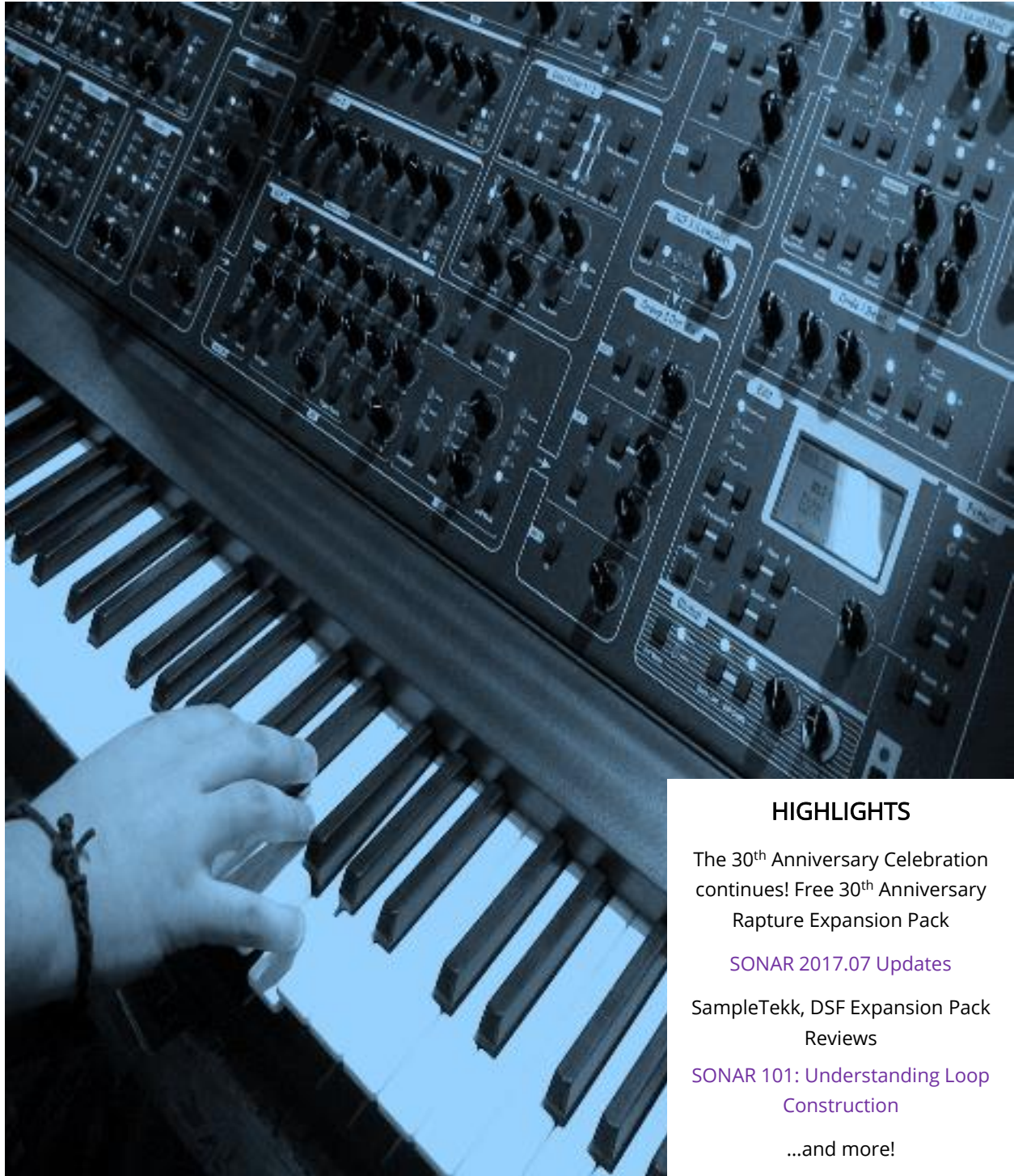# TECH+MUSIC

HIGHLIGHTS

The 30th Anniversary Celebration continues! Free 30th Anniversary Rapture Expansion Pack

SONAR 2017.07 Updates

SampleTekk, DSF Expansion Pack Reviews

SONAR 101: Understanding Loop Construction

...and more!

CONTENTS ISSUE 2017.07

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The following highlights apply to the Artist, Professional, and Platinum versions. For more information on these features, see the related pages.

- **Bus Pane Aim Assist** – Aim Assist has always been available in the Clips pane but not in the Bus pane. As the next step after making Aim Assist available in the PRV's Controller pane so that data from the Controller pane can be lined up easily to the notes in the Piano Roll view, now you can line up automation in the Bus pane to automation or clips in the Clips pane.

- **Recently Used Plug-Ins** – SONAR now keeps track of the five most recently used audio effects and virtual instruments plug-ins. This is not project specific, nor is it dependent on the current layout, so new projects will be able to take advantage of having the last five plug-ins readily accessible. This also means that users who prefer their own plug-in layouts will no longer have to configure layouts for the most commonly used audio effects or virtual instruments.

- **MIDI Ripple Editing Improvements** – Ripple editing has evolved to work better now with MIDI as well as audio data, and now prevents notes from getting deleted or truncated unexpectedly in some ripple edit operations. Also, MIDI clips are no longer split in some situations to help preserve clips that contain long notes.

- **Clip Edit Speed Improvements** – In projects with a large number of split clips, SONAR's graphical performance could slow down depending on the machine. The 2017.07 update improves split clip handling so that you can perform tasks like splitting clips at transients, or copy and paste loops hundreds of times, without any loss of performance.

- **Fixes and Enhancements** – and of course, SONAR just keeps getting better.

INSTALLING THE 2017.07 UPDATE

Open the **Cakewalk Command Center**. If you are prompted to download a newer version, please follow the on-screen instructions to download it.

To download the **SONAR 2017.07** core update, download from the core SONAR Artist, Professional, or Platinum category. Professional and Platinum owners should also update the **Engineering FX Suite** if they haven't yet updated the Adaptive Limiter to version 1.0.5, which offers fixes and enhancements.

Bus Pane Aim Assist

Artist, Professional, and Platinum

Aim Assist draws a vertical line in the Track or Piano Roll Views at the horizontal mouse cursor position. This makes it easy to align clips, automation, transients, and the like that are on different tracks or separated by a substantial vertical distance.

You can turn Aim Assist on or off with the keyboard shortcut X, or by choosing *Edit > Aim Assist.*

In the 2017.06 update, the PRV added the ability for Aim Assist to extend into the Controller Pane. In this update, Aim Assist can now extend into the Bus Pane. In the screen shot on the left, note that the Aim Assist line is lining up a drop in reverb to the start of a drum pattern in Track 1.

Note that you can customize the Aim Assist color. Choose *Edit > Preferences > Customization – Colors* and then in the Color Category list, select Track View. In the Screen Element list, select Aim Assist line. After you specify the desired color, click OK to close the Preferences dialog box.

Recently Used Plug-Ins

Artist, Professional, and Platinum

SONAR now remembers the five most recently used audio effects and virtual instrument plug-ins. Because this isn't project-specific, you can take advantage of this feature when working within any project, or starting a new project.

The five effects or instruments appear at the top of the list of effects or instruments respectively. In this example, the Objeq Delay from A|A|S is being added to a guitar track.
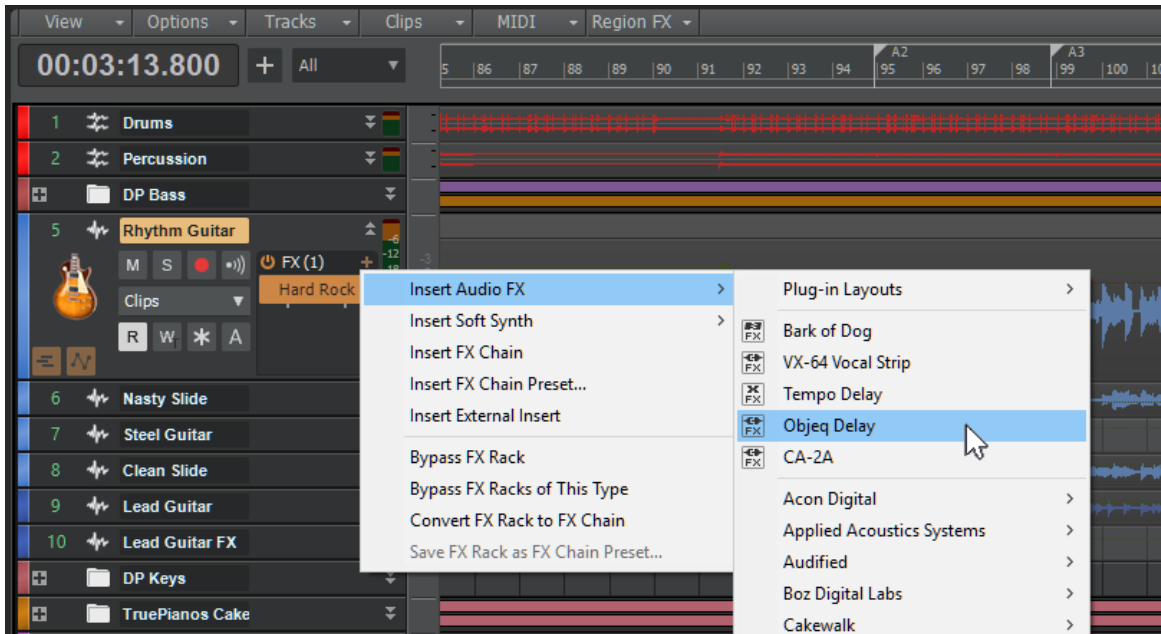
For Advanced Users

Advanced users can modify this list through the Registry, which stores the IDs of the most recently used plug-ins. That way if plug-ins you use rarely are used extensively on a particular project (e.g., restoration tools for a tough project), you can clear the list when you're done with the project. **Please note this is recommended only for extremely advanced users who have first backed up their registry**—mistakes in editing the registry can kill your system. The Registry tree for effects is:

HKEY_CURRENT_USER\Software\Cakewalk Music Software\SONAR\(Version)\Recently Used Plug-ins

For virtual instruments:

HKEY_CURRENT_USER\Software\Cakewalk Music Software\SONAR\(Version)\Recently Used Synths

Clip Edit Speed Improvements

Artist, Professional, and Platinum

In projects with thousands of clips, SONAR's performance can become slower if the machine can't handle the amount of graphics being displayed. Starting with this update, users can perform tasks like split multiple clips at transients, or copy and paste loops hundreds of times, and continue to work in the project without interruptions. These improvements also affect operations such as split, move, undo, redo, ripple edit, as well as zooming and scrolling in projects with many crossfades. Undo of splitting AudioSnap beats is also much faster, and memory usage has been reduced by 75%.

The benchmarks to the right compare differences between the 2016.06 and 2016.07 releases when doing operations with a project that contains 15,941 events (see below).

```
Clip Handling Improvement Benchmarks


Undo Split Clips at Transients

2017.06: 52.3 s
2017.07: 01.0 s
52.3 times faster

Split Clips and Ripple Edit to the Right

2017.06: 75.6 s
2017.07: 06.0 s
12.6 times faster

Undo Ripple Edit All

2017.06: 50.3 s
2017.07: 04.8 s
10.48 times faster

Select All and Drag Clips by 1 Measure

2017.06: 67.8 s
2017.07: 05.5 s
12.32 times faster
```
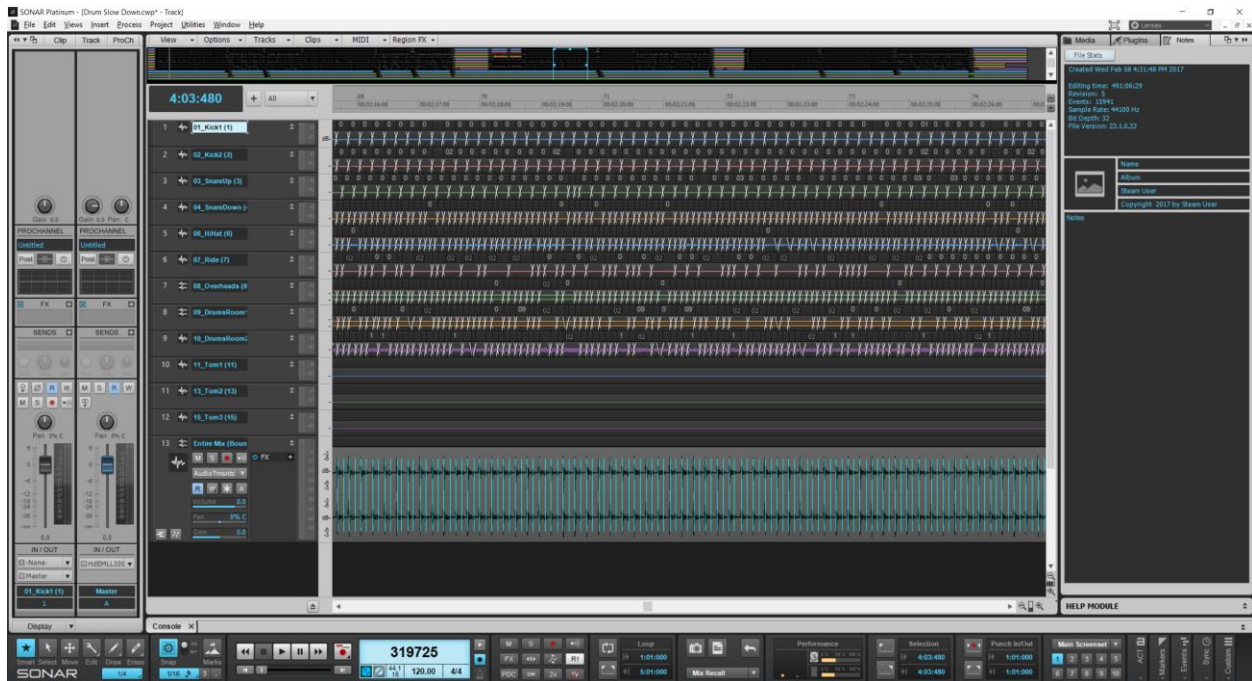
MIDI Ripple Editing Improvements

Artist, Professional, and Platinum

Compared to audio data, Ripple Editing is much more complex with MIDI data—but with the 2017.07 release, MIDI data joins the ripple editing club. Just remember one of the cardinal rules of ripple editing: turn it on before doing the edit (choose *Options > Ripple Edit Selection* or *Options > Ripple Edit All*), and turn it off after the edit so you don't move clips around inadvertently.

Here are some examples of how ripple editing affects MIDI notes with Ripple All selected.

USE CASE #1

The clip marked in red is about to be deleted. Note the selection in the timeline that encompasses measure 6.
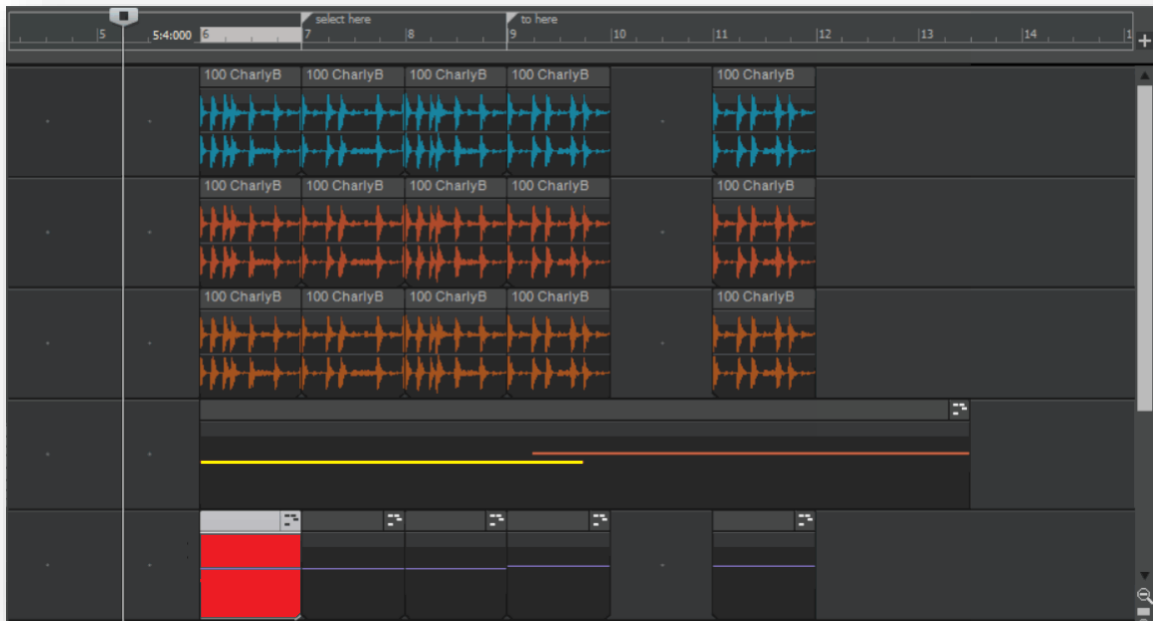
With Ripple Editing Select All, deleting this clip deletes everything in measure 6, so clips that started at measure 7 shift over to the left to start at measure 6. Note that because cutting deletes the start of the MIDI note (colored yellow for clarity), there is no note-on and therefore, cutting removes the note.
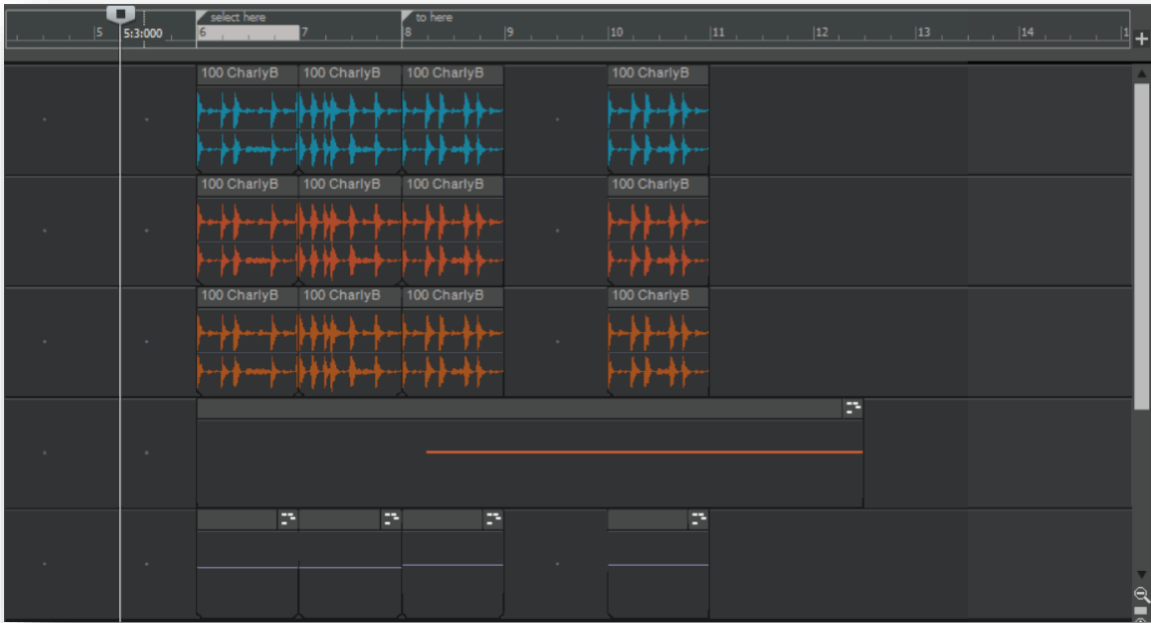
USE CASE #2

In this example, measure 7 has been selected in the timeline and the clip in red is about to be cut. Note the length of the MIDI note highlighted in yellow.
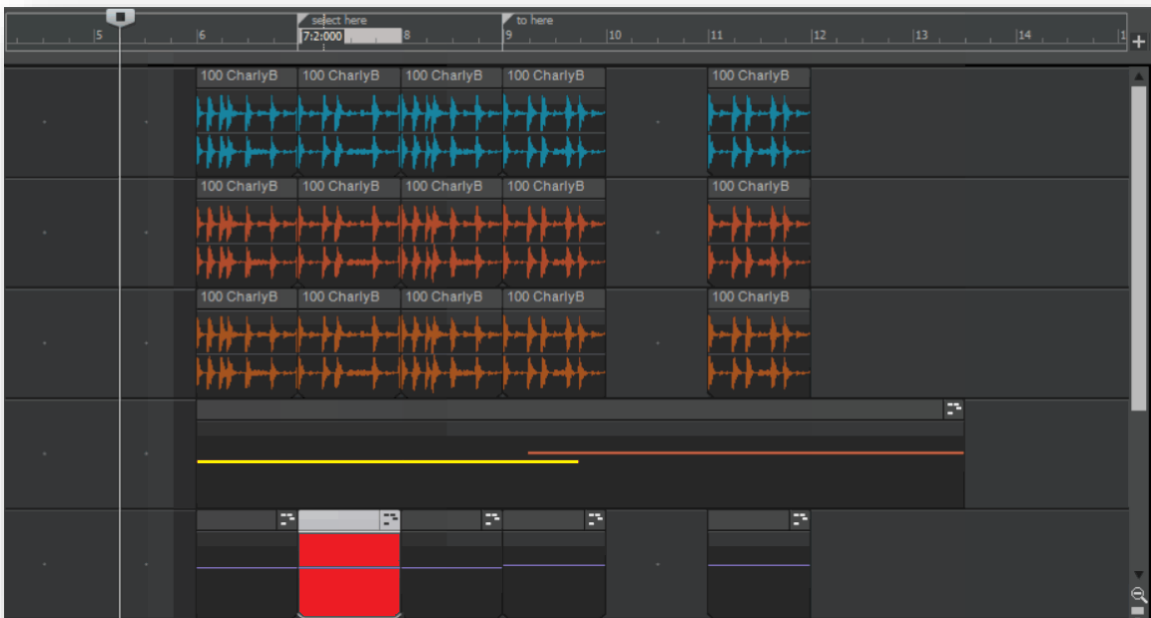
With measure 7 cut, what started at measure 8 now shifts left to measure 7 to fill in the hole. Because the MIDI note's note-on event is not included in the cut, the MIDI note simply becomes shorter. The note would also have been shortened if measure 8 had been cut.
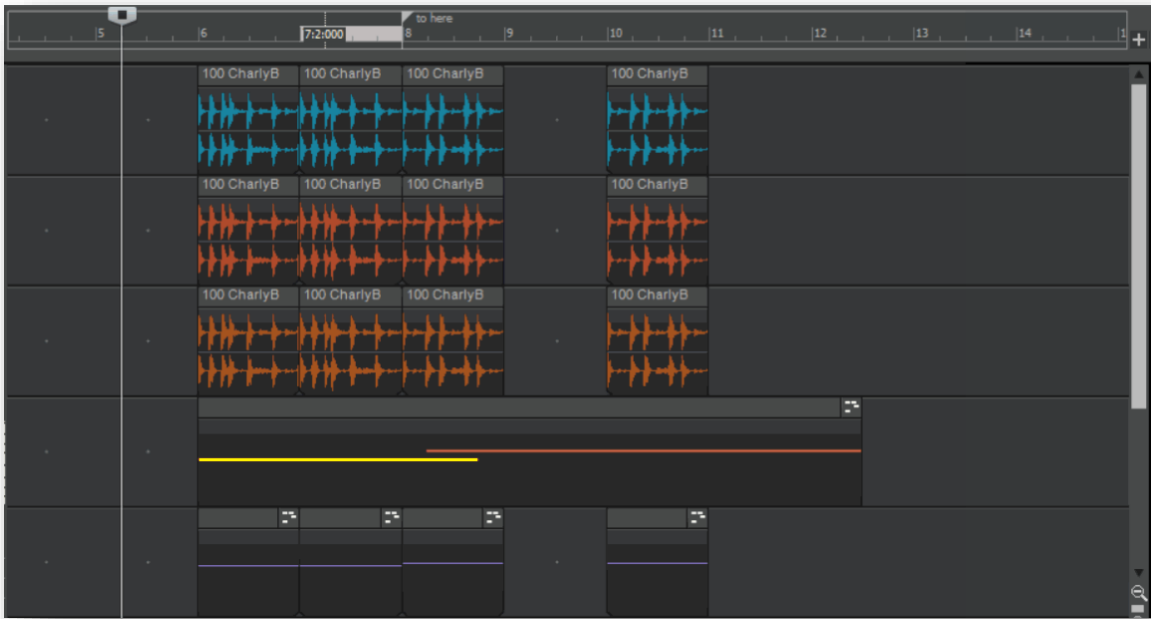
USE CASE #3

The clip highlighted in red is about to be deleted. Note that two MIDI notes are within this region—the end of one long MIDI note, and a note-on event for a second MIDI note.
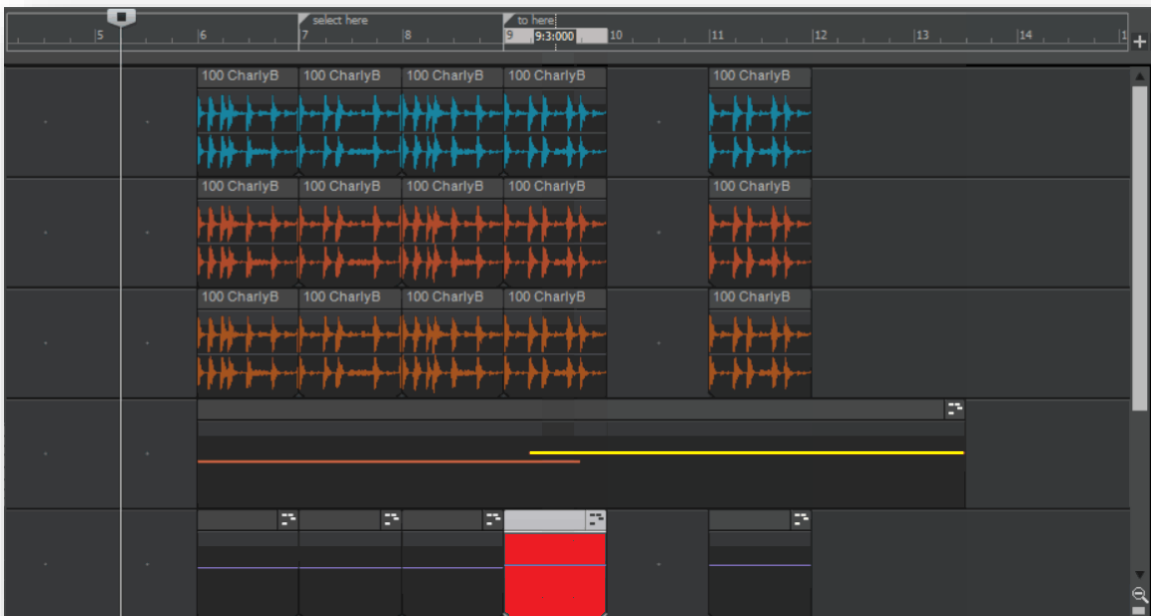
Cutting deletes the part of the first MIDI note that's contained within measure 9, thus shortening it. This also deletes the second note (highlighted in yellow) because its note-on event falls within the region being cut. The audio in measure 11 now starts at measure 10.
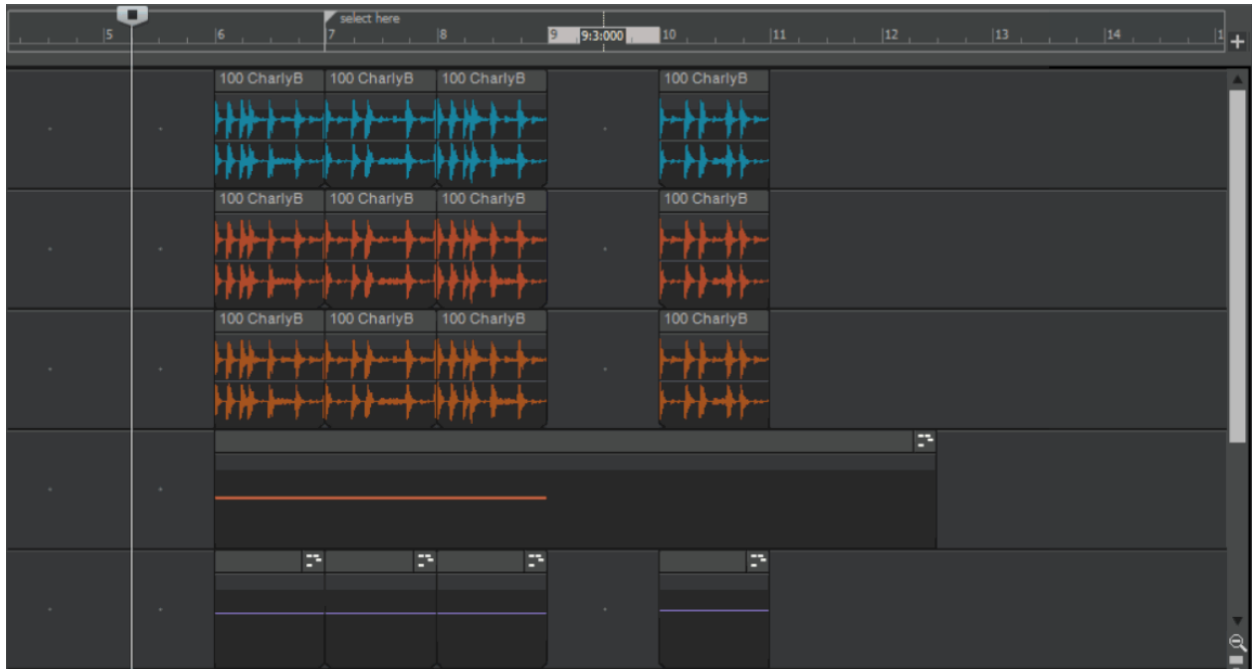
USE CASE #4

The timeline is selecting measure 11, and the clip highlighted in red is about to be deleted. Note the length of the MIDI note highlighted in yellow.
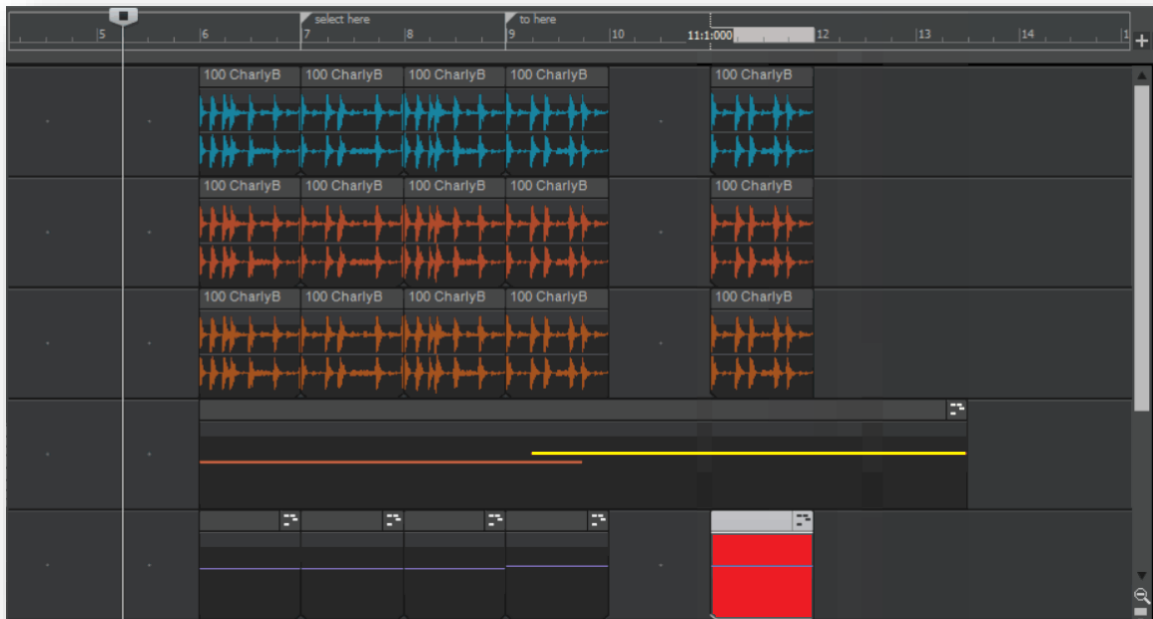
After cutting, all the clips in measure are deleted. However because the MIDI note started before measure 11 and extended past measure 11, it's simply shortened.
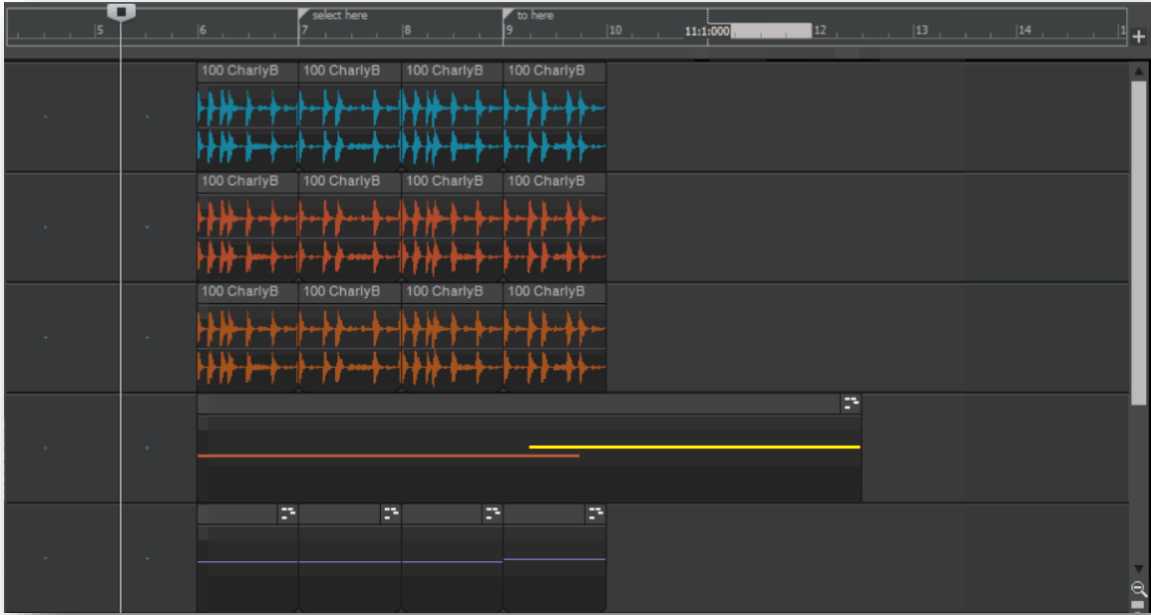
USE CASE #5

Measure 9 is selected in the timeline, and the clip highlighted in red is ready to be moved one measure to the *right.* Note the positions of the MIDI notes highlighted in light blue and yellow.
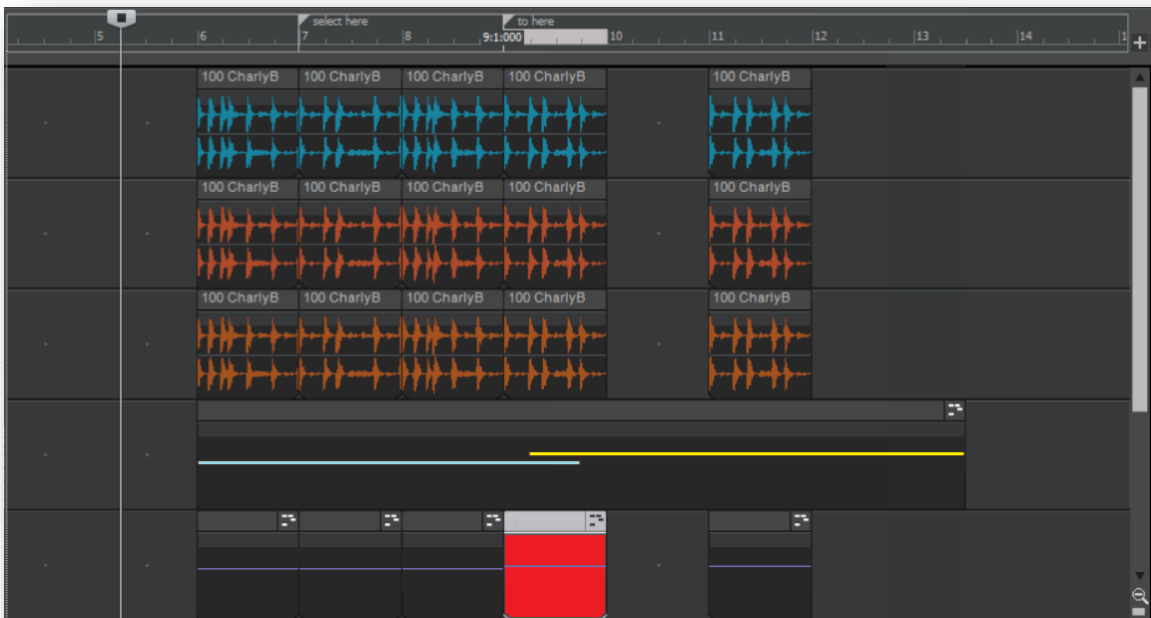
The material that started at measure 9 now starts at measure 11. The yellow MIDI note's note-on was within measure 9, so the note moves along with the other clips. The MIDI note highlighted in blue remains unchanged because there was no cut (moving the MIDI note's end would create a new, and likely unwanted, MIDI note fragment with a note-on in measure 11).
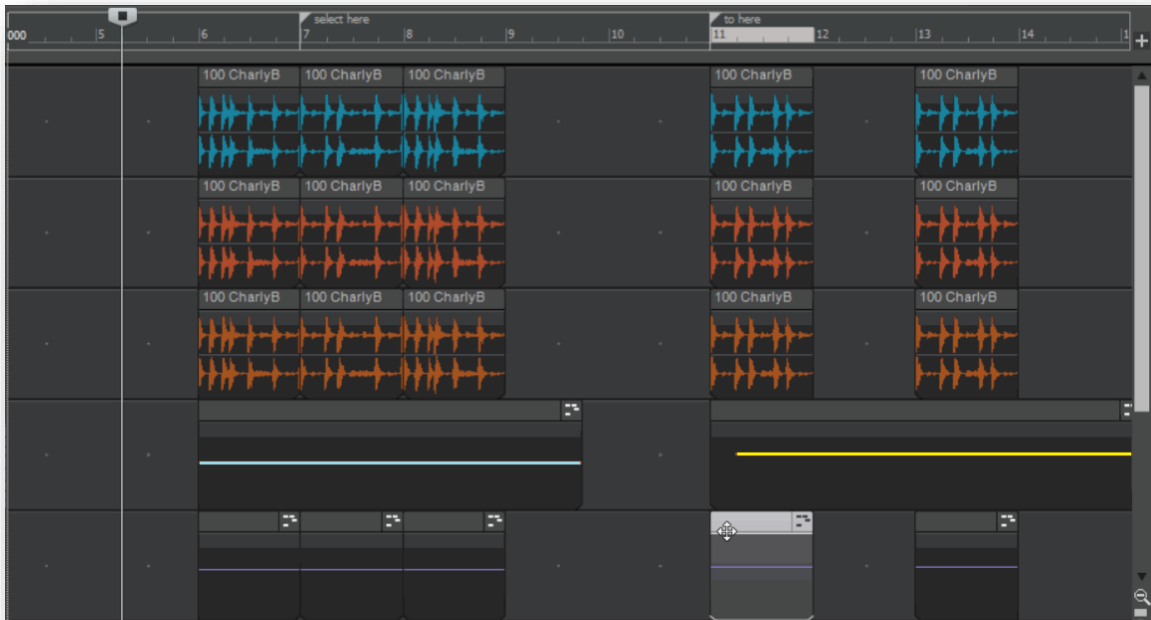
USE CASE #6

Measure 11 is selected in the timeline, and the clip highlighted in red is going to be moved two measures to the right.
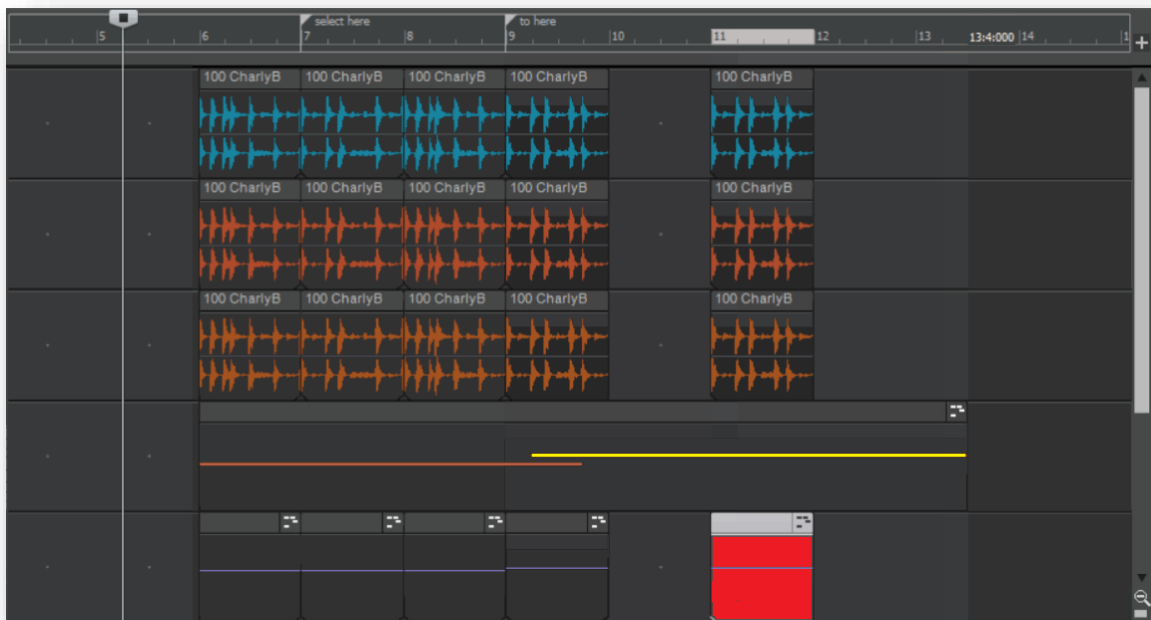
The material that started at measure 11 now starts at measure 13. The MIDI note highlighted in yellow remains unchanged, because its note-on event was not included in measure 11.
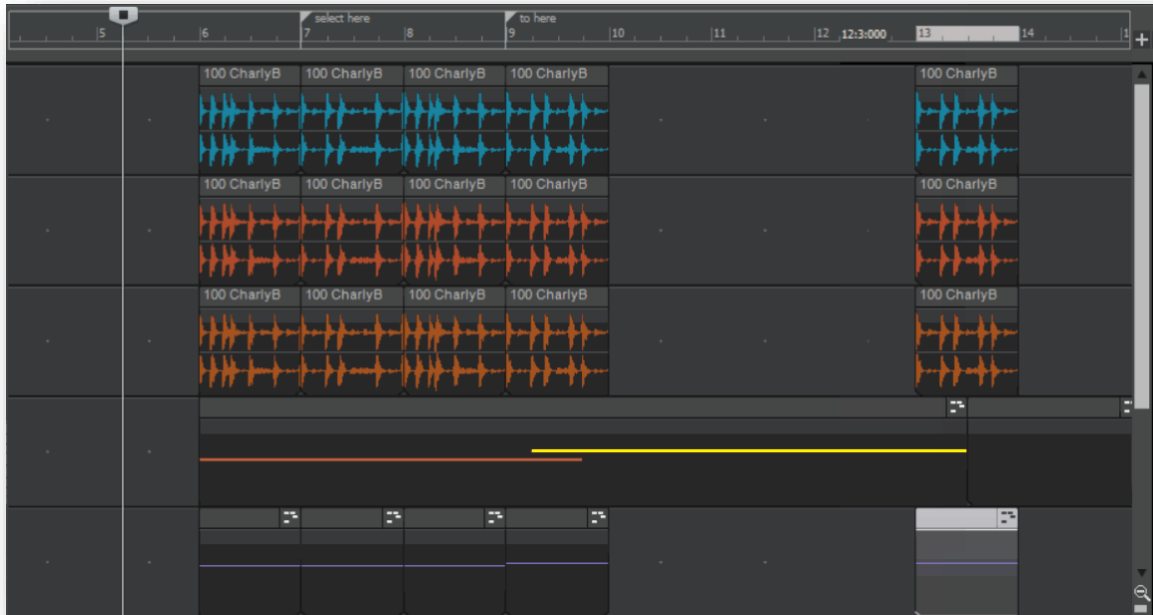
Fixes and Enhancements

Artist, Professional, and Platinum

General
- Using SONAR with a 64-sample buffer size could cause issues if 64-bit Double Precision was enabled for the audio engine
- The Track View In-line Piano Roll and Piano Roll View now have consistent behavior when thinning grid lines during zoom in/out
- Resolved a possible crash when using two-finger touch scrolling on the track pane
- Editing operations (split, move, undo, redo, and ripple edit) in large projects are now approximately 10x faster
- Zooming and scrolling in projects with many clips and crossfades is now considerably more responsive

AudioSnap
- Using AudioSnap to Split Beats could previously cause SONAR to become unresponsive when trying to display all the split clips
- Memory usage with AudioSnap has been reduced by 75% when using it to Split Beats without editing the transient markers

Browser
- Dragging plug-ins from the Plug-in Browser no longer collapses Browser folders after inserting the plug-in into the project

Ripple Editing
- *Please see the section on MIDI Ripple Editing Improvements for more information.*
- MIDI events will now be shortened or lengthened when Ripple Editing if the end of a note is selected or the selection is in the middle of a note. This prevents notes from getting deleted or truncated unexpectedly in some situations during a ripple edit.
- MIDI clips are no longer split in some situations. This is to help preserve clips that contain long notes.

Snap Module
- Disabling Snap previously created problems with showing triplets and dotted settings. These buttons will now stay lit to better indicate what Grid Lines are being displayed when Snap is Off.
- Snap settings could change unexpectedly if they were altered when Snap was Off
- The Control Bar's Smart Grid option is no longer disabled upon cancelling out of the menu

Staff View
- Arrow keys now change track selection in the Track Pane of the Staff View

Step Sequencer
- Click + Dragging in the Step Sequencer could cause SONAR's UI to stop updating momentarily until releasing the mouse button

Track View
- Aim Assist now feels more responsive and moves smoothly in the Track View
- Resolved an issue where copy and paste with lanes closed could result in overlaps on the same lane
- Track View Grid wouldn't update after changing the snap settings
- Track View wouldn't always follow (non-smart) grid line settings in the Snap Control Bar module
- The Time Ruler no longer shows additional ticks when set to Smart Grid. This now displays the only the Beat markers.
- The Track View In-line Piano Roll didn't follow snap setting in some situations

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Review of the Month 1: SampleTekk Classic Grand Piano

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By Craig Anderton

SampleTekk is no stranger to sampling grand and upright pianos, having produced 35 piano sample sets over the years not just for use with programs like Native Instruments' Kontakt, but also for Nord, Steinberg, Toontrack and others. The Classic Grand Piano expansion pack brings SampleTekk's pianos to Rapture Pro and Rapture Session. There are 27 main programs, but 81 total because there are three variations on each one. These variations are in three categories: Classic Grand, Classic Grand Bright, and Classic Grand Soft. Over 1,100 samples and 16 velocity levels are responsible for the responsiveness; there's a sound demo on YouTube.

This collection is all about the sampled piano, and about providing lots of useful sounds that are "plug and play"—just call up a program, and start hitting those keys.

THE GANG OF FOUR

Each program includes four Instrument controls, as well as X/Y Pad 1 assignments. The X/Y Pad 1 X-Axis controls distortion, however note that the maximum value provides the least distorted sound, while the minimum value grunges things up. The Y-Axis controls a 6-pole Highpass filter, which is enabled for all Elements in all programs. The maximum value takes the Highpass filter out of the picture, while lower values reduce low frequencies. So if you've done MIDI Learn for the X/Y pad in order to tie the parameters to CC #1, you'll want to do a MIDI Forget because having the mod wheel set to 0 produces a thin, distorted sound—which is not what these pianos are about.

You'll want to keep the four instrument controls at relatively low levels, because they're designed to add sonic artifacts. However they are effective at giving a "real piano" vibe, just like adding slides to bass samples or finger squeaks to guitar. Here's the story on the four controls.

- **Hammerback.** This is the sound the piano hammers make when they fall back after hitting the strings.
- **Pedal.** Pedals make noise, so for extra realism you can add in a pedal sound that plays whenever the CC #64 changes state (note that it doesn't respond to other pedals, i.e., CC #66 for sostenuto or CC #67 for soft).
- **Ambience.** This parameter does what you'd expect—it adds a degree of ambience to the sound.
- **Resonance.** When sustain is occurring, this adds string resonance that makes the sound bigger and more authentic.

CHECKING OUT THE SOUNDS

When auditioning the sounds, the most basic versions (and therefore most suitable for custom processing or "real" piano sounds) are at the end of the program list. The other 26 presets have varying degrees of processing, "hardness," and so on. 27 programs is a manageable number— it's easier to remember which ones have sounds you want to use—and then if you want a softer or brighter sound, you can use the same sound from one of the other appropriate categories.

I assume most people will wonder "are these better than the pianos that come with Rapture Session/Pro's stock factory programs?" The answer is yes, because the stock programs are

more special-purpose, while the SampleTekk ones are suitable for a wide variety of musical applications, and the samples themselves have more presence and accuracy.

As to comparisons with other libraries, piano samples are always controversial for what I think are two main reasons. First, no piano sound that depends on speakers or headphones will ever give the same visceral experience as a real piano, where hundreds of strings vibrate real wood. Second, pianos have very different characters. Two pianos can be sampled superbly, but one can appeal to you while another doesn't.

There are a lot of sampled piano libraries (if you go to Native Instruments' site, you'll find 35 different piano packages for Kontakt alone). Prices are all over the place as well—there are some pretty great piano sample packages from Synthogy and East West (which they better be, considering the price). Then you have more mid-priced products like Modartt's Pianoteq modeled piano, and XLN Addictive Keys.

The main competition for SampleTekk's offering is Waves' Grand Rhapsody piano at $29, so I compared that as well as the "lite" True Piano instrument (full version $120) in Platinum, and for a taste of a medium-priced library, Alicia's Keys ($99) for Kontakt.

With SampleTekk vs. Grand Rhapsody, Grand Rhapsody has more control over the sound (reverb, EQ, miking, etc.)—clearly, Waves expects it to be used stand-alone was well as a plug-in—but I find SampleTekk has a richer, more developed sound that fits into a variety of musical applications, not just pop. Add some ProChannel EQ after it, and you can really shape the timbre. Also, the Classic Grand Piano is laptop-friendly; the FLAC files are about a 200 MB download, but the samples expand to 1.4 GB when loaded into Rapture Pro/Session. Grand Rhapsody has a 14 GB and a 6 GB version, but the extra space doesn't make much difference in the resulting sound.

Compared to pianos in the $100 price range, the extra money gets what sounds to me like a more natural-sounding sustain compared to either Concert Grand Piano or Grand Rhapsody. The difference is subtle, and you'll notice it only if letting the notes ring out; under most circumstances, it won't make much difference.

CONCLUSIONS

The Classic Grand Piano has only two limitations I could find. The first is that it doesn't take full advantage of being a Rapture-based instrument. I believe the X/Y pad would be far more useful as treble and bass controls for tone-shaping, and the four unused Instrument page knobs could provide useful functions—like a fine tuning control, control over the effects (by inserting them in the individual Elements instead of as master effects), and maybe distortion for lo-fi and rock piano sounds. However, it's easy to add these mods—see the accompanying article, "DIY Sampled Piano Mods."

The second limitation has an easy workaround. At really high velocities, the keys hit hard and while this is accurate, the "clack" can be distracting. The solution is to use Cakewalk's Velocity

MIDI FX to limit maximum velocities to around 120 or so. This doesn't affect the expressiveness, only the timbre at high velocities.

My "go-to" pianos have been the TruePianos Amber in Platinum and Alicia's Keys for Kontakt. However, Classic Grand Piano provides a warm, rich character that's different from those two, and it's a very welcome addition. For Artist and Professional owners (these versions don't include TruePiano Amber), Classic Grand Piano gives an expressive, responsive, rich piano sound for under $40 (I also consider it worth the extra $10 compared to Grand Rhapsody).

SONAR Platinum owners may find Classic Grand Piano superfluous because TruePianos Amber fulfills many piano needs, and you can process its sound further within SONAR. However even if you're happy with your piano library, Classic Grand Piano will expand your sonic options at an extremely cost-effective price.

NOW AVAILABLE IN THE CAKEWALK STORE

SampleTekk's Classic Grand Piano is available as a [download in the Cakewalk Store](#) for $39.99.

Review of the Month 2: Digital Sound Factory B3 Tone Wheel Organ

By Craig Anderton

There are some really good hardware "clonewheel" instruments, which finally produce sounds that liberate roadies from the agony of carrying around tonewheel organs with rotating speaker cabinets. But there's more to life than hardware—and when you want to go virtual, there are plenty of choices. DSF's B3 expansion pack for Rapture, the subject of this review, is an unusually useful set of sounds that go well beyond the Rapture factory programs.

There are 50 programs featuring various drawbar settings and rotating speaker sounds, all of which are very well-sampled and feel "right" (there are 1,148 samples, with 44.1/16-bit resolution). An additional 18 "groove" programs take advantage of Rapture's modulation and step sequencing options to provide sounds that can kickstart songwriting, or perhaps fit into dance music when you want "old school" sounds with a modern vibe.

THE INSTRUMENT PAGES

So…the sampling is spot-on, and the price is right. But what adds real value to this package is the Instrument page programming for the eight controls. The controls for the various pages are not all the same, but optimized for the different programs. Some give additional control over the rotating speaker parameters, others add overdrive or effects, some alter the mix of the drawbars, and so on. This is in addition to having the mod wheel alter the rotating speaker speed. As a result, even though there's already an extensive collection of programs, these tweaks let you customize the sounds even further for particular applications.

The X/Y Pad does panning, but oddly, with some programs moving the crosshair to the left pans right and vice-versa. If this bothers you, the fix is easy: Click the Mixer Edit tab, then Mod Matrix, and change the X/Y Pad's Pan All parameter from -100 to 100 prior to re-saving the program. Finally, some might complain about the samples not being 24-bit resolution—but B3's don't have that kind of resolution anyway.

CONCLUSIONS

The B3 sound is a big part of musical history, and a must-have for some musical genres. Although there are quite a few good organs in the factory sound packs for Rapture, most are ports from Dimension Pro and don't have Instrument page controls—a major disadvantage compared to the DSF B3 Tone Wheel Organ pack, where it's so much easier to dial in the sound you want. It's also obvious a lot of work and care went into creating this pack; it takes advantage of what Rapture Pro does well, and comes across almost like a labor of love—check out the YouTube demo video.

Although I don't use a lot of B3 organ sounds in my own music, I spent enough years on the road and in studios to have "that" sound burned into my brain. As far as I'm concerned, the B3 Tone Wheel Organ Pack provides everything I'll need for projects that want a B3 sound.

NOW AVAILABLE IN THE CAKEWALK STORE

DSF B3 Tone Wheel Organ is available as a download in the Cakewalk Store for $39.99.

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DIY Sampled Piano Mods

By Craig Anderton

I really don't *need* another sampled piano…but I checked out the SampleTekk pack for Rapture, and I really like its rich, warm character (see the previous review for more info).

However while the samples sound fine, the instrument itself doesn't really take advantage of Rapture Pro's Instrument page—so let's add some versatility. And even if you don't have the SampleTekk pianos, the following "mods" apply to other sampled pianos, and also provide useful tips on synth programming in general.

SOLIDIFY THE FUNDAMENTAL

At one point in my life, I had the unenviable task of fitting a sampled piano into 64K of RAM (no, not 64 Megs)—which meant pulling out every trick in the book. In the process, I found a "cheat" that can add a subtle enhancement to sampled piano.

As luck would have it, Element 6 is unused in the SampleTekk factory patches. We'll add a low-level sine wave to reinforce the fundamental.

There are only three edits needed for Element 6:

- Load a Sine wave as the waveform
- Create an envelope for the Amp section so that the sine wave decays at a slightly faster rate than the decay of the sampled notes
- Set the Amp's Level parameter to 10

Now let's tie this to an Instrument page control. Click on **Mixer** and then the **Mod Matrix** tab. Choose **Source = Macro Knob 5, Destination = Volume 6,** and **Amount = 36**. Now Knob 5 on the Instrument page can mix in a sine wave "fundamental." Do so subtly (e.g., turn the knob up to about 66.0), and the piano will have more "authority."

ADD A TONE CONTROL

I didn't find the existing X/Y Pad 1 controls all that useful, so let's create better distortion elsewhere, and turn the X/Y Pad into a bass and treble shelving-type tone control.

1. Click on **Element 1** and turn off the power buttons for **DSP 1** and **Filter 1**.
2. Choose the following settings for the Element 1 Equalizer:

- **Band = 1, Type = Lo, Freq = 200, Q = 1.0, Gain = -12**
- **Band = 3, Type = Hi, Freq = 2000, Q = 1.0, Gain = -12**

To tie these to the X/Y Pad 1, click on **Mixer** and then the **Mod Matrix** tab. Do the following assignments:

- **Source = X/Y Pad 1X, Destination = Eq1 Gain 1, Amount = 24**
- **Source = X/Y Pad 1Y, Destination = Eq3 Gain 1, Amount = 24**

The "tone controls" are flat when the X/Y Pad crosshair is in the center. Moving it up increases treble, down decreases treble, right increases bass, and left decreases bass.

DIRTY IT UP!

Distorted piano has its uses, so let's give these samples some refined distortion.

1. Click on **Element 1** and set the drop-down menu for **DSP2** (which should have its power button enabled) to **Rect.**
2. Set Filter 2 to **LP2** as the mode, and **Cutoff** all the way clockwise.

Now let's create a distortion control on the Instrument page. Click on **Mixer** and then the **Mod Matrix** tab. Do the following assignments:

- **Source = Macro Knob 6, Destination = DSP2 1, Amount = 100**
- **Source = Macro Knob 6, Destination = F2 Cutoff 1, Amount = -3930**

As you turn Knob 6 clockwise, the distortion increases but at the highest settings, the filter pulls back a bit on the high frequencies to reduce harshness.

RADIATE AND REVERBERATE

You probably have a favorite reverb for SONAR, but if you use Rapture stand-alone, you may want some built-in reverb.
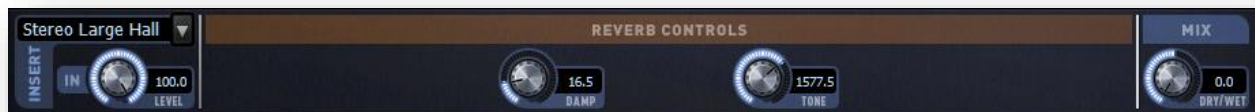
1. Click on **Element 1**.

2. For the **Insert** effect, choose **Stereo Large Hall** and set the controls so **Level = 100, Damp = 16.5, Tone = 1577.5, and Dry/Wet = 0**.

Let's assign the reverb to Knob 8. Click on **Mixer** and then the **Mod Matrix** tab. Do the following assignment:

- **Source = Macro Knob 8, Destination = FX Dry/Wet 1, Amount = 55**

FINE TUNING

A piano with a fine tuning control? Why not—it can come in handy for standalone applications, or if you want to layer two pianos and offset them slightly.

Make the following changes for **Elements 1, 5, and 6** in the Pitch section:

- **Transp = 0, Tune = 0**

To assign the reverb to Knob 7, click on **Mixer** and then the **Mod Matrix** tab. Do the following assignment:

- **Source = Macro Knob 7, Destination = Pitch All, Amount = 200**

With Knob 7 up halfway at 50.0, the piano is at concert tuning. Rotating clockwise or counter-clockwise will raise or lower the pitch by up to one semitone, respectively.

And there you have it—a modded sampled piano that not only sounds wonderful, but takes advantage of what makes Rapture Pro such a fun instrument.

SONAR 101: Understanding Loop Construction

By Craig Anderton

When SONAR first appeared, one of its strengths was the ability to create, edit, and save WAV files that could stretch automatically with the project tempo and pitch. Previously, this type of convenience was pretty much the domain of Sony's Acid software (originally introduced by Sonic Foundry). Although DJs and groove-oriented musicians took to this concept initially, over time loops have worked their way into a variety of musical genres, including rock and soundtracks.

While many musicians are content to use loops from sample libraries, quite a few create loops from their own recorded material. For example, if a guitarist plays a great lick, sometimes it's worth repeating as a motif in different parts of the song. But even if you use commercial loops, it's important to know how to edit them because sadly, a lot of sample CDs are carelessly "prepped" and do not stretch well over a wide range of tempos.

SONAR's Loop Construction window is the center of activity for editing, creating, and saving stretchable loops, which SONAR calls "groove clips." We've covered some aspects of looping before in The Big Book of SONAR Tips, but let's cover how to make loops from start to finish.

To make this article as real world as possible, download the example loop. This is a file from my AdrenaLinn Guitars sample CD (but with the groove clip characteristics removed), and we'll use it to illustrate the various points in this article.

GROOVE CLIP BACKGROUND

A groove clip embeds pitch and tempo information into a standard WAV file's file header. This information instructs SONAR how to play back the file when there are tempo or pitch variations. The more accurate and detailed the pitch/tempo information embedded in the file, the better the stretching quality during playback.

SONAR's groove clips are compatible with the "acidized" file format that was introduced in Sony's Acid loop-based composition program; in fact, you can load "acidized" files into SONAR, and SONAR "groove clips" into Acid (now owned by Magix).

The underlying technology is DSP-based. The basic process is to create "slices" of audio at transients, add or remove samples to lengthen or shorten the loop respectively, then crossfade these segments to smooth any transitions within the loop. Some wonder how this differs from REX files; the latter applies minimal DSP to the slices, so the audio quality is virtually unaltered. However, REX files pretty much require percussive material, because putting slices in the middle of a sustained tone produces an audible discontinuity. With DSP, crossfading within a sustained tone hides these kinds of problems.

Groove clips have limits to their stretching abilities. Slowing down a loop too much creates artifacts, as the algorithms struggle to insert samples that extend the material. Speeding up is less problematic, because it's easier to remove existing material than create new material that never existed. This is why loop library designers often record their loops at slower tempos, if possible.

LOOP CONSTRUCTION PREPARATION

Okay, enough theory. Download the file **W_FUNK04_Bb.WAV**, bring it into SONAR, and let's turn it into a groove clip.

Double-click on the clip, and the loop construction window opens up. Click on the Loop button to enable looping (you can also click on the Clip drop-down menu to turn on looping).
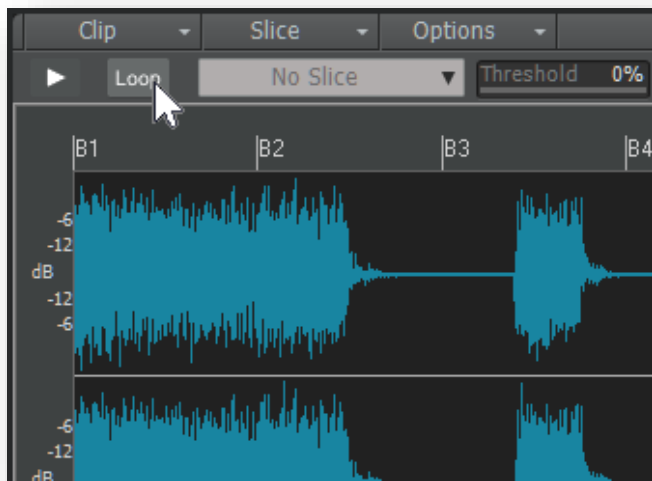
Click on the loop button to convert the clip from a standard WAV file to a Groove Clip.

We need to tell SONAR the Clip length. After you've enabled looping, the number of beats appears in the "Beats" field (8 in this case), and a bunch of "slice markers" (more on this later) default to eighth notes. Usually SONAR gets the numbers of beats right, but you can enter a number in the "Beats" field if you need to edit this. If it's incorrect, usually you'll need to divide the number of beats by two.
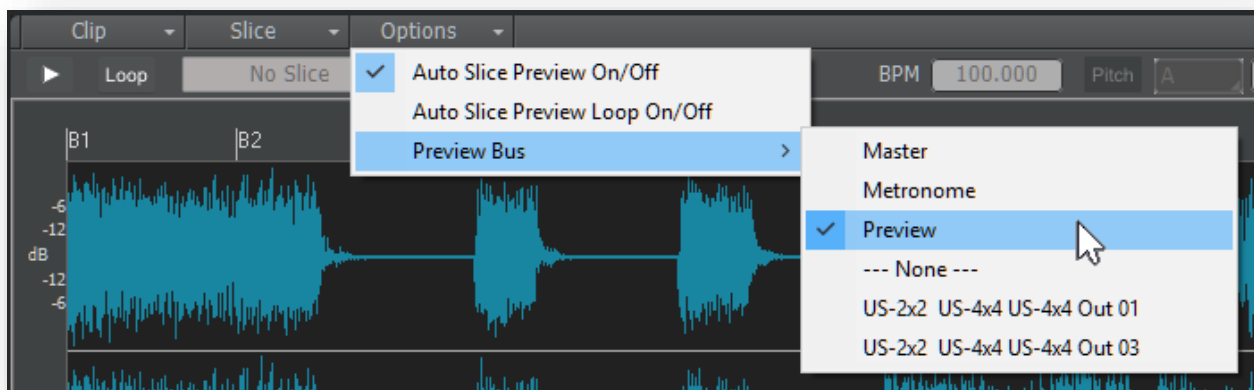
You can choose the bus over which you want to preview the loop's audio.

Set the Project tempo in the main program to 100 BPM (the same as the original loop tempo), and click on the Loop Construction Window's Play button (to the left of the Loop button) to hear what we have so far. Like the Browser, there's a drop-down menu for choosing the Preview Bus (under the Options tab).

While you're at it, under Options choose Auto Slice Preview. This lets you hear a slice if you click on it in the main waveform view. Enabling Auto Slice Preview Loop causes the selected slice to loop; leave it off for now.

TWEAKING THE SLICES

When you play the clip (remember to use the Loop Construction window's Play button, not the main Transport button), you'll hear there are several guitar chords. We want to place a slice transient marker at the precise beginning of each chord's attack, so that each chord lives in its own slice.

The drop-down menu below the "Slice" drop-down menu puts slice markers at specific intervals. This can save you a lot of time if you're slicing something like a drum machine pattern with a regular 16th note high-hat pattern; just set the slices to 16th notes, and you're probably done. Note that if you set the Threshold value to 0, slices will show up only at the interval you specified.

However because this is a guitar part played by a human, we're going to add slices manually—which is also more educational when learning how to create loops—so select No Slice from the drop-down menu.
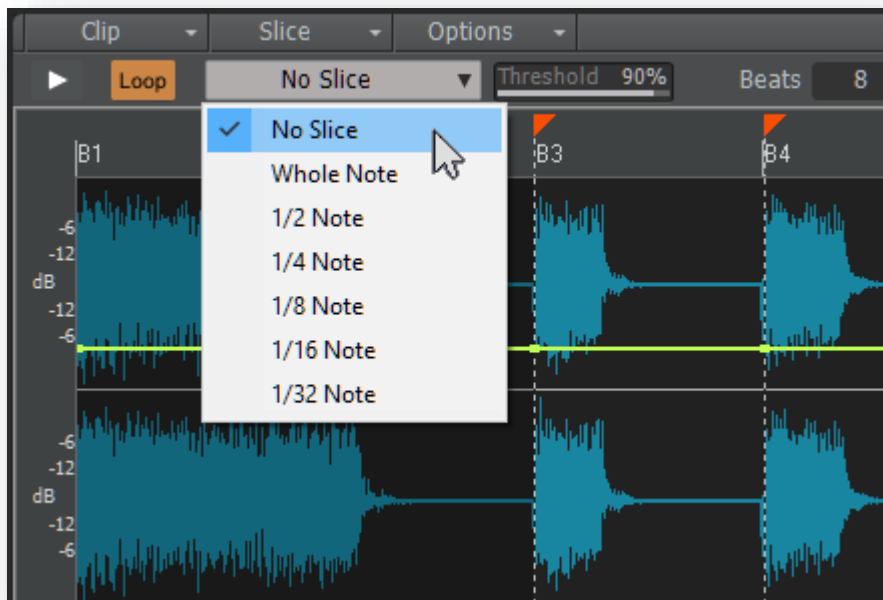
There are several semi-automatic options for placing slices within a file, but we'll do some of it by hand.

Note that SONAR has detected three transients – the most obvious transients in the file. These are at beats B3, B4, and B5. However, there are more chords being played than just that, so change the

Threshold parameter to 100%. This makes SONAR more sensitive to transients, and several more slice markers show up at these transients.
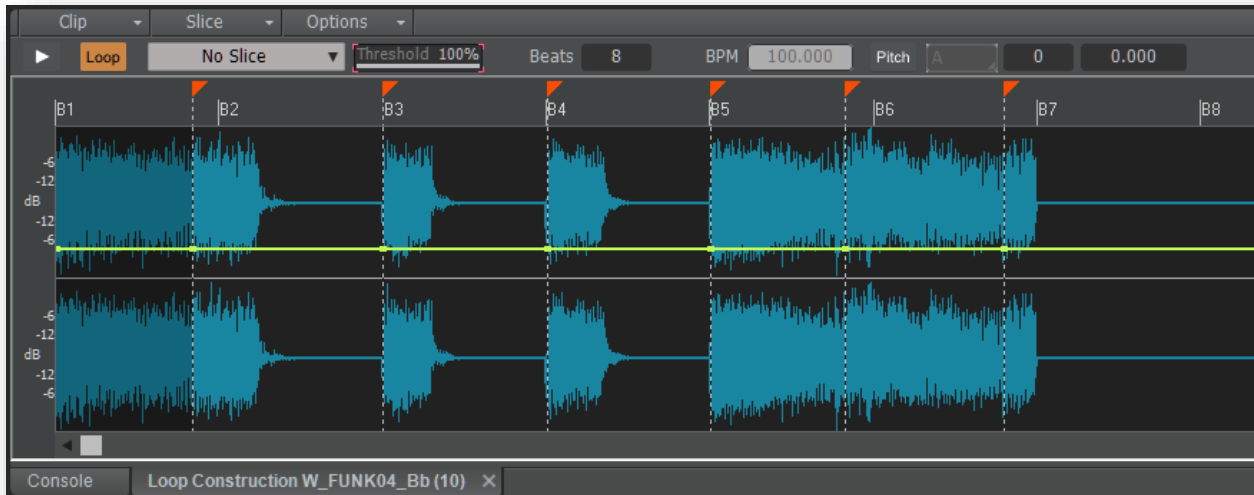
SONAR has now identified more of the individual slices in the loop.

Now click in each slice in the waveform. You'll note that SONAR has done a pretty good job of isolating the chords, except for the slices that fall around Beat 2 and Beat 6. We need to add more transient markers for these chords.

Double-click in the markers row to add another transient marker at B2, and create another slice.

Double-click with the Smart Tool in the markers row to add another transient marker at B2. Markers you add are purple. Now let's add the needed slices around Beat 6.

Use the horizontal zoom in button (+) so that this slice fills most of the Loop Construction window. Look closely at the waveform. You can pick out what appears to be a fairly significant "blob" of audio just before B6.

Double-click as you did previously to add a slice at this transient.
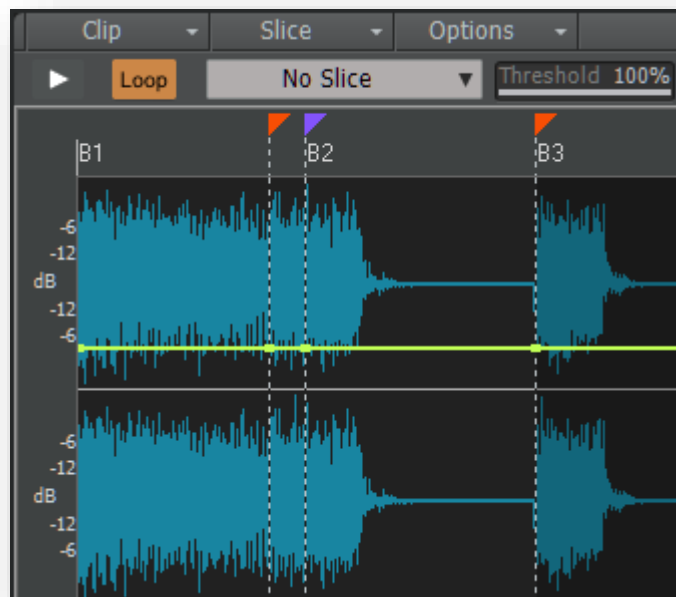
Click in the slice to the right of the marker you just added. We still need four more markers to mark the five chords that occur within this slice. To fine-tune a marker's placement, click on its triangle and drag to the desired position; continue listening to slices and tweaking markers until each chord has its own slice. You'll end up with slices in the following places.
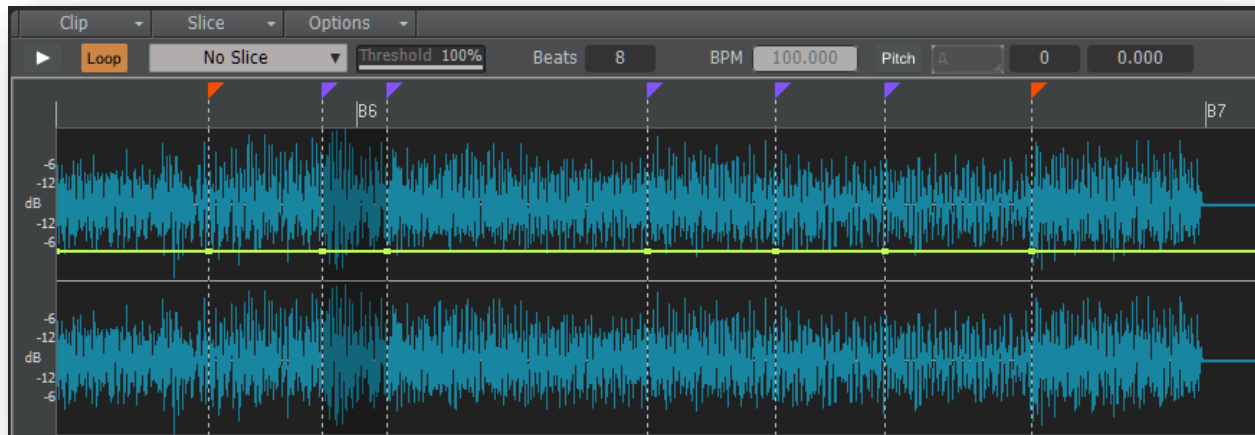
The transient around B6 are difficult to see unless you zoom way in. When you locate the transients, add another slice marker.

Ideally, you want markers to sit at the precise beginning of a transient. For example, if you zoom way in on the marker that was generated around Beat 3, it hits a little bit early. Drag this marker to the right so that it sits right at the beginning of the transient that hits on Beat 3. Note the triangle turns purple to show that's been adjusted manually.

Now let's test our loop. Change the project tempo to 150 BPM, and click on the Loop Construction Window's Play button to preview the loop. It should have the same rhythm as the original, only faster.

Change the project tempo to 70 BPM, then preview the loop. This makes the DSP work a lot harder, and also reveals a problem: The little decays at the ends of the chords that start at B2, B3, and B4 end up getting stretched so they last longer, and therefore sound unnatural. To solve this, add another slice marker just before each of the little decays.
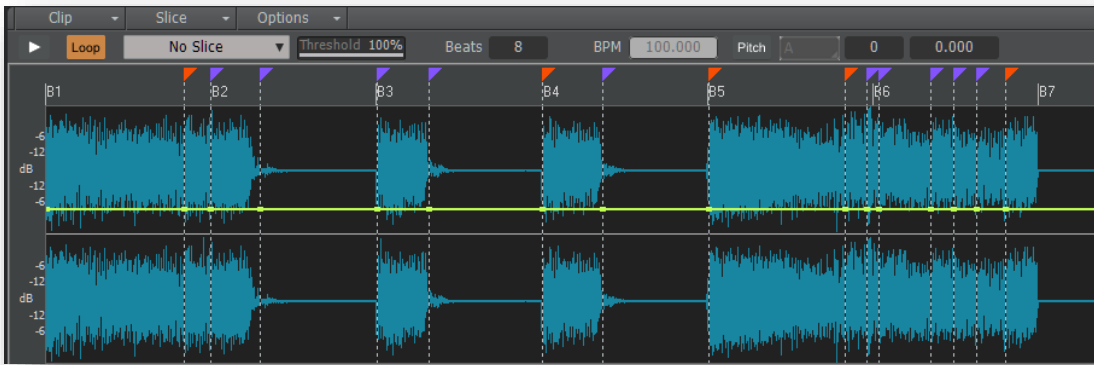
Note the three slice markers added just before the final decay for the chords at B2, B3, and B4. These help create a more realistic sound when slowing down the tempo.

Now play the file at 70 BPM; it sounds much better.

Another problem with slowing down is that sustained sections can sound uneven, because a fairly long section is being stretched. We can fix this by adding another slice marker in the middle of long sections. For example, when previewing the file at 70 BPM, note how the first slice has some "wavering." Add a slice marker in the middle of this slice, and the wavering goes away. Try the same technique with the slice that begins at B5 as well.

You can tweak groove clips forever, but this one works pretty well from about 80 to 180 BPM—better than a 2:1 tempo ratio. More tweaking won't improve it by that much.

ESTABLISHING THE ROOT PITCH

For melodic loops, enter the original key (the one at which the loop was recorded) in the Pitch field. This loop identifies the pitch as Bb in the filename, so set the pitch to A#.
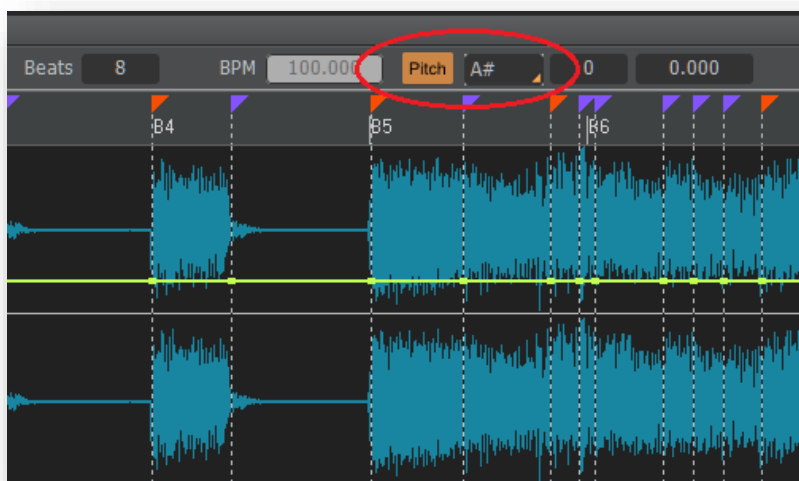
Here's the "key" to having a loop follow any project key changes, as set by the project pitch value.

Setting pitch should cause the loop to follow the project pitch, as specified under *Project > Set Default Groove Clip Pitch.* For example, if the Default Groove Clip Pitch is set to C, this Bb loop will play back at C.
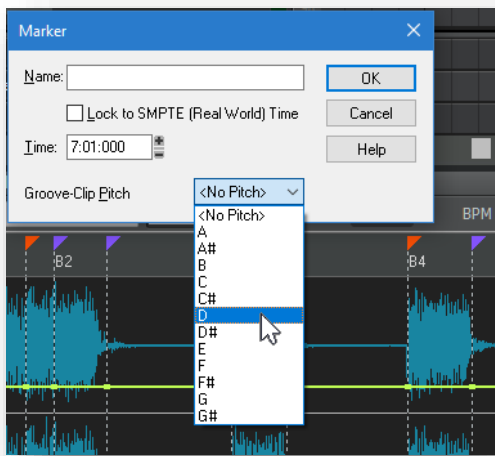
If you want to transpose the loop, then enter the new pitch by inserting a marker as you would normally (e.g., type "M" at the Now Time). You don't have to name this if you just want the marker name to reflect the pitch change.

To transpose Groove Clips, insert pitch markers in the timeline.

The Loop Properties window offers a variety of loop options, including whether or not to follow the Project Pitch.

You can choose to have a loop follow the project pitch or not (for example, you may not want a drum loop to follow pitch). To set this, choose *Clip > Loop Properties*. In the Audio Stretching tab, you can check or uncheck the "Follow Project Pitch" box, as well as fine-tune the loop's pitch or transpose it.
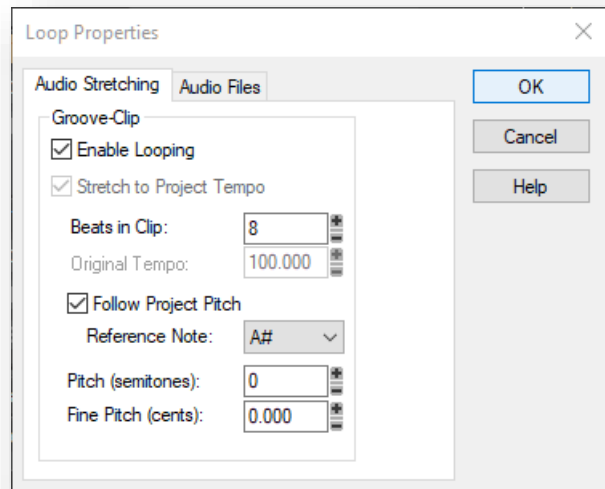
LET'S GO NUTS!
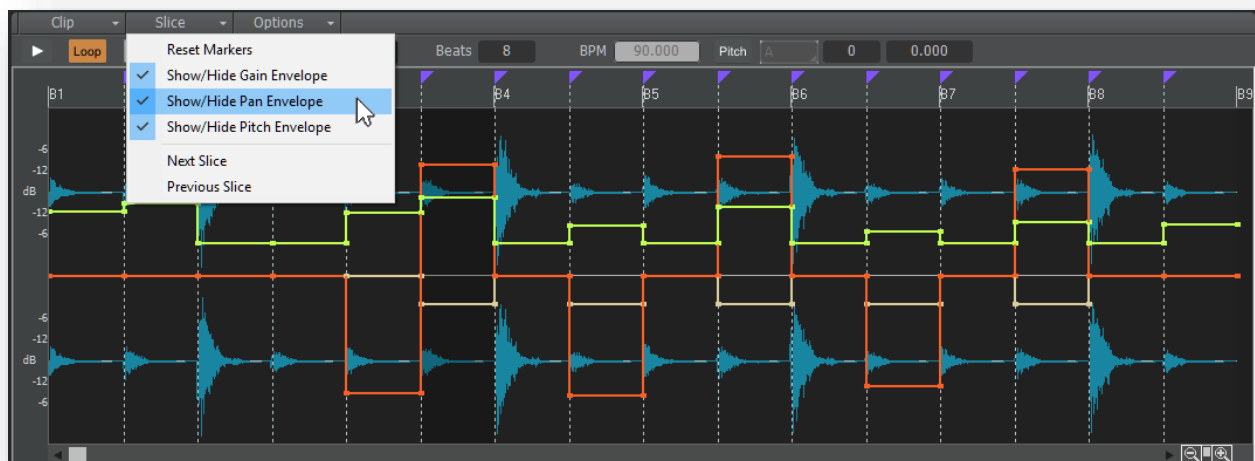
Changing gain, pan, and pitch on a per-slice basis is can lead to very creative results…as well as very twisted ones.

What's more, you can create envelopes to alter gain, pan, and pitch for each slice. This works very much like standard envelopes, although changes are quantized to each slice and you can't change values within a slice. In other words, an individual slice can't fade out or pan from left to right—it will be set at a constant level or constant pan position.

The edits can be done graphically; there are three choices from the Slice menu, each of which corresponds to show/hide for an envelope (orange for pan, blue for pitch, and light green for gain). Drag the envelope within the slice to edit.

While you're editing, a tooltip shows the amount of gain, pan, or pitch change for the selected slice while you're doing the editing. Pitch changes default to semitone steps, but you can hold Shift while editing the pitch envelope for fine-tuning the pitch. There are some limitations to using envelopes—gain changes might produce pops if there are significant level shifts—but being able to change these parameters allows for tremendous creative latitude.

LET'S GET SAVED!

You don't want to do all this tweaking again, right? So save the file by selecting the Clip tab in the Loop Construction view, clicking on "Save Loop," and then navigating to where you want to save the loop. Happy looping!

You Mix, We Master

By Craig Anderton

Sometimes you don't want a full-blown mastering job, but just a better-sounding mix. From time to time, we take a reader-submitted song and describe how to master it using SONAR's available tools. This issue's project is "Roasting on the Stones," an original song by Bill Saunders. However, the thrust of this particular installment is more like "you mix, we remix…"

ANALYSIS

Like the other tracks received so far, the song itself is "mastering-friendly"— plenty of headroom, with no processing added to the master bus. What's more, I thought the mix was already pretty much where it needed to be. I could quibble with the kick being separated into the right and left channels—I'm one of those "mix in the center" traditionalists—but overall, there was a good frequency balance.

I did feel the song lacked some lower midrange "meat." Many times there's a midrange buildup that I need to cut a bit, but boosting the lower mids somewhat put the bass and high-frequency

sheen into better perspective. Although I realize that reggae-based music tends to be a bit bass-heavy, I don't think that's diminished by the midrange EQ.

I also added some A-Type Console Emulator and hit the Drive pretty hard. Normally this is something where I'd consult with the client, but the song had a little hint of roughness and I wanted to accentuate this a bit.

The only other processing was adding some Adaptive Limiter to the stereo master. Now, of course someone will write in the "comments" section that limiting is bad. Well, it kind of is…but the reality is that it's a singles world, songs end up on playlists, and without at least some dynamic range squashing the song will sound weak by comparison. Again, this is something where I normally work with the client to determine what degree of squashing they want, but given the circumstances I just used a "default" type of dynamics processing.

But what I really heard was that the song needed a little more variety from beginning to end—just enough to give the listener an occasional surprise. So, this started to look more like a "light remix" project than straight-ahead mastering.

Now, whether a mastering engineer starts making creative decisions like this or not depends on the mastering engineer and the client. I'm the kind of engineer who likes a lot of interaction with an artist, and seek approval at every step along the way if I'm going to make any kind of substantive changes. In this case, though, I did what I felt like doing because I thought it would make for a more interesting article…and hoped Bill would be okay with it.

REMIX TIME

I didn't want to take this into dub territory, but a little echo never hurts…right? So, I set up the ever-popular Sonitus delay in a bus, and created send automation so that only specific parts of the song would be echoed. Here are the echo settings.
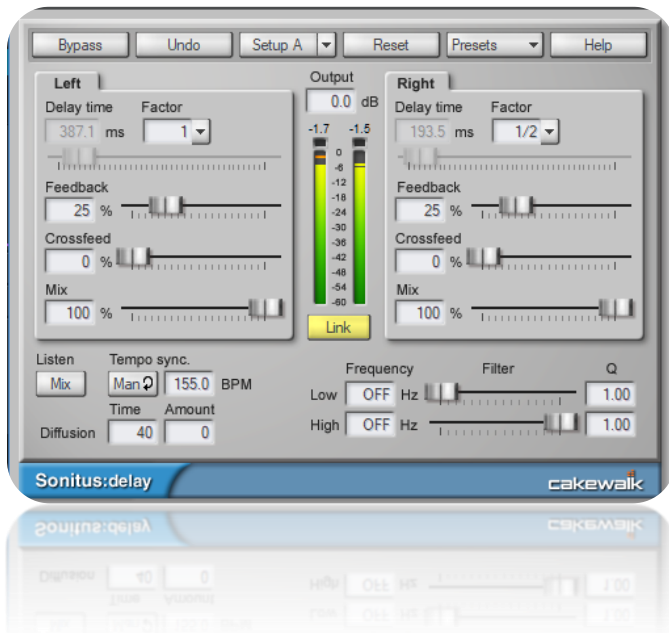
Creating the automation involved a lot of trial-and-error. Often I wanted to grab just a piece of a word, and also, it needed to fade out fairly fast; too much feedback would be problematic.

Using a technique like this can be very intrusive, so I had to be careful. Sometimes only a couple dB of send level made the difference between something that worked, and echo that was overbearing. Refer to the screen shot below; the peaks in the purple line indicate where signal was sent into the Sonitus echo.

The orange clips are even more interesting, because these involved changing the actual flow of the song itself. The first orange clip had a single drum hit that segued directly in the next part of the song. I felt a bit of a dramatic pause was in order, so I split at the hit's beginning and end, bounced it to itself so there wasn't anything after the hit, extended it (creating silence in the process), normalized to obtain the highest possible level, and then added the Sonitus reverb as a Clip effect. I thought this added an element of surprise that would keep listeners interested.
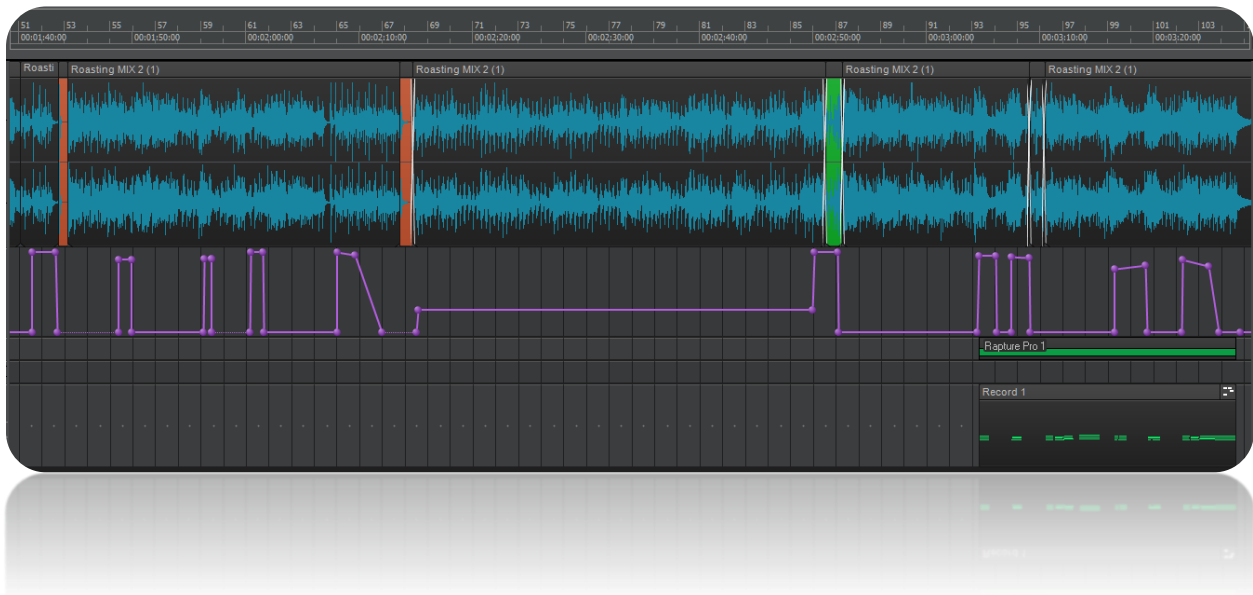
The green clip simply normalizes the section coming out of the verse to give a little better lead-in to the song's next section.

Finally, I added an organ part to re-inforce the existing, sustained one with phrasing that would be more like a horn section "sting" to emphasize the chord structure in the final chorus. Again because this was taking a chance with the artist's vision, I kept it fairly low.

AND FINALLY…

Even though the song had a mix that I liked, I felt some changes to the song itself were in order. That's what takes this from being less of a mastering job—all it really needed was more midrange, and some dynamics processing—to more of a remix. Although there weren't a lot of changes, I felt the ones that were there enhanced the song's flow.

Go to Cakewalk's YouTube channel to see a video that compares the original and mastered versions. To make for a fair comparison, I've matched the peak levels of the "before" and "after" sections.

Cakewalk 30th Anniversary Celebration:

30th Anniversary Rapture Expansion Pack

By Craig Anderton

This expansion pack started with sampling every note on a Gibson Midtown guitar, with individual samples for the bridge, neck, and both pickup positions. But as so often happens, things got out of hand. Of course you can play traditional guitar sounds with this pack, however there are also 12-string sounds that are quite useful—even though there's no physical 12-string Midtown guitar. And for the six-string guitars, there's "faux feedback" that's lots of fun. You'll even find octave above and suboctave components added to some of the guitars. There are also synth-type sounds, world sounds, clean leads, basses, and more. They all have unique sonic qualities because of their genesis as guitar samples.

The programs have some elements in common. All programs except for the Big Synth Organ program have Bass and Treble tone controls. The X/Y Pad 1 X-Axis controls Modulation Depth, and the Y-Axis controls Modulation Frequency.

The Mod wheel (Continuous Controller #1) is unassigned because you might want to use "MIDI Learn" so the mod wheel can control an expression parameter on the Instrument page, but it's easy to assign the X/Y Pad X-Axis to the modulation wheel. Right-click on the X/Y Pad crosshair, choose "X MIDI Forget" if the X-Axis is already assigned, then choose "MIDI Learn" and rotate the mod wheel. It will now control the X/Y Pad 1 X-Axis in all programs.

Oh, and one final tip: Try the guitars through amp sims or the CA-X amps. Tasty!

More online! Listen to a [2-minute audio/video demo](#) of ten of the expansion pack programs

12-STRING MIDTOWN (BRIDGE, NECK+BRIDGE, AND NECK)

All three 12-string programs have the same Instrument page controls. Although there is no physical Midtown 12-string guitar, we can have a virtual one! These programs use SFZ file coding to stack two sampled strings an octave apart over the typical 12-string range where you hear octave strings (up to B5), then starting at C5 doubles the higher strings where octaves aren't possible (just like a real 12-string guitar).

- **Fifth Above** adds a virtual string a fifth above the tonic string.
- **Suboctave** adds a virtual string an octave below the tonic string.
- **Hex Fuzz** applies distortion to each string independently.
- **Chorus Rate** and **Chorus Depth** emulate a typical chorus effect.

6-STRING MIDTOWN (BRIDGE, NECK+BRIDGE, AND NECK)

These programs are straight-ahead Midtown guitar samples, but there are still a few tricks. All three have four additional voices—one to provide an octave up virtual string, one for a suboctave virtual string, and two sine waves to emulate the sound of feedback being created as the note sustains. This really comes into its own when running any of these presets through a CA-X amp with distortion, like the Hard Rock amp (as you can hear on the demo video). All three programs (Bridge, Neck+Bridge, and Neck) have the same control complement.

- **+ Octave Higher** adds a virtual octave-above string.
- **Suboctave** adds a virtual suboctave string.
- **Feedback** adjusts the level of the virtual feedback, which fades in as you hold the note.
- **Tremolo Depth** controls the range of the amplitude changes caused by the
- non-tempo-synched tremolo effect.
- **Chorus Rate** and **Chorus Depth** emulate a typical chorus effect.

BASS (8-STRING AND BRIDGE)

Dropping the Midtown strings down an octave creates useful bass sounds. The Bass 8-String uses the same type of SFZ coding as the 12-string guitars to synthesize the sound of an 8-string bass, while the Bass Bridge program has the characteristic sound of a bass's bridge pickup. Both have the same control complement; the AutoWah provides a slow, rhythmic wah pedal effect.

- **Filter Resonance** and **Filter Cutoff** control a four-pole filter. Try turning up the Resonance control, and map the Filter Cutoff to a hardware controller. This provides useful wah-type effects.
- **Suboctave** adds a virtual suboctave string.
- **Edge** gives a gritty, dirty, amp-type sound.
- **AutoWah Range** increases the AutoWah effect's depth.
- **AutoWah Rez** sets the resonance for the AutoWah effect.

BASS NECK

Here's another bass sound, this time using the smooth sound of the neck pickup. The Instrument page controls are somewhat different from the other basses.

- **+ Octave Higher** adds a virtual octave above string.
- **Suboctave** adds a virtual suboctave string.
- **Tone Control** gives the effect of the tone control on a bass, but with a slightly steeper slope than standard tone controls (two-pole instead of the single-pole passive tone controls found in most basses).
- **Edge** gives a gritty, dirty, amp-type sound.
- **Chorus Rate** and **Chorus Depth** emulate a typical chorus effect. This can be useful in jazz bass applications.

MINOR = MAJOR

Minor = Major is a variation on the six-string guitar programs, and also includes virtual feedback. However, this program includes an extra voice to provide either a major third or minor third harmony. Here's what the controls do.
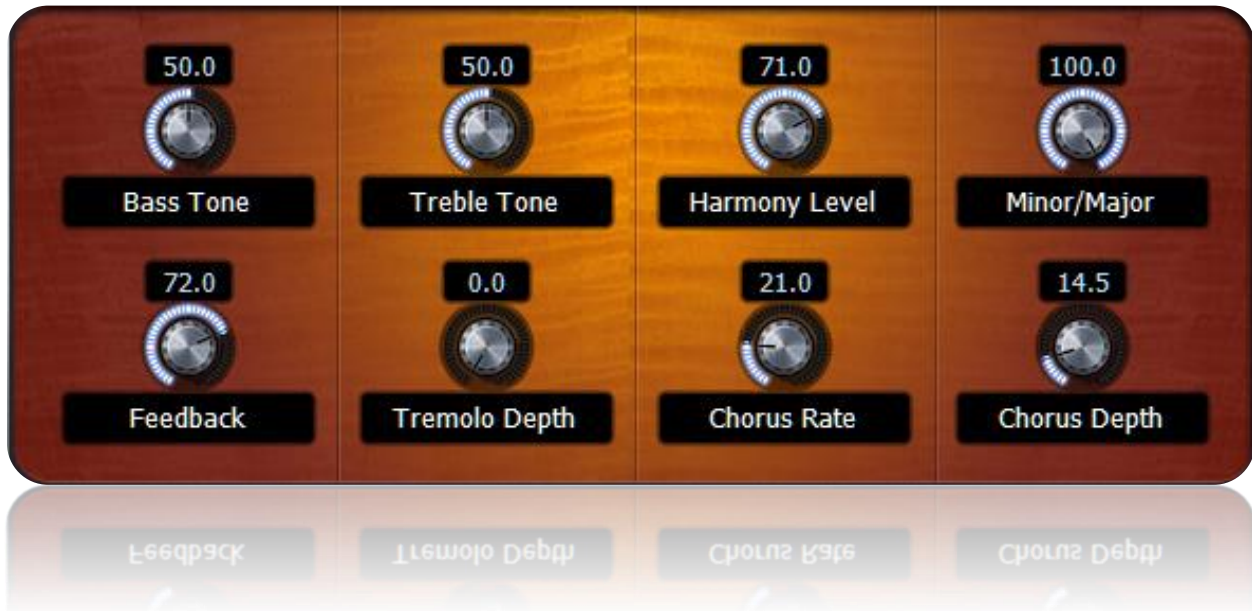

- **Harmony Level** controls the harmony's level.
- **Minor/Major** chooses the minor third harmony when fully counter-clockwise; turning this control clockwise ends up at the major harmony.
- **Feedback** adjusts the virtual feedback's level, which fades in as you hold the note.
- **Tremolo Depth** controls the range of amplitude changes caused by the non-tempo-synched tremolo effect.
- **Chorus Rate** and **Chorus Depth** emulate a typical chorus effect.

You can alter the harmony and interval controlled by the Minor/Major control easily. Element 2's Pitch Transposition sets the initial harmony, and the Pitch 2 limit that's assigned to Macro Knob 4 in the Mod Matrix sets the interval. With Macro Knob 4's amount parameter, adding 100 raises the pitch by one semitone.

For example, suppose you want the Minor/Major control to vary between a major third and fifth. Set Element 2's Pitch Transposition to 4 (a major third). For Macro Knob 4 to transpose up a fifth, it needs to go three semitones higher than the initial harmony, so you'd set the Macro Knob 4 amount in the Mod Matrix to 300.

POWER CHORD

Here's another program that really comes into its own when used with the CA-X amp sims (or other amp sims, for that matter). It combines the original string pitch with virtual strings a fifth and octave above, but if you want even more of a power chord feel, you can add another virtual string that produces a suboctave. Like several of the other guitar programs, you can mix in "faux feedback." After all—it's a power chord, right?
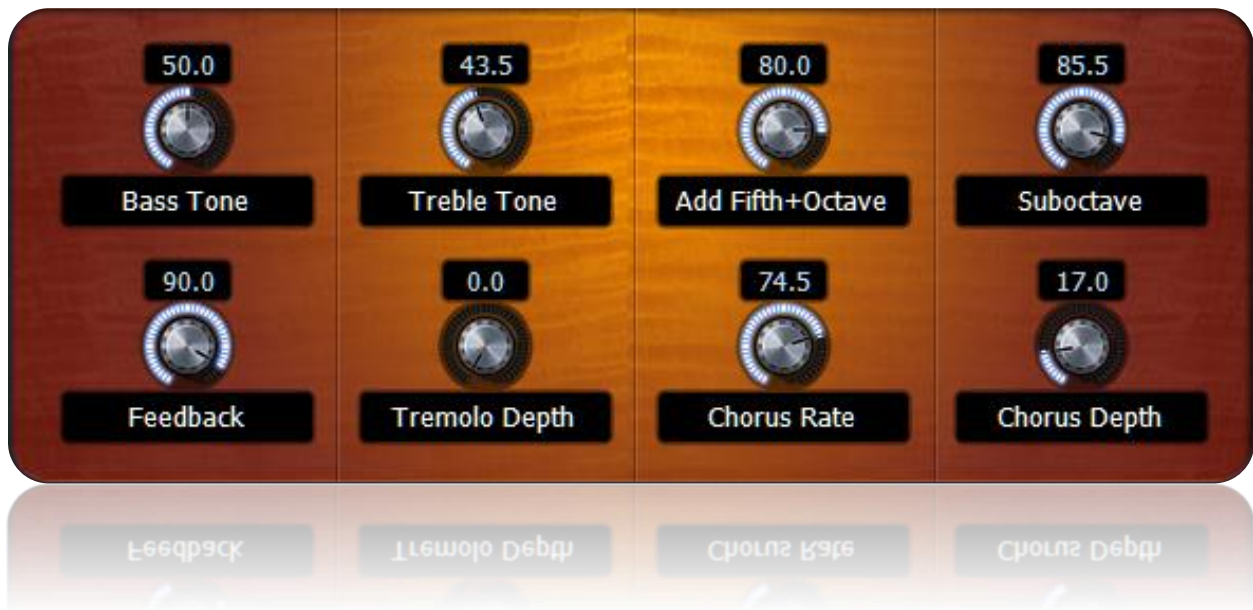
- **Add Fifth+Octave** mixes in the fifth and octave that create the power chord.
- **Suboctave** adds an octave-below virtual string to round out the bottom and add more power to the overall sound.
- **Feedback** adjusts the level of the virtual feedback, which fades in as you hold the note.
- **Tremolo Depth** controls the range of amplitude changes caused by the non-synced tremolo effect.
- **Chorus Rate** and **Chorus Depth** emulate a typical chorus effect.

GUITAR BRIDGE HEX FUZZ

This optimizes the hex fuzz sound for the guitar bridge pickup, but when you kick in the octave higher component and suboctave, the result is kind of like a punk pipe organ. The program defaults to this setting, so sit back and enjoy a big, powerful, guitar-based sound that ends up being more like a huge synth/keyboard.

- **+ Octave Higher** adds a virtual octave-above string.
- **Suboctave** adds a virtual suboctave string.
- **Hex Fuzz** controls the amount of distortion. Each string has dual distortion (DSP2 and DSP3) except for the Suboctave, which uses only a single distortion stage.
- **Tremolo Depth** controls the range of volume changes caused by the
- non-tempo-synched tremolo effect.
- **Chorus Rate** and **Chorus Depth** emulate a typical chorus effect.

Bonus Tip! *Try using the Rotating Speaker FX from the 2017.06 30th Anniversary FX Chains, with the settings shown. It adds another dimension to the "organ" sound.*

GUITAR BRIGHT AND HARD

Try this program when you want an alternative to rock piano samples. You'll have the same kind of percussive attack, and similar decay characteristics. Using the virtual 12-string samples provides the extra touch of brightness from having the octave strings in the mix. For an even brighter sound, turn up the Edge control to create more harmonics and add some "bite" to the sound.

- **Filter Resonance** increases the Q at the filter frequency set by Filter Cutoff.
- **Filter Cutoff** can dial in the desired amount of brightness, and is particularly useful for trimming the amount of brightness added by the Edge control.
- **Tremolo Rate** controls the amp tremolo speed. It's not synched to tempo, so if you want tempo sync, you'll need to turn on Sync in the Amp's LFO/KEYB tab for Elements 1 and 2.
- **Tremolo Depth** controls the range of volume changes caused by the tremolo effect.
- **Edge** adds distortion and brightness.
- **Reverb Mix** controls the amount of reverb mixed into the sound.

GUITAR MUTED BRIDGE

Palm muting with guitar creates a percussive sound, and it's good for a lot more than Bob Marley-type reggae strumming. This program implements more Chorus controls than other programs, which offers added flexibility when using a chorus effect. For example, if you turn down Chorus Rate and Chorus Depth, turning up Chorus Feedback and Chorus Mix gives a metallic effect not unlike "bathtub reverb."
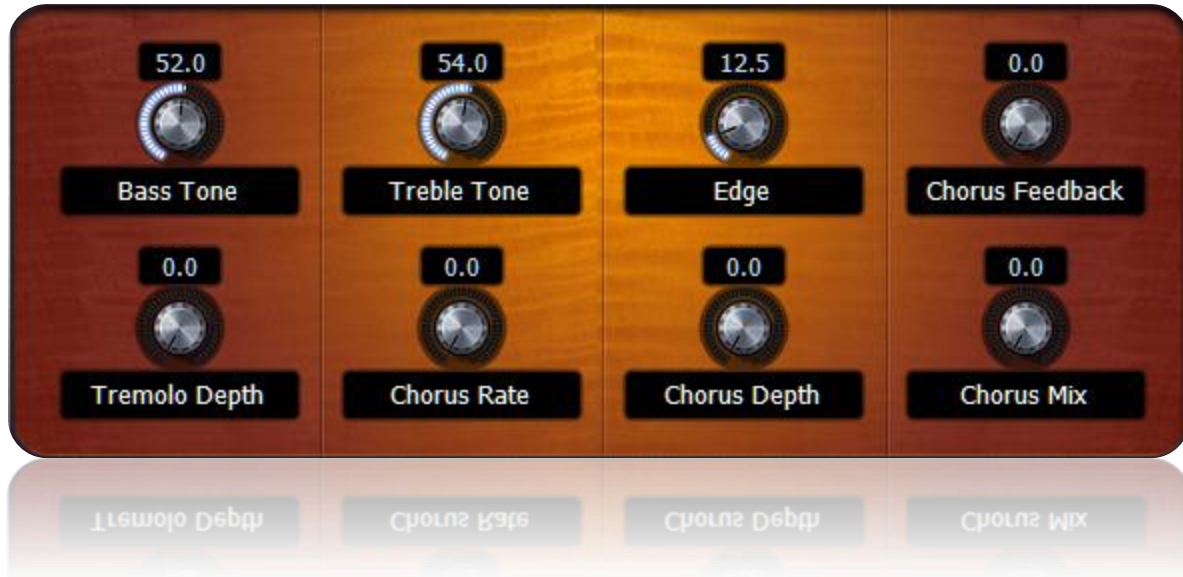
- **Edge** accents the timbre's intensity. The distortion isn't quite as much as some of the other programs, but it does add a useful edge.
- **Tremolo Depth** controls the range of volume changes caused by the non-tempo-synched tremolo effect.
- **Chorus Feedback**, **Chorus Rate**, **Chorus Depth**, and **Chorus Mix** provide the same controls as typical chorus effects.

Bonus Tip! The Slow Roll Phaser 6 FX Chain from the 2017.06 30th Anniversary FX Chains complements the muted bridge sound well.

GUITAR NECK HEX FUZZ

This is basically a "kinder, gentler" version of the Guitar Bridge Hex Fuzz, and includes the same complement of controls. The distortion has a bit more of an "amp" sound, and isn't as bright as the Guitar Bridge Hex Fuzz.

- **+ Octave Higher** adds a virtual octave-above string.
- **Suboctave** adds a virtual suboctave string.
- **Hex Fuzz** controls the amount of distortion. Each string has dual distortion (DSP2 and DSP3) except for the Suboctave, which uses only a single distortion stage.
- **Tremolo Depth** controls the range of volume changes caused by the
- non-tempo-synched tremolo effect.
- **Chorus Rate** and **Chorus Depth** emulate a typical chorus effect.

GUITAR PIANITAR

No, it doesn't sound like an acoustic piano…but it feels like it has something in common with electric and electronic pianos, so you can think of this program as a variation on keyboard synth sounds. Two 12-string samples form the basis of this sound.

In terms of processing, the Chorus capabilities are deep enough to give convincing chorus effects, and the tremolo depth synchronizes to SONAR's tempo.
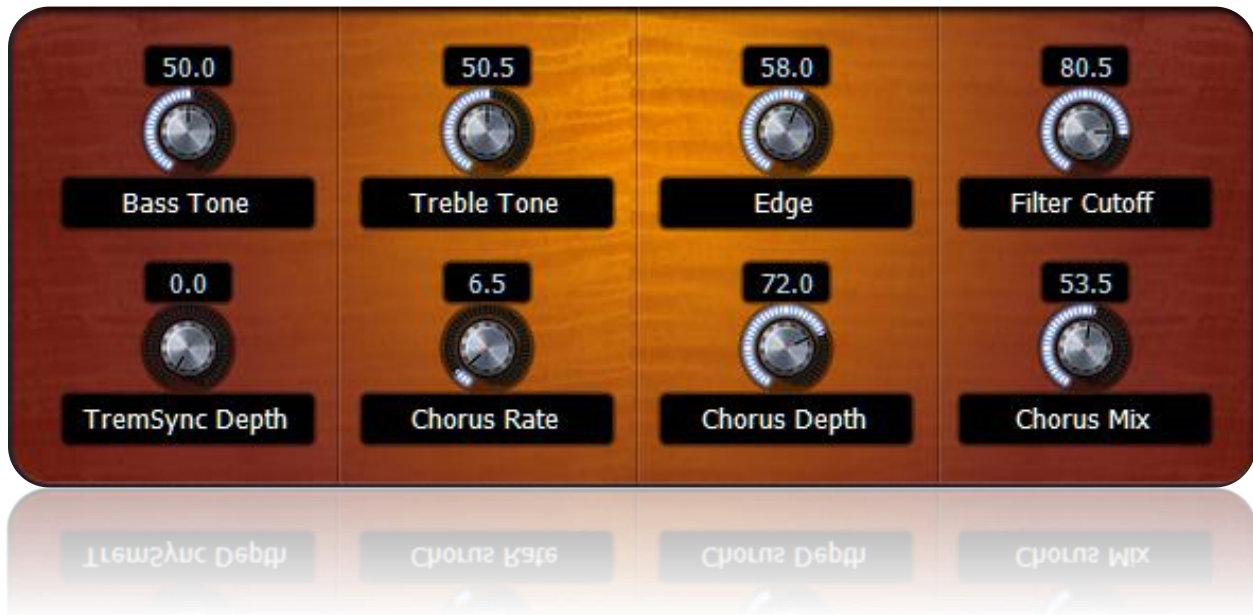
- **Edge** adds some brightness and color to the basic sound.
- **Filter Cutoff** allows more sophisticated tone control that what's available with just the Bass and Treble controls. Try controlling Filter Cutoff with a footpedal or other hardware controller.
- **TremSync Depth** controls the range of volume changes caused by the tempo-synched tremolo effect. To select a different sync rate, choose the Amp > LFO/KEYB parameter for each Element, and change the Sync rate from the drop-down menu.
- **Chorus Rate**, **Chorus Depth**, and **Chorus Mix** provide the controls for a typical outboard chorus effect.

GUITAR STEEL+PEDAL

With proper playing technique, this program does a pretty convincing steel guitar sound. In particular the vibrato can fade in, so if you use pitch bend to slide up to a tone, the vibrato appears naturally in the same way that it usually does with steel guitar. The X/Y Pad 1 X-Axis controls the vibrato frequency and depth; however, please note that you can't use it to add vibrato independently of the fadein.

What really helps in creating a realistic emulation is how you work the pitch bend control. With chords, sliding up to the ending pitch is a common technique, while for single notes, bending down and up to notes is a popular technique for soloing. Also, many steel guitar players use a volume pedal to add attacks to notes.
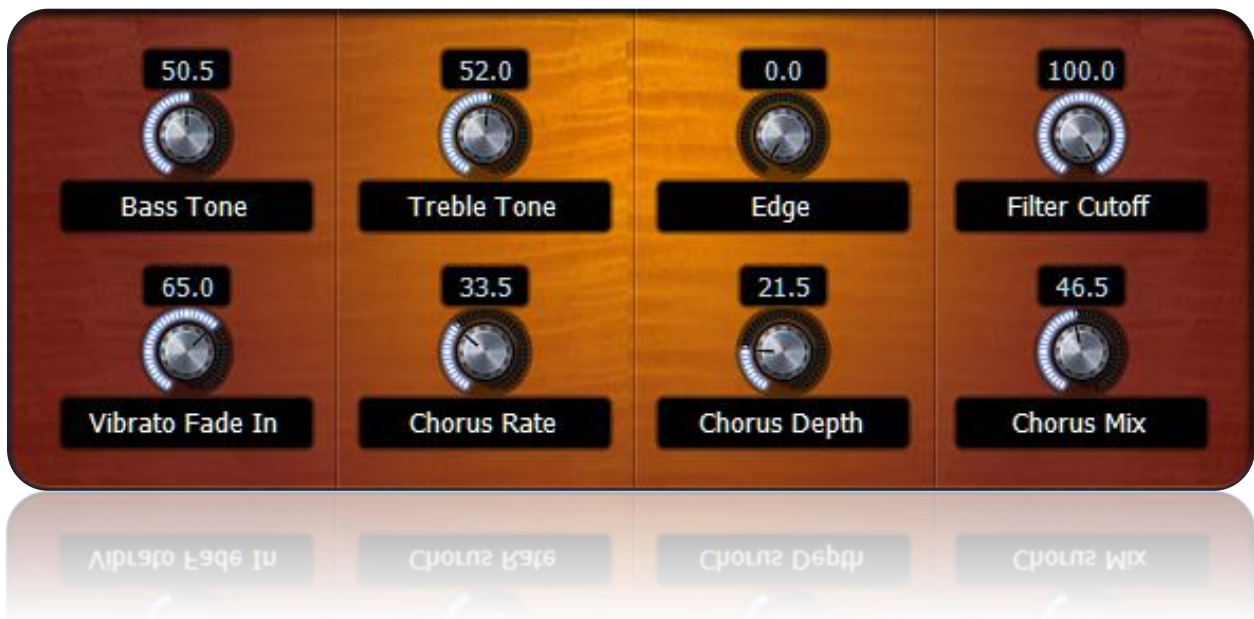
- **Edge** imparts more of an "amp sound" to your virtual steel guitar.
- **Filter Cutoff** allows more sophisticated tone control that what's available with just the Bass and Treble controls. Controlling it with a foot pedal can provide a useful wah effect.
- **Vibrato Fade In** controls how long it takes for vibrato to appear after hitting a note.
- **Chorus Rate**, **Chorus Depth**, and **Chorus Mix** provide the controls for a typical outboard chorus effect.

LEAD CLEAN

There are plenty of lead sounds that can cut through a track—this one is a bit more "chill," and designed more to "float" on top of the track. The Reverb and Delay controls have a lot to do with this, but so does the timbre and the way you introduce vibrato.

Auto Vibrato increases both vibrato depth and vibrato fade-in time simultaneously as you turn it clockwise. It also interacts with X/Y Pad 1, which sets the maximum amount of vibrato depth, as well as the vibrato frequency. Tremolo also has an unusual implementation. Element 2's tremolo syncs to tempo, while Trem Syncopate controls the speed of Element 1's tremolo.

- **Trem Depth** controls the range of volume changes caused by both the Element 1 and Element 2 tremolos.
- **Trem Syncopate** sets the speed of Element 1's tremolo, which provides syncopation because Element 2's tremolo frequency stays locked to tempo.
- **Delay Feedback** controls the number of repeats for the built-in delay line.
- **Delay Mix** determines the balanced of delayed and dry sound.
- **Reverb Mix** controls the amount of reverb mixed into the sound.

LEAD HARD SYNC

Maybe guitars can't do hard sync...but they can in virtual instrument-land. Unlike the Lead Clean program, this one is aggressive and can definitely cut through a track. The program emulates a synth's hard sync sound by passing a sound with resonant filtering through distortion (in this case, DSP1's "Tube" algorithm). There are also three ways to control the hard sync frequency (Manual, Step Generator, and LFO); note that all three are available simultaneously, and can interact with each other.

- **Fundamental** increases the level for Element 3, which is simply the unprocessed neck+bridge pickup samples—it's not subject to the hard sync effect. Emphasizing the fundamental can give more "girth" to the normally thin hard sync timbre.
- **Sync "Hardness"** determines the hard sync effect's tonal character. Turning this control counter-clockwise sounds more like "hard sync meets filtering," while clockwise gives the more traditional hard sync sound.
- **Manual Ctrl** alters the hard sync frequency. To have Manual exert the greatest influence over the hard sync frequency, turn down the StepGen Ctrl and LFO Ctrl parameters.
- **StepGen Ctrl** introduces step-generated modulation to the hard sync frequency, with the lowest frequency set by the Manual control.
- **LFO Ctrl** varies the hard sync frequency based on the LFO frequency.
- **LFO Rate** sets the LFO frequency.

LEAD SYNTH

Unlike the Lead Clean preset, this one is designed to stand out in a mix. It also has just enough attack time to add a bit of a "bowed" vibe, although with just a hint of hard sync-type harmonics.

Tremolo Rate and Tremolo Depth do what you'd expect, but Step Gen—which modulates the filter—uses a trick I've found handy on many programs. The filter defaults to being up all the way, so that with the Step Gen control down, there's no effect. When you turn up Step Gen, it applies a negative amount of modulation, which makes the effect more apparent by lowering the filter cutoff.

- **Tremolo Rate** controls the amp tremolo speed. It's not synched to tempo, so if you want tempo sync, you'll need to turn on Sync in the Amp's LFO/KEYB tab for Element 1.
- **Tremolo Depth** controls the range of volume changes caused by the tremolo effect.
- **Step Gen** applies step modulation to one of the program's filters.
- **Harmonic Control** does timbral variations by simultaneously altering the DSP distortion, filter cutoff, filter resonance, and volume (to compensate for level changes when the other parameters change).
- **Delay Feedback** controls the number of repeats for the built-in delay line.
- **Delay Mix** determines the balanced of delayed and dry sound.

RHYTHMIC HEAVY PATTERNS

One of Rapture's major strengths is extensive modulation capabilities, so three programs in this 30th Anniversary Celebration take advantage of step-generated modulation. Although these programs have nothing to do with traditional guitar sounds, they provide interesting electronic sounds based on the organic sounds of the Midtown guitar. Use them as textures mixed behind a rhythm track, as breaks in a conventional song, as part of the rhythm for EDM, and the like.
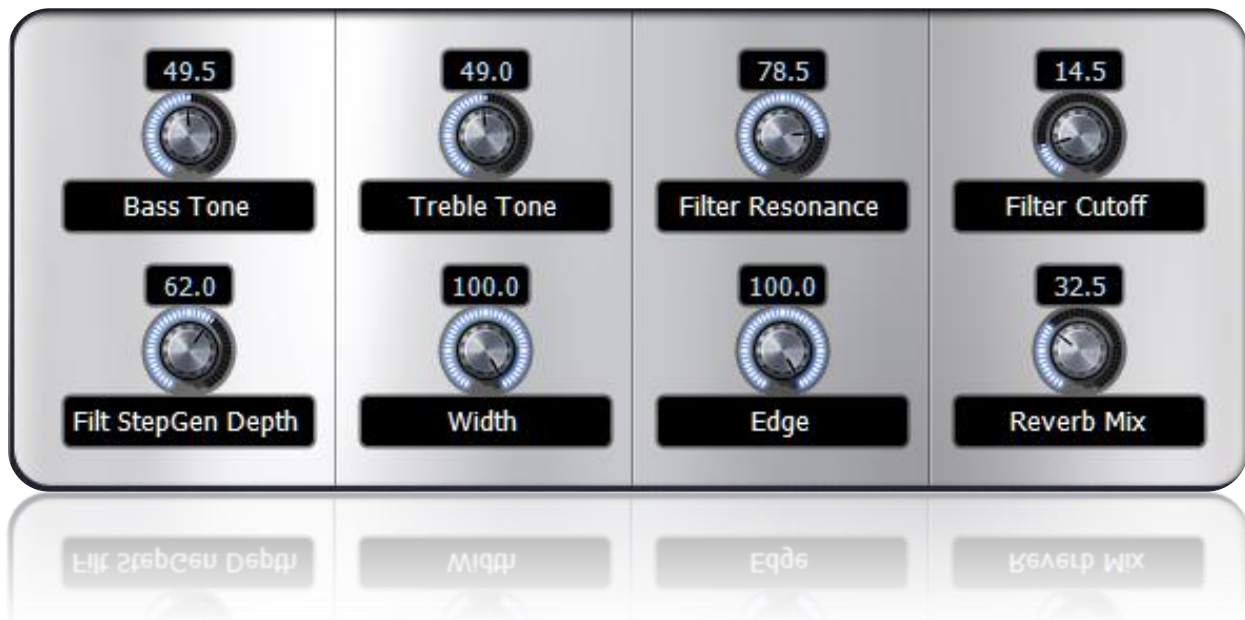
- **Filter Resonance** increases the Q at the filter frequency set by Filter Cutoff.
- **Filter Cutoff** adjusts the initial frequency to which the Step Generator adds modulation.
- **Filt StepGen Depth** applies step-generated modulation to the two Elements, whose step sequencers are set independently. This control interacts with Filter Cutoff; for example, with Filter Cutoff fully counter-clockwise, applying modulation will have the greatest effect and cover the widest range.
- **Width** sets the stereo separation of the two Elements. Fully clockwise gives maximum stereo separation.
- **Edge** adds the ever-popular combination of distortion and brightness.
- **Reverb Mix** controls the amount of reverb mixed into the sound.

RHYTHMIC STEPPED POWERCHORD

In this step sequencing-based program, the actual effect itself is fixed but what it affects is not. The basic effect consists of a single Element, but two addition Elements provide one voice an octave below, and one voice a fifth above, to create a step-sequenced power chord. As with the previous program, the step sequencing affects filter cutoff.

| 47.5	35.5	45.0	36.0
Bass Tone	Treble Tone	Filter Resonance	Filter Cutoff
72.0	100.0	36.0	54.5
Xtra Voices	Xtra Voices Width	Edge	Reverb Mix

- **Filter Resonance** increases the Q at the filter frequency set by Filter Cutoff.
- **Filter Cutoff** sets the initial frequency to which the Step Generator adds modulation.
- **Xtra Voices** controls the level of the octave-below and fifth-above Elements.
- **Xtra Voices Width** sets the stereo separation of the two extra voice Elements. Fully clockwise gives maximum stereo separation.
- **Edge** adds an edgy combination of distortion and brightness.
- **Reverb Mix** controls the amount of reverb mixed into the sound.

RHYTHMIC TENSION

Step lively…this sounds somewhat like marching synthesizers that add a feeling of tension, or lumbering, depending on your point of view. This program can add a useful backdrop to solos, and textures to dance music (particularly electro). The actual step-sequencing effect isn't editable from the front-panel controls, but there's quite a bit of leeway in how you can process the sound. In particular, turning up the delay line feedback can augment the "stepping" sense imparted to the filter.
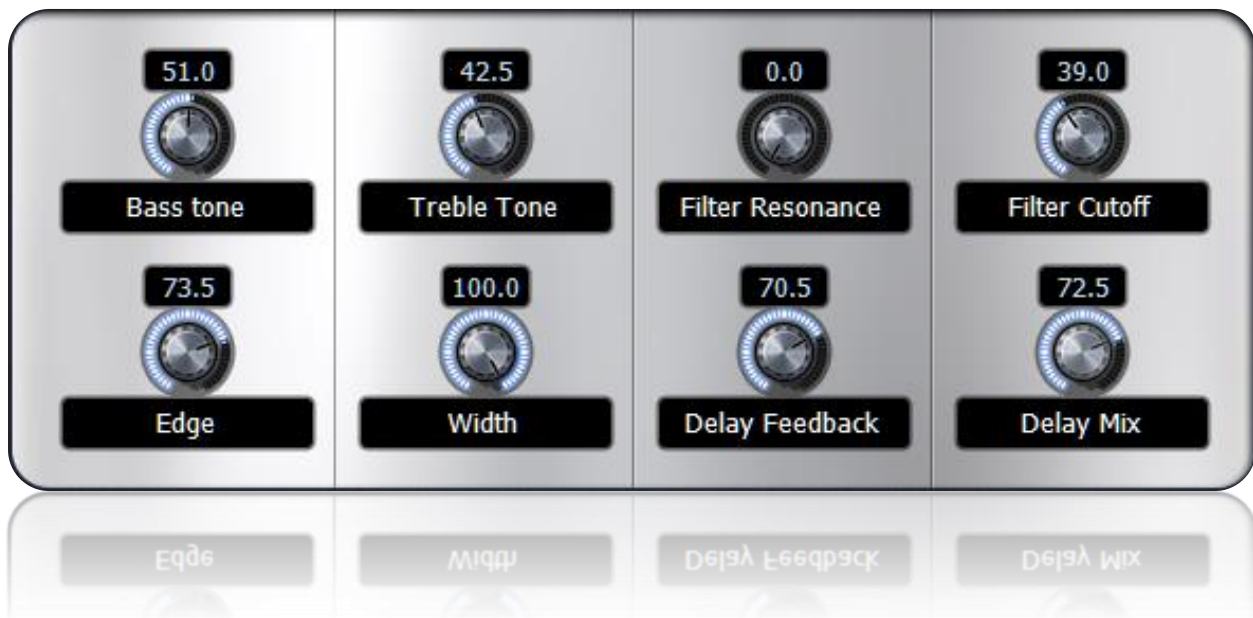
- **Filter Resonance** increases the Q at the filter frequency set by Filter Cutoff.
- **Filter Cutoff** sets the initial frequency to which the Step Generator adds modulation.
- **Edge** adds an edgy combination of distortion and brightness.
- **Width** increases the apparent stereo width.
- **Delay Feedback** determines the number of repeats generated by the delay line.
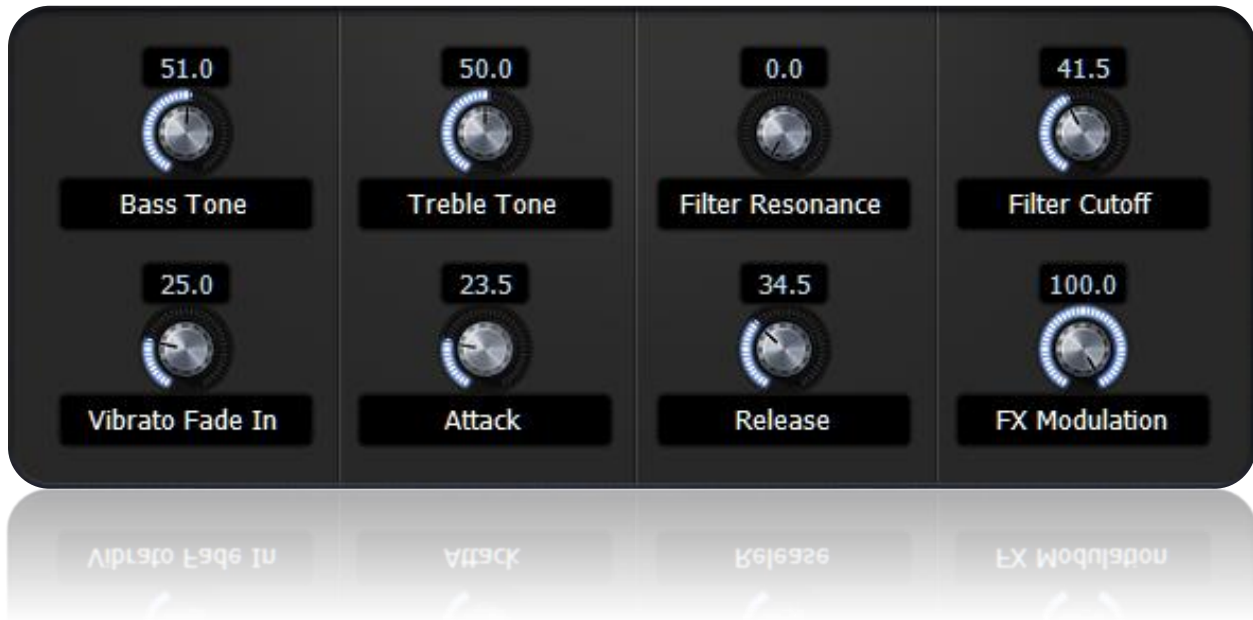- **Delay Mix** sets how much delayed signal gets mixed into the sound.

SYNTH BIG ORGAN

With guitar-based sounds that aren't looped, you can't do true organ sounds that sustain forever. So, this program is more like a cross between an organ sound and a polysynth. It can provide a textured, big background behind leads or percussion, or even do some stabs at strategic moments.
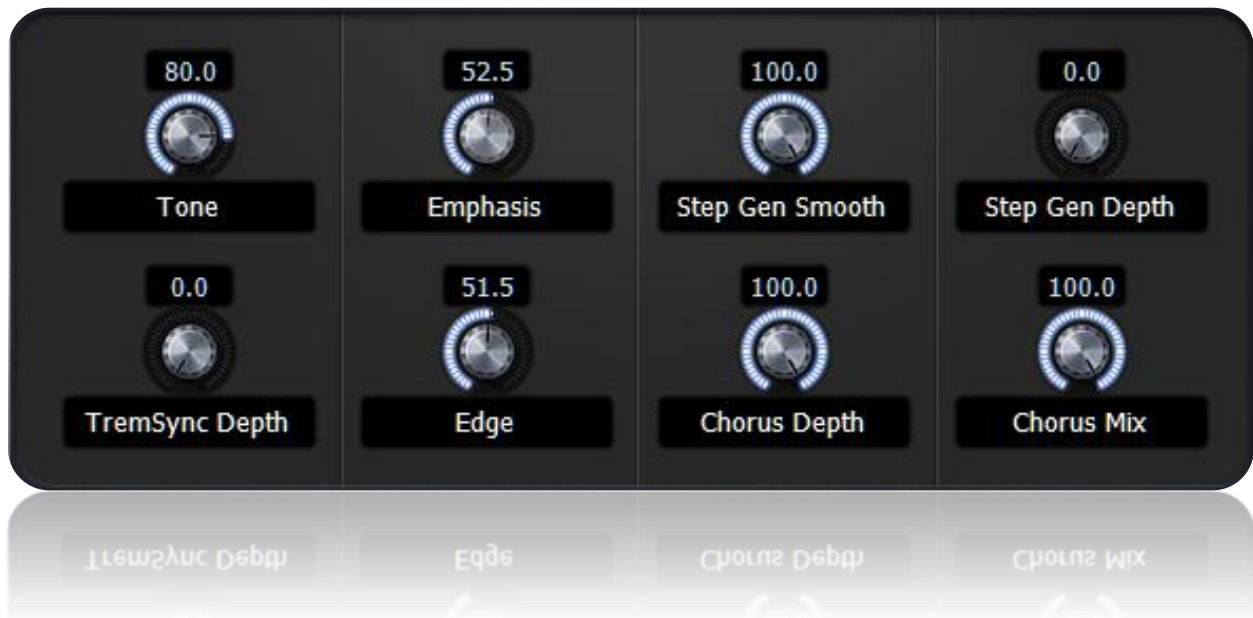
- **Tone** is a "morphing" tone control that goes from full bass when counter-clockwise to full treble when clockwise.
- **Emphasis** adds a subtle lift to the overall sound.
- **Step Gen Smooth** changes the shape of the step-generated modulation by rounding off the "corners" of the steps.
- **Step Gen Depth** applies step-generated filter modulation to add animation and interest.
- **TremSync Depth** controls the range of volume changes caused by the tempo-synched tremolo effect. To choose a different sync rate, choose the Amp > LFO/KEYB parameter for each Element, and change the Sync rate from the drop-down menu.
- **Edge** adds a taste of distortion and brightness.
- **Chorus Depth** and **Chorus Mix** provide the sound associated with outboard chorus effects.

SYNTH CHOIR PAD

What if you had a bunch of female singing guitars that wanted to sound like a choir? It might sound a little like this. The vibrato can fade in over time. The X/Y Pad 1 X-Axis controls the vibrato frequency and depth; however, you can't use it to add vibrato independently of the fadein.

51.0	50.0	0.0	41.5
Bass Tone	Treble Tone	Filter Resonance	Filter Cutoff
25.0	23.5	34.5	100.0
Vibrato Fade In	Attack	Release	FX Modulation

- **Filter Resonance** increases the Q at the filter frequency set by Filter Cutoff.
- **Filter Cutoff** dials in the desired amount of brightness.
- **Vibrato Fade In** controls how long it takes for vibrato to appear after hitting a note.
- **Attack** smooths the attack time. When fully counter-clockwise, there's an almost brass-like "blip" that occurs at the beginning.
- **Release** determines how long it takes for the audio to fade out after you release your fingers from the keys.
- **FX Modulation** applies a fixed chorus effect to give some animation to the "pseudo-choir" sound.

SYNTH ELECTRIC PIANO

This program has a surprising number of different ways to "shade" the basic sound. For example after the program loads, play with the Tremolo Depth, turn Filter Tone fully clockwise, and turn up Filter Resonance—now you have more of a clav-type sound, and varying Edge adds quite a bit of tonal variation. If you want to go more toward the electric piano end of the spectrum, don't forget the tremolo.

- **Filter Resonance** increases the Q at the filter frequency set by Filter Cutoff. Because it precedes distortion, turning up resonance can give a bit of a hard sync effect.
- **Filter Tone** dials in the frequency for a 2-pole highpass filter.
- **Edge** alters the timbre by adding distortion and overlaying some brightness.
- **Tremolo Rate** controls the amp tremolo speed. It's not synched to tempo, so if you want tempo sync, you'll need to turn on Sync in the Amp's LFO/KEYB tab for both Elements 1 and 2.
- **Tremolo Depth** controls the range of volume changes caused by the tremolo effect.
- **Reverb Mix** controls the amount of reverb mixed into the sound.

SYNTH PEACEFUL FILTER

This is a sweet kind of pad that would have been perfect back in the days when "new age" music was hot. Although you'll find a step generator controlling a filter, unlike some of the previous programs the default sound applies this fairly conservatively. Of course, you can always make it as radical as you want.

- **Step Gen Smooth** changes the shape of the step-generated modulation applied to a filter by rounding off the "corners" of the steps. This should be the first control you tweak when you want to make the sound more peaceful.
- **Step Gen Depth** applies step-generated filter modulation to add animation and interest.
- **Poly Fuzz** adds distortion in a way that's more about changing the audio waveform than creating a hotter, more distorted sound.
- **Attack** smooths the attack time.
- **Release** determines how long it takes for the audio to fade out after you release your fingers from the keys.
- **FX Modulation** applies a fixed chorus effect to give some animation to the pad sound.

SYNTH SHARP+GENTLE

When you want a guitar sound with a keyboard feel, try this program. It has a gentle overall vibe, but with a guitar attack that adds some character and definition to the sound. It's a pretty versatile program—it works for a clean lead sound as well as background chords with a little bit of "bite" to them.

- **Filter Resonance** increases the Q at the filter frequency set by Filter Cutoff.
- **Filter Cutoff** dials in the desired amount of brightness.
- **Detune** adds a natural chorusing sound when turned clockwise.
- **Width** alters the stereo image, but in a subtle way. Full clockwise widens the image somewhat, but also allows the program to sit back further in a track.
- **Chorus Depth** controls the depth of the chorus, which has a fixed, slow frequency.
- **Chorus Mix** sets how much of the chorused sound is mixed in with the unprocessed audio.

WORLD SITAR+DRONE

This is a pretty cool patch…too bad it was born about half a century too late to be part of the psychedelic sixties, when the Beatles introduced the sitar to rock music. My favorite part about this program is that you can play a sitar lead, with pitch bending, while the drone in the background stays at a constant pitch that's set by the Drone Transpose control. This is also the only program that uses up all 24 slots in the Mod Matrix.
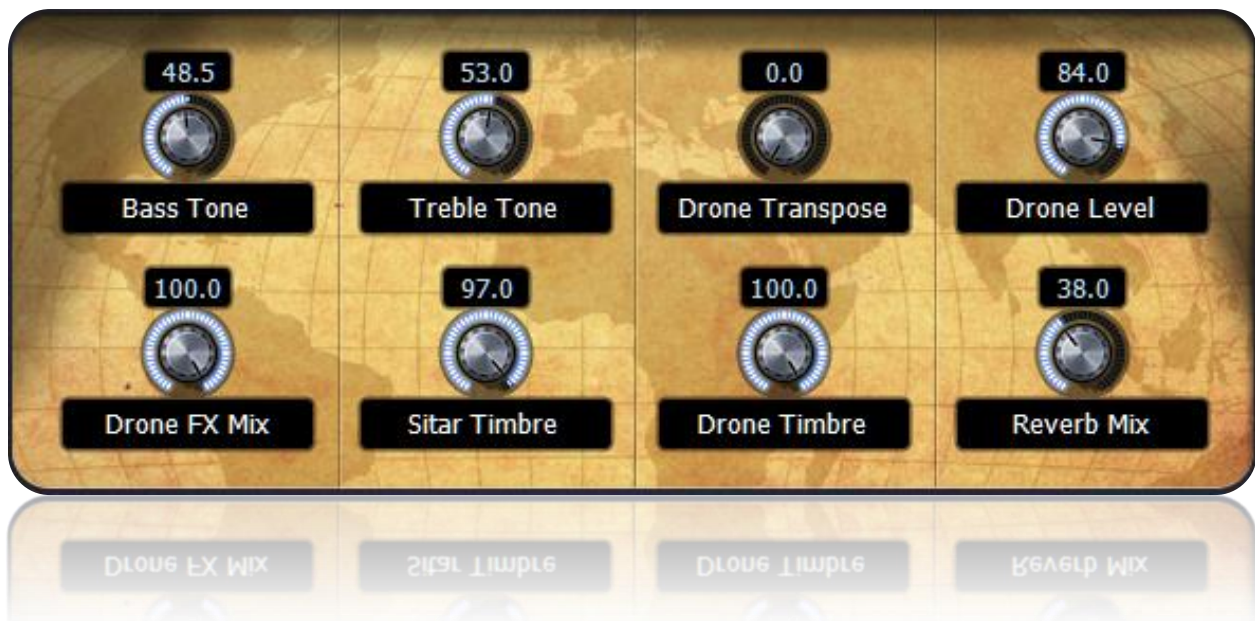
- **Drone Transpose** determines the pitch of the drones (C to C octave higher). The pitch does not change when you play different keys on the keyboard.
- **Drone Level** sets the level of the drones in relation to the sitar sound itself.
- **Drone FX Mix** dials in the amount of chorusing mixed in with the drones.
- **Sitar Timbre** changes the sitar tone's "bridge buzziness."
- **Drone Timbre** uses distortion to change the drone waveform. Turn it counter-clockwise for the most "mellow" sound.
- **Reverb Mix** controls the amount of reverb mixed into the sound.

WORLD TAMBURA

The drone sound in the World Sitar+Drone program is relatively inflexible, because the drone is there to serve the main sitar sound. But the drone sound is too good to relegate to a supporting role, so this program removes the sitar sound and lets the drone sound (based loosely on the Indian tambura) really shine.

- **Filter Resonance** increases the Q at the filter frequency set by Filter Cutoff.
- **Filter Cutoff** dials in the desired amount of brightness.
- **Auto-Pan** this isn't particularly obvious…it just adds some motion to two of the Elements to make for a more animated overall sound.
- **Drone Transpose** determines the pitch of the drones (C to C octave higher). Unlike the Sitar+Drone program, the drone pitch *does* change as you play the keyboard, so this control comes in handy more for real-time octave jumps.
- **Drone Timbre** uses distortion to change the drone waveform. Turn it counter-clockwise for the most "mellow" sound.
- **Drone FX Mix** controls the mix of reverb and chorus added to some of the Elements.