# LMMS Manual

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# Contents

# 1 Introduction

Short, introductory pages on each topic, establishing what you need to run LMMS and understand this document.

## 1.1 Getting LMMS

*(There is no content for the page 'Getting LMMS')*

## 1.2 Requirements

The hardware and software required to run LMMS is reasonably modest.

### 1.2.1 Hardware

**CPU/RAM**

Depending on the type and size of the songs you plan to write it's recommended to have at least 1 GHz and 512 MB of RAM. If you use VST-plugins and a recent SVN-copy of LMMS it's also recommended to have multiple cores and/or CPUs.

**Soundcard**

There're no special needs. LMMS will run with an ordinary cheap 2-channel soundcard but it can also make use of surround-soundcards! Furthermore a MIDI-port should not be missing if you plan to record your keyboard-plays with LMMS.

### 1.2.2 Software

For running LMMS you need Linux (Debian or Ubuntu recommended). Detailed requirements and recommendations can be found at Resolving dependencies.

## 1.3 Installation

This is meant to be a very basic and linear tutorial on how to install LMMS. Examples provided assume you're running Debian GNU/Linux.

### Installing LMMS from SVN

- First you need to get LMMS sources from the SVN repository, or update your sources, if you're upgrading from a previous version. The following command will checkout a recent SVN-copy of in a newly created folder named "lmms" in the current dir.

```
svn co
   https :// lmms . svn . sourceforge . net / svnroot / lmms / branches / lmms
   stable -0.3
```

- Then you have to configure LMMS: cd into the "stable-0.3" directory and generate the config script running

```
make  -f  Makefile . svn
```

- configure LMMS by running

```
./ configure
```

- resolve any unmet dependencies the configure script prompts you for (see section "Resolving dependencies" below for more on this topic)
- Now compile LMMS: cd into the sources directory (if you're not already there)

```
make
```

- Finally you can install LMMS by running as root

```
make  install
```

### Resolving dependencies

To compile LMMS from sources you need several development libraries, from graphical to sound ones. Some are essential and some are optional.

*Required libraries*

- Qt 3.x libs and Qt 3.x development libs, both multithreaded
  - under Debian run *aptitude install libqt3-mt libqt3-mt-dev libqt3-headers qt3-dev-tools*
  - under Fedora and RPM based system run *yum install qt-devel*. On 64-bit systems where you do not intend to compile 32-bit targets, run *yum install qt-devel.x86_64* so as not to install the 32-bit development libraries.
  - On a 64 bit system that uses lib64qt3, it may be necessary to make some modifications before configure will find your qt libraries. The kludge that worked for me was editing configure, and replacing all occurances of *$QT-DIR/lib* with *$QTDIR/lib64* — *Alex West 2006/04/30 10:30 Mandriva 2006*
  - Alternatively, on 64-bit systems you may be able to do *./configure --with-qtdir=/usr/lib64/qt-3.3/.* *–PaulWay 22:19, 18 November 2007 (PST)*

Next you need to allow LMMS to communicate with your audio hardware, so you have to choose one or more of the following setups and provide corresponding development libraries:

- ALSA - Advanced Linux Sound Architecture - apart from libs and -dev libs, you need ALSA modules for your soundcard (built-in with 2.6.x kernels) and those modules loaded - see http://www.alsa-project.org/ and http://alsa.opensrc.org/ for info
  - under Debian run *aptitude install libasound2-dev*
- JACK - Jack Audio Connection Kit - a low latency audio server that allows the connection of multiple applications to an audio device (typically an ALSA one), as well as allowing them to share audio between themselves
  - under Debian run *aptitude install libjack0.100.0-dev libjackasyn-dev*
- SDL - Simple Directmedia Layer - a layer that allows LMMS to output it's sound to sound servers like aRts, esd (otherwise you need to kill them *before* starting LMMS)
  - under Debian run *aptitude install libsdl-sound1.2-dev libsdl1.2-dev libsdl-mixer1.2-dev*
- OSS - Open Sound System - now replaced by ALSA

Even if you don't install all necessary libraries *before* configuring LMMS, you'll receive messages telling you what isn't in place to proceed, so you'll be able to fulfill the requirements *while* configuring LMMS, running *./configure* multiple times and resolving issues one at a time.

*Optional (but strongly recommended) libraries*

To make use of the full LMMS potential you may need to install some extra libraries. Here is a list of some of them:

- ogg-vorbis libraries - to decode/encode .ogg samples and/or songs
  - under Debian run aptitude install *libvorbis-dev libvorbisfile3 libvorbisenc2*
- samplerate conversion tools - to downsample and upsample audio from 4Hz up to 192kHz
  - under Debian run aptitude install *libsamplerate0-dev*
- sound file library - for reading and writing files containing sampled audio data
  - under Debian run aptitude install *libsndfile1-dev*
- asynchronous library for interfacing with the JACK sound server - to convert programs that do sound input or output via the OSS system into JACK clients by starting them with the jacklaunch command
- STK library + headers for using STK (Sound Synthesis Toolkit)
  - under Debian run aptitude install *libstk0-dev stk*
- WINE + devel-packages for being able to use VST-plugins within LMMS
  - under Debian run aptitude install *libwine-dev libwine*

Again, even if you don't install all the libraries **before** configuring LMMS, you'll receive warnings at the end of the configure process telling you what isn't in place to achieve the best setup, and you'll be able to get what's needed, again running *./configure* multiple times and installing software until you get the desired result.

**Installation under various distributions**

*Gentoo Linux*

LMMS is now avaible for Gentoo in the "semi-official" overlay www.gentoo-sunrise.org.

So, Gentoo users who want to install LMMS only have to do:

```
# emerge -va layman
# echo "source /usr/portage/local/layman/make.conf" >>
   /etc/make.conf
# layman -f -a sunrise
# echo "media-sound/lmms ~x86" >>
   /etc/portage/package.keywords
# emerge -av lmms
```

This ebuild stills experimental and no-official so bugs shouldn't be reported on Gentoo's Bugzilla unless it's a problem with the ebuild and you write a patch (you can report this patch at bugs.gentoo.org on bug 100170). If you have any other problem with it, please contact me: cooldwind at gmail dot com.

*Fedora*

Fedora has (early) LMMS packages available in the Planet CCRMA repository http://ccrma.stanford.edu/planetccrma/mirror/fedora/linux/planetccrma/.

## 1.4  Terms and Conventions

*(There is no content for the page 'Terms and Conventions')*

# 2  Tutorials

Step-by-step task-oriented guides to achieving particular goals in LMMS.

## 2.1  Getting started

### 2.1.1  Getting Started with LMMS

LMMS is a sequencer, software synthesis and composer for Linux (and soon for Windows). It includes a series of plug-in software synthesisers, audio sample playback, drum machine and piano roll composition, automation tools and access to LADSPA effects.

When you first start LMMS, several key components are shown. The menu bar is at the top, above the tool bar and master track controls. The toolbar permanently on the left is the Side Bar, which is an easy way to access the instruments, sounds, presets and projects. The windows displayed by default are the Song Editor, the Beat + Bassline Editor and the Project Notes.

To insert a new instrument plugin preset into the Beat + Bassline or Song Editor, click the yellow star in the Side Bar to display the Presets. You can also insert samples by choosing the single green note icon (the 'My samples' icon) from the Side Bar. You can click and hold on an instrument preset or sample to hear the sound it generates. You can then place the instruments you want into the editor by dragging it to the editor. You can also double click presets to place them directly into the Beat + Bassline Editor. If you make a mistake and want to remove an instrument, click on its grey 'toolkit' icon within the editor and choose 'Remove this track'. Instruments are divided into factory provided and user specified, and subfolders in your file system can be used to organise the instruments or samples heirarchially.

When you insert an instrument into the editor, the instrument's editor window will be automatically opened for you. You can also see this editor by clicking on its grey 'name' button in the Song or Beat + Bassline editors. This 'name' button acts as a toggle, to dispel the editor window again; you can also click on its window controls as normal. Instruments have five tabs: Plugin, Env/LFO/Filter, Arp/Chord, FX and MIDI. The 'Plugin' tab changes with the type of instrument; all other tabs are standard for every instrument.

**Creating a track**

The standard way to create a track is to add drum instruments to the Beat + Bassline

Editor and instruments for melody tracks into the Song Editor. Then create different drum loops using the **Add bassline** button in the Beat + Bassline Editor for each rhythm you want - a main bass line, a hihat line, special rhythms and breaks, etc. These are listed in the Song Editor as they're created. To make them sound, click on the start bar in the track's timeline to create a new segment. You can also drag its end out to make the pattern go across multiple bars. The same technique can be used for repetitive bass lines.

For melody tracks, click on the start bar to create a new segment and then double-click that segment to open the Piano Roll Editor. Place notes in the piano roll by clicking on their start quanta line (to create them) and then dragging their right-hand edge to be as long or short as you want. You can also drag notes up and down the scale and forward and backwards in time to position them correctly. Alternatively, you can press the 'record' button in the Piano Roll Editor and play notes in real time, either on the keyboard (Z = C, S = C#, X = D, Q = c, etc) or on a MIDI keyboard.

Finally hit 'play' and enjoy your music!

a brief walk-through for the impatient ==

## 2.2 Your First Song with LMMS

So you've just loaded up LMMS and you want to find your way around? In this situation, programmers write a "hello world" program; we're going to write "Popcorn", a classic for the synthesiser that should be well known.

### 2.2.1 Choosing the instrument

You've got the default screen in front of you, with the Song Editor, Beat + Bassline Editor and Project Notes open. First, click the Presets icon (⭐) on the Side Bar to open up the list of **preset** sounds. Double-click on the **TripleOscillator** to open this folder and you will be presented with a diverse range of instruments. You can hold the mouse button down on any preset to hear a preview of its sound.

Drag the "**Moog**" preset onto the space in the middle of the Song Editor and, when you drop it, a new track will be created with that preset as the instrument.[1] The instrument plugin will then be displayed. At this stage we're happy with how that instrument sounds, so click on its plugin button (TripleOscillator: Moog) to close it again.

### 2.2.2  Making the melody

We now want to add notes to make the melody. Left-click in the first bar of the Moog track and a new piano roll segment will appear (▆). Double-click on that and the Piano Roll Editor will appear, allowing you to put notes into that newly-created segment.
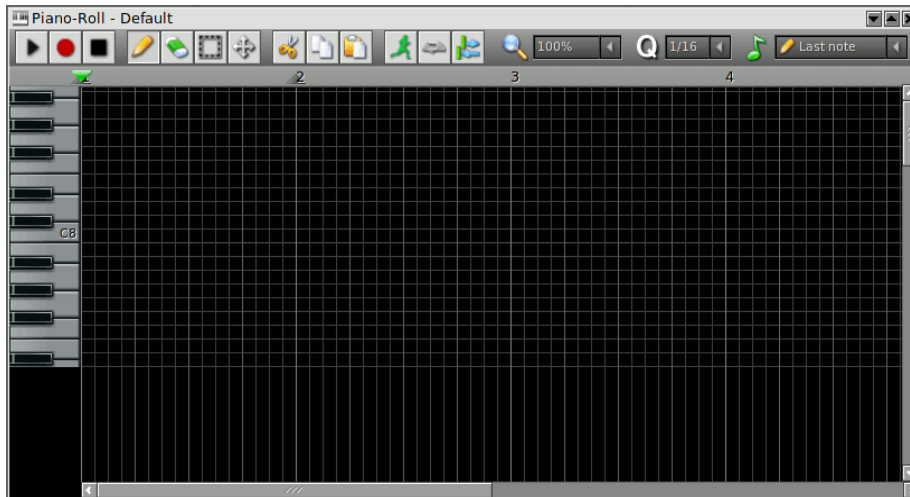


### The first note

Now click in the black square just to the right of the 'A4' note (which is three lines, or semitones, down from the note marked C5). This will create a new crotchet - a note one beat long - starting at that time.
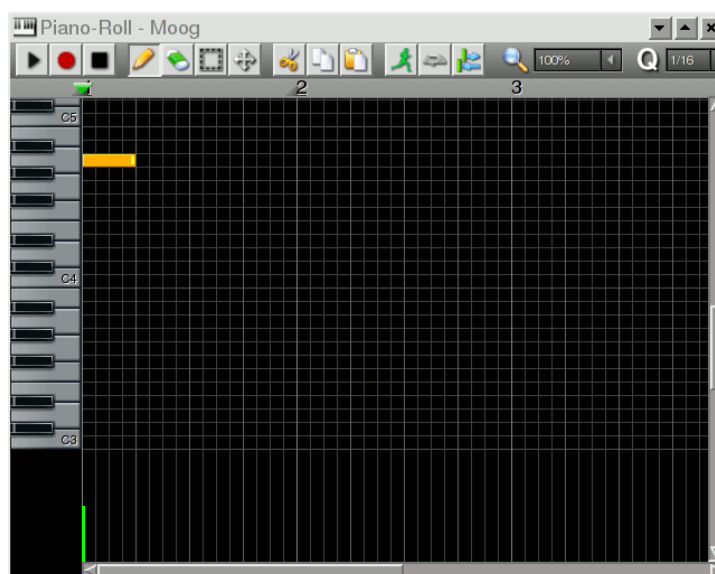
However, this is too long: we need notes half a beat - a quaver - long. To change this, we simply move the mouse pointer to the right-hand edge of the note, until the cursor changes into a left-and-right arrow. Then we hold the mouse button down and drag the end of the note left two 'blocks' (each block being one sixteenth of a bar).
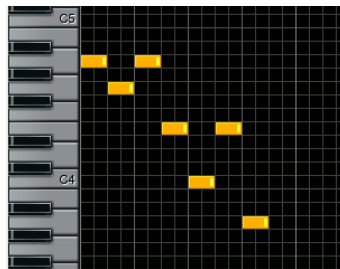
After this, the new notes we put down will be the same length, because the Piano Roll Editor is set to Last Note (          )

## More notes

Continue creating notes in the pattern shown:

To place a note, you need to aim for the line at the start of the beat; LMMS will recognise a small fraction of the area left of the beat line as being closer to that beat than the previous. If you make a mistake placing a note, you can move it to its correct position by clicking on the middle of the note (where the cursor turns into a four-way cross) and dragging the note to its new position. LMMS will play the note that you're dragging onto as an aide to correct placement. You can move notes horizontally (in time) as well as vertically (in pitch).

If you need to delete a note, simply right-click on it.

## Copy and paste

We now want to repeat those seven notes at the start of the bar in the next bar. One way to do that is to simply click the correct notes. But, for this tutorial, we'll introduce the Piano Roll's copy and paste functions.

Click on the **area selector** tool in the Piano Roll toolbar's editing palette ( ),
which is the third icon from the left - the dashed-outline square. Now drag an area from
the top-right (e.g. the C5 line in bar 2) to the bottom left (onto the G3 key). You'll see
a blue rectangle expand out and the notes that start inside this area will turn blue. To
select all the notes you will need to drag slightly onto the keyboard, something which
is possible when dragging *onto* the keyboard but not *off* it (which is why we started
dragging from the top right).

Once you have selected all the notes, press the **copy** button in the toolbar's clipboard
palette ( ), which is the middle icon, looking like a page on top of another. This
copies these notes into a clipboard. They will be pasted back into the first bar of the
piano roll, so we need to move the current notes out of the way.

Fortunately, the **move area** tool in the editing palette, looking like a four-direction
arrow, allows you to move all the notes in a selected area. Select this tool and grab
anywhere inside the selection to move it so that the first note is in the second bar. It
may be handy to actually grab one note, or note where the horizontal note shading lies
when you start dragging, because you will find you often drag the notes up or down as
well and we want to make sure we keep them at the same pitch. Ensure that the first
note is on the A4 line and starts on the first beat of the second bar.

Now we can paste the notes back in. Press the **paste** button in the clipboard palette
to paste the notes we previously copied back into the first bar.[2]

We can now press the **play** button ( ) in the Piano Roll Editor window to play the
melody back. When it gets to the end of the last bar in which there are notes, it will
automatically repeat back to the start of the first bar.

## Oops!

When we play the melody so far, we realise that the melody actually starts on the wrong
beat. The second A4 note is really supposed to be the start of the bar, and the two
notes before it are leading in from the previous bar. However, we can't go further back
than bar 1 in our piano roll. We need to move all the notes forward using the **select
area** and **move area** tools (as explained above) in order to have the first note start on
the right beat.

## The first 'four' bars

If you're confident, you can now continue adding the notes of the tune to make the first
four bars (up to where the main melody repeats). Here's what your piano roll should
look like at the end of this:
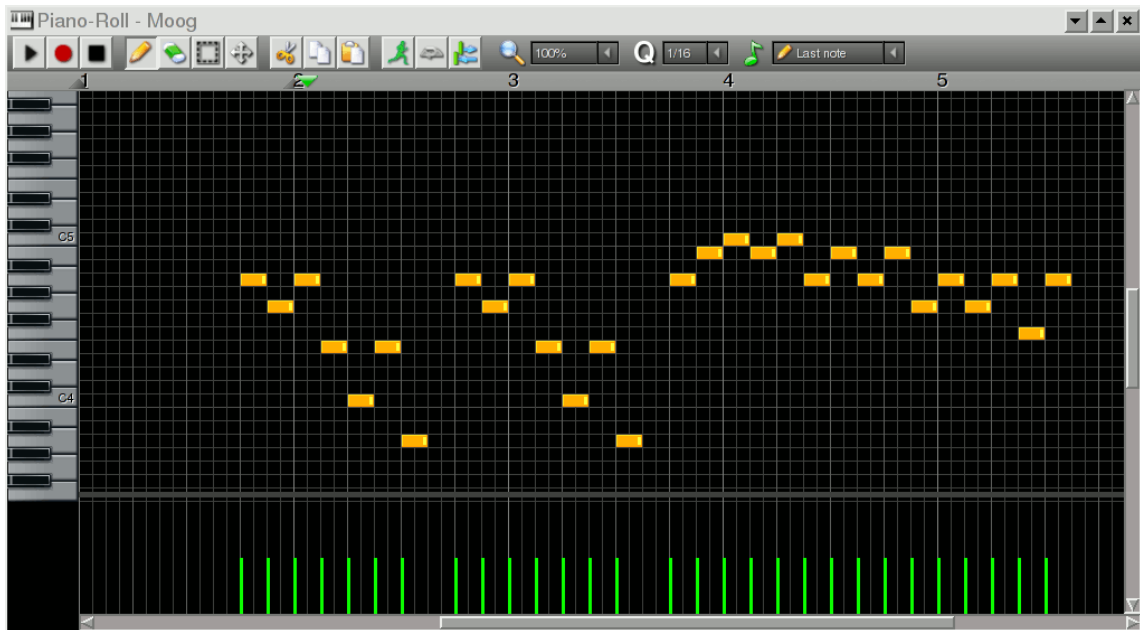
### 2.2.3 More structure

We can now close the Piano Roll Editor and go back to the Song Editor. You will see that the track segment that we initially double-clicked to create the melody has expanded out to fit the notes that we've added.

We now want to copy that segment to create the next four bars. The easiest way to do that is to simply hold down the Ctrl key, then drag the initial segment. This will drag a copy of the segment to a new location, which must be outside the initial segment. This process will look like this:
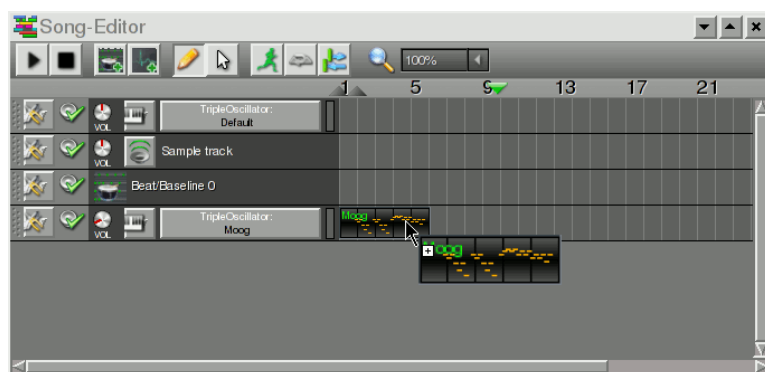


Drop the segment on bar 6. This is actually one bar too late, as the first three quarters

of a bar of this segment is empty, as is the last quarter of the last segment. Fortunately, segments can overlap and their notes will play simultaneously.[3] . Drag the second copy so that it starts at bar 5.

You can now play this using the play button in the Song Editor. You will hear a short pause as it counts the first three beats of silence, then the melody will start. It should play smoothly through the two repeats.

The Song Editor should now look like this:
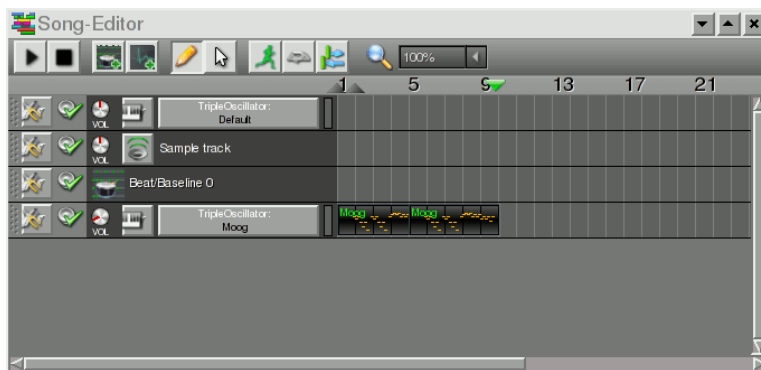


## Variation 2

We can now go on to create another piano roll segment and fill in the next four bars:
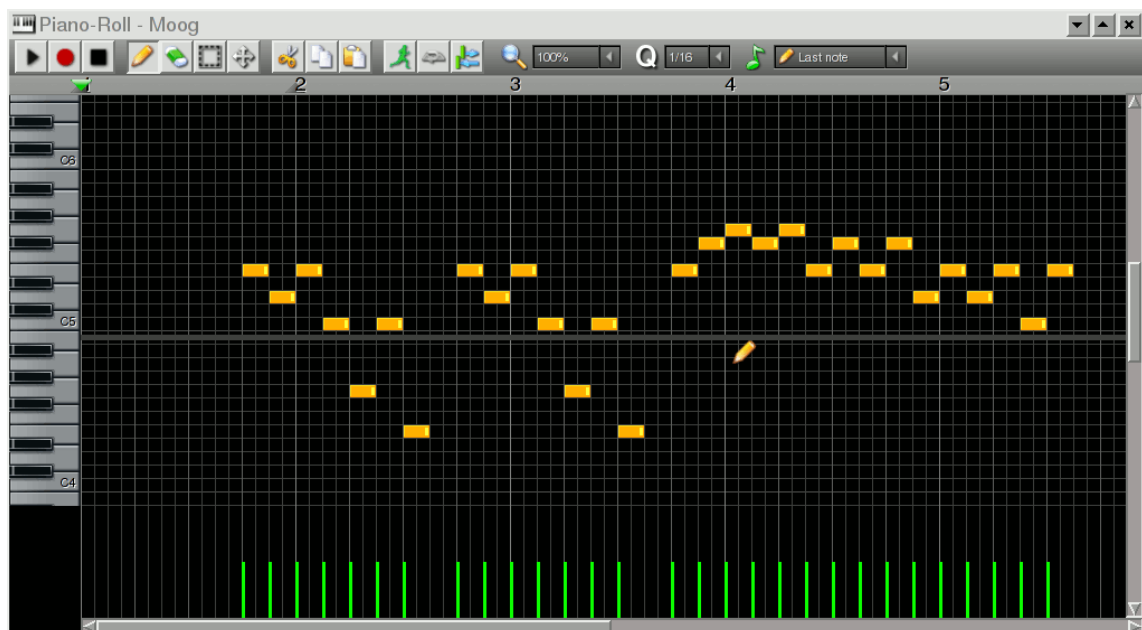
Due to the way that the segments overlap, you will have to create the new segment in a new bar (e.g. bar 11) and then move it into position over the previous segment.

Note that there is a slight oddity in the Piano Roll Editor that causes you to start editing at bar 2 when opening occasional new segments. Check which bar you're writing notes into before getting to far!

Your Song Editor should now look like this:
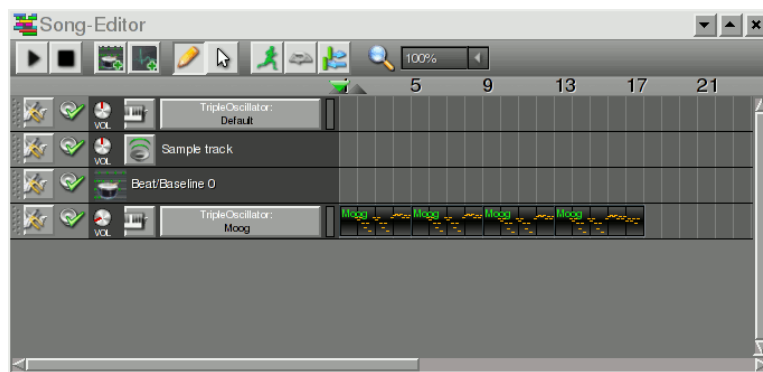


### 2.2.4  Footnotes

[1]  - You could alternatively have dropped it on the existing "TripleOscillator: Default" track to replace that instrument with the one you were dragging, but this gives you an idea of how to create new instrument tracks.

[2]  - As of version 0.3.1, the copy and paste functionality in the Piano Roll Editor has several known problems. The developers are aware of these problems and plan to fix them in a future release.

[3]  - You should avoid having segments that overlap as there is no clear display of how many segments overlap in a particular area. A small segment might completely disappear behind a large one, leaving you confused as to where those extra notes were coming from. In this case, it makes good sense to use it.

a more step-by-step tutorial ==

# 3 Using LMMS

A thematic description of how the various tools in LMMS work.

## 3.1 Working with Instruments

### 3.1.1 Instrument Basics

An instrument is a sound generator that plays notes on command. Each instrument is comprised of a specific plugin that generates the sound and a number of common ways to control the sound generated. Many parameters of an instrument can be changed in real time using Automation.

### 3.1.2 Creating an instrument

You can create an instrument in a variety of ways.

The most common method is to drag a preset of the appropriate type from the relevant section of the Side Bar. You drop it in the editor that you want to use it in - most tone-producing instruments (samples and synthesizers) will go into the Song Editor and drum sounds will go into the Beat + Bassline Editor. This creates a new track in the song editor or a new drum loop line in the beat + bassline editor.

You can also create a new instrument of any type by using the Instrument Plugin section of the Side Bar. Drag the new instrument into the editor as above.

### 3.1.3 The instrument window

The instrument window looks like this:
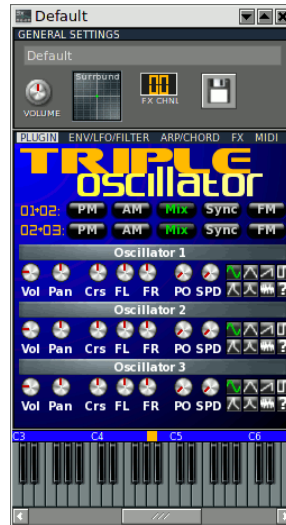
The window is divided up into three main sections - the instrument controls at the top, the sound controls in the middle and the piano keys at the bottom.

### Instrument controls

The main controls are:

- The instrument's volume.
- It's position in space (i.e. left or right pan position and front to back fade position). These can be controlled indepentently by Automation just like most other controls.
- The effects channel that the instrument is currently using. At the moment the effects channel is unused.
- A button to save the settings of this instrument.

These are always present no matter what plugin you have selected.

### Sound controls

The sound controls section is headed by a selector for five 'tabs':

- **Plugin** shows the controls for how this particular plugin generates sound. This is the only tab that changes per plugin.
- **Env/LFO/Filter** shows the controls for the sound's envelope (its loudness over time), its use of the Low Frequency Oscillator, and pitch filtering.
- **Arp/Chord** shows the controls for making the instrument automatically play arpeggios or chords.

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- **FX** shows the chain of LADSPA effects plugins operating on this instrument.

- **MIDI** shows which MIDI channels this instrument will receive and send events on.

Let's deal with these tabs in more detail.

### The Plugin tab

The plugin tab contains all the controls that set how this plugin actually generates sound. For more information on this, read the individual Plugins page.

### The Env/LFO/Filter tab

The Env/LFO/Filter tab looks like this:



*Envelope basics*

The **Envelope** of an instrument is how loud or soft it is from the moment the note is pressed to after it is released. Immediately before the note is pressed, the envelope is at zero and the instrument produces no noise. The note goes through an **attack** from when the note is pressed until it reaches its maximum loudness. From then there is an initial **hold** period where the note remains at maximum loudness. The note then **decay**s to a softer pitch which is the **sustain** level. Finally when the note is **release**d it fades away to silence. There may also be a **pre-delay** between when the note is pressed and when the volume starts rising.

To get a feel for these parameters it helps to compare them to the envelope of known instruments. A piano has a very short attack and no hold, a long delay to a very quiet sustain, and finally a release which is fast but not instantaneous. A flute has a slightly longer attack, and a very short hold and decay as the initial puff is expended. The sustain level is then almost the full volume, and the note has a quick release. A bell has a short attack, no hold or sustain, but a long release. A car passing by has a long attack and long release.

The Env/LFO/Filter section has three 'sub-tabs' that select the 'target' for three separate envelopes. The default one, and the one discussed above, is the volume target. You select the target in the same way that you select the tab in the instrument, by clicking on the label. To control the envelope, you have six knobs to set each of the above parameters - pre-delay, attack, hold, decay, sustain, release - and a seventh one to control the amount of effect that the envelope has on the parameter.

For the volume envelope, this 'amount' does not actually affect the sound - the envelope only works if the amount control is 100% on. Note that you can either either set the amount using its knob control or click on the envelope graph in order to turn it completely on or off. The graph is green when it's turned on, grey when off and a shade between those two colours when the control is between fully on (1) and fully off (0). The amount can also be turned down to negative one, a feature which is only useful for the Cutoff and Q/Reso targets.

In order to understand what the Cutoff and Q/Reso targets do, we must first deal with filters.

*Filters*

A filter is a method of changing a sound by letting some frequencies through and reducing other frequencies. For instance, a low-pass filter lets only the bass, or low frequencies, through and cuts the high, treble, frequencies. The frequency at which this takes place is set by the **cutoff** frequency control.

Although it is technically possible to build a frequency that has 'cuts' the unwanted frequencies entirely, it usually introduces unwanted delays and effects into the sound. Therefore, most filters also have a **Q factor** setting which controls how steep or sharp the drop-off is. The larger the Q factor, the steeper the drop-off in the sound level. In some filter designs, the Q factor also causes a resonance at harmonics of the cutoff frequency, so often the Q factor is also called the filter's *resonance*.

In order to enable the filter, press the **filter** title bar and the light at the left will turn on. When this light is on, the filter is active. Keep in mind that filtering the sound of an instrument adds a small calculation overhead and can add a slight delay to the sound,

so if you're not using the filter then keep it turned off.

The types of filter that LMMS offers are:

- **Lowpass** - This filter lets low frequencies through.
- **Highpass** - This filter lets high frequencies through.
- **Bandpass csg** and **Bandpass czpg** - These filters let only a certain band of frequencies through.
- **Notch** - The inverse of the Bandpass filter, this cuts only a certain frequency band.
- **Moog** - A modification to the normal Lowpass filter made popular by Moog synthesisers.
- **2x Lowpass** - A lowpass filter with twice the Q factor.

Each type of filter lets you control the **cutoff** frequency and the **Q/Reso**nance amount. You can experiment with this by choosing a plugin that generates multiple frequencies - using anything other than a sine wave will do that - and then set the cutoff and Q factor and see how it changes the sound.

### Filters with Envelopes

Filters do not have to be static and unchanged throughout the entire note.  LMMS allows you to control both the cutoff frequency and the Q factor via an envelope.  Nor does this envelope have to be the same as the volume envelope for the note - each parameter can have an independent envelope.  The envelope sets the value from its maximum or minimum to the set control level; for example, if a low-pass filter has the cutoff control set to 1000Hz and an envelope is used to sweep this value up in a long attack and long decay, the value of the control will go from 14000Hz (the maximum) down to 1000Hz and then back up.  This will make the instrument sound like it's been damped down and then the damping removed.

Another typical use of this is to add a resonance to an instrument that changes with time.  In this case the volume and Q envelopes would be quite similar, so that as the note hits the resonance sweeps down, and then disappears upwards again when the note is released. (Writer's note: add more detail about how to actually achieve this.)

### The Low Frequency Oscillator

Often you may want to have the sound waver or change in a repetitive way.  This is where the low frequency oscillator comes in.  It is called 'low frequency' because it is designed to have cycles of up to two seconds (?)  rather than the many hundreds or

thousands of cycles per second of an audible sound. The low frequency oscillator is usually called the LFO for short.

The LFO provided by LMMS allows you to control the value of the volume, cutoff and Q factor targets independently - the LFO for each is shown under the same 'tab' as the envelope for the same target. Each has four parameters that you can set:

- The **delay** before the oscillator starts.
- The **attack** or fade-in rate of the oscillator - the rate at which it goes from starting to having full effect.
- The **speed** of oscillation. This is probably the parameter you are most likely to use. It is measured in milliseconds per oscillation, because often one knows the time taken for a complete cycle rather than the rate in Hertz. (This is also because the accuracy of setting the LFO in fractions of a Hertz is less than setting it in fractions of a second.)
- The **amount** that the LFO affects the given target. Like the envelope, you can either set the amount control manually or click on the waveform display at the left of the LFO to turn it on or off.

**The Arp/Chord tab**

The Arp/Chord tab looks like this:
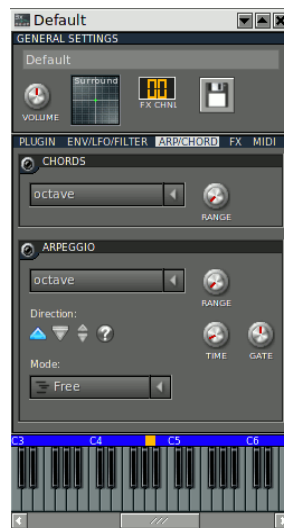


Normally, each 'note down' command plays one note in the instrument. With the Arp/Chord controls, you can change this so that it plays a chord (with the root note

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being the note played) and/or an arpeggio (i.e. the notes of the chord played one after another rather than simultaneously. To control this, the Arp/Chord tab is divided into two sections, one for chords and the other for arpeggios. You turn them on by clicking on their title bar and the light at the left will turn on. By default they will be off but shown; when turned off after this they will 'roll up'. They will unroll again when turned back on.

Both sections have two common controls - the list of chords that can be played and the range in octaves over which the chord will be played. Since some chords span more than one octave, some chords or arpeggios will overlap. The list of chords available is vast, ranging from standard chords through jazz to regional chords and natural modes such as Lydian and Dorian.

*Chords*

The chords section has no other controls than the ones listed above. When a note down signal is received, that note will be the base for the rest of the chord. All the notes of the chord will play simultaneously until the note is released.

*Arpeggios*

The arpeggios section has a number of extra controls:

- The **direction** that the arpeggio is played in can be selected from up, down, both directions (up then down) and random notes from the chord.
- The **time** (in milliseconds) between each note.
- The **gate** time (as a percentage of the note time above). At 100% gate time, each note will be played for the full time between each note. At less than this, each note will be cut short and the rest will be filled with silence. At more than this, each note will overlap the next note and will finish later than the start of the next.
- The **mode** of playing the arpeggio.
  - In **free** mode, each note will be start an arpeggio when the note starts. If a second note is played later, a second arpeggio will start at that (later) time and play independently of the first.
  - In **sort** mode, no matter when another note is pressed, the arpeggios will be played in the same order, with only one note being played at any one time. For example, if the key for C is played with an ascending Major chord arpeggio, the arpeggio of C-E-G will be played repeatedly. If the key for F is then held down, the arpeggio will play C-E-G-F-A-C one after the other - the arpeggio for C then the arpeggio for F.

– In **sync** mode, any notes held down at the same time will play a chord arpeggio in that interval. To take the above example, when F was held down the arpeggio would play CF-EA-GC repeatedly - the notes C and F simultaneously, then the notes E and A, then the notes G and C.

**The FX tab**

The LADSPA effects allow many ways to control the sound of an instrument. These can vary from simple effects like delays and echos to complex phasers, distortion and reverberation. Effects can also be chained one after the other to produce very complex sounds.

The FX tab looks like this:



In order to enable any effects processing to take place on your instrument, you must enable the FX tab by clicking the 'light' button beside at the top of the tab. This gives you an easy way to check the 'dry' sound of the instrument by itself against the 'wet' sound of the effects in place. The terms **wet** and **dry** are used often in this context.

The effects you select are taken from the list installed on your system, so you must have LADSPA effects installed in order to have them listed here. Click the 'add' button to select a new LADSPA effect to add to the chain. This then gives you several controls over the process of sending sound to and receiving it from the effect:

- The **wet/dry** balance - from 0% wet (i.e. no effect, just instrument) to 100% wet (only effects).

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- The **decay** control sets how much silence must pass before the effect turns off completely. Turning the effect off reduces the amount of CPU time used processing silence and reduces the chance of unwanted noise. However, if the effect turns off too soon it may introduce a 'clipped' sound to the effect: for instance, in the case of a reverb, if the reverb time is longer than the decay time then the reverb will be cut off before it has fully died away.

- The **gate** threshold controls a similar parameter: it sets the level of noise below which the instrument will be considered to be silent. A flanger effect placed on an instrument with a very long fade-out (say a ride cymbal) will be almost inaudible at the end of the tail of the cymbal. Cutting the effect off early may reduce the CPU requirements and the chance of unwanted effect noise being heard.

- The **controls** button displays (or removes) the separate window giving the controls specific to this effect.

For instance, here is the LADSPA 'Freeverb' effect added to the effects list:



Note that some effects will also have ways to set their internal wet/dry level. This sometimes takes the form of a wet/dry knob, but also can be two knobs to set the level of the wet output and the level of the dry, bypassed, output.

To remove an effect, select its context menu and choose 'Remove effect'.

Note that the CPU increase and signal quality change when using effects is mentioned here but should not be exaggerated. In reality, the author has used many instruments each with separate effects and has not noticed any problems with real-time playback on a modest dual-core processor. The CPU levels during such a performance likewise remained very low.

**The MIDI tab**

The MIDI tab looks like this:
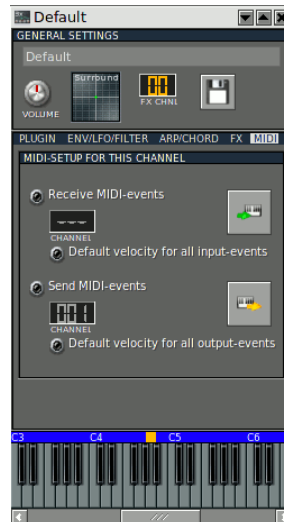


These controls allow you to set which MIDI channel the instrument receives MIDI events on, and which it sends events to. Both these controls work in similar ways:

- Click the **Receive MIDI-events** or **Send MIDI-events** title next to the light to turn the reception or sending of MIDI events on or off.

- The **channel** setting controls which MIDI channel events will be received or sent on.

- The **Default velocity** control clamps all incoming or outgoing notes to once velocity when set.

- The **Device selector** button shows a list of which devices in your system can act as sources or sinks for MIDI events.

### 3.1.4  Piano Keys

At the bottom of the Instrument window is a small section of a piano keyboard. This will display the notes that are playing by greying out the key or keys as they're played.

When the instrument window is selected, you can use the keyboard of your computer to play notes in a two-octave range. This starts from Z at C3 and goes horizontally across the bottom two rows of tke keyboard to M playing B3 - i.e. ZXCVBNM play the natural notes and SDGHJ play the sharps and flats. It continues with Q playing C4 and uses

the top two rows of the keyboard up to P playing E5 - i.e. QWERTYUIOP plays the natural notes and 2356790 play the sharps and flats. In addition, any MIDI keyboard can be used to send MIDI command to this instrument when it's selected.

## Base note

In addition, the orange mark just above the keys shows the 'base note' of the keyboard. Whichever note you select with this orange mark will be played as A4 - i.e. the concert pitch of 440 Hertz. For instance, moving this to A3 will make all the notes played move up by an octave (since A3 is now A4 and so forth). This allows you to adjust an individual instrument to be pitched correctly in relation to all the others. This is mostly unimportant for synthesizers where the A4 note is programmed to be 440Hz. However, for the AudioFileProcessor Plugin, this is extremely useful, as it allows you to adjust the note to be played back at its correct pitch. As an example, if you recorded a saxophone playing a Bb, you would adjust the base note to be Bb so that the saxophone was played in the same pitch as your other instruments.

The scroll bar at the bottom of the screen allows you to move up and down (i.e. left and right) the keyboard to see different ranges of notes.

## 3.2 Working with Samples

### 3.2.1 Samples

Samples are simply recorded audio in compressed or uncompressed form. They can be almost anything, from someone singing or playing a real instrument or an atmospheric recorded effect to the sound of a hand-clap, drum beat or percussion hit. Samples can be used in three fundamental ways - either played as a sound in their own right, played as an instrument, or played as percussion.

### 3.2.2 File formats

Your sound files can be in a number of formats:

- Lossless (large):
    - WAV - Microsoft WAVe format
    - AIFF - Audio Interchange File Format
    - AU - AUdio file format
    - FLAC - Free Lossless Audio Compression
    - RAW PCM samples in a file.
- Lossy (compact):
    - Ogg - Open wavelet compression format
    - MP3 - Layer 3 MPEG audio encoding
    - Speex - An Ogg subformat optimised for speech compression
    - VOC files created using Creative Labs Soundblaster cards
    - DrumSynth (ds) files

### 3.2.3 Samples as sounds

A sample treated just as a sound means that you want to play the sample back at exactly the same pitch and speed it was recorded at. You can put the sample in an AudioFileProcessor Plugin Instrument in the Song Editor and then create a note in the Piano Roll Editor that is the length of the sample. This can take some experimentation to stretch the note out to the length of the sample. By doing this you are also limited to playing only one sample on this track. There is an easier way.

In the Song Editor, you can use the **Add Sample Track** button () to create a track that plays samples. Click on the sample track timeline to create a new segment for

a sample. You can then add a sample into that segment by either double-clicking on the segment (which will display a File Open dialog for you to choose the sample to be played) or by dragging a sample from the Side Bar into the segment. The sample will be played in that segment and the segment will expand to take up the entire length of the sample. You can further crop the segment shorter (to clip sound off the end) by dragging the end of the sample left or right. All the regular actions of the song editor apply to samples.

The Sample Track also allows you to play several different samples in the same track. This is useful if you have recorded a chorus, solo and bridge separately (for example) and want to combine them into the same track. Simply create more than one segment and drop your samples into this.

You can also overlap samples and they will play simultaneously rather than one occluding the other. However, there is no indication in the sample of where the overlaps are, so even though you can put one sample completely over another you will not be able to see the sample underneath unless you actually move the top sample. This can be confusing and is not recommended.

Unlike other music composition programs, these tracks are stereo by default. If you have two mono recordings for the left and right channel and want to include them as a stereo pair, you can add them individually into separate sample tracks. At the moment there is no way to pan each track left or right, however. You may be better off at this stage combining the two tracks into one stereo track in your favourite audio editor.

### 3.2.4  Samples as instruments

Typically, you will use a sample as an instrument when the sample is of an instrument playing a single note and you want to play that note at different pitches to make a melody or harmony line.

In order to create an instrument using a sample, drag the sample from the Samples section of the Side Bar onto the Song Editor. This will create a new track with the sample in an AudioFileProcessor Plugin instrument window, already displayed if you need to change some parameters. Often you might need to change the amplitude, start or end time, or the base note of the sample in order to get the sound right, so having this window opened for you makes this easier. To close it, simply choose its close window or the large instrument button in the Song Editor.

You then create notes and edit them using the Piano Roll Editor.

### 3.2.5 Samples as percussion

A common use of samples is for percussion and repetitive note patterns. To do this, drag the sample from the Side Bar into the Beat + Bassline Editor. You can also double-click on a sample to directly add it to the Beat + Bassline Editor. Like other instruments, the instrument plugin is displayed when the track is opened in case you want to edit any of its parameters.

## 3.3 Composing in the Piano Roll Editor

The Piano Roll Editor is the main workspace for composing melodies.
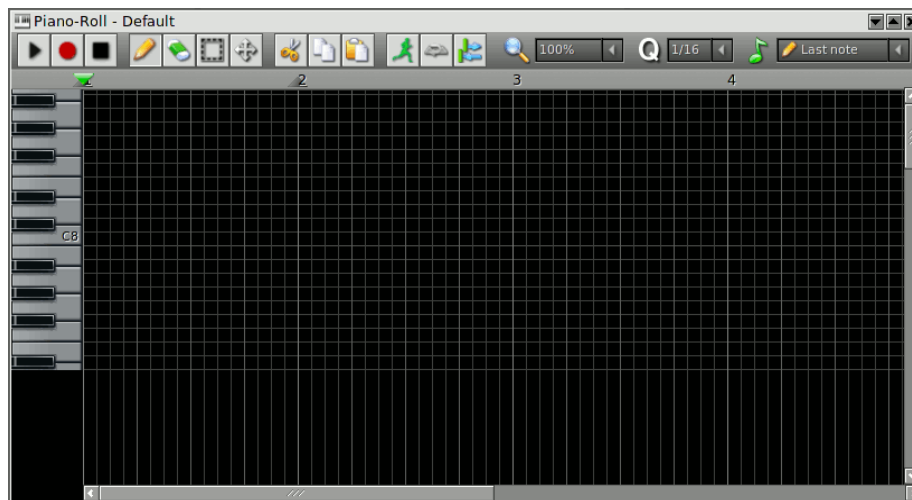


### 3.3.1 Writing Notes

**By mouse**

The standard tool for editing notes in the Piano Roll Editor is the pencil tool (). With this you can create, move, resize and delete notes.

To **create** a note, simply click inside the piano roll grid. The horizontal dark grey will show you which note on the keyboard you are going to be creating, and when you click the instrument will play that note as an aural cue.

The length of the note created is set by the note length control (). By default this is set to use the length of the last note created or edited. This is often

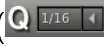convenient when creating many notes of the same length. Alternatively, you can select from a list of standard note lengths, expressed in fractions of a beat.

To **move** a note, drag any part of the note (except the end). You can drag it vertically to change pitch, horizontally to change its start time, or both.

To **resize** a note, drag the end of the note. This simply changes its end 'cut-off' point while keeping the note starting at its original point in time. You cannot change the start time while keeping the note end at its original point in time - to do this you should move the note to its new start time and then resize it to the desired length.

There are two ways of easily creating a much longer note in a series of short ones (or vice versa) and using the 'last note' length setting above. One is to create all the notes of one length first at their correct points in time, and then go back and fill in the longer notes; resizing the first longer note will then set the length. The other way is to create the longer note as a short note, resize it, and then grab the resize handle of a shorter note and resize it to its original length (e.g. move it one quanta shorter and then back).

To **delete** a note, right-click on it. You can also use the eraser tool () - when using this, simply left-click on any note to delete it.

The start time of a note is **quantised** to the fraction of a beat shown in the quantisation selector (). This controls both where a note starts and its length - both have to be multiples of the quantisation setting. It does not affect notes that are already created whose property you are not changing - for instance, with quantisation set to 1/32, you can position a note on an odd 32nd (i.e. not on a vertical 1/16th step line); then, with quantisation set to 1/16, you can resize that note and its end point will be forced to be on an even 32nd without changing the start point. In this example the note would always be an odd number of 32nds in length.

### By keyboard

You can also **record** yourself playing the notes either on a MIDI keyboard or on the computer's keyboard using the record button (). When recording, you will hear a 'click' sound every beat to help you stay in sync with the time signature. It can also be useful to set the quantisation to the minimum your piece requires; so even if you play a little early or late, the note will be placed in the piano roll at the correct time. You may still have to go through and edit the notes (as above) to make sure they're positioned correctly and to remove mistakes.

Once you have finished recording that section, press the **stop** button () or the space bar to stop recording.
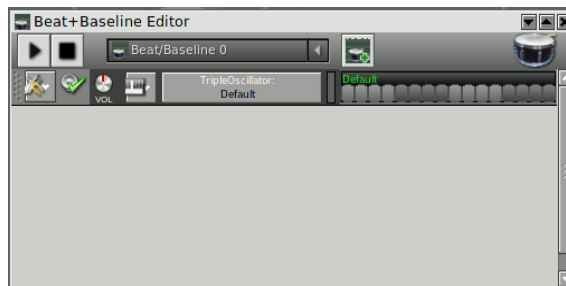
### 3.3.2 Editing Notes

**Copy and paste**

**Note velocities**

## 3.4 Composing Bass Lines and Drum Sequences

Bass lines and drum sequences are repetitive patterns usually lasting one, or occasionally several, bars. They are composed using the Beat + Bassline Editor, shown here:



### 3.4.1 Adding new instruments

Typically you'll be adding samples of drums and instrument notes into the Beat + Bassline Editor. For this reason, simply double-clicking on a sample or preset in the Side Bar will add it directly into the Beat + Bassline Editor. You can also drag samples and presets onto it as well and drop them in the free area at the bottom of the editor window. You can rearrange the order of instruments by dragging tracks by their stippled handle ( ).

### 3.4.2 Composing patterns

Beside each instrument plugin is a display of the beats in a bar, divided up into steps - four steps per beat in a four-beat bar. This resembles the classic interface of the Roland TR-808, with the four beats shaded alternately for easy reference. Pressing the step buttons turns on the note at that particular step of the bar; pressing it again turns it off.

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The best way to get the feel for this is to add a bass or kick drum and a hi-hat to the Beat + Bassline Editor, turn on the first, fifth, ninth and thirteenth steps (i.e. the first step of each beat in the bar) and press the 'play' button (). This will start the rhythm playing at four steady beats in a bar. Then you can turn buttons on and off on each instrument *while the rhythm is playing* to get a feel for the sound of that rhythm. This will give you an intuitive feel for the sound of the rhythm based on when the notes are played, and is the best way to refine a pattern.

### More than one pattern

This has all taken place in the first of what will be many separate patterns in your song. This is called 'Beat/Bassline 1' in the Song Editor and in the pattern selector of the Beat + Bassline Editor. You can create a new pattern using the **new bassline** button () and it will be named incrementally from there. You can also rename these patterns by right-clicking on their name in the Song Editor and typing in a new name. This is often useful to more specifically identify what the pattern is for future editing.

### 3.4.3 Philosophies of pattern design

There are several schools of thought to pattern design, usually stemming from the kind of software one has used previously. To illustrate the differences, imagine a typical 4/4 'trance' rhythm (the 'oontz-oontz-oontz-oontz' style: kick-snare-kick-snare-kick-snare-kick-snare) and a variation on that style with two snare hits instead of one at the end of the bar.

### One pattern per bar structure

This is probably the most common style of pattern in use. Each separate pattern includes beats for all the instruments it uses. In our example, you would have one pattern containing the kick-snare-kick-snare-kick-snare-kick-snare and one containing the kick-snare-kick-snare-kick-snare-kick-snare*snare*.

### Pattern and variations

Once again we have two patterns in our example. The key change here is that the variation pattern *only* includes the snare hit on the last sixteenth of the bar. In order to get the complete variation pattern, we sequence both the rhythm and the variation *together* in the Song Editor.

### One pattern per instrument

We now change our philosophy significantly by having three separate patterns. One contains just the kick drum, common to both the rhythm and variation. The second contains just the snare drum for the rhythm, and the third contains just the snare for the variation. Once again, in order to get the complete effect you sequence the tracks together in the Song Editor.

**Which is best?**

There are advantages and disadvantages to each of the above approaches:

- The first makes logical sense considered from a musical notation point of view, and is often easier to see the integration of all the instruments in the rhythm. For instance, you will get a clearer picture of whether two instruments play on the same sixteenth using this method.

- However, the first means that you have to reprogram the entire rhythm for each minor variation. It is often much quicker to simply program that second pattern to contain only the notes that vary. On the other hand, this does not allow you to take out notes that are already in the 'base' pattern.

- This might logically suggest that a further break-down into common sections and their variations.

- The 'one instrument per pattern' method is the logical extension of this. While it is often harder to compose the instruments individually, it is easy to combine them in new and novel ways in the Song Editor.

- Adding more tracks to separate out these individual differences, however, may make the rhythm tracks harder to manage and combine together.

- On the other hand, it often feels tiring to create yet another drum track for another slight variation in the rhythm, even when this might sound significantly better. The temptation to reuse what is already there even if it sounds boring is one of the great causes of songs sounding dispirited and ordinary.

Ultimately, like so many things in the artistic world it is better to use the methods you are familiar with than to struggle with a way that someone else considers 'correct'. For beginners I would recommend starting with the first or second methods until you have established a clear preference. It is also very useful to pick and choose from the methods here as the situation dictates.

### 3.4.4 Putting patterns into your song

Naturally, the patterns by themselves do not create rhythms in your songs. Using the editing tools in the Song Editor, you 'draw' new areas for the rhythm to be active at

any time in your song. This also allows you to have a pattern that goes for a fraction of a bar (using the drag-with-control method); however, you cannot shrink a pattern to be less than the size of one bar.

### 3.4.5  More than one bar?

Sometimes you have a rhythm that that is two bars long; or one that repeats not every bar, but every two bars. Sometimes it might make sense to create two patterns ('rhythm 1' and 'rhythm 2', for example) and alternate their use in the Song Editor. However, LMMS caters specifically for this by allowing you to create patterns that are more than one bar long.

Simply right-click on the pattern buttons and choose the number of bars you want to add in the **Add Steps** submenu of the pattern's context menu. This will allow you to increase the number of bars that *this specific pattern* takes. Instruments that are not set to have this many steps will repeat every bar. You can likewise remove steps using the **Remove Steps** submenu if you've changed your mind.

When adding a new pattern that is more than one bar long in the Song Editor, the initial pattern 'block' size will the same number of bars as the pattern. However, once created, you can shrink or enlarge this in multiples of a single bar, thus allowing you to cut a multiple-bar pattern in mid-pattern. The 'repeat' marks in these bars will be displayed at multiples of the pattern length, for easy identification.

### 3.4.6  Not just the same note?

The Beat + Bassline Editor can also be used to play instruments, not just drum samples. This is where the word 'bassline' in the title comes from - it is commonly used to play the repetitive notes of a typical bassline in electronic music. This saves a lot of the copy and paste process that would be required if you were composing for the instrument directly in a track of the Song Editor.

Using the standard pattern buttons as above, the sample will play its base note. However, sometimes you will have a repetitive bassline that does not play the same note all the time. In this situation, right-click on the pattern buttons and choose **Open in piano-roll**. This will open the Piano Roll Editor with a new pattern. This pattern, too, can be any length (not just a single bar).

Putting notes in a piano roll is also useful for times when you need more notes, or more accuracy in placement, than the sixteen steps per bar of the Beat + Bassline Editor can give you. It also allows you to vary the volume of each note.

## 3.5 Putting the song together

You use the Song Editor to link the various sounds, rhythms and melodies together into a complete performance.
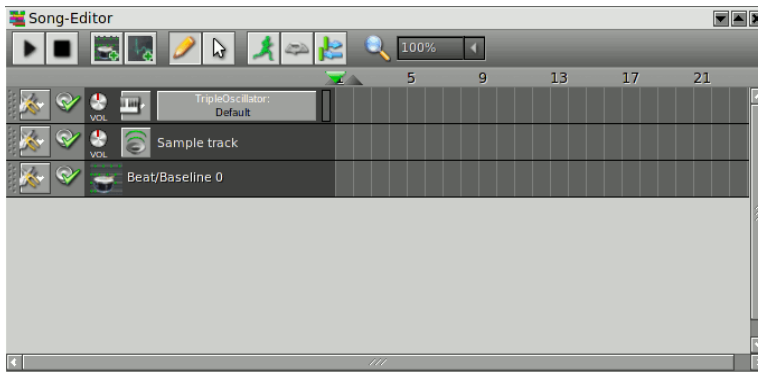


### 3.5.1 Track types

The fundamental unit that you work with in the Song Editor is a track. Each track is a row in the song editor window; the left part of the track controls the type of track and the right part displays when sounds are going to be created by that track. This sounds like a generalisation, because it is - tracks can be of a number of different types, and each type of track has a different way of working.

#### Sample Tracks

Typically, sample tracks are used to include recordings of singers or instruments playing a melody line. This allows you to have live musicians alongside the music in your LMMS projects. However, as yet there are no facilities to trim the start of the sample, or to tune it or scale it to fit with the bars in your music. These should be done in an audio editing program such as Audacity beforehand.

Sample tracks are the simplest type of track because they only have a volume control and an effects chain.

#### Bassline Tracks

#### Instrument Tracks

## 3.6  Working with Automation

*(There is no content for the page 'Working with Automation')*

## 3.7  Working with LADSPA effects

*(There is no content for the page 'Working with LADSPA effects')*

## 3.8  Using MIDI

*(There is no content for the page 'Using MIDI')*

## 3.9  Exporting the finished product

*(There is no content for the page 'Exporting the finished product')*

# 4  Reference

A reference style description of the functions of each menu item and tool, including how it fits in with the tasks in the Using LMMS section.

## 4.1  Main Menu Bar

The main menu bar gives you various options to control the overall functioning of LMMS:

Project  Edit  Settings  Tools  Help
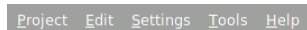
### 4.1.1  Project Menu

The Project menu allows you to load, save and export projects and import MIDI files.

- **New** creates a new project.
- **Open** gives you a dialog to choose an existing project file to open.
- **Recently opened Projects** opens up a submenu listing all the recent project files you have opened, so that you can easily open a project you were recently working on. This does not include a project that you have just created and saved, so you have to open the project at least once before it will show up in this menu.
- **Save** saves the current project if it has already been saved. If not it functions as if you had chosen 'Save as'.
- **Save As** gives you a dialog to choose a (new) location and name to save your project in.
- **Import** allows you to import MIDI and other files as new instrument lines.
- **Export** allows you to export your song as an uncompressed WAV file or compressed OGG file. No MP3 file export support is planned. Once you have chosen a name and location to save the file, you then get presented with a dialog:
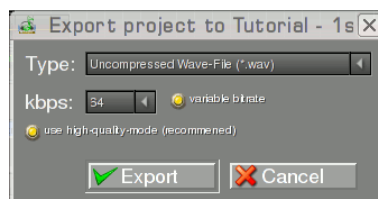
This allows you to choose the format of the file and, for OGG files, the bit rate and bit rate management method (these settings are ignored for WAV files). Please note that, at this stage, the format chosen here and the extension you used on the file in the export file dialog are not synchronised automatically - you must set them the same manually to end up with a file which is named correctly for its content. You can also choose whether to use the High Quality Mode when performing the song.

On pressing 'OK' the song will be performed from where the playback point was last set. To get the entire song exported you should check that the playback mark is at the start of the song before exporting it.

- **Quit** exits LMMS. You will be asked if you want to save your project if you have done any work on it since the last save or since you created it.

### 4.1.2  Edit Menu

The two options typically in this menu are **Undo** and **Redo**. These can be also accessed by pressing the common keys Ctrl-Z and Shift-Ctrl-Z, respectively. They allow you to step backward, or forward, through a history of edits to your project, reversing mistaken actions or re-applying them.

In this version the undo feature only works correctly for some forms of editing. In particular, in the Piano Roll Editor the bulk move, copy and paste facilities using the selection tool and/or clipboard do not get undone or redone correctly. The developers are aware of this problem and are working on a fix in a future version.

### 4.1.3  Settings Menu

These two menu items allow you various ways to configure how LMMS works. **Show settings dialog** gives you a full display of all the configurable options in LMMS, while **Show setup wizard** will walk you through configuring the most popular options in LMMS. For more details on these see the LMMS Settings documentation.

### 4.1.4  Tools Menu

The only option currently in this menu is the **Live Tool**. The Live Tool can be used to control instruments during a performance, but is also useful when previewing a mix checking the levels of various instruments. When it is open, pressing F1 - F10 will mute

or unmute the first ten instruments in the Beat + Bassline Editor and the Space bar
will toggle playback in the Song Editor.

### 4.1.5  Help Menu

There are three items in the Help menu.

- **Help** is planned to show a complete help system.  However, at this stage this
  option will only display a message saying no help is available and referring you to
  this site.

- **What's This?** changes your cursor into a help cursor.  When you click on any
  part of a LMMS window, you will then see the contextual help for this item.  Much
  of the help is in place but some items are still awaiting text being written for them.

- **About** gives you a dialog which lists the LMMS project's home page, its key
  developers, translation information if you are using LMMS in a language other
  than English, and the GNU GPL license that the software is released under.

## 4.2  Tool Bar

The Tool Bar is at the top of the window, permanently underneath the Main Menu Bar.
It looks like this:



### 4.2.1  File Controls

The first four buttons in the top row deal with opening and saving files.

The **New Project** button (⬚) creates a new song.  By clicking on the drop-down
symbol on the right hand side of the icon, you will get a list of pre-set templates that
can be used to fill out your new song with instruments and configure it ready for work.

The **Open Project** button (⬚) opens an existing song file in your LMMS Working
Directory.

The **Save Project** button (⬚) saves the current project. If you have not yet saved the
project you will be prompted for a name and location to save it.

The **Export Project** button (⊞) exports the current project as a WAV or OGG file. It will export it from the current play location in the Song Editor so be sure to set the play location to the first bar if you want the entire song exported.

### 4.2.2 Window Controls

The five buttons at the left of the bottom row shows or hides various windows. When clicked, the action depends on the location of the corresponding window. If the window selected is not at the front of the LMMS window, it is brought to the front. If it is at the front, it is closed. If it is closed, it is opened and brought to the front. The contents of the window do not disappear when the window is closed.

The **Beat + Bassline Editor Window** button (▣) shows or hides the Beat + Bassline Editor.

The **Piano Roll Editor Window** button (▣) shows or hides the Piano Roll Editor. You cannot edit in this window, however - you must double-click a piano roll segment in order to edit it. The window will then display automatically.

The **Song Editor Window** button (▣) shows or hides the Song Editor.

The **Automation Window** button (▣) shows or hides the Automation Editor. Like the Piano Roll Editor, this does nothing as is; open the automation of a particular control using its context menu to open the automation of that control.

The **Project Notes** button (▣) shows or hides the Project Notes window.

### 4.2.3 Tempo Control

The current **tempo** (▣) is shown in orange 7-segment numerals. This is a standard control, so it can be changed by dragging up and down inside it and it can be automated from its context menu.

### 4.2.4 Sound Quality Controls

Beneath the tempo control are two controls that set the quality of the sound produced by LMMS.

The **High Quality** button (▣) turns on use of higher precision mathematics in all the

instruments. This will generally increase the quality of the sound - reducing artifacts and obvious clipping - at the expense of increased CPU usage. It may also alter the sound of some LADSPA effects, particularly reverbs.

The **Auto Limit** button () activates a soft limiting function that prevents the sound from hitting the maximum or minimum extents of the 16-bit precision of a WAV file. This can make some sounds softer but will avoid having clipping if a chance resonance or constructive interference should occur during your song.

### 4.2.5 Volume and Pitch Controls

To the right of the tempo control are the master volume and pitch controls.

The **Master Volume** control () sets the master volume for the entire song.

The **Master Pitch** control () sets the 'root' note on which every other note in the song is based. Turn this down to make the piece play at a lower pitch, and vice versa. This can be useful if you have programmed a reproduction of another song to be in a certain key and, upon checking it against the original, find the original to be in a different key.

### 4.2.6 Wave and CPU Usage Display

Finally, the **Wave / CPU Display** () displays the current waveform being played during playback and the current CPU usage of all the LMMS instruments, effects and sequencing. You can turn the wave display off or on by clicking it, although this does little to reduce CPU usage.

## 4.3  Side Bar

The Side Bar is permanently attached to the left-hand side of the window. It has two modes, retracted and extended. In retracted mode it looks like this:
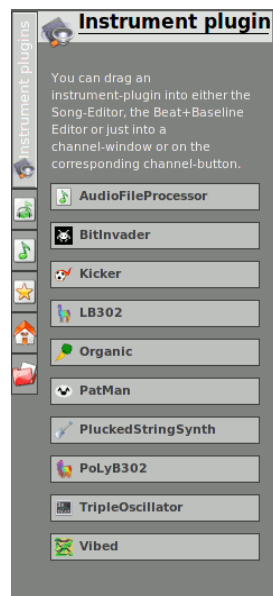
It has six sections that provide easy access to the variety of files and presets that you will use in LMMS. When you click on any one section label, the side bar will extend and show you the contents of that section.

## 4.3.1  Instrument Plugins

When you click on the Instrument Plugin button (), the sidebar expands to show you the available instrument plugins:



By default, no instrument plugin is selected.  When you hover the mouse over one, its box will expand to include a description of the plugin in question, like so:
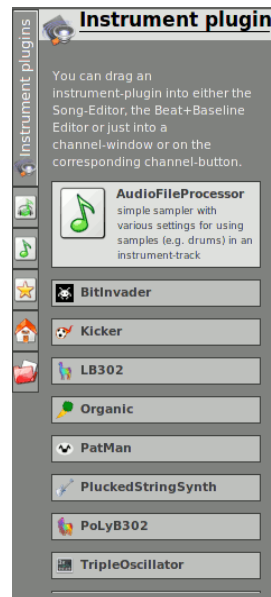
You can then drag an instrument plugin to either the Song Editor or the Beat + Bassline Editor, or double-click an instrument plugin label to add it directly to the Beat + Bassline Editor.

—-

In all sections but the Instrument Plugins section, the listing you get functions like a directory tree listing. Folders are marked with an folder icon. If you double-click on a folder, it opens and displays its contents indented to the right of the folder name. To close it again, double-click on the folder name again.

These folders match the directories on your own computer, allowing you a convenient way to group sounds and presets both on your hard disk and in LMMS.

### 4.3.2 Projects

### 4.3.3 Samples

### 4.3.4 Presets

### 4.3.5 Home Directory

### 4.3.6 Root File System

## 4.4 Plugins

This is the current list of instrument plugins, and links to their specific sections in the documentation:

### 4.4.1 Available Plugins

- AudioFileProcessor Plugin - playing audio files.
- BitInvader Plugin - 'simple and dirty' wavetable synthesis.
- Kicker Plugin - drum synthesis.
- LB302 Plugin - a monophonic implementation of the TB303 sound.
- Organic Plugin - an additive organ synthesizer.
- PatMan Plugin - a GUS-compatible patch instrument.
- SingerBot Plugin - a 'singing' sound synthesizer.
- TripleOscillator Plugin - the 'standard' synthesis module.
- VeSTige Plugin - VSTi-hosting plugin (only available on i386)
- Vibed Plugin - powerful vibrating-string synthesis module.

## 4.5 Song Editor

The Song Editor displays the structure of your song.
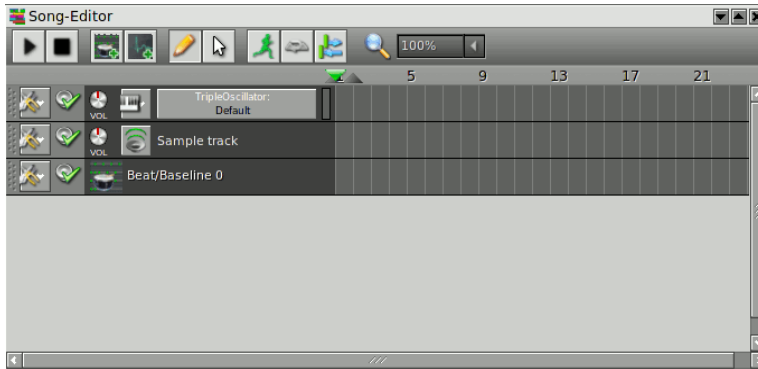
Down the left-hand side of the window are listed the instrument and beat/bassline tracks available; on the right of these is listed the activity of each track at each bar in the song. For beat lines this is simply a block showing that the beat/bassline is active; Instruments will have a small display of the notes in a piano roll. Double-clicking on this small note display will bring up the Piano Roll editor for that instrument at that point in time.

### 4.5.1 Tracks

#### The anatomy of a track

Each track has a section on the left hand side that shows the track tools and settings. The right hand side displays the segments of audio that the track will play over time. The right hand side scrolls left and right to show you a window of time from the song; the whole song editor scrolls up and down to show you the various tracks.

Each track's activity is divided into **segments**. For instrument tracks, these display a miniature piano roll; for beat-bassline tracks it simply displayed a filled (shaded) coloured bar for the length of the beat or bassline; for sample tracks it displays a miniature wave display of the sample.

#### Adding new tracks

You can add new instrument track to the song editor by dragging them from the Side Bar. The instrument's plugin will be displayed, allowing you to make any changes you need to the sound of the instrument. You can dispel this plugin display by using its close button or by clicking on the instrument name button in the song editor.

To add a new beat or bassline track, click the **add beat/bassline** button (  ) to add a new bassline. Alternatively, you can open the Beat + Bassline Editor and click the **add beat/bassline** button (same symbol) to the right of the bassline selector. You can

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then right-click on the name of the beat/bassline in the song editor in order to rename it to something more identifiable.

To add a new sample track, click the **add sample-track** button () to add a new sample track.

Note that there is no button allowing you to add a new instrument track. This is because you would have to select a plugin for the instrument before the track was created, and this is far easier to do by tradding the correct plugin or preset from the Side Bar.

## Working with existing tracks

### Moving tracks

You can drag instruments and beat/bassline tracks up and down in order to organise them by dragging the stippled handle on the left-hand side of the instrument line. You can also change the colour of the track by right-clicking on a segment of the track and choosing 'Change color' from the drop-down menu, allowing you to easily see track groupings. You can also change the icon of the track to more accurately reflect what instrument it is. The button next to the stippled handle is a drop-down menu for the track controls, allowing you to clone or remove the track.
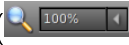
### Resizing tracks

By holding down the **shift** key and dragging in a track, you can resize the height of a track. This can be very useful for sample tracks when you need to see more precision in the sample.

### Scrolling around

The scroll bars at the right and bottom of the window allow you to move the segment view around. You can also hold down **shift** and use the mouse wheel to scroll horizontally.

### Zooming in and out

The zoom control () allows you to choose a magnification control for the segment area. Larger magnifications will show detail more clearly, and smaller magnifications will allow you to see more of the playback. You can also hold down **ctrl** and use the mose wheel to control the zoom setting.

## Working with Segments

Despite their different content, the ways of working with segments are mostly similar. Most of the work with segments is done using the edit tool (✏).

*The Edit Tool*

To **create a new segment**, simply left-click on the track activity inside the bar in which you want the segment to start. For instrument and sample tracks, this creates a blank area to put notes or samples in. For beat and bassline tracks, this creates one bar filled with the bassline as programmed.

To **move a segment**, simply drag it around by clicking and holding anywhere inside the segment. Normally this will lock to the start of the bar, but you can free drag (with a 1/64th resolution) the segment by pressing the *control* key down *once you have started dragging*.

To **copy a segment**, simply hold the *control* key down *before you click* and then drag the segment to its copies' new location. You can also right-click on the segment, choose *copy* from the context menu, click to create a new sample where you want the copy to go, right click and choose *paste* from the menu. You can't copy segments of one type to tracks of another type, however. To copy more than once, the control key has to be released and re-pressed before the next drag operation.

To **delete a segment**, click on it using the middle mouse button or right-click on it and choose 'delete' from the context menu.

Double-clicking on a segment aims to **edit the segment's contents**. If you double-click on an instrument track segment, the Piano Roll Editor window will open and the notes in that segment will be displayed for editing. If you double-click on a sample track segment, a file open dialog will display allowing you to choose a new sample for that segment. If you double-click on a beat or bassline segment, the Beat + Bassline Editor window will open and that beat or bassline will be displayed.

*The Move Tool*

The **Move** tool (🔲) allows you to select a rectangular region of the segments in the tracks and move them as a group.

In addition, you can use **Shift-Insert** and **Shift-Delete** to move all the segments in the song forward or backward one bar at a time. Effectively, Shift-Insert inserts a new bar at the start of the piece and Shift-Delete removes a bar. Segments that are already at the first bar will not be deleted but other later segments will still move up.

### 4.5.2  The Song Editor toolbar

The Song Editor window has a toolbar that allows you to control playback of the song, add new tracks, choose edit tools, customise the method of playback, and control the view of the song.

- The **Play** button (▶) starts playback at the current cursor point.

- The **Stop** button (■) stops playback if it has been started and moves the cursor depending on what mode you have chosen in the play control tool (see below).

- While the song is playing, you can use the **Pause** button (❚❚) to halt playback without moving the cursor.

- The **Add Bassline Track** button (⊞) allows you to add a new beat / bassline track.

- The **Add Sample Track** button (⊞) allows you to add a new sample track, and not to add a new penguin as you may have suspected. Penguins can only be added to LMMS in audio form.

- The **Edit** tool (✎) is the main tool used in the Song Editor. You use it to create segments in tracks (see above).

- The **Move** tool (▧) allows you to select regions of segments and move them around as one group (see above).

The next three buttons control various aspects of playback.

- The **Autoscroll** button (🏃), then the window position will not follow the playback point during playback.

- The **Loop** button (🔁), the loop points are turned on and playback will loop continuously between the start and end loop points. This can be useful when testing a particular section of your piece, but it only exists as a playback mode, not as a way to repeat a section a certain number of times.

- The **Return** button controls the way the playback position moves after you halt playback using the stop button (see above). It has three modes:
  - **To Start** (⏮) - by default, the playback position will return to the start of the song.
  - **To Before** (⏮) - when in this mode, the playback position will return to the position that it previously started from. This will usually be where you last placed the playback position.
  - **Continue** (⏭) - in this mode, the playback position will not be moved and playback will commence from where it is stopped.

- The final control is the **Zoom** control (). Setting this allows you to control how much detail is shown in the view of the track segments. The larger this is, the more detail you see; the smaller it is, the more of the song you see in the view. You can also hold down **ctrl** and use the mouse wheel to zoom in and out.

### 4.5.3  The Track Settings bar

To the left of the track's activity is a set of buttons and controls that allow you to work with the track as a whole.

The grey stippled area immediately at the left of the track () is the **grab bar**. This allows you to grab the track and drag it up and down in the order of tracks. This is very useful since new tracks are, by default, created at the bottom of the track list and you may be adding a track that is logically connected with tracks near the top.

Next appears the **track tools menu** icon (). This displays a drop-down menu with two options: **clone track** and **remove track**. Cloning a track makes an exact copy of the track and its contents and pastes them at the bottom of the track list. Hopefully it won't be necessary to explain what removing a track does. :-)

After this is the **mute control** (). This allows you to turn off the sound of this track temporarily. This is useful, for example, when you want to hear the sound of an accompanying instrument without the lead instrument. Right clicking on the track gives you the option to automate the muting process on the track, although this is strongly discouraged in preference to automating the volume control. Once the automation menu is displayed, right-clicking *again* on the control (which will require you to move your mouse slightly to the left) will toggle all the track mute buttons - in other words, all tracks 'on' will be turned 'off' and vice versa.

The rest of the track settings displays the **sound source** information. This varies between instrument tracks, sample tracks and beat/bassline tracks.

For instrument tracks you get a volume control ().

For sample tracks you get a volume control (likewise also automatable), a button which allows you to set up effects on the samples in the track, and the name of the sample track (which can be edited by right-clicking on it).

For beat / bassline tracks, you get an graphic displaying the content of the pattern (clicking on this gives you a file open dialog open to a directory of icons to allow you to choose an icon which reflects the content of the track) and the pattern's name (likewise

editable with a right-click).

At the far right of the sound source there is an **activity bar** ((▮) which lights up when the instrument is actually playing.

### 4.5.4  The Track Context menu

The track context menu appears when you right-click on a segment of a track's activity. The options presented depend on which type of track it is.

**Instrument Tracks**

The instrument track context menu looks like this:
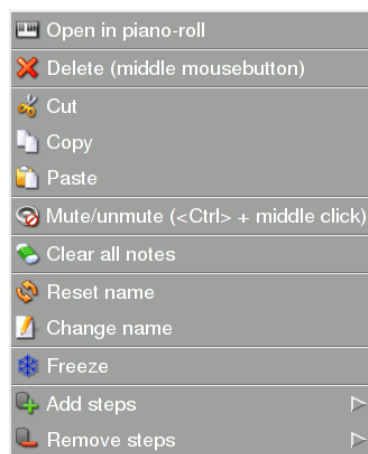


This gives you the most options of all the song editor context menus.

**Open in piano-roll** opens the clicked-on segment in the Piano Roll Editor (strangely enough).

**Delete** deletes the clicked-on segment.

**Cut** removes the clicked-on segment and puts it in the clipboard.

**Copy** takes a copy of the clicked-on segment and puts it in the clipboard.

**Paste** pastes the contents of the clipboard into this segment, overwriting its previous contents.

**Mute/Unmute** allows you to turn sound off or on for this track while editing it. This does not affect the set volume of the track, but acts like the 'mute' button on a mixing desk.

**Clear all notes** allows you to erase the contents of the clicked-on segment without deleting the segment itself.

Normally the name of the instrument is given to the segment. This is copied and pasted with the contents of the segment, so you can see the original source of this segment. **Reset name** allows you to reset that name to the name of the instrument plugin of the track, and **Change name** allows you to edit it manually.

**Freeze** allows you to freeze the sound of this track by creating a pre-rendered sample of the track alone. This then cuts down on the workload of rendering this track, which may be useful on lower-powered systems or tracks with complex effects and melodies. You can edit the track's contents while the track is frozen, but the edits do not take effect until it is thawed or refrozen.

**Add steps** and **Remove Steps** allow you to add or remove a number steps (equal to a 16th note) selected from a submenu to the end of a pattern. This is similar to the same option in the Beat + Bassline Editor but seems to have little purpose here.
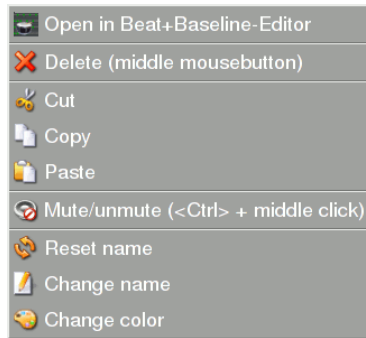
## Sample Tracks

The sample track context menu looks like this:
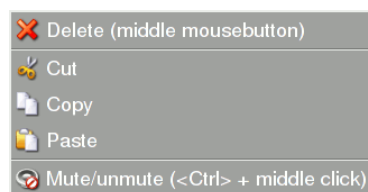


The actions of each option are essentially the same as those for the instrument track above.

## Bassline Tracks

The bassline track context menu looks like this:

The actions of each option are essentially the same as those for the instrument track above. The only addition is:

**Change color** allows you to change the colour of the bassline track. This allows you to coordinate the function or content of the tracks by their colour, allowing you to quickly work out which bassline in a complex rhythm section you are dealing with.

## 4.6 Piano Roll Editor

The Piano Roll Editor is the main method of working with melodies and harmonies.

It can be accessed by double-clicking a track segment created in an instrument track (e.g. ), but this does not open any piano roll in particular and you will not be able to add notes. A message will be displayed in the window telling you to double-click in a track segment first.

The piano roll editor looks like this:
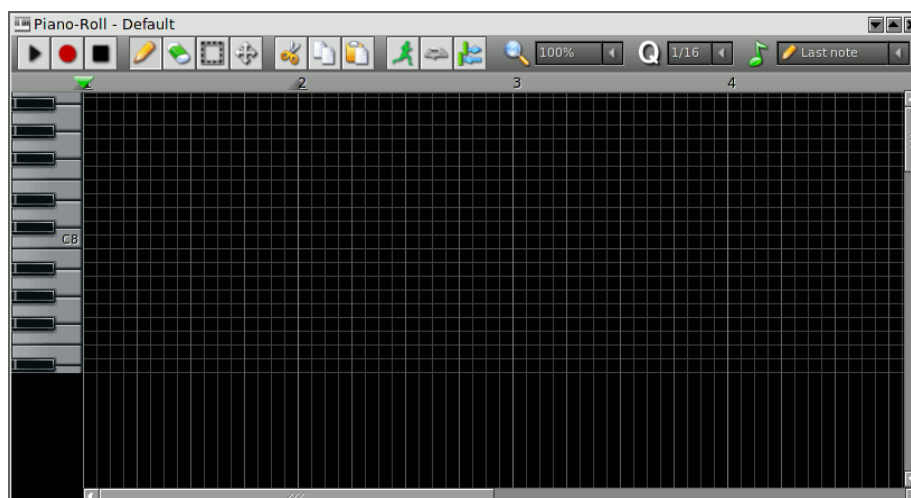
### 4.6.1  Tool Bar

The Piano Roll toolbar looks like this:

Many of the tools are similar to those found in the Song Editor but there are several important additions. In addition, there are slight but key changes in the way editing is done in the Piano Roll Editor. At this stage it means learning two slightly incompatible editing styles.

### Playback

The playback controls look like:

This gives you the standard play and stop controls, with the addition of a **record** button. Pressing this will start recording the notes you play on a MIDI keyboard or your computer's keyboard (see the Piano Keys section for more details). Press **stop** to stop recording. You can also press the space bar to toggle between play and stop (which also works when recording).

### Editing

The editing tools look like:

This is where the key difference between editing in the Piano Roll and in the Song Editor comes in. The four tools you have **create** notes, **erase** notes, draw **selections** and **move** selections. The behaviour of the create and erase tools will be detailed in the 4.6.3 at page 57 section below.

The selection tools allow you to move areas of notes around, as well as cutting and copying areas of notes using the clipboard (see below). Use the selection tool to draw rectangular areas on the piano roll, and notes whose start falls within that area will be selected. You can then move these notes by selecting the move tool and dragging any selected note. You can move notes both earlier (left) or later (right) in time, but up and down in pitch as well. The selection cannot go past the front of the rectangle selected, however, so it often help to leave little extra space on the left side of the drawn area. It may also help that when the move tool is selected, you can drag on any part of the piano roll to move the notes, not just inside the selection.

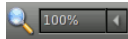### Clipboard

The clipboard tools look like:

The selection tools above also allow you to cut, copy and paste areas of notes. There are several minor 'gotchas' at of revision 0.3.1, however:

- The place notes are pasted is often not the same as the place notes are copied or cut from. It seems reliable when the start of the region is within the first bar, but from there it's a bit random.

- The notes you've just pasted are not selected.

**Playback Control**

The playback control tools look like: These have essentially the same function as the same tools in the Song Editor.
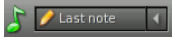
**Zoom**

You can alter the size of a bar as displayed on screen by choosing a magnification from the zoom control:

**Quantisation**

The current quantisation setting is displayed in a drop-down menu: This allows you to set the minimum 'step' of the start or length of each note when recording, or when using the pencil tool.

**Note Length**

The current note length setting is displayed in a drop-down menu: This controls the length of notes made with the creation tool. You can either specify a given note length, or specify that the next note will be the same length as the last note.

### 4.6.2 Keyboard

Below the tool bar on the left-hand side of the window is the keyboard. This shows a segment of a keyboard, seen side-on, that relates to the notes displayed in the piano roll.

This can be scrolled up and down using the scroll bar on the right-hand side of the piano roll, or by using the scroll wheel on your mouse. You can also click on this to play the corresponding note.

The main area of the Piano Roll Editor is the note area:
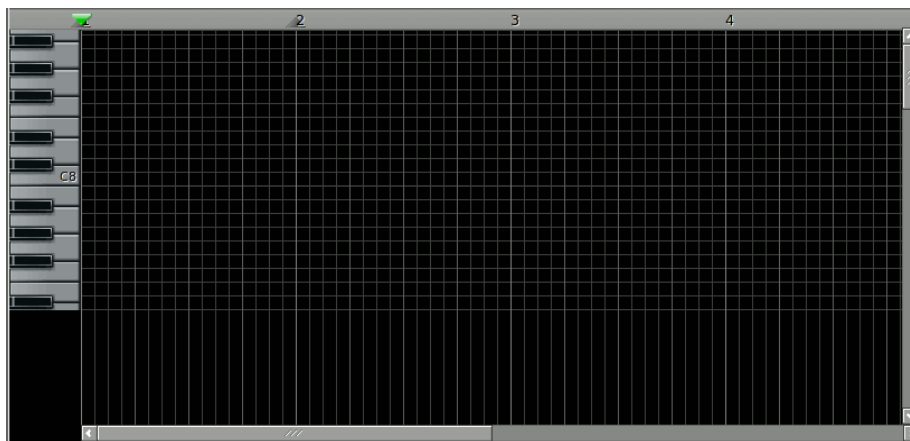
### 4.6.3 Notes

### 4.6.4 Velocities

## 4.7 Beat Bassline Editor

The Beat + Bassline Editor is the main mechanism for sequencing rhythms and repetitive musical lines in LMMS. It looks like this:
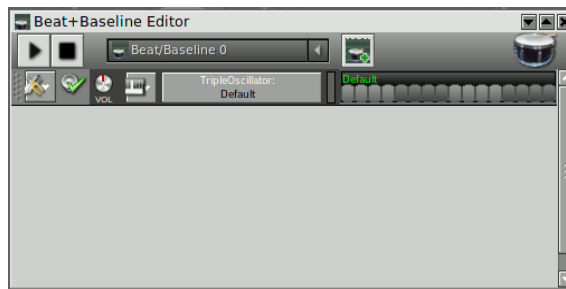


### 4.7.1 Tool Bar

The tool bar of the Beat + Bassline Editor looks like this:
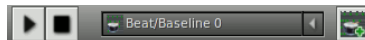


The **play** and **stop** buttons (▶) allowing you to pause the playback rather than stop it entirely. Stopping the playback returns you to the first step in the pattern, pause will allow you to continue from the step last played.

The next drop-down menu ( Beat/Baseline 0 ) allows you to select the **bassline** to edit. It displays the current bassline being edited.

The **new bassline** button ( ) creates a new bassline, incrementally numbered from "Beat/Bassline 0" up. This can (and should) be renamed in the Song Editor to make it easier to identify which pattern you are editing.

### 4.7.2 Instrument Track

Each instrument added to the Beat + Bassline Editor is listed in a bar looking like this:
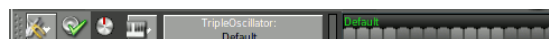
**Instrument Settings**

The instrument settings are very similar to the Song Editor's track settings bar. This gives you a way to move the instrument up and down in the order, clone or remove the instrument, change or automate the volume, and set the instrument's plugin settings.

**Steps**

To the right are shown sixteen steps, four to each beat in a four-beat bar. Each step is a button that can be turned on and off. When a step is turned on, the sound from the instrument will play at that step in the bar. The four steps in each beats are shaded alternately light and dark to make them easier to pick quickly.

**Adding and removing steps**

It is possible to add steps to and remove steps from the step display. This simply adds an extra bar (or more) and puts steps in that, so it does not change the tempo of the beats currently in the track or the duration of each step. You cannot remove steps so that there would be less than sixteen steps. Though it is possible to add or remove steps in increments of one, two, four, eight or sixteen, it makes little sense to add less than sixteen at a time.

### 4.7.3 Context Menu

Right-clicking on the steps for a track gives you a context menu for that track:
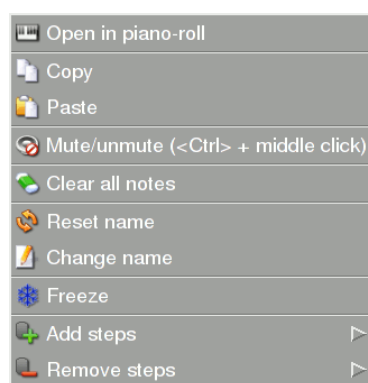


**Open in piano-roll** allows you to edit the notes of a pattern in the Piano Roll Editor rather than just as steps. This allows you to place notes with more than 1/16th precision, and to vary the pitch, length and volume of the notes.

**Copy** and **Paste** allow you to copy a set of steps from one track to another, by copying the original track's steps, right-clicking on the new track and choosing Paste.

**Mute/Unmute** allows you to quickly mute or unmute the entire instrument in all patterns.

**Clear all notes** allows you to quickly erase the steps in this track.

**Change Name** allow you to change the name of this track from its default of the instrument plugin or sample you loaded. **Reset Name** resets it back to this default.

**Freeze** allows you to pre-render the sound of this track. This requires much less CPU time to render the sound of the track compared to playing the same sounds in real time each time. While the track is frozen, changes to it do not take effect. You can thaw a track while playing, but can only refreeze it when playback is stopped.

**Add steps** and **Remove steps** allow you to add steps to or remove steps from the bar. See above for a more complete description.

## 4.8  Automation Editor

The Automation Editor allows you to control the absolute value of any automatable control at any point in time during the performance. This allows you everything from very simple effects like turning the volume on an instrument up at the start of the song, to very complex manipulation of the envelopes or filters of the instrument itself. Even the controls in LADSPA Effects can be automated!

### 4.8.1  The window itself

When opened using the Automation Editor button (), the main window looks like this:
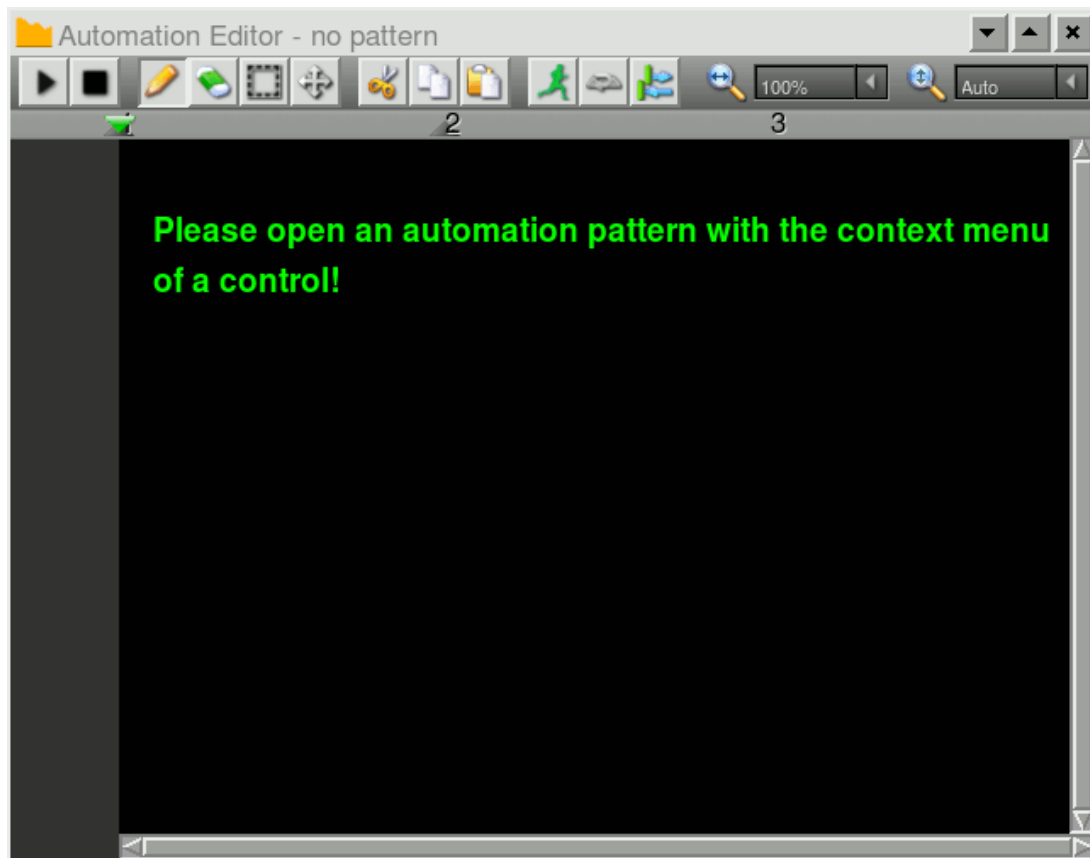
This is because the content of the automation has to be applied to an actual control. As the text suggests, you need to right-click on a control in order to edit the automation for that control.

### 4.8.2  What can be automated?

To automate a control, right-click on it and select **Open in automation editor** from the context menu.

The following controls allow you to automate them:

- Almost any knob (e.g. ▣).
- The BPM display (▣).
- Any other control that features seven-segment numeric LED display (e.g. ▣).
- The Instrument plugin's sound position pan and fade (i.e. X and Y axes) (▣) independently.

• The mute control on any instrument ( ).

### 4.8.3  Editing automation

This is a typical view of the automation window:
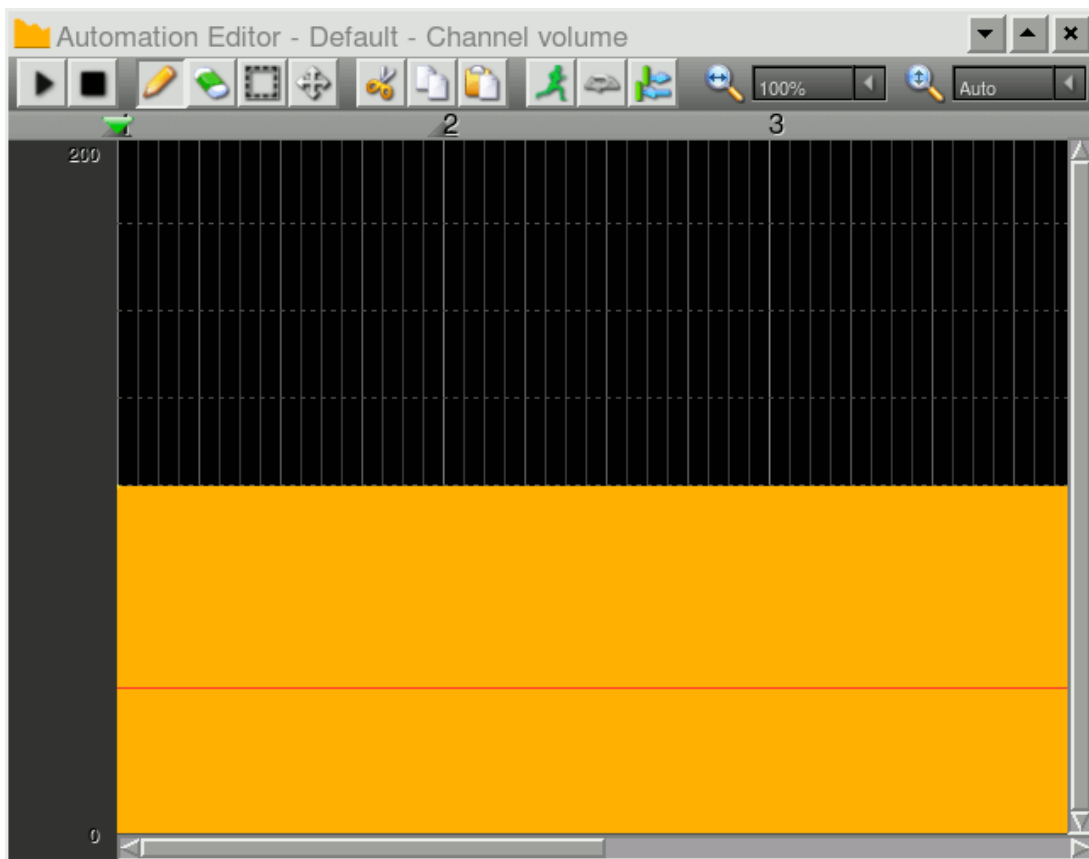


The window title **Default - Channel volume** tells you that this is editing the volume channel of the Default instrument plugin.

In the main part of the window we have a graph of the value of the control over time. The time is listed along the X axis (at the top of the window) and the value of the control is listed along the Y axis. The editor cursor is linked to horizontal and vertical red lines to make it easier to correlate a value either with a previous or future value or to precisely line it up with a time.

For most controls, the time axis (i.e. the horizontal ruler) is equivalent to the time in the Song Editor. In other words, bar one in the Automation Editor is equal to bar one in the Song Editor. The exception to this rule is with drum patterns, where bar one is the

start of the pattern. For drum patterns, bar one is repeated every time they are played, and subsequent bars of automation are ignored.

The area under the graph in orange provides an easy way to see the volume over time. It is displayed in this way because volume goes from 0 upward. In circumstances where the value can be negative, the zero line is inside the graph and values below zero are shaded orange from the value to zero. An example of such a control is the left-to-right pan position of an instrument.

The actual value of the control at any point in time is dictated by the last control point at or before that time. A zoomed-in view of a control point is shown here:



The yellow mark is the control point. There is only ever one control point for any point in time, although the same value can occur at many points in time.

Using the Edit tool () you can create new points simply by dragging over the graph. You can also move existing points either by drawing at a different location or by hovering the mouse over the control point and dragging it directly. You can also delete control points by hovering over them with the mouse and right-clicking (thus it is the same mouse interface as the piano roll editor).

The spacing of control points as you draw is set by the quantisation setting (see below).

### 4.8.4  Automation Editor Toolbar

The toolbar for the Automation Editor controls much of its functionality, and is similar in many ways to the toolbars of other windows.

## 4.9  Project Notes

The Project Notes window is a small text editor that allows you to write notes for yourself and others about your composition.
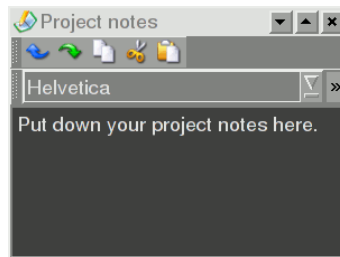


### 4.9.1  Editing the notes

A more complete view of the editor window shows its tools for formatting text:
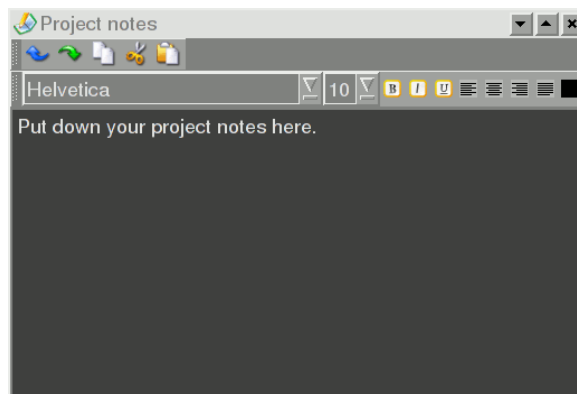


These tools allow you to choose the font, size, and colour of the text, as well as its location in the window.

## 4.10  LMMS Settings

LMMS is very configurable, with many settings allowing you to control how you interact with the software. There are two main ways to work with these configuration parameters.

### 4.10.1  Settings Dialog

The main settings dialog is accessed through the **Show settings dialog** menu option in the **Settings** menu. The window has a set of tabbed sections on the left and the settings for each on the right. The first tab displayed is the general settings tab.

Most of the settings in the Settings Dialog do not take effect until you restart LMMS.

**General Settings**
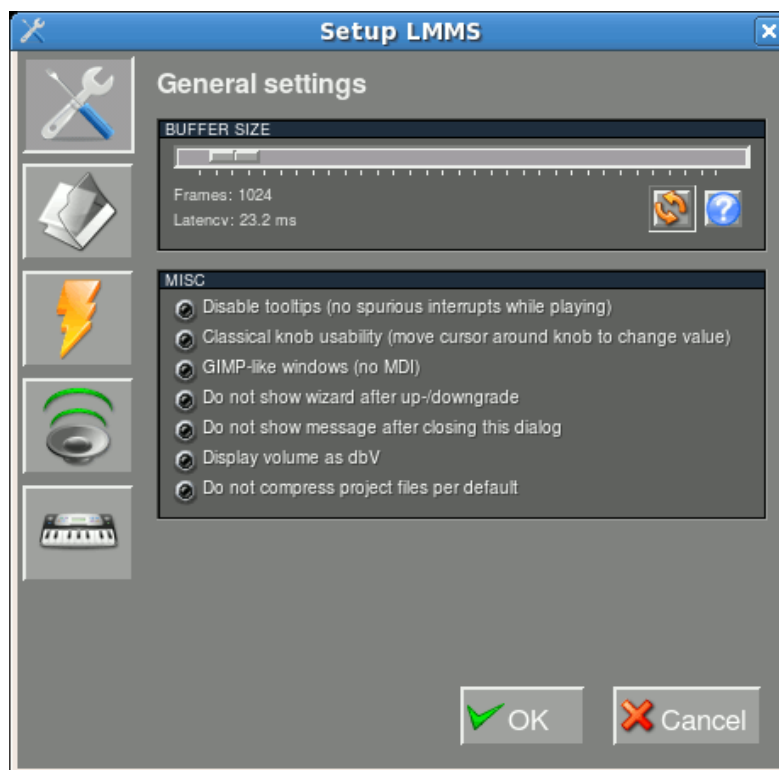


- The **Buffer Size** slider controls the size of the audio processing buffer. The display at the left of the control tells you the size of the buffer in frames and in milliseconds. The longer the buffer, the less temporary peaks in CPU usage and interrupts from the rest of the operating system will affect the sound output.

However, the longer the buffer the more delay between when you make a change to a control and when that change is finally heard. This affects both live performance and experimenting with the sound while composing. It does not affect normal playback.

- The Misc set of radio buttons controls various miscellaneous settings:
  - **Disable Tooltips** prevents moving the mouse over a control from popping up the small yellow tooltip for that control. As the text explains, the CPU has to spend time popping up the tooltip and this may take processor time away from rendering the project in a live performance setting, causing breaks in the sound. It is only likely to affect lower-end computers.
  - **Classical Knob Usability** controls how clicking and dragging on a knob affects its value. The 'classic' knob function is to turn it, so this would be performed using the mouse by making the pointer go in a circle around the knob. The more typical function for computer use is to drag the control up or down vertically, ignoring any horizontal movement. You may find one or the other more familiar to you.
  - **GIMP-like windows** controls the layout of the actual LMMS window. With this turned off, the standard MDI (Multiple Document Interface) functionality keeps all of LMMS's subwindows inside the main LMMS window. Turning this on frees the subwindows, allowing them to move anywhere on the desktop and even onto other workspaces. You may find either one of these easier to work with.
  - **Do not show wizard after upgrade/downgrade** does pretty much what it says - when set, LMMS will not run the Setup Wizard again when you upgrade to a new version. This may be useful for developers to turn off as they may be frequently changing the build of LMMS itself.
  - **Do not show message after showing this dialog** again is self-descriptive. Normally, LMMS will warn you after you change settings in the Settings Dialog that the changes will not take effect until you restart LMMS. Turning this control on causes that warning not to appear. You will still have to restart LMMS to get the changes to take effect, however.
  - **Display volume as dBV** controls how instrument volume is displayed throughout LMMS. Normally it is displayed in percentage - 100% is the normal setting. This equates to 0 dBV. Sound engineers may be more familiar with dBV settings. For more information see the WikiPedia article on Decibels. This does not control the master volume setting as of version 0.3.1.
  - **Do not compress project files by default** is another self-descriptive control. LMMS's project files in uncompressed form have the *.mmp* extension, and when compressed they take the *.mmpz* extension. There is no reason

to leave project files uncompressed at this point in time.

**Directories**



This tab allows you to set where files are loaded from and saved to.

- The **Working** directory is where your projects and saved presets are stored. Projects are saved in a subdirectory named 'projects' and presets similarly. You can put samples into a directory named 'samples' under the working directory and they will appear in the Side Bar's samples section. You can also use subdirectories in the samples directory to classify your samples; they will appear as folders in the side bar. They will be listed separately from the default samples and presets that come with LMMS.

- The **VST-plugin** directory is used if you have VST plugins installed (e.g. under WINE). Set this to the appropriate directory and your VST plugins will be available in LMMS.

- The **Artwork** directory is where themes for customising the look of LMMS can be stored.

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- The **FL Studio** installation directory is used if you have Fruity Loops Studio copyright installed. Set this to the directory containing your copy of Fruity Loops Studio and you can load your project files into LMMS.

- The **LADSPA Plugin** directory is where LADSPA effects are installed. If you have multiple locations, separate them with colons in the standard UNIX path manner.

**Performance Settings**



The controls on this tab affect the speed of the rendering of your song into audio in relation to other parts of the interface. While on most modern hardware rendering performance is not an issue, this may help people with older hardware use LMMS without gaps in playback.

- When the **Disable channel activity indicators** control is turned on, the activity indicators on each channel (▌) do not activate whenever there is activity on that channel. Normally, these glow orange and fade as each note is played per channel, and displaying this activity graphically can take up a reasonable amount of CPU time.

- When **Only press keys on channel-piano manually** is turned off, any open instrument plugin window will display the notes that it is playing on its piano keyboard, whether those be from actions by the user (e.g. on a MIDI keyboard) or during playback. By turning this on, these note presses are only displayed from user input, thus saving an amount of CPU time.

- By setting the **Number of CPUs** to equal the number of processor cores in your system, you can get LMMS to take full advantage of your CPU power by distributing the sound rendering across the cores. This allows slower multicore systems to play pieces that a single core may not be able to render. However, setting this to greater than the number of cores in your system does not make better use of the system and may waste time switching between the rendering threads on one processor.

You control this setting by dragging the number display up and down like a regular 'knob' control.

**Audio Settings**
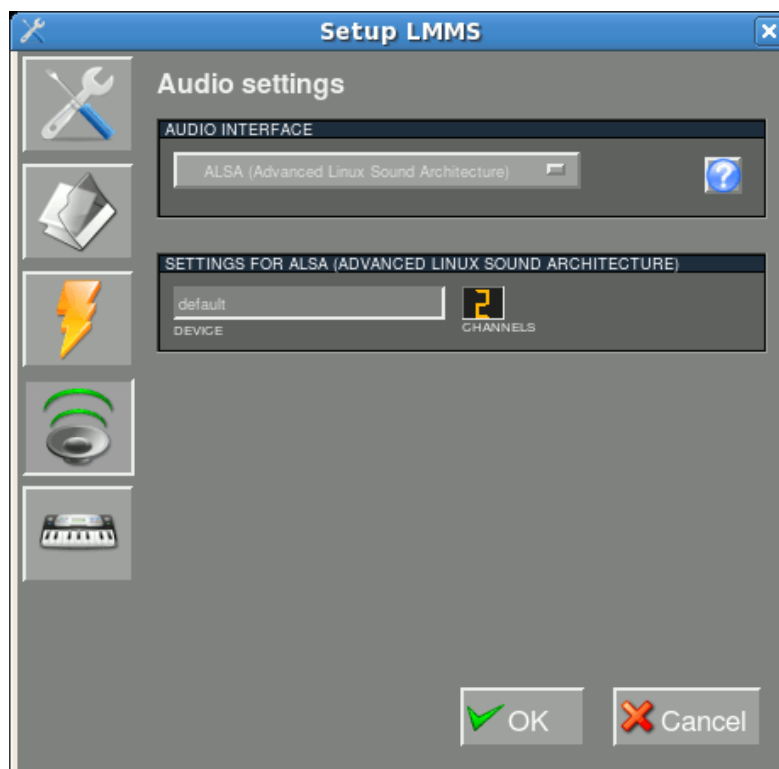


- The **Audio Interface** sets the mechanism that LMMS uses to produce audio. You can select from:

- – ALSA (Advanced Linux Sound Architecture)
- – dummy (no sound output) - useful only for testing whether LMMS is functioning correctly.
- – JACK (the Jack Audio Connection Kit)
- – OSS (the Open Sound System)
- – SDL (Simple DirectMedia Layer)

  JACK is the most advanced of all these interfaces, but requires a working JACK daemon to connect to in order to function. ALSA is the default and is standard on almost all modern Linux systems. Support for PulseAudio may be coming in the future.

- With each interface, you can select the actual **device** and the number of **channels** used by LMMS. These are interface-dependent settings and should be left at their defaults unless you have a good understanding of the interface in use on your computer.

## MIDI Settings
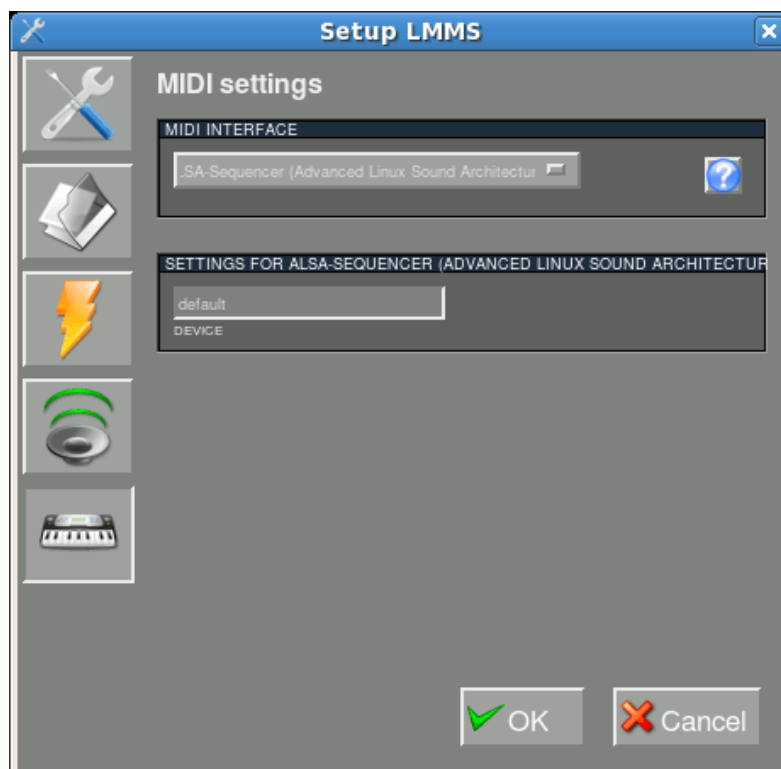


Similar to the Audio settings above, this allows you to select the interface to use to receive and send MIDI signals with your instruments. Select the **MIDI Interface** that

connects your computer to your MIDI instruments and set any device-specific **Settings** with these controls.

### 4.10.2  Setup Wizard

Alternatively, you can be guided through a series of steps that will configure the most commonly changed settings in your LMMS setup. This is accessed through the **Show settings dialog** menu option in the **Settings** menu. The wizard will also be shown to you the first time you start LMMS. The wizard has a series of pages, starting with a welcome screen for the first step:



By clicking **Next** you will move to the next page, which asks you for the directory that LMMS will save your projects and presets in and look for your samples in. This sets the **working directory** setting in the Settings Dialog above.

That's it! You can now click **Finish** to save your settings or **Cancel** to cancel any changes.

# 5 Appendices

## 5.1 Definitions

Here are a list of terms used in LMMS and their meaning.

**A**

**B**

**C**

**D**

**E**

**F**

**Freeze**

> To freeze a song or bassline track is to pre-render its sound and play that rather than render the track in real time. This allows you to render a very complex track that would otherwise take too much CPU time to play with all the other tracks in the song. While a track is frozen, changes to it do not take effect. When thawed, the changes will take effect and the track will once again be rendered in real time as the song progresses. Tracks can only be frozen when playback is stopped.

**G**

**H**

**I**

**J**

**K**

**L**

**LMMS**

the Linux MultiMedia System.

**M**

**N**

**O**

**P**

**Project**

The entire package of instruments, tracks, patterns and settings that comprise the whole performance of the song. This is what you save and load from the Project menu.

**Q**

**R**

**S**

**Sample**

An individual audio file, used either in an 5.1 at page 73 (see AudioFileProcessor Plugin) or a 5.1 at page 74.

**Sample Track**

A type of 5.1 at page 75 that is designed to take audio files. Multiple different 5.1 at page 74 can be placed in one sample track, and they can overlap. See Working with Samples.

**Segment**

A block in a 5.1 at page 75 that contains a sample (in the case of a 5.1 at page 74), notes in a 5.1 at page 74 or repeats of a 5.1 at page 73. Each type of 5.1 at page 75 only uses one type of segment. See Song Editor.

**Song**

The overall combination of 5.1 at page 75 playing simultaneously that makes up your composition. See Song Editor

**Step**
> One sixteenth of a bar in the Beat + Bassline Editor; a single 'tab' in the pattern display.

**T**

**Thaw**
> To unfreeze a track, rendering it again in real time during playback. See freeze.

**Track**
> A row in the Song Editor containing an instrument, sample track, or beat / bassline.

**U**

**V**

**W**

**X**

**Y**

**Z**

## 5.2  Programming Notes

*(There is no content for the page 'Programming Notes')*

## 5.3  Interfaces and APIs

*(There is no content for the page 'Interfaces and APIs')*

## 5.4  License

*(There is no content for the page 'License')*

## 5.5 Roadmap

**Future plans**

- current stable release is 0.3.1 (as of 2007-Nov). Uses Qt3.
- current development is on 0.4.x, forked from 0.3.0 (immediately after 0.3.0 release)
  - remove Qt3-support
  - improve Qt4-support
  - improve parallelization by introducing worker-threads (which can be done nice with Qt4's new multi-threading-infrastructure)
  - better undo-/redo-framework

**TODO**

*Things you can do as developer*

Bug fixes

- If opening a newly created segment in the Piano Roll Editor, and the previously open segment was displayed such that the first bar was no longer in the window, then the new segment will open at bar two. This should be bar one all the time.

Modifications

- **Interface**:
  - ability to have entire song at different time signature from 4/4 (e.g. 3/4, 12/8, etc.)
    * ability to have one bar at a different length or time signature.
  - support for third-notes. Ideally this can be done by changing the minimum division of a beat to be a multiple of three. Some programs use 1/96th (3 * 32); since LMMS allows a minimum division of 1/64th, I suggest using 1/192nds (3 * 64).
  - changes to **selections** in the **piano roll editor**:
    * Select notes by region, but don't keep that region box around. It's getting in the way of dragging the notes left. Instead, just have those notes selected.
    * This also gives you the chance to allow multiple selection by holding down CTRL when selecting, and selecting individual notes by clicking

on them. These are fairly common tool paradigms that I think we need to obey.

* You can then also do away with the 'move' tool by allowing the selected notes to be dragged by clicking on one note in the selection and dragging it. Space and non-selected notes can still forget the old selection and pick up the new.

* Because you don't have a region any more, the newly pasted notes can be set as selected. This then allows the user to grab them, even if some have gone on top of other notes, and move them as a whole.

Additions

- **Plugins**:
  - write more instrument-plugins (like an electric guitar)
  - code a LADSPA-hoster as an instrument-plugin
  - code plugin for using buzz machines / see buzztard.org to see whats meant
  - add support for multisample instruments - where a sample is available for many different pitches of one instrument (otherwise known as Sound Fonts or Sample Banks).
  - For the Audiofileprocessor, when you are working with your own samples, finetuning and ping-pong-loop are necessary when you want to make perfect loops and tune them with softsynths-sounds.
  - Add a 'wave traveller' or 'scrubber' plugin that allows the user to move backward and forward across a sample in a way compatible with Automation.

- **Import/Export**:
  - improve import-filter for FruityLoops-projects (flp-files)
  - add a LilyPond import-module
  - add support for Hydrogen drum machine import/export.

- **Interface**:
  - develop a classical note-editor or an interface for using widgets from Rosegarden, NoteEdit or similiar
  - add locking in the song-editor (like bar, 1/2, 1/4, and free)
  - improvements to sample track:
    * able to drag and drop samples from the side bar directly into the sample track (creating a new segment where dropped).
    * sample open dialog defaults to 'all files' rather than '*.raw files'.
    * able to stretch or squash samples to fit in a given time. This could be done e.g. by shift-dragging the end of the sample. It could also either be a resampling (changing pitch) or some reworking that would keep the

pitch. The ability to crop the sample as currently implemented should not be lost.
* ability to change the start point of a sample.
* ability to pan the sample track left-to-right and front-to back.
– Add a time display on the main tool bar beside the wave / CPU display. Being able to alternating the display of time between bars/beats/quanta and minutes:seconds:hundredths would be very useful too.

**Things you can do even if you're not familiar with programming**

- add localizations for Italian, Dutch, Swedish …
- help improving this Wiki
- **Documentation** needed for the new manual project:
  – **tutorials** are needed, especially on how to make the various plugins make useful noises.
  – Any document that isn't yet written.
  – Created documents needing work: Category:Incomplete (including this one now :-)
- record cool samples you release for free
- create cool demo-songs or presets for LMMS
- share your cool stuff on the LMMS Sharing Platform at http://lmms.sourceforge.net/lsp.php
- **your ideas…!**