



Kenaxis & Kenaxis VBAP the manual

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Kenaxis Overview

Please note that this manual is in the process of being updated for Kenaxis 3.0. Some of the pictures or references may refer to previous versions. There is also now a built-in help system. Just turn on the hints in the Preferences menu and a small window with an explanation of what each and everything in Kenaxis does will appear.

Kenaxis is a loop based software that allows you to easily manipulate sound in many creative ways. Designed to be used by musicians interested in being able to interact with other players or create solo works, Kenaxis transforms your computer into a powerful instrument of real-time musical expression. It works by playing back prerecorded sounds from your hard disk, and/or by capturing sounds from an external source on the fly. The pitch, loop points and volume can all be easily controlled to create all kinds of sonic textures.

There are many more advanced features as well such as full MIDI, joystick, and/or random generated control of all parameters. Granular synthesis, analog synthesis and a multi file player are included as well.



Kenaxis is made up of 4 main parts: the 6 klangs, the 2 basuneras, the granular synth, and the mixer. In addition there is an analog synth, and various screens for setting up control of all of these parts via random generators, joystick, or MIDI control. These extra windows can be accessed from the Extras menu.

There are some great videos on the [Kenaxis website](#) that show how to use these basic parts and help get you started right away. (Look to the right of the Kenaxis screen shot.)

Kenaxis has default setups to be used by the Wingman Rumble Pad Joystick, and the Evolution UC-33 or UC-33e MIDI controller. Other controllers can be easily configured for use as well. While using a keyboard and mouse goes a long way, to realize the full potential of Kenaxis, a MIDI controller is invaluable.

- Setup

To use Kenaxis there are two important steps to start with. The first is to choose which audio driver to use. On the far right of the mixer window there is a drop down menu to select the audio driver you want to use. The driver menu will show you all of the currently available drivers. CoreAudio Built-in Output refers to the builtin sound card of your mac. If you are using an external audio interface such as a MOTU 828 or M-Box, make sure that you have the audio interface turned on before starting Kenaxis. (The same is true of any MIDI interfaces or joysticks you wish to use.)

Select the driver you want to use and make sure that the audio is turned on. If not try hitting the reset button and see if the audio goes on.

To further configure your audio setup click on the "Audio Settings" button.

The second thing you need to do is register. In demo mode, your session will be interrupted with a message to "please register" this disappears once you have registered. You will also not be able to record your output directly to disk.



To register, go to the Kenaxis Menu and select About Kenaxis... There will be a computer id number. To purchase Kenaxis follow [this link to ShareIt.com](#) or get there from the [Kenaxis website](#), bottom of the page.) Once you have purchased Kenaxis you will receive an unlock number that you can enter to activate a full functioning copy of Kenaxis.

Note: for optimal performance quit all other programs other than Kenaxis when using it in performance. In particular, other audio programs open at the same time can cause major problems with sound.


- Keyboard & Mouse Control

When changing values in Kenaxis there are a few ways to go about it. If you click in a number box (any of the small boxes with a small arrow on the left side and a number in it) the arrow changes from grey to yellow. You can now use the numbers on your keyboard to type a new value. Press return or enter to make this new value take effect.

When using the mouse you can click and drag to change values. If you click and drag to the right of the decimal point the numbers will change gradually. If you click and drag to the left of the decimal point the number change much more quickly.

Now we will get to the Klang so you have some number boxes to try out.

The Klang

	<p>Start, Stop, Load, Save, and Reset buttons</p> <p>Recording options, Loop, Loop Width</p> <p># of Filters, xFade Time</p> <p>Pitch, Glissando Time</p> <p>Mute, Gain, Pan</p> <p>Filter Control</p> <p>Waveform Display</p> <p>Playback location</p> <p>File Name</p>
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The Klangs are the main way of creating music in Kenaxis. You have 6 Klangs all of which work the same way. There are two ways to get a sample into a Klang.

- Loading a sample

The first is the quickest and easiest way. Go to the finder (the screen that lets you see your hard drive and files.). Find a sound file, then drag and drop it onto a Klang. As you drag over the Klangs a blue box appears around them so you know which Klang your file will load in. Another way to load a sample is to click the load button and a standard open dialog will appear.

For the fastest load time use .aif or .sd2 (AIFF or Sound Designer II) files. You can drag and drop or use the load button and Kenaxis will import just about any kind of sound file, including Wave, MP3 or M4A files. Any internal loop points you have set inside a file will also be preserved in AIFF or Wave files. (To set preset internal loop points you must use an external sound editor like Peak.) At this point Kenaxis works best with 16 bit, 44,1 KHz sound files. (CD Quality) The size of the files you load is limited by the amount of memory you have installed on your machine. With a 512MB machine you will be able to load over 40 minutes of total material.

Once you have loaded a sample you can quickly change to another sample in the same folder by clicking on the file name. This becomes a popup menu that displays all sound files located in the same folder as the currently loaded sample.

Hint – It is very important to organize your sounds so that you can quickly find the sound you are looking for. Aliases are also a great way for organizing sounds.

- Recording a sample

The second way of getting a sound into a Klang is to record one into it in real-time. Beneath the lstart, stop, load, save, and reset buttons are the recording options. You can record up to two and a half minutes. First you need to choose your recording source. For each Klang there are a couple of options, live (the default), k-out and a direct line from inputs 1-8. (If you are not using an external audio interface only inputs 1 & 2 will work.

Live records the signal from the live input. Make sure you turn up the volume of the live input in the mixer, and have the correct audio driver and input chosen in the Audio Settings. (Click the "Audio Settings" button in the mixer window to adjust these.) For more information on the live input see the mixer section.

K-out records the master output. This means that if you have sounds playing in Klangs 1-5 you can record all of these into Klang 6. A bit like bouncing tracks in a multi track recording system.

If you use a direct in this bypasses the live-in in the mixer section. This means you can sample any input without having to send it out the master output.

To start recording click the check box beneath the load button. Recording will start. You will see the record indicator light up and the waveform appear in the waveform display. To stop recording before the maximum time, click the check box again. Otherwise recording will automatically stop once the maximum record time of two and a half minutes is reached.

- Start, Stop, Load, Save, Reset

Start – This resets the play head to the beginning of the sound and starts playing the sound. Note: if the gain is set to 0, the sound will not play.

Stop – This stops the sound from playing.

Load - as explained previously brings up a standard open dialog box to enable loading of a sample.

Save – This saves the contents of the Klang to disk. This is useful if you have captured a great sample in real-time and want to save it for future use. This save is only for the Klang it is attached to. To save a composition you use the save and record buttons in the mixer as explained in the mixer section.

Reset – This restores the loop points of a sample to the internal loop points. If no internal loop points are set, it selects the entire sound for looping.

- Loop, Loop Width

Loop – This check box determines if the sound will loop, or just play once from start to

finish. By default the loop box is checked and will loop the entire sample or use loop points saved in a file using software such as peak.

If loop is unchecked, clicking in the waveform display will start playback from this location. It will play until it reaches the end of the sound, ignoring any loop point that you have set.

Loop width. This number just to the right of the loop checkbox indicates the length of the current loop in seconds. If the entire sound is selected to be looped, it tells you the length of the sound. You can adjust this number to create smaller or larger loops. Generally this is done by selecting the loop in the waveform display and is used only as an indicator as to the current length of the loop.

- # of Filters, xFade Time

of Filters – This sets the number of parametric filters available in the Filter Control Area directly below. (0=bypass, 12 = max)

xFade Time – This sets the crossfade time to help create click free loops. The maximum crossfade time is half the length of the loop. Negative crossfade times create a space between loops.

Note: If your loop is 2 seconds long and you have a 1 second crossfade - the loop will shrink to 1 second in length since it will spend 1 second fading in the first half while at the same time fading out the second half. If the crossfade is set to 0 seconds the crossfading algorithm is bypassed and your sample will loop exactly. This will slightly reduce the amount of processing power needed and is perhaps best for prerecorded loops. Using even a small crossfade of 10 milliseconds or .01 seconds will greatly reduce clicks when using live loops.

- Pitch, Gliss Time

Pitch – This number changes the pitch of a sound. 1 = the normal pitch, 2 = double the pitch or up one octave, 0.5 is half the pitch or down one octave and -1 = backwards. You can use any number for the pitch. Number between -0.99 and 0.99 are slower than the original pitch. Numbers greater than 1 are higher than original and numbers less than -1 are higher than the original sound and backwards.

Unlike more conventional programs there is no limit to the pitch transformation. While a pitch of 46 sounds just like a bunch of squeaky noise, perhaps its what you want. By entering direct values into the pitch number box you can get values below 0.01, although it is very doubtful that this will provide audible results as the frequencies will be too low.

Gliss Time – Glissando Time. This number determines how long in seconds it will take for a sound to reach a new pitch. Inspired by the glissandos in the works of Xenakis, this is the perfect way to make long perfect pitch changes. If you change the Gliss Time to 12 seconds the next time you change the pitch it will take 12 seconds to reach the new value. For instance you can type 14 in to the pitch number box to change the pitch up 14 octaves. Now change the Gliss Time to 12. You will here a high noise if the sound is now playing. If you

now type 1 and hit return in the pitch box you will hear a slow steady glissando down to the normal pitch. The default is .25 seconds or 250 milliseconds. This creates an audible but very quick change. The Gliss Time can be set to any number greater than or equal to 0. If you set it to 300, it would take 300 seconds or 5 minutes to reach the new pitch.

- Mute, Gain, Pan

Mute – This mutes the sound coming out of the Klang to the main output. It does not mute the sound entirely as it actually switches the output of the Klang to outputs 3&4 on your audio interface. You can use this to monitor your sounds if you have a multi-channel audio interface before adding them to the main mix. You can use the I/O settings in the Audio Settings window to choose which outputs 3&4 are directed to.

Gain – This is the current volume at which the sound is being played back at. Due to the panning algorithm used 2 equals the original volume of the sound. When the gain is set to 0, playback stops. Gain can be set at any level. Gains over 2 start to create distortion, gain over 100 creates very serious distortion.

Pan – You use this slider to pan a sound from the left to the right.

- Filter Control

Filter Control – This lets you set the Frequency, Q (width) and gain of up to 12 parametric EQs. To increase the number of filters you can control you need to change the “# of Filters” parameter located above the Filter Control.

Clicking and dragging in this window between two vertical lines allows you to change the frequency and gain of a filter. To change the Q (its width), click on the parallel lines and drag. The control is a little rough as the window is small so using over 4 filters may be impractical. Still this give you the ability to do some nice shaping of the sound and if using the same sound in multiple Klangs allows you to differentiate between them.

- Waveform display, playback position, file name

Waveform display – The Waveform display is a graphic representation of the left channel of the sound currently in the Klang. (The Klang plays stereo files but only displays mono.) Clicking and dragging in the waveform display changes the loop points. Holding shift while clicking allows you to extend one side of the loop point. Holding command (also known as the apple key) while dragging left or right lets you move the loop point around while keeping the same loop width. Dragging up and down with the command key changes the loop width.

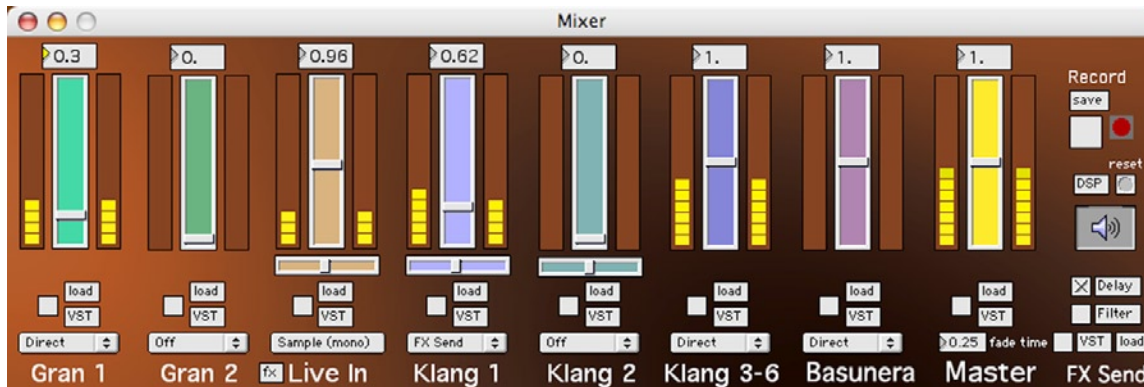
Another feature is the ability to crop the current sound to the loop point you have selected. This allows you greater control of a smaller subsection of a larger sound. This process is irreversible but does not effect the original sound file. Press option and the number of the Klang to crop. For example option 5 will crop Klang 5 to the currently selected loop.

Playback Position - The small line under the waveform display lets you know which part of the sound is currently being played.

File Name – This box below the playback position indicates the name of the file currently loaded or indicates if a live input or k-out have been recorded into a Klang. If you click on the file name a popup menu will appear displaying all files in the same folder as the currently loaded sample. By selecting one of these it will load the new sample allowing you to quickly change files. Note: if you use the load button instead of drag and drop, the drop down menu will not work.

Mixer

The mixer window allows you to monitor and adjust the balance of your various sounds. It allows for the addition of VST plugins and routing to an FX Send. This is also where you set your audio driver preferences and record your Kenaxis output to disk.



For each strip in the mixer window you have a gain indicator, a fader and left and right meters. Some strips also have a pan fader. Granulator 1&2, Live Input and Klangs 1 & 2 are single source strips. This means the gain indicated on these strips are the same as those in the main Kenaxis window. This also means that a VST plugin enabled on one of these strips effects only the one source it is connected to. Klangs 3-6, the Basuneras, and the Master are multi input strips. Any changes to the Klang 3-6 strip effect Klangs 3-6. If the Klang 3-6 strip gain is set to 0, you will not hear any of the Klangs numbered 3-6 no matter how high you set their gain. This also means that a VST plugin enabled on one of these strips effects all of the inputs associated with it.

<p>Klang 1</p>	<p>Gain</p> <p>Left and Right meters</p> <p>Fader</p> <p>Pan</p> <p>VST – load, VST, enable check box</p> <p>Routing</p> <p>Name</p>
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- Gain, Fader, Pan, Meters

Gain – This number indicates the current gain or volume of the strip. You can also click and drag or directly enter a number into this box. While the fader goes to a maximum gain of 3, using the number box you can change the gain to any value equal to or greater than zero.

Fader – This slider allows for a quick visual representation of the current gain and allows you to adjust the gain from 0 - 2.

Pan – The Live Input and Klangs 1 & 2 have a pan control available on the mixer. Klangs 3 – 6 can be panned but you must use either a Joystick, MIDI controller, or a random generator to do so. The Basuneras can be panned via the Kenaxis window or a controller. Granular Synthesis cannot be panned in the normal sense although you can control how many grains are coming out either the left or right side in the Kenaxis window.

Meters – The meters to either side of the fader give you a graphic representation of the level of audio coming through the strip.

- VST Plugins

VST Plugins are a popular effect plugins standard. You can find many free plugins on the net as well, if you have any other audio software installed on your computer often they come with VST Plugins. VST Plugins can add a huge palate to your sound creation. Adding reverb can make everything sound a bit more blended and natural. Delays can make everything a bit prettier. There are hundreds of plugins available for every sound need. There are two ways to load a VST plugin into a strip. You can drag and drop a plugin from the finder or press load.



box. Find the plugin you are looking for stored in two main places. 1 – Hard Drive: users: your name: Library: Audio: Plug-Ins: pane of your finder window in OS X you

ow. This only works if you have loaded a e indicators, these will not be active until

VST plugin. If the check box is unchecked only is the VST plugin bypassed, but it is not

Hint – If you enable a plugin on the master strip, this will affect all of your sounds.

- Routing

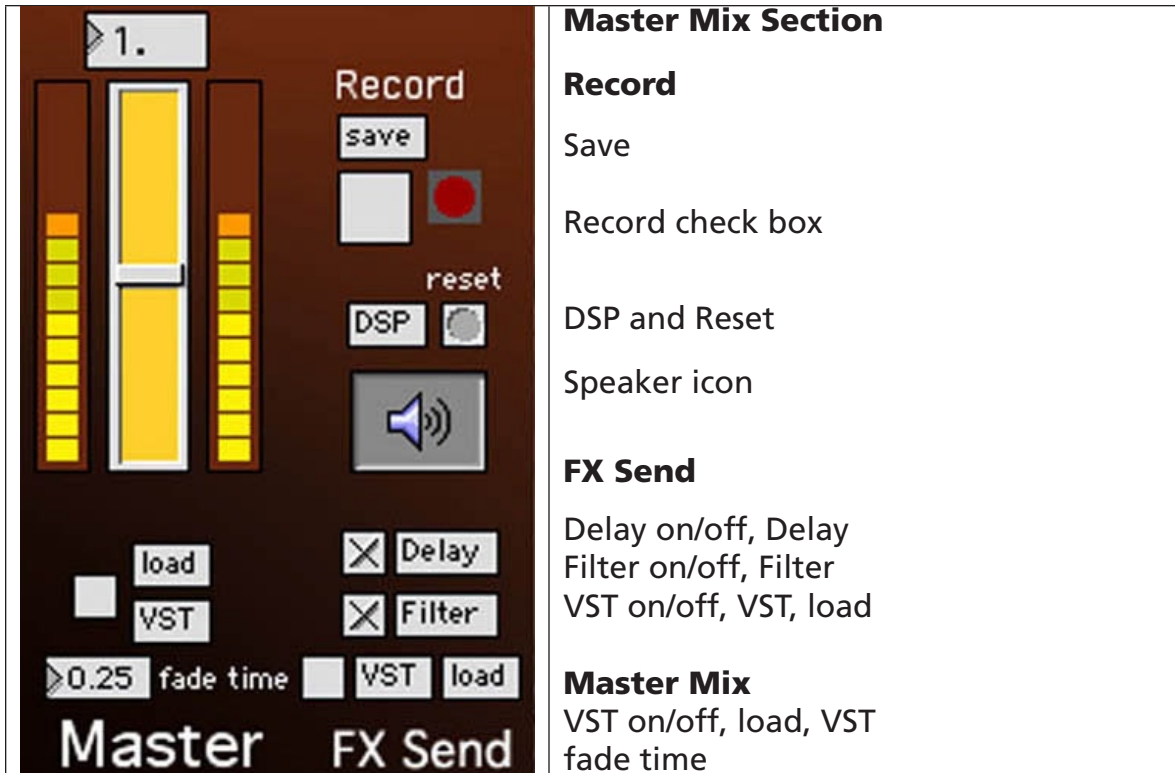
Beneath each VST Plugin section is a routing menu. If the gain is set to 0 this menu will display off. This indicates that the sources connected to it are off and not taking any processing power. Once you turn the gain up, the default setting is for the menu to display direct. This means the source is being routed directly to the master output. If you change the routing to FX Send the strip will be routed through the FX Send and then to the master output.

- Live In

The Live In strip has a few more options. Direct and FX Send are the same but there are mono and stereo options. In stereo mode the left and right inputs are sent to the left and right outputs respectively. In mono mode the left and right inputs are each sent to the left and right outputs. This is useful if you have 1 or 2 microphones setup to sample 1 or 2 players and you do not want them to come out only from one speaker. There is also a Sample mode. In Sample mode the input is not fed to the output. This allows you to record sounds into the Klangs or Granulator without sending a continuous sound out the main outputs.

At the bottom of the Live In mixer strip is a small box that says "fx". Clicking on this button brings up a new window called LiveFX. Here there is a compressor, reverb and 75 second delay. These effects only effect the Live Input.

It is also possible to record the Live In as a separate stereo track from the kenaxis output. Check out Separate Live Record On/Off in the Preferences menu for more information.



Master Mix Section

Record

Save

Record check box

DSP and Reset

Speaker icon

FX Send

Delay on/off, Delay
Filter on/off, Filter
VST on/off, VST, load

Master Mix

VST on/off, load, VST
fade time

- Master Mix

master fader – This fader is exactly like all the rest of the fader’s for the individual channels except that it affect all of the channels and has a fade time attached to it. (See below)

VST on/off, load, VST – This is the same as for all individual channels except that a Master VST will affect all the sounds produced by Kenaxis.

fade time – This allows you to set a time in seconds for a perfect linear fade from one gain value to another. If you set the fade time to 30.0 and then changed the gain from 1 to 0 you would get a perfect 30 second fade out.

- Record

The record option in the mixer allows you to create a perfect digital copy of the current output of Kenaxis. (Note: this is disabled in demo mode.)

save - Pressing the save button pops up a standard save dialog box. Choose the location and format of the file you wish to save, then click save.

record check box – click to start recording. If you have not hit save before, a save dialog box appears. As soon as you choose the location and hit save, it will start recording. The record light indicator will turn on. When you are finished, click the record check box again to stop recording.

- Audio Settings

Audio Settings Button - This opens the Audio Settings window. From the Audio Settings window you can turn the audio on/off, choose your audio driver, input device, input source, output destination and various other DSP settings.

Reset - The reset button quickly turns on and off the audio which can help in cases where the audio driver is overloaded and you have lost sound.

Audio Status - indicates whether the audio is on or off. If your audio status is off when Kenaxis has just started up - this is a strong indicator that you do not have your audio driver preferences set correctly.

Driver Menu - This is a list of all available audio devices.

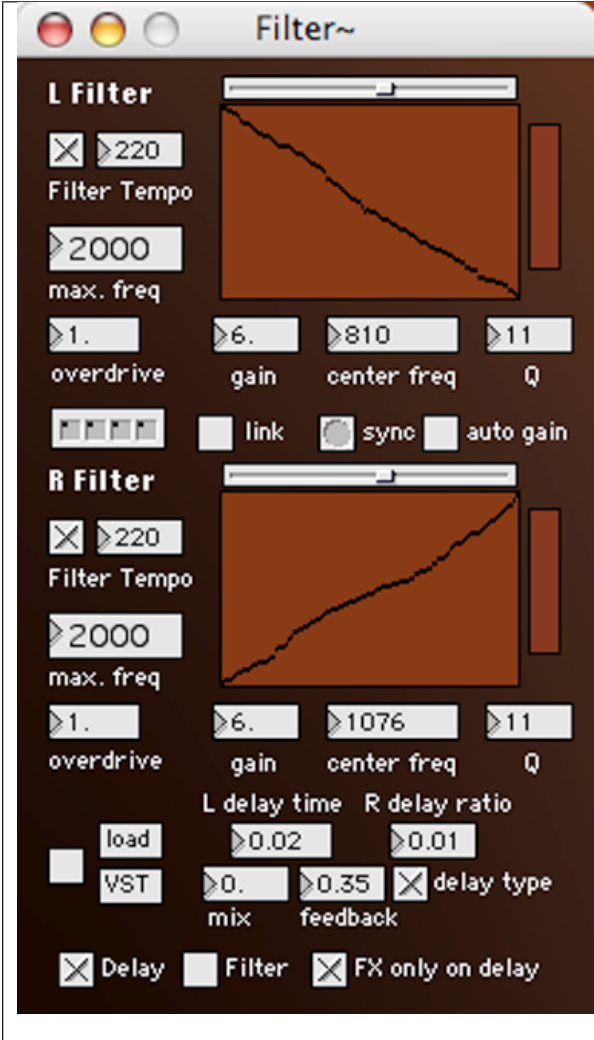
- FX Send

Any strips in the mixer routed to the FX Send will go through the FX Send process and then to the master output. Kenaxis has a built-in 30 second delay and variable filter that can be combined or used separately.

The delay controls are conveniently located in the Mixer window as well as in the Filter and Delay Window. To see a description of how to use the delay see the next section.

- The Effects Window

The built in 30 second delay and programmable filter in Kenaxis can be used for all kinds of striking effects.

	<p>Filter</p> <p>Graph Location Filter Tempo on/off, Tempo Filter Graph, Signal Meter Maximum Frequency overdrive, gain, center freq, Q Presets, link, sync, auto gain</p> <p>Same as above but for Right Channel</p> <p>Delay & VST</p> <p>VST, Delay Time Delay mix, feedback, delay type</p> <p>Effects Options</p>
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- Filter

The two channel filter can be used to create great stereo effects by filtering the sound in different ways in the left and right channel. It uses a band pass filter controlled by a centre frequency and a Q. This means that the centre frequency will be emphasized and all other frequencies will be de-emphasized. The Q determines how wide of an area will be affected: the higher the Q the sharper the emphasis. At higher Q levels (20+) it sounds as if the center frequency is ringing. It also has an overdrive option to create distortion.

Graph Location – This indicates the current location in the filter graph.

Filter Tempo on/off, Tempo – The tempo on/off toggle turns on and off the programmable filter. If the Tempo is off you can manually indicate the Center Frequency by changing it. The tempo indicates how quickly the filter moves through the filter graph.

Filter Graph – You use the Filter Graph to program the filter. The X axis is time (controlled by Filter Tempo) and the Y Axis is the Center Frequency. (0 to Maximum Frequency.) As the Filter Graph is currently programmed there is a sweep down in the Left filter while the right filter sweeps up.

Signal Meter – This meter indicates the level of the signal after it has come through all of the process in the Effects Window. (Filter, VST, Delay)

Maximum Frequency – This determines the maximum frequency in the Filter Graph.

Overdrive – This is a built in distortion. Turn it up and your signal will get that crunchy edge. It also greatly increases the gain. You may need to turn down the gain to compensate.

Gain – When you filter a signal you loose gain. The Higher the Q the more gain you loose. Use this to turn up the gain.

Center Frequency – This indicates the current frequency from the Filter Graph that is being used as the center frequency in the filter process. If the Filter Tempo is turned off you can use this to manually adjust the Center Frequency.

Q – This adjust the Q of the filter. The higher the number the more dramatic the filtering.

Presets – If you click on the four boxes you see you can bring up four different presets.

Link – With this on the left and right filters are linked. Any changes to the left filter are duplicated in the right filter. The right filter can always be independently changed.

Sync – This sets the graph location to the beginning in the left and right filters to help you sync them.

Auto Gain – With this checked, Kenaxis attempts to compensate the gain for adjustments in Q and overdrive. There is no perfect mathematical relationship so this is very rough but can help.

- Delay

The built-in delay has a maximum time of 30 seconds. It is extremely powerful and can be used as a looping tool in its own right. You can also use very short delay times with a high feedback level to create some very interesting effects. (Try a delay of 0.07 with a feedback of 0.98) Watch out for feedback though if you are using a live input.

L Delay Time – This determines the left delay time. Ranges from 0.001 seconds to 30 seconds.

R delay ratio - this determines mathematically what the right delay time will be depending on the left delay time. This allows you to change the left delay time and have the right delay time change proportionately as well. The right delay time equals the left delay time multiplied by the R delay ratio. This means that if the left delay time is set at 2 seconds and

the R delay ratio is equal to 0.9 your Right delay time equals $0.9 * 2$ or 1.8 seconds. If the R delay ration was 1.2 then your right delay time would be $1.2 * 2$ (the left delay time) = 2.4 seconds.

Delay mix – This indicates how strong of a signal is being sent to the delay. It can range from 0 – 1.2 or 0% to 120%. Sending a mix of over 100% (over 1.0) is playing with feedback – beware.

Delay Feedback – This indicates how much of the delayed signal is sent back into the delay. It ranges from 0 – 1.2 or 0% to 120% just like the delay mix. If the feedback is set at 0% (0.0) you will only hear the delayed sound once. Once you start increasing the feedback you will hear the delayed sound multiple times. At 100% (1.0) any sound played will keep being heard. You will then build up an infinite number of layers. At values above 100% (greater than 1.0) you are playing with a very dangerous level of feedback. At short delay times you can very very quickly have mass blasts of noise coming out. Use this with the utmost caution unless you are in a Japanese Noise Band such as Hospital.)

Delay type – There are two different delay types. Unchecked is delay type one – if you change the delay time you may hear a slight click but pitch will not change. Checked is delay type two – if you change the delay time you will not hear a click but pitch will change.

- VST

The Effects Window also has the ability to use VST plugins. Any mixer channel sent to the FX Send can then be affected by a VST plugin of your choice. The on/off toggle turns on or off the plugin, the load button loads the plugin of your choice and the VST button allows you to access the VST parameters. Note: there are two modes for the VST plug-in, before or after the delay. (See “FX only on Delay” below)

- Effects Options

Filter on/off – This turns on/off the filter process.

Delay on/off – This turns on/off the delay process.

FX only on Delay – This is a very useful option. With this turned on, the filter and the VST plug-in only affect the delayed output. This modifies the echoes by filtering them or adding a VST of some kind (reverb is great for this) and creates a difference between the sounds before and after they are delayed. This can be used to thin the sounds after the delay to help avoid getting too thick of a sound.

Note: if you have this turned on you will not be able to hear the filter or the VST plug-in if the delay is turned off. If you want to use the FX Send to add a VST plug-in or filter a channel then you must have this turned off.

Granulator

The Granulator is a powerful granular synthesis engine. Most often granular synthesis is used to stretch sounds out giving you the ability to make slow motion sounds without changing the pitch. The Granulator built into Kenaxis allows this and much more.

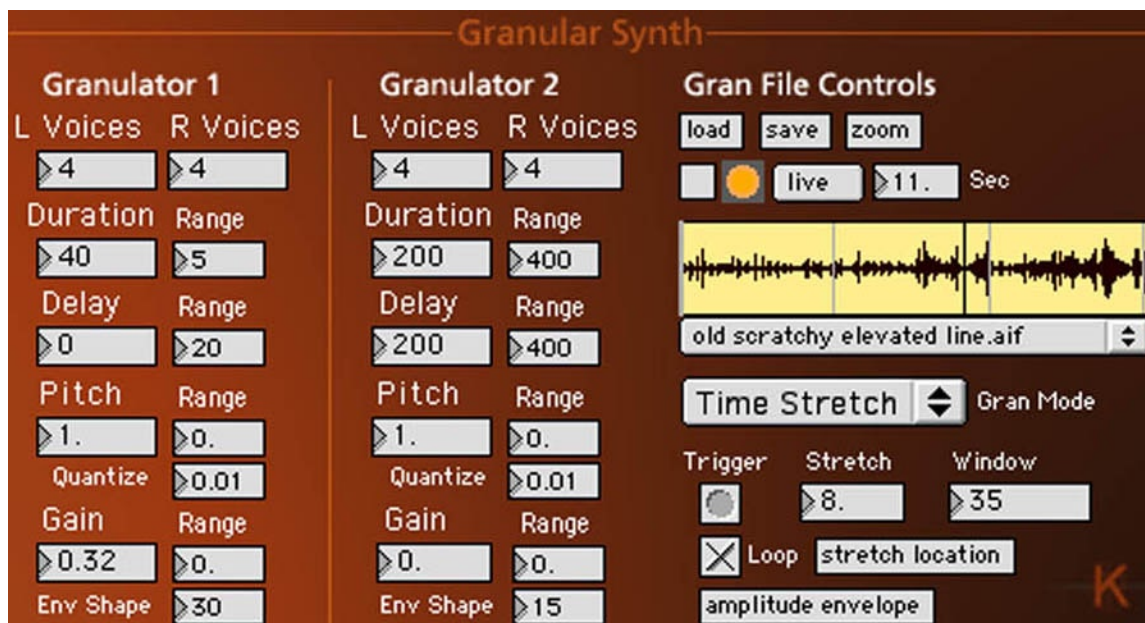
To really understand how to use the granulator you need to know a little about granular synthesis.

- About Granular Synthesis

Granular synthesis arises from the idea of sound having discrete units or particles much like light is both a wave and a particle. The term grain to describe a particle of sound was first coined by Iannis Xenakis in 1960. Granular synthesis uses small sound events of generally 1 to 100 ms in length to build sounds with.

The grain duration can be constant, random or vary with frequency. It is important to note that 50 ms grains played one after the other would create a pulse at 20 Hz, the lower limit of human hearing. Grain durations greater than 50 ms start to become individually audible.

To create a smoother blend an envelope is almost always applied to the grains. The grain envelope affects the character of the output. One of the most effective and commonly used envelopes is a linear fade in and fade out with the peak in between extended to 30 to 50 percent of the grain. The basic granular synthesis engine applies an envelope to a grain and outputs it.



- Gran File Controls

Load, Save, Zoom, Record, Waveform Display, File Name – These controls are just the same as on the Klangs. For more information read the section under the Klangs. Just as with the Klangs it is also possible to drag and drop sound files onto the Granulator to load a sample.

- Voices, Duration, Delay, Pitch, Gain, Envelope

Kenaxis has two granulators. They are identical and both use the same sample as a source. Having two granulators lets you setup a variety of textures. For instance, one granulator can be setup to stretch a sound and play it back at normal pitch and the other granulator can be setup to play very sparse little blips of sound at different pitches.

L & R Voices – The number of grain streams or voices refers to the number of basic grain synthesis engines running in parallel, each additional one creating a thicker, denser sound. If only one voice is used it is possible to hear the sequence of grains. When more voices are used the output is smoothed out. If you want to pan a sound, turn on more voices for one particular side (Left or Right). Each Granulator has a maximum of 12 voices per side for a total of 48 total possible voices if you use both Granulators.

Duration, Range – This determines the length of the grains being output. Classic Granular Synthesis uses a grain size of 40 with a range of 5, thus grains being output are between 40-45 ms in length. This being Kenaxis, there are no limits on the duration and range. For interesting results you can use a duration of 2000 ms (equal to 2 seconds). At this point you will very clearly hear each grain that comes out.

Delay, Range – This sets the amount of space between each grain that is coming out. The Delay amount is the minimum delay time between two grains. The Range is a random time between grains. If the Delay = 200 and Range = 400 that means that between each grain there is a delay of 200-600 ms. If you would like a very sparse minimalist sound try high values such as 12,000 (equal to 12 seconds).

Pitch – If you change just the pitch setting you will change the pitch that all of the grains are played at, this is independent of duration. If you set the stretch factor for playing through a sound to 1 this lets you change the pitch without changing the duration. You can also set the pitch at -1 for instance thus playing all of the grains backwards even though you are going through the sound forwards.

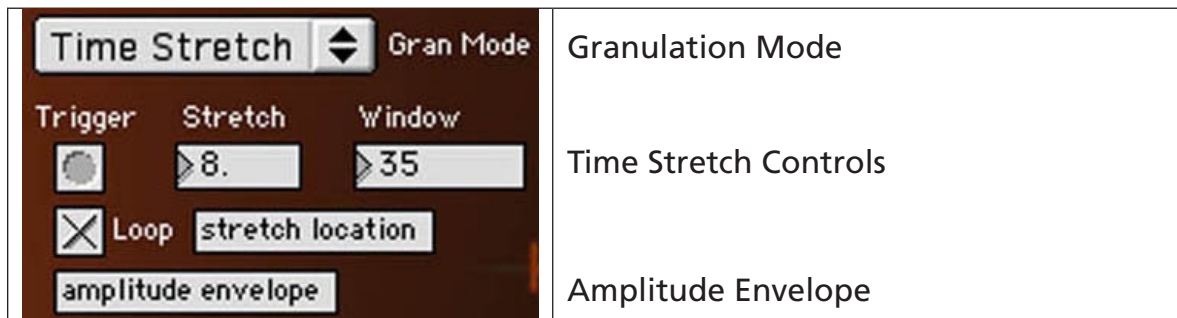
Pitch Range, Quantize – Using the Pitch Range settings you can create dramatic pitch clouds of sounds. When you set the pitch range you are allowing for each grain to be played back at a random pitch. For instance if Pitch = 0.5 and Range = 1.5, then each grain that gets played can be anywhere from 0.5 to 2.0 in pitch (half speed = down one octave to double speed = up one octave.) Without Quantize on you will get a very noisy jumbled pitch cloud. Quantize can be used to mathematically reduce the number of random options. If Quantize was set to 0.25 with Pitch = 0.5 and Range = 1.5 then only multiples of 0.25 are possible. Thus the pitch of the grains coming out would be limited to 0.5, 0.75, 1.0, 1.25, 1.5, 1.75, and 2.0. Using Quantize it is possible to tame the randomness and create pitch clouds based on the harmonic series or other mathematical multiples.

Gain, Range – This is the volume of the grains coming out. The Range adds an interesting possibility by allowing for a random modulation of the volume of each individual grain coming out. Range goes from 0.0 – 1.0. A value of 0 means that all of the grains coming out are at the same gain. A value of 0.5 would indicate that grains coming out would be anywhere from the full gain value to half the gain value. A Range of 1.0 would create the largest variety, grains would be anywhere from 0 (inaudible) to the gain volume indicated in the gain box. Using the gain range allows for creating more complex granulated sounds where the layers are all at different volumes.

Env Shape – Envelope Shape. This is the envelope applied to each grain that is coming out. Think of this as the fade in and fade out applied to each grain. If this is set to 0 then you will hear lots of clicks since there will be no fade in and fade out. Set it at 50 and you will hear a swell as each grain takes 50% of its length to fade in and 50% of its length to fade out. This is more audible as the grain durations get larger.

- Granulation Mode

There are two modes of granulation: Manual and Time Stretch. Once you have broken a sound into grains you can do various things with it.



Manual – This mode of granulation lets you manually select a part of the sound file to granulate. Simply click and drag in the waveform display to select the part of the sound to granulate. Playing random grains from a sound can lead to a texture that is an abstraction of the original sound. This is perfect for creating a static type drone that contains sound from whatever portion of the sound file you have selected.

Time Stretch – This mode of granulation automates which part of a file is being granulated. Most often it is used to slowly move through a sound file thus stretching it out by playing a grain multiple times before moving to the next grain. This stretches a sound without changing its pitch (unless you change the pitch settings) creating a very strange surreal effect that sounds much like one is slowing down time.

- Time Stretch Controls

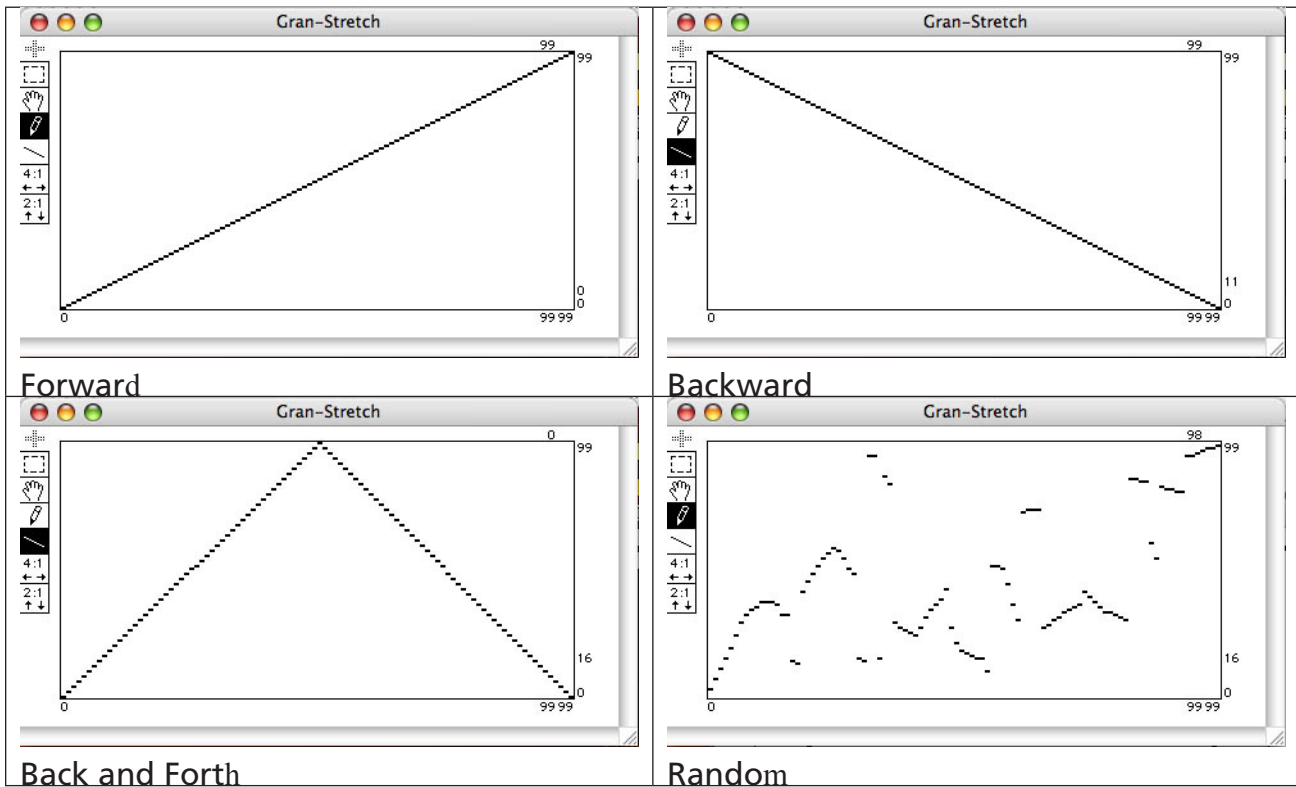
Trigger – Press trigger to start time stretching a file from the beginning.

Stretch – This is the multiple of the original sample time you want to stretch a sound by. For example, if your original sample is 10 seconds in length, a stretch factor of 8 would create a final length of 80 seconds. Numbers less than one speed up the sound. A stretch factor of 0.5 on a 10 second sample creates a final length of 5 seconds. Negative numbers move through the sound backwards.

Window – The window is the size of the area from which grains are taken from while stretching through the sound. The easiest way to understand this is to set a large window – say 1000 ms. You will see graphically in the waveform display that a one second window is now moving through the sound file. Grains from anywhere inside this one second area are now being played. Increasing the window diffuses the clarity of the sound as it is being stretched, making the sound more abstract.

Loop – With the loop check box checked the stretch process will continually loop. Otherwise the sound will be stretched once and stop.

Stretch Location – This is one of the things that makes the granulator in Kenaxis so unique. Instead of just stretching a file from beginning to end you can setup various ways of moving through a sound file. Clicking on Stretch Location opens a new window called Gran-Stretch. This table determines how the granulator moves through a file. The X axis is time and the Y axis is location. If you use the pencil tool you can draw each bit of data – great for creating a more organic or random flow through a file. To use the line tool, click on it, then click on only the start and end points and it will draw a perfect line in between them.



Note: if you change the stretch table, you will be asked to save the changes when you quit Kenaxis. If you want to revert to playing a sound from beginning to end, do not save the changes.

- Amplitude Envelope

The amplitude envelope button opens a new window that can be used to shape your granular output into beats or swells.



Sequence Location
 Amplitude Sequencer
 Tempo on/off, Tempo, Sync

Sequence Location – This bar indicates where in the sequence you are.

Amplitude Sequencer – In the default setting all of the “faders” are set at full volume. This means that as the granulator plays – all of the grains play at normal volume. In the above example under Grain1 Envelope you can see that the grains from Granulator 1 will be turned on and off – creating a beat of a sort. Those faders set to 100% will play at full

volume while those faders set at 0% will be silent spots. Granulator 2 on the other hand will swell up and down.

Tempo on/off – This turns the sequencer on or off. Note: if you turn off the sequencer and the “fader” is at zero in the sequence – you will not be able to get any sound out of the granulator. You have frozen the volume at zero.

Tempo – this is the speed at which the sequencer plays. Each fader is equal to a quarter note.

Sync – Press this button to start the Grain 1 envelope and Grain 2 envelope at the same time. Note: you can have two different tempos going to create polyrhythms.

Basunera

The Basunera is a random file playing module. Instead of playing sounds from memory, it plays them from the disk. The Basuneras have two important differences from the Klangs. One, since it plays files from the disk, you can play very long files and not worry about running out of memory. Two, the Basunera does not load a file, it loads a folder full of files and then gives you access to all of the files in that folder. Note: the Basunera can only play wave or aiff sound files, it does not work with MP3s.

The power of the Basunera is the ability to randomly play a series of sound files with a set or random interval of time between them. This allows you to create a random series of events. It also allows you to quickly play a file from a drop-down menu with out any delay for load time.



- **Sequence Mode**

This pull down menu controls how the basunera works.

Single File Loop – This will loop the currently selected file

Single File Once – This will play the currently selected file once.

Random Sequence Loop – This will randomly select and play each file in the selected folder once and then start over again playing each file once before starting again...

Random Sequence Once – This will randomly select and play each file in the selected folder once.

Sequential Loop – This will play each file sequentially in alphabetical order and then start over from the top.

Sequential Once – This will play each file sequentially in alphabetical order and then stop when it reaches the end.

There are keyboard short cuts to change the sequence modes for the basuneras: Option a,s,d,f controls sequence mode for basunera 1 and option zxcv controls sequence mode for basunera 2.

- Basic Controls

gain – This controls the volume of playback.

Pitch – This determines the pitch of the currently playing file. Since the file is being read from disk it is much more limited than the pitch of a Klang. Values for pitch are from 0 – 12. (Pitch less than 1 are slower, greater than 1 are faster than the original sample.)

R Time – This is the Ramp Time. It controls how long in seconds it takes to go from the currently selected pitch to a new pitch. (How long of a glissando.)

trigger – This button can have a few different functions depending on how the Basunera is setup. If the Basunera is in Single File mode, it starts playing the currently selected file. If it is currently playing a file, it will start playing the file from the beginning. If the Basunera is in Random Sequence mode it will start the random sequence. If the random sequence is already going it will start over and choose from any file in the folder. If the Basunera is in Sequential mode it will either start the sequence or begin the sequence again from the top if the sequence is already going.

folder – This button opens a dialog window to let you choose which folder to use as your source folder. You can also drag and drop a folder onto a Basunera.

Space – This is a set delay time between files in a sequence. The time is in seconds. The minimum value is 2 milliseconds.

Rnd Space – This is a random delay time between files in a sequence. This time is also in seconds.

For example, if the delay is set at 2 and the delay range at 4, after a file has played there will be a delay of between 2 – 6 seconds before the next file will play. This is only valuable if the random or sequential mode is being used.

pan – This is a left/right pan control for the Basunera.

- Current Folder, File & Done

Current Folder – Shows you the path to the currently selected Folder.

Current File – This is a drop-down menu that shows you all of the audio files in the currently selected folder. You can use this menu to select a file to play, or if you are playing the files in a random sequence it shows you which file is currently playing.

Done – This lights up when the Basunera is finished playing though all of the files in a folder.

Presets

Presets are a powerful way of quickly changing all of your settings. A Preset recalls every Klang, Granulator and Basunera setting – file name, pitch, loop points, ramp time, etc. It also remembers all of the settings in the Effects Window – delay time, delay mix, filter, etc. It also remembers any KlangRnd, GranRnd random generator settings and Analog Synth settings. There are only a few things it does not remember.

Gains are not remembered. This is to help their use in a live environment. If you loaded a Preset and all the sounds came on at their saved volume it would not be very useful. Also due to the complications of the way VST plug-ins are stored, at this point they are not remembered either. (Coming soon!)

Also - MIDI and Joystick Settings are considered system settings and any changes to these are not stored in a preset but are automatically saved independently of the Presets. (Use Restore Kenaxis System Defaults to restore these to their defaults.)

Note: which sample file is loaded into each Klang, Granulator and Basunera is only recalled when loading a preset. This means that you cannot save different sets of sample arrangements in different preset numbers – you must load a different preset for each arrangement. (This can be very quickly done using the drop down Preset Name menu.)

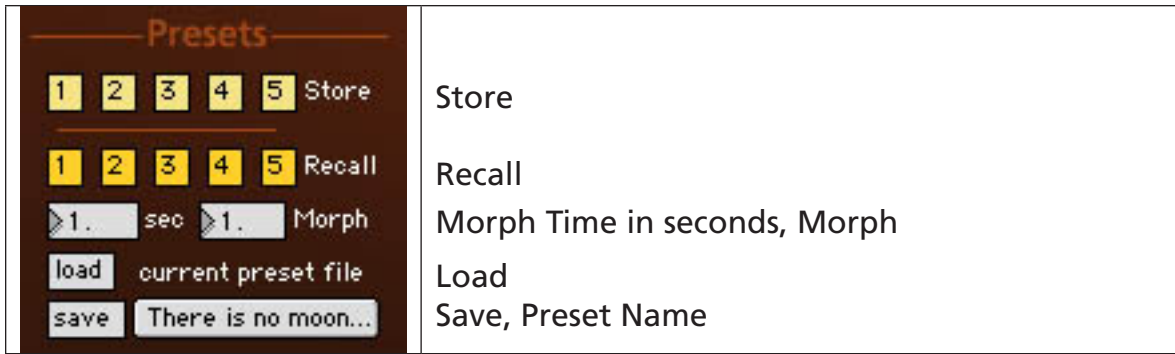
Note: if you move a file into a different location on your hard drive your preset will no longer work. It uses an absolute path to the file.

As an added bonus for people using Kenaxis as a live instrument – preset loading is semi-intelligent. If a sound is playing (gain is greater than 0.0) in a Klang, Granulator or Basunera – then that particular and only that particular Klang, Granulator or Basunera will be ignored when loading a preset. This means that sound will not be interrupted as you change presets. If you later want to load the missing file(s), just select the Preset again in the Preset Name menu once you have turned off that particular Klang, Granulator or Basunera to load the sample associated with that Preset.

There is also unfortunately a small quirk in Kenaxis. When a file is loaded it automatically selects the built-in loop points of a file. If you want to use different loop points you must hit the recall 1 button again after the files have loaded.

Each Preset has five slots. Each slot remembers all of the various settings. (Except for files as mentioned above.) An exciting feature lets you morph from one set of parameters to another. This lets you change a lot of variables at once – becoming a powerful tool for dramatic transformations.

It is also possible to quickly change from one preset file to another using the keyboard. The numbers plus shift 1-5 (!,@,#,\$,%) recall presets 1-5 while option-shift 1-5 store a preset. The letters a-z will load a new preset a = preset 1 in a folder , b = 2 , z = 26. This allows you to quickly change the audio files you are using.



- Store & Recall

Store – This stores the current settings (All Klang, Granulator, Basunera settings minus gain, Effects Window settings, KlangRnd, GranRnd and Analog Synth) into a slot. (1-5)

Recall – This recalls the settings of a slot, changing all of the parameters from their current settings to the stored settings. The time it takes to do this is set in the Morph Time. (Default one second.)

- Morph Time, Morph

Morph Time – This sets the time in seconds it takes to morph from one setting to the next when a recall number is pressed.

Morph – This box lets you manually morph between stored slots. Setting it at 1.5 for instance sets all of the parameters halfway between the settings stored in slots 1 and 2. Note: you must store parameters in more than one slot for this to work.

- Load, Save, Preset Name

Load – As an alternative to dragging and dropping a preset file into the preset area to load a preset, you can press load to bring up a standard open dialog box.

Save – This saves a preset (slots 1-5) to disk. Note: when you press save, it takes the current settings and stores it into slot one before saving to disk. It does not change slots 2-5.

Preset Name – This drop down menu displays the currently loaded preset. If you click on it, it displays any other preset saved in the same folder as the current preset. Select another preset from this menu and it will quickly load. Try organizing presets into folders for the best efficiency. Note: this menu currently only works when presets are drag and dropped, not when the load button is used.

Global Control Modifier



The global control modifier parameter can be found just to the left of the presets tucked into the granular synth section. It is not a part of the granular synth.

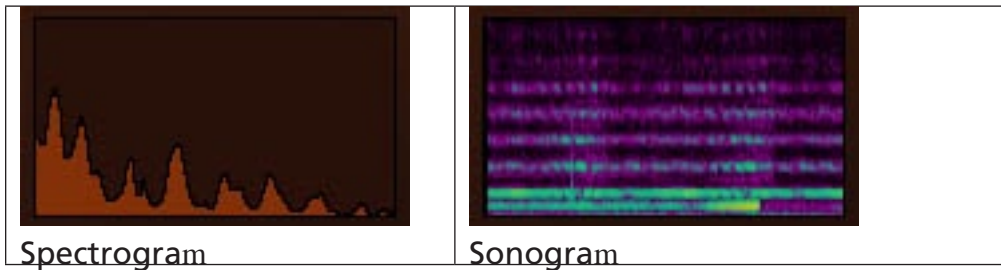
The Global Control Modifier number changes the magnitude that any controller (Klang Randoms, MIDI Control or Joystick control) has on all of the Kenaxis parameters.

For instance - normally the range that MIDI controls values for a Klang's pitch are from -1 to 3 - this is still the case if the GCM = 1. If the GCM = 2 then the values will go from -2 to 6. If GCM = 0.5 then values are from -0.5 to 1.5. This allows you to quickly change how much control you have of the Kenaxis parameters.

You can use this to quickly switch from fine control of parameters within a narrow range to dramatic gestures over a very large range.

Spectroscope

Smack in the middle of the main Kenaxis screen is a spectroscope. Clicking on it produces one of three modes:



Spectrogram mode – frequency vs. amplitude (20 - 3000 Hz)

Sonogram mode – frequency vs. time with amplitude displayed as color

None – No output. The Spectroscope stays blank.

Convolution

Convolution is the process of multiplying sounds in the frequency domains. Some great sounds can be obtained this way but it tends to be a little unpredictable. Note - there are different methods of convolution possible and the one implemented in Kenaxis is not the same type used in convolution reverbs.

Convolution requires that FFT (Fast Fourier Transformations) are carried out on the sounds and this can take some CPU processing.

- **Source**

Off - no convolution is happening.

Klang 5 & Klang 6 - Klang 5 and Klang 6 are being convolved with each other.

Live In & Klang 6 - The Live input and Klang 6 are being convolved with each other. Note that due to the unpredictable nature of convolution you may end up with some very harsh and unexpected sounds while doing this. It all depends on what you have going in Klang 6.

Invert - This changes the order of the convolution. Depending on which source is driving the convolution you get very different results.

Note - to hear the convolution the gain on both sources must be above 0. Often convolution can significantly reduce the gain of a sound so the gain level often needs to be turned up a bit.

- **Convolution Type**

As it is hard to predict what the outcome of convolution will absolutely sound like it is best to experiment.

Amplitude - amplitude convolution is the most common form. In Amplitude convolution the amplitude or gain of one sound is used to control the amplitude or gain of another.

Phase - In phase convolution the phase of one sound is multiplied with another to create a sound somewhere in between the two.

Imaginary - This takes the imaginary mathematical numbers of a sound and multiplies them with another. This tends to be a higher frequency type sound.

Self - This convolves a sound with itself, bring out different frequency characteristics. Use invert to choose which sound is convolving with itself.

Sparkle - This is a convolution that I cooked up that uses both sounds and adds a bit of sparkle.

Control Menu

The extras menu allows you to open extra features contained in new windows. Most of these features allow you to control parameters in the main window. Notice that the keyboard short cuts are listed to the right of the items.

- Mixer

This opens the mixer window in case you have closed it.

- KlangRnd

This opens a window that allows you to randomly control all of your Klang parameters. To make random control truly useful you need to be able to regulate it. Kenaxis uses a random generator model called random walk. The idea is that a parameter called chaos controls the step size so you can choose how much the random generator staggers its way around.



Tempo on/off – This turns the random generator on or off.

Pitch Mode - this is only present on Pitch. Off of course is off. Random changes the pitch randomly at a rate of the tempo selected in beats per minute. See Chaos for more information on how random works. New to Kenaxis 3.0 are Sine, Sawtooth and Square. These allow for audio-rate modulation of pitch. For instance with Sine wave mode selected and a Tempo of 60 Hz the pitch will be modulated from the minimum to the maximum at 60 times a second.

Tempo – This set the speed in beats per minute at which random parameters are generated. It is effected by the global Tempo Randomizer.

Hz - This is only applicable to Sine, Sawtooth and Square wave modulation of pitch. This is the frequency that the pitch is modulated at. Anything over 18 Hz causes additional ring modulation like overtones.

Minimum, Maximum – These two parameters determine the effective range of parameters sent by the random generator. When using audiorate modulation of pitch some beautiful slowmotion effects can be achieved by setting the minimum to -.95 and the maximum to 1. This will oscilate the pitch between -.95 (backwards slightly less fast than normal speed) with 1 (forwards at normal speed.) This allows you to crawl through the sound. You can also create unique doubling tones by using .5 as the minimum and 1 as the maximum. You will then hear both the normal speed and one ocatve down. For cleaner sound use the square wave - for a smoother sound try the sine wave.

Chaos – This determines the step size used by the random generator. With chaos at full, you have your normal completely random generator. As you reduce the chaos to 0 you reduce the amount of change between each random jump resulting in a more organic motion. This does not reduce the overall range of randomness. It just means that it might take a bit of time to stagger from one side to the other. (This type of randomness is called a drunk walk if that helps you imagine the inspiration.)

Presets – You can click on a square with a dot in it to recall a preset of all of the parameters on the KlangRnd screen. To store a preset hold shift and then click. You can save and load presets of KlangRnd settings as well. Note: This is slightly outdated as the main screen Kenaxis presets now control the KlangRnd settings as well.

Tempo Randomizer – The Tempo Randomizer is a global setting that affects all of the KlandRnd random generators. If the tempo randomizer is set to zero you will hear distinct sequential changes happening at the tempo indicated in each generator. The Tempo Randomizer adds a random factor to the timing to help create a more organic randomizing feeling. If the Tempo for a particular generator is set at 60 this means each change would normally happen one second apart. With the Tempo Randomizer set at 0.5 changes coming out will actually happen somewhere between 1 and 1.5 seconds. [$1 + (1 * 0.5) = 1 + 0.5 = 1.5$] Note: The higher the Tempo Randomizer is set the slower the random changes outputted will occur.

- GranRnd

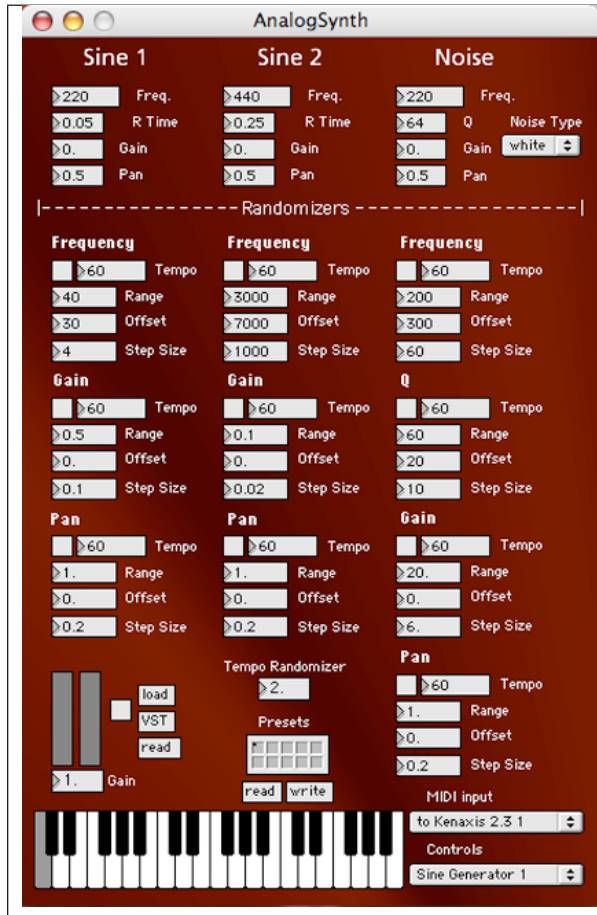
The GranRnd is exactly like the KlangRnd except it changes the Granulator values. See the KlangRnd for a more detailed description of how it works.



At this time GranRnd still uses the old step size parameter instead of Chaos. The Step size is how large of a step each number generated by the randomizer can take from the last number generated. For example if your Range = 3.0 and Offset = 0.2 you have an effective range of 0.2 - 3.2. This means that a number generated can be anywhere between 0.2 and 3.2. Lets say the step size = 0.5. The step size comes into play once you have generated the first number. Say the first number = 1.0. With a step size of 0.5 the next number must be within 0.5 of 1.0 i.e. 0.5 to 1.5. Say the random output ends up being 0.6. The next number generated now must once again be within 0.5 of this number or 0.1 to 1.1. Because the lowest possible number due to the effective range that is setup is 0.2 the next number is limited to being between 0.2 and 1.1. This leads to a kind of drunk staggering walk from the lowest possible number up to the highest number and makes it possible to use a randomness that has a large range but does not jump around in a crazy manner. (Of course making the step size = range makes any number possible at any time within the effective range.)

- Analog Synth

Sometimes playing back samples just isn't enough and you just want a good old sine wave. Perhaps you are looking for a blast of white or pink noise – then the Analog Synth window is for you. (Note this is not available in Kenaxis VBAP.)



The screenshot shows the AnalogSynth window with three main sections: Sine 1, Sine 2, and Noise. Each section has controls for Frequency, R Time, Gain, and Pan. Below these is a Randomizers section with three columns of controls for Frequency, Gain, and Pan, each with Tempo, Range, Offset, and Step Size parameters. At the bottom, there are Presets, Signal Meters, MIDI Input, and Controls sections.

Direct control of Sine and Noise

Random modulators

Presets, Signal Meters

MIDI Input

Controls

Direct control – This section allows you to control two sine wave generators and a noise generator. For the sine wave generator there are four variables: Frequency – the frequency of the sine wave, Ramp Time – the time in seconds that it takes to go from one frequency to another, Gain – volume, and Pan – the pan of the sine wave generator (0 = left, 1 = right).

The Noise generator has one option – White noise or Pink Noise. Try both to hear the difference. Attached to the Noise generator is a filter to tame the noise to your needs. This filter has four variables: Frequency – center frequency to be emphasized, Q – the sharpness or tightness of the curve to be emphasized (higher the value the narrower the band of sound that is passed is), Gain – volume, Pan – pan (0= left, 1 = right).

Random Modulators – These modulators each control one of the direct control parameters. See the KlandRnd section for more details.

Presets, Signal Meter – The Presets are the same as in the KlangRnd. The Signal Meters indicate visually the audio signal being sent to the main mix.




Presets, on/off – The presets are there for legacy reasons. Previous users might have setups saved that they wish to recall. This preset only works with the Joystick setup. Now the current setup automatically is saved so that the next time you use Kenaxis you are ready to go. If you want to use the presets, shift clicking on a box stores a preset, clicking on a box recalls it. The read and write buttons can be used to load and save sets of presets respectively. The on/off button simply turns on or off joystick control. This is useful since the default USB controller might be a mouse. You can also turn on and off the joystick using the extra’s menu option.

Input – this chooses which USB device you are using as your input. The Joystick setup is optimized for the WingMan RumblePad joystick. I like this particular joystick since it has two sticks and a thumb slider for lots of control options at a cheap price. Other joysticks should work similarly but there are no guarantees. Their parameters might be mapped differently. If you do run into problems [email me](#) and I will see what I can do. I have added a configure button where you can attempt to configure your own joystick as well.

Other Settings – There are two other options for the Joystick setup screen. Buttons pause/resume Klangs is the first one. With this checked, the X,Y,Z and A,B,C buttons on the WingMan RumblePad will each pause/resume one of the Klangs. (X,Y,Z = Klang 1,2,3, A,B,C = Klang 4,5,6)

The second option “Thumb selector sends preset# to:” uses the thumb selector switch on the WingMan RumblePad to change the current preset number in Kenaxis (this is the equivalent of pressing one of the recall buttons in the preset section of the main screen of Kenaxis), or sending a preset number change just to the old legacy preset boxes in the Joystick setup or the KlangRnd screens. You can select all three options if you like. Note the Kenaxis preset now controls the KlangRnd screen so they will counteract each other.

Next lets look at one variable and how we choose to control it.

	<p>Name of destination to be controlled</p> <p>Specific parameter to be controlled</p> <p>Input</p> <p>Offset</p> <p>Range</p> <p>Invert</p>
---	--

Name of destination to be controlled, Specific parameter to be controlled – these are just as labeled. In the above example you see the specific settings to control the pitch of Klang 2.

Input – Here you choose which joystick action will control this particular parameter. The key in the Global Joystick settings area will help you remember that “left stick = x1,y1 right stick = x2,y2 and throttle = t1” X refers to a horizontal movement and Y to an up and down movement This means that if the input is set to y2 , a Y axis movement also known as an up and down motion on the right stick will control the parameter. Note: you can control many different parameters with one input – for instance you can control the pitch of all of the Klangs with y2 simply by setting all of their inputs to y2. You do not need a one to one correspondence. For the Wacom tablet x1 and y1 are the x,y coordinates. t1 = pressure and x2,y2 are the angle for those wacom tablets that support it.

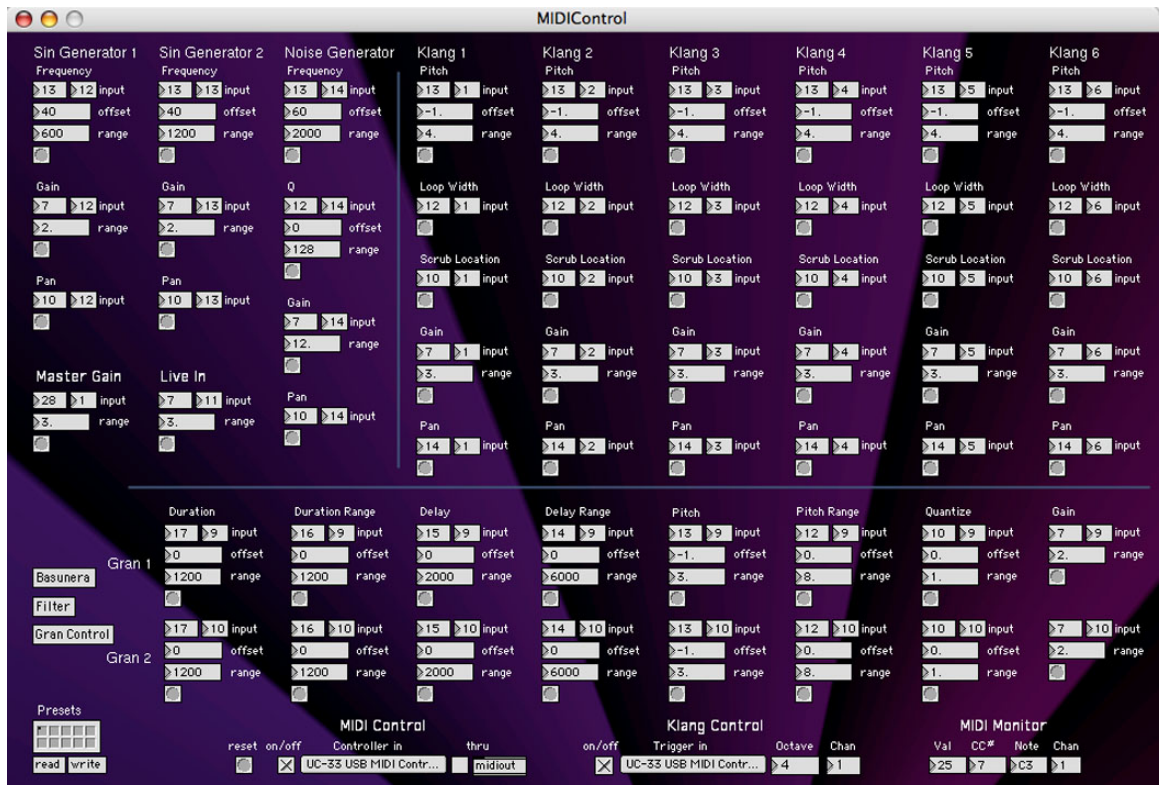
Offset – This is the minimum value that is sent when the joystick is in either far left position (X axis) or bottom position (Y Axis).

Range – This is the range of number that can be sent. Add the Offset and Range together and you have the largest number that can be sent out. In the above example the Offset is -1 and the Range 4 – this means the largest number is 3. (Overall range of -1 to 3).

Invert – This flips the axis of the input. For example if x1 was the input the far right would now be the smallest value and the far left the largest. If y1 was the input all the way down would be the largest value and all the way up would be the smallest.

- MIDI Control

All of the parameters in the main Kenaxis window can be controlled by a MIDI device. This window lets you setup which parameters are controlled and by how much.



Lets first look at how to control one parameter and then we will look at the other MIDI options.

Klang 3 Pitch >13 >3 input >-1. offset >4. range <input type="checkbox"/>	Name of destination to be controlled Specific parameter to be controlled Input (Continuous Controller #, Channel #) Min Max MIDI Active Light
--	--

Name of destination to be controlled, Specific parameter to be controlled – these are just as labeled. In the above example you see the specific settings to control the pitch of Klang 3.

Input – Here you choose which controller# and channel# will affect a parameter. In the above instance Continuous Controller# 13 on Channel# 3 will control pitch. The input does not need to be exclusive – you can have one controller/channel controlling many parameters.

Min – This is the minimum value that is sent.

Max – This is the maximum value sent.

MIDI Active Light – This light blinks on if this parameter has received a MIDI message. It is useful for troubleshooting and seeing what your MIDI interface is doing.

MIDI Control, Klang Control, MIDI Monitor



MIDI Control – This is where you choose the MIDI device that you will use to control the parameters in Kenaxis. All of the parameters are setup to work well with the default Evolution UC-33 or UC-33e MIDI controllers.

reset – this resets the MIDI Control and attempts to find new MIDI interfaces if they are not currently in the Controller in list.

on/off – this turns on/off MIDI control.

Controller in – this drop down menu lets you select the MIDI device you want to use to control the various parameters.

thru – checking the thru box sends a MIDI thru to the device chosen by double clicking the midiout box. This is useful if you want you MIDI input device to control other MIDI devices as well.

Klang Control – This was setup so that I could pause/resume and record into the various Klangs using a MIDI organ pedal that sits on the floor. The MIDI interface chosen for Klang Control is independent of the MIDI Control so that you can use two different MIDI interfaces.

on/off – turns on/off Klang Control

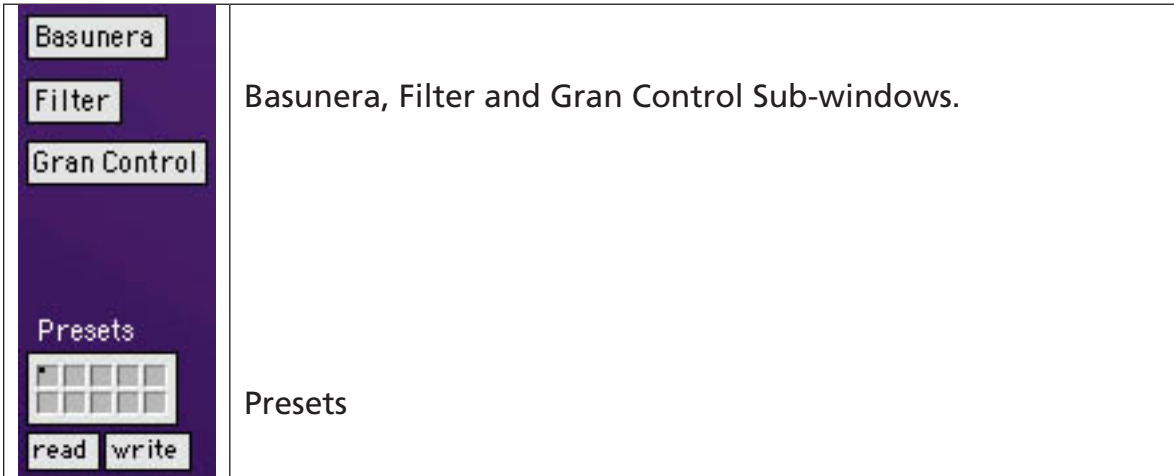
Trigger in – this drop down menu let you select the MIDI device you want to use to trigger pause/resume and record into Klangs.

Octave – This determines the octave or which C triggers pause/resume for Klang 1. The pause/resume for Klang 2-6 then go diatonically up for example D controls Klang 2. Octave C controls the Granulator. The sharp keys above a Klang control recording into a Klang. As a hidden feature, if instead of pause/resume, you want to trigger playing from the beginning of a sample, two octaves up from the octave indicated will trigger Klang 1 – the D two octaves up Klang 2 etc. (This is equivalent to hitting the start key for a particular Klang from the main Kenaxis screen.)

Channel – This determines which channel the Klang Control will work on.

MIDI Monitor – The MIDI Monitor simply tells you what the currently selected MIDI interface under MIDI Control is sending to Kenaxis. This is very useful for troubleshooting and setup.

Basunera, Filter, Gran Control, Presets

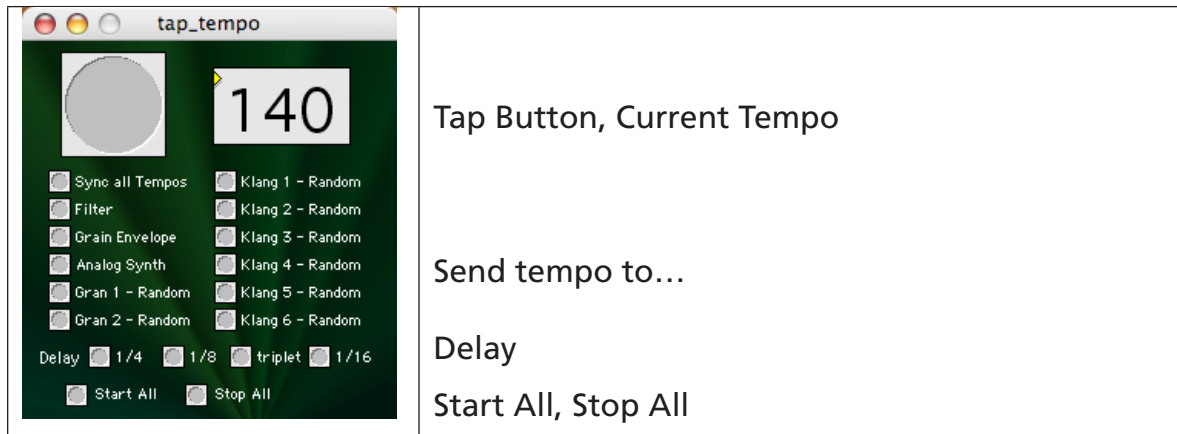


Basunera, Filter, Gran Control Sub-windows – clicking on one of these buttons opens a sub-window that allows you to choose the control options for the associated parameters. For example – Basunera opens a window allowing control of all of the Basunera parameters. (Just couldn't fit everything on one screen.)

Presets – The presets are there for legacy reasons. Previous users might have setups saved that they wish to recall. This preset only works with the MIDI setup. Now the current setup automatically is saved so that the next time you use Kenaxis you are ready to go. If you want to use the presets, shift clicking on a box stores a preset, clicking on a box recalls it. The read and write buttons can be used to load and save sets of presets respectively.

- Tap Tempo

This window has two uses. The first is that by tapping on the large tap button you can estimate the current tempo. This is useful when trying to fit prerecorded beats to a live setting. The second is that you can send the tempo indicated in the window to any or all of the parameters listed.



Tap Button – click on the tap button in time to the music to determine the current tempo.

Current Tempo – This indicates the current tempo as determined by tapping on the tap button. You can also change this number if you know the exact tempo.

Send tempo to... – Click on these buttons to send the number indicated in the current tempo box to the location indicated by the button.

Delay - this sends the current tempo to the left delay time. Pressing 1/4 will give you quarter notes, 1/8 - eighth notes etc.

Start All, Stop All - these buttons start or stop all 6 Klangs, both Basunera and the Granulator. This can be used to start everything at once so that you can sync multiple tracks. Click "Stop All" first then set the playback volume on all of the Klangs to your desired level (1.0 for instance). Then click "Start All" and all of your tracks will be in sync.

- Audio Settings

This shortcut opens the Audio Settings window.

- Filter and Delay

This shortcut opens the Filter and Delay window.

- Value Randomizer

The Random Impulse gives you one pulse of random changes. The changes are determined by your Klang Random and Gran Random settings but instead of continuous change - you get one change when you want it.

- Random File Impulse

The Random File Impulse randomizes the files loaded in your klangs. It randomly loads a new file from the drop down menu list of each Klang. For example you have a folder with 7 sounds in it and you drop this on the Klang. You can now see those 7 sounds in the drop down menu. Triggering a Random File Impulse loads a random sound from this list. This allows you to very quickly change the set of sounds you are working with.

Preferences Menu

- Restore Kenaxis System Defaults

Any changes to the MIDI or Joystick settings are automatically remembered. Selecting this menu item restores the MIDI and Joystick settings back to the default settings.

- Open Kenaxis System Prefs

If you have saved a set of Kenaxis System Prefs - this allows you to open them changing all of your MIDI, Joystick and Audio Settings to the saved file.

- Save Kenaxis System Prefs

This allows you to save a set of Kenaxis System Prefs. (MIDI, Joystick and Audio Settings.)

- Hints On/Off

This allows you to turn on and off the built-in help system.

- Joystick On/Off

This allows you to quickly enable/disable joystick control of Kenaxis.

- Separate Live Record On/Off

This option changes how Kenaxis records its output to disk. With "Separate Live Record" turned on you get two stereo audio files instead of one. The first file has all of the output except for audio from your Live In. The second file will have the same name but have the word "live" added to it. This file contains your Live In audio but without the reverb. The built-in reverb is perfect for live performance and does not take a lot of CPU power but cannot compare with a good convolution reverb now available for mastering. This is very useful if you want to remix material you create while using the Live input into Kenaxis.

If you want more multi-tracking options - use Kenaxis VBAP. With the direct output option you can send to 4 stereo files - mixing the various klangs, basuneras and granular synth outputs as you like.

Other Kenaxis Menu Items

- *About Kenaxis*

This is the window you use to register Kenaxis. It is found on the far left under the Kenaxis Menu on a Mac and the far right under the Help menu on a PC.



computer id – This number identifies your computer. You need to email me this number once you have paid for Kenaxis so that I can send you an unlock number.

unlock number – once you have paid for Kenaxis, I will email you an unlock number. This number will stop the please register message and allow you to save.

- *Normalize*

Pressing command 1-6 will normalize the sound contained in Klangs 1-6 respectively. Pressing command 7 will normalize the granulator sound. Normalization is useful for making quite sounds louder. This makes it easier to balance different sounds. It also makes it easier to see quiet sounds in the waveform display.

Kenaxis VBAP

The Kenaxis project started in 2000 and has been evolving greatly. There is now also a Kenaxis VBAP that allows for real-time multichannel output. (From 3 – 8 speakers including 5.1) You can pan, spin, spiral and save your creations to 5.1 or 8 channel files. It has all the same functions of Kenaxis minus the Analog Synth.

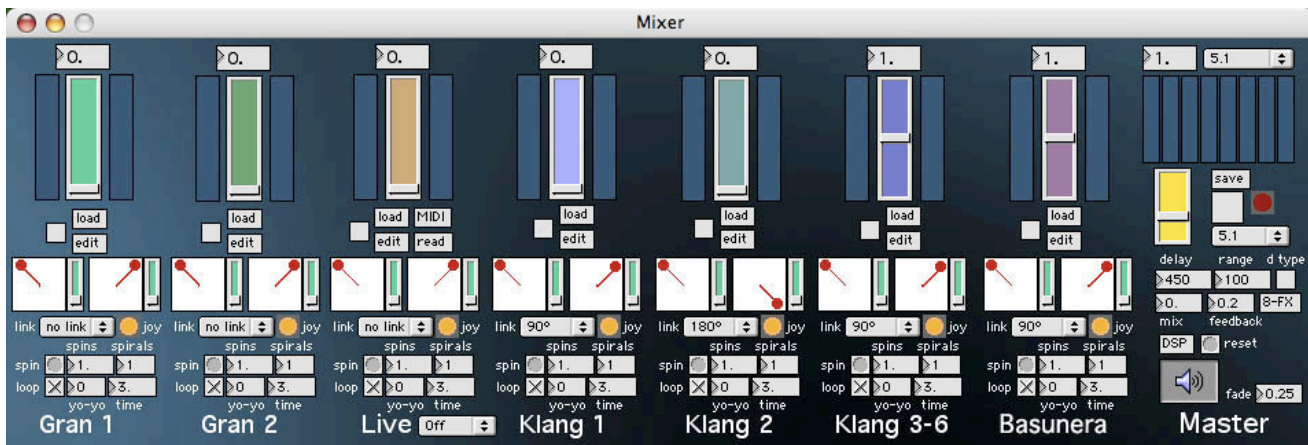
Kenaxis VBAP works identically to Kenaxis with a few minor differences. The most notable difference is that the Kenaxis VBAP mixer window adds controls for manipulating your sounds in surround sound and has a different FX setup that allows for some built-in multi-channel effects.

There is no Analog Synth in Kenaxis VBAP but there is an added speaker setup window for setting up anywhere from 3 - 8 speakers in different custom configurations and a VBAP Random window for creating random panning of your sounds.

Once you get hooked on using more than 2 speakers, giving all of your sounds room to breathe and using multi-channel effects its hard to go back to stereo.

- Kenaxis VBAP Mixer

The Kenaxis VBAP mixer window.



As you can see this window is very similar to the regular Kenaxis mixer window. The difference is in the panning section below the VST plugin section and in the Master mix section.

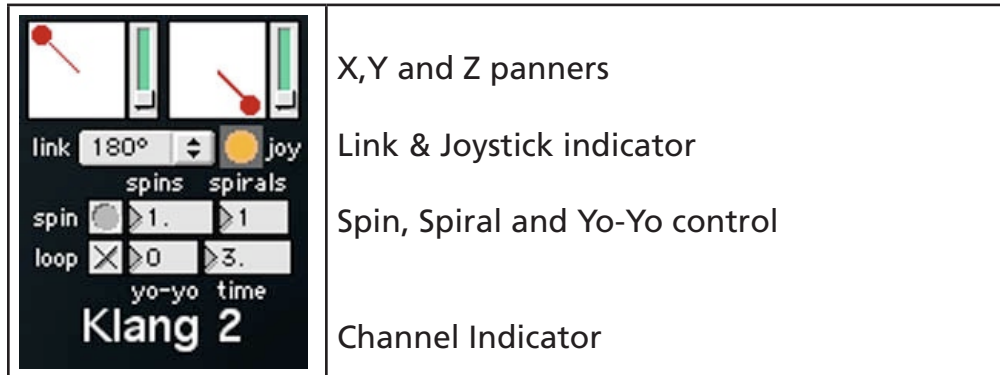
There is also a hidden difference. Since Kenaxis VBAP requires an audio interface with more than 2 outputs it also allows for more than 2 inputs. Inputs 3&4 are routed into Gran 1 and inputs 5&6 into Gran 2. The volume is controlled exclusively by the input gain on your audio interface. Changing the volume of either Gran 1 or Gran 2 only controls the volume of granular synth playback. They can be left a 0.0 if you are not using the granular synth.

This way you can still use the volumes for Gran 1 and Gran 2 to control the volume of granular playback and mix it with the live input. Any spatialization done in Gran 1 left

channel effects input 3, Gran 1 right channel input 4 and so on. This way Kenaxis VBAP can be used to diffuse (spatialize) 6 live inputs.

- Kenaxis VBAP Panner

Located below the VST section on each channel strip in the Kenaxis VBAP Mixer window.



X,Y panners - The X,Y panner uses a red point to indicate the position of a sound. The further from the center that the red point is the more specifically located the sound. As the red point moves to the center the sound can be heard from more speakers. If the red point is directly in the center it can be heard from all speakers.

Z panner - This up/down fader moves a sound in the 3rd dimension if you have setup a 3d speaker setup.

Link - This pull-down menu let you choose how the right channel behaves when you make a change in the left channel. "No Link" means that there is no link and the left and right channels are independently controlled. "0°" means that the channels are linked 0° apart, in other words they are in the same spot giving you a "mono" spatialization of your sound. This is useful if you want the sound to be more localized. "90°" keeps a stereo field with the left and right channels always separated by 90°. "180°" keeps a more drastic stereo field with the left and right channels always separated by 180°.

Joystick indicator - When using the joystick it is possible to quickly scroll through and choose which channel strip you are controlling. This light indicates which channel strip you are controlling. To setup the joystick use the Joystick window found under the extras menu.

Spin & Spiral control - The left most button starts the panner spinning and spiralling. If loop is on the sound will continue to spin and spiral. If it is off, triggering the spin and spiral section will cause the sound to spin once. To determine how fast the sound spins and spirals you set the number of spins and or spirals during a set time. For instance the above settings call for 1 spin and 1 spiral in 3 seconds. You can set incredibly fast spins - say 30 spins per second if you like, or very slow almost imperceptible spins such as 1 spin in 180 seconds. Clicking inside the X,Y panner will automatically stop the spin and give you specific control again.

Yo-Yo control - This has not be implemented yet.

Troubleshooting

If you are not hearing any sound.

Click on the Audio Settings button in the mixer window. This will bring up the Audio Settings window. Make sure you have a valid audio driver selected and that audio is turned on.

If you are having problems getting a MIDI device or external audio device to work.

The order that you turn things on is very important. Kenaxis must be closed when you first turn on an external device. (Quit if it is open.) Turn on any audio or MIDI devices, and wait at least 30 seconds for them to initialize and be recognized by your computer. Now open Kenaxis.

If Kenaxis crashes at startup.

There is a good chance that your audio/midi preferences have become corrupt. To fix this open "Audio MIDI Setup" application usually found in the utilities folder inside your applications folder.

If you want to use two different audio interfaces, one for input, another for output.

The correct combination is setting the driver to coreaudio built-in, and selecting your output, then select your input device. It has to be done in this order, otherwise you lose the ability to change your output as it blanks out.

Thanks

There are many people to thank. First I'd like to thank Arne Eigenfeldt at Simon Fraser University for introducing me to Max/MSP – the programming language that Kenaxis is written in. I'd like to thank Barry Truax up at SFU as well for his work on granular synthesis and teaching me about it. Chris Rolfe was also invaluable. His MacPod Software inspired me as well as talks with him about spatialization. The Max/MSP mailing list and community at large has also been invaluable in learning the finer points of coding. And of course a thanks to [Cycling74](#) for making Max/MSP in the first place.

Kenaxis started off as Sound Mangler. If the enthusiasm for SM by Kelly Churko had not been as great as it was – Kenaxis would never have evolved. Chris Kelly and Ben Wilson were also instrumental as early users of Kenaxis in developing features and usability.

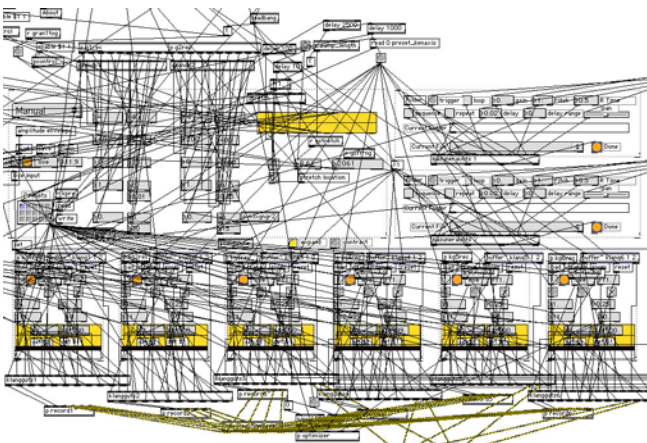
Thanks to the many other people who have used Kenaxis since then and given me their feedback.

Kenaxis VBAPs development was fuelled by Jeff Corness and Max und Moritz. Two channels are no longer enough. Also many thanks to the amazing VBAP (Vector Base Amplitude Panning) object created by [Ville Pulkki](#). If it were not for his object Kenaxis VBAP would not exist.

Thanks to [Mitch Kinney](#) for his amazing graphic design and [Greg Hamilton](#) for his work on the Kenaxis website text. Thanks to [Tzaddi Gordon](#) for the current website.

Of course my wife Viviane Houle deserves the most thanks for being patient with me while I spent untold hours programming away into the middle of the night and beyond and for dealing with that glazed over far away look in my eyes while I was obsessing on how to fix a bug.

If you run into any bugs, have suggestions or feedback I'd love to hear from you. I'd also like to know if you use Kenaxis in any recordings and would love to hear them. (stefan@kenaxis.com)



(Snapshot of Kenaxis code.)

About Stefan Smulovitz

A truly interdisciplinary collaborator Stefan has performed and composed for film, live visuals (Pierre Hebert, Jamie Griffiths), theatre (Radix, Rumble, Theatre Replacement), dance (Noam Gagnon - The Holy Body Tattoo, Barbara Bourget - Kokoro Dance, Mascall Dance, Cheryl Prophet, Rob Kitsos), art installations (Museum of Contemporary Art in Los Angeles), and DVD-ROMs (Confluences – work of Frank Gehry).

As a performer he is renowned for his “quicksilver ability to morph and manipulate sound via digital technology” (Georgia Straight) Transforming the laptop into an instrument using his custom software Kenaxis. Stefan has performed with many of the worlds top improvisers including: Evan Parker, Uri Caine, Mark Dresser, Fred Frith, Paul Plimley, Francois Houle, Jesse Zubot, Peggy Lee, Mark Feldman, and the NOW Orchestra. With his band Eye of Newt Stefan has created over 60 live scores for film. His interdisciplinary project Gesture4 with vocalist Viviane Houle, dancer Noam Gagnon, and visual artist Jamie Griffiths was just selected by the Georgia Straight as one of the top 12 events of 2007.

His electro-acoustic works have won a national Canadian award (JTTP). He recently won the 2006 Vancouver New Music Chamber Music Competition for his piece for 12 players plus electronics entitled “the still unanswered question.”

Stefan’s compositions have been performed by the Vancouver Symphony Orchestra, Turning Point, Ensemble Symposium, Chor Leoni, Elektra, and at the Sonic Boom Festival from 2002-2007. Most recently the Standing Wave Ensemble premiered a new work as part of the 2008 Alcan Award for Music.

He can be reached at stefan@kenaxis.com

(For Kenaxis inquiries please email info@kenaxis.com)

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