

# Crystallizer™

Granular Echo Synthesizer

 **soundtoys™**



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## **T H A N K S !**

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First off we'd like to give you a loud THANK YOU for purchasing Crystallizer! We know there are an awful lot of plug-ins for you to choose from and we are truly grateful that you have chosen to spend your hard earned scratch (old school for cash) on our product. We take a lot of pride in our work and we sincerely hope that you find Crystallizer inspirational and musically useful.

We'd also like to thank all the people that helped in the development of Crystallizer and the whole new SoundToys line of plug-ins:

Nick Caiano for his super-cool demo sessions and guitar work.

Mikail Graham for letting us hi-jack his wonderful collection of guitar pedals (we'll return them soon we promise!) and for all the help and feedback along the way.

Wendy Letven for her amazing design work on the SoundToys logo, all the SoundToys packaging, and much more.

Andrew Schlesinger for all of his help from the very start of the SoundToys concept from product names, design ideas, and presets, to his witty and useful contributions to this user guide and other sage advice.

Our whole crew of beta testers for Crystallizer, especially Arthur Alexander, BT, Jez Colin, Andy Gray, Fab, Lars Fox, Terry Fryer, Peter Freeman, Jon Goldstein, Rich Hilton, Michael James, Pete McCabe, Oliver Momm, Allan Speers, Morgan Page, Michael Costa, Andrew Souter, Willie Wilcox, Doc Wiley, and Richard Zvonar.

--- Ken, Bob, Jamey, Noah, Mitch and Aimee



## **I N T R O** (the one that comes before the sequel!)

### About Crystallizer

Crystallizer is the third in a series of totally cool new plug-ins to come out of the SoundToys (formerly Wave Mechanics) plug-in development lab. As with FilterFreak, our Analog Filtering module and PhaseMistress, our killer analog phase shifter, a truly ridiculous amount of programming time, head scratching, listening and tweaking has gone into the development and design of Crystallizer in order to provide you with an incredibly creative, powerful, new granular-pitch-splice-forward-backward-echo-plus-space-drive-shimmer-accumulator-effect-device for your Pro Tools rig. That makes sense, right? However, one of the most difficult things facing us is how to describe what Crystallizer does. It is a special tool and sounds unlike anything else so a little history may be in order.

A bunch of years ago the brains at our company (Sound Toys in case you did not know) worked for a little company called Eventide in the swamps of New Jersey (yes, there are swamps). While there, these geniuses created the H-3000 Harmonizer® which also contained a new algorithm called Reverse Shift. That algorithm sat around kind of unused for a little while until this sound designer by the name of Andrew Schlesinger (yours truly) realized that by using the algorithm with a lot of feedback and delay that you could create these incredible "Crystal-Like" echoes and shimmering effects that sounded absolutely incredible, especially on guitar. So a preset was created called "Crystal Echoes" which has subsequently been used by hundreds of artists and producers on tons of albums.

Fast-forward to 2004 and you now have an updated and more powerful Pro Tools plug-in device created by the same guys and based around the same concept (but with a lot more capabilities). And what does it do? Crystallizer basically grabs a "slice" of stereo or mono audio coming in from it's input and plays it back either forward or in reverse with the ability to shift the pitch of the audio slice (4) octaves up, or (4) octaves down. It also includes the ability to delay the playback of the audio by up to (2) seconds and most importantly use regeneration or "Recycle" to feed the output back into the input allowing you to create some radical and beautiful effects on all sorts of input signals. We have also thrown in our standard fare of "Tweak" parameters to further mutate the signal, but that will be covered a bit later on.

Since Crystallizer is not your standard fare it is a little hard to accurately describe all the functions (some are clearer than others) and this is one of those devices that begs to be tweaked and futzed with. There is nothing to break, nothing to ruin and it won't stain your carpet so you might as well just start digging in and playing around to see what this puppy can do.



As with all SoundToys devices we have included a whole bunch of really cool presets (at least we think so) that span the gamut from relatively tame to "out there". So for sure take a little time to go through them with different kinds of input material as it just might create the spark for your next hit record...CD...MP3...DVD...Film...Game...MUSIC! Right!

## What and Who is SoundToys Anyway?

If you already own one of our other products like FilterFreak or PhaseMistress you can skip this section but if not, read on to find out who we are and what we do!

So what the heck is "SoundToys" anyway? SoundToys is a concept, a vision, a new line of totally cool, sonically superior audio FX plug-in devices designed to set a new standard in regards to plug-in processing and sound. And, it's our new company name.

You see all of us at SoundToys (formerly Wave Mechanics) are a bunch of audio geeks that thirst for new ways to manipulate and mangle sound that are innovative, unique, and with sound quality that is in a class all its own.

While everyone and their grandmother is modeling older gear these days, we are busy wracking our collective brains to develop NEW devices that are truly inventive and will stand the test of time - the kind of things you'd take with you to a desert island.

Just so you know, we are the guys that were responsible for designing such groundbreaking and industry standard products as the Eventide H-3000, DSP-4000, and the Wave Mechanics UltraTools line of plug-ins for Pro Tools TDM. Our DSP algorithms can even be found in such high-end studio gear as the TC Electronics Fireworx, G-Force, and G-Major processors, and more.

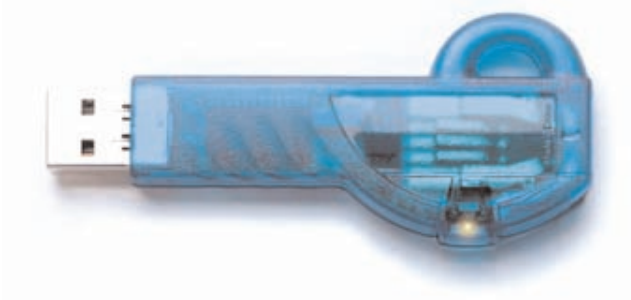
Our approach in developing the SoundToys series of Pro Tools plug-ins is to create a series of dedicated processors that provide the absolute best possible sound quality, flexibility and creative sound manipulation in the wonderful world of digital, but that also possess that truly analog character and vibe.



## GETTING STARTED

### System Requirements

Crystallizer is a software plug-in for the Digidesign Pro Tools system. You'll need to have at least one decent Macintosh computer (G3 or better - faster is always better) running OS 9.2 or later and of course you'll need a copy of Pro Tools version 5.0 or later. To use Crystallizer you'll also need one of those little "iLok" hardware keys. It's a small blue plastic key that looks like this:



If you don't have an iLok we'll be happy to sell you one at a modest price or you can purchase one from Digidesign or your favorite Pro Tools dealer.

### Installing Crystallizer

Installing Crystallizer is really pretty easy. First, make sure that you have your iLok hardware key connected to your computer, and that you have the Crystallizer license card handy. Once you're ready, simply pop the Crystallizer CD into your computer's CD-ROM drive and when the CD icon appears on your screen double-click the Crystallizer installer program to start the process.

Follow any instructions included in the installer and at the end of the installation process you will be prompted to 'authorize' Crystallizer. To do this, carefully detach the license chip from the license card, and insert the chip into the slot in the rear of your iLok.

Once installed, a copy of the Crystallizer plug-in will be located in your Digidesign plug-ins folder along with a cool set of Crystallizer presets. Finally, a SoundToys folder will be created in your Applications folder. Please note that if you already have FilterFreak, our totally cool analog filter box, this folder will already be on your hard drive and Crystallizer will be placed there. The SoundToys folder contains this manual, as well as other useful documentation and tools that you can read or ignore depending on your level of patience or interest in reading babbling things like this manual.



## Registration

If you chose not to register your product during the Crystallizer installation, please take a moment to register Crystallizer by going to <http://www.soundtoys.com/register>. We also strongly recommend that you go to <http://www.iLok.com>, set up an iLok.com account, and register your Crystallizer authorization.

So, why should you bother with all this tedious registration stuff? When the day comes that your pet boa constrictor swallows your iLok in the middle of a recording session, and you NEED to use Crystallizer, we will be able to get you up and running again MUCH MORE QUICKLY. If you haven't taken the time to do this, we will still try to help you, but we'll have no easy way of knowing whether you are really you, or some bozo that swiped your copy of Crystallizer when you weren't looking.





## Some Information on Pitch Shifting and Other Stuff...

As we mentioned earlier, it is a bit hard to describe how this thing really works but a little more detail might be helpful as there are "oddities" involved in pitch shifting and reverse shifting that are worth noting. Nothing bad, just inherent aspects of the process that are worth a few words of explanation.

As we stated earlier, a pitch shifter grabs a slice of audio and plays it back at a different speed to create the alteration in pitch. The important thing to know is that in reality the pitched signal is really being "pushed up" or "pushed down" and modulated with a kind of saw tooth wave and the farther you move from the original frequency the faster this modulation occurs. This is sometimes referred to as "glitching" and is an artifact and byproduct of all pitch shifting algorithms.

It is not just how *far* you deviate from the original pitch (shifting up as opposed to down usually introduces more artifacts) but how *big a slice* of the audio you set the unit to sample that also has some affect on both the speed and depth of the modulation. In addition, the larger the slice the more inherent delay is introduced between the time the original signal is played and the slice of audio that is played back.

As the *size of the slice increases* so does the *amount of delay* between the original signal and the playback of the effected signal. But this delay time does not remain constant due to the modulation that is used in creating the pitch shift. So if you use a long slice and play a riff, the time between your playing the original riff and the playback for the effected riff can vary due to the modulation of the effected signal.

Most pitch shifters automatically adjust the size of the slice to keep it constant so that the effected signal is played back with just a little bit of delay. Crystallizer, on the other hand, offers you the ability to take *much larger* slices of audio, shift the signal up or down (4) octaves (that's a lot of shifting!), play the pitch shifted signal back either in forward or reverse and allows you to feed the output of the shifted signal back into the input so as the signal repeats it is re-shifted with each successive repeat. It also provides the ability to tempo lock the playback so that the repeating signal always starts playing back on the selected beat.

So the important things to keep in mind are the fact that the pitched signal is constantly being modulated, and the larger the slice of audio the longer the inherent delay between the original sounds and the effected signal, and finally, that this delay is not always constant.



# USING CRYSTALLIZER

## Basics

Note: Since you would probably not be reading this unless you own a Pro Tools system we kind of take it for granted that you have at LEAST a basic working knowledge of your computer and of Pro Tools. If you don't, we strongly suggest you make yourself a strong cup of coffee (or two), get a comfortable chair and familiarize yourself with the ins and outs of your Pro Tools system before delving too much further into Crystallizer. Digidesign is really nice and provides lots of manuals for your reading pleasure!

## Knobs



You can use a mouse to control all of the knobs in Crystallizer and they all work in the same way: To turn a knob up, (to the right, clockwise etc), click on the knob with your mouse and drag the cursor to the right or slide the cursor up (towards the ceiling). To turn a knob down, (to the left, counter-clockwise), click on the knob with the mouse and drag the cursor to the left or down (towards the floor). "Mousing" around in a circle doesn't really work; you'll just get frustrated and or dizzy, neither of which is a lot of fun.

### Jumping to a Value using Text Markings

Some knobs have text markings showing minimum, maximum, or other values. Clicking on one of these text markings will automatically move the knob directly to that value.


### Returning a Knob to its Default Value

To return to the knobs "default value", simply hold down the *option* key and click on the knob. This will automatically move the knob back to its default value.

### Viewing a Knob's Exact Value

To view the exact numerical value of a knob simply hold down the *control* key and click on the knob. To see the knob's title, hold down *control* and click on the knob a second time.

### Adjusting a Knob with Fine Control

To get finer control over knob values, hold down the apple  key while dragging the mouse.



## Toggle Switches



In an effort to provide the feeling of real analog gear our toggle switches "switch" when clicked. To change the "state" of a toggle switch (like the analog/digital control), simply click on the switch. It will change from where it was to the "other" setting. Click again to change it back. Really simple!

## LED Displays



LED displays on Crystallizer work in a couple of ways:

### Nudge Buttons

Most text readouts also include a pair of nudge buttons next to the display. Clicking on the upper button will increase the value by one and clicking once on lower button will decrease the value by one. This is useful for tweaking a value by small steps.

### Numerical Readouts & Entering Values from the Keyboard

For numerical readouts, (like BPM), you can enter exact values right from your computer keyboard. Clicking on the LED display highlights the field and makes it "live". Once highlighted, you can enter a new value via the computer keyboard. Press, "Return" to submit the value and deselect the field. You can also click & drag the cursor to change the value. Simply click on the value and drag the cursor up to increase the value or down to decrease the value, similar to using a knob control. Press, "Return" to submit the new value and deselect the field.



## Pop-Up Menus & Changing Values:



For most text-based readouts (meaning things that aren't a number), like LFO WaveShape etc, clicking on the readout with the mouse will display a pop-up menu. To change a value in the pop-up, hold down the mouse button and drag to select the desired value and let go. The selected entry will show up in the field, or a new pop-up window may appear depending on what you have selected.

## Accessing Crystallizer

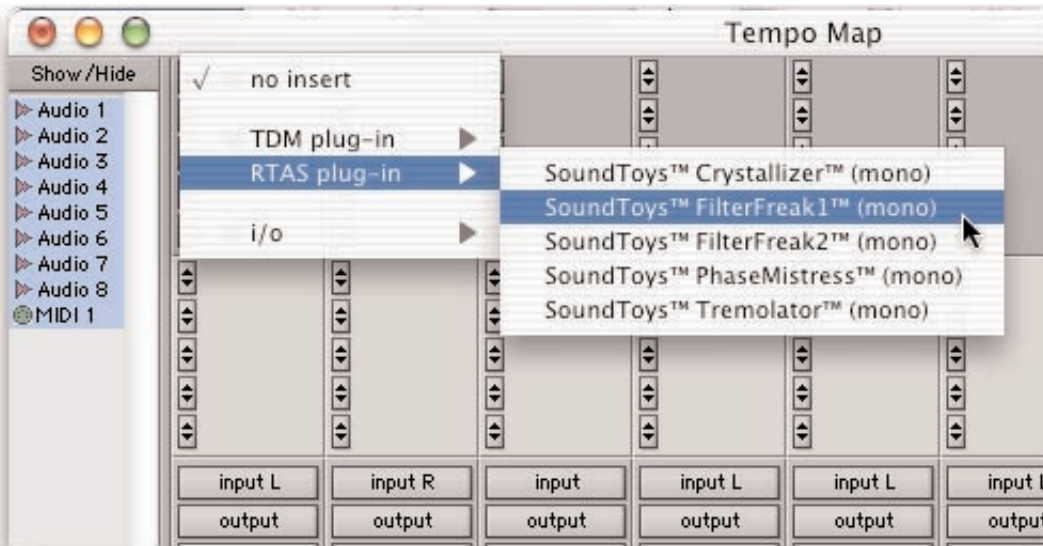
Now that you know how to use knobs and pop-up menus, it's time to actually use Crystallizer within Pro Tools. Crystallizer is available to process your audio in two different ways: Real-Time, or Non Real-time.

### Real Time Processing (RTAS or HTDM)

As a real-time plug-in, Crystallizer works a lot like a real hardware...umm... Crystallizer! Whatever sound goes into Crystallizer, comes out filtered, and you can hear it as it is happening (in real time!). Keep in mind that using Crystallizer in this manner always chews up some CPU processing power.

To use Crystallizer in this way, you must first select Crystallizer as one of the insert devices within Pro Tools, by clicking on the inserts button on a track. You can do this either from the edit or mix window in Pro Tools. From the inserts pop-up, select Crystallizer as shown in the next graphic...

You can insert as many versions of Crystallizer as you'd like. Just keep in mind that each one gobbles up a certain amount of CPU cycles and can make your computer start to sweat in terms of what's left over for other tasks.



### Non-Real Time Processing (AudioSuite)

If you want to save computer power, Crystallizer can also be used to process a specific region of audio destructively. This is done in Pro Tools using the AudioSuite version of Crystallizer. To do this, first select the region of audio you'd like to process from the Edit window of Pro Tools. Then choose Crystallizer from the AudioSuite menu of Pro Tools.

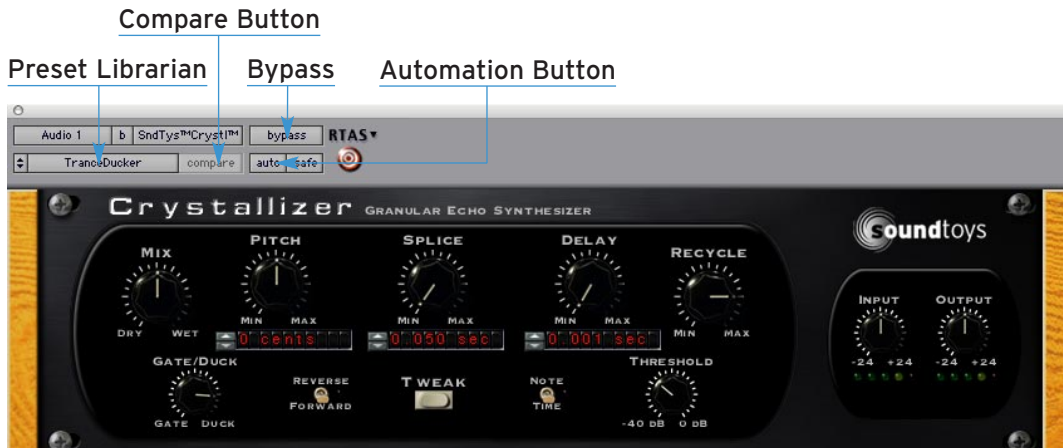
Hit the process button to process the selected region with Crystallizer and to write the result back to disk. To hear the effect before committing to disk, click on the preview button.





## Using Crystallizer Within Pro Tools

Crystallizer is designed to be very integrated with Pro Tools, supporting all of the "standard" Pro Tools plug-in features and controls including parameter automation, MIDI control, etc. Access to these functions can be found in the gray bar that Pro Tools attaches to the top of Crystallizer. The display below shows the real-time version of Crystallizer. When using the AudioSuite version, an additional gray bar will appear on the bottom with buttons to control previewing and processing.



## The Crystallizer Preset Library

For your immediate listening pleasure and for those who just can't wait, we've included a bunch of carefully crafted, creative, cool presets with Crystallizer. You might want to check these out, as they not only provide a good example of the various types of effects that can be achieved with Crystallizer, but one of them just might be the ticket you need for your latest hit record or production. They also provide a great starting point for you to tweak and mangle to your hearts content. Besides, we spent a whole bunch of time making them so you might as well give them a spin.

### Loading a Preset:

To view and load a Crystallizer preset, simply click on the Settings Librarian button located in the standard Pro Tools plug-in controls area, located at the top of the plug-in window, located in Pro Tools, located on your computer, located in your, oops,





sorry! And as you would expect, for more info on the Pro Tools Settings Librarian, please read the Pro Tools manual.

### Saving a Preset

Saving a preset is just as simple. Click on the small button to the left of the preset name and choose "Save" to update the current preset, or "Save As" to create a new preset.

## Compare Button

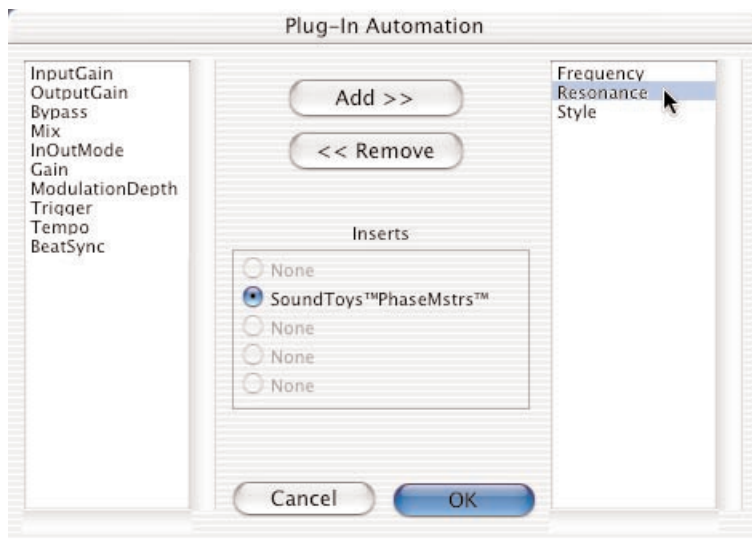
The compare button (often called the compare "light" by Pro Tools pros) is a great way to audition the effect of any changes you've made to one of the Crystallizer presets. As soon as you change any parameter in Crystallizer, the compare light will come on. Click on the compare light to toggle between the original preset and your current changes.

## Bypass

One of the more useful features on any plug-in is the Bypass button. Click on this to bypass the effect of Crystallizer. This also recovers any CPU cycles being used by Crystallizer.

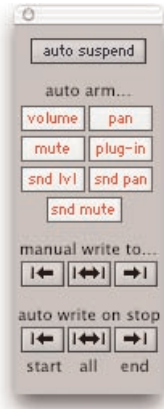
## Using Parameter Automation

Many of the controls in Crystallizer can be automated. Click on the 'auto' button to bring up the Plug-In Automation window. At the left is a list of parameters available for automation. On the right are any of the parameters that are currently automated. Select whichever parameter or parameters you'd like to automate then click on the 'Add' button. Those parameters will appear on the right side of the window, and can now be automated from within Pro Tools.





To record automation data, you'll first need to do a few things within Pro Tools. First, bring up the Pro Tools automation window (see Pro Tools Manual for enabling automation) and make sure 'plug-in' is enabled.



Next, in the track you're working on, select 'auto-write' to enable the real-time recording of automation data.

Now, press play and fiddle with the Crystallizer controls. Pro Tools should now record any control changes you make. When the transport is stopped, the automation will automatically switch to 'auto-touch'.



Please Note: In auto-touch mode, the automation data you've just recorded will be played back, and any new control changes you make will be written over the older automation data. To prevent these new control changes from being recorded, change the automation mode to 'read'. To turn off all automation on this track, set the mode to 'off'.

It would be really cool to edit these control changes, wouldn't it? Pro Tools has got you covered. From the edit window, click on the waveform button and slide the mouse over until you see Crystallizer and its automated parameters. Choose whichever parameter you'd like to edit (it would be nice to see all parameters at once, but for now you've got to work on one at a time.)





Now you'll see the automation control superimposed on the audio waveform. From this you can click and drag to your hearts content, creating all sorts of wild and crazy effects!

## Locking Crystallizer to Tempo and Down Beat

One of the coolest features of Crystallizer is its ability to synchronize its sweep to the tempo (BPM) and downbeat (the '1' of 1, 2, 3, and 4) in your music. This is a totally awesome way to make Crystallizer hip-hop and groove along with your tunes.





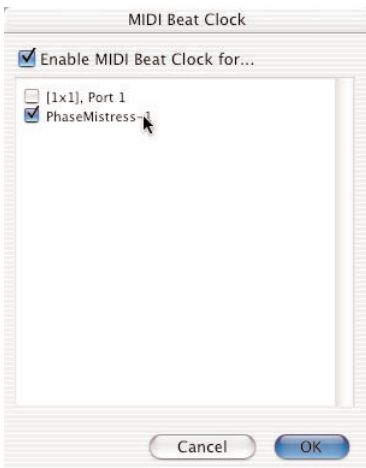
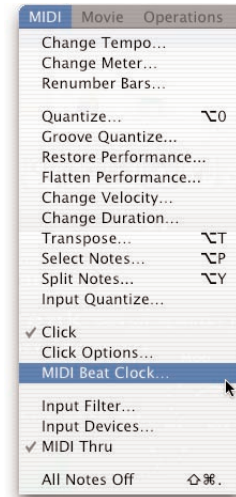
## How to Get Crystallizer to Sync

Crystallizer uses MIDI clock to synchronize with your music.

To sync Crystallizer to your tune:

If you are using Pro Tools 6.2 or later simply click on the 'Midi' switch on the front panel of Crystallizer. If you are using an earlier version of Pro Tools, you'll also need to do the following:

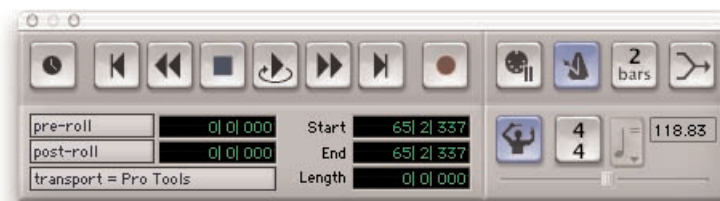
1. Select 'MIDI Beat Clock' from the Pro Tools MIDI menu.
2. From the dialog box, make sure "enable MIDI Beat Clock" is checked and that Crystallizer (and any other SoundToys plug-in) are also checked. You will need to repeat this step every time you insert a new Crystallizer plug-in.



3. Select 'OK' to lock to the Pro Tools tempo and beat clock.

But WAIT! There are still a few things to note before this will all work. New Pro Tools sessions always set the default tempo to 120 BPM, and the downbeat will start at the beginning of the session. In order for tempo locking to be useful, the downbeats and tempo of your music needs to line up with the downbeats and tempo in your Pro Tools session. If you've recorded everything to a click track within Pro Tools, everything should be cool. If not, you'll need to enable the conductor track within ProTools and create a tempo map for your song.

## Creating a Tempo Map



1. Enable the conductor track by clicking on the conductor button in the transport window of Pro Tools. If you don't see the conductor button on the transport window, Select Display->Transport Window Shows from the Pro Tools menu. Make sure MIDI and "Expanded" are both checked.
2. Create a tempo map by defining bar | beat markers in your song. A simple way to do this is to select the first measure of your song (very precisely) in the Edit window, and then use the Identify Beat command in ProTools (⌘ - I) to define the

Page 18, 1st paragraph  
Tools" in 3 places  
- Page 18, 1st paragraph  
MIDI Beat Clock  
- Page 18, 2nd paragraph  
Page 18 Under  
item 2 should read  
'enable MIDI Be



starting and ending beat numbers for the selection. Pro Tools will then calculate the correct tempo based on this. If the tempo of your music varies (which it probably does if it wasn't recorded to a click), then you may need to repeat this procedure at various points in your song to keep the beat locations lined up correctly.



**Hint:** It is very, very useful to use a drum track along with the tab to transient feature within Pro Tools to help with this. If you're a Pro Tools TDM user, you may also want to learn about Beat Detective, which can help to automate this potentially tedious process.

**More Info:** All of this and more are covered in great detail in the Pro Tools manual. For info about tempo maps and conductor tracks look at Chapter 21 of the Pro Tools 6 reference guide. For info about Beat Detective see Chapter 22, and for info about the extremely useful tab to transients feature read Chapter 16, Playing and Selecting Audio.

## Using the HTDM version of Crystallizer

If you are a Pro Tools TDM user, Crystallizer is also available as an HTDM plug-in, and will appear in the TDM inserts menu of Pro Tools. The HTDM version is available because RTAS plug-ins cannot be used on aux tracks and cannot have real-time monitoring when used within Pro Tools TDM systems.

The HTDM format allows native plug-ins like Crystallizer to be used just like TDM plug-ins (except that the host CPU is used for processing instead of the DSP chips on the DSP farm cards). One very big caveat here is that the HTDM format causes significant latency (or delay) in the audio stream.



**IMPORTANT:** Digidesign has a special low-latency version of the 'Stream Manager' driver for Pro Tools. This can reduce the latency from 1024 audio samples to 256 audio samples (from 21 milliseconds to 5 milliseconds at 48 kHz sample rate!) For the latest and greatest info on optimizing HTDM for your system and to download the low latency Stream Manager, please visit the HTDM Q&A page on the Digidesign website. The link to it is:

<http://www.digidesign.com/support/faq/htdm.html>

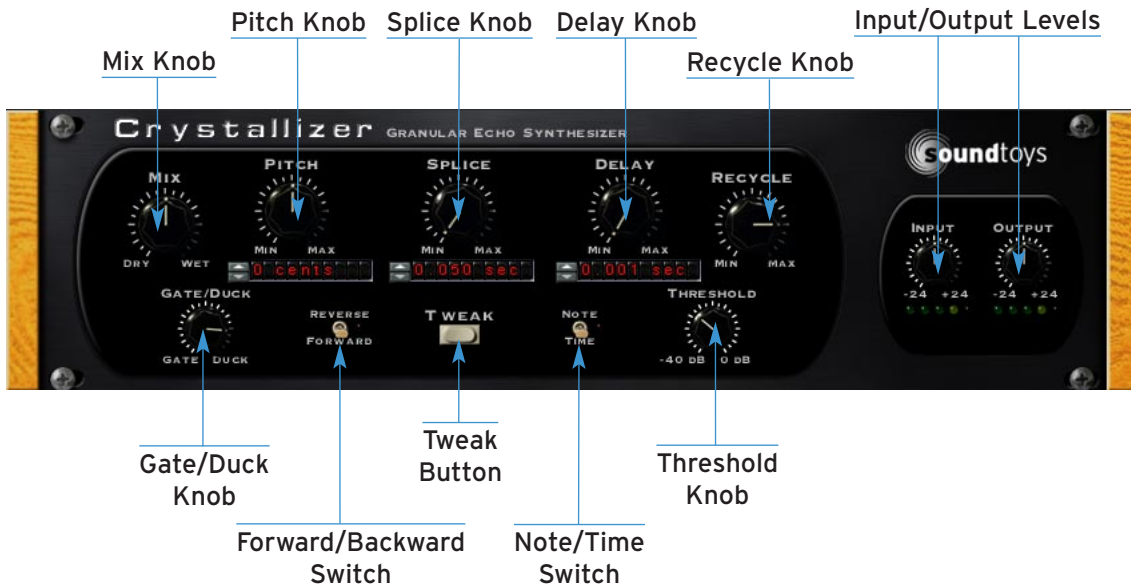
## Optimizing CPU Usage

Crystallizer is a native plug-in, which means that it uses your computer's processor to do its audio processing. Because of its advanced DSP algorithms, Crystallizer can put a pretty heavy load on your processor. Here are some tips to reduce the processing:

- If you're running multiple tracks through the same effect, use Crystallizer on an aux track and use sends to route the audio through Crystallizer.
- Commit your effect to disk by using AudioSuite, or, by bouncing to disk



# CRYSTALLIZER CONTROL PANEL



## Input and Output Level

The Input and Output level controls are used to (you guessed it) boost or attenuate either the input or output of Crystallizer. The default setting of the controls approximates "unity gain" (what goes in comes out the same level) and should provide the best overall "normal" sound quality when set to these levels. The LED's beneath the Input and Output knobs provide visual display of the input and output signal levels. The yellow LED indicates that the signal is 6dB below clipping. The red LED indicates maximum signal level, and possible clipping which may or may not sound so good depending on the switch setting and what your ears like to hear.

It's important to note that the input and output level only affects the shifted signal and leaves the dry signal unchanged. This approach may be slightly different than that of some other plug-ins and we found this implementation to work best for Crystallizer.

## Mix

The Mix control is used to set the balance between the shifted sounds created by Crystallizer (and Input/Output control settings) and the dry signal. The Mix control provides a convenient means of setting just the right balance between the dry and shifted signals right in and on Crystallizer.

So, if you're using Crystallizer on an Aux Send/Return configuration, you may want to leave the mix at 100% and use the fader on the return to control the amount of the effected sound. If you are using it "in-line" and sending the signal right through Crystallizer you probably want to set the Mix knob at 50% or less depending on the type of shifted effect being used.



## Pitch

The Pitch control allows you to adjust to pitch of the effect signal up or down (4) octaves, (8 octave total range) with the maximum values being +4800/-4800. The readout is in "cents" and the values increment in (1) cent intervals. This allows you to get slight detuning effects by setting the Pitch value to say + or - 10, or set the pitch between notes, i.e. +750, between a 5th and 6th.

## Splice

As discussed earlier, the Splice control determines the length of the section of audio that is captured and played back. The values are in milliseconds and the range of knob is from 0-2050ms (a little over 2 seconds).

Setting the Splice length really short, say below 30ms, will result in very short delay time, will play back the audio really, really fast and will most likely result in a sound that does not have a discernable pitch. This can actually be a cool effect on non-pitched percussive sounds but on pitched sounds it can sound kind of metallic. You really need to set the Splice control somewhere above 30ms to have the pitched signal resemble the input when using a regular pitched sound. This is especially true as you add more pitch shift.

Setting the Splice control to a high value of say, 300ms or greater will result in a section of the input signal being "grabbed" and played back each 300ms and pitch shifted to the amount set by the Pitch knob. In addition, there will be approximately the same amount of delay (300ms) inserted between the original sound and the onset of the effect sounds as each new slice is taken.

So for example, if you set the Splice control to 1000ms it will be looking to grab a slice of audio every 1000ms and there will be approximately a 1000ms (1 second) delay before the effect sound is played back. But remember that the delay time within the spliced section is being modulated so the actual onset of the playback may not be exactly 1000ms and depending on when your input signal occurs *within* the 1000ms "grab" will also affect how and when the playback will occur.

This is really a bit difficult to explain in words and we strongly recommend that you experiment with various Splice lengths while playing some short riffs or notes. As you change the Splice value you will hear how the audio is being captured and played back. Also try experimenting with forward and reverse modes, using the Delay and add some of the Recycle and hear how that alters the nature of the effect.



## Delay

This control allows you to insert a specific amount of delay between the original signal and the effected signal. This delay is not modulated and is fixed to the value that you set. It is added to any delay that might be inherent based on the Splice setting. The delay range is: 0-2050.

## Recycle

The Recycle knob is like a "feedback" control and allows you to send the output of the effect signal back into the input at varying amounts. Turning the control up will generate repeating, spiraling pitch effects and depending on the setting, the Pitch knob can create upward or downward spirals. The longer the splice, the longer the time between repeats and adding Delay can also increase the space between each repeat. Using a Splice of say 500ms and above, a Pitch setting of 1200 and a decent amount of recycle will create the classic "Crystal Echoes" like effects.

## Threshold

Ok, so we are going a little out of order here but there is a method to this madness. Before we can really discuss the way the Gate/Duck knob works (below) you need to know that the setting of the Threshold defines "when" the Gate/Duck action happens. The Threshold control allows you to define a specific level (as in loudness) that the input must reach before the Gate/Duck begins to take affect. As long as the level of the input signal is above the Threshold level the Gate/Duck will be "on" and activated. As soon as the level of the input signal falls below the Threshold setting the Gate/Duck are turned "off" and de-activated.

The LED ring around the Threshold knob displays the level of the input signal providing a visual cue to how the input level is changing. This allows you to easily set the Threshold level to a setting that will provide the type of results you want. Setting it too low will cause the Gate/Duck action to always be on and setting it too high will keep the Gate/Duck from ever turning on.

There is no right or wrong settings as it all depends on the type and level of input signal being used (percussive, sustaining, etc) and what type of effect you want to achieve. Experimenting with the Threshold knob along with the Gate/Duck (described below) can yield some very dynamic and cool effects especially with the long echo washes that Crystallizer is capable of producing.



## Gate/Duck

The Gate/Duck knob is a dual-purpose knob that allows you to either "duck" (dynamically lower the level of the effected signal) while the original sound is above the setting of the Threshold knob, or, Gate the effected signal (dynamically increases the volume of the effected signal) while the original signal is above the Threshold setting.

To make it easier to hear how this Gate/Duck works set the Pitch to 1200, Splice to 500, Delay to 500 and Recycle to 11 o'clock. This will create a repeating echo an octave above the original signal that gets increasingly higher in pitch with each repeat.

Setting the Gate/Duck knob smack dab at 12 o'clock is the "off" position where no Gate or Ducking will be employed. As you turn the knob clockwise you will begin to add "Ducking" to the effected signal, which will *decrease* the level of the echoes as long as the input signal is above the Threshold. The more you turn up the Ducking the more you will decrease the level of the effected signal while the input is above the Threshold setting. If you turn it all the way up the effect will totally disappear while you are playing and as soon as the input signal drops below the Threshold the echo effect will appear again. This is a really cool way to have the effect "move out of the way" while you are playing and then reappear when you stop.

Turning the knob counter clockwise works in a manner inverse to the Duck. As you crank the knob counter clockwise you will progressively *lower* the level of the effect signal and turning it all the way counter clockwise will set the level of the effect signal to zero as long as the input signal is below the Threshold.

As the input signal moves above the Threshold the effect signal will reappear and remain present as long as the input signal is above the Threshold. The effect sound is "gated" based on the level and dynamic of the input signal. This too can be a really cool effect as you can be playing notes below the Threshold and creating these swirly, echo wash effects that will only appear when you hit a loud note.

Since the knob allows you to set the relative level of the effect signal from full on to full off you can have the effect signal just drop by various amounts in the Duck mode and in Gate mode you can set the effect to always be heard somewhat but when you play louder the effect will come full on. There are a lot of creative possibilities for sure.

Lastly, under the Tweak menu you will find two additional controls: Attack and Decay that are used to define how fast or slow the Gate/Duck action takes place. These are discussed in detail under the "Tweak" section.





## Forward/Reverse

This one is really easy. When this switch is in the "Forward" setting the slice of effect signal is played back normally...forward! When the switch is set to "Reverse", the slice of effect signal is played back in reverse...backwards! Keep in mind that any pitch shifting will be imparted on the effect signal regardless of the Forward/Backward setting. Reverse can sound really cool especially at longer Slice settings and with Recycle turned up. But be careful not to get lost in space as it can be tons of fun.

## MIDI Sync

Switching the Midi Sync button to "on" locks Crystallizer to incoming midi clock. You will also notice that the Splice and Delay control readouts will change from milliseconds to note values. This allows you to select specific note lengths and have the effect stay in sync with the midi clock. Keep in mind that the Splice will be forced to restart at each downbeat based on the selected note length, kind of like how oscillator sync works on a synth.

## Tweak Button

Pressing the Tweak button will open the Tweak menu screen providing access to a new set of parameters that provide the ability to "tweak" Crystallizer even further.



### FB Mode

This stands for "Feedback Mode" and defines how multiple repeats in the feedback loop will appear in the stereo field.

**Mixed** - In Mixed mode both the left and right channels of the feedback signal are mixed and are heard in both the left and right channels. Turning up the Recycle setting and adding some Delay Offset can yield a more "diffused" sound with this setting.

**Dual** - In Dual mode the feedback path for the left and right channels are independent, are not mixed and appear in their respective channels.

**Ping Pong** - When Ping Pong mode is selected the repeats will appear on one side then the next and ping pong back and forth with each successive repeat.



### Pitch Offset

The Pitch offset control allows you to add additional detune to the signal but will detune the left channel down and the right channel up by the selected amount. So, whatever the setting of the main Pitch control, the value set on the Pitch Offset will subtract the selected amount from the pitch of the left channel and add the selected amount to the pitch of the right channel.

This can be very useful especially for creating thick stereo detune effects. If you set the main Pitch control to '0' and set the Pitch Offset to say '11', the left side will be tuned flat by 11 cents and the right side will be tuned sharp by 11 cents. The range of the Pitch offset control is (4) octaves (4800). So you could conceivably have the left channel shifted down (4) octaves and the right side shifted up (4) octaves. Keep in mind that the maximum shift is +/- 4800 cents so regardless of where the Pitch control is set you cannot go higher or lower than this maximum range.

### Splice Offset

The Splice Offset control only affects the right side signal. As you turn the knob clockwise it starts to shorten the right side splice length by the percentage shown in the numerical readout. A setting of .25 indicates that the right side will have a splice length 25% shorter than the left side, a setting of .50 means that the right splice length will be 50% or  $\frac{1}{2}$  of the left side and a setting of 1.00 indicates that the right side will be 1/100th of the left side splice length.

With longer settings on the Splice control you can get some really interesting stereo effects by varying the Splice offset and creating different splice lengths in the left and right channels.

### Delay Offset

The Delay Offset control works like the Splice Offset and also only affects the right side signal. As you turn the knob clockwise it starts to shorten the right side delay length by the percentage shown in the numerical display. A setting of .25 indicates that the right side delay time will be 25% shorter than the left side, a setting of .50 means that the right side delay time will be 50% or  $\frac{1}{2}$  of the left side and a setting of 1.00 indicates that the right side will be 1/100th of the left side delay time.

As with the Splice Offset, varying the Delay offset allows you to get some really cool stereo effects by creating different delay values on the right and left channels.



## Attack

The Attack control is used in conjunction with the Gate/Duck control and allows you to adjust how quickly or slowly the effected signal is gated or ducked when the input level passes the setting of the Threshold knob.

With Ducking, the Attack time determines how quickly or slowly the effect signal will be *ducked* once the input signal passes above the Threshold setting. With Gating, the Attack time will determine how quickly or slowly the signal is gated and will *appear* as the input signal passes the Threshold setting. The faster (lower) the setting of the Attack knob the faster the effect signal will be ducked as the input signal passes the Threshold level setting. The slower (higher) the value of the Attack knob the slower the effect signal will be ducked or gated as the input signal passes above the Threshold setting.

This allows you to change the level of the effect very quickly with short Attack settings or to have the effected signal slowly drop in volume with longer Attack times. It is important to keep in mind that with longer Attack times the input signal has to be held above the Threshold level long enough for the signal to slowly fade out. If the input signal is rapidly going above and below the Threshold setting the response of the Ducking or gating will be too slow to respond. In this case you would need to lower (speed up) the Attack time so it can react more quickly.

## Release

The Release control is used in conjunction with the Gate/Duck control and allows you to adjust how quickly or slowly the effected signal returns to its "normal" level once the input level drops below the setting of the Threshold knob.

With Ducking, the Release time determines how quickly or slowly the effect signal will "come back up" to its normalized level. With Gating, the Release time will determine how quickly or slowly the signal will "drop back down" to the level set on the Gate knob. In both cases the Release is engaged once the input signal drops below the Threshold setting. Again, keep in mind that the longer the Release times the slower the change in the level of the effect signal. In most cases you will want to tweak both the Attack and Release times based on the dynamics of the input signal.

## Low Cut

The Low Cut knob controls a 12db per octave highpass filter and allows you to reduce the low frequencies of the effect signal based on the frequency setting of the knob. The range of the knob is from 1.00Hz to 5000Hz and as you turn the knob up the frequency increases and more of the low to mid of the signal in the effected sound will be eliminated.



### High Cut

The High Cut knob controls a 12db per octave lowpass filter and allows you to reduce the high frequencies of the effect signal based on the frequency setting of the knob. The range of the knob is from 20 kiloHertz at the highest setting and to 500 Hertz at the lowest setting. So as you turn the knob down or counter clockwise the frequency decreases and more of the high end of the effect signal will be eliminated.

Using the Low and High Cut filters together allows you to create various types of band pass filters. Keep in mind that these only affect the effected signal.



## **S U M M A R Y**

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As we stated way back at the beginning of this story, Crystallizer is one tough puppy to describe. It is really a highly powerful and creative sound mangling tool and can create a wide range of unique effects on just about every kind of input signal. The best way to learn how it works is to fire it up with a session filled with different types of sounds and try it on different tracks and with different settings. Again, you just might find that special spice sound to take your music into new directions. We had a blast making this thing and there is a whole lot of fun waiting for you to explore and we think it was worth all the effort. We hope you will too...Enjoy!



## **FINAL PAGE**

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### Getting Help

We offer free technical support for all registered users. We love to hear from you, but if you are having problems, first try to look in the manual or on the support page of our web site for an answer. If you are still stumped, please e-mail us with the following info:

- The product version and serial number
- The version number of your Pro Tools system, and type of hardware (e.g. Mix, HD, Digi-001, etc.)
- Your computer type and operating system version number (e.g. System 9.1, OS X, etc.)
- A detailed description of the problem

The e-mail address for support is: [support@soundtoys.com](mailto:support@soundtoys.com)

If you don't have e-mail, you can call us at 1-802-951-9700.

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