L u c i f e r

V e r s i o n   2 . 0

Lucifer 2 – An Effect Plug-in for Windows and Macintosh OS X

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Getting in Touch

If you experience any problems while using this plug-in, or you just wish to pass on your comments, you can email the developer at: steve@devine-machine.com.

Alternatively, you can find help and advice in the official Devine Machine forum on the excellent K-v-R website: www.kvraudio.com.

Additional information about Lucifer and the other excellent Devine Machine software is available from the Devine Machine website: www.devine-machine.com.

Demo Version

If you are using the demo version of Lucifer, please be aware of the following limitations:

- 8-bit funky guitar in the background (on the upbeats of beat 1 and 2).
- You can save your edits of the demo plug-in but these edits can only be loaded into the full version.

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Contents

1.Introduction

Lucifer is a blood-red audio effect plug-in that can twist and warp your music into beautiful and deadly shapes. Using the combination of a MIDI keyboard and your computer's mouse, you can trigger repeats, reverse the audio, re-arrange it, scratch it, filter it, distort it, bounce it, and many other effects besides, all in real-time and all in time to the beat.

Lucifer 2.0 adds many new exciting possiblilities – audio file loading and saving, AutoRandom (randomize a graph at the end of each cycle), mix button (capture input audio as synchronized loops), 99 new 64-bit DSP effects, mutltiple outputs, multiple buffers, and much more!

Lucifer is available (sold separately) in PC and Mac OS X versions.   It is designed to be used within a host audio application that supports the VST plug-in format.

For Mac OS X hosts that do not support the VST format, but that do support the Audio Units format, Lucifer can be used with the FXpansion VST-Audio Unit Adapter

(http://www.fxpansion.com/).

ProTools 7 users can use the 2.0 version of the Fxpansion VST-RTAS adapter. If you do not wish to purchase either of those products (though recommended) and you wish to run Lucifer in RTAS or AU formats, contact Devine-Machine about the possiblilty

> Keep in mind- Lucifer is a **unique type** of plugin (**effect which can take MIDI notes as input**), so in some hosts there may be configuration you are not used to (e.g. Logic Audio, inserting it as an Instrument and sidechain function for audio in).

Installing Lucifer

Lucifer comes as zipped file which includes the plug-in (*Lucifer2.dll on PC, Lucifer2.vst on OS X*).

Installing on the PC

Unzip the files and move or copy *lucifer.dll* to the host's VST plug-ins folder. Please check the documentation for your host as to where this folder is located on your PC.

Installing on Macintosh OS X

Unzip the files and move or copy *lucifer.vst* to your VST plug-ins folder (e.g. ~/Library/Audio/Plug-Ins/VST).

If you wish to remove Lucifer from your computer, simply delete that plug-in file.

Using Lucifer with your host

Being an effect, Lucifer makes no sound itself; it needs to have audio routed through it for the magic to begin. Also, although you can achieve some of its many audio manipulations just through use of the mouse, to take full advantage of the effects that Lucifer can produce you should have access to a MIDI keyboard. Route the MIDI data from this keyboard to the Lucifer plug-in within your host.

If you're an experienced user of audio software, this set-up process will be straightforward and you could skip to the next chapter. But we all have to begin somewhere, so if you need some guidance, see the table that begins on the next page.

Using Lucifer with your chosen host

Lucifer is intended to be used as an insert effect, completely processing the audio that you route through it. Check the documentation for your host as to how you achieve this. You should also have a MIDI keyboard connected to pass MIDI information into your host. Instructions for using Lucifer with a variety of popular hosts are given below:

Logic Audio for Mac OS X

Insert Lucifer as an instrument. Select *sidechain* in the Logic-area of the plug-in window, and choose the source audio track/aux to process. Logic is now routing the sound here, so you may wish to mute the source (*MIXER*) channel by turning its fader down in Logic (so that you don't hear both the wet and dry signals).

FLStudio for PC

Insert Lucifer in a free slot in the External Effects Bank in the Mixer window. Open Lucifer and set the *Port* parameter in the top right-hand corner to an unused MIDI port (e.g. 5). Now, in the Step Sequencer, right-click on a row and select *Insert Channel* then *MIDI Out* to create a MIDI Out device. In the window that opens for that new channel, set the *Port* parameter to that same value (in this example, it's 5).

You may alternatively use Lucifer 2.0 as a Generator in FL Studio. In this case it is impossible to access a realtime audio input, but you can use audio files as source material inside of Lucifer (new feature in 2.0 version).

EnergyXT for PC

Open an instance of Lucifer in the EnergyXT workspace, along with any sound sources you wish to process. Make the appropriate audio connections and then connect the Master In MIDI source to Lucifer's MIDI input.

Ableton Live for PC and Mac OS X

Insert Lucifer into the Audio Effects section of an Audio track or the Master track. Create a MIDI track for controlling Lucifer. In Session View, set *MIDI from* to the MIDI input your keyboard is connected to and set *MIDI to* to the track containing Lucifer. You should now see Lucifer's name appear just below. Finally, either record-enable that MIDI track or make sure that its Monitor option is set to *On*.

You may alternatively insert Lucifer on a MIDI track, and load audio files into Lucifer.

Using Lucifer with your chosen host

Cubase SX/SL for PC and Mac OS X

Insert Lucifer in an insert slot on an audio channel that you wish to process. Create a MIDI track and, for that track, select the MIDI In port that your MIDI keyboard is connected to as the *in* setting and *lucifer* as the *out* setting.

Cakewalk Sonar for PC

Once you have copied Lucifer into your Vstplugins folder, run the Cakewalk VST Adaptor program. When it has finished scanning your plug-ins, the VST Plug-In Configuration window appears. Find Lucifer in the list, highlight it then click on the 'Properties' button. In the window that opens, make sure that both the 'Enable as DX plug-in' and the 'Configure as DXi synth' options are ticked. (For Lucifer to receive MIDI data in Sonar, it has to be identified as a synthesiser plug-in.)

When you have completed this configuration, Lucifer is ready for use. Open Sonar and load an instance of Lucifer into the FX bin of either an audio track or the audio output track of a DXi synth. Do this by right-clicking in that FX bin and selecting *DXi Synth > VST > lucifer*. Now insert a MIDI track into the project. Finally, set the input for that MIDI track to the MIDI input that your keyboard is connected to, and set the output for that MIDI track to *lucifer*.

2.First words

Triggering effects using your MIDI keyboard

Lucifer includes a variety of effects, and a variety of ways of bringing them into play. The most important and most immediate of those ways is to play particular notes on your MIDI keyboard. Many of the repeat-based effects are mapped to a two octave range of notes. This two octave range is repeated up the length of the MIDI keyboard, with the result that there is almost always more than one note to play to trigger a particular effect.

The instructions in this manual often refer to the two octave range that spans the notes C1 to B2, as it is probably the most convenient range to play when using a regular five octave MIDI keyboard. The diagram on the next page illustrates both the effect assignments within this two octave range of notes, and also how that range is repeated across the length of the MIDI keyboard. This diagram will become a useful reference for you as the various effects get explained in subsequent chapters. Also, you can see from the diagram that there is an area of the MIDI keyboard - highlighted in green - which does not have the two octave range of notes assigned to it. These are the Pitch Change notes and they will be also be explained in due course.

The Assignable Notes [C2] to [B2]
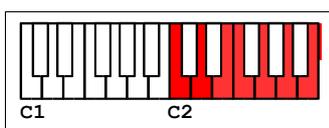
All other MIDI notes in Lucifer have pre-set assignments, but these 7 ites are user assignable. You can choose yourself which effect each of these notes trigger, simply by clicking on (or pressing from MIDI) the desired key and then selecting an item in the menu to the right:

Assignable Note Menu

Some of the choces in the menu include a value i.e. 50 or 100. This is the percentage amount of the particular effect that will be applied.
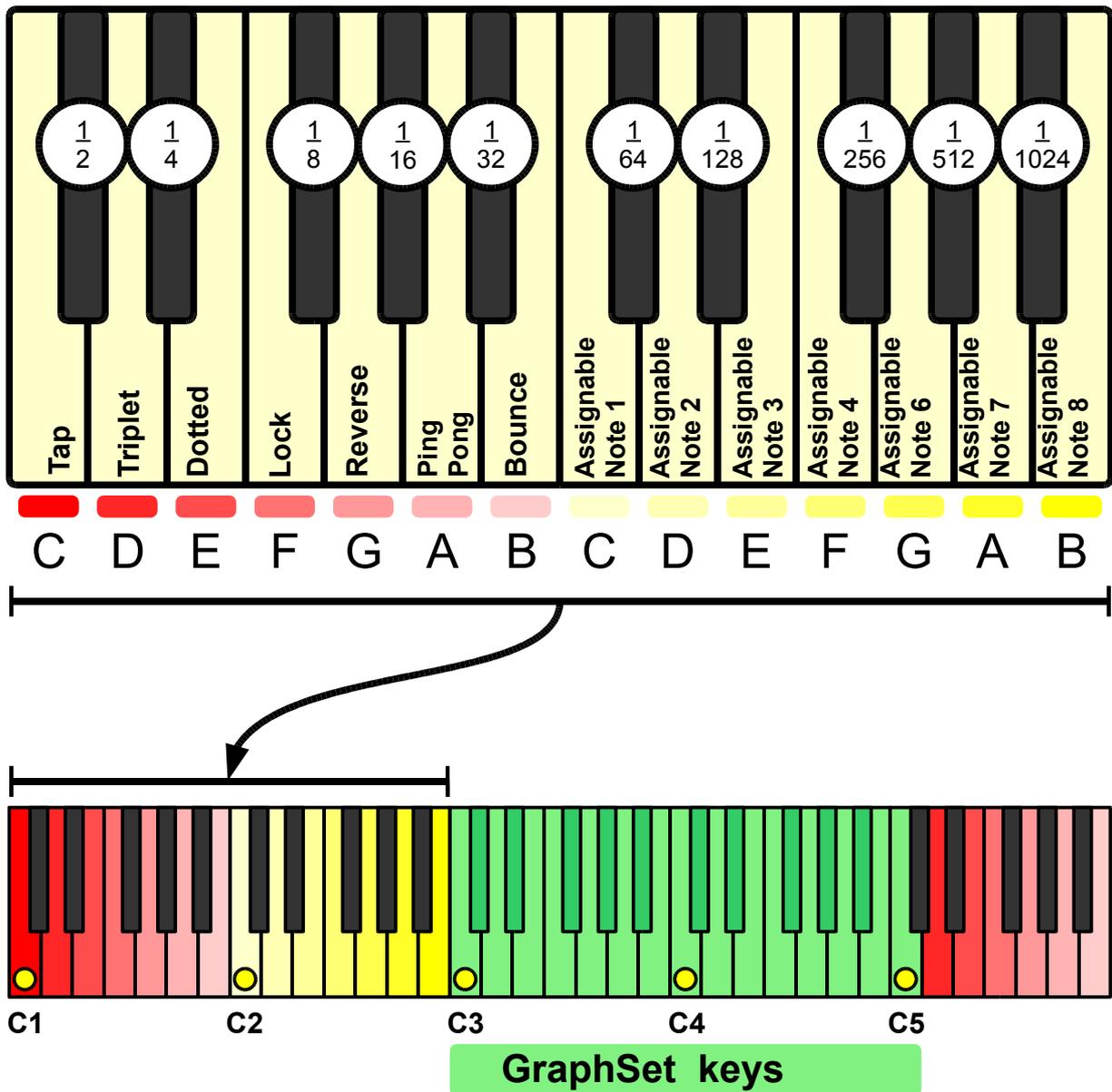
The note assignments across the MIDI keyboard

Triggering effects using the user interface controls

Most of the repeat effects in Lucifer also have related controls within the user interface. For example, the keyboard graphic at the bottom of the user interface can be used as a (poor) substitute for your MIDI keyboard. The notes in this display trigger the same effects as the corresponding two octave range of notes that's mapped across the MIDI keyboard.   Be sure to try real MIDI to Lucifer as well, because interesting things will happen not possible with the mouse (e.g. Holding a black key and white key at the same time).

For almost all of the knobs in the user interface, as well as being used for altering the exact sound of the assigned effect, they also turn that effect on and off. For these knobs, a setting of hard left switches the effect off, indicated visually by a change of appearance - the pointer on the knob disappears. Also, if you want to make fine adjustments to a knob's position, hold down the [Shift] key as you're turning it with the mouse. Finally, [Ctrl]-clicking ([Command]-click on OSX) on a knob will return it to its default position.

Triggering effects using MIDI Continuous Controllers

Many of the controls in the Lucifer user interface also have MIDI Continuous Controller assignments. You can make use of these to control Lucifer using modulation wheels, MIDI knobs, MIDI faders, ribbon controllers etc. See Appendix 2 for a full list of these assignments.

Controlling effects using the graphs

Graph display

Graph Selector tabs
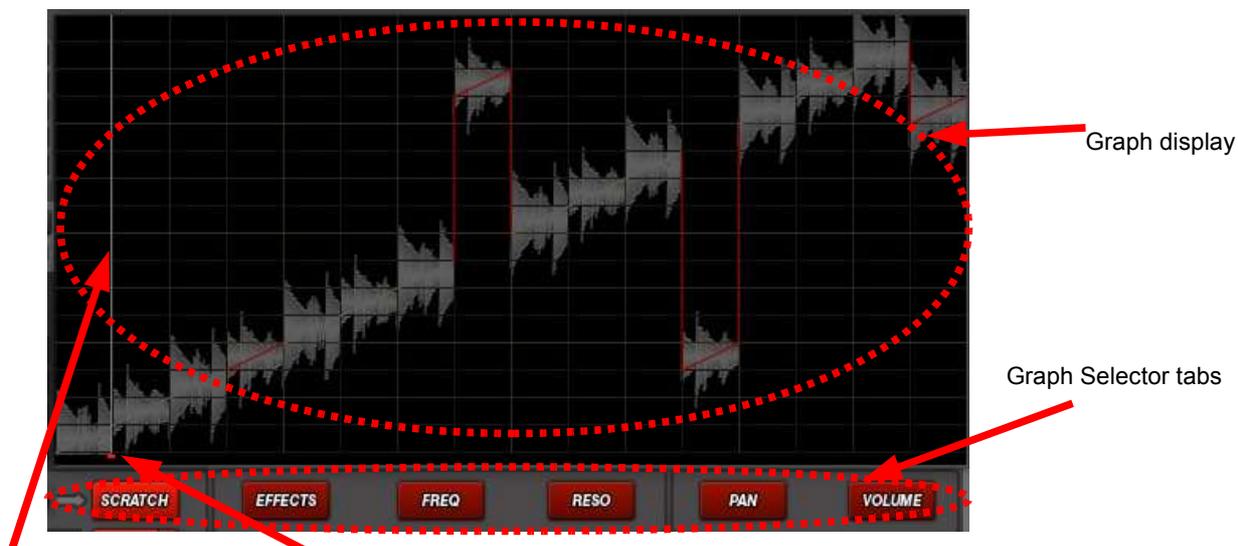
Vertical white line is called the "cycle cursor". See page 15.

Red blip = "playback cursor". See page 16.

The upper half of the window is dominated by a graph display. Directly below this graph, there is a row of six Graph Selector tabs:There are in fact several graphs available, each controlling a particular parameter. The Graph Selector tabs are used to select which is to be the currently displayed graph. The shape you draw on that graph then tells Lucifer exactly how you want a particular effect to vary with time.

Range knobs

The Range knobs allow you to adjust the range / depth of the current visible graph. With these knobs set to their default positions (as shown in the screen shot to the left), the graph allows for the full (maximum) range to be sent out. But by changing the position of these knobs, you can restrict the base and range of the graph output.

The default values for these two knobs are appropriate for many situations but if you wish to influence, for example, the filter's cut-off frequency in real-time, then these are the knobs to use.

The left knob is Base, and sets the minimum graph value to be output. Think of this as a "+" control (add amount to graph).

 The right knob is Scale, and sets the overall range of the graph. If you want to automate a single knob, it is probably this one. Think of this as a "*" control (multiplying overall graph value)

These knobs hold a value on every Graph in every GraphSet (2 knobs x 6 graphs x24 GraphSets) so you can use them without worry of affecting other GraphSets.

There are dedicated VSTParameters ("*Scratch base" thru "*Vol Scale") as well as MIDI CC's (CC#50-61) for these parameters .   Use these for automation, as the visible knobs on the Lucifer interface are **not** set to automate in host, as they change based on which graph is showing (but you will notice the aforementioned Parameters set / move the knobs on the interface).

Normal mode and Pitch mode

At the bottom of the user interface, you will see either the phrase *NORMAL MODE* or *PITCH MODE* (as shown in the screen shot on the right)*.* Simply clicking on the phrase changes the mode.

Lucifer can be operated in one of two modes: Normal mode is the mode you should select for the majority of this manual.
Pitch mode is dealt with towards the end in its own chapter. (If Lucifer is currently in Pitch mode, please change to Normal mode.)

3.Synchronising Lucifer to the beat

Lucifer manipulates, in real-time, the audio that's fed into it. To do this, it has to constantly record that audio into an internal audio buffer. Lucifer is always cycling through this buffer, recording whatever audio is currently at its input to the location that it has reached in the buffer at that moment. Additionally, Lucifer is at the same time cycling through the various graphs that this plug-in offers. These graphs are each used to control a particular parameter over the course of a cycle within Lucifer. This control is achieved by the shape drawn on each graph.

The Cycle Cursor

The Cycle Cursor shows where in the current cycle Lucifer is, and it is the thin vertical line that travels from left to right across the current graph:

Current Sync position (recording / graph location)

Current playback position (different from top if a repeat is held) see next page.
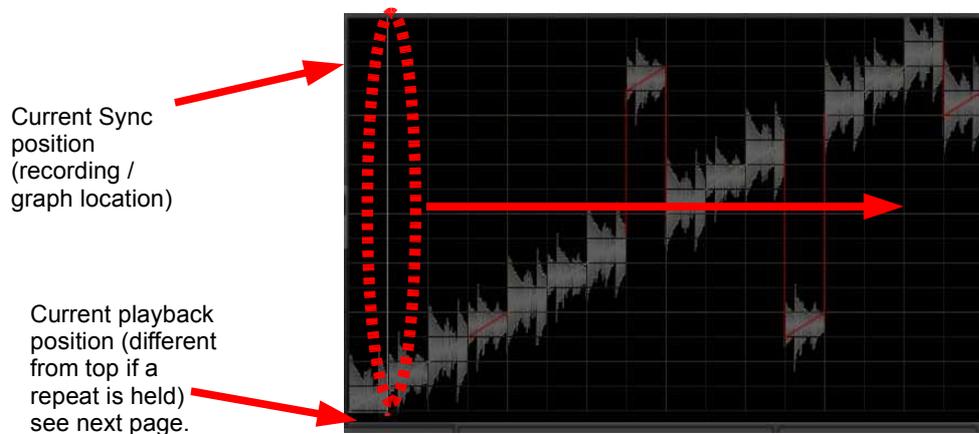
Lucifer is at the start of the current cycle when the Cycle Cursor is at the extreme left of the graph, and it is at the end of the current cycle when that cursor is at the extreme right position.

The cycle (total graph length) can be either 1,2,4, or 8 bars in length as determined by the "# Bars" control on the right of the window.   This is a global setting (applies to all graph sets).

The Playback Cursor

The Playback Cursor indicates how Lucifer is playing back the audio that's been recorded into the audio buffer:
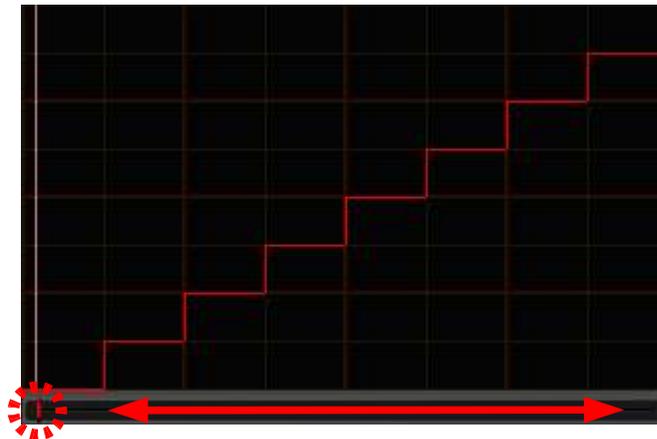
When this cursor is at the extreme left position, Lucifer is playing back the audio that's at the start of the buffer. When this cursor is at the extreme right position, Lucifer is playing back the audio that's at the end of the buffer. As you start to use some of the more extreme playback effects that Lucifer offers, you'll see that the Playback Cursor can sometimes jump around frantically to locations all across the audio buffer.

Cycle Size ("Bars")

The size of a cycle within Lucifer, and so the size of the audio buffer, is set using the Bars parameter (see right).

Lucifer is designed for manipulating music in 4/4 time, the time signature that most popular music uses. A bar in 4/4 time is four beats long. (For example, you can create a simple drum beat in 4/4 time by playing a kick drum on the first and third beats, and a snare drum on the second and fourth beats.) The Cycle Size setting dictates how many of these 4/4 bars a single cycle within Lucifer consists of. There are four possible settings: 1 bar, 2 bars, 4 bars and 8 bars. These choices are shown respectively by the numbers *1*, *2*, *4* and *8*, with the selected size being the highlighted number.

When you first create an instance of Lucifer in your host, this setting defaults to one bar; *1* is the highlighted number. With that setting, the audio buffer within Lucifer is sized to be one bar of 4/4 time in length, so Lucifer is manipulating one bar of audio information. Also, with that setting, the various graphs available represent the change of a particular parameter over the same one-bar period.

These concepts of beats and bars only make sense if Lucifer is synchronised to the audio that you are passing through it. This synchronisation is an **essential** step toward using Lucifer.

Synchronising using the Sync button

If you are using Lucifer in a host audio application that passes tempo information to the plug-ins, then getting Lucifer synchronised with the host is easy - just make sure that the Sync button (shown here to the right) is lit up; press it if it isn't. The BPM Display next to this button should now be displaying the host's current tempo.

When you start your host playing, you'll see some activity in the user interface:

- The Cycle Cursor will be scrolling across the graph. Notice that the time taken for this cursor to scroll across the graph is the same as the time taken for your host to play back the number of bars indicated by the current Cycle Size setting in Lucifer.

- The Playback Cursor will be similarly scrolling across the bottom of the graph, mirroring the movement of the Cycle Cursor. This indicates that the audio in the buffer is currently being played back exactly as it has been recorded there. This is because you have not yet started altering the playback of that audio. When you do, expect to see the Playback Cursor jumping around to reflect this change.

The BPM knob and the Tap Tempo note [C1]
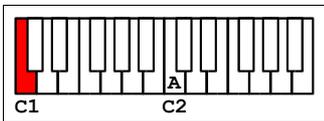
If you are using a host that does not pass tempo information to the plug-ins, or you are using Lucifer to process live audio, then you'll need to make use of either the BPM knob or the Tap Tempo feature.

The BPM knob can be used to set a known tempo manually. (See the screen shot on the right for its location.)

As an alternative, when the exact tempo of the audio being processed is not known, you can use the Tap Tempo note. This note is C1 on your MIDI keyboard. Start playing the audio that you're wanting to process, then begin tapping the note C1 in time to the beat. You should do this for several beats to get Lucifer synchronised closely to the audio.

There is, however, an additional consideration when manually synchronising Lucifer. Earlier in this chapter, it was explained that Lucifer is always in a cycle. We don't just want to get Lucifer synchronised to the incoming audio, we also want to get it synchronised so that the first beat of a cycle within Lucifer coincides with the first beat of the equivalent cycle in that audio. We do this by ensuring that the last tap on the Tap Tempo note is that exact beat. You can do your tapping so that this last tap is the last of a string of taps you make to set the tempo, or you can tap to set the tempo, then do one final tap a bit after that on the beat you want the cycling to begin

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from.

If you set the tempo using the BPM knob, you can then simply tap once on the Tap Tempo note at the appropriate point in the music to tell Lucifer where to begin its cycling from.

4.Loop for life

The most important effect in Lucifer is the looping of the incoming audio. It is only by looping audio that many of the other available effects (e.g. the rows of knobs on both sides of the crossfader) can be brought into play.

Before you start looping, please make sure that Lucifer is not currently in Incarn mode. This is indicated by the Incarn button being lit up, as it is in the screen shot to the right. If it is lit up like this, please click once on it to switch it off.

Loop
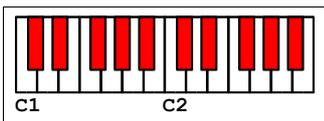
This effect can be accessed by:

- *The black notes on the MIDI keyboard*
- *The NoteLock, which will enable a black note if none are currently playing (C#1 if Incarn on, G#1 if Incarn off)*

When you play a black note on your MIDI keyboard, the chunk of audio at the current location in the cycle gets repeated for as long as you hold the note down. Notice that the Playback Cursor changes its motion. Before a black note is played, that cursor simply mirrors the movement of the Cycle cursor,since the audio in the audio buffer is being played back without any change. But by playing a black note, playback does change and the motion of the Playback cursor changes as well to reflect this.

The different black notes trigger differently sized loops. The different possible sizes are mapped to the black notes over the two octave range:
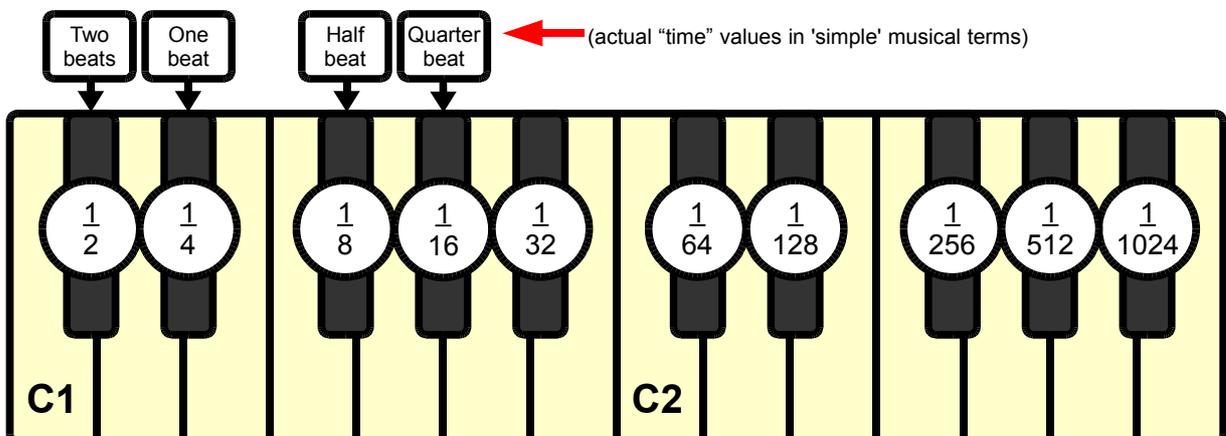
There's an important point to make about these loop sizes: in musical terms, they do not change if the Cycle Size (BARS) setting is changed. For example, regardless of the current Cycle Size setting, playing the note C#1 will produce a loop that is two beats in length (half-note) , and playing the note D#1 will produce a loop that is one beat in length (quarter-note).

Additionally, you can utilise the black notes polyphonically. Try playing a black note, and then play another while still holding down that first note. The loop size changes to that of the second black note played. If you release just that second note, the loop size changes back to that of the first black note you're still playing. Lucifer's ability to maintain this "rhythmic phase" allows for realtime jamming on audio fragments - without getting off beat!

If you hold down a black note for a long time while you're playing audio that varies through Lucifer, you can hear for yourself how Lucifer works. Play the note D#1. This, as expected, causes the audio to begin looping, and the looping continues as long as you hold that note down. But listen to what happens each time the Cycle Cursor (on the graph) passes the looping Playback Cursor. The audio in the loop changes at that moment!

The Cycle Cursor reflects the way the incoming audio is being recorded into the audio buffer, and at the moment the Cycle Cursor passes the Playback Cursor, the audio in the audio buffer which is currently being looped has just been overwritten.

(There is a way of stopping this behaviour, to freeze the audio that's in the audio buffer so that it doesn't get overwritten. This freezing is achieved by activating the Lock feature - it's detailed later in this chapter.)

QUANT

The Quant button is used to select how Lucifer behaves when you play a black note. There are three possible behaviours, and by clicking on this button you can cycle between them.

Wait When a black note is pressed, the note does not activate until the sync position is at a "correct" location . This wait boundry location is based on the time value of the black note you push.

Free Looping begins the very moment you play a black note.

Quant This behaviour is similar to *Quant*. However it acts more similar to a Quantize function on a MIDI sequencer. In other words keypushes can in a sense be moved "early" in time.   In *Quant*, Lucifer assumes that the chunk of audio you wish to hear repeating is the chunk closest to the time of your key press.   For example, imagine you wanted to loop a bit of a snare drum, but you got excited and anticpated the upcoming snare drum, and pushed the repeat key a little early. QUANT mode would "know" this, by knowing you are closer to the next time boundry than the current one.

When using Lucifer, you will most likely have either the *Wait* or *Quant* option selected.   Both of these result in looping that is synchronised to the beat. (The exception to this will probably be when you're using Lucifer in Pitch mode, when the *Free* setting is usually preferred.) Again, the *Quant* option has the advantage that if you happen to press a black note slightly too early (i.e. just before the chunk of audio you're wanting to loop), you will still get the desired loop. Experiment with both of these settings to see which best suits you.

Lastly, it should be mentioned that the sound of the Length knob (described later) behaves intentionally different in FREE mode, where the knob becomes unrestricted by rhythmic divisions of the beat).

If you want to appreciate these differences in looping for yourself, try the following:

Set the Cycle Size to *1* (remember, that's a Cycle Size setting of one bar) and select the *Free* behaviour. Play the audio you are effecting through Lucifer, fix your eyes on the Playback Cursor and play the note C#1 on your MIDI keyboard. You'll see that as soon as you play that note, Lucifer jumps back two beats to begin looping (two beats being the loop size triggered by playing the note C#1).

Now try the same thing but with *Wait* active. Since the current Cycle Size is one bar and the loop size being played (C#1) is two beats, then the audio buffer is being divided into two chunks, each two beats long. With *Wait* active, you'll see that Lucifer loops whichever of these two chunks playback is within at the moment you play the black note C#1. Lucifer waits until playback reaches the end of that particular chunk before jumping back to the start of the chunk and beginning to loop it.

Finally, select the *Quant* behaviour and repeat the exercise. You'll see that if playback has reached a point within the first half of one of those two chunks, that is the chunk that gets looped. This is the same result as when *Wait* was selected. But if playback has reached a point within the second half of one of the chunks, it is the subsequent chunk that gets looped.

When you're ready to continue, set the Cycle Size back to its default setting of *2* and make sure that the Wait mode is set to either *Wait* or *Quant*.

End

The End feature is enabled by clicking on the word *END*; the word will light up red. Lucifer will now execute an 'all notes off' command at the end of each cycle. To see this for yourself, hold down a black note to create an audio loop. This looping will now stop when Lucifer reaches the end of the current cycle, even though you are still holding down the black note. This feature is particularly useful when you're using Lucifer to creating fill or climax effects, as it guarantees that audio playback will return to normal at the start

of the next cycle.

For a simple example of this feature, activate End and then, towards the end of a cycle, play the notes F#1, G#1 and A#1 in succession. This will create a climax effect that ceases the moment the current cycle ends.

NoteLock
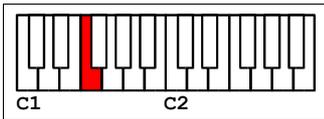
This effect can be enabled by:

- *clicking on*
- *The Lock MIDI note [F1].*
- *The related NoteLock Knob (directly above the lock).*

At any time when you're playing a black note, try tapping the note F1 on your MIDI keyboard. What you'll find is that you can now release that black note and Lucifer will continue to loop. Notice also the Lock symbol in the Lucifer user interface (see right) lights up when you play that note; you can also click directly on that Lock symbol to activate the 'lock'. When you tap the Lock note again, normal playback resumes.

While Lock active, you can play different black notes, white effect notes and twist the knobs to change the sound of the audio within the loop, all while looping continues. Critically, with Lock active, Lucifer's audio buffer is frozen.

As described in the previous chapter, Lucifer is normally constantly writing the incoming audio to the audio buffer, but while Lock is active this refreshing doesn't take place. You can freeze a particular loop of audio for as long as you like, freely using the controls on the plug-in to change that loop's sound.

New in Lucifer 2.0, now if no notes are playing and/or you click on the lock, the "default repeat time" is enabled.   This auto-enabled repeat note is either C#1 (snaps each repeat duration to segment's length on the scratch graph) if Incarn switch is on, or G#1 (16th notes) if Incarn switch is off .

When black notes are being played and Lock is active, the Tap Tempo note (discussed on page 17) takes on an additional role. Tapping it resets the timing of the looping audio, so that the loop moves in time (but the loop size remains the same). This is a useful feature when Lucifer is not being synchronised to the host audio application, for example when you're processing live audio. In that situation, a locked loop of audio could begin to drift in time. Tapping the Tap Tempo note at the appropriate moment will get that locked loop back in time.

Buffers

New to Lucifer 2.0 is the buffer selector.   Lucifer has 4 stereo 32-bit buffers which can each hold different audio loops. These loops can either be loaded WAV files, or audio captured via the MIX button/Input Lock (described next).

The 1-2-3-4 control also changes the graph's line color to match the active buffer color (as extra visual feedback).
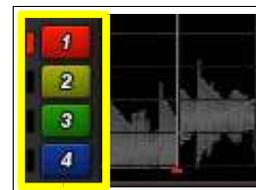
Input Lock

The Input Lock allows you to view and optionally set the input lock. This control when enabled stops Lucifer from recording the audio input. The result is you see and hear a "captured" loop.

You may be tempted to click on it, but the MIX button is a better way to capture loops (see next control).

You can also click the input lock to "deactivate" a loaded WAV file in the current Buffer (it will no longer save in host).

Mix Button
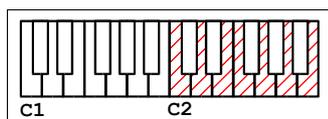
This effect can be accessed by:

- *Userkey notes (see left).*
- *Clicking on it (see right).*

Lucifer is always "recording" its own output, which you can capture with this button!

Clicking the MIX button will automatically enage the input lock at the end of the cycle to give you a captured loop exactly spanning that cycle in time.

There are several instances where this can be useful.   There are four different capture choices, which you can select on the UserKey menus, or by using modifier keys while clicking on the Mix Button:

Name	Menu Name	Key PC	Key OSX
Mix	Mix	Click (on MIX)	Click (on MIX)
Mix to Background	"Mix->BG(shft)"	Shift-Click	Shift-Click
Mix and Overdub	"Mix+OD(alt)"	Alt-Click	Option-Click
Mix Next Cycle	"MixNext(RtClik)"	RightClick	Ctrl-Click
Mix Prev Cycle	(not available)	Alt-RightClick	Option-Ctrl-Click

Mix – Regular function

Pretend for a moment you have an active audio input (music track, instrument, etc). You hear something "good" happen and wish to be able to loop and/or manipulate it. If it is within the current cycle, you can click the Mix button, and the Mix button will illuminate for the rest of the cycle, indicating capture is underway. Lucifer will now start playing this captured cycle instead of the audio input (notice the control on the left side of the Crossfader switch from 'dry' to 'buffer').

Mix to BG

There may be circumstances where you do not wish Lucifer to interrupt the live audio input, you can shift-click on the mix button (Mix to BG). This will leave the left side of the crossfader alone (dry) so you will only hear the captured audio if you activate a repeat (black note / NoteLock).

Mix Previous Cycle (Alt-RightClick)

"but what if I hear something cool happen, but by the time I think to capture it, Lucifer is already in the next cycle??"

This can happen, you hear an interesting sound but the cycle is now ending/over!

If this happens, don't worry, you can still access it with nimble fingers and a sharp memory!   Alt-RightClick on the Mix button (option-ctrl-click MAC OSX)   and Lucifer will grab the previous cycle and Lock it, even though you thought it was gone!

Mix Next Cycle

This is like the normal MIX function, except delayed to start at the next cycle.

Imagine you are already jamming about using Lucifer to manipulate something (perhaps you loaded an audio loop into Lucifer, or already used Mix). Now you realize you want to "commit" what Lucifer is doing to it for a cycle length (1-2-4-8 bars - perhaps to export to a WAV with the Save button) But imagine part of what you are doing is performing on Lucifer, so thus you need time to get your hands ready on the MIDI keyboard.   In this case, You simply Right-Click on Mix (ctrl-click on OSX) and it will start the capture on the next pass (MIX will not illuminate until the start of the next cycle, and will remain illumiated for that cycle as the "capture" is taking place).

Mix + Overdub (Alt-Click)

This is intended for a sound-on-sound type of manipulation.   Probably the last of the Mix options to try and make sense of.   Using this feature activates the 'Mix to BG'

function mentioned on the previous page, but the scratch (incarn) graph is also reset.

5.The Loop position modifiers

When you're looping audio, there are several effects and controls available that can alter the position and size of the loop.

Groove
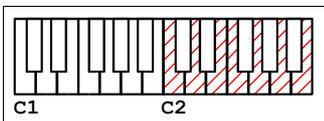
This effect can be accessed by:

- *Userkey notes (see left).*

- *X-Y controller menus.*

- *The Groove knob. (See right.)*

Groove affects the timing of the repeats when you play the black notes. A percentage shift is made to every second repeat, creating a swing effect. The further the Groove knob is turned to the right, the greater the shift. The Groove assignable note applies a full swing effect.

Spread
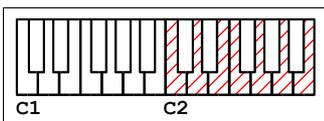
This effect can be accessed by:

- *Userkey notes (see left).*

- *X-Y controller menus.*

- *The Spread knob. (See right.)*

Normally, the looping triggered by the playing of the black notes results in the repetition of a single chunk of the audio buffer. But by applying the Spread effect, you can cause each repetition to begin at earlier or later point than the last.

First try setting the Spread knob to the 12 o'clock position. If you play a black note, you should hear no looping at all! This is because Lucifer is shifting the start point for each repetition of the loop forwards by the size of the loop, with the result being that no section of the audio buffer gets repeated. Now turn the Spread knob a little to the left and watch the Playback Cursor. It is moving back in time, because the start point for each repetition is being shifted backwards. Similarly, turning the Spread knob to the right of the 12 o'clock position resulting in the start point for each repetition being shifted forwards, and the motion of the Playback cursor reflects this.

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This shift backwards or forwards is done in multiples of the loop size of the black note that you're playing, which makes the Spread effect a simple way to create drum loop variations. When doing this, try varying the position of the Spread knob and the particular black note that you play.

The behaviour of the Spread effect when the Spread knob is in the 12 o'clock position can be put to very good use. Some of Lucifer's effects, like Hyper and Reverse, can only be heard when you're looping audio. Ordinarily, that would mean you cannot have unchanged audio playback at the same time as applying these effects. But by using Lucifer with the Spread knob in the 12 o'clock position, you can have your cake and eat it!

MicroSpread

This effect can be accessed by:

- *The MicroSpread knob. (See right.)*

- *X-Y controller menus.*

The MicroSpread knob behaves in a similar way to the Spread knob. With that latter knob, the further it is turned to the left or to the right, the further playback is shifted earlier or later within the audio buffer. This shifting occurs in multiples of the particular black note being played. The MicroSpread knob also allows for playback to be shifted earlier or later, but it shifts in **fractions** of the particular black note being played.

While the Spread knob is great for creating rhythmic variations, the MicroSpread knob is ideal for timestretch effects, either on its own or in conjunction with the Spread knob.

Example 1: Set the MicroSpread knob to the 12 o'clock position and play and hold the note C#2. Now move the MicroSpread knob slowly to the left. The loop will begin to slowly scrub backwards in time, with the Playback Cursor illustrating this movement. Also try moving the MicroSpread knob to the right. The loop slowly scrubs forwards, with the speed picking up as the knob is turned further to the right.

Example 2: For a different way of timestretching the audio, set both the Spread and MicroSpread knobs to the 12 o'clock position, then play a black note (say, G#1). Now move the MicroSpread knob slowly to the left.

When Incarn mode is on, MicroSpread serves the same function technically, but is useful instead for nudging the playback repeats slightly earlier or late. This can be useful in very small amounts (e.g. -2%) if a captured/loaded loop is slightly ahead of the beat and you are hearing clicky/choppy relocation points.

Bounce
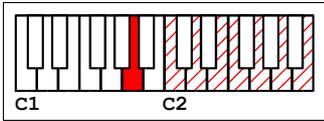
This effect can be accessed by:

- *UserKeys or MIDI [A1] (see left).*

- *X-Y controller menus.*

- *The Bounce knob. (See right.)*

The Bounce effect simulates the effect of bouncing the audio as if it were a bouncing ball. The result of adding this effect and playing the black notes is loops that progressively decrease in size until they are tiny, at which point the loop size returns to normal and the process begins all over again.

When using the Bounce knob, you are controlling the time over which the bounce occurs; the further to the right the knob is turned, the quicker the bounce. So if you want a longer, more obvious 'bouncing ball', keep this knob set relatively low. When you play the Bounce note [A1] on your MIDI keyboard, you can see the Bounce knob turn hard right. As this would suggest, the effect triggered by playing the Bounce note is a quick bounce.

There's one more detail about the Bounce knob to be aware of: at both the 12 o'clock (fifty per cent) and the full right (one hundred per cent) settings, each bounce overall will be synchronised to the beat.

Dotted
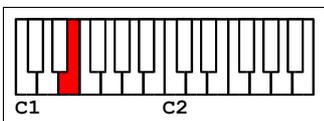
This effect can be accessed by:

- *The Dotted note [E1].*

The Dotted note modifies the length of the loop size on each black note. Playing the note E1 on your MIDI keyboard at the same time as playing a black note will result in the loop size for that black note increasing by 50 per cent.

Triplet
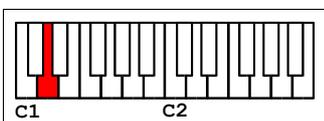
This effect can be accessed by:

- *The Triplet note [D1].*

The Triplet note is used to modify the length of the loop size on each black note. Playing the note D1 on your MIDI keyboard at the same time as playing a black note will result in the loop size for that black note increasing by 33 per cent.

6.The Loop sound modifiers

There are several effects available that can change the sound of the audio within the loop.

Gate
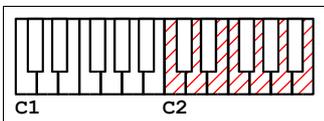
This effect can be accessed by:

- *UserKeys or MIDI [A1] (see left).*
- *X-Y Controller Menus.*
- *The Gate knob. (see right.)*

The Gate knob applies a gating effect to a percentage of the audio; the further this knob is turned to the right, the greater that percentage. If this knob is set to the hard left position, the Gate effect is switched off.

This effect is very useful for creating severe, glitch-type effects, plus it is often an important addition when using the Scratch effect.

Gate Decay

The Gate Decay knob alters the decay time of the Gate effect. By turning this knob to the left the decay time is increased, and to the right, decreased. To hear the effect of using this Gate Decay knob, the Gate effect must be active (the Gate knob must not be in the hard left position).

For more organic glitch and scratch effects, try setting the Gate knob near to its maximum, then jam around with the Gate Decay knob as you play the black notes.

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Length Knob

This effect can be accessed by:

- *X-Y Controller Menus.*

- *The Length knob. (See right.)*

The Length effect results in the looping audio repeat time to shorten or lengthen . This is similar to the "Bounce" effect (described on page 25) but it holds a fixed value (instead of shortening/lengthening each time).

Note that this effect is fairly different if the WAIT switch is set to FREE (instead of QUANT or WAIT).   In FREE, the Length knob 'directly' changes the repeat length, whereas in WAIT/QUANT, the length value is quantized to fixed time divisions of the original repeat length.

Blend
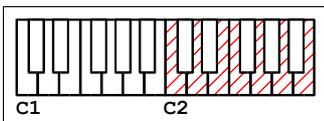
This effect can be accessed by:

- *Assigning BLEND to one of the Assignable MIDI notes.*

- *The Blend knob. (See right.)*

If the Blend effect is added when looping, the audio in the loop becomes somewhat blurred. (The exact mechanics of this are that a synchronised crossfade is applied between forward and reverse playing of the audio). Be aware that the result of adding Blend will not always be apparent, as it depends what other effects are active at the same time.

This is a useful effect if you wish to remove the transients in the loop for a soft, sustaining sound. Try using this effect in conjunction with the Ping Pong note.

Reverse
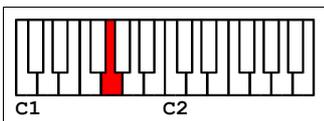
This effect can be accessed by:

- *The Reverse note [G1].*

- *The Reverse knob. (See right.)*

Playing the Reverse note when playing the black notes will result in the looping audio being played in reverse. Notice that when you play the Reverse note, the Reverse knob jumps to the right. Now try moving this Reverse knob with your mouse while you're playing the black notes. By doing this you can vary the pitch of the audio in the loop. Up to the 12 o'clock position for that knob, the audio plays forwards at a progressively lower

pitch. Beyond the 12 o'clock position, the audio plays backwards at a low pitch, with the pitch increasing as you continue to turn the knob to the right. In the full right position, the audio will be played back in reverse at the original pitch. Also, by twisting the Reverse knob backwards and forwards, a scratching effect can be produced.

Attack

This effect can be accessed by:

*   *The Attack knob. (See right.)*

Attack is used to fade in the looping effect produced when you play the black notes. The further the Attack knob is turned to the right, the longer the fade-in takes.

Release

This effect can be accessed by:

*   *The Release knob. (See right.)*

Release knob has a similar effect to Attack, but it acts on the audio when you release the black notes. Rather than the looping effect ceasing immediately when all black notes are released, the looping audio will gradually fade away. The further the Release knob is turned to the right, the longer the fade-out takes.

Hyper
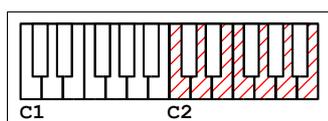
This effect can be accessed by:

*   *Assigning HYPER 50/100 to one of the Assignable notes.*
*   *The Hyper knob. (See right.)*

Hyper combines filtering and playback of the audio at higher speeds. The looping audio is played back at regular speed, at two times speed and at four times speed. The regular speed audio is low-pass filtered, the two times speed audio is band-pass filtered and the four times speed audio is high-pass filtered. The result is then passed through another filter, and it is the cut-off frequency of that final filter that the Hyper effect controls influence. With the Hyper knob, the cut-off frequency of that final filter falls as it is turned to the right. The Hyper knob has the advantage of being able to be swept around for a dynamic effect. With the Hyper note, a particular frequency for that final filter is selected.

Ping Pong
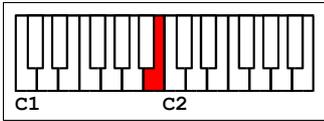
This effect can be accessed by:

- *The Ping Pong note [B1].*

Try holding down the note B1 on your MIDI keyboard as you play the black notes. If you listen carefully, you should hear that the effect of holding down this Ping Pong note is to cause the audio in the loop to alternate between being played forwards and being played in reverse.

Try the following for a Ping Pong example. Add a little bit of Spread and set the Blend knob to full. Now play a black note (maybe F#1) whilst holding down the Ping Pong note. You'll find with a little experimentation that Blend is a useful effect to use in combination with the Ping Pong note.

Pitch Change

This effect can be accessed by:

- *The Pitch Change notes [C3 to C5].*

- *The Pitch Change slider, located directly above the lowest two octaves of MIDI notes displayed in Lucifer.)*
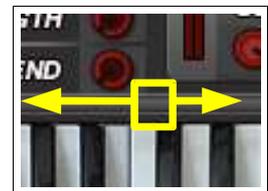
By playing the Pitch Change notes, the pitch of the audio in the loop can be altered. Playing the note C4 results in no change in pitch. Playing the note C5 results in the pitch of the audio rising by an octave. Playing the note C3 results in the pitch of the audio being lower by an octave. Between these two extremes, the pitch of the audio can be altered in semitone intervals.

In addition to playing those notes, the same effect can be achieved in the Lucifer user interface by adjusting the Pitch Change slider. This slider is a little red indicator located just above the keyboard graphic. It indicates the current pitch of the audio, and it can be clicked on with the mouse and dragged to a new position to change that pitch. If this indicator is over the second C note, or it is at the 'off' position (just to the left of the lowest note in the keyboard graphic), no pitch change occurs.

Another important control of the pitch of the audio in the loop is the Pitch* option for the FX effect. (See page 44 for the details.)

7.Getting graphic

The graphs allow for the dynamic control of an effect over the course of a cycle within Lucifer. Later chapters in this manual will examine specific graphs in detail, but there are a number of controls that relate to all of the available graphs, and these are now discussed here.

The Twenty-Four GraphSets

In earlier chapters, it was mentioned that there are several individual graphs available, with the Graph Selector tabs being used to select which one of these is to be the graph that's currently displayed. Looking at the tabs, you can see that the available graphs are 'Scratch', 'Effects', 'Freq', 'Reso' (Resonance), 'Pan' and 'Volume'. (As you'll discover later, there are also another graph available, called 'VOL>XF'.)

As a whole, these graphs and parameters deemed related (see inset below) are referred to as a *graph set*. There are twenty-four of these graph sets within Lucifer, accessed from the GraphSet Keys.   You can set up a particular combination of effects within each graph set, and then switch between them to achieve some radical variations in timbre and audio buffer playback.

The following parameters store in a GraphSet:

🔴 All graphs, their associated Grid Quantize, Range, and Smooth knobs, AutoRandom status, and MIDI Out CC Assignments.

🔴 All paramerters directly below the graph selector buttons (Pre/Post, Effects Switch, Effect Menu item, Filter II switch and type, Vol/Pan).

🔴 Output Selector (1-2-3-4).

🔴 Buffer Selector (1-2-3-4).

GraphSet Keys
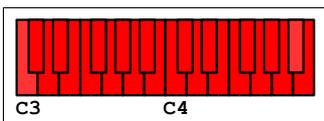
The graph sets can be selected by:

- *The GraphSet notes via MIDI [C3] - [B4] .*

- *The GraphSet keys on the interface (top two octaves)*

🔴 Selecting a GraphSet permanently selects that GraphSet until you select another.

- Only one can be selected at a time, it is the current GraphSet.

- You may copy a graphset to another with shift-copy (select destination, paste).

- You may copy graphset #1 (C3) to all GraphSets (alt-click copy, click paste).

Grid Quantize

Grid Quantize sets the resolution that will be used when drawing on the current graph. The larger the Grid Quantize value, the finer the resolution.

The Grid Quantize setting is individual to each graph in each graph set. Also, changing the Grid Quantize value for a graph often changes the shape on that graph. If you've got a graph just how you want it, don't change its Grid Quantize value!

> The exact note value of the quantize resolution depends on the Cycle Size setting. For example, if the Grid Quantize value is 4 and the Cycle Size is 2, then the resolution for that quantize setting will equal 2 bars divided by 4, which is 2 beats. If the Cycle Size is *4*, with the Grid Quantize setting remaining as 4, then the actual resolution of that quantize setting will equal 4 bars divided by 4, which is 1 bar.

Smooth

The Smooth knob controls the amount of smoothing that is applied to the currently displayed graph. If this knob is set to the hard left position, no smoothing is applied and the stepping in the shape on the graph is accurately applied. To smooth this stepping out, you can turn this knob to the right.

The best way to demonstrate the effect of Smooth is to make use of the Volume graph. Select that graph and set its Grid Quantize value to 8. (Also check that the Cycle Size is set to *2*.) Then draw a shape on it that alternates between high volume and low volume (top and bottom), like so:

High volume

Low volume

Make sure that the Smooth knob is turned hard left and play some audio through Lucifer. You should hear that the audio is chopping between sounding very loud and silence. Now, slowly turn the Smooth knob to the 11 o'clock position, listening as you do so. You should hear that the audio continues to transition from silence to full volume instantly, but the transition from full volume to silence no longer occurs instantly. Instead, it fades away gradually.

If you now turn the Smooth knob to the 12 o'clock position, and continue slowly turning it to the right from there, you'll hear another change to the audio. Now both transitions (from silence to full volume and from full volume to silence) occur somewhat gradually.

If you wish to just smooth the decays of the shapes you create, set the Smooth knob to a position within the first half of its travel. If you wish to smooth the entire shape on the graph, set the Smooth knob to a position with the second half of its travel.

Gate

Pressing the Gate button results in the shape on the current graph getting gated, with every second value (according to the current Grid Quantize setting) being set to the minimum value.

Peak

Pressing the Peak button results in Lucifer drawing a shape on the current graph that mirrors the volume of the dry audio being input. This is an easy way to create envelope follower effects that track the volume of the audio being processed.

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The Arrows

The Arrows allow you to move the shape on the graph up, down, left and right. Notice that the shape wraps around. For example, if you keep pressing the 'up' arrow, when the top of the shape reaches the top of the graph, it wraps around to appear at the bottom of the graph.
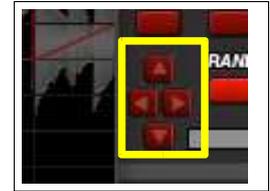
The Arrow modifiers

The Arrows have additional functions which allow you to alter the shape on the current graph in useful ways:

To VERTICALLY EXPAND the shape:

(The centre for the expansion is the centre of the graph.)
$$\boxed{\text{Shift}} + \blacktriangle$$
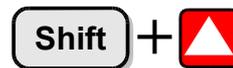
To VERTICALLY COMPRESS the shape:

(The centre for the compression is the centre of the graph.)
$$\boxed{\text{Shift}} + \blacktriangledown$$
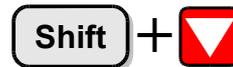
To create a HALF-TIME version:

(The first half of the shape is stretched over the whole of the graph.)
$$\boxed{\text{Shift}} + \blacktriangleleft$$

To create a DOUBLE TIME version:

(The shape on the graph is doubled in time and duplicated.)
$$\boxed{\text{Shift}} + \blacktriangleright$$

To INVERT the shape:

PC $\boxed{\text{Right-click}}$ ▼ or ▲

MAC $\boxed{\text{Ctrl}}$ + ▼ or ▲

To REVERSE the shape:

PC $\boxed{\text{Right-click}}$ ◀ or ▶

MAC $\boxed{\text{Ctrl}}$ + ◀ or ▶

> The ability to create half-time or double-time versions of the shapes on the graphs is particularly useful when you've changed the Cycle Size setting.

Copy and Paste

Clicking the Copy button stores the shape on the current graph to the copy buffer. When you later wish to paste that shape onto a graph, click on the Paste button. Also, by [Shift]-clicking on the Paste button, you create a very useful sine wave shape on the graph.

Rand

The Rand button creates a random shape on the current graph. The shape is created using the current Grid Quantize setting for that graph. [Shift]-clicking on the Rand button will create a random gated shape.

Pos Chase
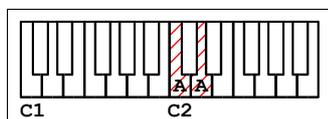
This effect can be accessed by:

- *Assigning POS CHASE to one of the Assignable notes.*

The point about the graph-related effects is that their sound can be varied over the course of the cycle according to the shapes that you draw on them. Sometimes, though, you may wish to freeze the current effects, so that there is no dynamic changes in their sound. For these occasions, Lucifer offers the Pos Chase facility. Assign this to one of the Assignable notes, then play that note when you want to freeze the effect sound.

Drawing with MIDI Continuous Controller #98 (or GraphRecorder VSTparameter)

You can use MIDI Continuous Controller #98 (or the VSTparameter named 'GraphRecorder') to draw shapes onto the currently selected graph. Set up a MIDI controller (like a modulation wheel or a MIDI control knob) to transmit MIDI CC #98. This controller will send values to Lucifer while it is being moved. The exact values it sends depends on its position. Each value sent results in Lucifer redrawing the step on the graph that has been reached at that moment. How high or low it redraws this step depends on the exact value of the CC message received.

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This parameter has a fairly quick timeout, so that it won't draw over existing data you may want to keep. The sideffect of this timeout is, if you wish to draw slow motions, you may need to wiggle your MIDI controller value slightly when you are trying to draw flat.

8.Volume and Pan

Each of the four graph sets includes a Volume graph and a Pan graph.

Volume & Pan On/Off button

This button switches the Volume and Pan graphs for the current graph set on or off.

It is also possible to control this button using your MIDI keyboard. Simply assign either the *VOL/PAN m* (momentary) or the *VOL/PAN t* (toggle) option to one of the Assignable notes.

Volume graph

This graph controls the volume of the effected audio. The higher up the graph you draw your shape, the louder the audio becomes; the lower that shape, the quieter the audio becomes. The default shape for this graph (no volume change) is a

Default shape

horizontal line, three-quarters of the way up:

Pan graph

This graph controls the panning of the effected audio. Drawing in the top half of the graph pans the audio to the left, while drawing in the bottom half pans the audio to the right:

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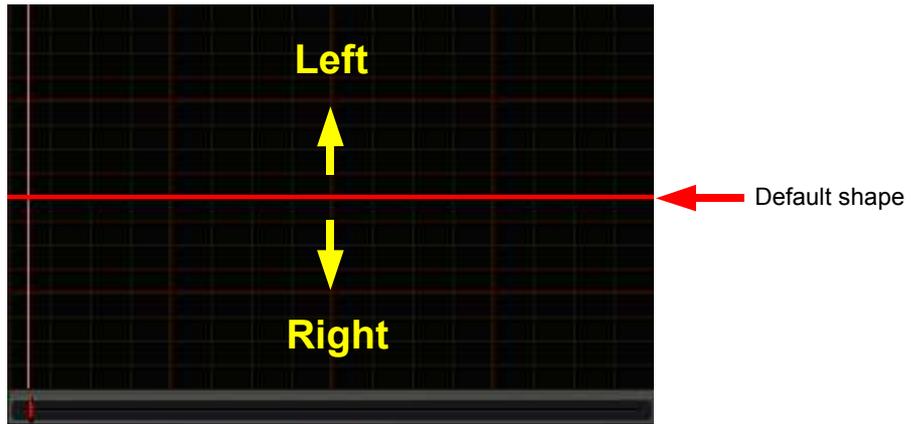
9.Filter II

Lucifer includes an additional multi-mode filter, with control over the cut-off frequency and the resonance amount. The settings for this filter are particular to each graph set, so simply by clicking on the Graph Set buttons or by playing the Graph Set notes, you can switch between different filter effects.

This filter can be used in conjunction with the Effects menu effect- however keep in mind that if you are selecting a 3-parameter effect from the Effect menu (Moog thru Reverb), the FREQ and RESO graphs are controlling both effects simultaneously.

Filter II On/Off button

The current graph set's filter effect is only heard if its Filter On/Off button is pressed in. This is indicated by the button lighting up.

It is also possible to control this button using your MIDI keyboard. Simply assign either the *FILT m* (momentary) or the *FILT t* (toggle) option to one of the Assignable notes.

Filter II Type

The type of filter can be changed for each graph set using the Filter Type buttons. There are four buttons to select from, with the currently selected Filter Type being the highlighted one. The four available types are **L**ow-pass, **B**and-pass, **H**igh-pass and **N**otch.

Filter II graphs

There are two graphs that together control the filter effect:

The *FILTER* graph controls the cut-off frequency of the filter. To raise the cut-off frequency, draw a shape that ascends the graph. To lower the cut-off frequency, draw a shape that descends the graph.

The *RESO* graph controls the resonance amount. Resonance is a level boost applied at the cut-off frequency. The frequencies around that cut-off point become more pronounced, at the expense of frequencies further away. It is a useful effect if

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you wish to exaggerate any filter sweeps made using the Freq graph. The higher the shape you create on this graph, the greater the resonance amount that's applied. If you create a shape on this graph that runs only along the bottom, minimal resonance will be applied (assuming the Base knob for this graph is kept at its default minimum value).

10.The EFFECTS section

Each of the 24 graph sets includes a selectable FX effect. Control for the chosen FX effect is achieved by drawing shapes on the FX graph.

EFFECTS graph On/Off button

This button switches the FX effect on and off.

It is also possible to control this button using your MIDI keyboard. Simply assign either the *FX m* (momentary) or *FX t* (toggle) option to one of the Assignable notes.
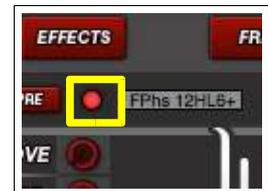
EFFECTS graph Pre/Post button

This button controls the order of the effects processing within Lucifer. If '*pre*' is selected, the Distortion effect is located before the Filter; if '*post*' is selected, the Distortion effect is located after the Filter. The default choice for this setting is '*pre*', which results in the same effects order as found in previous versions of Lucifer.

EFFECTS graph Effect Type

Clicking on this setting opens a pop-up menu, allowing you to select which of the available FX types is to be the active one in the current graph set, and so which effect the shape on the FX graph controls. There are four groups to these menu effects:

DM DISTORT thru phaser (first 18 on the menu) Simple FX (only one parameter – they use just the Effects graph). These FX are pre/post switch capable.

GATE* thru OUTPUT* (next 9) These also just use the Effects graph. However these control existing parameters.

MIDI CC and MIDI CC LAT These make all 6 graphs output a MIDI cc (for controlling other plugins or external hardware), shown to the right of the graph. MIDI Note is an option at the top of the MIDI out list.

Moog 6 thru Reverb These are the Vellocet DSP effects, a nice suite of effects which use 3 graphs (Effects, Freq, Reso) to control 3 parameters of the effect.

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The FX effects available are as follows:

DM DISTORT	The distortion type found in previous versions of Lucifer.
BITCRUSH	Reduces the word length of the audio.
RESAMPLE	Reduces the sample frequency of the audio.
SIMPLE HPF	A regular high-pass filter. Good to use when Band-pass is the selected Filter Type in the current graph set.
SHAPERS 1 to 4	Dynamic multishapers which morph between various waveshaping functions depending on the audio level.
MICROGATE	The shape you create on the graph is the threshold for this Microgate. If the level of the audio exceeds that threshold, it is passed. If it does not exceed it, it is muted. This is great for giving your audio a really crunchy texture.
SUB/MID/HI RING	These all bring a ring modulator into play. The difference between the types is the frequency of the carrier signal for the effect. (The audio you input into Lucifer acts as the modulator signal.)
FOLDBACK	The audio waveform gets inverted (i.e. folded back) above a threshold. The higher the shape on the graph, the greater the foldback amount.
TRANSISTOR	A distortion type.
ASYMETRIC	A distortion type.
HARD CLIP	A distortion type.
SP LOFI	A special lofi effect.
HARD CLIP	A distortion type.
GATE *	The FX graph controls the Gate knob.
HYPER *	The FX graph controls the Hyper knob.
REVERSE *	The FX graph controls the Reverse knob.
PITCH*	The FX graph controls the Pitch change.
SPREAD *	The FX graph controls the Spread knob.
MICROSPRD*	The FX graph controls the MicroSpread knob.
SCRATCH *	The FX graph controls the Scratch knob.
BUFFER*	The FX graph controls which audiobuffer plays (1-2-3-4).
OUTPUT*	The FX graph controls which stereo output is active (1-2-3-4).
MIDI CCs	All 6 graphs will output MIDI CC's based on the value at right.
MIDI CCs LAT	Same as MIDI CC's, except graph output will follow playback (repeat notes).

The FX effects with the star (*) symbol after their name all result in the FX graph controlling the amount of another effect. For example, the Gate* FX option gives you control over the Gate knob, and when this is done the Gate knob can be seen to move according to the shape on the FX graph.

The next 97 effects after MIDI CCs LAT are the 3-param FX, which use the EFFECTS, FREQ, and RESO graphs to manipulate 3 separate effect parameters.

On the following page is a grouped list of the next 97 Effects to follow on the Effects menu, from Moog6 to Reverb, and the destination DSP parameter which the three graphs will alter for the given effect.

Parameter List for the 3-Parameter Effects - (Moog6 to Reverb on Effects Menu)

EFFECT GROUP	EFFECTS graph	FREQ graph	Reso graph
Moog 6/12/18/24	"Fat" amount	Cutoff Frequency	Resonance
Low 6/12/18/24	"Fat" amount	Cutoff Frequency	Resonance
High 6/12/18/24	"Fat" amount	Cutoff Frequency	Resonance
Band/Peak/Notch	"Fat" amount	Cutoff Frequency	Resonance
LH/LB/LP/LN/HB/HP /HN/BP/BN/ PP/PN/NN (unlinked)	Cutoff Frequency "2" (for the 2nd of the two filters)	Cutoff Frequency	Resonance
Same as above (but with "Link")	Stereo Separation	Cutoff Frequency	Resonance
LBH/LPH/LNH/BPN	Morph	Cutoff Frequency	Resonance
CombL /FlangeL / PhaseL	LowPass (feedback filter) Frequency	Cutoff Frequency	Resonance (Feedback)
CombH /FlangeH / PhaseH	HighPass (feedback filter) Frequency	Cutoff Frequency	Resonance (Feedback)
CombHL / Flange HL / Phase HL	HL Width (band separation)	Cutoff Frequency	Resonance (Feedback)
EQ	dB Gain	Frequency	'Q'
Combs/Allpasses/ Reverb	Damping	Freq. ("Size")	Resonance (Feedback)

Scratching and the Scratch graph

The Scratch effect simulates the scratching of the audio in the loop, as occurs when scratching a record. The result depends on the audio in the loop, the shape on the Scratch graph, the settings on the Scratch, Smooth and Gate knobs, and exactly which black notes you play. Generally speaking, the notes D#1, F#1, G#1 and A#1 will give the best results, with the Triplet and Dotted notes being useful additions.

Scratch knob

The Scratch knob can be used to both control the amount of Scratch effect that's applied to the audio in the loop, and to actually scratch the audio. In its default, hard left position, no Scratch effect will be added.

How to scratch

There are two basic approaches to scratching audio in Lucifer:

🔴 **Draw a simple shape on the Scratch graph and manipulate the Scratch knob live to create the scratching sounds.**

The best shape to draw on the Scratch graph for this purpose is probably the following:

A good shape to use

🔴 **Alternatively, set the Scratch knob to a fixed position (for example, the hard right position) and draw a shape on the Scratch graph that frequently crosses the centre line of the graph.**

An example of such a shape is the following:
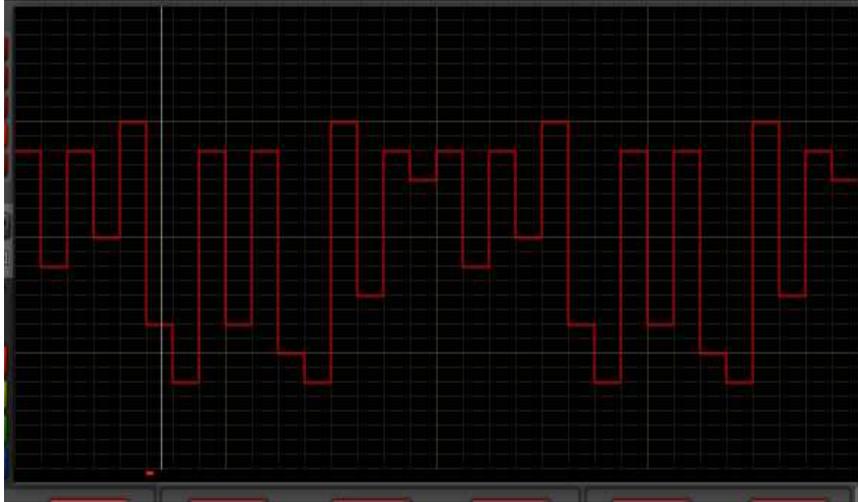
Experiment with the amount of smoothing (start by setting that knob to around the 10 o'clock position), and also experiment with the exact setting for the Scratch knob.

For both approaches, adding some Gate effect with a steep Gate Decay is usually an important addition if you wish to simulate a turntabilist!

11.The Incarn effect

Activating the Incarn effect

The Incarn effect for the current graph set is activated by pressing the Incarn button.

It is also possible to control this button using your MIDI keyboard. Simply assign the *INCARN sw* option to one of the Assignable notes.

Explaining the effect

The Incarn effect involves using a graph to directly control playback of the audio in Lucifer's audio buffer. Rather than having its own dedicated graph, the Incarn effect shares a graph with the Scratch effect. Normally, the Scratch graph is used to control the Scratch effect. But when the Incarn button is pressed, the Scratch graph controls the Incarn effect instead. You'll see that pressing the Incarn button results in the shape on the graph changing from having flat tops on each step to having sloping tops.

The default shape for the Incarn graph is a straight line drawn from the bottom left corner of the graph to the top right corner, as in the following screen shot:

Please draw this shape on the graph. (Make sure that the Cycle Size is set to *2* and use a Grid Quantize value of *16*.)   There are a few "shortcuts" to draw this shape. One is the shape menu found on the right (just to the right of the arrow buttons). Another is to click the Incarn Record switch **TWICE** ("R" button adjacent to the Incarn switch).

The Incarn effect involves using the graph to control which part of Lucifer's audio buffer is played back at any point in the current cycle. The **vertical** axis of the Incarn graph represents the audio buffer. The range of values runs from the start of the buffer at the bottom of the axis to the end of the buffer at the top. The **horizontal** axis represents **time**, specifically, time within the current cycle. The range of values runs from the start of the cycle at the left of the axis to the end of the cycle at the right. The following diagram illustrates this:
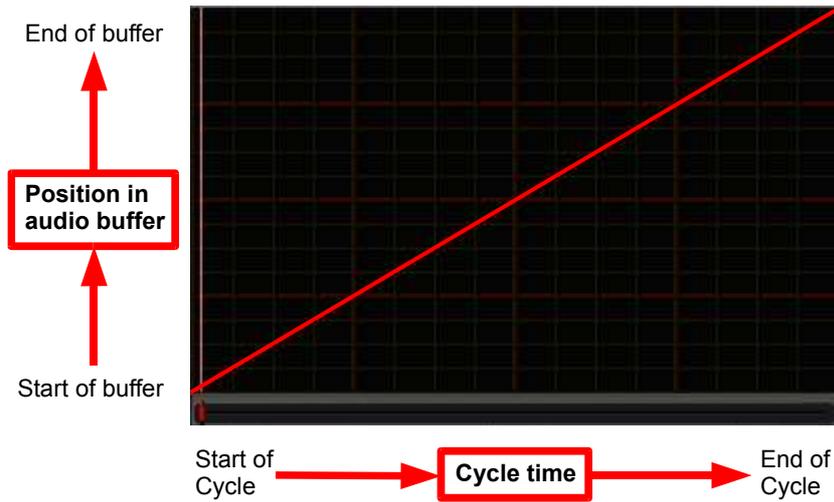
So how should you read the shape on this graph? Think of it like this:
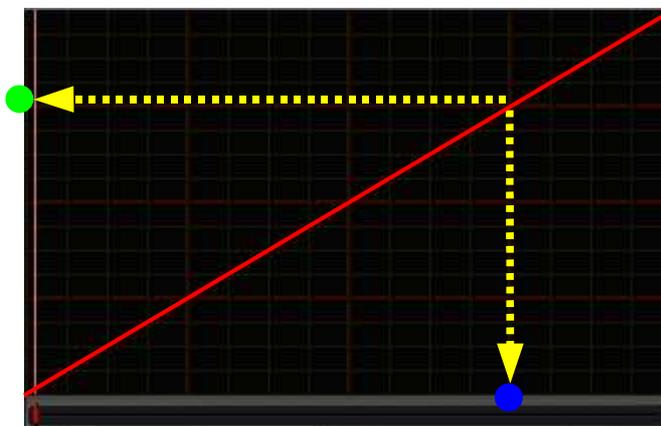
1) At **this** point in the cycle...
2) play **this** part of the audio buffer.

With the default shape drawn on the Incarn graph, the audio gets played back exactly as it has been recorded into the audio buffer. In other words, nothing changes. It's only by changing the shape on the graph from that default diagonal line that the playback of the audio in the audio buffer gets altered.

Check it for yourself. First, make sure no Smooth is being applied to this graph (the Smooth knob should be set to the hard left position), then hold down the note F#1 while you play audio through Lucifer. You should hear no change to that audio.

Let's make a change to the shape to reinforce the understanding. If the following change were made...

what would the result be? Answer: Lucifer would play the first half of the audio buffer twice within each cycle. Halfway through each cycle, the shape would tell Lucifer to jump back to the start of the audio buffer and continue playback for the rest of the current cycle from that position. So the audio in the second half of the buffer would never get played! Notice that by watching the Playback Cursor, you can see this jump occurring.

Here's another example:

With this shape on the graph, the audio in the second half of the audio buffer gets played first, followed by the audio from the first half of the buffer.

If you have ever used **Devine Machine** - it's another great audio software creation by Devine Machine LLC - you'll recognise that this description is correct for the Incarn graph found in that particular program. Lucifer's Incarn graph behaves in a similar way but there is a very important difference: in Lucifer, the effect of the Incarn graph is heard only by playing the black notes (clicking the noteLock will latch one for

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you).

Playing the black notes in Lucifer means playing loops, so the exact result of a shape you draw on the Incarn graph depends on what black note is currently being used to play Lucifer with. This can be simply illustrated. Create the following shape on the Incarn graph:
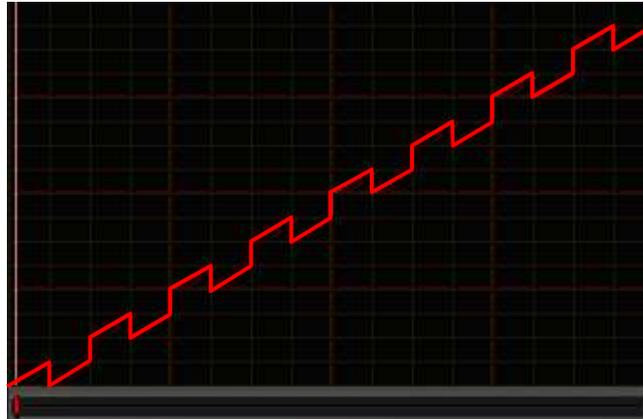
Use a Grid Quantize value of *16*. Make sure that the Scratch Smooth knob is set to the hard left position and that the Cycle Size is *2*.

Try playing the note F#1. You'll hear a nice repeating effect. Looking at the shape on the graph, that's probably what you'd expect to hear. (Every quarter note, an eighth note chunk of audio is being played twice.) But now try playing the note D#1. Cue much surprise, as the audio plays back with no change at all!

When you play loops with the Incarn graph active, Lucifer is checking at the start of every loop at what position in the audio buffer it should begin playing this next loop from. Before the end of each loop is reached, while the body of the loop is playing, the playback position in the audio buffer for that loop does not change. What this means is that if there are changes in the shape of the Incarn graph between these positions that are being checked, the effect of those changes will not be heard. This is exactly what happened when playing the note D#1 in the last example. It was only by playing a shorter loop size (the note F#1) that the exact effect of the stepped shape on the graph was heard.

Try now playing even shorter loop sizes, such as the notes G#1 and A#1. You'll hear a different effect again. The loop size is small enough to reflect the stepped shape on the graph, but the result differs from playing the note F#1.

There's a few important points to make here:

🔴 For the stepped shape that was created, the note F#1 was the optimum loop note to play; it followed the shape on the graph exactly. Playing a longer loop note than the optimum resulted in the shape not being followed exactly.

🔴 The optimum loop note to play for a graph shape on the Incarn graph depends on the current Grid Quantize value and on the current Cycle Size setting. Try altering the Cycle Size to *1* for the stepped shape that was previously created and play the note F#1 again. This time - no change! With this Cycle Size change, the optimum loop size to play has changed to a smaller one, the note G#1.

🔴 Because it can be difficult to remember which is the optimum loop size to play for the current graph (since it depends on the Grid Quantize and Cycle Size settings), Lucifer offers a helping hand. When the Incarn graph is active, playing the note C#1 will always result in looping at this optimum loop size.

If you're interested in knowing what the optimum loop size note is for a particular Cycle Size and Grid Quantize settings, check the following table:

Cycle Size = 1	Cycle Size = 2	Cycle Size = 4
GQ 8 = F#1	GQ 8 = D#1	GQ 8 = C#1
GQ 16 = G#1	GQ 16 = F#1	GQ 16 = D#1
GQ 32 = A#1	GQ 32 = G#1	GQ 32 = F#1
GQ 64 = C#2	GQ 64 = A#2	GQ 64 = G#2

While the optimum loop size note is probably going to be the one you play the most when the Incarn graph is active, the other loop sizes can still produce good results. Be sure to try the alternatives!

Smoothing the Incarn graph

Like all the graphs, the Incarn graph has a Smooth knob setting. With no smoothing applied, playback of the shape on the Incarn graph will be as precise as it can be. To see the result of adding Smooth to the Incarn graph, create a shape on that graph that jumps position a lot. Add some Smooth and watch the Playback Cursor carefully as you play the black notes. Notice that the cursor takes its time now to make those jumps, sliding around instead of quickly changing position. That sliding can sound very good when you're playing fast repeats on the black notes.

See page 34 for additional information about the Smooth knob.

Incarn Spread

The result of adding Spread differs when the Incarn graph is active. The Spread knob and the Spread note do not shift the loop start position, but instead offset the whole shape on the Incarn graph in time. This offset is equivalent to using the left and right Arrows to move the shape on the graph sideways.

Random Incarn

There is a world of fun to be had by setting the Smooth knob to the hard left position (no smoothing), clicking on the Rand button and playing the result using the optimum loop size note. In this way, totally new feels can be imposed on drum loops. (Using the Lock feature - see page 22 - while you're doing this saves having to keep the

optimum loop size note held down.) Experiment with the Grid Quantize value to see which gives the best results for the current Cycle Size setting.

Also be sure to try AutoRandom, by alt(option)-clicking on the RAND switch! If you alt-click steps on the graph, you can prevent these steps from randomizing!

...The Lucifer programmer says:

 Slightly related, this my personal favorite new pasttime – to get 3-8 Lucifers running at once all slightly improvising, by loading an audio loop (LOAD button), enabling the NoteLock, enabling AutoRandom, and Locking a bunch of graph steps (alt-clicking on the diagonal steps on the scratch graph).   Try various Grid Quantize or Bars settings on each one...!

Incarn Record

When the Incarn Record button is pressed, the looping triggered by playing the black notes gets recorded onto the Incarn graph. The shape on the graph updates as you play the black notes, mirroring the looping effects that you're creating. When recording, you can make use of the Groove, Spread and Bounce knobs. You'll see that the shape drawn on the Incarn graph will reflect the action those knobs have on the looping audio.

When you've created a shape that you like, click again on Incarn Record to stop the recording. After you've done this, and when you then play the black notes, the result of the shape you have recorded can be heard.

There's a few points about Incarn Record to be aware of:

🔴 The Grid Quantise value for the Incarn graph changes to '64' when you press the Incarn Record button. This is because it is necessary to have a high resolution to the graph to capture the looping caused by playing the very short black notes.

🔴 Each time you enter Incarn Record mode by clicking on the Incarn Record button, the shape on the Incarn graph gets reset. So if you get the shape on the Incarn graph just right, don't press that button again!

🔴 The shapes created when using the Incarn Record option in Pitch mode differ to those created when using the Incarn Record option in Normal mode. The details relating to this are on page 59.

Scratching the Incarn graph

If you're using the Scratch graph as the Incarn graph, what effect will turning up the Scratch knob have? Lucifer creates a scratch shape that's similar to the Incarn graph shape and applies that to the audio. (When you switch the Incarn effect on and off, you can see the shape on the Scratch/Incarn graph jumping between the Incarn shape and the Scratch shape.) It may be that the shape on the Incarn graph creates an interesting Scratch shape; it may not. Your only choice is to try it and see!

12.The Crossfader and related effects

The Crossfader

There are two streams of audio within Lucifer. One is the dry, uneffected audio and the other is the wet, effected audio. The Crossfader allows you to mix between them. With the Crossfader set fully to the left, only dry audio will be output; with the Crossfader set fully to the right, only wet audio. A setting between these two extremes results in a mix of wet and dry audio.

> Be prepared for the occasions when you can't understand why your note playing and knob turning is having no apparent effect on the audio at all. It's bound to be the case that you've left the Crossfader in the dry position by mistake. (The person sat here writing this manual does this all too frequently.)

Dry Thru

If the Crossfader is set to the 'all wet' position and no notes are being played, you still hear audio from Lucifer, effected according to the shapes on the various graphs (if they are switched on). This behaviour when no notes are being played is appropriate when using Lucifer as an insert effect - when no notes are being played, the result is not silence. However, if you wish to use Lucifer as a send effect, it would be better if Lucifer didn't output audio when there are no notes being played. This can be achieved by turning the Dry Thru knob fully to the left to mute that audio entirely.

Crossfader Action

There are two common behaviours possible when crossfading between two audio streams. They are termed equal power and equal gain. These behaviours, or actions, dictate the way in which the two audio streams are faded between as the Crossfader is moved. The **equal gain** action consists of linear

fades, while the **equal power** action consists of curved fades. If the two audio streams are very similar, an equal power action will result in a volume rise in the middle of the Crossfader's travel.

By default, the action used by the Crossfader in Lucifer is a combination of the two possibilities. If no notes are being played, the Crossfader uses the equal gain (linear) action. If notes are being played, the Crossfader uses the equal power (curved) action. This default action is the one you are most likely to use, but by clicking on the Crossfader Action graphic on the Crossfader, an alternative action can be selected. With this alternative, the Crossfader action will always be a boosted equal power (curved) version.

VOL>XF

The VOL>XF option allows you to use the Volume graph to control the action of the Crossfader during a cycle. This option is activated by clicking on the VOL>XF button.

It is also possible to control this button using your MIDI keyboard. Simply assign either the *Auto XF m* (momentary) or *Auto XF t* (toggle) option to one of the Assignable notes.

The VOL>XF shape is displayed on the Volume graph, but it is actually a separate graph to that one; the Volume graph is still active, it just can't be edited. Note also that the VOL>XF graph is also affected by the Volume & Pan On/Off button. (See page 39 for the details on that button.)

Drawing a shape along the top of the graph will result in the Crossfader staying in the 'all wet' position. If the shape is drawn along the bottom of the graph, the Crossfader will stay in the 'all dry' position:

One effective way to use this graph is to draw a shape that alternates between the two extremes. The following is an example of this:
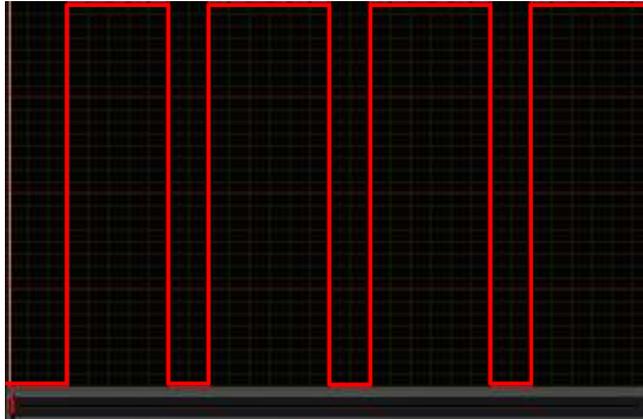
One issue that can arise when using the VOL>XF option, especially when making use of the filtering in Lucifer, is that the wet audio can sound too quiet compared to the dry audio. Normally, you would just draw a new shape on the Volume graph that's higher than the current one (so raising the volume of the wet audio), but that's not possible when the VOL>XF option is active. To get around this, just switch the VOL>XF option off, make the change to the shape on the Volume graph, then switch the VOL>XF option back on again.

A great way to use the VOL>XF option on drum loops is to create a shape that picks out the main kick and snare hits as 'all dry', with the rest of the shape between those hits being set to 'all wet'. In this way, the skeleton of the beat remains intact and unprocessed, but you can use Lucifer to do interesting things in the spaces around it.

13.Pitch mode

You'll be aware that all of our experiments have been done while Lucifer has been in Normal mode. As mentioned earlier in this manual, Lucifer can actually be in one of two modes. Normal mode is the usual mode that this plug-in is operated in, but there is a second mode, accessed by clicking on the words *NORMAL MODE* in the keyboard graphic (as in the top screen shot on the right). The label then changes to show the phrase *PITCH MODE* (as in the bottom screen shot on the right).

There are two main ways to use Pitch mode: for melodies or for scrubbing the audio.

Pitch mode for melodies

In Pitch mode, all 127 MIDI notes (both black and white) cause Lucifer to loop when they are played. As you play up the keyboard, the loop sizes decrease, so that rather than hearing a chunk of the input audio looping, the loops are so short that they are perceived as distinct pitches. The loop sizes decrease in a musical way, with an octave increase on the keyboard resulting in the loop size halving. That has the result of increasing the perceived pitch by an octave.

To use Lucifer to play melodies, make the following adjustments:

1. Switch Sync off.
2. Switch Wait mode to *Free*.
3. Use the BPM knob to set the tempo to 120 bpm.
4. Select *2* as the Cycle Size.
5. Turn the Dry Thru knob fully to the left.

Now try playing a chromatic scale up the length of your MIDI keyboard. At first you'll probably still hear looping chunks of audio, but at a certain point (maybe within the second octave), you'll start to hear a distinct pitch from each note when you play it. These pitches will be in tune with the other audio and the synthesisers in your host.

It should be mentioned that the C keys in Notes mode are equivalent to the black keys in Normal mode (½ note, ¼ note, etc).

Be sure to try the Length control in this mode, it is useful for "abstract" rhythms (expanding/contracting) similar to bounce knob (but controllable).

Try switching Wait mode to *Wait* or *Quant* to see why it is best to switch it to *Free* when playing melodies. If you try to play a riff, you're find that Lucifer sometimes ignores your playing and won't produce a pitch for one of the notes you play.

Also try altering the tempo setting (using the BPM knob) to see why the tempo of 120 bpm was chosen for this example. Changing the tempo alters the tuning of the notes Lucifer produces. The result is that melodies played with Lucifer will no longer be in tune with the other audio and the synthesisers in your host. However, you can halve or double this tempo setting. The result with a tempo of 60 bpm is that the notes sound an octave lower, and the result for a tempo of 240 bpm is notes that sound an octave higher.

Altering the Cycle Size creates a result similar to doubling or halving the tempo within Lucifer. The shorter *1* bar setting raises the pitch by an octave and the longer Cycle Sizes lower it progressively by octaves.

Finally, it's up to you whether or not you use the Dry Thru knob to silence Lucifer when no notes are being played.

You can now begin to bring the other effects into play. Turning up the Attack knob fades in the note when played, and turning up the Release knob will result in a slow fade to the note when it's released.

The timbre of the note produced by Lucifer can be changed by sweeping the Reverse knob - the result is almost like formant shifting. Alternatively, turn up the Gate knob to create an effect that is perceived as changing the pulse width of the note. (The sound gets thinner and reedier, just like when the pulse width of a square wave is changed.)

Pitch mode for scrubbing

The Spread knob is the source of the second main way to use Pitch mode; its use creates a granular scrubbing effect. If you use this Scrub effect, Pitch mode is no longer about playing melodies.

First try adding a small amount of Spread. The effect is like a very grainy time-stretch. Try changing the note you play and the Cycle Size. Also try adding the Blend and Bounce effects.

Alternatively, add a large amount of Spread. If you watch the Playback Cursor, you'll see that it goes into reverse when you do this. For an example, change the Cycle Size to 8 bars, add a bit of Bounce and maybe set the Gate knob to 12 o'clock to chop the sound.

Pitch mode and the Incarn graph

The Incarn graph can also be used when Lucifer is in Pitch mode. Because the result of playing notes on your MIDI keyboard differs in this mode, the shapes

created on the Incarn graph when using the Incarn Record option in Pitch mode differ significantly from those you'll have created previously. This can be a difference to make use of when you're in Normal mode. Just switch to Pitch mode, use the Incarn Record option to create an Incarn graph shape with that distinctive 'Pitch mode' look, then flip back to Normal mode to play it using the black notes.

14.X-Y Controller

New to Lucifer 2.0 is the X-Y controller.   This onscreen device allows for you to control 2 VSTparameters (parameters automatable in your host) at one time with the mouse.

X and Y Menus

The X and Y menus show the entire list of VSTParameters available (see Appendix 4). These X and Y menus default to "Hyper" and "Spread".   The result is control over the Hyper and Spread knobs on the GUI.   If you click and drag the mouse in the X-Y pad (hilighted in the diagram above), you will see these two knobs move automatically in the Lucifer window.

15.Load/Save Buttons

Also New to Lucifer 2.0 are the Load and Save buttons.   These buttons allow you to load an audio file (WAV, AIFF) or save an audio file (32-bit wav).

Load your loops..and destroy!

Loading an audio file involves Lucifer making an attempt to fit the audio file into the current BPM. This involves Lucifer needing to also guess the number of bars of the

audiofile. Essentially it truncates to the first half until the length looks reasonable. Sensibly enough, if you are on a larger # of bars in lucifer, you'll be able to load more bars of the file in. In most situations you are best off to load audio loops near the BPM of your project, and to have these loops be properly trimmed (to their correct length).

if the BPM or number of bars is altered, Lucifer reloads all loaded files. Fortunately it loads pretty darn quick, but you still should probably avoid too many tempo changes with Lucifer running with loaded audiofiles, as reloading files takes system resources.

Load / Save, and paths to enlightenment

Doing either of these functions (Load or Save) will store the path (folder location to the soundfile) in the host song, so the loop will be there when you reload!   If you are sharing a project with another Lucifer customer, you would be wisest to make a folder named Lucifer in your plugin folder (the one with Lucifer) and save the audiofiles here, because Lucifer will do an additional check for this folder location. Windows users can optionally create a C:/Lucifer/ folder as Lucifer will also search there for missing audio files. If an AudioFile cannot be found, Lucifer will display a dialog notifying you of the missing file/location.

16.Multiple Outputs
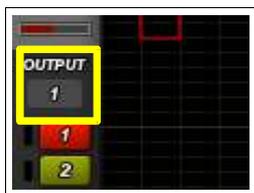
The Output Selector is located on the left side of the plugin window. It determines which of the 4 stereo output pairs Lucifer will utilise for all sound output. This is useful for having external momentary effects (by using additional effect plugins in your host).   This setting stores in each GraphSet, so you can easily change outputs by changing GraphSets via a MIDI note.

This is also a choice to automate this control from the Effects Menu, so you can automate between the outputs on the graphs!   One example would be if you wanted a reverb, but just on your snares. You could add a reverb in your host on its own track, select Lucifer-2 as the input for that track, choose OUTPUT* this the effects menu, enable the Effects On/Off switch, and draw between 25 and 50% on the graph height on the snare drum steps.

Tip: Since this value stores in all graphsets, you can Alt-Click (option-click OSX) on this control to assign the the desired output to all 24 GraphSets simultaneously.

17.Waveform Views
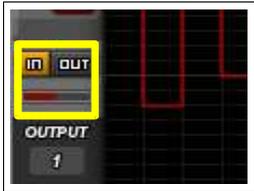
Behind the Graphs is a waveform display. On the Effects, Freq, Reso, Pan, and Volume graphs, you have the choice between viewing the input or the output of the waveform (the Scratch graph always views input, for Incarn purposes).

The In/Out Selector allows you to toggle between viewing the input audio, or the output audio.

The slider below this selector adjusts the depth, both luminance and Waveform Height.   You can also lower this slider to zero if you wish to disable the waveforms from drawing altogether.

Appendix 1: Tips

- Lucifer is great to use when processing drum loops, but be sure to try it out on all types of audio. Lucifer is excellent on vocals, on chords, on arps, on sound effects... well, you get the idea!

- The fastest way to utilise Lucifer is to Load a loop, click the NoteLock in lower-left, and draw on the ScratchGraph with Incarn mode enabled.   This will re-arrange the loaded loop into segments.   However, don't neglect the origins of Lucifer, which was as a realtime effect with MIDI notes as input.   Be sure to try using Lucifer with a MIDI keyboard, and Incarn Disabled!

- Some live-performers with Lucifer choose to run two instances, one in both modes: One in INCARN ON (optionally with NoteLock enabled for constant re-arranging), and one with INCARN OFF for spontaneous performance/manipulation from a MIDI keyboard.

- The decision about which Cycle Size setting to use depends on the audio that you're processing and the effect you want to achieve. For example, if you are processing a four bar chord progression, and you want the minimum of audio from the first two bars to mix with the last two bars - they might be in a different key - simply use a Cycle Size setting of *1*, or maybe *2*. As for the longer Cycle Size settings, they're useful when you want use the graphs for gradual changes, for example, a slow fall in a filter's cut-off frequency over several bars.

- The Mix button in the lower-left is a useful way to capture incoming audio / Lucifer's output. An alternative tool for capturing loops out of Lucifer is LiveSync Recorder (LSR) plug-in, another great Devine Machine LLC product. LSR is very useful when you're wanting to capture one or two bars of audio at a time. There's a free version available, plus there's also a deluxe paid-for version that has more features. For further details, see the following page: http://www.devine-machine.com/LSRfree.html.

- Try using two instances of Lucifer, one after the other. For example, use Incarn mode in the first instance to create variations on a drum loop. Then use the second instance to loop and effect the audio further, controlling it via your MIDI keyboard.

- Several note-based knobs behave different depending on the status of the INCARN switch. The Groove, Length, and Bounce knobs are best suited for INCARN OFF! The Spread and MicroSpread knobs have similar function in both INCARN states, but technically different.

- If things sound unexpectedly crazy, look at your knobs! Make sure the main ones are all down (dark center to the knob).   Also make sure the pitch slider is down or centered.

Appendix 2: MIDI CC's

Parameter name	CC number	Function
XY X	12	X-Y controller X-axis
XY Y	11	X-Y controller Y-axis
Scratch Graph - Base	50	knob (not always visibile in GUI)
Scratch Graph - Range	51	knob (not always visibile in GUI)
Effects Graph – Base	52	knob (not always visibile in GUI)
Effects Graph - Range	53	knob (not always visibile in GUI)
Freq Graph – Base	54	knob (not always visibile in GUI)
Freq Graph – Range	55	knob (not always visibile in GUI)
Reso Graph - Base	56	knob (not always visibile in GUI)
Reso Graph - Range	57	knob (not always visibile in GUI)
Pan Graph - Base	58	knob (not always visibile in GUI)
Pan Graph - Range	59	knob (not always visibile in GUI)
Volume Graph - Base	60	knob (not always visibile in GUI)
Volume Graph - Range	61	knob (not always visibile in GUI)
3p Drive (for 3-FX)	66	amp - 'Moog thru Reverb' Effects
Effect graph Range	67	'dedicated FX' Range Hi knob
Smooth	70	knob
Range Base	71	knob (visible graph Range Low)
Scratch	72	knob
Range Scale	73	knob (visible graph Range High)
XFader	74	knob
Groove	75	knob
Spread	76	knob
Gate	77	knob
Feedback	78	knob
Bounce	79	knob
Reverse	80	knob
Attack	81	knob
Release	82	knob
Graph sw	83	two-state switch

(list continued on next page)

Parameter name	CC number	Function
FilterType	84	four-state switch (L B H N)
Pitch sw	85	two-state switch (Pitch/Normal)
Bar Len	86	four-state switch (Cycle Size)
HostSync sw	88	two-state switch (Sync On/Off)
Dry Thru	89	knob
Blend	91	knob
Hyper	92	knob
Incarn sw	93	two-state switch
Record sw	94	two-state switch
VOL->XF sw	95	two-state switch
GateDecay	96	knob
GraphSelect	97	four-state switch
Graph Recorder	98	Knob
FX graph enable	102	two-state switch
MIDI key menu	103	
Dedicated Filter	104	Filter Graph's Range Hi (scale)
Dedicated Reso	105	Reso Graph's Range Hi (scale)
Vol/Pan graphs enable	106	two-state switch
Pitch	107	in semitones
MicroSpread	108	knob
Graph Selector	109	selects which graph to view
Random	110	random (same as clicking RAND)
C#1	111	MIDI note alternative
D#1	112	MIDI note alternative
F#1	113	MIDI note alternative
G#1	114	MIDI note alternative
A#1	115	MIDI note alternative
C1	116	MIDI note alternative
D1	117	MIDI note alternative
E1	118	MIDI note alternative
F1	119	MIDI note alternative
G1	120	MIDI note alternative
A1	121	MIDI note alternative
B1	122	MIDI note alternative
C2	68	MIDI note alternative
B2	69	MIDI note alternative

Note: cc 111-122 (and 68,69) were included for a Lucifer user - The actual MIDI notes are recommended over sending this 111-122 range of cc's.

Appendix 3: New to version 2.0

- All Graphs have the option to send MIDI CC or even a monophonic note stream

- 24 GraphSets instead of four.

- 97 new DSP FX from Vellocet (Moog Filter, SVF, phasers, flangers, combs, reverb, etc). www.vellocet.com

- New waveform displays show the input/output (toggle control) behind the graph.

- Mutliple outputs (4)

- Ability to load AIFF or wav files (path to file will store in preset/host)

- Ability to save AIFF or WAV files (path to file will store in preset/host)

- New MIX switch allows for capturing live loops (current/previous/next pass)

- 4 buffer locations for the ability to switch playback between different loaded files or live input captures

- Assignable X-Y Controller

- "OFFSET" keys (C6-D#7, non-incarn) to displace entire playbuffer by buffer-16ths

- 7 menu-assignable notes instead of 2 (c2-b2)

- Support for 48 and 96k in addition to 44.1

- Vol_XF now smoothes a touch

- Copy first GraphSet to all GraphSets - (alt-copy, click paste)

- Copy current GraphSets to another location - (shift-copy, click new GraphSet, click paste)

- Auto-random each Graph optionally at end of cycle (alt-click RAND switch) with the ability to lock graph steps (alt-click where you want to lock on the graph)

- Drawing optimisations (including quartz engine on OSX)

- New effects - phaser effect, sp lofi

- Hyper FX sonic tweaks

- New scratching algo

- Non-SYNC (tap BPM) mode no longer searches for transients (was causing timing problems for sustain-material)

- New incarn default presets

- Onscreen Help

- Parameter values now display on screen

- VSTSDK 2.4

- Shape Menu for creating graph shapes instantly.

- Input Lock - prevents the audio input from recording (over itself).

<u>Fixes</u>

- fixed - GraphSetSwitch now automates correctly.

- fixed - pitchshift above keys now visually snaps to semitones again

- fixed - Pentium4 denormal fix on Hyper knob

- fixed - Volume-Graph-to-Xfader "smart memory" (return to old value when disabling)

- fixed - graph-set switching via MIDI now always displays the correct graph tab (was jumping to INCARN)

Appendix 4: VSTparameter list

The list of automatable parameters in host. Same list shows on X-Y controller menus.

Parameter name	Friendly Name	When does it make sound?
Groove	Groove Knob	(requires active note)
Spread	Spread Knob	(requires active note)
Gate	Gate Knob	(requires active note)
GateDecay	Gate Decay	(requires active note)
Len	Length Knob	(requires active note)
Blend	Blend Knob	(requires active note)
Bounce	Bounce Knob	(requires active note)
Reverse	Reverse Knob	(requires active note)
Attack	Attack Knob	(requires active note)
Release	Release Knob	(requires active note)
Hyper	Hyper Knob	(requires active note)
Xfader	Xfader Knob	(requires active note)
Dry Thru	DryThru Knob	(requires no-note-active)
Wet Thru	WetThru Knob	(requires active note)
Scratch	Scratch Knob	(requires active note)
Pit Shift	Pitch Slider	(requires active note)
*Scrt Base	Scratch Graph Base	(requires active note)
*Scrt scale	Scratch Graph Scale	(requires active note)
*FX base	Effects Graph Base	(requires Effects On)
*FX scale	Effects Graph Scale	(requires Effects On)
*Cut base	Freq Graph Base	(requires Effects On and/or Filter II on)
*Cut scale	Freq Graph Scale	(requires Effects On and/or Filter II on)
*Res base	Reso Graph Base	(requires Effects On and/or Filter II on)
*Res scale	Reso Graph Scale	(requires Effects On and/or Filter II on)
*Pan base	Pan Graph Base	(requires Vol/Pan switch on)
*Pan scale	Pan Graph Scale	(requires Vol/Pan switch on)
*Vol base	Volume Graph Base	(requires Vol/Pan switch on)
*Vol scale	Volume Graph Scale	(requires Vol/Pan switch on)
WAV-	alt-click LoadButton	(Wav loaded and you are on a PC)
Output #	Output Selector	Stereo output pair 1-2-3-4
3PFX drive	Vellocet FX drive	requires FX to be set to Moog or later