# Advanced Gtk+ Sequencer

## User's Handbook

**Joël Krähemann**

# Advanced Gtk+ Sequencer: User's Handbook

Joël Krähemann

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# Dedication

This book is dedicated to my father †Hans-Jörg Krähemann.

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# Foreword

When I started to use GNU/Linux in 2001 I missed only one thing. A sequencer with a nice GUI. There was already rosegarden available. But who didn't get stuck of midi setup, yet? The time before I was using free software and became an affiliate to its community I was using Microsoft Windows 98 on my father's desktop computer and did my first steps in Sun Microsystem's Java 1.2.

My very first own Notebook was a Compaq Evo n160 and it's preinstalled Microsoft Windows 98 had to vanish because I became a fellow of Richard Stallman. Soon, I begun to code and older I became my demands to ags increased. I developed the concept of the underlying audio library myself as not graduated college student.

October 2005, I decided to reimplement Advanced Gtk+ Sequencer from scratch in order to get rid of inherited burden. And it was one big development process until I was almost satisfied with it's design. There was a time in 2007 where I even wanted to replace GObject and Gtk+ dependencies with my own libraries I begun to develop. I'm glad of didn't doing so.

Thank you!

# Chapter 1. The menubar

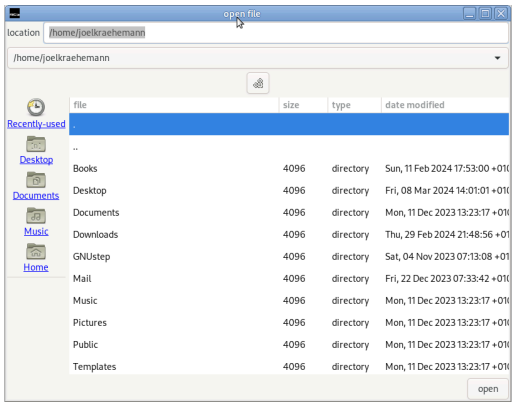
Within the menubar you may do basic tasks like open/close files. In this section we cover briefly the the different entries. The menus have mnemonics e.g. press ALT and F key in order to open File menu.

# File

The file menu lets you do maintenance related to files or quit application. Note there was a simple XML file format introduced in 0.7.x to speed up things. The advanced file format needs optimization work to fulfill. The file format can be modified by configuration file located in your home directory $(HOME)/.gsequencer/ags.conf. The simple file interface is defaulted and can be altered by section generic and simple-file key set to false.

- Open - open an Advanced Gtk+ Sequencer XML file. Uses per configuration the simple XML Input/Ouput interface.
- Save - save your current work. Uses per configuration the simple XML Input/Ouput interface.
- Save as - save your current work as a different filename. Uses per configuration the simple XML Input/Ouput interface.
- Export - export to PCM audio file.
- Quit - leave Advanced Gtk+ Sequencer.

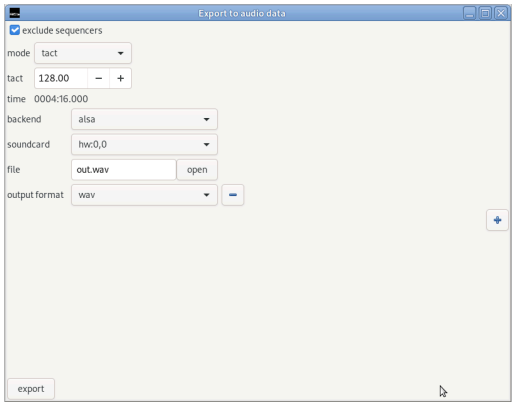
## Open file




The file open screenshot

Open files using dialog window.

## Export to PCM audio file



The export window screenshot

This shows you the export dialog. Exclude sequencers affect mainly AgsDrum and AgsMatrix pattern sequencers to be started to output. You may select filename to export to and duration of the exported track. BPM adjustment is take from the navigation. Basically Advanced Gtk+ Sequencer exports what you hear of the speakers.

With the export toggle button you can start exporting to PCM audio file or stop it at an arbitrary time.

# Edit

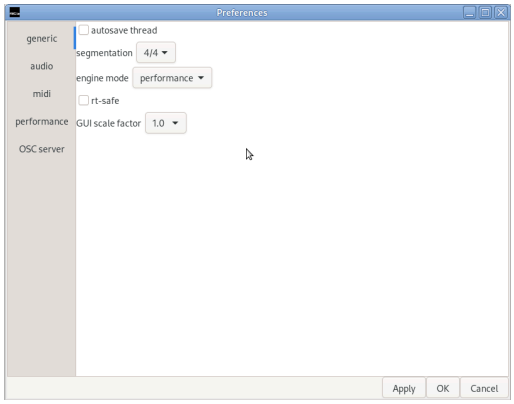
The edit menu lets you add audio machines of the related submenu, open automation window or preferences dialog.

- Add - select of different machines. You might want to add the bridged machines of plugins like LADSPA, DSSI or Lv2. Instrument plugins are available within notation editor.
  - Panel - acts as your default sink.
  - Mixer - enables you to bundle your different output engines.
  - Spectrometer - enables you to visualize played frequency using FFTW3.
  - Equalizer - enables you to adjust 10 band equalizer.
  - Drum - is used to do pattern editing using PCM audio files.
  - Matrix - is used to pattern editing, intended to be linked against Synth.
  - Synth - is a software synthesizer supporting variable oscillator count. Use with Matrix.
  - FM Synth - is a frequency modulation software synthesizer supporting variable oscillator count. Use with Matrix.
  - Syncsynth - is a software synthesizer supporting variable oscillator count. Use with notation editor.
  - FM Syncsynth - is a frequency modulation software synthesizer supporting variable oscillator count. Use with notation editor.
  - Hybrid Synth - is a software synthesizer supporting 2 oscillators with relative phase modulation. Use with notation editor.
  - Hybrid FM Synth - is a frequency modulation software synthesizer supporting 3 oscillators. Use with notation editor.
  - FFPlayer - may be used to open Soundfont2 audio file container format in order to do notation.
  - SF2 Synth - may be used to open Soundfont2 audio file container format in order to do notation. Computation just-in-time.
  - Sampler - may be used to open SFZ audio file container format in order to do notation.
  - SFZ Synth - may be used to open SFZ audio file container format in order to do notation. Computation just-in-time.
  - Audiorec - can be used to edit wave form or capture audio from your microphone
- Preferences - open preferences dialog.

# Preferences dialog

Within preferences dialog you may choose between different topics. For each one one tab. The configuration is applied in place after click Apply or OK. There is no need to restart the application.

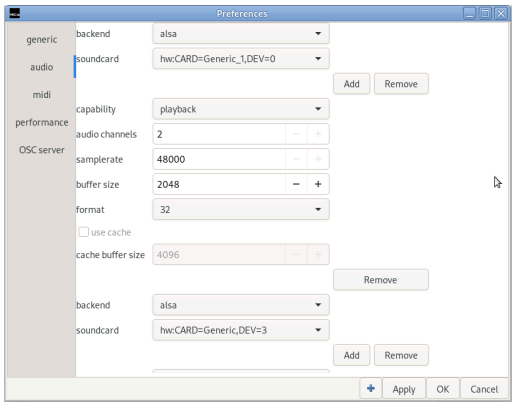
## Generic




The preferences dialog screenshot - generic tab

The autosave thread option enables auto-saving to $HOME/.gsequencer directory. Segmentation is used as a delay factor, you can do tactation with it.

## Audio




The preferences dialog screenshot - audio tab

Sound card is your physical devices to do playback.

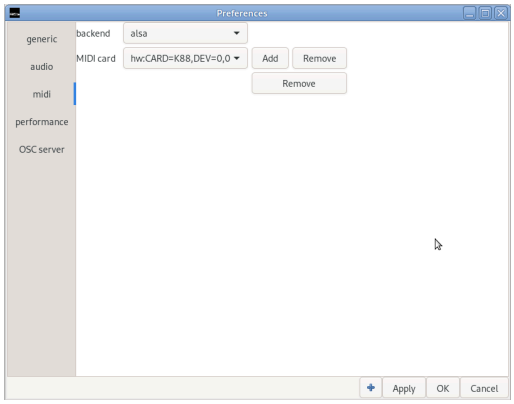
Audio channels specifies the audio channels to allocate for output device.

Samplerate affects the entire project. Your audio files have to be at very same rate further your device has to support the given rate. Like buffer size this affects the thread's related to audio processing their frequencies. Note a too low frequency may cause unexpected behavior like no proper velocity.

Buffer size is used for all audio buffers. Your soundcard has to support the passed buffer size. This preference affects thread's frequencies.

Format determines the storage size of one frame. All available formats are signed integers. The following sizes in bits are available: 8, 16, 24, 32 and 64. Your hardware has a need to support the format in order to get sounds.

## MIDI



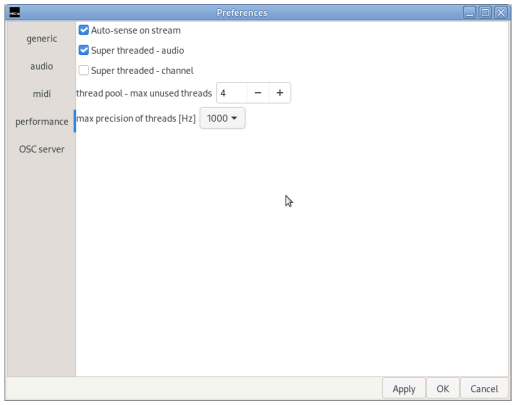

The preferences dialog screenshot - midi tab

You can add MIDI sequencers to the configured project. These are intended to connect by the MIDI dialog, later.

There is a combo box availabe to choose your backend like ALSA, OSS or JACK.

The second combo box lets you choose the device. The JACK backend allows you to add MIDI ports.

## Performance




The preferences dialog screenshot - performance tab

Auto-sense on stream is required for certain plugins and recalls but may cause additional performance losses.

The maximum precision of threads allows you to fine tune performance. A higher frequency allows you to use smaller buffer size and a higher samplerate. But causes a higher synchronization over-head.

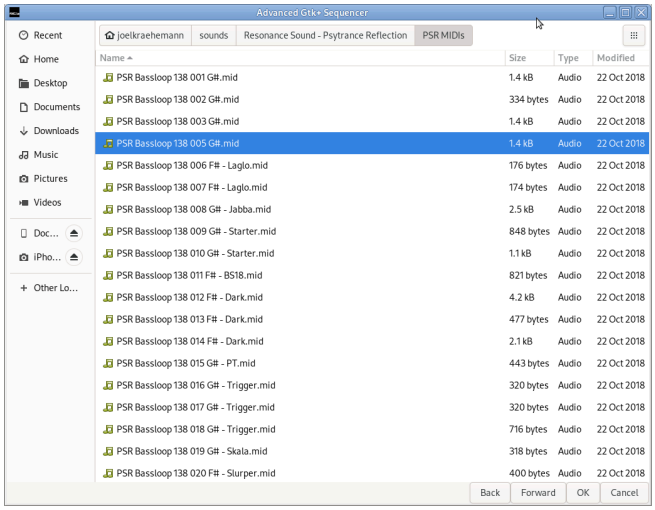
# MIDI

The MIDI sub-menu provides functionality related to MIDI like the import or export wizards.

# The MIDI import wizard

The MIDI import wizard allows you to import Standard MIDI Files. You might choose the machine which will be added after import. The notation is available within the pattern or notation editor.

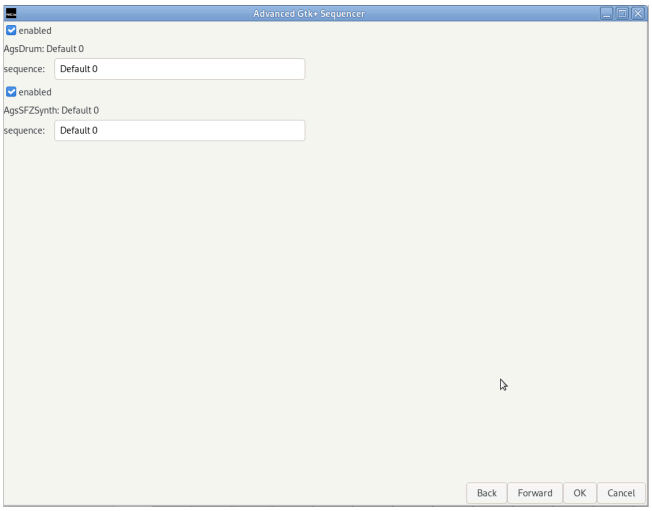
## Step #1 - file chooser




The MIDI import wizard - step #1

First you have to choose the Standard MIDI File you would like to import. As selected the desired file you might want to click Forward.

## Step #2 - mapping



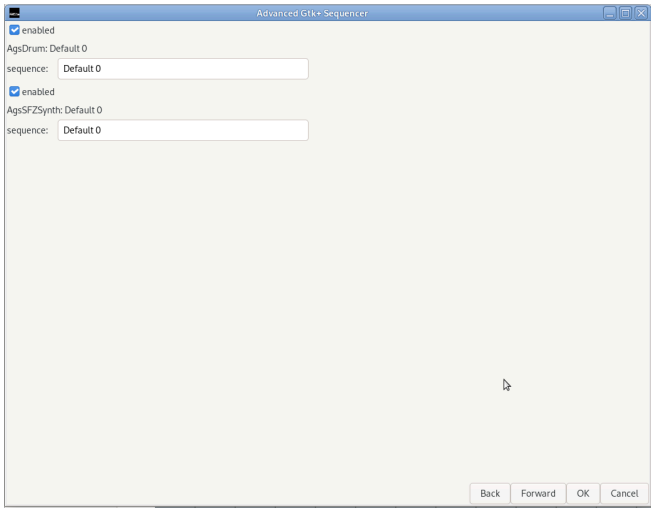

The MIDI import wizard - step #2

After parsing the MIDI file there is one more step involved. You have to enable the appropriate track. There are 2 labels visible showing meta information. Below there is a combo box allowing you to choose the machine getting mapped. The spin buttons let you adjust the number of audio channels to create. As well the first offset.

# The MIDI export wizard

The MIDI export wizard allows you to export Standard MIDI Files. You might choose the machine which will be exported.

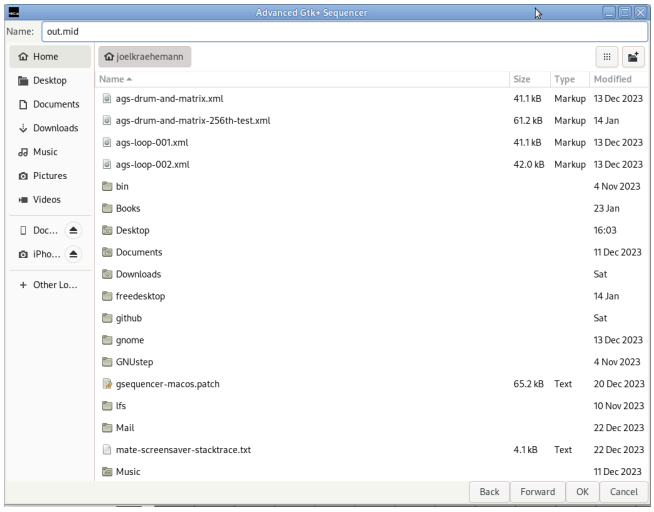
## Step #1 - select machines




The MIDI import wizard - step #1

First you have to enable the machines you wish to export. The entry allows you to set the sequence meta information.

## Step #2 - file chooser




The MIDI import wizard - step #2

After enabled the machines to export you shall specify the filename. As next you click OK in order to write the MIDI file.

# Chapter 2. Engines

You can add engines by activating the appropriate menu item within the "add" submenu of the "edit" menu item. You may change the properties of an engine by opening the properties dialog from the context menu at the top of each machine within vertical order. From the context menu you may perform some other tasks, as well.

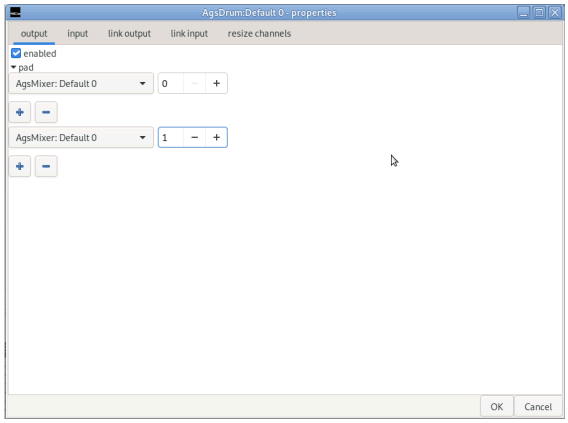
The edit submenu is only available by sequencers like AgsDrum and AgsMatrix.

- To move up or down an engine open context menu and activate "up" respectively "down" entry.
- To show or hide an engine open context menu and activate "show" respectively "hide" entry. Note the engines won't be hidden entirely they are just collapsed.
- To remove an engine open context menu and activate "destroy" entry.
- To rename an engine open context menu and activate "rename" entry.
- To remove an audio object open context menu and activate "rename audio" entry. This name can be used by the OSC Server to address the audio object.
- To reposition an audio object open context menu and activate "reposition audio" entry. This position can be used by the OSC Server to address the audio object.
- To open properties dialog open context menu and activate "properties" entry. There you might link, resize or asign LADSPA effects to channels. NOTE for LADSPA sink or generators aren't supported, yet.
- To change multiple grouped controls at once check sticky controls.
- Edit gives you editing options.
  - Copy pattern does convert your pattern bitmap into a pattern based notation suitable to paste in notation editor.
  - Envelope opens a dialog with envelope editor, info and pattern editor tab. Allowing you to edit envelope presets and apply to selected notes.
- Connection gives you audio/MIDI options.
  - Audio connection allows you assign output or input soundcards.
  - Midi dialog allows you to assign MIDI sequencers to an instrument.
- Export gives you audio exporting options.
  - Audio export does export your wave data into an audio file without any effect processing.
- To adjust many input controls at once open context menu and activate "sticky controls" entry.

# Machine properties

Within properties dialog you can link lines either in single channel or in bulk mode, add effects and adjust audio-channels/pads.

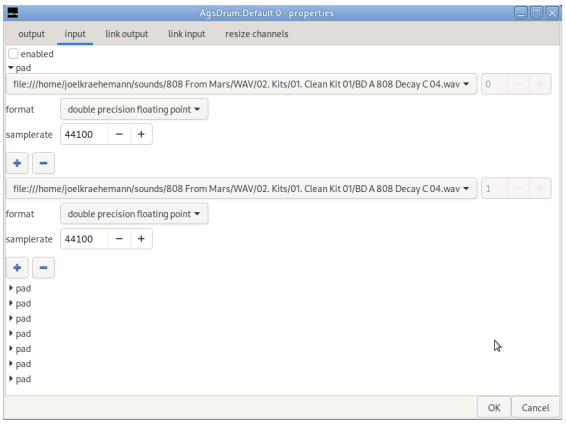
# Output tab




The machine properties dialog screenshot - output tab

The output tab lets you mainly perform linking lines and adding effects to them. For each line there's a combo box listing available linking engines, on the right of it there is a spin button let you choose the input line to be linked. As you have added a plugin by clicking add and selected appropriate effect by using plugin browser dialog. You may remove it by clicking checkbox of the listed plugin and finally click remove. Note you can have a effect only once per channel.

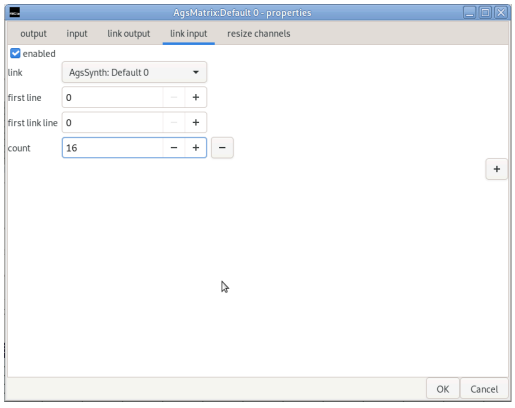
# Input tab




The machine properties dialog screenshot - input tab

The input tab does the mainly same as output tab in view of input lines. If supported you might assign files, too. In general you connect output to input.

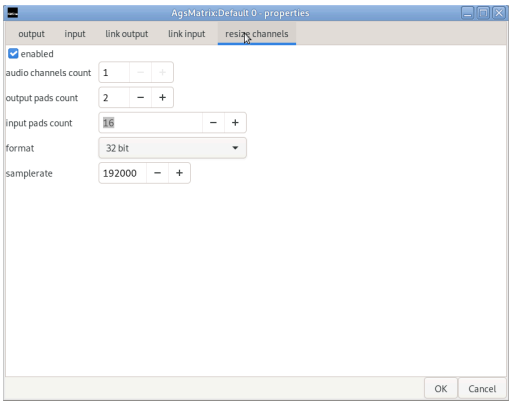
# Link input tab



The machine properties dialog screenshot - link input tab

Do linking in batch mode. This means you're able to assign multiple lines at once. Thus you have to decide what start channel on each side to use and the count of lines to be linked.

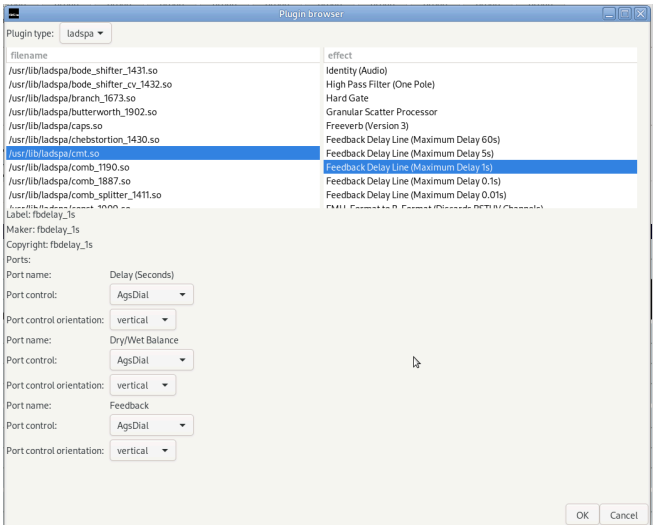
# Resize channels tab




The machine properties dialog screenshot - resize tab

Adjust audio channels or input/output pads. If supported the GUI may provide more lines and pads as increasing the amount.

# Plugin browser dialog



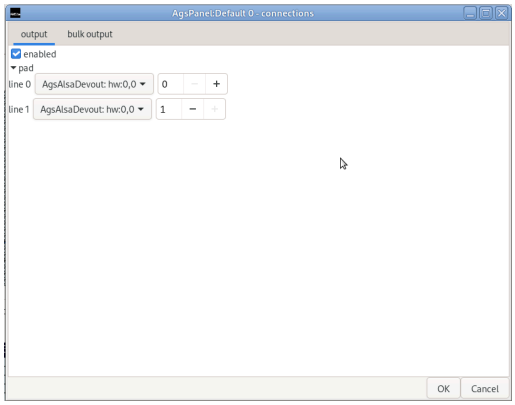

The LADSPA browser dialog screenshot

The plugin browser gives you choice of available LADSPA or Lv2 plugins. It lets you modify the controls to be used. The added plugin can be removed by activating checkbox in output/input tab and clicking remove.

# Audio connection dialog

The audio connection dialog allows you to specify to what soundcard to write output to or read input from. This can be modified either by assigning single channels or in bulk mode.

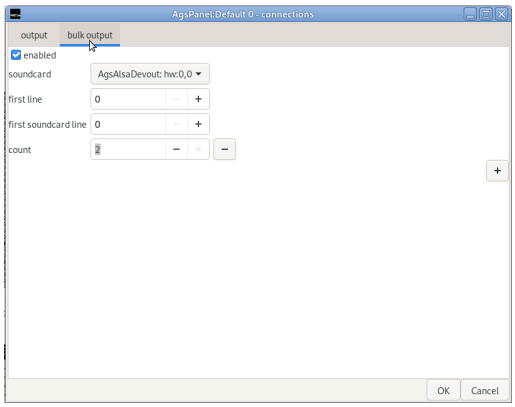
# Audio connection output line




The audio connection output line screenshot

Select the desired soundcard and don't forget to click enable. In order apply your modifications. After click OK.

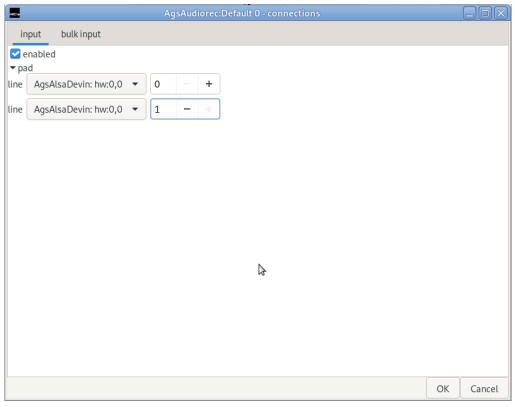
# Audio connection output bulk




The audio connection output bulk screenshot

The output connection tab allows you to link a bunch of channel at once.

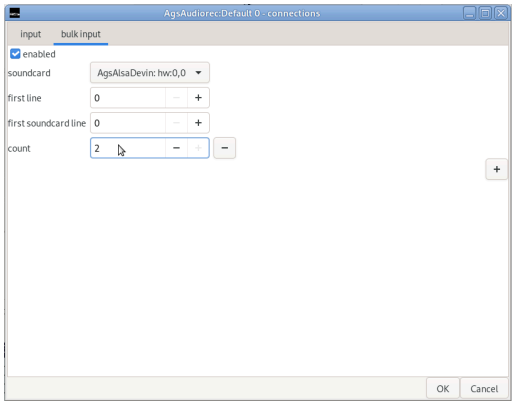
# Audio connection input line




The audio connection input line screenshot

Select the desired soundcard and don't forget to click enable. In order apply your modifications. After click OK.

## Audio connection input bulk




The audio connection input bulk screenshot

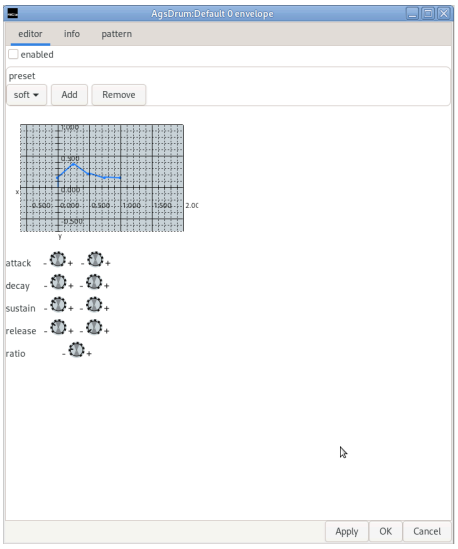
The input connection tab allows you to link a bunch of channel at once.

# Envelope dialog

The envelope dialog allows you to edit envelope information as presets. These presets can be assigned to a specific note. Selection is done with select tool of notation editor and selecting notes of active audio channel.

The enelope's width matches with x length 1.0 the audio signal's length. The magnitude has normal volume with value 1.0.

## Envelope editor




The envelope dialog's editor tab screenshot

Modify or create presets and apply it to selected notes. Selection is performed within notation editor.

Add new or remove unwanted presets.

Attack is the initial x length and y magnitude.

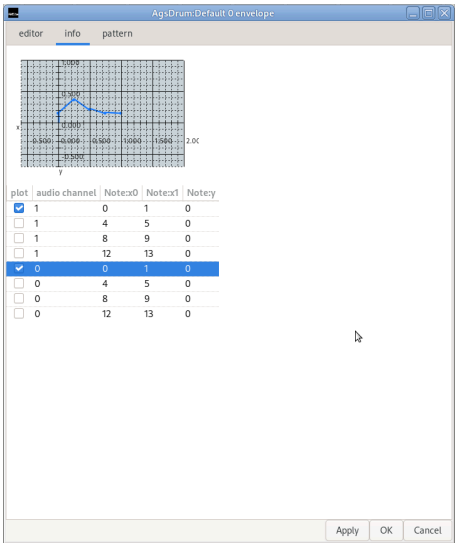
Decay is the second x length and y magnitude.

Sustain is the third x length and y magnitude.

Release is the last x length and y magnitude.

Ratio increase/decrease the entire envelope's magnitude.

# Envelope info




The envelope dialog's info tab screenshot

Show envelope information of selected notes. There are 5 columns with information of the specific selection. The selection itself is presented by the list view.

Plot enables plotting of the matching note's envelope information.

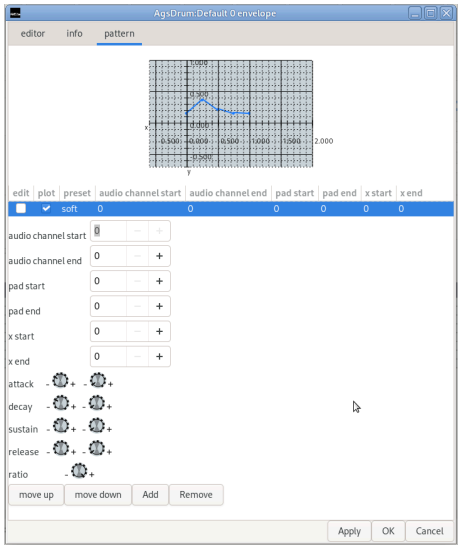
Audio channel is the selected note's audio channel.

Note x0 is the selected note's x0 offset.

Note x1 is the selected note's x1 offset.

Note y is the selected note's y key.

# Envelope pattern




The envelope dialog's pattern tab screenshot

Modify and create pattern related envelope presets. There are 9 columns with information of the pattern's region to apply the envelope preset.

Edit means modify the matchin preset.

Plot enables plotting of the matching envelope preset information.

Preset is the preset's name.

Audio channel start the preset's start audio channel.

Audio channel end the preset's end audio channel.

Pad start the preset's start pad.

Pad end the preset's end pad.

X start the preset's x start offset.

X end the preset's x end offset.

There are the usual envelope editor controls.

Organize your presets with move up and move down. Or add new or remove unwanted presets.

# MIDI dialog




The MIDI dialog screenshot

The MIDI dialog allows you to select the MIDI sequencer to assign of the current machine. The MIDI channel is the MIDI channel assigned to the MIDI device, useful with multiple devices. Upto 16 devices are allowed. You might want to perform start and end key. Further you can adjust the start and end channel.

# Panel

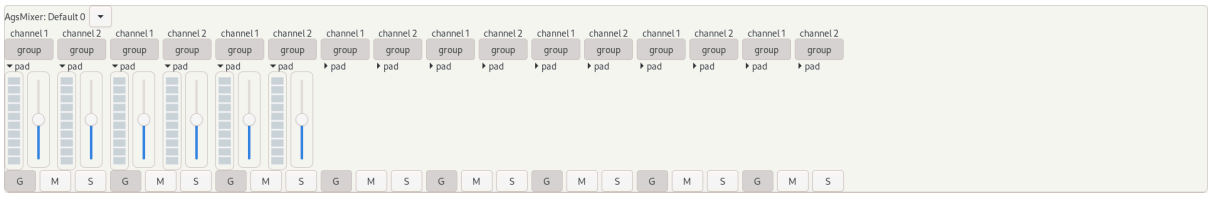



The panel screenshot

The panel is used for outputting to your soundcard and should be at topmost of your audio processing tree. It contains per audio channel a mute check box.

Due the synchroneous nature of the output engine you're just able to adjust the audio channels. The output pads aren't visible and the ones available for input are packed vertically.

# Mixer

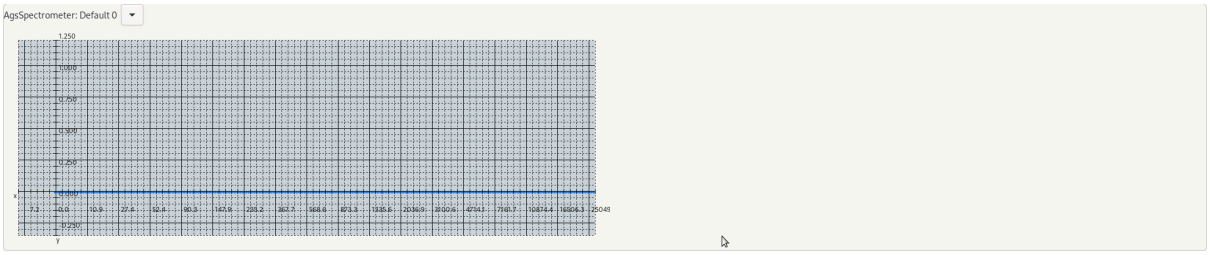



The mixer screenshot

Bundle audio lines with the mixer and perform toplevel stream manipulation. It contains per audio channel a volume indicator and may contain LADSPA or Lv2 plugins.

Due the limitation of recycling it is just able to handle multiple input lines and only one output pad. Whereas the output is hidden. They are locate just below the machine's menu tool button.

# Spectrometer




The spectrometer screenshot

Visualize input by plotting it using FFTW3 library.

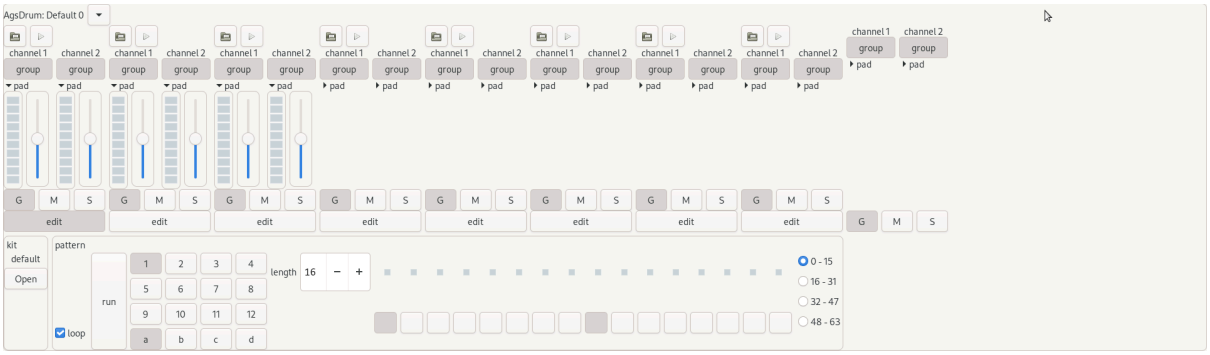
# Equalizer10




The equalizer10 screenshot

Adjust a 10 band equalizer with additional pressure control.

# Drum




The drum screenshot

Produce an audio stream by defining a pattern. The drum supports opening audio files and associate to its input. You might doing it by open button located preceeding to pattern box. Thus multi-selection of files is supported and assigning can be controlled by the controls just above the action widgets. The drum input pad contains an open button, too. It assigns available audio channels of the file to the grouped lines. One more way to assign audio files is doing it so by link editor of machine's property dialog. The drum may contain LADSPA plugins, too.

The drum may contain multiple input as well output pads. They are packed on top of the composite widget, just below the machine's menu tool button. The input is packed horizontally followed by vertically packed output. The edit button within every input pad enables it as current input for editing pattern data. Further you may de-/activate the group toggle button to control audio channel assignment.

Next to the multi-selection enable open button there's a loop check-box followed by the run button what starts the drum sequencer. It follows the into a two dimensional matrix packed pattern banks. Labeled from 1 to 12 and

an the combined index labeled a throughout d. The length spin-button controls the number of pattern pads to be played in sequence which may be looped.

# The pattern box

As entering to pattern box with focus the only way to get out of it is by tabulator key. With arrow keys you may navigate within pattern or toggle with space.

- Left, Left-Arrow
  - Move within pattern box left, as the pattern pad control is activate you get an audible feedback.
- Right, Right-Arrow
  - Move within pattern box right, audible feedback as above.
- Up, Up-Arrow
  - Decrease pattern box offset about available number of pattern pads, audible feedback as above.
- Down, Down-Arrow
  - Increase pattern box offset about available number of pattern pads, audible feedback as above.
- Space
  - Toggle audio pattern and give audible feedback.
- Ctrl+c
  - Copy the current pattern to clipboard
- Tab
  - Leave pattern box focus.

# Matrix




The matrix screenshot

Produce an audio stream by defining a pattern. The matrix itselves doesn't have any audio signals on its own input you may rather link it to a synth engine. The matrix is a rectangular area you may navigate within by arrow keys or toggle pattern by hiting space. The matrix is a true mono device but you may emulate multiple channels by doing multi-output. This is fulfilled by adjusting output pads within machine's properties dialog.

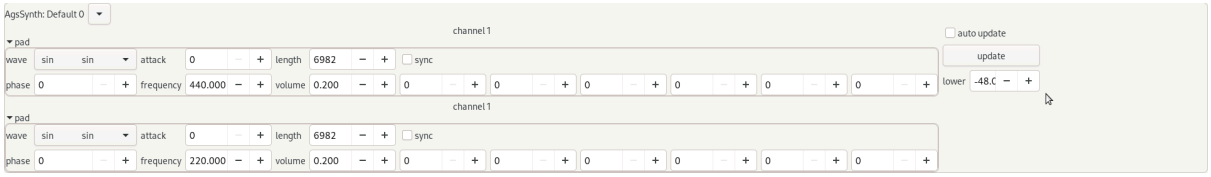
Run button comes first and is followed by a one dimensional vector bank index labeled from 1 to 9. Then follows the matrix you have to leave it by hiting tab then you might modify sequence length or do loop control of the sequence.

- Left, Left-Arrow
  - Move within matrix left, as the pattern pad control is activate you get an audible feedback.
- Right, Right-Arrow
  - Move within matrix right, audible feedback as above.
- Up, Up-Arrow

- Decrease matrix offset about available number of pattern pads, audible feedback as above.

- Down, Down-Arrow
  - Increase matrix offset about available number of pattern pads, audible feedback as above.
- Space
  - Toggle audio pattern and give audible feedback.
- Ctrl+c
  - Copy the current pattern to clipboard
- Tab
  - Leave matrix focus.

# Synth




The synth screenshot

Produce audio data using its oscillators. The count of oscillators depends on number of input lines. They are adjusted vertically.

Wave is the actual oscillator either sine, sawtooth, square, triangle or impulse.

Attack is the first frame after key on to start output.

Length is the length of the output in frames.

Phase is the initial phase as x offset within oscillator's algorithm.

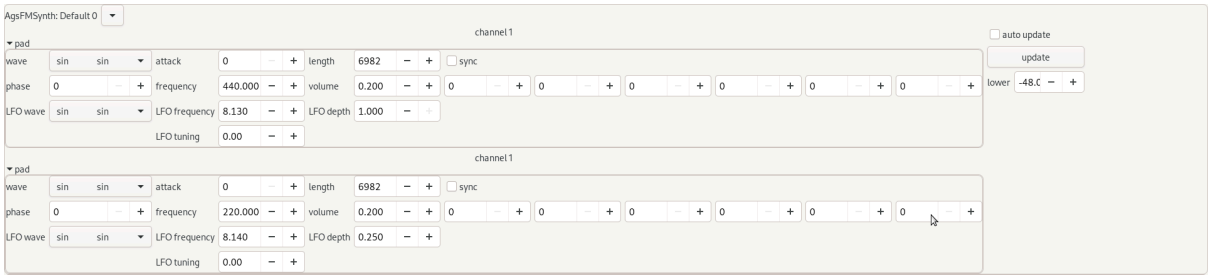
Frequency is the lower range key's frequency.

Volume is the output volume of the oscillator.

Sync allows you reset the phase with 3 times a tuple of x offset and new x offset of phase.

You have on the right the option to auto-update changes you do with the controls or do it manually by the update button. Lower is the very first y key.

# FM Synth




The frequency modulation synth screenshot

Produce audio data using its oscillators. The count of oscillators depends on number of input lines. They are adjusted vertically. You have on the right the option to auto-update changes you do with the controls or do it manually by the update button.

FM Synth has additional controls than Synth for its oscillators to control. The controls are related to the Low Frequency Oscillator that does the actual Frequency Modulation.

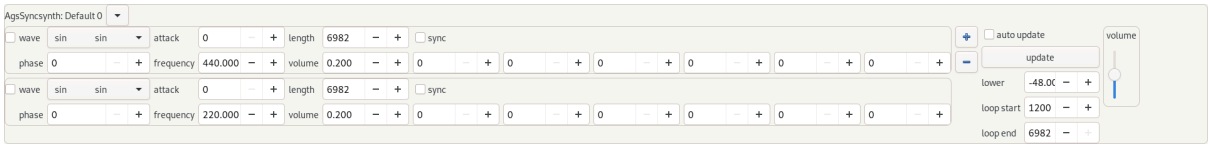
LFO wave use specific function to modulate frequency.

LFO frequency use specific frequency to modulate frequency.

LFO depth is the depth of the frequency modulation.

LFO tuning tunes by cents.

# Syncsynth




The synced synth screenshot

Produce audio data using its oscillators. The count of oscillators can be adjusted by clicking add/remove. You have on the right the option to auto-update changes you do with the controls or do it manually by the update button. Loop start and loop end allows you to specify what region of the audio data shall be looped in order to get the desired note length.

The Syncsynth has the very same oscillators as Synth.

# FM Syncsynth




The frequency modulator synced synth screenshot

Produce audio data using its oscillators. The count of oscillators can be adjusted by clicking add/remove. You have on the right the option to auto-update changes you do with the controls or do it manually by the update button. Loop start and loop end allows you to specify what region of the audio data shall be looped in order to get the desired note length.

The FM Syncsynth has the very same oscillators as FM Synth.

# Hybrid Synth



The hybrid synth screenshot

Produce audio data using 2 oscillators, those can be phase modulated with attack and phase tuples.

In order to enable phase modulation for the first oscillator, you need to check "OSC 1 - sync enabled". The "OSC 1 - sync factor" applies to every tuples attack. The tuples maximum value is 2 times Pi for attack and phase. The LFO applies to the phase reset.

The pitch tuning does additional frequency shift.

There is a white noise source, which can adjust its gain.

The low-pass filter is disabled by default.

The high-pass filter is disabled by default.

There is a chorus, which provides additional controls.

The synth is compute just-in-time.

# Hybrid FM Synth



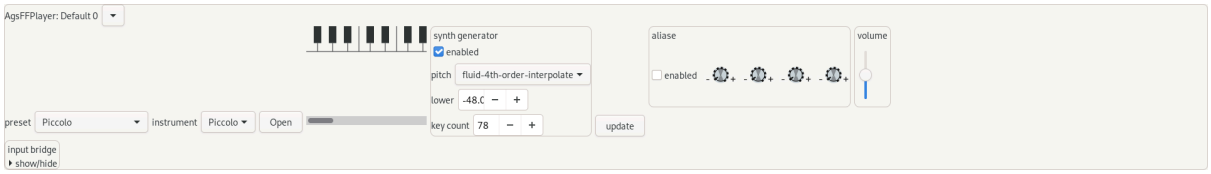

The hybrid frequency modulation synth screenshot

Produce audio data using 3 FM oscillators. The synth is compute just-in-time.

The Hybrid FM Synth has got the same additional effect processors like Hybrid Synth.

The synth is compute just-in-time.

# FFPlayer



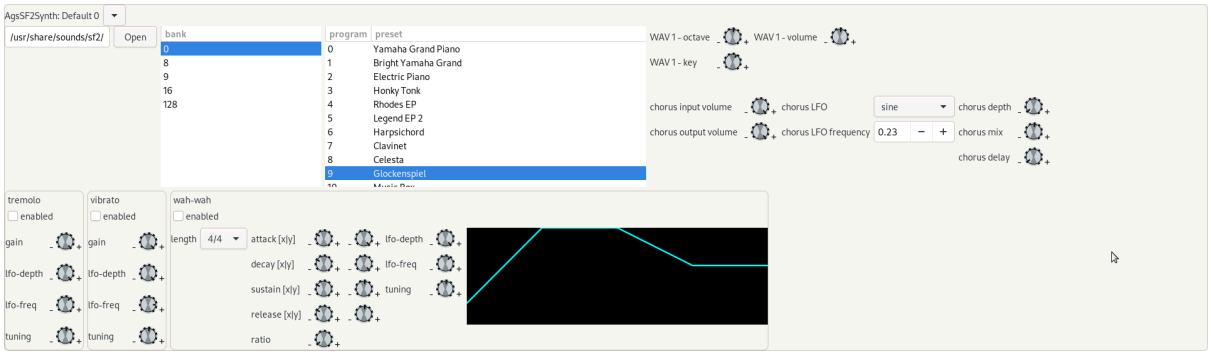

The ffplayer screenshot

Produce audio data by opening Soundfont2 audio file container format. There three available controls, preset and instrument to navigate within container format and a open button to read Soundfont2 files and assign the selected instrument to the input.

Synth generator can be enabled to pitch missing keys from lower upto specific key count.

The ffplayer contains recently the bridge widget. You can add plugins in bulk mode by click Add or Remove within AgsFFPlayer's bridge, what you can collapse/expand. To add an effect to a line, you have open as usual input/output of machine properties.

# SF2 Synth



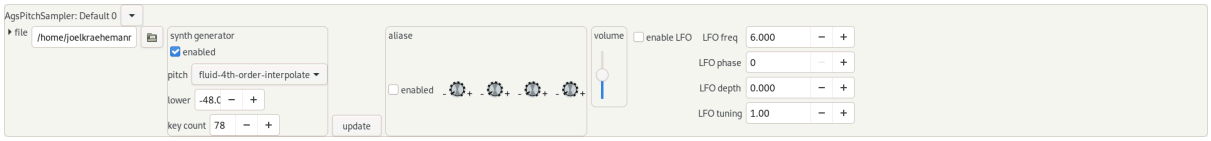

The SF2 synth screenshot

Produce audio data using Soundfont2 files.

There is a chorus, which provides additional controls.

The synth is compute just-in-time.

# Sampler




The pitch sampler screenshot

Produce audio data by opening SFZ audio file container format. There is a open button to read SFZ files and assign it to the input.

Synth generator can be enabled to pitch missing keys from lower upto specific key count.

There is a LFO enable control allowing you make adjustments to LFO amplification (currently defunctional):

- LFO freq
- LFO phase
- LFO depth
- LFO tuning

# SFZ Synth



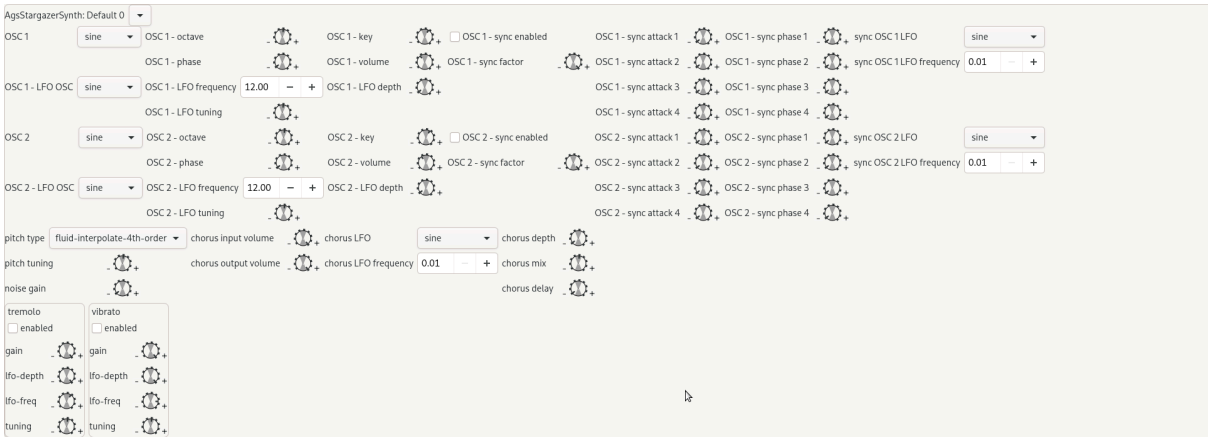

The SFZ synth screenshot

Produce audio data using SFZ files.

There is a chorus, which provides additional controls.

The synth is compute just-in-time.

# Stargazer Synth




The stargazer synth screenshot

Produce audio data using 2 oscillators, those can be phase modulated with attack and phase tuples. It has additional controls to modify pitch, chorus, tremolo and vibrato effect processors.

In order to enable phase modulation for the first oscillator, you need to check "OSC 1 - sync enabled". The "OSC 1 - sync factor" applies to every tuples attack. The tuples maximum value is 2 times Pi for attack and phase. The LFO applies to the phase reset.

The pitch tuning does additional frequency shift.

There is a chorus, which provides additional controls.

The tremolo modifies volume by a LFO.

The vibrato modifies frequency by a LFO.

The synth is compute just-in-time.

# Quantum Synth




The quantum synth screenshot

Produce audio data using 2 oscillators, providing frequency and volume sequencers with 8 steps. If a control is 0.0 following controls are ignored. those can be phase modulated with attack and phase tuples. It has additional controls to modify pitch, chorus, tremolo and vibrato effect processors.

In order to enable phase modulation for the first oscillator, you need to check "OSC 1 - sync enabled". The "OSC 1 - sync factor" applies to every tuples attack. The tuples maximum value is 2 times Pi for attack and phase. The LFO applies to the phase reset.

The pitch tuning does additional frequency shift.

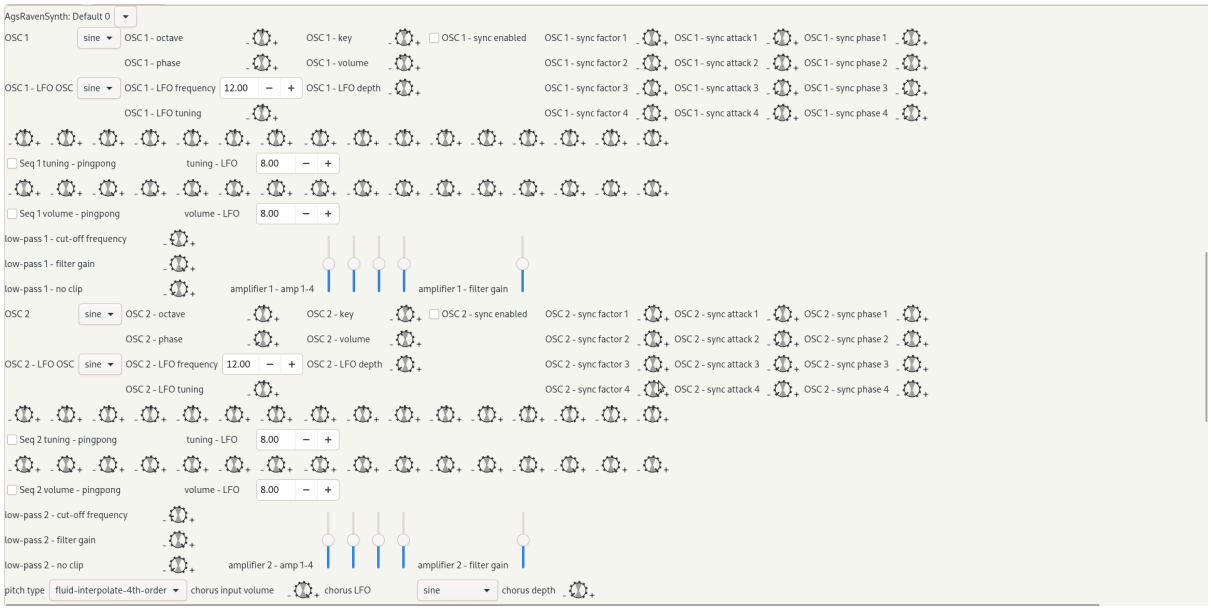
There is a chorus, which provides additional controls.

The tremolo modifies volume by a LFO.

The vibrato modifies frequency by a LFO.

The synth is compute just-in-time.

# Raven Synth




The raven synth screenshot

Produce audio data using 2 oscillators, those can be phase modulated with attack and phase tuples. Per oscillator a low-pass filter and amplifier. It has additional controls to modify pitch, chorus, tremolo and vibrato effect processors.

In order to enable phase modulation for the first oscillator, you need to check "OSC 1 - sync enabled". The "OSC 1 - sync factor" applies to every tuples attack. The tuples maximum value is 2 times Pi for attack and phase. The LFO applies to the phase reset.

The low-pass filter cut-off frequency is given in Hertz.

The amplifier gives you control over 4 bands and filter gain.

The pitch tuning does additional frequency shift.

There is a chorus, which provides additional controls.

The tremolo modifies volume by a LFO.

The vibrato modifies frequency by a LFO.

The synth is compute just-in-time.

# Modular Synth




The modular synth screenshot

Produce audio data using 2 oscillators, those controls and pitch tuning and volume control can be varied by 2 envelope, 2 LFOs and one pink noise. The sends are assigned by a boolean matrix to receivers. Pitch tuning and main volume. A low-pass filter and amplifier. It has additional controls to modify chorus effect processor.

The low-pass filter cut-off frequency is given in Hertz.

The amplifier gives you control over 4 bands and filter gain.

There is a chorus, which provides additional controls.

# Audiorec




The audiorec screenshot

Open large audio files and manipulate the wave form using wave window. You might want to capture sound using it. By either replacing or mixing existing audio data.

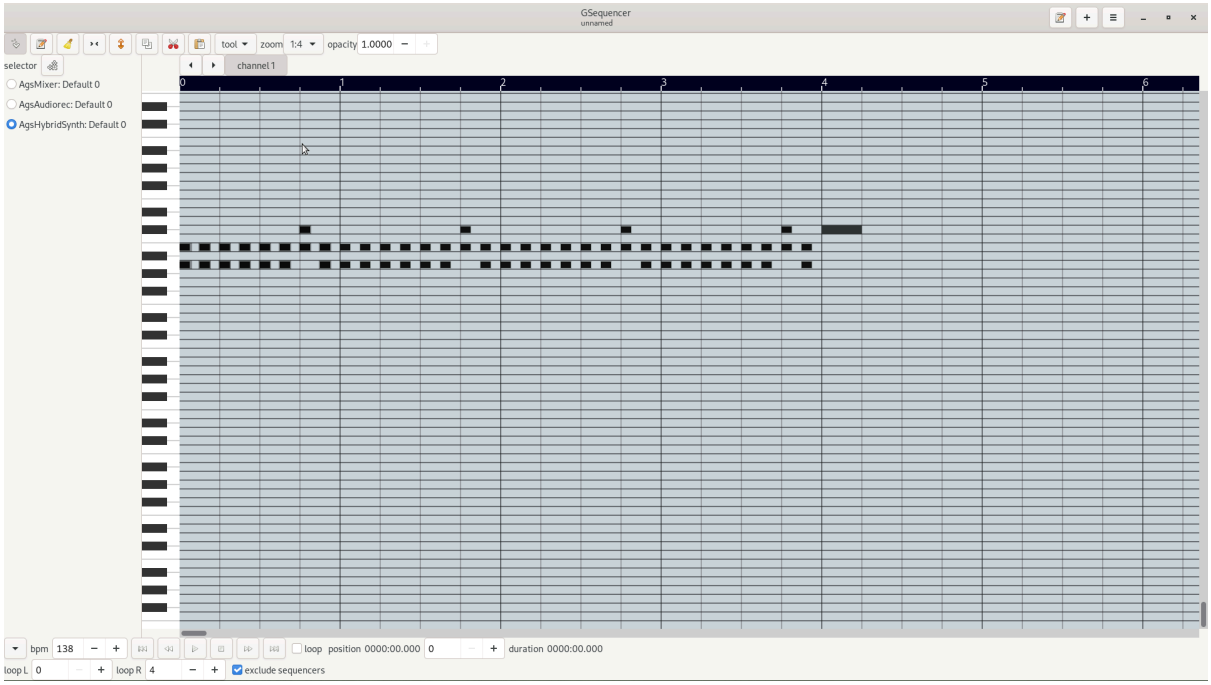
# Chapter 3. Composite editor

The composite editor features 3 different implementations like notation, automation and wave form editing. You switch the implementation by opening the Edit menu and click one of:

- Notation
- Automation
- Wave

Note there are individual tools available depending on active editor implementation within toolbar.

# Notation editor




The notation edit's screenshot showing notes

The notation editor features a piano roll. After linking an editor index with an enginge you may perform tasks like adding notes or copy, cut and paste them. You may change view segmentation, too. Further you might shift the displayed piano on the left or reverse the channel mapping.

## Linking

Before you might perform any task with the editor you have to link engines by adding an index. Then you should link it with an engine. That can all be done by using the menu button ⚙ of the index list. The corresponding editor appears as you click appropriate link.

## Toolbar




The editor's toolbar screenshot

In the table below are the various buttons explained you may use for editing.

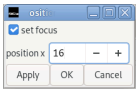
### Table 3.1. AGS editor toolbar controls table.

| icon | action | description |
|---|---|---|
|  | cursor | You may want to set the cursor to paste notes at the position where it is located. |
|  | notes | Add notes by clicking within the piano roll and move to till them having the wished duration. You can resize notes using shift key and mouse click and motion. |
|  | delete | Delete notes by clicking on the note you don't want anymore. |
|  | select | Select notes to copy or cut them. |
|  | copy | Copy notes to the clipboard. |
|  | cut | Cut notes to the clipboard. |
|  | paste | Paste the previously copied or cutted notes at the cursor position or just insert them where they are/were located. |
|  | invert | Invert entire notation in conjunction with reverse mapping or MIDI import. |

## Editing tools

The tools menu button contains items that opens dialogs to do common editing tasks. Like move, crop or select notes.

## Position cursor




The positon notation cursor dialog screenshot

The position notation cursor dialog allows you to position the cursor.

### Table 3.2. AGS position notation cursor dialog controls.

| control | description |
|---|---|
| position x | Set the cursor at position x. |
| position y | Set the cursor at position y. |

## Move notes




The move note dialog screenshot

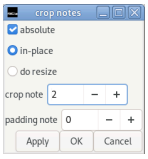
The move notes dialog allows you to move selected notes to a given position.

### Table 3.3. AGS move note dialog controls.

| control | description |
|---|---|
| relative | Radio button to choose relative positioning. The x- and y-offset are going to be added to current selections insets. |

| control | description |
|---|---|
| absolute | Radio button to choose absolute positioning. The x- and y-offset are goint to be added to most upper-left position x = 0 and y = 0. |
| x | The x-offset to position the selected notes. |
| y | The y-offset to position the selected notes. |

# Crop notes



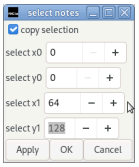

The crop note dialog screenshot

The crop notes dialog allows you to crop selected notes to a specified width or insert desired padding. Per default the values are added or subtracted of each note and doesn't require any additional space.

### Table 3.4. AGS crop note dialog controls.

| control | description |
|---|---|
| absolute | Modify behavior of crop, if checked it does use crop note control as absolute value, rather than add/subtract the value of current insets. |
| in-place | Radio button to specify that all crop happens in-place i.e. no additional space is used. |
| do resize | Radio button to specify that all crop adds some extra space i.e. the padding is increased as well. |
| crop note | Set the crop note value to resize the selected notes. This may be a relative or absolute value. |
| padding | Set the padding per tic to use. |

# Select notes




The select note dialog screenshot

The select note dialog allows you to select notes of given position and region.

### Table 3.5. AGS select note dialog controls.

| control | description |
|---|---|
| copy selection | Check button to say if you would like to copy selection to clipboard. |
| select x0 | Set the x0 offset of region to select. |
| select y0 | Set the y0 offset of region to select. |
| select x1 | Set the x1 offset of region to select. |

| control | description |
| --- | --- |
| select y1 | Set the y1 offset of region to select. |

# Pattern edit

The pattern edit widget is available as linking an editor index with a pattern sequencer e.g. drum or matrix.

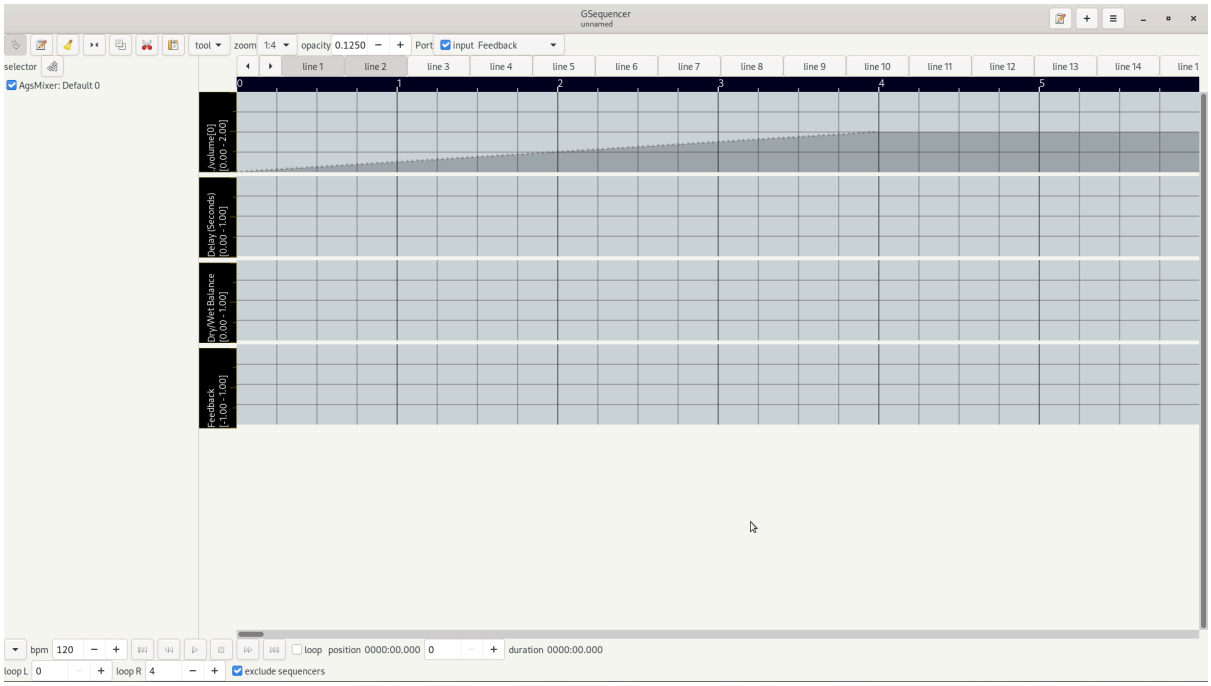
- Left, Left-Arrow
  - Move within notation left, as there is a pattern you get an audible feedback.
- Right, Right-Arrow
  - Move within notation right, audible feedback as above.
- Up, Up-Arrow
  - Move within notation up, audible feedback as above.
- Down, Down-Arrow
  - Move within notation down, audible feedback as above.
- Space
  - Add audio pattern and give audible feedback.
- Delete
  - Remove audio pattern and give audible feedback.
- Ctrl+c
  - Copy the selected pattern to clipboard.
- Ctrl+x
  - Cut the selected pattern to clipboard.
- Ctrl+v
  - Paste pattern from clipboard.
- Ctrl+a
  - Select all.
- Ctrl+i
  - Invert all.
- Ctrl+m
  - Show/hide meta information.
- Tab
  - Leave notation focus.

# Note edit

The note edit widget is available as linking an editor index with a notes sequencer e.g. Soundfont2 file player.

- Left, Left-Arrow
  - Move within notation left, as there is a note you get an audible feedback.
- Shift and Left, Left-Arrow
  - Shrink note by zoom factor.
- Right, Right-Arrow
  - Move within notation right, audible feedback as above.
- Shift and Right, Right-Arrow
  - Grow note by zoom factor.
- Up, Up-Arrow
  - Move within notation up, audible feedback as above.
- Down, Down-Arrow
  - Move within notation down, audible feedback as above.
- Space
  - Add audio notes and give audible feedback.
- Delete
  - Remove audio notes and give audible feedback.
- Ctrl+c
  - Copy the selected notes to clipboard.
- Ctrl+x
  - Cut the selected notes to clipboard.
- Ctrl+v
  - Paste notes from clipboard.
- Ctrl+a
  - Select all.
- Ctrl+i
  - Invert all.
- Ctrl+m
  - Show/hide meta information.
- Tab
  - Leave notation focus.

# Automation editor



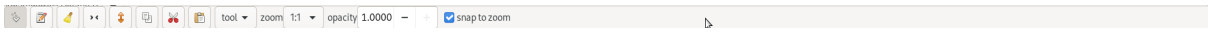

The automation editor's screenshot showing ramped values

The automation editor features a timeline value map. After linking an editor index with an enginge you may perform tasks like adding values or copy, cut and paste them. You may change view segmentation, too.

# Linking

Before you might perform any task with the editor you have to link engines by adding an index. Then you should link it with an engine. That can all be done by using the menu button of the index list. The corresponding editor appears as you click appropriate link, if automation editor is not the default view you have to change it by clicking Edit -> Automation from your menu bar or context menu.

# Toolbar




The editor's toolbar screenshot

In the table below are the various buttons explained you may use for editing.

### Table 3.6. AGS automation editor toolbar controls table.

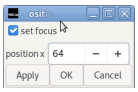
| icon | action | description |
|---|---|---|
| | cursor | You may want to set the cursor to paste accelerations at the position where it is located. |
| | accelerations | Add accelerations by clicking within the automation area. You can modify acceleration using shift key and mouse click and motion. |
| | delete | Delete accelerations by clicking on the acceleration you don't want anymore. |
| | select | Select accelerations to copy or cut them. |
| | copy | Copy accelerations to the clipboard. |

| icon | action | description |
|---|---|---|
|  | cut | Cut accelerations to the clipboard. |
|  | paste | Paste the previously copied or cutted accelerations at the cursor position or just insert them where they are/were located. |

## Editing tools

The tools menu button contains items that opens dialogs to do common editing tasks. Like move, crop or select accelerations.

## Position cursor



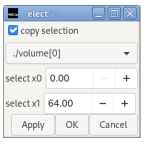

The positon automation cursor dialog screenshot

The position automation cursor dialog allows you to position the cursor.

### Table 3.7. AGS position automation cursor dialog controls.

| control | description |
|---|---|
| position x | Set the cursor at position x. |

## Select accelerations



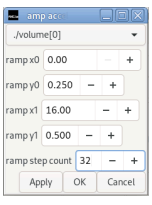

The select acceleration dialog screenshot

The select acceleration dialog allows you to select accelerations of given position and selected controls.

### Table 3.8. AGS select acceleration dialog controls.

| control | description |
|---|---|
| copy selection | Check button to say if you would like to copy selection to clipboard. |
| add/remove | Add/remove controls to enable/disable for selecting automation area. |
| select x0 | Set the x0 offset of region to select. |
| select x1 | Set the x1 offset of region to select. |

## Ramp accelerations




The ramp acceleration dialog screenshot

The ramp acceleration dialog allows you to ramp accelerations to a specified value using given number of steps.

**Table 3.9. AGS ramp acceleration dialog controls.**

| control | description |
|---|---|
| ramp control | Select the control to ramp. |
| ramp x0 | The x0-offset to start ramp from. |
| ramp y0 | The y0-value to use as first value. |
| ramp x1 | The x1-offset to stop ramp to. |
| ramp y1 | The y1-value to use as last value. |
| step count | The number of steps to use to ramp value y0 to y1 from offset x0 to x1. |

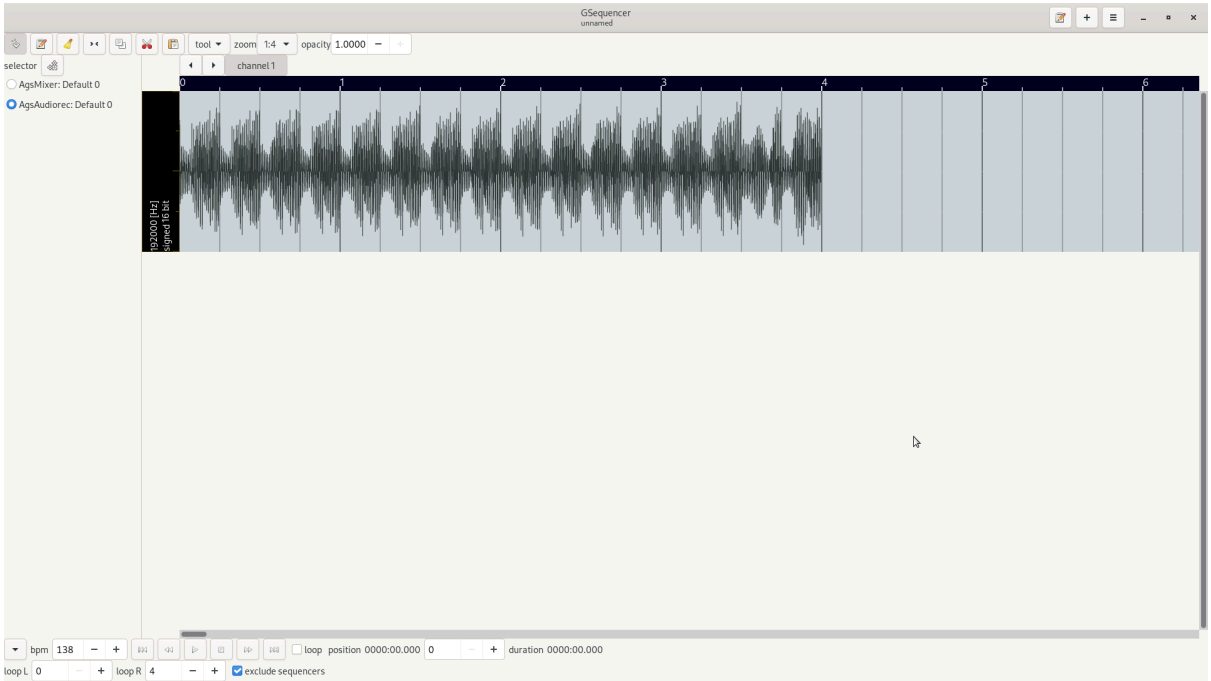
# Automation edit

The automation edit widget is available as linking an editor index with any machine.

There are basic edit tools available to do your automation. You can use keyboard bindings to do your tasks are select appropriate edit tool of toolbar. As the appropriate port is checked it enables the automation of it. Else it is by-passed and won't see any automation data. By enabling a port it gets visible within the editor.

- Position cursor. Use arrow keys. Page-Up and Page-Down switches the automation area.
- Add automation point applied horizontally by time and vertically as value. Add by enter space.
- Delete automation point. Use delete key.
- Select automation. Alternatively do select all, note selects everything visible within scope tab.
- Copy automation. Control-c key-stroke.
- Cut automation. Control-x key-stroke.
- Paste automation. Control-v key-stroke.
- Show/hide meta information. Control-m key-stroke.

# Wave editor



The wave edit's screenshot showing audio data

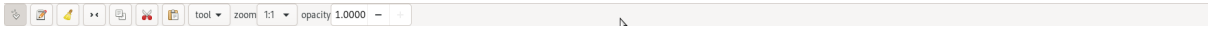
The wave edit widget is available as linking an editor index with AgsAudiorec.

The wave editor features a wave form area. After linking an editor index with an enginge you may perform tasks like copy, cut and paste audio data. You may change view segmentation, too.

# Linking

Before you might perform any task with the editor you have to link engines by adding an index. Then you should link it with an engine. That can all be done by using the menu button  of the index list. The corresponding editor appears as you click appropriate link, if wave editor is not the default view you have to change it by clicking Edit -> Wave from your menu bar or context menu.

# Wave toolbar




The wave editor's toolbar screenshot

In the table below are the various buttons explained you may use for editing.

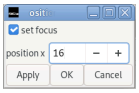
### Table 3.10. AGS wave editor toolbar controls table.

| icon | action | description |
|---|---|---|
|  | cursor | You may want to set the cursor to paste buffers at the position where it is located. |
|  | select | Select buffers to copy or cut them. |
|  | copy | Copy buffers to the clipboard. |
|  | cut | Cut buffers to the clipboard. |
|  | paste | Paste the previously copied or cutted buffers at the cursor position or just insert them where they are/were located. |

## Editing tools

The tools menu button contains items that opens dialogs to do common editing tasks. Like move, crop or select buffers.

## Position cursor



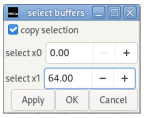

The position wave cursor dialog screenshot

The position wave cursor dialog allows you to position the cursor.

### Table 3.11. AGS position wave cursor dialog controls.

| control | description |
|---|---|
| position x | Set the cursor at position x. |

## Select buffers



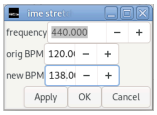
The select buffer dialog screenshot

The select buffer dialog allows you to select buffers of given position.

### Table 3.12. AGS select buffer dialog controls.

| control | description |
|---|---|
| copy selection | Check button to say if you would like to copy selection to clipboard. |
| select x0 | Set the x0 offset of region to select. |
| select x1 | Set the x1 offset of region to select. |

## Time-stretch buffers




The time-stretch buffer dialog screenshot

The time-stretch buffer dialog allows you to stretch time of buffers at given frequency.

### Table 3.13. AGS time-stretch buffer dialog controls.

| control | description |
|---|---|
| frequency | The time-stretch center frequency. |
| orig BPM | The original BPM the audio data was recorded. |
| new BPM | The new BPM the audio data shall have. |

# Wave edit

The wave edit widget is available as linking an editor index with AgsAudiorec.

There are basic edit tools available to do modify wave form. You can use keyboard bindings to do your tasks are select appropriate edit tool of toolbar. The wave editor shows all audio channels in vertical alignment and are grouped by default.

- Position cursor. Use arrow keys. Page-Up and Page-Down switches the wave area.
- Select wave. Alternatively do select all, note selects everything visible within scope tab.
- Copy wave. Control-C key-stroke.
- Cut wave. Control-X key-stroke.
- Paste wave. Control-V key-stroke.

# Chapter 4. The navigation




The navigation screenshot

With the navigation you have overall control of your song. Settings you perform here may influence the behaviour of AGS. There's a duration label doing a time approximation. It is really unreliable and may differ about 30 seconds after 3 minutes of playback. Note with higher frequency of the audio related threads it may differ less. An other factor is bpm what has an influence, as well.

# BPM

The beats per minute (BPM for short) indicates the velocity of a song being played. To adjust the BPM of the project in-/decrement the spinner labeled with bpm. To edit patterns or notes at a more granular rate select the wished tact within the appropriate engine or editor.

To calculate timings you divide 1 minute with the entered BPM and divide it with basic. For example you have a BPM rate of 120 and a 4/4 tact you would calculate the timing as follow:

$$t = 1 / 120 * (1 / 4) \quad (4.1)$$

# Playback controls

With these controls you can play/stop a song or seek to the wished position.

### Table 4.1. AGS playback controls table

| icon | action | description |
|---|---|---|
|  | backward | Seeking back until it's pressed again. |
|  | previous | Seeking back until it's not pressed anymore. |
|  | play | Starts the engines and the piano roll. |
|  | stop | Stops the engines and the piano roll. |
|  | next | Seeking forward until it's not pressed anymore. |
|  | forward | Seeking forward until it's pressed again. |

The loop checkbox enables the loop L and loop R settings below. It causes the notation to loop playback. Auto-Scroll checkbox animates the horizontal scrollbars to follow playback position. Use exclude sequencers checkbox to enable/disable pattern based sequencers.

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