

## The LAoE tutorial serie - How to use selections

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first edition, april 2002

author: Olivier Gäumann  
rue Matile 6  
2000 Neuchâtel  
Switzerland

e-mail: laoe@oli4.ch  
web: www.oli4.ch/laoe

wordprocessor: OpenOffice 641

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**LAoE** is a rich featured graphical audiosample-editor, based on multi-layers, floating-point samples, volume-masks, variable selection-intensity, and many plugins suitable to manipulate sound, such as filtering, retouching, resampling, graphical spectrogram editing by brushes and rectangles, sample-curve editing by freehand-pen and spline and other interpolation curves, effects like reverb, echo, compress, expand, pitch-shift, time-stretch, and much more...

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## 1. Introduction

The **LAoE tutorial serie** is a serie of articles focussed to LAoE-users. These articles have been written with the idea to bring LAoE to a larger public, and to discover many unexpected features, because LAoE isn't as easy to use without documentation. At the time of writing this article, no documentation was existing about LAoE.

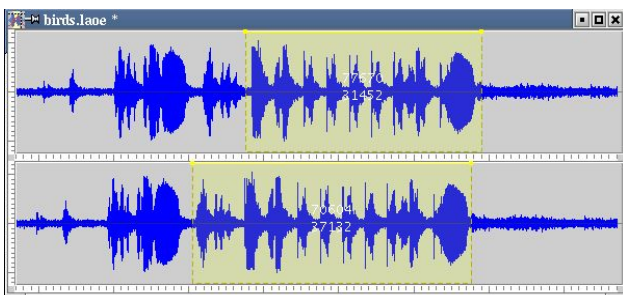
In this article, we will learn the **selection-concept**, how to create and manipulate them, how to use every feature of the selections optimally, how to apply them on the different effects and plugins. We will look around, not focussing exclusively on selections, but also largely the domains around, the ones who get in touch with selections.

This article is based on the current **version of LAoE v0.4.05**. So when you read this lines, maybe a newer version of LAoE will be out, and the graphical user interface will probably have minor differences to the figures of this document.

## 2. What is a selection?

In LAoE, a selection is a defined range in the horizontal axis of a sample-curve. Most of the editing, functions and effects are performed on that range only, and let the other areas untouched. So the selections are needed, if only a certain range of the samples should be manipulated. Each channel of a clip contains its own selection.

The selections are shown as yellow semi-transparent area, with dashed borders. The figure below shows a clip with two channels, each channel containing a individual selection.



### What, when no selection?

If a channel doesn't contain any selection, then full selection is supposed. No selection is aequivalent to "whole channel selected". When applying an effect to a

channel without a selection, then the whole channel will be modified.

### Limitations of selections

LAoE doesn't support multiple selections per channel, only one selection is allowed in each channel. This is the reason, why no invert-selections plugin exists (the result could be two selection ranges). This limitation can be avoided with the use of intensity for most of the plugins (see chapter Intensity) .

## 3. Selection's view

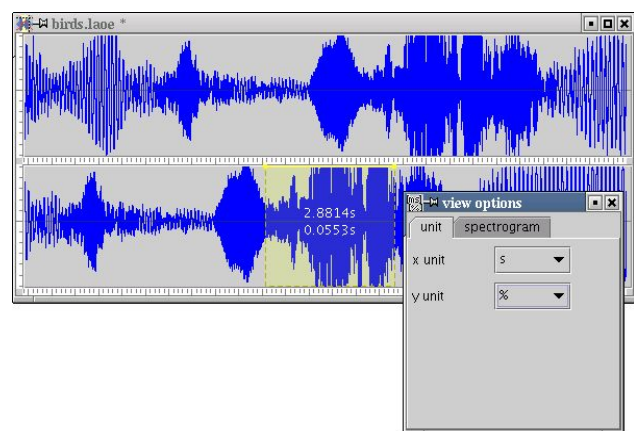
As mentioned before, the selection are shown as yellow semi-transparent areas, with dashed borders. The two numbers in the middle are the numeric description of the selection. The top number represents the offset, the bottom number represents the length of the range.

### Current layer's selection

Since a clip may contain multiple layers, you cannot see all selections at once, this would be too much disturbing. So you see exclusively the selections of the current layer (the layer selected in the layer-stack). So when you click through the layer-stack, the selections changes in function of the current layer.

### Unit settings

The unit of the numeric representation of a selection is modifiable with the view-options plugin.



## 4. Edit a selection

### With the mouse

The simplest and most intuitive way to edit selections is with the help of the mouse. The mouse allows to...

- select a range of a channel
- select a whole channel at once
- select a whole layer at once
- unselect a channel

Of course, to start defining a selection, you have to start the select-plugin first. You will see the selection-cursor.

The **mouse-press**, -drag and -drop allows to select a range of a channel. The location where the mouse was pressed defines the offset of the new selection. At that time, the old selection of that channel is replaced, if one was existing.

During **mouse-drag**, the size of the selection is adapted. If you drag the mouse out of the channel to other channels below, then the same selection will be created for all these neighbour-channels. This is the multi-channel selection mode.

Finally on **mouse-drop** the selection(s) is definitely created. If you're not happy, you can re-edit or correct a border of the selection, when pressing down close to a border of a selection. This enable the resize-mode of the selection. The other border of the selection is not changing. Imagine a first rudimentary definition of a selection, then zooming into the border-area of the selection to finetune the selection-borders.

One **mouse-click** unselects the actual channel. The **mouse-doubleclick** selects the whole channel at once, and the **mouse-tripleclick** selects the whole layer at once.

### Layer-selection

There is a select-layer plugin with the shortcut Ctr-A to select the whole layer at once.

### Deep selection

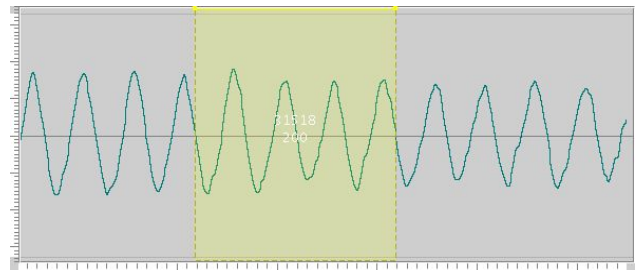
When editing selections with the mouse, there is a deep-selection mode, which creates the same selection through all layers at the given channel. To enable this deep mode, press the Shift-key before pressing the mouse. You will see the cursor adding a small symbol. The deep mode is very useful when working with multiple layers and wanting to keep the layers synchronous after copy-paste-

cut for example.

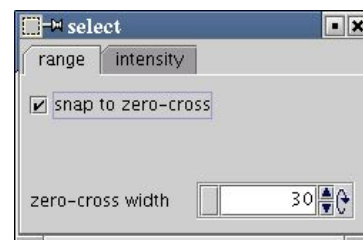
### Automatically smooth the borders

When performing copy-paste-cut manipulations on any non-silent sound, and if nothing would be done to avoid them, then you would hear disturbing clicks at these copy-past-cut borders. This is due to the fact, that the signal would have a phase-jump and/or an amplitude-jump at this location. When zooming very deep inside to sample-domain, you would see this jump very clearly with your eyes, in form of a vertical slope in the signal.

LAoE proposes two methods to avoid or reduce these disturbing clicks. One is the **snap to zerocross** method, to snap the selection-border to the nearest zerocross of the sample-curve. This is possible when dragging with the mouse only. The figure below shows a selection created in this mode. You can clearly see the selection-borders are located at the sample-zerocrosspoints. This method reduces amplitude-jumps but not phase-jumps nor slope-jumps.

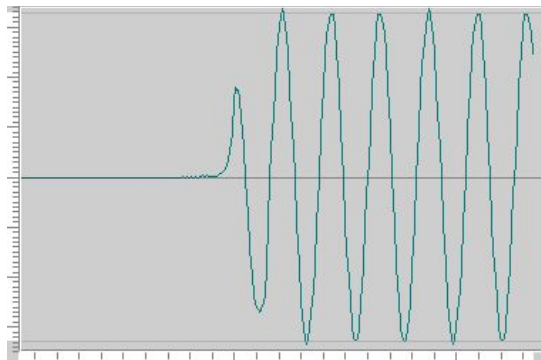


To get the best result on stereo-clips, you need to drag both channels separately. The snap to zero-cross mode can be enabled/disabled via the select-plugin.



The other method consists of mixing the two ends in a way as the two signals were melt together. The whole mixing is performed in a non-hearable time-range of a few milliseconds. The time-range is configurable in the **zero-cross-width** field. Choose values between 0 and 300 samples, where 0 means disabled and 30 samples is the default-setting.

The figure below shows a silence (left part) and a normalized sinus (right part) melt together after a cut-operation. You see, the sinus has a relative smooth transition now. What you don't see is that the selection, which was cut away, had its end on the peak of the sinus, I mean at the worst location in terms of hearable clicks, to test a really hard situation.



In some rare cases, these smooth borders are not welcome. For example when editing a spectrum and you explicitly want to have sharp edges, or when editing a parameter curve. So disable both methods. In general, we can say, the smoothing of the borders are required for audio-signals only.

### Numeric selection editing

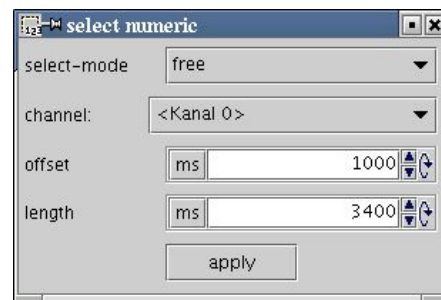
Another way to create a selection is to use the select-numeric plugin. In many cases, this gives a more direct way to work, e.g. when having placed the loop-points optimally, then you can create selections that directly take the values of these loop-points.

Four select-modes exists:

- free (uses the two numeric values of the plugin)
- loop-points (from loop-begin to loop-end)
- begin (the first sample only)
- end (the last sample only)

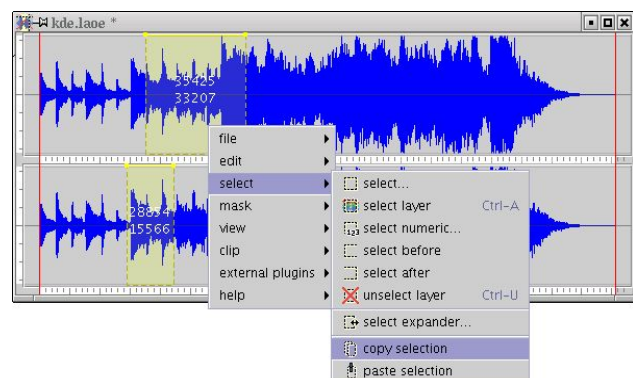
Why select the first or last sample? This is useful on paste, because, the copied sample-ranges are always pasted to the current selection-offset. It is easy to paste the samples in front of the current samples or behind them.

On apply, only the selected channel will get a new selection, the other channel's selections keep unchanged. If you want to apply to all channels, you have to do it individually for each channel.



### Copy/paste selections

There is a special clipboard to copy and paste selections between different clips and layers. This concerns the selections only, and not the selected samples. When copying a selection, the selection and only the selection is copied, but never the samples of the given channel.



### Moving selections

The move-plugin has a special mode, where the selection is moved only, but not the samples of the channel. To do so, press the Ctrl-key before moving with the mouse. You will see a small selection-symbol added to the cursor, when move-selection mode is enabled.

### Expand/reduce selections

The select-expander plugin allows to...

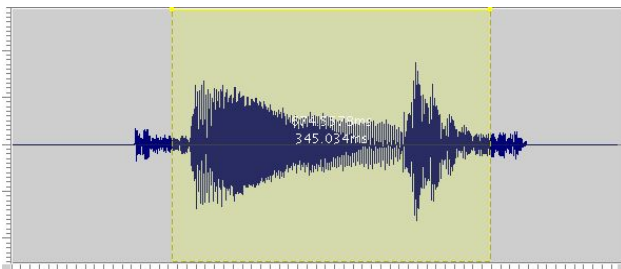
- expand to the borders of the currently selected noise

- expand to the borders of the currently selected silence
- reduce to the next inner noise
- reduce to the next inner silence

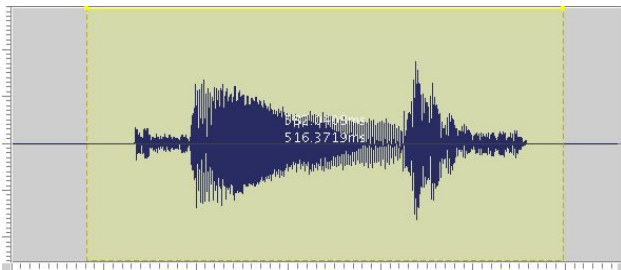
So with the help of this plugin it is very simple to select approximately a noise-range, and then let LAoE finetune the selection, finding automatically the precise borders of this noise-range. There are two possibilities:

- reduce the selection
- expand the selection

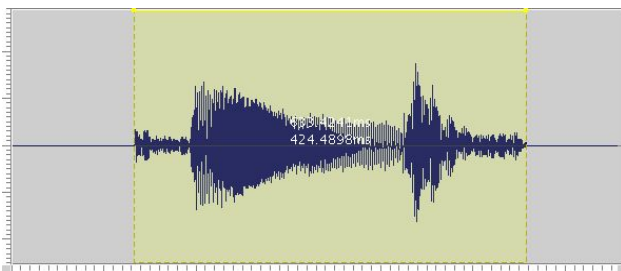
To expand the selection, the way to go is to make a raw selection, which is limited inside the given noise. Be sure to keep inside. So LAoE expands automatically both ends till the end of noise.



In opposite, it is possible to select more than the wished range, be sure to keep outside. And then let LAoE reduce to the given noise borders.



The figure below shows the result in both cases, after an expansion or a reduction of noise.



We have seen how to expand and reduce to the borders of a noisy part of a clip. There is an equivalent possibility to work with silent parts, expanding and reducing to the exact border of a silence part, with the same plugin.

### **Duplicate a channel-selection to all other channels**

You have created a selection, with custom intensity and you spend much time to do this.... And now you want all other channels of that layer having this selection too. Don't panic, you don't need to do the same work again. Just open the select-expander plugin, choose the channel-axis tab, and choose then the source-channel.



On apply, LAoE takes the selection of the source-channel, and clones it to all other channels, including intensity-information.

### **Select before/after**

Imagine a clip where you want to perform an effect to the first part and another effect to the rest of the clip. Let's say, the transition of one effect to the other should be very narrow. The easiest way to go is to select the first part, perform the effect, and then apply the select-after plugin, and perform the second effect.

The **select-after** plugin will make a new selection, taking the end of the current selection, use it as beginning of the new selection, which goes till the end of the channel.

The **select-before** plugin takes the beginning of the current selection, and creates a new selection from channel-begin to there.



## Unselect

With LAoE you can unselect a single channel (with the mouse and the select-plugin on clicking) or unselect a layer (with the unselect-layer plugin).

## 5. Intensity

### Why intensity?

Intensity is a kind of new dimension in the selection-domain. Instead of having only selected and unselected samples, black and white, you can now have fine-granulated half-selection-shapes, with all values between 0% (not selected) and 100% (fully selected), all gray-scales inbetween.

What does it contribute? When applying an effect to a certain range of the clip, you can have smooth progressive begin and end of the effect. This sounds more natural. This would not be possible with classic selections, you would have hard borders, the effect would begin and end sharply.

### The concept

Every selection has an additional visible yellow segmented line which represents the selection-intensity in function of time. The intensity-scale is defined as follows:

- 100% is on top of the channel
- 0% is at the bottom of the channel
- the values inbetween are of linear scale

The vertical scale of intensity is zoom-independent. The default intensity setting is 100% on the whole selection (as if the intensity-concept wouldn't exist). You recognize the yellow line on the top of each selection.

How does the intensity work internally? When applying an effect to a selection with variable intensity, the effect-result is mixed with the original part in proportion of the actual intensity, variable in time. When 0%, only the original part resides, when 50%, the original and the effect part are mixed equally (with linear scale), when 100%, only the effect part resides.

### Edit the intensity

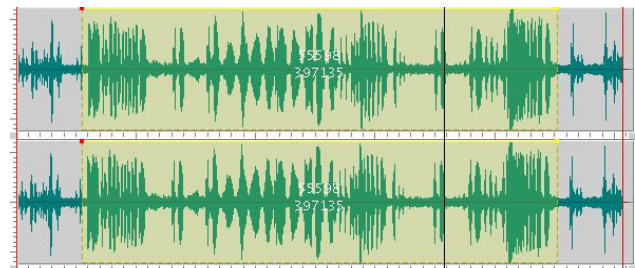
The intensity-curve is exclusively editable with the mouse:

- mouse-click to create a new point inbetween
- mouse-click with pressed Shift-key to remove a point
- mouse-press, -drag, -drop to move an existing point

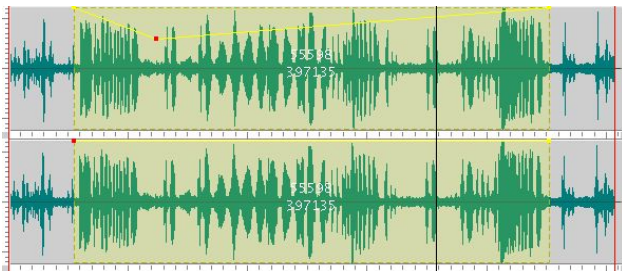
These three operations allows you to edit completely the segmented intensity-curve.

Enough theory! let's consider an example: We want to perform reverbation in a limited range of a clip. The reverb-effect should increase in linear manner and decrease in exponential manner at the end. The transitions on both ends must be long enough (a few seconds), to give a natural smooth impression.

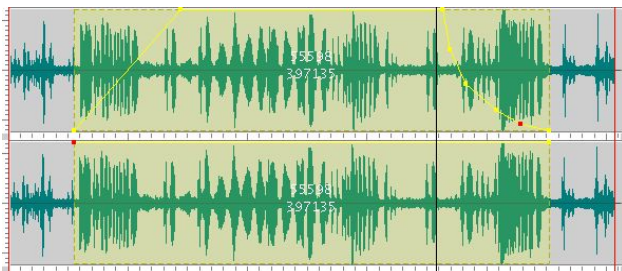
So let's start. First, define the range where the reverbation should occur. Select this range with classic selection. We want both channels of this stereo-clip having the same selection. At this state, we need to work with one channel only.



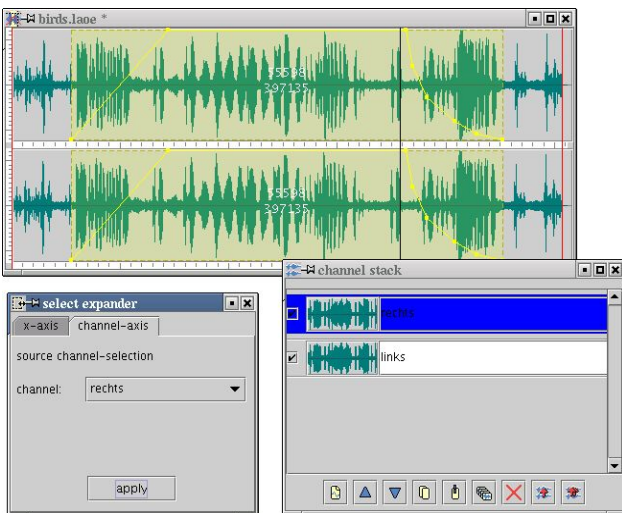
Now choose the intensity-tab in the select-plugin. So we can now edit intensity. Click with the mouse anywhere inside the selection. A new segment-point is appearing, and the original segment is splitted into two segments. The actual point is painted in red, this point can be moved with mouse-press, -drag, -drop. The range of a point is limited vertically inside the channel, and horizontally between its two neighbour-points. The two extreme points cannot be moved horizontally, to guarantee an intensity-curve on the whole selection.



Now create enough points and move them to the right place, to build the desired intensity-curve. Erase superfluous points with a mouse-click with pressed Shift-key.

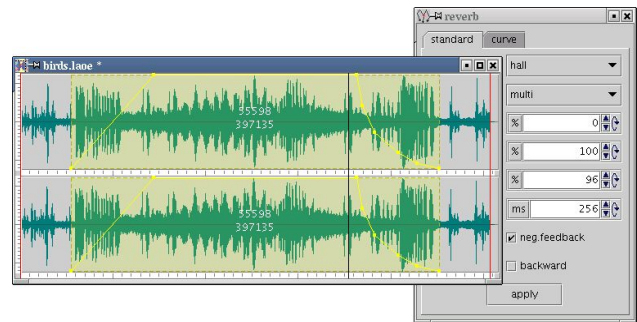


It is important to know, that if you want to have the intensity-editing-steps saved in the undo-stack, you have to perform manual savings there. These steps are not saved automatically (may change in future versions of LAoE). We have created an intensity-curve of the first channel. We could do the same for the second channel, or use a different curve, or simply duplicate the first selection to the second channel with the help of the select-expander plugin.



Don't forget to save the undo-stack when you have finish the intensity-curves. This allows you to retry an effect

multiple times, to finetune it, without redefining the intensity. We apply now the reverb-plugin to this selection. Can you see how the reverb has modified the sample-curve, without making hard transitions at the selection-borders, in the figure below.

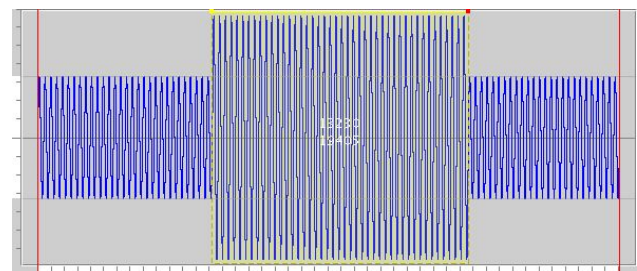


We could not only perform reverb, but also progressive filtering, distortion, equalizer, signal generating, chorus flange, vibrato, narrow-wide... etc.

### Different vertical scales

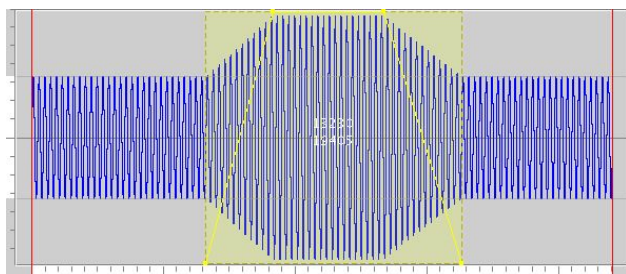
The select-plugin allows to choose different vertical scales of the intensity-values. Default is linear scale, but you could also choose square, cubic and square root. To give an idea, what this means, we have an example of amplifying a sinus-signal with variable intensity. For sure, the envelope-function would be more appropriate, but we have chosen the amplify-function because the result is clearly visible in this document.

The original clip has a sinus-signal of low amplitude (as at both ends in the figure below). We amplify the signal with a factor of 2. So the high amplitude represents the effect in our examples. The four figures below gives a comparison of the different select-scales. The first example uses no intensity at all.

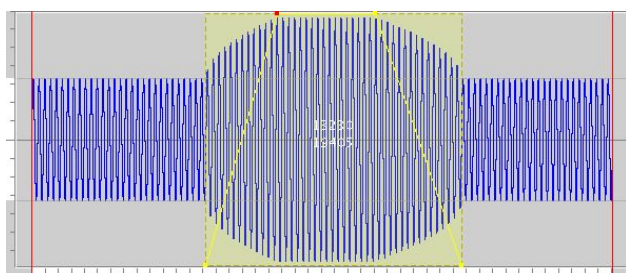


The second example uses linear scale.

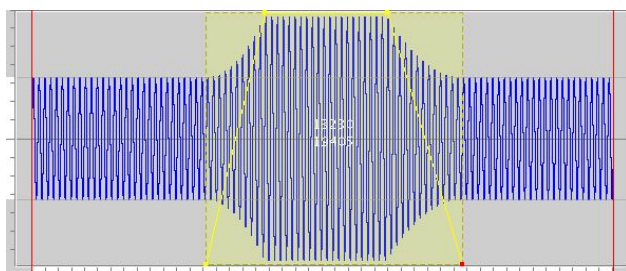




The third example uses square-root scale.



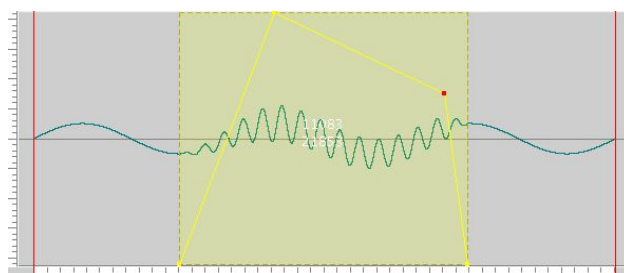
The fourth example uses square scale.



What you see here as different formed ramp-shapes will in reality be the mixing-curve of original part and effect-part.

### Signal generating

Intensity makes signal-generating easier, when special signals are required. The example below shows a sinus of low frequency with another sinus of higher frequency superposed. The superposed sinus has been generated in one step! First the selection has been created, then the intensity representing the fading has been edited, and after that the signal is generated in one step, with the add-mode enabled.

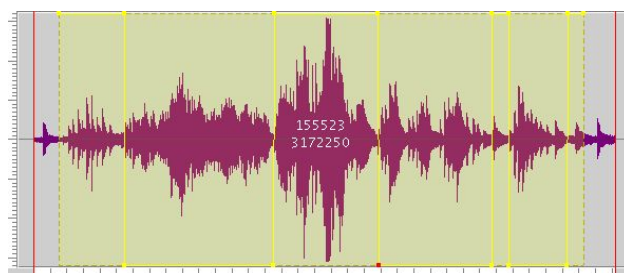


If intensity would not exist, you have to create the second signal in a separate layer, fading the borders in and out, and then merge again, the two layers. So intensity considerably simplifies the signal generating in this case.

### Select multiple ranges

LAoE allows only one selection per channel. Multiple selections per channel is not possible. But there is a little work-around of this limitation: with the help of intensity, we can make a limited multi-range-selection. It is limited, because it don't work for all functions, e.g. copy, paste, cut don't work. But most of the effect- and amplitude-plugins work!

Simply create an intensity-curve, which is 100% at these ranges and 0% inbetween, as the example in the figure below, which contains 4 fully selected ranges.



That's all folks!