

# **cakewalk synthesizers**

**from presets to power user**

**update#2**  
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# Welcome an introduction to this update

Welcome to the second update to *Cakewalk Synthesizers: From Presets to Power User*, the ultimate guide to understanding and using all of Cakewalk's synthesizers, and learning about synthesizer programming.

Since the book was published in October 2006 there have been a number of changes to the featured synthesizers. This is the second Update to the book and includes all of the material in Update#1 (issued in May) which is superseded by this note.

## What Does This Note Cover?

The main changes that this note covers are:

- Rapture LE has now been launched [new in Update#2].
- The synthesizers included with Cakewalk products (such as SONAR 7) have changed—a revised Table I.1 is included on page 3 of this Update [new in Update#2].
- Rapture has been updated to version 1.1.
- Dimension LE has been launched.
- New soundsets for the Rapture and Dimension families have been made available [updated information is included with Update#2].
- Z3TA+ has been updated to version 1.5 and Z3TA+ Update Manager has been released.
- Session Drummer 2 has not been changed, but a new expansion pack (Hip Hop Pack volume 1) has been launched.

This note updates the information in the book following the changes.

If you don't have a copy of *Cakewalk Synthesizers: From Presets to Power User*, then please do check it out. Details can be found on my website at [www.noisesculpture.com/cakewalk](http://www.noisesculpture.com/cakewalk) where you can also find the table of contents and a sample chapter.

## Changes to Z3TA+ and Rapture

There are a number of changes introduced by the updates to Z3TA+ and Rapture which are common to both synthesizers. These changes are:

- **New features.** These new features are detailed in the remainder of this note.
- **Bug fixes.** These are not discussed in this note. For details of the fixes, you should check the installation notes. You should also note that this document does not cover the installation/upgrade process which is also covered by the installation documentation.
- **Windows Vista® support.** One implication of this compatibility is that some of the locations of the files have changed. Check the installation documents for details.
- **Support of x64.** Z3TA+ and Rapture now ship with x64 binaries for DXi and VSTi formats and so can be used in x64-compatible hosts such as SONAR.
- **Stand-alone mode.** Z3TA+ already had a stand-alone mode, but this has been enhanced, and a new stand-alone mode has been introduced for Rapture. Both synthesizers can now function as a stand-alone instrument in all versions of Windows (Windows XP, Windows XP Professional x64 Edition, Windows Vista, and Windows Vista x64). In addition, Rapture can run in stand-alone mode under OS X PowerPC, OS X Intel.
- **Format support.** Rapture now offers Universal Binary support for Audio Units, VSTi, and RTAS (Pro Tools 7.3 compatible); Mac formats: AU™, VSTi™ 2.4, and RTAS™ (Universal Binary); as well as Windows formats: DXi (32-bit & 64-bit), RTAS, VSTi 2.4 (32-bit & 64-bit).

With these updates, some of the user interfaces have been changed. In particular, there are some different menu options and some minor textual changes. This update does not update all of the graphics where there has been a change in the printed graphics, but it does include updated versions of the relevant graphics.

## Copyright and Other Disclaimers

This note has been produced by me, Simon Cann, and is my copyright © 2007. It has not been produced in conjunction with Cengage, so if you've got any problems with it, please shout at me and don't go whining to Cengage. You can contact me through my website: [www.noisesculpture.com](http://www.noisesculpture.com).

This note supplements Cakewalk Synthesizers: From Presets to Power User and is not intended to be read as a free-standing document. Or rather, please do read it as a free-standing document, but be aware that it cross-references material that is in the book.

You may print, copy, and redistribute this note freely, provided you distribute it in its entirety and without amendment.

This note will be updated again as and when Cakewalk make any further updates to the synthesizers covered by the book.

	<b>Kinetic 2</b>	<b>Project5 (version 2)</b>	<b>Project5 (version 2.5)</b>	<b>SONAR 7 Studio Edition</b>	<b>SONAR 7 Producer Edition</b>	<b>SONAR Home Studio 6</b>	<b>SONAR Home Studio 6 XL</b>	<b>Available to purchase separately</b>	<b>Free to download</b>
Triangle I (Download Chapter 1)									•
Triangle II (Download Chapter 2)									•
Square I (Download Chapter 3)						•	•	•	
DreamStation (Download Chapter 4)				• [32]	• [32]				
Roland GroveSynth (Download Chapter 5)	•	•		•	•	•	•		
TTS-1 (Download Chapter 6)				•	•	•	•		
SFZ (Chapter 4)				•	•				•
SFZ+ (Chapter 4)								•	
VELOCITY (Chapter 5)		•	•						
nPULSE (Chapter 6)		•	•						
Cyclone (Chapter 7)		•		•	•				
RXP (Chapter 8)				•					
DropZone (Chapter 9)	•			•	•				
PSYN II (Chapter 10)	•	•			•				
DS864 (Chapter 11)		•							
Pentagon I (Chapter 12)					•			•	
Session Drummer 2 (Chapter 13)				•	•		•	•	
Z3TA+ (Chapter 14)					•			•	
Dimension (Chapter 15)		•							
Dimension LE (Chapter 15)			•	• [G] [V]	• [G] [V]		• [G] [V]	• [G]	
Dimension Pro (Chapter 15)								•	
Rapture (Chapter 16)								•	
Rapture LE (Chapter 16)				• [V]	• [V]				

[32] Available on CD as part of the 32 bit installation.

[V] VSTi version only.

[G] Includes Garritan Pocket Orchestra

Update to Chapter 13

# SESSION DRUMMER™ 2

Session Drummer™ 2 was introduced with SONAR version 6 Producer Edition and is now also included with SONAR Home Studio 6 XL. It is now included with SONAR 7 (both Studio and Producer editions) and is available to buy as a separate plug-in.

Hip Hop Pack Volume 1 is the first expansion pack for Session Drummer™ 2. It has been created by Smart Loops, the company behind the original Session Drummer 2 content.

The expansion pack comes on a CD with its own installation routine that finds your existing Session Drummer library and adds the new files. All you then have to do is load Session Drummer, open the browser, click F5 to refresh the browser so that you can see the new programs, and you're good to go.

## What's in Hip Hop Pack Volume 1?

So what's in Hip Hop Pack Volume 1?

- Over 600 unique samples. These samples include complete kits, kick combinations, snare combinations, cymbals, toms, percussion, and special FX. There are samples of both real instruments (in other words, real drums) and electronic instruments (drum machines).
- 16 standard drum kits and over 400 sfz format multi-sample maps.
- 242 MIDI patterns. These patterns have been designed to work with the included kits.
- 33 Session Drummer 2 programs. This may not sound like much, but remember that each program loads up to eight MIDI patterns and a full drum kit.

The new programs have been given names that are indicative of their style. For instance, the following programs are included:

- Chill Groove
- Eighties

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- Funky Time
- Latin Rap
- NWB
- Slow M&M
- Street Swing

I think you will get the idea about the sort of style that these programs cover.

The combination of sounds and grooves make this expansion pack immediately useful for anyone looking for a collection of authentic urban grooves.

## Update to Chapter 14

# z3ta+ waveshaping synthesizer

It is encouraging to see the version 1.5 update for Z3TA+ as the synthesizer hadn't been updated since Cakewalk purchased rgc:audio. In particular, it is good to see that a 64 bit version is now available allowing Z3TA+ to be used in the most modern systems.

Version 1.5 introduces a number of significant changes which are detailed in the remainder of this section.

### **Saving Waveshaper Waves**

See pages 227 and the following pages.

Waves which have been transformed with the waveshaper can now be saved. To save a transformed wave, right-click on the waveform display in the Z3TA+ Shaper and select Save Wavetable As... from the pop-up menu. You will then be given the opportunity to save the wave in .wav form. By default these waves will be stored in the Z3TA+/Wavetables folder. You can then load these waves from the Program menu using the Load User Wavetable (.wav) option.

You can also load these saved waves into any other synthesizer that loads .wav format files including Dimension and Rapture.

### **Enhancements to the Arpeggiator**

See page 239.

Z3TA+ version 1.5 introduces a number of changes and improvements to the arpeggiator. One change that is not immediately obvious is the optimizations to the arpeggiator which reduces the CPU load when the arpeggiator is engaged.

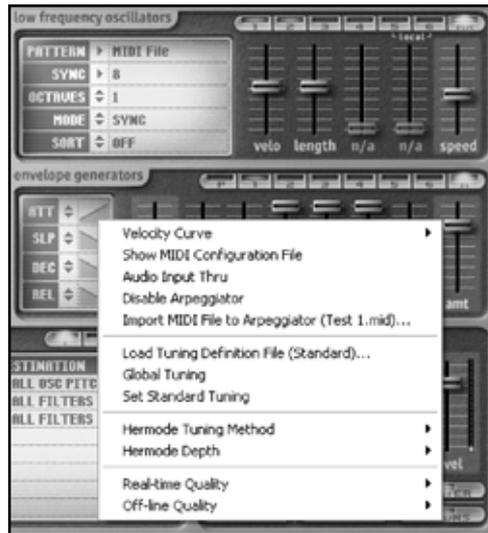
### **Switching Off the Arpeggiator**

One great functionality improvement is the option to switch off the arpeggiator. Once switched off, the arpeggiator will be disabled for all programs.

You can switch of the arpeggiator by selecting the Disable Arpeggiator option on the Options menu (see Figure 14.17a). If you disable the arpeggiator as suggested in the box on page 239 of the book headed “To Permanently Switch off the Arpeggiator”, any program which uses the arpeggiator will not play unless you also select the Disable Arpeggiator option on the Options menu.

**Figure 14.17a**

The Options menu in Z3TA+ version 1.5 which shows the new arpeggiator options. You can see that Test 1.mid has been loaded as an arpeggiator pattern.



You can re-enable the arpeggiator by deselecting the Disable Arpeggiator option on the Options menu.

## Importing Arpeggiator Patterns

In Z3TA+ version 1.5, there is a much easier way to create arpeggiator patterns, so you can ignore the procedure using mid2cmp.exe set out on page 239. Mid2camp.exe is not included with the version 1.5 installation files, but the existing \*.cmp patterns do still work.

With version 1.5, arpeggiator patterns (stored as MIDI files) can be loaded directly into Z3TA+ by selecting Options > Import MIDI File to Arpeggiator... Once a MIDI file has been loaded, the Pattern name in the Arpeggiator window will show as MIDI File, and the name of the MIDI file will show in the Options menu (as Figure 14.17a shows).

The MIDI file data is then stored with the program allowing it to be recalled. If you want to use the same MIDI pattern in another program, then the MIDI file will need to be imported for that pattern too. While the imported MIDI patterns are stored as part of the program, they are not automatically available to other programs from the Arpeggiator Pattern selector in the way that the existing .cmp patterns are.

## Changes to the Program Menu

See page 248 and the following pages.

A new option has been added to the Program menu: “Browse Programs...” (see Figure 14.24).

The Browse Programs... option opens up a Windows Explorer window so you can browse all of the programs on your system. By default this Explorer window opens at the default program location folder. You can then load a program by dragging it from Windows Explorer and dropping it on Z3TA+'s face. Alternatively, you could use the Load Program File (.fxp) option on the Program menu.

**Figure 14.24**  
The updated Program menu.



## Changes to the Options Menu

See page 250 and the following pages.

I've already looked at two of the changes to the Options menu when I discussed the changes to the arpeggiator.

There is one other change to the Options menu:  $2 \times$  Oversampling has been replaced with two options:

- Real-time Quality.
- Off-line Quality.

**Figure 14.25**  
The Options menu in Z3TA+. As you can see, the new Real-time Quality sub-menu is displayed.



These two options allow you to individually set the playback quality settings for real-time and off-line processing. As figure 14.25 shows, these two options allow you to set the quality from a range of options:

- $0.5 \times$  the internal sampling rate.

- $0.6 \times$  the internal sampling rate.
- $0.7 \times$  the internal sampling rate.
- $0.8 \times$  the internal sampling rate.
- $0.9 \times$  the internal sampling rate.
- $1.0 \times$  the internal sampling rate.
- $2.0 \times$  the internal sampling rate.

With lower internal sampling rates less CPU is used. For the off-line quality settings, this will have an effect on the time it takes to render a track. Depending on the program that is selected, different quality settings can give a warmer, smother, or more detailed sound.

If you want to hear the difference (and it can be significant), then load up a Vintage Saw 1 wave without any filtering and try the different quality settings. You should also check this out with FM sounds (for instance, FM Part II in the programs with Download Chapter 13). You may be quite surprised with the difference you hear. You may also find that the higher quality settings do not always give the sound you are looking for.

## Enhancements to the Hardware Control and MIDI Learn Functionality

See "Using Hardware: MIDI Learn" on pages 252 and 253.

The MIDI learn functionality has been enhanced in Z3TA+ version 1.5 and is now consistent with the functionality offered in Rapture version 1.1.

To invoke the hardware control/MIDI learn functionality, right-click on a slider that you want to control. A menu with four options will appear as shown in Figure 14.25a.

**Figure 14.25a**  
The initial hardware control/  
MIDI learn menu in Z3TA+



## MIDI Learn and Assigning Hardware Control

There are two ways to train Z3TA+ to respond to your MIDI hardware:

- 1 Right-click on the slider you want to control
- 2 Choose MIDI Learn
- 3 Move the corresponding control on your hardware that you want to control the slider in Z3TA+

Alternatively:

- 1 Right-click on the slider you want to control
- 2 Choose Add MIDI Control
- 3 Select an appropriate MIDI CC (MIDI control code) that corresponds to the MIDI CC output by the control on your hardware that you want to use to control the selected slider

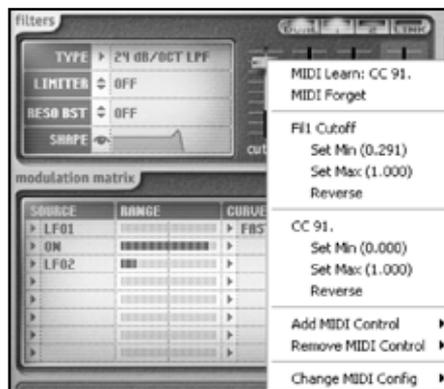
One new feature in version 1.5 is that you can assign more than one hardware control to a slider so you can control a slider from several controls. To assign a second controller, simply repeat the process set out in this section (in other words, use MIDI learn or Add MIDI control again).

## Controlling Hardware Assignments

Once you have assigned a hardware controller to control a slider, you can set how that controller and the slider interact.

If you right-click on a slider that has hardware assigned to it you will see a menu similar to that shown in Figure 12.25b. As you will see, the menu is divided into five sections. I want to look at the second and the third sections (that is the Fill Cutoff and CC91 sections in the Figure).

**Figure 12.25b**  
The MIDI hardware control menu in Z3TA+ when a hardware controller has been assigned to a slider.



In each of the two sections, there are three options:

- **Set Min.** This sets the minimum value of the controlled slider when the hardware controller is at its minimum. So, for instance, when your hardware is set at zero, the slider could be set at 25%.
- **Set Max.** This sets the maximum value of the controlled slider when the hardware controller is at its maximum.
- **Reverse.** This reverses the operation of the hardware controller, so when your hardware is set at its maximum, the slider will be at its minimum and vice versa.

You can set the minimum, the maximum, and the reverse feature for either the slider on Z3TA+ or your MIDI controller. This means that if you assign more than one hardware controller you could have one controller that operates over a wide range and another that operates over a narrow range.

As with earlier versions of Z3TA+, when either the minimum or the maximum range has been set, a blue bar shows in the fader's "groove". However, this blue bar only shows when the minimum or maximum range has been assigned to the slider control itself (in this example, to Fill Cutoff). If you assign a range to the MIDI CC, a blue bar will not be visible.

## Removing Hardware Assignments

MIDI hardware assignments can be removed either individually or for all assignments to the slider.

- To remove all hardware assignments, right-click on the slider to be unassigned, and select MIDI Forget from the menu. All hardware assignments will be removed.
- To remove individual hardware assignments to the slider, right-click on the slider, and select Remove MIDI Control from the menu. This will give you a list of the MIDI CCs of each of the controls assigned to the fader. Select the assignment you wish to remove, and repeat the process if you want to remove more than one assignment.

## MIDI Configurations

Z3TA+ now offers up to ten different user definable MIDI configurations. This allows you to use Z3TA+ with different hardware set-ups without having to remap every control.

To select a different hardware configuration, right-click on any slider, and select Change MIDI Config from the menu. You can then select the appropriate MIDI configuration.

There are three other options you can select under the Change MIDI Config option:

- **Reset.** This option will remove all MIDI assignments as if you had performed a MIDI forget operation on all of the sliders.
- **Copy.** This option will copy the current MIDI configuration.
- **Paste.** This option will paste a copied MIDI configuration as the current MIDI configuration setting.

## Z3TA+ Update Manager

This is a new tool, not previously discussed in *Cakewalk Synthesizers: From Presets to Power User*.

With the 1.5 release, Cakewalk has also put out a new tool called Z3TA+ Update Manager. At the time of writing this update, Z3TA+ is the first synthesizer to use the tool, but there are plans to roll it out through the rest of the Cakewalk synthesizer family.

The operation of the Update Manager is quite simple. It is a separate program which can be run at any time, and must be run on a machine on which Z3TA+ is installed.

- When it is run, it checks that there is an internet connection available and then checks to find the latest version of Z3TA+ which it compares against the installed version.
- If the installed version is the latest, the Update Manager confirms this (see Figure 14.27) and then disappears.

- If the installed version is older than the latest version, Update Manager offers to download and install the update. If you don't accept the update, Update Manager ends, but if you do accept it, Update Manager starts downloading the update from the Cakewalk website.
- Once the update is downloaded successfully, it is installed so that your version of Z3TA+ is up-to-date.

**Figure 14.27**  
Z3TA+ Update Manager will confirm when you are running the latest version of Z3TA+ on your computer.



## Chapter 14-and-a-half

# soundsets for dimension and rapture

Since the launch of Dimension (in its various incarnations) and Rapture, a number of Expansion Packs and additional soundsets/programs have been made available. This section is an attempt to keep track of those sounds: it is not intended as a review or a recommendation.

You will also see that some sounds have been designed specifically for the Dimensions or Rapture. In either of these cases the soundsets (in other words, the underlying waves/SFZ files) can be loaded into the other synthesizer; however the programs can only be loaded into the synthesizer for which they were designed.

### Galbanum Architecture Waveforms for Rapture and Dimension

Architecture Waveforms Cakewalk Edition is a collection of over 2,500 waves in standard .wav format. These waves can be loaded into Rapture and Dimension Pro as well as the other Cakewalk synthesizers that recognize the sfz format (such as the sfz player featured in chapter 4). Unfortunately, these waves won't work with Z3TA+ and Pentagon I since these synthesizers only recognize 16 bit waves.

The Architecture Waveforms are available from the developer (Galbanum) at <http://galbanum.com/products/architecturewaveforms-ce/> and directly from Cakewalk at <http://store.cakewalk.com/b2cus/category.aspx?categoryID=59>. The download package contains over 2,000 waves. The remaining 500 can be obtained from Galbanum's website.

Galbanum originally developed Architecture Waveforms for U&I Software's Metasynth and later converted the waves for use in Native Instruments' Absynth. A number of waves from the collection are also used in NI's Massive synthesizer. The number of waveforms in this Cakewalk Edition has been expanded from the earlier editions and there are many waves which have not been previously available.

The waveforms have been created both mathematically and also through editing in a high end wave editor. The end result is a collection of pristine 24 bit waves which are immediately usable and offer a huge pallet of varying timbres.

The developer asserts that this is the largest and most diverse collection of its kind on the market. I'm not going to argue with this claim. All I will say is that the waves really do sound good and I have not found any that doesn't play perfectly. The range of tones is quite stunning.

The waves are categorized which helps when looking for a sound. However, many of the categories relate to how the waves were created and not what they sound like. This highlights one issue with the product: this is not a simple product that you will learn in a few hours. Using the waves is simple enough, but you're really going to have to spend some time listening to the timbres in order appreciate the breadth of sound sources that are available.

If you own Rapture or Dimension (in any of its incarnations), then at the price, this product is as close as you will get to a must-have no-brainer.

## Using the Architecture Waveforms

So what can you do with 2,500 waves?

The most obvious thing is to load them and create programs or replace waves in your existing programs. However, you will often find that some of the sonic differences between the waves are quite subtle and you're left in more of a quandary than you started with. There are times when too much choice really isn't good!!

However, there is a lot more you can do with a bit of work and some imagination. Ultimately, these are "just" waves—very nice waves—but just waves. Each wave will always sound the same, and so perhaps the most obvious thing you can do is create layered soundsets. So, for instance:

- Velocity layered soundsets could be created so the tone can change without needing to use a filter.
- Different waves could be assigned to different key ranges (probably with some cross-fading) to give a far more interesting result over the span of the keyboard.

With the sfz format, creating multi-sample soundsets like this is a simple task. The hard work is figuring which waves to put together. This is where you need to take some time to listen to the waves.

One point to remember, if you do create an sfz file, then don't forget the `oscillator=on` opcode if you want the waves to work as oscillators.

Here's an example sfz file creating a velocity layered soundset:

```
<group> oscillator=on default_path=Additive - Partials N\  
<region> sample=Add Partials 01-32 (3rd).wav xfout_lovel=25 xfout_hivel=45  
<region> sample=Add Partials 01-32 (4th).wav xfin_lovel=25 xfin_hivel=45 xfout_lovel=50 xfout_hivel=70  
<region> sample=Add Partials 01-32 (5th).wav xfin_lovel=50 xfin_hivel=70 xfout_lovel=75 xfout_hivel=95  
<region> sample=Add Partials 01-32 (6th).wav xfin_lovel=75 xfin_hivel=85 xfout_lovel=100 xfout_hivel=120  
<region> sample=Add Partials 01-32 (7th).wav xfin_lovel=100 xfin_hivel=120
```

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If you've got the waveforms, then you can take this text and drop it into a blank sfz file and you're good to go. This sfz file should be located at the same level as the waveform category folders. You can drop it into the Additive - Partial N Folder, in which case, remove the `default_path=Additive - Partial N\ opcode`.

## Digital Sound Factory Volume 1: Dimension Piano Expansion Pack

Timothy Swartz, who was the sound design guru at EMU for over 20 years, is the brains behind Digital Sound Factory.

Digital Sound Factory Volume 1 features a new 520MB Yamaha C5 piano soundset with over 200 programs which use multiple velocities of pedal up, pedal down, and key up in an attempt to preserve the acoustic harmonic content.

## Rapture Expansion Packs 1 and 2 from Cakewalk

Rapture Expansion Pack 1 and 2 are free to download for registered users.

Expansion Pack 1 includes over 350 sound programs and more than 110MB of new samples and wavetables. The pack was developed by Nico Hertz of BigTone Studios, Chad Beckwith, and René Ceballos.

Expansion Pack 2 includes 350 sound programs and more than 140MB of new multi-samples (including sample content from Nucleus SoundLab). The pack was developed by Frank Genus from Pro-Sounds ([www.pro-sounds.net](http://www.pro-sounds.net)) and René Ceballos.

## Biolabs Volume1

Biolabs Volume 1 is a Rapture Expansion Pack containing 250 programs from Biomechanoid (Colin, as his mother calls him) with a 230 MB sample library. The pack is available from [project5.com](http://project5.com). You can read more about Biomechanoid at [www.biolabsaudio.com](http://www.biolabsaudio.com).

## Nucleus SoundLab

As well as providing some of the soundset content for Rapture Expansion Pack 2, Nucleus SoundLab has also made two packs of soundsets available which you can pick up from [project5.com](http://project5.com). You can read more about Nucleus SoundLab at [www.nucleus-soundlab.com](http://www.nucleus-soundlab.com).

## Viral Outbreak Volume 1

Viral Outbreak Volume One is the first in a series of sample libraries based on the sounds of the Virus TI synthesizer.

## Ambient Drums

Ambient Drums is focused on atmospheric and otherworldly percussion sounds of all variations. Resynthesis, wavetable, granular, convolution and more methods were used in product development.

Update to Chapter 15

# dimension, dimension le, and dimension pro sampling synthesizers

With SONAR Home Studio 6XL and Project5 version 2.5, Cakewalk has introduced a new synthesizer, Dimension LE.

I could spend a lot of time trying to describe Dimension LE, and I will later in this chapter, however, for now, let me cut to the chase. Dimension LE is Dimension Pro with a different interface and a reduced sample library.

Dimension LE's interface (see Figure 15.22) is much smaller than Dimension's and Dimension Pro's interfaces. The key difference with the Dimension LE interface is that many of the editing controls—in particular, the envelopes, the LFOs, the EQs, and the Element FX units—cannot be accessed from the interface.



**Figure 15.22** Dimension LE which comes with SONAR Home Studio 6XL and Project5 version 2.5.

## What's So Good About Dimension LE?

At this point you might be wondering why you would use Dimension LE. There are several compelling reasons:

- Dimension LE is a very highly specified piece of kit which creates very high quality sounds. Remember, LE uses the same Expression Engine (that is the sfz engine) that is present in Dimension Pro, so from a sonic perspective, there is no difference between the two (except on rendering as LE does not have the sinc interpolation option).
- LE comes with a wide range of high quality programs taken from Dimension Pro. As well as being accessible from the Program Browser, these programs are also accessible from the Presets drop-down menu.
- If you don't have Dimension Pro, then Dimension LE gives you access to sfz files with embedded rhythm data which can be drag-and-dropped into your sequencer.
- Although LE may look like a big preset machine, if you're prepared to get your hands dirty and craft your own sfz files (in the book, see Chapter 17: The sfz Format, and The sfz Format Opcode Listing in appendix A), you will find that LE is as powerful and controllable as Dimension Pro.
- If you've got Project5 version 2.5 (and don't have Project5 version 2.0), then it's your only choice since Dimension LE is now included rather than Dimension.

## Getting to Know Dimension LE

I will talk about some of the differences between the Dimension editions in a moment, but for now I want to have a quick look around Dimension LE. Instead of repeating all of the material in the book, let me instead refer you to the appropriate places.

- **Dimension LE's architecture.** The signal flow through LE is the same as that through Dimension and Dimension Pro which is detailed on pages 265 to 267. However, Dimension LE does not have the multi-timbral option that is offered by its two larger siblings.
- **Program Browser.** The Program Browser in LE works like the browser in Dimension and Dimension Pro. Check out details on pages 267 to 269. Dimension LE can load Dimension and Dimension Pro programs, provided the soundsets referenced by the programs are available.
- **Working with Elements.** Dimension LE offers the same utilities (such as Load and Reset) that are used to control Elements in the two other Dimensions. Details of the controls and utility functions are set out on pages 269 to 271.
- **Multi-Sample section.** The Multi-Sample section in Dimension LE looks the same as those in Dimension and Dimension Pro. The only functional difference is that the Loading Mode and Polyphony cannot be controlled from the interface. Instead, these two items display the settings in any loaded program. Pages 271 to 273 detail the operation of the Multi-Sample section.
- **LoFi section.** The LoFi section in LE is the same as that in Dimension and Dimension Pro which is described on page 274.
- **Filter section.** The Filter section in LE is the same (and offers the same filters) as that in Dimension and Dimension Pro. The Filter section and the filters are described on pages 274 and 275.

- **Drive section.** The Drive section in LE is the same as that in Dimension and Dimension Pro. Further details are contained on pages 275 and 276.
- **Master FX.** Like Dimension and Dimension Pro, there are two master FX units in Dimension LE—the Modulation FX and the Reverb FX. These are detailed on page 293. As Dimension LE is based on Dimension Pro, it offers the wider range of Reverb FX units that is available in Dimension Pro.
- **Program Handling.** The Program Handling button (and the underlying functionality) which is described on page 294 works for Dimension LE in the same way that it works for Dimension Pro.

If you are familiar with Dimension or Dimension Pro, you will find Dimension LE second nature.

## Key Differences between Dimension LE, Dimension, and Dimension Pro

I've mentioned some of the differences between the synthesizers already. Table 15.2 now sets out the differences between Dimension, Dimension Pro, and Dimension LE in much greater detail.

**Table 15.2** *The key features of, and differences between, Dimension LE, Dimension, and Dimension Pro.*

	<b>Dimension LE</b>	<b>Dimension</b>	<b>Dimension Pro</b>
<b>Availability</b>	Included with SONAR Home Studio 6XL and Project5 version 2.5	Included with Project5 version 2	Available for purchase from Cakewalk and music stores
<b>Formats</b>	DXi, VSTi, and RTAS	DXi	DXi, VSTi (Windows and Mac), RTAS, and Audio Units
<b>Data</b>	150MB of samples included (with Project5 version 2.5), 800MB with SONAR Home Studio 6XL (which includes the Garritan Pocket Orchestra)	3GB	7GB (including the Garritan Pocket Orchestra)
<b>User Interface</b>	Smaller with restricted functionality (see "Dimension LE Interface" section, later in this note)	Full	Full
<b>Element FX Units</b>	24 Element FX Units (not accessible through user interface)	15 Element FX Units (accessible through user interface)	24 Element FX Units (accessible through user interface)
<b>Modulation Master FX Unit</b>	Chorus, Symphonic, Phaser, Chorus/Phaser	Chorus, Symphonic, Phaser, Chorus/Phaser	Chorus, Symphonic, Phaser, Chorus/Phaser
<b>Reverb Master FX Units</b>	Seven options: Small Room, Mid Room, Large Room, Small Hall, Mid Hall, Large Hall, and Chamber	Two options: Hall and Room	Seven options: Small Room, Mid Room, Large Room, Small Hall, Mid Hall, Large Hall, and Chamber
<b>MIDI Learn</b>	Yes	No	Yes
<b>Loads Dimension Programs</b>	Yes (subject to waveforms used by program being available—if the waves are not available, the program may not load properly)	Yes	Yes

	<b>Dimension LE</b>	<b>Dimension</b>	<b>Dimension Pro</b>
<b>Loads Dimension Pro Programs</b>	Yes (subject to waveforms used by program being available)	No	Yes
<b>REX Support</b>	Yes	No	Yes
<b>Drag and Drop Groove Programs</b>	Yes	No	Yes
<b>Multi-Timbral Option</b>	No	Yes	Yes
<b>Sinc Interpolation on Render Option</b>	No	Yes	Yes
<b>Vector Mixer</b>	No	Yes	Yes
<b>MIDI Matrix</b>	Not accessible from user interface, however, any modulations set up in loaded programs are recognized	Yes	Yes
<b>Microtuning and alternate tunings</b>	No	No	Yes

## Dimension LE Interface

There are many features of Dimension LE which are not accessible from the user interface, but as noted above, these features can still be accessed and controlled by using sfz files.

However, while these features may not be directly accessible, they are stored as part of any program, so if you load a Dimension or Dimension Pro program in Dimension LE, the feature will still function even though you can't control it through the user interface.

The features which are present in Dimension LE but are not accessible on the Dimension LE interface—and which are accessible on the Dimension/Dimension Pro interfaces—are set out below.

- **EQ Sections.** There is no direct access to each Element's EQ section.
- **Element FX Sections.** There is no direct access to each Element's FX section.
- **Modulators Sections.** There is no direct access to:
  - Envelope Generators
  - LFOs
  - Key Tracking
- **MIDI Matrix.** There is no direct access to the MIDI Matrix settings (and hence no MIDI matrix button that is present in Dimension and Dimension Pro).
- **Multi-Sample Section.** In the Multi-Sample section, the following items cannot be controlled from the interface. These items are display settings stored with the program:
  - Loading Mode, and
  - Polyphony

## Programs that Accompany the Book

Dimension LE can load the Dimension/Dimension Pro programs which accompany the book (see Appendix B for details). However, these programs were designed to work with Dimension and/or Dimension Pro. Due to the limitation of the soundsets supplied with Dimension LE, many of these programs will not load as intended (and will give an error message).

# Update to Chapter 16

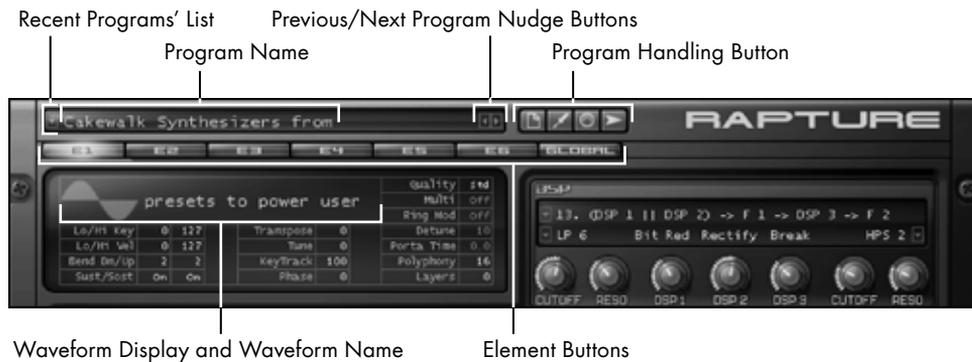
## rapture wavetable synthesizer

Rapture 1.1 introduces a wealth of new features which are discussed below. The Rapture engine has also been optimized in version 1.1 for faster load times and reduced memory usage.

### Changes to the Program Loading Process

See page 302 and the following pages.

In Rapture version 1.1 Previous/Next buttons have been added to the right of the Program's name (see Figure 16.3) to allow you to nudge up and nudge down through programs.



**Figure 16.3** To open the Program Browser, click on the Program's name. To select an Element, click on the corresponding Element button. To load a wave in an Oscillator, click on the wave's name. The new previous/next buttons introduced in version 1.1 are to the right of the Program's name.

## Changes to the Oscillator Loading Process

See page 306 and the following pages.

In Rapture version 1.1, you can now scroll through waves in the Oscillator section with your mouse wheel by holding your cursor over the waveform image or the name of the wave and scrolling up or down.

## Enhancements to the DSP Block

See page 309 and the following pages.

Perhaps the most radical changes introduced by version 1.1 are in the DSP block (see Figure 16.9). There are new DSP and filter routing options, new DSP transforms, and new filters.

**Figure 16.9**

The new DSP block in Rapture.



## Enhancements to the Signal Flow in the DSP Block

With Rapture 1.1, the number of DSP signal flow options has been increased from four to 14. These new routings include the option for parallel routings so that the signal can be separately processed by two DSP units. Figure 16.10 shows the new routing options.

With the increased number of DSP signal routing options, the routings can be accessed from a drop-down menu selected by clicking on the arrow to the left of the display showing the currently selected loading options. You can, of course, still left-click and/or right-click on the currently selected routing option to cycle through the algorithms.

One other change with the signal flow is that the Bit Reducer/Decimator has been split into two separate components so that each can be individually placed individually in the signal chain. With this separation, the number of DSP units has increased from two to three (DSP 1, DSP 2, and DSP 3).

## New DSP Transformations

As well as the Bit Reducer/Decimator being split into two separate units, six new transformations have been added:

- Soft Clip
- Hard Clip
- Warp
- Break
- Rectify
- Width

With the exception of Width, these all add different qualities of distortion.

00

Bypass

01



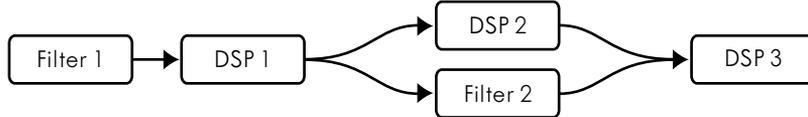
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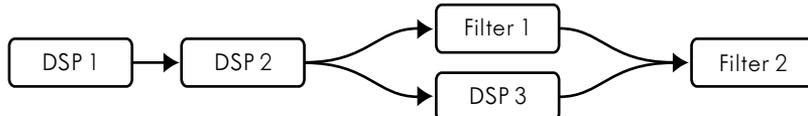
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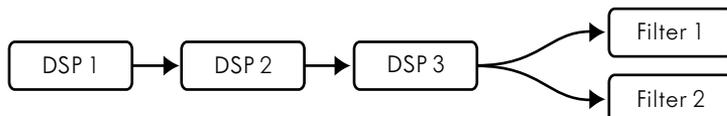
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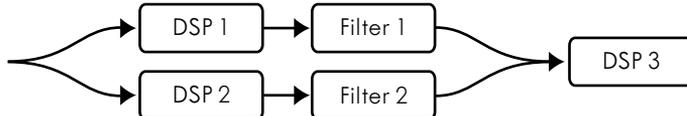
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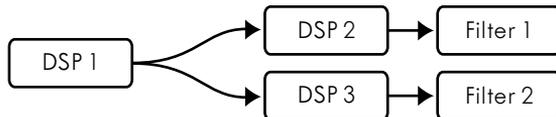
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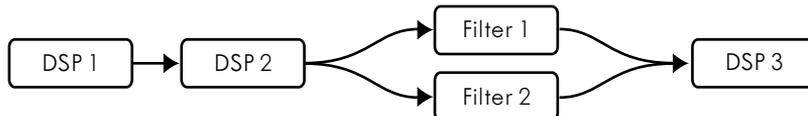
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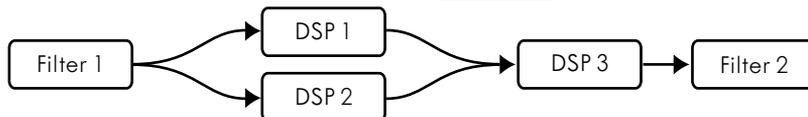
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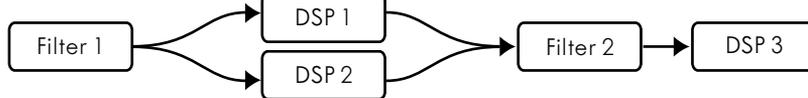
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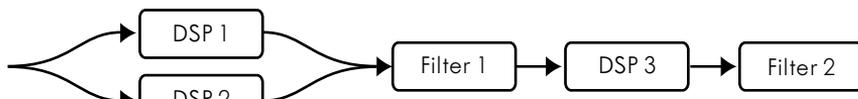
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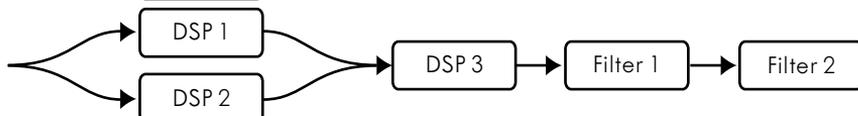
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13



14



**Figure 16.10**  
The 14 options for the DSP signal flow in Rapture.

The Width control is intended to adjust the stereo spread of an oscillator whether that be a stereo sample or Multi detuned wave which gets spread across the stereo spectrum as Figure 16.8 (in the book) illustrates. The Width DSP allows you to narrow the stereo field so that the output can fit in a mix. This DSP unit has no effect on mono waves.

To select the DSP transformation, left-click or right-click on the name of the currently selected unit to cycle up or down through the options: you will see that the new options have been included with the existing choices.

## New Filters

Rapture 1.1 has introduced four new state-variable filter options:

- **LPS 2.** A two pole (12dB/octave) low-pass state-variable filter.
- **HPS 2.** A two pole (12dB/octave) high-pass state-variable filter.
- **BPS 2.** A two pole (12dB/octave) band-pass state-variable filter.
- **BRS 2.** A two pole (12dB/octave) band-reject (notch) state-variable filter.

These new filters can be selected from the filter drop-down menu (see Figure 16.11).

**Figure 16.11**  
The Filter drop-down menu in Rapture.



These new filters offer a different tonal characteristic to their non-state-variable counterparts: to my mind, they sound slightly “thinner” (which may, or may not, be a good thing, depending on the sound you are after). However, please do feel free to disagree with my assessment of the filters and make up your own mind as to how they sound.

## Enhancement to the Modulators Section

See page 312.

In Rapture 1.1, the Modulators section looks slightly different (see Figure 16.12).



**Figure 16.12** The Modulators section in Rapture.

The Sync options (which have also been added to the Envelope Generators) are selectable from a drop-down menu (see Figure 16.12a). You can still cycle through the sync settings by left-clicking or right-clicking on the currently selected value.



**Figure 16.12a**  
The new Modulators' section drop-down sync menu (in this case, the envelope sync drop-down).

## Enhancements to the Envelopes

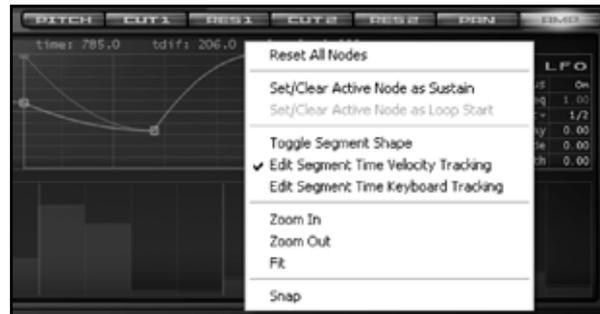
See "Modulation Sources: Envelopes" on page 313 and the following pages.

The Nodes in each of the envelopes can be synchronized to the tempo of the host. To synchronize the Nodes, select the beat division from the Sync drop-down in the controls on the left-hand side of the envelope. The selected beat division will then be applicable to all Nodes in that Envelope Generator.

The available beat divisions are 128, 64, 32, 16, 8, 4, 2, 1, 1/2, 1/4, 1/8 beats, plus all triplet and dotted values.

Nodes can then be snapped to these sync divisions. To engage snap mode, either hit P on your computer keyboard, or select Snap from the envelope pop-up menu (see Figure 16.15) which you can access by left-clicking on the Node value display.

**Figure 16.15**  
The envelope pop-up menu in Rapture.



## Enhancements to the Step Generators

See "Modulation Sources: Step Generator" on page 317 and the following pages.

There have been enhancements to the Step Generator in several areas.

### New Step Generator Modes

Two new modes have been added to the Step Generator: Shot mode and Step mode:

- **Shot mode.** When Shot mode is activated, the Step Generator will play all of the defined Step values once only, and then stop.
- **Step mode.** When Step mode is activated, the Step Generator will play through the defined Step values on successive note-on events

You can cycle through the modes by left-clicking or right-clicking on the current Status.

### New Step Generator Options

New options have been added to the Step Generator menu which is accessed by right-clicking on the steps (see Figure 16.16).



**Figure 16.16** The Step Generator options menu (in this case, the Amp Step Generator menu).

The new options are:

- **Normalize Step Levels.** This option expands the dynamics for the current Step Generator pattern to fit in the maximum level range of that Generator.
- **Copy Shape from LFO.** This option copies the LFO shape from the currently selected Modulator into the Step Generator.
- **Extract Shape from Sample File.** This option calculates the amplitude envelope of any sample file, and sets the selected Step Generator accordingly.

## Enhancements to the Utilities Functions in Rapture

See pages 332 and 333.

A new option has been added to the Program Handling button: Browse Programs... (see Figure 16.24). When you select this option, it opens a Windows Explorer window (or MAC equivalent window which gives you file management capabilities) so you can browse through your programs and rearrange them. You can also load programs by dragging and dropping programs from the Explorer browser onto Rapture's interface.



**Figure 16.24**  
The Program Handling menu  
in Rapture.

If you mess with your programs (perhaps you decided to re-categorize your Program files), please remember to open your Program Browser and refresh it (press F5) in order to ensure your changes can be seen in the Program Browser.

This is a great feature if you want to load the Rapture programs that come with the book (which are described in Appendix B to the book). To load the programs (or any other Rapture format programs):

- Select Browse Programs... from the Program Handling menu. A Windows Explorer window (or Mac equivalent) will open.
- Create a new folder (if you want to keep your new programs together).
- Open the new folder and copy your programs into the folder. Then close the Windows Explorer window.
- Open the Program Browser and hit F5 to refresh the view.

Your programs are now available for use.

## Enhancements to the Hardware Control and MIDI Learn Functionality

See "Using Hardware: MIDI Learn" on pages 252 and 253.

The MIDI learn functionality has been enhanced in Rapture version 1.1 and is now consistent with the functionality offered in Z3TA+ version 1.5.

To invoke the hardware control/MIDI learn functionality, right-click on a control. A menu with four options will appear as shown in Figure 16.25.



**Figure 16.25**  
The initial hardware control/  
MIDI learn menu in Rapture.

### MIDI Learn and Assigning Hardware Control

There are two ways to train Rapture to respond to your MIDI hardware:

- 1 Right-click on the function you want to control
- 2 Choose MIDI Learn
- 3 Move the corresponding control on your hardware that you want to control the function in Rapture

Alternatively:

- 1 Right-click on the function you want to control
- 2 Choose Add MIDI Control
- 3 Select an appropriate MIDI CC (MIDI control code) that corresponds to the MIDI CC output by the control on your hardware that you want to use to control the selected function

One new feature in version 1.1 is that you can assign more than one hardware control to a function so you can control a slider from several controls. To assign a second controller, simply repeat the process set out in this section (in other words, use MIDI learn or Add MIDI control).

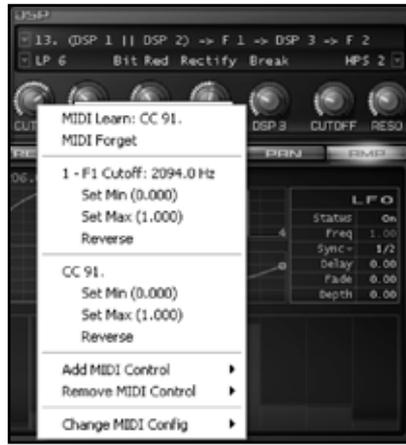
Another new feature of version 1.1 is that you can control the X-Y Pad with MIDI through MIDI learn. Just right-click on the X-Y Pad, select X MIDI Learn or Y MIDI Learn, and you're good to go: there is no option to Add MIDI Control on the X-Y Pad.

## Controlling Hardware Assignments

Once you have assigned a hardware controller to control a slider, you can set how that controller and the slider interact.

If you right-click on a slider that has hardware assigned to it you will see a menu similar to that shown in Figure 16.26. As you will see, the menu is divided into five sections. I want to look at the second and the third sections (that is the F1 Cutoff and CC91 sections in the Figure).

**Figure 16.26**  
The MIDI hardware control menu in Rapture when a hardware controller has been assigned to a slider.



In each of the two sections, there are three options:

- **Set Min.** This sets the minimum value of the controlled destination when the hardware controller is at its minimum. So, for instance, when your hardware is set at zero, the slider could be set at 25%.
- **Set Max.** This sets the maximum value of the controlled destination when the hardware controller is at its maximum.
- **Reverse.** This reverses the operation of the hardware controller, so when your hardware is set at its maximum, the destination will be at its minimum and vice versa.

You can set the minimum, the maximum, and the reverse feature for either the function in Rapture or your MIDI hardware controller. This means that if you assign more than one hardware controller you could have one controller that operates over a wide range and another that operates over a narrow range.

In the X-Y Pad (see Figure 16.27) you can:

- Set X Min
- Set X Max
- X Reverse
- Set Y Min
- Set Y Max

- Y Reverse.



**Figure 16.27**  
Setting the MIDI hardware control parameters in the X-Y Pad.

Since there is no option to assign a specific MIDI CC, there is no option to set the minimum, maximum, and reverse for individual MIDI CCs.

## Removing Hardware Assignments

MIDI hardware assignments can be removed either individually or for all assignments to a function.

- To remove all hardware assignments, right-click on the function to be unassigned, and select MIDI Forget from the menu. All hardware assignments will be removed.
- To remove individual hardware assignments to the function, right-click on the function, and select Remove MIDI Control from the menu. This will give you a list of the MIDI CCs of each of the controls assigned. Select the assignment you wish to remove, and repeat the process if you want to remove more than one assignment.

With the X-Y Pad you have the option to MIDI Forget the X or Y controller.

## MIDI Configurations

Rapture offers up to ten different user definable MIDI configurations. This allows you to use Rapture with different hardware set-ups without having to remap every control.

To select a different hardware configuration, right-click on any destination, and select Change MIDI Config from the menu. You can then select the appropriate MIDI configuration.

There are three other options you can select under the Change MIDI Config option:

- **Reset.** This option will remove all MIDI assignments as if you had performed a MIDI forget operation on all of the functions individually.
- **Copy.** This option will copy the current MIDI configuration.
- **Paste.** This option will paste a copied MIDI configuration.

## Rapture LE

With SONAR 7, Cakewalk has included Rapture LE which is Rapture 1.1 with a different (smaller) interface (see Figure 16.28). The key difference with the Rapture LE interface is that many of the editing controls – in particular, the envelopes, the LFOs, the EQs, the FX units, and the Global page – cannot be accessed from the interface.



**Figure 16.28** Rapture LE which comes with SONAR 7.

Rapture LE comes with a wide range of high quality programs taken from Rapture. Although it may look like a big preset machine, if you're prepared to get your hands dirty and craft your own sfz files (in the book, see Chapter 17: The sfz Format, and The sfz Format Opcode Listing in appendix A), or you're happy to use SONAR's automation controls, then you will find that LE is as powerful and controllable as Rapture.

## Getting to Know Rapture LE

Instead of repeating all of the material in the book, let me instead refer you to the appropriate places to introduce Rapture LE.

- **Rapture LE's architecture.** The signal flow through LE is the same as that through Rapture which is detailed on pages 300 to 302. However, Rapture LE does not have the multi-timbral option available in Rapture.
- **Program Browser.** The Program Browser in LE works like the browser in Rapture. Check out details on pages 302 and 303. Rapture LE can load Rapture programs provided the soundsets referenced by the programs are available.

- **Working with Elements.** Rapture LE offers the same utilities (such as Load and Reset) that are used to control Elements in Rapture. Details of the controls and utility functions are set out on pages 304 to 306.
- **Oscillators section.** The Oscillators section in Rapture LE looks the same as that in Rapture, however, apart from the oscillator loading function, the controls are not accessible from the interface and the section only displays the oscillator settings in the program. Pages 306 to 309 detail the operation of the Oscillator section in Rapture (and explains what the display in LE shows).
- **DSP section.** The DSP section in LE is the same as that in Rapture which is described on pages 309 to 312.
- **Step Generator.** Each Element has a Step Generator which works like the Element Step Generators that are discussed on pages 317 to 319.
- **Program Handling.** The Program Handling button (and the underlying functionality) which is described on page 332 works for Rapture LE in the same way that it works for Rapture.

There are many features of Rapture LE which are not accessible from the user interface, but these features can still be accessed and controlled by using sfz files or through using SONAR's automation controls. While these features may not be directly accessible, they are stored as part of any program, so if you load a Rapture program in Rapture LE, the feature will still function even though you can't control it through the user interface.

The features which are present in Rapture LE but are not accessible on the interface—and which are accessible on the Rapture interface—are set out below.

- **EQ Sections.** There is no direct access to each Element's EQ section.
- **Element FX Sections.** There is no direct access to each Element's FX section.
- **Modulators Sections.** There is no direct access to:
  - Envelope Generators
  - LFOs
  - Key Tracking
- **MIDI Matrix.** There is no direct access to adjust the MIDI Matrix settings (and hence no MIDI matrix button that is present in Rapture).
- **Vector Mixer.** The Vector Mixer cannot be accessed (and cannot be controlled) from the Rapture LE Interface
- **Global Page.** The Global Page (with the Global FX units, Global Step Generators, Master EQ, and Master FX controls) cannot be directly accessed.

Further Reading

# an unapologetic plug

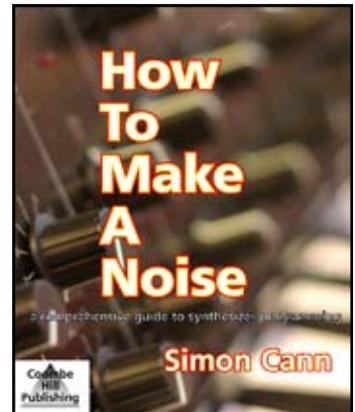
I can't leave an Update like this without mentioning some of my other books. If you haven't already checked them out, can I suggest that you have a look at them.

## How to Make a Noise: A Comprehensive Guide to Synthesizer Programming

ISBN-10: 0955495504, ISBN-13: 978-0955495502

How to Make a Noise is a comprehensive, practical guide to sound design and synthesizer programming techniques using:

- subtractive synthesis
- FM and phase modulation synthesis
- additive synthesis
- wave sequencing
- sample-based synthesis



The book looks at programming using examples from six software synthesizers: Cameleon 5000 from Camel Audio, Rhino 2 from BigTick, Surge from Vember Audio, Vanguard from reFX, Wusikstation from Wusik dot com, and Z3TA+ from Cakewalk.

For further details, go to [www.noisesculpture.com/htman](http://www.noisesculpture.com/htman)

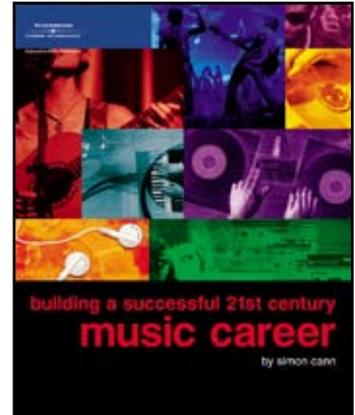
Cakewalk Synthesizers: From Presets to Power User  
Update#2: September 2007

## Building a Successful 21<sup>st</sup> Century Music Career

ISBN-10: 1598633708, ISBN-13: 978-1598633702

Building a Successful 21<sup>st</sup> Century Music Career is about how you can proactively start and manage your own music career so that you can earn your living through making music—whether as a musician playing pop, rock, soul, R&B, classical or any other style of music; as a songwriter or composer; or as a producer.

For further details, go to [www.noisesculpture.com/c21](http://www.noisesculpture.com/c21)



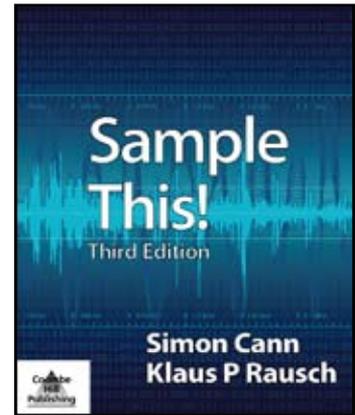
## Sample This!! (Third Edition)

Written with Klaus P Rausch. ISBN-10: 0955495512, ISBN-13: 978-0955495519  
(available from 1 November 2007)

Sample This!! is a practical guide for musicians about using samplers to make music.

It has been written both for experienced musicians who are looking to expand their understanding of how to use the most modern tools that are available to them and for first time users of samplers.

For further details, go to [www.noisesculpture.com/st](http://www.noisesculpture.com/st)



And Finally...

# additional notes to, and errors in, the first print run

I tried to catch all the errors in *Cakewalk Synthesizers: From Presets to Power User* before it was published; however, unfortunately a few crept through. The changes to the first print are noted below.

Page 13, paragraph 2, line 6: change “Asio4, all of” to “ASIO4ALL”.

Page 26, figure 2.18 (label on figure): change “untill” to “until”.

Page 55, paragraph 2, line 2: delete “The envelopes that departed most from that theme were included in DS864 (see Chapter 11, “DS864 Sampler”).”

Page 56, paragraph 6, line 2: change “In Rapture, the only Cakewalk synthesizer to” to “In DropZone, Dimension/Dimension Pro, and Rapture, the Cakewalk Synthesizers that”

Page 58, paragraph 10, line 6: change “for pad” to “for a pad-type program”.

Page 71, paragraph 2, line 4: change “synthesizer: Rapture” to “synthesizers: Rapture and Session Drummer 2”.

Page 261, paragraph 5, line 4: delete “However, two areas that are notably different in the two chapters are the sound design sections.”

Page 275, bullets 1 and 2: change “6 pole (24dB/octave)” to “6 pole (36dB/octave)”.

Page 290, paragraph 2, line 3: change “destination very” to “destination in very”.

Page 297, paragraph 2, line 4: delete “One area that is notably different in the chapters is the sound design section.”

Page 297, paragraph 5: Since the publication of this book, Expansion Pack 2 has been released. The pack includes 350 new professional sound programs by Frank Genus and René Ceballos and 140 MB of new wavetables and multi samples.

Page 305, bullet 7: change “Many options are available from drop down menus. For instance, the filter type—access a drop down menu by clicking on an arrow.” to “Many options are available from drop-down menus, for instance, the filter type. Where you see an arrowhead you will find a drop-down menu accessed by clicking on the arrow.”

Page 311, bullets 1 and 2: change “6 pole (24dB/octave)” to “6 pole (36dB/octave)”.

Page 312, Figure 16.12: change “Dimension Pro” to “Rapture”.

Page 328, paragraph 2, line 3: change “destination very” to “destination in very”.

Page 337, chapter 17. It should be noted that at the time of publication some of the newest sfz features (such as the FM, PM, and RM features and all of the effects units) have yet to be implemented into Cakewalk Synthesizers and so these opcodes may not work at present.

Page 347, chapter 17, line 9: change “4,000” to “3,000”.

Page 368, paragraph 4, line 1: delete “DropZone, ”.

Page 391, xfout\_lovel= and xfout\_hivel= opcodes: change xfout\_lokey and xfout\_hikey to xfout\_lovel and xfout\_hivel as appropriate.

Download chapter 16 (Power Users at Work), page 196: If there are problems with Patch Arena, Francesco Silvestri’s Z3TA+ mods—Virus\_z3ta+ MOD and Muz3uM—can be downloaded from <http://p5.sonarama.com/p5/index.php/z3ta>.