Advanced Gtk+ Sequencer

User's Handbook

Joël Krähemann

Advanced Gtk+ Sequencer: User's Handbook

Joël Krähemann

Copyright (C) Joël Krähemann.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

Dedication

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

Table of Contents

Foreword v
1. The menubar 1
File 1
Export to PCM audio file 1
Edit 1
Preferences dialog 2
MIDI 4
The MIDI import wizard 4
The MIDI export wizard 5
2. Engines 7
Machine properties 7
Output tab 8
Input tab 8
Link input tab 8
Resize channels tab 9
Plugin browser dialog 9
Audio connection dialog 9
Audio connection output line 9
Audio connection output bulk 10
Audio connection input line 10
Audio connection input bulk 10
Envelope dialog 10
Envelope editor 11
Envelope info 12
Envelope pattern 12
MIDI dialog 13
Panel 13
Mixer 14
Spectrometer 14
Equalizer10 14
Drum 14
The pattern box 15
Matrix 15
Synth 16
FM Synth 17
Syncsynth 17
FM Syncsynth 17
Hybrid Synth 18
Hybrid FM Synth 18
FFPlayer 19
SF2 Synth 19
Sampler 19
SFZ Synth 20
Audiorec 20
3. Composite editor 21
Notation editor 21
Linking 21
Toolbar 21
Pattern edit 24
Note edit 25
Automation editor 26
Linking 26
Toolbar 26
Automation edit 28
Wave editor 29

Linking 29
Wave toolbar 29
Wave edit 31
4. The navigation 32
BPM 32
Playback controls 32
A. GNU Free Documentation License 33
B. Resources 39

List of Tables

3.1. AGS editor toolbar controls table. 22
3.2. AGS position notation cursor dialog controls. 22
3.3. AGS move note dialog controls. 23
3.4. AGS crop note dialog controls. 23
3.5. AGS select note dialog controls. 23
3.6. AGS automation editor toolbar controls table. 26
3.7. AGS position automation cursor dialog controls. 27
3.8. AGS select acceleration dialog controls. 27
3.9. AGS ramp acceleration dialog controls. 28
3.10. AGS wave editor toolbar controls table. 29
3.11. AGS position wave cursor dialog controls. 30
3.12. AGS select buffer dialog controls. 30
3.13. AGS time-stretch buffer dialog controls. 31
4.1. AGS playback controls table 32

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

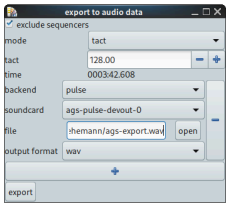
Within the menubar you may do basic tasks like open/close files. In this section we cover briefly the the different entries. The menus have mnemonics e.g. press ALT and F key in order to open File menu.

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.

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.

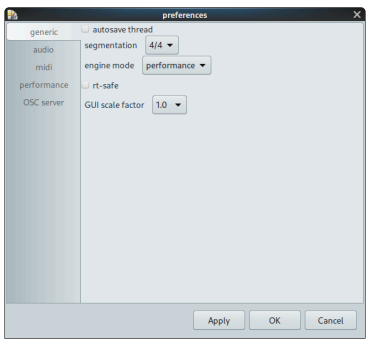
- Drum - is used to do pattern editing using PCM audio files.
- Matrix - is used to pattern editing, intended to be linked against Synth.
- Synth - is a software synthesizer supporting variable oscillator count. Use with Matrix.
- FM Synth - is a frequency modulation software synthesizer supporting variable 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.

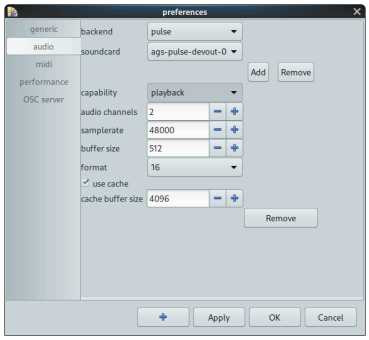
Generic



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.

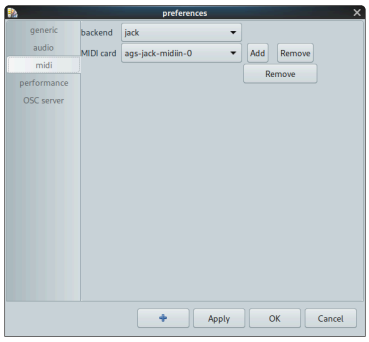
Audio channels specifies the audio channels to allocate for output device.

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



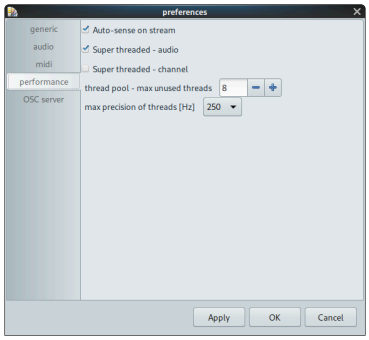
The preferences dialog screenshot - midi tab

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.

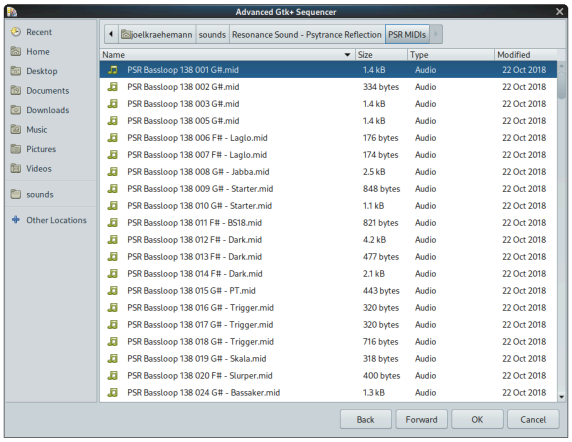
MIDI

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.

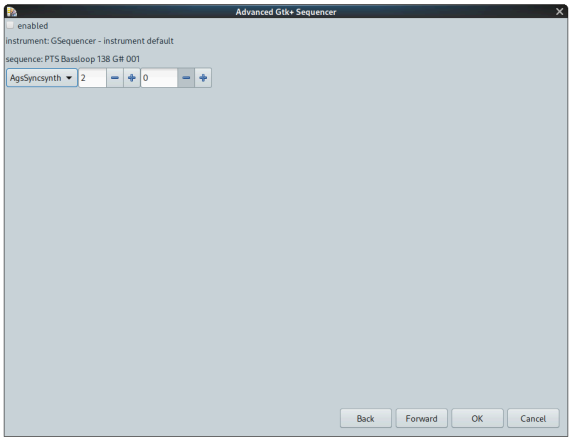
Step #1 - file chooser



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



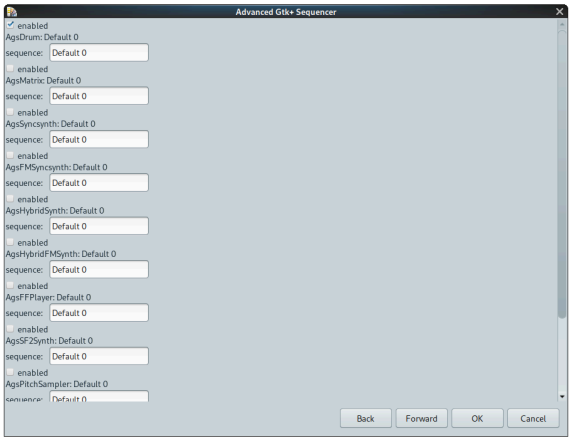
The MIDI import wizard - step #2

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.

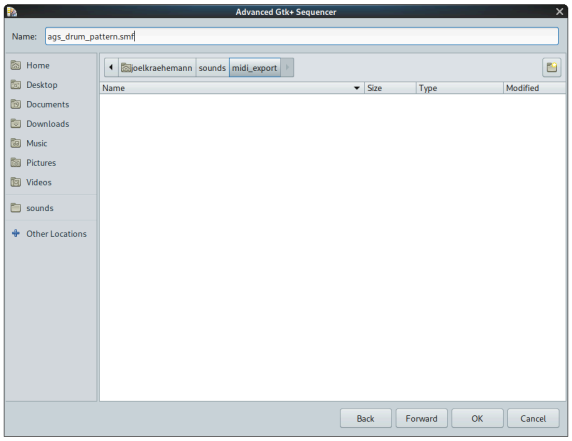
Step #1 - select machines



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.

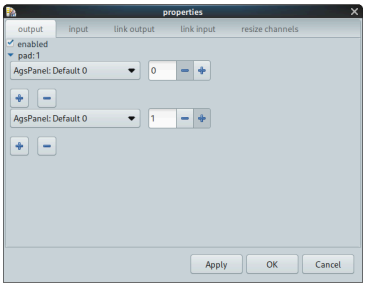
The edit submenu is only available by sequencers like AgsDrum and AgsMatrix.

- 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.

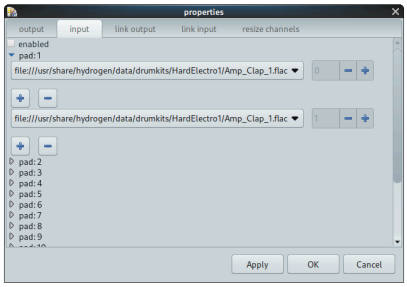
Output tab



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.

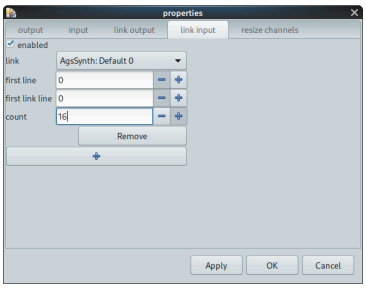
Input tab



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.

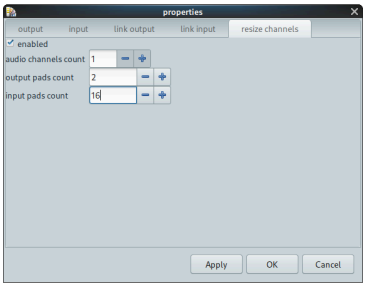
Link input tab



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.

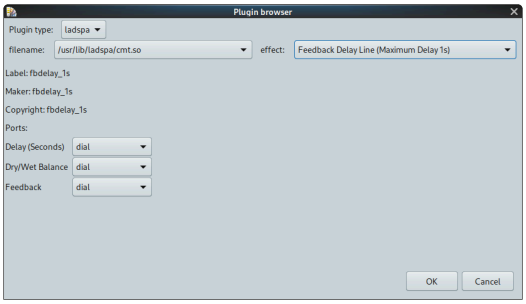
Resize channels tab



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



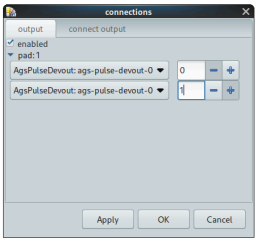
The LADSPA browser dialog screenshot

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.

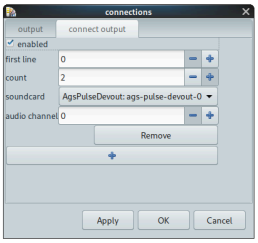
Audio connection output line



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.

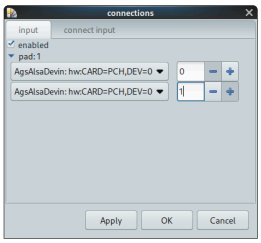
Audio connection output bulk



The audio connection output bulk screenshot

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

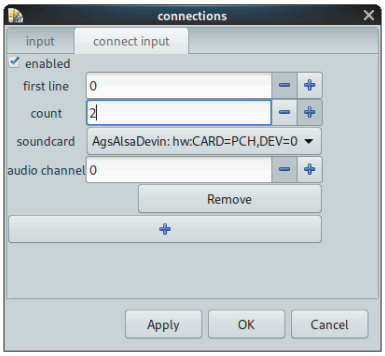
Audio connection input line



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

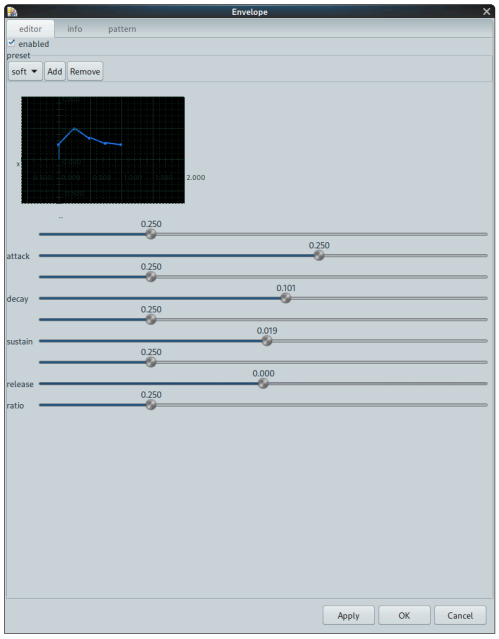
The input connection tab allows you to link a bunch of channel at once.

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.

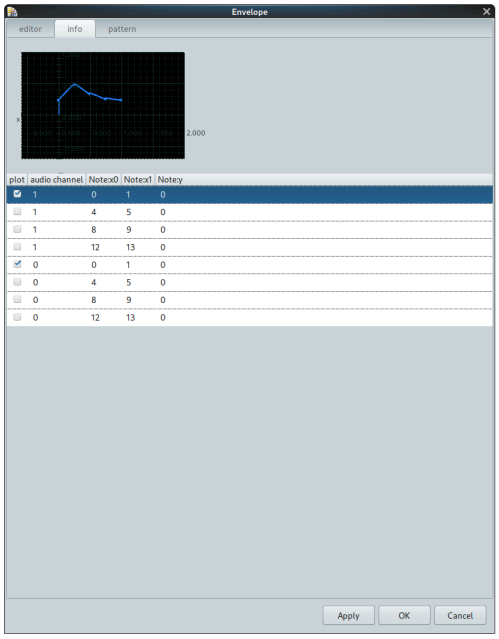
Decay is the second x length and y magnitude.

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.

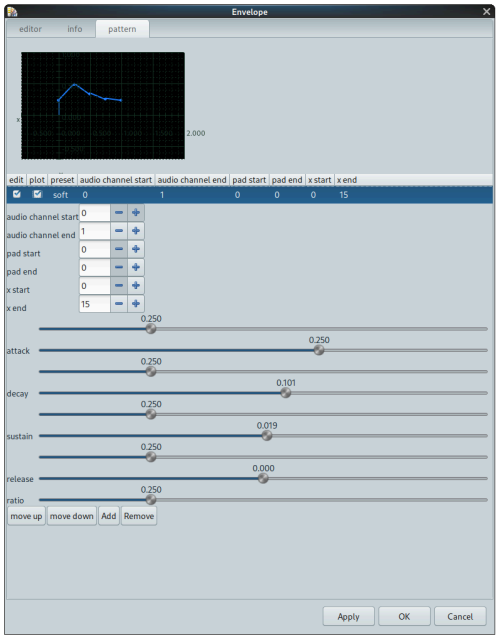
Audio channel is the selected note's audio channel.

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.

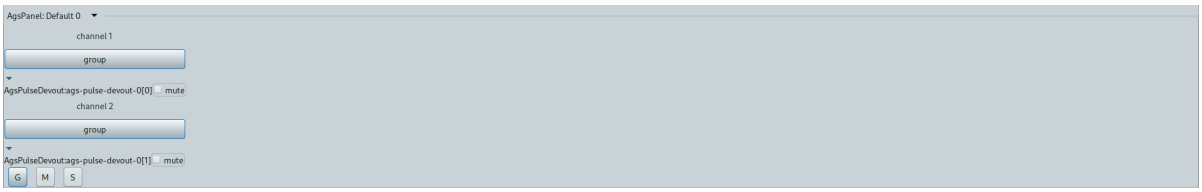
MIDI dialog



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

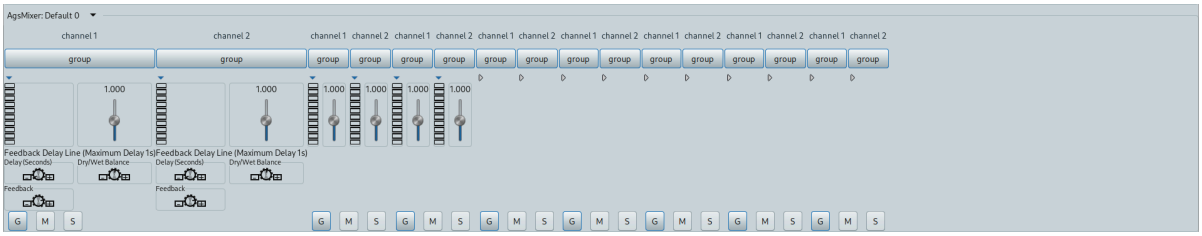


The panel screenshot

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

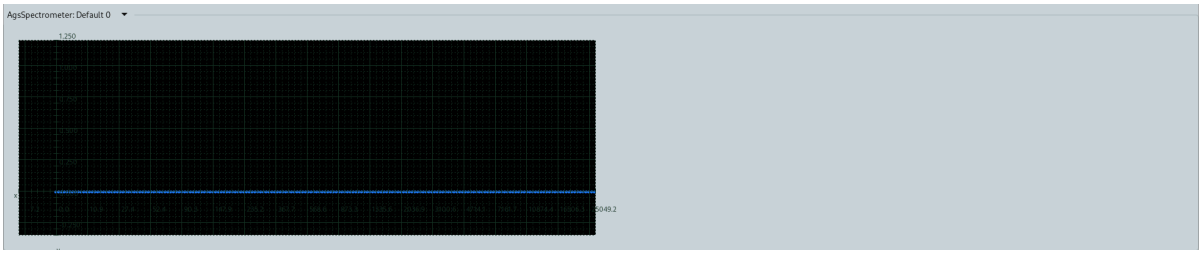


The mixer screenshot

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.

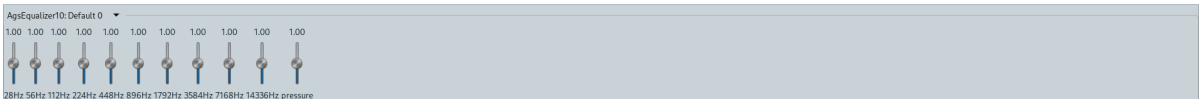
Spectrometer



The spectrometer screenshot

Visualize input by plotting it using FFTW3 library.

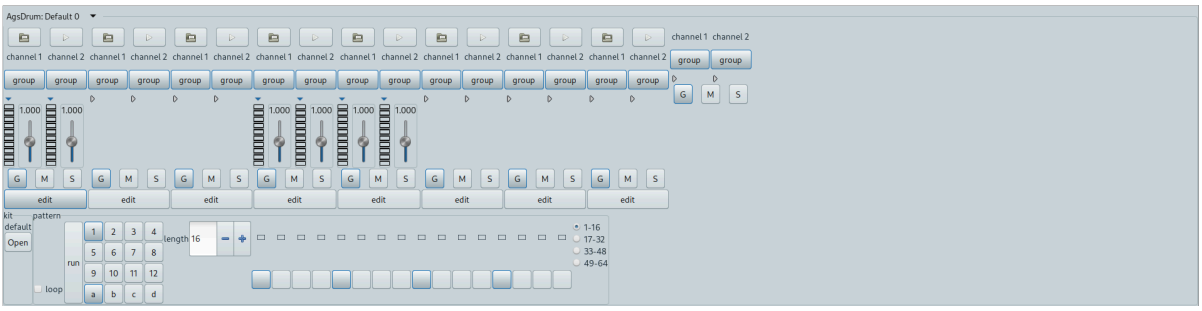
Equalizer10



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.

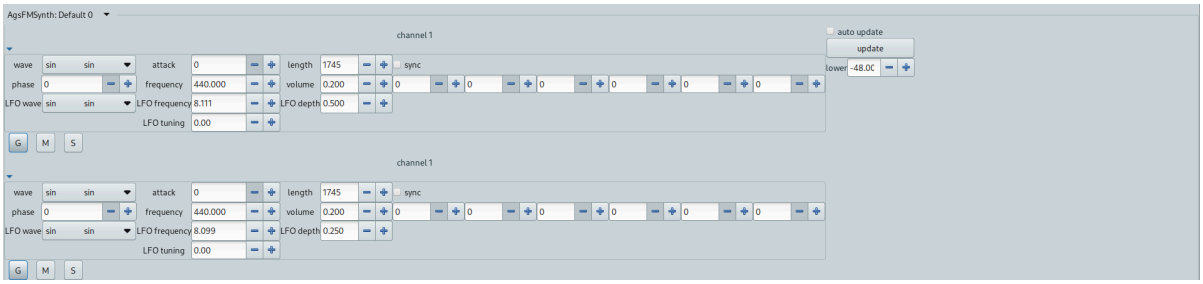
Frequency is the lower range key's frequency.

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.

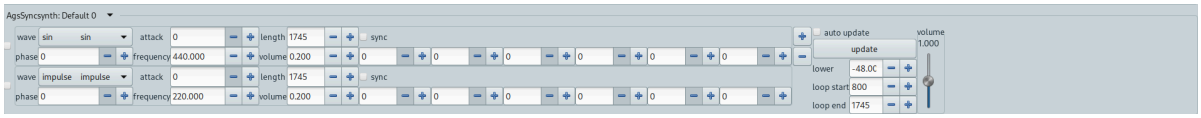
LFO wave use specific function to modulate frequency.

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



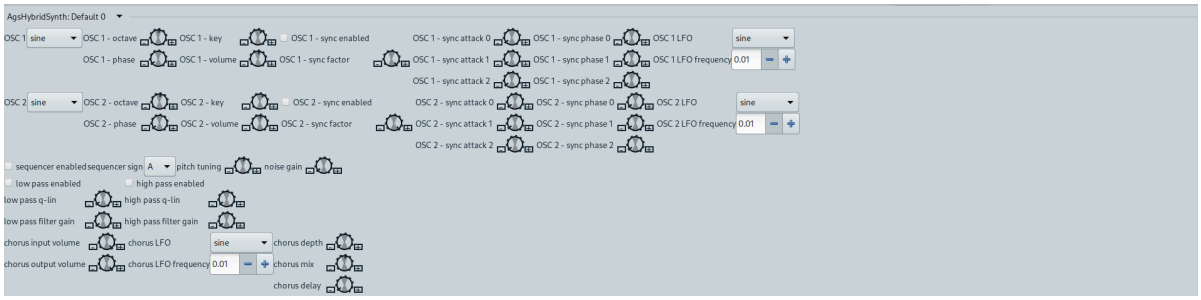
The frequency modulator synced synth screenshot

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.

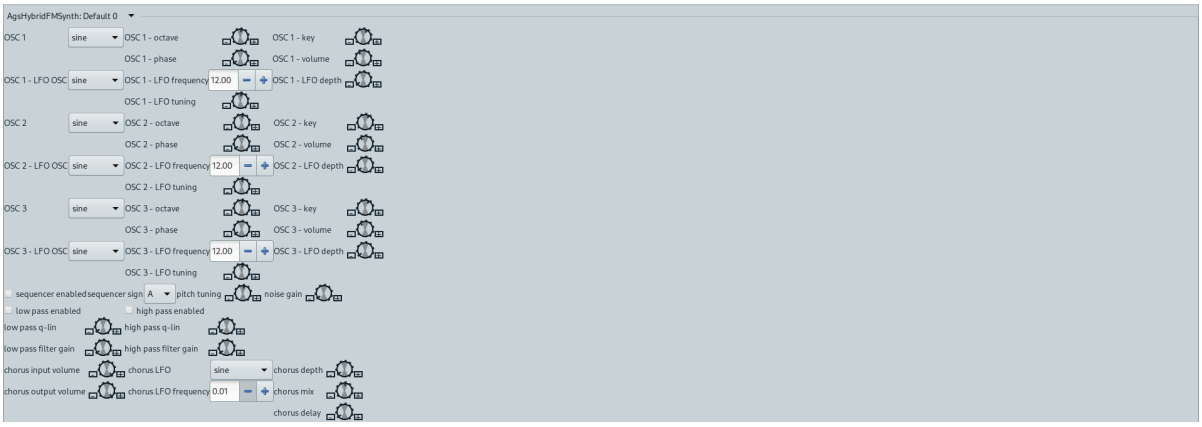
The low-pass filter is disabled by default.

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



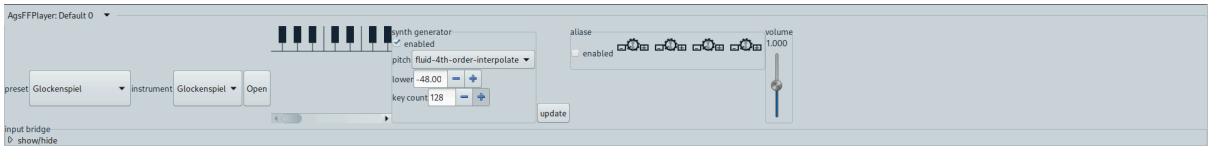
The hybrid frequency modulation synth screenshot

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



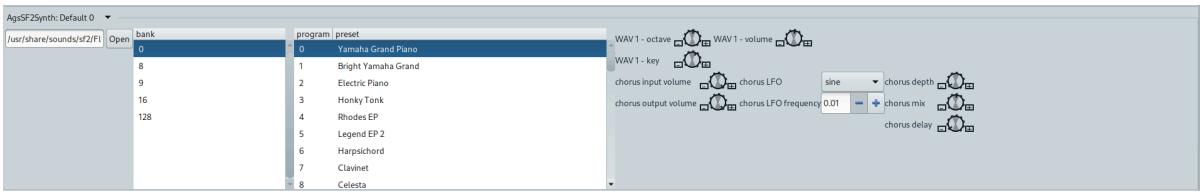
The ffplayer screenshot

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



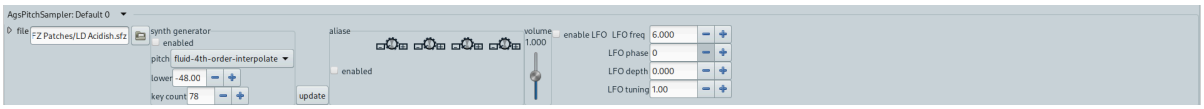
The SF2 synth screenshot

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

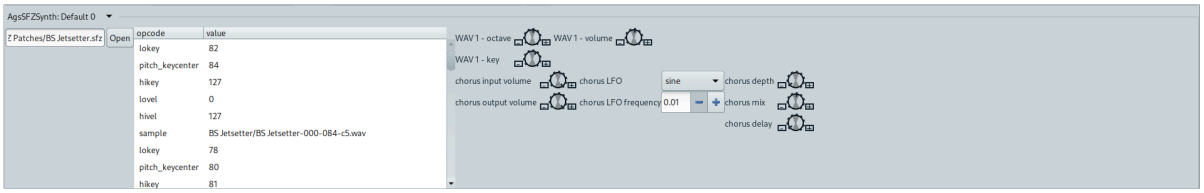
Produce audio data by opening SFZ audio file container format. There is a open button to read SFZ files and assign it to the input.

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



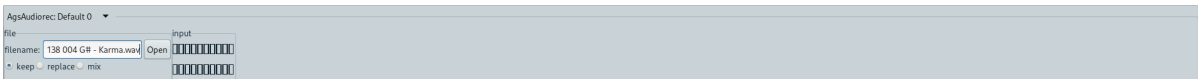
The SFZ synth screenshot

Produce audio data using SFZ files.

There is a chorus, which provides additional controls.

The synth is compute just-in-time.

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.

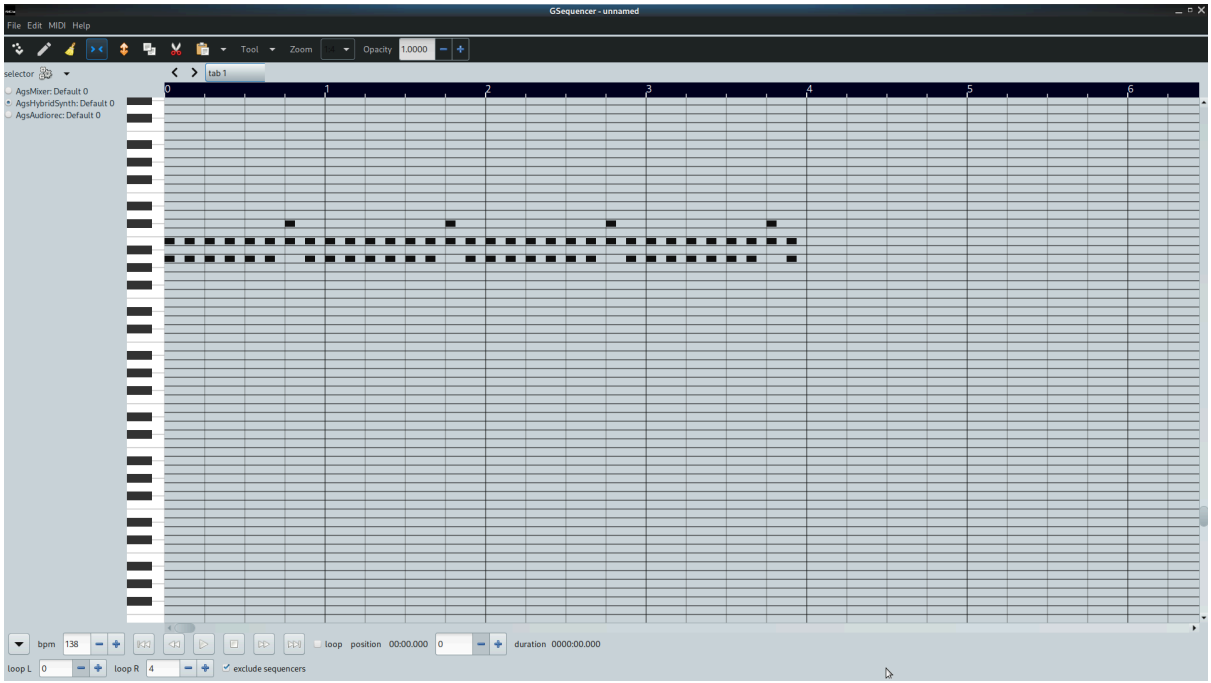
Chapter 3. Composite editor

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.

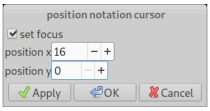
Table 3.1. AGS editor toolbar controls table.

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.
	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



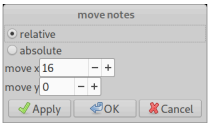
The positon notation cursor dialog screenshot

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



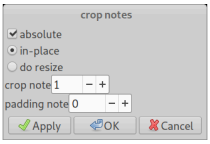
The move note dialog screenshot

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.
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



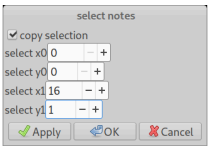
The crop note dialog screenshot

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.

control	description
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.
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.

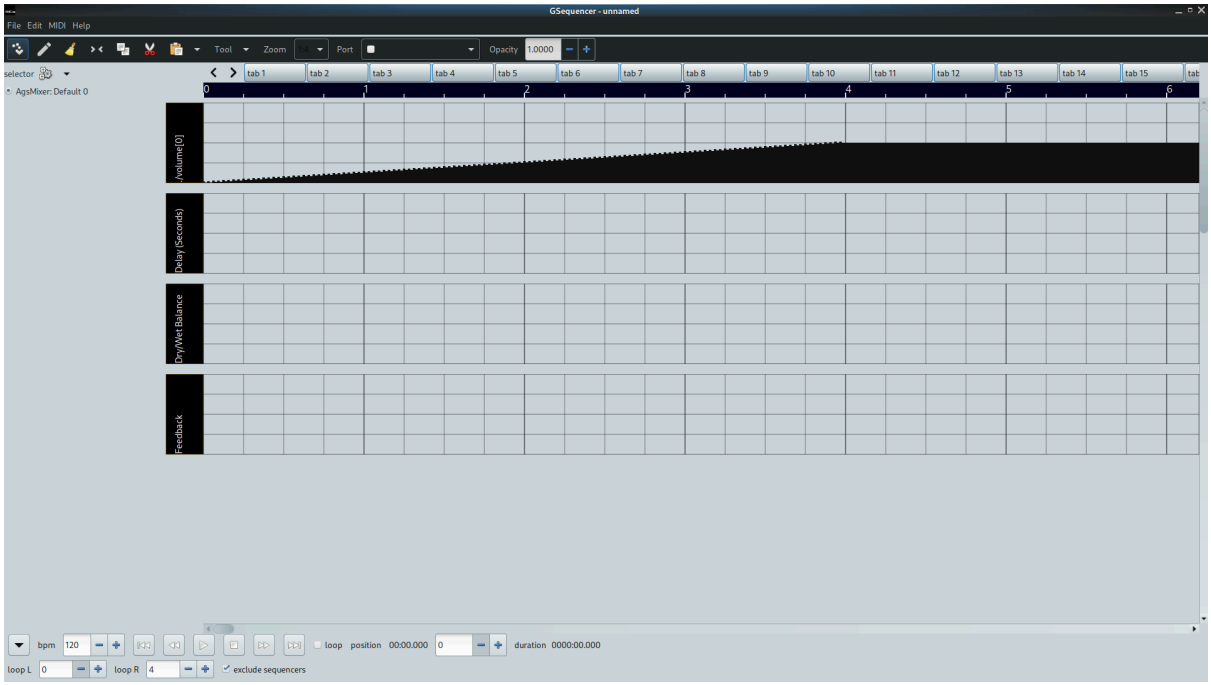
- Left, Left-Arrow
  - Move within notation left, as there is a pattern you get an audible feedback.
- Right, Right-Arrow
  - Move within notation right, audible feedback as above.
- Up, Up-Arrow
  - Move within notation up, audible feedback as above.
- Down, Down-Arrow
  - Move within notation down, 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.

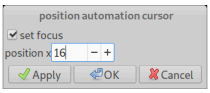
icon	action	description
	cursor	You may want to set the cursor to paste accelerations at the position where it is located.
	accelerations	Add accelerations by clicking within the automation area.
	delete	Delete accelerations by clicking on the acceleration you don't want anymore.

icon	action	description
	select	Select accelerations to copy or cut them.
	copy	Copy accelerations to the clipboard.
	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



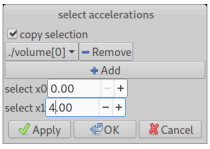
The positon automation cursor dialog screenshot

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



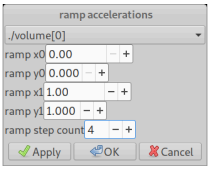
The select acceleration dialog screenshot

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.

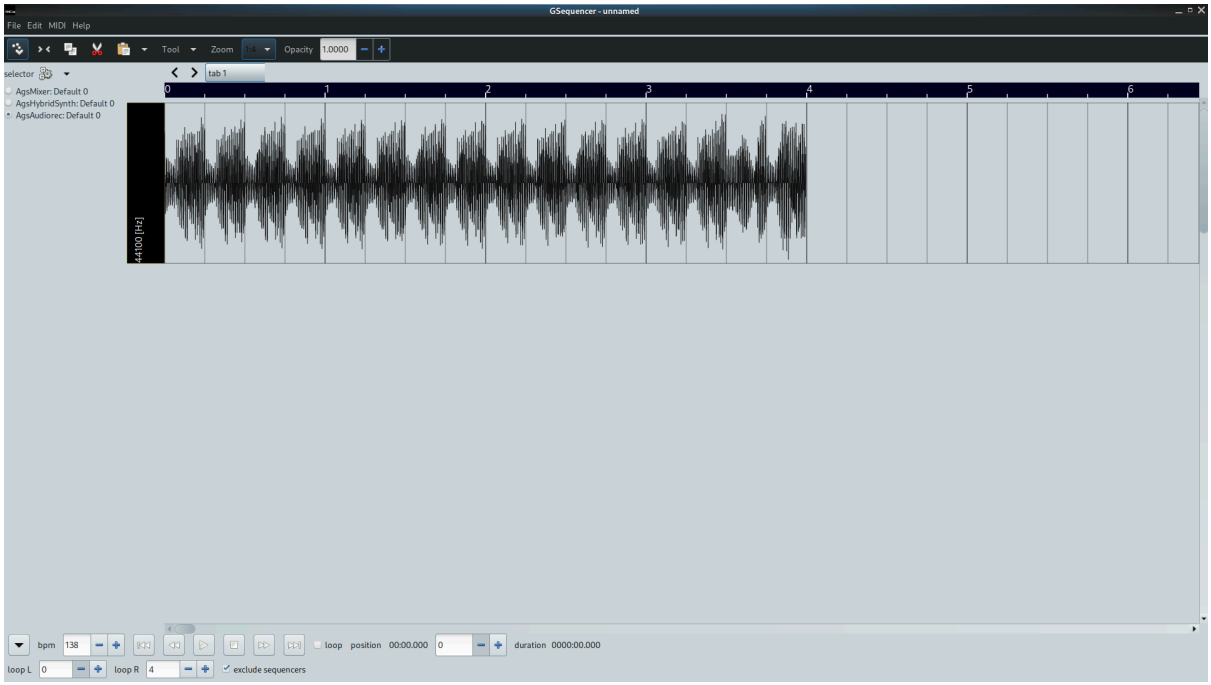
Automation edit

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.

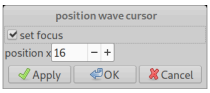
icon	action	description
	cursor	You may want to set the cursor to paste buffers at the position where it is located.
	select	Select buffers to copy or cut them.

icon	action	description
	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



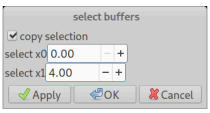
The position wave cursor dialog screenshot

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



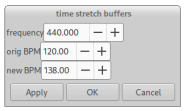
The select buffer dialog screenshot

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.

Appendix A. GNU Free Documentation License

Version 1.3, 3 November 2008

Copyright © 2000, 2001, 2002, 2007, 2008 Free Software Foundation, Inc. [http://www.fsf.org/]

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

0. PREAMBLE

The purpose of this License is to make a manual, textbook, or other functional and useful document “free” in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or noncommercially. Secondarily, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of “copyleft”, which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

1. APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The “Document”, below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as “you”. You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A “Modified Version” of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A “Secondary Section” is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document’s overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The “Invariant Sections” are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The “Cover Texts” are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A “Transparent” copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with

generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not “Transparent” is called “Opaque”.

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The “Title Page” means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, “Title Page” means the text near the most prominent appearance of the work’s title, preceding the beginning of the body of the text.

The “publisher” means any person or entity that distributes copies of the Document to the public.

A section “Entitled XYZ” means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as “Acknowledgements”, “Dedications”, “Endorsements”, or “History”.) To “Preserve the Title” of such a section when you modify the Document means that it remains a section “Entitled XYZ” according to this definition.

The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

2. VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

3. COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document’s license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a

computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

4. MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

A. Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.

B. List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.

C. State on the Title page the name of the publisher of the Modified Version, as the publisher.

D. Preserve all the copyright notices of the Document.

E. Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.

F. Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.

G. Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.

H. Include an unaltered copy of this License.

I. Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.

J. Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.

K. For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.

L. Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.

M. Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.

N. Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title with any Invariant Section.

O. Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version's license notice. These titles must be distinct from any other section titles.

You may add a section Entitled "Endorsements", provided it contains nothing but endorsements of your Modified Version by various parties — for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

5. COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled "History" in the various original documents, forming one section Entitled "History"; likewise combine any sections Entitled "Acknowledgements", and any sections Entitled "Dedications". You must delete all sections Entitled "Endorsements".

6. COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

7. AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an "aggregate" if the copyright resulting from the compilation is not used to limit the legal rights of the compilation's users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document's Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

8. TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled “Acknowledgements”, “Dedications”, or “History”, the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, or distribute it is void, and will automatically terminate your rights under this License.

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, receipt of a copy of some or all of the same material does not give you any rights to use it.

10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See Copyleft [http://www.gnu.org/copyleft/].

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License “or any later version” applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation. If the Document specifies that a proxy can decide which future versions of this License can be used, that proxy’s public statement of acceptance of a version permanently authorizes you to choose that version for the Document.

11. RELICENSING

“Massive Multiauthor Collaboration Site” (or “MMC Site”) means any World Wide Web server that publishes copyrightable works and also provides prominent facilities for anybody to edit those works. A public wiki that anybody can edit is an example of such a server. A “Massive Multiauthor Collaboration” (or “MMC”) contained in the site means any set of copyrightable works thus published on the MMC site.

“CC-BY-SA” means the Creative Commons Attribution-Share Alike 3.0 license published by Creative Commons Corporation, a not-for-profit corporation with a principal place of business in San Francisco, California, as well as future copyleft versions of that license published by that same organization.

“Incorporate” means to publish or republish a Document, in whole or in part, as part of another Document.

An MMC is “eligible for relicensing” if it is licensed under this License, and if all works that were first published under this License somewhere other than this MMC, and subsequently incorporated in whole or in part into the MMC, (1) had no cover texts or invariant sections, and (2) were thus incorporated prior to November 1, 2008.

The operator of an MMC Site may republish an MMC contained in the site under CC-BY-SA on the same site at any time before August 1, 2009, provided the MMC is eligible for relicensing.

ADDENDUM: How to use this License for your documents

To use this License in a document you have written, include a copy of the License in the document and put the following copyright and license notices just after the title page:

```
Copyright © 2013 Joël Krähemann

Permission is granted to copy, distribute and/or modify this document under the
terms of the GNU Free Documentation License, Version 1.3 or any later version
published by the Free Software Foundation; with no Invariant Sections, no
Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in
the section entitled “GNU Free Documentation License”.
```

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the “with… Texts.” line with this:

```
with the Invariant Sections being LIST THEIR TITLES, with the Front-Cover Texts
being LIST, and with the Back-Cover Texts being LIST.
```

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.

Appendix B. Resources

Websites

`Swami`	Soundfont editor - http://www.swamiproject.org
`Musescore`	Sheet music - http://musescore.org
`Calf Studio Gear`	LV2 plugins - http://calf-studio-gear.org/
`Linux Studio Plugins`	LV2 plugins - http://lsp-plug.in/
`Analog Modelling Synthesizer`	LV2 plugins - http://amsynth.github.io/
`XSynth DSSI`	DSSI plugins - http://smbolton.com/xsynth-dssi.html
`Computer Music Toolkit`	LADSPA plugins - http://www.ladspa.org/cmt/overview.html