MusE synthpop tutorial

Project: MusE synthpop tutorial
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License: Attribution-NonCommercial 4.0 International
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Project site: http://www.oscillator.se/opensource

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Overview

This tutorial is an introduction to the MusE Digital Audio Workstation.

Read more about MusE: https://muse-sequencer.github.io/

The goal of this tutorial is to make a synthpop song with a drum machine, software synthesizers and vocals. It ends with some short instructions on how to mix and master the song.

This is an example of how to work with MusE when the focus is on sequencing and programming the music.

The instructions assume you have a computer with Jack and MusE (3.1+). To record vocals you need to have a soundcard with recording capabilities and a microphone.

For instructions on how to get there, see https://github.com/muse-sequencer/muse/wiki/Documentation#introduction.

Before starting you need a project folder. Create one in your Documents folder and name it "musesynthpop".

Startup

Install effects and instruments

Before running MusE we are going to install an additional instrument as well as some effects. We are going to use the Plugins section of the KXStudio repository (https://kx.studio/Repositories:Plugins) as the source.

First we will download the Calf effects pack. Look for "Package Name: calf-plugins" and download the deb-file by clicking amd64. Save the file in your Downloads folder.

We are also going to use the Surge synthesizer. Look for "Package Name: surge" and download the two files needed by clicking "amd64" and "data". Save the files in your Downloads folder.

Open a terminal and go to the Downloads folder. Install the downloaded packages by typing:

```
sudo apt-get install  libxcb-cursor0
sudo dpkg -i *.deb
```

We are also going to use the drum machine included with MusE, called SimpleDrums. For that we need some sounds. A good source is Music Machines (http://machines.hyperreal.org/). Download the TR-707 set from http://machines.hyperreal.org/manufacturers/Roland/TR-707/ and save and unpack it in the "musesynthpop" folder. Then move all extracted files into a subdirectory named "tr707".

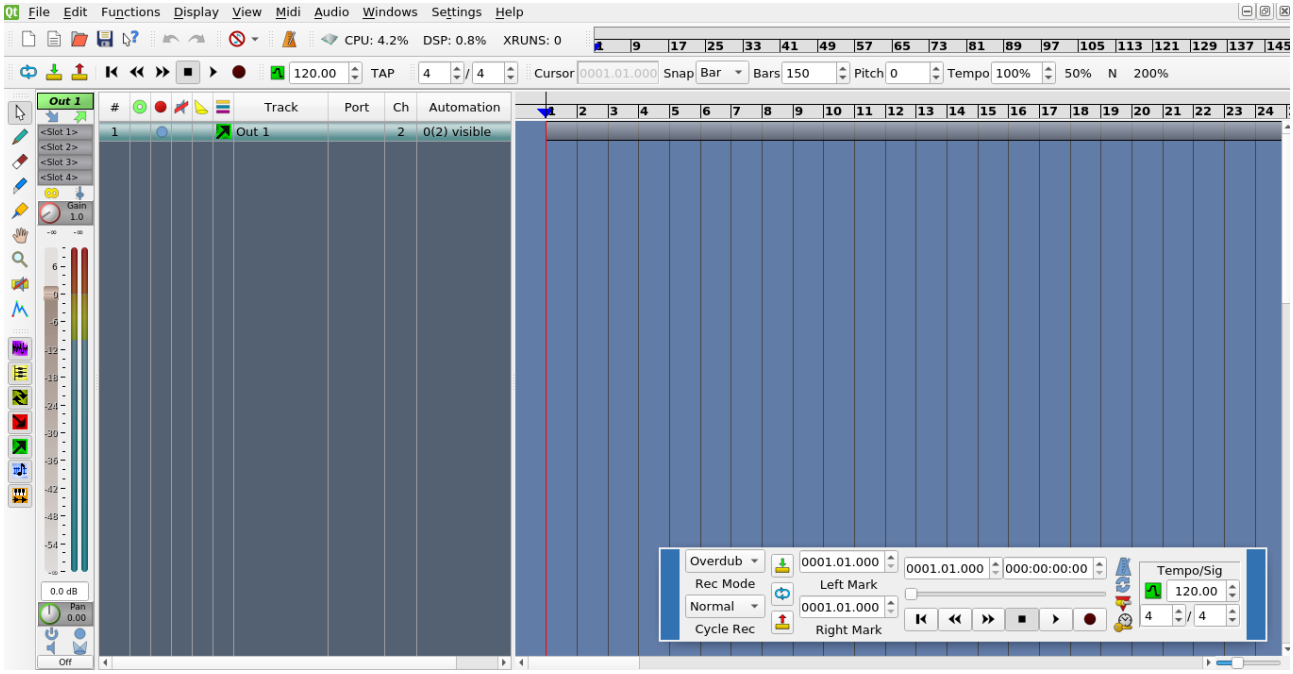
Start it all

Start Jack. I use QJackCtrl for this (https://qjackctl.sourceforge.io/). You can download an AppImage from https://sourceforge.net/projects/qjackctl/.

Now run MusE.

I like to rearrange the main window so it gives me more room for the arrangement vertically. I also want to see more columns in the Track pane.

Set the tempo to 120 on the Transport panel.



For more information: https://github.com/muse-sequencer/muse/wiki/Documentation#basic-overview

The composition

We start with a chord progression for the verse: G Min, Eb Maj, F Maj, D Min. It moves downward.

We also need a chorus, so we take the same chords and rearrange them: Eb Maj, F Maj, D Min, G Min. This has a more upward moving feel.

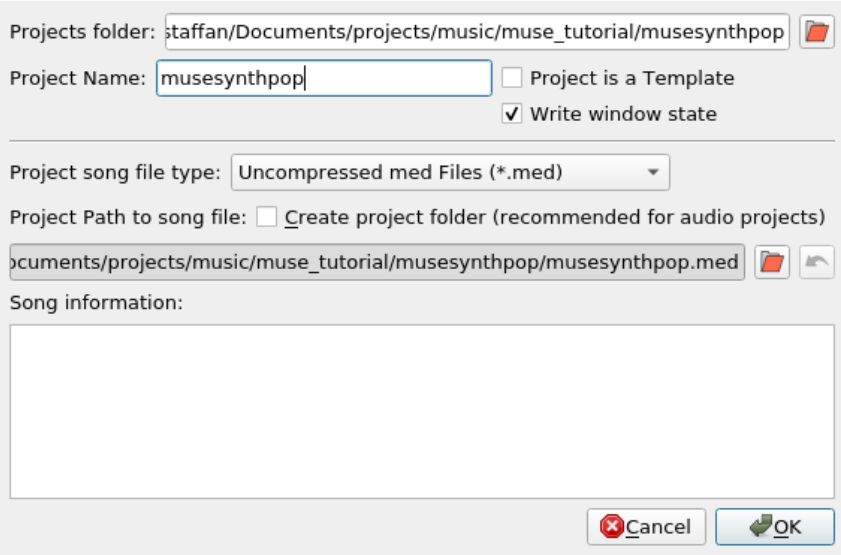
For the break we will just stay on G Min.

The song structure will be

1. intro
2. verse
3. chorus
4. verse
5. chorus
6. bridge
7. chorus
8. outro

Each instrument gets its own track in the Arranger (the main window). The MIDI note data controlling the instrument lies in another track. So for each "voice" in the song we will have two tracks: the instrument and the MIDI notes.

Save our empty MusE song in the "musesynthpop" directory so we can use the shortcut Ctrl+S to save it from now on.



Create the parts

Verse: Drums

Let us start with making 4 bars of drums.

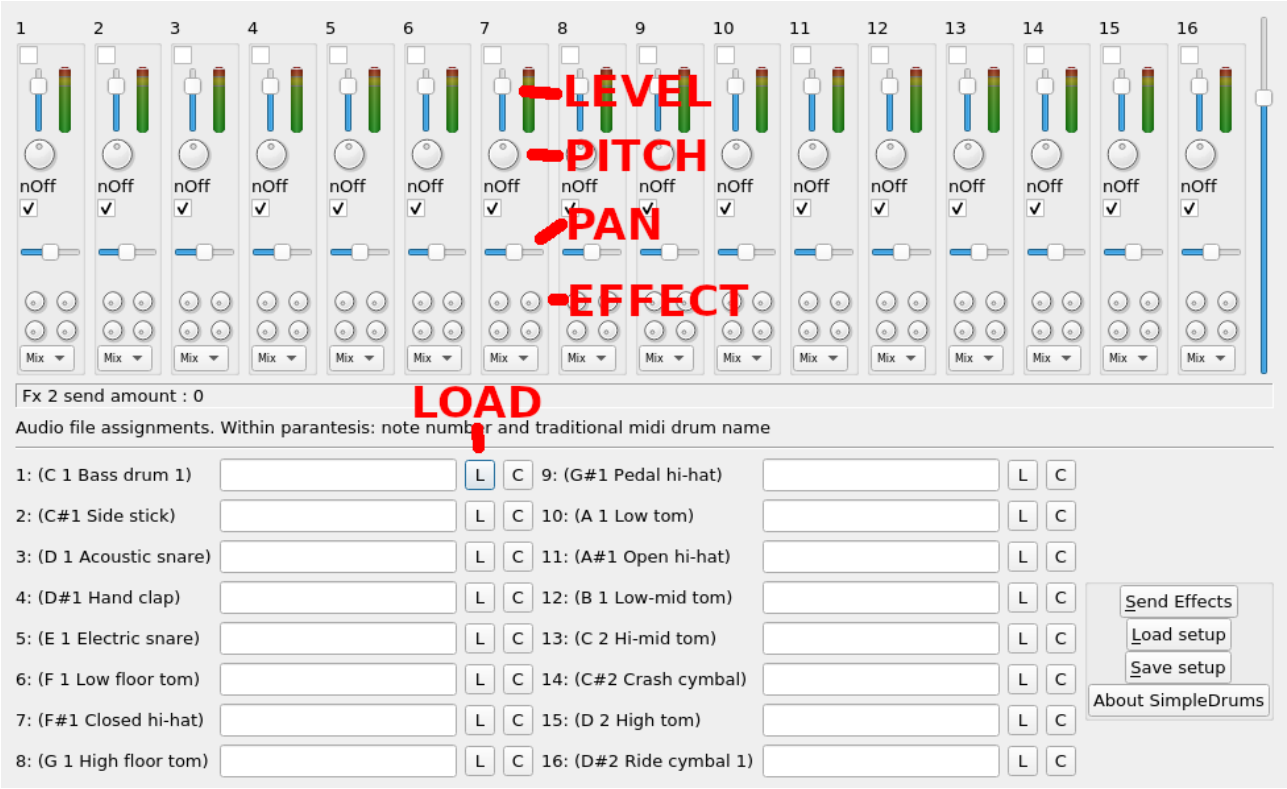
Setup: Drum machine

First we have to add the drum machine.

Right click in the Track-pane and select Add Synth > MESS > SimpleDrums. A synth track is added.

Now we will setup the sounds and effects of the drum machine.

You edit software synths by right-clicking in the Port column of the Synth track and select Show native GUI. You can also select the track and press Ctrl+U.



Let's load the samples we previously downloaded from the TR-707 drum machine by clicking L:

1. Bass drum: BassDrum1.wav

4. Hand clap: HandClap.wav

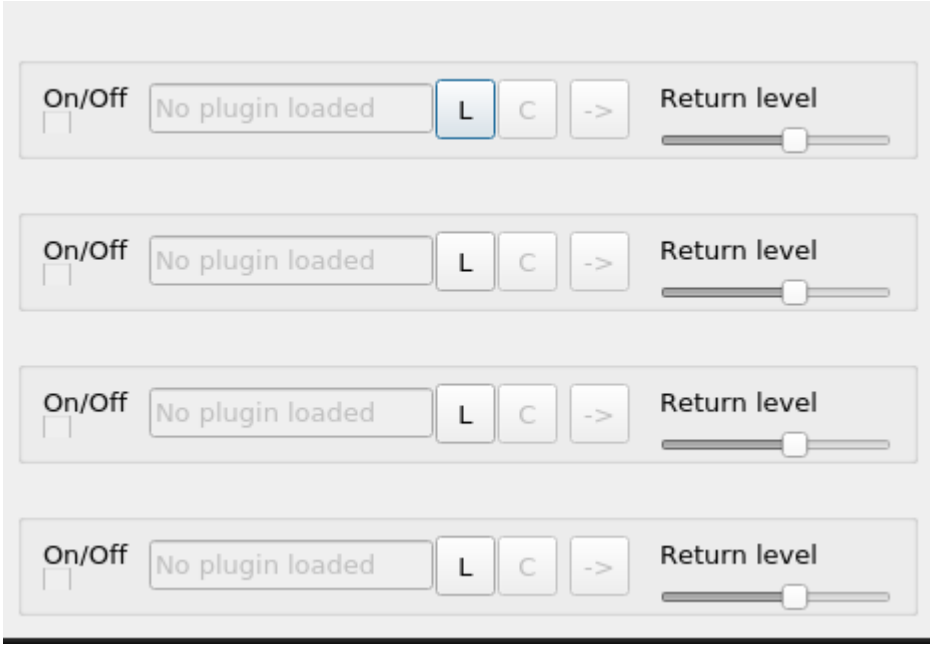
5. Electric snare: Snare2.wav

7. Closed hi-hat: HhC.wav

11. Open hi-hat: HhO.wav

14. Crash: Crash.wav

We would like some reverb on the drums. Click the button "Send Effects".



Click the first L button and load "freeeverb". (You can only select LADSPA effects.) Check the On/Off button and click the arrow button to adjust the settings. For now, you can leave them at the default.

Close the effects window.

Adjust the level of the first Effect button (fx1 send amount) for the Bass drum (very little), Clap (medium), Snare (a bit), Hihats (a bit). You can always go back and adjust this later when we have some notes playing. You will probably also want to adjust the level of each sound.

Pan the Clap (a bit to the right) and the Hihats (a bit to the left).

Save the setting using the "Save setup"-button if you want to reuse them in another song.

Close the SimpleDrums window.

Program: Drum machine

Lets create 4 bars of drums.

Right click in the Track pane and select "Add Drum track". This track will automatically connect to the previously created Synth track. You can check and change this in the Port column of the Synth track.

Rename the track "drums" by double-clicking in the Track column of the track.

Now lets create a part that is 4 bars long.

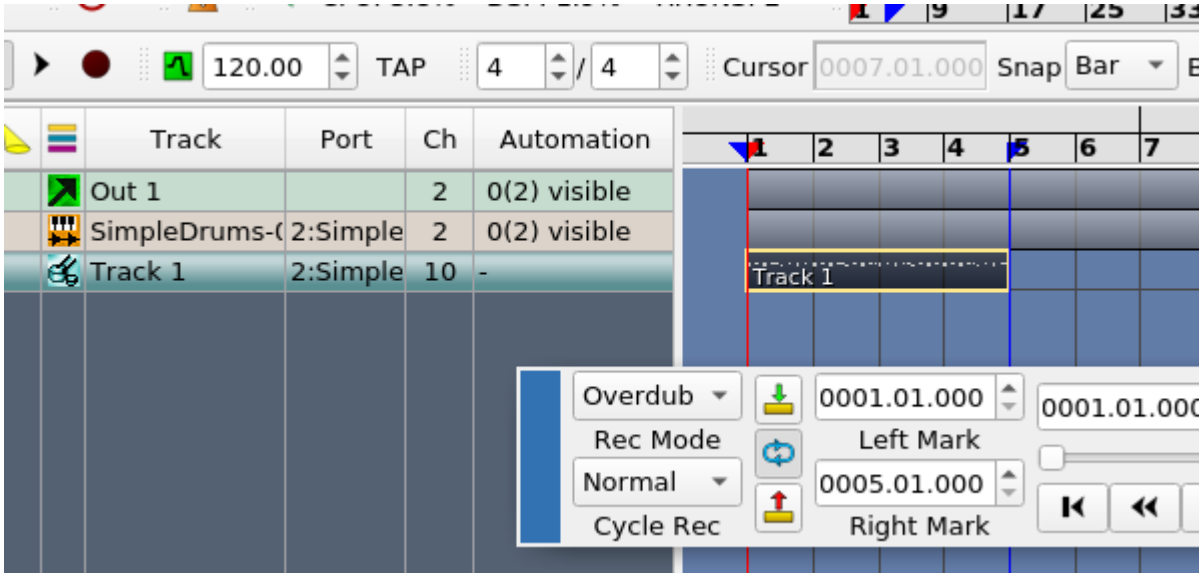
Parts are the basic building blocks for MIDI music. They contain note data and other MIDI information. You can move them around with the Pointer (also selectable by pressing A as in Arrow).

Make sure "Snap" is set to "Bar". Select the Pencil (or press D as in Draw) and drag on the "drums" track from 1 to 5.

Before we begin editing, we would like to loop our song across bars 1 to 4. The two blue arrows at the top of the Arranger canvas points to where the loop starts and ends. You set them with

- Middle-click: loop start
- Right-click: loop end

and enable looping by pressing the circle with two arrows to the left in the Transport panel.

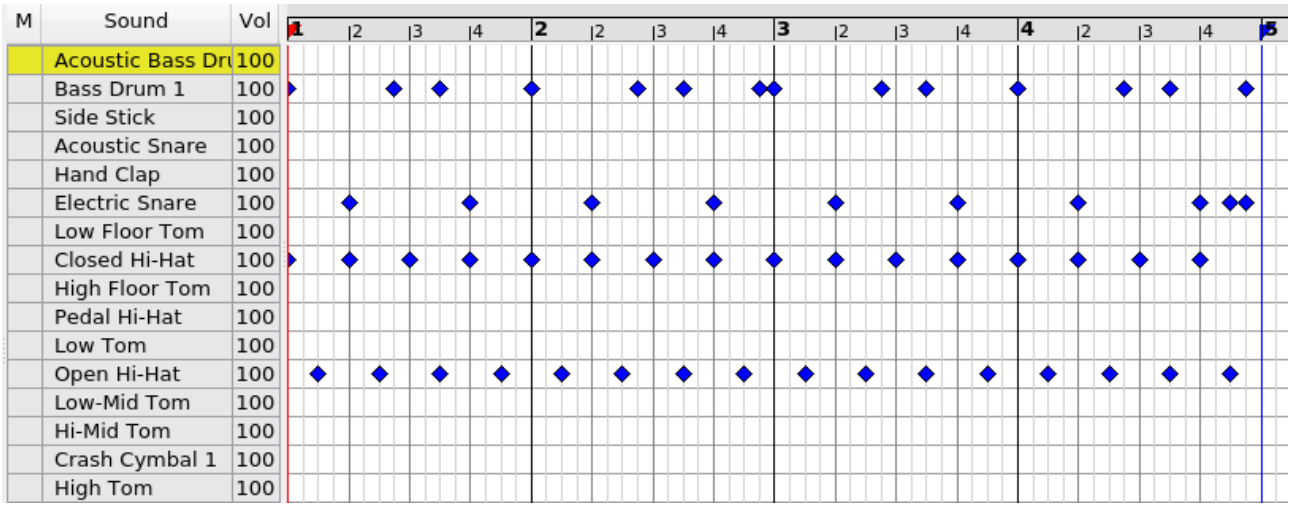


If you work on a laptop chances are you wont have a Middle button to click. Go into Settings > Global Settings > GUI Behaviour and select another option under "Set range markers left/right".

We are now going to enter the notes. Select the Pointer (press A on the keyboard) and double-click the part. You can also press Ctrl+D while the part is selected. You will be presented with the Drum editor. Drag to adjust the columns so all sound names are visible.

Select notes or groups of notes with the Pencil tool. Delete notes by pressing Delete on your keyboard. You can also make copies of selected notes by Ctrl-dragging.

Set "Snap" to 16. Select the Pencil (or press D) and enter a pattern using the sounds we loaded in SimpleDrums (Bass drum 1, Hand Clap, Electric Snare, Closed Hi-Hat, Open Hi-Hat, Crash Cymbal 1).



Press Play in the Drum editor or the Transport panel.

While the 4 bars are playing and loop, go back to the Arranger and right click in the Port column of the SimpleDrums Synth track and select Show native GUI.

You can now edit the levels, effect sends and pan of the individual drum sounds. I lowered the levels of the hihats, panned them, and panned the Clap and Crash.

Close the SimpleDrums GUI, the Drum editor and save the song (Ctrl+S).

Verse: Bass

Now for the bass. We will create two basslines as this makes the sound fatter and a bit more dynamic.

Setup: Bass 1

Right click in the Track-pane and select Add Synth > LV2 (synths) > Surge LV2. A synth track is added.

Once again right click in the Track pane and select "Add Midi track". This track will automatically connect to the previously created Synth track. You can check and change this in the Port column of the Synth track.

Rename the track "bass1" by double clicking in the Track column of the track.

We will now select a bass patch (sound) for Surge by Right clicking in the Port column of the Synth track and select Show native GUI. You can also select the track and press Ctrl+U.

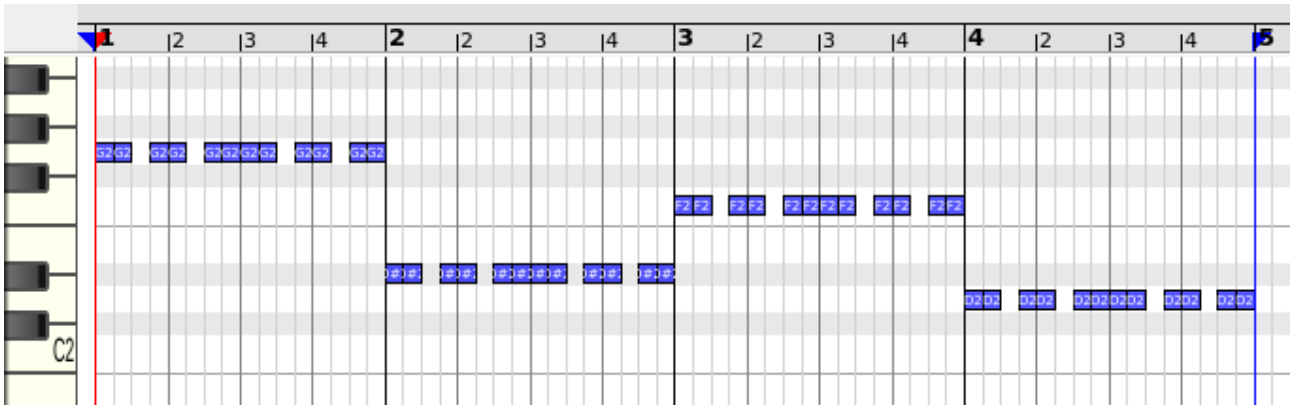
You should see the Surge UI. Click the patch name at the top and select Basses > Deep End. Close the Surge window.

Surge user manual: https://surge-synthesizer.github.io/manual/.

Program: Bass 1

Create a part that is 4 bars long and enter the Piano roll editor by double clicking it.

Set Snap to 16 and enter some notes that works with the verse chords.



Close the Piano roll editor.

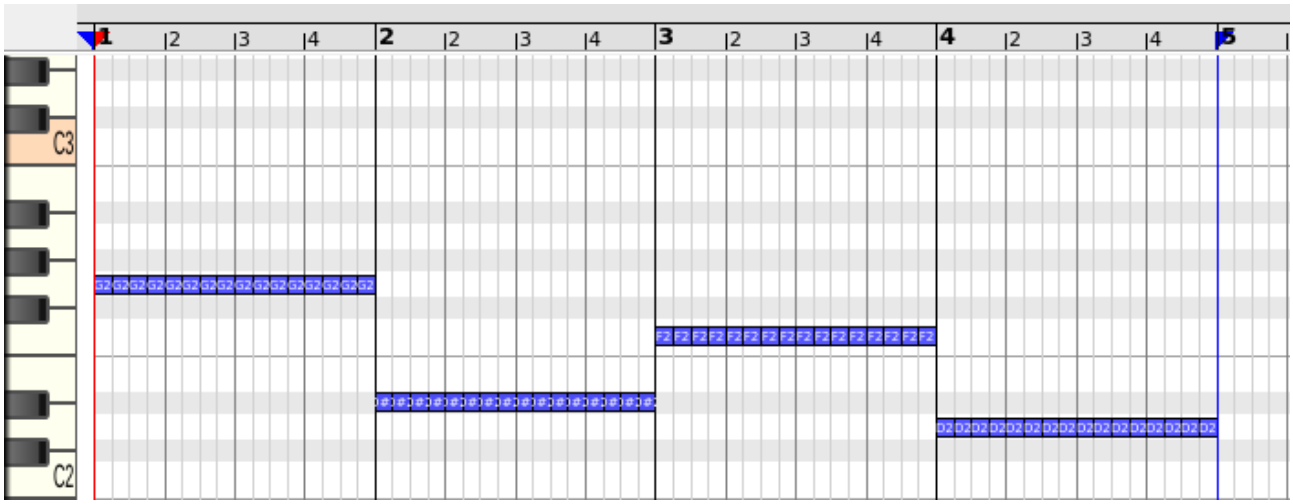
More information on working with the editors:
https://github.com/muse-sequencer/muse/wiki/usage-of-the-editors

Setup: Bass 2

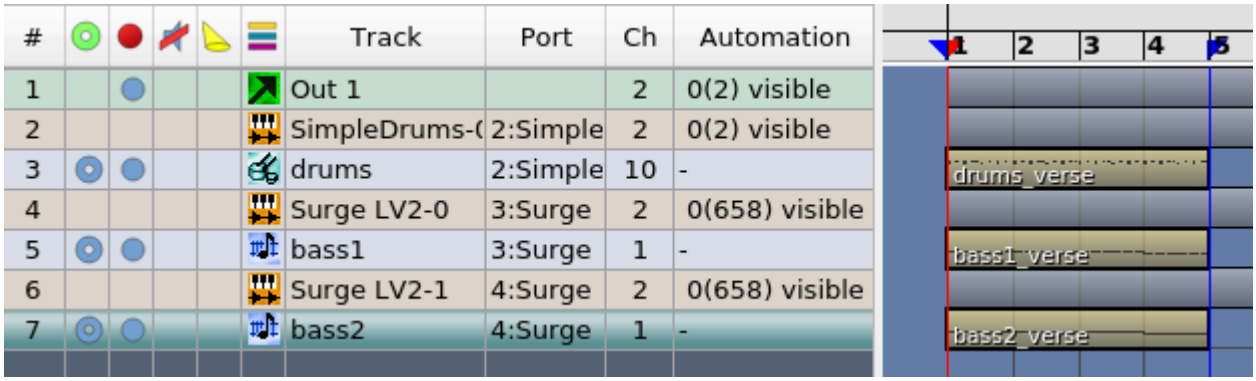
Repeat the process and create another Surge Synth track and MIDI track. Name it "bass2". I used the patch Nick Moritz > Basses > Crash Attack.

Program: Bass 2

Use the same notes as for the "bass1" track but let the bass play every 1/16th. Select the part on the "bass1" track and Ctrl-drag it to the "bass2" track to make a copy that you can edit:



You can rename the 3 parts by Right-clicking them and select "Rename".

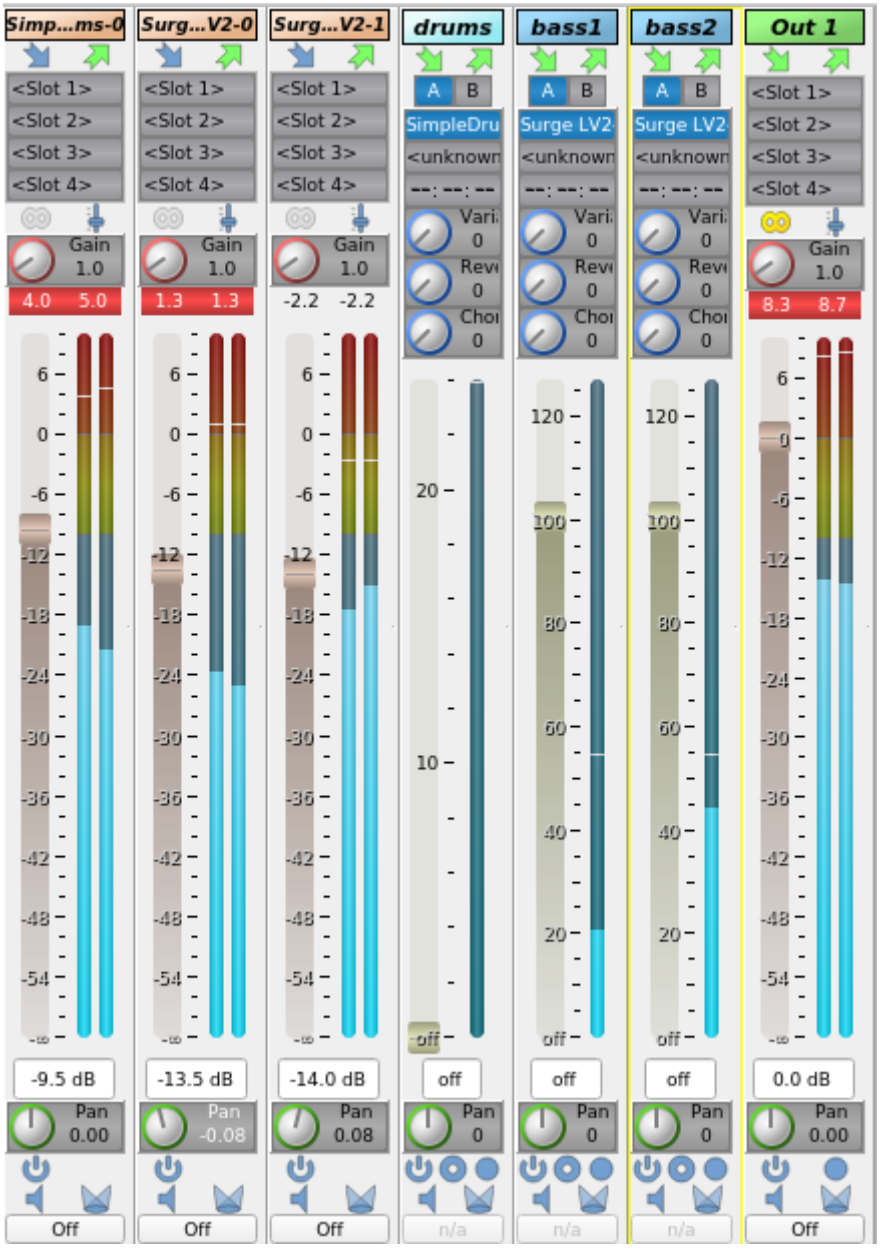


Basic mixing

If we click the play-button we can listen to our creation looping. It's a good idea to adjust the mix a bit.

Bring up the mixer. We chose Mixer B as it groups the Synth tracks together as default and we only want to adjust those, not the MIDI tracks. Bring down SimpleDrums a bit, and the two basses even more. Pan each bass a bit off center.

You can also bring up the SimpleDrums GUI (right-click on the Port column of the SimpleDrums track and select Show native GUI) and adjust levels. I brought down the open hihat even more.

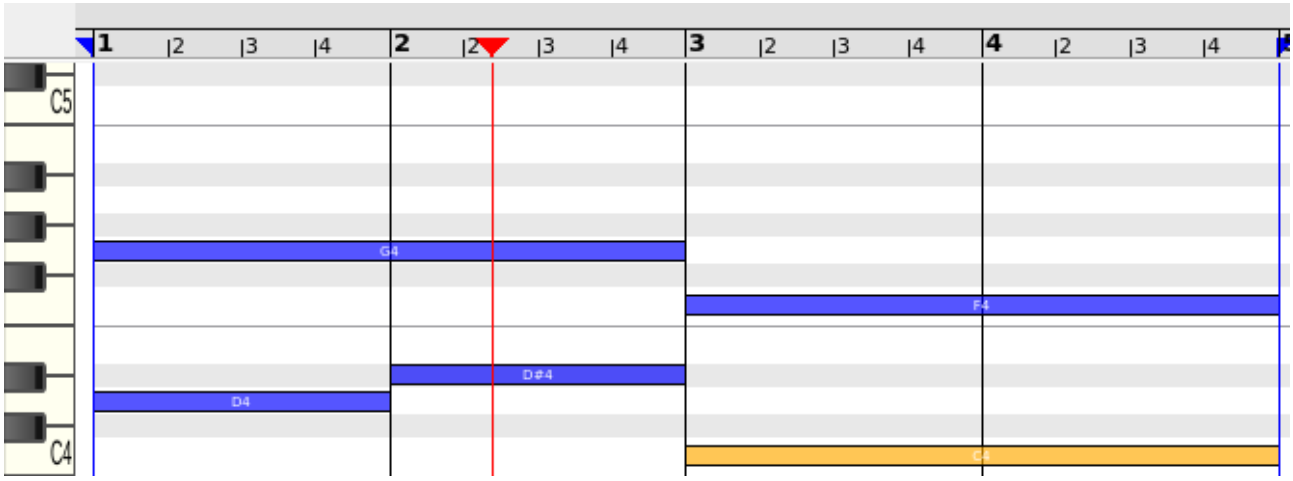


We will go into working with effects later on.

Save the song (Ctrl+S).

Verse: Pads

Let's add some pads just playing the chords. Create a new Synth track with Surge with the preset Pads > Distant. Add a MIDI track and name it "chords". Add 4 bars in the Arranger and enter the Piano roll editor. Set snap to 1 and enter the chords (or some parts of them).

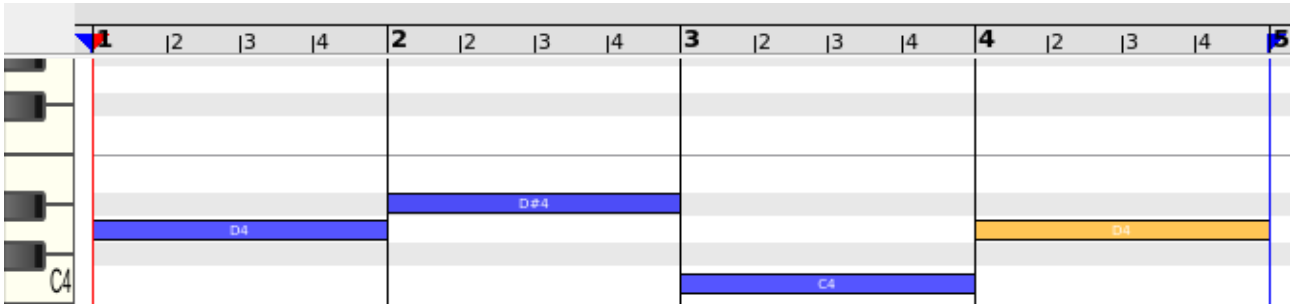


You can adjust the level of the new track by selecting the Synth track and dragging the fader in mixer strip to the left of the Track pane. We want this track to be very quiet and panned right.

Verse: Arpeggio

On to some arpeggios. Surge has patterns with built in sequences so let's use one of them.

Create a new Synth track with Surge with the preset Sequence > Gate Chord. Add a MIDI track and name it "arpeggio". Add 4 bars in the Arranger and enter the Piano roll editor. Set snap to 1 and some notes.



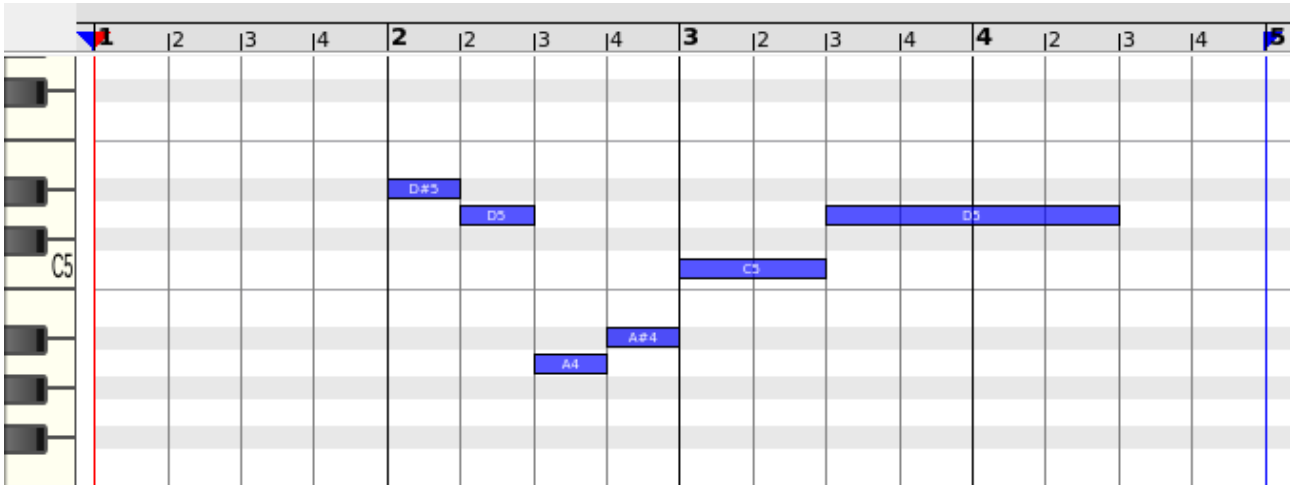
Use the mixer strip to the left to lower the volume.

This gives us a bunch of auto-gated notes (not really an arpeggio).

Verse: Leads

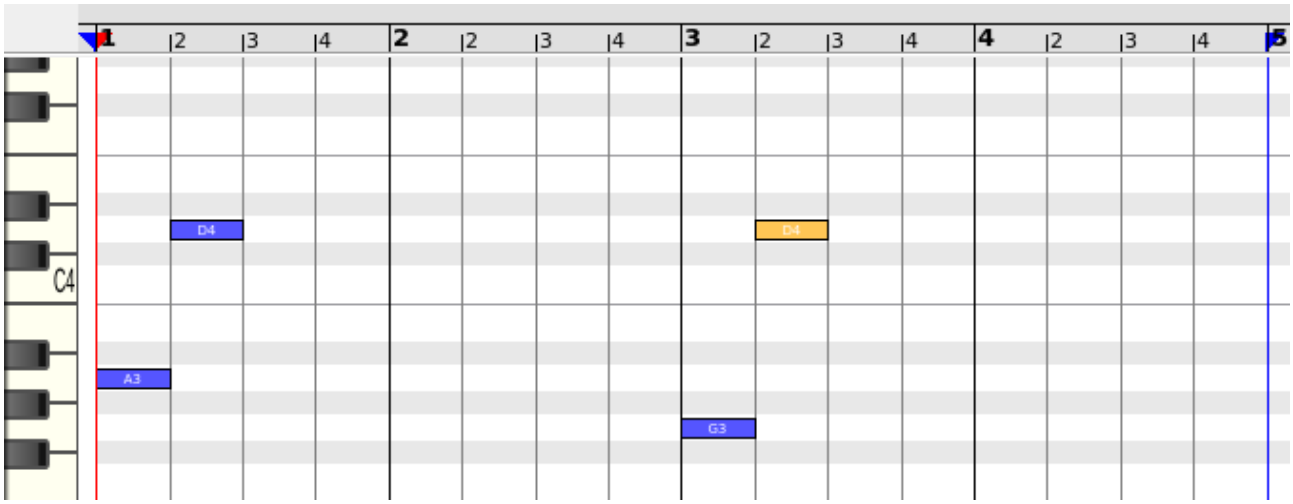
Now let us add some lead synth sounds.

Lead 1. Add a Synth track with Surge, preset Leads > Crisp PWM. Add a MIDI track, "lead1", add 4 bars in the Arranger, enter the Piano roll editor, set snap to 4, and enter some notes.



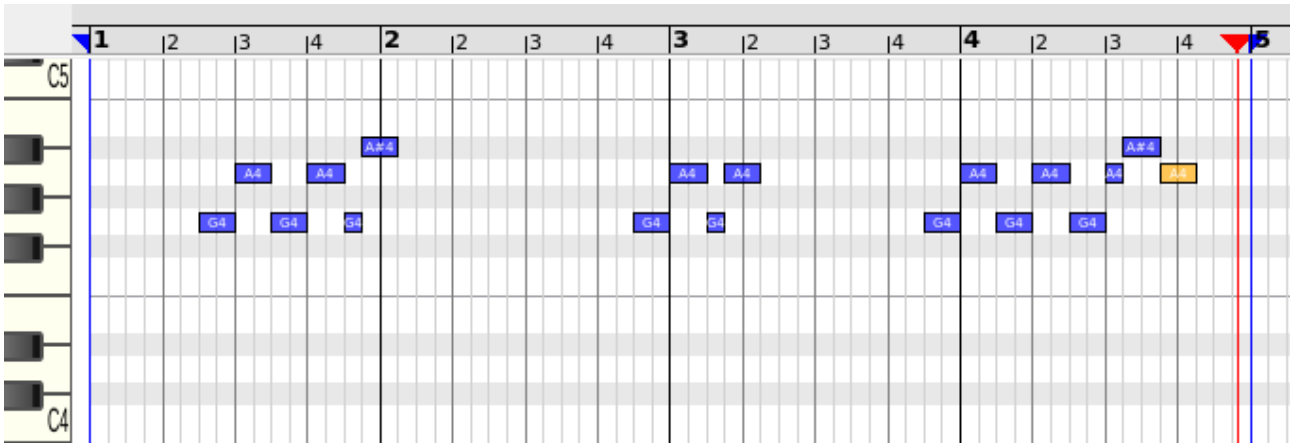
Lower the volume and pan left.

Lead 2. Add a Synth track with Surge, preset Polysynths > Anthemish 3. Add a MIDI track, "lead2", add 4 bars in the Arranger, enter the Piano roll editor, set snap to 4, and enter some notes.



Lower the volume and pan right.

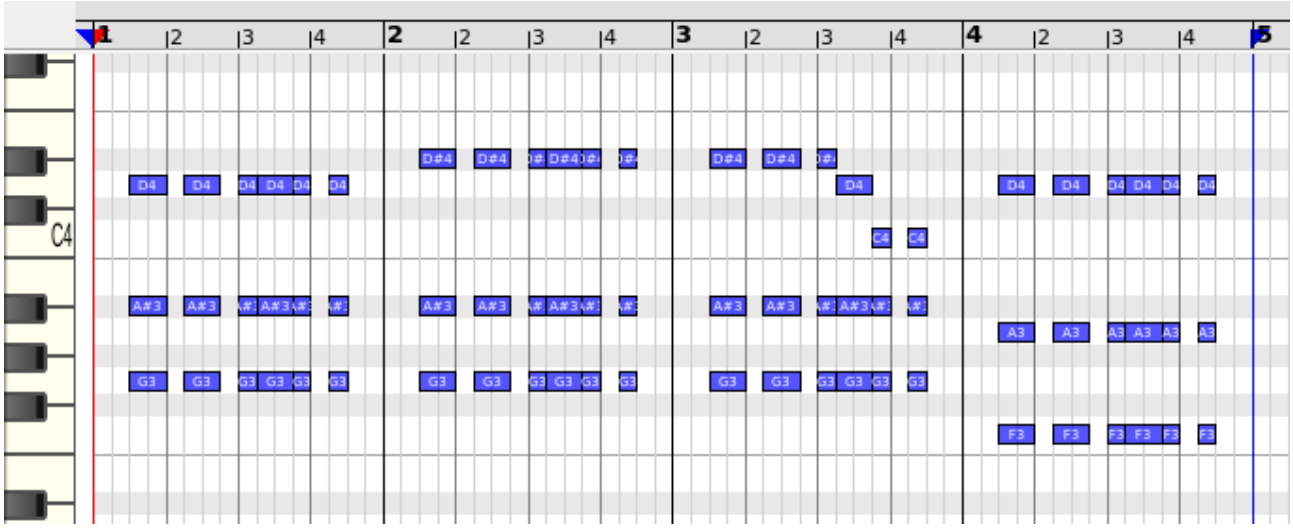
Lead 3. Add a Synth track with Surge, preset Plucks > Delay Pops 4. Add a MIDI track, "lead3", add 4 bars in the Arranger, enter the Piano roll editor, set snap to 16, and enter some notes.



Lower the volume and pan just a bit off center.

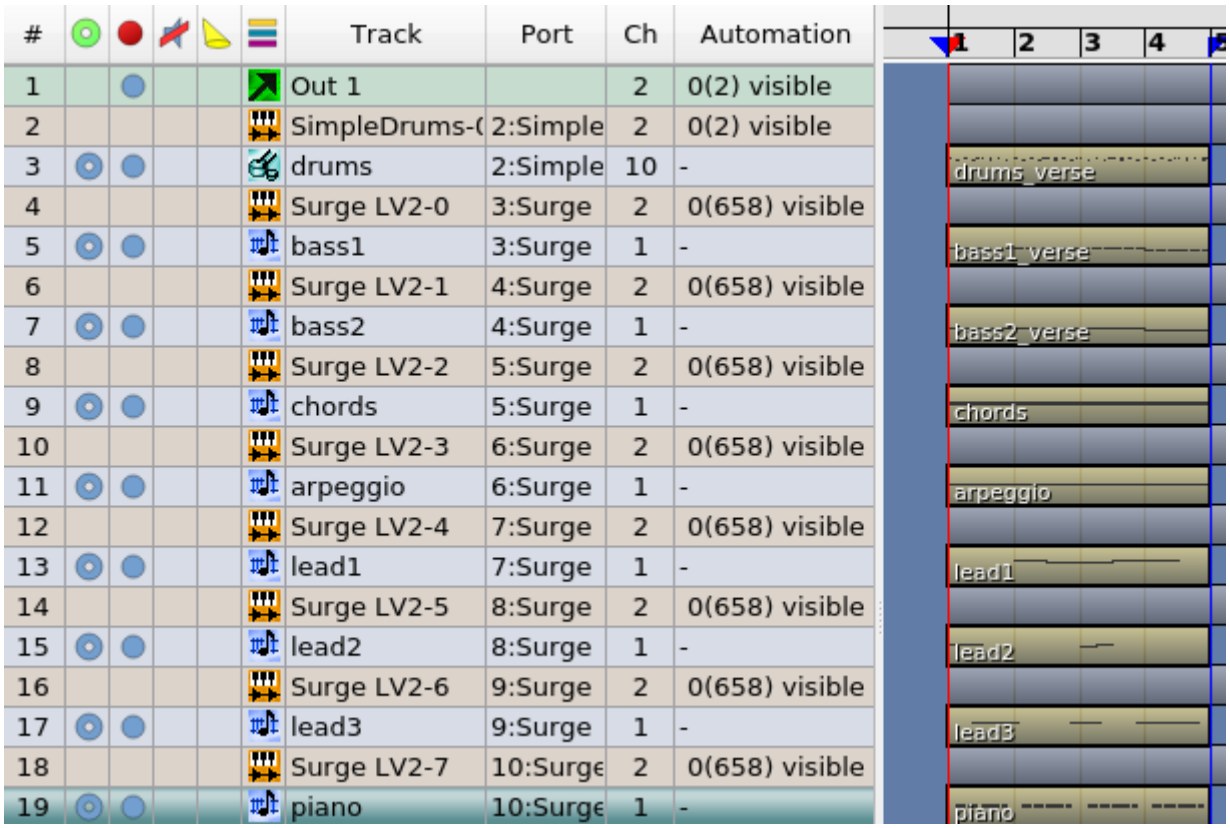
Verse: Piano

Add a Synth track with Surge, preset Polysynth > Jim. Add a MIDI track, "piano", set snap to 16, and enter some notes.



Lower the volume and pan the track.

The verse is finished!



Chorus

Now on to the chorus. We will create it on bars 5-8. We will save the proper arrangement of the song for later.

First we will color all parts belonging to the verse. Using the Pointer, drag-select all parts and right-click on one of them. Select the green part color (called "Bridge", but ignore the naming).

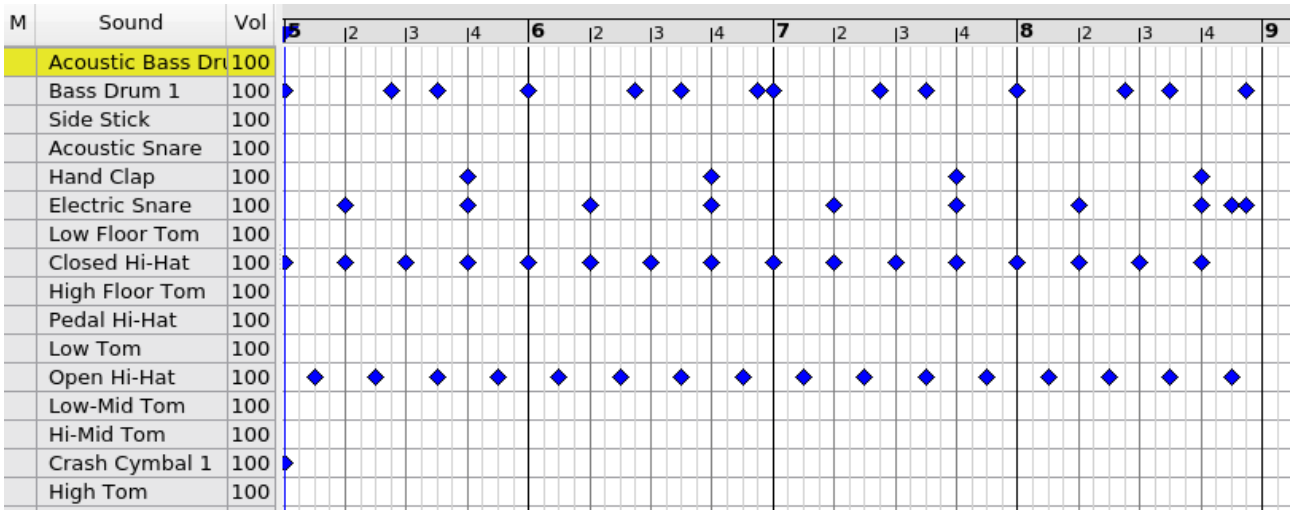
All parts belonging to the chorus we will color red. By doing this the song structure will be clear when arranging all parts.

By now you know to create parts so I will make this section short by just providing the name of the track and the notes that I entered for the part. All parts are 4 bars, from bar 5 to 8 (inclusive).

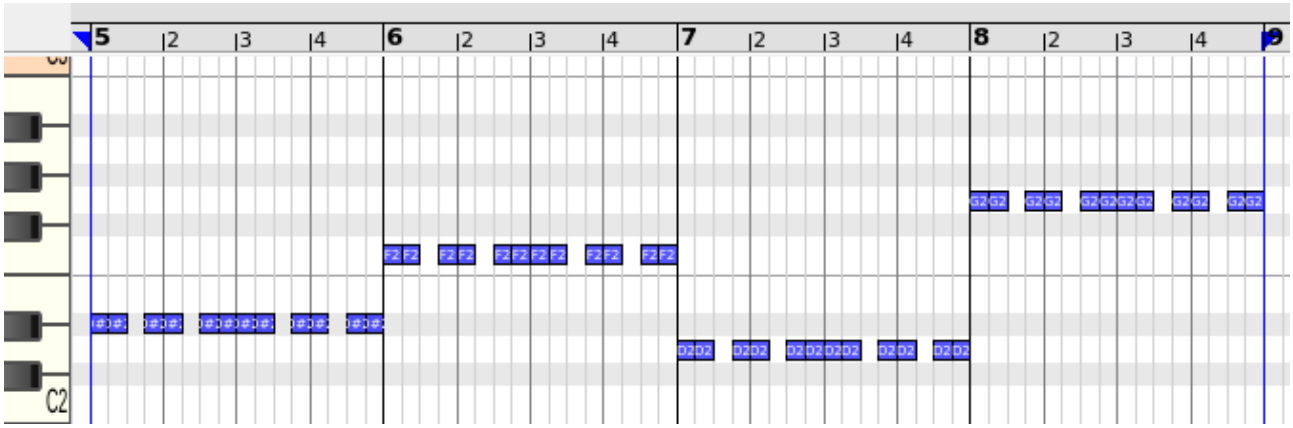
Move the Left and Right mark (loop points to start of bars 5 and 9).

Remember our chords for the chorus: Eb Maj, F Maj, D Min, G Min.

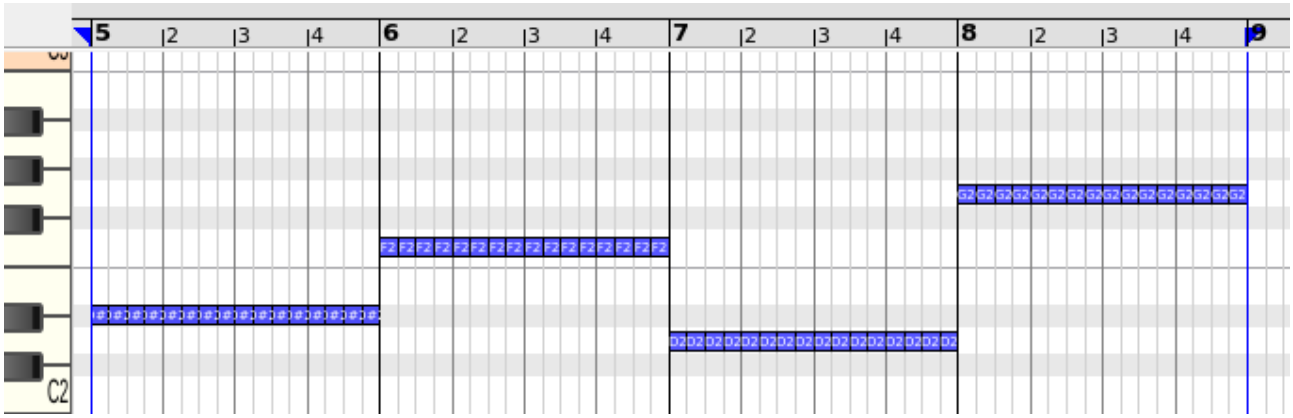
Track "drums". Ctrl-drag a copy of the verse. Make some changes, I just added a crash at the start and a clap on every 4th beat. Don't forget to color the part red and rename it "drums_chorus".



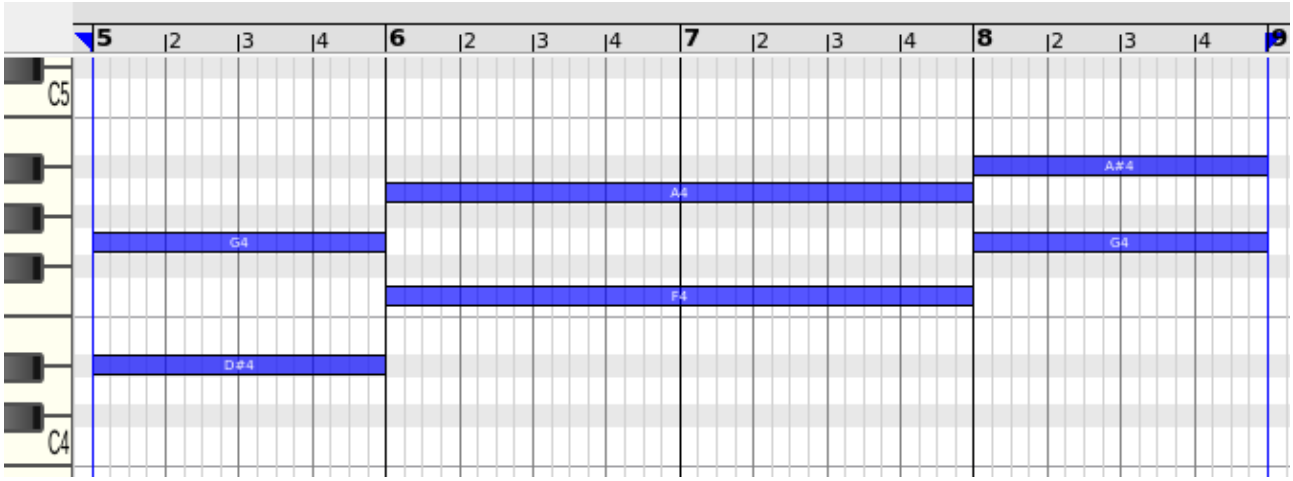
Track "bass1". Ctrl-drag a copy. Change the pitches of the bass notes by drag-selecting and dragging.



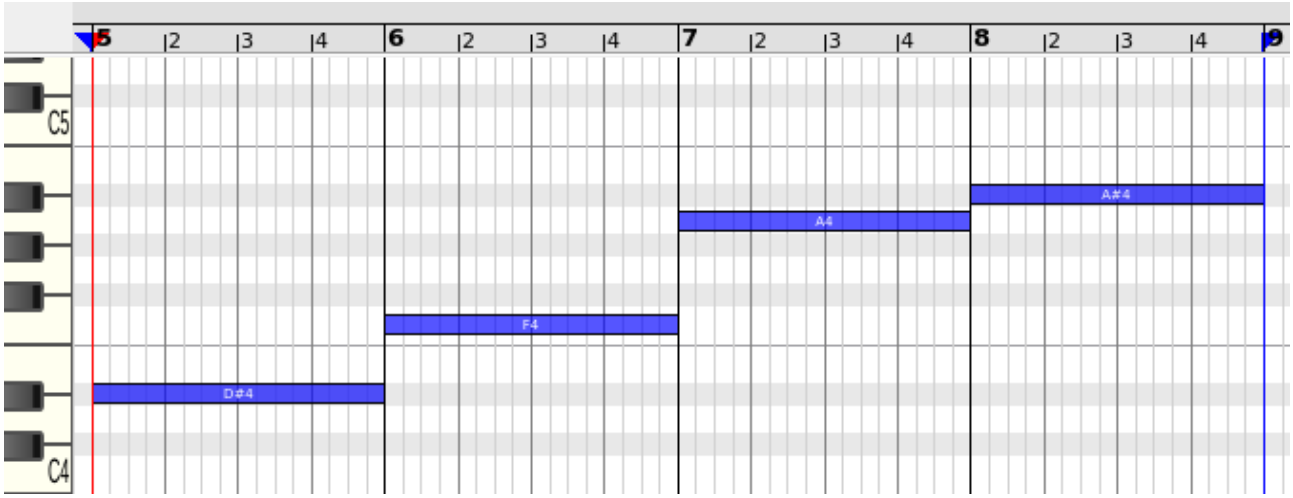
Track "bass2". Create it the same way as "bass1".



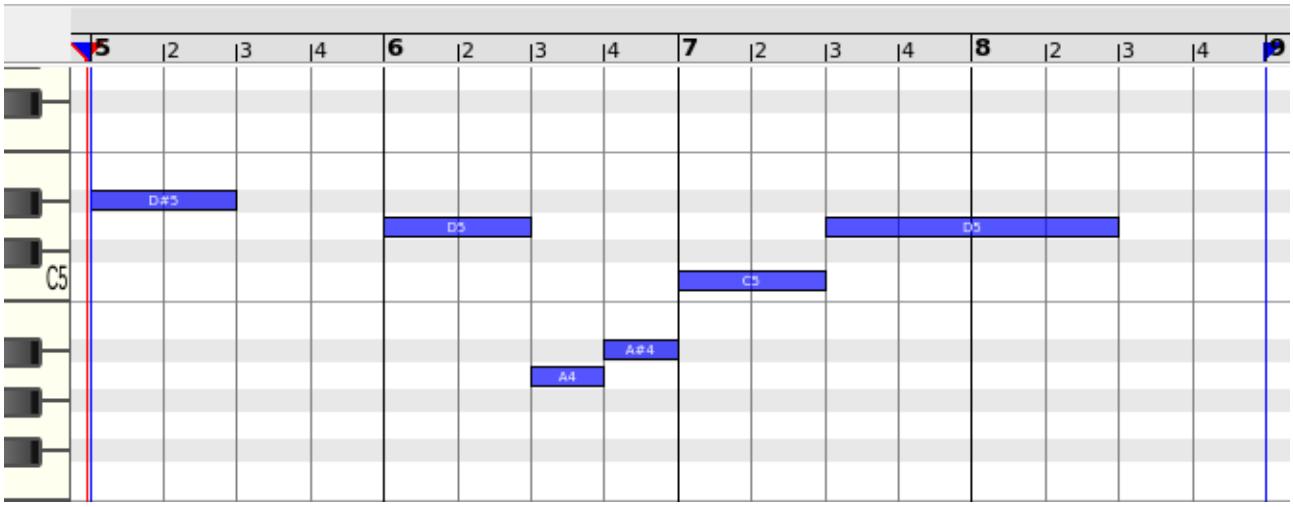
Track "chords". Strive for a movement upwards.



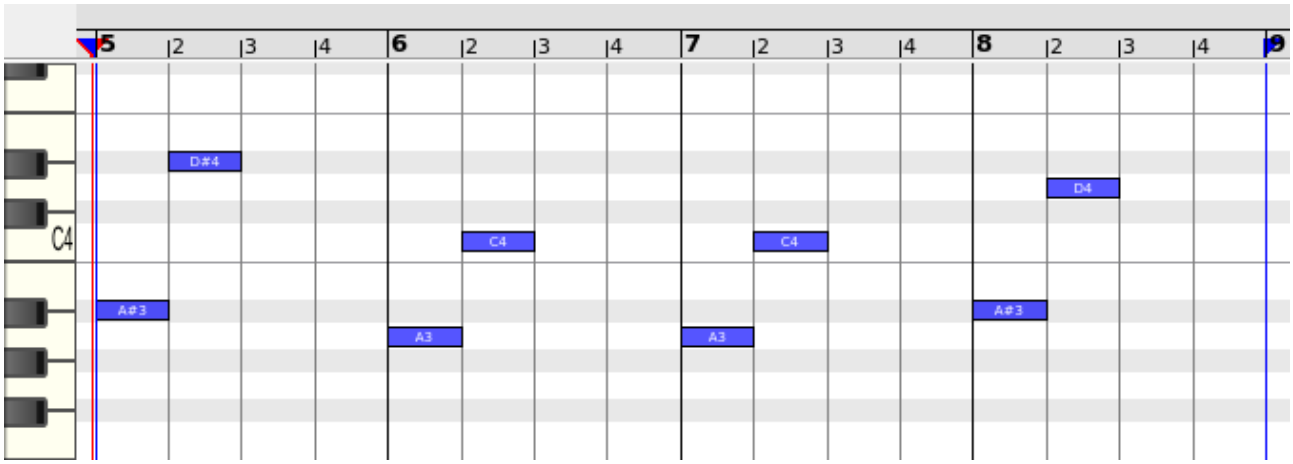
Track "arpeggio".



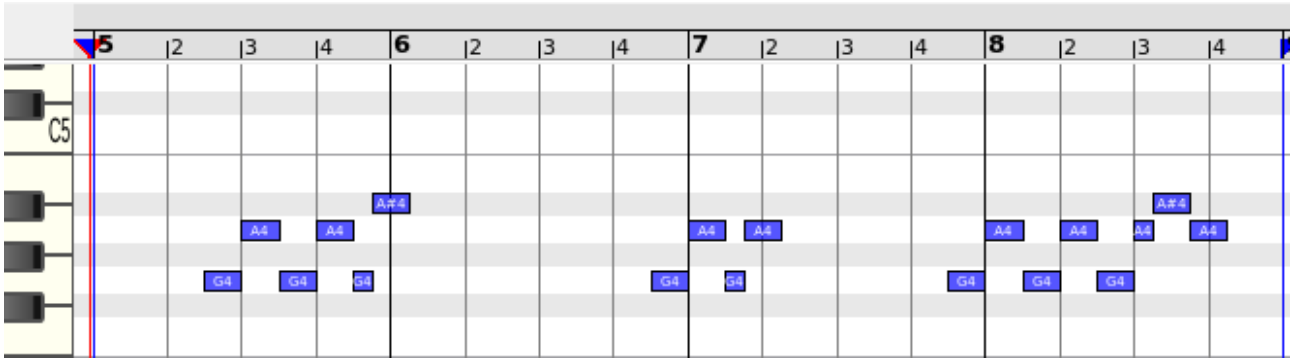
Track "lead1".



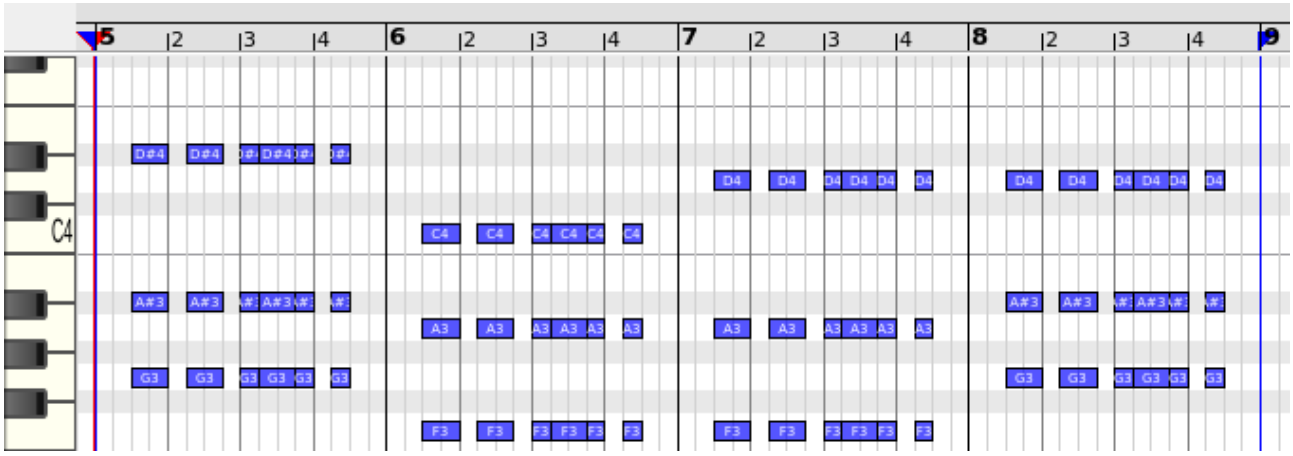
Track "lead2".



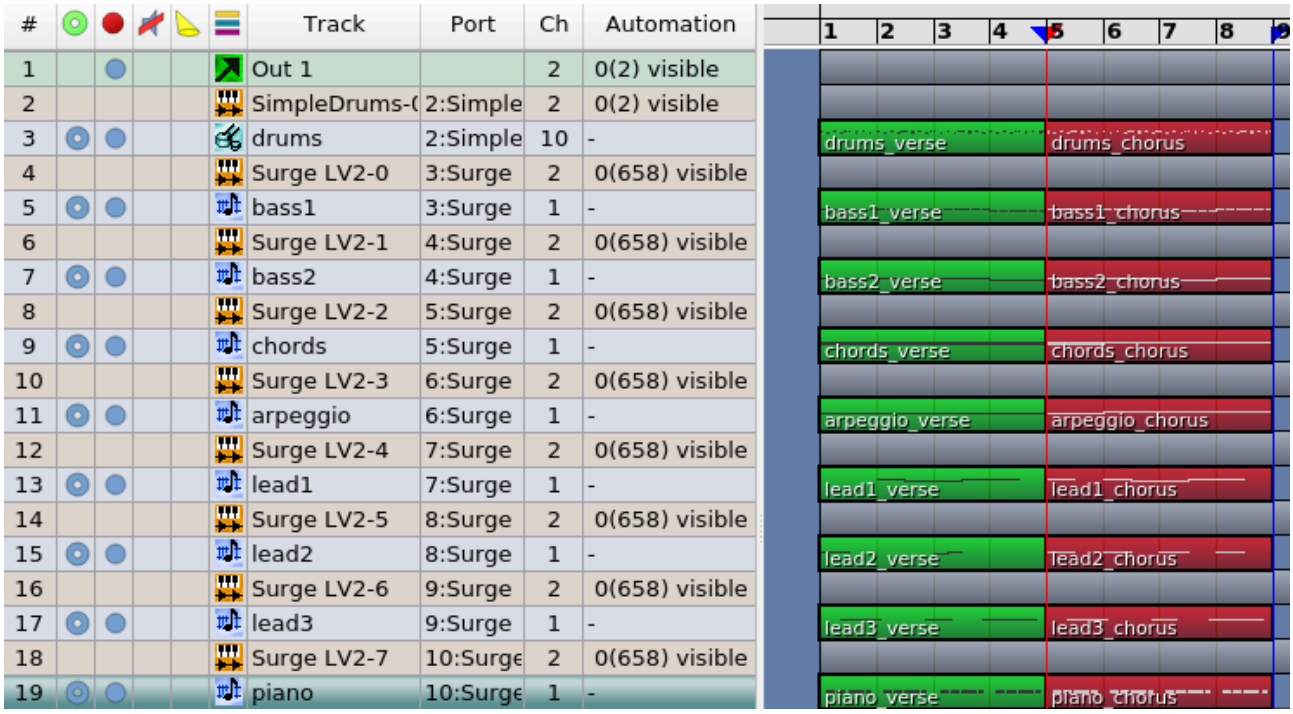
Track "lead3". Just a copy of the verse.



Track "piano".



The song now looks like this:

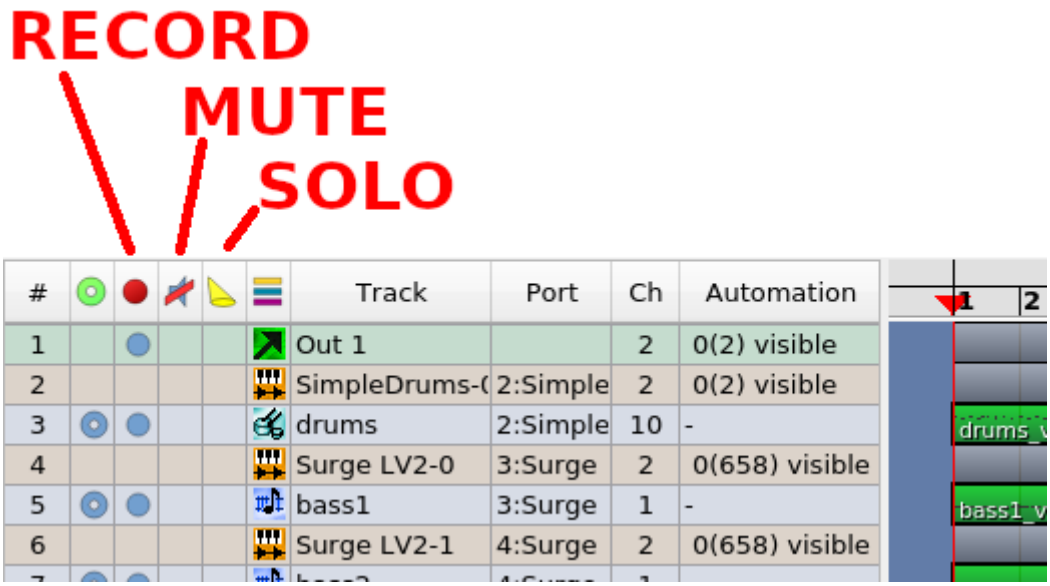


#	Track	Port	Ch	Automation
1	Out 1		2	0(2) visible
2	SimpleDrums-(	2:Simple	2	0(2) visible
3	drums	2:Simple	10	-
4	Surge LV2-0	3:Surge	2	0(658) visible
5	bass1	3:Surge	1	-
6	Surge LV2-1	4:Surge	2	0(658) visible
7	bass2	4:Surge	1	-
8	Surge LV2-2	5:Surge	2	0(658) visible
9	chords	5:Surge	1	-
10	Surge LV2-3	6:Surge	2	0(658) visible
11	arpeggio	6:Surge	1	-
12	Surge LV2-4	7:Surge	2	0(658) visible
13	lead1	7:Surge	1	-
14	Surge LV2-5	8:Surge	2	0(658) visible
15	lead2	8:Surge	1	-
16	Surge LV2-6	9:Surge	2	0(658) visible
17	lead3	9:Surge	1	-
18	Surge LV2-7	10:Surge	2	0(658) visible
19	piano	10:Surge	1	-

Create the song

Arrange

When making an arrangement it's helpful to be able to solo a channel and/or mute channels. You can do that by clicking before the track name in the Track pane.



Let's repeat the song structure

1. intro
2. verse
3. chorus
4. verse
5. chorus
6. bridge
7. chorus
8. outto

We will now move and copy parts to make this structure.

Each time we Ctrl-click and drag parts we create copies. If we Ctrl+Alt-click and drag we create a **clone**. A clone is a copy that shares the note data with the original part. So if you change the notes in the clone (or the original) the notes in the original (or the clone) will change too. If you later on want to convert a clone to a normal independent copy you can do that by right-clicking on the clone part and select "De-clone". All clones and the original will have dotted borders.

You can also **mute** parts by selecting the Mute parts tool (keyboard shortcut: M) and clicking on the parts that you want to silence. This is a great way to try out different arrangements without having to delete parts.

First we will switch of looping and zoom out. The zoom level is controlled by the small slider in the bottom right of the Arranger. Make sure Snap is set to Bar.

Clone parts to make an arrangement. Notice the single empty bar after the first chorus and the 8 bars after the second chorus.

Intro and outro

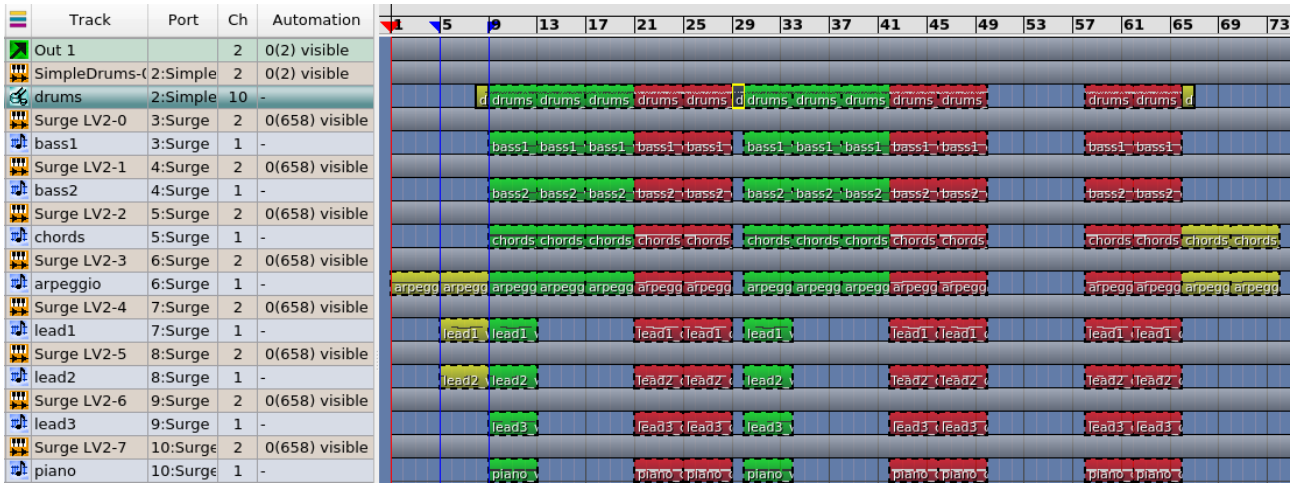
We will make a simple intro by reusing some parts from the verse.

Add one bar on the Drum track with some Snare hits leading up to the verse.

Do a similar thing to create an outro. Add a bar on the Drum track with a Crash hit.

Add a bar on the Drum track after the first chorus. Put some bass drum and a Snare on it.

Color all new parts yellow.

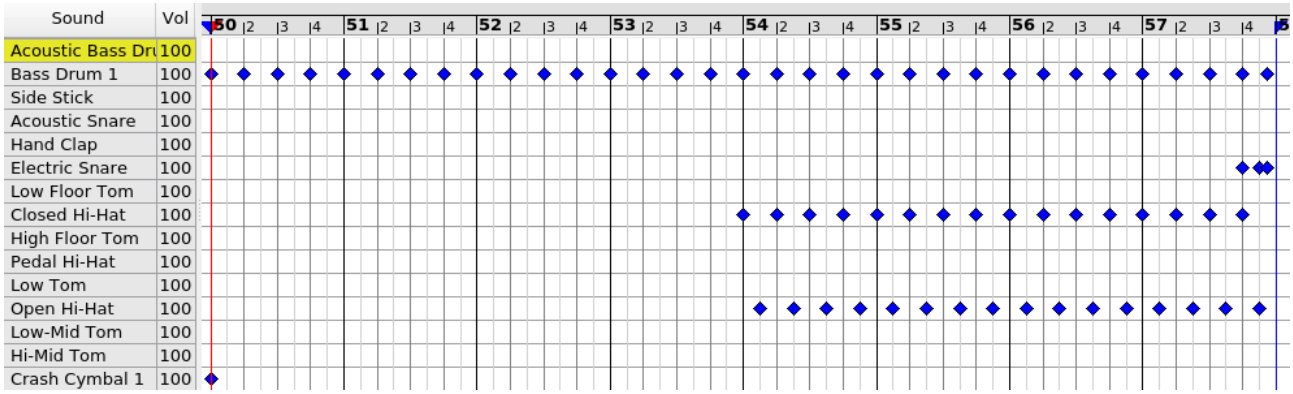


Bridge

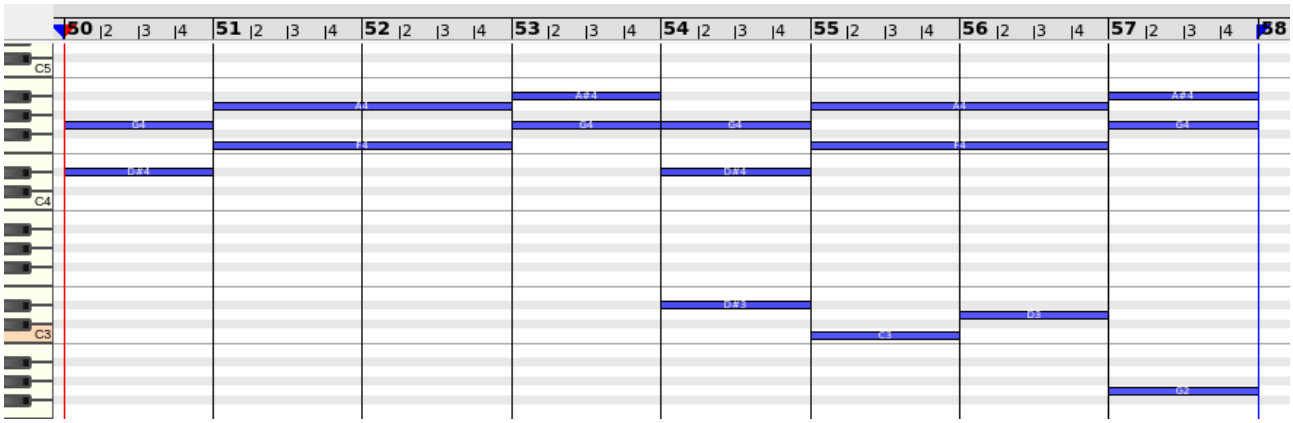
Lets make the bridge.

Copy two drum parts from the chorus and place them between the second and third chorus. De-clone them (right-click > De-clone). Now glue them together into on 8 bar part by selecting the Glue tool (keyboard shortcut: G) and clicking on the first part. They are now one.

Remove the snares and let the bass drum play on every quarter.



Copy two parts from the chorus of the "chord" track. De-clone them, glue them together and add some bass notes to the last 4 bars.



Clone-copy a chorus part from the Arpeggio track and place it on the 4 last bars of the bridge.

Color all bridge parts yellow.

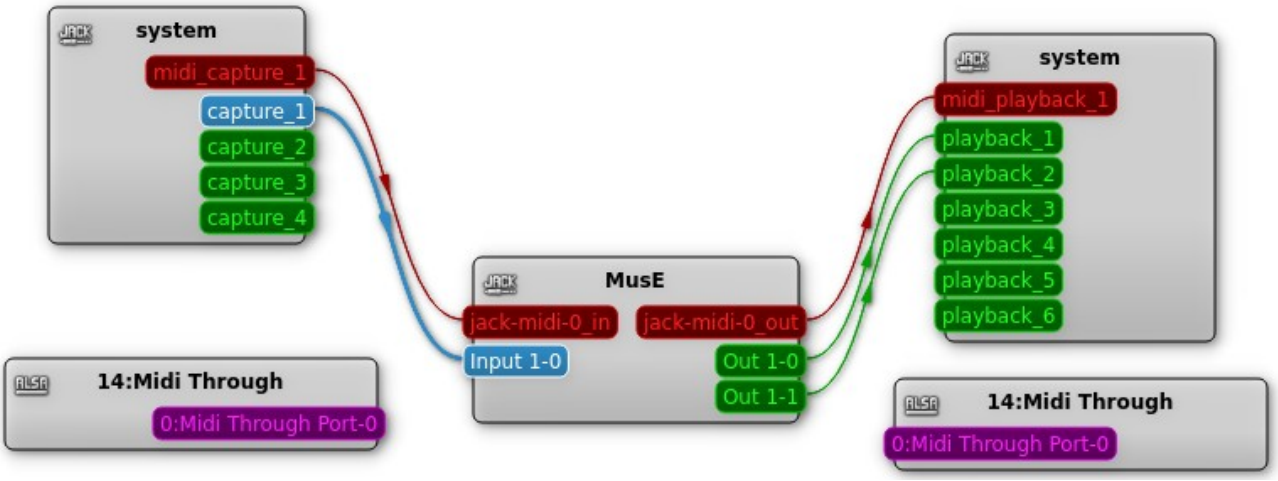
All instrument tracks are now finished.

Vocals

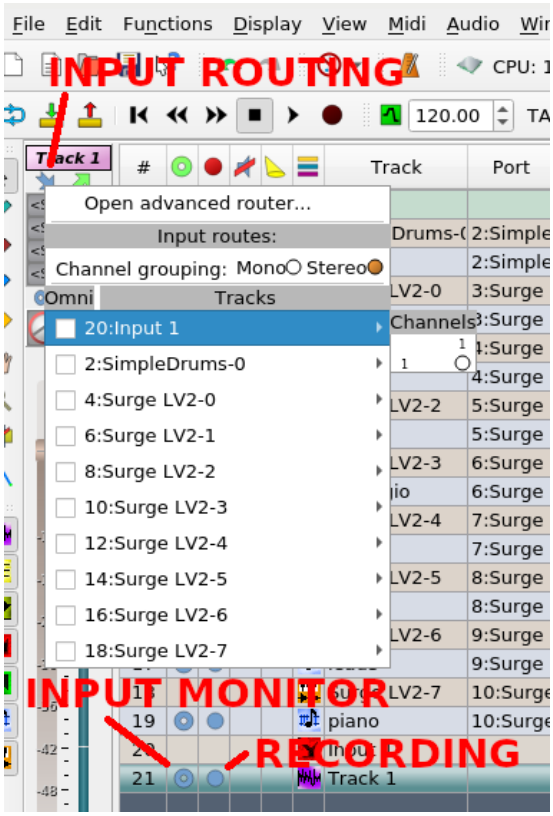
Now it is time to record the vocals, so first of all we have to decide on the tempo of the song. As all music until now is controlled by MIDI we can change the tempo without affecting the sounds. For this song we will keep it at 120 bpm.

First we have to add an Audio Input track by right-clicking in the Track pane.

After this step I have to switch to QJackCtl and connect the system > capture_1 to MusE > Input 1-0.



Switch back to MusE and add a Wave track. To connect it to the input track, click the "Input routing" arrow on top of the mixer strip to the left of the Transport pane. In the list select "Input 1" (the name of the Audio input track).



To be able to hear the input audio click the hollow circle in the "Enable input monitor" column on the Wave track.

Rename the track "vocals".

Set snap to Bar. Place the Play position (the red line) 4 bars before where you want the recording to begin, click Record and then Play on the Transport panel. You will hear the instrument tracks playing and see the recording take shape as a new part on the "vocals" track.

Lyrics:

Verse 1:

I have no wishes left

I can't go back in time

I close me eyes and wait for

sleep

I'm falling through the void

I'm drowning in my bed

I drink too hard to leave my

life

Chorus:

You said that you were home

you told me you would stay

you told me you would

wait for my embrace

But I came way to late

And you had gone away

I told you that I

never lose my way

Verse 2:

I play the message back

and listen to your voice

There is no peace in

memories

I failed the final test

I'm not the one for you

I close me eyes and wait for

sleep

You can record the vocals bit by bit so they are in separate parts. Or you can do it all in one take. I prefer the first method. Then I trim the audio parts using the Cutter (keyboard shortcut: S) at even bars. Color the parts green and red. I recorded the chorus twice and reused the first recording on the third chorus.

#	Track	Port	Ch	Automation
1	Out 1		2	0(2) visible
2	SimpleDrums-(	2:Simple	2	0(2) visible
3	drums	2:Simple	10	-
4	Surge LV2-0	3:Surge	2	0(658) visible
5	bass1	3:Surge	1	-
6	Surge LV2-1	4:Surge	2	0(658) visible
7	bass2	4:Surge	1	-
8	Surge LV2-2	5:Surge	2	0(658) visible
9	chords	5:Surge	1	-
10	Surge LV2-3	6:Surge	2	0(658) visible
11	arpeggio	6:Surge	1	-
12	Surge LV2-4	7:Surge	2	0(658) visible
13	lead1	7:Surge	1	-
14	Surge LV2-5	8:Surge	2	0(658) visible
15	lead2	8:Surge	1	-
16	Surge LV2-6	9:Surge	2	0(658) visible
17	lead3	9:Surge	1	-
18	Surge LV2-7	10:Surge	2	0(658) visible
19	piano	10:Surge	1	-
20	Input 1		1	0(2) visible
21	vocals		1	0(60) visible

You probably have to redo the singing a couple of times. All recordings are saved in the directory we entered when we first saved the song. If you look in it with a file manager you can see all the recordings, named "TRACK_*.wav". You can get rid of the recordings you haven't used in the Arranger by chosing File > Find Unused Wave Files and clicking "Move files to 'unused' subdir". All unused takes are moved to this folder and you can delete it.

Now let's add som effects to the "vocals" track. We want a compressor, an equalizer and some delay.

Effects are added in the mixer strip to the left of the Track pane, near the top where the text says "<Slot 1>" etcetera. You can have up to 8 effects on one track, and you can use the same method when working with Synth tracks.

Right-click "<Slot 1>", select New and you will see a list of your effects. Select "Calf Equalizer 5 band".

Right-click "<Slot 2>", select New and add "Calf Compressor".

Right-click "<Slot 3>" and add "Calf Vintage Delay".

Right-click "<Slot 4>" and add "Calf Reverb".

We want to adjust their default settings. We can bring up the settings (GUI) of each effect by right-clicking on the effect and chosing "Show native GUI".

These are the settings we are going to use for each effect.

Calf Equalizer 5 band, less bass, more treble:

Calf Compressor, adjust the Threshold:

Calf Vintage Delay, default settings:

Calf Reverb, adjust Delay time, Room size, Wet and Dry settings:

Mixing

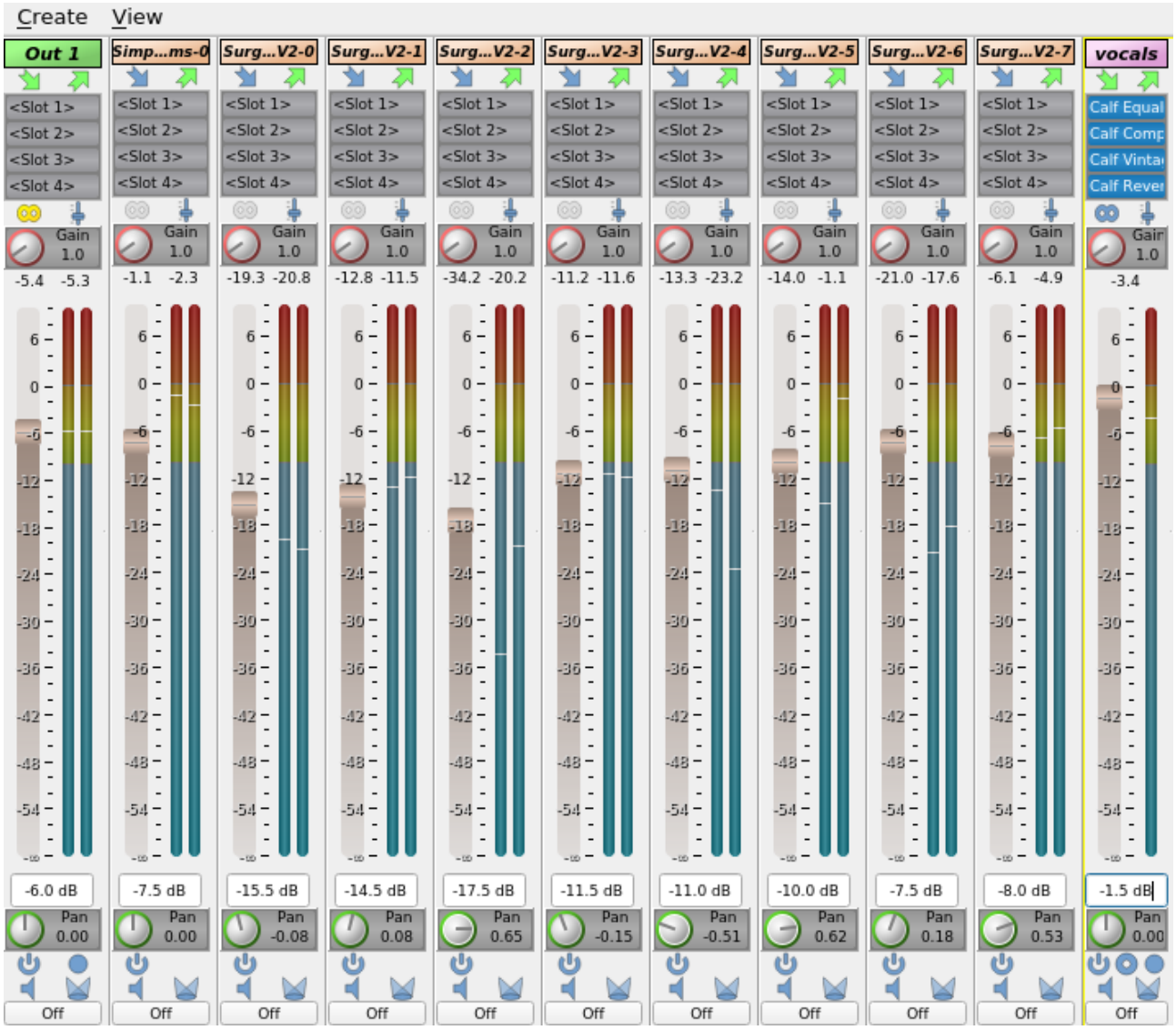
With all tracks recorded and effects applied, let's bring up Mixer B and adjust the levels.

From the view menu all the different kinds of tracks can be toggled on/off from the mixer. Use that to hide all MIDI tracks and Input tracks.

If the small numbers above the meters are read the track is too strong and has to be lowered (drag the fader down).

Use the Pan controls to spread out the mix across the stereo field.

You will probably also adjust the levels of the individual drum sounds in SimpleDrums.



Mastering

Mastering is the art of enchancing the final mix. We do this in MusE by adding effects to the "Out 1" track.

Select the "Out 1" track and right-click on "<Slot 1>" in the mixer strip. Select "New" and add the Calf Compressor. Right-click on the effect and chose "Show native GUI". Lower the threshold value and add some Makeup Gain.

Add "Calf Multiband compressor" to "<Slot 2>". In the native GUI add some Sub band, Low band and High band.

Check all levels so we don't get any distortion. We want to keep the "Out 1" meter below the red area.

Now it is time to create a wav file of the song. Set the Left and Right markers to they encompass the whole song and a couple of bars extra at the end. Select Audio > Bounce to file. Press the button with the dots and name the output file ("musesynthpop.wav") and select the "musesynthpop" directory. Click "Save", make sure that Channel is set to "Stereo" and Format to "wav, 16 Bit". Click OK. MusE runs through the song and saves it to a file.

You can now use for example Audacity to open the song, study the levels, and save it to OGG or MP3.

Improvements

There are a lot of improvements to do.

Several of the cloned synth parts should be de-cloned and some variation introduced, especially in the drum tracks.

The intro and outro needs more work.

Everything that makes the song more dynamic and interesting is probably a good idea.

Aux Send

Surge has its own effect engine. This means that some patches already have reverb applied. Others have not.

SimpleDrums has its own reverb effect. As does the "vocals" track.

It would be better if they all hade a common reverb effect that we can send their sound to.

For this we can add an Aux track.

More information: https://github.com/muse-sequencer/muse/wiki/Documentation#tracks-and-parts

Automation

For audio and MIDI we can record control changes. By using automation you can program changes in the synths settings, for example the volume change over time, or the filter cutoff.

More information on automation:

- https://github.com/muse-sequencer/muse/wiki/Documentation#automation
- https://github.com/muse-sequencer/muse/wiki/Documentation#tracks-and-parts
- https://github.com/muse-sequencer/muse/wiki/Documentation#plugins