NanoStudio 2 User Manual

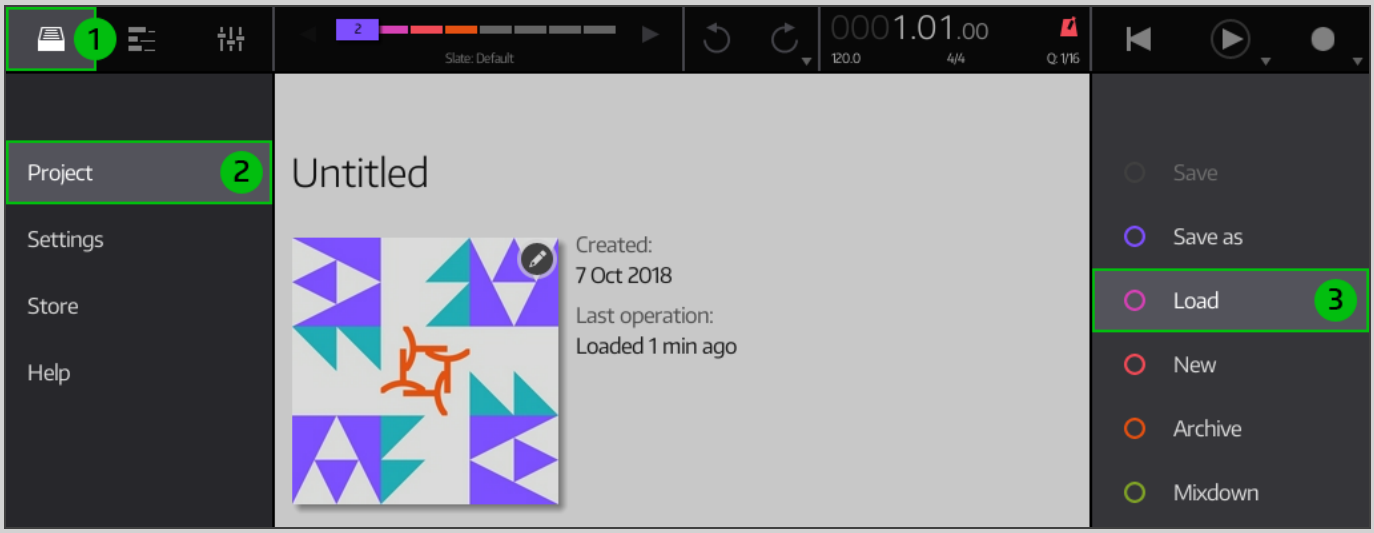
Getting Started

If you've never used NanoStudio before then you should first read all about the **Common Controls** to get a better understanding of the user interface and navigation.

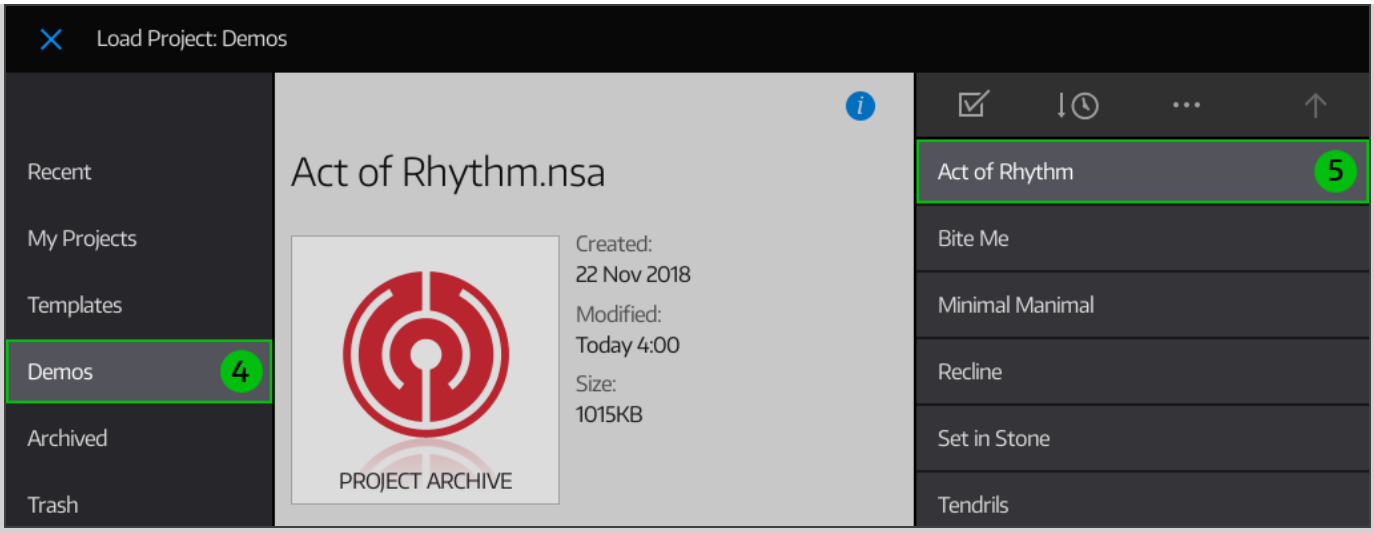
Done that? OK, I believe you.

Loading and Playing a Demo Project

1. Tap on the **Status Bar**'s HOME button.
2. Select the **Project** category.
3. Tap on **Load**.



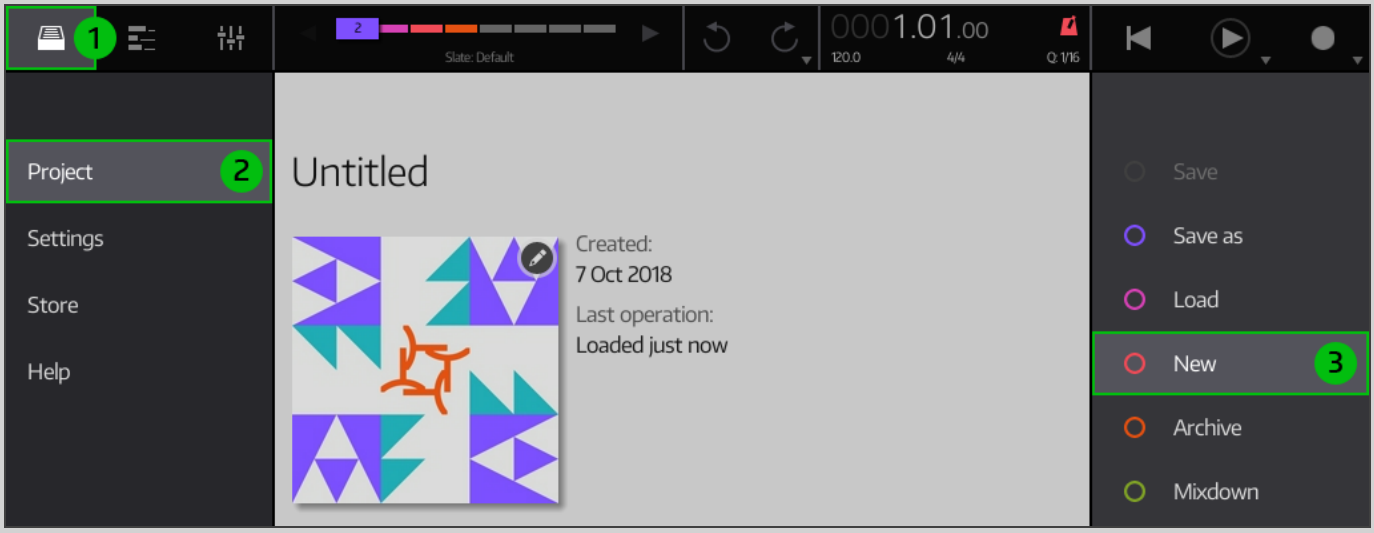
4. Select the **Demos** category.
5. **DOUBLE TAP** on a demo project to load it.



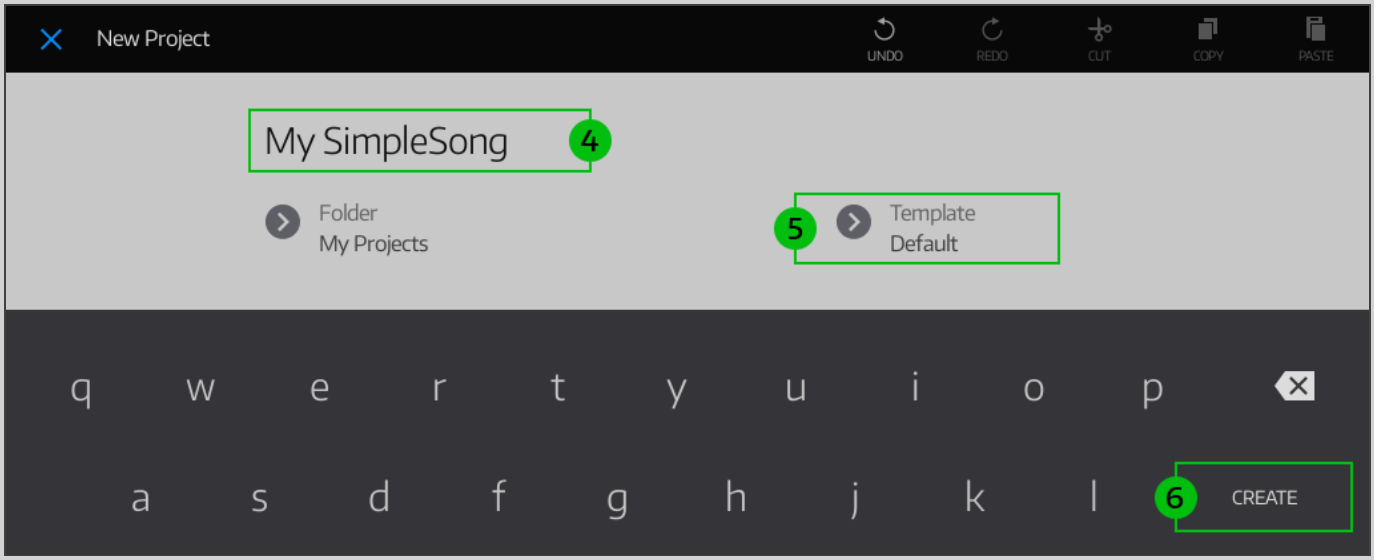
6. Tap on the **Status Bar**'s PLAY button.

Creating a Simple Song

1. Tap on the **Status Bar**'s HOME button.
2. Select the **Project** category.
3. Tap on **New**.



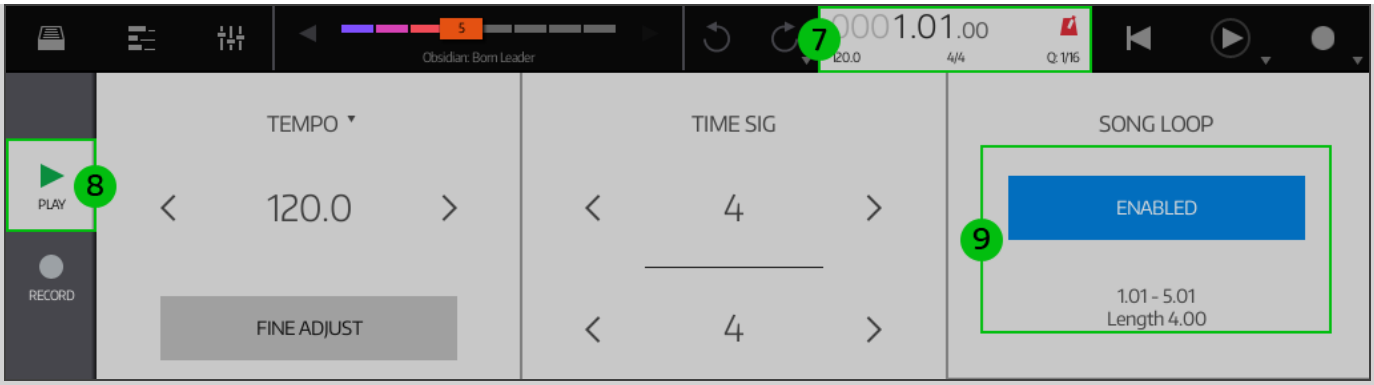
4. Name your song, or just use the default name provided.
5. Ensure that the Default project is selected.
6. Tap on **CREATE** to create your new project based upon the Default template.



NanoStudio's Default **project template** automatically creates a simple 4 track song with a **Slate** drum kit and and 3 **Obsidian** synths (for bass, strings and a lead synth sound).

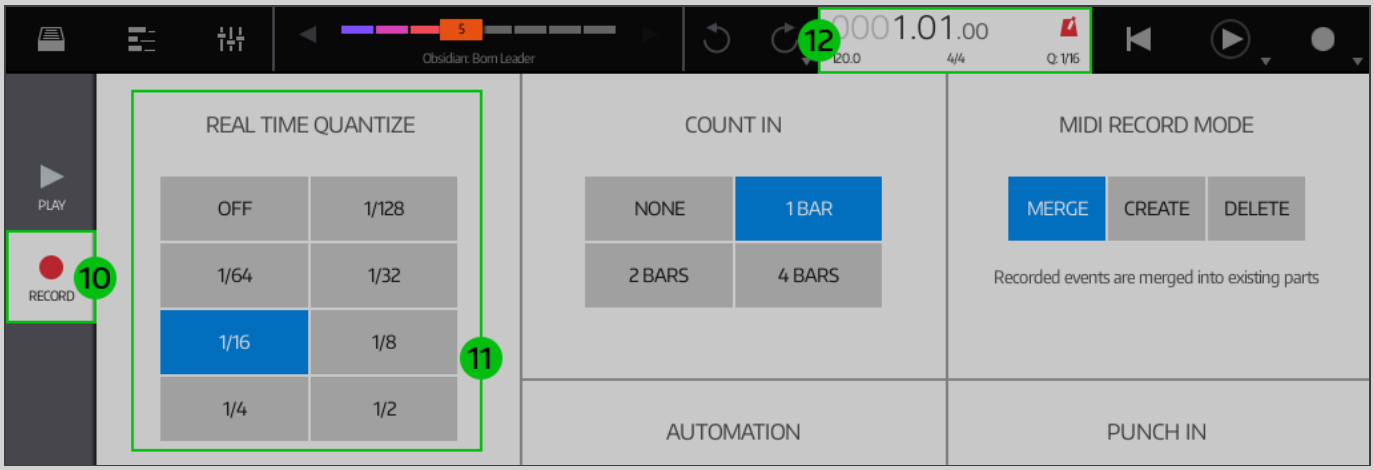
The default template should have 4 bar song loop which is already enabled - let's check that now:

7. Tap on the **Status Bar**'s song position indicator to invoke the **song settings dropdown**.
8. Tap on the **PLAY** tab to view the settings which relate to song playback.
9. Verify that song looping is enabled and that the length of the loop is 4 bars.



Since you will be recording a performance in real-time, you may wish to set the real-time quantize interval you'd like to use:

10. Tap on the **RECORD** tab to view the settings which relate to song recording.
11. Set the real-time quantize interval you'd like.
12. Tap on the **Status Bar**'s song position indicator to close the song settings dropdown.



Let's start by recording a drum track using the first **Slate** instrument provided by the Default project template.

13. Keep tapping on the instrument select button until you have selected the Slate instrument. Note that instead of tapping, you can also **SWIPE HORIZONTALLY** on the status bar's instrument select area to make rapid changes.
14. Tap the **RECORD** button. Recording will start after a 1 bar count-in, and then will continue in a 4 bar loop until you tap **STOP** or **PLAY**. We'll just leave it

running so we can build up a few instrument layers. Tap out a few beats on Slate's pads for 4 bars and listen to the recorded loop.

15. If you make a mistake, you can use the **UNDO** button to undo the entire recording session. To start a new recording session, you can tap **PLAY** and then **RECORD** again. You can also **TAP AND HOLD** on the **UNDO/REDO** buttons to see the full undo history.

16. Tap on the instrument select button to choose the next instrument, and record your performance using the instrument's keyboard. Keep doing this until you have recorded all four instrument tracks.
17. When you've finished, tap **STOP**

Congratulations, you've now made your first NanoStudio composition!

To edit your recording, see the **Song Editor**.

To adjust the mix, see the **Mixer**.

To save your project, see **Saving a Project**.

To perform a mixdown, see **Project Mixdown**.

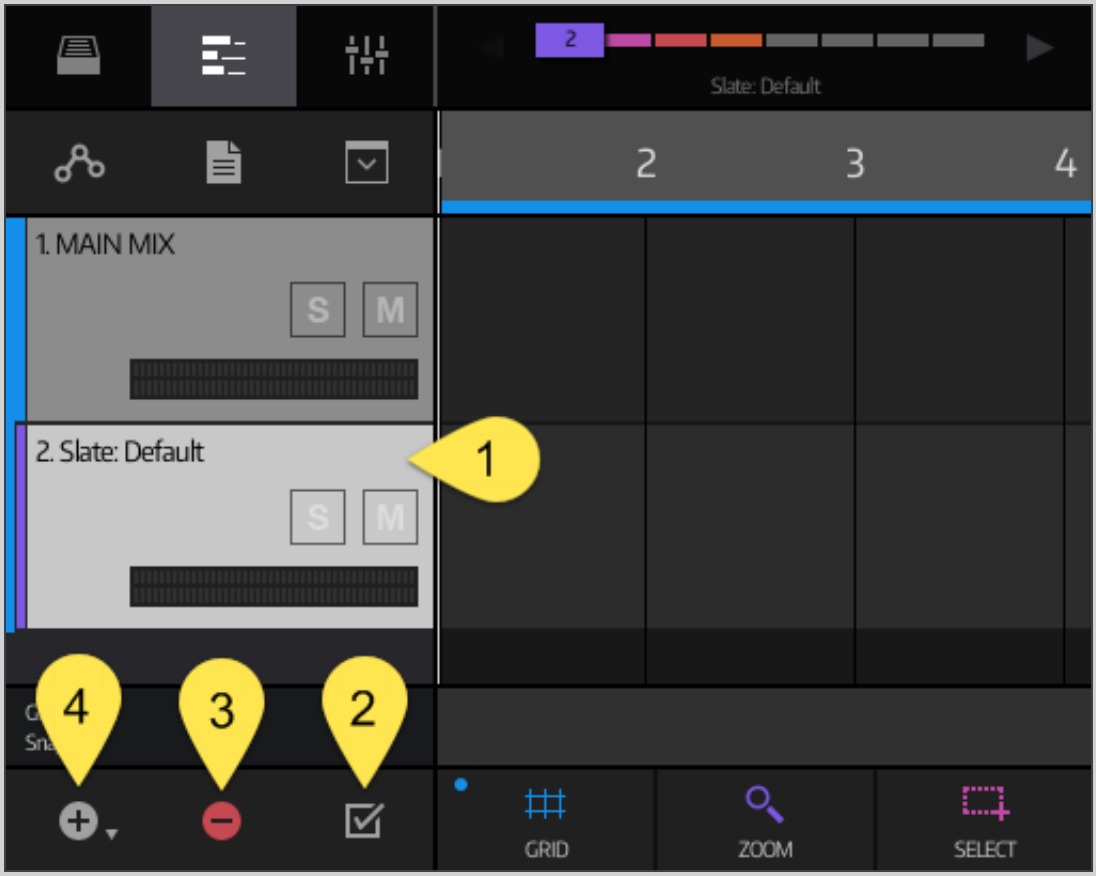
Finally, have a look at **Tips and Tricks** for explanations on how to perform other common tasks.

Tips and Tricks

Adding and Removing Tracks

You can easily add and remove tracks in the **Song Editor**:

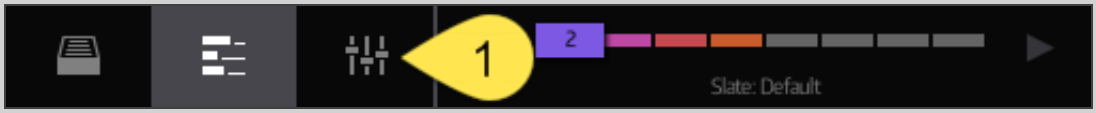
1. Select a track.
2. Optionally, use the multi-selection button to select more tracks.
3. Remove the track(s) by tapping on the red '-' delete button.
4. Add a track below the selected track(s) by selecting the grey '+' button. **TAP** to add an Obsidian instance, or **TAP AND HOLD** to choose any track type.



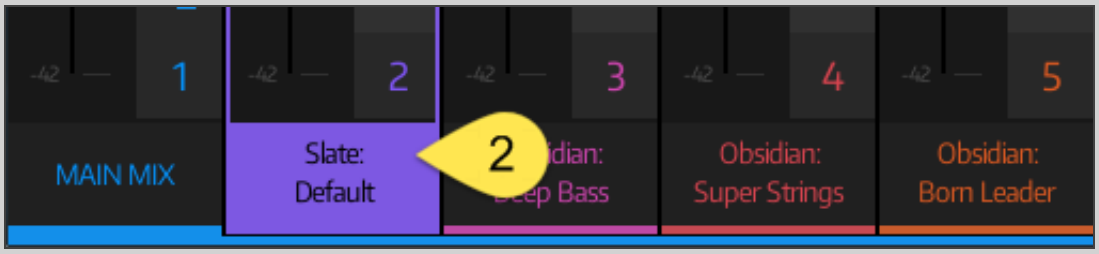
Changing a Track's Instrument

You can change the instrument on an existing track as follows:

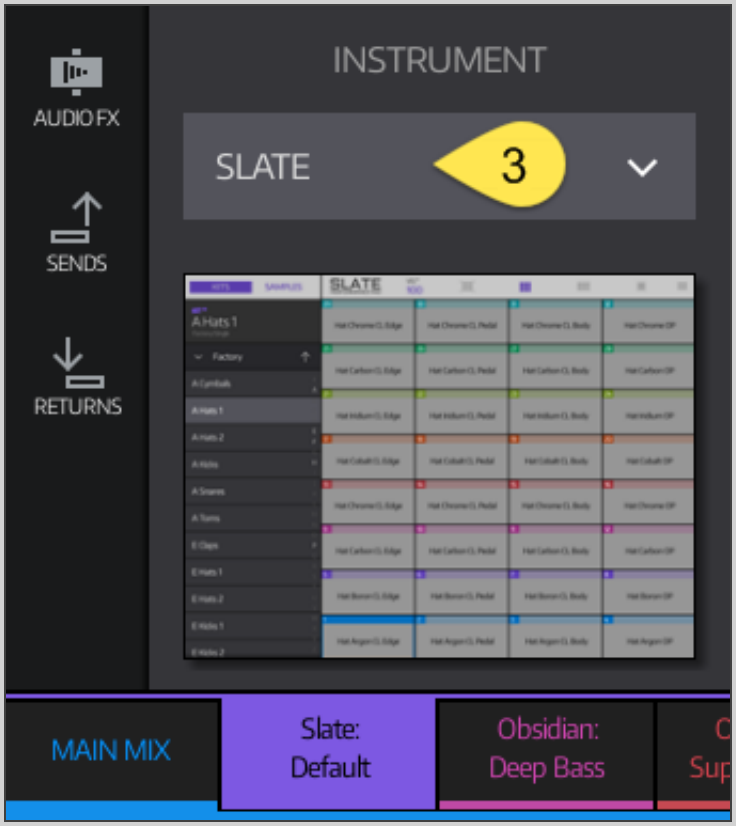
1. Tap on the Mixer button.



2. In the **Mixer**, **DOUBLE TAP** on the track's title (at the bottom of the strip).



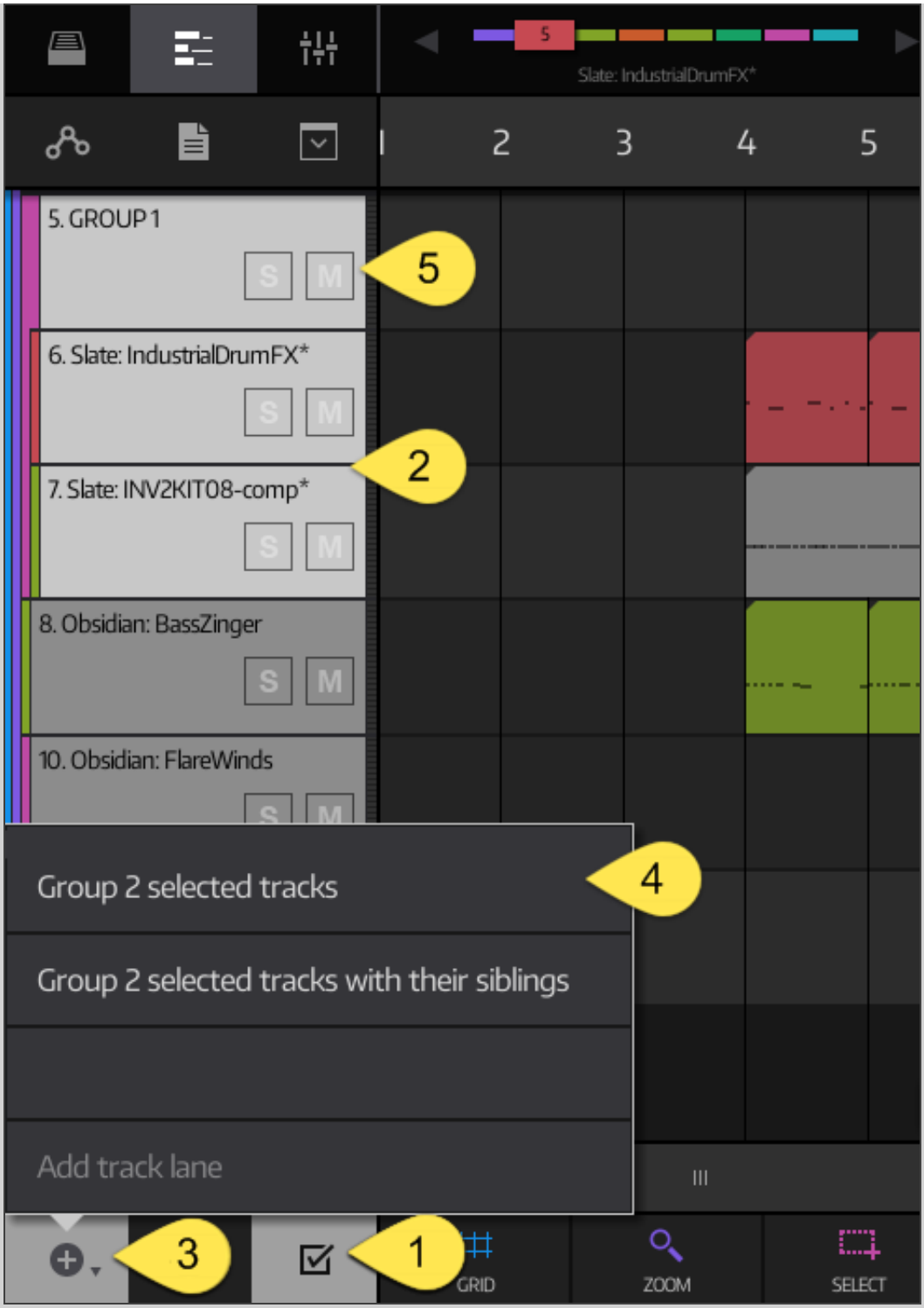
3. Use the dropdown menu to choose the instrument type.



Grouping Tracks

It's often convenient to combine tracks under a single group track in order to apply effects to the entire group rather than each track individually:

1. In the **Song Editor**, **TAP** the multi-selection button.
2. Select the tracks you wish to group together.
3. **TAP AND HOLD** on the grey '+' button.
4. Select **Group Selected Tracks** from the menu.
5. The Group track is inserted above the selected tracks, with a vertical bar indicator to indicate which tracks are grouped.

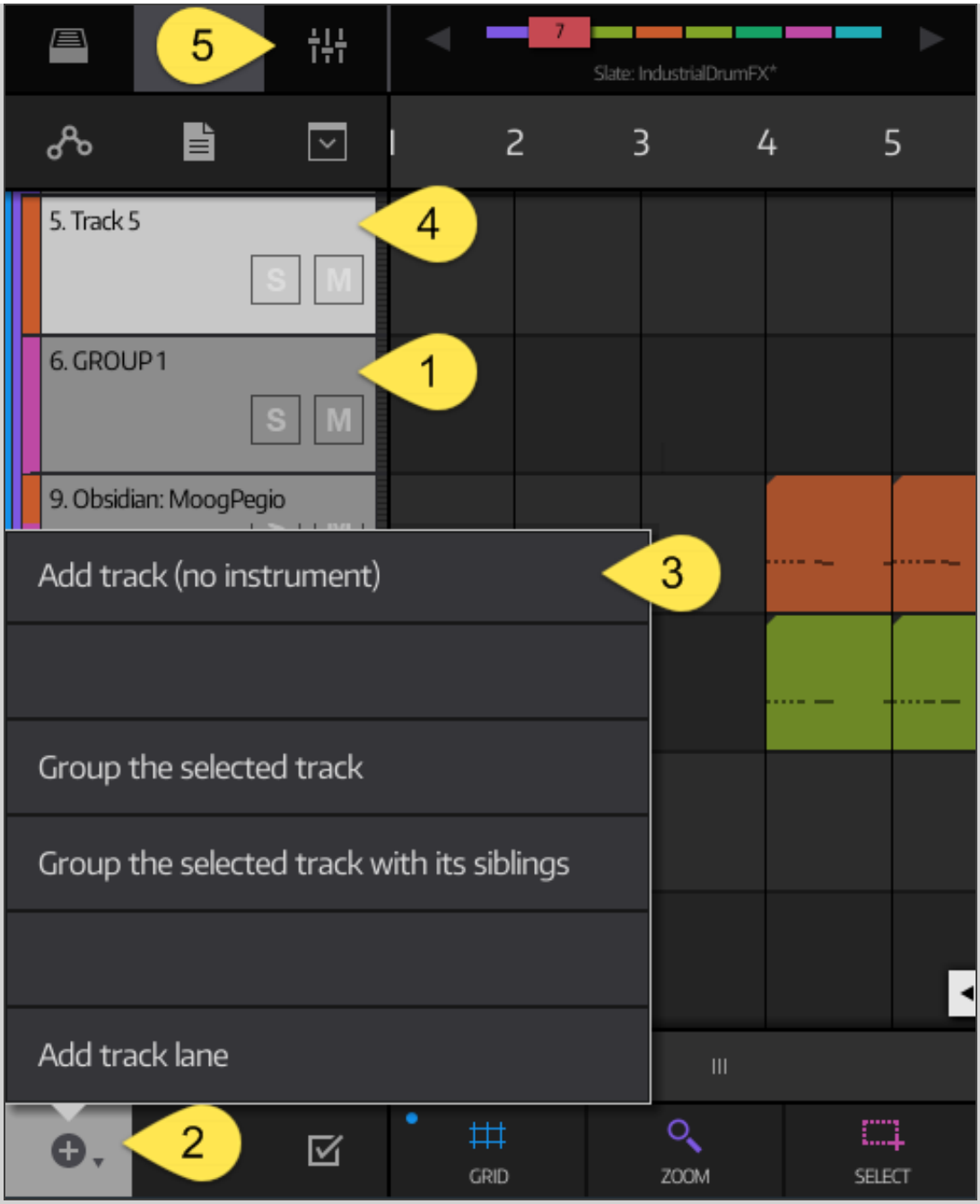


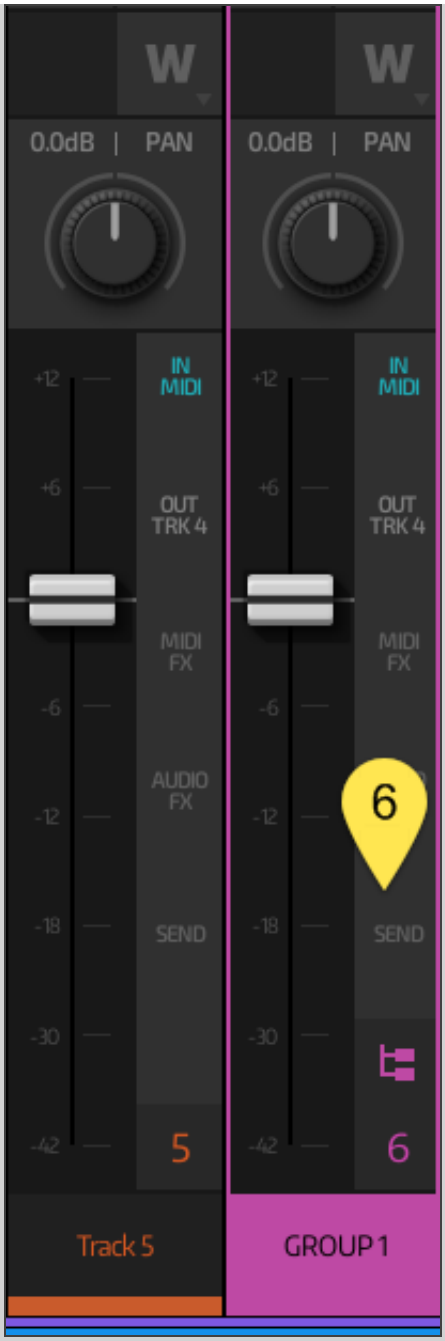
Creating a Send Effects Track

A useful feature is to re-use effects across multiple tracks. This has a host of benefits including saving processing, keeping projects organized and allowing for a variety of creative effects with precise control over uneffected (dry) and

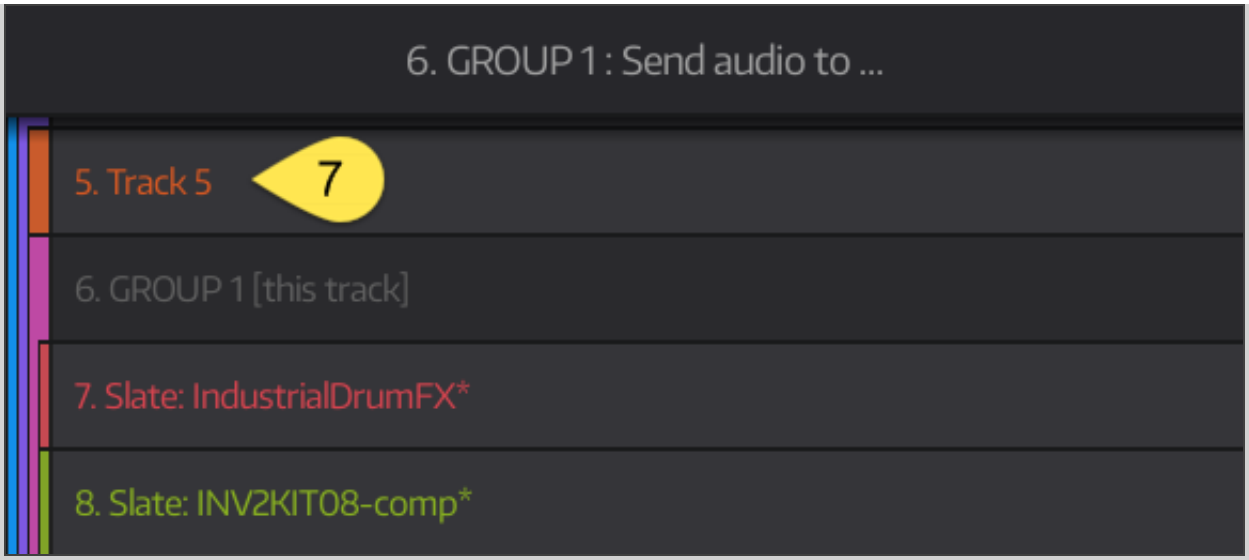
effected (wet) signals. Here are the steps to implement a typical Send effects track setup:

1. Select a track. The Send effects track will be inserted above or below this track, so choose a track that makes the most organizational sense.
2. **TAP AND HOLD** on the grey '+' button to invoke the track insert menu.
3. Select **Add Track (no instrument)**.
4. An empty track will be inserted below the track you selected in step 1. If you wish, use **TAP AND HOLD** on the **Track Header** and **DRAG VERTICALLY** to move it.
5. With the empty track selected, tap the mixer button on the **Status Bar**.
6. In the **Mixer**, tap the **SEND** button on the track you wish to send from. In this example, we will send audio from the 'GROUP1' track to the empty track we created called 'Track 5'.


5
Slate: IndustrialDrumFX*
1
2
3
4
5
5. Track 5
S
M
6. GROUP 1
S
M
9. Obsidian: MoogPegio
Add track (no instrument)
Group the selected track
Group the selected track with its siblings
Add track lane
GRID
ZOOM
SELECT

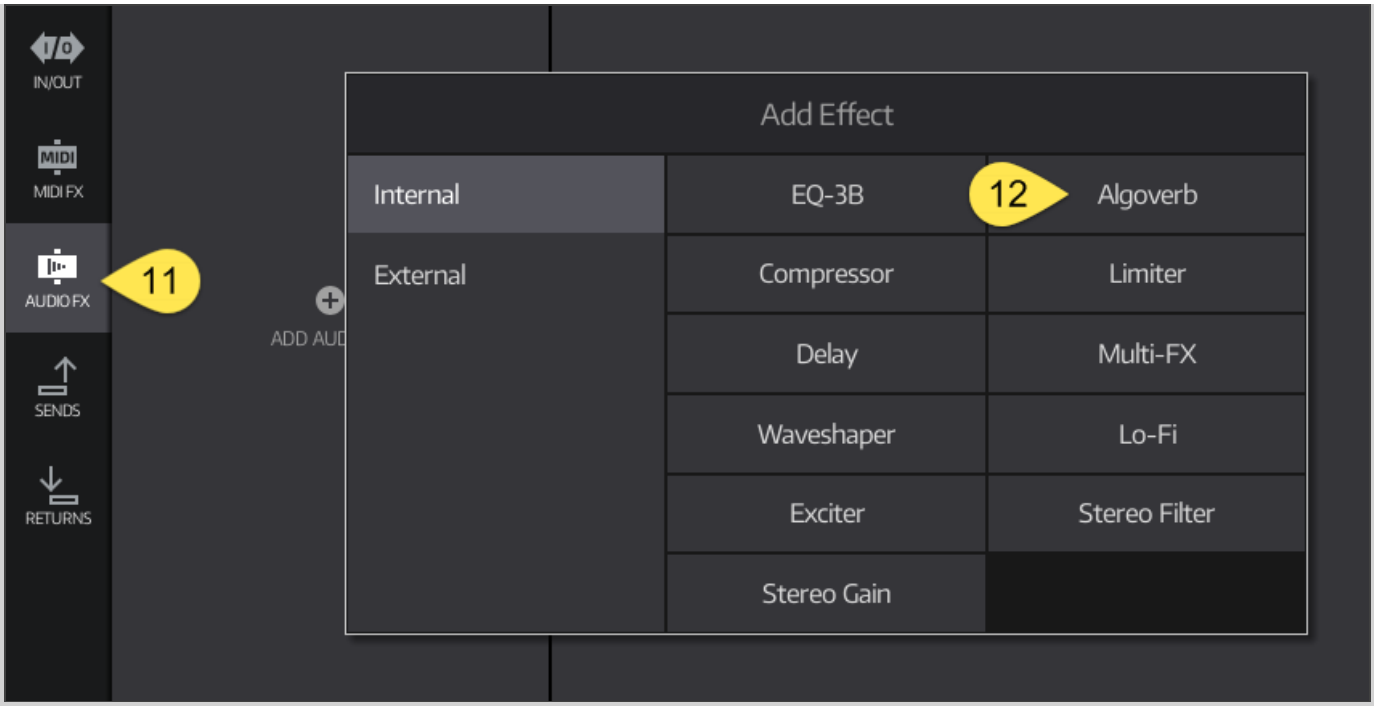


7. In the mixer's **SEND** page, tap on **ADD AUDIO SEND** and choose the track you wish to send to.
   In this example, select 'Track 5'.



8. Optionally, select **PRE** so that the signal is sent before the track's fader/pan controls are applied to it. This means that the signal will still be sent even if you lower the track's fader completely to silence its output.
9. Adjust the level of the signal being sent (particularly useful when controlling the amount being sent to a 100% wet reverb track).
10. Tap on the send's **DEST** button to quickly move to the track the send goes to (in our example, this is 'Track 5').

11. Tap on the **AUDIO FX** tab button to set up the send effects.
12. A typical use is sending to a reverb track, so we'll select the 'Algoverb' effect here.



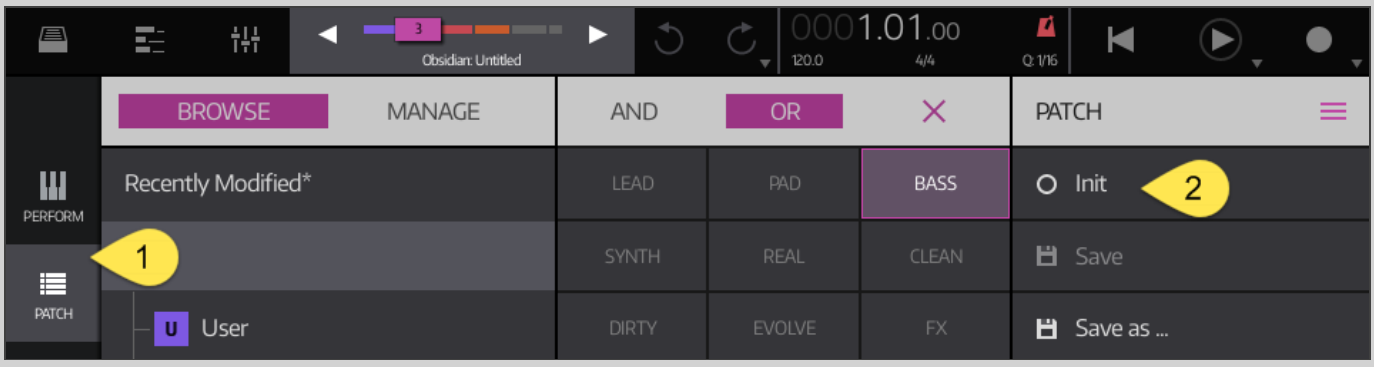
13. For send effects, we usually want to have only the wet signal (we can control the dry amount using the fader of the track sending the dry signal) so set Algoverb's **DRY** control to its minimum value.
14. Again, since we only want the wet signal, set Algoverb's **WET** control to its maximum value.
15. We can now control the amount of reverb using track fader on the right. (Note: some screen sizes don't have room for the track fader on this page - you will have to return to the main mixing desk view).

Repeat steps 6-9 for other tracks that you might want to send to the send effects track.

Modulation Routing in Obsidian

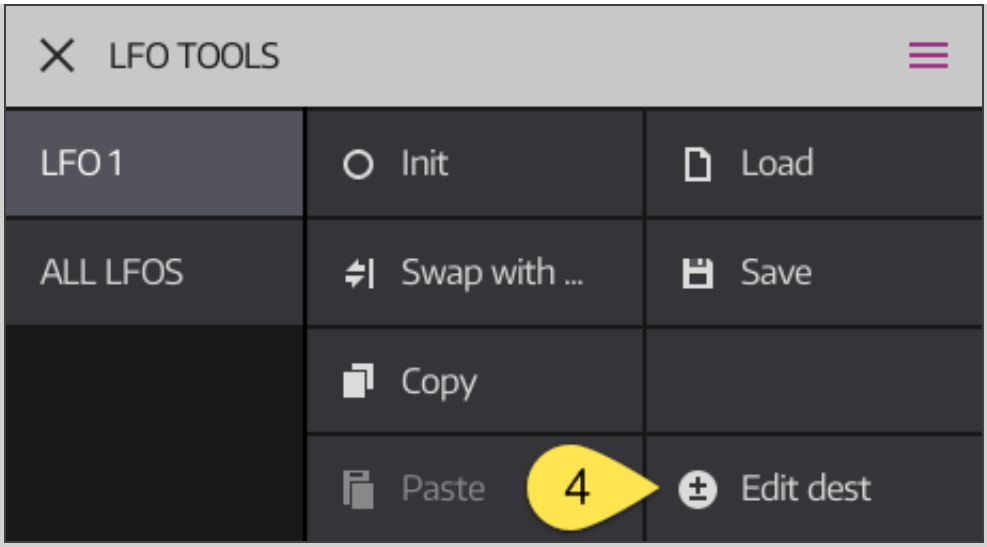
One of the key features of the Obsidian synthesizer/sampler is its quick and flexible modulation routing options. This brief tutorial will show you how to wire up a quick 'wobble bass' sound using this intuitive routing system:

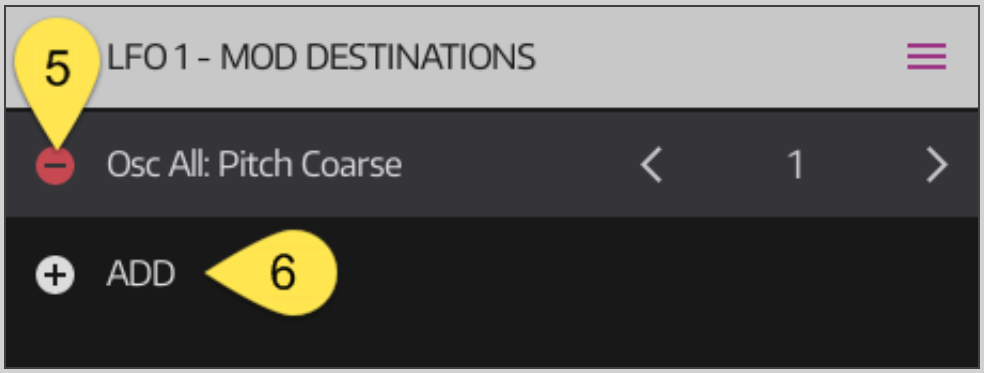
1. Choose an Obsidian instrument, tap on the **PATCH** tab button and tap the patch list's **HAMBURGER BUTTON**.
2. Choose the **Init** item to create a blank patch.



3. The ENV and LFO outputs in the bottom two panels (highlighted in purple) can be routed to almost any OSC or FILTER control in the top two panels (highlighted in magenta). In this example, we'll use LFO 1 to modulate FILTER 1's cutoff.
   TAP on LFO 1's **HAMBURGER BUTTON**.

4. Choose the **Edit dest** item to bring up a list of destinations that LFO 1 modulates (note: if LFO 1 isn't currently routed to anything then this item will instead be named **Add dest**).
5. By default, LFO 1 modulates the global pitch parameter. Tap the red '-' button to remove this modulation connection.
6. Tap the '+' button to add a new control to route the LFO to.





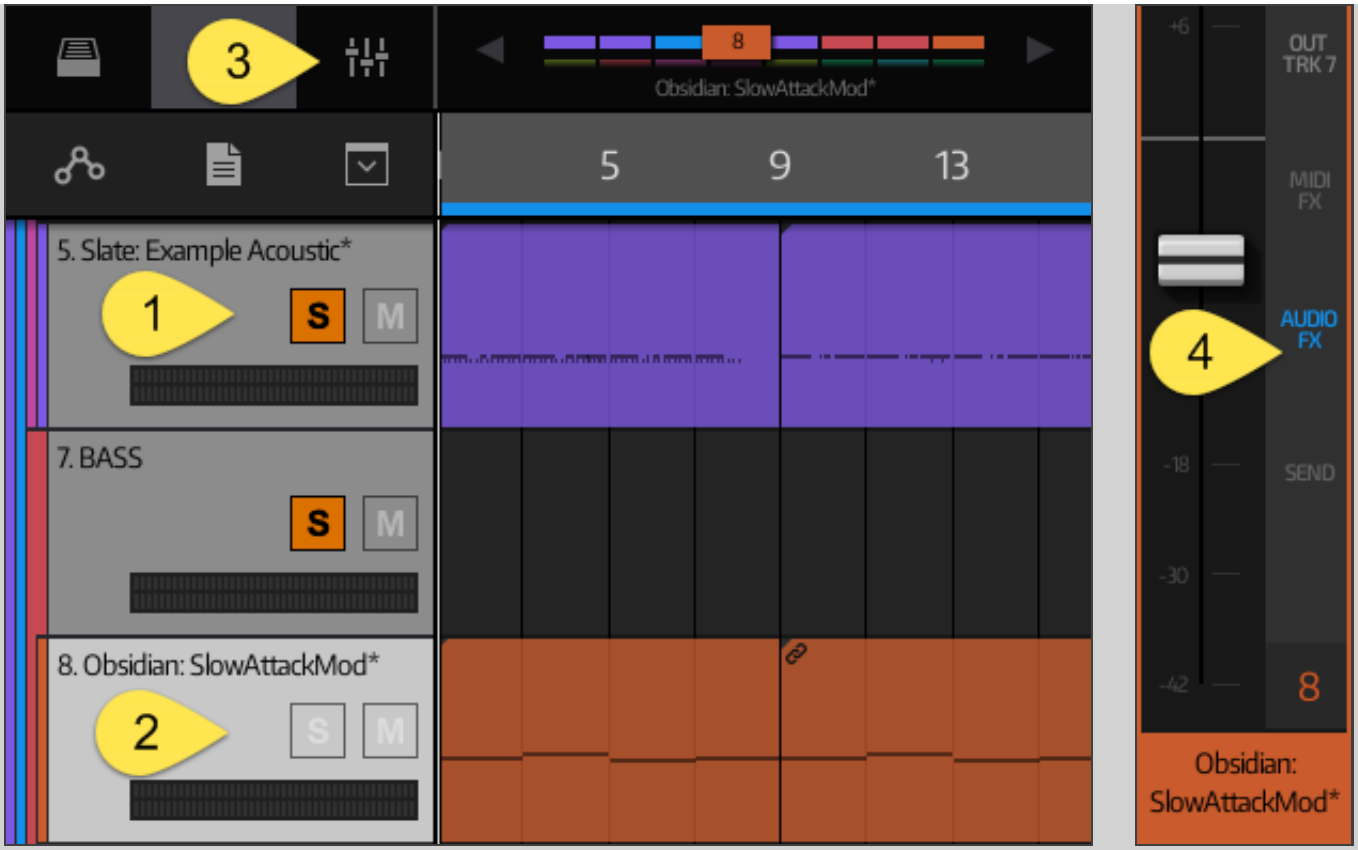
7. By default, the FILTER ENV is routed to FILTER 1's cutoff. It's easier to just have LFO 1 modulate the FILTER ENV **LEVEL** control rather than the FILTER 1 cutoff directly. Tap on the FILTER ENV's **LEVEL** control and the modulation connection is now made!
8. Now that the FILTER ENV level controls the cutoff, set FILTER 1's **CUTOFF** control to zero.
9. Increase LFO 1's **LEVEL** control for maximum effect.
10. Set LFO 1's **OUTPUT** option to **UNI FULL** so it can only add to the FILTER ENV's **LEVEL**.
11. Set LFO 1's **SYNC** option to **KEY** to make the LFO start its cycle from the beginning when a note is played.
12. Remember that you can also view and manage all modulation connections in Obsidian's **MOD** list.

When you press a key, it should now apply a modulating 'wobble' effect to the FILTER 1 cutoff. Experiment with the 'RATE' knob under LFO 1 to increase or decrease the effect.

Setting up Sidechain Compression

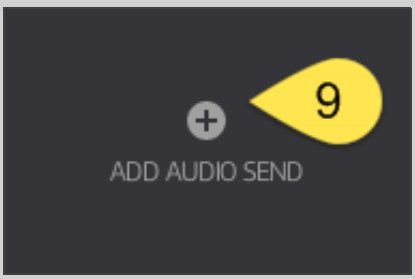
The NS2 **Compressor** supports sidechain input. This allows an external audio source sent from another track to act as the input upon which the compressor acts. One of the most common uses for this effect is the 'pumping' or 'breathing' effect you hear in many electronic music tracks. The following is a quick guide to setting this up:

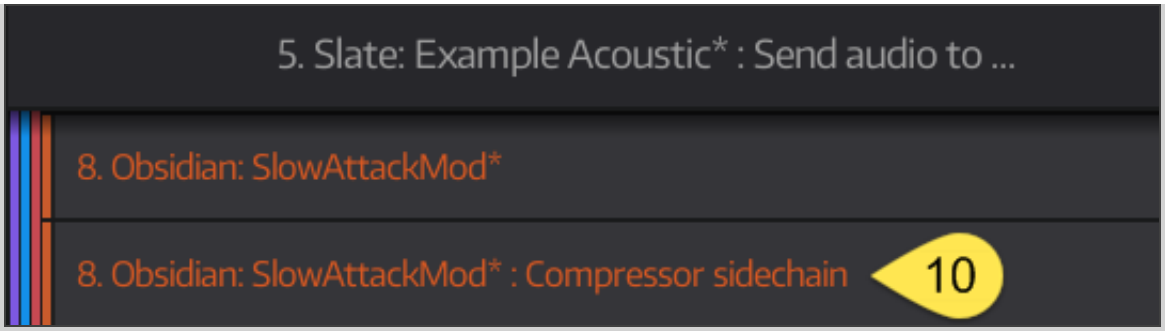
1. To set up the pumping effect, we'll want to send the kick drum signal from our drum track to a bass, lead, pad or fx instrument. Start by identifying the track that will contain the kick drum input. Here we identified the 'Example Acoustic' drum track.
2. Identify the track you want to have the pumping effect. Here we identified, and selected, the 'SlowAttackMod' bass track.
3. With the destination track selected, tap on the mixer button.
4. Tap on **AUDIO FX** for the destination track.



5. Add a compressor effect.
6. Set the compressor for a low threshold and high ratio to ensure you hear the effect properly. Use its reduction meter to understand the amount of work it's doing.
7. Lower the compressor's **SC FILTER** to lowpass only the bass frequencies of the incoming signal. Note: if there are bass sounds other than the kick drum, such as toms, you may want to lower this setting further. If that doesn't provide good results you can simply create another fresh track with just a kick drum to create the effect instead.

8. Go back to the **mixer** and tap **send** on the source (drum) track.
9. Tap on **ADD AUDIO SEND**.
10. Choose the destination track's **Compressor sidechain**. You now made the connection from the drum track to the bass track's compressor side chain!



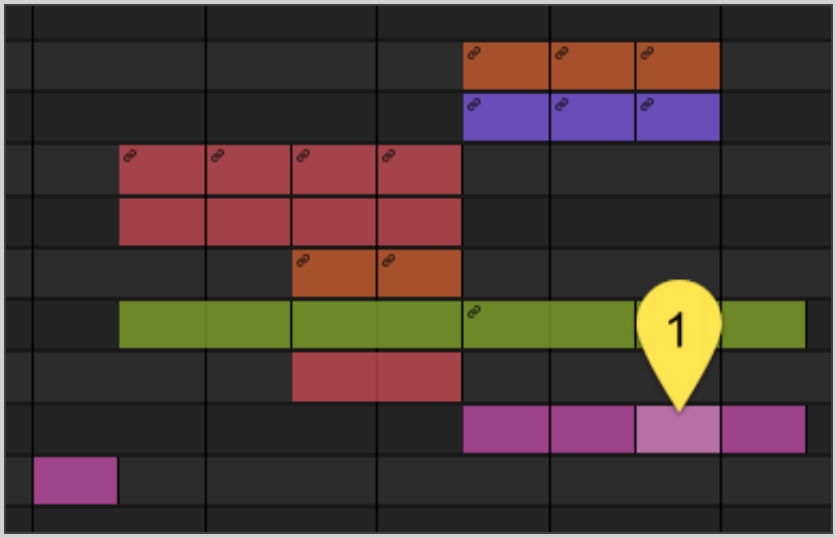


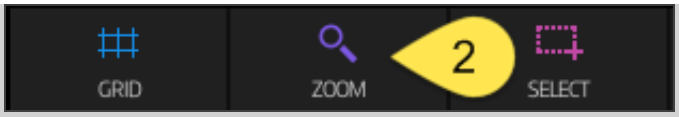
Go back to the compressor and adjust the settings to modify the effect. If you want real rhythmic pumping, play around with the compressor's **HOLD** and **RELEASE** values to suit the song's tempo.

Quick Zooming in Editors

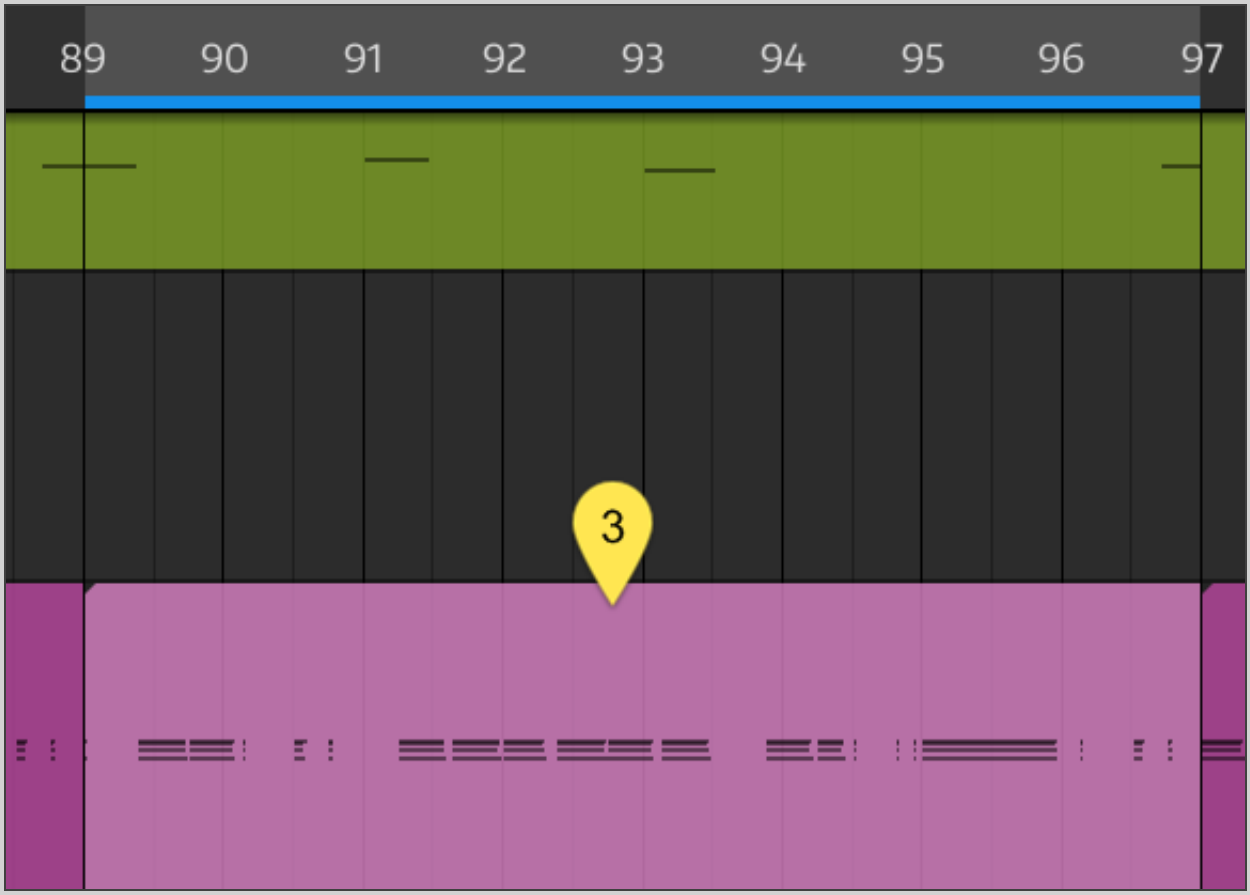
Although the Song, Part, Sample and Automation Editors all support traditional pinch zooming, it's usually not the fastest or most accurate way to zoom when you have a specific task in mind. A better way to work is as follows:

1. With the editor's view zoomed out, make a rough selection of the area you want by **TAPPING** on an item or **DRAGGING** a selection rectangle using one finger in the editing window.
2. **DOUBLE TAP** the editor's **ZOOM** **command button** (at the bottom of the editor).





3. The viewport will zoom into the highlighted selection.



DOUBLE TAP ZOOM at any time to toggle between the selected area and a fully zoomed out view.

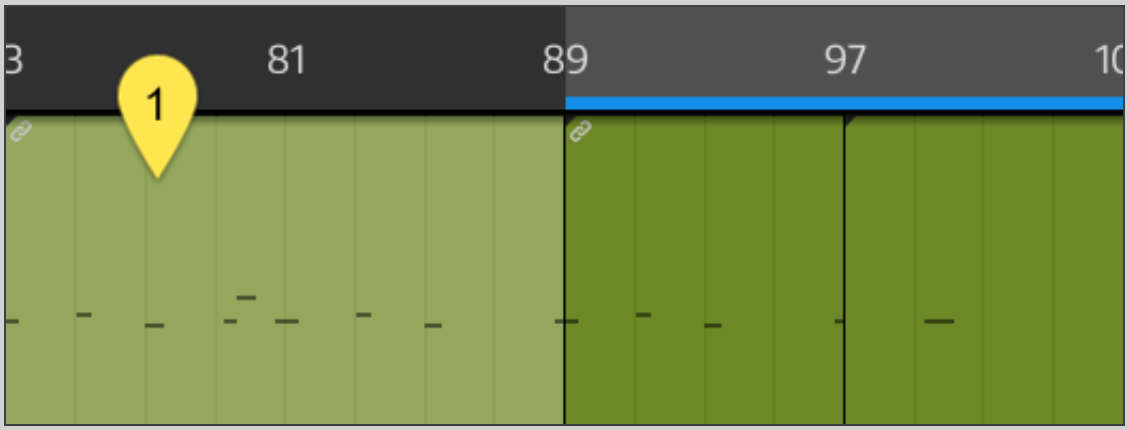
Quick Part Mute in Song Editor

1. Select the parts you wish to mute in the Song Editor's **Editing Window**.
2. Double-tap the **PROPERTIES command button** (at the bottom of the Song Editor).
3. All selected parts will be muted. Double-tap the **PROPERTIES command button** again to toggle mute on or off.

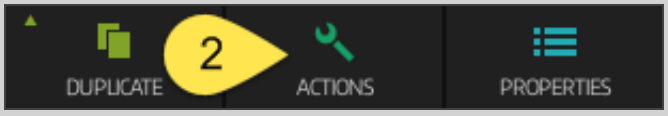
Quick Loop to Selection

When working on a selection of parts in the **Song Editor**, it's often useful to set the song's loop points to the region you're working on.

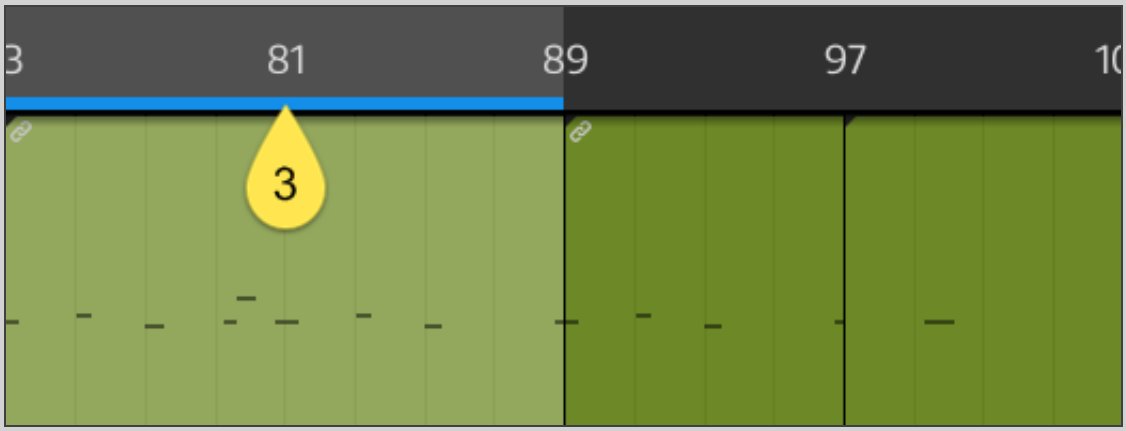
1. Select the parts you wish to include in the loop using the Song Editor's **Editing Window**.



2. Double-tap the **ACTIONS** **command button** (at the bottom of the Song Editor).



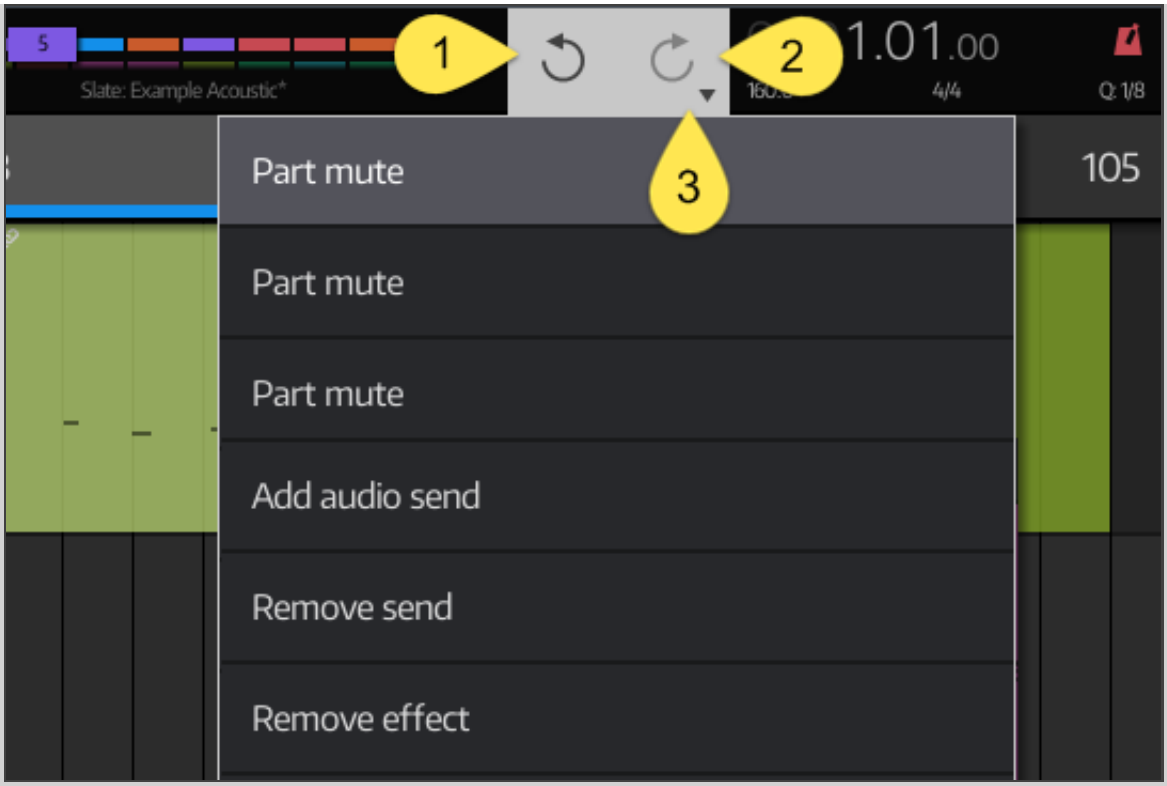
3. The blue loop indicator will now shift to the selection's time range, and song looping will be automatically enabled if necessary.



The **Part Editor** has a similar function. Double-tap its **ACTIONS** **command button** to set the song loop to the part's time extents.

Undo and Redo Actions

1. Undo the last action by **TAPPING** the left button on the **Status Bar**.
2. Redo the last undo action by **TAPPING** the right button on the **Status Bar**.
3. Access the full list of history actions by **TAPPING AND HOLDING** either button.

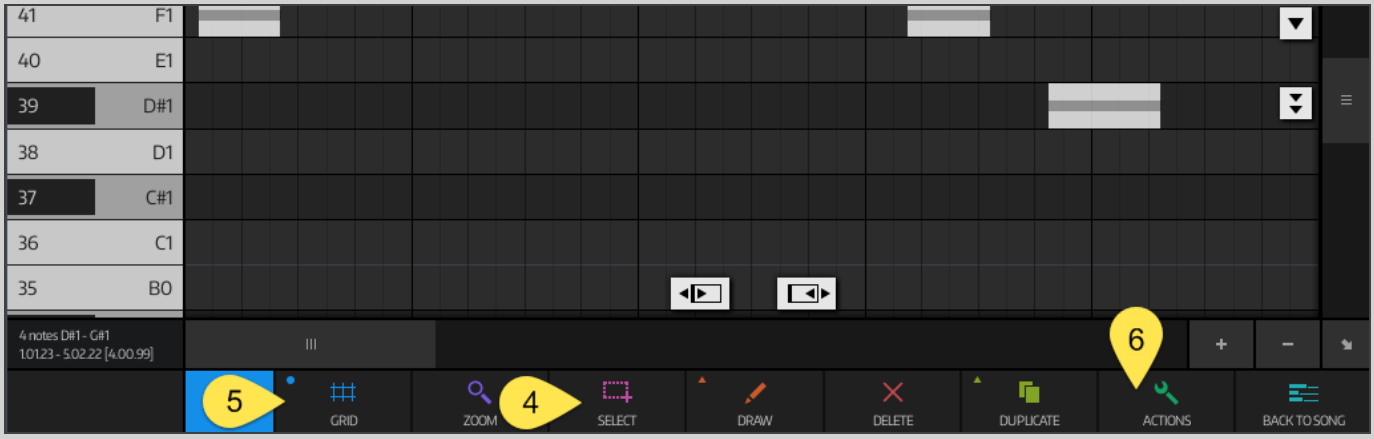


Quantizing Notes

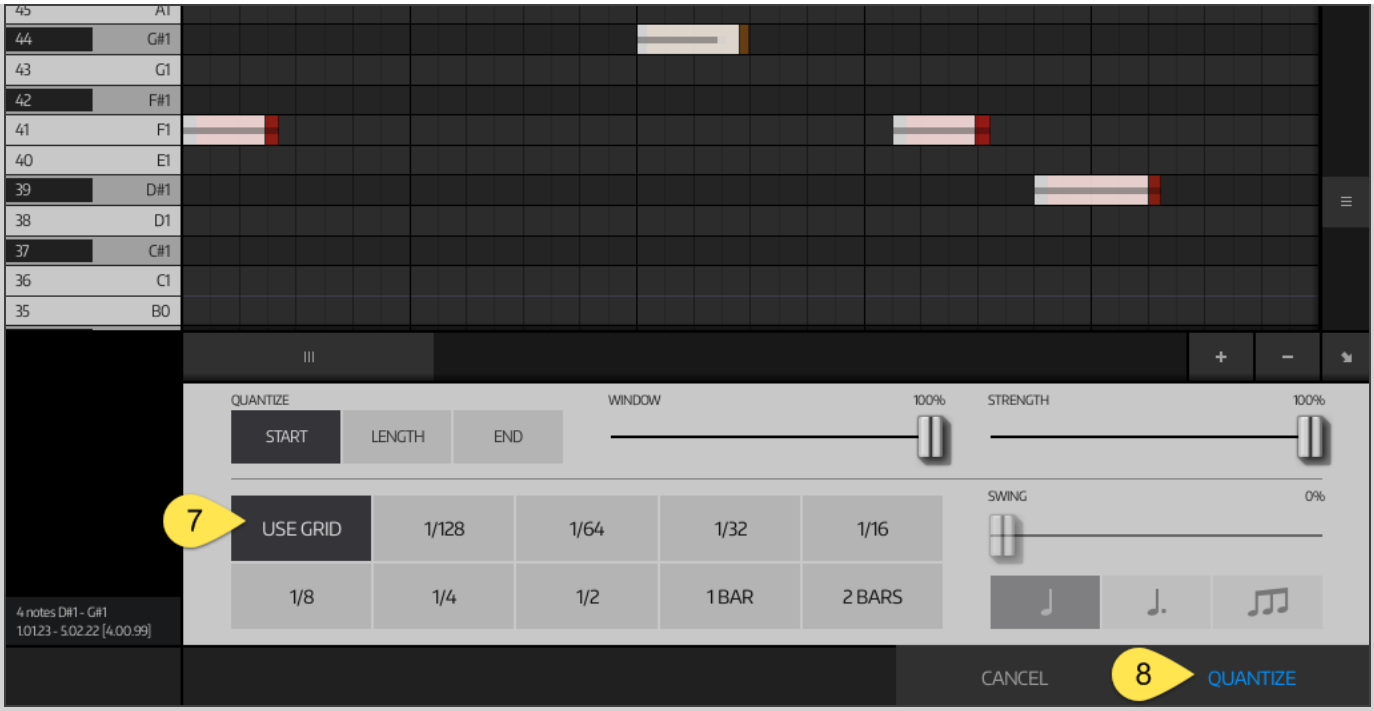
By default NS2 quantizes all notes in real-time as it records. You can re-quantize the notes after they've been recorded by following these steps:

1. For the purpose of this tutorial, we'll turn off real-time quantization to deliberately allow looser note timing when real-time recording. Begin by tapping the Status Bar's Song Position Indicator to invoke the **Song Settings Dropdown**.
2. Tap on the **RECORD** tab button to show the **RECORD settings**. Note: you can alternatively **TAP AND HOLD** on the Status Bar's **RECORD** button to get straight to the record dropdown.
3. Set **REAL TIME QUANTIZE** to **OFF**.

4. Record a part and double-tap it to enter the **Part Editor**. Notice how the notes do not line up perfectly with the quantization grid. Select all of the notes you wish to snap to the grid with quantization.
5. Optionally, enable the grid by tapping the **GRID command button** and select the note interval that best suits the part.
6. Tap on the **ACTIONS command button** and choose **QUANTIZE**.



7. Select **USE GRID** to quantize the notes according to the grid setting in step 5, or alternatively choose a different note interval.
8. You will see a preview of where the notes will shift before committing the quantization - red notes are those the furthest away from the quantize interval, and green notes are ones which are already close to the interval. Once you're happy, tap the **QUANTIZE** button.

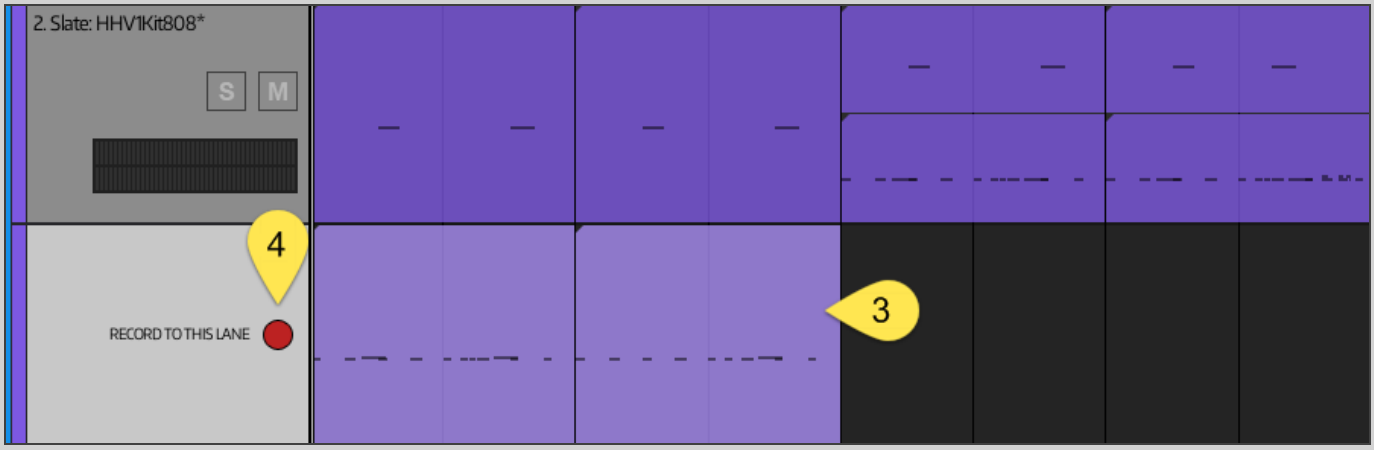


Using Track Lanes

NS2 is flexible in how it allows you to record and manage separate 'lanes' of parts within a single track. Here's a brief overview on managing track lanes according to your preference:

1. The **Song Editor** allows you to shift parts so that they overlap other parts. When you do this, it will automatically create a new lane within the same track, shown here in highlight.
2. Alternatively, you can add permanent extra lanes to any track. This is particularly useful when layering multiple recorded parts of a single instrument (eg. a separate lane for hi-hats on a Slate instrument). **TAP AND HOLD** on the **ADD TRACK** button in the bottom left corner and select **Add track lane** from the list of options.

3. Drag and move the previously highlighted lanes from step 1 into the newly created track lane.
4. By default, the sequencer will automatically record to the first lane of the track. You can set this to a different lane by enabling its **RECORD TO THIS LANE** option.



Recording Automation in Real-Time

You can record automation in real-time for:

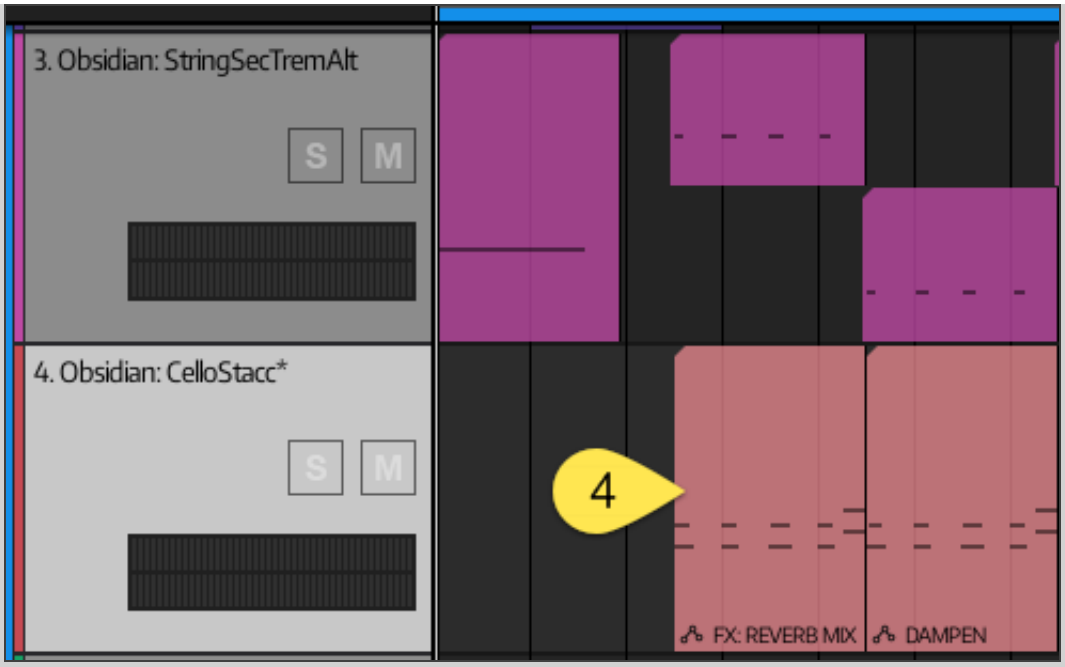
- Mixer strip volume and pan

- Mixer send volume and pad
- Instrument macro controls
- Most effects

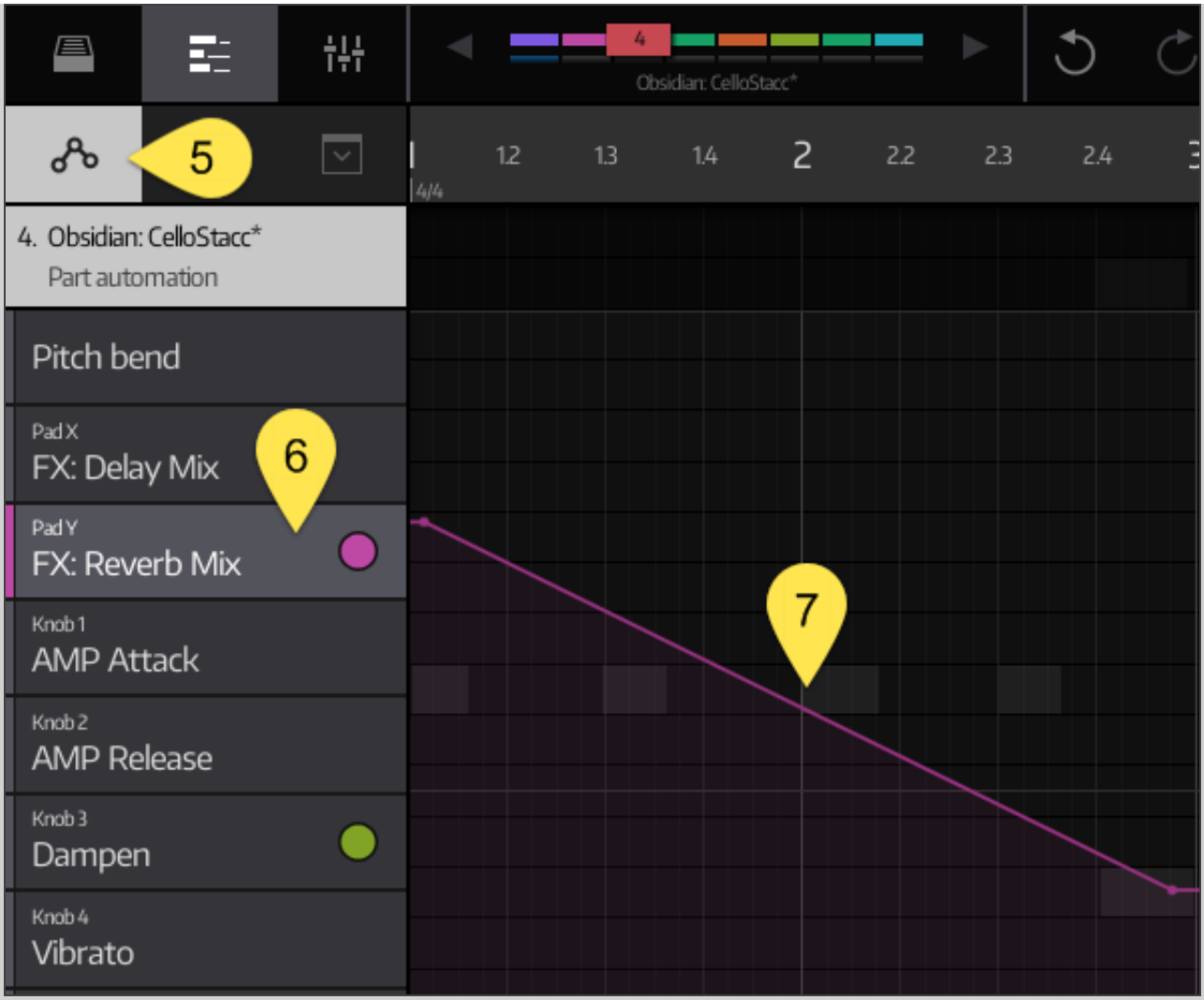
Here's an example of how to do it in Obsidian:

1. Go to Obsidian's **PERFORM** page and tap the **RECORD** button on the **Status Bar**.
2. Whilst recording, modify any macro control to record your movements as automation. A red dot next to the control indicates that the control's movements will be recorded. When not recording, a green dot indicates automation has been recorded for a control.
3. The green dot also indicates recorded automation for the X/Y pad as well.

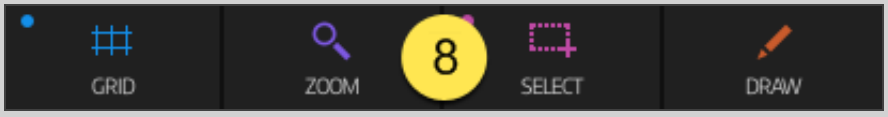
4. Back in the **Song Editor**, the parts containing your recorded automation will show the name of the automated control(s). You may have to zoom in a little if you have a lots of tracks.



5. From the Song Editor, **DOUBLE TAP** on the part to open the **Part Editor** and then tap on the **Automation Button** to open the **Automation Editor**.
6. Select the automation parameter you wish to view or adjust using the **Parameter List**.
7. Edit the recorded event data by adjusting the points in the **Editing Window**.



8. Use the Automation Editor's **command buttons** to assist with your selection and editing.



Common Controls

Before you start, it's worth familiarizing yourself with some of the common controls used throughout NanoStudio.

It's also worth experimenting by double tapping on controls you find throughout the app. Often, shortcuts are available which are not essential to using the app but will speed up your workflow once discovered.

Quick links:

Standard Controls

KNOBS
You may choose between Vertical or Rotary control modes and set the control sensitivity for knobs in the **UI Settings**. The Vertical mode is the default and recommended setting.

VERTICAL - Drag up or down to change value.
ROTARY - Drag in a circular motion to change value.

DOUBLE TAP - Reset to default value.

SPIN BUTTONS

DRAG the number up or down to make coarse changes.

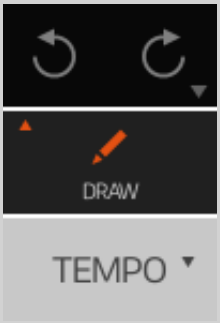
TAP THE BUTTONS to make fine adjustments.

SLIDERS

DRAG up or down to make coarse changes.

TAP on the space above or below the handle to make fine adjustments.

DOUBLE TAP on the handle to reset to its default value.



TAP AND HOLD

If you see a button or title with a small triangle icon in its corner, this indicates that you can **TAP AND HOLD** the button for extra options.

DRAG HANDLES
Drag handles are used in editors for making fine adjustments to selections.

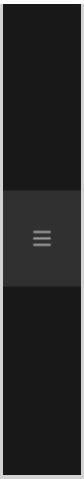
RECTANGULAR DRAG HANDLES - **DRAG** to change.

SQUARE DRAG HANDLES - **TAP** to make a single step change.

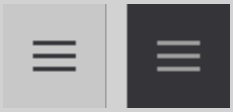
SCROLLBARS
Scrollbars are used in editors for making adjustments to a view's axis.

DRAG on the handle to move it.

TAP on the space outside the handle to move in smaller steps.



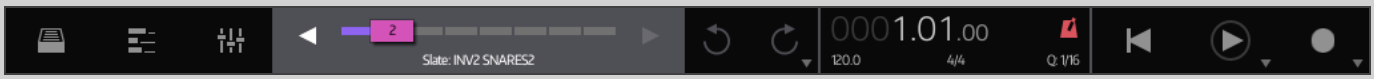
DOUBLE TAP on the handle to toggle between minimum and maximum zoom.



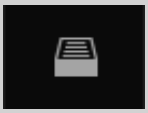
HAMBURGER BUTTONS
Buttons with an icon depicting 3 horizontal lines are referred to (in some parts anyway) as *hamburger buttons*. Hamburger buttons typically appear in the top right corner of a page or panel. When tapped, they invoke a dropdown menu containing functions which would otherwise clutter the main view. Whenever you see one, it's worth giving it a tap to see what's on offer.

Status Bar

The status bar is shown in nearly every view. Its purpose is to navigate the main pages of the app, show important status information and provide quick access to commonly used options and settings.

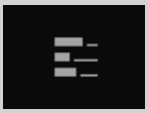


HOME



Use the home page to organize your **projects** and **files**. You can also use it to set up global preferences or purchase extra content from within the app.

SONG EDITOR



Use the **Song Editor** to arrange and edit your song. You can also use it to add, remove or rearrange tracks and create track groups.

MIXER

Use the **Mixer** to balance the levels of each track in your song. You can also use it to add, remove or rearrange tracks and instruments, manage insert effects and set up send/return routings between tracks.

INSTRUMENTS

Shows the currently selected instrument.

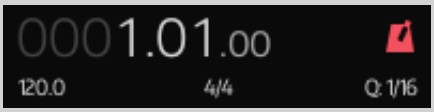
TAP to select.
TAP WHEN SELECTED to show the **Instrument Dropdown**.
TAP LEFT/RIGHT ARROWS to move to the previous or next instrument.
DRAG LEFT/RIGHT to quickly move to a different instrument.

UNDO/REDO

Most operations can be undone or redone.

TAP AND HOLD to show the complete list of operations currently held in the history buffer.

SONG POSITION INDICATOR



Indicates the transport's current position, tempo and time signature and metronome mode.

Song position text:
TAP to show the **Song Settings Dropdown**.
DOUBLE TAP to toggle between bars/beats or minutes/seconds representation.

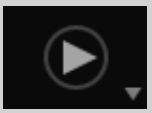
Metronome icon:
DOUBLE TAP to toggle metronome modes.

STOP/LOCATE

Stops the sequencer when playing or recording.

When the sequencer is stopped:
TAP locates the transport to the start of the current loop.
DOUBLE TAP locates the transport to the start of the song.

PLAY



Starts the sequencer in play mode. When loop mode is enabled, the circular icon indicates the current position in the loop section.

	TAP AND HOLD to show the **PLAY Settings**.
RECORD 	Starts the sequencer in record mode. **TAP AND HOLD** to show the **RECORD Settings**.

Instrument Dropdown

The instrument dropdown is invoked by tapping on the status bar's instrument area when it is already selected. From here you can select, adjust the volume and mute/solo all of the instruments currently used in your project.

SIMPLE	A simple view of the instruments with an output level meter. **TAP** on an item to select that instrument.
MUTE/SOLO	Mute/solo options and buttons to jump to the mixer or sequencer track belonging to the instrument. **TAP** on the instrument's name to select that instrument.
VOLUME	Volume control for each instrument. **TAP** on the instrument's name to select that instrument.

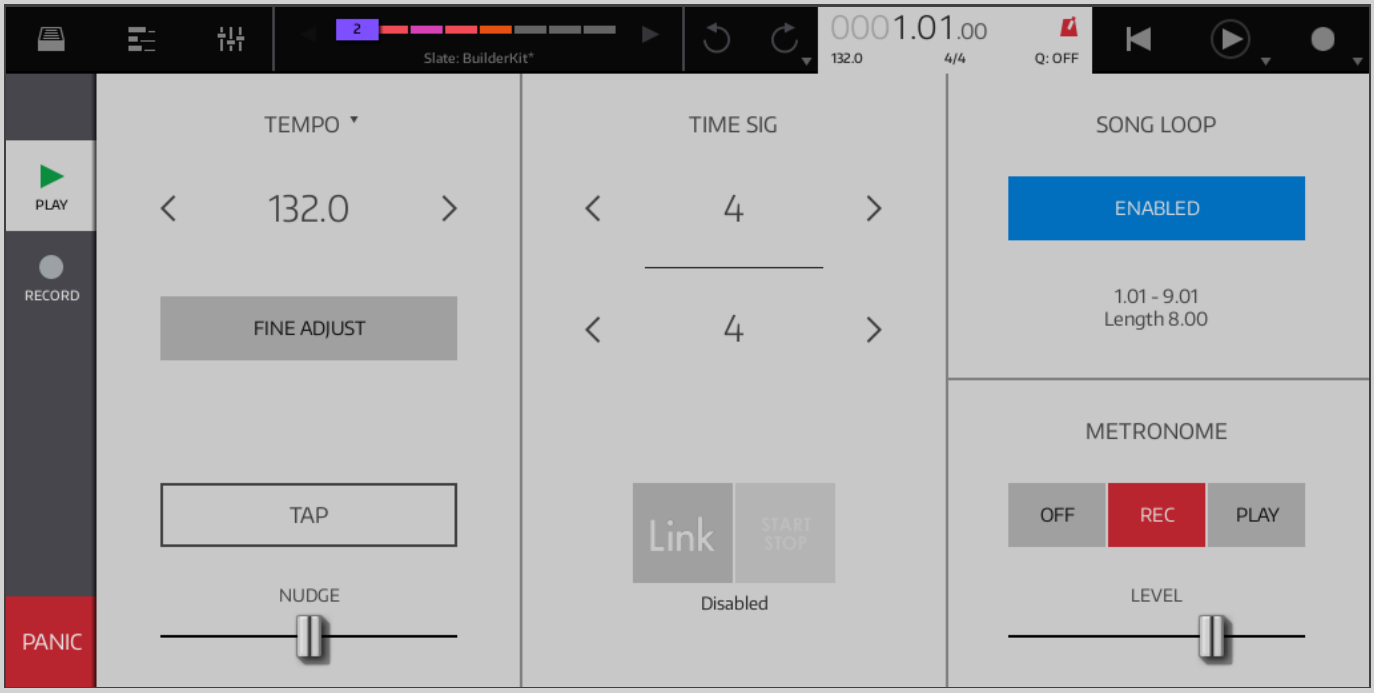
Song Settings Dropdown

The song settings dropdown is invoked by tapping on the status bar's song position indicator. Alternatively, it may be accessed with a **TAP AND HOLD** on the status bar's **PLAY / RECORD BUTTONS**. The settings are split between pages and are selected by tapping on the large tab buttons on the left side of the dropdown.

The **PANIC BUTTON** is shown on all pages. This is used to forcibly stop all currently playing notes and send 'note off' messages to external MIDI devices and plugins, in the rare cases where a 'hanging note' occurs.

PLAY Settings

This page of the song settings dropdown contains the most commonly used controls for song playback. You can use it to set the song's tempo, time signature and loop enable and control how the metronome behaves.



There are many methods available for setting the tempo.

TAP ON THE TITLE to enter a precise value via the numeric keypad dropdown.

To make coarse changes, **DRAG THE NUMBER** up or down.

To make fine changes, **TAP ON THE LEFT / RIGHT** buttons. You can enable **FINE ADJUST** to reduce the value increment from 1 BPM to 0.1 BPM.

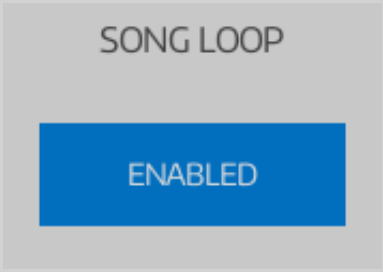
The **TAP BUTTON** allows you to set the tempo by tapping in time to the music.

The **NUDGE SLIDER** temporarily slows down or speeds up the tempo before returning it to its current value. This is useful for syncing with an external source when you already have the correct tempo.

Sets the song's time signature.

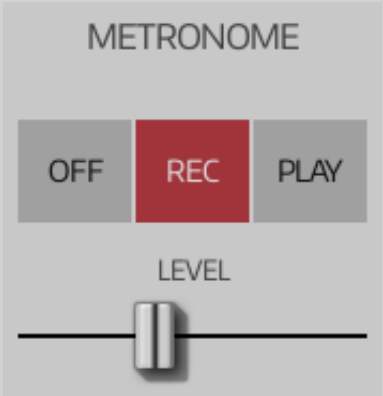
To make coarse changes, **DRAG THE NUMBER** up or down.

To make fine changes, **TAP ON THE LEFT / RIGHT** buttons.



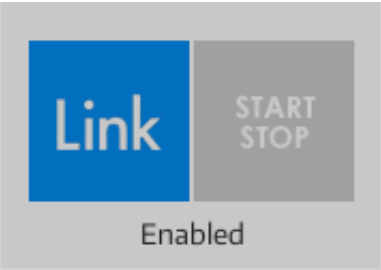
Enables song looping.

The song loop points may be set in the **Song Editor** by dragging on the time ribbon.



OFF disables the metronome completely.
REC enables the metronome only when recording.
PLAY enables the metronome when playing or recording.

NOTE: When enabled, the metronome will play during the count-in and continue to play thereafter. If you only want it to play during the count-in, this behaviour can be changed in the **Settings Page**.

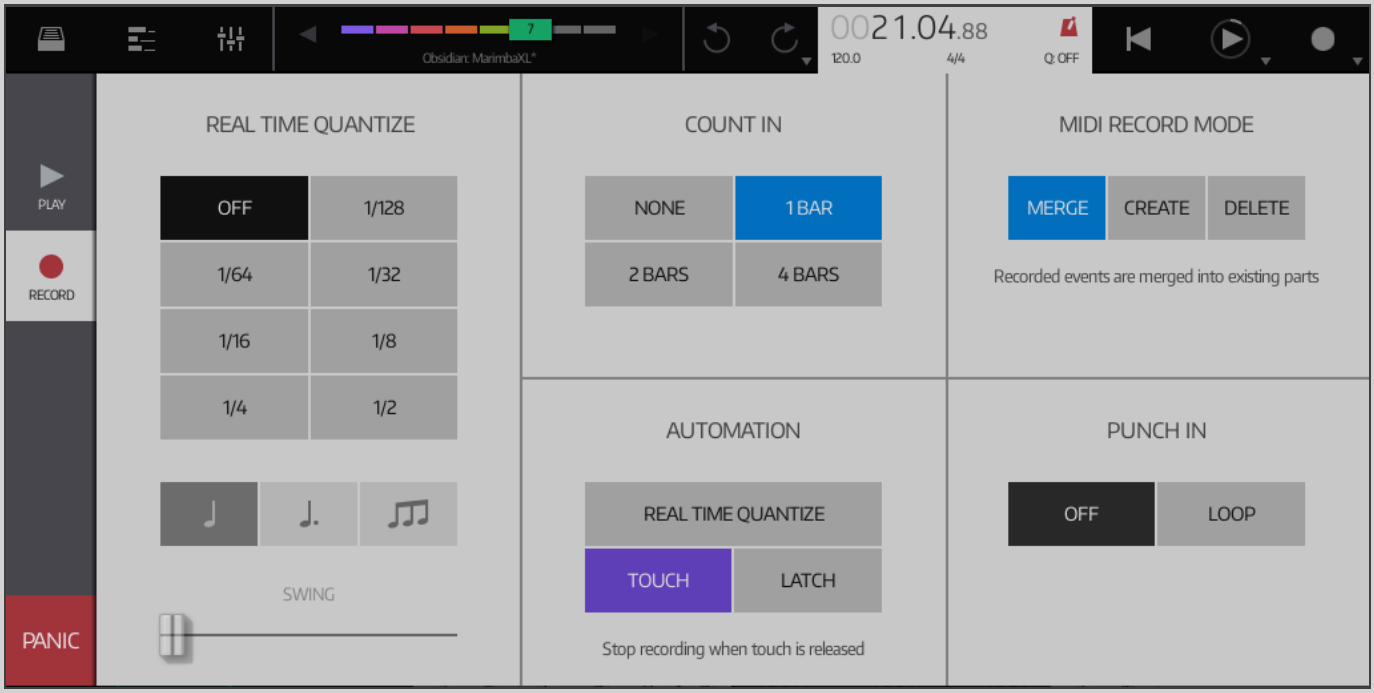


Enables or disables **Ableton Link**, which allows you to sync NanoStudio's beat and tempo with other Link enabled apps.

Enable the **START/STOP BUTTON** to sync the transport start/stop state in addition to beat and tempo.

RECORD Settings

This page of the song settings dropdown contains the most commonly used controls for song recording. You can use it to set real-time quantize, record count-in and punch-in and control how automation and MIDI events are recorded.



REAL TIME QUANTIZE	Sets the quantize interval used when recording a performance in real-time. Choose **OFF** to disable automation quantizing when real-time recording. You can always quantize your performance later using the **Part Editor**, which has more powerful quantize features.
COUNT IN	Sets the length of the record count-in.

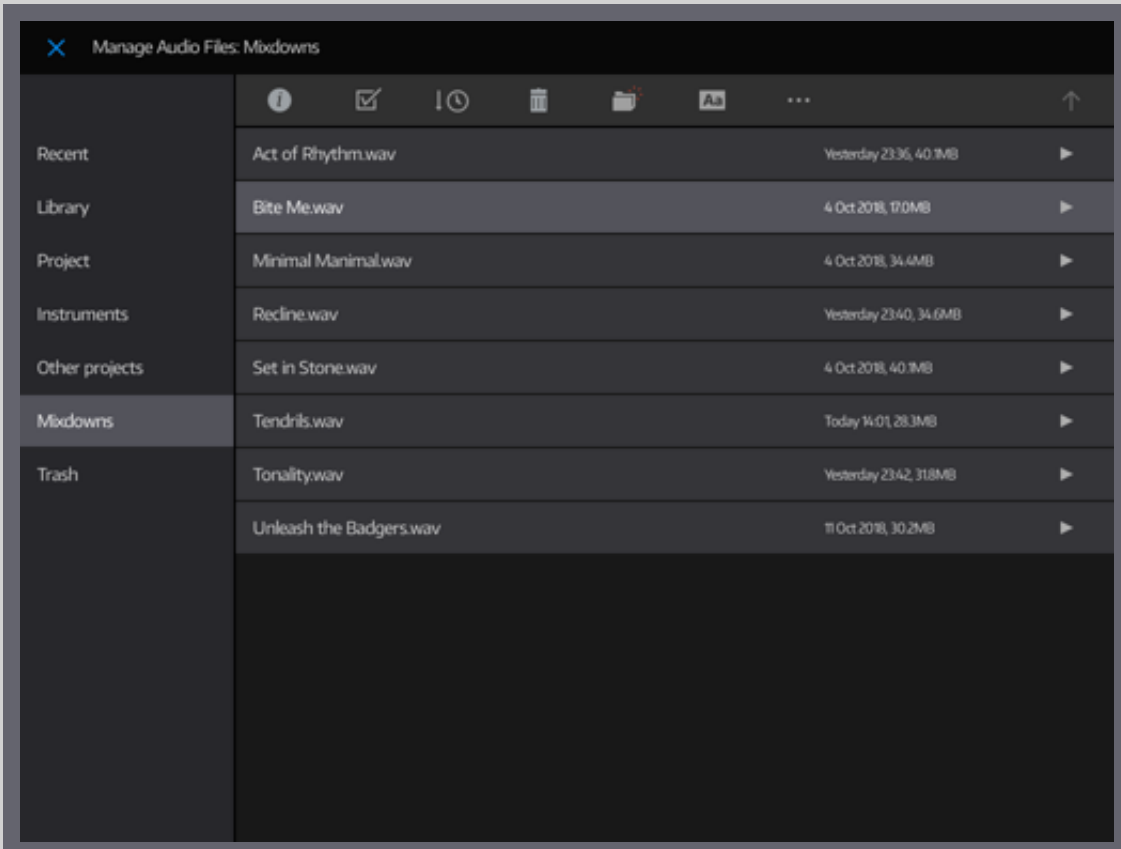
	Choose **OFF** to disable the count-in. When disabled, recording starts as soon as the record button is tapped.
MIDI RECORD MODE	Determines how MIDI notes and controller events are handled when recording a performance in real-time. **MERGE** - The sequencer will attempt to merge recorded events into an existing part if one is found at the current song position. If no part is found, a new one will be created. **CREATE** - The sequencer will always create a new part for any events recorded during the current recording session. **DELETE** - Any notes you hold down or controllers you move whilst recording will be deleted from the sequence rather than added.
AUTOMATION	Determines how automation and MIDI controller events are handled when recording a performance in real-time. **REAL TIME QUANTIZE** - When enabled, automation events will be quantized in the same manner as note events (according to the real time quantize settings). **TOUCH** - When an automation control is released, the sequencer will stop recording that controller. **LATCH** - When an automation control is released, the sequencer will continue to record that controller's last value.
PUNCH IN	When enabled, the sequencer will only record when the song position is within the song loop section.

File Browser

The file browser is used throughout the app for dealing with file-related operations. It's not just for loading or saving - you can use it to rename, copy, move, import and export files, create new folders and show info about your files.

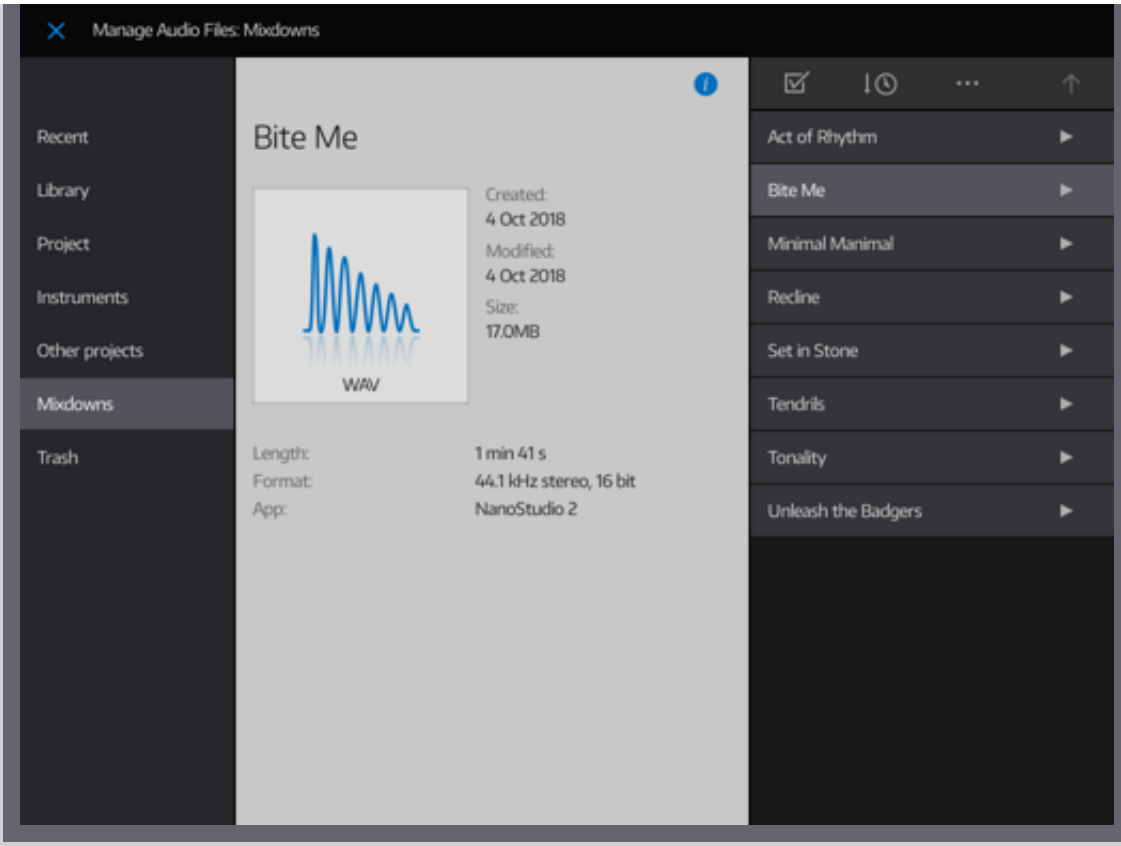
It also supports multiple selection, so it's easy to perform bulk operations.

NOTE: If the current project is among the selected files, the operations described above will not be available. This is because the active project needs access to files inside its own folder at all times and would not respond well if those files were moved or changed. If you need to perform file operations on the current project then you must first unload it.

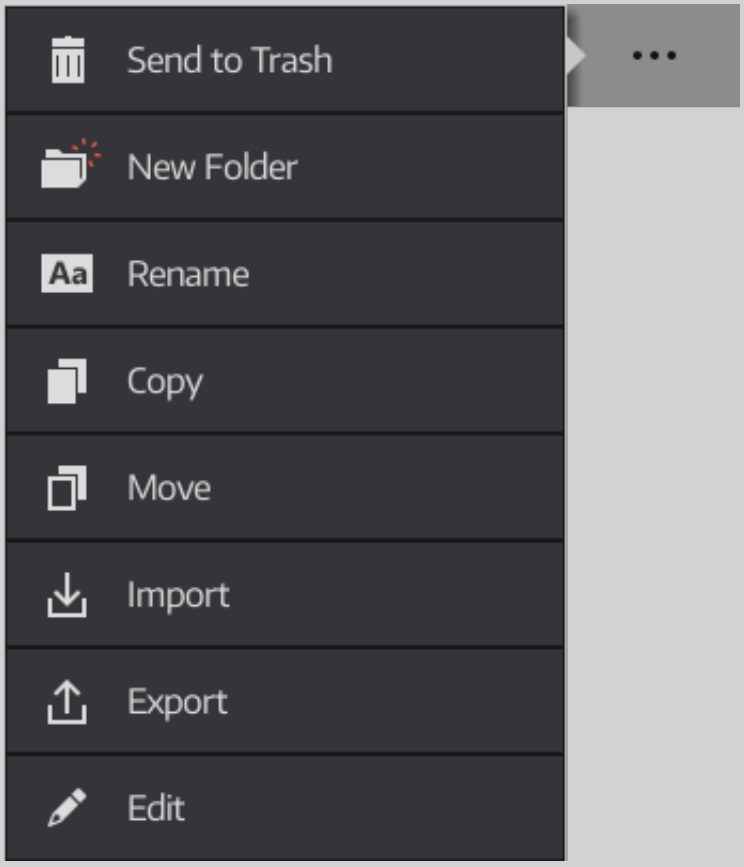


The file browser has an info pane which you can hide and reveal using these buttons:

The info pane shows properties related to the current selection and provides help about the current folder if there is no selection. If the info pane is open then the file



browser has less room for buttons and you may instead access all file commands via the **command dropdown button**:

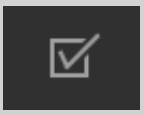


Use the **command dropdown** to perform operations on the current file selection.

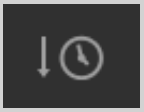
NOTE: These operations are not available if the active project is included in the current selection.

Import and **Export** allow you to get files in and out of the app via a variety of different methods. Multiple files are usually zipped into a single file before they are exported. See **Integration and Sharing** for more details.

Edit may be used to open the **Sample Editor** when an audio file is selected.



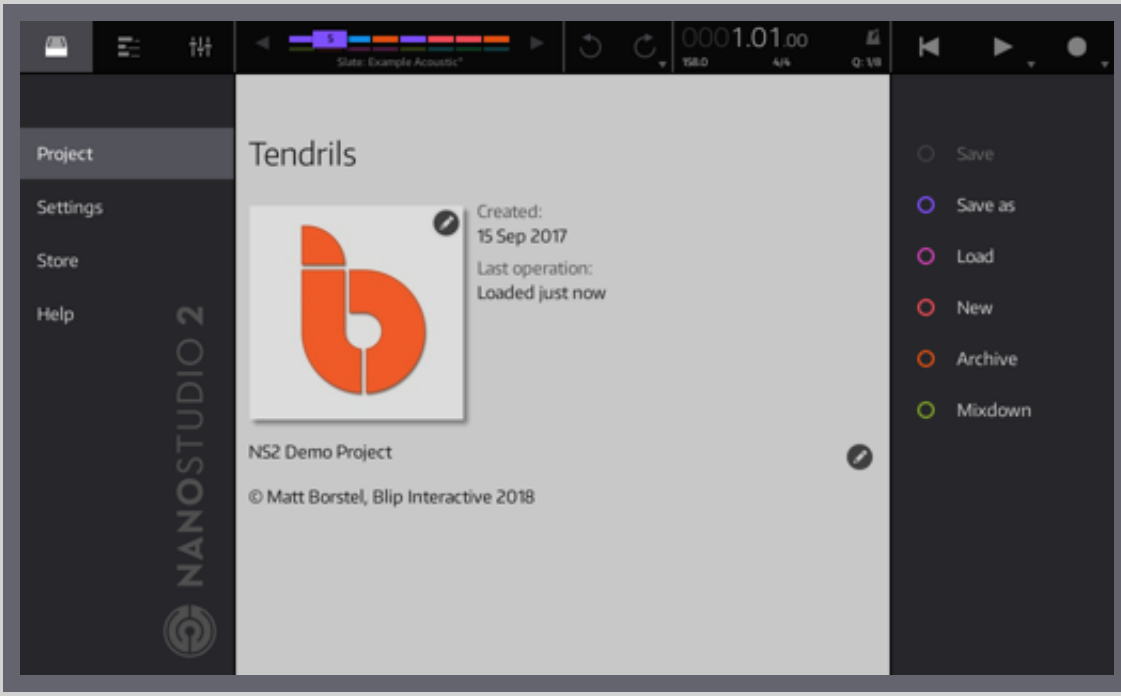
Enables multiple file selection.

	By default, the file browser sorts the list alphanumerically. Enable this button to sort the list according to the file's time and date.

Projects

Use the project page to create, load, save, archive and mixdown your projects. You can also use it to add an image and text notes to the current project.

Access the project page by tapping the **HOME** button on the **Status Bar**.



Quick links:

Overview

A single NanoStudio project comprises:

- A song, including all the MIDI patterns and automation data it needs
- All the instrument, mixer and effect settings needed to restore the project's state
- References to where samples external to the project can be found on your device
- Sample files internal to the song (optional)
- A project image (optional)
- The project's text notes (optional)

Within a project, NanoStudio automatically maintains 3 special versions:

Autosave	Automatically saved by the app whenever it is closed, sent to the background or before it performs a lengthy operation such as a mixdown.
User save	The last version you saved by explicitly using the **Save** operation.
Previous save	The previous user save. This is useful if you accidentally save changes you didn't wish to keep.

When NanoStudio is started, it always loads the **autosaved** version of the last project you were working on so that the app is returned to the same state you left it in. Sometimes this is undesirable (eg. if you were making some experimental changes you didn't wish to keep). In this case, you use the **Load** operation to load one of the other versions instead.

You can also **archive a project**, which is useful for backing up or distributing your project to another device or NanoStudio user without worrying about missing samples.

Creating a Project

To a create a new project, open the **Project Page** and select **New** from the column on the right. If you've made modifications to the current project, you will first be asked if you wish to keep them.

You can now type a name for your new project. Otherwise, stick with the default name - you can always rename it later if your project becomes good enough to deserve a real name!

By default, your new project will be be created in the 'My Projects' folder. If you want to start a different folder, tap the **Folder** button and choose or create a new subfolder inside 'My Projects'. Again, you don't have to worry about this too much

for now as you can always move the project at a later date using the **File Browser**.

Finally, you can optionally tap on the **Template** button to choose a template you wish your project to be based on. You can find out more about this in **Project Templates**.

Once you've made your choices, tap the **CREATE** button on the keyboard and you're ready to go!

Loading a Project

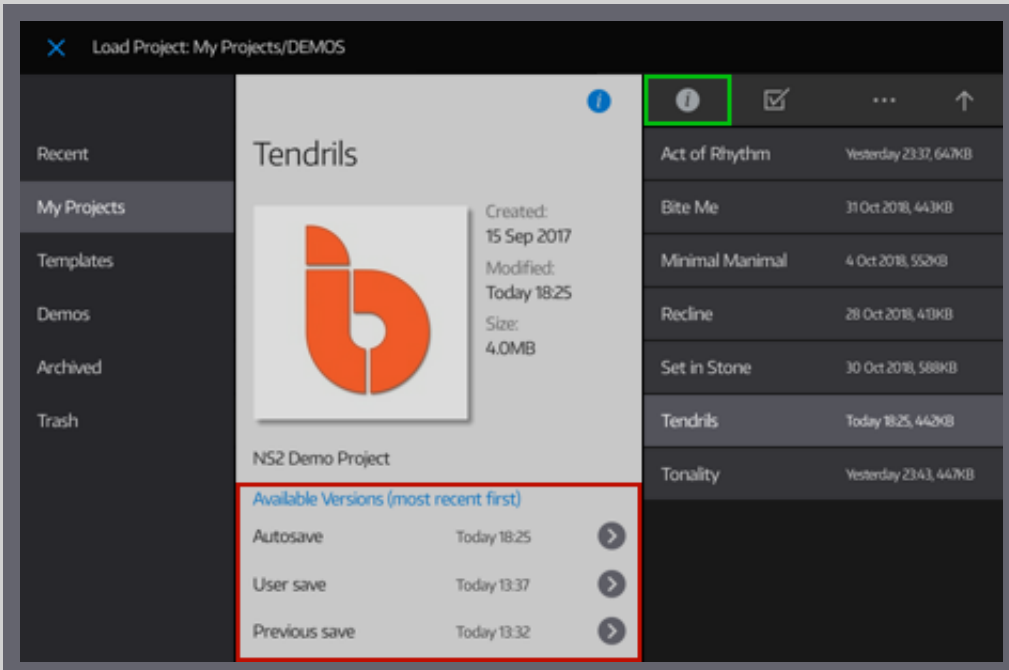
To a load an existing project, open the **Project Page** and select **Load** from the column on the right. If you've made modifications to the current project, you will first be asked if you wish to keep them.

Use the **File Browser** to choose a project. The browser automatically organizes projects into these categories:

Recent	Projects you've recently created or loaded. You can pin certain projects if you wish so that they're not removed from this list.
My Projects	The default folder for projects you've created or imported. If you wish, you can create further subfolders inside this folder.
Templates	Projects saved here can be used as **templates**, which may be used as the starting point for new projects.
Demos	Demo projects which come with the app or IAP packs.
Archived	Projects you've **archived**. If you wish, you can create further subfolders inside this folder.
Trash	Projects you've recently deleted. The oldest items in this folder may be deleted if your device needs more storage space. **DOUBLE TAP** on a project to restore it to its original location.

Note: When you open an **archived** project from the **Demos** or **Archived** folder, the archive will first be decompressed to **My Projects** before loading. If there is a project with the same name already in the **My Projects** folder, NanoStudio will automatically append a unique number to the end of the project's name so the existing project is not overwritten.

Loading Alternative Versions



As discussed in the **Overview**, NanoStudio maintains up to 3 versions of each project.

To see if there are any other versions available, use the **File Browser's info** button (highlighted in GREEN to show the info pane (highlighed in RED).

Tap on one of the **arrow buttons** to load a different version.

Saving a Project

To save the current project, open the **Project Page** and select **Save** from the column on the right. If you haven't made any modifications to the current project,

this option will not be available.

To save the current project under a different name, use **Save as**. You can choose a new name or let the app auto-number the new version for you. This last option is a good way of keeping historical snapshots which you may want to return to in future. If you later decide you no longer want some of the older versions, use the **File Browser's** multiple selection and delete features to easily clean them up.

Project Templates

Projects saved to the **Templates** folder become available for use as templates when creating new projects. Templates can be considered as 'starting points' for common applications and setups. You can save as many templates as you wish.

NanoStudio automatically installs some templates which contain a few instruments so that you can get started quickly. You're free to overwrite these with your own versions containing your preferred track set up, artist image, copyright text notes or anything else you like.

Save a project named **Default** to the **Templates** folder to make it the default template when creating new projects.

Image and Text Notes

You can add a custom image or text notes to the current project. To do this, open the **Project Page** and tap on the circular edit buttons on the top right of the project's image and/or text.

Archiving a Project

As mentioned in the **Overview**, NanoStudio projects usually don't contain the samples they use. Instead, they just maintain the path to where the samples are to be found on your device (such as the Factory, IAP and User folders). This avoids having multiple copies of the same samples on your device and helps to reduce the size of the project. However, if you wish to distribute your project to another device or NanoStudio user, or you want to protect your project against accidental changes made by editing a shared sample, you can archive your project.

When a project is archived, all the samples the project needs are copied into the project's Audio folder so that the project is fully self-contained. Samples in the Factory or IAP folders are not copied, as these are expected to be present on the device used to load the archive. The archived project is compressed into a single file so that it uses the minimum storage space and can be distributed as efficiently as possible.

To archive the current project, open the **Project Page** and select **Archive** from the column on the right. Choose a different name or folder for the archive if you wish, and then tap the **ARCHIVE** button on the keyboard.

Once NanoStudio has saved the archive, you can tap on the **EXPORT** button to share it via various methods such as Airdrop, Dropbox, Mail, the iTunes file app and others.

If you don't want to export the archive right now, you can always do it at a later date by using the export operation in the **File Browser**.

Archived projects are loaded in just the same way as usual NanoStudio projects. See **Loading a Project** for more details.

Mixdown

You can use the mixdown function to create a final audio mix of your project at any time. However, you're not just limited to a simple stereo mixdown. You can also mixdown individual tracks or regions of the song, making the mixdown function ideal for exporting stems and resampling the output for further re-

synthesis.

To mixdown the current project, open the **Project Page** and select **Mixdown** from the column on the right.

The column on the left of the mixdown page enables you to create a new mixdown or browse the previous mixdowns you've made.

New Mixdown

Type	**Final Mix** - Mixes the master output to a single stereo output file. **All Tracks** - Creates a file for each individual track. **Top Level Tracks** - Creates a file for each of the top level tracks. Each file will also contain the output from the top level tracks' child tracks. **Soloed Tracks** - Creates a file for only the tracks which are currently soloed.
Region	**Entire Song** - Mixes the entire song. **Song Loop** - Mixes just the current song loop region.
Format	Determines the audio output file format.
Sample Rate	Determines the audio output file sample rate.
Normalize Files	**No** - Samples are not normalized. **Globally** - Normalizes all output files based upon the loudest file, so that they all retain the same relative volume. **Individually** - Normalizes all output files individually, so each file is as loud as possible.
Wait for AUs to Load	Some Audio Units need extra time to load before they are ready for mixdown. If an AU appears silent in the output file, try adding a wait time to give it a chance to get ready.
Render Tail	When enabled, the mixdown will continue to run until the tail of the song has fully decayed to silence.
Trim Start Silence	Removes any silent sections from the start of each output file.

Trim End Silence	Removes any silent sections from the end of each output file.
Zip Output Files	Zips the output file (or files) into a single file. This is useful when you're mixing down individual tracks and wish to distribute them as a single file.
START	**TAP** to start the mixdown.

Previous Mixdowns

The previous mixdowns page shows the previous mixdowns you've made. You can use the **File Browser** to copy, move, rename, delete, import or export your mixdowns.

TAP on a file's play button to audition it.

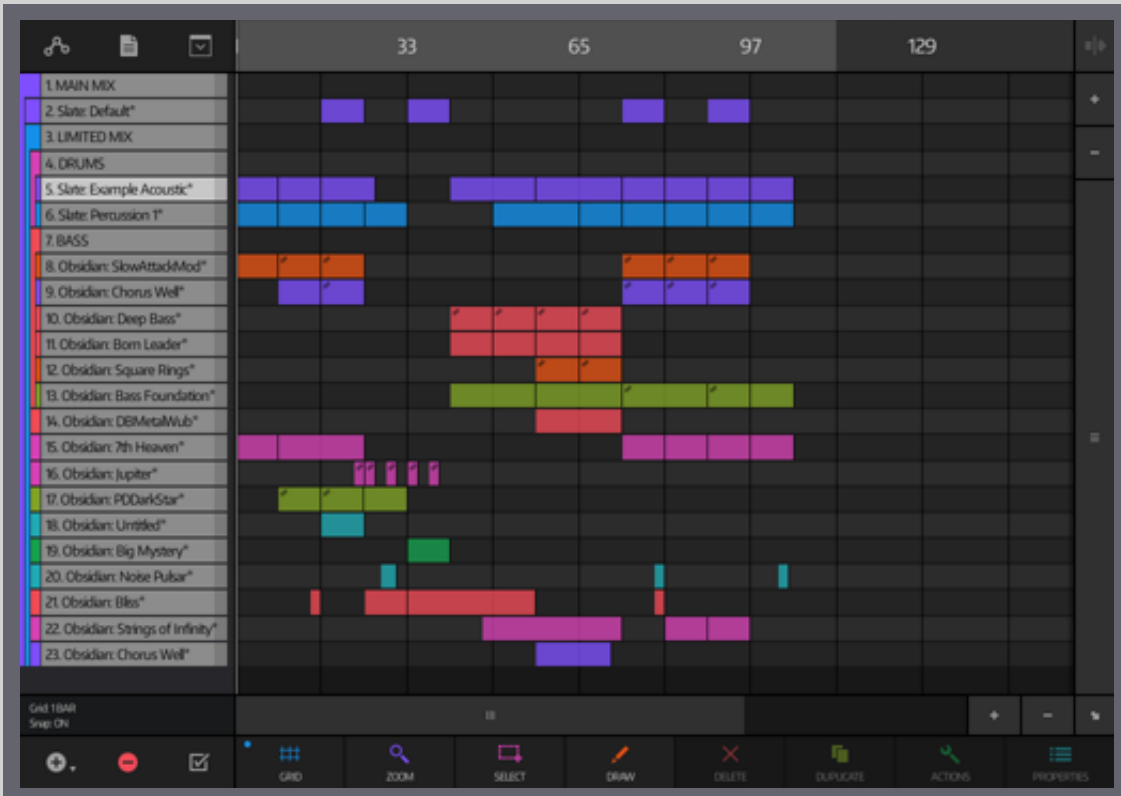
DOUBLE TAP on a file to open it in the **Sample Editor**.

If you're using the mixdown for resampling, it's a good idea to use the Sample Editor's 'Save As' function to save the mixdown to more suitable location, such as your **Library** folder (if it's something you'll use generally) or your **Project** folder (if it's specific to your project).

Song Editor

The song editor is the central place for arranging your composition. It also provides the following features:

- Adding, removing and arranging tracks and track lanes
- Global tempo and time signature tracks
- Track automation (sent to the track's mixer and insert effects)
- The ability to import MIDI files



Quick links:

Overview

A song contains a list of tracks. Tracks are typically assigned an instrument to play, but this is not always the case as they can be used to group other tracks together or as effect return buses.

A song also has two special master tracks: a **tempo track and a time signature track**. These allow you to make tempo and time signature changes within your arrangement.

Tracks within the song contain a sequence of parts. They may also contain **track automation** data, which is sent to the track's mixer and insert effects.

Parts usually contain a sequence of notes to be played, but they can also contain **part automation**, which is sent to the instrument on the track.

Parts begin life by containing their own note or automation data, but when duplicated they can be made into *linked parts*. Linked parts share the same note and automation data with their linked counterparts. When you change the contents of a linked part, all the other parts which share a link with it will also be changed. This is useful in situations where you'd like to make an edit to a loop and have that edit appear in all other instances of the loop without any extra work. If you need to make an edit to a particular instance of a linked part and you don't want that edit to appear in its linked counterparts, you can easily unlink a part to make it unique again. Once unlinked, a part contains its own notes and automation data again and any edits to that part won't affect any others.

Parts can be optionally set to cycle repeat. This means that when you extend their length, they automatically loop without the need to be duplicated.

If you wish, you can add extra lanes to a track. These are really just extra list rows on the track to help you stay organized. A good use for extra track lanes is to dedicate one to parts containing notes and others to parts which contain automation. It's then much easier to see what's going on and apply edits without unwanted side effects.

The song editor provides many tools for working with parts and song arrangement in general, such as drawing, moving, extending, duplicating, splitting, joining and copy/pasting.

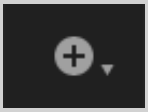
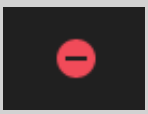
To edit the notes or automation within a part, **DOUBLE TAP ON A PART** to invoke the **Part Editor**. The part editor is similar in operation to the song editor, but is designed for editing MIDI notes and part automation. Once you get familiar with the song editor, you will have no problem using the part editor.

Managing Tracks

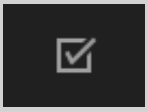
The simplest possible track layout you can have is just a flat list of tracks. A slightly more complex alternative is to create a single master track and then group all other tracks within it so they are children of the master track. This allows you to add effects to the master track (eg. a final limiter or mastering EQ) which are applied to the mix of all the other tracks in the song. NanoStudio's default project templates use a layout such as this.

If you wish, you may have as many track groups as you need and you can also place groups inside other groups. This is useful when you want to keep all your percussion or bass tracks grouped together so that you can easily control their overall volume level or apply insert effects to the group as a whole. You have complete freedom to create track setups which are as simple or as complex as you like, according to your requirements.

You can add or remove tracks using the buttons on the bottom left of the song editor page:

ADD TRACK 	**TAP** to add a new Obsidian synth track. **TAP AND HOLD** to add a track containing a different type of instrument or a new lane to the currently selected track.
REMOVE TRACK 	**TAP** to remove the selected track(s).

MULTIPLE SELECTION



When enabled, you can select more than one track at the same time. This is useful when you want to rearrange or delete a group of tracks in a single operation.

Tracks may be rearranged using the **Track Headers**.

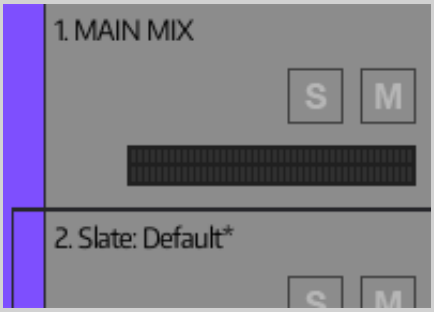
Track Headers

The track headers are located on the left side of the song editor. They show the names of each track and indicate how the tracks are ordered and grouped.

To change the order of the tracks, **TAP AND HOLD** on a track header and then drag vertically to move the track to the desired position. You can also drop a track's header on top of another track to make it a child of that track.

When the song editor's view is zoomed out there is only enough room to show the name of the track.

DOUBLE TAP on the header to view the instrument assigned to the track. If the track has no instrument then you will instead be shown the track's mixer insert FX.



When the song editor's view is zoomed in the track header has enough room to reveal extra mute/solo buttons and an audio output level meter.

DOUBLE TAP ON THE TRACK NAME to view the instrument assigned to the track.

DOUBLE TAP ON THE METER to view the mixer's track.

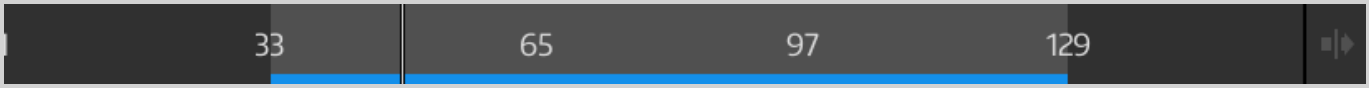
Time Ribbon

The time ribbon indicates the sequencer transport's current position and the song loop region.

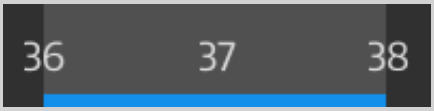
TAP on the ribbon to move the sequencer's transport to the desired position.

DOUBLE TAP INSIDE the loop region to toggle the loop on or off.

DOUBLE TAP OUTSIDE the loop region to move the start point of the loop region to the desired position.



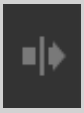
LOOP REGION



Indicates the region of the sample used by the player for looping. The blue bar is shown if looping is enabled via the **PLAY Settings**.

TAP AND HOLD ON THE START / END to drag the loop extents.
TAP AND HOLD ON THE LOOP REGION to drag the entire region.
DOUBLE TAP ON THE LOOP REGION to toggle the song loop on or off.

FOLLOW BUTTON



When enabled, the song editor will automatically scroll its view to keep the current transport position visible.

Editing Window

Use the editing window to navigate the view and make selections.

Navigation and selection can be performed with the traditional **DRAG** and **PINCH ZOOM** actions, but you will often find that the **SELECT** and **ZOOM** **command**

buttons are a more efficient way to achieve these operations in a more task-oriented manner.

NAVIGATION AND SELECTION

SCROLLING - Use two fingers to **PINCH ZOOM**, and then release one finger and drag. Alternatively, you can use the scrollbars.

ZOOMING - Use two fingers to **PINCH ZOOM**. You can perform a context-sensitive zoom by double tapping the **ZOOM command button**. Alternatively, you can use the +/- buttons on the scrollbars.

TAP or **DRAG** to make a selection.
You can change the selection mode via the **SELECT command button**.

TAP on the background to deselect all.
DOUBLE TAP on the background to select all.

Editing Parts

To edit the contents of a part, **DOUBLE TAP** on it to open the **Part Editor**.

To move a part or a selection of parts, **TAP AND HOLD** on a part. After a short pause you will be able to freely move the selected part(s) by dragging horizontally or vertically.

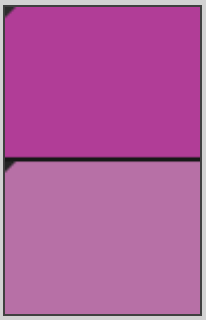
Most of the time you will just want to move the selection horizontally or vertically. The best way to achieve this is with the white drag handles which appear around the edges of the view when a selection is made:

Moves the selection **forwards or backwards** in time.

Changes the **length** of the selection.

Moves the selection **vertically**.

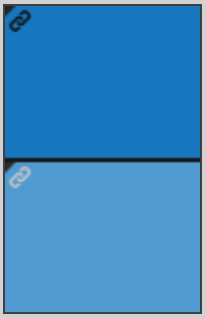
Part Appearance



By default, parts use the same colour as the track they are on (see mixer **Track Setup**).

You may give a parts a custom colour via the **PROPERTIES command button**.

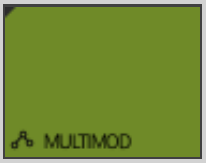
Selected parts are indicated using a lighter colour.



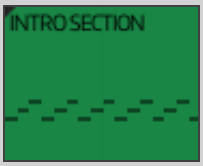
Linked parts are shown with a small chain link icon in the top left corner.

When a linked part is selected, the icons of its linked counterparts will turn white to help you visualize the relationship with the other linked parts in the song.

Muted parts are shown in grey. Parts may be muted for more than one reason:
- The track the part is on (or a parent of that track) is muted.
- The part itself is muted. You can mute any part via the **PROPERTIES command button**.

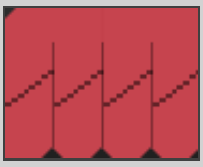


Parts containing automation show the names of the automated parameters along their bottom edge. Part automation is always sent to the instrument on the track and will use the instrument's custom automation names if it has them.



If a part has been given a custom name it will be shown along its top edge.

You can set a custom name via the **PROPERTIES command button**.



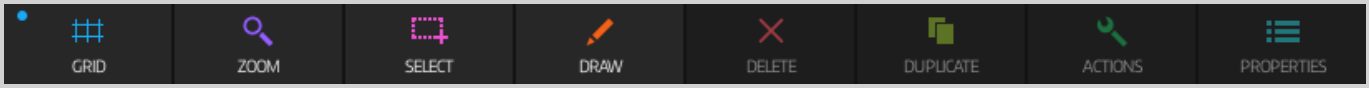
Parts which have been set to cycle repeat show a vertical bar at each cycle repeat point.

You can enable or disable cycle repeat for any part via the **PROPERTIES command button**.

Overlapping parts are represented using separate rows if there is enough space. You can overlap as many parts as you like and the sequencer will play, but the editor view will only draw up to a maximum of 4 rows. If you frequently overlap parts, you may be better off creating track lanes with **TAP AND HOLD** on the **TRACK ADD BUTTON** (see **Managing Tracks**).

Command Buttons

Use the command buttons to set beat grid properties, perform task-oriented zoom/selection and edit the selected region of the song.



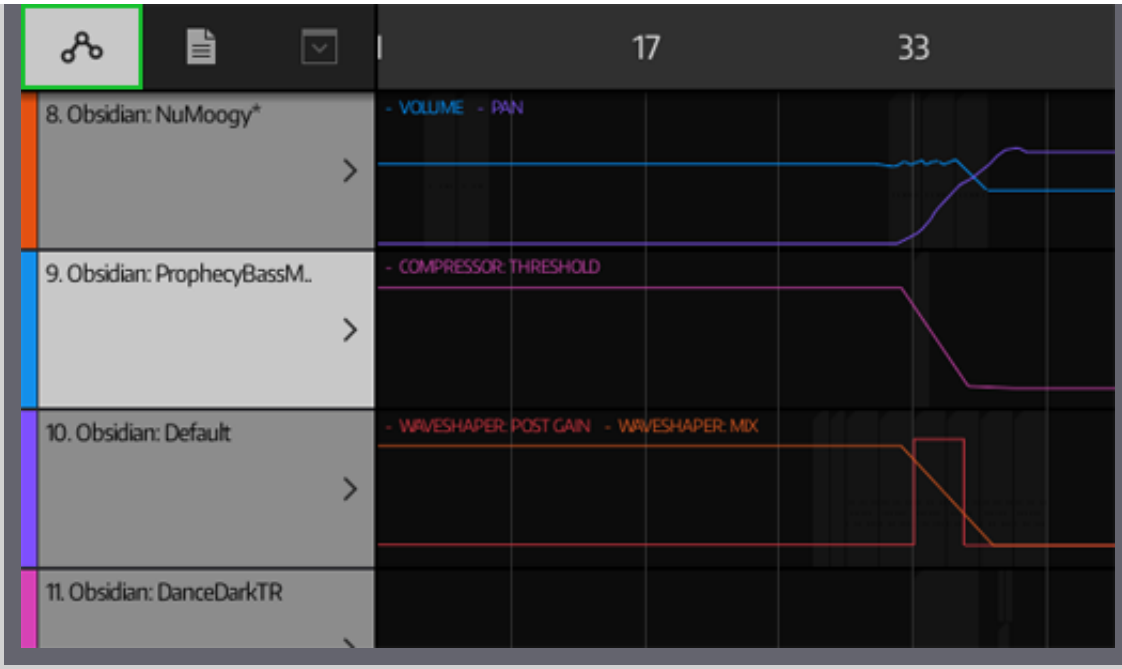
GRID	**TAP** to view or change the grid and snap options. **DOUBLE TAP** to toggle the grid snap on or off.
ZOOM	**TAP** to zoom on a specific area of the song. **DOUBLE TAP** to perform a context-sensitive zoom. **DOUBLE TAP AGAIN** to revert to the previous zoom.
SELECT	**TAP** to select a specific area of the song.

	DOUBLE TAP to toggle the selection mode.
DRAW	**TAP** to enable draw mode. When draw mode is enabled you can drag in the editing window to create a new empty part. Draw mode is automatically disabled once you have drawn a part.
DELETE	Deletes the current selection.
DUPLICATE	Duplicates the current selection. **TAP AND HOLD** for more options, such as making multiple or linked duplicates.
ACTIONS	Performs general editing actions on the current selection such as joining, splitting, unlinking and exporting as a MIDI file. **DOUBLE TAP** to set the song loop to the current selection.
PROPERTIES	**TAP** to view or change the properties of the current selection such as part muting, cycling, colour and custom naming. **DOUBLE TAP** to toggle the mute status of the selected parts.

Track Automation

Tracks may optionally contain automation. Automation is essentially a sequence of values which is used to automatically vary the controls of an instrument, effect, mixer track or send during playback. Track automation can only control the **mixer's controls, insert FX** or **sends** on the track. If you wish to automate the instrument then you must instead use **Part Automation**.

To reveal the track automation, tap the automation

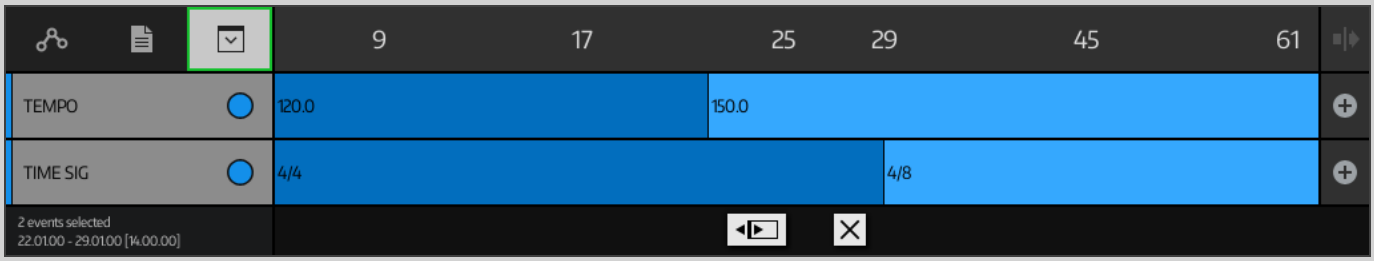


button (highlighted in GREEN).

Tap on any track (or **Track Header**) to open the **Automation Editor**.

Tempo and Time Signature Tracks

A song also has two special master tracks: a tempo track and a time signature track. These allow you to make tempo and time signature changes within your arrangement. It's up to you if you want to use them. By default they are disabled and you set a fixed tempo and time signature via the **PLAY Settings**.



To reveal the tempo and time signature tracks, tap the **MASTER TRACK** button (highlighted in GREEN).

To add a new tempo or time signature change, move the transport cursor to the desired position and tap the circular + icon on the far right of the track. Alternatively, if the track is empty then you can just **DOUBLE TAP** at the desired position. You can only add time signature changes on a bar division.

To select one or more sections, **TAP** or **DRAG** on the tracks.

To edit the properties of an existing section, **DOUBLE TAP** on that section.

	Enables or disables the track. When the track is disabled, the song uses the fixed values set in the **PLAY Settings**
	Adds a new section at the transport's current position. You can only add time signature changes on a bar division.
	Moves the selected section(s) backwards or forwards in time.
	Deletes the selected section(s).

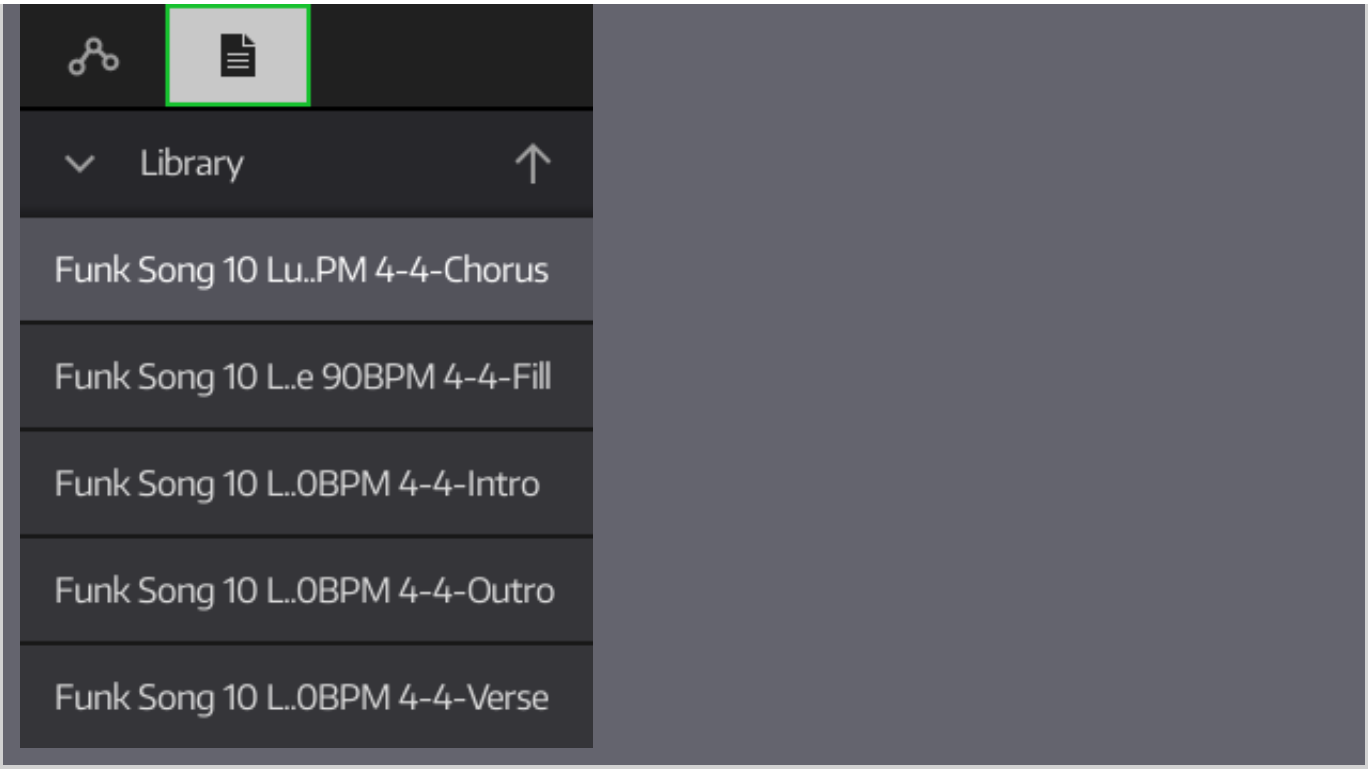
Importing and Exporting MIDI Files

You can use the song editor to import and export MIDI files. The importer and exporter are both capable of handling multiple tracks including tempo and time signature tracks.

Importing a MIDI File

- Tap the **FILE** button (highlighted in GREEN).

- Use the **File Browser** to find the MIDI file you wish to import.
- **TAP AND HOLD** on the file.
- You can then drag the file to a track of your choice.

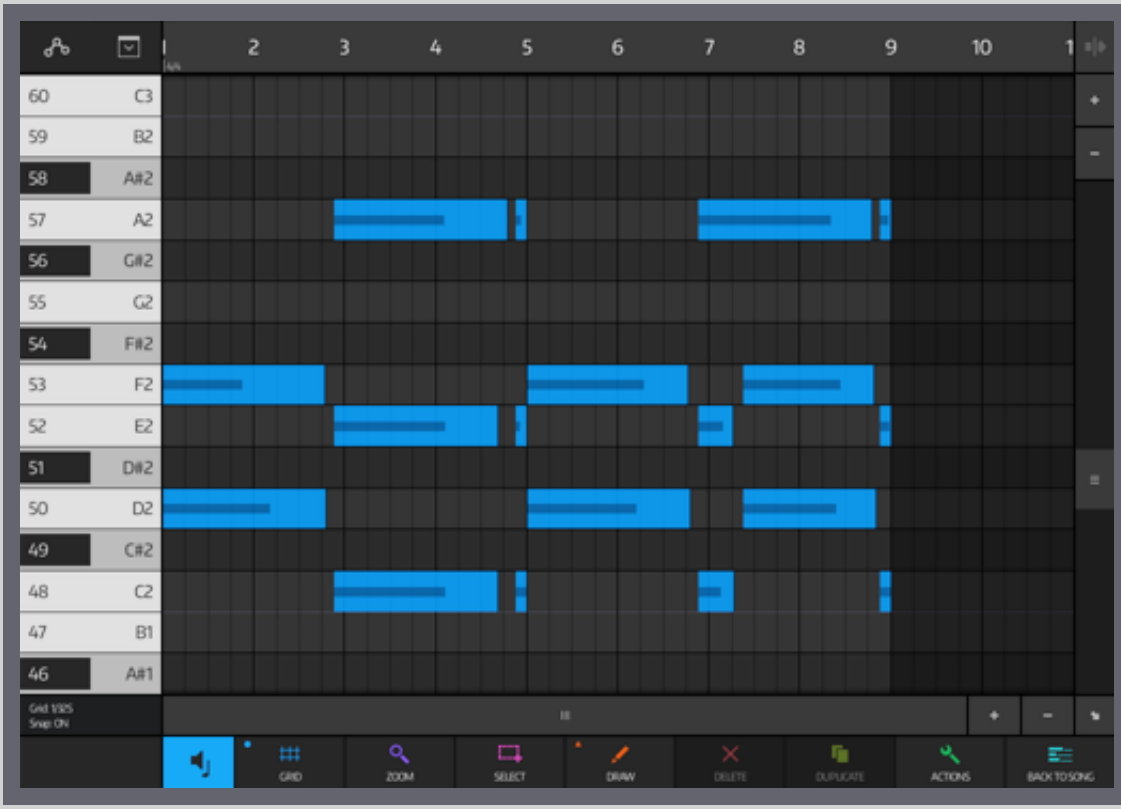


Exporting a MIDI File

- Select the parts you wish to export to the MIDI file
- Tap on the **ACTIONS command button**
- Choose a filename (and optionally a folder) for the MIDI file
- Tap **EXPORT** on the keyboard

Part Editor

The part editor is used to edit the contents of a part, which usually consists of MIDI notes but may also include **automation**, which is always sent to the instrument on the note's track.



Quick links:

Row Header
Time Ribbon
Editing Window
Command Buttons
Quantizing Notes
Editing Note Velocity
Part Automation

Row Header

The row header is located on the left side of the part editor.

The row header uses a traditional keyboard representation for most instruments. However, if the note's track uses the **Slate** instrument, the row header will use a list representation which also indicates the instrument's pad names.

DRAG to move the view up or down.

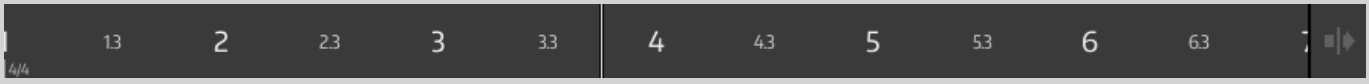
PINCH ZOOM to change the vertical scale.

TAP to audition a note (if the note audition command button is enabled).

Time Ribbon

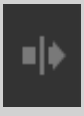
The time ribbon indicates the sequencer transport's current position.

The part editor's time ribbon always represents time relative to the part. In other words, it always shows the part as beginning at bar 1 even if the actual part starts on a different bar in the song itself.



TAP on the ribbon to move the sequencer's transport to the desired position.

When working on a part, you may find it useful to set the song loop so that it matches the part you're working on. You can do this quickly by **DOUBLE TAPPING** on the **ACTIONS** **command button**.

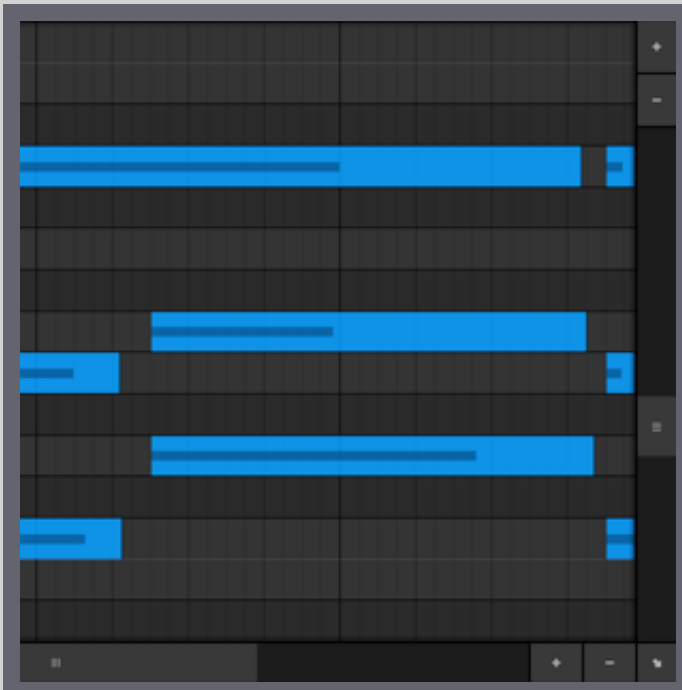


FOLLOW BUTTON
When enabled, the part editor will automatically scroll its view to keep the current transport position visible.

Editing Window

Use the editing window to navigate the view and make selections.

Navigation and selection can be performed with the traditional **DRAG** and **PINCH ZOOM** actions, but you will often find that the **SELECT** and **ZOOM** **command buttons** are a more efficient way to achieve these operations in a more task-oriented manner.



NAVIGATION AND SELECTION

SCROLLING - Use two fingers to **PINCH ZOOM**, and then release one finger and drag. Alternatively, you can use the scrollbars.

ZOOMING - Use two fingers to **PINCH ZOOM**. You can perform a context-sensitive zoom by double tapping the **ZOOM** **command button**. Alternatively, you can use the +/- buttons on the scrollbars.

TAP or **DRAG** to make a selection.
You can change the selection mode via the **SELECT** **command button**.

TAP on the background to deselect all.
DOUBLE TAP on the background to select all.

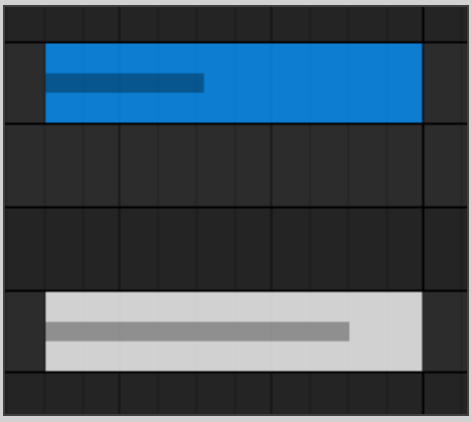
Editing Notes

To move a note or a selection of notes, **TAP AND HOLD** on one of the notes. After a short pause you will be able to freely move the selected note(s) by dragging horizontally or vertically.

Most of the time you will just want to move notes horizontally or vertically. The best way to achieve this is with the white drag handles which appear around the edges of the view when a selection is made:

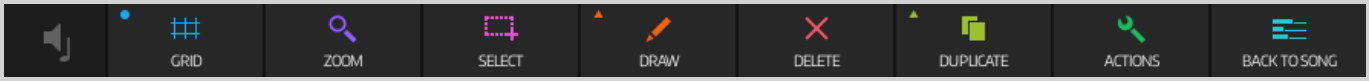
	**Moves** the selection **forwards or backwards** in time.
	Changes the **length** of the selection.
	**Moves** the selection **vertically**.
 	**Moves** the selection **up or down** by a single row.
 	**Moves** the selection **up or down** by a whole octave.
	**Scales** the **velocity** of the selected notes.

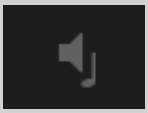
Note Appearance

	Unselected notes are blue. Selected notes are white. The smaller horizontal bar within the note indicates the note's velocity.

Command Buttons

Use the command buttons to set beat grid properties, perform task-oriented zoom/selection and edit the selected region of the note.



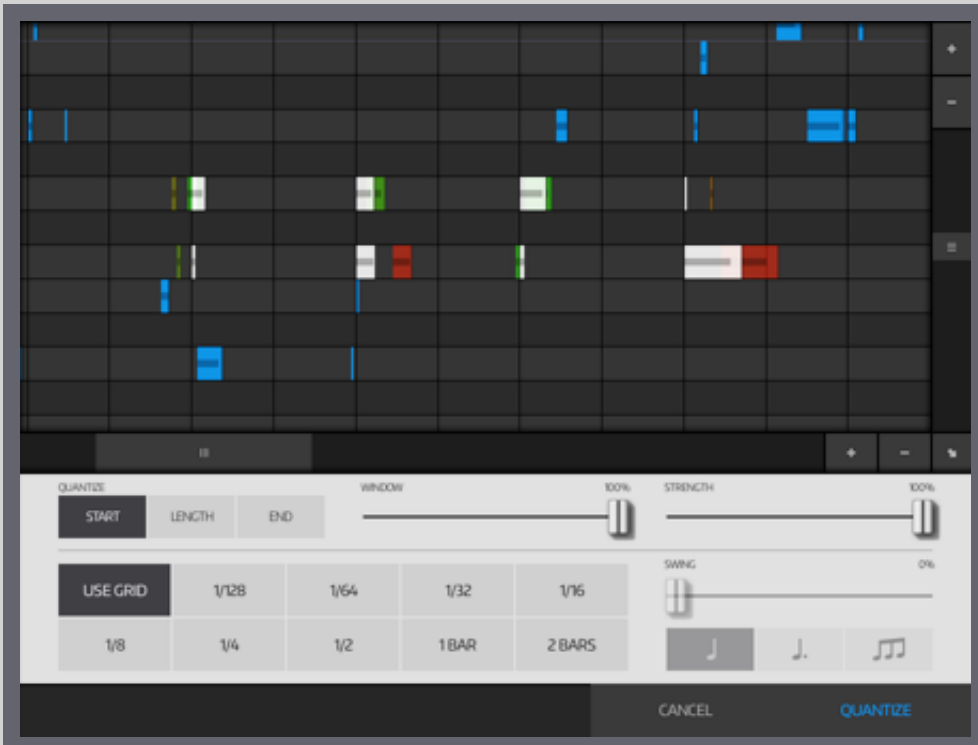
	**AUDITION BUTTON**. When enabled, the part editor will play a note when it's selected or edited. It will only play if the selection contains the same note.
GRID	**TAP** to view or change the grid and snap options. **DOUBLE TAP** to toggle the grid snap on or off.
ZOOM	**TAP** to zoom on a specific area part. **DOUBLE TAP** to perform a context-sensitive zoom. **DOUBLE TAP AGAIN** to revert to the previous zoom.
SELECT	**TAP** to select a specific area of the part. **DOUBLE TAP** to toggle the selection mode.
DRAW	**TAP** to enable draw mode. When draw mode is enabled you can tap or drag in the editing window to create or delete notes. **TAP AND HOLD** for extra options, such as drawing multiple repeating notes at the current grid interval.
DELETE	Deletes the current selection.
DUPLICATE	Duplicates the current selection. **TAP AND HOLD** for more options, such as making multiple duplicates.
ACTIONS	Performs general editing actions on the current selection such as joining, splitting, **quantizing**, copying and pasting.

DOUBLE TAP to set the song loop to the entire part.

BACK TO SONG Closes the part editor and returns back to the **Song Editor**.

Quantizing Notes

To quantize a selection, tap on the **ACTIONS command button** and choose the **QUANTIZE** option.

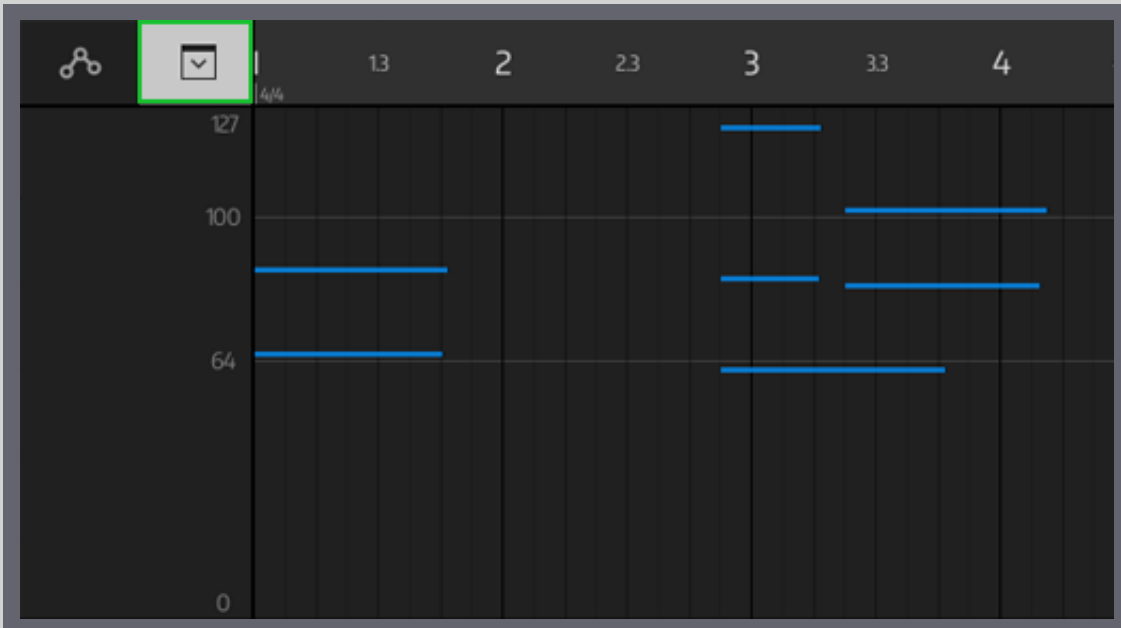


The WHITE notes preview the result of the quantize operation. The RED notes are the ones which are the furthest away from the chosen quantize interval and require the most quantization. The GREEN notes are the ones closest to the quantize interval.

Use the **WINDOW** slider to filter out any notes which are too far away from the quantize interval.

Use the **STRENGTH** slider to reduce the effect of the quantization if you want to retain a more natural feel.

Editing Note Velocity



To reveal the velocity editor, tap the button highlighted in GREEN.

Navigation and selection in the velocity editor works in just the same way as editing notes.

Any selection you make in the velocity editor will also select the corresponding notes in the note editor, and vice versa.

The velocity editor has two dedicated vertical drag handles:

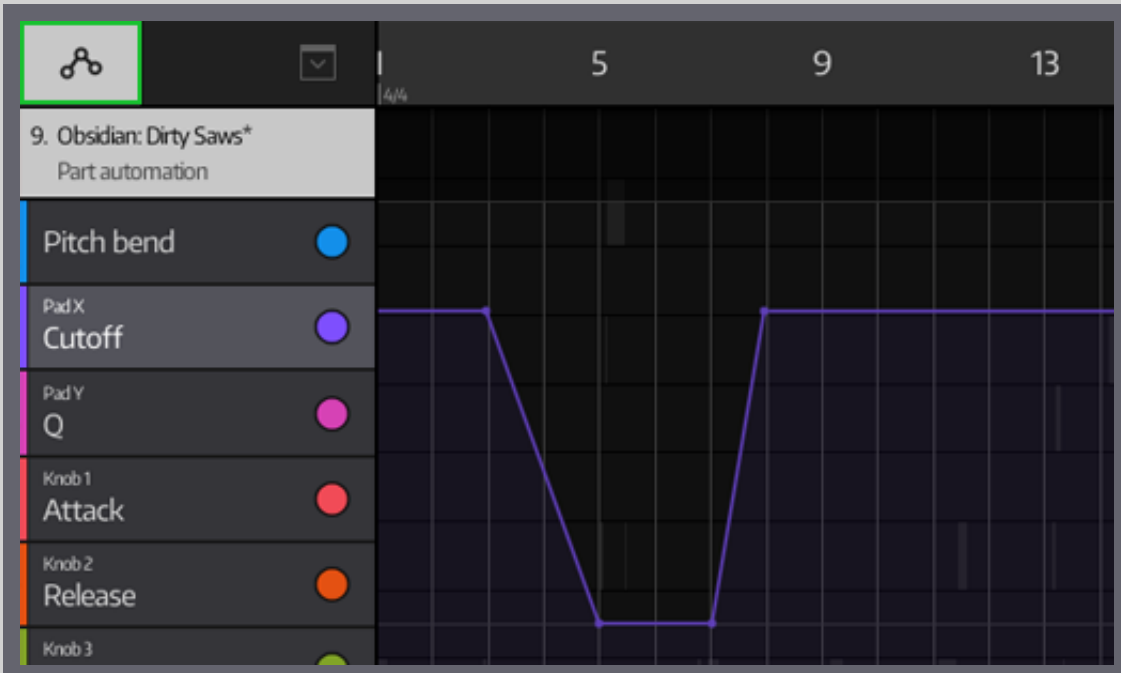
SCALES the velocity of the selected notes (ie. by multiplying their velocity values).

OFFSETS the velocity of the selected notes (ie. by adding to or subtracting

from their velocity values).

Part Automation

Parts may optionally contain automation. Automation is essentially a sequence of values which is used to automatically vary the controls of an instrument, effect, mixer track or send during playback. Part automation can only control the **instrument** on the part's track. If you wish to automate the mixer's controls, insert FX or sends then you must instead use **track automation**.



To reveal the part automation, tap the automation button (highlighted in GREEN).

Tap on any automation parameter to open the **automation editor**.

Sample Editor

NanoStudio's sample editor is capable of efficiently editing mono or stereo samples of up to 2 hours in length. It supports most audio file formats such as wav, aiff, ogg, m4a and mp3 and can handle all common bit depths and sample rates.

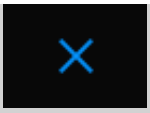
NOTE: MWAV is a proprietary read-only audio format used by NanoStudio to encode multisampled instruments and cannot be edited by the sample editor.

Quick links:

Status Bar

The sample editor's status bar is similar to the app's main **Status Bar** but also has a number of differences specific to the sample editor.

CLOSE BUTTON	Closes the sample editor. If you have made edits to the sample, you will be offered the option of discarding those edits or saving them in



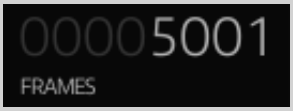
a format of your choice.

UNDO/REDO

The sample editor uses its own history buffer which is independent to the app's main history.

TAP AND HOLD to show the complete list of operations currently held in the sample editor's history buffer.

SAMPLE POSITION INDICATOR



Indicates the player's current position and grid units.

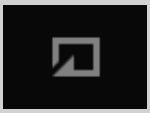
TAP to change the grid units via the **Grid Units Dropdown**.

STOP/LOCATE

Stops the sample player.

When the sample player is stopped:
TAP locates the player to the start of the current loop.
DOUBLE TAP locates the player to the start of the sample.

LOOP



TAP to toggle the sample player's loop mode on or off.

PLAY

Starts the sample player. When loop mode is enabled, the circular icon indicates the current position in the loop region.

RECORD

TAP to show the **Sample Record Dropdown**.

Grid Units Dropdown

The grid units dropdown is invoked by tapping on the status bar's sample

position indicator.

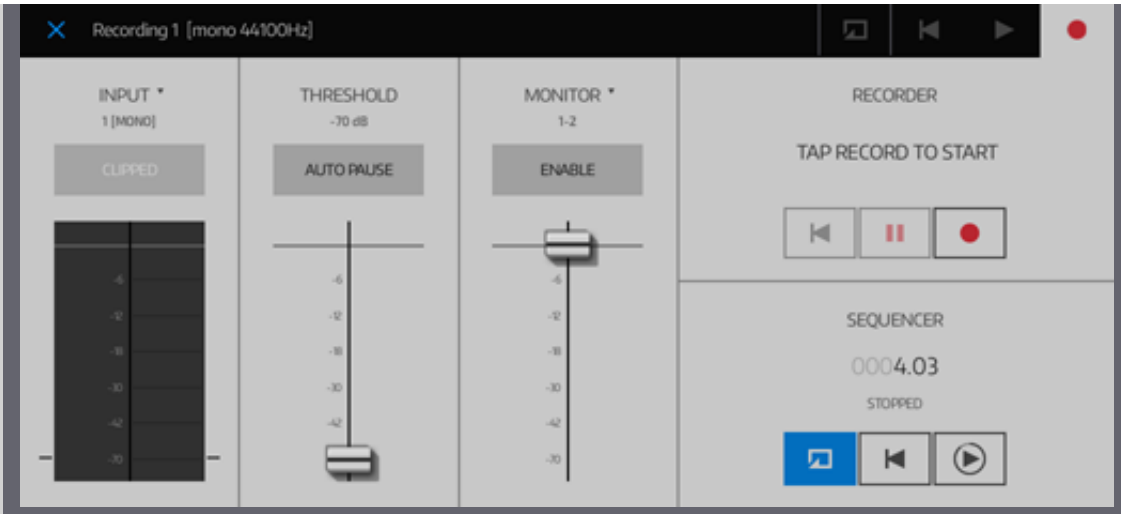
Use the dropdown to choose the sample editor's grid time units.

For BEAT units, you must also set the tempo and time signature the sample editor should use.

GRID UNITS	Choose between sample **FRAMES**, **TIME** (hrs:min:sec) or **BEATS**. If you select **BEATS** then you must also specify the tempo and time signature of the sample.
TEMPO AND TIME SIG	These controls are only available when the **GRID UNITS** are set to **BEATS**. Their operation is the same as the controls detailed in the **PLAY Settings**. The additional buttons allow you to set the tempo or time signature to match the song or the sample currently being edited. If the sample does not have embedded tempo/time sig information then some of these buttons may not be available.

Sample Record Dropdown

The sample record dropdown is invoked by tapping on the status bar's record button.



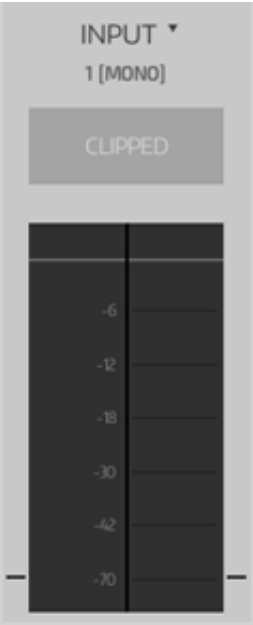
Use the dropdown to record from your device's built-in microphone or an external hardware audio device.

TAP THE CLOSE BUTTON when you have finished a recording session to return to the sample editor. You can use the editor to perform further post-editing on your recording before you save it.

RECORDER INPUT SETTINGS

TAP ON THE TITLE to choose the input channel(s) you wish to record.

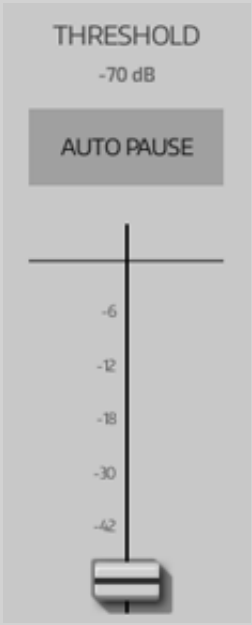
The **CLIPPED** indicator button will light up if the input signal was clipped during the current recording session.



TAP ON THE INDICATOR to reset it.

The **INPUT LEVEL METER** shows the current input level. The small horizontal bars on each side indicate the current record start threshold.

Note: The input will automatically switch to an **Audiobus** input source if it detects an app is sending audio to NanoStudio in the active Audiobus session.



RECORDER THRESHOLD SETTINGS

The recorder uses the threshold settings to automatically pause or start recording when the input signal passes the threshold level. This helps to reduce the amount of post-editing required when recording material which contains unwanted quiet sections.

By default, the recorder only uses the threshold to determine when it should start recording. Enable **AUTO PAUSE** to make the recorder automatically pause when the input signal goes below the threshold.

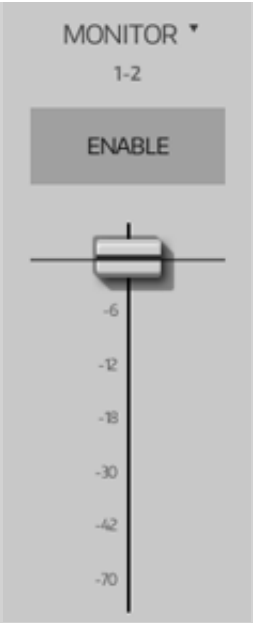
If you want recording to start immediately, you can disable the threshold by setting the **THRESHOLD SLIDER** to its minimum value.

RECORDER MONITOR SETTINGS

Use the monitor function to listen to the recorder's input signal.

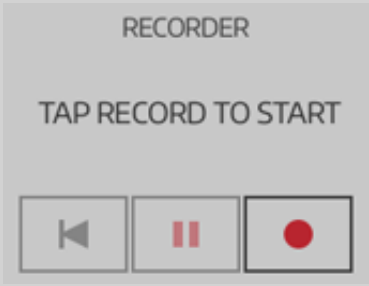
WARNING: To avoid feedback, it is recommended that you only enable this function when monitoring via headphones.

TAP ON THE TITLE to choose the output channels the monitor signal will be sent to.



Use the **ENABLE** button to enable or disable monitoring.

Use the **MONITOR LEVEL SLIDER** to set the volume of the monitor output signal.

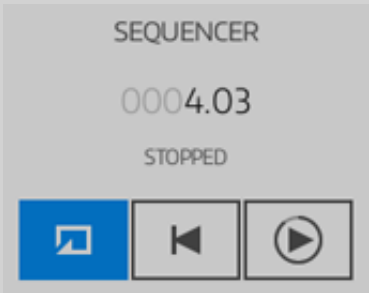


RECORDER CONTROLS

Tap the **RECORD BUTTON** to start recording. Recording will not start until the input signal exceeds the threshold.

When recording, you can tap the **PAUSE BUTTON** at any time to temporarily stop recording at the current position.

Tap the **REWIND** button to discard the current recording and start again.



SEQUENCER CONTROLS

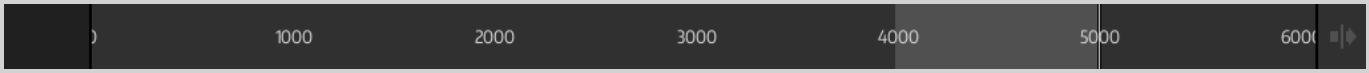
Use these controls to operate the sequencer whilst recording.

Time Ribbon

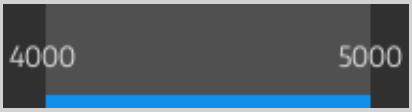
The time ribbon indicates the sample player's current position and the sample loop region.
The grid units may be changed via the **Grid Units Dropdown**.

TAP on the ribbon to move the sample player to the desired position.

DOUBLE TAP on the ribbon to move the start point of the loop region to the desired position.



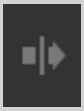
LOOP REGION



Indicates the region of the sample used by the player for looping. The blue bar is shown if looping is enabled using the loop button on the **Status Bar**.

TAP AND HOLD ON THE START / END to drag the loop extents.
TAP AND HOLD ON THE LOOP REGION to drag the entire region.
DOUBLE TAP ON THE LOOP REGION to set the editor's selection to the loop region.

FOLLOW BUTTON



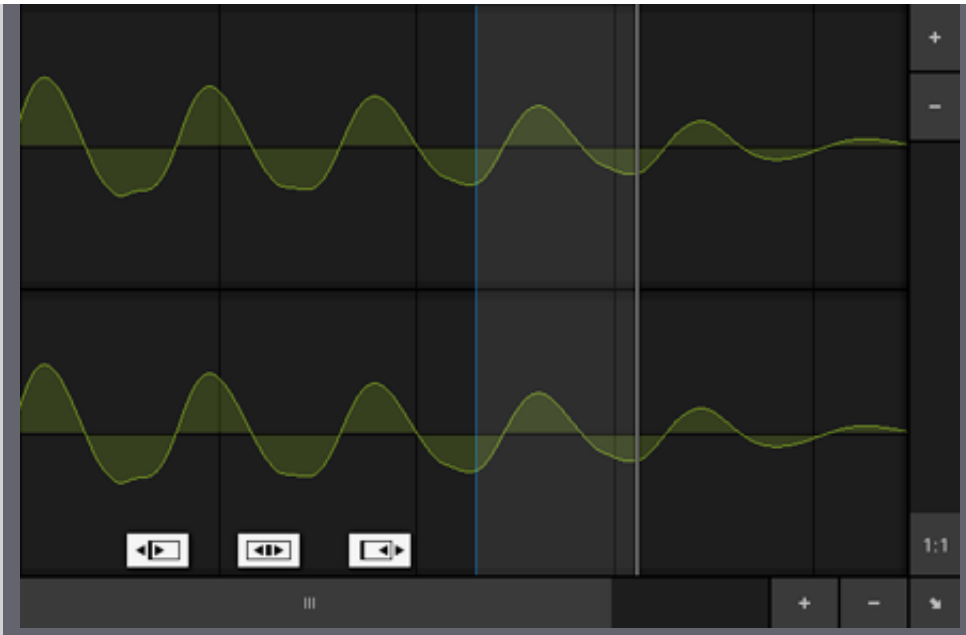
When enabled, the sample editor will automatically scroll its view to keep the current play position visible.

Editing Window

Use the editing window to navigate the view and make selections.

Navigation and selection can be performed with the traditional **DRAG** and **PINCH ZOOM** actions, but you will often find that the **SELECT** and **ZOOM** **command buttons** are a more efficient way to achieve these operations in a more task-oriented manner.

SCROLLING - Use two



fingers to **PINCH ZOOM**, and then release one finger and drag. Alternatively, you can use the horizontal scrollbar.

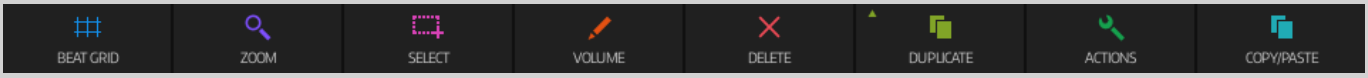
ZOOMING - Use two fingers to **PINCH ZOOM**. You can perform a context-sensitive zoom by double tapping the **ZOOM command button**. Use the **VERTICAL SCROLLBAR** to magnify the waveform.

DRAG to make a selection and then use the white drag handles to fine tune it.

DOUBLE TAP to select all.

Command Buttons

Use the command buttons to set beat grid properties, perform task-oriented zoom/selection and edit the selected region of the sample.



BEAT GRID	**TAP** to view or change the grid and snap options - also see the **Grid Units Dropdown** for setting up the correct beat tempo and time signature if you want to work in beats.

	DOUBLE TAP to toggle the grid snap on or off.
ZOOM	**TAP** to zoom on a specific area of the sample. **DOUBLE TAP** to perform a context-sensitive zoom. **DOUBLE TAP AGAIN** to revert to the previous zoom.
SELECT	**TAP** to select a specific area of the sample. You can also **DOUBLE TAP** on the editing window to select the entire sample.
VOLUME	Performs volume operations on the current selection such as mute, normalize and fade in/out.
DELETE	Deletes the current selection.
DUPLICATE	Duplicates the current selection. **TAP AND HOLD** for more options, such as making multiple duplicates.
ACTIONS	Performs general editing actions on the current selection such as trimming, reversing and removing DC offsets. Use **SAVE SEL** to save the current selection as a new sample file. If there is no selection then the entire sample may be saved using **SAVE AS**. **DOUBLE TAP** to perform a TRIM operation on the current selection.
COPY/PASTE	Copy, cut and paste regions of the sample.

Automation Editor

The automation editor is used by both the **Song Editor** and **Part Editor** for editing automation data.

Quick links:

Overview

Automation is essentially a sequence of values which is used to automatically vary the controls of an instrument, effect, mixer track or send during playback.

An automation sequence is defined using one or more *automation points*. Depending upon how the points are placed, they can be used to create steps, ramps or curves.

Automation points may be recorded in real-time by dragging knobs and sliders on the UI, or by using external MIDI controllers which have been mapped to UI controls. See the **Record Settings** for information about the options available

when recording real-time automation.

The automation editor can also be used to directly draw automation points in non-realtime.

Track vs Part Automation

Automation can be contained within tracks or parts. The only difference between track and part automation is the type of destination they can control:

- Track automation can only control the **mixer, insert FX or sends** on the track
- Part automation can only control the **instrument** on the track

Aside from this difference, automation works in exactly the same manner in both cases and may be created or edited using the automation editor.

Track automation is accessed from the **Track Automation** page of the Song Editor.

Part automation is accessed from the **Part Automation** page of the Part Editor.

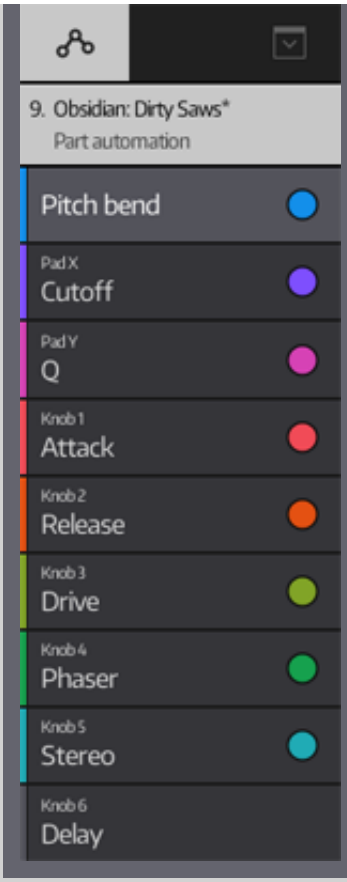
Parameter List

The parameter list is located on the left side of the automation editor.

Each entry in the list represents a parameter which may be controlled via automation.

Parameters which have one or more automation points are represented with a coloured bar and an enable/disable button.

If a parameter does not have any automation points then its



enable/disable button is hidden and the bar will be grey.

TAP on a parameter in the list to create or edit its automation points.

Editing Window

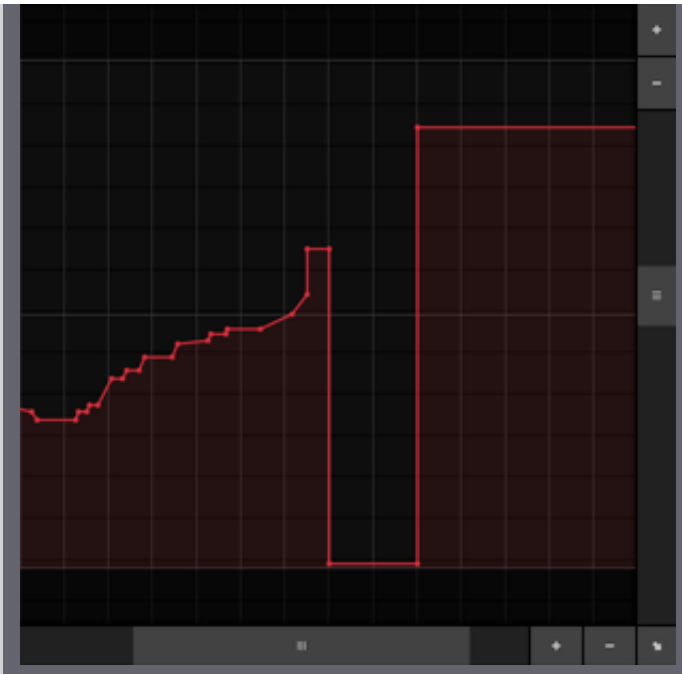
Use the editing window to navigate the view and make selections.

Navigation and selection can be performed with the traditional **DRAG** and **PINCH ZOOM** actions, but you will often find that the **SELECT** and **ZOOM** **command buttons** are a more efficient way to achieve these operations in a more task-oriented manner.

Note that the **VERTICAL SCROLLBAR** does not change the view of the automation points. Instead, it allows you to scroll the background so that you can see the content of the track or part the automation belongs to.

NAVIGATION AND SELECTION

SCROLLING - Use two fingers to **PINCH ZOOM**, and then release one finger and drag. Alternatively, use the horizontal



scrollbar.

ZOOMING - Use two fingers to **PINCH ZOOM**. You can perform a context-sensitive zoom by double tapping the **ZOOM command button**. Alternatively, you can use the +/- buttons on the scrollbars.

TAP on a point or **DRAG** to make a selection.
You can change the selection mode via the **SELECT command button**.

TAP on the background to deselect all.
DOUBLE TAP on the background to select all.

Editing Points

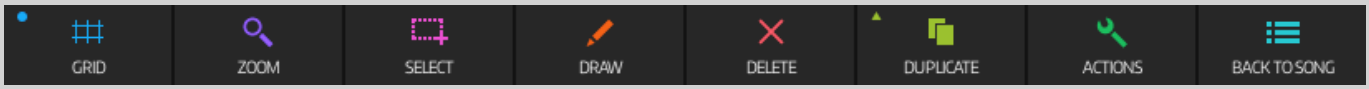
To move an automation point or a selection of points, **TAP AND HOLD** on one of the points. After a short pause you will be able to freely move the selection by dragging horizontally or vertically.

Most of the time you will just want to move points horizontally or vertically. The best way to achieve this is with the white drag handles which appear around the edges of the view when a selection is made:

	**Moves** the selection **forwards or backwards** in time.
	**Scales** the **amplitude** of the selected points (ie. by multiplying their values).
	**Offsets** the **amplitude** of the selected points (ie. by adding to or subtracting from their values).

Command Buttons

Use the command buttons to set beat grid properties, perform task-oriented zoom/selection and edit the selected automation points.

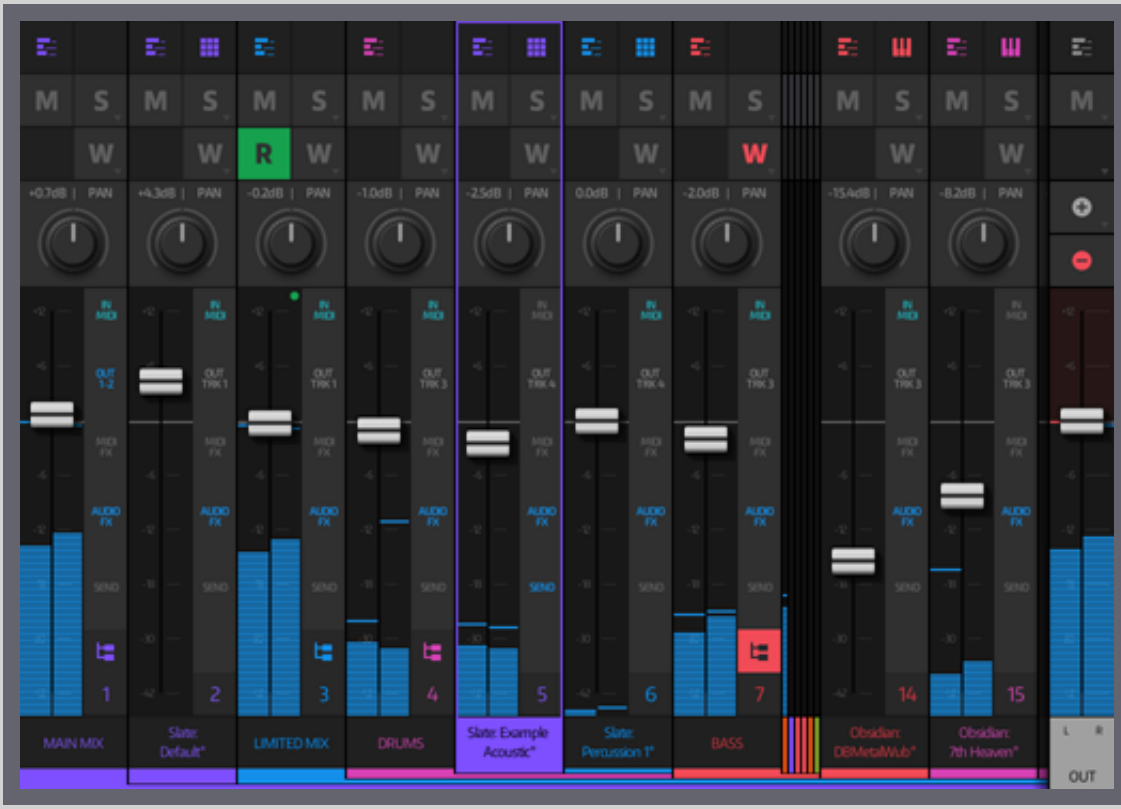


GRID	**TAP** to view or change the grid and snap options. **DOUBLE TAP** to toggle the grid snap on or off.
ZOOM	**TAP** to zoom on a specific area. **DOUBLE TAP** to perform a context-sensitive zoom. **DOUBLE TAP AGAIN** to revert to the previous zoom.
SELECT	**TAP** to select a specific area. **DOUBLE TAP** to toggle the selection mode.
DRAW	**TAP** to enable draw mode. When draw mode is enabled you can tap or drag in the editing window to create or delete automation points.
DELETE	Deletes the current selection.
DUPLICATE	Duplicates the current selection. **TAP AND HOLD** for more options, such as making multiple duplicates.
ACTIONS	Performs general editing actions on the current selection such as quantizing, removing excess points, copying and pasting.
BACK TO SONG	Only available when editing part automation. Closes the Part Editor and returns back to the Song Editor .

Mixer

The mixer's main purpose is to deal with visualizing, processing and mixing the audio produced by the tracks in the song. Its final output is typically a single stereo master track which is sent to your audio output (eg. headphone jack or speakers) and is used for the final **Mixdown**.

Whenever you add a track to your song, the mixer adds a corresponding **Track Strip** which allows you to view, adjust and configure that track according to your needs.



Quick links:

Overview
Master Strip
Track Strip
Managing Tracks

Track:
Setup
Input
Output
Audio and MIDI FX
Send/Returns

Overview

The mixer page provides the following features:

- Monitoring, volume, pan, mute, solo and automation read/write controls for each track

- Monitoring and volume control of the master output
- Adding, removing and arranging tracks and track groups
- Buttons to navigate quickly to the song row or instrument for each track
- Setting a track's instrument
- Configuring a track's audio and MIDI I/O
- Managing audio and MIDI track insert effects
- Adding send/return connections between tracks and effects
- Setting up MIDI controller mappings for instruments, effects and send/returns
- Giving tracks a custom colour or name

You have a lot of flexibility with how you choose to organize your tracks. You will encounter some terminology which helps to describe the relationship between them:

- **Parent track**. A track which groups together (or owns) one or more *child tracks*.
- **Child track**. A track which is contained within (or owned by) its *parent track*.
- **Sibling track**. A track which shares the same *parent track* with other tracks. You can think of a sibling track as 'being in the same group' as its other siblings.

All Tracks Are Created Equal

Traditional hardware and software mixers typically have a type of track dedicated to each purpose, such as input tracks, output tracks, auxiliary buses, send/return buses and track groups.

In NanoStudio, **there is only one type of track**. You can configure, rearrange and group any track or collection of tracks in order to perform any of the traditional mixer track functions.

The simplest possible track layout you can have is just a flat list of tracks. A slightly more complex alternative is to create a single master track and then

group all other tracks within it so they are children of the master track. This allows you to add effects to the master track (eg. a final limiter or mastering EQ) which are applied to the mix of all the other tracks in the song. NanoStudio's default project templates use a layout such as this.

If you wish, you may have as many track groups as you need and you can also place groups inside other groups. This is useful when you want to keep all your percussion or bass tracks grouped together so that you can easily control their overall volume level or apply insert effects to the group as a whole. You have complete freedom to create track setups which are as simple or as complex as you like, according to your requirements.

You may also add audio or MIDI send/returns between tracks (and in some cases the effects they use, such as a compressor's sidechain input). A send/return can be thought of as a wire from one track to another. The send is the end of the wire which sends the signal, and the return is the other end of the wire which receives the signal.

NanoStudio's mixer automatically performs **latency compensation**. This means that if you add an effect to a track which has non-zero latency (such as a lookahead limiter) then all other affected tracks will be similarly delayed so that the overall audio remains perfectly in phase. Latency compensation is performed for send/returns as well as tracks and track groups.

A track doesn't care about how it's arranged in the grand scheme of things as it simply follows a set of default rules:

- If it has child tracks, it takes their outputs and mixes them together.
- If it has returns coming in from another track, it takes their outputs and mixes them together.
- If it has an instrument, it plays that instrument via any MIDI effects on the track and then adds the instrument's audio output to its mix.
- If it has audio effects, it applies them to the combined audio mix of its child tracks, returns and instrument to create its final output.
- If it has sends going out to another track, it then sends its final output to

them. This may be pre- or post-fader.

- If it has a parent track, it then sends its final post-fader output to that parent. If it has no parent, it sends to the first L/R channel pair of MASTER OUT.

As mentioned, these are the default rules. In some cases you may want to change this behaviour using the **Track IO** page.

Master Strip

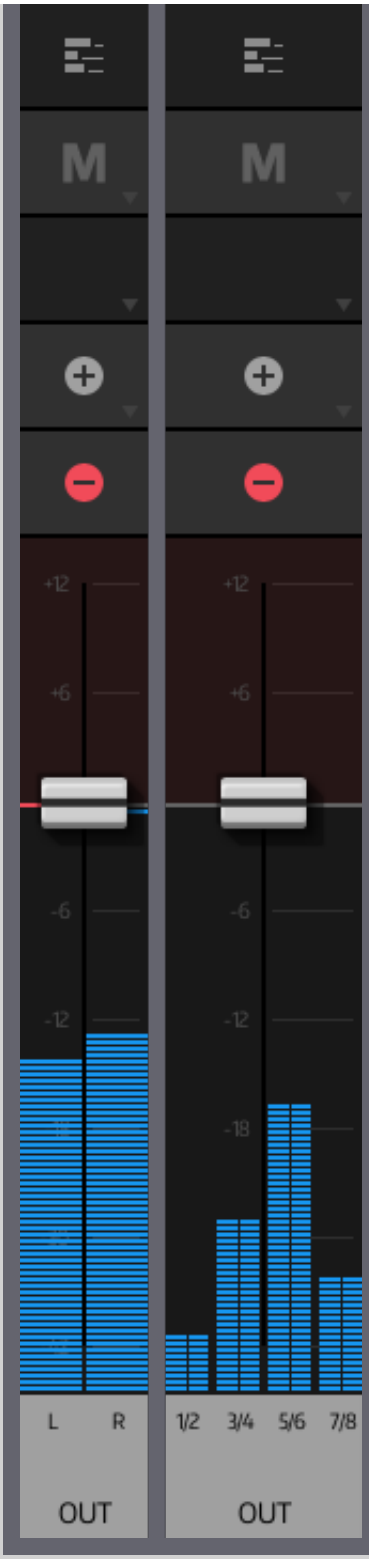
The master strip is always visible and is located on the right side of the mixer's view.

The master strip's **FADER** controls the overall mixer output level, including the level used for final **Mixdown**.

NanoStudio uses floating point sample data throughout its signal chain (including instruments, effects and the mixer) so you typically don't have to worry about signal headroom or noise floors like the good old days of analogue or low bit-depth hardware. You can drive any mixer strip well above 0dB without any problems, although extreme levels aren't recommended as this often puts non-linear effects such as compressors, limiters and waveshapers outside their ideal working range.

When the mixer's output signal reaches the master **OUT** strip it is converted to 16 bits for the audio hardware, which is why only the master strip has a meter with a red section above 0dB. This means that the signal level at the master strip WILL CLIP IF IT GOES INTO THE RED.

Ideally, you shouldn't go into the red. However, in practice it's usually possible (and sometimes preferred) to clip the odd transient, provided that it is not too large and very brief. This can depend upon your source material - if it contains lots of high frequencies then the aliasing introduced by a short clipped transient is normally hidden in the rest of the mix.

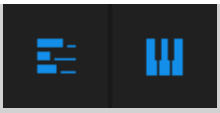


The peak meter's highest bar will turn red if it detects any clipped samples, but if it hasn't risen above 0dB then this indicates you can probably get away with it.

If an external **MULTICHANNEL AUDIO DEVICE** with more than one stereo output pair is connected, you will see more than one L/R meter pair. The master strip's fader will affect the level of these outputs too.

Track Strip

JUMP BUTTONS



Quickly navigate to the track's row in the **Song Editor** or the track's instrument.

MUTE / SOLO

DRAG HORIZONTALLY to mute or solo multiple tracks.
TAP AND HOLD for extra options.

AUTOMATION READ / WRITE

To write automation data, the sequencer must also be in **RECORD** mode. You can only enable read if the track has automation. **TAP AND HOLD** for extra options.

PAN CONTROL

Sets the track's stereo position.
DOUBLE TAP to set to the centre default.

LEVEL FADER

Sets the track's output level.

DOUBLE TAP on the fader to set the 0dB default level.
TAP ABOVE OR BELOW the fader to adjust in small increments.

AUTOMATION STATUS
Indicates the read, write or modified status of the control's value when track automation is enabled.

Indicates the track's current input source.

TAP to show the track's input setup page.

Indicates the track's current output destination.
TAP to show the track's output setup page.

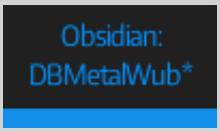
Indicates the status of the track's MIDI insert FX.
TAP to show the track's MIDI FX page.

Indicates the status of the track's audio insert FX.
TAP to show the track's audio FX setup page.

Indicates the status of the track's sends.
TAP to show the track's send setup page.

MINIMIZE CHILD TRACKS
If the track does not have any child tracks then this button is not available.

TRACK NUMBER
The track's overall number in the song, indexed from 1.



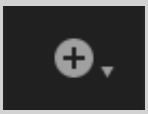
TRACK TITLE

DOUBLE TAP to show the track's setup page.
HOLD AND DRAG HORIZONTALLY to move the track.

Managing Tracks

You can add or remove tracks using the buttons on the **Master Strip**:

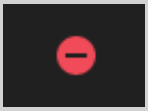
ADD TRACK



TAP to add a new Obsidian synth track.

TAP AND HOLD to add a track containing a different type of instrument or a new group track.

REMOVE TRACK



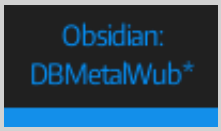
TAP to remove the selected track.

TAP AND HOLD on a track's title to drag the track horizontally to the desired position. You can drop it between other tracks to make it a sibling, or on top of a track to make it a child.

If you're rearranging many tracks then you may prefer to **Manage Tracks** using the Song Editor, since it supports multiple track selection.

Track Setup

From the main mixer page, **DOUBLE TAP** on a track's title to show the track's setup page:



Use the setup page to set the track's **custom name** or **colour**.

You can also use it to set the track's **instrument**.

The list on

the right allows you to set up **MIDI controller mappings** for the instrument, mixer strip, effects and send/returns on the track.

Track IO

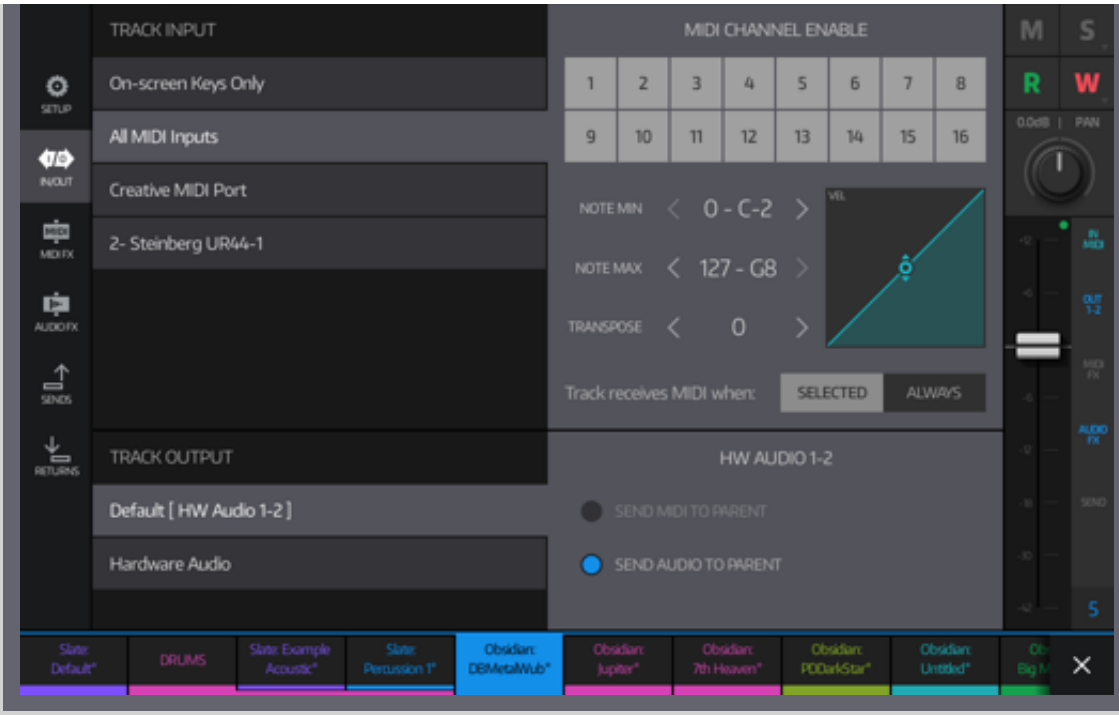
To view a track's input/output settings from the main mixer page, **TAP** on the track strip's input or output source indicators:

If the **Track Setup** is already visible then you can use the **IN/OUT** tab button on the left side.

The track IO page is divided into two halves.

The top half shows the track's **Input Settings**.

The bottom



half shows the track's **Output Settings**.

Input Settings

Use the top half of the **Track IO Page** to configure the track's input settings.

On-screen Keys Only	The track ignores all external MIDI input and responds to the on-screen touch keyboard only.
All MIDI Inputs	The track responds to all MIDI inputs (also see **MIDI Inputs** of the Settings Page).
Other MIDI Input	The track only responds to the selected MIDI input.

MIDI CHANNEL ENABLE	Determines which MIDI channels the track will respond to. By default, all channels are enabled.
NOTE MIN/MAX	Allows you to set the MIDI note range the track responds to.

TRANSPOSE VEL CURVE	You may also transpose incoming MIDI notes and set a velocity response curve.
Track receives MIDI when:	**SELECTED**: The track only responds to MIDI input events when it is selected or its instrument is visible. **ALWAYS**: The track always responds to MIDI input events even when not selected or its instrument is not visible.

Output Settings

Use the bottom half of the **Track IO Page** to configure the track's output settings.

Default	The track sends its audio (and optionally MIDI) to its parent track. If it has no parent track then it sends its audio to the first master L/R output channel.
Hardware Audio	The track sends its audio straight to the master L/R output channel. If a multichannel hardware audio device is connected, then you can choose which output channels of the audio device are used.

Track Effects

To view a track's audio or MIDI insert FX from the main mixer page, **TAP** on the track strip's audio or MIDI FX indicators:

If the **Track Setup** is already visible then you can use the **MIDI FX** or **AUDIO FX** tab buttons on the left side.

MIDI effects are applied to MIDI messages

which come from the track, before they are sent to the instrument.

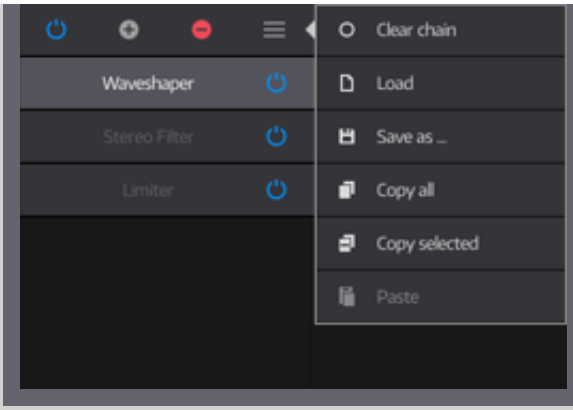
Audio effects are applied to the track's audio output, before it is sent to its parent track (or the master output if the track has no parent).

See the **Effects** section to find out more about NanoStudio's built-in effects.

Use the **FX LIST** to add, remove and rearrange the track's effects.

TAP AND HOLD on an effect in the list and **DRAG VERTICALLY** to change the order of the effect in the chain.

The **POWER BUTTON** on the list's title bar allows you to bypass the entire effect chain.

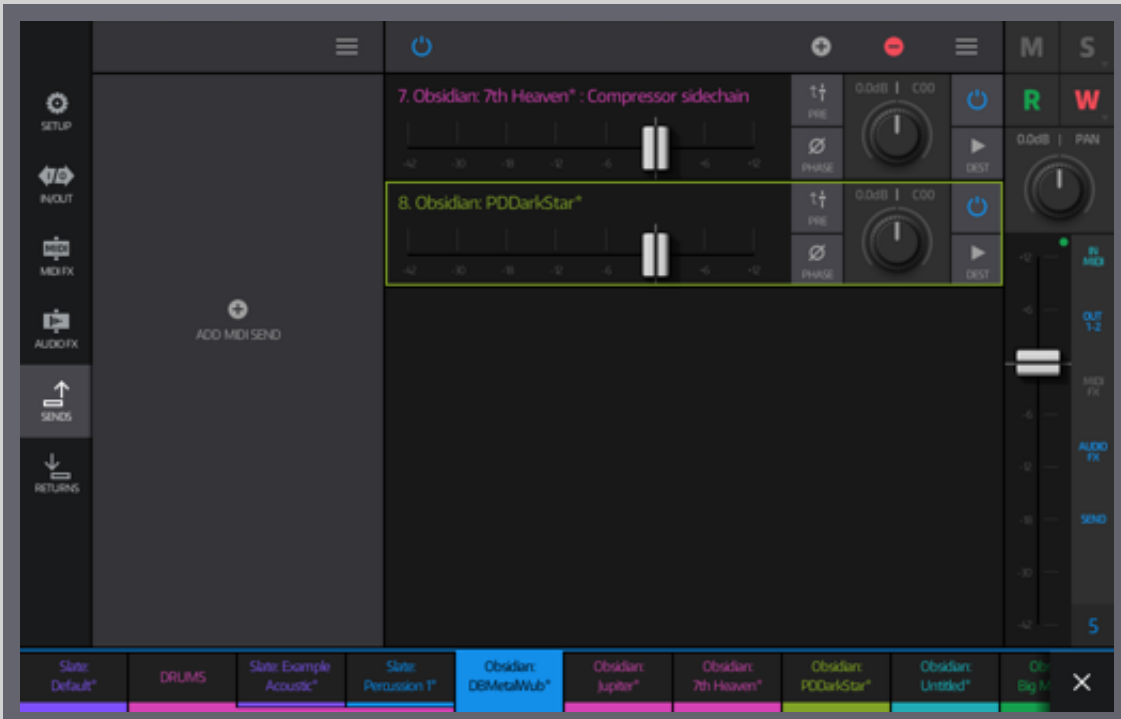


The **HAMBURGER BUTTON** invokes a list containing additional management options. You can copy and paste single effects or an entire effect chain setup between different tracks or other projects.

Track Send/Returns

To view a track's sends or returns from the main mixer page, **TAP** on the track strip's send indicator:

If the **Track Setup** is already visible then you can use the **SENDS** or **RETURNS** tab buttons on the left side.

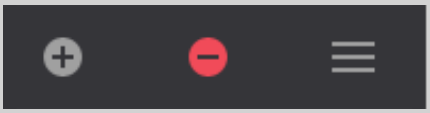


The **SENDS** and **RETURNS** pages are almost identical.

The **SENDS** page shows the outgoing connections from the track.

The **RETURNS** page shows the incoming

connections to the track.



Use the **ADD** or **REMOVE** buttons on the title bars to add or remove a send or return.

The **HAMBURGER BUTTON** invokes a list containing additional management options. You can copy and paste sends or returns between different tracks or other projects.

PRE: Enable to send audio *before* it goes through the track's volume fader and pan controls.

PHASE: Inverts the polarity of the sent signal.

POWER BUTTON: Enables or disables the send.

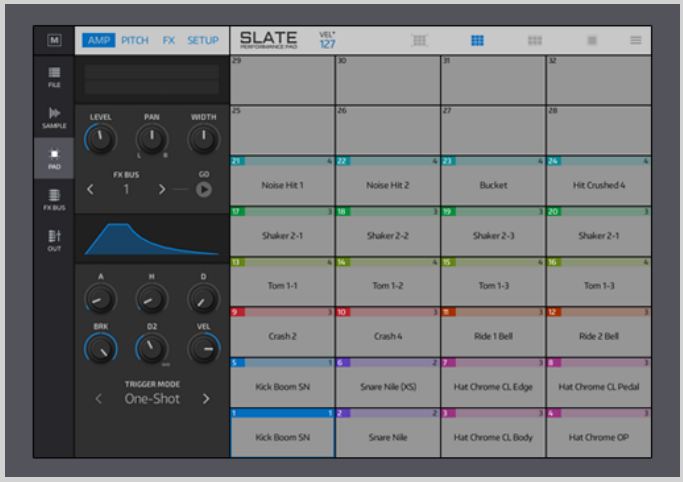
DEST: Navigates to the corresponding return or send.

Instruments

Tap on an instrument below to find out more about it.

OBSIDIAN
Hybrid subtractive sampling synthesizer

SLATE
Sample performance pad



AU INSTRUMENT
Hosts AUv3 plugin instruments

EXTERNAL MIDI
Outputs to other MIDI devices

Effects

Tap on an effect below to find out more about it.

EQ-3B
3 band equalizer with spectrum analyzer

ALGOVERB
Algorithmic reverb

COMPRESSOR
Compressor/expander with optional external sidechain

LIMITER
Lookahead limiter

DELAY
Multi-mode stereo delay with optional beat sync

MULTI-FX
Chorus, ensemble, flanger or phaser effect

WAVESHAPER
Waveshaper with optional oversampling

LO-FI
Bitcrusher and sample rate decimator

EXCITER
Synthesizes extra high frequency content

STEREO FILTER
Single band multi-mode filter with spectrum analyzer

STEREO GAIN
Stereo gain and image processor

EXTERNAL EFFECT
Hosts 3rd party AUv3 audio and MIDI effects

EQ-3B

An equalizer with 3 independent frequency bands. Each band may use a different filter shape and can be individually enabled or disabled. If you need more bands you can always add more EQs in series.

Unlike most other effects, the EQ-3B does not support automation. If you wish to automate a frequency band you may instead use the **Stereo Filter**.

Use the spectrum analyzer to help visualize the frequency content of the signal. The **PRE / POST** button toggles its view between the EQ's input or output.

The **OUT** control sets the master gain when the effect is enabled. Use this to minimize volume differences when the effect is enabled or disabled.

Each band is functionally identical and provides the following controls:

ENABLE	Enables/disables the band. The band is automatically enabled whenever you adjust one of its controls.
SHAPE	Selects the filter shape the band should use.
GAIN	The band's gain. The exact behaviour depends on the filter shape. Some filter shapes do not have a gain control.
FREQ	The band's centre frequency.
Q	The band's resonance. Low values create a smoother response over a wider range of frequencies. High values create a sharper response over a narrower range of frequencies.

Algoverb

A reverberation effect with a choice of 4 different algorithms.

Reverb algorithms:

SMALL ROOM - From close ambience up to a small room.
LARGE ROOM - General purpose room.
DENSE ROOM - Room with a thick decay tail.
PLATE - Bright with a long smooth decay tail.

PREDELAY TIME	Adds an initial delay to the input signal before it is sent to the reverberator. Useful for creating space between the dry signal and its reverb response.
PREDELAY MIX	Controls the mix between the undelayed and predelayed signals sent to the reverberator. Useful for making the predelay more subtle.
EQ LOW CUT	Reduces the amount of low frequency content sent to the reverberator, so it sounds less boomy.
EQ HIGH CUT	Reduces the amount of high frequency content sent to the reverberator, so it sounds less airy.
REVERB SIZE	The length of the reverb tail.
REVERB DAMPING	How quickly higher frequencies will decay as the reverb tail evolves.
REVERB WIDTH	Controls the stereo width of the reverberated signal.
OUT DRY	The amount of the dry input signal which is mixed to the effect's output.
OUT WET	The amount of the wet (reverb) signal which is mixed to the effect's output.

Compressor

A compressor/expander with an optional external sidechain input.

In basic terms, a compressor/expander is an automatic gain control. When operating as a compressor it reduces the level of the signal when it's above the threshold and thus reduces (ie. compresses) the signal's dynamic range. When operating as an expander it reduces the level of the signal when it's *below* the threshold and thus increases (ie. expands) the signal's dynamic range.

To keep things simple we'll assume the effect is being used in its normal compressor mode. If you're using the expander mode, remember that the threshold works differently as described above.

In order to achieve its task, a compressor must assess the volume level of the incoming signal. The part of the effect which is responsible for this is known as the *sidechain*. The input to the sidechain is usually the same as the input signal to the effect, known as *internal sidechaining*.

Sometimes, *external sidechaining* is useful, where the sidechain's input comes from a different source. A good example of this would be ducking the volume of the bassline when the kick drum plays. In this case, the bassline track would have a compressor whose sidechain input comes from the kick drum track. You can achieve this by using the mixer to add a **Track Send** from the kick drum track to the compressor on the bassline track.

Use the **REDUCTION** meter and **RELEASE** / **HOLD** indicators to help visualize how the compressor is working.

THRESHOLD	The level where the compressor starts to act. If set low, the compressor will be working most of the time. If set high, the compressor will only react to the very loudest parts of the input signal.
RATIO	The amount of gain reduction the compressor will apply once the input signal exceeds the threshold. If set low, the compressor will only apply a mild reduction. If set to maximum, the compressor will heavily limit the gain.
ATTACK	How quickly the compressor reacts once the input signal exceeds the threshold. If set low, the compressor will react almost immediately. If set high, the compressor will take some time to react - useful if you wish to let the initial attack transient through (eg. for a snare drum).
RELEASE	How quickly the compressor will restore the gain to its normal level once the input signal falls below the threshold and the hold time has elapsed. If set low, the compressor will restore full gain almost immediately. If set high, the compressor will take some time to restore the gain - you can use this on reverb drum loops to create a pumping or rushing sound after each beat.
HOLD	Adds an extra time delay before the compressor goes into its release state.
MAKE UP	Since the compressor always works by reducing the level of the incoming signal, this may be used to compensate or 'make up' this volume reduction so that the peak output is approximately the same as the original signal.
MIX	Sets the dry/wet mix between conventional series compression (100% wet) and parallel compression (50/50 mix). Use parallel compression to preserve more of the original input signal's dynamics.
EXPANDER	Enables expander mode.
RMS	When enabled, the sidechain uses the RMS signal level. When disabled, it uses the peak level. RMS is generally preferred as it prevents the compressor from reacting to very short transients.
SC FILTER	Applies a high or low pass filter to the sidechain input (internal or external). This is useful for filtering out frequencies you don't want the compressor to react to, such as hi-hats or kick drums.

Limiter

A brickwall limiter with lookahead. A limiter ensures that its output signal never exceeds a given level, known as the *ceiling level*. In some ways it is similar to a compressor with an infinite ratio and zero attack time. However, zero attack times are undesirable in practice since sudden gain changes can result in ugly click noises. The limiter solves this problem with *lookahead* - it delays the signal slightly so it has enough time to see what's coming and can reduce the gain smoothly *before* the transient occurs.

The disadvantage with lookahead is that the limiter's output signal is also delayed and will add extra latency. NanoStudio automatically compensates all other tracks and sends by adding delays to them so that everything stays in sync, but it can't remove the additional latency. Therefore, if you use NanoStudio for real-time performance then a lookahead time of less than 1-2ms is recommended. Longer lookahead times are best reserved for non-realtime playback and final mastering/mixdowns.

Use the **REDUCTION** meter and **RELEASE** / **HOLD** indicators to help visualize how the limiter is working.

THRESHOLD	The level where the limiter starts to act. If set low, the limiter will be working most of time. If set high, the limiter will only react to the very loudest parts of the input signal.
CEILING	Sets the maximum signal level the limiter can output.
ATTACK	How quickly the limiter reacts to signals above the threshold. If set to minimum, the limiter will react quickly enough to reduce the gain before the transient occurs. If set to higher values, the limiter will take more time to react and will resort to clipping any transients which it couldn't remove via gain reduction.

RELEASE	How quickly the limiter will restore the gain to its normal level once the input signal falls below the threshold and the hold time has elapsed.
HOLD	Adds an extra time delay before the limiter goes into its release state.
LOOK AHEAD	How much the limiter will delay its output signal by so it has enough time reduce its gain prior to the next transient. If you use NanoStudio for real-time performance then a lookahead time of less than 1-2ms is recommended.

Delay

A traditional single-tap stereo delay with feedback. The delay time may be set either in seconds or as beat intervals (synchronized to the song's tempo).

The delay mode determines the feedback routing between L/R channels:

STEREO - The left and right channels are delayed individually.
CROSS FEEDBACK - The delayed signal from each channel is fed into the opposite channel.
PING PONG - Similar to CROSS FEEDBACK, but the input L/R channels are also swapped before they are fed to the delay.

TIME	The length of the delay. By default, the delay time is set in seconds. To set the delay time using beat intervals, **TAP THE UP BUTTON** above the 'sec' units text.
L : R	Sets the delay time ratio between the left and right channels. A ratio of 1:1 means that both channels are delayed by the same amount.
FB AMOUNT	The amount of the delayed output which is fed back to the delay's input. At the minimum setting, the delay will only produce a single repeat. Higher settings result in multiple repeats.

FB BALANCE	Sets the pan of the wet (delayed) signal. This is useful for creating complex stereo patterns when layering multiple delays.
FB LOW CUT	The amount of low frequency content which is attenuated before it is fed back to the delay.
FB HIGH CUT	The amount of high frequency content which is attenuated before it is fed back to the delay.
OUT DRY	The amount of the dry input signal which is mixed to the effect's output.
OUT WET	The amount of the wet (delay) signal which is mixed to the effect's output.

Multi-FX

An effect capable of producing time modulated delay/filtering effects such as chorus, ensemble, flanging or phasing.

CHORUS - Mixes delayed copies of the input signal together to create a thicker sound. The delays are modulated slowly to add variation.
ENSEMBLE - Uses multiple chorus units to create a thicker sound.
FLANGER - Similar to CHORUS, but uses longer delay times and more feedback for a more metallic sound.
PHASER - Mixes filtered copies of the input signal together. These copies introduce phase-shifts to the signal to create a distinctive phasing sound. Each filter is modulated slowly to add variation.

MOD RATE	The speed at which the effect is modulated.
MOD DEPTH	The amount of modulation applied to the effect.
FEEDBACK	The amount of the effect's output signal which is fed back to its input.

DELAY	Adds an additional fixed offset to the delay time generated by the effect's modulation.
MIX	The balance between the dry input signal and the wet output signal.
BASS BYPASS	Reduces the effect's processing of low frequencies. Useful for preserving the stereo image of bass sounds.

Waveshaper

A waveshaper with optional oversampling. This effect is capable of producing mild saturation, hard distortion or FM-like wave folding.

Waveshaping adds extra harmonics to the input signal. If you're using it on a signal which has a lot of high frequency content, these harmonics can exceed the sample rate and cause aliasing. To reduce the amount of aliasing you can enable oversampling. However, oversampling comes at the cost of increased CPU load so you should generally only use it when needed.

TUBE - Warm saturation.
SOFT - Overdrive.
HARD - Clipped distortion.
ENHANCE - Adds subtle higher frequencies.
SINE - FM-like wave folding using a sine wave shape.
TRI - FM-like wave folding using a triangle wave shape.

DRIVE	The amount of gain applied to the input signal before it is sent to the waveshaper.
EQ BIAS	Applies an EQ tilt filter to the input signal before it is sent to the waveshaper. Use this to emphasize the effect on the high or low frequency content of the signal.
POST GAIN	The amount of gain applied to the signal after it has been through the waveshaper. Use this to minimize the difference in signal level between the waveshaper's input and output.

MIX	The balance between the dry input signal and the wet output signal.
OVERSAMPLE	Oversamples the signal to reduce aliasing. Higher oversample values will also result in higher CPU usage.

Lo-Fi

A bitcrusher and sample rate decimator which digitally degrades the signal.

BITCRUSH	Emulates bit-depth reduction by reducing the number of amplitude 'steps' available to the output signal.
DECIMATE	Emulates sample rate reduction by sampling the input signal at a lower rate than usual.
MIX	The balance between the dry input signal and the wet output signal.

Exciter

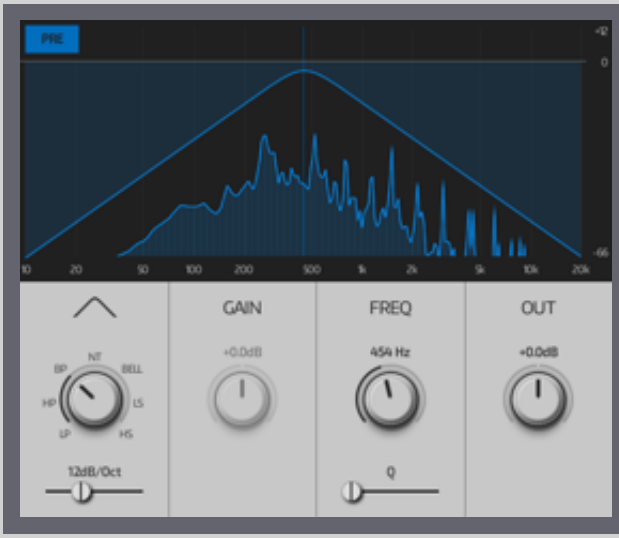
Adds brightness to the sound by artificially synthesizing new high frequencies which are not present in the original input signal.

The **CRUNCHY / SMOOTH** setting subtly affects the character of the sound. Choose the setting which sounds the best for your source material.

FREQ	Sets the minimum synthesis frequency.
HARMONICS	The number of extra harmonics introduced to the signal by the synthesis process.
MIX	The balance between the dry input signal and the wet output signal.

Stereo Filter

A precise stereo filter with a choice of filter shapes. It is similar to a single band of the **EQ-3B** effect, but also supports automation and provides more control over the filter's slope.



Use the spectrum analyzer to help visualize the frequency content of the signal.

The **PRE / POST** button toggles its view between the EQ's input or output.

SHAPE	Selects the filter shape.
SLOPE	How quickly the filter attenuates frequencies outside its passband, in units of dB/Octave.
GAIN	The filter's gain. The exact behaviour depends on the filter shape. Some filter shapes do not have a gain control.
FREQ	The filter's centre frequency.

Q	The filter's resonance. Low values create a smoother response over a wider range of frequencies. High values create a sharper response over a narrower range of frequencies.
OUT	The master output gain when the effect is enabled.

Stereo Gain

The Stereo Gain effect provides a number of functions for processing the gain and imaging of stereo signals.

It's also useful for gain-staging before or after non-linear effects such as compressors, limiters and waveshapers.

Suggested uses:

- Gain-staging before or after non-linear effects such as compressors, limiters and waveshapers.

- Fixing phase issues with material recorded via stereo microphones.

- Getting a track to sit in the stereo mix more satisfactorily.

GAIN	The master output gain.
PAN	The master output pan.
WIDTH	The difference between the left and right output channels. 0% is mono, 100% is no change and 200% adds additional width. Has no effect on mono signals.
INVERT L/R	Inverts the phase of one or both channels.
SWAP L/R	Swaps the left and right channels with each other.

MONO	Converts the signal to mono.

External Effect

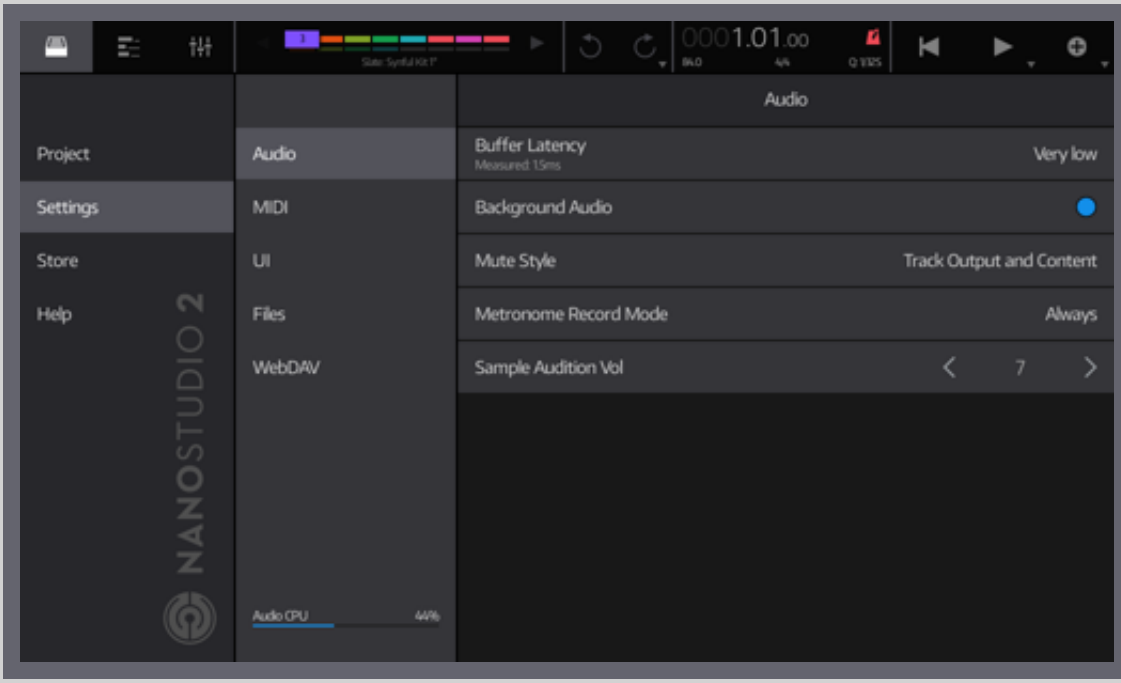
The External Effect is used to host 3rd party AUv3 audio or MIDI effects.

Use this button to toggle between normal size and full screen views.

Settings

The settings page is the place to set up global preferences according to your personal requirements. Additionally, you can use it to manage your audio and MIDI files and enable NanoStudio's built-in WebDAV server for transferring files to your computer.

Access the settings page by tapping the **HOME** button on the **Status Bar**



Quick links:

Audio Settings
MIDI Settings
UI Settings
Managing Audio / MIDI Files
WebDAV

Audio Settings

Buffer Latency	The size of the audio buffers used by NanoStudio. Lower settings result in less delay between tapping the screen and hearing the sound, but makes heavier use of the CPU. If you hear the audio stuttering or slowing down during playback, you may have to increase the buffer size.
Background Audio	By default, NanoStudio stops playing when the app goes into the background. If you enable this option then NanoStudio will continue to play audio and respond to most types of MIDI input when it is in the

	background. **WARNING:** Enabling this option may increase the drain on your device's battery, even when NanoStudio is not visible. It is recommended that you only use this option if you really need it, or that you fully close NanoStudio when you have finished using it.
Mute Style	Determines the behaviour of muted tracks. **Track Output and Content** mutes the track's audio output **AND ALSO** stops playing the track's content (such as MIDI notes and automation events). This reduces CPU load when muted, but means that if you unmute the track it will not play until the next MIDI event occurs. **Track Output Only** just mutes the track's audio output and leaves the track's contents playing. This means that when you unmute the track it immediately resumes, but muted tracks will not reduce CPU load.
Metronome Record Mode	Determines the behaviour of the metronome when recording. **Always** will play the metronome both during the count-in **AND** when recording. **Count In Only** will play the metronome during the count-in, but will stop it when recording starts. This can be useful when you've already laid down a rhythm track and no longer need to hear the metronome during your recording session.
Sample Audition Vol	Sets the volume level used when auditioning sample files via the **File Browser**

MIDI Settings

MIDI Inputs

Shows a list of the currently available MIDI input ports. Tap an input's **BLUE BUTTON** to enable or disable it.

You can choose to include specific inputs in 'All MIDI Inputs'. 'All MIDI Inputs' is a virtual MIDI input which tracks use by default to respond to all currently available MIDI inputs. Tap an input's **ORANGE BUTTON** to include or exclude it from 'All MIDI Inputs'.

MIDI Outputs

Shows a list of the currently available MIDI output ports. Tap an output's **BLUE BUTTON** to enable or disable it.

Sending MIDI Clock events to Outputs

- Tap an output's **GREEN BUTTON** to send MIDI Clock and Start/Stop/Locate events to it.
- When an output's MIDI Clock is enabled, you may use the horizontal slider control (at the bottom of the page) to apply a fixed time offset. This can be useful for fine-tuning the synchonisation of external hardware MIDI devices.
- Typically, any MIDI device you wish to slave to NanoStudio's clock should have its 'Clock Source' set to 'External'. Consult the manual for that device if you need help on how to do this.

Limitations of MIDI Clock and things to be aware of:

- Negative MIDI Clock offsets may incur additional audio latency. If this additional latency is excessive then a warning icon will appear in the settings menu.
- Syncing multiple devices using MIDI clock is never perfect and the timing will inevitably have some jitter. Using a larger audio buffer size may improve this. A jitter of less than 1ms is achievable, but this depends heavily upon the hardware interface and slave device.
- MIDI Clock can only relocate (change the song position of) slave devices when the transport has stopped. Therefore, NanoStudio is unable to sync slave song positions to its own loop region when the transport is running.
- MIDI Clock can only relocate slave devices to the nearest 1/16th note. If NanoStudio's transport is moved to a position which does not lie on a 1/16th interval then it will start the slave as soon as the transport reaches the next

1/16th note.
- Some MIDI devices will advertise multiple ports. Depending upon the device, it may use the MIDI clock events from one port or it may merge MIDI clock events from all ports. If you find that a slave's MIDI clock is running at double speed or higher then it is probably merging the clock events from all its ports and you should disable MIDI clock for all but one of that device's ports.

Bluetooth

Allows you to pair wireless Bluetooth MIDI controllers with NanoStudio. When pairing your Bluetooth MIDI controller:

- It should be within a few metres of your device for it to be recognized.
- Depending upon your controller, you may have to put it into a special pairing mode.
- Once the controller has been successfully paired, you won't have to do it again unless you uninstall/reinstall NanoStudio.

UI Settings

Key Width	Sets the width of the touch screen UI keys used by NanoStudio's internal instruments.
Knob Control	Choose between rotary (angular) or vertical drag. Vertical drag is recommended.
Control Senstivity	Sets the touch sensitivity for controls such as knobs, sliders and draggable numbers.
Start View	Determines the default view which should be shown when a project is loaded.

Files

Use the files page to view, edit and generally manage your audio and MIDI files.

When viewing audio files, you can invoke the **Sample Editor** by **DOUBLE TAPPING** on an audio file.

WebDAV

Musicians often need full control over their files so that they can safely back them up, organize them and arrange them as they wish without limitations or restrictions. With this in mind, NanoStudio includes a built-in WebDAV server. WebDAV is a modern equivalent of file transfer systems such as FTP. When enabled, it allows you to browse all of your NanoStudio files using a desktop computer connected to the same Wi-Fi network as your device.

To enable NanoStudio's WebDAV server, tap the circular enable button on the top right of the WebDAV page. Provided that your device is connected to a Wi-Fi network, it will then show you a list of connection URLs you can use with the most popular desktop operating systems.

If you use macOS or Windows you don't need to install any extra software to browse NanoStudio's files as WebDAV clients are already built into macOS Finder's 'Connect to Server...' and Windows Explorer.

However, both of these clients are not guaranteed to be the most reliable or the fastest. CyberDuck is recommended - it's free, cross platform, reliable and faster than the built-in OS clients.

Audio and MIDI Files

You can view and manage all the audio and MIDI files on your device via the **Files** category in the **Settings Page**.

From there, use the **File Browser** to copy, move, rename, import or export files.

DOUBLE TAP on an audio file to open it in the **Sample Editor**.

Audio File Formats

Mono and stereo audio files at most bit depths and sample rates are supported:

- **wav** - Supports sample loop points, tempo, time signature and other metadata.
- **aiff** - Supports sample loop points only.
- **ogg** - An open source lossy compressed format.
- **m4a** - Lossy or lossless compressed format.
- **mp3** - Lossy compressed format. You can load and edit mp3s but you must save them in a different format.
- **mwav** - NanoStudio's proprietary format for velocity split/round robin multisamples. You can load mwavs but you cannot edit or save them.

MIDI File Formats

The following MIDI formats are supported:

- **Type 0** - All MIDI channels on the same track.
- **Type 1** - Each MIDI channel is on its own track.

MIDI files may have a **.mid** or **.midi** extension.

File Locations

You are free to read or copy audio and MIDI files from most locations in NanoStudio's file system, but you only have write access (ie. save, delete, move, rename and create subfolders) in these folders:

- **Library** - This is your own area for files you use a lot and intend to use in more than one project.
- **Project** - This is the place to put files which will only ever be specific to your current project.
- **Mixdowns** - You can edit a mixdown using the sample editor and then save the new version back to this folder, or create subfolders to organize your mixdowns.

You can't directly write to or modify audio and MIDI files in these folders:

- **Instruments** - Instruments manage their own patches and any audio files they use.
- **Other projects** - You can only modify audio and MIDI files for the project you have currently loaded.

There are also two other special folders:

- **Recent** - Files you've recently loaded or saved.
- **Trash** - Files you've recently deleted. These may be deleted when the app isn't running if your device requires more storage space.

Library Inbox

You may see an **Inbox** subfolder in your audio or MIDI libraries. This is where NanoStudio places samples which have been exported to it (eg. when you select 'Open in NanoStudio' from another app).

If NanoStudio receives a zip file from another app which contains multiple audio or MIDI files, it will place them in a new subfolder within the Inbox so they don't

get mixed up with other files.

When files are added to the Inbox, NanoStudio will notify you via the **Status Bar**. You're free to move them elsewhere using the **File Browser**.

Importing and Exporting Files

You can import or export audio and MIDI files via the **File Browser**.

There are also other methods available - see **Integration and Sharing** for more details.

NanoStudio will also import and export multiple files by placing them all in a single zip file.

Using Your Own Audio Files

To create an instrument patch using your own audio files:

- Place (or import) your audio files in the **Library** folder (create a subfolder for them if you wish).
- Tell the instrument to load them from the **Library**.
- Once you're happy with your patch, tell the instrument to save it.

Instruments always copy user files into the patch. This ensures the patch is unaffected by any changes you might make to your Library in future.

Factory and **IAP** files are not copied to patches as they never change or move. Instead, patches just save the path to where they can be found.

Using Your Own MIDI Files

To use your own MIDI files in a song:

- Place (or import) your MIDI files in the **Library** folder (create a subfolder for them if you wish).
- Use the Song Editor's **MIDI Import Function**

Integration and Sharing

NanoStudio supports a number of Apple and 3rd party technologies, mainly for sharing files but also for other purposes.

General Notes on Sharing Files

Although there are different methods for file sharing, NanoStudio always follows a few common rules:

- If multiple files are selected for export, NanoStudio will export them as a zip file.
- If NanoStudio receives a zip file it will automatically open it, extract its contents and place the files in the correct places based upon their type. Any file types it does not recognise will be ignored.
- Audio or MIDI files which do not belong to patches or projects are imported to your **Library Inbox** folder.
- You can't directly export NanoStudio projects. You should instead **archive your project** and then export the archive.

Audiobus

Audiobus is an app which allows you to route the audio and MIDI I/O between different apps running on your iOS device. NanoStudio sends its main mix audio output to Audiobus, and NanoStudio's **Sample Editor** is capable of recording audio received by its Audiobus input. The Sample Editor will automatically switch to recording the Audiobus input source if it detects an app is sending audio to NanoStudio in the active Audiobus session.

Note: iOS can sometimes be a little fickle when running multiple audio apps

routed via Audiobus. If you run into strange behaviour then it is recommended that you reboot your device prior to starting Audiobus or NanoStudio.

Ableton Link

Ableton Link is a technology that synchronizes beat, phase and tempo of Ableton Live and Link-enabled iOS apps over a wireless network. It lets you play devices together with the freedom of a live band. Anyone can start and stop their part while others keep playing, and anyone can adjust the tempo and the rest will follow. You can use Link to play with several instances of Ableton Live, with Live and iOS apps, or even without Live in your setup: using Link enabled apps on multiple devices, or multiple apps on the same device.

Ableton Link can be enabled or disabled via the Status Bar's **Song Settings Dropdown**.

Audio Units (AUv3)

NanoStudio acts as a host for 3rd party Audio Unit instruments and effects.

For information about using AU instruments, see the **Audio Unit Instrument**.

For information about using AU effects, see the **External Effect** Unit.

WebDAV

WebDAV is a system for viewing, managing and editing files and folders on a remote device over a network. In many ways it can be thought of as a modern version of FTP.

NanoStudio has a built in WebDAV server which gives you full access to all of the user files on your device from a desktop computer (or other WebDAV client) on the same network.

For more information, see the **Settings Page**.

Dropbox

You can import or export files with Dropbox via NanoStudio's **File Browser** command dropdown.

Alternatively you can export files to NanoStudio from the DropBox app by tapping **Export** and choosing **'Copy to NanoStudio 2'**.

AudioShare

You can import or export audio or MIDI files with **AudioShare** via NanoStudio's **File Browser** command dropdown.

Alternatively you can export files to NanoStudio from the AudioShare app by tapping **Export** and choosing **'Copy to NanoStudio 2'**.

iOS Files App

NanoStudio is compatible with Apple's Files app, which was introduced in iOS 11. You can use the iOS Files app to view and share your user files.

Import from iTunes Library

You can import songs from your device's iTunes Library via NanoStudio's **File Browser** command dropdown.

Sometimes it's not possible to import a song if it is protected using DRM (Digital Rights Management).

iTunes File Sharing

Your user files are available to iTunes File Sharing. To use this feature your device must be connected to a desktop computer via USB. Open iTunes on the computer, select your device and then choose the File Sharing category.

iTunes won't let you open NanoStudio's folders directly, but you can drag them out to the desktop, edit them (or back them up) and then drag the edited folder back into iTunes again.

If you want to fully browse all files and folders, we recommend using **WebDAV** instead.

AirDrop

AirDrop is an easy way to export files to another iOS device or a Mac. You can do it via NanoStudio's **File Browser** command dropdown.

AirDrop is particularly useful for quickly sending your project to another device. To do this, **archive your project** and tap on **EXPORT** once NanoStudio has prepared the archive. The other device will notify you when it has received the file, and if you confirm it will automatically open NanoStudio and import the archive.

Email

You can export files as an email attachment via NanoStudio's **File Browser** command dropdown.

Alternatively you can export files to NanoStudio from the iOS Mail app by tapping on an attachment and choosing **'Copy to NanoStudio 2'**.

Exporting From Other iOS Apps

Any app which supports the standard iOS export dialogue will offer you a **'Copy to NanoStudio 2'** option if it's a file type that NanoStudio supports.