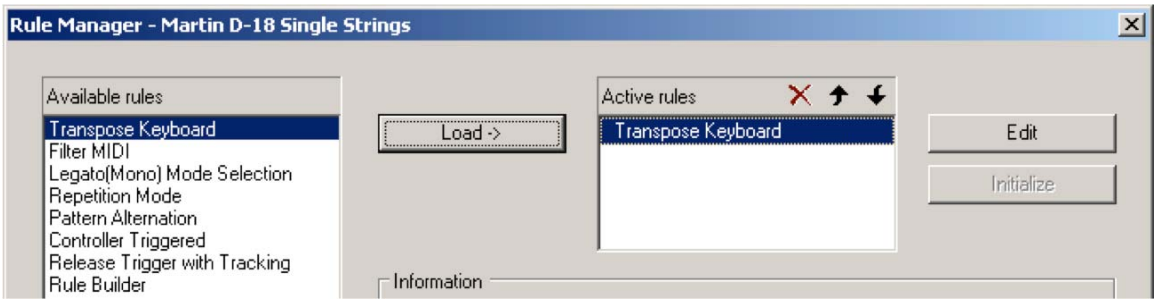
iMIDI Rules in the Instrument Editor

1. The instrument needs to be opened in the Editor and loaded to a MIDI channel. Otherwise, the iMIDI Rule Manager will be disabled.

2. Right-click on the instrument and choose *iMIDI Rule Manager...* from the context menu.



3. Add and edit your iMIDI rule (the current version of GigaStudio supports one rule per instrument). Click OK to apply the rule.

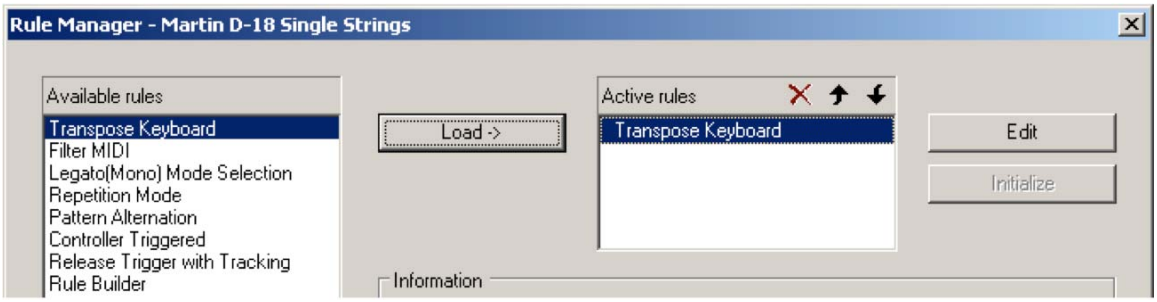


4. Save the .gig file to embed the rule.

5. Whenever this instrument is loaded in the future, its iMIDI rule will be loaded as well.

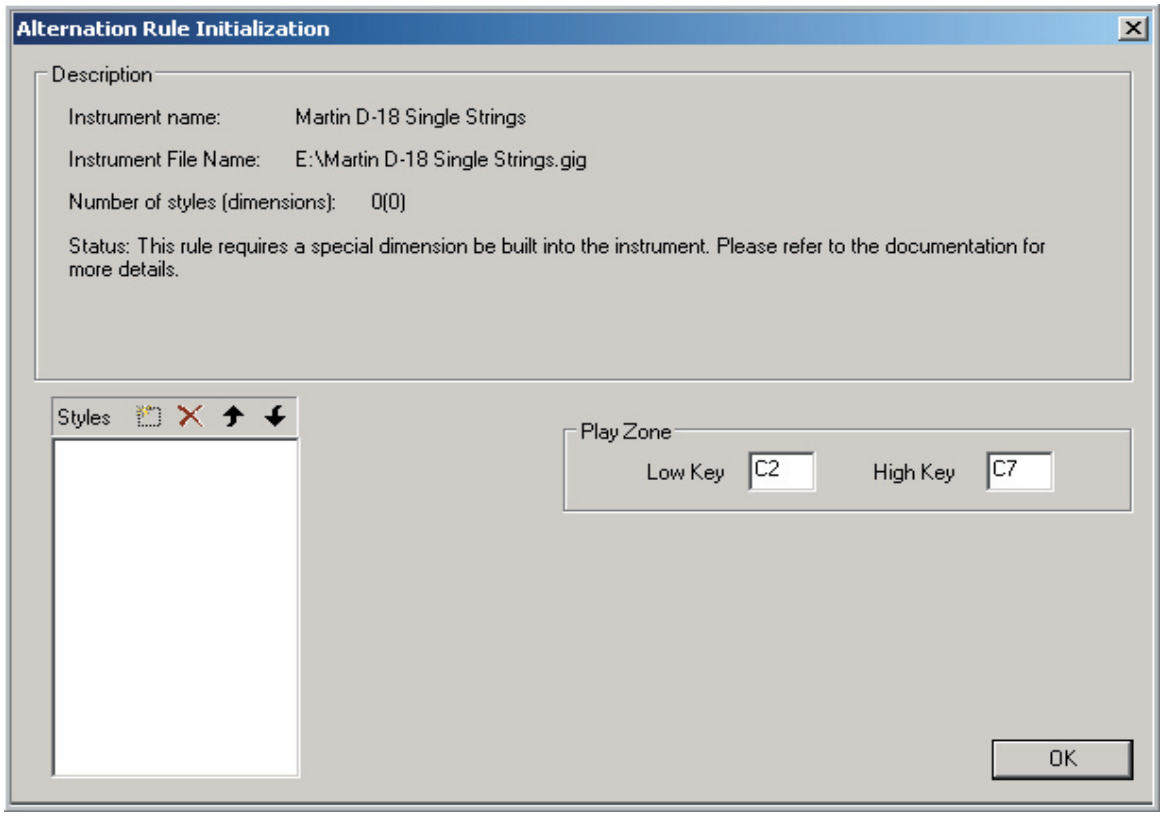
Using the iMIDI Rule Manager

1. Select a rule from the Available Rules window and click the Load button.



2. Depending on the rule, you may get an initialization dialog. Fill in the necessary details and click OK. See the sections on the individual rules for details of the initialization settings. The example configuration dialog below is from the Pattern Alternator rule:

Pattern Alternator Initialization window



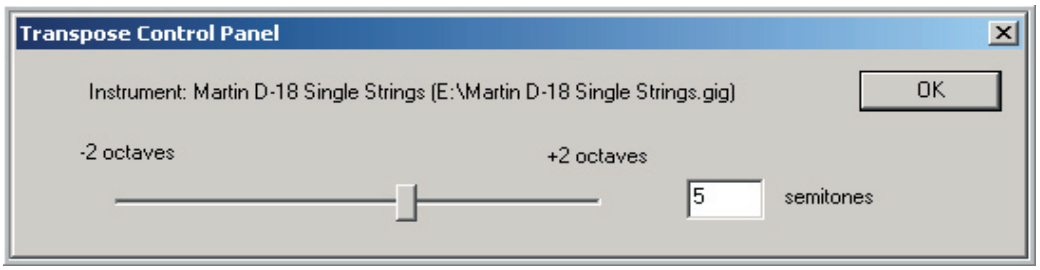
3. Click on the Edit button to edit the settings of the rule. See the sections on the individual rules for details on editing.

4. When you are finished, click OK to close the Rule Manager.

Next we'll discuss each of the available iMIDI rules in detail.

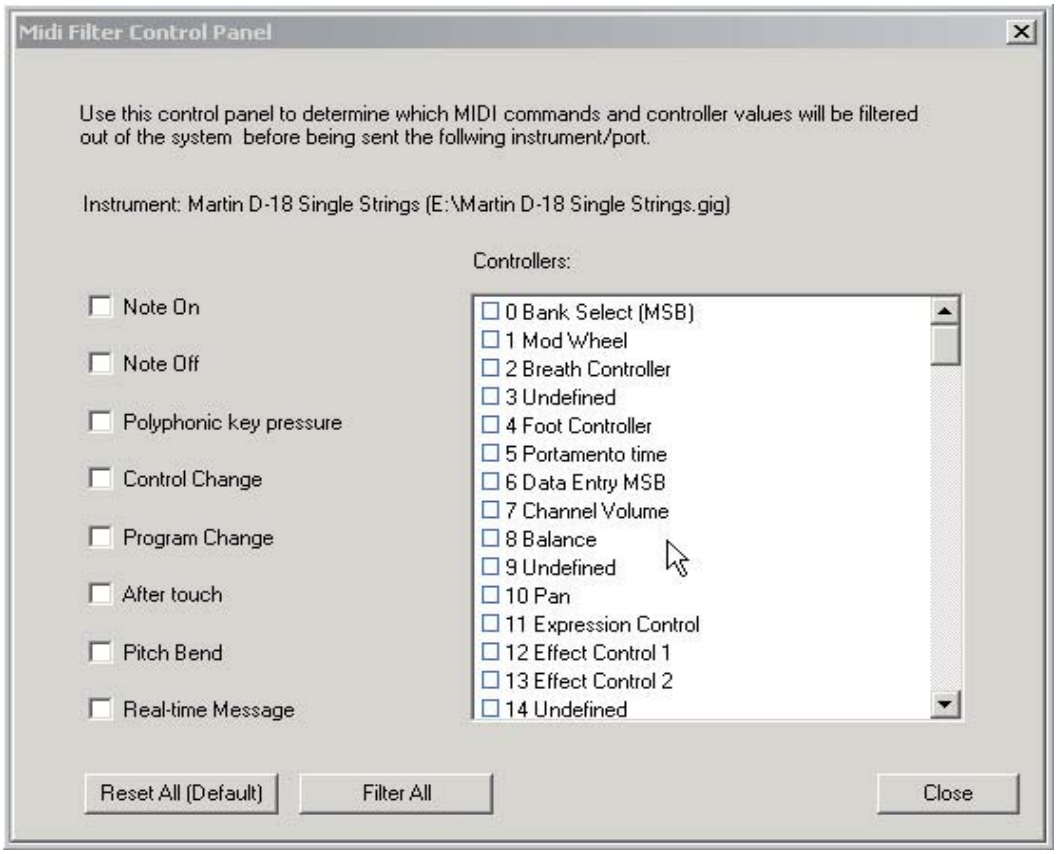
The Transpose Rule

This rule is very simple. It transposes every MIDI note by a given number of half steps, up to two octaves in either direction.



The MIDI Filter Rule

This rule allows you to filter any type of MIDI event or group of events so that the instrument will ignore them. Simply check the box of any event that you want to be ignored.



The Reset All button will uncheck all the boxes. The Filter All button will check all the boxes.

The Legato Mode Rule

The Legato Mode rule allows you to play authentic legato lines in real time on your keyboard. This tool creates the most stunning and realistic note-to-note transitions ever. These can be used for long portamento slides bewteen notes or for natural legato note transitions. The rule automatically takes care of complex dimension switching in real time as you play the keyboard.

Legato Mode requires some very meticulous sampling sessions to capture all the intervals, speeds and loudness levels but the results are as realistic as can be.

The nice thing about this rule is that you need only to play the keyboard a certain way: there is no need for key switching or MIDI sequence editing. The rule does all the connecting work in real time as you play. All that is required is that you hold down one note while playing the next note in a phrase to connect those two notes. To avoid connecting the notes, you lift off a note before triggering the next note.

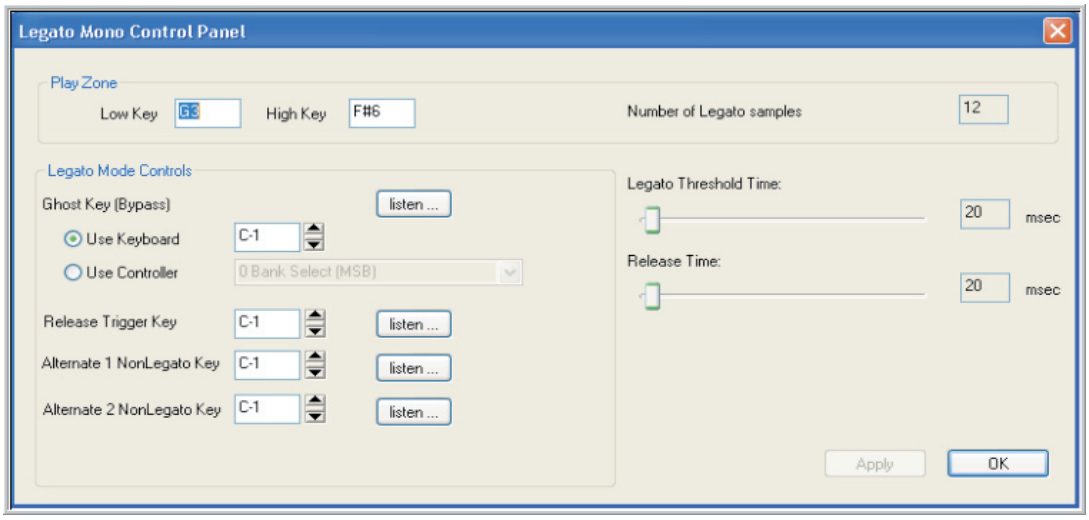
Some audio examples of the Legato Rule can be found in the "Editor Tutorial Files" directory for this chapter:

Trumpet Without Legato.wav. This is how typical sampled instruments sound. There is no connectivity between the notes.

Trumpet With Legato.wav. Now we hear the same instrument with the Legato Mode Rule added. Notice how the notes connect together seamlessly and realistically.

Cellos Portamento Legato.wav. Here we use the longer portamento slides. You don't want to overuse this because it can be unrealistic. It's best used as needed for dramatic or romantic slides depending on the music context.

Legato Rule settings



Play Zone. The Legato Rule will automatically discern the key range of the instrument if the instrument is fairly simple and has one obvious key range of regions. If needed, you can change the note range here.

Number of Legato samples. Displays the number of Legato articulations. For the time being this will always be 12.

Ghost Key (Bypass). This controller will mute the Default Sustain samples until you release it. This function makes it possible to start a legato passage with any other articulation from another MIDI track: for instance, from a crescendo, diminuendo, or sustain with a harder attack. The key is released when you want to slide to a note.

Keyboard. Sets the MIDI key that will bypass the default starting note.

MIDI Controller. Use a MIDI controller instead of a MIDI note.

Release Trigger Key. Triggering this key will allow you to have the last note of a phrase end with a special release sample. Press the trigger note once the last note is played. The release trigger sample will play when you let up.

Alternate Non-Legato Key 1 and 2. These keys provide alternate sustaining samples when pressed. You can toggle between the Default and Alternate Sustain articulations by pressing these keys between notes. This is good for repeating the same note within a phrase. Instead of triggering a fresh starting note, you can trigger one of these alternate samples.

Legato Threshold Time. This setting can help the Legato Mode rule adapt to your performance technique on the keyboard. The threshold sets the time in which the tool will recognize two consecutive notes as a legato transition. Experiment with this setting until it works best for you. Ideally, the Release Time and Threshold Time should be set to the same value.

Release Time. This sets the delay time of the note-off. This value should match the Legato Threshold setting.

Mapping and creating a Legato Mode instrument

The raw material for a Legato Mode instrument will include the following sets of samples:

Default Sustain samples. You need some basic long sustaining samples to serve as your default samples. This is the articulation that plays first before sliding to another note.

Release Trigger samples. If you want to have the natural sound of the instrument release or some natural room or hall ambience, you will need to create some standard release trigger samples. This is usually done by creating a copy of the sustain samples and then deleting everything except the tail. Release Trigger samples are optional.

Alternate Sustain samples. There is room in a Legato Mode instrument for two alternate variations of the sustaining samples. Alternate Sustain amples are optional.

Legato Samples. To do a complete Legato Mode instrument, you will need recordings of the instrument sliding to and from every interval for every note. The recording starts on the original note, then slides to the interval and holds the note. The length of this hold should match the Default Sustain samples. The samples are then trimmed right at the slide leaving a little bit of the original note in the samples. As with the Release Trigger samples, a little experimenting will be necessary to get the right sound. To save sample space and recording time, you can skip every other note or every third note as is done with other samples. You don't want to go further than every third note though, or the timing of the slides will be too noticeable. The end result needs to be 24 folders of legato samples, 12 up and 12 down.

The articulations listed above need to be mapped in a strict order, using a 32-split Smart MIDI dimension. One way to go about this is to create individual instruments for each articulation (sustain, release, etc.) and then use the Combine Instruments function to assemble them in the proper order.

The Smart MIDI splits should be laid out as follows:

1. Legato Up 1 (half step)
2. Legato Up 2 (whole step)
3. Legato Up 3 (minor 3rd)
4. Legato Up 4 (major 3rd)
5. Legato Up 5 (perfect 4th)
6. Legato Up 6 (diminished 5th)
7. Legato Up 7 (perfect 5th)
8. Legato Up 8 (minor 6th)
9. Legato Up 9 (major 6th)
10. Legato Up 10 (minor 7th)
11. Legato Up 11 (major 7th)
12. Legato Up 12 (octave)
13. Empty
14. Empty
15. Empty
16. Empty
17. Legato Down 1 (half step)
18. Legato Down 2 (whole step)
19. Legato Down 3 (minor 3rd)
20. Legato Down 4 (major 3rd)
21. Legato Down 5 (perfect 4th)
22. Legato Down 6 (diminished 5th)
23. Legato Down 7 (perfect 5th)
24. Legato Down 8 (minor 6th)
25. Legato Down 9 (major 6th)
26. Legato Down 10 (minor 7th)
27. Legato Down 11 (major 7th)
28. Legato Down 12 (octave)
29. Default Sustain
30. Alternate Sustain 1
31. Alternate Sustain 2
32. Release Trigger

Because the Smart MIDI dimension requires an iMIDI rule to function, the Legato Mode rule is normally embedded in the .gig file so that it will always be loaded together with its instrument. To add the rule, launch the iMIDI Rule Manager from the Instrument Editor as explained earlier in this chapter.

The Repetition Mode Rule

Repetition mode plays a pre-recorded sequence of notes. The Repetition rule allows this sequence to be played at a faster tempo, and for notes in the sequence to be omitted.

The Pattern Alternator Rule

The Pattern Alternator acts like an automatic key-switcher. It changes articulations on the fly as you play the notes on the keyboard. Every note you hit advances to another articulation instantly.

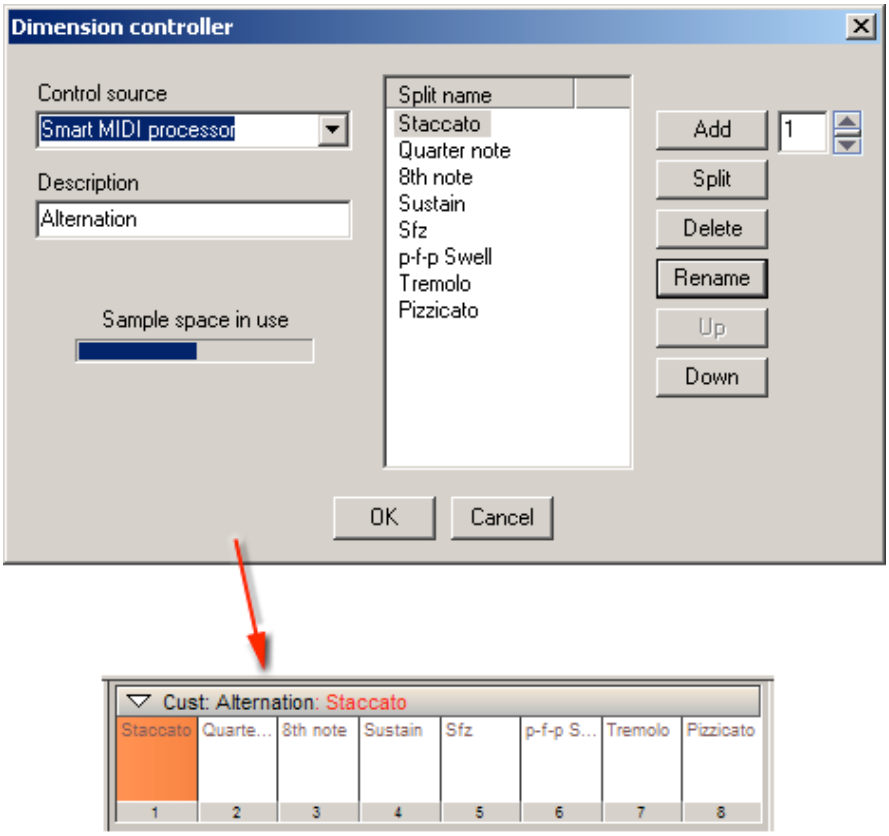
The order of the articulations is completely customizable by the composer. Key switches (as implemented by the Giga “keyswitch” dimension) are very handy, but it can be difficult to change them fast enough in real time for certain types of music. The Round Robin dimension also does real time changing but only in a certain repetitive order. With the Pattern Alternator, you can have the advantages of both of these tools in real time.

Sample layout

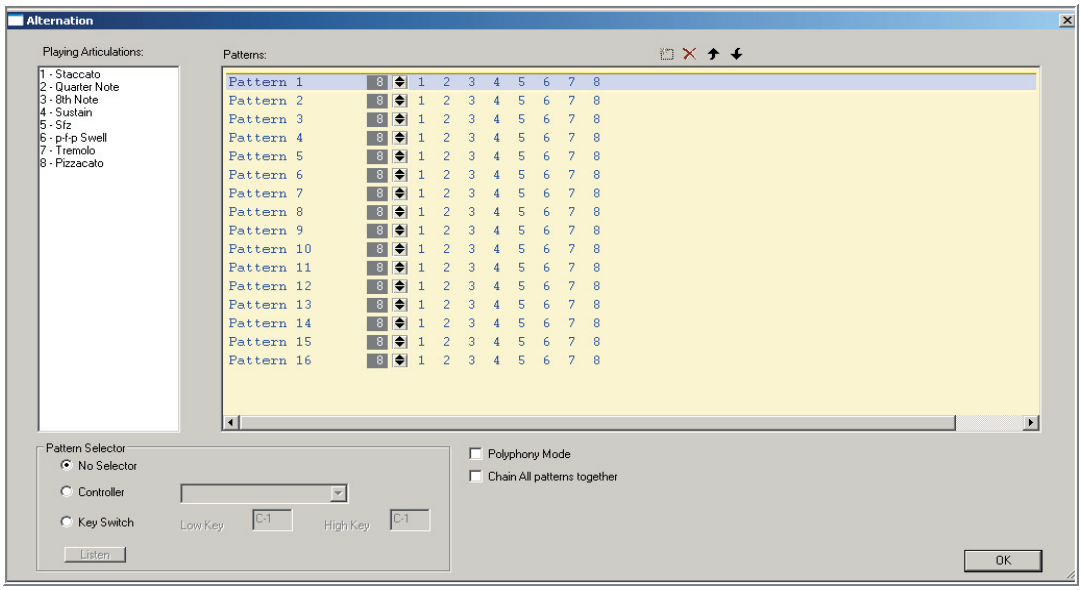
The Pattern Alternator rule works in conjunction with the special "Smart MIDI processor" dimension, which must be present in every region of the instrument. Each split in this dimension represents one of the steps in the alternator pattern. Unlike the Legato Mode Rule, which requires a specifically designed sample at each split position, the Pattern Alternator can work with any combination of sampled articulations. For this example, we'll use a Smart MIDI dimension with eight splits mapped to different articulations as follows.

1. Staccato
2. Quarter note
3. Eighth note
4. Sustain
5. Sforzando

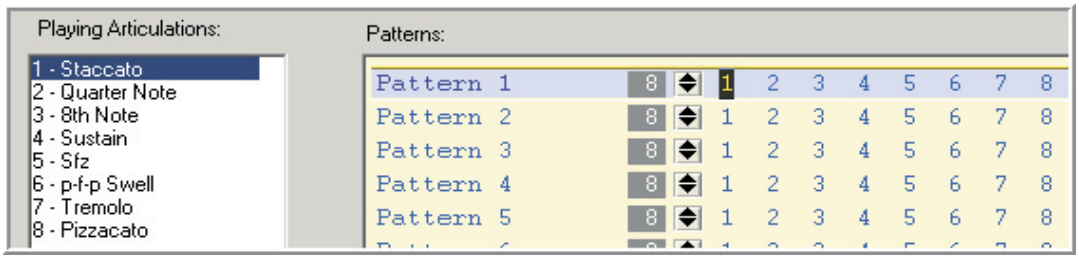
6. p-f-p swell
7. Tremolo
8. Pizzicato



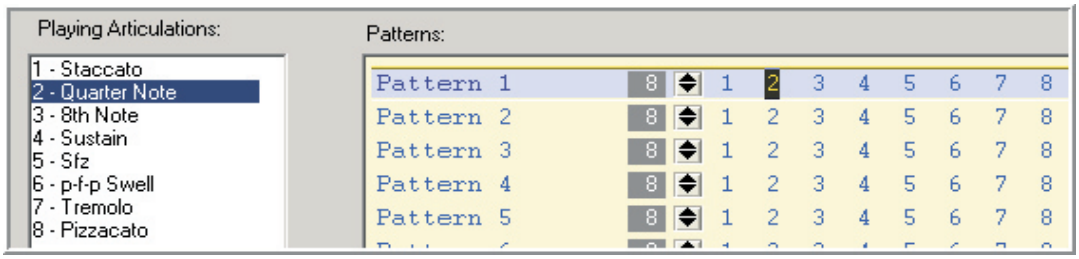
Add the Pattern Alternation rule using the iMIDI Rule Manager. The configuration dialog for this rule looks like this:



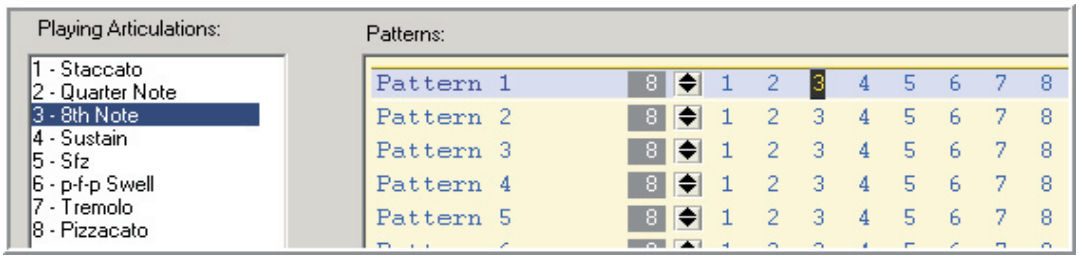
Play the keyboard and watch how the articulations advance from left to right each time you play a note in the top pattern. Also notice how the names of the articulations change in real time as well. This helps you identify which articulation is assigned to which number in the pattern.
The first note is staccato: when released it will advance to the next articulation in the list.



The next note played advances to the next articulation (Quarter Note):



Then the 8th Note articulation:

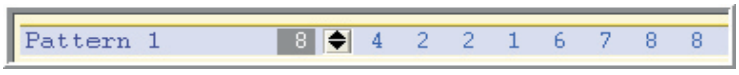


And so forth. When all of the articulations have been performed, the pattern will start over again with the Staccato sample. This default setting gives the same effect as a Round Robin dimension. But the Pattern Alternator rule allows you to modify the default pattern, to store multiple patterns, and to select any of the stored patterns using a MIDI controller or keyswitch.

Editing a pattern

To change a pattern, click on any of the numbers and use the Up or Down arrows on your computer keyboard to change its value.

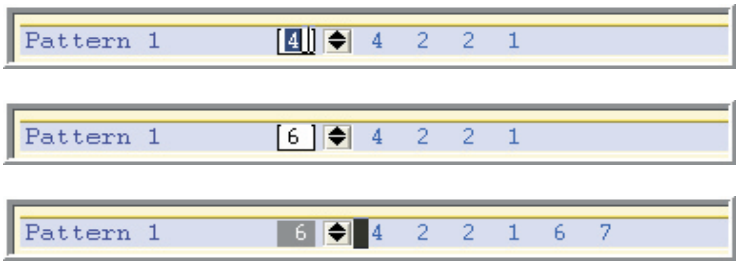
Use the Left and Right arrows to select other numbers in the pattern.



Try changing some of the numbers around and play the keyboard again, noticing the difference in the order of the samples.

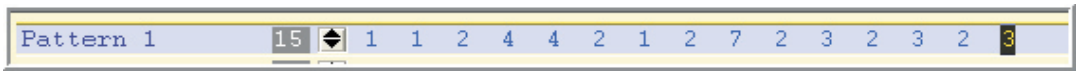
You can also change the number of articulations in the pattern, by dragging the split count indicator up or down:

Alternatively, click on the split count and type in a new value with the keyboard:



This enables us to have a simpler or more complex pattern. For example, you might just want a simple three-part pattern that gives you two short notes followed by a longer note. In this case we would set the split count to 3 and change the pattern to something like 1-1-2 (Staccato-Staccato-Quarter Note repeating).

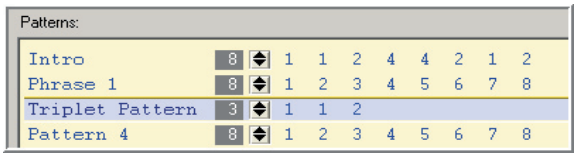
On the other hand, you might want a very complex pattern that covers a whole phrase or line of music. In that case you increase the split count to as many notes as you need up to a maximum of 32. Then you change the articulations to cover your musical phrase note by note.



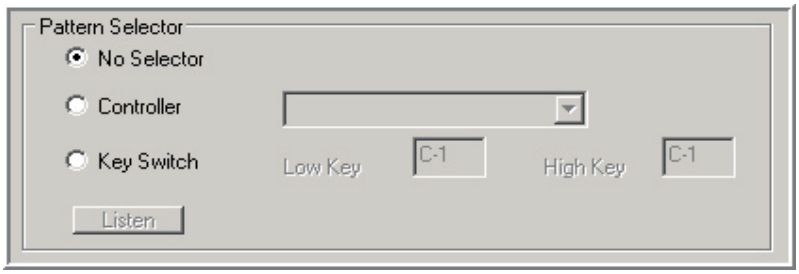
Multiple Patterns

So far we have worked with a single pattern, but we can have up to 32 different patterns to work with. Click the New button to add more patterns.

Each pattern can be given a custom name as well. Just double-click on the name and change it:



You can change between patterns using either a MIDI controller or a key switch. The key switch method is similar to a Key Switch dimension: assign an otherwise unused area of the keyboard, and when you strike a key in this area the corresponding pattern will be selected.



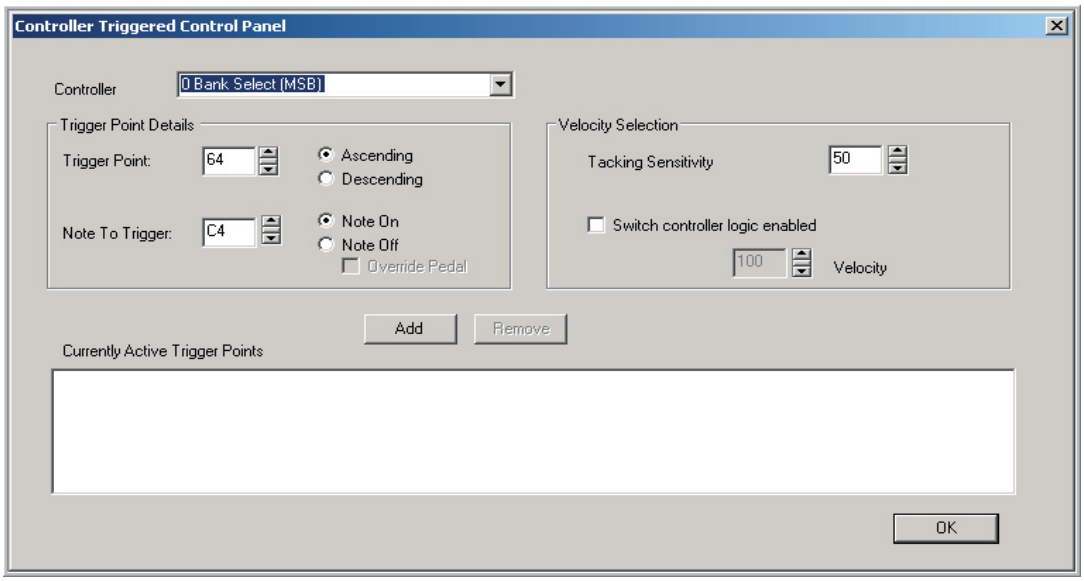
Saving a Pattern Alternation rule

Like any iMIDI rule, the Pattern Alternation rule can be saved into a .gig file from the Instrument Editor, linking the rule permanently to the instrument. However, it's more common to save this rule into an instrument performance (.gsi file) from GigaStudio. This allows you to save custom Pattern Articulation setups for each song you are working on for a particular instrument. When you compose, you can keep your performance files in a special folder for each song you work on.

The Controller Trigger Rule

The Controller Trigger rule allows any MIDI controller to trigger any MIDI note. For continuous controllers, this rule is "velocity sensitive": the faster you more the controller, the louder the sample plays back.

It's possible to define multiple triggers with a single instance of this rule.



Controller. Use the Controller list to select any of the available MIDI controllers.

Trigger point. Sets the exact spot in the continuous controller range (0 to 127) where the trigger will occur. For example, you can have the Mod Wheel trigger a note at its halfway point with a value of 64.

Ascending/Descending. Determines whether the controller triggers the MIDI note when it moves upward or downward across the trigger point. You can trigger the note from both directions by defining two triggers.

Note to trigger. The MIDI note that will be triggered by the controller.

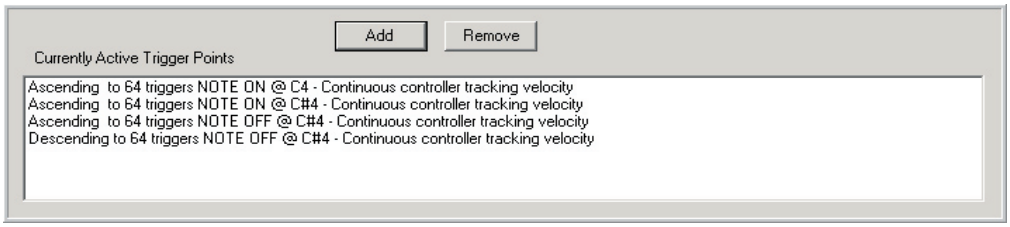
Note On/Note Off. Determines whether the controller will trigger a Note On or Note Off message.

Override pedal. If you are defining a Note Off trigger, check this box if you want the Note Off to be performed even when the sustain pedal is down.

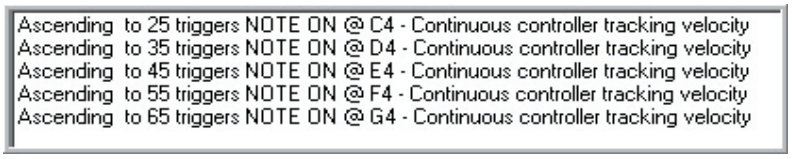
Tacking sensitivity. Defines the velocity sensitivity of the trigger. Change this value to make the Note On velocity more or less sensitive to the rate at which you sweep the controller.

Switch controller logic enabled. This checkbox and the Velocity setting next to it are used with controller devices that do not send continuous values, such as a switch-type pedal that only sends 0 for "up" and 127 for "down." With a controller like this there is no basis for velocity sensitivity. When this box is checked, the velocity of triggered notes is fixed at the value defined in the Velocity box.

When you have defined a trigger, click the Add button. You can combine several triggers for complex effects.



For example, here we have the Mod Wheel triggering a small scale (C-D-E-F-G) when pushed forward:



Use the Remove button to delete any trigger from the list.

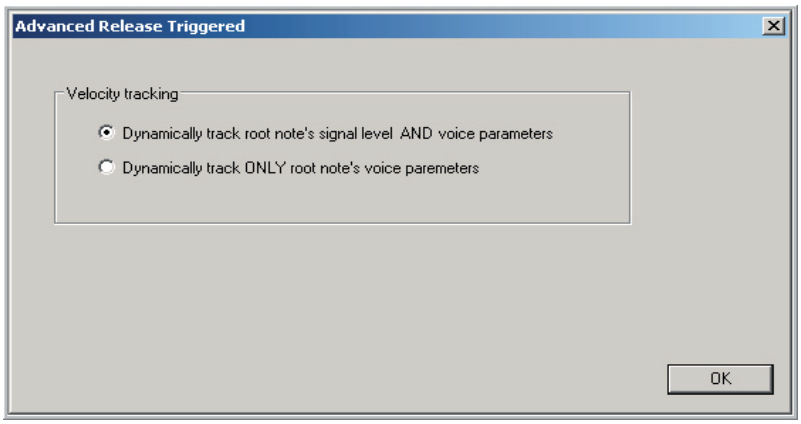
The Release Trigger With Tracking Rule

This is a simple-looking rule that does some very fancy work.

- When using Release Trigger dimensions, this tool tracks the volume of the samples as they play.
- When the note is released, the release trigger plays back at an appropriate volume based on how loud the sample was when it was released.
- It can track the voice parameters such as the amplitude envelope and base the release trigger playback volume based on the position of the envelope.
- It can also track both the parameters and the signal level.

This rule was created to enhance sample libraries that rely on the real ambience of the room or hall they were recorded in for a lush and authentic reverb tail. By putting the release of the recordings on the release trigger, the results are stunning. However, there is a problem with this method. Sometimes the samples are expressive and use diminuendos and crescendos or simply fade out. The problem occurs when a note is released while the sample has died out or is at a low point in its volume: if the release sample plays back at its default volume, a sudden unnatural increase in volume is heard. This rule solves that problem by constantly tracking the signal level of each sample and setting the volume of the release trigger samples accordingly.

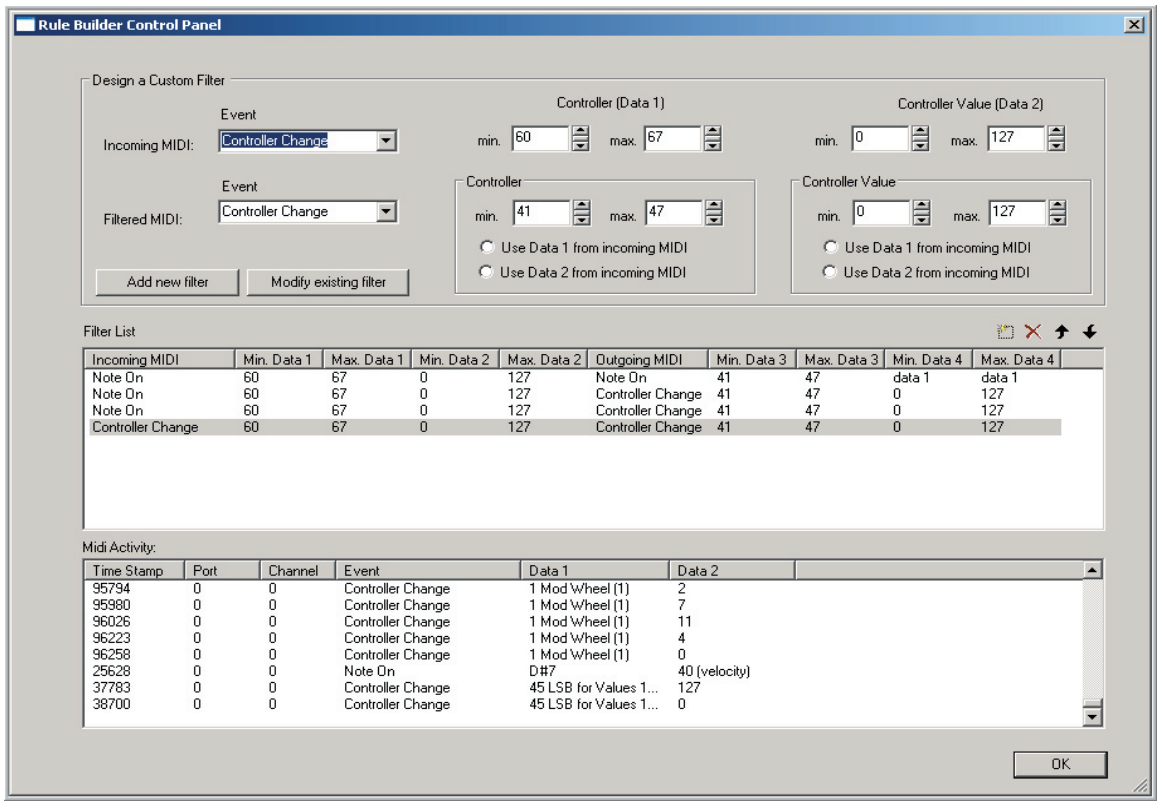
The configuration dialog for this rule is shown below. The sample's voice parameters, such as the amplitude envelope, are always included in the tracking calculation. Optionally, the sample's signal level can also be tracked.



The Rule Builder

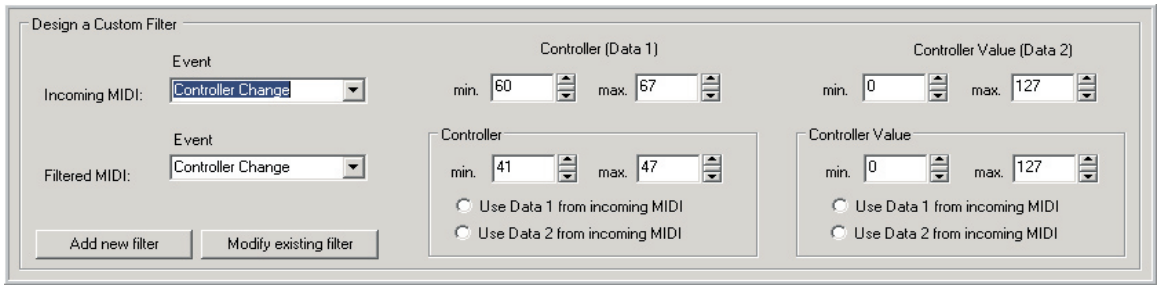
The Rule Builder is a special iMIDI rule that allows you to perform complex transformations of MIDI data. It can take any incoming MIDI event at any range, and have it trigger any other kind of MIDI event with its own range of settings. It's the equivalent of having a built-in high end MIDI processor. The Rule Builder enables library developers to create custom MIDI responses and filters for their instruments.

The Rule Builder dialog is shown below.



Designing a custom filter

MIDI filters are designed in the upper third of the Rule Builder dialog.



Incoming MIDI: Event

Select an incoming MIDI event type from the drop down list.

Incoming MIDI: Data-1

- This will change depending on the type of incoming MIDI event.
- For Note On & Off the data will be in Note Names. (C-1 – G9)
- For all the other controllers the data will be in MIDI control numbers. (0-127)
- Set a minimum and maximum value. Use the incoming MIDI data window at the bottom of this window to help figure out what Notes or MIDI controller numbers to use.

Incoming MIDI: Data-2

- This will also change depending on the type of incoming MIDI event.
- For Note On & Off the data will be Velocity Levels. (0-127)
- For all the other controllers, the data will be in MIDI control numbers. (0-127)
- Set a minimum and maximum value.

Filtered MIDI: Event

Select the outgoing MIDI event type from the dropdown list.

Use Data 1 from incoming

This overrides the values entered here and lets whatever values are in the Incoming Data-1 section determine the range instead.

Filtered MIDI: Data-1

- This will change depending on the type of Filtered MIDI event.
- For Note On & Off the data will be in Note Names. (C-1 – G9)
- For all the other controllers the data will be in MIDI control numbers. (0-127)
- Set a minimum and maximum value. Use the incoming MIDI data window at the bottom of this window to help figure out what Notes or MIDI controller numbers to use.

Use Data 2 from incoming

This overrides the values entered here and lets whatever values are in the Incoming Data-2 section determine the range instead.

Filtered MIDI: Data-2

- This will also change depending on the type of Filtered MIDI event.
- For Note On & Off the data will be Velocity Levels. (0-127)
- For all the other controllers, the data will be in MIDI control numbers. (0-127)
- Set a minimum and maximum value.

Use Data 1 from incoming

This works like before and overrides the values entered here and lets whatever values are in the Incoming Data-1 section determine the range instead.

Use Data 2 from incoming

This works like before and overrides the values entered here and lets whatever values are in the Incoming Data-2 section determine the range instead.

Add New Filter

Click to add the current filter to the Filter List. You can add several filters at once, each with their own custom settings.

Modify Existing Filter

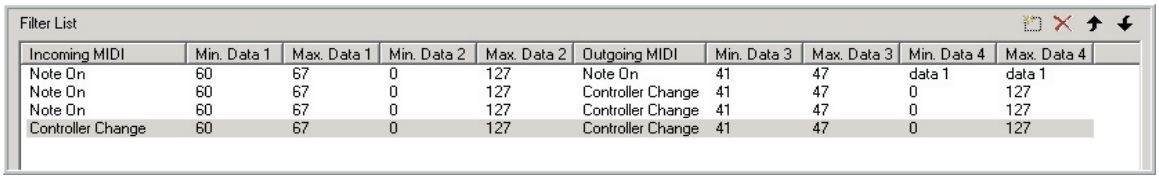
Choose an existing Filter from the Filter List to edit it. This avoids having to create an existing filter from scratch.

Delete and Up/Down arrows

Select any Filter from the Filter List and delete it or move it up and down with these buttons.

Filter List

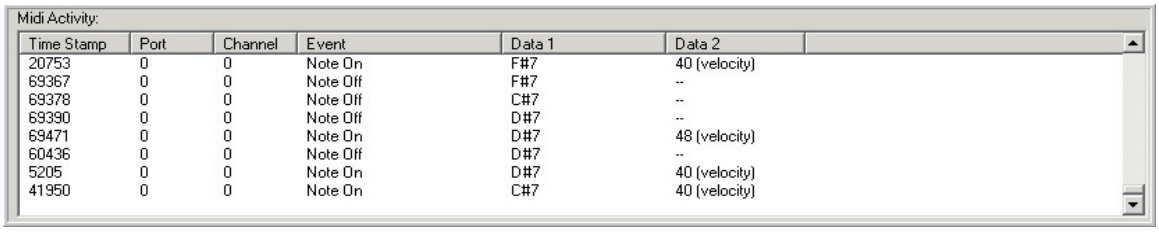
All the filters that are created and added appear in this list. From this list, you can select, delete and reorder the filters. The menus in the Filter List reflect the various settings from the Filter Design area.



Incoming MIDI	Min. Data 1	Max. Data 1	Min. Data 2	Max. Data 2	Outgoing MIDI	Min. Data 3	Max. Data 3	Min. Data 4	Max. Data 4
Note On	60	67	0	127	Note On	41	47	data 1	data 1
Note On	60	67	0	127	Controller Change	41	47	0	127
Note On	60	67	0	127	Controller Change	41	47	0	127
Controller Change	60	67	0	127	Controller Change	41	47	0	127

MIDI Activity Window

- This window tracks every incoming MIDI event and puts it in this list.
- This is real helpful for discerning the MIDI controller numbers. Just play a note or controller and look at the list to see what it is.
- To clear the list, close the interface and reopen it.



Time Stamp	Port	Channel	Event	Data 1	Data 2
20753	0	0	Note On	F#7	40 (velocity)
69367	0	0	Note Off	F#7	--
69378	0	0	Note Off	C#7	--
69390	0	0	Note Off	D#7	--
69471	0	0	Note On	D#7	48 (velocity)
60436	0	0	Note Off	D#7	--
5205	0	0	Note On	D#7	40 (velocity)
41950	0	0	Note On	C#7	40 (velocity)

Experiment away with this tool. The possibilities are endless!

The Mando-Tremolo Rule

The Mando-Tremolo rule was designed as a means to emulate instruments that are often played in a tremolo style (the quick repetition of the same note), like the mandolin for example.

Developer Requirements

1 set of standard sustain samples (preferably alternating strokes)

1 Smart MIDI Processor Dimension (up to 256 splits)

Once the Smart MIDI Processor Dimension has been created, you can assign the Mando-Tremolo rule to your instrument. The samples are played back in the same order that they are sequenced within the Smart MIDI Processor Dimension splits (alternating up and down stroke samples is a good idea).

Functionality

The following parameters are available for customizing your Mando-Tremolo rule:

Tremolo Rate controller. Used to assign a MIDI controller input to the real-time rate of the tremolo playback.

Minimum Tremolo Rate. Measured in Hertz over milliseconds

Maximum Tremolo Rate. Measured in Hertz over milliseconds

Note-off Delay. Use the "note-off delay" slider to determine how long to wait after a new note-on before terminating the previous note. The release time of terminated samples is determined by that regions EG1 release time.

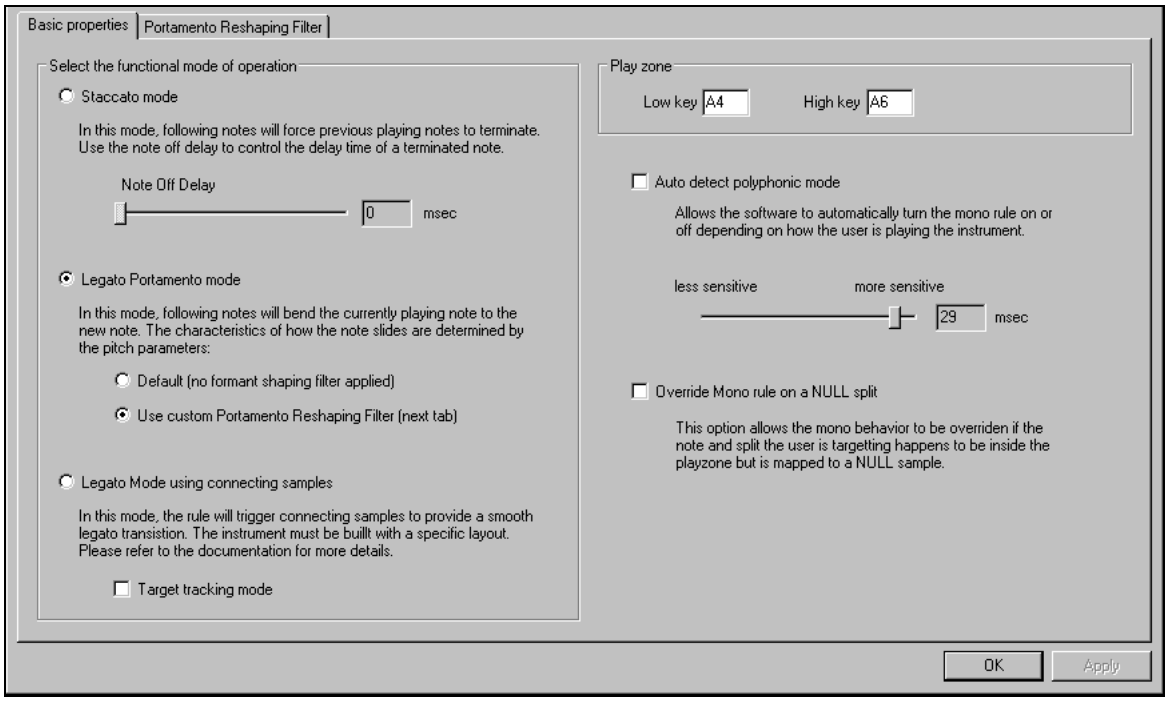
Play Zone. Determines the upper and lower boundaries of instrument regions effected by the iMIDI rule, defaulting to the max range of the instruments existing regions.

Instrument Layout. Determines the number of tremolo and non-tremolo splits present in the instruments layout.

The Mono Mode Rule with Portamento Reshaping Filter (PRF)

The Mono rule has three functional modes: Staccato, Legato, and Legato with connecting samples. This section has a detailed description of all three modes of the Mono rule.

The Mono rule is configured using the dialog seen below:



After instantiating the rule from the GigaEditor, use the above configuration panel to determine the mode you wish to use for your instrument. All three modes share some common features:

Playzone
The playzone defines the musical keyboard region over which the rule will be applied. By default the software will initialize the playzone to be the entire valid region of your instrument.

Auto detect polyphonic mode
This feature enables the sampler to automatically switch between monophonic and polyphonic playback depending on how the user is playing the instrument. Using the sensitivity setting, you can adjust the timing threshold at which this feature will activate.

With this hybrid mono/poly mode enabled, note on messages that fall within the user defined timing sensitivity (chordal playing) bypass the Mono Mode rule and play back with traditional polyphony while note on messages that fall outside of the user defined timing sensitivity (melodic playing) will be processed using the Mono Mode rule.

Override Mono rule on a NULL split
Basically, this will cause the logic to verify that the note you are sliding to has a NON-null sample mapped to it. If it is determined that the target note and split is a NULL sample then the mono rule is overriden and the note does not slide. Useful for stacking multiple Portamento enabled instruments with overlapping ranges.

Mono Rule: Staccato mode

Overview
Staccato mode is the most simple of the three Mono Mode Rules. In this mode, following notes will force previous notes to terminate. Use the "note-off delay" slider to determine how long to wait after a new note-on before sending a note-off message to the previous note. The release time of terminated samples is determined by that regions EG1 release time.

Developer Requirements
There are no specifications for using the Staccato mode Mono Rule. It can be applied to any instrument, regardless of dimension architecture.

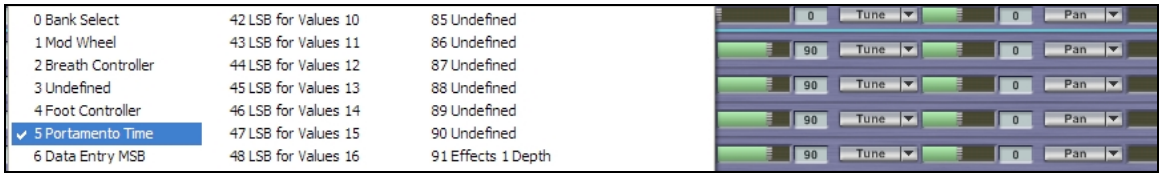
Mono Rule: Legato Portamento mode (PRF)

Overview
In this mode, following notes will bend the currently playing note to the new "destination" note. The characteristics of how the note slides are determined using both global and custom Mono Rule parameters. There are two basic Legato Portamento modes to choose from:

Default (Notes are transposed without filtering applied)

Custom (PRF - Portamento Reshaping Filter applied)

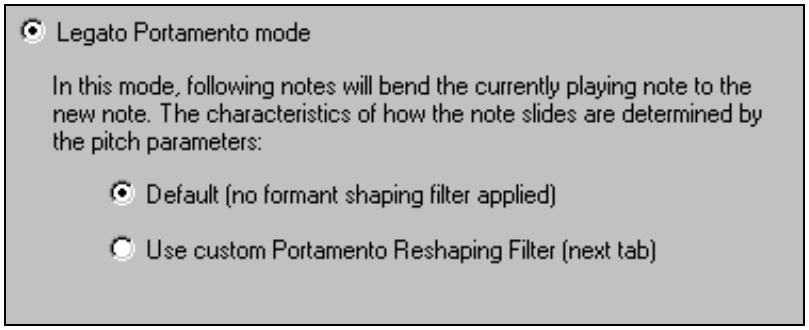
Controlling Portamento time
Both Default and Custom versions of the Legato Portamento Mode provide continuous control over portamento time by virtue of MIDI Continuous Controller #5 (Portamento Time). In GigaStudio, any of the three MIDI channel controllers can be assigned to Continuous Controller #5 (Portamento Time), replacing the default Volume, Tune, or Pan control. It is also possible to control portamento time using an external controller transmitting Continuous Controller #5 data.



A fast portamento time (lower CC value) is excellent for trills over short intervals (up to a perfect fourth if the filters are well calibrated) but not as good for longer intervals. Conversely, long intervals or glissandos can be well simulated with slower portamento times.

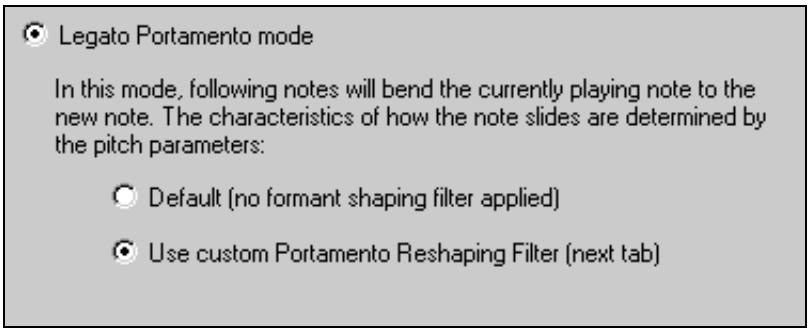
Default Legato Portamento Mode

There are no specifications for using the default Legato Portamento mode; it can be applied to any instrument regardless of dimension architecture or bit rate.



The Default Legato Portamento Mode glissandos from one note to the next like a traditional mono portamento style instrument without using the formant shaping filters or extended portamento controls of the Custom PRF profiles. This default mode simply bends samples from an original source note to a secondary destination note when the notes are played in a connecting (overlapping) fashion.

PRF - Custom Legato Portamento Mode



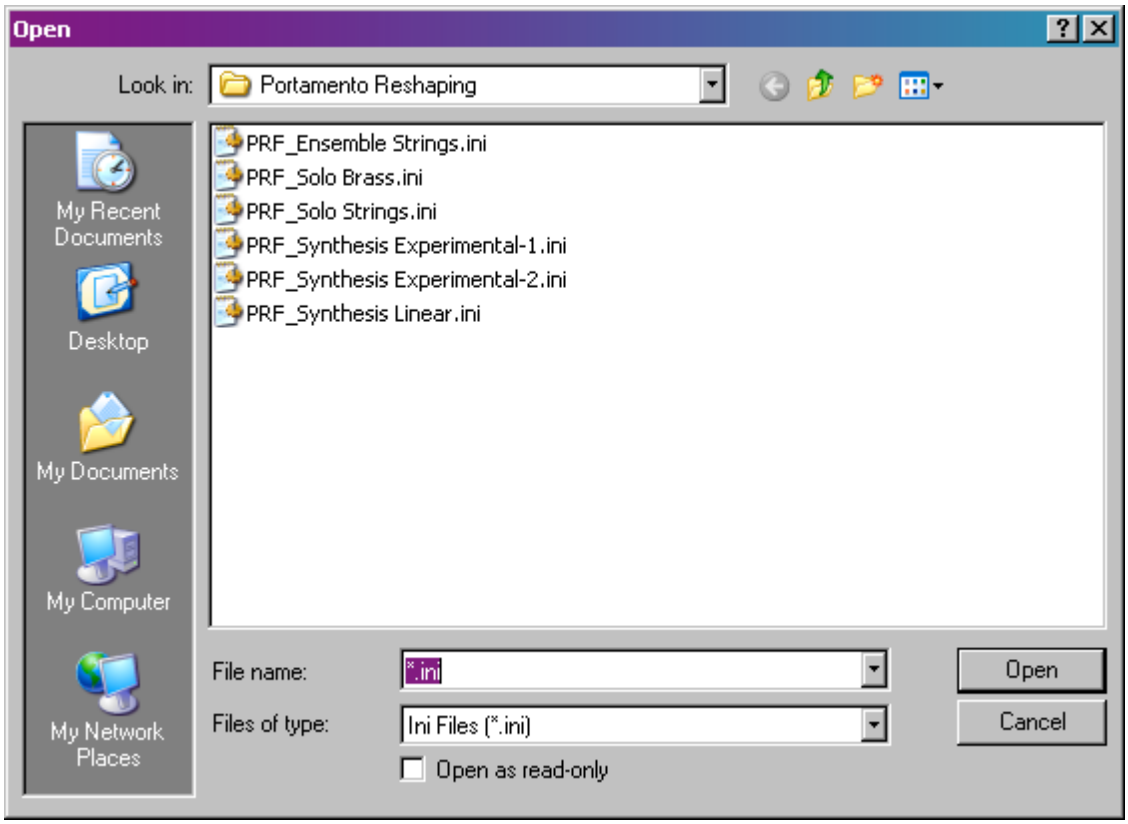
The PRF filter functionality is applicable ONLY to 24bit instruments

Much more complex than traditional filters, GigaStudio's PRF and DEF technology introduces phase corrected, 7th order, musically adapted morphing filters that were designed to deal specifically with the spectral coloration (formant shifts) resulting from the pitch and dynamic transposition of samples. In other words, the PRF filter continuously morphs the frequency response of notes as they are stretched beyond their natural pitch and dynamic range.

The Custom PRF mode (Portamento Reshaping Filter) of the Legato Portamento rule incorporates region specific PRF filter settings as well as extended portamento controls like slide range, velocitiy sensitivity, and slide curve type.

How it works
To put it simply, the user defines four filter settings (Fc, Q0, Q0H, V0) for each of the Up Long, Up Short, Down Short and Down Long intervals using the PRF editor tab. The PRF then tracks the currently running pitch of a sample and continuously morphes between these "Up interval" and "Down interval" filter points. Unique PRF filter settings can be specified for every region and sub-region of an instrument.

Loading a factory PRF profile
Creating accurate PRF profiles from scratch can be an involved process, for this reason GS4 includes a nominal set of factory PRF profiles for different instrument types that are easily applied to any 24-bit instrument. To load a factory PRF profile to an instrument, first select the Custom Legato Mode in the Mono Mode Rule Dialog then navigate to the "Portamento Reshaping Filter Tab" and click 'Load from file'.



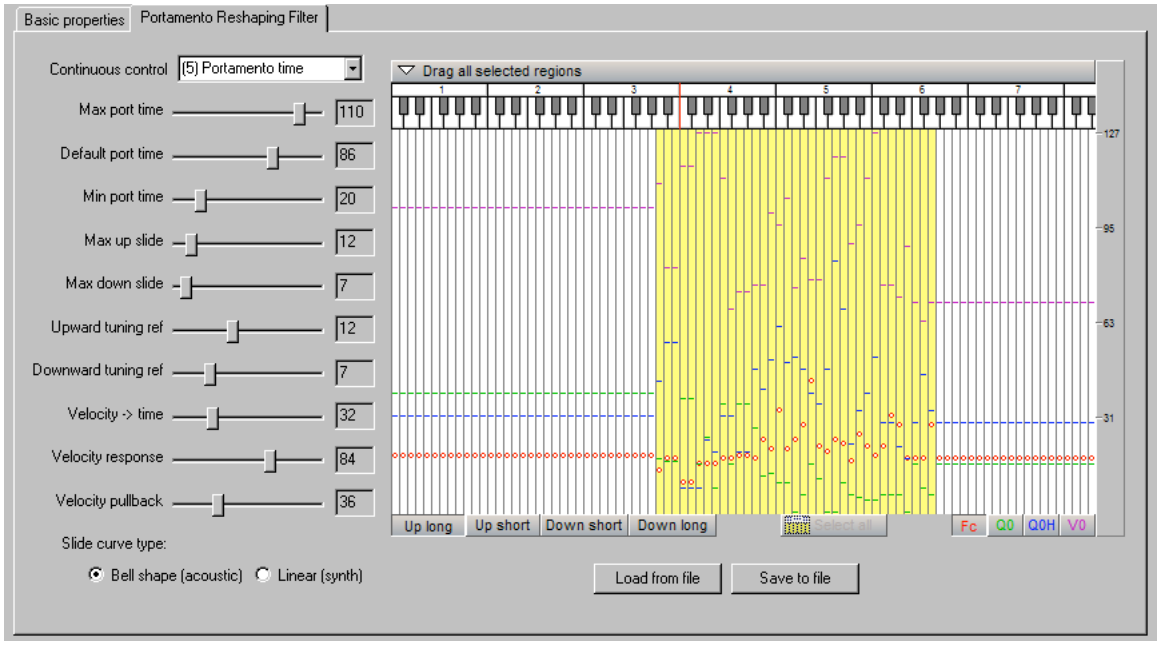
Factory PRF profiles are installed in the following directory:

C:\Program Files\Common Files\TASCAM\Giga\profiles\Portamento Reshaping

Select and open the appropriate factory PRF profile then hit 'Apply'. After clicking 'Apply" you will be able to audition the loaded profile. If you are working in the Editor, PRF profiles can be saved permanently into a .gig file instrument. If you are working in GigaStudio however, PRF profiles can only be saved into a .gsi (GigaStudio Instrument) or .gsp (GigaStudio Performance) and are not stored in the original .gig instrument.

Portamento Reshaping Filter Tab (Customizing Profiles)

Extended portamento controls and region specific PRF settings are accessed in the Editor by right-clicking on a loaded, PRF enabled instrument and selecting “Edit Mono Mode Rule”. Within the Mono Mode Rule dialog, the “Portamento Reshaping Filter” tab contains the region specific PRF parameters.



Note: To Open the extended PRF controls in the GigaStudio workstation, right click on a PRF enabled instrument in the loaded instruments pane and select “iMIDI Rule Manager”; highlight the Mono Mode rule and click “Edit”. The “Portamento Reshaping Filter” Tab contains the region specific PRF parameters.

Portamento Extended Controls:

Portamento extened controls are located on the left hand side of the PRF tab and give the user specific control over the style and range of how an instrument slides from note to note…

Continuous Control

Selects whether the portameno time (slide rate) will be controlled internally or by a MIDI Continuous Controller.

Max Portamento time

Sets the high (slowest) limit of the slide rate for this instrument (0-127)

Default Portamento time

Selects the default speed of the slide rate when loaded (0-127)

Minimum Portamento time

Selects the low (fastest) limit of the slide rate for this instrument (0-127)

Maximum Up Slide

Limits the upward slide range by 'n' notes, “0” implies there is no limit

Maximum Down Slide

Limits the downard slide range by 'n' notes, “0” implies there is no limit

Upward tuning reference

Selects the PRF's 'Upward long' interval tuning reference. 1-31 = specified in semitones, 0 = defaults to octave. The 'Upward short' interval tuning reference is fixed at a minor third (3 semitones).

Downward tuning reference

Selects the PRF's Downward long interval tuning reference. 1-31 = semitones, 0 = defaults to octave. The 'Downward short' interval tuning reference is fixed at a minor third (3 semitones).

Velocity -> Time

Selects the amount of portamento time modulation determined by note-on velocity (0-127). 0 = none, 127 = max. With this parameter set to a value other than 0, lower velocities will result in a slower slide rate and higher velocities will result in a faster slide rate.

Velocity Response

Selects the velocity response for the target note (0-127). With this parameter set to 0, the target note (destination of slide) will sound with the same velocity as the original note. With this parameter set to 127, the target note is subject to the full rage of the instruments velocity response. 0 = none (original), 127 = max (full velocity response).

Velocity Pullback

Determines the degree to which the PRF filter response is reduced (flattened) based on incoming note-on velocity. 0 = no filter pullback, 127 = full pullback range. With this parameter set to 127, an incoming note velocity of 127 will use the full value of the PRF filter coefficients while lower velocites result in a flatter filter response.

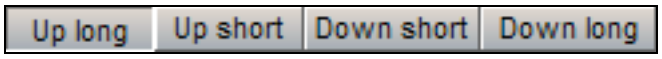
Slide Curve type

Selects the portamento slide curve type, either nonlinear bell-type(acoustic) or linear (synth).

Note: Because GigaStudio streams samples directly from your hard drive, transposing a sample more than three octaves above it's root can cause unexpected results…

PRF Intervals and Filter Coefficients

There are four filter sets associated with a PRF profile which correlate to pitch intervals: Upward Long, Upward Short, Downward Long and Downward short. Each of these interval sets contains four parameters (Fc, Q0, Q0H, V0) which are explained below. As a sample is transposed up and down the keyboard, the PRF continuously tracks the samples pitch and morphs between the appropriate interval sets.



Upward Long – Controls the target filter settings for the Upward Long Interval as defined by the 'Upward Tuning Reference' value.

Upward Short – Controls the target filter settings for the Upward Short Interval which is fixed at three semitones.

Downward Short – Controls the target filter settings for the Downward Short Interval which is fixed at three semitones.

Downward Long – Controls the target filter settings for the Downward Long Interval as defined by the 'Downward Tuning Reference' value.

The PRF/DEF filters were designed specifically to address and emulate the characteristics of samples whose pitch and dynamics have been transposed. For this reason, this musically adapted filter does not behave like a traditional EQ, with one parameter effecting the next. Experimentation is encouraged. It might also be helpful to use a Frequency Analysis Plug-in at first to get a feel for each filter parameter.

Fc – Determines the initial center frequency for the Q0 Quality factor.

Q0 – Simultaneously determines gain, Quality (filter width) and a center frequency offset relative to the initial Fc setting.

Q0H – This high frequency quality factor has a fixed center frequency near 7.5 khz and is especially helpful in de-emphasizing the harsh overtones of upwardly transposed samples.

V0 – Initially designed to compensate for any gain attenuation imposed by the filter, V0 can also be used creatively to increase the dynamic range of an instrument, achieving softer pianissimos and bolder fortes.

Designing Filter Profiles

When designing filter profiles, it is best to set ALL four filter parameters (Fc, Q0, Q0H, V0) for a single interval set before moving on to the next interval set, i.e. once you select 'Up Long' you should finish tweaking Fc, Q0, Q0H, and V0 before selecting the 'Up Short' interval.

For example, to adjust the 'Up Short' filter set parameters, first select the 'Up Short' interval set.

Now trigger a note and bend that note upward by three semitones to hear what the current filter settings sound like. Next, adjust Fc, Q0, Q0H and V0 until the transposed note sounds as close as possible to the non-transposed note. The goal is to adjust the 'Up Short' filter parameters until, for example, a note transposed from C3 to D#3 sounds the same as a non-transposed triggered at D#3.

Note: Once a parameter has been modified, it is necessary to first hit 'Apply', then retrigger the note before the new settings will be audible.

Before Adjusting the 'Up Long' and 'Down Long' filter sets, make sure that you specify the Upward and Downward Tuning References on the main 'Portamento Reshaping Filter' Tab. The 'Long' filter sets correspond directly to the number of semitones specified by these tuning references. For instance, if you set the upward tuning reference to 12 semitones, the exact 'Up Long' filter settings will be applied to samples that have been transposed upward by 12 semitones. Samples transposed upward to less than 12 semitones (between 4 and 11 semitones) will be filtered by a composite of the 'Up Short' and 'Up Long' filter set parameters (morphed).

Please see Chapter 9 on editing parameters in the Region Window for more specific details on adjusting region specific values.

Additional PRF Tips and Considerations

Short and Long Interval Calibration

If you are going to create both short and long interval settings, be aware that when a long interval is played it first goes through the short interval filter settings and then morphs between short and long settings as the transposed sample exceeds the short interval and approaches the long interval. Because the filters react in this way it is best to create your long interval immediately after creating the short interval by emphasizing the already existing short interval settings, this gives a more natural sounding transition between the short and long interval coefficient values.

Fretted vs. Open Strings

When applying filters to stringed instruments and string ensembles, open string samples do not bend as well as fretted notes since bending an open string on an instrument is not often done. In general, the looser the performance of the original sample, the more successful the filtered transposition becomes. This is due in part because all the players of the ensemble are being transposed simultaneously, instead of with a natural time/pitch variance per player.

Region mapping plus PRF

Another issue to consider is when samples have already been stretched or transposed through region mapping. The further you transpose a sample using the instrument mapping, the less effective the filtering process becomes. Ideally you would want an independent sample for each note region of an instrument. If this is not an option, find PRF settings for every sample that is NOT transposed by the instruments region mapping and then apply those same filter settings to all keyboard regions that contain that sample. For instance, if a sample of C4 is mapped to both C4 and C#4, find the PRF settings for C4 and then apply those same settings to C#4.

Use of Body Models and Room Models

Of course the use of body models contributes greatly to the realism of programmatic portamento, but the use of modeled rooms also helps. Attempting to bend a note as well as the resonance of the instruments body and the frequency spectrum of the room the instrument was played in is quite problematic. Solution: apply the PRF to DRY instruments and add a room model post filter…

Calibrating Decaying Instruments

A decaying sound is harder to calibrate for than a sustaining sound. When the transient sounds different from the decay of a note (eg, Guitars, possibly Timpani, GuZheng), use your ***expression pedal*** to audition just the decay portion of a sound. Long decays like guitars allow you to strike a note, gliss to the target note, then fade in, cross referencing the transposed and non-transposed samples until you've matched not their transients, but their decay. Constant sustaining sounds, like a steady mf on trombone, would not require this approach but it might help minimize distractions due to hearing different transients during cross-referencing.

Portamento Time Ranges and Trills

A clarinettist may lip up to a note at the slowest speed that the mono rule offers, almost imperceptibly slow. On the other hand, at the fastest rate the glissando is practically instantaneous. Start with a setting of 20-30 for most instruments that can do quick bends/slides. The clarinet example would benefit from a speed range of about 25-70. Settings lower than 10 are useful for performing trills!

Mono Rule: Legato mode with connecting samples

Overview

The legato mode with connecting samples enabling developers to simulate legato transitions without the need for interval specific sampling.

There are two modes this version of rule: normal and target tracking.

Developer Requirements

- Set of standard sustain samples (primary sustain)
- Set of standard release trigger samples (primary release)
- Set of 'connecting samples' (transitional sample)
  Will require developer to sample an instrument performance of a 'legato movement,' i.e. two notes performed in succession from which a sample of the transition can be extracted.
- Set of 'target' sustain samples (target sustain)
  Optional for developer; primary sustain samples can double as target sustain since independent envelope control and sample start offset capability will allow for one set of sustain samples to perform both tasks effectively.
- Set of secondary release trigger samples (secondary release)
  Also optional; 1 set of release triggers can be mapped to different dimensions w/independent editing capability to provide note-off functionality to entire instrument.

Functionality

Poly Mode
instrument behaves typically, note-off messages fire primary release trigger samples

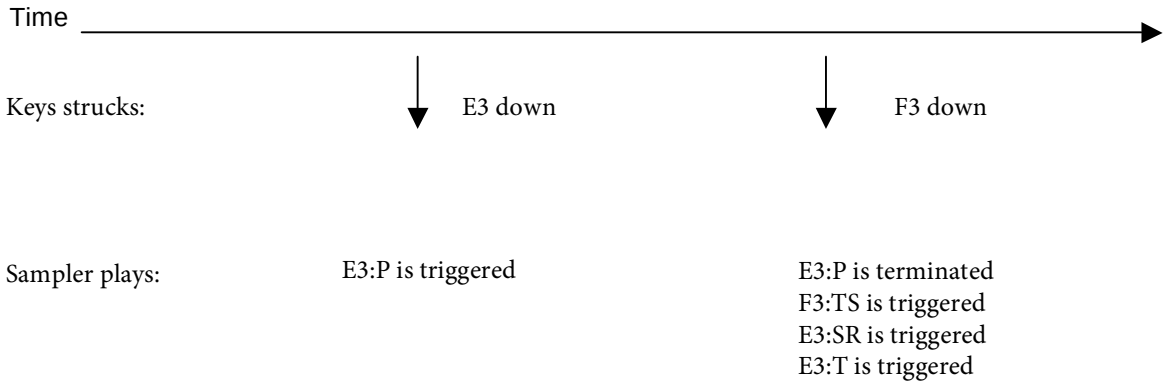
Mono Mode
Giga tracks root of primary sustain to fire off corresponding secondary release and transitional samples as primary sustain note moves to target sustain note, i.e. if the primary sustain is C4 and the target sustain is F4, Giga recognizes C4 as the 'active' note and fires off the corresponding C4 secondary release and C4 transitional samples when a note-on status is triggered by the F4 key.

Instrument Behavior: *Normal Mode*

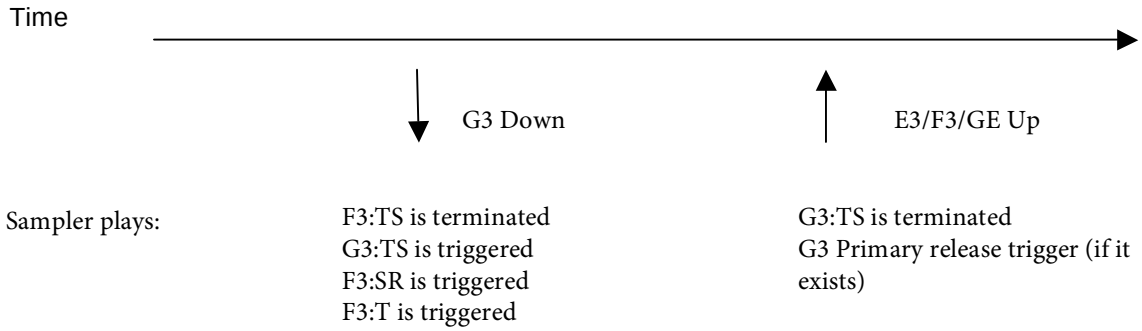
Region Layout	
Dimension	
1 (Round Robin –optional)	
2 (Smart Midi Processor)	Primary Sustain (P)
	Target Sustain (TS)
	Secondary Release (SR)
	Transitional (T)
3 (Release Trigger – optional)	

NOTES: The round robin dimension is an optional dimension that allows the instrument to vary samples and/or articulations as the user plays the instrument. For example, if the instrument was played with a bowing technique then the designer might want a separate set of samples for the up and down bows.

Following is a simple example of how the sample will connect two notes using the above layout assuming no Round Robin dimension:



Continuing on with the above example:



Instrument Behavior: *Target Tracking mode*

Target Tracking mode extends the rule to provide additional functionality. The instrument layout is slight different from the *Normal mode*. Here is a description of the instrument layout expected if an instrument is to take advantage of this mode:

Region Layout	
Dimension	
1 (Round Robin –optional)	
2 (Smart Midi Processor)	Primary Sustain (P)
	Target Sustain Up (TSu) “Hammer on”
	Secondary Release (SR)
	Transitional (T)
	Target Sustain Down (TSd) “Pull off”
3 (Release Trigger – optional)	

The transitional and secondary release will trigger exactly the same way as defined in the normal mode. If the sound developer does not wish to have a secondary release or transitional sound, then the instrument layout must leave these dimension splits mapped to a null sample (also referred to as 'unmapped').

One unique feature of the '*Target Tracking mode*' is the 'return to root' capability. This allows users to perform real-time Hammer-On/Off trills. When performing real-time trills where the "Root" note is sustained while a secondary note is toggled, the rule logic comprehends the interval direction and fires off the proper "Target" sustain sample when returning to root.

For example, a trill from C4 to F4 would behave in the following manner (omitting the release and transition samples):

C4 - primary sustain
F4 - "Target Up" Sustain
C4 - "Target Down" Sustain
F4 - "Target Up" Sustain
C4 - "Target Down" Sustain
F4 - "Target Up" Sustain
C4 - "Target Down" Sustain.....

When 'returning to root' the Target sustain (as well as the transitional sample and the secondary release) will inherit the velocity of the note that is being released.

Appendix

PerfUtility

PerfUtility is a command line utility found in the GigaStudio program directory (typicaly c:\Program Files\TASCAM\GigaStudio 4). The utility is designed to aid developers in migrating their content to the latest version of Giga technology. It can be run from a script file, facilitating batch processing of a large number of files.

Please be sure the GigaStudio application is not running when using PerfUtility. The utility must be run from the directory in which it is installed.

Running PerfUtility with no command line arguments displays the usage prompt:

```
Usage: PerfUtility -command <file or folder> -[? r p]
```

Valid commands:

```
-convert <file or folder> - this will convert a file or folder
                            worth of content to the latest version
```

Valid optional switches:

```
  -?            displays this help menu.

  -r            recusively searchs all subdirectories for performance
                files (.gsi and .gsp)

  -p            perserve the original file. Create a subdirectory with
                the name '/v4' and copy original file.
```

Additional info:

```
  -comments <string up 63 characters long>

  -author   <string up 63 characters long>

  -company  <string up 63 characters long>
```

e.g.
```
PerfUtility -convert d:\tascam\gig\MyFolder
     -comments "Giga 4 converted performance" -author "Joe Bibbo"
     -company "TASCAM"
```

This will convert all the performance files in the specified folder to the latest version.