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What is NanoStudio?

NanoStudio is a highly integrated audio app which combines sampling, synthesis, sequencing and mastering.

NanoStudio provides two types of sound generator instrument - a virtual analogue keyboard synthesiser called Eden and a performance pad for triggering samples called the TRG-16. Each instrument allows in-depth editing and has its own automated insert effects.

You can use up to 5 instruments at the same time (6 including the mixer). If you need to use more instruments then you can upgrade to 16 with the '16 Instrument Tracks' in-app purchase*.

A sequencer allows you to record, edit and play note and controller events. It incorporates many features such as advanced quantization, multi-level undo/redo and controller editing/automation.

A mixer instrument is used to combine the audio signals from the sound generators. Each mixer input/output can have up to 4 insert effects and there are 2 global 'send/return' effects. Mixer volume and pan movements can be recorded and edited in the sequencer.

You can record samples using a microphone or resample a section of your song. Resampling is a powerful technique which allows you to 'bounce down' your mix complete with effects and assign that sample to a trigger pad so you can re-use NanoStudio's instruments for something else. Alternatively, you can preprocess samples with your favourite effects chain or assign a sample to a synth for further manipulation.

Once you are happy with your composition you can render the final mix to a wav or ogg file and share it with the world on SoundCloud. If you plan to continue working on your track in a desktop environment then NanoStudio can perform a mixdown of individual tracks or parts and automatically zip them into a single file. Other sharing possibilities include MIDI file import/export and audio copy/paste with other iOS apps using both the Sonoma and general pasteboard standards.

NanoSync is a stand-alone application for the PC or Mac which allows you to transfer your own samples to your device over Wi-Fi. You can also use it to download final mixes to your computer.

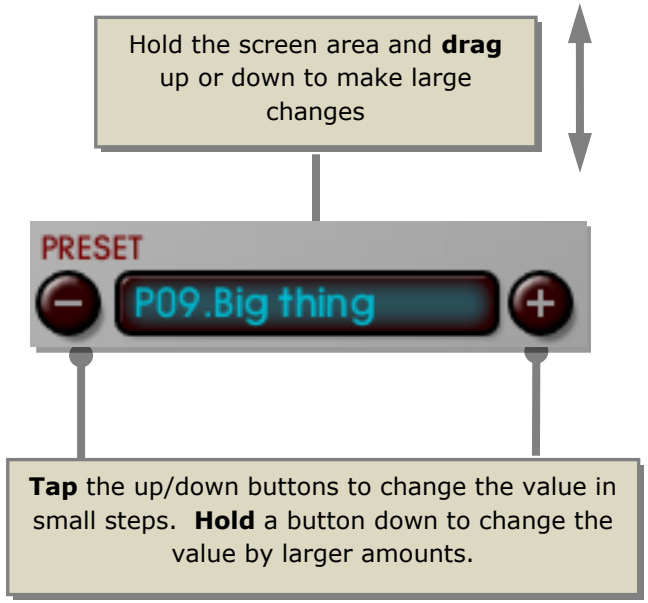
Each of these elements will be described in detail in later sections of this guide. If you are new to making electronic music, you may find it helpful to refer to the glossary of terms at the end of the manual.

* Depending on the complexity of your project and the specification of your hardware, you may not be able to use the full 16 instruments at the same time.

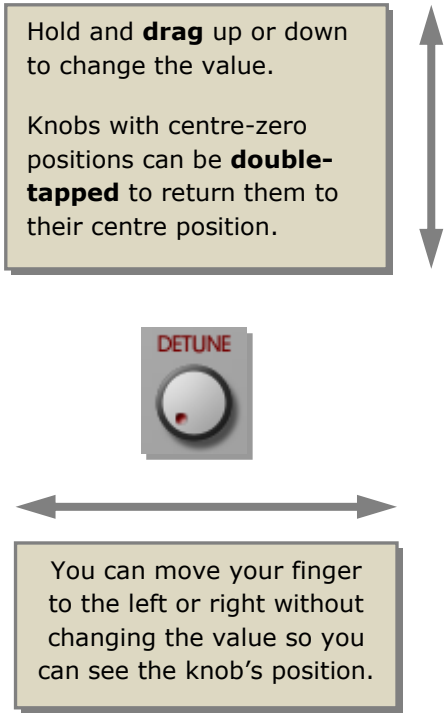
Introduction

Common controls

Up/down buttons



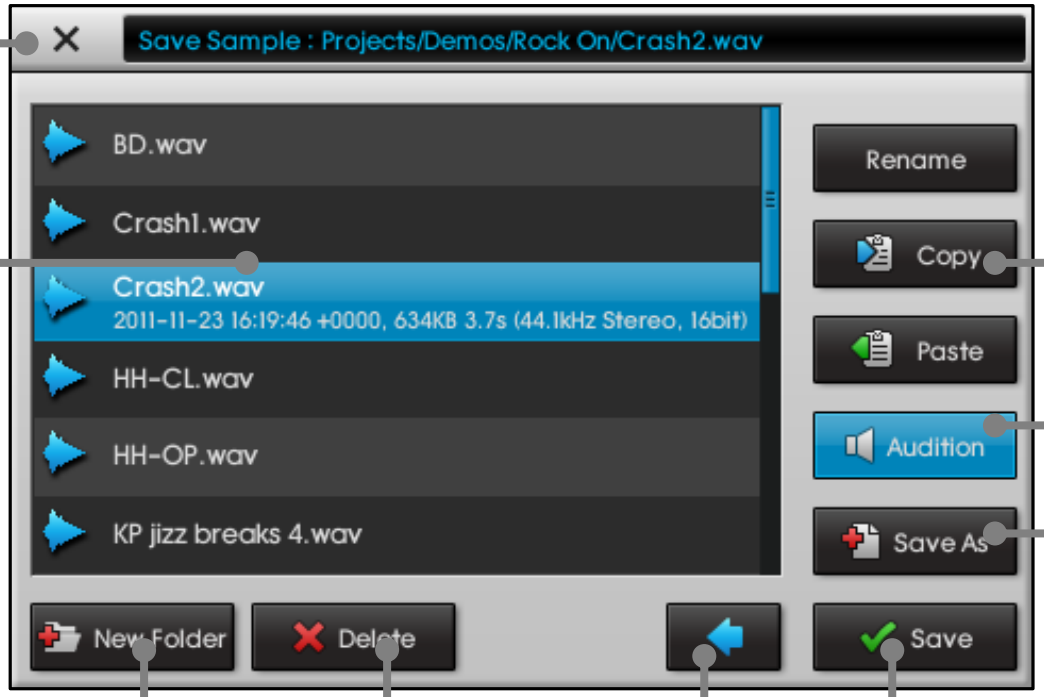
Rotary knobs



If you prefer a rotary (angular) adjustment style you can change it in the Manage/Settings page, along with the control sensitivity.

The file dialog

The file dialog is used for loading and saving files.



STATUS BAR TEXT
Shows the path and name of the selected file or folder

FILE LIST

Tap to select a file or folder.

Tap again to enter the selected folder.

Drag to move the view up or down.

You may also drag the scrollbar to move the view quickly.

To avoid mistakes, you must use the confirm button to load or save the selected file.

AUDIO COPY/PASTE*
Allows you to copy and paste samples between NanoStudio and other compatible applications.
See next section.

SAMPLE AUDITION
Allows you to listen to the selected sample before you load it.

SAVE AS
Save the file under a different name

CREATE NEW FOLDER
Note: it is not possible to create a folder in some locations.

DELETE FOLDER/FILE
Note: it is not possible to delete some read-only folders/files.

BACK BUTTON

Takes the view up a folder level.

CONFIRM

Confirm the current operation (eg. load or save).

*** -** On PC/Mac, the copy/paste buttons are replaced with an Explorer/Finder button. This opens the current folder in an Explorer or Finder window.

Audio copy/paste

Audio copy/paste allows you to transfer your samples between NanoStudio and other compatible apps.

NanoStudio supports both the Sonoma (V1.0/1.1) and the General pasteboard formats, providing compatibility with the widest possible range of apps.

The audio pasteboard 'unifies' the formats and therefore may contain up to 14 samples at any one time (1 for Intua, 1 for Sonoma V1.0 and up to 12 for Sonoma V1.1).

When you copy a file, it is simultaneously copied to both the Intua pasteboard and the Sonoma V1.1 pasteboard.

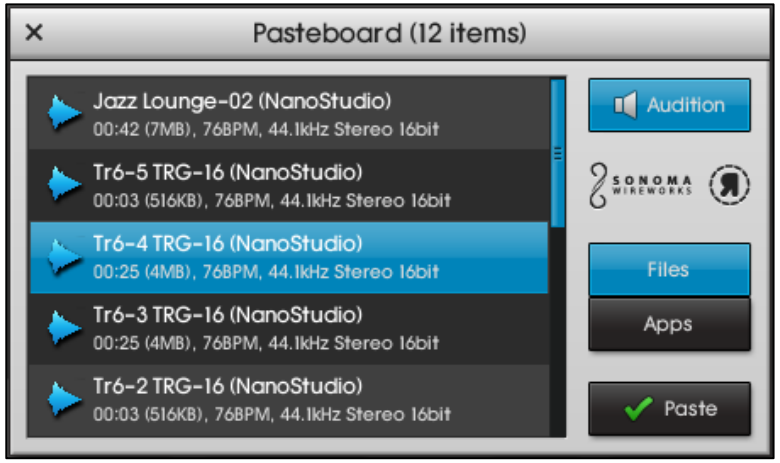
The pasteboard supports mono or stereo samples, but they must be 16 bit wavs with a sample rate of 44.1kHz.

Copying a sample to the pasteboard

From the file dialogue, select the sample file you wish to copy. Tap Copy. The file will be copied to both the Sonoma and Intua pasteboards.

Pasting sample file(s) from the pasteboard

Using the file dialogue, navigate to the folder you wish to paste your samples to. Tap Paste. The Pasteboard dialogue will appear:



The Pasteboard dialogue shows you all the audio files currently on the pasteboard. Select the sample (or multiple samples) you wish to paste and tap Paste. The samples will be copied to the file dialogue's current folder.

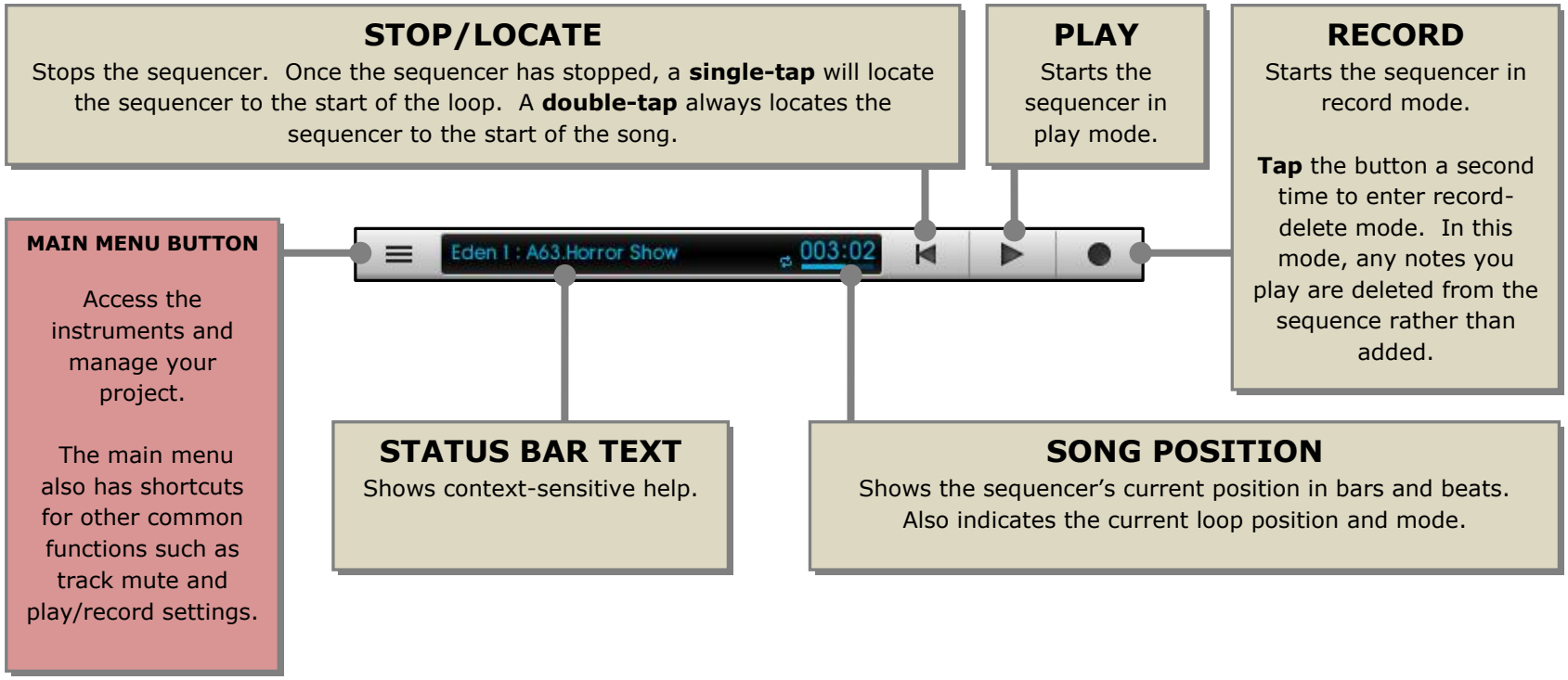
If you wish to hear samples before you paste them you can enable Audition. Audition will only play the first part of long samples.

Note: Even though you can paste samples of any length, the TRG-16 and Eden synth may not be able to load them if they are too long.

The status bar

The status bar is always located at the top of the screen. It is used to navigate pages, control sequencer operation and provide context-sensitive help information.

The status bar will look a little different to this if you are running on a tablet device, but the operation is much the same.



The main menu

Invoke the main menu by tapping the button at the top left of the screen.

TEMPO

Set the current project's tempo and time signature.

QUANTIZE

Sets the quantize interval used when recording a performance in real-time.

UNDO

Undoes the last real-time recording session.

LOOP

Enables song looping. The loop points may be set in the Song Editor by dragging on the bar ribbon.

CLICK

Enables the metronome click sound.

INSTRUMENTS

Tap to view an instrument. **Hold** to change the instrument's type, name or MIDI channel.

SONG EDITOR

Select the Song Editor to arrange and edit your song.

MANAGE YOUR PROJECT

Load, save or create new projects and configure global settings.

Online help is also available.

Creating, loading and saving projects

You can think of a project as a single song together with all the settings the song needs. Projects may also contain samples.

Tap the menu button and choose 'MANAGE'.

Select the 'Project' tab.

You can now use the 'New', 'Save', 'Save As…' or 'Load' buttons to manage your project.

The 'Export NSP' button is for exporting a self-contained version of your project

Importing and exporting projects

Why use project export?

You could just use NanoSync to copy your entire project's folder to your computer. However your project may be using global samples or presets which may not be the same on the destination device. Project Export solves this problem by performing the following tasks:

- Relocates all global presets in use by your project to the exported project's Project bank.

- Relocates all samples required by your project to the exported project's folder. All samples within the current project's folder will be exported, even if they are not currently in use.

- Exports the sequence as a MIDI file and adds it to the exported project's folder. Although NanoStudio does not directly use this, you may find it useful if you're transferring your project to a desktop DAW.

- Zips up the exported project's folder and gives the final file a .nsp extension.

Note: The export procedure will not make any changes to the current project. The steps described above only apply to the exported version.

What do I do with my exported project?

Once the export is complete, you will end up with a single self contained .nsp file. You can transfer it to your computer using NanoSync (see later section). From there you may:

- Upload it to different device using NanoSync.

- Open it using the OSX/Windows version of NanoStudio.

- Send it as an email attachment.

- Rename the file so it has a .zip extension and then open it using a standard zip file application.

Importing a project

You can import projects using the usual project load procedure. Projects available for import are shown with an orange icon and have a .nsp extension. NanoStudio will automatically unzip the project when it imports it.

Note: If a project folder with the same name already exists, NanoStudio will rename the imported project to avoid conflicts.

Emailing files (iOS only)

You can send any file from NanoStudio as an email attachment.

Tap the menu button and choose ‘MANAGE’.

Select the ‘Project’ tab.

Tap the 'Email File' button. If the button is not available, check that email is set up correctly on your device. If your device is set up for email but current not connected to a network, you may be able to still compose the mail and save it as a draft to send in future.

Use the file dialogue to choose the file you wish to attach to the mail. Note that it only possible to attach a single file - if you want to send an entire project, firstly export the project as an NSP and then attach the NSP file to an email. Since NSP files are compressed, this will also make the email smaller to send.

Once you have chosen your file, you can use the email composer to choose a recipient, and modify the subject or message body if you wish.

NanoStudio file associations

NanoStudio associates itself with .wav, .mid and .nsp files.

iOS

You can select one of these file types in another application (eg. Mail or Mobile Safari) and choose 'open with NanoStudio'.

Windows and OS X

You can double-click on one of these file types to open them in NanoStudio.

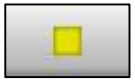
How NanoStudio handles files

When NanoStudio handles an incoming file, it does not load it immediately. Instead, it gives you the option to copy the file to a location within its sandbox folder.

If you wish to then load the file, you can do so as a second step when you are ready (eg. after saving the project you're currently working on).

Playing and stopping the song

Tap the play button on the status bar. The song will start playing.



Tap the stop button to stop the sequencer.

Resetting the song position

Single-tap the locate button to set the song position to the loop start.

Double-tap to go to the beginning of the entire song.

The actual loop points are set in the Song Editor by dragging on the bar ribbon. The Song Editor will be covered in detail in a later section.

Real-time recording

Tap the record button to begin real-time recording. The sequencer will begin recording any notes or controller changes you play on the instruments.

Quickly correcting mistakes

If you make a mistake during a recording session there are a couple of ways you can quickly correct it.

Undoing the last recording session

Invoke the main menu and tap 'UNDO'. The last recording session will be undone.

A new recording session is started whenever you enter record mode. If you have recorded something you're happy with it's a good idea to briefly stop the sequencer (or briefly hop in and out of play mode) to begin a new session. You can then always undo the session to the last point you were happy with.

NOTE: If you edit the song using the Song Editor, you will lose the ability to undo the last real-time recording session.

Removing notes and controller events

Whilst recording, you can tap the record button to toggle record delete mode on or off.

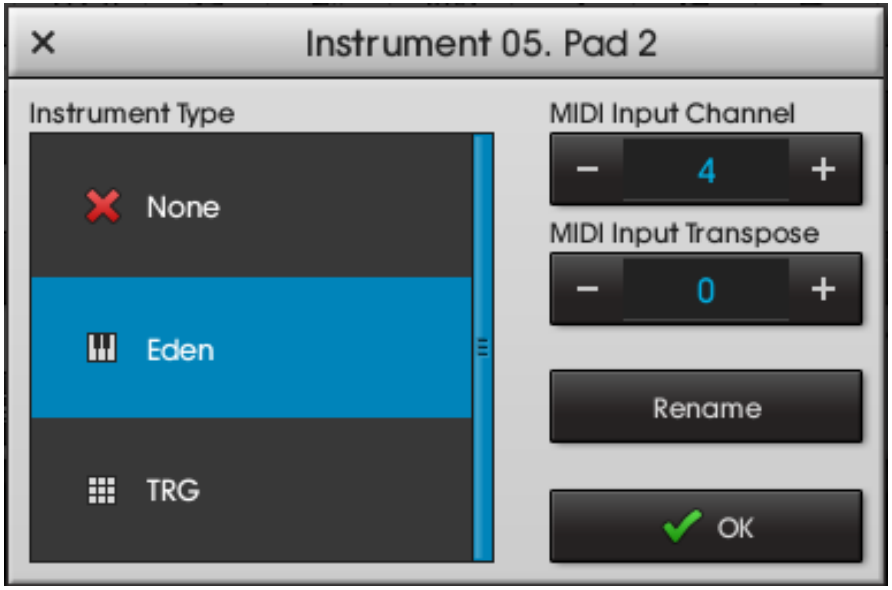
In record delete mode, any notes you play are deleted from the sequence rather than added. Additionally, touching a controller such as the pitch wheel or XY pads will remove the events for that controller.

Editing notes and controller events

If you need to do something more complex than undoing the last session or deleting notes then you need to use the Song and Pattern Editors, which are detailed later in this manual.

Adding, removing and renaming instruments

Invoke the main menu and then **hold** the button for the instrument you wish to change. The instrument dialogue will appear:



Select the type of instrument that you'd like to use and then tap OK. You can also rename the instrument, apply a note transpose for MIDI input or change the MIDI channel that the instrument responds to.

If you add, remove or change an instrument but then change your mind, you can undo the change in the Song Editor.

TRG-16 Performance Pad

Overview

The TRG-16 is an instrument with 16 pads. You can assign a sample to each pad which will be triggered when the pad is tapped or held.

The TRG-16 has 3 output busses. All busses have their own effects sends, and busses 2 and 3 also have a filter section. For each pad you may choose which bus it should use for its output. This allows you to apply, say, a reverb to some samples but leave others unaffected.

The colour of a pad indicates the output bus it is using:

Colour	Output bus
Blue	1
Green	2
Red	3

Using the TRG-16 with the sequencer

The sequencer will also record the changes to some controls in addition to your performance on the pads. The controls which are recorded are as follows:

Control	Recorded By Sequencer
Send 1	**YES**
Send 2	**YES**
Filter Cutoff	**YES**
Filter Enable	NO
Filter Type	NO
Filter Q	NO

You can easily recognise which controls are being recorded because they have a flashing icon next to them in record mode.

Importing and exporting banks

A *bank* consists of a set of 16 samples together with the settings required to play each sample. Exporting a bank means you can save your favourite setups for use in new projects. When you begin a new project, you can import an existing bank and avoid the process of setting up each pad individually. NanoStudio has some default banks to get you started.

To import a bank, tap the home button and then tap the import button.

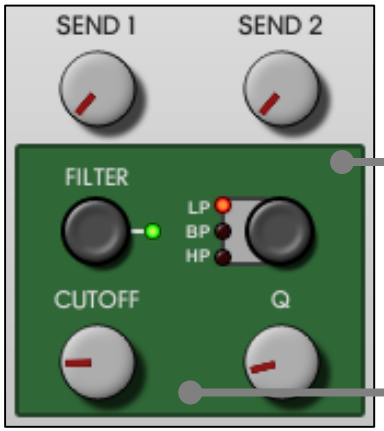
Once you have chosen a bank, NanoStudio will give you the option to copy the bank's samples to the current project.

Copying the samples allows you to edit them without worrying about affecting the original bank or any other projects using the bank. If in doubt, you should use this option.

If you choose to use the original samples, then any changes you make to them will also affect other projects using them.

Setting up an output bus

Firstly, select the output bus you wish to modify. On tablet devices, you can see all three output busses on the same page.



Set how much of this output is sent to the mixer's send/return effects busses. By default, Send 1 is a reverb and Send 2 is a chorus/delay.

Filter settings for the bus.

If you are unsure about what filters do, the synth chapter gives a good explanation.

Using the pads

Tap a pad to play the sample assigned to it. Depending upon how the pad has been set up (see Editing a Pad) you may need to hold the pad down to continue playing the sample.

NOTE: If a sample could not be found (eg. it has been deleted) the sample's name will be shown in red.

Muting a pad

Tap the mute button to toggle mute mode on or off.

In mute mode, **Tap** a pad to toggle its mute or **drag** to mute multiple pads. You can use more than one finger if you wish.

Muted pads are shown with a bold mute logo.

Tap the mute button again to disable mute mode.

Pad velocity and Autobeat

Pad velocity refers to how hard a pad is struck, and determines the volume at which the sample will be played. Because the iPhone's screen is not velocity sensitive, the velocity is instead set using a rotary knob.

Autobeat simulates tapping a pad at regular intervals and is a quick way to play or record repetitive patterns.

Tap the performance page button.

Use the buttons to enable Autobeat.
The indicator will flash in time with the chosen interval.
Autobeat is only active when the performance page is visible.

Use the rotary knob to set the current velocity level.
The knob is only active when the performance page is visible. If you select another page, the knob will be reset back to 80%.

Editing a pad

Tap the edit button and then choose the pad you wish to edit.

Set the pad currently being edited. You can use this as a shortcut to jump to other pads without leaving the edit page.

Clear, **copy** or **paste** all the settings from one pad to another.

Load a different sample or **edit** the sample's waveform. See the Sample Editor chapter (later in the manual) for details.

Set the **output bus** used by the pad.

Record a new sample

KEY MODE

Trigger – The sample always plays to the end. Used mainly for single drum samples.

Hold – The sample plays to the end, unless the pad is released.

Loop – The sample continuously loops until the pad is released.

Volume section. See the synth chapter for an explanation of volume envelopes.

Auto BPM will take a guess at the number of beats in your sample and adjust its pitch to match the current song tempo.

This is mainly useful for rhythmic samples such as drum loops, where the exact pitch is less important.

You can assign the pad to a voice **group**. Within a voice group, only one pad at a time is allowed to play. This is particularly useful for open/close hi-hats.

Pitch transpose and fine tune

Copying settings from one pad to another

You can use the pad copy/paste buttons on the edit page to copy settings from one pad to another. Firstly, edit the pad you wish to copy and tap the Copy button. Now edit the pad you wish to paste to and tap the Paste button.

When you tap Paste, NanoStudio will ask you if you wish to make a new copy of the pad's sample, or just refer to the original sample. If you plan on editing the sample's waveform and you don't want to affect the original then you should take a copy. The copy will be placed in the current project's folder.

Editing a sample's waveform

From the pad edit page, tap the Edit button to invoke the sample editor. The sample editor allows you to perform some operations on the sample such as chopping and volume editing and applying effects. See the section 'Sampling and the Sample Editor' for more details.

Recording a new sample

From the pad edit page, tap the Record button. Depending on which tab you select you can now record a new sample using the mic or resample the main mix. See the section 'Sampling and the Sample Editor' for more details.

Copying a sample prior to editing

If you wish to copy a sample before you start editing it, a quick way is to tap Copy, Paste and then answer OK when NanoStudio asks you if you wish to make a copy.

If you start editing a sample and then realise you forgot to copy it first, you can also use the 'Save As' button in the file dialogue when you exit the sample editor.

Eden Synth

Overview

Eden is a keyboard instrument which emulates a classic analogue subtractive synth.

An Eden sound setup is called a Preset. There are 512 presets, arranged into 8 banks of 64.

The Global banks (A-G) contain presets which are shared between all projects. Banks A and B contain a wide range of example presets to get you started, but you are free to overwrite them with your own. Banks C-G are initially empty.

The Project bank contains presets which are specific to the current project. This is a good place to save presets when you don't want them to be affected by other projects.

Compare button

If you have changed a preset, use the compare button to toggle between the edited and the original versions.

Keyboard octave up/down buttons

Swipe to go to the top or bottom octave.

Keyboard scroll enable

When key scroll is enabled, dragging left or right on the keyboard will scroll the keyboard's position.

The key's note. The transposed key (see MANAGE/Settings page) is also shown in red.

WRITE Button

Use the write button to save any changes you have made to the current preset. When you write a preset, you have the option to rename it.

Page up/down

Tap to move a page at a time.
Hold to rapidly change.
Swipe to go to the top or bottom.

Keyboard scale button

Use the keyboard scale button to choose alternate musical scales.

Performance Modulation Page

The Performance Modulation page is used to control modulation parameters in real-time. Movements can be recorded and played back using the sequencer.

Use the Patchbay (see later section) to set which preset parameters are controlled.

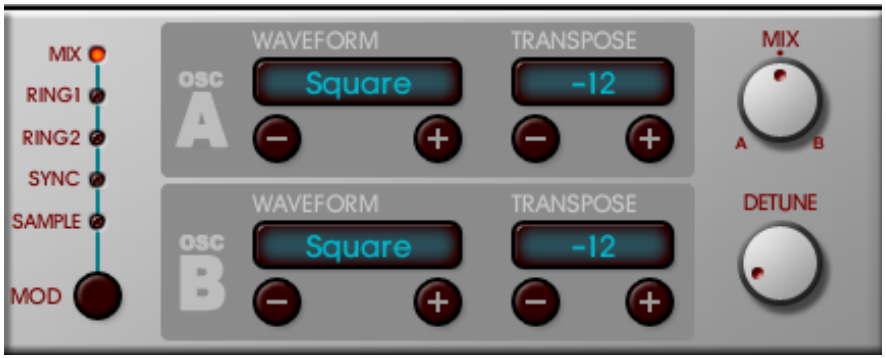
To use the pitch bend wheel, touch the bar and drag up or down. You can set the pitch wheel's range in the project Manage page, under the Settings tab.

The XY pads are controlled by touching within the square and then dragging up/down or left/right. You can also tap within the square.

Use the ACCEL button to control an XY pad using the accelerometer (tilt) instead of a touch. Eden will only respond to tilt movements when this page is visible.

When you write the current preset to a bank, the current controller positions are written.

Oscillator Page



Oscillators generate sound. An oscillator's waveform determines how it sounds. For example, a sine wav sounds pure and smooth and a sawtooth wave is bright and buzzy. The oscillator is where everything begins – its output is fed other synth components such as filters and envelope generators for further processing.

Each synth voice has two oscillators, A and B. Each oscillator may have its own waveform and transpose (pitch offset).

The Mod control determines how the output of the two oscillators is combined.

- Mix – the outputs of the two oscillators are simply mixed (added) together
- Ring 1 – the outputs of the two oscillators are multiplied together. This can produce harsh, metallic sounds when the oscillators are transposed. Note that some transpose settings can cause the two oscillators to cancel out and produce silence.
- Ring 2 – as ring 1 but the pitch of oscillator B is not changed by the keyboard. Good for discordant non-musical sounds.
- Sync – oscillator B resets oscillator A at the start of its cycle. Oscillator B's waveform is not used, only its transpose - this determines the pitch of the note. Transposing oscillator A will change the tonal quality of the sound. In Sync mode, the A-B Mix will also perform this function – this allows you to modulate it via the Patchbay if you wish.
- Sample – the two oscillators are disabled and a sample can be used as the sound generator.

Oscillator B can be disabled in most modes by setting its waveform to 'OFF'. When oscillator B is disabled, A-B Mix and Detune are not available.

The A-B Mix knob sets the volume balance between the two oscillators. In Sync mode, it doubles as a tonal control by modulating Oscillator A's frequency.

The Detune knob is used to pitch the oscillators apart by a small amount (up to one semitone). Low settings create a fatter chorused sound. Higher settings will make the voice sound out of tune.

Sample Page

Eden can use a sample instead of an oscillator to generate the sound. To use a sample, set the MOD type to SAMPLE on the oscillator page.

Use the LOAD button to choose an existing sample.

Use the RECORD button to create a new sample by recording from a microphone or resampling the mix.

Use the EDIT button to modify the current sample.

Samples often come in a wide range of amplitudes, so use the LEVEL control to adjust the sample's volume level. Ideally, aim to set the sample to a volume level similar to the standard oscillators so that volume levels stay consistent when you are browsing presets.

The sample playback rate is normalized such that middle-C on the keyboard will play the sample at its normal speed. To modify this, use the TRANSPOSE and PITCH controls for coarse and fine tuning respectively.

The LOOP and DIRECTION controls should hopefully be fairly explanatory. If you're having trouble getting a seamless loop with a sustained sample (eg. strings), try setting the DIRECTION control to FWD+REV or REV+FWD.

Note Slicing

When NOTE SLICE is set to OFF, each key will trigger the sample at the appropriate pitch. This is the default behaviour you'd normally want for melodic samples (eg. a piano).

When NOTE SLICE is set from 1-64 the sample is always triggered at the same pitch, and the key instead determines which 'slice' is played by affecting the sample's start position. This is useful for chopping and re-arranging beat loops, but can also be used for interesting effects on other samples such as vocals.

When NOTE SLICE is enabled, the C1 key ('C', one octave up from the bottom) always triggers slice 1. Slice 2 is triggered by C#1, slice 3 by D1, etc.

Tip : NanoStudio comes supplied with some standard MIDI files for triggering sliced loops at various intervals. You can import one of these MIDI files into the song editor and then use it as the basis for re-arranging the loop by transposing notes within the pattern editor.

Filter Page

Filters are synth components which alter the oscillators' sound by removing certain frequencies. Because a filter tends to only remove frequencies and not add new ones (known as *subtractive synthesis*) the effects of a filter are most noticeable when it is used to process a waveform already rich in frequency content. As a general rule, waveforms which have lots of 'sharp edges' (such as squares and saws) have a rich frequency content and respond well to filtering.

There are 4 filter types:

- OFF – Filter is disabled
- LP (Low Pass) – the filter lets low (bass) frequencies through and suppresses high (treble) frequencies. Use this to create smoother tones.
- BP (Band Pass) – the filter suppresses low (bass) and high (treble) frequencies but lets a band of mid frequencies through. Use this to create thinner tones.
- HP (High Pass) – the filter lets high (treble) frequencies through and suppresses low (bass) frequencies. Use this to create lighter, buzzy tones.

The Slope knob sets how steeply the filter cuts unwanted frequencies. Use the 12dB setting if you can to reduce CPU load.

The Cutoff knob determines point in the frequency range where the filter begins to cut unwanted frequencies.

The Q knob determines the resonance of the filter. At extreme values it produces a ringing tone at the Cutoff frequency. Be careful to avoid distortion with very high settings.

Key tracking is enabled by touching the 'Track Keys' button. When enabled, the filter's cutoff frequency is shifted according to the pitch of the current note. This is useful for smooth pad sounds when you wish each note to have the same tonal quality.

When you play a note, a fixed cutoff frequency can sound quite boring. The filter envelope is used to add an extra amount to the filter's cutoff frequency over the duration of the played note. Its controls are as follows:

- Attack Rate – How quickly the envelope reaches maximum after the note is started
- Decay Rate – How quickly the envelope drops to the Sustain Level after the initial peak
- Sustain Level – The level at which the envelope remains until the note is released.
- Release Rate- How quickly the envelope fades to minimum when a note is released
- Amount – How much of the envelope is added to the filter's cutoff frequency
- Invert – Flips the output of the envelope so that it begins and ends at the maximum cutoff rather than the minimum

Amp Page

Most musical instruments produce sounds whose volume level varies over time. For example, a crash cymbal begins initially with a very high volume which then reduces slowly over time. A violin (when bowed softly) may increase in volume, hold at a certain level and then fade away again.

The Amp Envelope the synth component which is responsible for varying the volume of a note over the duration of the played note.

The controls are as follows:

- Attack Rate – How quickly the envelope reaches maximum after the note is started
- Decay Rate – How quickly the envelope drops to the Sustain Level after the initial peak
- Sustain Level – The level at which the envelope remains until the note is released.
- Release Rate - How quickly the envelope fades to minimum when a note is released
- Amount – The overall volume of the envelope
- Invert – Flips the output of the envelope so that it begins and ends at the maximum volume rather than the minimum

The polyphony control determines the maximum number of notes the synth can play at once. If your sound does not require many voices, use the lowest possible value to reduce CPU load.

Set the polyphony to '1 – Mono' to restrict the synth to playing only one note at a time. This allows you to do fast synth solos by holding one note down on the keyboard as you tap other notes.

Set the polyphony to '1 – Glide' to enable glide (also known as portamento). Glide also restricts the synth to playing only one note at a time but unlike Mono the synth will smoothly slide the pitch between glissando (overlapping) notes. The Glide Time knob determines how long the note takes to glide.

The Send 1 control determines how much of the synth's output is sent to the mixer's Send 1 bus (by default, set up as a reverb).

The Send 2 control determines how much of the synth's output is sent to the mixer's Send 2 bus (by default, a chorus/delay effect).

LFO/Aux Envelope Page

LFO stands for Low Frequency Oscillator. An LFO produces a waveform just like the voice oscillators, but the difference is that the LFO is used as a sound modifier rather than a sound generator. The other difference is that LFO's frequency (the rate at which it varies) is much lower – in the range of 0-20Hz rather than the audible range of 20Hz-20kHz used by the voice oscillators. A common use for an LFO would be to generate vibrato, where the pitch of a note is made to vary up and down continuously over time.

A synth voice has 4 LFOs. Use the Patchbay page (see later section) to set which preset parameter is controlled by each LFO. In the vibrato example used above, you could use the Patchbay to set up LFO 1 so that it controls the voice's pitch.

Choose the LFO you wish to edit by using the button with the quarter circle legend. The numbered LED indicates which LFO is currently being edited.

Set the LFO's waveform using the -/+ buttons:

- Sine - A smoothly varying waveform.
- Square – The waveform jumps between minimum and maximum.
- Saw Up – The waveform ramps smoothly up to the maximum and then sharply drops to the minimum.
- Saw Down – The waveform ramps smoothly down to the minimum and then sharply rises to the maximum.
- Triangle – The waveform ramps between minimum and maximum.
- Rand Step – The waveform steps between random values.
- Rand Ramp – The waveform ramps smoothly between random values.

The Delay knob determines how quickly the LFO amount is increased as the note is held.

The Amount knob determines how much of the LFO's output is applied to the controlled parameter (as determined by the Patchbay).

The Rate parameter controls the repeat rate (ie. frequency) of the LFO.

Tap the Sync button to cycle between three modes:

- Off – The LFO runs continuously.
- Key – The LFO is reset to the beginning of its waveform cycle when the voice is started.
- Beat – The speed and phase (ie. position) of the waveform is synchronised to the sequencer's current tempo. Use the rate control to set the time division.

The Aux Envelope is a general-purpose envelope which may be configured to control any preset parameter via the Patchbay Page. For a description of envelope parameters, refer to the Amp Page section.

Patchbay Page

The Patchbay page is used to connect a modulation source (such as the output of an envelope, LFO or XY Pad) to a parameter. Its name derives from the good old days of analogue synths when patch cables connected the various components of the synth together in order to create a particular sound.

Each row of the list shows a modulation source, the parameter it is connected to and the amount of modulation (change) that will be applied to that parameter.

Scroll through the list by dragging up or down. Tap on the modulation source you wish to connect. The selected row is highlighted with a red bar.

Set the destination using the first column's -/+ buttons. This is the component of the synth that the modulation source will be sent to.

Set the parameter using the second column's -/+ buttons. The available parameters are determined by the destination you chose.

Set the amount of modulation that will be applied using the third column's -/+ buttons. Positive values add the source's value to the destination and negative values will subtract.

Effects Page

The synth has two fixed *insert effects*, a Waveshaper and a Chorus/Delay. These effects are referred to as insert effects because they are inserted into the signal chain between the synth and the mixer. The master output of the synth is fed through Waveshaper and then through the Chorus/Delay before eventually arriving at the mixer.

Unlike the mixer's *send effects*, insert effects are not shared between instruments - each of the Eden synths in NanoStudio has its own dedicated pair of insert effects.

By using the patchbay, effect parameters can be modulated using the synth's XY pads or control knob.

For a full description of each effect, see the 'Mixer and Effects' section.

If you don't require an effect, disable it by tapping the effect's power button. This will reduce CPU load.

Sampling and the Sample Editor

Overview

Sampling and sample editing may be accessed from the TRG-16 Performance Pad or the Eden synths.

Sampling is the process of capturing audio using the microphone or external audio input. NanoStudio will use stereo sampling if a stereo input device is available.

Resampling is the process of capturing a section of the song from NanoStudio's main mix stereo output. It's useful for 'bouncing down' parts to free up additional instruments, or to further process a loop using the synth.

The Sample Editor is used to edit samples. It is possible to edit both mono and stereo samples, but stereo samples are represented as mono in order to simplify the editing view. The Sample Editor is best suited to quickly tidying up samples recorded from the microphone. Currently it does not support cut, copy or paste operations. There are 4 levels of undo/redo history available.

The effects section is used to apply a chain of effects to the sample.

Samples can also be transferred to or from the device over WiFi using the NanoSync application for PC or Mac. This is detailed later in the manual.

Sampling

From the TRG-16 Performance Pad:

Tap EDIT and choose the pad you wish to sample to. Tap the RECORD button and select the Sample tab.

From the Eden Synth:

From the Oscillator Page use the MOD button to select SAMPLE mode.

Tap the REC button and select the Sample tab.

You can now set up the sampling options:

If you enable Loop record then NanoStudio will continuously sample until you press stop. This is a good way to capture a sound when you're not sure exactly when that sound is going to occur.

Note: You cannot set the sample length if Monitor is set to Song. Instead, the sample length is determined by the current song loop points.

Monitoring during sampling

You can use the Monitor option if you wish to listen to your song or a click track while you're sampling. If no headphones are plugged in then monitored audio will be heard through the receiver (iPhone only) but will not be heard through the speaker to avoid 'bleed through' to the mic. Headphones are recommended when monitoring is enabled to reduce the chances of the mic picking up the monitored audio.

Off - No audio will be output whilst sampling.

Click - The metronome will be heard. The BPM is the same as the current song's BPM.

Song - The main mix will be heard. The region is determined by the current song loop points. There is a 2 bar count in so that you can get ready before the sample starts recording.

Resampling

From the TRG-16 Performance Pad:

Tap EDIT and choose the pad you wish to sample to. Tap the RECORD button and select the Sample tab.

From the Eden Synth:

From the Oscillator Page use the MOD button to select SAMPLE mode. Tap the record button select the Resample tab.

You can now set up the resample properties:

Start from bar – The bar of the song to begin sampling

Number of bars – The number of bars to sample

Pre-roll bars – The number of bars to play before sampling begins. This is a good way to capture the tail end of sustained notes and effects to make a perfect loop.

Tap REC when you are ready to begin.

Editing samples

From the TRG-16 Performance Pad:

Tap EDIT and choose a pad. Tap the SAMPLE EDIT button.

From the Eden Synth:

From the Oscillator Page use the MOD button to select SAMPLE mode. Tap the EDIT button.

Note: The EDIT button will not be available if the synth does not have a sample loaded.

Sample editor buttons

Button	Description
History	Shows the last four editing operations. Use it to step backwards or forwards through your most recent edits.
Zoom	All – zooms out to show the entire sample. Selection – zooms to fit the current selection.
Select	To start – extends the current selection to the beginning of sample. To end – extends the current selection to the end of the sample. None – Clears the current selection.
Del	Deletes the current selection.
Trim	Removes all samples before and after the current selection, so that just the selected samples remain.
Volume	These operations alter the volume of the current selection. If no selection is made, they apply to the whole sample: Fade Out – Fades from maximum volume to zero volume. Fade In – Fades from zero volume to maximum volume. Normalize – Readjusts the volume of the entire sample so that it fits the full range. Silence – Sets the volume to zero.

EXIT BUTTON
This is exactly the same as using the DONE button.

HORIZONTAL SCROLLBAR
Drag the scrollbar to quickly move to a part of the waveform.

SAMPLE PLAYER CONTROLS
Use these controls to start or stop the sample player. You may also toggle loop play mode. **Double-tap** the stop button to locate to the beginning of the sample.

MOVE MODE
When move mode is enabled you can use one finger to move and two fingers to pinch zoom. To make a selection, zoom/move mode must be disabled.

TIME UNITS BUTTON
Choose to view the time units in seconds, frames or beats (according to the sequencer's current tempo)

EDITING WINDOW

SELECTION (move mode off)
Use one finger to make a selection.

ZOOMING
Use two fingers to pinch zoom.

MOVING (move mode off)
Use two fingers to start a pinch zoom, and then release one finger. You may now drag to move.

MOVING (move mode on)
Use one finger to move.

VERTICAL ZOOM
Increase the vertical zoom to see low volume sections more clearly.

DONE BUTTON
Use this button when you have finished editing your sample. If you don't wish to keep your changes you can decline to save.

SELECTION DRAG HANDLES
These are only visible when a selection is made. Drag left or right to make fine adjustments to the start or end of the current selection. Zoom in beforehand if you require finer control.

Sequencer

Overview

The sequencer is responsible for recording and playing back your performance. It does not record audio, but instead records the sequence of notes that you play and any controller movements you make. It then plays back that sequence to repeat your original performance.

An *event* is the general term given to a note or controller movement:

Note event – A note event consists of the note that was played (eg. C#), the duration the note was played for, and a velocity (how hard the note was struck) which determines the volume of the note. The touch interface is not velocity sensitive, but note velocities may still be modified in the editor.

Controller event – A controller event consists of the controller which was moved (eg. the pitch bend wheel) and the position the controller was moved to.

A sequence of events is contained within a *part*. When recording, parts are automatically created by the sequencer and then the events generated by the performance are stored inside it.

Parts (and the events contained within them) are edited using the Part Editor.

The Song Editor is used to arrange the parts onto *tracks*. A track feeds the sequence of events to the instrument assigned to that track.

When you use the main menu to create an instrument, the sequencer will automatically create one track assigned to that instrument.

You can use the Song Editor to add further tracks, up to a maximum of 4 tracks per instrument. You can also use the Song Editor to delete these tracks, but to delete the last track you must delete the instrument using the main menu.

Adding and deleting instruments (and their associated tracks) is integrated into the Song Editor's undo system, so if you accidentally delete or change an instrument you still have the chance to restore it to its previous state.

The song editor

MOVE MODE
When zoom/move mode is enabled you can use one finger to move and two fingers to pinch zoom. To make a selection, zoom/move mode must be disabled.

HORIZONTAL SCROLLBAR
Drag the scrollbar to quickly move to a part of the song.

FOLLOW BUTTON
When follow is enabled, the view automatically scrolls to follow the current song position

EXPAND TRACK INFO

See next section.

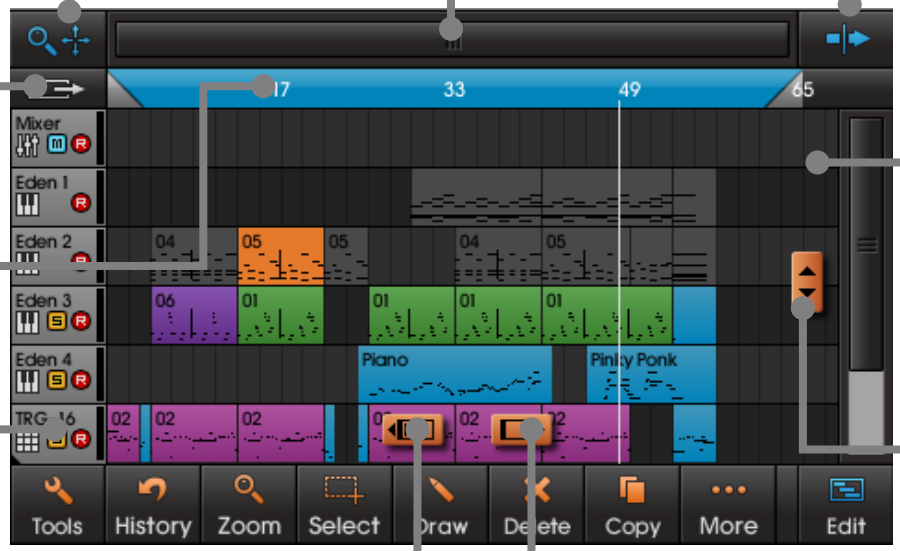
BAR RIBBON
Drag on the grey triangular markers to set the song loop's begin or end points. Tap to set the song position.

TRACK INFO

Drag up and down to scroll the view.

Double tap to jump to the instrument's page.

M - Track is muted
S - Track is solo'd
R - Track is armed for recording



EDITING WINDOW

SELECTION (move mode off)
Use one finger to make a selection.

ZOOMING
Use two fingers to pinch zoom.

MOVING (move mode off)
Use two fingers to start a pinch zoom, and then release one finger. You may now drag to move.

MOVING (move mode on)
Use one finger to move.

MOVE DRAG HANDLE
Visible when a selection is made. Drag left or right to move the current selection.

LENGTH DRAG HANDLE
Visible when a selection is made. Drag left or right to change the length of the current selection.

TRACK DRAG HANDLE
Visible when a selection is made. Drag up and down to move the current selection to a different track.

Track info

EXPAND TRACK INFO

Tap this button to expand the track info.

MUTE TRACK

Mute this track so it will not play. Note : Muted tracks will still record events in record mode.

SOLO TRACK

Solo this track. When one or more tracks are solo'd, only the solo'd tracks will play and all others will be muted.

ADD TRACK

Tap to add another sequencer track for the instrument. You can add up to 4 tracks per instrument.

REMOVE TRACK

Tap to remove a track. You cannot remove the last track for an instrument in this way. Instead, you should use the main menu to remove the instrument itself.

ARM TRACK FOR RECORDING

Sets the track to record any events coming from the instrument (or via MIDI). Only one track per instrument can be armed at any one time.

Song editor buttons

Button	Description
Tools	Set up song tempo, time signature and metronome. Erase song and clear unused patterns.
History	Shows the last four editing operations. Use it to step backwards or forwards through your most recent edits.
Zoom	**Min** – zooms to the minimum level so that the entire song can be seen. **All** – zooms to all parts within the song. **Selection** – zooms to fit the current selection
Select	**Add to** – toggles 'add to selection' mode. **To start** – extends the current selection to the beginning. **To end** – extends the current selection to the end. **Track** – selects all parts on the same track as the current selection. **Inverse** – inverts the current selection. **All** – selects all parts in the song.
Draw	Enables draw mode. Use draw mode to create new empty parts by tapping or dragging in the editing window.
Del	Deletes the current selection
Copy	Copies the current selection
More..	**Split** – splits the selected parts at the current song position **Join** – joins the selected parts together. Only two parts may be selected for joining. **Properties** – shows the part properties dialogue. From here you can convert a part to a pattern, and also set which synth preset the part will use. **Loop to Sel** - Sets song loop points to the current selection.
Edit	Edits the selected part using the part editor. Only one part should be selected. You can also edit parts by double tapping on them.

Selecting parts

Tap once on a part to select it. **Drag** to select more than one part.

Selected parts are shown in orange.

To deselect all parts, tap on the background.

The Select button (see Command Buttons) has a number of useful operations to make the task of selecting parts easier. As you grow familiar with the song editor you will find that you will use it extensively.

For more complex selection, use 'add to selection' mode (see the Select Command Button). In this mode, tapping on parts will toggle their selection state rather than starting a new selection each time.

The text on the status bar at the top of the screen helps when editing. It will tell you the number of selected parts, the start/end points and the length of the selection in bars.

Editing parts

Double-tap on a part to invoke the Part Editor.

Alternatively, select the part you wish to edit and tap the 'Edit' button.

Zooming

You will often find that zooming use the 'Zoom' button (eg. 'Zoom All' and 'Zoom to Selection') is a quicker way of working on tasks than using pinch zoom.

Setting the tempo and metronome

- Tap the 'Tools' button
- Use the 'Tempo' tab to set the tempo and time signature
- Use the 'Preferences' tab to set the metronome and count-in

Setting the song loop begin/end points

Drag the grey triangular markers on the bar ribbon. The bar ribbon is the horizontal strip at the top of the editing window containing the bar numbers.

The blue area represents the loop region.

Erasing the song

To fully erase the song including all patterns and set the tempo/metronome settings to defaults:

- Tap the 'Tools' button
- Tap the 'Clear' tab
- Choose 'Song' and tap 'Clear'

Moving parts

- Select the parts you wish to move
- Drag the 'Move' drag handle left or right to move the parts to a different position in the song
- Drag the 'Track' drag handle up or down to move the parts to a different track.

Changing the length of parts

- Select the parts you wish to resize
- Drag the 'Length' drag handle left or right to change the length

Copying parts

- Select the parts you wish to copy
- Tap 'Copy'

The editor places the copies after the current selection. If the copies are overlapping existing parts, use the move drag handle to move them elsewhere.

Deleting all the parts on a track

- Select one of the parts on the intended track
- Tap the 'Select' button and choose 'Track'
- Tap 'Delete'

Splitting parts

- Select the parts you wish to split
- Tap on the loop bar to move the song position to the intended split position
- Tap 'More..' and choose 'Split'

Joining parts

- Select the two parts you wish to join together
- Tap 'More..' and choose 'Join'

Parts and patterns (advanced)

When you record a performance or use the 'Draw' function, the sequencer will create a *part*. Parts are unique – when a part is copied, all events inside that part are also copied. Any changes you then make to the original part won't affect the copies, because they have their own set of events.

Sometimes you'd like to edit a part (such as a repeating bass line or drum loop) and have that change automatically reflected in all the copies. You can do this by turning a part into a *pattern*.

To turn a part into a pattern (or a pattern back into a part):

- Select the part
- Tap 'More..' and choose 'Properties'
- Select the 'Pattern' tab and choose 'Convert to Pattern'

A pattern is shown in the editing window with a number in its top left hand corner. This is the number of the pattern it uses.

When you copy a pattern, the copy will use the same pattern number as the original. Editing the copy or the original will have the same effect, since they both share the same set of events.

Patterns will automatically repeat if their length is stretched in the song editor. For example, if a pattern is 2 bars long and its length is dragged to 16 bars in the song editor, it will repeat 8 times.

When you split or join a pattern, the song editor will try to preserve it as a pattern if it can. In cases where this is not possible (eg. where two different patterns are joined together), the editor will convert it into a part.

Clearing unused patterns (advanced)

When you delete a pattern in the editor, the events for that pattern number are not deleted in case you wish to use them again later.

You can delete all patterns not in use by the song as follows:

- Tap the 'Tools' button
- Tap the 'Clear' tab
- Choose 'Patterns' and tap 'Clear'

Part synth presets (advanced)

By default, each part plays using the synth's current preset. However, you can make a part tell the synth to use a different preset. This is useful if you want to use one preset for the introduction of a song and then change to a second or third in later parts of the song.

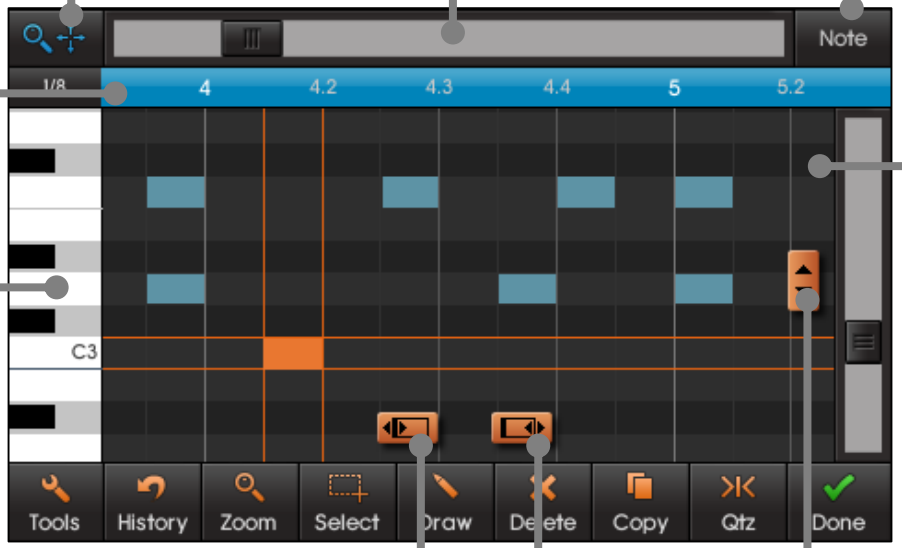
To change a part's synth preset:

- Select the part
- Tap 'More..' and choose 'Properties'
- Select the 'Preset' tab and tap 'Enable'
- Set the synth preset that the part should use

You do not have to do this for all later parts on the track. They will all now use this preset.

* Only Eden tracks support this function – TRG-16 does not support presets.

The part editor



MOVE MODE When move mode is enabled you can use one finger to move and two fingers to pinch zoom. To make a selection, zoom/move mode must be disabled.

SCROLLBAR
Drag the scrollbar to quickly move to a different area of the part.

EVENT TYPE
Use this to choose the type of events you wish to view/edit such as note, velocity or controller events.

BAR RIBBON
If the part has been converted to a pattern (advanced) you can drag the grey triangle to set the pattern's repeat length.

KEYBOARD
Drag to move the view up or down.

Pinch zoom to change the vertical scale.

Double-tap to jump between minimum and maximum zoom (this is useful when drawing events).

EDITING WINDOW

SELECTION (move mode off)
Use one finger to make a selection.

ZOOMING
Use two fingers to pinch zoom.

MOVING (move mode off)
Use two fingers to start a pinch zoom, and then release one finger. You may now drag to move.

MOVING (move mode on)
Use one finger to move.

OTHER BUTTONS
The Part Editor buttons are detailed on the next page.

MOVE DRAG HANDLE
Visible when a selection is made. Drag left or right to move the current selection.

LENGTH DRAG HANDLE
Visible when a selection is made. Drag left or right to change the length of the current selection.

VERTICAL DRAG HANDLE
Drag to move the current selection up or down (for note events, this transposes them).

Part editor buttons

Button	Description
Tools	Choose the grid settings for editing. Copy events from another pattern. Clean up identical events and controller events. Set part editing preferences.
History	Shows the last four editing operations. Use it to step backwards or forwards through your most recent edits.
Zoom	**Min** – zooms to the minimum level so that the entire part can be seen. **All** – zooms to all events within the part. **Selection** – zooms to fit the current selection
Select	**Add to** – toggles 'add to selection' mode. **To start** – extends the current selection to the beginning. **To end** – extends the current selection to the end. **Note** – selects all events on the same note as the current selection. **Inverse** – inverts the current selection. **All** – selects all events in the part.
Draw	Enables/disables draw mode. Using draw mode you can create new events by tapping or dragging in the editing window.
Del	Deletes the current selection
Copy	Copies the current selection
Quantize	Quantizes the current selection
Done	Returns to the song editor

Hearing note events when selected or edited

If you wish to hear what a note event sounds like when you select or edit it, you can turn on 'Audition Edits'. This can found in the Part editor under Tools/Preferences.

Selecting events

Tap on an event to toggle its selection. **Drag** to select more than one event.

Selected events are shown in orange.

To deselect all events, tap on the background.

The Select button (see Command Buttons) has a number of useful operations to make the task of selecting events easier. As you grow familiar with the part editor you will find that you use it extensively.

You can turn the default 'add to selection' mode off (see the Select Command Button). When 'add to selection' is off, a tap or drag always starts a new selection.

The text on the status bar at the top of the screen helps when editing. It will tell you the range of selected events and the start/end points.

Zooming

You will often find that zooming use the 'Zoom' button (eg. 'Zoom All' and 'Zoom to Selection') is a quicker way of working on tasks than using pinch zoom.

Choosing the grid setting for editing

Many editing operations (eg. move, copy and draw) will snap according to the current grid setting. To change the grid setting (or turn it off altogether):

- Tap the 'Tools' button
- Choose the 'Grid Setting' tab
- Set your preferred grid settings

Deleting all events

- Tap the 'Select' button and choose 'All'
- Tap the 'Delete' button

Moving events

- Select the events you wish to move
- Drag the 'Move' drag handle left or right to move the events to a different position in the part.

Transposing events

- Select the events you wish to transpose
- Drag the 'Transpose' drag handle up or down to move the events to a different note.

The status bar text is very useful when transposing events.

Changing the length of events

- Select the events you wish to resize
- Drag the 'Length' drag handle left or right to change the length.

Copying events

- Select the events you wish to copy
- Tap 'Copy'

The editor places the copies after the current selection. If the copies are overlapping existing events, use the move drag handle to move them elsewhere.

Deleting all events of a particular note

- Select one of the events using the note
- Tap the 'Select' button and choose 'Note'
- Tap 'Delete'

Quantizing events

- Select the events you wish to quantize
- Tap 'Quantize' and choose the quantize settings. The settings default to the current grid.

Creating 16th notes

- Tap the 'Tools' button
- Choose the 'Grid Setting' tab
- Set the grid to 1/16 (you may also choose dotted, triplets and swing)
- Close the tools dialogue and tap the 'Draw' button
- Drag in the editor window to draw the events
- Before you release the touch, you can move the drawn events up or down to place them on the intended note.

You will find this easier if you zoom into the area of interest before you begin drawing. The best way to zoom when drawing notes is to **double-tap** on the keyboard.

Alternatively, zoom in afterwards and use the drag handles to reposition the drawn notes – the last set of notes that you drew will already be selected.

Copying events from another pattern

- Tap the 'Tools' button
- Choose the 'Copy' tab
- Select the source pattern and tap 'Copy'

The copied events will be merged with any events already contained within the part.

Editing note velocities

- Touch the 'Event Type' button on the top right hand corner of the editor window and choose 'Velocity'
- Select the events you wish to edit and use the vertical drag handle to change their velocities.
- Alternatively, tap the 'Draw' button and drag in the editor window to draw the new velocities.

If your part contains lots of events, it can be difficult to distinguish one note from another. In this case, select the notes that you wish to edit *before* you change to the velocity view. Only the selected notes' velocities will be shown.

Editing controller values

- Touch the 'Event Type' button on the top right hand corner of the editor window and choose the controller you wish to edit.
- Select the controller events you wish to edit and use the vertical drag handle to change their velocities.

Drawing controller events

- Touch the 'Event Type' button on the top right hand corner of the editor window and choose the controller you wish to edit.
- Tap the 'Draw' button and drag in the editor window to draw the new controller events.

The density of the controller events drawn depends upon the current grid settings. Be careful with small grid settings such as 1/32 – you can fill up the pattern very quickly. Try to use the largest grid setting you can.

Reducing the number of controller events

- Tap the 'Tools' button
- Choose the 'Clean' tab
- Select 'Redundant Ctrl' and tap the 'Clean' button

The editor will remove any events which cause a controller change of less than approximately 5%.

To reduce the number of controller events further, quantize the events to a larger grid setting before running the clean function.

Removing all controller events

- Tap the 'Tools' button
- Choose the 'Clean' tab
- Select 'All Controller' and tap the 'Clean' button

Importing and exporting MIDI files

You can import or export your song to or from a MIDI file (with a .mid extension). MIDI files are a standard file format compatible with nearly all desktop DAW software and even desktop media players such as Quicktime and Windows Media Player.

Unlike audio files such as wavs or aiffs, MIDI files do not store an audio waveform but instead contain a sequence of note and controller events held on tracks, just like the sequencer. If you play back the MIDI file in a different application its sound will depend much upon the instruments used to play it, even though the sequence of events will be the same.

You can transfer MIDI files between your computer and your device using NanoSync. You can also use MIDI files to transfer events from one NanoStudio project to another.

Importing a MIDI file

From the Song Editor, tap Tools and select the MIDI File tab.

Tap Import and select your MIDI file. Imported events are appended to the end of your current song.

Exporting a MIDI file

From the Song Editor, tap Tools and select the MIDI File tab.

Tap Export and select your MIDI file. All events in the current song will be exported to your chosen file. If you wish, you can now use NanoSync to transfer the file to your computer.

Controller mappings

Before you import or export a MIDI file, you may wish to set up controller mappings. These mappings determine which MIDI controller relates to NanoStudio's instruments' controllers. You can do this on the MANAGE page under the MIDI tab. See the MIDI Settings section for a more detailed explanation.

MIDI channels

When exporting a MIDI file, NanoStudio assigns each instrument to a unique MIDI channel. If an instrument has more than one sequencer track assigned to it, all its tracks are bounced into a single MIDI channel in the file.

When importing a MIDI file, NanoStudio will automatically create instruments for each non-empty MIDI channel.

Mixer and Effects

Overview

Each stereo instrument output is fed into its own mixer input channel, where it can have a chain of up to 4 insert effects applied to it. After these effects have been applied the volume is adjusted by a vertical slider called a *fader*. Because the insert effects are applied before the volume adjustment, they are known as *pre-fader insert effects*.

All the inputs are then mixed into three separate channels (or *busses*).

The first bus goes straight to the main output and is known as the *dry* mix (a mix with no effects) or *main output bus*.

The other two busses are passed through two extra effect chains known as *global send/return effects* before finally being mixed with (or *returned* to) the main output. By default, one send is set up as reverb effect and the other send is a delay effect, but you can change them just like the input insert effects. Send/return effects are particularly useful for reverbs and delays since (unlike insert effects) they allow you to share the same effects units between multiple inputs.

If all this audio terminology confuses you, don't worry. All you really need to know is that the sliders control the volume of the instruments, and effects are applied to them.

Where are the send knobs?

If you're familiar with mixers you may be wondering where the send knobs for each channel can be found. The answer is that the sends are determined by the instruments, not by the mixer. This allows each synth preset to control its own sends.

Using the VU meters

The VU meters on the input channels show the level of the signal coming into the mixer from each instrument.

The VU meter on the output channel shows the level of the final output mix.

You must be careful to ensure that the **output** meter does not go into the red too often, or the output will sound distorted. If the output meter is peaking too much you can choose to reduce the output level or all of the input levels.

Ideally, aim for the output signal to very occasionally peak on the red indicators. This will give you the highest volume and generally you will find that you can get away with a small amount of occasional distortion.

Note: When performing a final mixdown to a wav file, NanoStudio will warn you if it thinks that the level of distortion is unacceptable. If you get this warning you may want to try reducing the output fader and perform the mixdown again.

Why is it OK for the input VU meters to go into the red?

NanoStudio internally uses a 32 bit floating point signal path, which has a virtually unlimited dynamic range.

However, the output hardware of the device is only 16 bit integer. With this representation, it's quite easy to exceed the available headroom.

Mixer

A mixer channel can be selected by tapping on its title or pan/fader controls. The selected channel is highlighted in white, and it is this channel whose insert effects you will see (see below).

PAN CONTROLS

Adjust the stereo panning (balance) for each input.

FADERS

Adjust the volume level for each channel.

Drag to make large changes.

Tap on the top or bottom to make small step changes.

TITLE STRIP

Drag left or right to scroll the view. Alternatively, use the left/right buttons on the far ends of the panel to scroll a whole page at a time.

OUTPUT CLIP INDICATORS

Watch these carefully. If they turn red too often, try reducing the output fader to avoid a distorted output.

MUTE/SOLO BUTTON AND FX INDICATOR

Most channels can be muted or solo'd by tapping the strip's mute or solo buttons. On phone devices, **double-tap** the mute button to solo a channel.

The FX indicator shows the state of the channel's insert effects:

Grey - The channel has no insert effects.

Red - The channel has insert effects but they are all disabled.

Green - The channel has insert effects and one or more are enabled.

Effects

Setting up send/return effects

An insert effect typically works by outputting some of the original (dry) signal mixed with some of the effect (wet signal). However, when you set up a send/return effect chain you should bear in mind that since the mixer's main output bus deals with the dry signal, your send/return effect chain should only output the wet signal. You should make sure that at least one effect in the chain (typically a reverb or delay) has its 'wet/dry' control set fully to 'wet' so that none of the original dry signal gets through the chain.

EFFECT CHAIN

Drag left or right to change the order of the effects.
Hold to add, remove or change an effect.

TCE-1 Compressor

Put simply, a compressor makes quiet sounds louder, loud sounds quieter, or both. You can use it to subtly change the dynamics of a sound, or you can use it with extreme settings as an effect in its own right.

A compressor works by continuously measuring the level of the incoming signal and then using that level to control the volume of the output signal. The controls are as follows:

Threshold. The incoming volume at which the compressor starts to act. If set low, the compressor will be working most of time. If set high, the compressor will only react to the very loudest parts of the input signal.

Ratio. Once the input signal exceeds the threshold, the ratio control determines how much the compressor will reduce the volume by. If set low, the compressor will only reduce the volume mildly. If set to maximum, the compressor will heavily limit the volume.

Attack. Once the input signal exceeds the threshold, the attack control determines how quickly the compressor will react. If set low, the compressor will react almost immediately (useful for a limiter). If set high, the compressor will take some time to react - useful if you wish to let the initial attack of the signal get through (eg. for a snare drum).

Release. Once the input signal falls below the threshold, the release control determines how quickly the compressor will restore the volume to its normal level. If set low, the compressor will restore the volume almost immediately. If set high, the compressor will take some time to restore the volume - you can use this on reverb drum loops to create a pumping or rushing sound after each beat.

Output. The compressor works by only reducing the volume of the incoming signal, but we began by saying that it could make quiet sounds louder. The output control is used to compensate or 'make up' this volume reduction, so that the peak output is approximately the same as the original signal.

RMS/Peak. Determines the method used by the compressor to estimate the input signal level. Peak responds to the highest level and is best used for limiters. RMS uses an averaging method which sounds more natural to the human ear, and is best used for most other applications.

Although the concept of a compressor is fairly simple, it can take a lot of experience to get the desired results since an adjustment to one control tends to affect the other controls to some degree. Use the compressor's meters to understand what the compressor is doing. The red bar is the most important, since it shows the amount of volume reduction being applied by the compressor, and hence how hard the compressor is working.

To use as a limiter, select the Peak input method, set the ratio to maximum and set attack, release and output to minimum. You can then use the threshold control to set the limit level.

For other applications, begin with the ratio set fairly high and the attack, release and output set to minimum. Reduce the threshold until the red bar is reacting at around the volume level you desire, and then experiment with the ratio - you may need to iterate between the ratio and threshold before you're happy. Finally, adjust the attack and release and then set the output so that the peak output level is about the same as the peak input level (you can use the meters for this).

EQ-3B 3 band parametric EQ

The EQ-3B has three stereo filter stages:

- 6dB/oct low shelf (bass)

- Adjustable width bandpass/stop (mid)

- 6dB/oct high shelf (treble)

Each stage has a frequency control (which determines the point at which it acts) and a gain control (which determines how much it acts by). The mid section has an additional width control which sets the range of frequencies that it will affect.

If you are processing a signal that is already very loud, you may find that you are unable to increase the gain controls without causing distortion. If so, enable the gain compensation control. This will automatically reduce the overall gain of the EQ based on the control settings to help prevent clipping.

5th PLANET Waveshaper

5th PLANET is best suited to creating distortion effects. You can use it on mono (single) voices to harden up the sound, or on polyphonic (multiple) voices for guitar-like power chords. There are 6 different wave shapes, ranging from a soft clip (overdriven amp) to hard modulation effects and a Lo-Fi bitcrusher/decimator. There is also an EQ only setting, where no waveshaping takes place and only the Contour control has an effect on the sound.

Choose the wave shape according to taste using the -/+ buttons.

The Drive knob determines the intensity of the wave shape effect.

The Contour knob determines the tonal content. Low values will boost bass and cut treble. High values will boost treble and cut bass. When centred, the control has no effect.

The level control works like an output volume control. Its typical use is to compensate the output volume of the effect so that it similar to the volume when the effect is disabled.

CHRONOS Chorus/Delay

Chronos may be used to add a chorus/flanger effect. It does this by delaying the audio signal by a small amount and then mixing it with the original signal. The amount of delay is varied over time and the signal is fed back on itself to create a richer sound. The flanger can be considered to be a harsher variation on the chorus effect.

Chronos can also be used as a delay effect. This is achieved but making a delayed version of the signal and mixing it with the original. The delay is much longer than that used by the chorus/flanger effect so that discrete echoes can be heard. Feedback can be applied to create multiple repeating echoes.

In Chorus Mode, the following controls are available:

- Delay – A small fixed delay value
- Depth – How much the delay time is varied
- Feedback – How much of the delayed signal is fed back to the input again. Low values produce negative feedback and high values result in positive feedback. Positive feedback tends to have more bass content than negative feedback. Extreme values can create a ringing sound. When centred, the control has no effect.
- Rate – How quickly the delay time is varied. When using fast rates, you may need to reduce the Depth control if you want to avoid pitch changing effects.

In Delay/X-Delay Mode, the following controls are available:

- Amount – The volume of the delayed signal (echo volume)
- Feedback – How much of the delayed signal is fed back (number of echo repeats)
- Time (Beat Sync disabled) – The length of the delay (time between echoes)
- Rate (Beat Sync enabled) – The time division applied to the sequencer's current tempo (echo rate expressed in quarter, eighth notes etc.)
- Beat Sync button – Tap to enable/disable synchronisation with the sequencer's current tempo

E-SPACE Reverb

The E-Space reverb effect simulates the effect of sound in a reflective space by adding dense echoes to the signal. There are several presets to choose from, simulating spaces of different shapes and sizes.

Final Mixdown

You can mix a song down to create a final stereo mix. The output file can then be transferred to your PC or Mac over WiFi using NanoSync (see later section) or uploaded directly for sharing on SoundCloud. Depending on how you set up your mixdown, the whole operation may use up to 4 steps:

1. RENDER
The song is played and output to one or more uncompressed wav files (multiple files are put into a new folder). NanoStudio warns if clipping is detected.

↓

2. COPY TO AUDIO PASTEBOARD
The uncompressed wav file(s) are optionally copied to the audio pasteboard

↓

3. APPLY COMPRESSION FORMAT
The uncompressed wav file(s) are now optionally compressed to Ogg or Zip format.

↓

4. TRANSFER OR SHARE
The final output files may optionally be sent to your desktop computer using NanoSync, or shared on SoundCloud by directly uploading from your device (Note: zip files cannot be shared on SoundCloud).

You are not limited to creating a single stereo mix - you can also mixdown individual mixer channels or song parts. Output files are 16 bit 44.1kHz stereo, and may be wav, ogg or zip format.

When you create a final mix, you specify a single output **file**.

When you mixdown individual tracks or parts, you specify an output **folder** which **multiple files** will be placed into.

If you use the 'Zipped Wav' option and your mix produces multiple output wav files, they will all be added to a single output zip file.

Tap the main menu button and choose MANAGE.

Select the Project tab and tap Mixdown. The Mixdown dialogue will appear (see next page).

OUTPUT

The type of mix you wish to create.

Final mix - Renders a stereo mix of the entire song to a single output file.

Mixer Channels - Each mixer input channel is rendered to a separate file and placed inside a new output folder.

Song Parts - Each song part is rendered to an separate file and placed inside a new output folder.

REGION

The area of the song that the mixdown will use.

Entire Song - Renders the entire song from beginning to end.

Song Loop - Renders only the part of the song contained within the current loop points.

You can set the loop points in the Song editor.

Loop mode does not have to be enabled.

RENDER TAIL

When enabled, the mixdown will continue rendering beyond the end of the region until the output has reduced to an inaudible level.

Enable to capture the end of sounds with long release times (eg. for a final output mixdown).
Disable to output a sample with an exact length suitable for looping (eg for an individual part mixdown that you wish to take to your desktop DAW).

ADD TO PASTEBOARD

Enable to add the mixdown files to the pasteboard before they are (optionally) compressed. This is useful when you wish to transfer your mixdown to another pasteboard compatible application.
Note: Since the pasteboard can only hold 12 files, only the first 12 output files will be added.

FORMAT

The type of final output file produced.

Wav - One or more uncompressed stereo 16 bit wav files at 44.1kHz.

Ogg (64/128/256) - One or more compressed stereo 16 bit ogg files at the specified rate in kbps.

Zipped Wav - One or more uncompressed stereo 16 bit wav files at 44.1kHz which are then compressed into a single zip file.

BEGIN THE MIXDOWN

Tap OK once you have set up your desired mixdown properties.

If you are performing a final mix, NanoStudio will prompt you for a single output file.

If you are mixing down individual tracks or parts, you will be prompted for an output folder or (in the case of zipped wav) a single zip file.

Clipping (distortion) during mixdown

If NanoStudio detects significant distortion during the mixdown it will warn you before the mixdown proceeds to the next step. You may then want to reduce the mixer's output fader a little and try again.

NanoStudio allows a small amount of distortion before it will notify you, since this is usually undetectable and allows for a louder mix.

Using the mixdown output files

Unless the mixdown output files are very short you won't be able to assign them to a pad or synth as samples because these instruments have a limit on sample file size.

Instead, you can transfer them to your computer using NanoSync or share them on SoundCloud by uploading them straight from your device.

If you intend to transfer a large number of files to your computer (eg. individual part mixdown), the zipped wav option is recommended to keep them all together in a single file.

If you intend to share your mix on SoundCloud, an ogg format is recommend in order to reduce the upload time. Depending on the bit rate used, an ogg file will be approximately 10 times smaller than the equivalent wav file and therefore much faster to upload. Bear in mind though that ogg compression is a very processor intensive procedure, and may take quite a long time on older hardware.

Sharing with SoundCloud

SoundCloud is an online audio distribution platform which allows musicians to collaborate, promote and distribute their music.

You can share your track on SoundCloud by uploading it directly from NanoStudio. Here's what you need to get started:

- **A final mix**, preferably in ogg format to reduce upload time (see Final mixdown section)

- **A good upload connection**. Ideally you should have a WiFi connection, but a good 3G connection with a high signal strength may suffice if your mix is short and compressed with a lower bitrate.

- **Your SoundCloud login details**. However, if you do not have a SoundCloud account you can create one during the login procedure.

Tap the main menu button, choose MANAGE and tap the Share button.

Alternatively, you can do a mixdown and tap the Share button on the mixdown results dialogue.

The Share dialogue will appear (see next page).

ACCOUNT

Shows your account details when you are connected.

If you are disconnected, this will show any relevant status messages (such as no internet connection).

CONNECT/DISCONNECT

If you are currently disconnected this will take you to an embedded web browser where you can enter your login details or create a new account. Once connected, you will only need to disconnect if you want to change to a different account. If you stay connected you will continue to be connected when you next launch NanoStudio.

PUBLISH AS

Private - Only you can see your track

Public - Everyone can see your track. When you've uploaded your file, you will also have the opportunity to add it to the NanoStudio SoundCloud group.

FILE

The path and filename of the wav or ogg file to be shared.

TRACK NAME

The name of the track as it will appear on SoundCloud. By default this is set to the same as the file, but you can change it if you wish.

LICENCE TYPE

All Rights Reserved - you reserve all rights to your uploaded track. The track is not downloadable.

No Rights Reserved - your track is fully public domain. The track is downloadable.

Creative Commons (CC) - you choose which rights you'd like to keep. The track is downloadable.

START THE UPLOAD

Tap the Share button once you have set up your desired sharing properties and you're ready to start the upload. If you set your track to be public you will have the opportunity to add it to the NanoStudio SoundCloud group once the upload is complete.

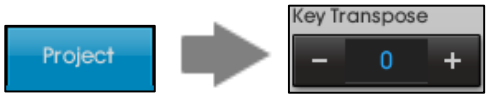
Settings

Key transpose

You can use key transpose to shift the notes you play on the keyboard (or incoming MIDI note events) to a different key.

Transpose does not affect the notes played by the sequencer, but will affect the notes recorded.

Tap the main menu button and choose MANAGE.



Select the project tab and choose your transpose value. You can transpose up to 11 semitones in either direction.

The transpose value is saved with the current project.

If transpose is enabled the keyboard will indicate the transposed key in red.

Global settings

Global settings are common to all projects. Generally you will probably only need to set them once according to your taste.

Tap the main menu button and choose MANAGE. The global settings can be found under the Settings tab.

Key width – Width of keys on keyboard instruments.

Knob control – Choose between rotary (angular) or vertical drag.

Control sensitivity – How rapidly a control value changes when dragging.

Buffer latency – Determines the size of the audio buffers used by NanoStudio. Lower settings will result in less delay between tapping the screen and hearing the sound but will use the CPU more heavily.

On older iOS devices the medium setting is recommended for the best tradeoff between latency and CPU. New devices will probably be fine with the low setting, but you may need to increase the latency to medium if you hear the audio stuttering when playing complex songs with lots of instruments.

Audio quality (iOS only) - Affects how samples and waveforms are interpolated. On older hardware you can lower this to reduce CPU usage. This only affects real-time operation - offline operations such as Resampling and Mixdown operations will always use the high setting.

Lock orientation (iOS only) – Locks the screen rotation to the current position so that it won't change if you turn your device upside down.

Stop samples when song stops – Halts all triggered samples when the sequencer is stopped. Otherwise, triggered samples are left to run to their end.

Always start on project page – Makes the project page your home page. Otherwise, NanoStudio will begin on the last page you were viewing when the project was saved.

Maximize Audio CPU (newer iOS devices only) - Dedicates as much of the CPU as possible to audio in order to reduce stuttering under heavy loads. Typically, most newer iOS devices won't allow the audio CPU usage to go above 50% without stuttering. If you enable this option you can drive the audio CPU as high as 75%, but you may find that the display starts to become less responsive, and MIDI devices which use the accessory connector (such as the Akai SynthStation and the Line 6 MIDI Mobilizer) will suffer from poor latency. Core MIDI does not suffer from this issue, and will run with a good latency all the time.

Play audio when in background (iOS only) - By default, NanoStudio stops playing any audio when the app goes into the background (eg. when you press the 'Home' button). 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 will **significantly 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 via the iOS task bar when you have finished using it.

External MIDI Input

NanoStudio only supports MIDI for input. This means that you can use a MIDI device to play the synths or record to the sequencer, but events played by the sequencer are not sent to the MIDI output. NanoStudio supports these MIDI input events:

- Note on/off (with velocity)
- Controller
- Pitch bend
- Program/bank change

MIDI clock, song position pointer and sequencer start/stop are not yet supported.

Connection methods

NanoStudio supports several different methods for connecting external MIDI input. Each method has its own advantages and disadvantages. The summary below may help you to choose which is the best for you:

- Line 6 MIDI Mobilizer. This is a small accessory available from Line 6 which is compatible with all iDevices (iPod, iPhone and iPad). It is compatible with all MIDI hardware (eg. keyboards, drums, control surfaces) which use a 5 pin DIN connector. If your MIDI hardware only has a USB MIDI port you cannot connect it using the MIDI Mobilizer. Since the MIDI Mobilizer connects to the accessory port, you cannot charge your phone which the MIDI Mobilizer is attached.

- Akai SynthStation 25. This is a small (laptop sized) 2 octave velocity sensitive MIDI keyboard. It is compatible with the iPod and iPhone, but not the iPad. The phone docks inside the SynthStation to form a single unit with no trailing wires. It can be powered using batteries or an external AC adaptor (which will also charge the phone). Since the SynthStation also has a USB port, it can double as a general USB MIDI controller. More information on using the SynthStation can be found in a later section (Using the Akai SynthStation 25).

- Core MIDI over USB (using the Camera Connection Kit). This method is only supported on the iPad using iOS 4.2 or later and will not work with the iPhone or iPod. Your external MIDI hardware must have a MIDI USB port, not the older style MIDI 5 pin DIN connector. The iPad only allows very low power USB devices to be connected via the camera connection kit so if your external MIDI hardware is bus powered there is a chance it may not work. If it is self-powered (via batteries or an external AC adaptor), there is a better chance that it will work. There are no guarantees with this method so it may pay to do some research online to see if people have had success with your particular setup.

- Soundcard or external audio interface (Windows/OSX only). If you are using the Windows/OSX version of NanoStudio, it should automatically detect all available MIDI devices.

- Virtual MIDI. This is a little different to the other options in that it is a connection to another software app, rather than a hardware device. If you have another app which supports virtual MIDI output and has the ability to run in the background, then you should be able to use that app to play NanoStudio's instruments. In NanoStudio, a virtual MIDI input looks much like any other MIDI input.

MIDI settings

MIDI settings are global (ie. they are common to all projects).

Tap the main menu button and choose MANAGE. The MIDI settings can be found under the MIDI tab.

Panic button

In some situations, an incoming MIDI note can get stuck. A typical situation is when a MIDI cable becomes unplugged whilst a note is held. If a note gets stuck, tap this button to cancel all held notes.

MIDI inputs

Choose the Inputs category to see a list of the available MIDI input devices. To activate an input, tap its ENABLE button.

You may selectively enable or disable MIDI channels for any input by selecting the input in the list and then using the 16 channel buttons at the bottom. Each channel button also has an activity indicator to help you to visualize incoming MIDI messages and diagnose problems.

When OMNI Mode is ON, all incoming MIDI events (regardless of their channel) are sent to the currently visible instrument. This mode is useful if your MIDI hardware device is fixed to a single channel, or if you prefer to determine the instrument you play from NanoStudio's user interface.

When OMNI Mode is OFF, NanoStudio routes incoming MIDI events based upon the event's channel and the track mappings (see MIDI mapping, below). This mode is useful if your MIDI hardware device is capable of outputting on multiple channels, and allows any instrument to be played regardless of the currently visible instrument.

Virtual MIDI connections

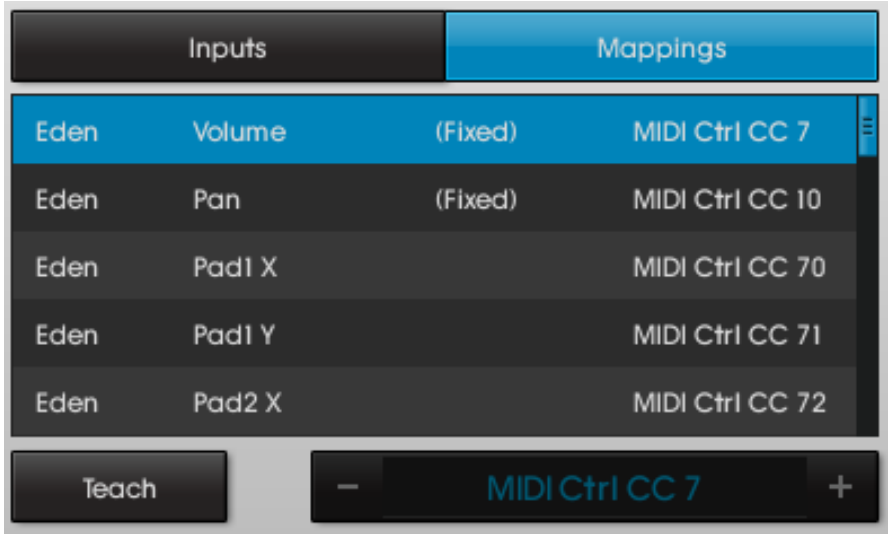
Setting up virtual MIDI connections can be confusing because there is no established standard between apps. Two possible methods are available, but the method you choose will depend upon the app you are trying to connect to.

Method 1 – NanoStudio 'pulls' MIDI from another app's output. To use this method, try to find the other app in NanoStudio's input list and enable it (in this example, you can see ThumbJam listed). You may also need to go to the other app and change its settings so that it sends MIDI data to its output.

Method 2 – The other app 'pushes' MIDI to NanoStudio's input. In the example, you can see that 'NanoStudio' is also listed as an input. This is a special input which NanoStudio creates for other apps to connect to. Enable the 'NanoStudio' input and then go to the app and try to find 'NanoStudio' in its outputs list. You may need to change the settings in the other app so that it sends MIDI data to NanoStudio's input.

Warning: Make sure you only use one of the above methods to connect to any given app. If you use both methods then there is a chance that the other app will send 'doubled' MIDI notes (ie. the MIDI data will get sent twice).

MIDI Controller Mappings



The MIDI Controller Mappings determine which MIDI controllers NanoStudio's instruments will respond to. In the example below, MIDI controller 70 has been set to control the mixer's send 1 volume.

The controller mappings are also used when importing and exporting MIDI files in the Song Editor (see Importing and Exporting MIDI Files).

Teaching Controller Mappings

You may set a MIDI mapping manually using the +/- buttons, but often it is not obvious which MIDI controller values your particular MIDI hardware device uses.

You can normally find this information in the device's manual, but there is an easier way - NanoStudio can find the value for you by using the 'Teach' button:

1. Ensure that your MIDI controller is connected to the device

2. Tap the 'Teach' button to enable Teach Mode

3. Select the MIDI mapping that you'd like to change

4. Move the MIDI controller (knob, pad, ribbon or wheel) on your hardware MIDI device.

Setting an instrument's MIDI channel

You can set an instrument's MIDI channel by holding down the instrument's button on the main menu. See 'Adding, removing and naming instruments' for more details.

Using the Akai SynthStation 25

NanoStudio will recognise the SynthStation as soon as the phone is plugged into the SynthStation's docking bay. If it is not recognised:

- Ensure that the phone is firmly plugged in.

- Ensure that the SynthStation's power button is on, and that the SynthStation's batteries are OK.

Before you can use the Mod controller you must teach NanoStudio the controller's mapping (see Teaching Controller Mappings).

You can choose to operate the SynthStation in one of two modes, determined by the MIDI OMNI mode setting:

OMNI OFF - The SynthStation can transmit MIDI events on any of the 16 MIDI channels. Each NanoStudio instrument will respond to the MIDI channel it has been set to receive on. By setting more than one instrument to respond to the same MIDI channel you can play 'stacked' sounds.

OMNI ON - The SynthStation always transmits its MIDI events to the currently visible instrument. You can only play one instrument at a time.

SynthStation lower button row

The function of the SynthStation's lower buttons (PROGRAM PREV/NEXT, OCTAVE UP/DOWN) is always fixed.

To change the current preset, **tap the Program Prev/Next** buttons. **Hold the button** to change presets rapidly.

SynthStation upper button row

The function of the SynthStation's upper buttons (DRUMS, SYNTH 1/2/3) depends upon the MIDI OMNI mode setting. The SynthStation's button labels aren't appropriate to NanoStudio so you should ignore them and instead interpret them as follows:

OMNI OFF:

SynthStation button	NanoStudio function
DRUMS	MIDI Channel down
SYNTH 1	MIDI Channel up
SYNTH 2	Show instrument *
SYNTH 3	Show song page

* Shows the instrument which is set to respond to the current MIDI channel. If more than one instrument is set to respond to the current MIDI channel then this button will cycle through them.

OMNI ON:

SynthStation Button	NanoStudio Function
DRUMS	Previous instrument
SYNTH 1	Next instrument
SYNTH 2	Show manage page
SYNTH 3	Show song page

To change the current octave, **tap the Octave Up/Down** buttons. When the centre octave (Middle C) is selected, both button indicators will be off.

NanoSync for Windows and Mac OS X

Overview

NanoSync is a stand-alone application for the PC or Mac which allows you to transfer your own samples to your device over Wi-Fi. You can also use it to download the final mix to your computer.

NanoStudio contains some network software called the 'NanoSync Server'. In simple terms, this software waits on the network for NanoSync to connect, and then does whatever NanoSync asks it to do, such as sending or receiving files.

You can download NanoSync from the Blip Interactive website, under the Downloads section. Once you have download the correct version for your computer, run the installer and follow the instructions it gives you.

NanoSync requires access to the network. The first time you run NanoSync, your computer will probably ask you if you want to allow NanoSync access to the network. **You must answer yes otherwise NanoSync will not work. If you answer no by mistake, please see the Troubleshooting section for instructions on how to unblock the firewall for NanoSync.**

Connecting

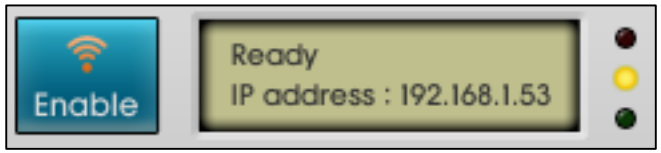
Whenever you start NanoStudio, the NanoSync Server will start off disabled for efficiency reasons. Your first task is to enable it:

Tap the main menu button and choose MANAGE.

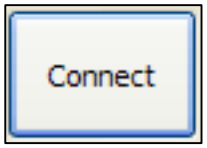
Select the NanoSync tab and tap Enable.

If your device reports that WiFi is unavailable, it is sometimes necessary to wait a bit longer for it to find the network. In some extreme cases, this can take more than 30 seconds.

If the NanoSync Server has been enabled correctly, your device should now report 'Ready' and display its own IP address. There are also on-screen instructions to follow.



Connecting (cont.)



On your computer, click NanoSync's Connect button. The 'Connect To Device' dialog will appear.

NanoSync will list the names of the devices it can find on the network which are current running NanoStudio.

With some network setups it is not possible for NanoSync to find your device by name. In this case, you can enter your device's IP address manually. In the example above, the IP address to enter would be 192.168.1.53.

Click OK to connect.

Operation

Once connected, operation is fairly simple. NanoSync will give you a tree view of all the NanoStudio files and folders that you have access to.

Double click on a folder to enter it. Use the back button to go up a folder level.

You are allowed to create folders in some (but not all) locations.

You can delete one or more files by selecting then and clicking Delete. Be very careful when deleting files, there is no Trash or Recycle Bin.

For safety, NanoSync does not let you delete folders. You must do this on the device using NanoStudio's file browser.

To send wav or aiff files to the device, drag and drop them onto the file view. Alternatively you can use the Send button.

To get wav files from the device, click the Get button. Currently it is not possible to drag files from the file view.

Network troubleshooting

It's impossible to cover all possible hardware, software and router configurations but here's a checklist you can use to find some of the most common issues.

Another basic thing to try which can fix a large number of problems is to reboot your phone, router and/or computer.

If you have tried everything in the checklist and still can't get it to work, we recommend that you visit the Blip Interactive forums for NanoSync. It could well be that another user has got the same problem as you and has found a solution.

Device does not have a WiFi connection available

- Make sure that you are within range of a WiFi network
- Ensure that you have Airplane Mode disabled and WiFi enabled (you can find these options if you exit NanoStudio and go to your devices Settings page).

WiFi seems to be available but I can't connect

- Ensure that you have enabled the NanoSync Server (using NanoStudio's MANAGE/NanoSync page).
- Ensure that your computer is connected to the WiFi network and that both your computer and device are on the same network.
- Check that your computer's firewall is not blocking NanoSync.
- Check that your router is not blocking NanoSync. Please note that this is difficult task unless you are experienced with networks.

My device isn't listed in NanoSync's connection dialogue

- With some network configurations it may not be possible for NanoSync to find your device automatically. Use NanoStudio's MANAGE/NanoSync page to look up the device's IP address and try typing it into NanoSync manually.

Unblocking the firewall in Windows

When you installed NanoSync on Windows, you may have answered 'no' when it asked you if you wish the program to have network access. If so, you will need to manually add NanoSync as a firewall exception in order for it to work.

Instructions on how to do this are located on the Microsoft website.

Windows XP:

http://www.microsoft.com/windowsxp/using/networking/security/winfirewall.mspx

Windows Vista:

http://windows.microsoft.com/en-us/windows-vista/Allow-a-program-to-communicate-through-Windows-Firewall

Windows 7:

http://windows.microsoft.com/en-us/windows7/Allow-a-program-to-communicate-through-Windows-Firewall

Audiobus (iOS only)

Audiobus is a 3rd party application which allows you to route audio signals between different apps running on your device. To use Audiobus features with NanoStudio you must have the Audiobus app installed on your device. For full details, please refer to the Audiobus website at http://audiob.us/. Once you have installed the Audiobus app you will be able to obtain help, read FAQs and view tutorials by starting Audiobus and tapping the 'Help' button.

NanoStudio can be used with Audiobus as either an input or output, but it cannot be simultaneously used as both and input and output. There are no settings within NanoStudio that you will need to change to make it work with Audiobus. NanoStudio will detect if it is running with Audiobus and automatically route its inputs/output accordingly.

When NanoStudio is used as an Audiobus input it will send the main mix to Audiobus instead of the speakers/headphones.

When NanoStudio is used as an Audiobus output, it will sample from Audiobus instead of using the microphone or external audio device.

Keyboard Shortcuts (Windows/OS X only)

NanoStudio has some keyboard support for typing file names, playing keys/pads and basic song editing.

General

Shortcut Key	Function
Space	Stop/play sequencer
Ctrl+Space	Start record
Home	Go to song start
End	Go to song end
Page Up	Go to loop start
Page Down	Go to loop end

Song/Pattern Editor

Shortcut Key	Function
T	Tools menu
H	History menu
S	Select menu
D	Draw
Backspace	Delete selection
C	Copy selection
M	'More...' menu
Q	Quantize menu
P	Toggle pan/zoom view
Enter	Edit pattern

Eden Synth*

Shortcut Key	Function
'Q' - ']', '2' - '='	Higher octave
'Z' - '/', 'S' - ';'	Lower octave
Cursor up/down	UI page up/down
Cursor left/right	Octave up/down

TRG*

Shortcut Key	Function
'1' - '4'	Pads 13-16
'Q' - 'R'	Pads 9-12
'A' - 'F'	Pads 5-11
'Z' - 'X'	Pads 1-4

* If you have a non-US keyboard (eg. AZERTY), your keys may be labelled differently but the physical layout will still be the same as the diagrams above.

APPENDIX A - Glossary of terms

ADSR Envelope – A value which varies over time, typically used to modulate a voice parameter such as volume or pitch. It consisting of 4 distinct phases (or states) - Attack, Decay, Sustain and Release.

Amp/Amplifier – Something which changes the volume of an audio signal.

Attack – How quickly an envelope reaches maximum after the note is started.

Attenuate – To reduce in volume.

Automation – The process of recording a steady stream of controller values and then playing them back.

Band Pass Filter (BPF) – A type of filter which attenuates low and high frequencies but lets a band of mid frequencies through.

Cutoff Frequency – The frequency around which a filter operates.

Chorus – A type of delay effect which produces a fatter sound, like several similar voices all playing in unison.

Decay – How quickly an envelope drops to the sustain level after the initial peak.

Delay – Usually refers to delaying an audio signal in time.

Envelope – A value which varies over time, usually triggered when a note is first played. Also see ADSR Envelope.

Event – Something recorded and played by the sequencer. Usually a note start or end but could also be controller values.

Filter – Something which attenuates some audio frequencies but lets others pass.

Gain – A change in amplitude (volume), usually indicating an increase.

Glide – Sliding from one note's pitch to another. Also known as Portamento.

High Pass Filter (HPF) – A type of filter which lets high frequencies pass but attenuates low frequencies.

Low Frequency Oscillator (LFO) - A periodic signal which may be used to control a voice parameter such as oscillator pitch or filter cutoff.

Low Pass Filter (LPF) – A type of filter which lets low frequencies pass but attenuates high frequencies.

Mixer – Something which combines (adds) audio signals from two or more sources.

Modulation – The process of changing one signal using another.

Polyphony – The maximum number of voices an instrument can play.

Preset – A set of parameters defining a synth's sound.

Quantize – Setting (or snapping) time to specific step intervals.

Release - How quickly an envelope fades when a note ends.

Reverb – Small dense echoes simulating a reflective audio environment.

Ring Modulation – Modifying one signal by multiplying it by another.

Sampler – Something which records audio snips.

Sequencer – Something which records musical events, allowing them to be edited and played back.

Subtractive Synthesis – A type of synthesis which begins with a harmonically rich basic waveform and then subtracts from it by using filters.

Sustain - The level at which an envelope remains following the decay until the note is released.

Sync Modulation. A type of modulation where one periodic signal is reset (in terms of phase) by a second periodic signal.

Velocity – How hard a note was struck. In NanoStudio it is always used to modulate a voice's volume.

Version history

V1.45

* Bug fix for blank screen on OS X El Capitan 10.11

V1.44

* Updated to Audiobus SDK 2.1.2 for iOS 8 compatibility. Due to this change, NanoStudio V1.44 now requires iOS 7 or later (iOS 5/6 users may still download V1.43 from the app store)

V1.43

* Fixed a bug with the reverb unit (bug introduced in 1.42)

V1.42

* Updated to Audiobus SDK 1.0.2 for improved compatibility with iOS7
* Fix for app closing when in background (and/or corrupted MIDI port settings)

V1.41

Bugfixes

* Fix for audio sometimes not working when app is returned to foreground
* Fix for vertical zoom '-' button not working in song editor (Windows/OS X)

V1.4

Features

* Audiobus support for input (sampling) and output (main mix) (iOS)
* Virtual MIDI inputs for note and controller data (iOS/OS X)
* MIDI input transpose
* 4 extra banks for your Eden presets

Bugfixes

* Fixed 'empty sample' bug when pasting from some Waldorf apps

V1.35

Bugfixes

* Improved touch responsiveness on iOS

V1.34

Features

* Support for iPhone 5's 4" retina display
* iOS support for stereo sampling (when an external stereo input device is connected)
* iOS 3.x and 4.x are no longer supported. iOS devices must use iOS 5 or later.

Bugfixes

* iOS 6 - MIDI files will now open correctly from other apps
* Empty untitled projects are cleaned up on app start up
* Crash bug fixed with copying/pasting TRG pads with long sample names
* Minor UI tweaks
* Minor bug fixes

V1.33

Features

* Retina display support for new iPad
* Files can be Emailed from within NanoStudio (iOS)
* .nsp, .wav and .mid files are now associated so they can be opened with NanoStudio from other apps (iOS)
* .nsp files are associated so they can now be opened with NanoStudio by double-clicking (Windows and OS X)
* Eden sample page supports note slicing, so samples can be sliced across the keyboard in up to 64 slices
* Computer keyboard support for typing file names, playing keys/pads and basic sequencer operation (Windows and OS X)
* NanoStudio for OS X is now available via the Mac app store

Bugfixes

* Projects were not always exported with relative sample paths (so they had to be decompressed to the same folder path to work)
* Using AV adapter on iOS causes crash
* Channel L/R buttons in mixer are sometimes visible when they shouldn't be
* The last note event of a loop section was sometimes played at the beginning of the loop when resampling with pre-roll enabled
* Tapping FX indicator on mixer channel sometimes selects the wrong channel (iPad)
* When using more than 32 mixer channels, the later channels would sometimes be silent
* NanoStudio would shutdown the network MIDI session for other apps on start up
* Removed small click on the end of a couple of default TRG samples (eg. 808 BD)
* Couldn't set metronome to zero volume

V1.32

Features

* Added an extra wide key setting
* Made TRG-16 edit mode more apparent by adding a graphical surround to the pads

Bugfixes

* iOS Notifications now appear in the correct orientation
* Eden keyboard and other touches are no longer offset if device is tilted to a portrait orientation
* TRG pads flickered when using large audio buffer sizes
* Increased width of Monitor control on sampling page to accommodate longer text
* Improved touch response of Eden navigation controls (octave, page up/down etc.)
* Disabled vertical scroll in song editor when dragging loop points
* Fixed text overflow for track names in song editor
* Renamed waveshaper destination parameter to 'Drive/BitCrush' in Eden patchbay

V1.31

Features

* Eden max pitch bend range changed to 24 semitones

Bugfixes

* View stuck in portrait mode for some users when updating from a previous version
* Metronome click was not in sync for larger buffer latency settings
* TRG mute button behaved incorrectly on iPad edit screen
* TRG sample name could overflow allocated area on UI

V1.30

Features

* Universal iPad version
* Free desktop version now supports window sizing
* Added extra musical scales to keyboard
* Increased size limit for a single sample to 32MB
* Ability to slide the keyboard by fractions of a note
* Mixer mute/solo
* Improved bottom range of mixer volume faders
* Double tap on mixer channel title to go to instrument
* Double tap on 'centre zero' knobs to return to centre
* Added ability to tap song position on status bar to toggle between bars and hours/minutes
* Added indicator to main menu to show the last selected instrument
* Update to latest Akai SynthStation library
* Added 'Mix audio with other apps' option to allow iTunes music background play (iOS)
* Added buffer latency settings (iOS)
* Automatic normalization is now optional after sampling or resampling
* Added an 'add effect' button to empty effects slots
* Changed TRG behaviour to allow drags across pads
* Added load/save effects chain to the effects select dialogue
* Song editor - vertical zoom
* Song editor - mute/solo buttons can be swiped vertically
* Song editor - added MIDI activity indicators to each track
* Song editor - parts on muted tracks are shown in grey
* MIDI file and .nsp file export dialogues now have a 'show file' button (Windows/OS X)

Bugfixes

* Buzzing sound on Eden ring mod when phase was non-zero
* TRG-16's 'auto BPM' function was sometimes inaccurate
* Possible fix for OS X not enumerating some MIDI input devices

V1.21

* Fix for crash in sample player when using certain Eden presets (eg. B30)
* Project now autosaved when app is killed as a background task
* Improved view scrolling when left drag handle is used in song editor with the track info panel visible
* Fixed bug where doubled notes are drawn on a triplet grid
* Built in help manual refers to compressor 'decay' knob - should be 'release'
* Updated demos in iPhone version

V1.2

Features

* In-app purchase to upgrade 6 to 16 instrument tracks (always unlocked on Windows/OS X)
* Configurable instruments on each track (TRG or Eden), mixer has its own track
* Configurable mixer with volume/pan automation and up to 4 insert effects per bus (input, send or output)
* New effects include compressor, 3 band parametric EQ and Lo-Fi (bitcrush/decimate) setting added to Waveshaper
* Offline processing of samples through an effects chain using the sample editor (with undo)
* Up to 4 sequencer tracks per instrument (up to 64 sequencer tracks in total)
* Retina display support for iPod/iPhone 4
* Supports launching and purchasing other audio copy/paste apps via the Sonoma compatible apps list
* TRG pad copy/paste function for duplicating pad settings and samples
* Sequencer track mute/solo, quantize down to 1/64, quantize event length and end as well as start, view grid without snapping
* Better mixer VU meters and accurate clip detection algorithm for final output stage
* Better 'picker' for choosing controller events in the pattern editor, note events can now be seen when editing controllers
* Eden loads samples ahead of time, so preset changes are ready when they're needed
* Added triplet settings to Eden LFO (this will affect some existing projects and presets)
* Increased instrument polyphony
* New Akai SynthStation25 button operation
* Tempo/time sig available from main menu
* New 'click only during record' setting
* Tidied up UI

Bugfixes

* Autobeat missing during first count in
* Autobeat recording notes incorrectly if received via MIDI input
* MIDI file import/export improvements, time signature now correct
* Sequencer relocates to next earlier whole bar when recording starts
* TRG samples were played too loud on earlier hardware models (pre-iPhone 3GS)
* Eliminated click when TRG choke group polyphony was exceeded
* Fixed crash when pasting sample files exported from BM2
* Fixed bug where sample audition would sometimes incorrectly play in the file browser
* TRG pad releases at wrong velocity when using external MIDI keyboard

V1.13

* Support for Core MIDI using the Camera Connection Kit (iPad only)
* Added MIDI thru for Akai SynthStation 25 (NanoStudio will respond to MIDI events received via the SynthStation's USB MIDI port)
* New Line 6 MIDI Mobilizer library
* Eden pan/filter modulation bug fixes

V1.12

* Support for Akai SynthStation 25
* Song/metronome monitor during sample record
* Improved sample interpolation quality
* Mixdown tracks now exports mixer channels (not instrument tracks)
* SoundCloud uploads are tagged with BPM value
* Performance optimizations

V1.11

* Audio copy/paste - couldn't paste audio from some apps which use the Sonoma V1.0 pasteboard
* Project load/save - fix for rare crash bug during project load/save with modified unwritten Eden presets

V1.1

Features

* Audio copy/paste - both Intua and Sonoma standards
* MIDI file import/export
* Support for the Line 6 MIDI Mobilizer
* Project import/export (self contained projects complete with samples packaged in a single file)
* Direct SoundCloud export from phone
* More mixdown options - individual track split, song regions, render tail option
* Pan controls in mixer
* Note preview in piano roll view when selecting and dragging
* Complete backup/restore of unsaved Eden presets when the app is closed or a call is taken
* Eden preset numbers now begin from zero, not one (this is to match preset changes made via MIDI)
* New (empty) global bank C for Eden
* Increased sample size limit to 8MB
* 'Loop on selection' feature in song editor - sets song loop points to the current selection
* Samples above 8MB can now be previewed in file dialogue (the first 20 seconds)
* MIDI input on Windows version
* NanoSync - Support for 24 bit wavs, copying folders and older PowerPC machines
* Snap to centre zero on pan knobs

Bugfixes

* When an Eden controller is mapped to oscillator pan, it now takes it over the full L/R range
* Glide notes not recorded correctly (they don't overlap slightly as they should so they need lengthening afterwards in the editor)
* Drawing lots of notes in the pattern editor can result in a synth not responding until the project is reloaded
* Infrequently there is a hanging note (possibly when deleting a part which is being played), resolved by reloading the project.
* Chorus delay modulation destination doesn't work
* Using '&' in sample file or folder names causes the message 'The project file could not be loaded'. It may be possible to load your project's .bak file and then change any samples using a '&' in the file or folder name before resaving.
* Samples with a rate other than 44.1kHz do not play back at the correct speed.
* Vertical scrollbar doesn't behave properly when drawing in the pattern editor.
* Fix for first metronome beep not being played during count in at certain tempos
* Improved sequencer timing drift - now stays perfectly in time even when rendering a wav of any length
* Changed TRG-16 minimum release time so it doesn't sound different during resample/mixdown