Gotharman's zaTurn

Modular Synthesizer

User Manual 4.02

Table of Contents

In The Box

In the Zaturn box should be:

-Zaturn itself.
-A power supply –Multi plug –Works in most countries.

If any of these items are missing, please get in touch with Gotharman's.

Introduction

Zaturn is a polyphonic/multi-timbral modular synthesizer with memory. All connections between modules, module settings, sequences and sample assignments can be memorized for instant recall.
Like many other Gotharman instruments, each preset contains 2 versions of the preset, that can be morphed between. With one knob, you can morph all the settings of a complete modular system!
It will also hold all your samplings and wavetables in memory, even after a power recycle.

Zaturn has a number of build-in modules, which are divided into 4 equal groups, A, B, C and D. Within each of these groups, it is possible to arrange the modules in 2 parts, so Zaturn has 8 parts in total. Each part can be trigged separately, and they have their own separate output module. Keeping the modules in groups, made it possible to add the Favorite Sound system from SpazeDrum!

Part 1 and 2 in Group A can each be set in polyphonic mode, so that Zaturn can be in 2 x 4 notes polyphonic mode. Modules in groups B, C and D can be linked to Group A, to get the same sounds on each polyphonic note, or they can be unlinked to have different sounds on each polyphonic note.

Like most other Gotharman instruments, each of the 8 parts can also just be in monophonic mode, for 8 completely separate parts.

Zaturn comes either with a set of newly engineered 12 db dual self-resonating analog filters, with a special character, or with a set of 24 db HPF/LPF Spaze filters. Each Group has one dual analog filter. These filters are arranged as LPF and BPF in parallel to each other (zaTurn filter), or as LPF and HPF in serial (Spaze filter), and can be controlled by a filter frame sequencer.

8 Patch Points are also available, for inter-connection of the 4 Groups.

1024 preset, 1024 songs, 64 favorite sounds and up to 8192 samplings can be held in its internal FLASH memory.

Unlike the Anamono X, which had 2 separate bus systems, one for audio and one for modulation, Zaturn only has one bus, that handles both audio and modulation, so everything can be connected to everything.

The modules of each Group (4 groups in total):

- 2 standard Gotharman Oscillators (8 in total) - Waveforms, pitched noise, drum oscillators, samplings, wavetables.

-1 Oscillator B (4 in total) – A special oscillator with a manipulative sine wave.

-1 Noise Generator (4 in total) – While the oscillators can output pitched noise, a simple unpitched white noise generator is also available.

-1 Dual analog filter (4 in total) – 12 db LPF and BPF in parallel, with a special character, or 24 db HPF + LPF in serial, and filter frame sequencer.

- 1 digital filter (4 in total) - 27 filter types. Standard filters, triple filters, sharp filters, tube filters...

 - 2 VCA's (8 in total) - with ADSR envelope, 16 different characteristics and a clip parameter. Can be trigged by any source.

- 2 Effects Processors (8 in total) - Many of the LD effects plus a new reverb, a wavefolder and some new pitch effects.

 - 4 LFO's (16 in total) - With variable waveform and curve. Key syncable. Can trigger parts and sequencer.

- 2 Envelopes (8 in total) - ADSR + decay envelope with loop options. Can be trigged by any source.

-2 Sample and Hold Generators (8 in total) .

- 1 Ring VCA (4 in total) – With several modes, like Ring Modulator, AND, XOR and Mix.

- 2 Output modules (8 in total -1 for each part) - Handles the final output level and the stereo panning.

Some Features

Connecting Modules
Zaturn has different ways of connecting the modules. They can be connected manually, by setting the source and the amount, for audio and modulation, by turning a knob, they can be connected via an overview module grid, using the touch interface, and modules in the audio path, can be added and removed into/from the signal chain, by using Zaturn's auto functions.

8 Parts
The modules can be arranged into 8 parts, to make it possible to make tracks on Zaturn with 8 different sounds.
On an initialized preset, the modules are arranged in the 8 parts, each with oscillator, filter, VCA, effects processor and envelope, to make it possible to make tracks instantly.

Sequencer
An LD3 style sequencer is available to compose music with the parts. It has 8 note tracks and 16 controller tracks. Each of the 4 Groups has 2 note tracks and 4 controller tracks assigned.

Sample recorder/editor
Samples can be recorded from the audio inputs and outputs, imported via USB, and edited.

Wavetable editor
Not only can the oscillator 1 in each group play back wavetables, Zaturn also has a wavetable editor built in, where you can edit and draw wavetables on the touch screen, and, of course, save these.

Connectivity
Zaturn can interface with other instruments via MIDI and audio connectors.

Touch display
It comes with a 4.3" touch display. Most operations can be performed via knobs and buttons, but sometimes the touch display can help speeding up the workflow. The touch interface on Gotharman instruments work in a very simple way, without any annoying "touch gestures".

Solid
Built to last in a steel box with extruded aluminium sides. All powdercoated with a "Black Sand" finish, that is very resistant to scratches and dust. All knobs, buttons and connectors are of the highest quality.

Cleaning

For cleaning your instrument, to my experience it is best to use some standard windows cleaner, which usually comes as a spray bottle. Before you use it, please make sure, that it contains **no alcohol**. Spray a little of this on a cloth and clean.

DO NOT USE any kind of alcohol or any of these alcohol wipes, which has become popular under the current pandemic.

If you do, this might happen:

Getting Started

Connecting Zaturn

On the back panel of your Zaturn, you will find the power switch, connection for power supply, audio inputs and outputs and MIDI in and out.

Audio In L and R
The two rightmost 1/4" jack connectors, marked "AUDIO IN R L" are always the stereo audio inputs.

Connect any line stereo/mono audio sources to the audio input, for sampling and/or processing through Zaturn's effects and analog filters.

Audio Out L and R
The next 2 1/4" jack connectors are the main stereo outputs. You would probably like to connect these audio outputs to a mixer or an amplifier, or anything else that ends out in a speaker/a set of speakers. Since Zaturn doesn't have built in speakers, it just needs to be connected to something, that can transfer its amazing sound to you. These should be connected, using ¼" mono jack cables.

The left audio output doubles as a stereo headphone connector. Please make sure that nothing is connected to the right audio output, when plugging headphones into this connector.

The Volume knob on the Zaturn front panel will affect the level of these outputs.

MIDI In and Out

If the Zaturn touch screen keyboard and step buttons seems a bit too limited, you might want to connect a MIDI keyboard to MIDI in, in order to take full advantage of Zaturn's fully chromatically playable sounds. It is also possible to connect anything that transmits a MIDI clock, if you would like the sequencer of Zaturn to sync to the rest of your setup.

On MIDI out, MIDI clock, MIDI CC's from the Zaturn edit knobs, and notes and CC's from its sequencer are transmitted. Connect any MIDI gear to this, that you would like to control from Zaturn.

On the front panel of your Zaturn, you will find the USB connector.

USB Connector

To the USB connector, a USB drive can be connected.

This should be:

-Maximum 32 GB

-FAT formatted

With a USB drive connected, you can:

-Import, export and back up samples as .wav files

-Import deFormer .lds samples

-Import, export and back up Zaturn presets and songs

-Update Zaturn

To import a .wav file from another device, it must be:

-Mono or stereo

-44.1 KHz sample rate – Zaturn will import other sample rates, but they will play back in a wrong speed

-16 bit or 24 bit native PCM

-Standard wav's or broadcast wav's

Starting Up

Connect the supplied power adaptor to the Power input, and to a 100V to 240V AC power source – Usually a wall socket.

It's a 9V, minimum 2.0A type with a 2.1 mm DC plug, with positive middle. The power supply on the picture is only for reference. The actual one might look different.

Turn it on

Push the "I" on the power switch. Your Zaturn should now turn on.

While starting up, a start-up icon will be shown.
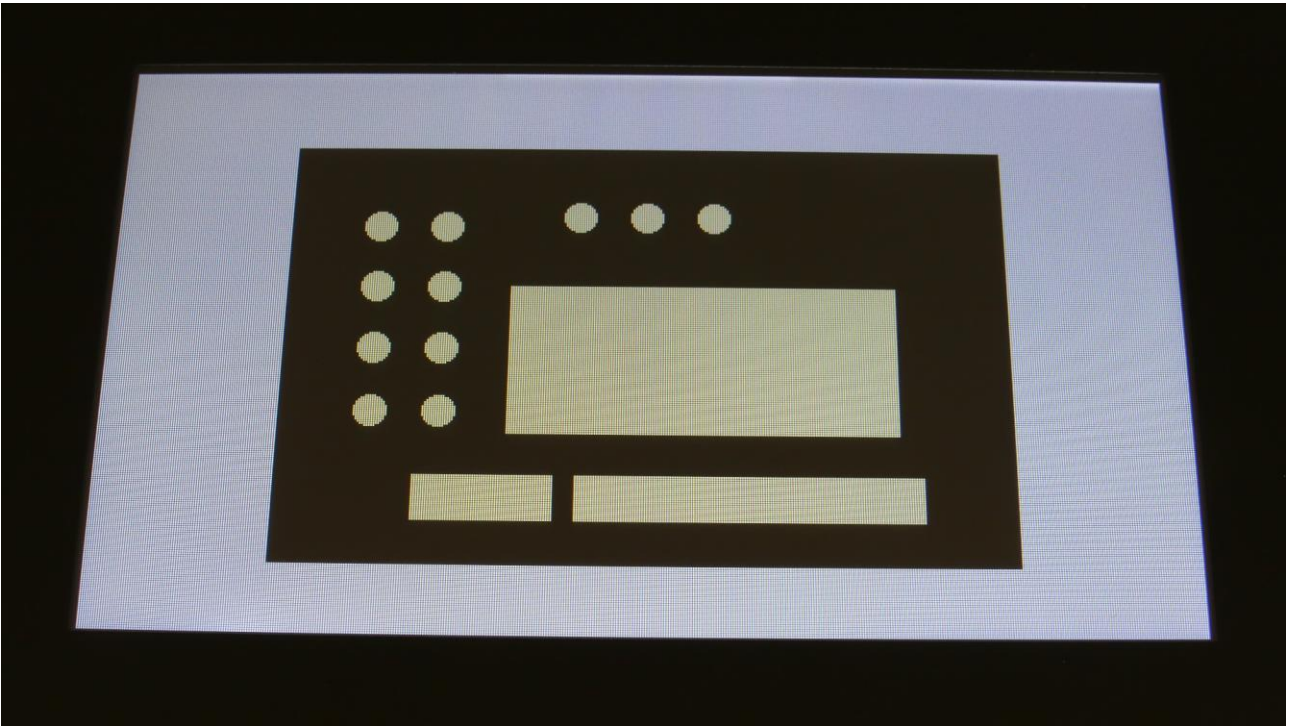
The User Interface

Zaturn has a highly sensitive and responsive capacitive touch display, 8 step/trigger/part select/quick jump buttons, a Modules/Bar Sel button, a Func/Mute button, a Steps/Part button and a Sequencer Play button. It has 8 Edit/Quick Edit Knobs for controlling and editing parameters and sending MIDI CC's, a (synth) Morph knob, a Sequencer Morph knob and a volume knob.

Pushing the **Trigger 1-8** buttons, with Modules/Bar Sel, Func/Mute and Steps/Part unlit, will trigger the respective Zaturn part. Each trigger button will send a settable note number (Settable in the Synth "Trig"" section). When a part is trigged, the button will light up.

The **Play** button will start and stop Sequencer playback. When the sequencer is playing back, the Start/Stop button will light up.

When the **Modules/Bar Sel** button is held down, it is possible to select one of 8 half bars, for the currently selected sequencer note track, that will be monitored on the trigger/step buttons, when the Steps/Part button is lighting up.
When it is lighting up, the 8 trigger buttons functions as **quick jump** buttons, to the modules listed right below the trigger buttons. These will primary take you to modules, that are used by the currently selected part.

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When the **Func/Mute** button is held down, it is possible to **mute/unmute** the 8 sequencer note tracks, by pushing any of the 8 trigger buttons. When it is lighting up, the 8 trigger buttons functions as **Quick Jump** buttons, that will take you to the edit pages, which names are showed right above each step button (Sequencer and Sample Edit). It is also possible to switch effect freeze on/off, select Morph layer, Copy/Paste and exit from pages, using this button combination

When the **Steps/Part** button is held down, the 8 trigger buttons functions as **Part Select** buttons. Pushing any of these, will select part 1 to 8.
When it is lighting up, the 8 trigger buttons will show the **steps** of the selected sequencer note tracks half bar. The half bar to be monitored, can be selected by the Modules/Bar Sel + trigger button combination described earlier. Steps that are on will light up, steps that are off will not light.

The **Morph** knob (**MIDI CC#1**) will morph between the two layers of Synth parameters, and the **Seq Morph** knob (**MIDI CC#2**) will morph between the two layers of Sequencer parameters.

The **Volume** knob always adjusts the audio output volume.

The **Edit 1-8 Knobs** to the left of the display, adjusts the parameters on each edit page. On the **Preset Select screen**, they controls the quick edit parameters (named on the knobs), or if the Qedit parameter on the MOR>COMMON2 page is off, they acts as modulation sources, that controls any parameters that has knob1 to 8 set as modulator, and transmits MIDI CC's, if The KnbCC parameter is on.

The Quick Edit Knobs controls:
-Edit Knob 1: VCF LPF Cutoff (**MIDI CC#4**).
-Edit Knob 2: VCF LPF Reso (**MIDI CC#5**).
-Edit Knob 3: VCF BPF Cutoff (**MIDI CC#8**).
-Edit Knob 4: VCF BPF Reso (**MIDI CC#9**).
-Edit Knob 5: DGF Cutoff (**MIDI CC#10**).
-Edit Knob 6: DGF Reso (**MIDI CC#11**).
-Edit Knob 7: VCA Envelope Release Time (**MIDI CC#12**).
-Edit Knob 8: VCA Level (**MIDI CC#7**).

The Touch Screen Keyboard

The Zaturn display is touch sensitive. The touch interface is used for navigating through the edit and settings pages, and in the bottom of most pages, a fully playable touch keyboard is present.

On the Preset and Song Select pages, it is, besides from playing notes on the touch keyboard, also possible to apply modulation to the sound, by placing your finger on different positions between the top and the bottom of the keyboard. This is referred to as Y modulation. On any other pages, the keyboard only plays notes.

On the Preset and song Select (Main) pages, the keyboard can be on up to 3 octaves, and Pitch Bend can also be controlled through playing the keyboard.

The touch keyboard is always controlling the currently selected part.

It is possible to select the keyboard octave, by touching any of the 8 squares just above the keyboard.

The Y position modulation is transmitted, received and recorded as MIDI CC#16.

Setting the number of octaves

To change the number of touch keyboard octaves, touch the "oct" switch, which is located to the left, right above the keyboard. Every time you touch it, it will toggle between 1oct, 2oct and 3oct. When 2 octaves are selected, the upper and lower octaves get divided by a line in the middle of the keyboard. When 3 octaves are selected, the upper, middle and lower octaves get divided by 2 lines.

Pitch Bend Function

Usually, when swiping your finger across the touch keyboard, each note will trigger a sound.

It is though also possible to use finger swiping to pitch bend the sound. To make this possible, you must set the keyboard in Bend mode, by touching the "BND" button, which is located to the right, just above the keyboard, so that this turns dark blue.
Now new notes will only be trigged, the moment you put your finger on the keyboard, and swiping your finger over the middle of the keyboard, will activate the bend function, and you can now pitch bend the sound up and down by swiping. The pitch bender is centered around the middle of the touch keyboard.

The Main (Preset Select) page

This is the first screen you will see, right after Zaturns's start-up screen, unless you left your Zaturn in Song mode, the last time it was turned off. Here you can change preset, jump to Zaturn's edit and settings pages, and set the touch keyboard octave, as described on the previous pages.

On the top of this screen, the Sequencer bar/beat, that is currently being played back, is shown.

To the right of the bar/beat indicator, you will find the last step of the currently selected sequencer note track and the tempo of the currently selected preset in BPM. Touching this field, will enter the sequencer main page, where you can set the last step and resolution of the currently selected note track, set the sequence tempo, erase and double the note track, switch the metronome on and off, and set the skipper effect.

In the right side of the screen, the selected part number is indicated. Right below this, you will find a sequencer record indicator (REC). When the REC indicator is red, the sequencer is in record mode. Touching the REC indicator, will switch the sequencer in and out of recording mode.

In the left side of the screen, the number and name of the currently selected preset/song is shown.

Below the preset name/number, you will find the touch screen keyboard.

To the right of the preset name/number, zaTurn shows which analog filter board was installed, when the currently selected preset was stored. It will show "ZAT" for the original zaTurn filters, or "SPZ" for the Spaze filters.

Right above the preset name, 8 small VU-meters are shown. These shows the activity of part 1 to 8.

Touch the "EDIT" field in the upper right corner of the screen, to enter the edit and setup pages.

Touch the "PRESET" field, to select a memorized preset.

Selecting a preset

Touch the "PRESET" field. A list of 5 presets near the currently selected preset, will now appear:

Touch "PREV" or "NEXT" to view the previous or next 5 presets, and finally touch the preset name of the preset you would like to select. 1024 presets can be selected, from A01 to P64.

Zaturn will now jump back to the main Preset Select screen, and show the name of the newly selected preset.

If the sequencer is playing back, the Play LED will now start to flash, and the text "NEXT:" will show right above the new presets name, awaiting track 1 to reach its start/end step. As soon as this happens, Zaturn will switch to the newly selected preset, the Play LED will stop flashing, and "NEXT:" will disappear.

If the sequencer is not playing back, Zaturn will immediately switch to the new preset, when you touch the preset name.

When Zaturn is turned off, it will remember which preset was selected, and start up with this, when turned on again. It will also remember if it was in preset or song mode, and start up in the same mode, and if it was in song mode, it will also remember which song was selected.

Presets can also be selected, using the buttons.

If you activate the PreView mode, by touching the PreView field, so it turns black with white text, you can preview the presets, without Zaturn jumping back to the main Preset Select screen.

If the sequencer is running, it will still wait for track 1 to reach step 1, until it jumps to the next preset. This is indicated by the Play LED flashing.

If any parameters of the preset has been edited, and the edits has not been stored, a "*" will appear right between the preset number and the preset name.

When this appears, you will need to save your preset, in order to keep your edits.
Please see how to do this in the "Save Preset" section, later in this manual.

Operating Zaturn

Starting and stopping the Sequencer, and trigger parts manually
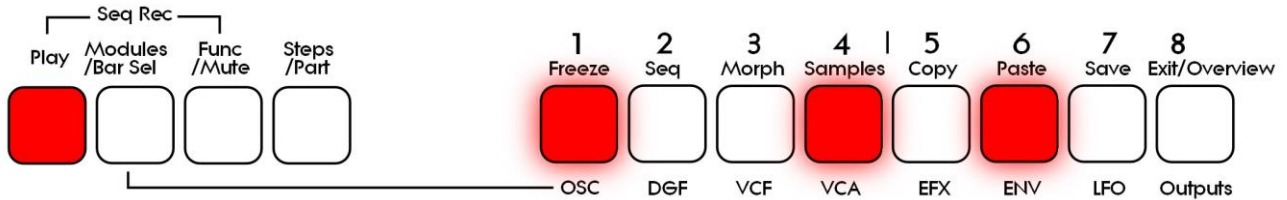
To start the sequencer playback, push and release the Play button, so that it lights up.

The sequencer will now start to play back. When the Modules/Bar Sel, the Func/Mute and the Steps/part buttons are not lighting up, every time a part is trigged to play back, the corresponding step button will light up shortly.

To stop the sequencer, simply hit the Play button again, so that it is no longer lighting up.

To trigger the 8 parts manually, make sure that neither the Modules/Bar Sel button, the Func/Mute button or the Steps/Part button is lighting up, and then push any of the 8 step buttons, to trigger the sounds that is programmed on each part.

Selecting a part/group
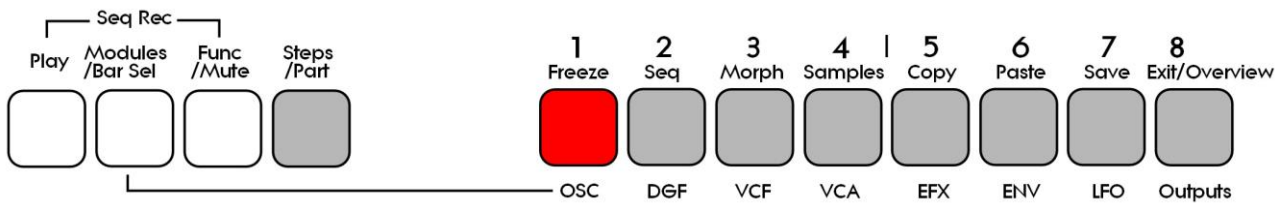
Push and hold the Steps/Part button.
The selected part number will now be shown, by one of the 8 step buttons lightning up. The number above the step button, is the part number that is currently selected.
To select another part, while still holding down the Steps/Part button, push any of the 8 step buttons.

Each of the parts belongs to a module group. You can find the group letter below the step buttons.
Parts 1 and 2 selects module group A, parts 3 and 4 selects module group B and so on…
This means, that each 2 parts is using the same group of modules.

The selected part, is the part which parameters will be shown on the display, when entering the edit pages.
Selecting a part, also selects the equally numbered Sequencer Note Track.
When entering the Sequencer Controller tracks 1 to 8, track 1 to 8 is selected in the same way.
When entering the Sequencer Controller tracks 9 to 16, 1 will equal 9, 2 will equal 10, and so on.
The Sequencer Controller tracks are selected separately from the parts.

Sequencer Note Track Steps view/edit
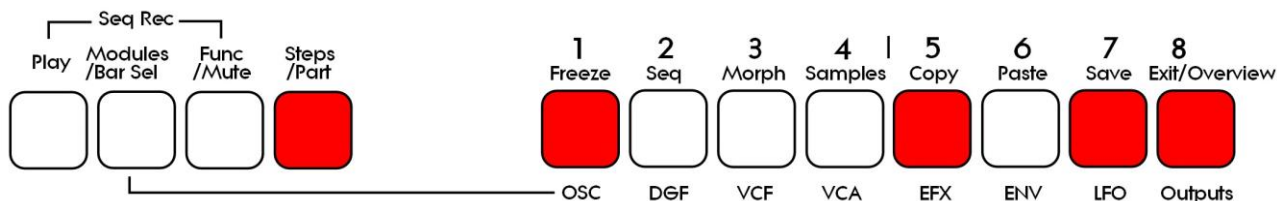
First, select the part, for which you would like to view/edit the note steps, as described on the previous page of this manual. You can, of course, select another part at any time, also after you have entered note step edit mode.

To enter note step edit mode, push and release the Steps/Part button. This should now light up. Any note sequencer steps that are switched on to play back, on the first half bar of the selected note track, will now also light up on the 8 step buttons.

If the sequencer is running, the light state of each step button will be reversed, when a step is playing back.

To switch a step on or off, simply hit the corresponding step button, at it will toggle its state.

When the sequencer are in recording mode (the Play button is flashing), pushing any of the step buttons, will set record mode to step mode, and select this step for recording. The step button will now flash.

When using the Zaturn sequencer as a usual step sequencer, the steps will play back from left to right. In this case, step 1 plays back at position 1, step 2 plays back at position 2 and so on.
On the Zaturn sequencer, it is though possible to break this pattern, and make each step play back on any position, using the position subtrack. It is even possible to make more steps playing back at the same position, for polyphonic step sequencing.

Only 8 steps (one half bar) are shown at a time. The note tracks of Zaturn has 64 steps. Please read on, to experience how to switch between half bars (step 1-8, 9-16, 17-24 and so on…).

Selecting a Note Track Half Bar and/or a controller track bar, to be viewed/edited

Note tracks: When you are located on any other pages, than the sequencer controller tracks pages, a half bar is selected to be viewed for a note track. The selected half bar, is the half bar that is shown on the step buttons, and one half of the bar shown on the note track pages.
Push and hold the Modules/Bar Sel button. The step button that indicates the selected half bar will now light up, while the other 7 step buttons will be flashing. Now push a step button, to select the desired half bar. Step button 1 will select the first half bar of bar one, step button 2 will select the second half bar of bar one, step button 3 will select the first half bar of bar 2 and so on…

Controller tracks: When you are located on any of the sequencer controller track pages, a bar can be selected to be viewed for the currently selected controller track. The selected bar, is the bar that is shown on the controller track pages.
While the note tracks has up to 64 steps divided into 4 bars, the controller tracks has up to 128 steps, divided into 8 bars. Each of these 8 bars can be selected, using the 8 step buttons.
Push and hold the Modules/Bar Sel button. The step button that indicates the selected bar will now light up, while the other 7 step buttons will be flashing. Now push a step button, to select the desired bar. Step button 1 will select bar 1, step button 2 will select bar 2, step button 3 will select bar 3 and so on…

Mute/Unmute Note Tracks, Start/Stop Seq/Song Recording

To mute, unmute or view the mute state of the 8 note tracks, push and hold the Func/Mute button.

Unmuted tracks will now be shown by a step button that is lighting up, and shortly flashes off, every time the track is triggering.

Muted tracks are shown by a step button that is unlit, and that lights up shortly, every time the track would have triggered something, if it weren't muted.

To mute or unmute a track, simply hit the corresponding step button, while still holding down the Func/Mute button.

Toggling Sequencer Record On/Off

By pushing and holding the Func/Mute button, and then pushing the Play button, when the sequencer is not in Song mode, Sequencer realtime recording mode will be toggled on or off. When the sequencer is in recording mode, the Play button will flash.

When the sequencer are in Song mode, this button combination will toggle Song realtime recording on or off.

Copy Morph Layer A to Layer B
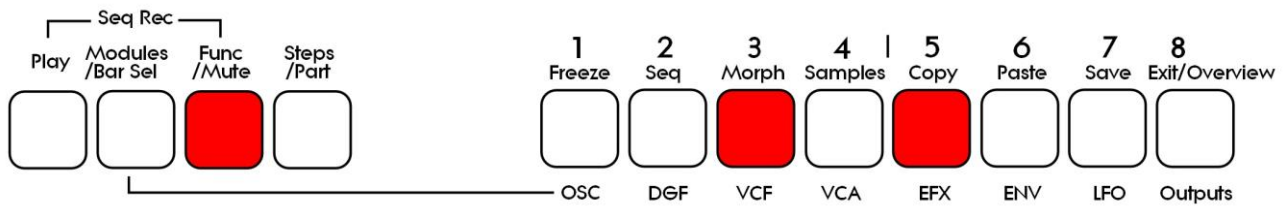
Push and release the Func/Mute button, so that it lights up, to enter the function buttons. Now push and release step button 5 (Copy), so that this also lights up. Instructions for copy and panic will now be shown on the screen. Push and release step button 3 (Morph). Morph layer A synth parts and sequencer parameters have now been copied to morph layer B. If you turn the Morph knob, you should now hear the same sound/sequence, no matter what position the knob is in.

Selecting the next preset
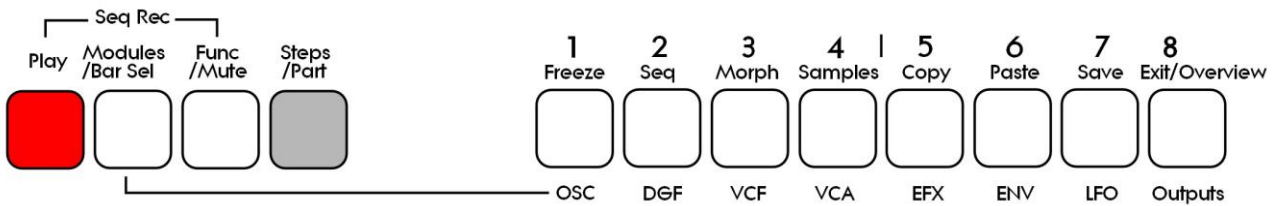
Push and hold the Steps/Part button while pressing the Play button. Zaturn will now select the next preset. If the sequencer is playing back, the Play button will now start to flash, and the text "NEXT:" will show right above the new presets name, awaiting track 1 to reach its start/end step. As soon as this happens, Zaturn will switch to the newly selected preset, the Play button will stop flashing, and "NEXT:" will disappear.

If the sequencer is stopped, Zaturn will immediately switch to the new preset.

Selecting the previous preset
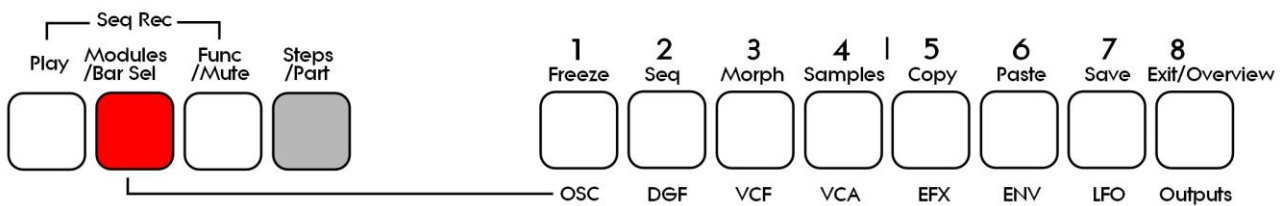
Push and hold the Steps/Part button while pressing the Modules/Bar Sel button. Zaturn will now select the previous preset. If the sequencer is playing back, the Play button will now start to flash, and the text "NEXT:" will show right above the new presets name, awaiting track 1 to reach its start/end step. As soon as this happens, Zaturn will switch to the newly selected preset, the Play button will stop flashing, and "NEXT:" will disappear.

If the sequencer is stopped, Zaturn will immediately switch to the new preset.

Preset Reload / Advance Song realtime record step
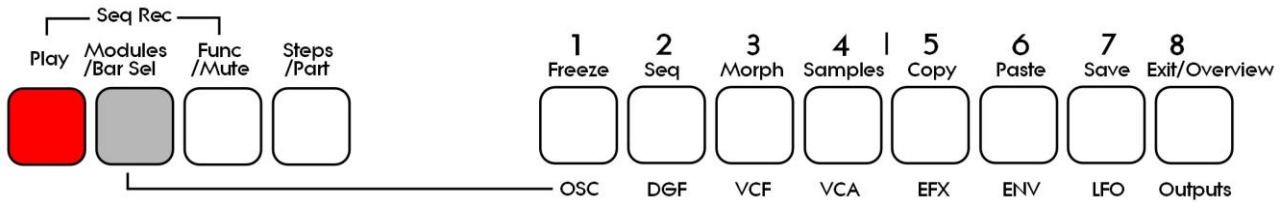
Push and hold the Morph Set button, while pressing the Play button, to reload the currently selected preset.

While realtime recording a song, reloading the preset, will cause the song recorder to advance to the next song step. This is useful for recording track mutes of the same preset into the song.

Panic
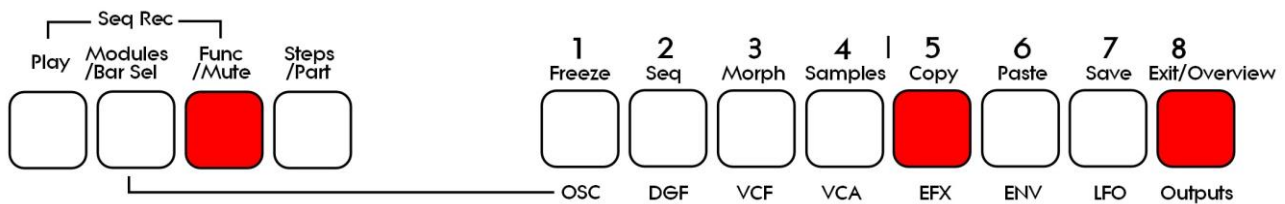
Push and release the Func/Mute button, so that it lights up, to enter the function buttons. Now push and release step button 5 (Copy), so that this also lights up. Instructions for copy and panic will now be shown on the screen. Push and release step button 8 (Exit).

Now all internal sounds will be shut off.

Compare Edited Preset With Saved Preset
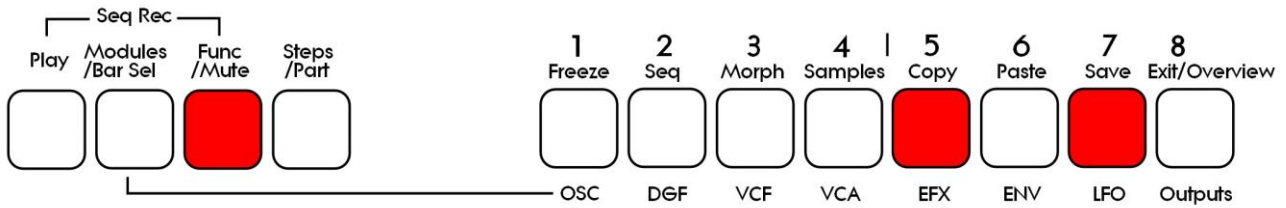
When you are editing a preset, and you would like to compare this with the originally saved preset, this is possible, using the Compare function.

To listen to the previously saved preset:
-Push and release the Func/Mute button, so that it lights up.
-Push and release step button 5 (Copy).
-Push and release step button 7 (Save).
You can now play with the previously saved preset.

To de-active the Compare function, and jump back to the edited preset:
-Hit step button 7 (Save) again.

To de-activate the Compare function, and discard your edits:
-Hit step button 5 (Copy). Zaturn will now ask you to confirm, that you wish to discard your edits, by pushing step button 5 (Copy) again.
If you are absolutely sure, that you would like to discard your edits, hit this button.

Shortcuts to Synth Modules
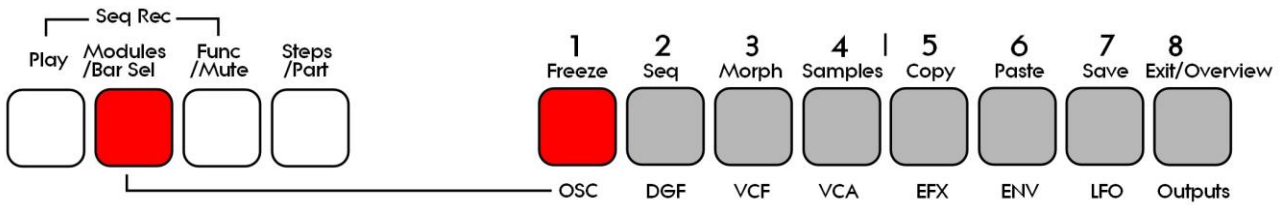
No matter where you are located in the Zaturn menu system, it is possible to quick jump to the synth modules, using the push buttons.

To do so, push and release the Modules/Bar Sel button, so that this lights up, and push the step button, that has the name of the module, which you would like to jump to, below it.

When you enter a module this way, Zaturn wil jump to modules inside the currently selected Group.

The modules, which can be accessed via the push buttons:

OSC: Oscillator 1-2. You will have to touch the display, to switch between Osc1 and 2.
DGF: Digital Gotharman Filter.
VCF: Analog Filter.
VCA: VCA 1-2. You will have to touch the display, to switch between VCA1 and 2.
EFX: Effect Processor 1-2. You will have to touch the display, to switch between EFX1 and 2.
ENV: Envelope 1-2. You will have to touch the display, to switch between Env1 and 2.
LFO: LFO 1-4. You will have to touch the display, to switch between LFO1 to 4.
Outputs: The outputs module.

Function Buttons / Shortcuts
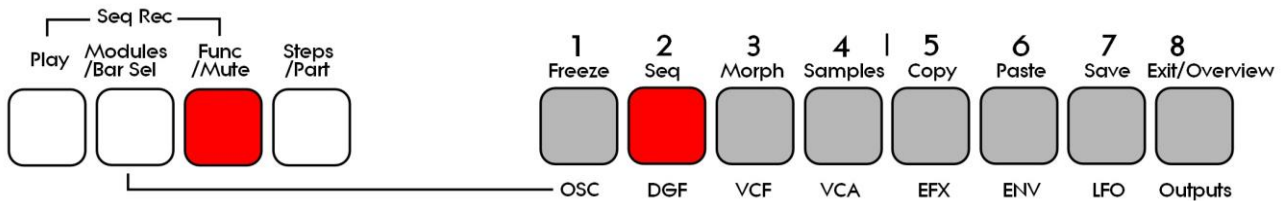
Push and release the Func/Mute button, so that it lights up. Now push and release the step button, that has the name of the edit page over it, that you wish to jump to, or the function, that you wish to activate.

Functions, which can be activated by the function buttons:

Freeze: If any of the effect processors have their Freeze control set to "Buton", it is possible to manually freeze or un-freeze this/these effects, by pushing step button 1 (Freeze). When manual Freeze is on, this button will light up.

Morph: Pushing step button 2 in function button mode, will switch the synth and sequencer parameters to be edited, between morph layer A and B. When this button lights up, the parameters of Layer B is edited (i.e. the parameter setting that you will morph to, when turning up any of the Morph knobs). When this button is not lighting up, the parameters of Layer A is edited (the layer which you morph from, when the morph knobs are turned fully down).

Copy: Pushing this function button, will make Zaturn copy the settings of the complete currently selected preset. It is then possible to Paste the settings of separate modules, using the Paste button.

Paste: When you are located at a page, for which the copy buffer is holding settings for, the paste function button will light up. If you are located on the synth module or sequencer pages, a page will pop up, asking where to paste from and to.

For more info about the Copy/Paste system, please see the Copy/Paste chapter later in this manual.

Save: This function button will take you to the save preset/song pages. For more information about this, please see the "Save Preset" and "Save Song" chapters, later in this manual.

Exit/OverView: When you are located on any other page, than the Main (Preset Select) page, pushing this function button, will take you back to the previous page (1 level up). If you are located on the Main (Preset Select) page, it will take you directly to the Part Overview page.

Pages, which can be reached via the Function Buttons

When pushing some of these buttons a number of times, it will toggle through a number of pages:

Seq: Sequencer Main > Note Tracks 1-8 > Controller Tracks A-B, Controller Tracks C-D.

Samples: Sample Rec > Start Recording > Stop Recording > Save Sampling.
Samples and then Exit: Sample Edit.

Save: Save To Preset select > Save to name > Saving Preset.

Exit/Overview: Exits from any page. From the Main (Preset Select) page, it jumps to the Part Overview page.

The Synthesizer Modules

Zaturn has a lot of different built in modules. To access these, from the Main (Preset Select) page, touch the "EDIT" field in the upper right corner, to access the Synth Modules page.
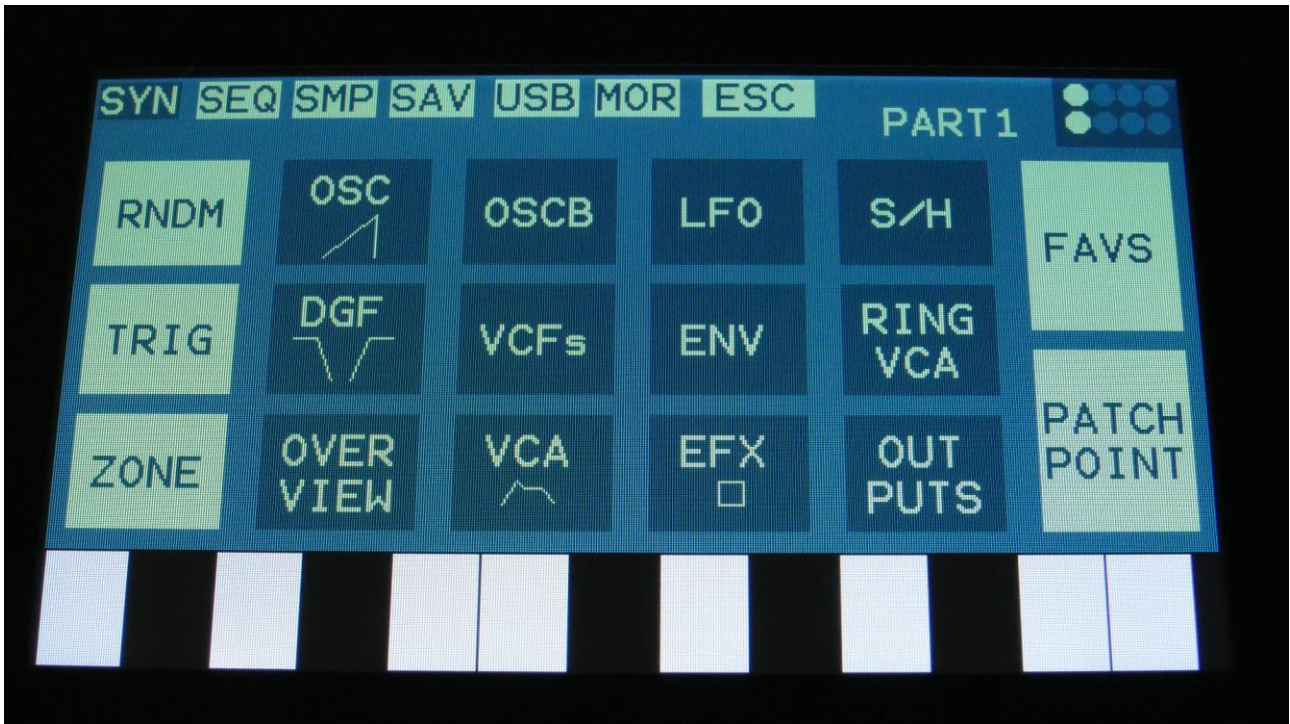
Here you have an overview of the different types of modules. To access a specific module, simply touch the module type, that you would like to enter. It is also possible to enter the modules by pushing the Modules/Bar Sel button, and then pushing a step button. Please see "Operating Zaturn", for more information about this.

In the upper right corner of this page, the current sequencer position is shown with dots.
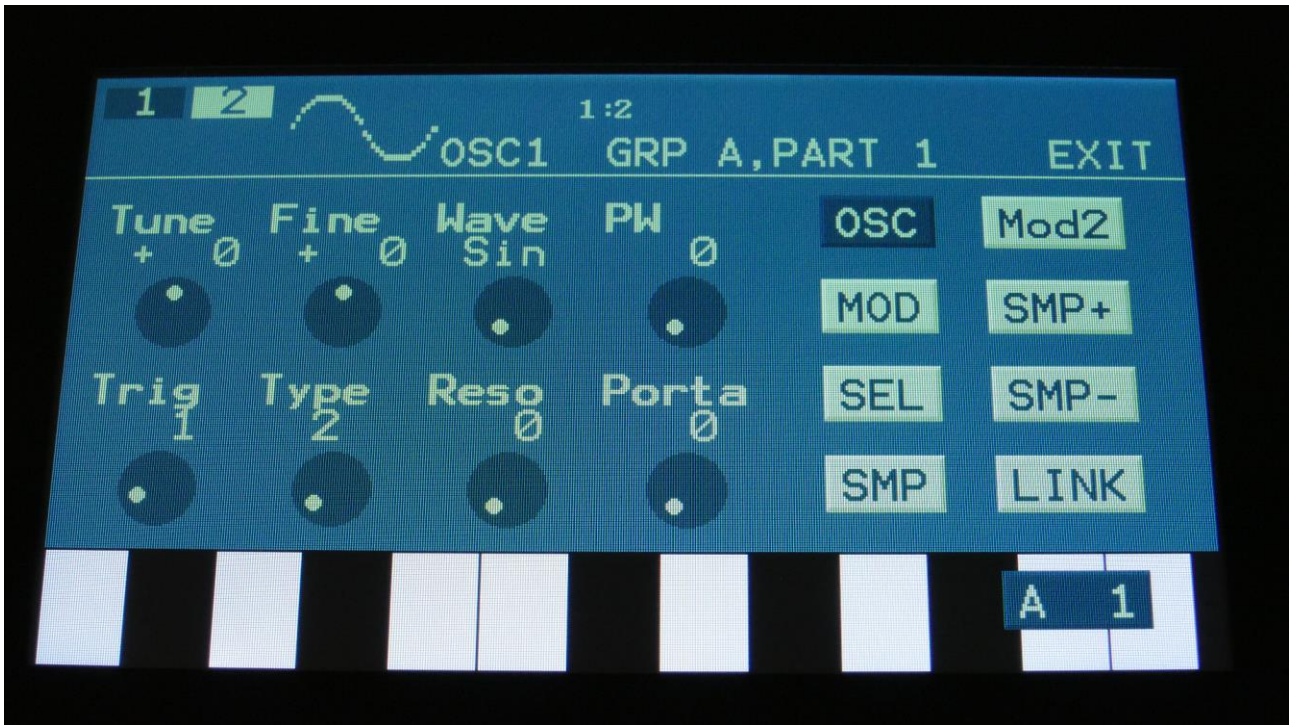
When you have entered a module type, that contains more than one of the same type, you can select the different module numbers, by touching the numbers in the upper left corner.

Each module has a **LINK** touch button. Touch this to activate/deactivate. When you are using a part (only part 1 and 2) in polyphonic mode, and you would like all polyphonic tones to sound the same, you should activate LINK on the modules, which you are using in this part. When LINK is activated, all the same modules in all groups, will use the parameter settings of group A.

The Group Overview Page

From the Synth Modules page, it is also possible to access the Group Overview page, by touching the "OVERVIEW" field. This page can also be accessed from the Main (Preset Select) page, by pushing the Exit/Overview function button.
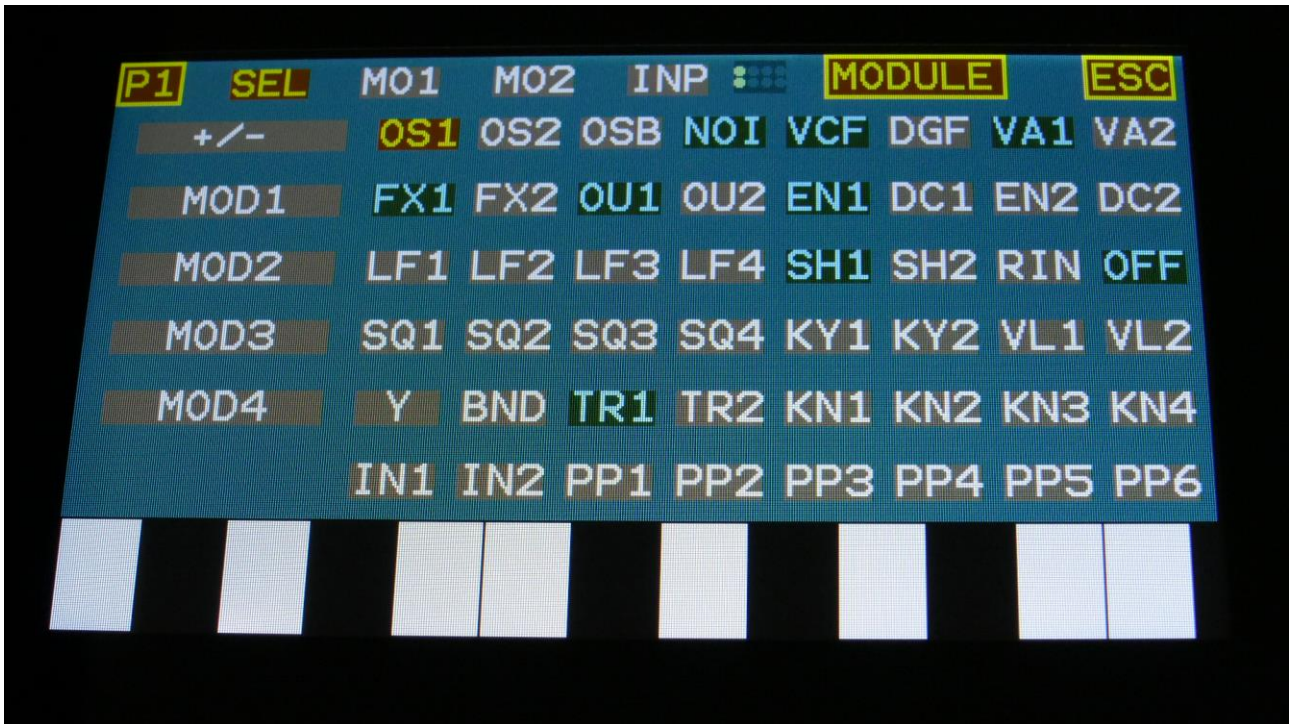
On this page you have an overview of all the synth modules of one module group, and you can easily see which modules are used by the currently selected part. The colored modules are used by the part, the grey modules are not. You can select parts 1-8, by pushing and holding the Steps/Part button, while pushing a step button.

In order to determine which modules are used by the selected part, Zaturn first checks which modules that are connected to the part trigger, and then it checks which modules that are connected to these modules. So if you for instance is using the same LFO in both parts of a group, Zaturn will see all the modules as connected.

On the other hand, if no modules are connected to a part trigger, all modules will be grey.

On this page, you can select a module by touching it. When you do this, the module will turn brown. To enter the module itself, touch the "MODULE" button in the upper right corner.

When a module is selected, its main parameters can be adjusted directly on the Part Overview page, using Edit Knob 1-8.

It is also possible to connect modules directly on this page, but this will be described in the "Connecting Modules" chapter, later in this manual.

The modules which can be selected/connected
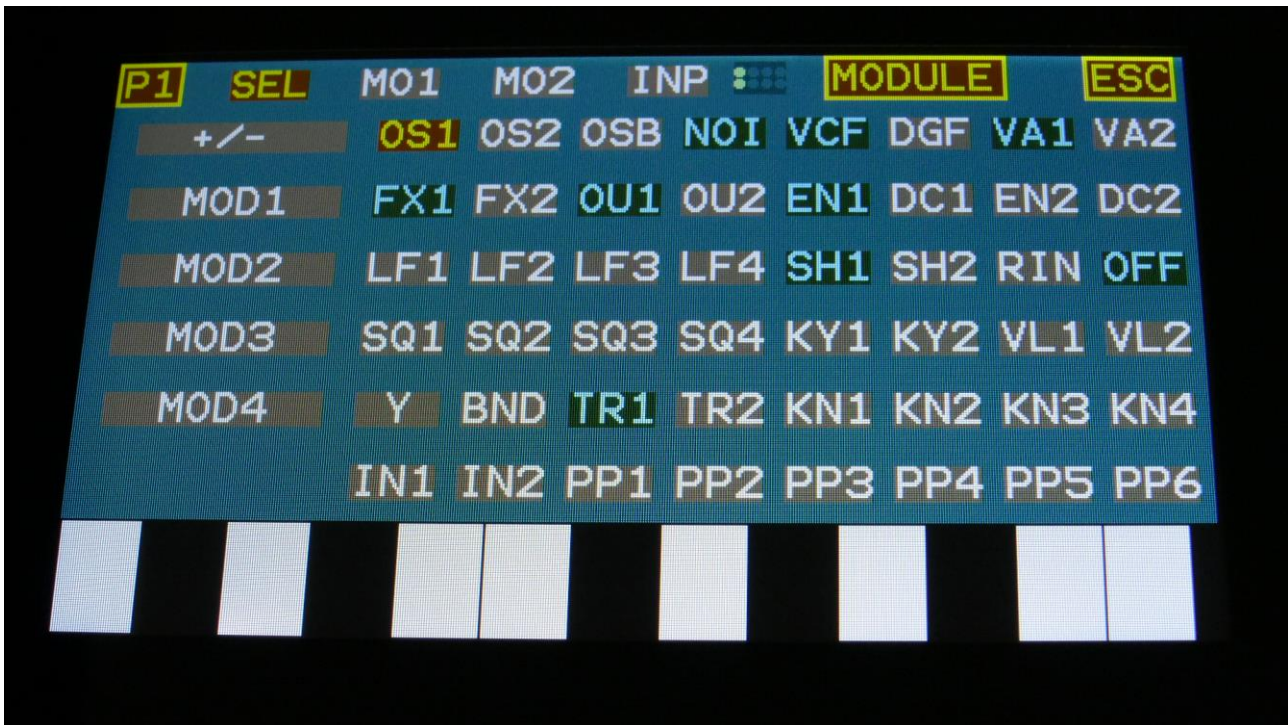
SEL, MO1, MO2, INP: Overview mode selection.

SEL lets you select a module. You can then touch **MO1, MO2 and INP**, to select sources for the selected module inputs, and you can touch **MODULE**, to jump directly to the parameters of the selected module.

MO1, MO2 and INP lets you connect other modules to the selected modules modulation and audio inputs, in combination with **MOD1, MOD2, MOD3 and MOD4**.

MOD1, MOD2, MOD3, MOD4: Each modulation and input page has up to 4 connections. When the **MO1, MO2 and INP** modes are selected, these touch buttons lets you select which of the 4 input sources, you would like to monitor and/or set. When an input is selected, simply touch the module, which you would like to connect to this input.

+/-: After a source has been selected for a modulation or audio input, touch this button to invert/un-invert the signal of the source.

MODULE: Will take you directly to the parameter pages of the currently selected module. When you exit the module parameters, you will be taken back to the Overview page.

ESC: Escape. Will exit from the Overview page, to the Synth Modules page.

OS1, OS2, OSB: Oscillator 1, 2 and B. Modulation inputs can be set for these, but they have no audio inputs. Can be selected as sources for any inputs.

NOI: White Noise. This module can't be selected by itself, since it has no parameters or inputs, but it can be selected as the source for any inputs.

VCF: Analog Filter. Modulation and audio inputs can be set for this, and it can be selected as the source for any inputs.

DGF: Digital Gotharman Filter. Modulation and audio inputs can be set for this, and it can be selected as the source for any inputs.

VA1, VA2: VCA 1 and 2. Modulation and audio inputs can be set for these, and they can be selected as the sources for any inputs.

FX1, FX2: Effect 1 and 2. Modulation and audio inputs can be set for these, and they can be selected as the sources for any inputs.

OU1, OU2: Audio Output 1 and 2. Modulation (pan) and audio input can be set for these, but they can't be selected as the sources for any inputs, since their outputs only goes directly to the main stereo outputs.

EN1, EN2: ADSR Envelopes 1 and 2. Modulation inputs can be set for these, but they have no audio inputs. Can be selected as sources for any inputs.

DC1, DC2: Decay Envelopes 1 and 2. These have no modulation inputs and no audio inputs, so they can only be selected as sources for any other inputs.

LF1, LF2, LF3, LF4: LFO1, 2, 3 and 4. Modulation inputs can be set for these, but they have no audio inputs. Can be selected as sources for any inputs.

SH1, SH2: Sample/Hold generators 1 and 2. Modulation inputs can be set for these, but they have no audio inputs. Can be selected as sources for any inputs.

RIN: Ring Modulator. Modulation inputs can be set for these, but even though these are great for audio processing, all connections are done on the modulation inputs. Can be selected as source for any inputs.

OFF: Not a module by itself. Can only be selected to switch off any modulation or audio input.

SQ1, SQ2, SQ3, SQ4: Group Sequencer controller track 1, 2, 3 and 4. Does not have any modulation or audio inputs, but can be selected to jump directly to the controller track pages, and can be selected as the sources for any inputs.

KY1, KY2: Keyboard inputs 1 and 2. These can't be selected by themselves, since they have no parameters or inputs, but they can be selected as sources for any inputs.

VL1, VL2: Velocity inputs 1 and 2. These can't be selected by themselves, since they have no parameters or inputs, but they can be selected as sources for any inputs.

Y: Touch Screen Keyboard Y modulation. This can't be selected by itself, since it has no parameters or inputs, but it can be selected as the source for any inputs.

BND: Latest received Pitch Bend Value. This can't be selected by itself, since it has no parameters or inputs, but it can be selected as the source for any inputs.

TR1, TR2: Trigger 1 and 2. These can't be selected by themselves, since they have no parameters or inputs, but they can be selected as sources for any inputs.

KN1, KN2, KN3, KN4: Knobs 1, 2, 3 and 4. These can't be selected by themselves, since they have no parameters or inputs, but they can be selected as sources for any inputs.

IN1, IN2: Audio Inputs 1 and 2. These can't be selected by themselves, since they have no parameters or inputs, but they can be selected as sources for any inputs.

PP1, PP2, PP3, PP4, PP5, PP6: Patch Points 1, 2, 3, 4, 5 and 6. These can be selected, to route signals to the Patch Points, and they can be selected as sources for any inputs.

OSC – Oscillators
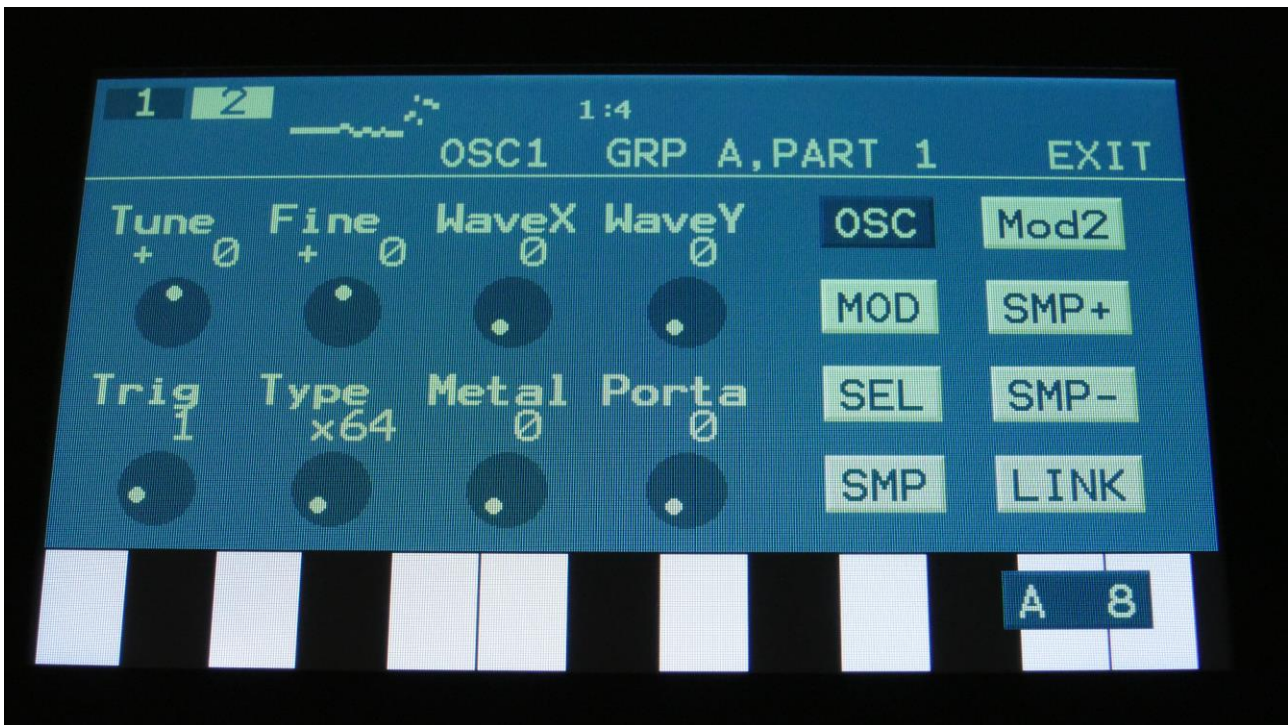
Each group has 2 of these oscillators (8 in total), which can run in several different modes, for maximum flexibility. The outputs of the oscillators can be connected to any audio and modulation inputs. To select a specific oscillator, first select the group/part, and then touch the numbers in the upper right corner.

On the Oscillator SEL page, various oscillator modes can be selected:

-Osc: Various oscillator types, including percussion and resonator types. Described a bit below. Tune, wave, PW and other parameters can be adjusted and modulated.

-Smp: Sample Playback. Pitch, sample start, sample length, chop point select and portamento can be adjusted and modulated.

-ChKy: Chopped sample keyboard. The chop points of the selected sampling, will be spread over the keyboard. Pitch, sample start, sample length, chop point select and portamento can be adjusted and modulated.

-Noise: Pitched noise generator. Pitch and PW can be adjusted and modulated.

-**Wtbl**: Wavetable oscillator (Only oscillator 1 in each group). Plays back 32 KB wavetables with 8 or 64 single cycle waveforms. Morphs smoothly between each cycle. WaveX, WaveY, Metal and portamento can be adjusted and modulated.

Any wav file held in the sample bank(s) can be selected and used as a wavetable. Wavetables can be imported to the sample banks, and edited/created using the wavetable editor.

When Osc has been selected as the oscillator mode, several oscillator types are available:

-**Type1** : Morphs between sine wave, triangle wave, sawtooth wave, pulse wave and feedback wave. PW works on all waveforms. Pitch, wave. PW and portamento can be modulated. This oscillator type has a fat sound, without any aliasing.

-**Type2** : Morphs between sine wave, triangle wave, sawtooth wave, pulse wave and feedback wave. PW works on all waveforms. Pitch, wave, PW and portamento can be modulated. This oscillator type has a more organic sound than type1, and the pitch tracking on the higher notes are more smooth and precise.

-**Reso**: Resonator oscillator. An oscillator that is partly generated by a special Gotharman engineered filter, that has multiple resonances in its feedback path. Great for emulating string instruments, and for new synthetic sounds. Morphs between sine wave, triangle wave, sawtooth wave, pulse wave and feedback wave. PW works on all waveforms and Reso, the amount of resonances, can be adjusted. Pitch, wave, reso, PW and portamento can be modulated.

-**Perc, Prc2, Prc3** : Percussion oscillators. Special oscillators for creating drum sound. Each of the 3 models has different characteristics. Detune, attack, noise amount, PW and portamento can be adjusted and modulated.

-**Cymb, Cym2** : Cymbal oscillators. Special oscillators for creating hihat, cymbal and other metallic sounds. Cym2 are a bit more aggressive than Cymb. Detune, FM, PW and portamento can be adjusted and modulated.

-**Clap**: Hand Clap oscillator. A noise source controlled by a special hand clap envelope, to emulate the classic hand clap sounds. Tune, detune, PW, clap envelope amount and portamento can be adjusted and modulated.

On the following pages, the different oscillator mode parameters will be described in detail.

Oscillator parameters

The OSC page, when in oscillator mode
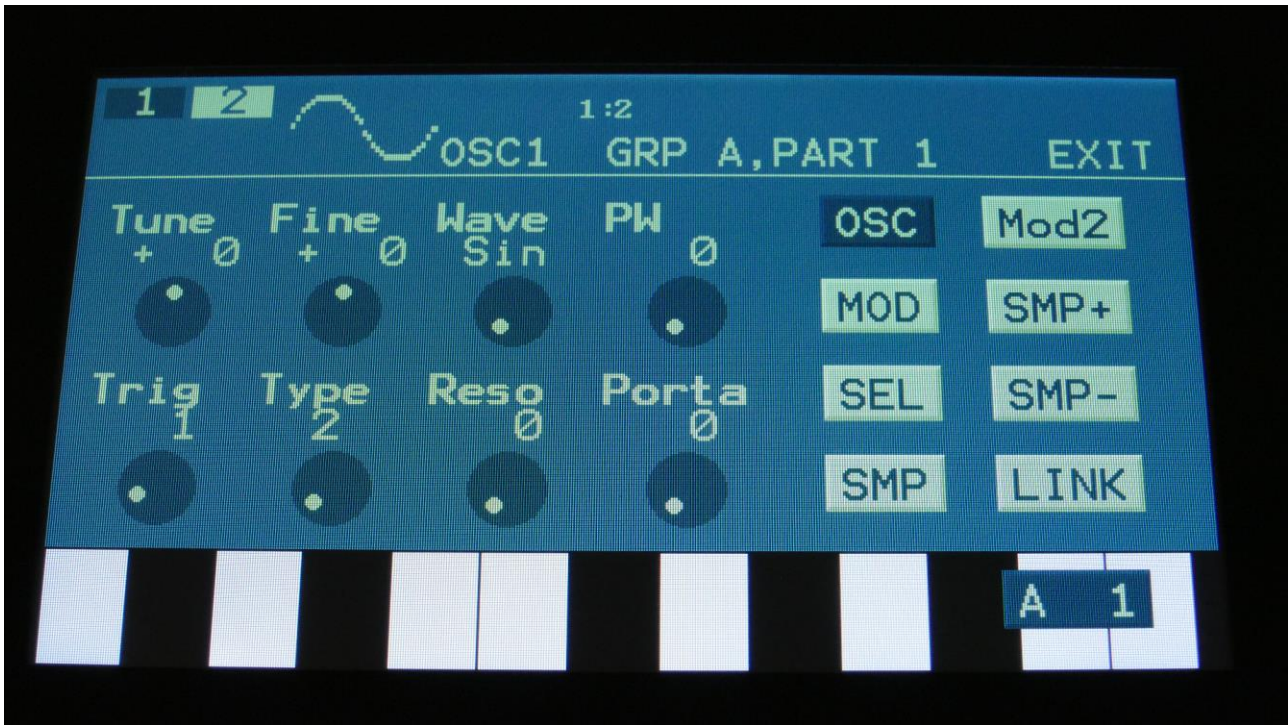
In the upper left corner of the oscillator page, the currently generated waveform is shown.

Touch the buttons named OSC, MOD, SEL, SMP and Mod2, to enter other oscillator pages, like Modulation and oscillator/sampler/noise/Wavetable mode select.
Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Tune: Adjust the basic pitch in semitones. Range: -64 to + 63.

Fine: Fine tuning of the pitch. Range: -256 to +255.

Wave: This parameter lets you morph between sine, triangle, saw, pulse and feedback waves.

PW: Adjusts the pulse width of the waveform. Unlike many other oscillator designs, the pulse width can be adjusted on all of Zaturn's waveforms, not just the pulse wave.

Trig: Sets the part number, inside the group, which will send note values to the oscillator. Range: Off, 1-2.

Type: Sets the oscillator type. Choices are:
1: Bright oscillator. This oscillator has a bright tone with a high harmonic content. Great for advanced filtering sounds. The pitch modulation in the upper notes is though not super smooth.
2: Smooth oscillator. This oscillator has a very smooth sound, and the pitch modulation is smooth over the whole note range. Great for lowpass filtered and natural sounding sounds.
Reso: Resonator oscillator. An oscillator that is partly generated by a special Gotharman engineered filter, that has multiple resonances in its feedback path. Great for emulating string instruments, and for new synthetic sounds.
Perc, Prc2, Prc3: Percussion oscillators 1, 2 and 3.
Cymb, Cym2: Cymbal oscillators.
Clap: Hand clap oscillator.

Reso: The amount of resonances fed back, when the resonator oscillator is selected. The higher this parameter is set, the more resonances are fed back into the oscillator. Even at setting zero, some resonances are fed back. Range: 0 to 511.

Porta: Portamento. The more this is turned up, the slower the oscillator pitch will slide from one note to another. Range: 0 to 511.

The OSC page, when Perc, Prc2 or Prc3 is selected as type
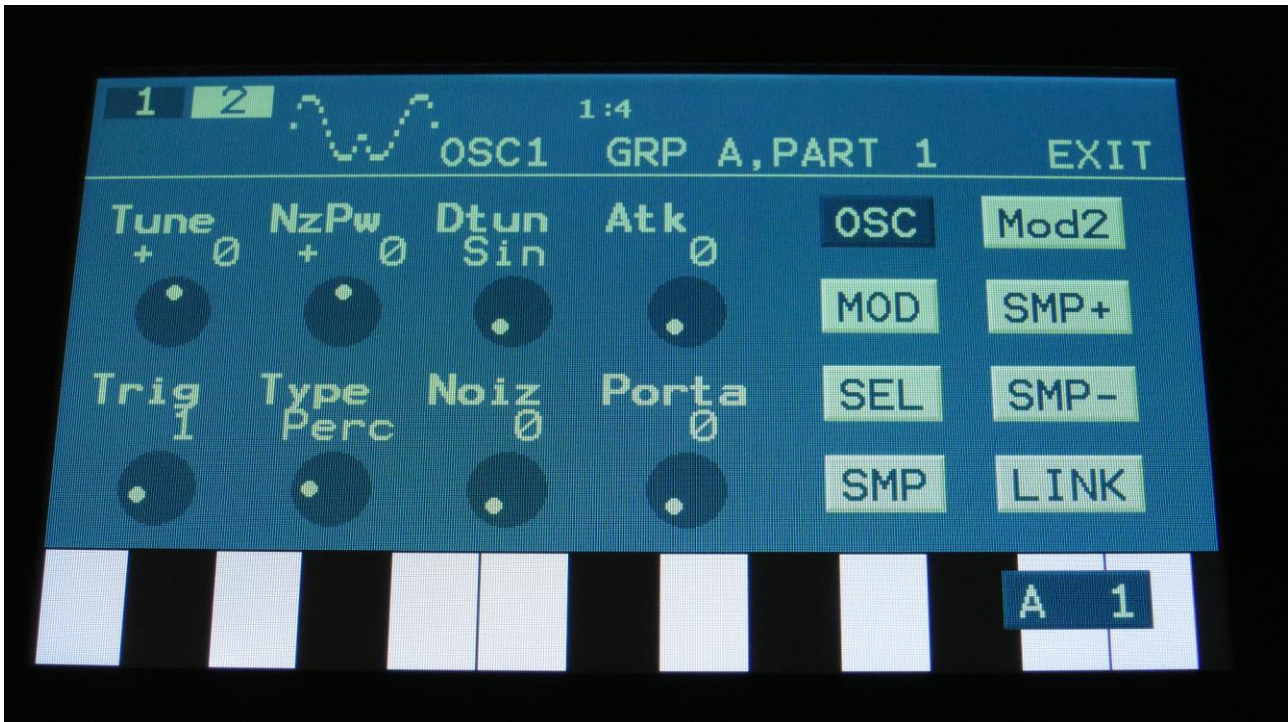
In the upper left corner of the oscillator page, the currently generated waveform is shown.

Touch the buttons named OSC, MOD, SEL, SMP and Mod2, to enter other oscillator pages, like Modulation and oscillator/sampler/noise/Wavetable mode select.
Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Tune: Adjust the basic pitch in semitones. Range: -64 to + 63.

NzPw: Sets the intensity of the FM noise. Range: -256 to +255.

Dtun: Detunes percussion wave 2 from percussion wave 1. Value 0 to 511.

Atk: Will morph from the percussion waves body (0) to the percussion waves attack (511). Modulate this parameter with an envelope, to imitate the strike of a drum. Value 0 to 511.

Trig: Sets the part number, inside the group, which will send note values to the oscillator. Range: Off, 1-2.

Type: Sets the oscillator type. Choices are:
1: Bright oscillator. This oscillator has a bright tone with a high harmonic content. Great for advanced filtering sounds. The pitch modulation in the upper notes is though not super smooth.
2: Smooth oscillator. This oscillator has a very smooth sound, and the pitch modulation is smooth over the whole note range. Great for lowpass filtered and natural sounding sounds.
Reso: Resonator oscillator. An oscillator that is partly generated by a special Gotharman engineered filter, that has multiple resonances in its feedback path. Great for emulating string instruments, and for new synthetic sounds.
Perc, Prc2, Prc3: Percussion oscillators 1, 2 and 3.
Cymb, Cym2: Cymbal oscillators.
Clap: Hand clap oscillator.

Noiz: Adds noise FM to modulate the pitch of the percussion waves. Range: 0 to 511.

Porta: Portamento. The more this is turned up, the slower the oscillator pitch will slide from one note to another. Range: 0 to 511.

The OSC page, when Cymb or Cym2 is selected as type
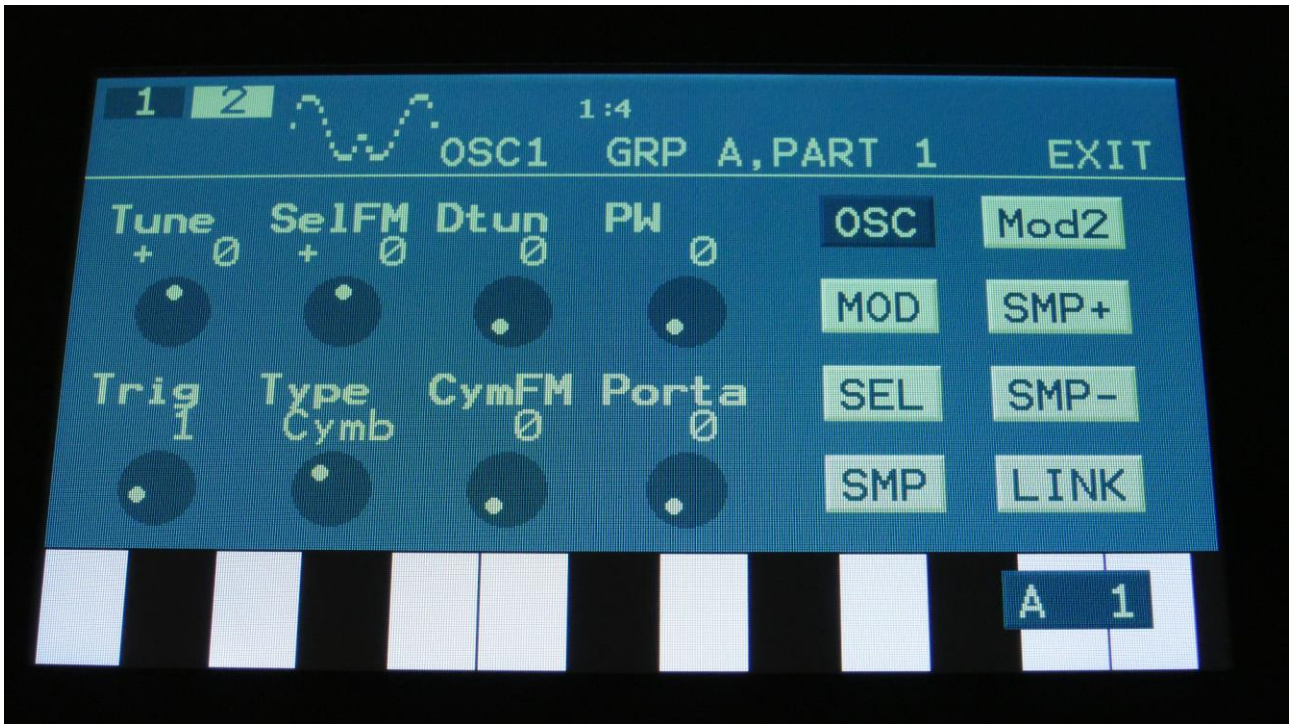
In the upper left corner of the oscillator page, the currently generated waveform is shown.

Touch the buttons named OSC, MOD, SEL, SMP and Mod2, to enter other oscillator pages, like Modulation and oscillator/sampler/noise/Wavetable mode select.
Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Tune: Adjust the basic pitch in semitones. Range: -64 to + 63.

SelFM: Sets self FM amount of the first square wave oscillator (A modulator). Range: -256 to +255.

Dtun: Sets self FM amount of the first square wave oscillator (A modulator). Value 0 to 511.

PW: Sets the pulse width of all square waves. Value 0 to 511.

Trig: Sets the part number, inside the group, which will send note values to the oscillator. Range: Off, 1-2.

Type: Sets the oscillator type. Choices are:

1: Bright oscillator. This oscillator has a bright tone with a high harmonic content. Great for advanced filtering sounds. The pitch modulation in the upper notes is though not super smooth.

2: Smooth oscillator. This oscillator has a very smooth sound, and the pitch modulation is smooth over the whole note range. Great for lowpass filtered and natural sounding sounds.

Reso: Resonator oscillator. An oscillator that is partly generated by a special Gotharman engineered filter, that has multiple resonances in its feedback path. Great for emulating string instruments, and for new synthetic sounds.

Perc, Prc2, Prc3: Percussion oscillators 1, 2 and 3.

Cymb, Cym2: Cymbal oscillators.

Clap: Hand clap oscillator.

CymFM: Set the FM amount between the square wave oscillators. Range: 0 to 511.

Porta: Portamento. The more this is turned up, the slower the oscillator pitch will slide from one note to another. Range: 0 to 511.

The OSC page, when Clap is selected as type
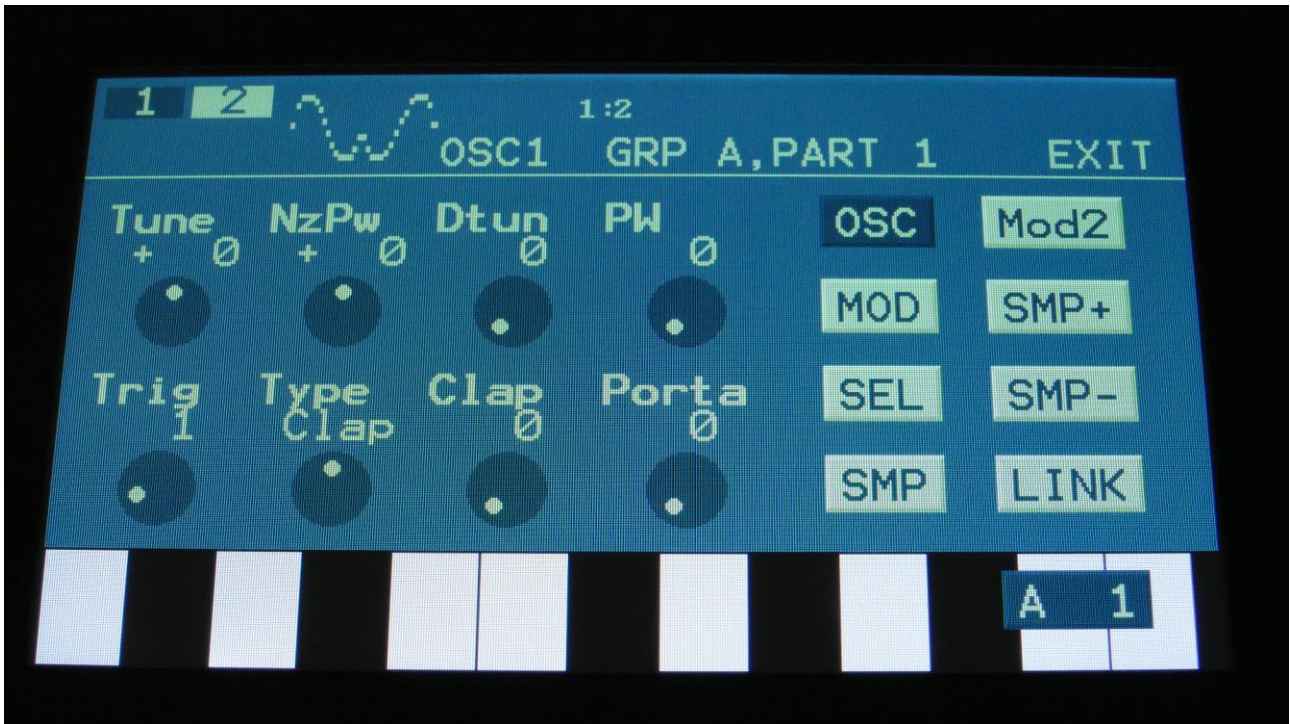
In the upper left corner of the oscillator page, the currently generated waveform is shown.

Touch the buttons named OSC, MOD, SEL, SMP and Mod2, to enter other oscillator pages, like Modulation and oscillator/sampler/noise/Wavetable mode select.
Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Tune: Value -64 to +63. When the Clap oscillator is selected, the Tune parameter sets the speed of the clap envelope.

NzPw: Value -256 to +255. Sets the intensity of the Clap noise.

Dtun: Value 0 to 511. Detunes the noise sound.

PW: Value 0 to 511. Sets the pulse width of a square wave, that is placed on top of the noise signal. 0: No square wave is added.

Trig: Sets the part number, inside the group, which will send note values to the oscillator. Range: Off, 1-2.

Type: Sets the oscillator type. Choices are:
1: Bright oscillator. This oscillator has a bright tone with a high harmonic content. Great for advanced filtering sounds. The pitch modulation in the upper notes is though not super smooth.
2: Smooth oscillator. This oscillator has a very smooth sound, and the pitch modulation is smooth over the whole note range. Great for lowpass filtered and natural sounding sounds.
Reso: Resonator oscillator. An oscillator that is partly generated by a special Gotharman engineered filter, that has multiple resonances in its feedback path. Great for emulating string instruments, and for new synthetic sounds.
Perc, Prc2, Prc3: Percussion oscillators 1, 2 and 3.
Cymb, Cym2: Cymbal oscillators.
Clap: Hand clap oscillator.

Clap: Value 0 to 511. Sets how much the clap envelope should shape the noise signal.

Porta: Portamento. The more this is turned up, the slower the oscillator pitch will slide from one note to another. Range: 0 to 511.

The OSC page, when in Sampler and Chopped Keyboard modes
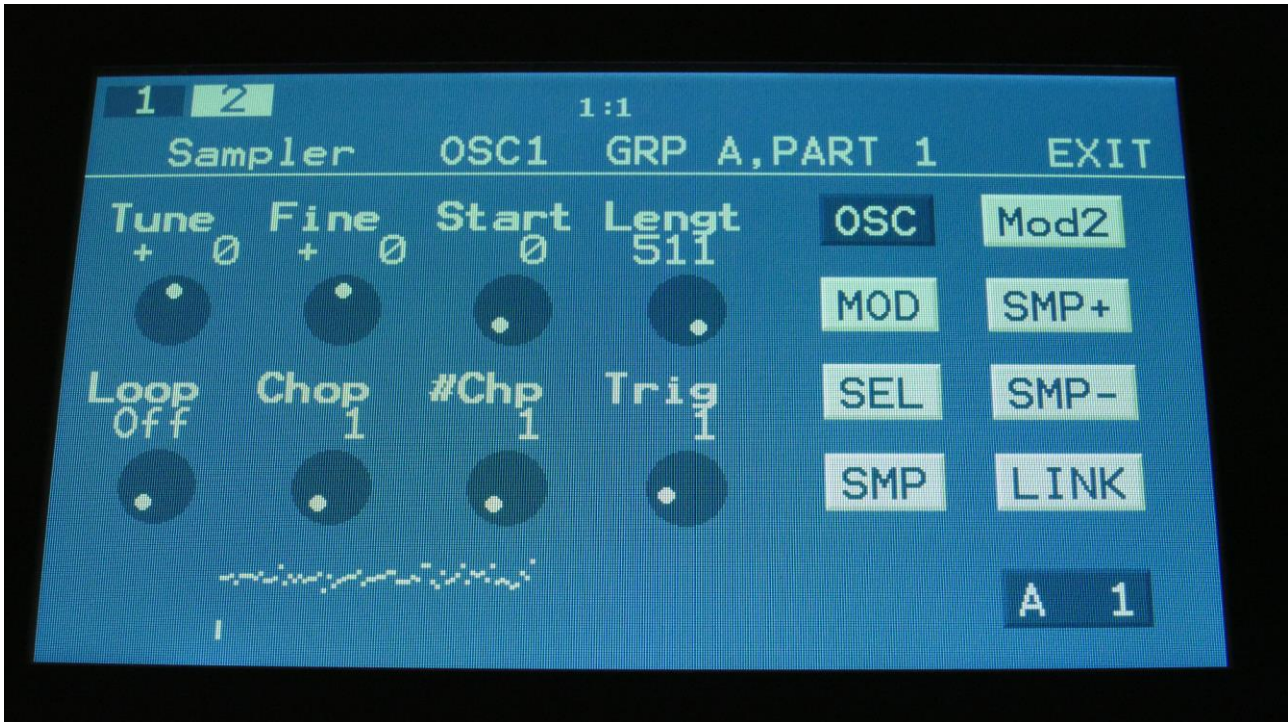
In the bottom of the sampler page, the selected samplings waveform is shown in rough graphics. When the sample, or part of it, is played back, the small black line below the waveform will show the current playback point.

Touch the buttons named OSC, MOD, SEL, SMP and Mod2, to enter other oscillator pages, like Modulation and oscillator/sampler/noise/Wavetable mode select. Touch the SMP+ and SMP- to quick select sample 1/Wavetable. The sample number is shown right below these touch buttons. Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Tune: Adjust the basic pitch in semitones. Range: -64 to + 63.

Fine: Fine tuning of the pitch. Range: -256 to +255.

Start: The sample start point. Selects at what point the sample will start to play back, when it is triggered. Range: 0 to 511, stretching over the whole sampling.

Length: Sets how much of the sampling should be played back. Range: 0 to 511, stretching over the whole sampling.

Loop: Sets the sampling loop mode.

Off: The sample will not loop, just play back one time from the adjusted, or chop selected, start to end, and then stop. If the selected sampling has chop points, these will always be used.

On: The sample will play back from the adjusted start point, when triggered. When it reaches the adjusted end point, it will loop back to the start point, and play back the sample over and over again. If the selected sampling has chop points, these will always be used for the loop points.

Sust: When you hit a key, playback of the sampling starts at the sample startpoint.

When the playback reaches the endpoint of the selected chop, it loops back to the chop startpoint, and keeps looping between the chop start and end point, until a key is pressed again.

OfUc: Off, unchopped**.** The sample will not loop, just play back one time from the adjusted start to end, and then stop. Chop points will be ignored.

OnUc: On, unchopped. The sample will play back from the adjusted start point, when triggered. When it reaches the adjusted end point, it will loop back to the start point, and play back the sample over and over again. Chop points will be ignored.

Free: Free running sampling. Setting the sample oscillator in this mode, will make the sample constantly play back and loop. When the oscillator is trigged, the sample will not be reset and play back from the start, it will just continue playing back. This will make the sampler work as a complex oscillator.

REGARDING THE GOOD "OLD" TOGGLE MODE: On Zaturn the toggle mode is not only available for sample playback. This mode, where a trigger button can start and stop the playback of a part is available for any oscillator type on Zaturn ☺ Please see the "Play" parameter in the TRIG section.

Chop: If chop points has been generated for the selected sampling, a chop can be selected by setting this parameter. If the #Smp parameter on the SEL page is set to 2 or 4 samplings, this parameter will also select which of the 2 or 4 samplings, that will play back, and the chop points for sample 2 to 4. Range: 0 to 63 for sample 1, 64 to 128 for sample 2, 129 to 192 for sample 3, 193 to 255 for sample 4.

In chopped keyboard sample mode, this parameter and the chop modulation selects one of the 4 selected samplings, which will have its chops spread over the keyboard range.

0-63: Sample 1, 64-127: Sample 2, 128-191: Sample 3, 192-255: Sample 4.

This parameter can be morphed and modulated in most modes, but not in Xfade mode. In Xfade mode, the #Smp parameter are ignored, and set at the fixed value of 4 samplings.

#Chp: The number of Chops to be played back in a row. Range: 1 to 64.

Trig: Sets the part number, inside the group, which will send note values to the oscillator. Range: Off, 1-2.

The OSC page, when in Wavetable mode
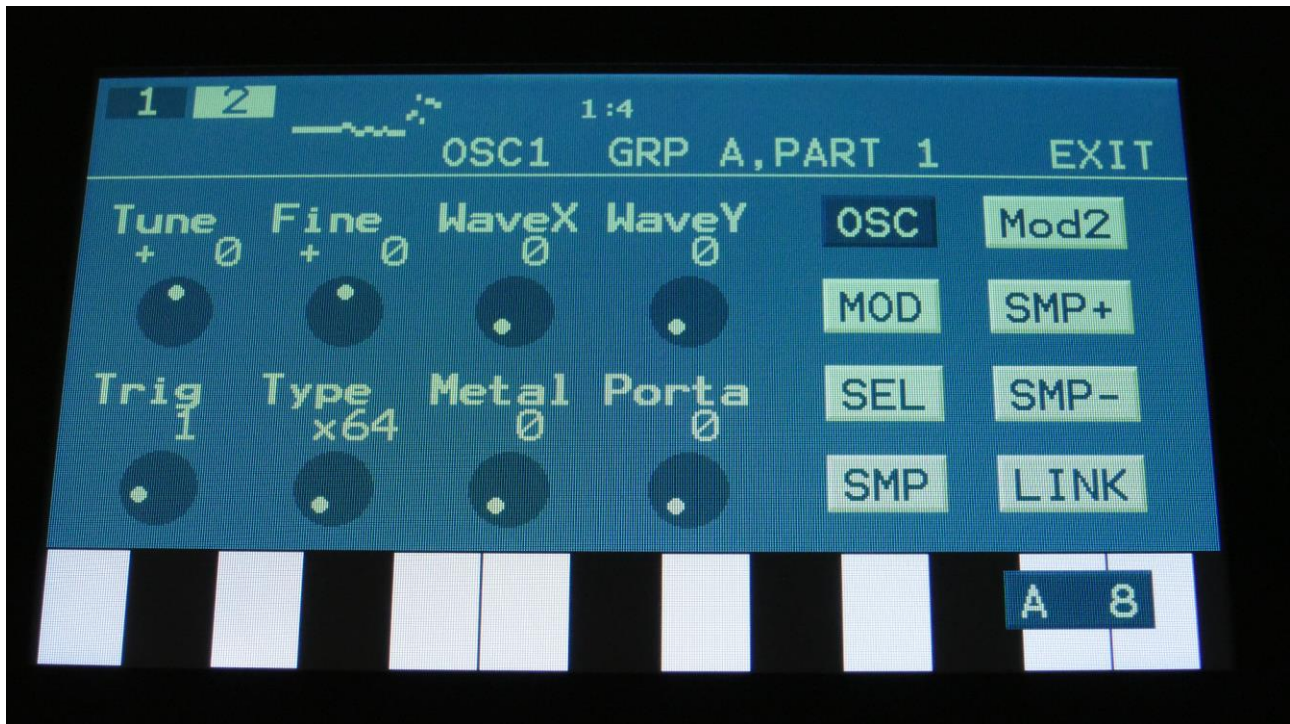
In the upper left corner of the oscillator page, the currently generated waveform is shown.

Touch the buttons named OSC, MOD, SEL, SMP and Mod2, to enter other oscillator pages, like Modulation and oscillator/sampler/noise/Wavetable mode select. Touch the SMP+ and SMP- to quick select sample 1/Wavetable. The sample number is shown right below these touch buttons. Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Tune: Adjust the basic pitch in semitones. Range: -64 to + 63.

Fine: Fine tuning of the pitch. Range: -256 to +255.

WaveX: Wave Morph X. When wavetable type is set to x64 (64 waves), this parameter morphs between the 8 waves on the X axis of an 8x8 wave matrix. When wavetable type is set to x8 (8 waves), this parameter morphs between the 8 waves. Range: 0 to 511.

WaveY: Wave Morph Y/Wavefolding. When wavetable type is set to x64 (64 waves), this parameter morphs between the 8 waves on the Y axis of an 8x8 wave matrix. When wavetable type is set to x8 (8 waves), this parameter adds a sort of wavefolding to the waves. Range: 0 to 511.

Trig: Sets the part number, inside the group, which will send note values to the oscillator. Range: Off, 1-2.

Type: Wavetable type, x64 (64 waves) or x8 (8 waves). Regardless of the selected wavetable or sampling, this can be set to either value. When set to the "wrong" value, the wavetable will sound different, and this might create interesting results.

Metal: Metalizes the wavetable sounds. Range: 0 to 511.

Porta: Portamento. The more this is turned up, the slower the oscillator pitch will slide from one note to another. Range: 0 to 511.

Oscillator modulation

The MOD page, when in oscillator mode
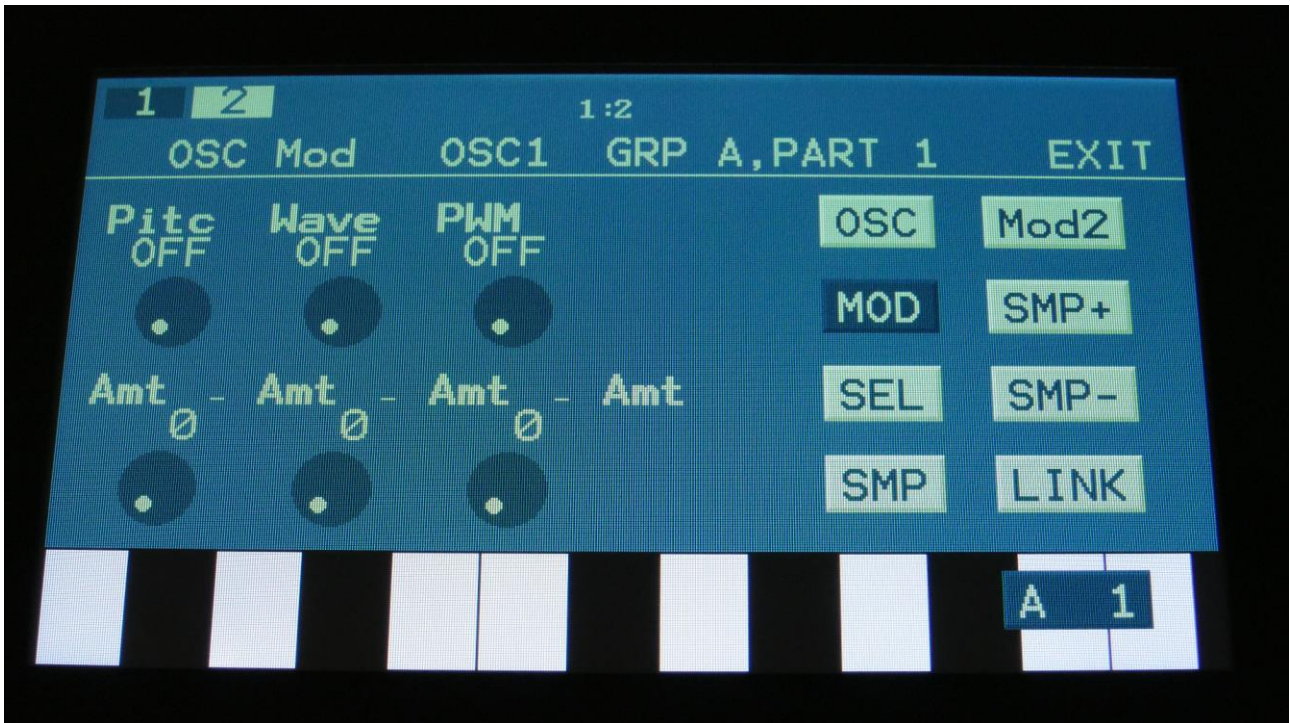
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc: Modulates the oscillator pitch.

Wave: Modulates the wave select morphing.

PWM: Modulates the pulse width of the waveform

The MOD page, when Perc, Prc2 or Prc3 is selected as Type
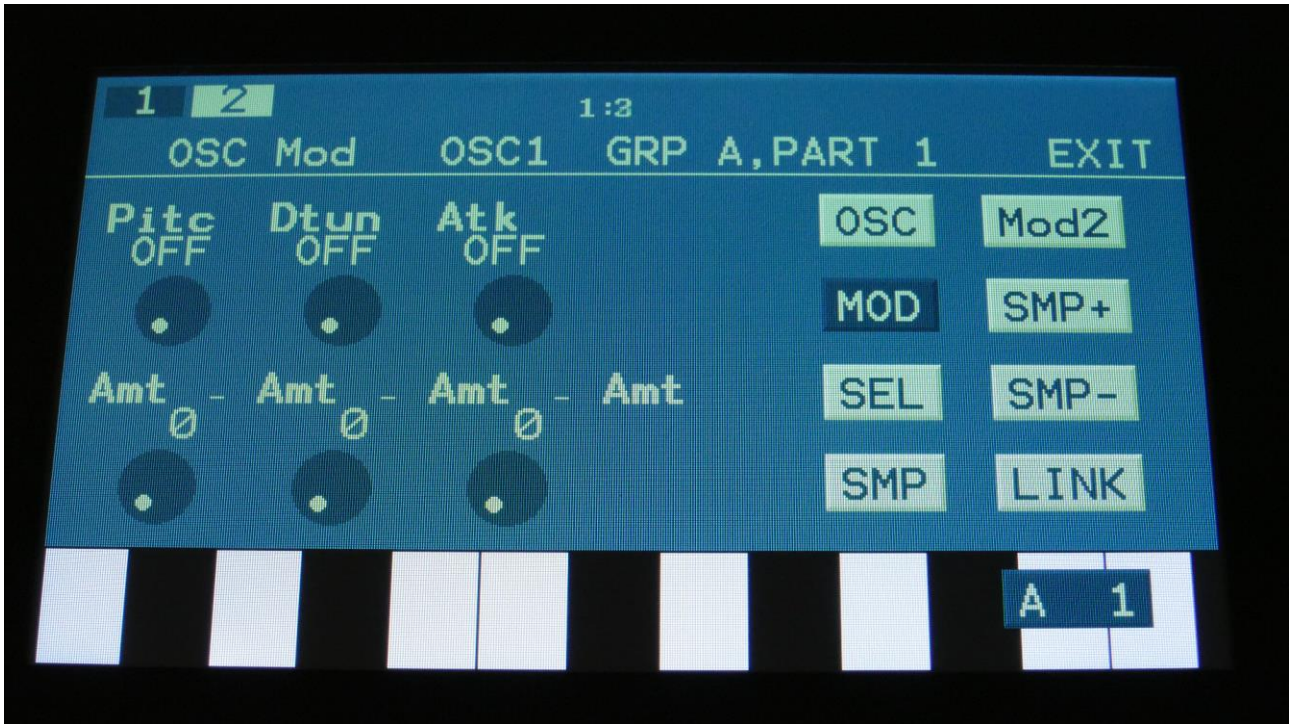
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc: Modulates the oscillator pitch.

Dtun: Modulates the detuning of the 2 percussion waves.

Atk: Modulates the percussion waves morphing between body and attack waves.

The MOD page, when Cymb or Cym2 is selected as Type
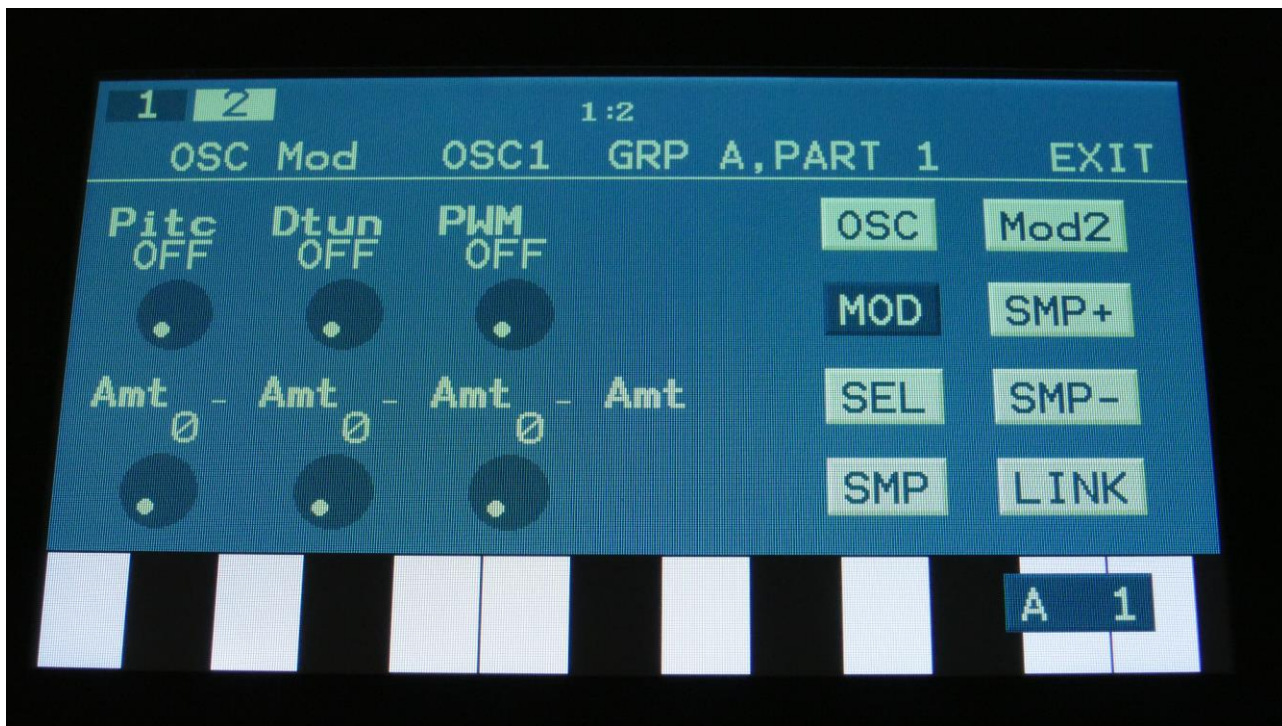
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc: Modulates the oscillator pitch.

Dtun: Modulates the detuning of the square waves.

PWM: Modulates the pulse width of all the square waves.

The MOD page, when Clap is selected as Type
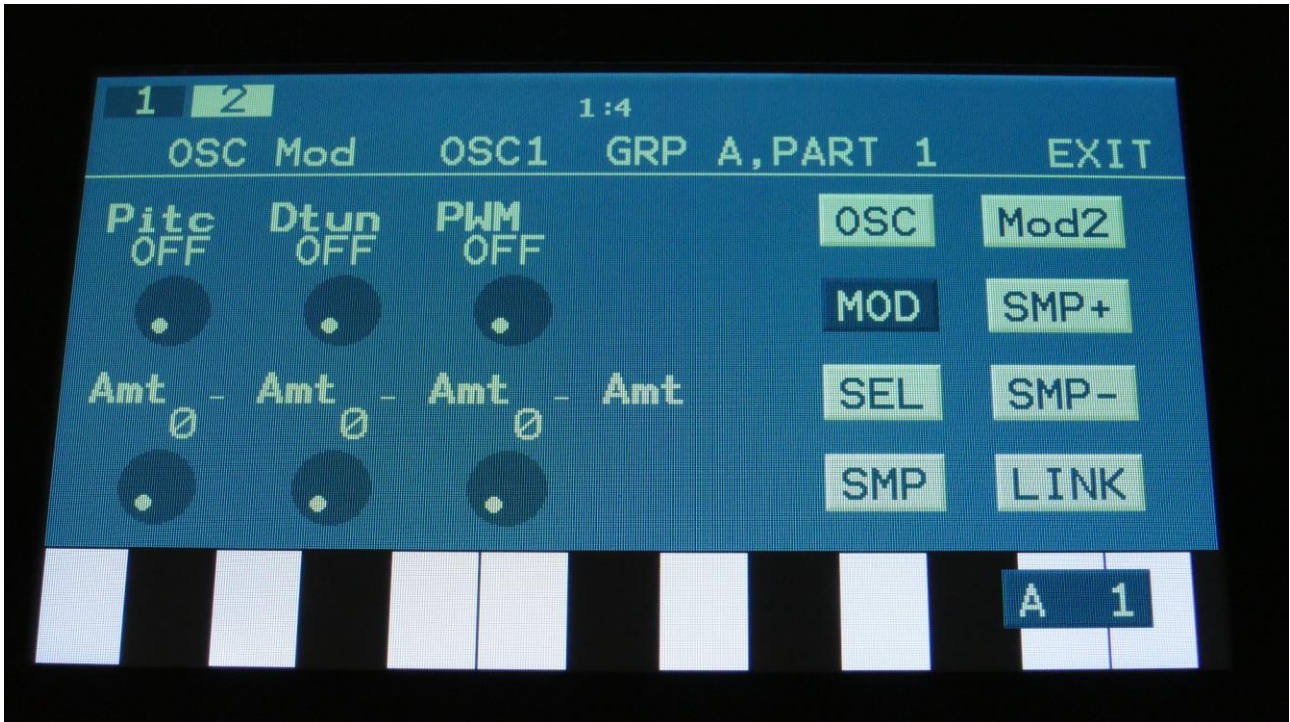
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc: Modulates the clap envelope speed.

Dtun: Modulates the detuning of the noise wave.

PWM: Modulates the pulse width of an added square wave.

The MOD page, when in sampler or chopped keyboard mode
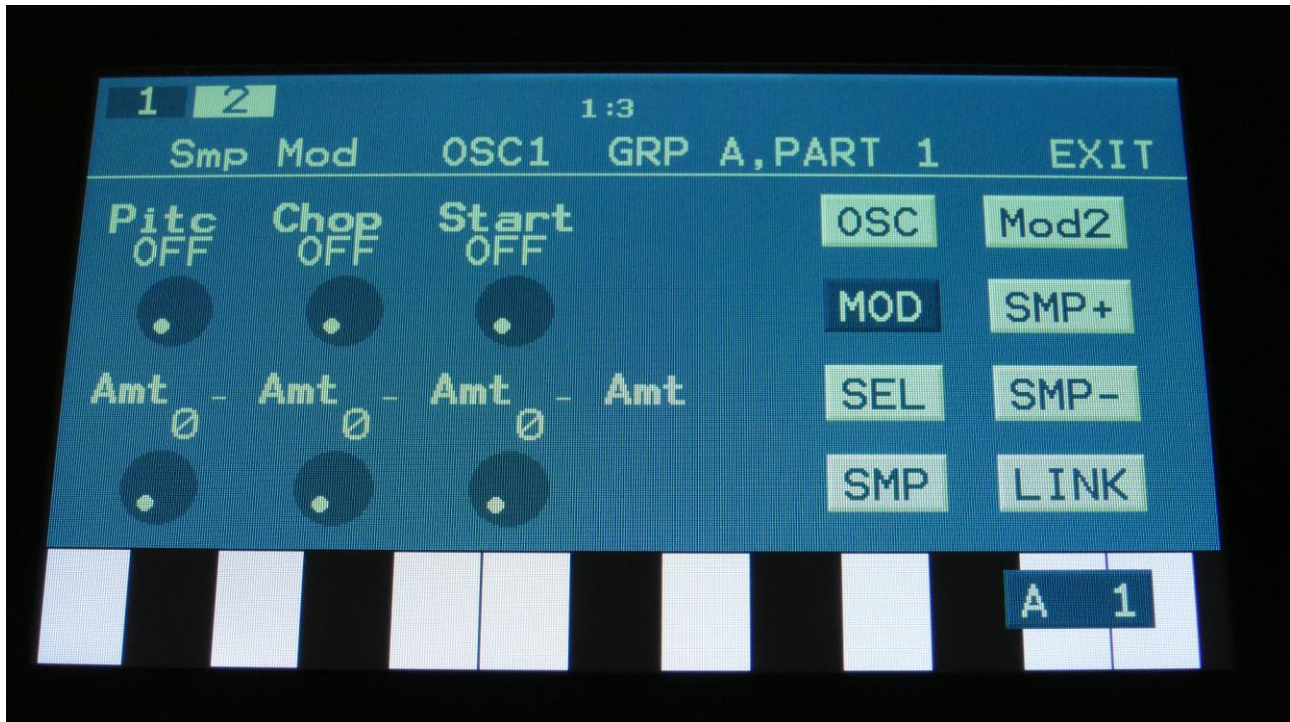
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc: Modulates the sampler pitch.

Chop: Modulates the Chop number select, and sample select if #Smp is set to 2 or 4.

Start: Modulates the sample start point.

The MOD page, when in Wavetable mode
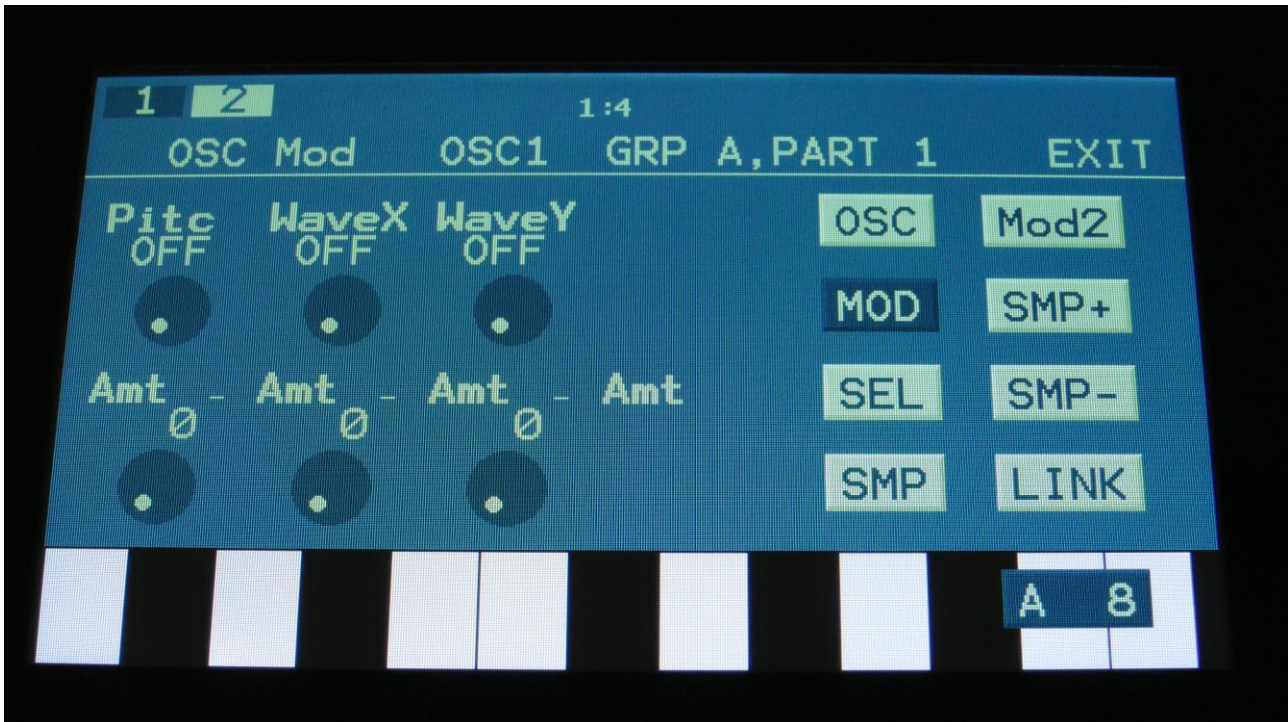
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc: Modulates the oscillator pitch.

WaveX: Modulates the X morph position of the waves.

WaveY: Modulates the Y morph position of the waves in x64 mode, or the wavefolding amount in x8 mode.

Oscillator/Sampler/Chopped Keyboard/Noise/Wavetable mode select

Touch the SEL button, to enter this page.
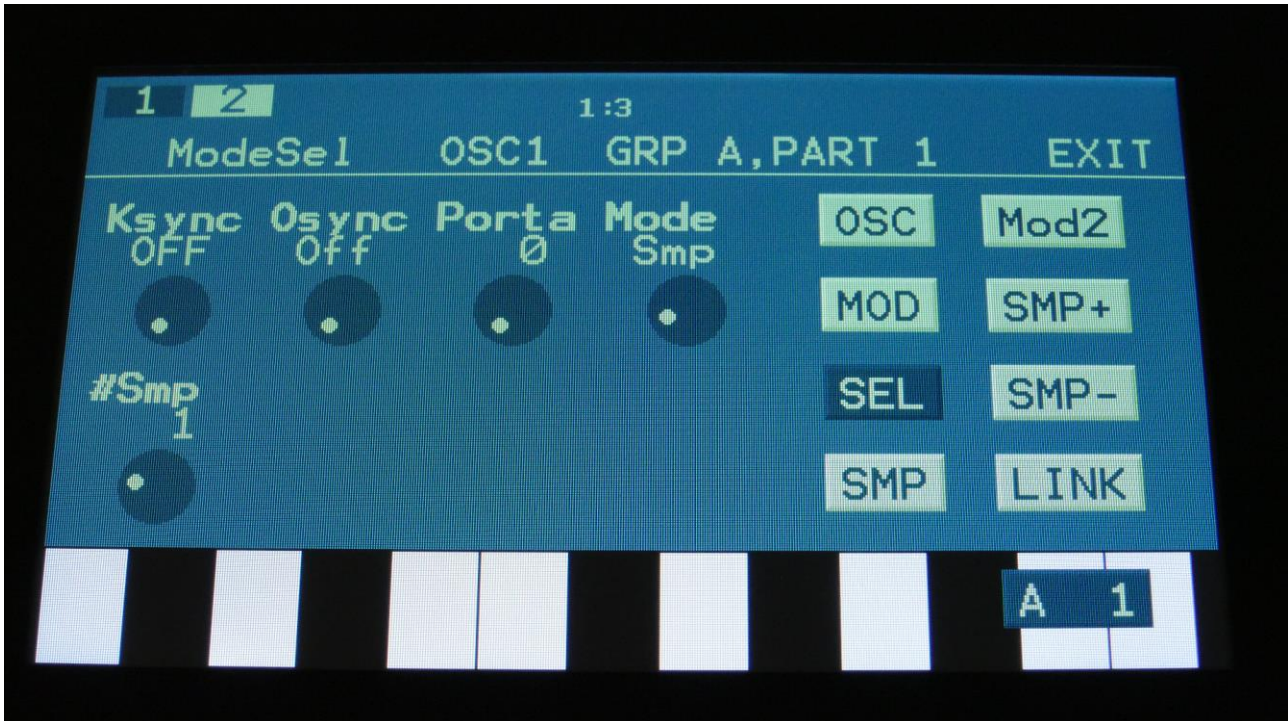
Ksync: Key Sync (Oscillators only). Can be set to off, or to a specific amount between 1 and 511, which indicates the start point of the oscillator waveform, that is the point at where the waveform generation will start, every time the oscillator is trigged from the part trigger.

Osync: Oscillator sync (Oscillators only). This can be set to off (no oscillator sync), or the currently selected oscillator can be set to synchronize to any of the other 7 oscillators, to create the classic oscillator sync effect.

Porta: Sampler Portamento. The more this is turned up, the slower the sampler pitch will slide from one note to another. Range: 0 to 511.

Mode: Selects whether the part oscillator should act as an oscillator (Osc), a sampler (Smp), a chopped keyboard sampler (ChKy), noise generator (Nois), or wavetable mode (Wtbl).

#Smp: Number of samplings. Sets if the part should use 1, 2 or 4 samplings. The 4 samplings are selected on the SMP page, and the samplings can be selected, using the Chop parameter on the sampler OSC page. This only affects the sampler and chopped keyboard modes.

Part Samples Select

Touch the SMP button, to enter this page.
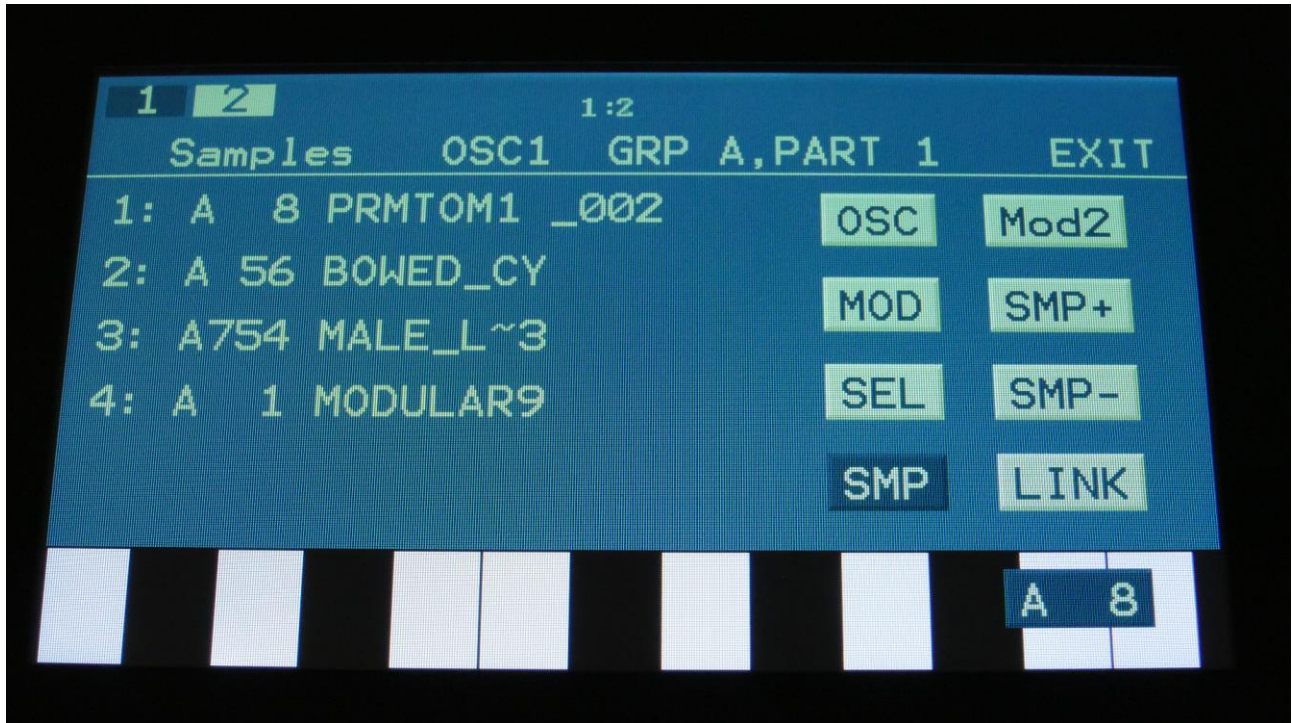
Here you can select 4 samplings for the part. The number of these samplings, that are used, is set by the #Smp parameter on the SEL page. The 4 samples can be selected to play back, setting the Chop parameter, and by chop select modulation.

To select a sampling for any of the 4 slots, simply touch the sample name. Now this page will pop up:

On each page you will view 16 of the samplings, that are held in the Zaturn FLASH memory, Bank A, B, C or D. Please notice, that the 18 and 43 minutes models only have Sample Bank A.

Touch A, B, C and D to select the sample bank, touch PREV and NEXT to view the previous or next 16 samplings.

To select a sampling, touch the sample name.

A small red square is shown near the sample name of the sampling, that is the last one, that was added to the bank.

When you have found the right sampling, touch OK to return to the Synth Part Sample Select page.

Oscillator Modulation 2

The Mod2 page, when in oscillator mode
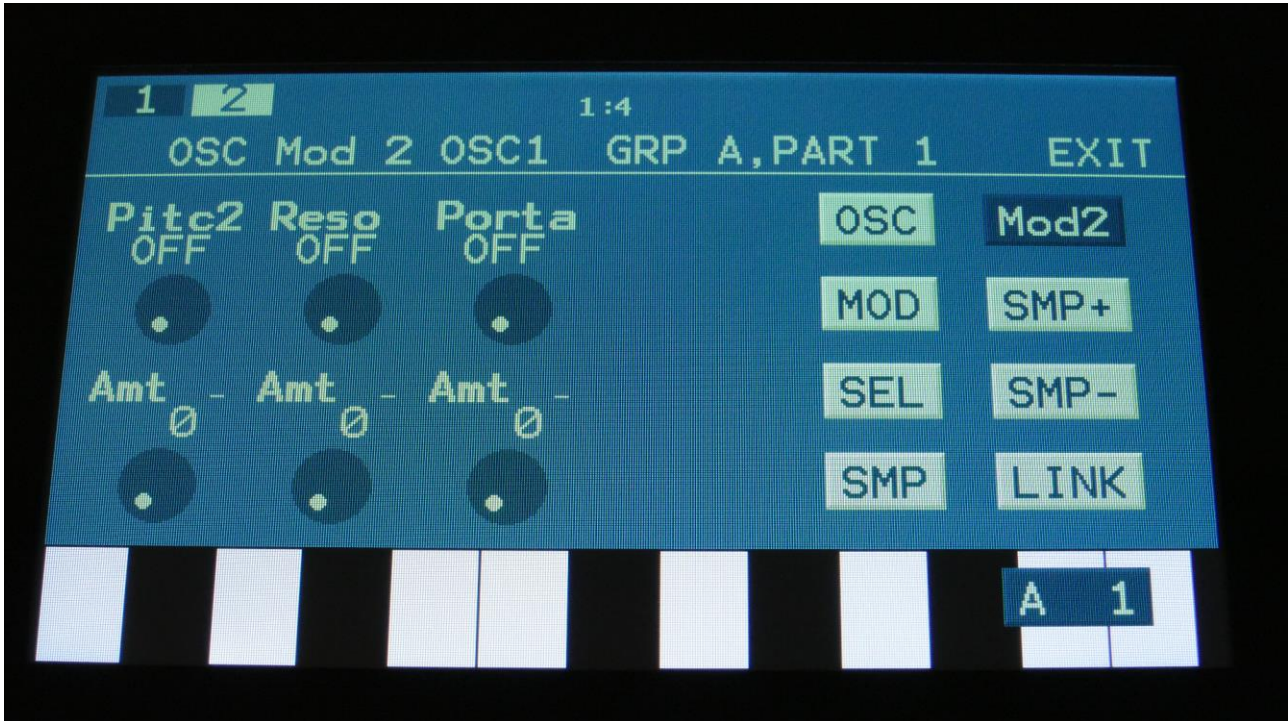
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc2: An extra pitch modulation destination, so that it is possible to modulate the oscillator pitch with 2 modulation sources at the same time. When Osc Type 2 or Reso is selected, this modulation input has a non-linear characteristic, which is optimized for self-FM.

Reso: Will modulate the number of resonances fed back, when oscillator type "Reso" is selected.

Porta: Will modulate the amount of portamento.

The Mod2 page, when Perc, Prc2 or Prc3 is selected as Type
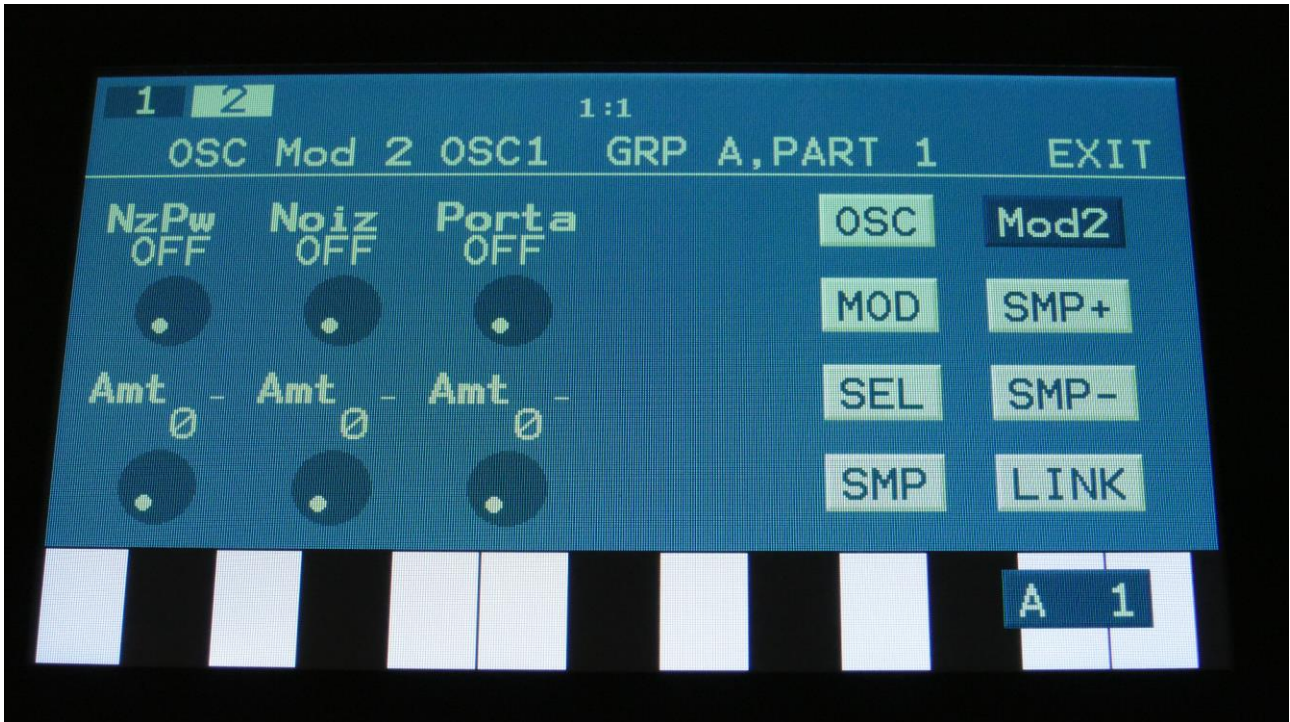
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source, either directly or by group (**Func/Mute / Steps/Part** held), and to adjust the modulation amount. For a complete list of modulation sources, and complete instructions, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

NzPw: Will modulate the FM noise PW.

Noiz: Will modulate the amount of noise FM applied to the percussion waves.

Porta: Will modulate the amount of portamento.

The Mod2 page, when Cymb or Cym2 is selected as Type
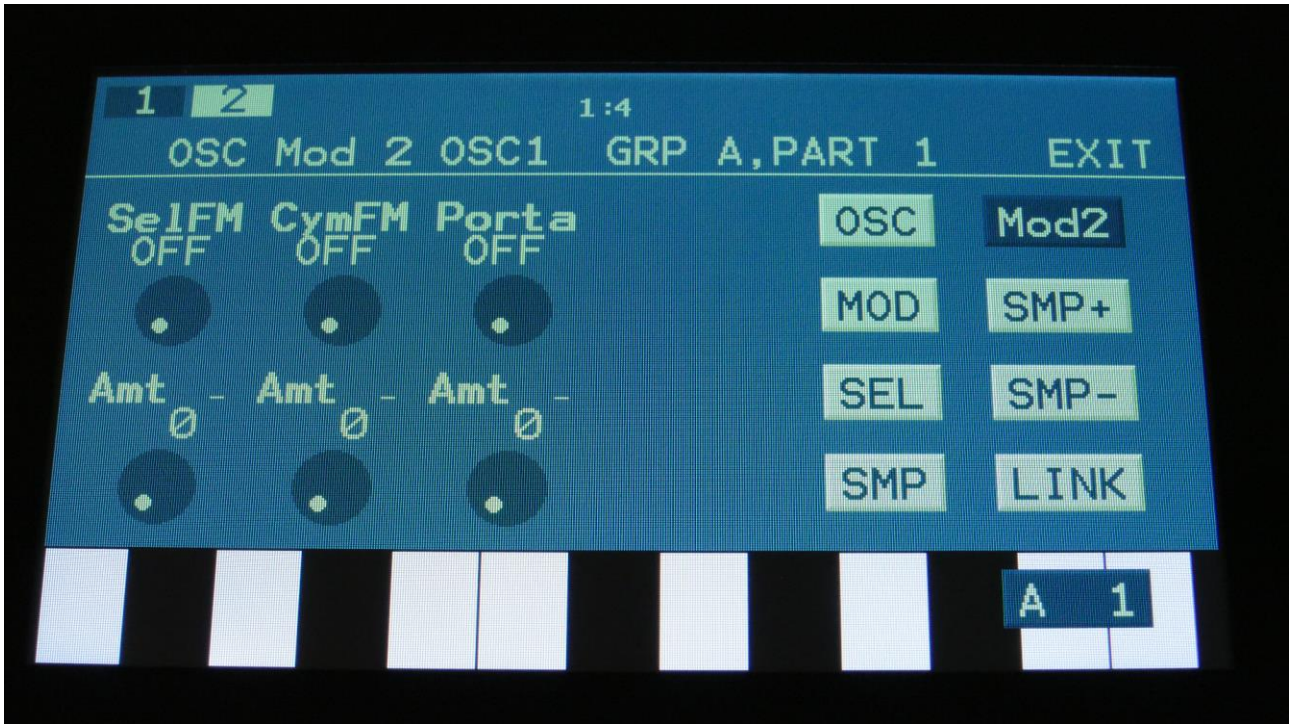
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

SelFm: Will modulate the amount of self-FM applied to the first square wave oscillator.

CymFM: Will modulate the amount of FM applied between the square waves.

Porta: Will modulate the amount of portamento.

The Mod2 page, when Clap is selected as Type
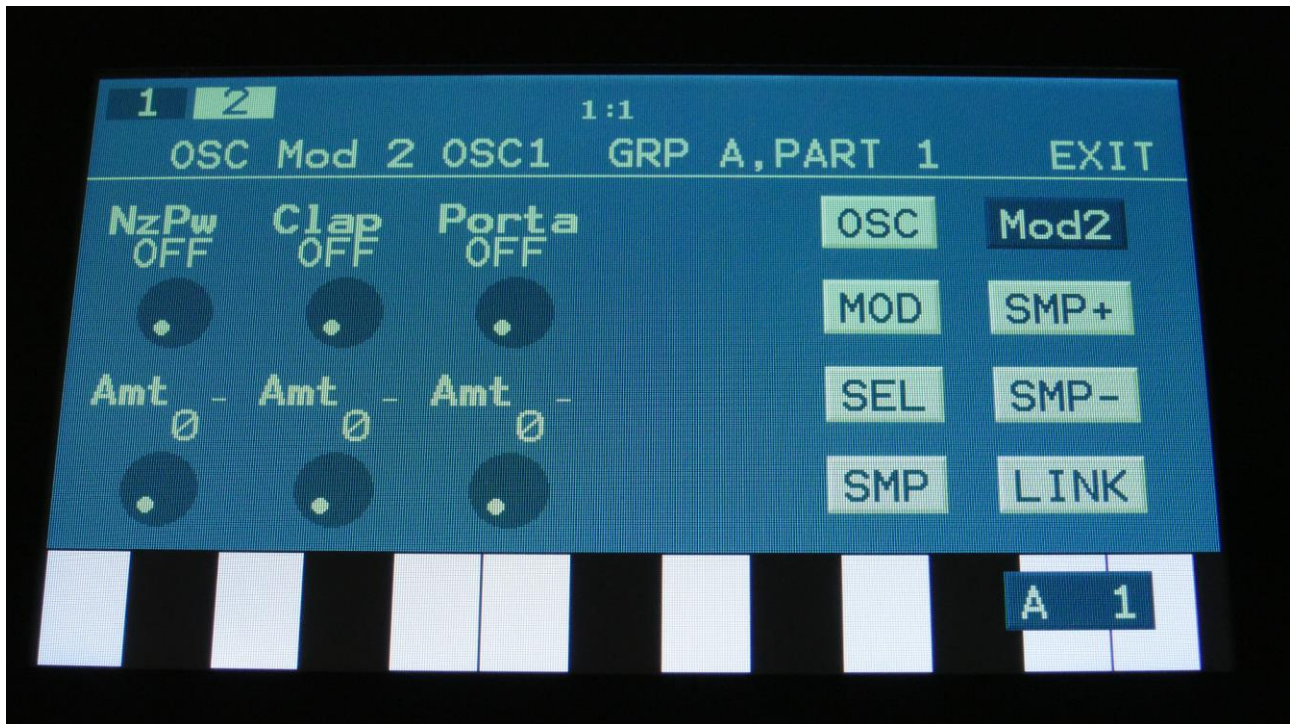
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

NzPw: Will modulate the clap noise PW.

Clap: Will modulate the intensity of the clap envelope.

Porta: Will modulate the amount of portamento.

The Mod2 page, when in sampler or chopped keyboard mode
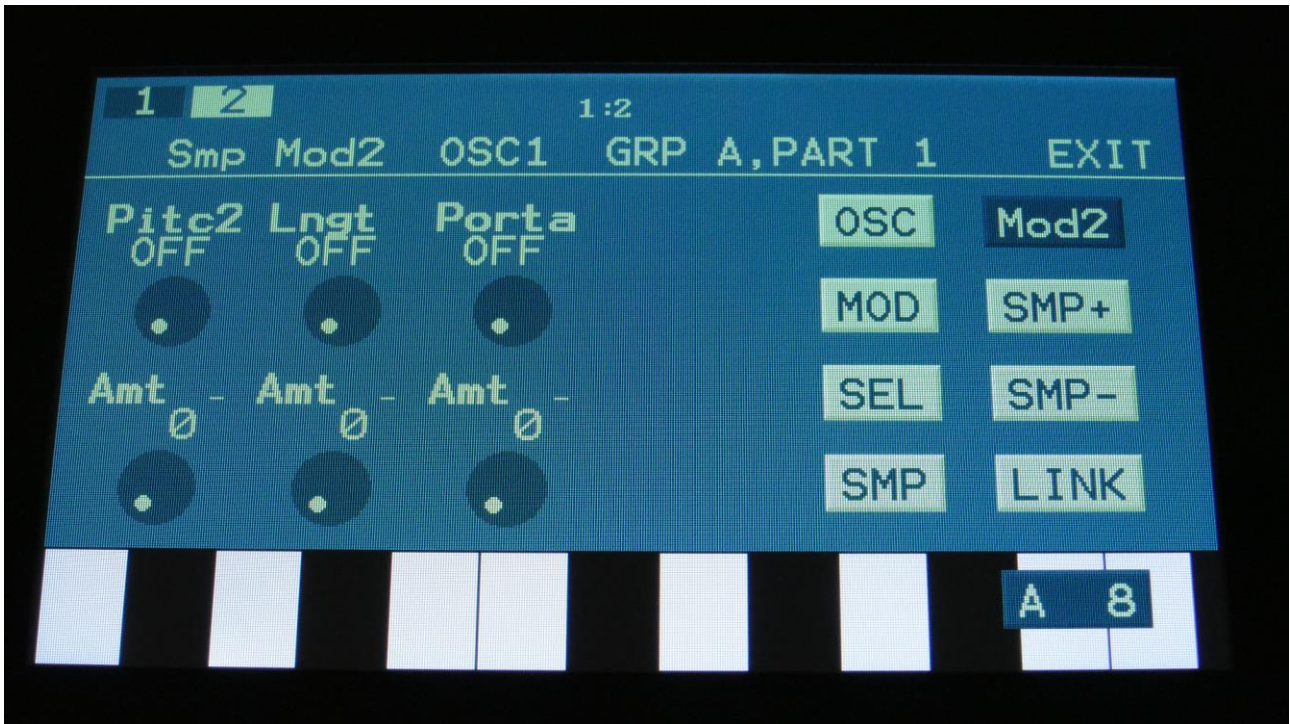
The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc2: An extra pitch modulation destination, so that it is possible to modulate the sampling pitch with 2 modulation sources at the same time.

Lngt: Will modulate the sample length.

Porta: Will modulate the amount of portamento.

The Mod2 page, when in wavetable mode

The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

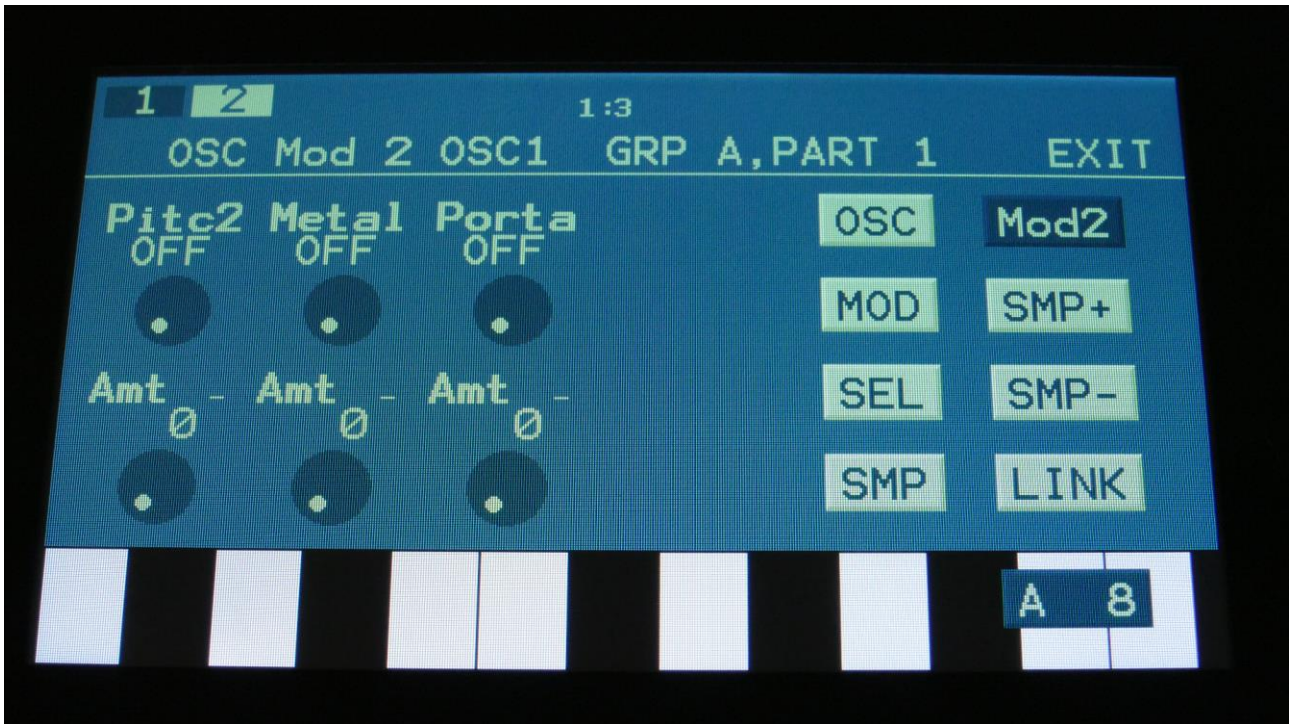**Pitc2:** An extra pitch modulation destination, so that it is possible to modulate the oscillator pitch with 2 modulation sources at the same time.

Metal: Will modulate the amount of Metal, that will be added to the sound.

Porta: Will modulate the amount of portamento.

Percussion Synthesizer

6 of the oscillator types are dedicated to generate percussion sounds. In this chapter, I will go through some of the intended possibilities with these oscillator types.

The 6 Percussion Oscillator types:

Perc: Percussion oscillator 1. This outputs 2 percussion waves, that can be detuned from each other, and noise FM can be applied. Atk will morph between the attack and the body of the percussion sound. To imitate the strike of the drum, modulate Atk with an envelope. Noise PW can also be set, to adjust the intensity of the FM noise. This percussion oscillator is optimized for **kicks, snares and noise sounds**, but can also produce a lot of other sounds. Like the other oscillator types, its parameters can be modulated by any modulation source, and it can be routed through filters and effects, which expands the possibilities.

Prc2: Percussion oscillator 2. This outputs 2 percussion waves, that can be detuned from each other. Squared noise FM can be applied, and noise PW can be adjusted, to set the intensity of the FM noise. Atk will morph between the attack and the body of the percussion sound. To imitate the strike of the drum, modulate Atk with an envelope. This percussion oscillator is optimized for **analog style hi hats and cymbals**, but can also produce a lot of other sounds. Like the other oscillator types, its parameters can be modulated by any modulation source, and it can be routed through filters and effects, which expands the possibilities.

Prc3: Percussion oscillator 3. This outputs 2 percussion waves, that ring modulates each other, and that can be detuned from each other. Noise FM can be applied. Atk will morph between the attack and the body of the percussion sound. To imitate the strike of the drum, modulate Atk with an envelope. Noise PW can also be set, to adjust the intensity of the FM noise. This percussion oscillator is optimized for **hi hats, toms and bell type sounds**, but can also produce a lot of other sounds. Making kick and snare drums with this, results in very special sounds. Like the other oscillator types, its parameters can be modulated by any modulation source, and it can be routed through filters and effects, which expands the possibilities.

Cymb: Cymbal oscillator. A cymbal sound is a complex sound, and this is a complex oscillator. It is made up of a small group of squarewave oscillators, that modulates each other (CymFM). The pulse width can be set for the oscillators, they can be detuned from each other, and the amount of CymFM can be set. Self FM can be applied to the first oscillator in the chain, which is only a modulator, so the effect of self FM can only be heard, if CymFM is turned up. This percussion oscillator is optimized for **cymbals and metallic noises**, but can also produce a lot of other sounds. Like the other oscillator types, its parameters can be modulated by any modulation source, and it can be routed through filters and effects, which expands the possibilities.

Cym2: Cymbal2. By combining FM and ring modulation, this can make cymbal sounds that are a bit more aggressive than cymbal 1.

Clap: A handclap oscillator. A noise source is shaped by a "clap envelope". The speed and the amount of the clap envelope can be adjusted, together with the noise PW.

Sound ideas / Start points

If you would like to start from scratch, designing sounds with the Percussion Synthesizer, or you just want to get an idea of, how specific sounds can be generated, here are some ideas.

The best way to use these examples, is to start with an initialized preset, and then use part 5 to 8 (the parts without analog filters).

Analog style kick drum

Select the Perc oscillator type. Set the Dtun, Atk and Noiz parameters all to zero. Set pitch modulation to an Env and something around 100 for a start. Set Atk modulation to an Env and something around 150. If you are triggering the sound from the trigger buttons, set Tune to -15.

Set VCA envelope to LogSm mode, A to 0, D to 137, S to 0 and R to 130.

Set the Env to Log mode, A to 0, D to 45, S to 0 and R to 0.

Now you should hear an analog style kick drum. Experiment with the settings of pitch and Atk modulation, the envelope decay time, and of course the Tune parameter, to get variations of this.

To make a long kick sound, set pitch modulation to the decay envelope, and set the decay value of this to around 40. Keep the Env controlling Atk (Attack). Adjust the VCA envelope decay and release, and the Env decay and release.

Acoustic style kick drum

The percussion oscillators might not be able to perfectly imitate an acoustic kick drum, but they can get somewhere near.

Use the analog style kick drum, and adjust the Dtun parameter. To get it even more realistic, add a Pitch Shifter effect after it, and detune this too.

Snare drum

Select the Perc oscillator type. Set Noiz to 511, Dtun to 210 (sets the brightness of the snare), Atk to 0 and NzPw to +0. Turning up Atk, will give the snare drum more "bite". Set Atk modulation to an Env and set this to 270. If you are triggering the sound from the trigger buttons, set Tune to -43.

Experiment, by tweaking the parameters, to get the snare sound, that you want.

Tom

Select the Prc3 oscillator type. Set Dtun, Atk and Noiz all to zero. Set pitch modulation to an Env, to 42, and set Atk modulation to the same Env, to 305. If you are triggering the sound from the trigger buttons, set Tune to -8. Set Env1 A to 0, D to 52, S to 0 and R to 118. Set the VCA Env A to 0, D to 84, S to 408 and R to 66. Now you should be able to hear a basic tom sound.

Make new tom sounds, by tweaking the parameters.

Closed Hi hat

Select the Prc3 oscillator type. Set Dtun to 19, Atk to 0, NzPw to +0, and Noiz to 85. If you are triggering the sound from the trigger buttons, set Tune to +33. Set Atk modulation to an Env, and set this to 226. Set VCA Env A to 0, D to 22, S to 0, R to 20. The Env can be left at the default settings (A=0, D=40, S=0, R=0).

Tweak the parameters, to obtain different hi hat flavors.

Open Hi hat

Use the settings from the closed hi hat. Set the VCA Env A to 0, D to 22, S to 415 and R to 208. Now you got an open version of the closed hi hat!

Analog style closed hi hat

Select the Prc3 oscillator type. Set Dtun to 186, Atk to 0, NzPw to +0 and Noiz to 62. If you are triggering the sound from the trigger buttons, set Tune to +21. Set Atk modulation to an Env, and set this to 80. Set VCA Env A to 0, D to 22, S to 0, R to 20. The Env can be left at the default settings (A=0, D=40, S=0, R=0).

Tweak the parameters, to obtain different hi hat flavors.

Analog style open Hi hat

Use the settings from the analog style closed hi hat. Set the VCA Env A to 0, D to 22, S to 415 and R to 208. Now you got an open version of the closed hi hat!

Cymbal

Select the Cymb oscillator type. Set SelFM to +255, Dtun to 127, PW to 120 and CymFM to 511. Set VCA Env A to 0, D to 39, S to 446, R to 434.

This will create a different cymbal sound on almost any key, so by adjusting the Tune parameter, you will obtain different sounds

Tweak the parameters, to obtain different cymbal flavors. Run it through filters, to make it less wild.

To make it a bit more metallic, try to run it through a Bit Crusher effect. Add a distortion effect, to give it more edge.

Crash Cymbal

Select the Cym2 oscillator type. Set Tune to -22, SelFM to +88, Dtun to 254, PW to 272, and CymFM to 511.

Set VCA envelope to LogSm mode, A to 0, D to 20, S to 511 and R to 390.

Hand Clap

Select the Clap oscillator type. Set Tune to -23, NzPw to +107, Dtun to 0, PW to 272, and Clap to 511.

Set VCA envelope to LogSm mode, A to 0, D to 20, S to 511 and R to 96.

Bell sound

Select the Perc oscillator type. Set Dtun to 169, Atk to 120 and Noiz to 0. If you are triggering the sound from the trigger buttons, set Tune to +0. Set Atk modulation to an Env, and set this to 254. Set VCA Env A to 0, D to 22, S to 511, R to 191. The Env can be left at the default settings (A=0, D=40, S=0, R=0).

Tweak the parameters, to obtain different bell sound flavors.

OSC B – Special Oscillator type

Each of the 4 module groups of Zaturn has one Oscillator B (4 in total).

This is a new Gotharman oscillator type, which starts out with a sine wave, which can be continuously shaped into other waveforms, using the Wave and Shape controls.

OSC B Parameters

From the Synth Modules page, touch the OSCB block, to enter the Oscillator B pages.
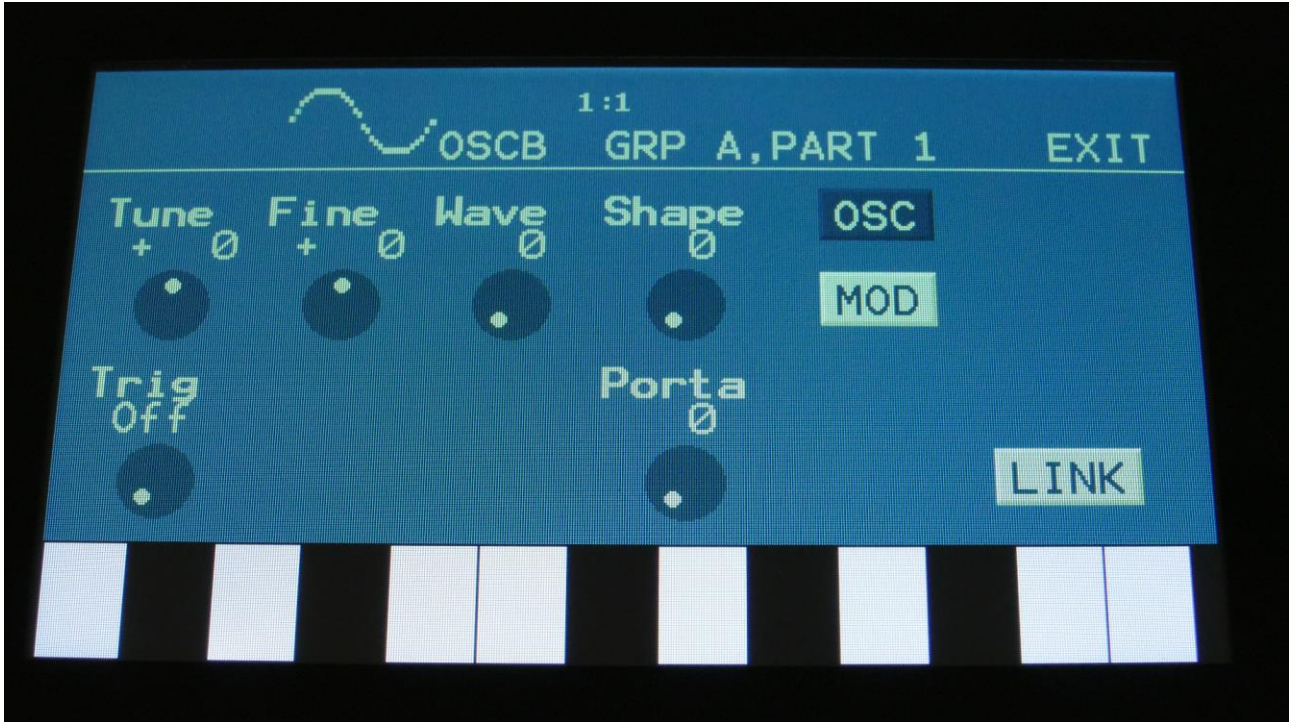
Touch the OSC touch button, to enter this page.

In the upper left corner of the oscillator page, the currently generated waveform is shown.

Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Tune: Adjust the basic pitch in semitones. Range: -64 to + 63.

Fine: Fine tuning of the pitch. Range: -256 to +255.

Wave: This parameter will, when turned up, turn part of the sine wave into a square wave, to make it generate more harmonics.

Shape: This parameter will wavefold the positive period of the sine wave, giving the impression of feedback.

Trig: Sets the part number, inside the group, which will send note values to the oscillator. Range: Off, 1-2.

Porta: Portamento. The more this is turned up, the slower the oscillator pitch will slide from one note to another. Range: 0 to 511.
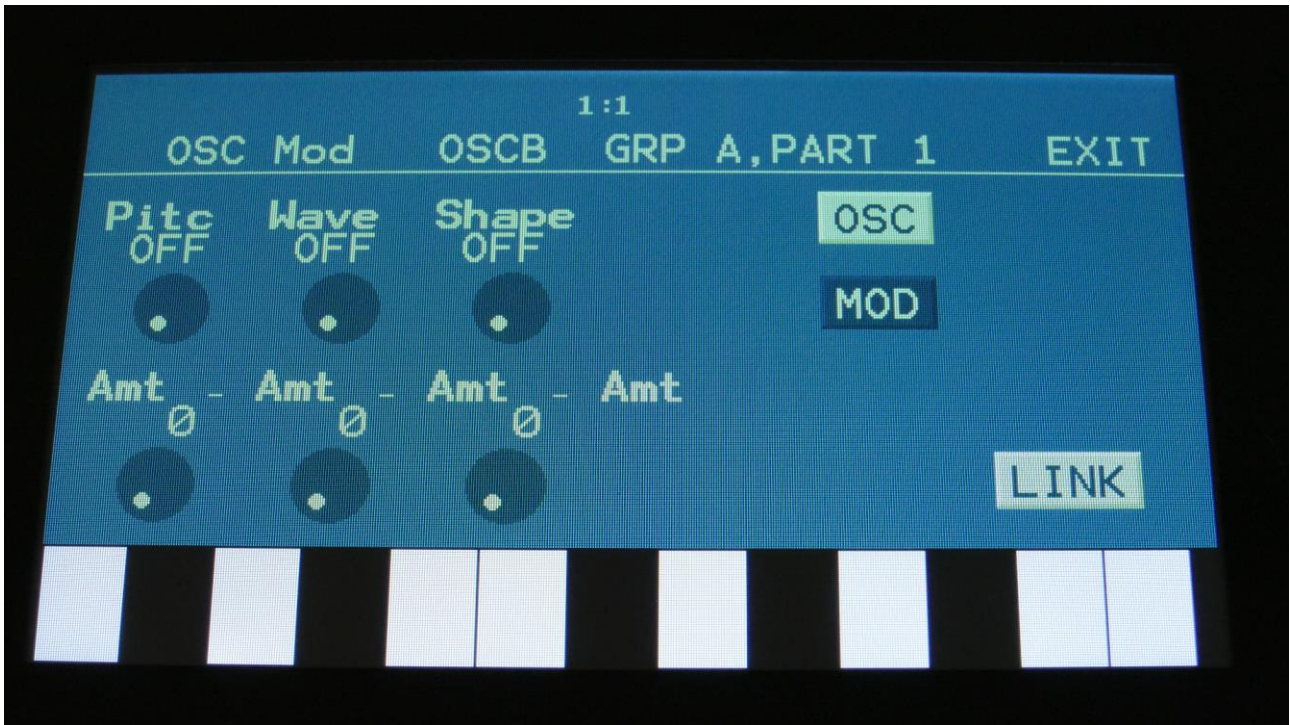
Touch the MOD touch button, to enter this page.

The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc: Modulates the oscillator pitch.

Wave: Modulates the Wave parameter.

Shape: Modulates the Shape parameter.

Noise Generator

Zaturn has an extra noise generator, that does not have any parameters. It just outputs a white noise signal to the audio/modulation bus.

VCF - Analog Filters

Each of the 4 module groups of Zaturn has one dual analog filter (4 dual analog filters in total). Each of these consists of a 12 db self-resonating low pass filter and a 12 db self-resonating band pass filter, connected in parallel to each other (original zaTurn filters), or a 24 db high pass filter and a 24 db low pass filter connected in serial (Spaze filters).

The original zaTurn filters are a newly engineered design, using SSI2140's as OTA's. These filters have very a special character.
The Spaze filters are the filters previously used in PolySpaze, SpazeBoard2 and VCF8.

A filter frame sequencer, derived from the almighty Vothar 8, are available for controlling the filter parameters.

And of course Gotharman's G-Ray, intermodulation feedback, are available for the analog filters.

Most parameters can be modulated.

If your Zaturn starts to sound very different than usual, the analog filters might need to be tuned. Zaturn can do this automatically. Please check the Mor Preset Parameters section of this manual, for instructions on how to tune the filters.

Analog Filters Parameters

From the Synth Modules page, touch the VCFs block, to enter the analog filter pages.
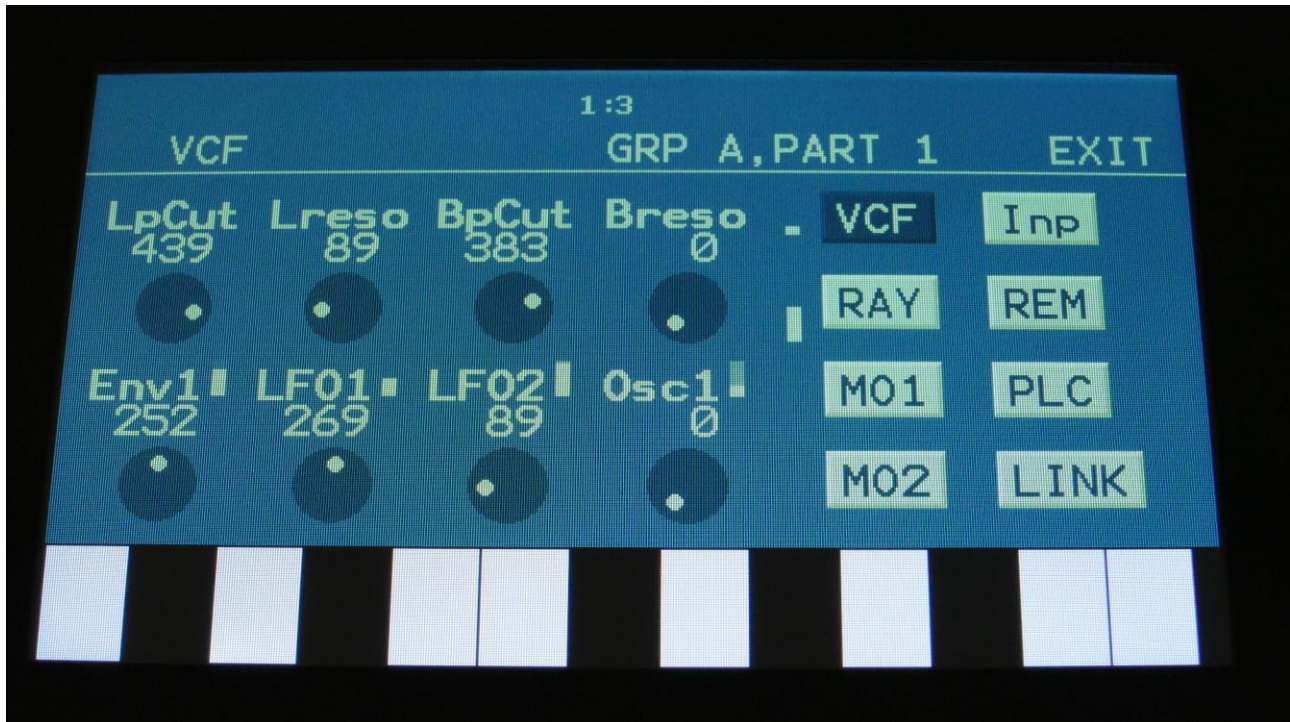
Touch the VCF touch button, to enter this page.

The VU-meters at the right of the screen, shows the filter input and output activity.

Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

LpCut: 0 to 511. Sets the cutoff frequency of the analog low pass filter.

Lreso: 0 to 511. Sets the resonance of the analog low pass filter.

BpCut/HpCut: 0 to 511. Sets the cutoff frequency of the analog band pass/high pass filter.

Breso: 0 to 511. Sets the resonance of the analog band pass/high pass filter.

The 4 lower parameters: Shows the LPF Cut and BPF/HPF cut modulation sources, which are selected on the MO1 page, and it is possible to adjust the modulation amounts.
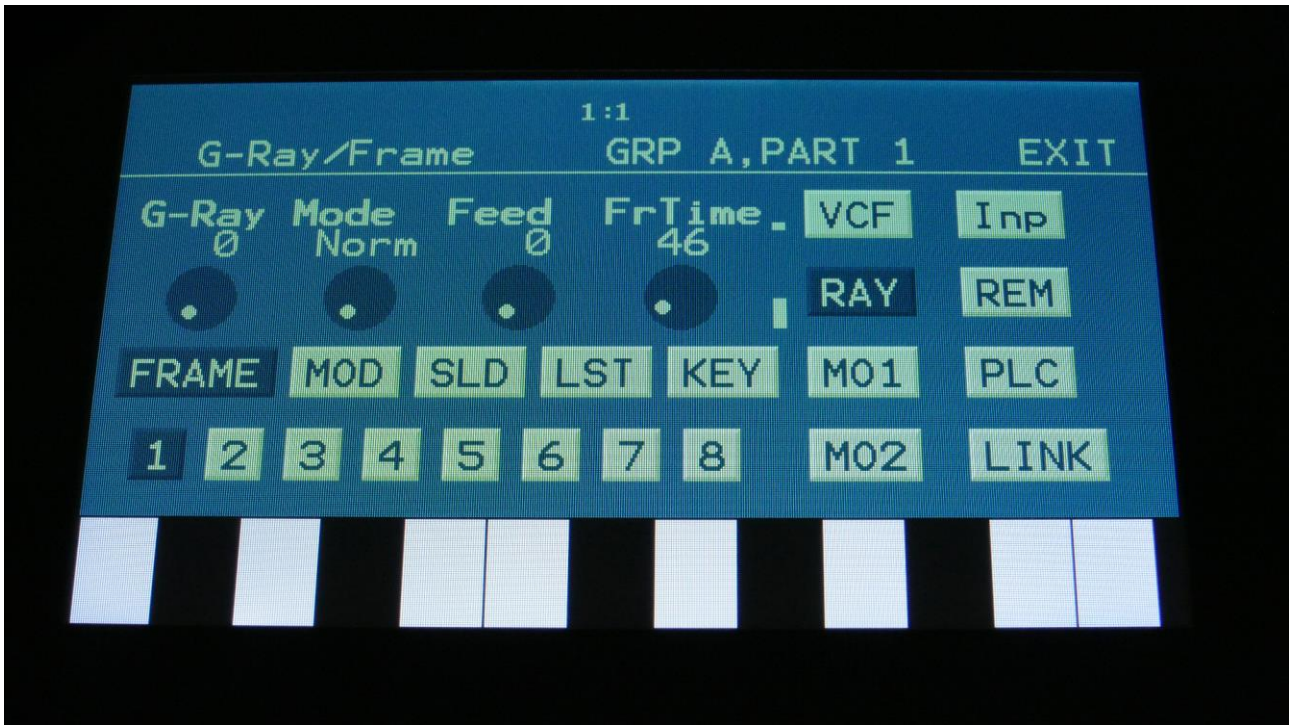
Touch the RAY touch button, to enter this page.

The VU-meters at the right of the screen, shows the filter input and output activity.

G-Ray: Adjusts the amount of g-RAY intermodulation. 0: no g-RAY, 3: max g-RAY. Range: 0 to 3.

Mode: G-Ray mode.
-Norm: Normal 1:1 feedback.
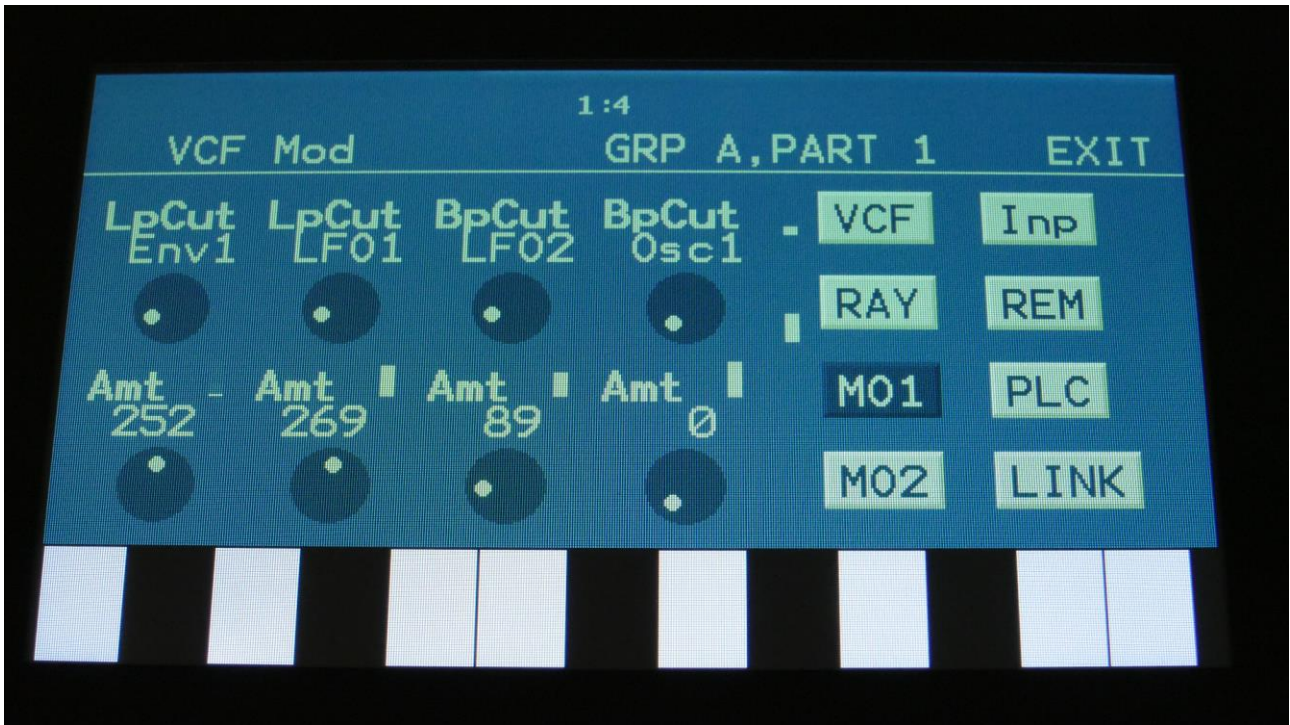**-Neg:** 1:1 feedback with the signal inverted (a 180 degree phase shift)
-Ultr: Boosted feedback.
-Uneg: Boosted feedback with the signal inverted (a 180 degree phase shift)

Feed: 0 to 511. G-Ray feedback level for both analog filters.

The rest of the parameters and touch buttons on this page, is for the Filter Frame Sequencer. This is explained at the end of this chapter.

Touch the MO1 touch button, to enter this page.

The VU-meters at the right of the screen, shows the filter input and output activity.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

LpCut (x2): Will modulate the Cutoff Frequency of the analog low pass filter.

BpCut/HpCut (x2): Will modulate the Cutoff Frequency of the analog band pass/high pass filter.
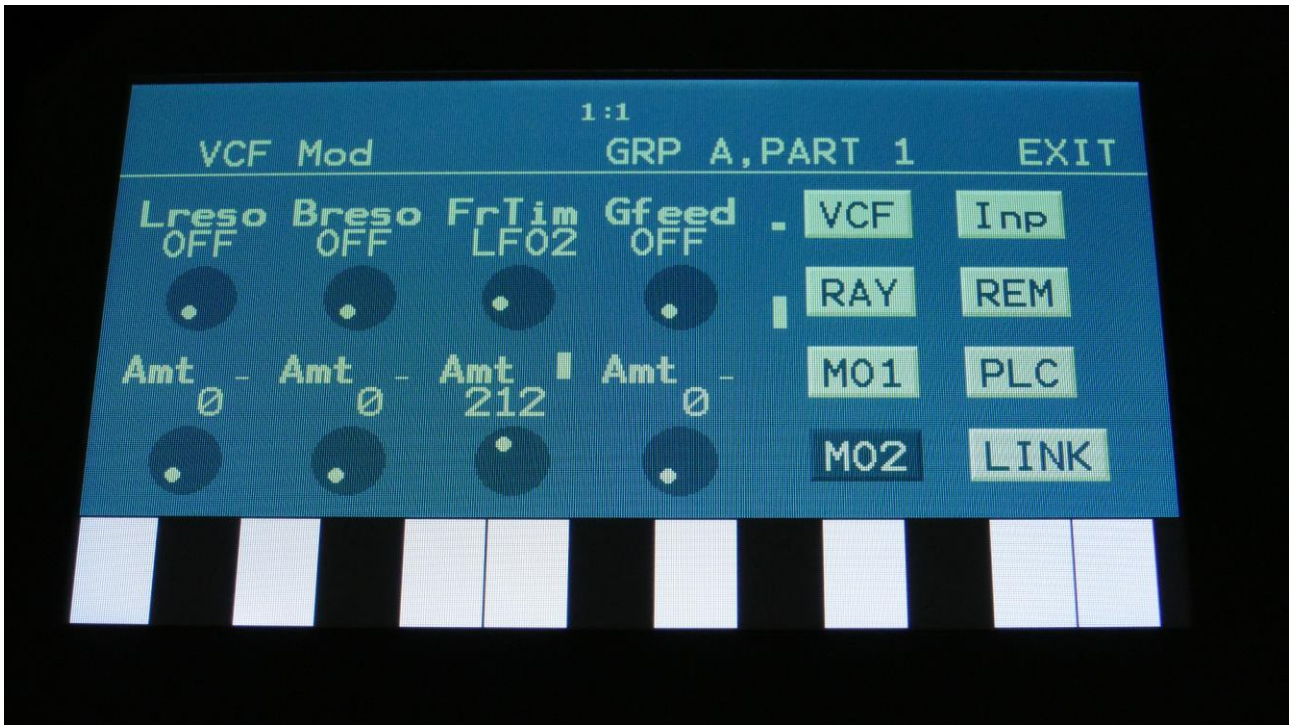
Touch the MO2 touch button, to enter this page.

The VU-meters at the right of the screen, shows the filter input and output activity.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **The lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

Lreso: Will modulate the amount of resonance applied to the analog low pass filter.

Breso/Hreso: Will modulate the amount of resonance applied to the analog band pass/high pass filter.

FrTim: Filter Frame Sequencer Time modulation.

Gfeed: Will modulate the amount of G-Ray feedback applied to both analog filters.
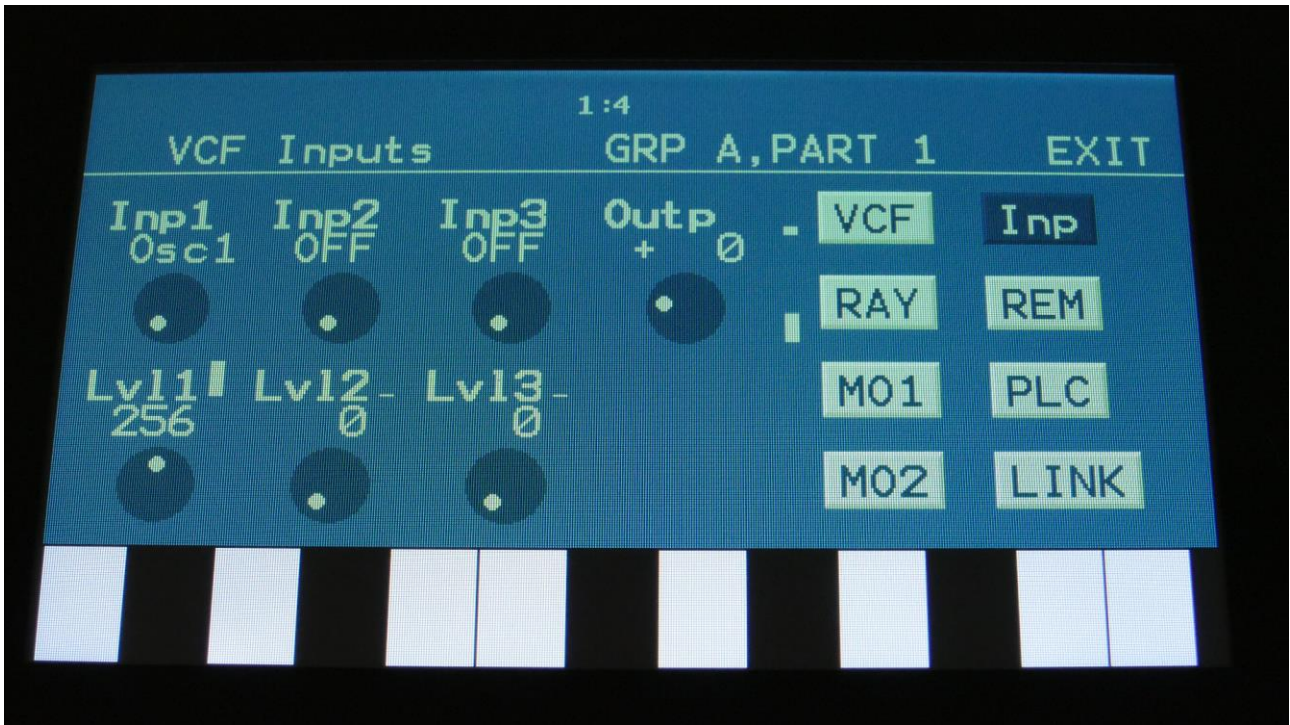
Touch the Inp touch button, to enter this page.

The VU-meters at the right of the screen, shows the filter input and output activity.

Inp1, Inp2, Inp3: Select any 3 module outputs, to connect to the 3 audio inputs of the filter. A complete list of possible sources can be found in the "Connecting Modules" later in this manual.

Lvl1, Lvl2, Lvl3: Filter input levels. Sets the levels for each of the 3 sources, connected to the filter inputs. 0 to 511.

Outp: Filter Output Level. Negative values are attenuating the output level, positive values are gaining. -128 to +383.

Filter Frame Sequencer

The filter frame sequencer from our mighty Vothar 8 has been included in zaTurn ☺

This will allow you to program 8 "frames" of filter settings, and let the frame sequencer morph through these. Morph time and stepped/smooth transition can be set for each step.

It is possible to morph the Cut and Reso parameters only, or to include G-ray Feed, Output Level and modulation amounts as well.

The Morph Times can be modulated by any source.

A filter frame sequence can be free running or key synced.

Each of the 4 analog filters has their own frame sequencer.

And, of course, the frame sequencers have 2 layers of parameters that can be morphed between.

How to set up a frame sequence

The Filter Frame Sequencer is located on the VCF G-Ray page.
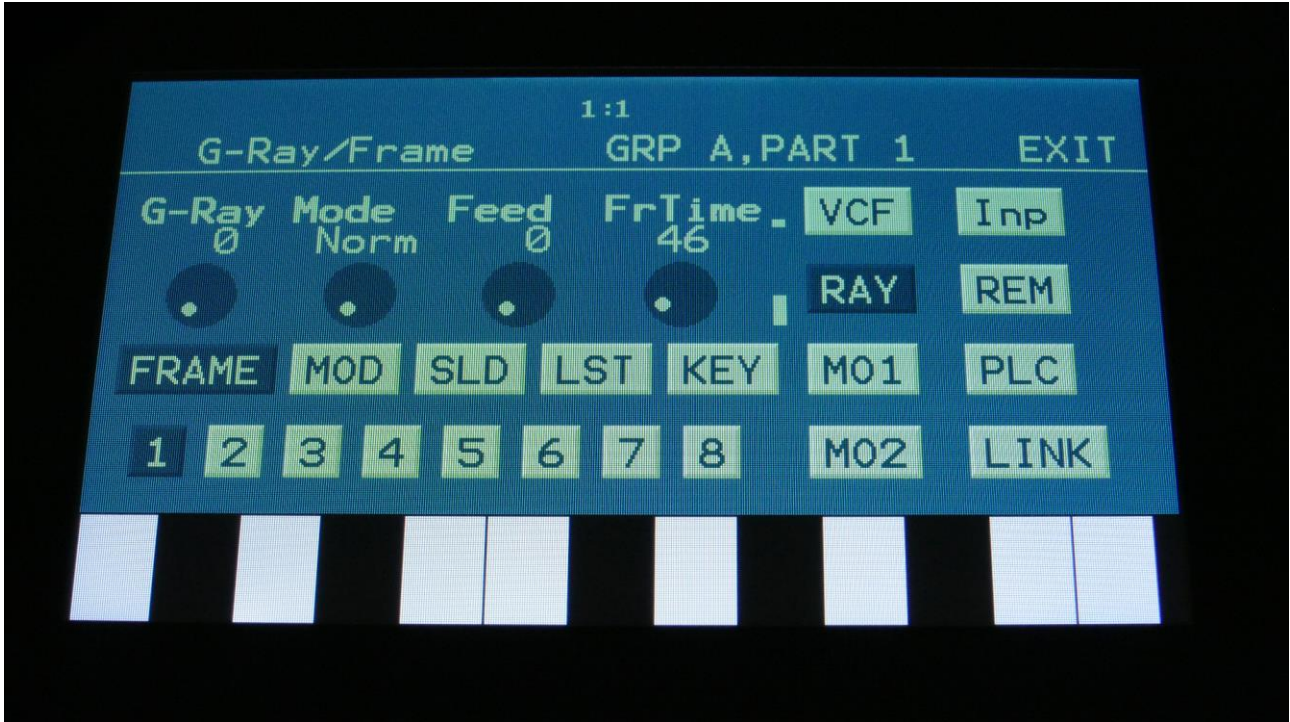
Touch the **FRAME** button, so that it turns dark blue. The frame sequencer has now been activated, and you will hear the sound of the first filter frame (make sure that **"1"** is dark blue).

Now touch the VCF button, to go to the main VCF page.
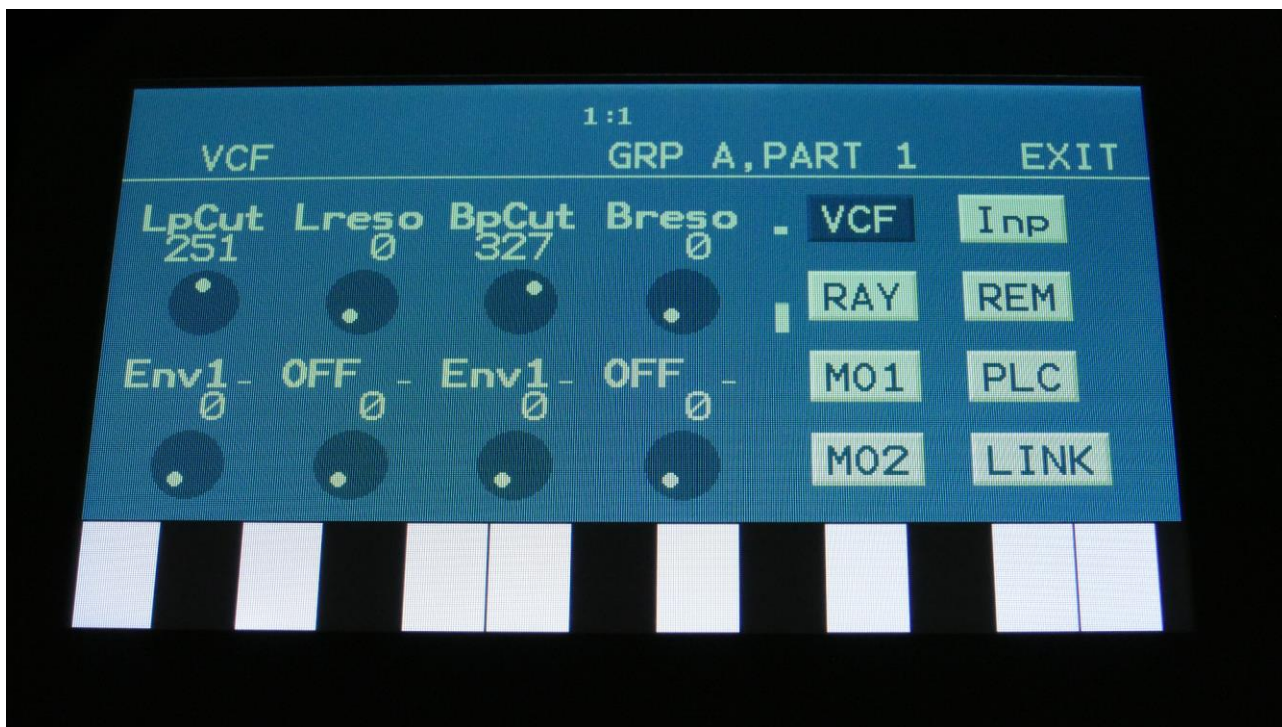
Adjust the **LpCut, Lreso, BpCut and Breso** parameters to obtain the desired sound for the first filter frame.

Now let's add the second filter frame.

Touch the RAY button, to go back to the filter frame page.
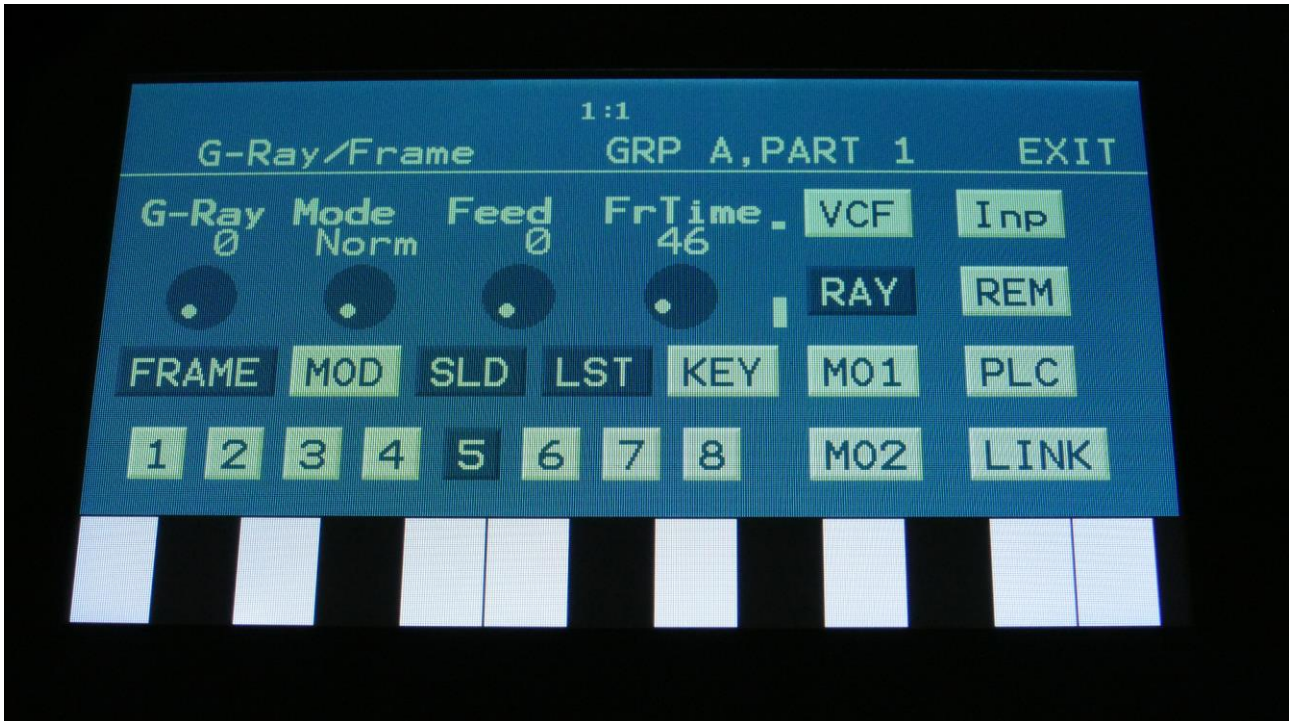
Touch the **LST** button (Last Step), so that it turns dark blue.

Now touch **"2"**, so that this turns dark blue. You have now set the last step, to be filter frame 2.

Touch the **LST** button again, so that it turns white.
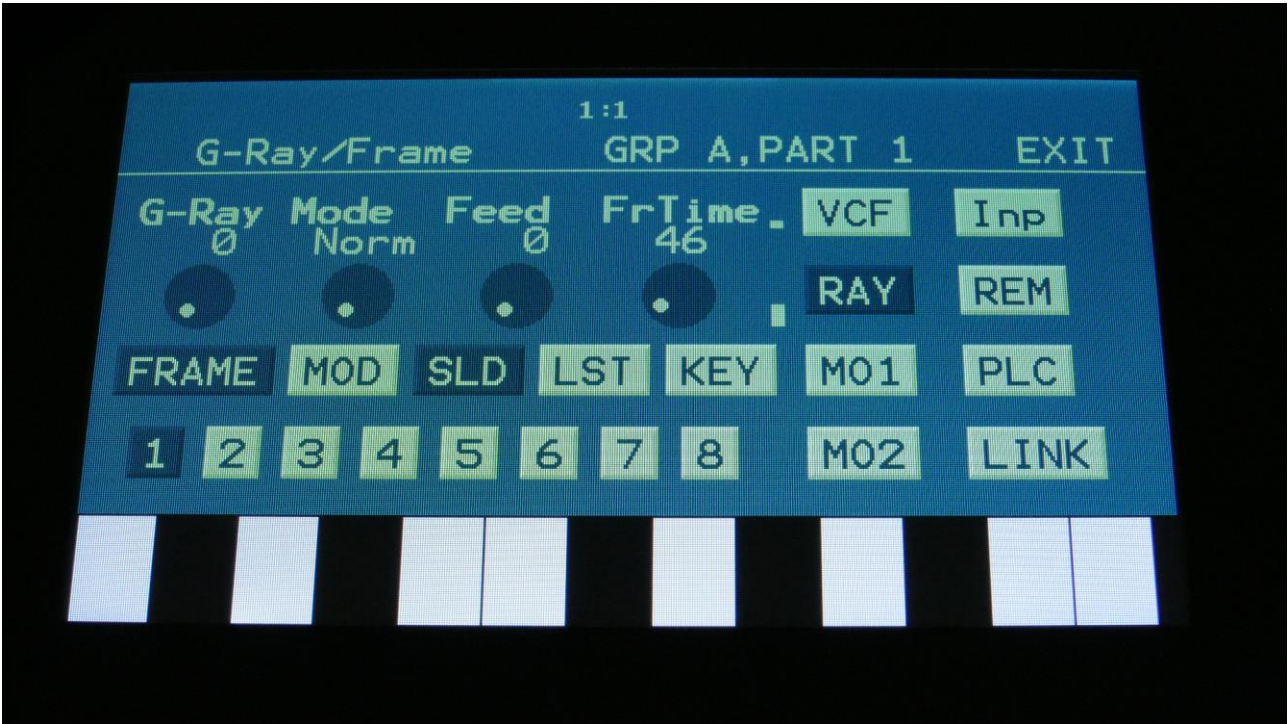
With frame one still selected, you might now want to adjust the frame 1 time, using the **FrTime** parameter, and to touch the **SLD** (Slide) button, to make the frame sequencer slide smoothly from frame 1 to frame 2.

Now touch **"2"** to select frame 2, set **SLD** and **FrTime** as desired, and go to the main VCF page, to adjust the filter parameters for frame 2.

Repeat this process, to set the parameters for the other frames (up to 8).

You can, of course, also just go to the parameter Randomizer page and select VCF, to get the filter frames randomized, instead of setting things up yourself.
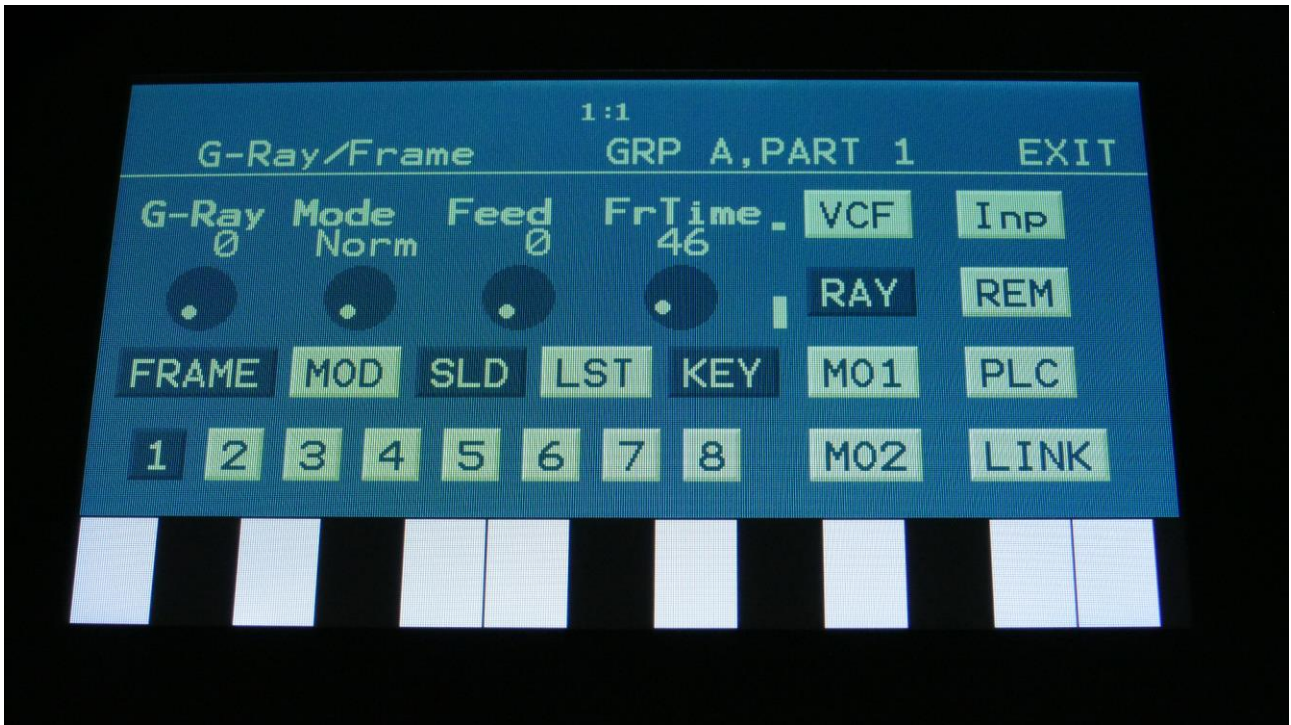
To make the frame sequence restart every time you hit a key, touch the **KEY** button, so that this turns dark blue.
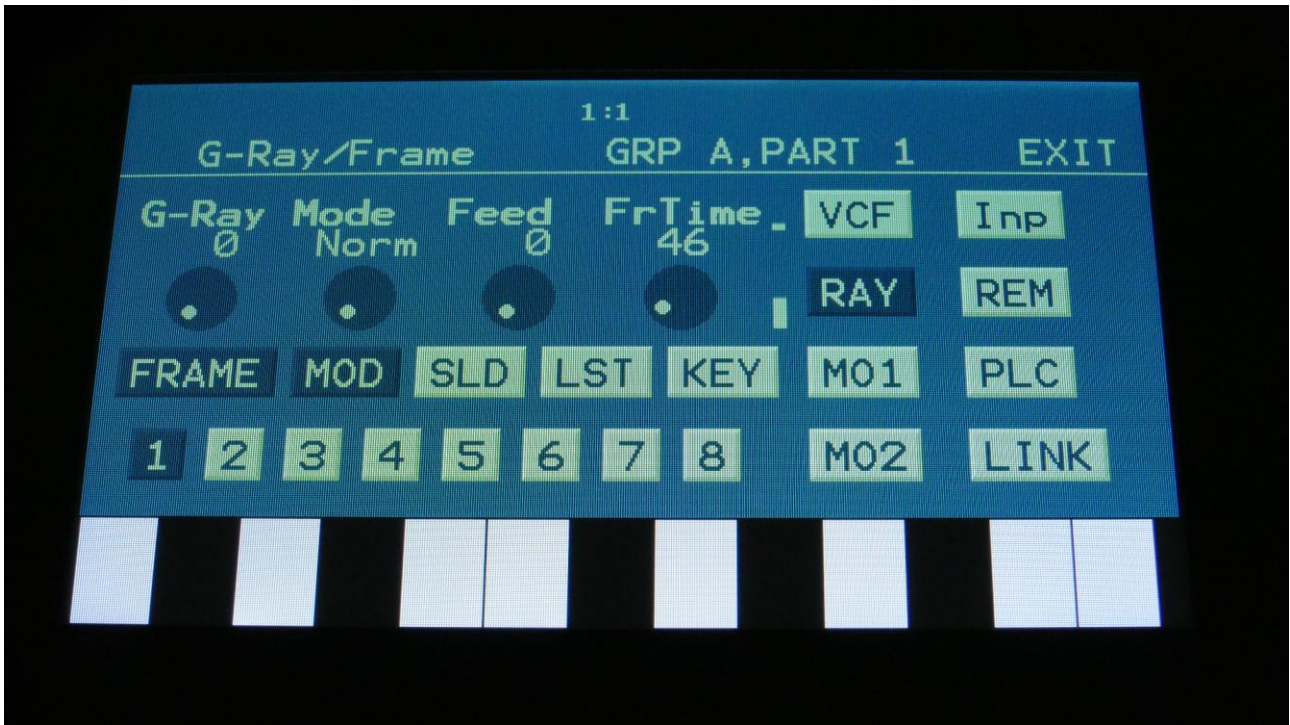
To make even more advanced filter frame sequences, it is also possible to include the G-Ray Feed, Outp, and all modulation amount parameters in each frame. To do so, hit the **MOD** button, so that it turns dark blue.

When the **MOD** button is white, the G-Ray Feed, Outp and modulation parameters can be adjusted as usual, and will affect all the filter frames at the same time.

Frame Sequencer Time Modulation

The time it takes the frame sequencer to move from one frame to the next, can be modulated.
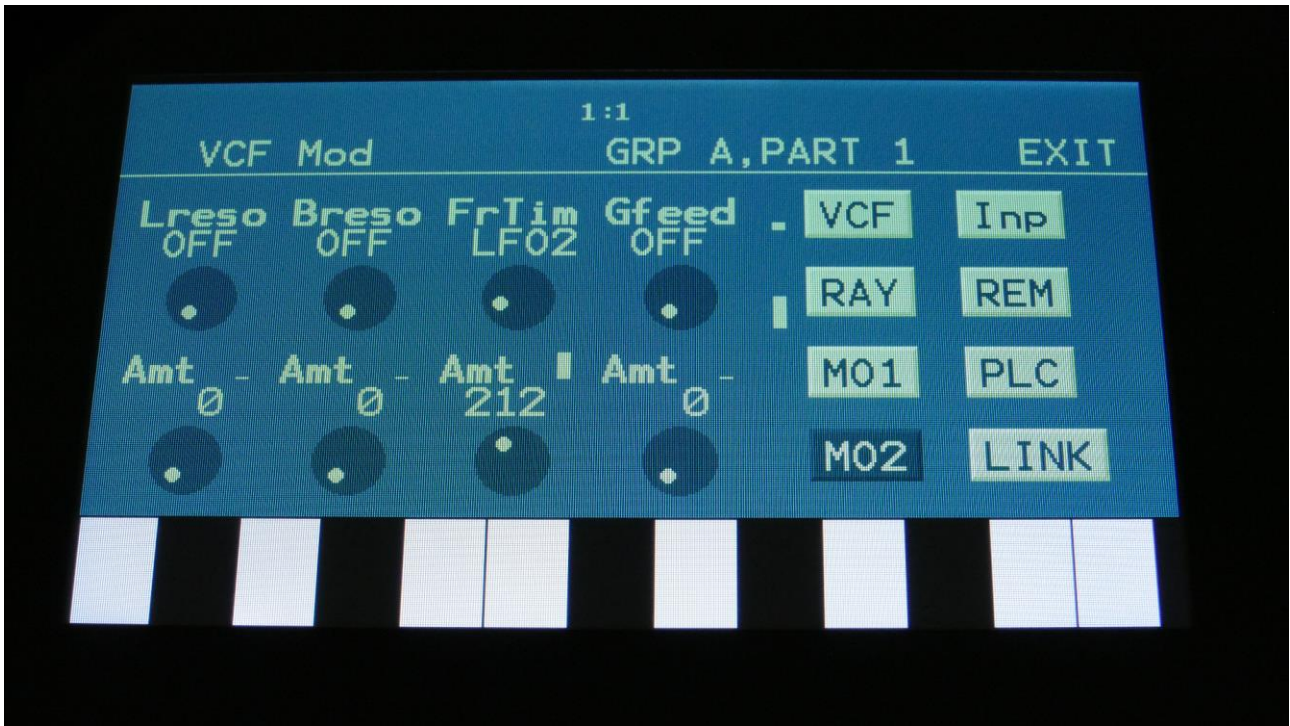
On the VCF MO2 page, you will find the FrTim parameter. Setting this up to a modulation source, and turning up the amount, will make it modulate the frame transition times.

DGF - Digital Gotharman Filters
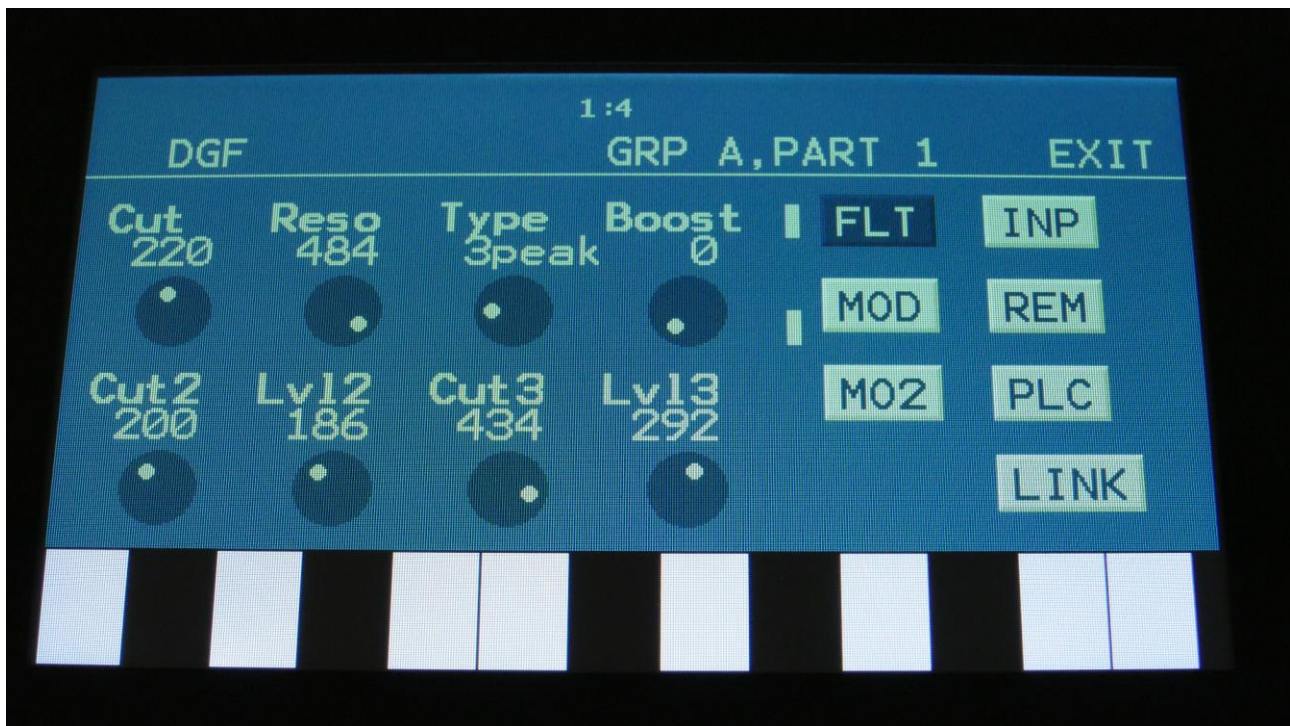
The 8 digital filters on Zaturn have 27 different filter types to choose from. Cutoff frequencies, resonance and triple filter levels can be adjusted and modulated.

Filter Types:
-**SvfLp** : 12 dB very smooth lowpass filter.
-**SvfBp** : 6 dB very smooth bandpass filter.
-**SvfHp** : 12 dB very smooth highpass filter.
-**SvfNt** : 6 dB very smooth band eliminate filter.
-**ShpLp** : 12 dB lowpass filter with a sharp response.
-**ShpHp** : 12 dB highpass filter with a sharp response.
-**3peak** : 3 bandpass filters with a smooth response.
-**3shp** : Sharp triple filters with narrow frequency bands.
-**LPF1** : Lowpass filter with emphasis on the bass response. Has a weak high frequency response.
-**LPF2** : Lowpass filter with a strong bass response, and better high frequency response than LPF1.
-**LPF3** : Lowpass filter that has a bit less character than LPF 1 and 2, but has a sharper resonance.
-**LPF4** : Lowpass filter with a bit more emphasis in the bass area.
-**LPF5** : Lowpass filter with a more soft character.
-**LPF6** : Lowpass filter with soft character, that has a more sharp resonance.
-**LPF7** : Thin and sharp lowpass filter.

-BPF1 : Pretty basic bandpass filter.

-BPF2 : Bandpass filter with improved bass response and a strong, almost distorted character.

-BPF3 : Sharp bandpass filter.

-BPF4 : Bandpass filter that is even sharper than BPF3.

-BPF5 : Bandpass filter that is even more sharp than BPF4.

-BPF6 : Thin and sharp bandpass filter.

-BPF7 : Thin bandpass filter, that is a bit sharper than BPF6.

-TUB1, TUB2, TUB3, TUB4, TUB5 : Tube emulation filters with a very nonlinear and distorting response.

Digital Filters Parameters

From the synth Modules page, touch DGF to enter the digital filters.
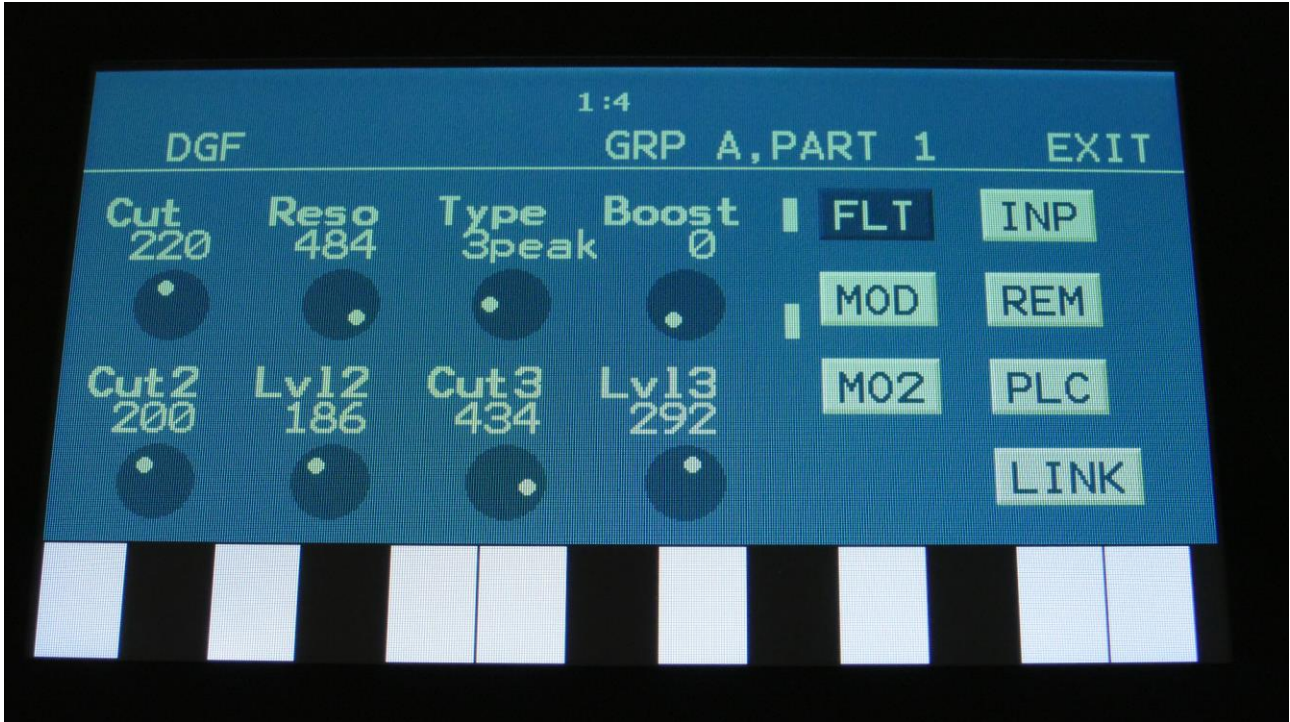
Touch the FLT touch button, to enter this page.

The VU-meters at the right of the screen, shows the filter input and output activity.

Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Cut: 0 to 511. Sets the cutoff frequency of the filter.

Reso: 0 to 511. Sets the amount of resonance applied to the filter. When the 3peak or 3shp filter types are selected, this sets the resonance for all 3 bandpass filters.

Type: Sets the filter type. See the list of filter types in the beginning of this chapter.

Boost: 0 to 511. Gains the filter output level.

Cut2: Sets the cutoff frequency for the second bandpass filter, when the 3peak or 3shp filter types are selected.

Lvl2: Sets the output level of the second bandpass filter, when the 3peak or 3shp filter types are selected.

Cut3: Sets the cutoff frequency for the third bandpass filter, when the 3peak or 3shp filter types are selected.

Lvl3: Sets the output level of the third bandpass filter, when the 3peak or 3shp filter types are selected.

Filter Modulation 1
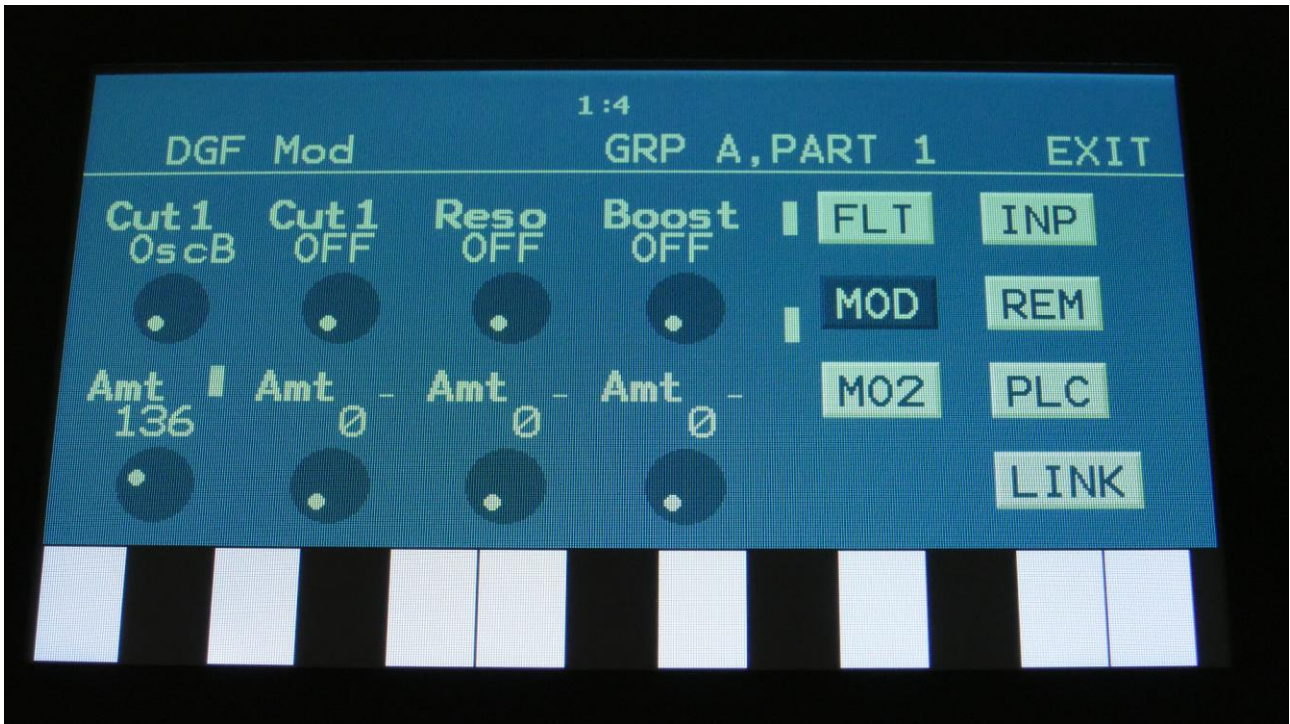
Touch the MOD touch button, to enter the Filter Modulation 1 page.

The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

Cut1, Cut1: Will modulate the filter cutoff frequency.

Reso: Will modulate the amount of resonance applied to the filter.

Boost: Will modulate the filter output Boost.

Filter Modulation 2
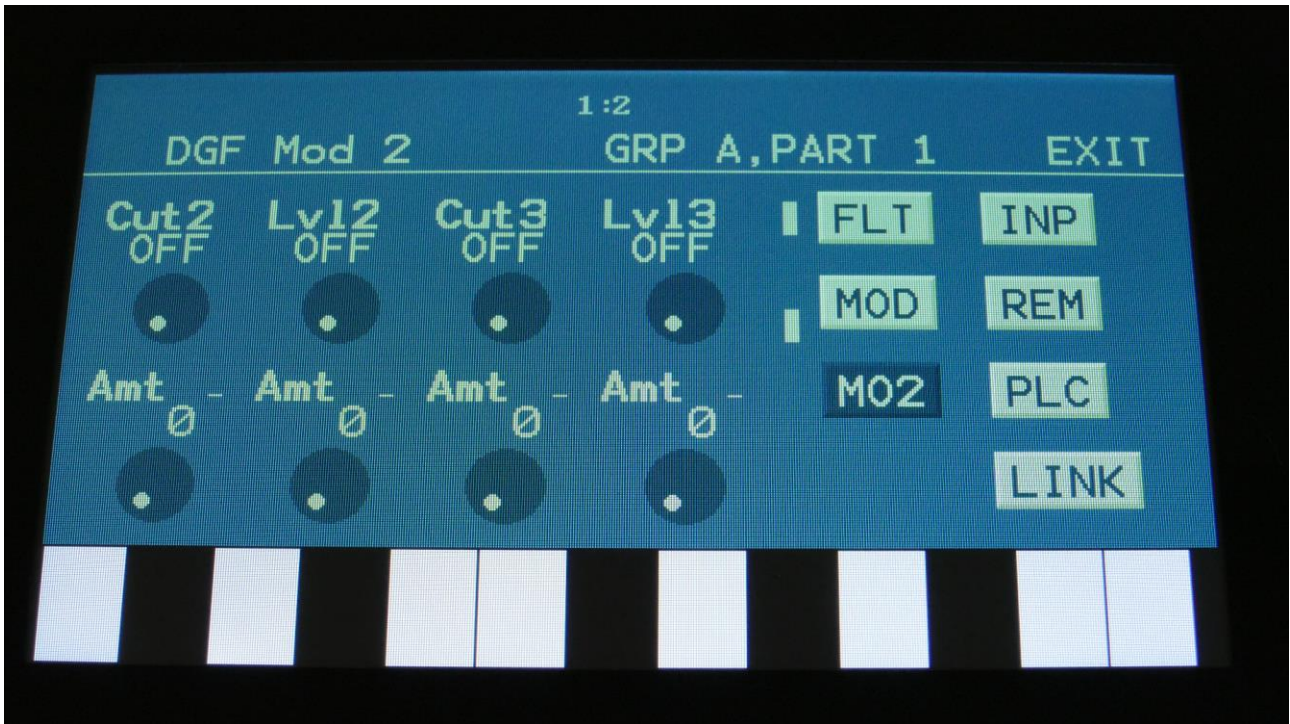
Touch the MO2 touch button, to enter the Filter Modulation 2 page.

The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

Cut2: Will modulate the filter cutoff frequency of the second bandpass filter, when the 3peak or 3shp filter types are selected.

Lvl2: Will modulate the output level of the second bandpass filter, when the 3peak or 3shp filter types are selected.

Cut3: Will modulate the filter cutoff frequency of the third bandpass filter, when the 3peak or 3shp filter types are selected.

Lvl3: Will modulate the output level of the third bandpass filter, when the 3peak or 3shp filter types are selected.

Filter Inputs
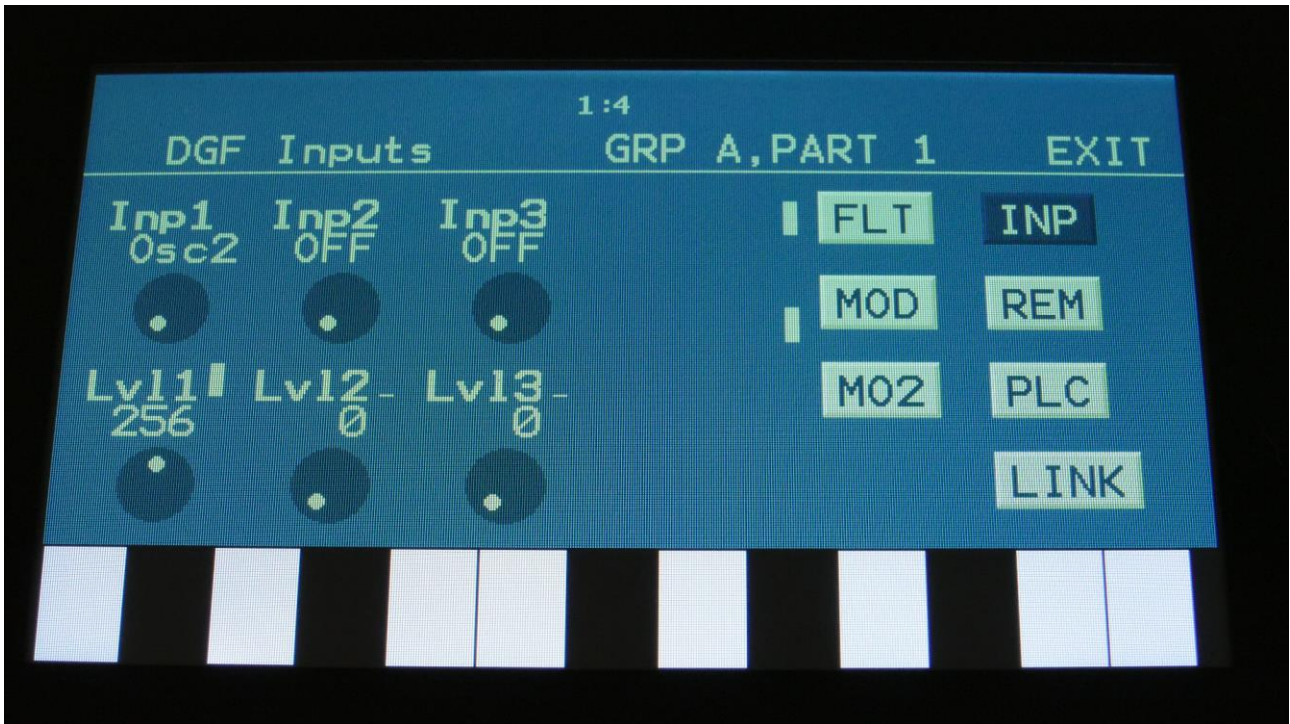
Touch the Inp touch button, to enter this page.

The VU-meters at the right of the screen, shows the filter input and output activity.

Inp1, Inp2, Inp3: Select any 3 module outputs, to connect to the 3 audio inputs of the filter. A complete list of possible sources can be found in the "Connecting Modules" later in this manual.

Lvl1, Lvl2, Lvl3: Filter input levels. Sets the levels for each of the 3 sources, connected to the filter inputs. 0 to 511.

VCA
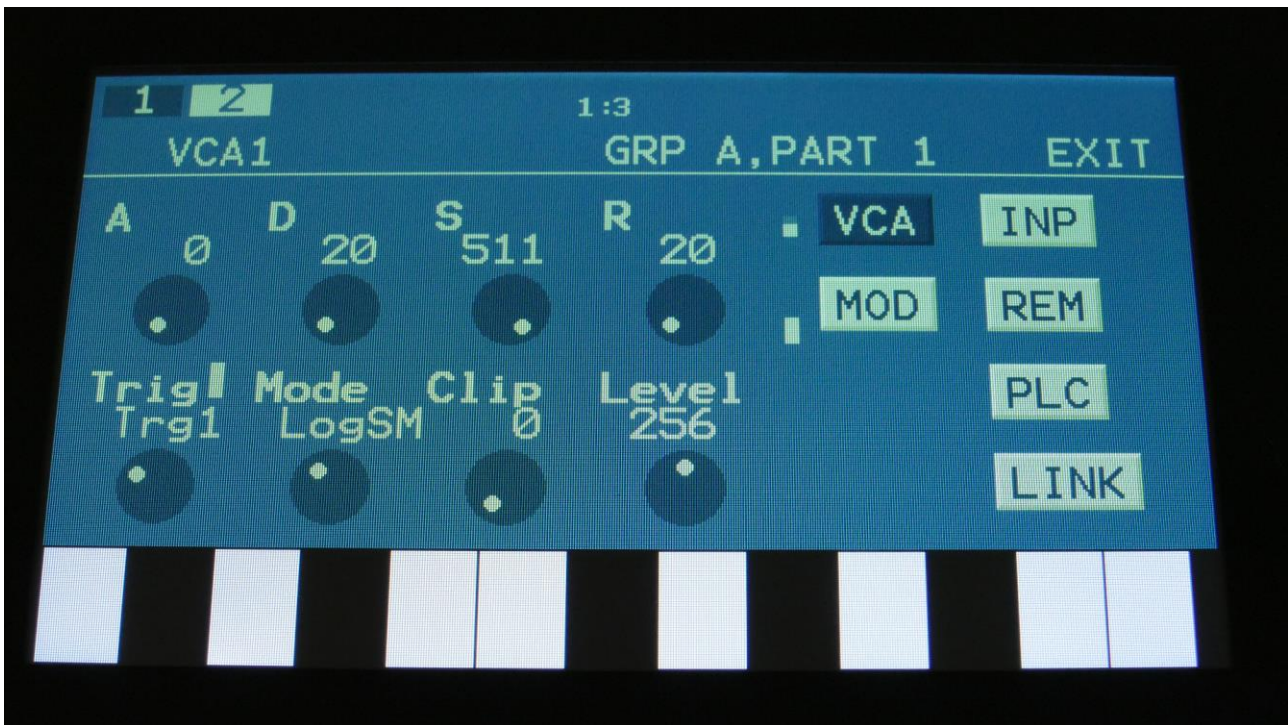
Each group of Zaturn has 2 VCA's (8 in total) with built-in ADSR Envelopes and an envelope Clip parameter, that adds more punch to the VCA. The VCA's has 16 different linear and logarithmic modes (characteristics), and the envelope time can be timed by 4, for long envelope times. The VCA envelopes can be trigged by any sources. The A, D, R and output level parameters can be modulated.

VCA Parameters

From the synth modules page, touch VCA to enter the VCA pages.
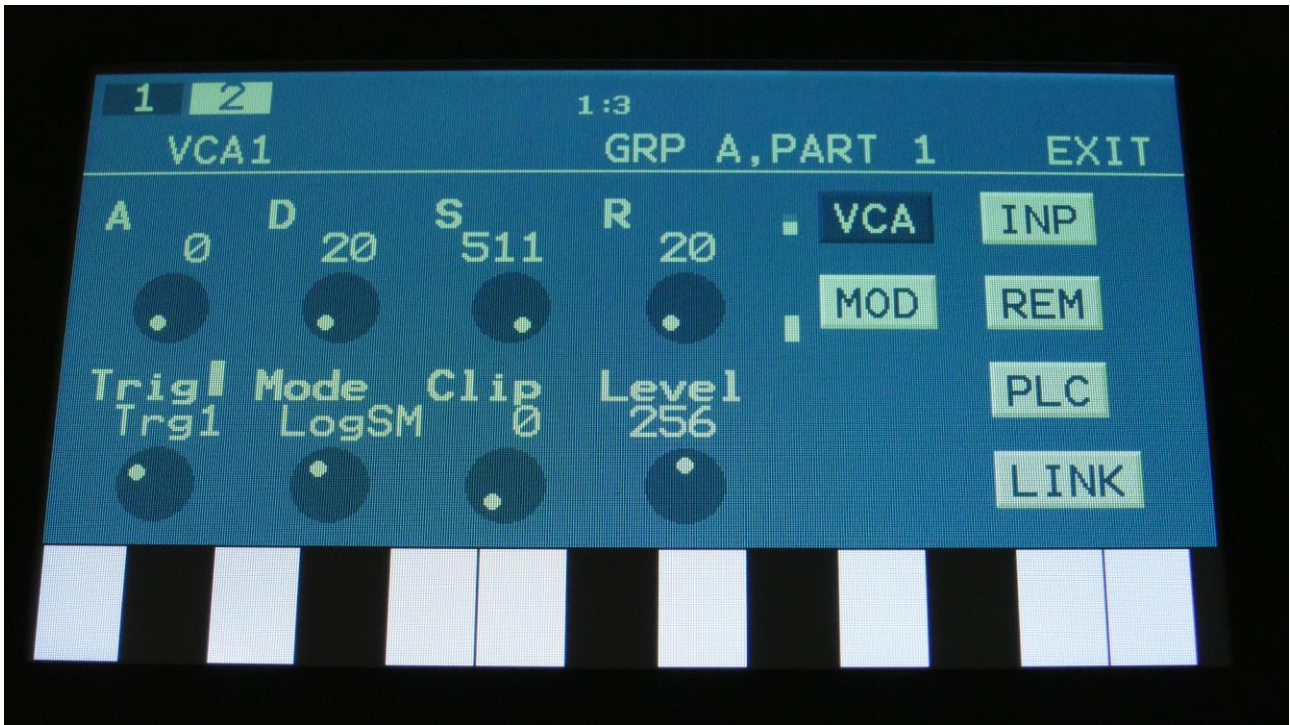
Touch the VCA touch button, to enter the VCA parameters page. Touch the numbers in the upper left corner, to select VCA 1 and 2 in the group.

The VU-meters at the right of the screen, shows the VCA input and output activity.

Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

A: 0 to 511. VCA envelope attack time. The time it will take the VCA envelope to rise from zero to its maximum value, when a note event is received and held down.

D: 0 to 511. VCA envelope decay time. When the VCA envelope has reached its maximum value, in the time set by the attack parameter, it will decay, until it reaches the sustain level, and stay there, as long as the note that trigged it is held.

S: 0 to 511. VCA envelope sustain level. Explained under the "D" parameter.

R: 0 to 511. VCA envelope release time. The time it will take the VCA envelope to decay from the value it is at, when a note off event are received, to zero.

Trig: VCA Envelope trigger. Any modulation/audio source can trigger the VCA. For a complete list of modulation sources, see the "Connecting Modules" chapter, later in this manual. For "normal" use, you would set this to "Trg1" or "Trg2", which is the group part triggers.

Mode: Selects the VCA characteristics, which can be:
-**Lin**: Linear response with a click in the attack at low attack settings. Fade out it not smooth.
-**Log**: Logarithmic response with a click in the attack at low attack settings. Fade out it not smooth.
-**LimSM**: Smooth linear response. No click in the attack and the fade out is more smooth.
-**LogSM**: Smooth logarithmic response. No click in the attack and the fade out is more smooth.
-**Lin4, Log4, LinS4 and LogS4:** Same as the above 4 characteristics, but with 4 times longer envelope times.
-**Log2**: Super smooth logarithmic response, both when fading in and out. Can create a click at lower attack settings.
-**LogD**: Double logarithmic response. Can create a click at lower attack settings.
-**Log2S**: Super smooth logarithmic response, both when fading in and out, with extra smoothing added, to avoid clicks.
-**LogDS**: Double logarithmic response, with extra smoothing added, to avoid clicks.
-**Log24, LogD4, Lg2S4, lgDS4**: Same as the above 4 characteristics, but with 4 times longer envelope times.

Clip: 0 to 511. VCA envelope clip. When this is turned up, the top of the VCA envelope curve will be more and more flattened out. This will give more punch to the sound. The effect of this is most significant with lower sustain values and shorter decay times.

Level: The VCA output level.

VCA Modulation
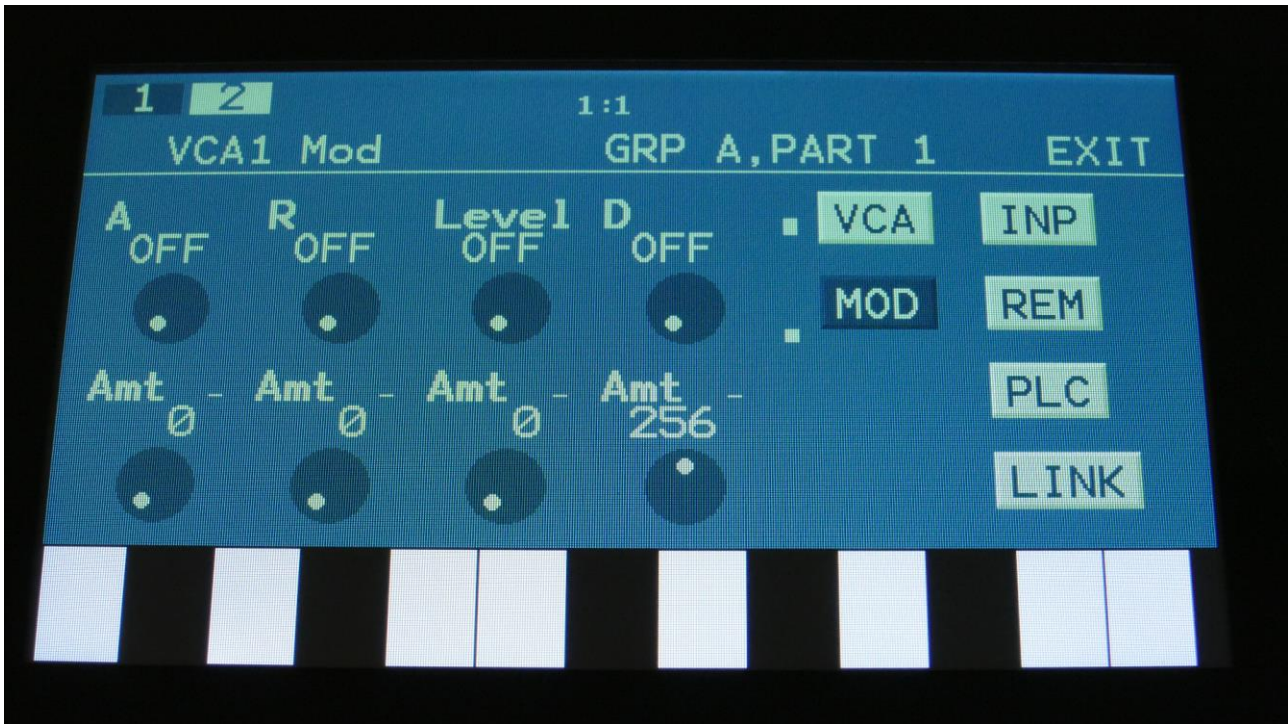
Touch the MOD touch button, to enter the VCA modulation page.

The VU-meters at the right of the screen, shows the VCA input and output activity.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

A: Modulates the VCA Envelope attack time.

R: Modulates the VCA Envelope release time.

Level: Modulates the output level of the VCA.

D: Modulates the VCA Envelope decay time.

VCA Inputs
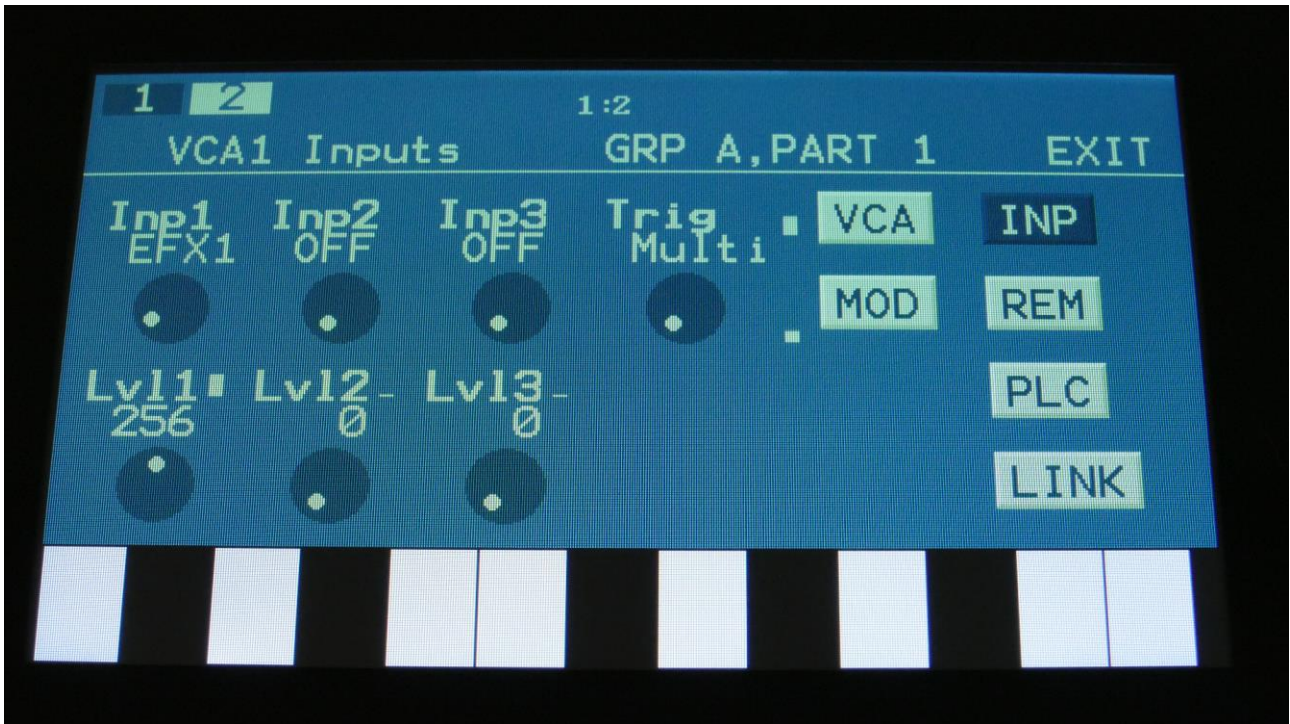
Touch the Inp touch button, to enter this page.

The VU-meters at the right of the screen, shows the VCA input and output activity.

Inp1, Inp2, Inp3: Select any 3 module outputs, to connect to the 3 audio inputs of the VCA. A complete list of possible sources can be found in the "Connecting Modules" later in this manual.

Lvl1, Lvl2, Lvl3: VCA input levels. Sets the levels for each of the 3 sources, connected to the VCA inputs. 0 to 511.

Trig: Sets the VCA Envelope to be multi or single triggered. In multi trigged mode, when the VCA envelope is trigged from any internal note sources (touch screen keyboard, trigger buttons, internal sequencer), the envelope will be re-trigged every time it gets a trigger on, regardless of if the previous trigger was released. In single trigger mode, the previous trigger has to be completely released, before a new trigger can trig the envelope. The multi trigger is an internal system, and it only works with internal note sources. When trigged from external sources, via the trigger inputs, or an internal non-note source (LFO's etc.) the envelope will always be in single trigger mode.

RING VCA
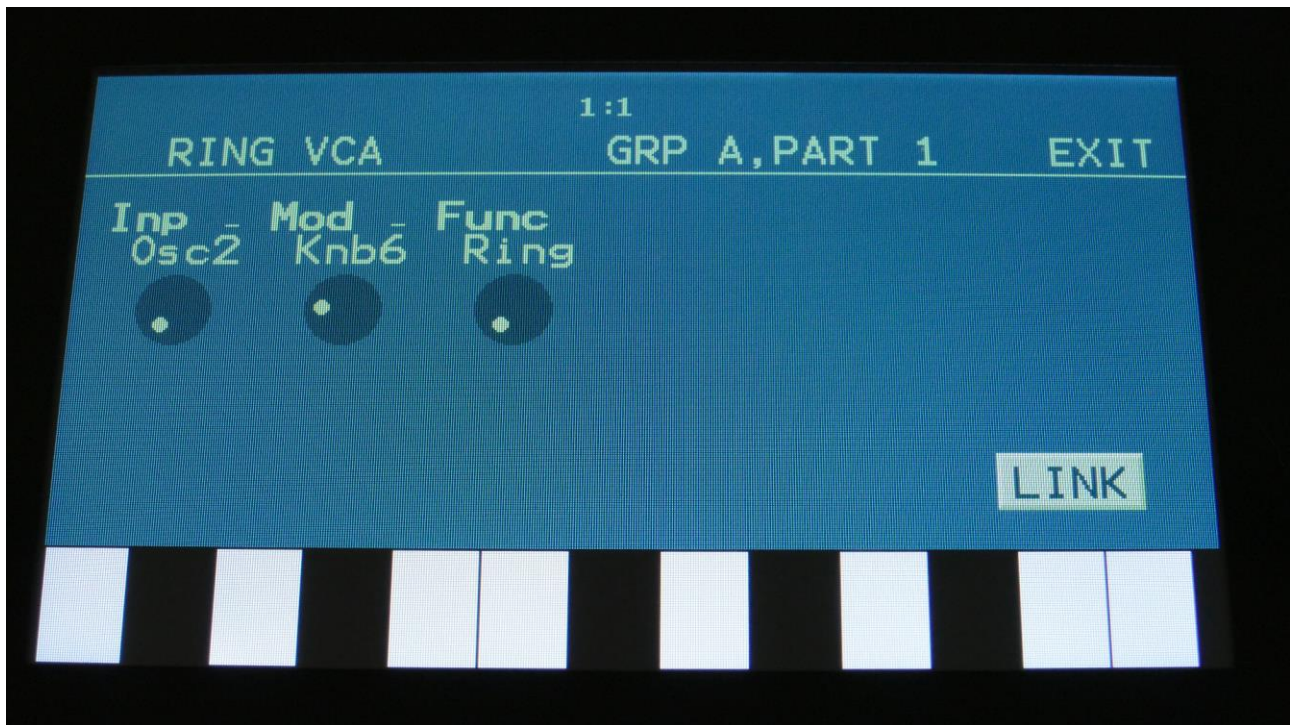
Each group has one Ring VCA (4 in total), which can be used as both VCA's, Ring Modulators, as logic modules and as mixers.

Ring VCA Parameters
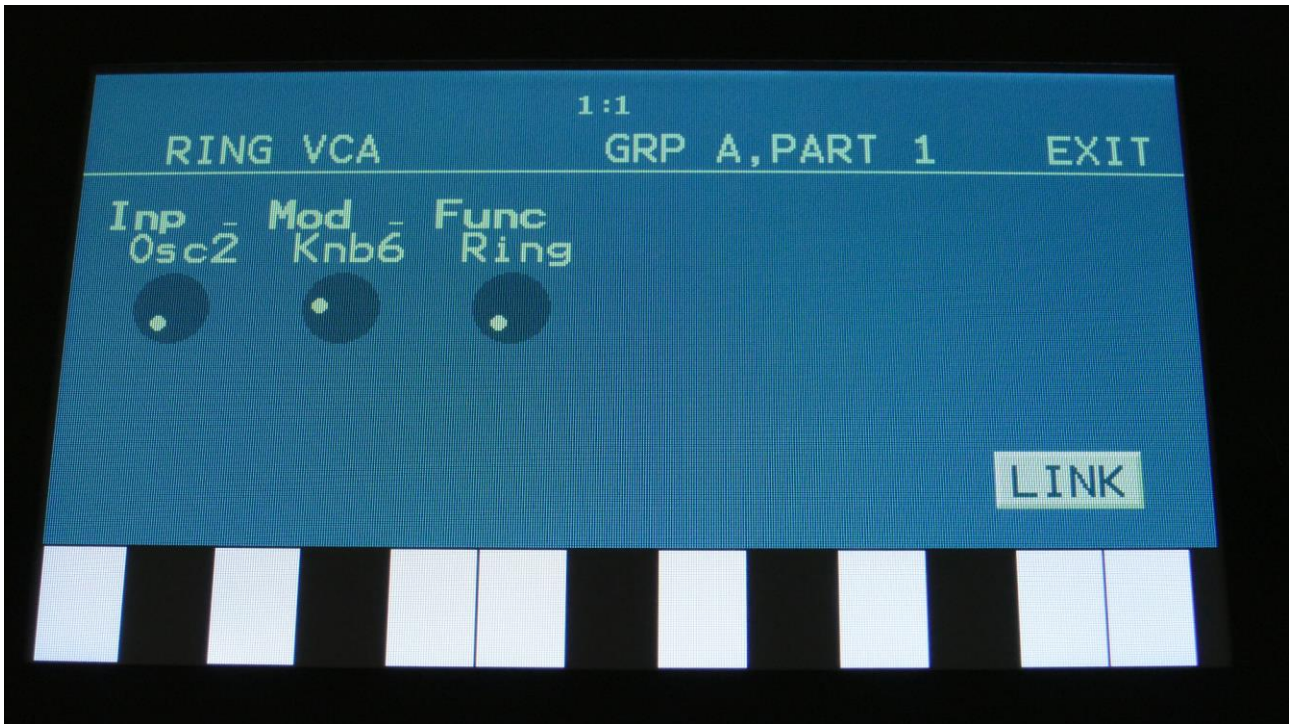
Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Inp: Source input. Connects any audio/modulation source to the input of the Ring VCA. This is the input, that gets modulated. A complete list of possible sources can be found in the "Connecting Modules" later in this manual.

Mod: Modulation input. Connects any audio/modulation source to the modulation input of the ring VCA. This is the input, that modulates the other input. A complete list of possible sources can be found in the "Connecting Modules" later in this manual.

Func: The following functions that can be selected and performed by the Ring VCA:
-Ring: The standard Ring VCA functionality.
-XOR1: Will quantize the 2 input signals to low/high square waves, and perform an exclusive or function on these.
-XOR2: Will look at the input signals as 16 bit waveforms, and perform an exclusive or function on each of these bits separately.
-AND1: Will quantize the 2 input signals to low/high square waves, and perform an AND function on these.

-AND2: Will look at the input signals as 16 bit waveforms, and perform an AND function on each of these bits separately.

-OR1: Will quantize the 2 input signals to low/high square waves, and perform an OR function on these.

-OR2: Will look at the input signals as 16 bit waveforms, and perform an OR function on each of these bits separately.

-Mix: Will mix the 2 input signals together.

Setup examples:

Ring Modulator: Connect audio range modulators (like oscillators or samples) to both inputs.

Modulation VCA: Connect the source that you would like to be level modulated to "Inp", and connect the desired level modulator to "Mod".

Logic module and Mixer: Just select these functions, using the Func parameter.

EFX - Effect Processors
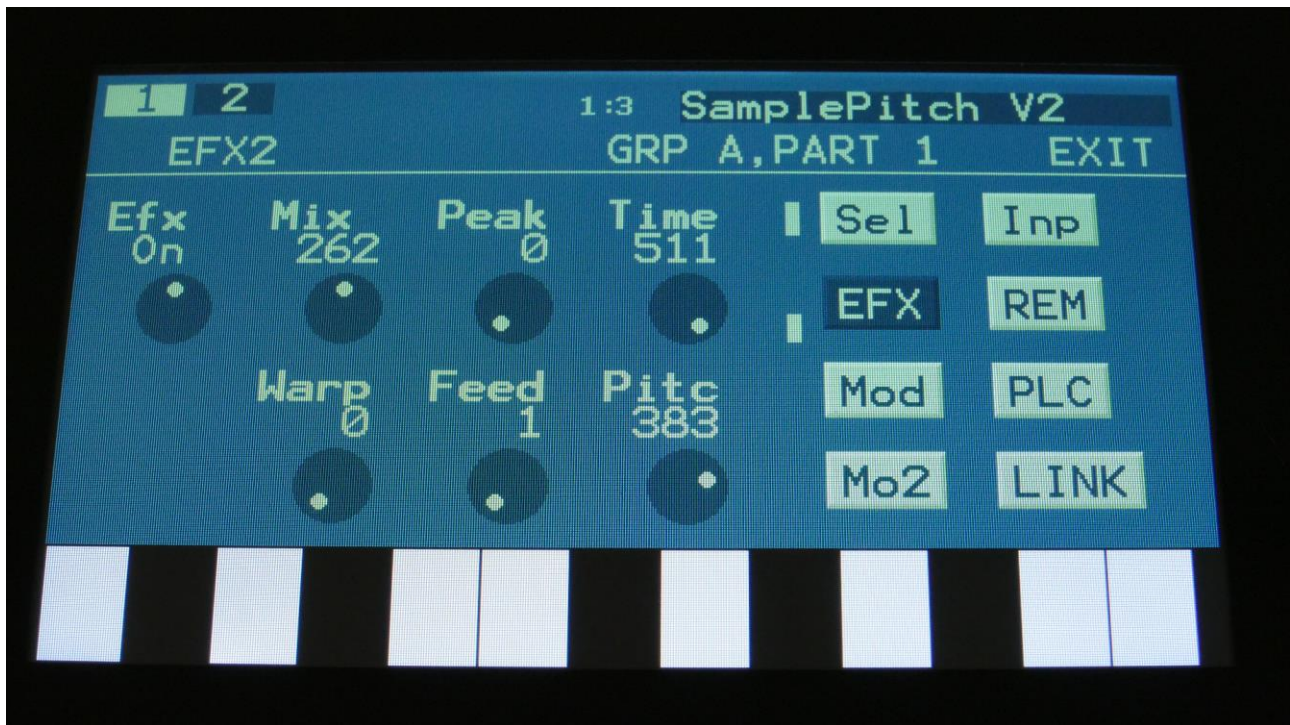
Zaturn has 8 effect processors, 2 in each group, EFX 1 and 2. All effect types are available in both EFX 1 and 2, but EFX 2 has some additional "large" effects, like reverb and granulators. Most parameters can be modulated. Zaturn has many of the classic deFormer effect, but also some new ones, like a wavefolder and some new pitch effects.

Effect types

-Chorus : Gotharman's special chorus with an added Deep parameter, that adds space to the chorus.

-Resonator : Simulates the resonances that comes, if a sound goes through a small box. Zaturn's resonators are synthetic, with more focus on making sounds, than on simulating actual boxes.

-Distortion : 6 types: Valve, Sine, Fuzz, Xdis, Asym, Curv.

-Bit Crush : Lowers the sample rate and the bit resolution of the sound, to obtain lo-fi effects.

-PitchShift : Shift the pitch of the sound up to 4 octaves up or down, without changing the time resolution or "tempo" of the sound. Adjustable sense.

-Stretcher: Tries to time stretch the input signal, while at the same time keeping up with it. Impossible? Yes, indeed :-)

-FM : Adds self-FM to the input signal in +/- 1 octave, +/- 2 octaves or +/- 4 octaves ranges.

-Sample Pitch : Changes the pitch of a sampling, without changing the length, using granular technology. It is possible to set the size of each pitch grain, to generate great granular effects. This effect has to be triggered from any of the parts, in order to function properly. It will work on external signals, but it still needs to be triggered by a part.

-SamplePitch V2:   NEW!   A pitchshifter that is degrading the sound. A Peak parameter are available, that alters the formants, and a Warp parameter will warp the signal into another dimension.

-Roto Pitch: NEW! Rotating pitch shifter. This is not as smooth as the same effect in processors 7 and 8, but still usable for some weird pitch effects.

-Variator : Creates new variations of the input signal. Both pitch and rhythmic variations.

-PitchShaper : 1 input version of Gotharman's special Pitch Shaper, that forces an audio signal to play back at a specific pitch, determined by an adjustable frequency.

-PitchShaper2 : This is a dual input PitchShaper. The pitch of the signal applied to input 1, is pitch matched to the signal applied to input 2. When changing the pitch of the pitch matched signal, the waveform on the effect output will change, still matched to the pitch of input 2. It is also possible for the signal applied to input 1, to affect the output pitch, by turning the Vari parameter up.

-Time Stretch : This effect is able to change the length of the input signal, almost without changing the pitch. Old fashioned time stretch done in realtime, that can be applied even to live input signals! It is also possible to change the pitch if desired, and it is possible to trigger this effect, for bigger precision.

-Filter : The original digital Gotharman filters from the deFormer series. 16 filter types.

-Triple BPF: **NEW!** This is the same triple filter as found in the DGF section, but with an added "Gates" parameter, that "digitalizes" the filter for some special effects.

-WaveFolder: **NEW!** A dual Wavefolder.

-FAT : Adds up to 3 layers of the sound to itself, and it is possible to adjust the phase of these, and to select whether the effect sound should be boosted or just layered.

-EQ : A parametric EQ with different characteristics.

-EQ2 : A parametric EQ with different characteristics than EQ1.

-OverShifter : A kind of frequency shifter, that can shift the frequency bands of the input signal up, and add feedback and ring effects.

-Bass Enhancer : Enhances the bass area of the sounds, that goes through it, and adds some boom to these.

- Compressor : Damps audio signals that are above a settable level, in order to make the signal less dynamic, and easier to record.

-Expandor : Gains audio signals that are above a settable level, in order to add more kick to sounds.

-Delay1 : Delay with time and feedback controls, plus Gotharman's Deep and Xfade controls. Deep adds space to the delay. The Xfade control on this delay, creates valleys between the delay taps. The more it is turned up, the more time the valleys takes up.

- **Roto Delay** : This is a 2 tap delay, that is constantly crossfading between the 2 taps. When the Xfade control is turned down, the crossfading is rough, the more it is turned up, the more smooth the crossfading gets. Other controls are the same as the first delay.

-**Bright Delay** : First delay, but with a brighter sound, created by a resonator.

-**Br Roto Delay** : Roto delay, but with a brighter sound, created by a resonator.

-**Delay1_L (Large –EFX2 only)** : Delay with time and feedback controls, plus Gotharman's Deep, Size, Beam and Xfade controls. Deep adds space to the delay, Size makes the playback range more narrow than the input recording range, and beam beams the delay to previously unknown places. The Xfade control on this delay, creates valleys between the delay taps. The more it is turned up, the more time the valleys takes up.

-**Roto Delay_L (Large –EFX2 only)** : This is a 2 tap delay, that is constantly crossfading between the 2 taps. When the Xfade control is turned down, the crossfading is rough, the more it is turned up, the more smooth the crossfading gets. Other controls are the same as the first delay.

-**Bright Delay_L (Large –EFX2 only)** : First delay, but with a brighter sound, created by a resonator.

-**Br Roto Delay_L (Large –EFX2 only)** : Roto delay, but with a brighter sound, created by a resonator.

-**Granulator SQ_L (Large –EFX2 only)** : Cuts the input signal up in grains, that can be re-arranged. This granulator is synced to the sequencer.

-**Variator_L (Large –EFX2 only)** : Creates new variations of the input signal. Both pitch and rhythmic variations.

-**Reverb_L (Large –EFX2 only) :** **NEW!** A newly designed reverb effect, that is more smooth, and has simplified parameters, for easier programming.

-**Granulator_L (Large –EFX2 only)** : Cuts the input signal up in grains, that can be re-arranged, using the step values of a selectable controller sequencer track. This is the granulator that was named "AnaGran" in earlier Gotharman instruments. Unlike the Granulator SQ, this is not synced to the sequencer. It plays back one grain, and then it immediately advances to the next grain.

-**Xfade Granulator_L (Large –EFX2 only)** : Cuts the input signal up in grains, that can be re-arranged, using the step values of a selectable controller sequencer track. This granulator plays

back one grain, and then it crossfades to the next grain. It is also possible to adjust and modulate the pitch of the granular sequence, using any modulation source.

-Abstruct0_L (Large –EFX2 only) : This effect constantly records the audio applied to its input, in a time interval determined by a ”Rec” parameter. It uses 2 ”playback heads” to play back the recorded audio. Each of these playback heads can be switched on and off, and the playback length can be adjusted for each of them. Every time a head has played back the adjusted amount of time, it jumps to a new random location of the recorded piece, and starts play back again. The playback pitch of head 2 can be adjusted.

-Time Stretch_L (Large –EFX2 only) : This effect is able to change the length of the input signal, almost without changing the pitch. Old fashioned time stretch done in realtime, that can be applied even to live input signals! It is also possible to change the pitch if desired, and it is possible to trigger this effect, for bigger precision.

-Roto Pitch_L (Large –EFX2 only) : **NEW!** Rotating pitch shifter, that can create smooth echoing pitch shifts.

-SamplePitch V2_L (Large –EFX2 only) : **NEW!** A pitchshifter that is degrading the sound. A Peak parameter are available, that alters the formants, and a Warp parameter will warp the signal into another dimension.

Effects Select page

From the synth modules page, touch EFX to enter the effect pages.

To select Effect 1 to 2, touch the numbers in the upper left corner. Push and hold the Steps/Part button, while pushing step button 1 to 8, to select another module group.
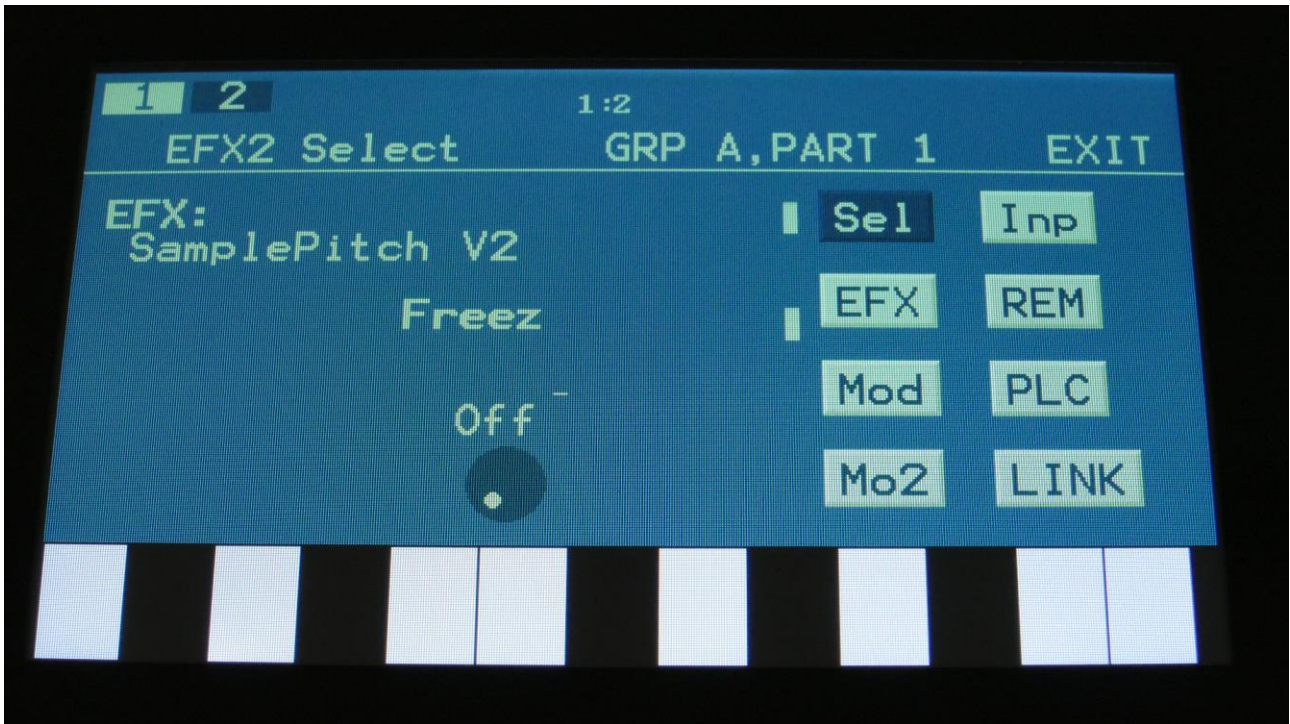
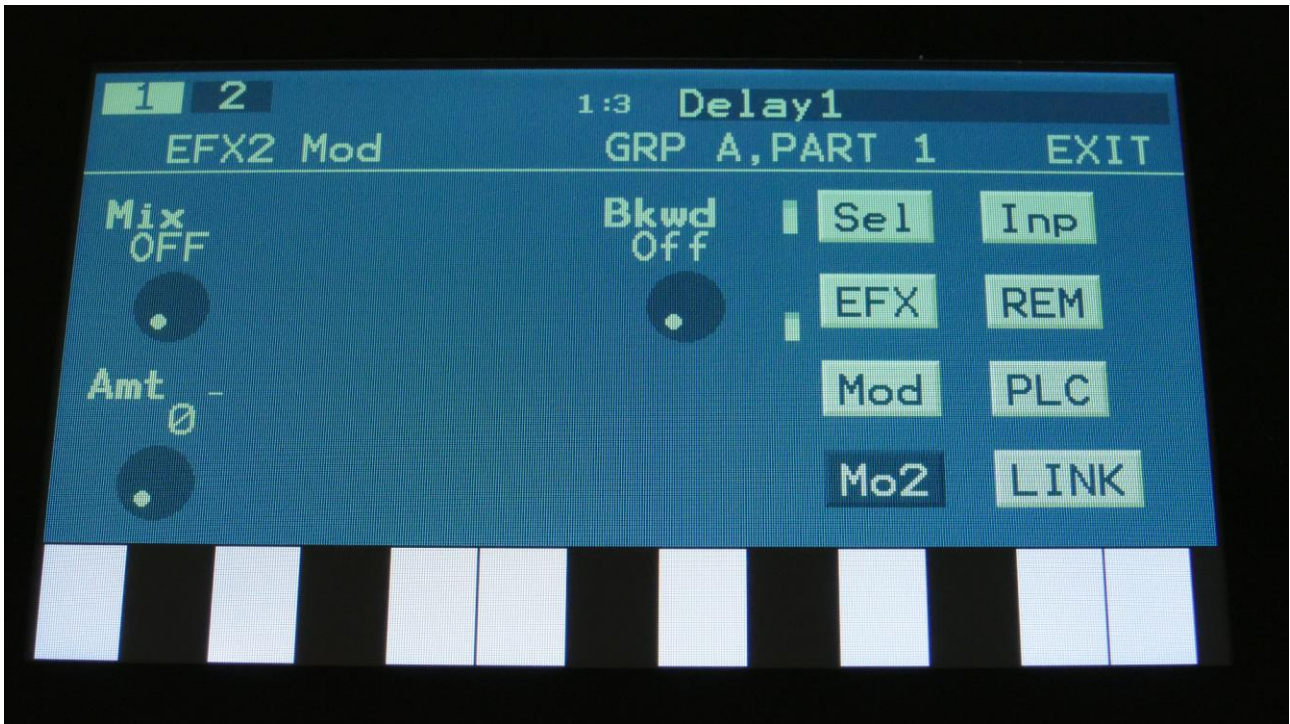Touch the SEL touch button, to enter the effect select page.

The 2 VU-meters at the right of the screen, shows the Effect input and output activity.

Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

EFX: Selects the effect. Please see the List Of Effects in the beginning of this section.

Freez: Freeze modulation. Can be set to off, Freeze button (Buton) or to any audio/modulation source. When set to any other value than off, the effect will freeze, when the modulation source are in its upper range. When an effect freezes, it no longer samples its audio input signal, but only outputs whatever it already holds in its audio buffer.

Mix Modulation and Backwards Delay

The Effect dry/wet mix can be modulated on all effects.

Touch the MO2 touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.
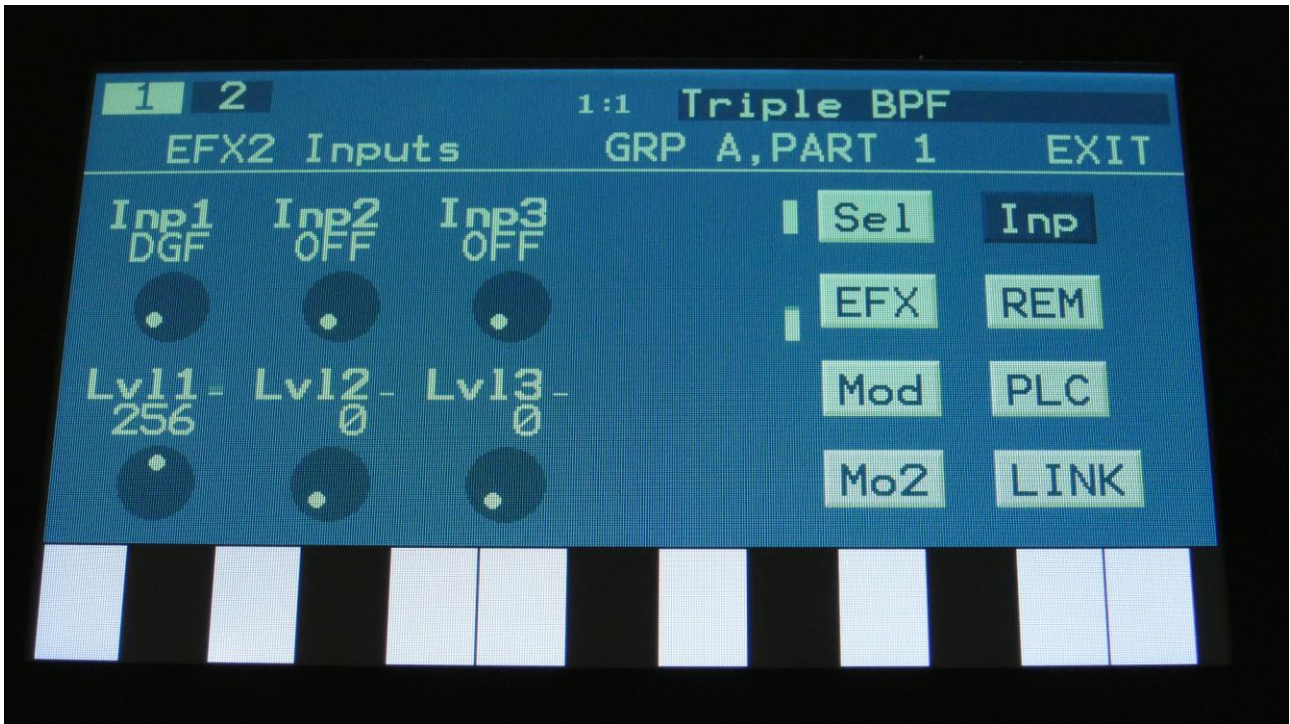
The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Mix: Modulates the effect dry/wet mix.

Bkwd: This is only visible, when a delay effect is selected. Turning this on, will make the delay effect play back backwards.

Effect Inputs

Touch the Inp touch button, to enter this page.

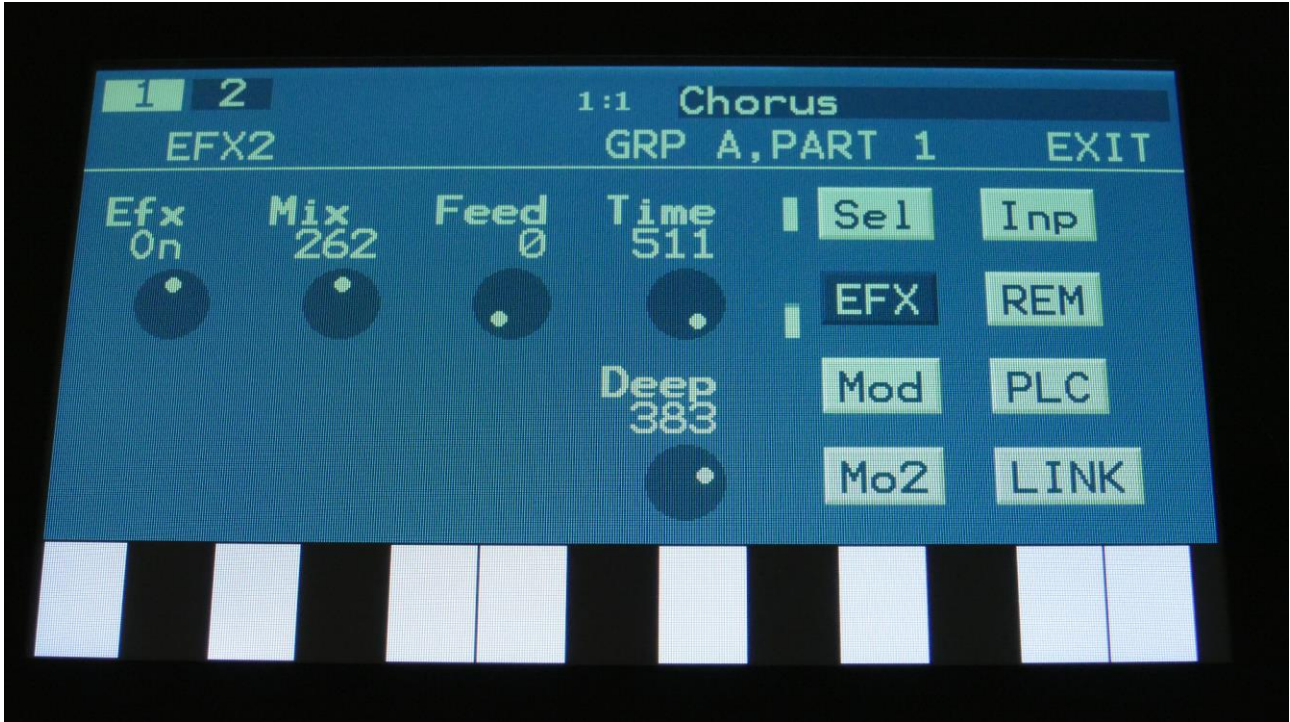The VU-meters at the right of the screen, shows the Effect input and output activity.

Inp1, Inp2, Inp3: Select any 3 module outputs, to connect to the 3 audio inputs of the effect. A complete list of possible sources can be found in the "Connecting Modules" later in this manual.

Lvl1, Lvl2, Lvl3: Effect input levels. Sets the levels for each of the 3 sources, connected to the effect inputs. 0 to 511.

Effect Parameters

Chorus

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Feed: Chorus feedback amount.

Time: Chorus Time. This should be modulated by an LFO, to get the traditional chorus effect.

Deep: Adjusts how deep the chorus box should be. A Gotharman special.

Chorus Modulation
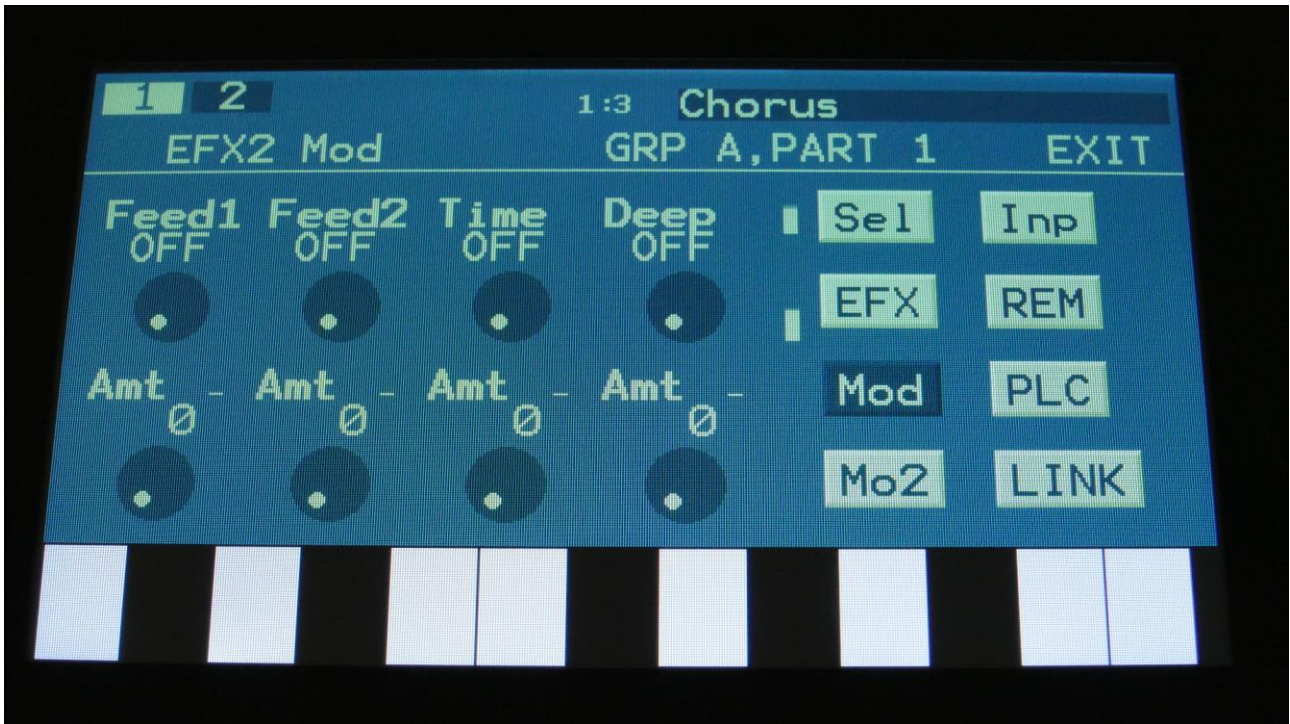
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Feed1 and Feed2: Modulates the chorus feedback.

Time: Modulates the time parameter.

Deep: Modulates the Deep parameter.

Resonator

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

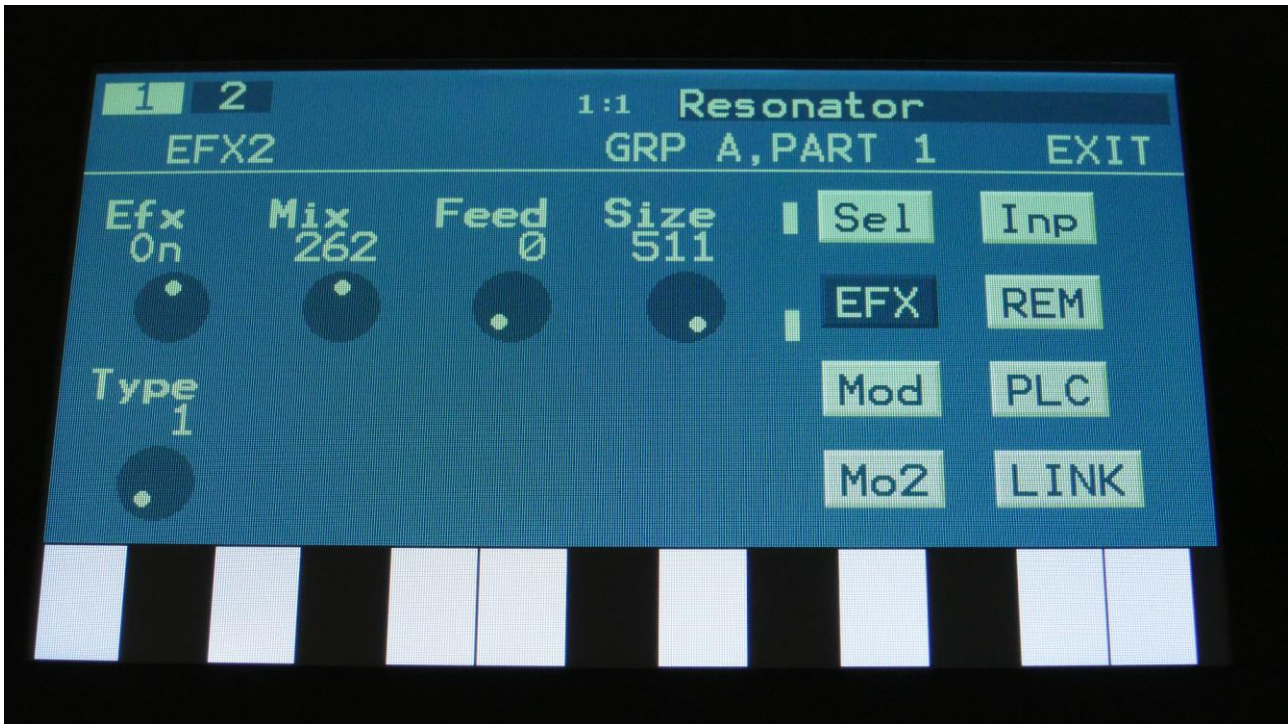**Efx:** Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Feed: Resonator feedback. The more this is turned up, the more it will resonate.

Size: The size of the resonator box. Different sizes will give different resonance frequencies.
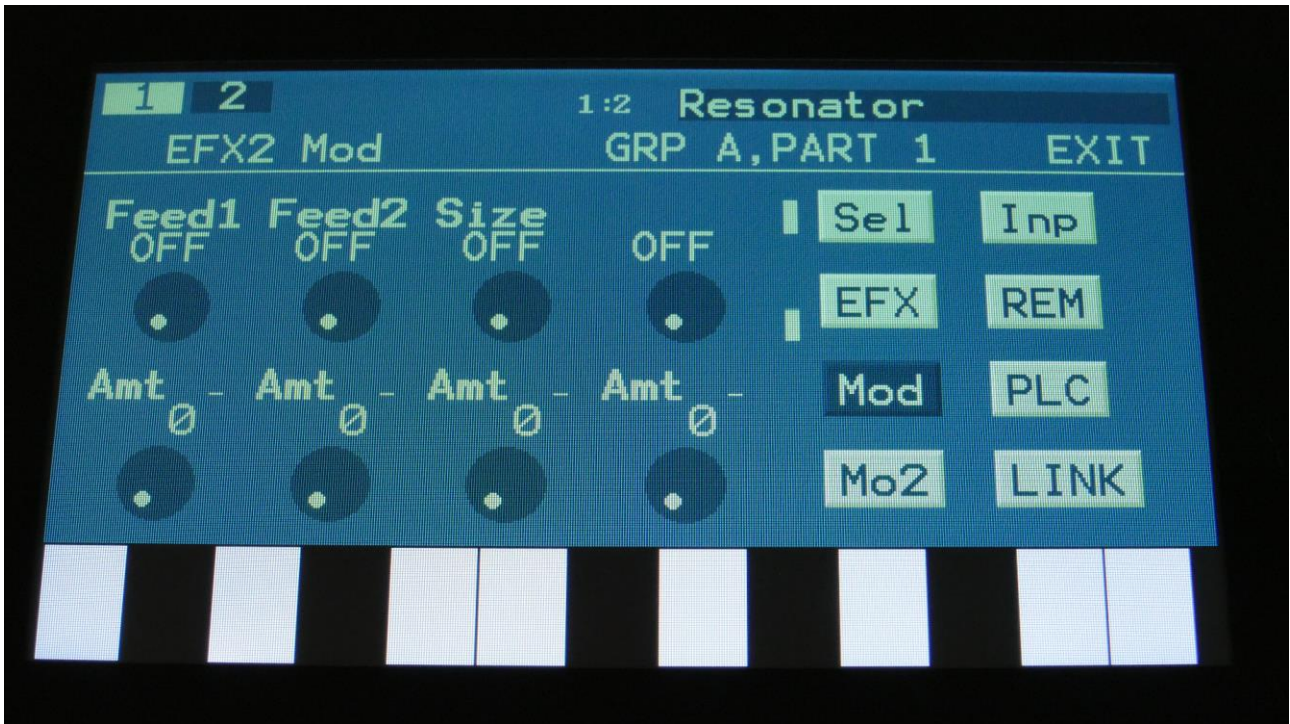
Type: 2 different resonator types are available.
Type 1 are a traditional resonator, based on the Karplus Strong algorithm.
The **Type 2** Resonator are a new type, that is based on generating the resonances, that are fed back, using real filtering.
The 2 types are quite different.

Resonator Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Feed1 and Feed2: Modulates the feed parameter.

Size: Modulates the Size parameter.

Distortion
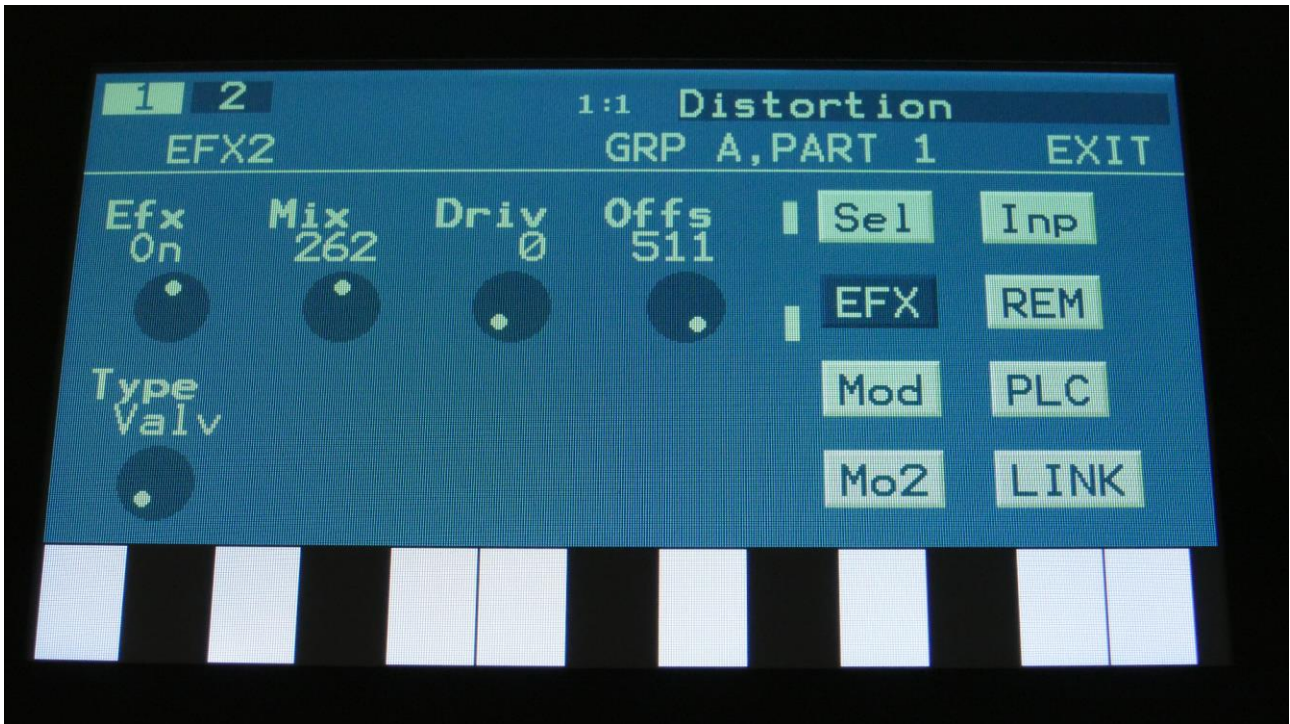
Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Drive: The higher the value, the more the sound will distort. If this is set to zero, no sound will pass through the distortion.

Offs: Distortion offset. The more this is turned up, the more asymmetric the distortion will get.

Type: Distortion type. Choices are:

-**Valve:** A digital simulation of a classic valve distortion.

-**Sine:** A noisy and warm sine shaping distortion.

-**Fuzz:** Simulates a classic fuzz distortion.

-**Xdis:** Complete destruction of the sound.

-**Asym:** Asymmetrical distortion.

-**Curv:** NEW! Curve distortion. The Offset parameter will bend the curve of the input signal. Below 256: logarithmic curve. Above 256: Exponential curve. 256: Linear curve.

Distortion Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.
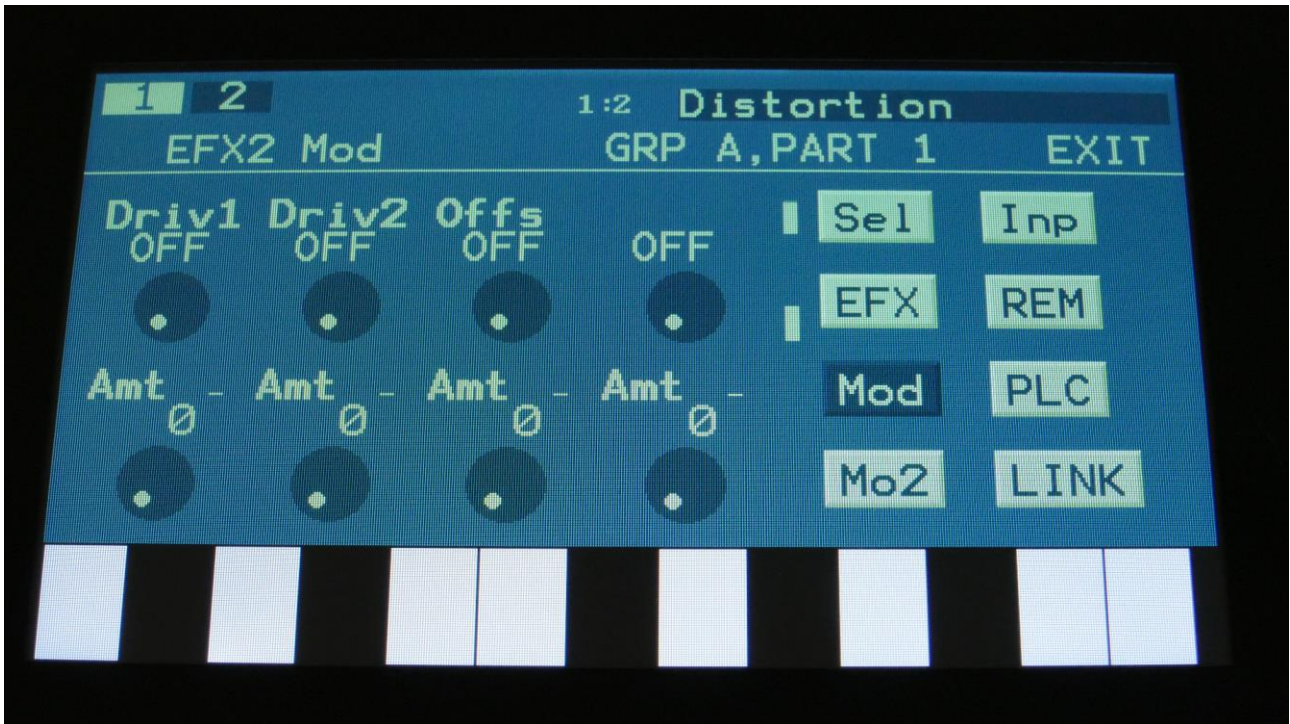
The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Driv1 and Driv2: Modulates the drive parameter.

Offs: Modulates the offset parameter.

Bit Crush
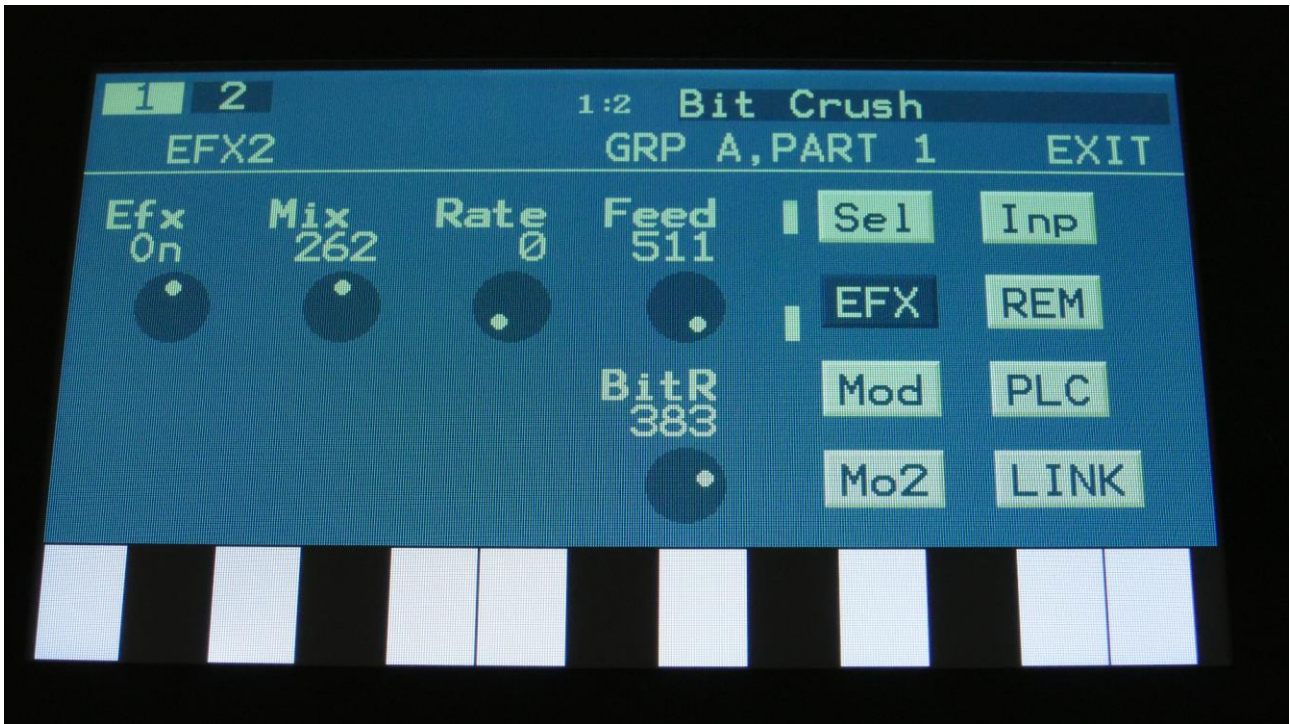
Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Rate: Sample Rate Reduction. The more this is turned up, the lower the sample rate will be. From 44.1 KHz to 1 KHz.

Feed: Feedback. Turning this up will slightly overdrive the sound.

BitR: Bit Reduction. The more this is turned up, the lower the bit resolution will get. When it is turned fully down, resolution is 16 bit, when turned fully up, it is 1 bit.

Bit Crush Modulation
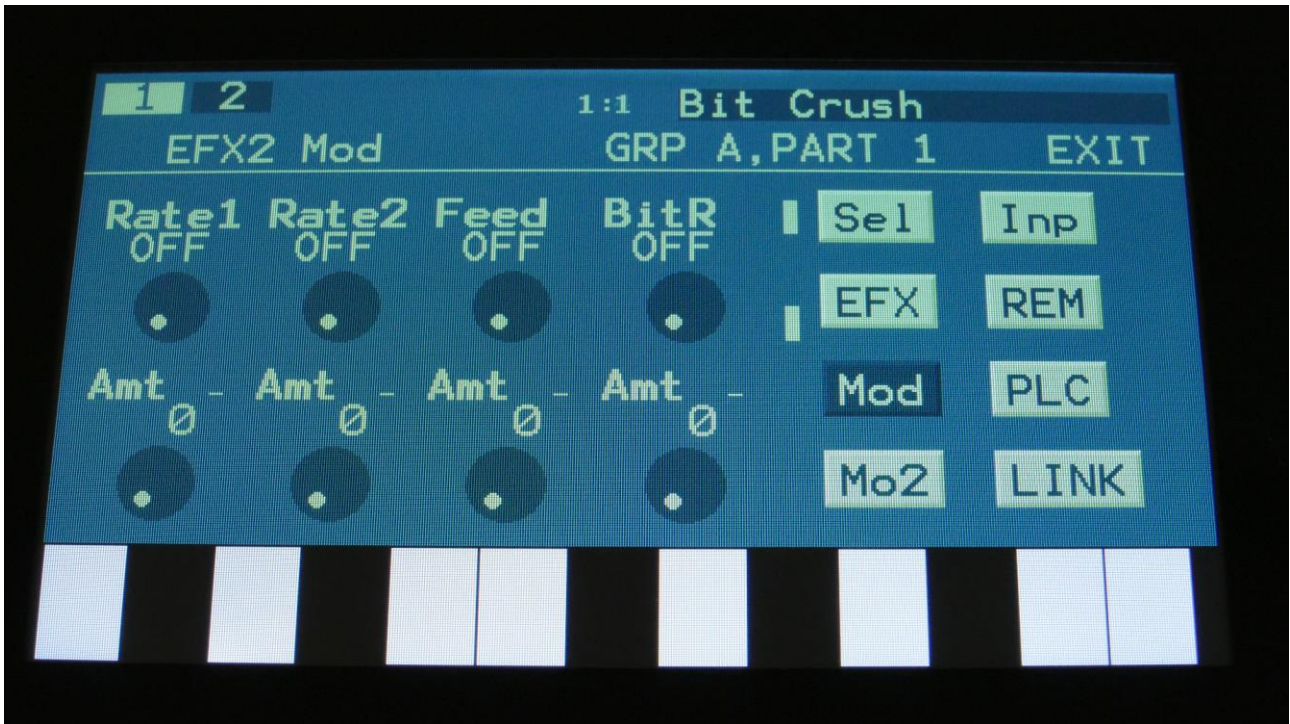
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Rate1 and Rate2: Modulates the sample rate parameter.

Feed: Modulates the feedback parameter.

BitR: Modulates the bit reduction parameter.

Pitch Shifter

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

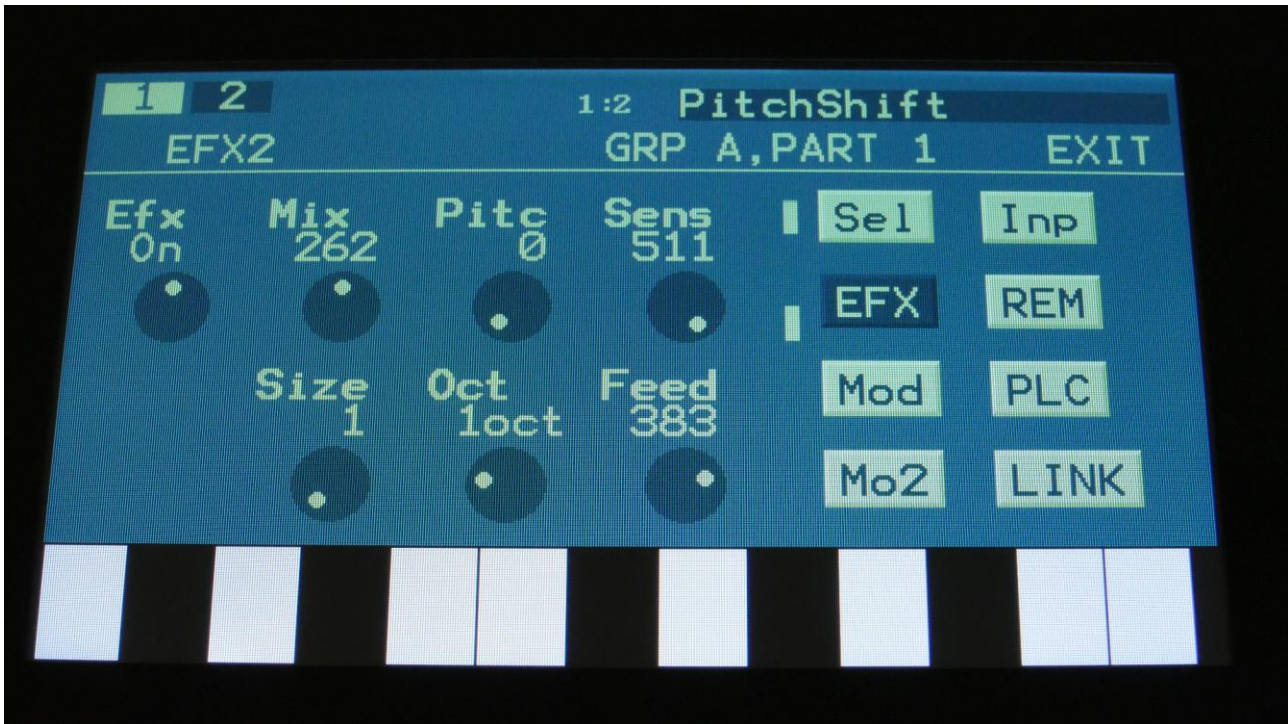**Efx:** Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Pitc: Smoothly pitches the sound from up to 4 octaves below the original pitch, to 4 octaves above.

Sense: Pitch detection sense. On a pure waveform, turn this fully down to make sure, that it detects all the waves of it, and pitch shifts correctly. On more complex sounds, turn this up until the desired effect are obtained. At higher settings, only portions of the sound will be pitch shifted, and when it doesn't detect any pitch, it will repeat the portion it detected, making the sound "granulate".

Size: 1 to 64. This sets the size of the buffer, used for the pitch shifting effect. When pitch shifting more complex sounds, it might make the pitch shifting more precise, when turning this parameter up a bit.

Oct: The octave range of the pitch shifter. From +/- 1 to +/- 4 octaves.

Feed: Pitch shifter feedback. Adjusts the portion of the output signal, that is fed back to the input.

Pitch Shifter Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc1 and Pitc2: Modulates the pitch shift parameter.

Sens: Modulates the Sense parameter.

Feed: Modulates the Feed parameter.

Stretcher
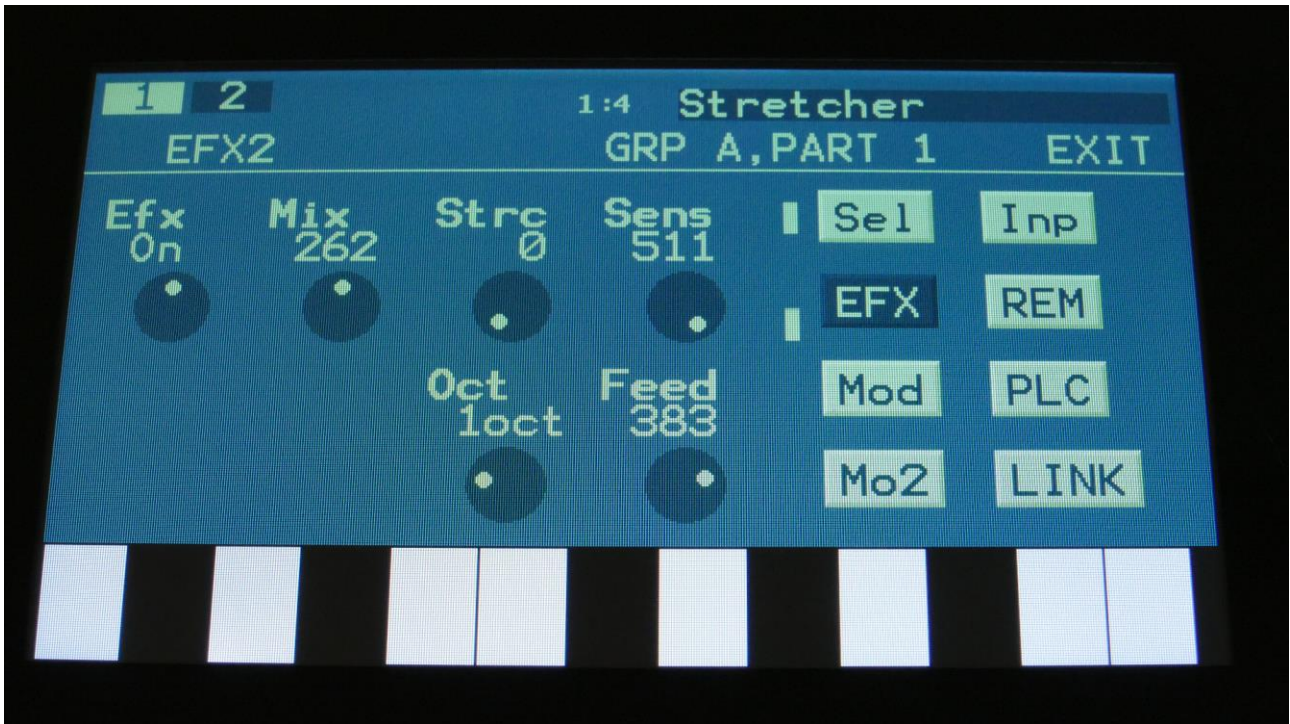
Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Strc: The degree of time stretch.

Sens: Stretch detection sense. At lower settings the sound will "wobble", at higher settings it will "granulate". Adjust this to obtain different effects.

Oct: The octave range of the stretch effect. From +/- 1 to +/- 4 octaves.

Feed: Stretcher feedback. Adjusts the portion of the output signal, that is fed back to the input.

Stretcher Modulation
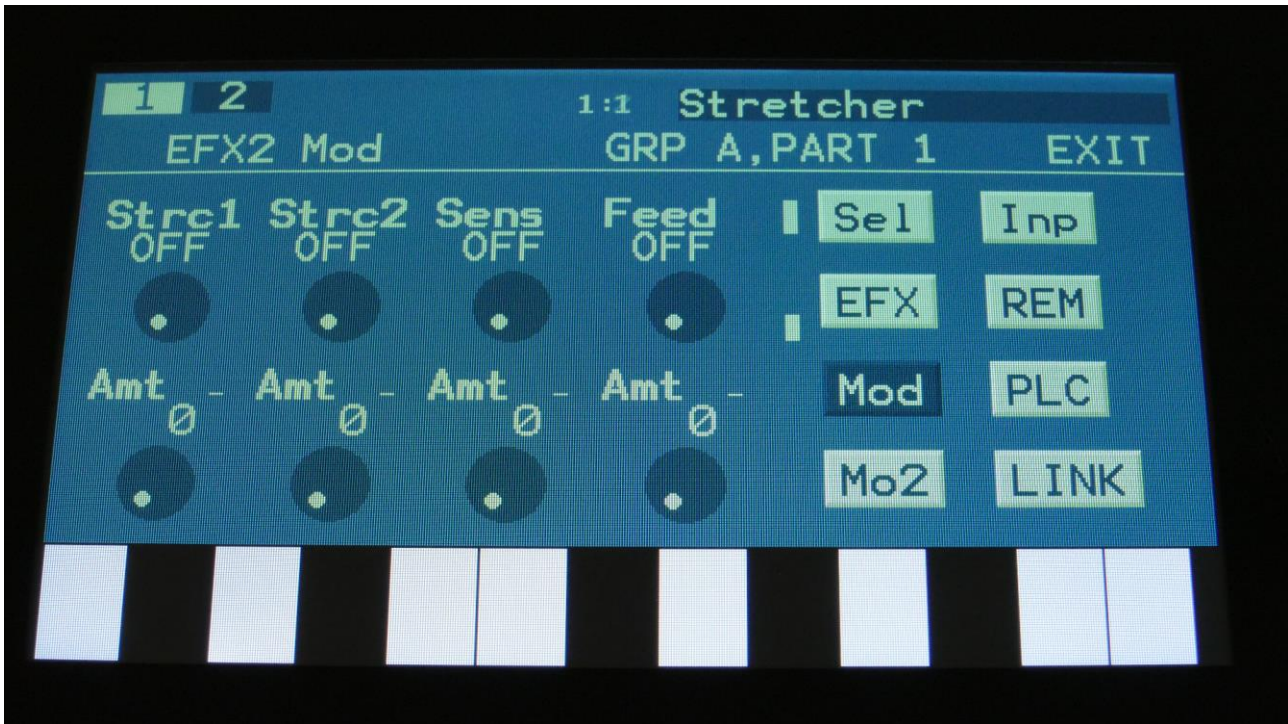
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Strc1 and Strc2: Modulates the stretch parameter.

Sens: Modulates the sense parameter.

Feed: Modulates the feed parameter.

FM

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.
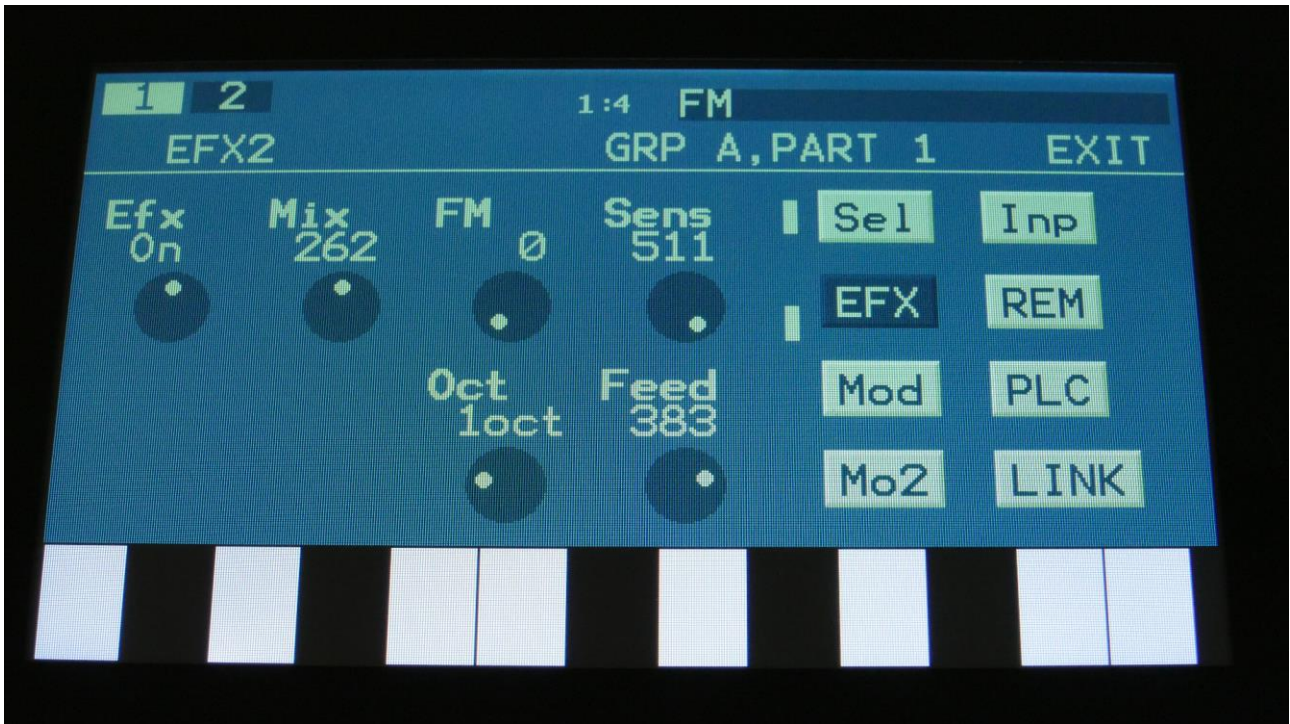
FM: The amount of self-FM from 0 to up to +/- 4 octaves.

Sense: FM pitch detection sense. On a pure waveform, turn this fully down to make sure, that it detects all the waves of it, and pitch shifts correctly. On more complex sounds, turn this up until the desired effect are obtained. At higher settings, only portions of the sound will be pitch shifted, and when it doesn't detect any pitch, it will repeat the portion it detected, making the sound "granulate".

Oct: The octave range of the FM effect. From +/- 1 to +/- 4 octaves.

Feed: FM feedback. Adjusts the portion of the output signal, that is fed back to the input.

FM Modulation
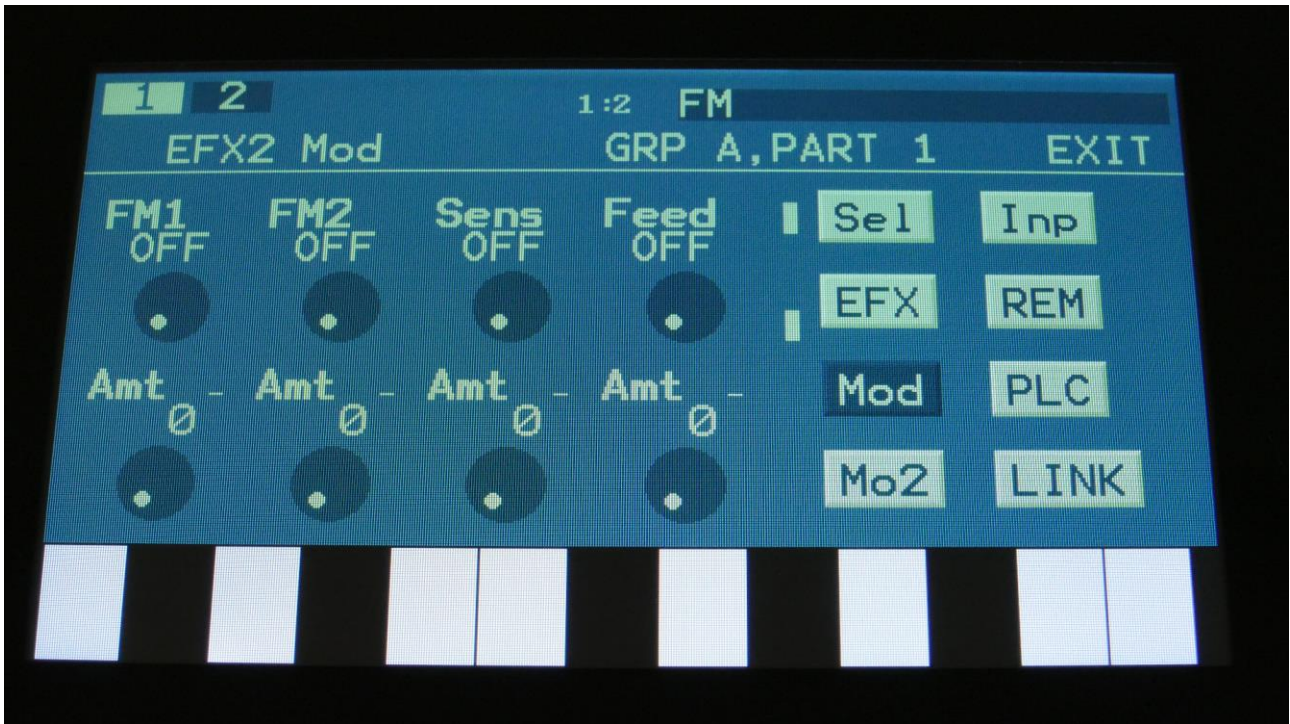
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

FM1 and FM2: Modulates the FM parameter.

Sens: Modulates the sense parameter.

Feed: Modulates the feed parameter.

Sample Pitch

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

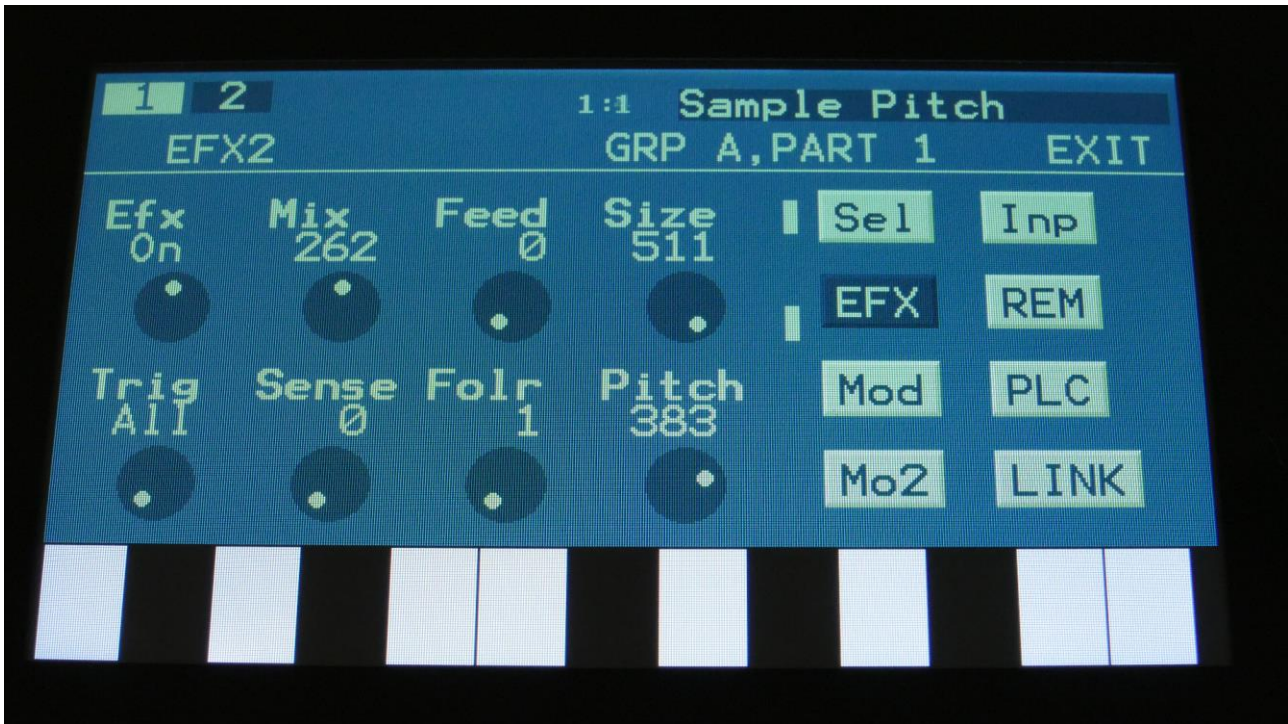**Mix:** The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Feed: Sets how much of the effect output signal should be fed back to its input.

Size: 0 to 511. The number of wave frames used for each pitch grain.

Trig: Off, 1 to 2, OffM, 1M to 2M. Determines if the sample pitch effect should be trigged by all parts or a single part. The "M" suffix indicates that the playback pointer will be moving in another pattern, that will give slightly different results.

Folr: The sample pitch effect output envelope follower rate.

Pitch: The playback pitch. Values below 256 will tune down, values above 256 will tune up.

Sample Pitch Modulation
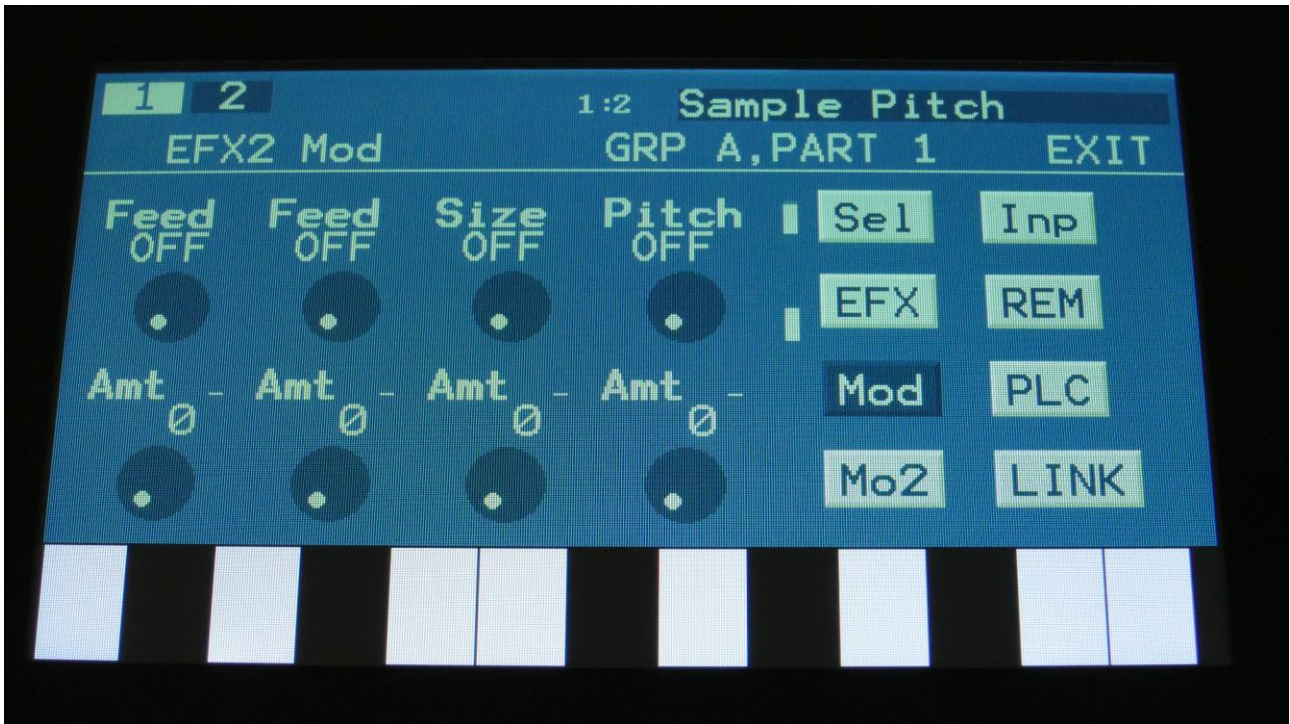
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Feed: Modulates the feed parameter.

Size: Modulates the number of waveframes, used for the pitch shifting.

Pitch: Modulates the pitch shifting.

Sample Pitch V2

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.
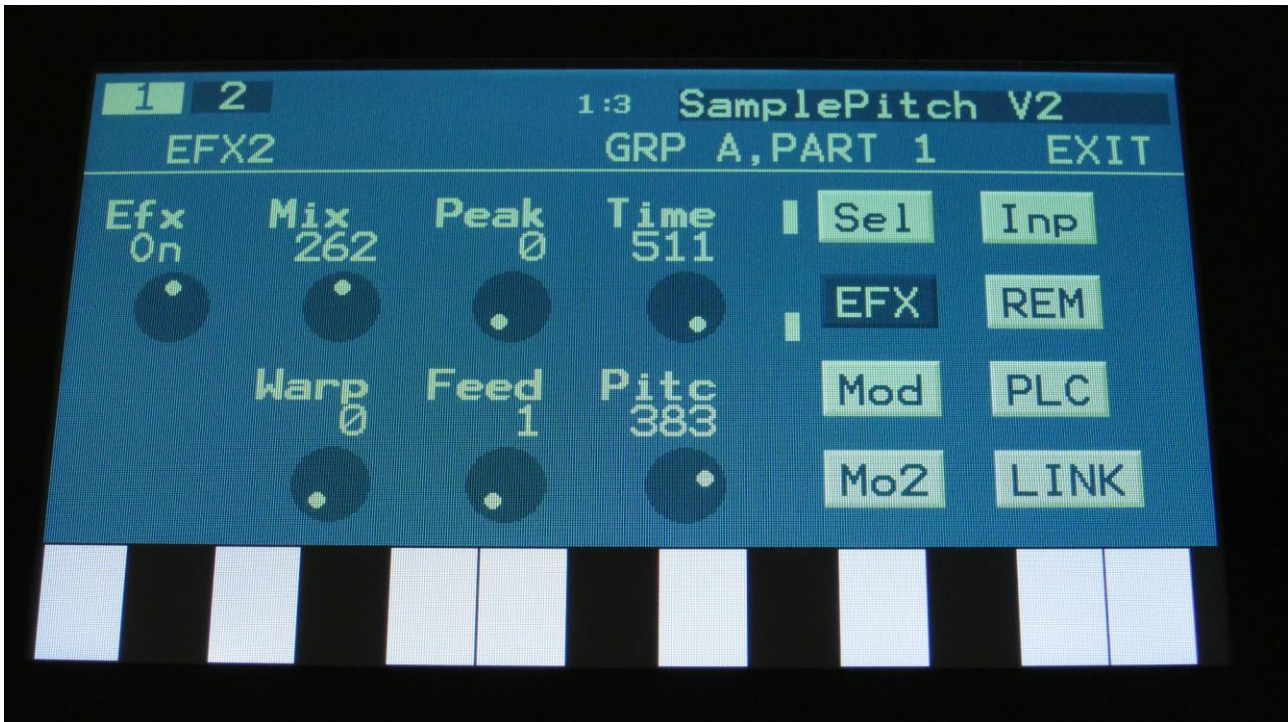
Peak: Adjusts the formant peaks of the sound. When set to zero, the formants of the sound are not altered.

Time: Sets the time base of the pitch shifting. When set to the maximum value, the relationship between time and pitch shifting is 1:1. When turned down, this relationship gets out of sync, and things starts to sound different.

Warp: Warps the signal over the edge, to make things sound really weird.

Feed: Adjusts the portion of the output signal, that is fed back to the input.

Pitc: Sets the output pitch of the effect. Goes from minus one octave to plus one octave.

Sample Pitch V2 Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Peak1 and Peak2: Modulates the Peak parameter.

Time: Modulates the Time parameter.

Pitc: Modulates the Pitc parameter.

Roto Pitch

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Feed: Adjusts the portion of the output signal, that is fed back to the input.

Size: Sets the size of the pitch shifting buffer. At higher values, this will create a pitch shifting delay.

Warp: Warps the signal over the edge, to make things sound really weird.

Curve: Set the curve for the pitch rotation. From logarithmic (0) to linear (256) to exponential (511).

Pitc: Sets the output pitch of the effect. Goes from minus one octave to plus one octave.

Roto Pitch Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
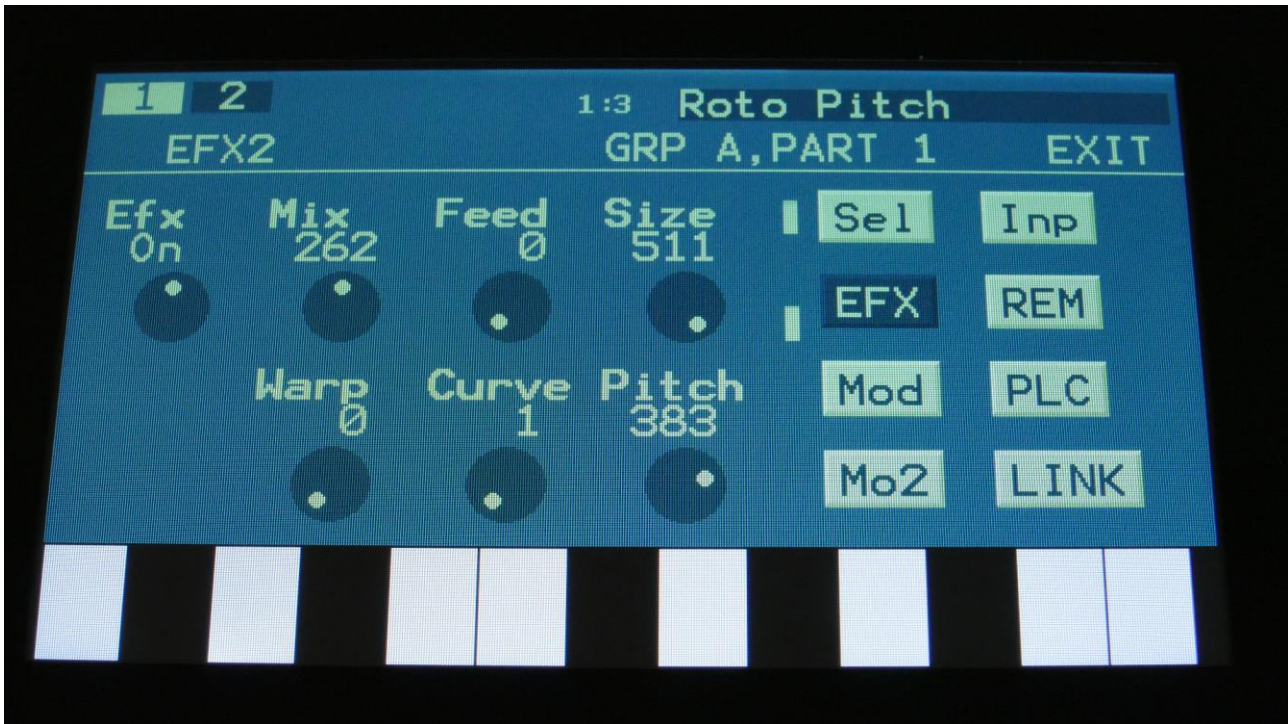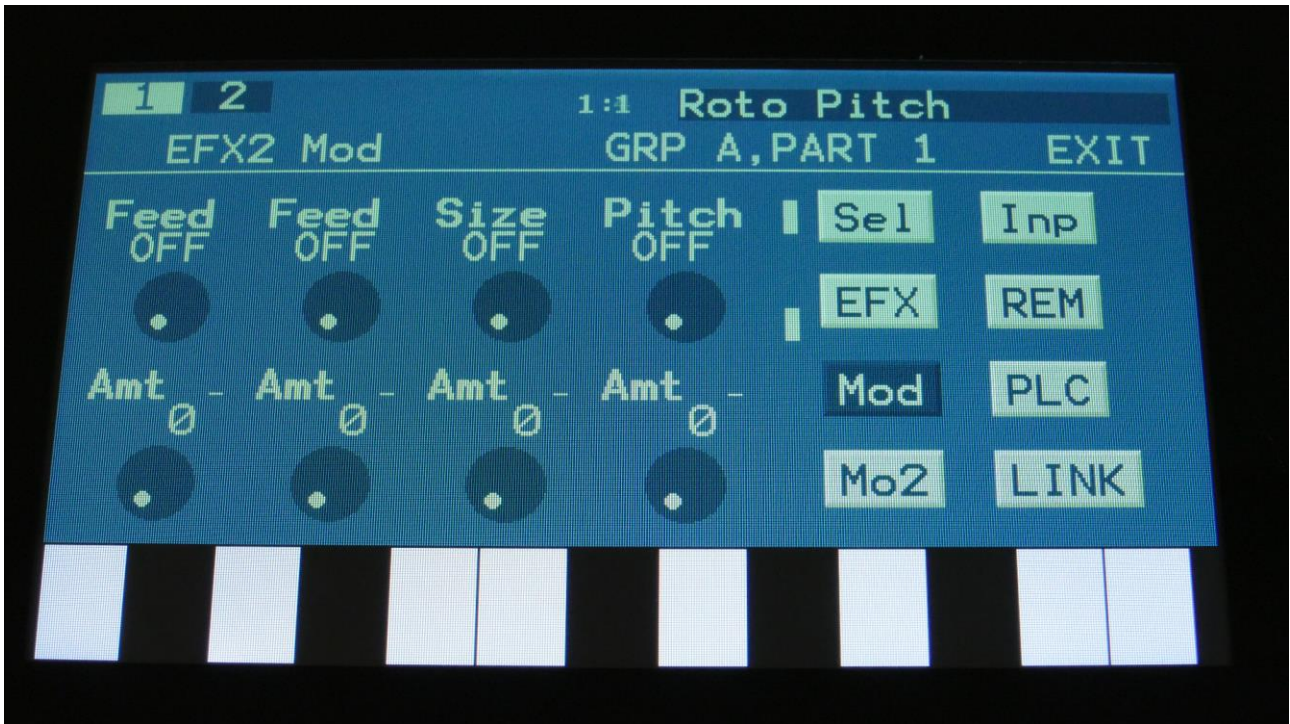
The parameters on this page:

Feed1 and Feed2: Modulates the Feed parameter.

Size: Modulates the Size parameter.

Pitch: Modulates the Pitch parameter.

Variator

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Gran: Determines the variation pattern. Range: 0 to 511.

Time: The size of the RAM buffer used for the variator. When this is set to zero, the Variator will use no RAM at all, and become quite unpredictable.

Size: The size of one grain.

Feed: Adjusts how much of the Variator output signal should be fed back to its input.

Pitc: The amount of Variator pitch shift.

Variator Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
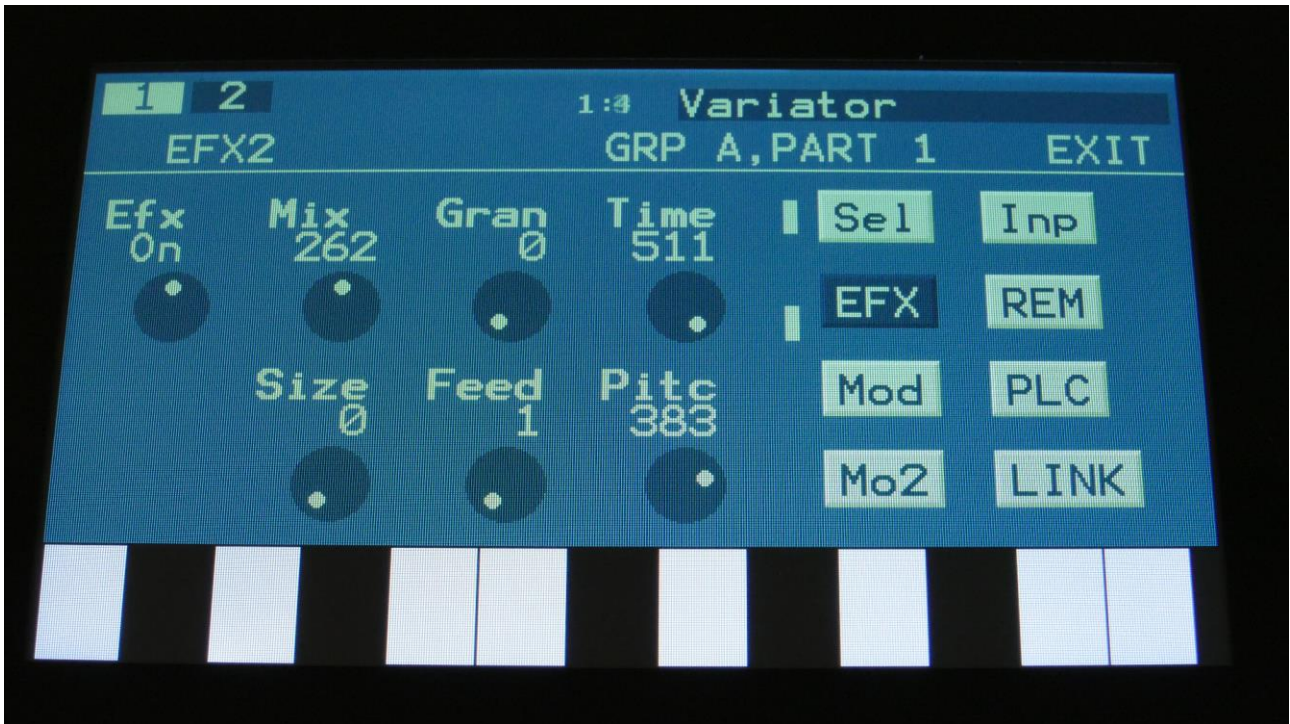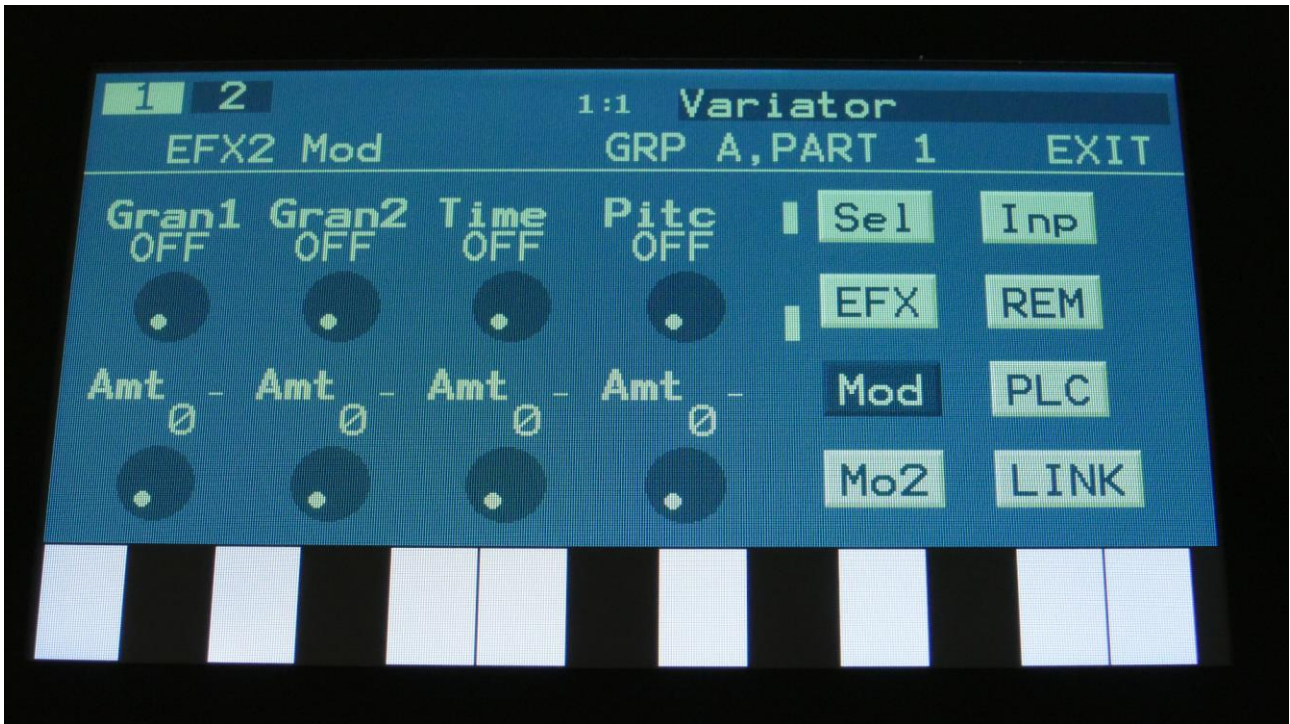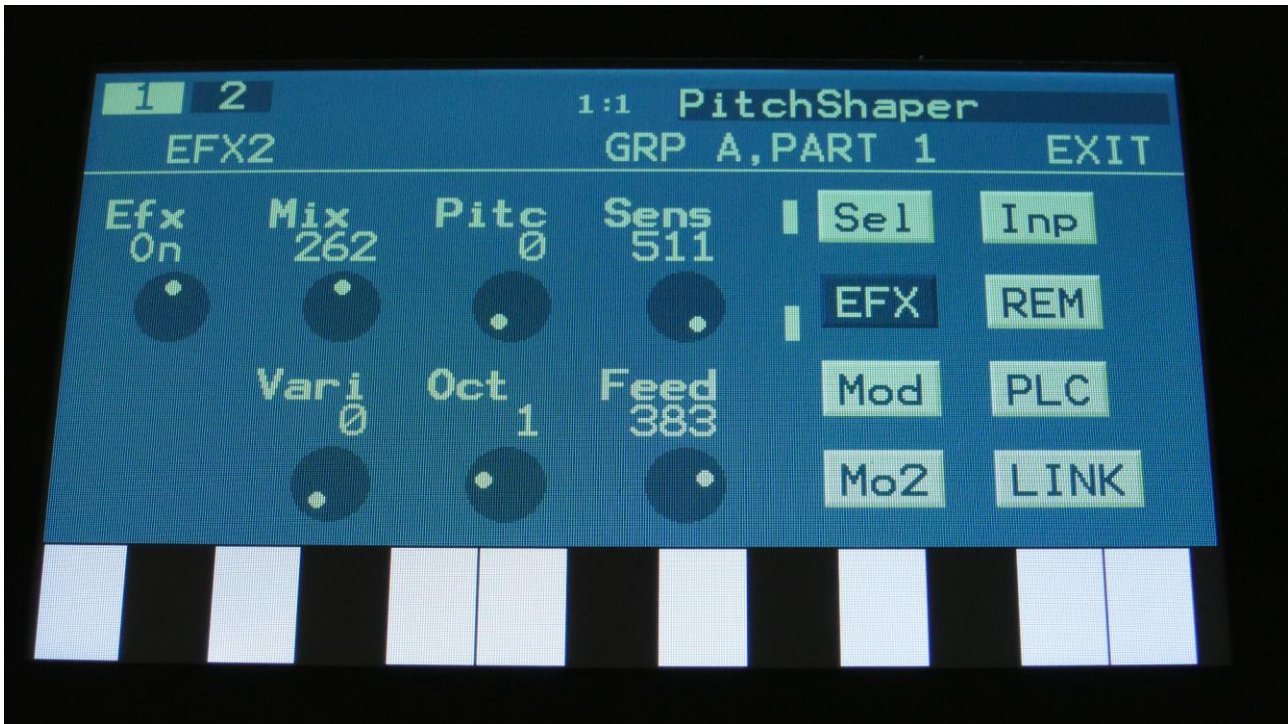
The parameters on this page:

Gran1 and Gran2: Modulates the gran variation pattern parameter.

Time: Modulates the time parameter.

Pitc: Modulates the pitch shift parameter.

PitchShaper

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Pitc: Sets the frequency, that the input signal should be re-pitched to.

Sense: Pitch detection sense. On a pure waveform, turn this fully down to make sure, that it detects all the waves of it, and pitch shifts correctly. On more complex sounds, turn this up until the desired effect are obtained. At higher settings, only portions of the sound will be pitch shifted, and when it doesn't detect any pitch, it will repeat the portion it detected, making the sound "granulate".

Vari: Pitch variation. The more this is turned up, the more the pitch variations on the input signal affects the pitch shaper frequency.

Oct: Octave transpose. From 0 to +3 octaves.

Feed: Pitch shaper feedback. Adjusts the portion of the output signal, that is fed back to the input.

PitchShaper Modulation
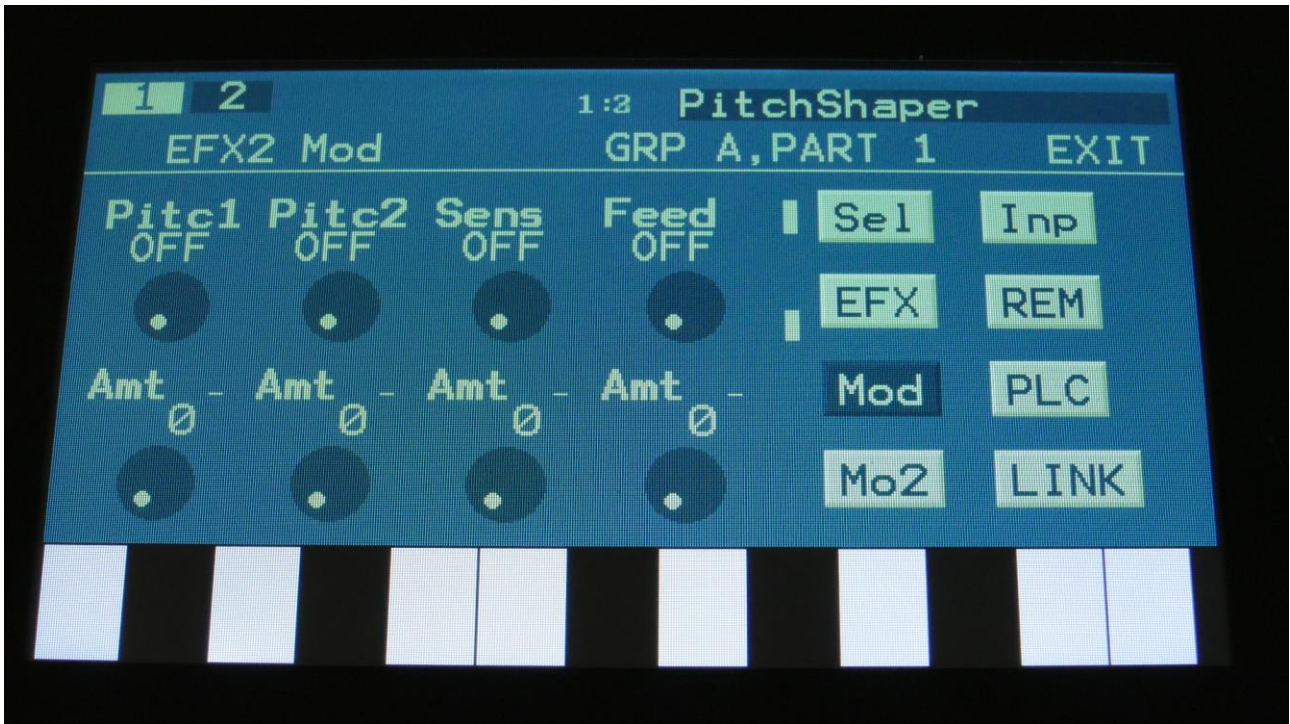
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Pitc1 and Pitc2: Modulates the pitc parameter.

Sens: Modulates the Sense parameter.

Feed: Modulates the Feed parameter.

PitchShaper2

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.
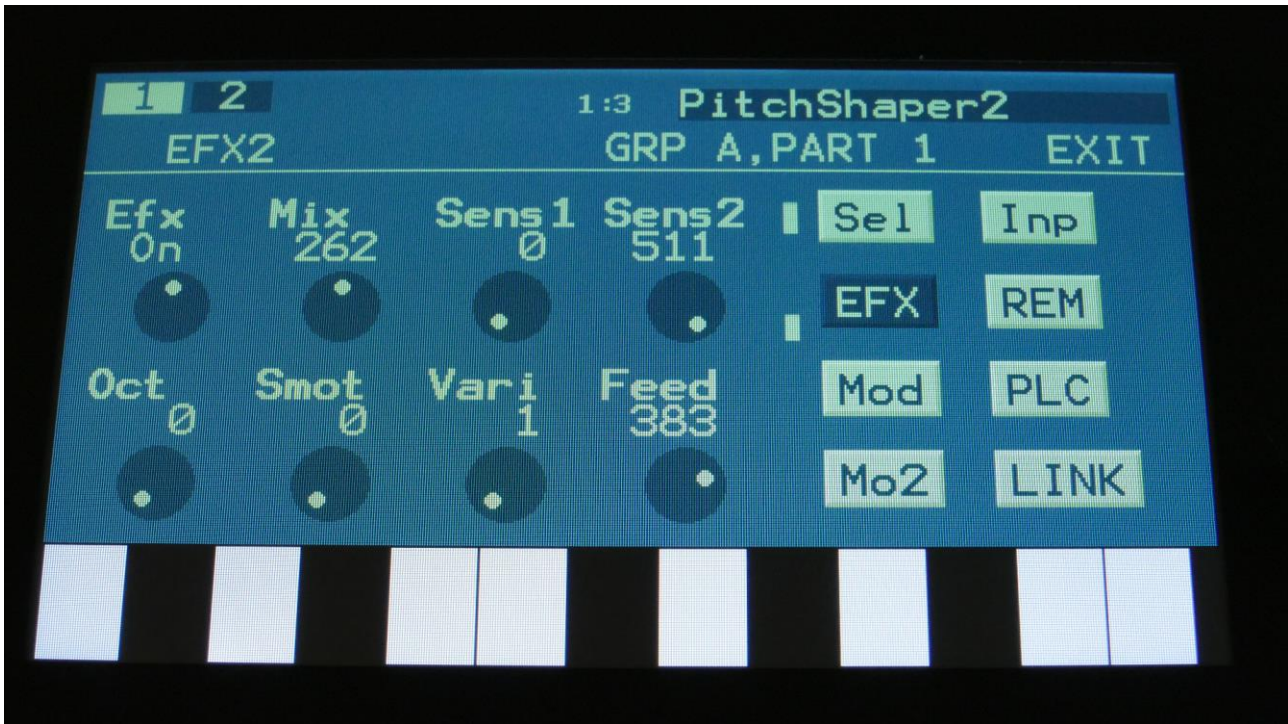
Sens1: Pitch detection sense input 1. On a pure waveform, turn this fully down to make sure, that it detects all the waves of it, and pitch shifts correctly. On more complex sounds, turn this up until the desired effect are obtained. At higher settings, only portions of the sound will be pitch shifted, and when it doesn't detect any pitch, it will repeat the portion it detected, making the sound "granulate".

Sens2: Pitch detection sense input 2. On a pure waveform, turn this fully down to make sure, that it detects all the waves of it, and pitch shifts correctly. On more complex sounds, turn this up until the desired effect are obtained. At higher settings, only portions of the sound will be pitch shifted, and when it doesn't detect any pitch, it will repeat the portion it detected, making the sound "granulate".

Oct: Octave transpose. From 0 to +3 octaves.

Smot: Smooth. The more this is turned up, the more the changes in pitch are smoothened.

Vari: Pitch variation. The more this is turned up, the more the pitch variations on the input 1 signal affects the pitch shaper frequency.

Feed: Pitch shaper feedback. Adjusts the portion of the output signal, that is fed back to the input.

PitchShaper2 Modulation
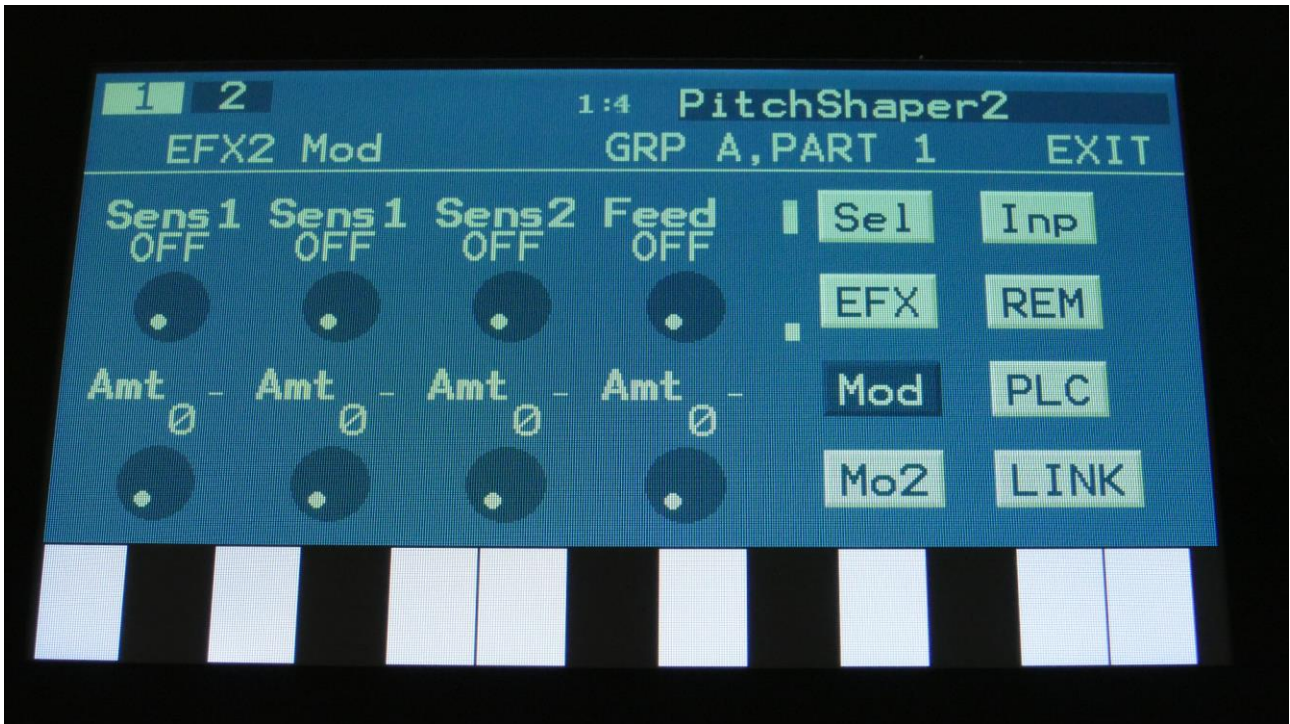
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Sens1 and Sens2: Modulates the sens 1 and 2 parameters.

Feed: Modulates the Feed parameter.

Time Stretch
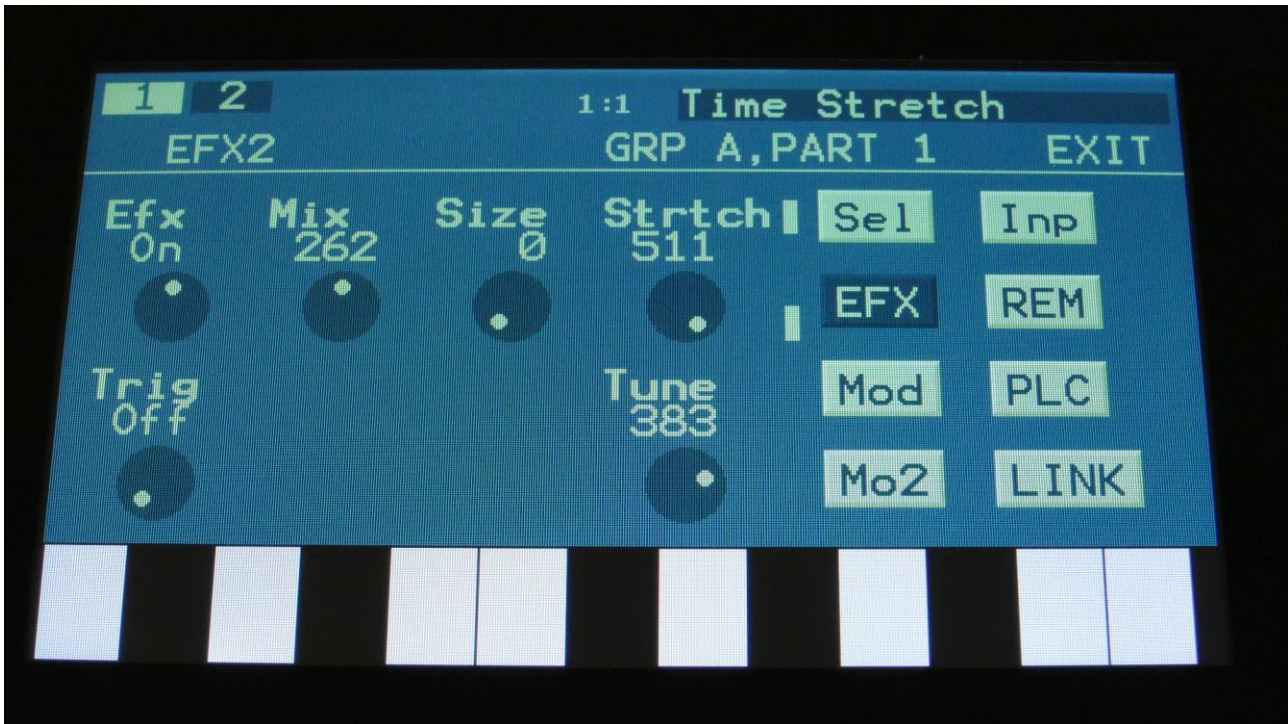
Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Size: 0 to 511. The size of the RAM buffer used for the TimeStretcher.

Strtch: 0 to 511. Time stretch. A value below 256 will stretch the sound longer, a value above 256 will compress the sound to become shorter.

Trig: Off, 1, 2. Determines if the time stretch effect should be trigged by a part or not.

Tune: Pitch Coarse. A value below 256 will pitch the signal down, a value above 256 will pitch it up.

Time Stretch Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.
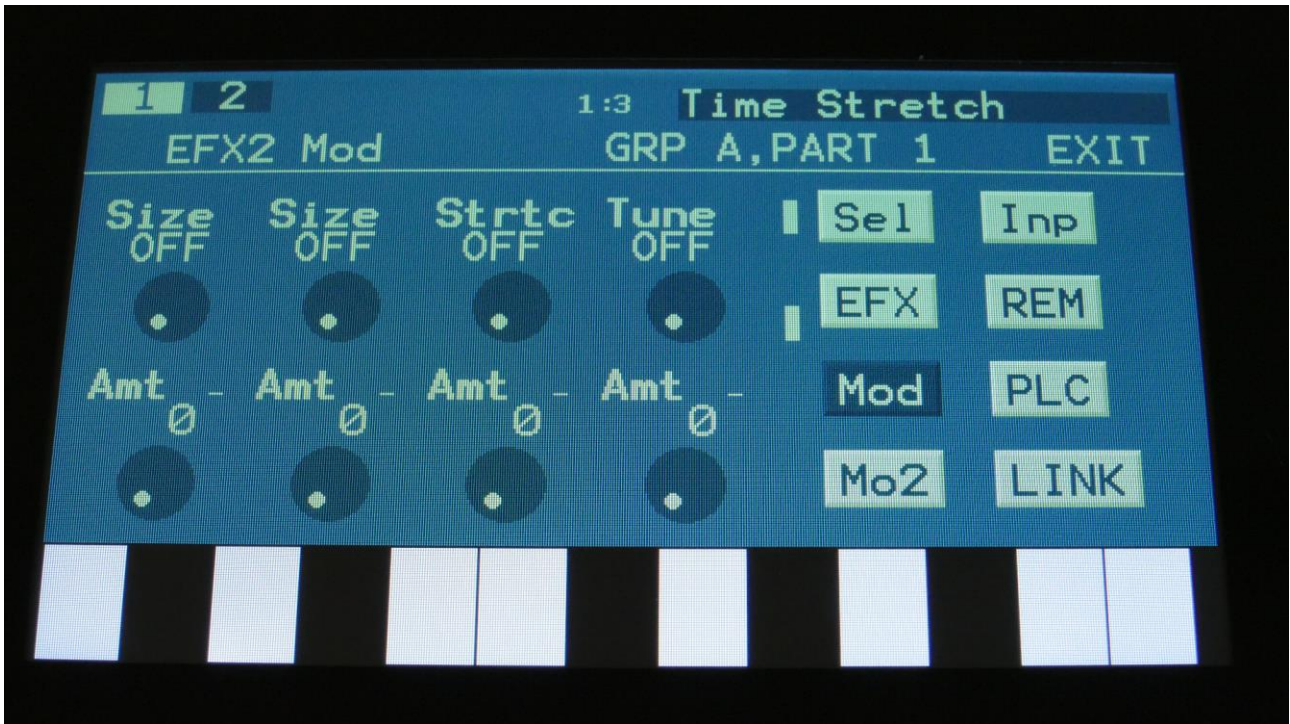
The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
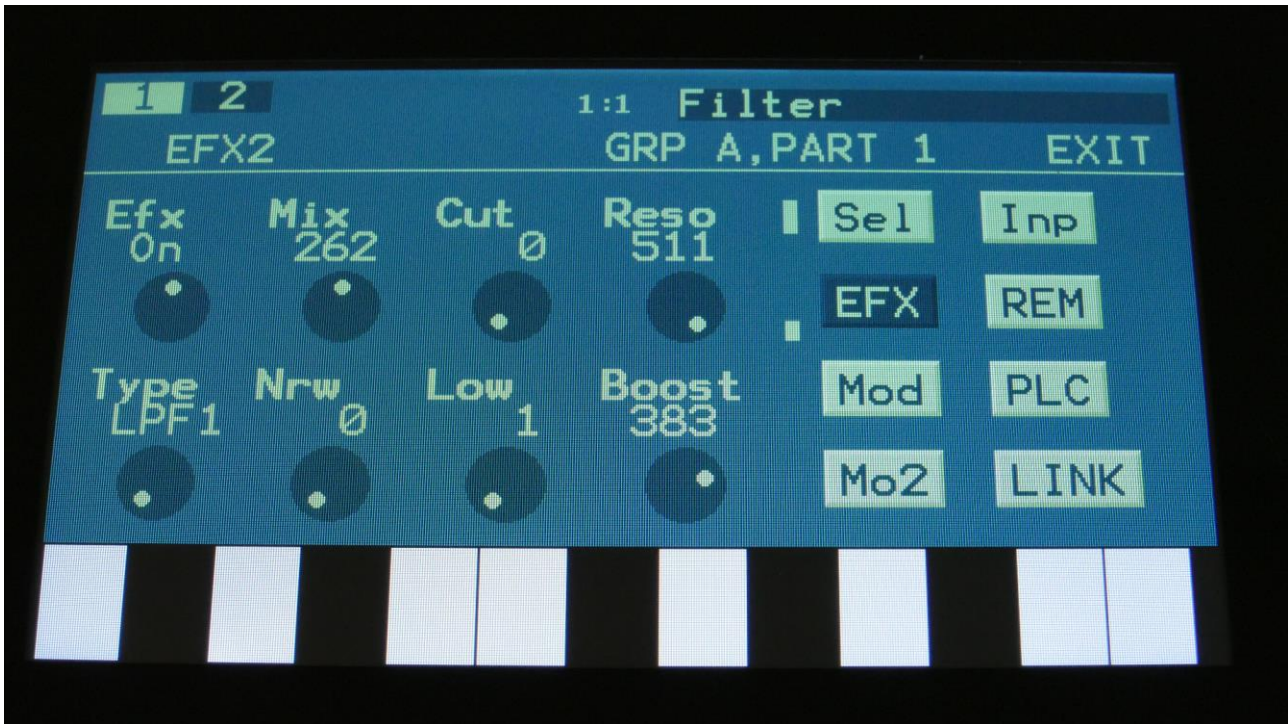
The parameters on this page:

Size: Modulates the size of the time stretch input buffer.

Strtc: Modulates the time stretching.

Tune: Modulates the pitch coarse.

Filter

The filter types:

LPF1: Lowpass filter with a rather weak character. Resonance does not self-oscillate.

LPF2: Lowpass filter that are a bit sharper than LPF1. Resonance does not self-oscillate.

LPF3: Sharp Lowpass filter with self-oscillating resonance.

LPF4: Very sharp Lowpass filter with self-oscillating resonance.

BPF1: Bandpass filter with a rather weak character. Resonance does not self-oscillate.

BPF2: Bandpass filter with focus on the bass area. Distorts at higher input levels. Resonance does not self-oscillate.

BPF3: Sharp Bandpass filter with self-oscillating resonance.

HPF1: Sharp Highpass filter with self-oscillating resonance.

HPF2: High gained Highpass filter with self-oscillating resonance. Distorts at higher input levels.

HPF3: Sharp Highpass filter with self-oscillating resonance. A bit weaker than HPF1.

Dstr: Destruktion. A rather defective filter. Self-oscillates at some points, distorts at others.

FAT1: Slightly distorting lowpass filter, with a sharp response and self-oscillating resonance.

FAT2: A slightly weaker version of FAT1.

LoFi: A very distorting and unpredictable lowpass filter.

LPF5: A lowpass filter with a very soft character. Resonance does not self-oscillate.

BPF4: A bandpass filter with a very soft character and self-oscillating resonance.

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Cut: 0 to 511. Sets the cutoff frequency of the filter.

Reso: 0 to 511. Sets the amount of resonance applied to the filter.
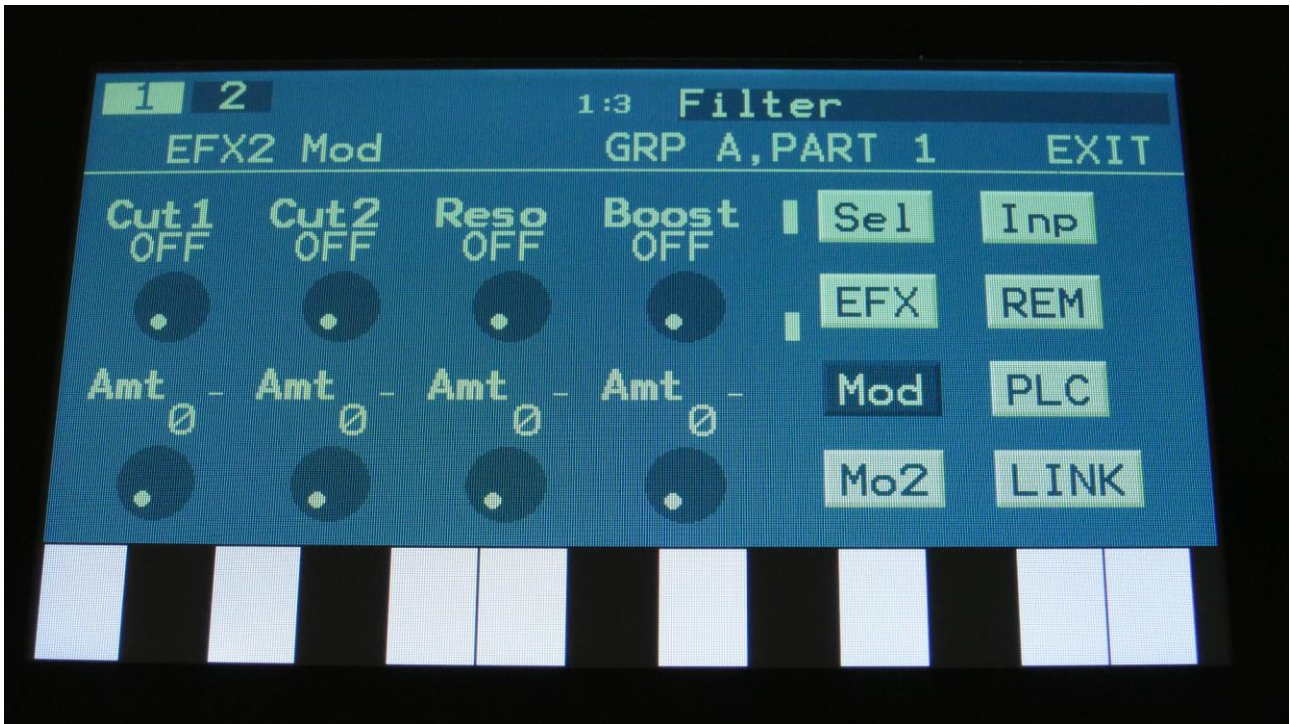
Type: Sets the filter type. See the list of filter types.

Nrw: 0 to 511. Turning this up, will make the frequency response of the filter more and more narrow.

Low: 0 to 511. Sets the lowest frequency offset point of the filter. Turning this up, will in many filter types, make the bass bottom more present or distorted.

Boost: 0 to 511. Gains the filter output level.

Filter Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
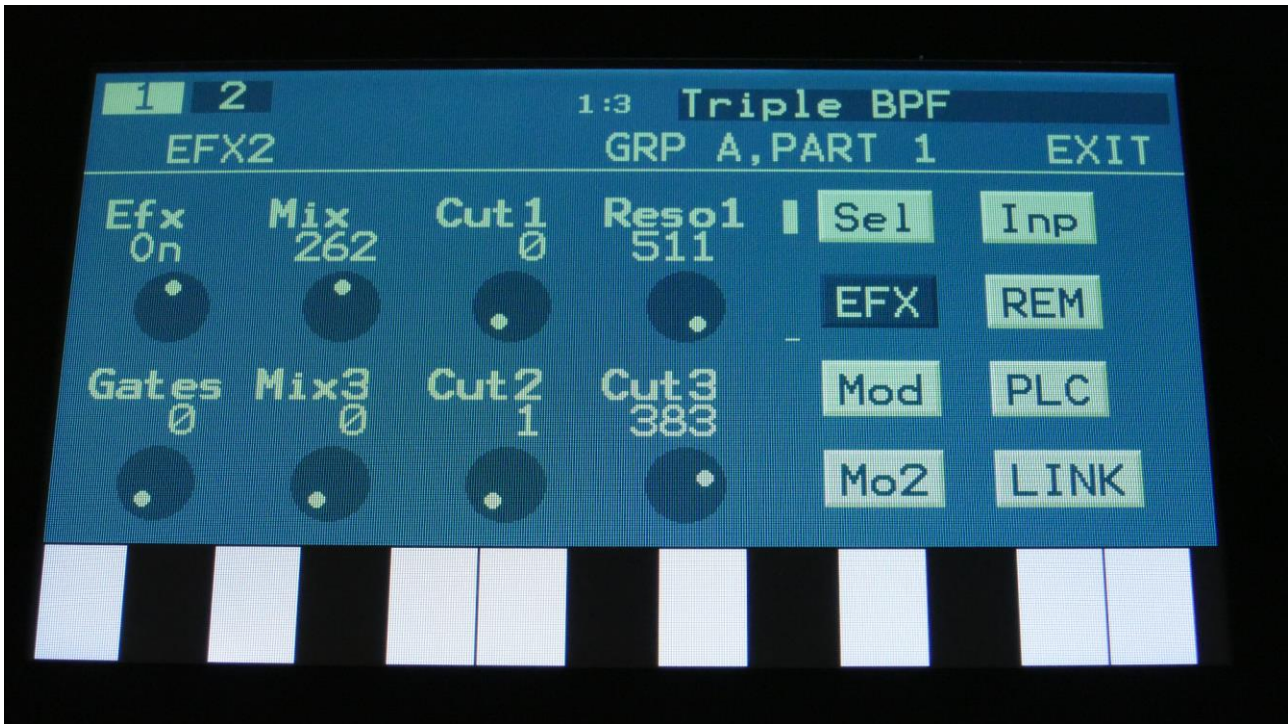
The parameters on this page:

Cut1, Cut2: Will modulate the filter cutoff frequency.

Reso: Will modulate the amount of resonance applied to the filter.

Boost: Will modulate the filter output gaining.

Triple BPF

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Cut1: The cutoff frequency of band pass filter 1.

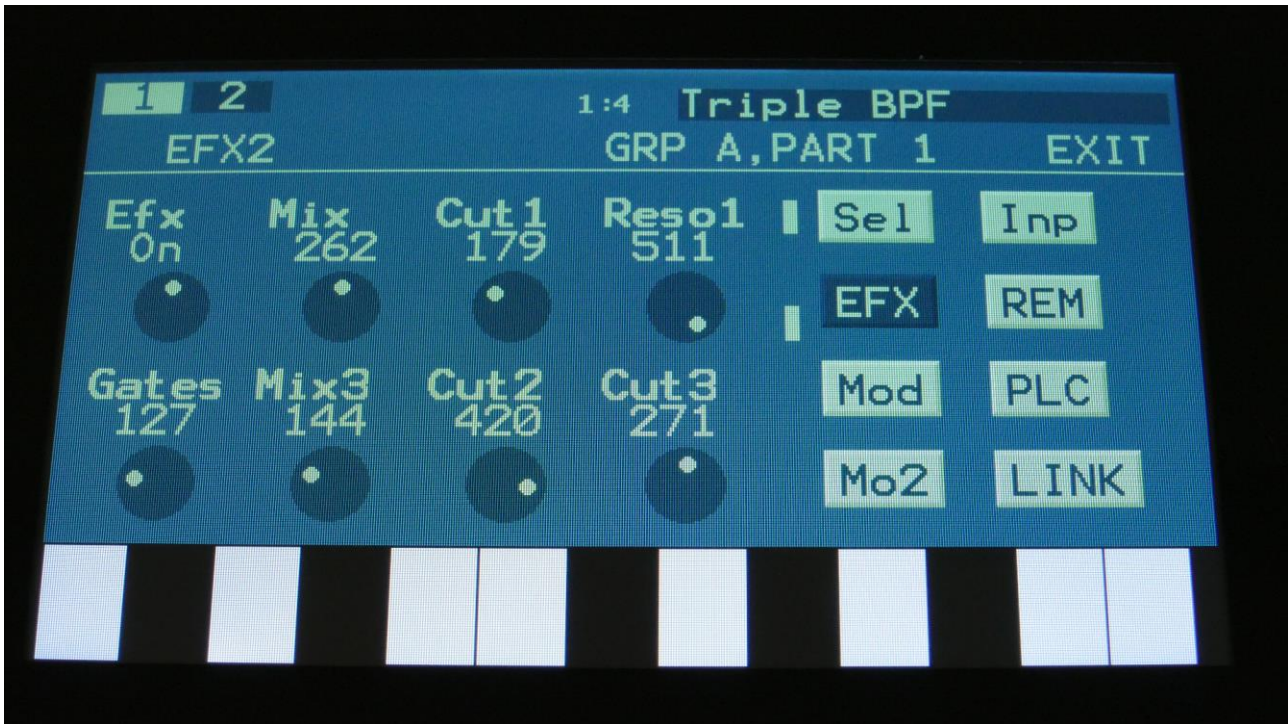**Reso1:** The resonance of all 3 band pass filter.

Gates: Band pass filters 1, 2 and 3 running through an XOR gate. The Gates parameter adjusts the mix between the clean signal from the filters and the XOR'ed signal.

Mix3: Band pass filter 3 level.

Cut2: The cutoff frequency of band pass filter 2.

Cut3: The cutoff frequency of band pass filter 2.

Triple BPF Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Cut1: Modulates the Cut1 parameter.

Reso1: Modulates the Reso1 parameter.

Cut3: Modulates the Cut3 parameter.

WaveFolder
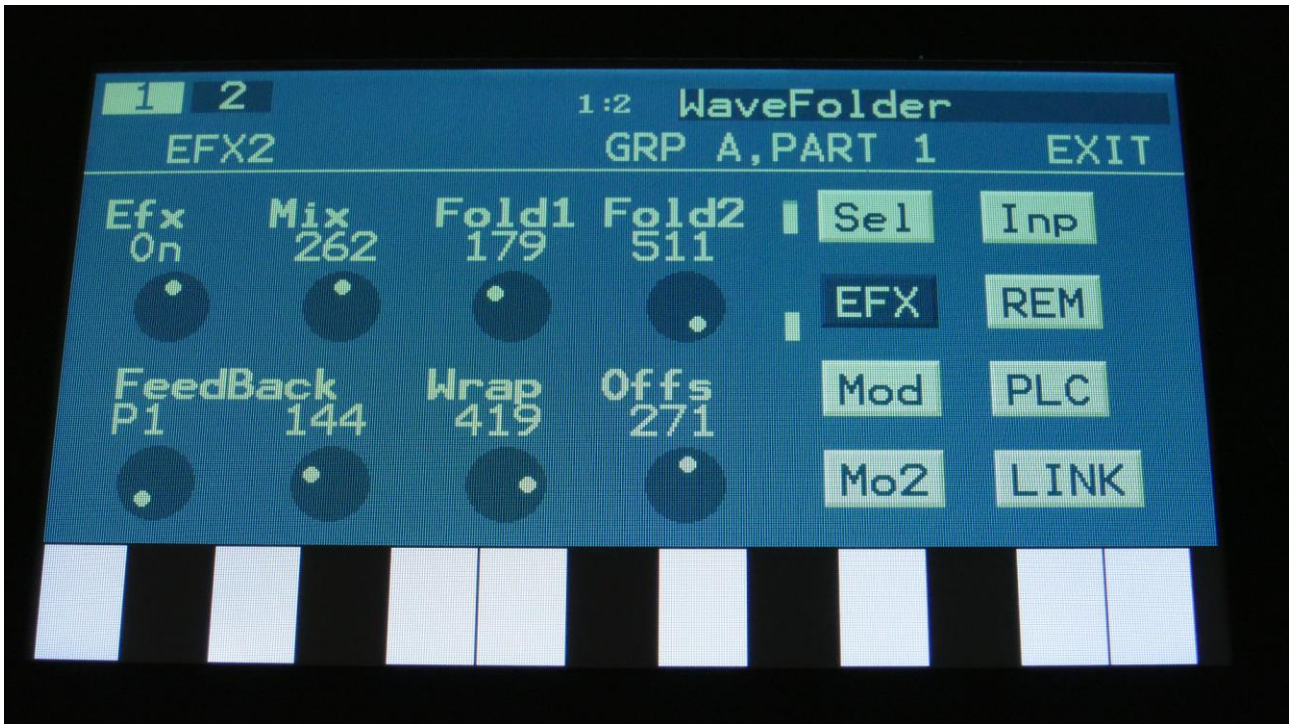
Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Fold1: The level of the 4-stage wavefolder 1.

Fold2: The level of the 4-stage wavefolder 2.

FeedBack: Feedback point and feedback level. Feedback points: P1-P4: Wavefolder1 stage1-4. P5-P8: Wavefolder2 stage1-4.

Wrap: Wraps the folded signal over the edge.

Offs: Wavefolding offset.

WaveFolder Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
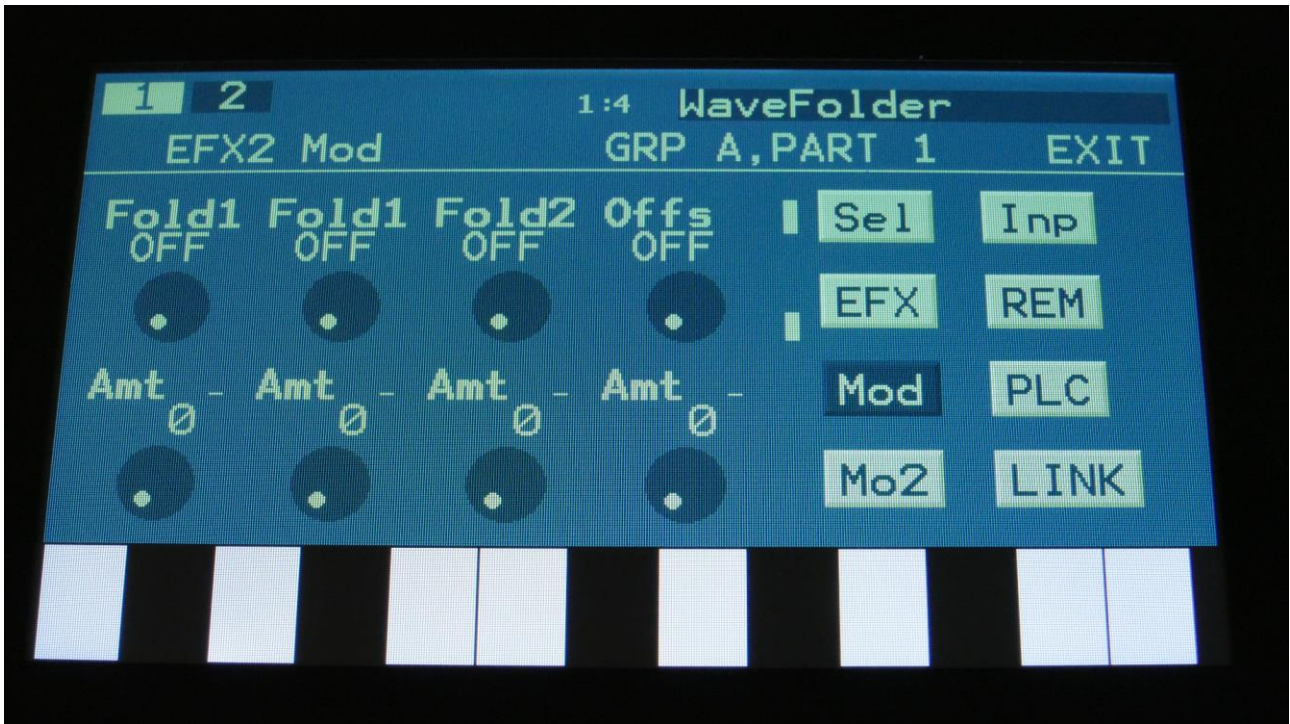
The parameters on this page:

Fold1: Modulates the Fold1 parameter.

Fold2: Modulates the Fold2 parameter.

Offs: Modulates the Offs parameter.

FAT

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Phaze: Adjusts the phase difference of the FAT layers. When turned fully down, all layers are in phase. The more it is turned up, the more the layers goes out of phase to each other. Useful for creating comb filter type sounds.

FAT: Adds 0 to 3 layers of the input sound to itself.

Boost: When this is on, the FAT layers are sonically added to each other, which will make the sound louder, and might cause it to saturate. If it is off, the sound stays at its original sonic level, even when layers are added.

FAT Modulation
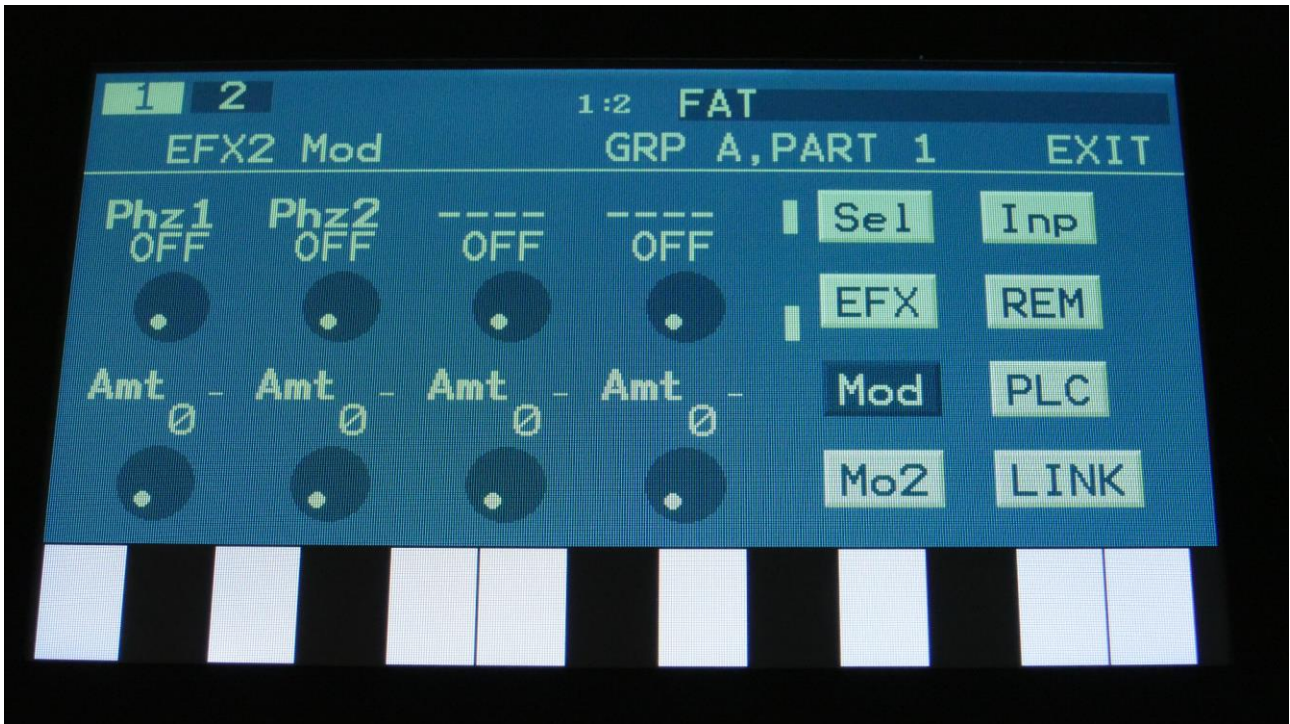
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
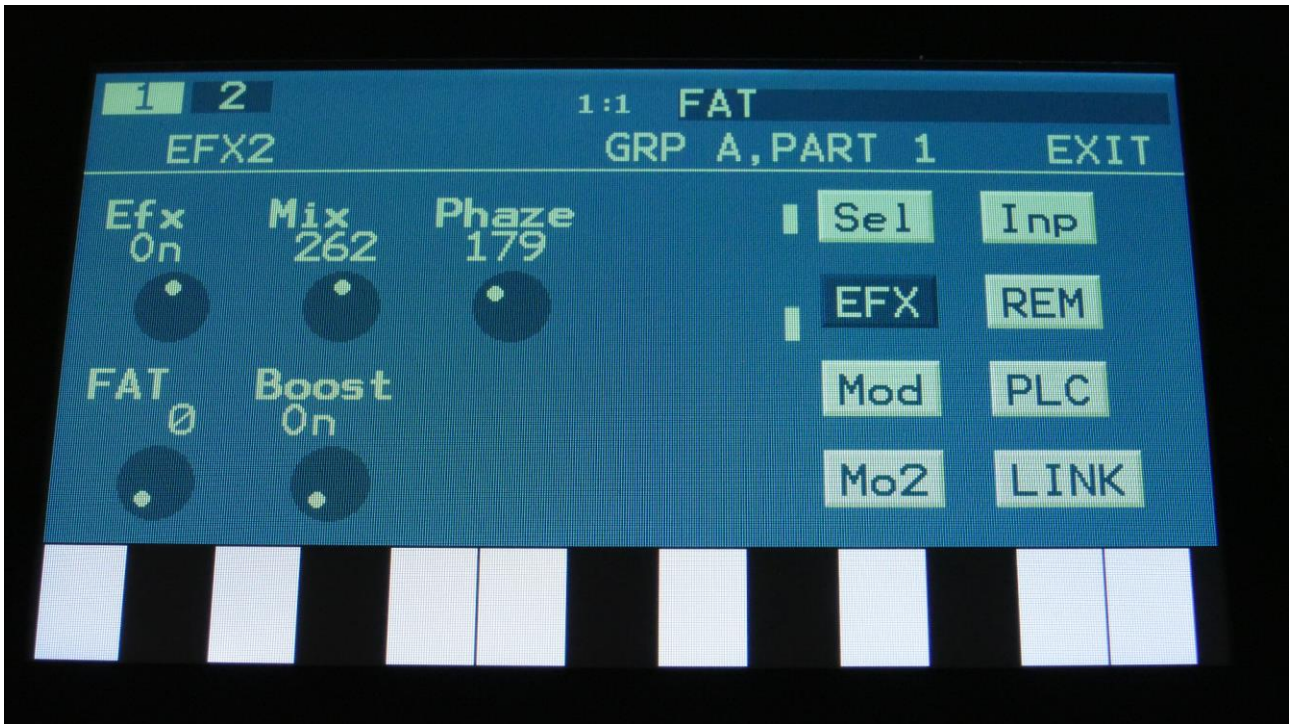
The parameters on this page:

Phz1 and Phz2: Modulates the Phaze parameter.

EQ
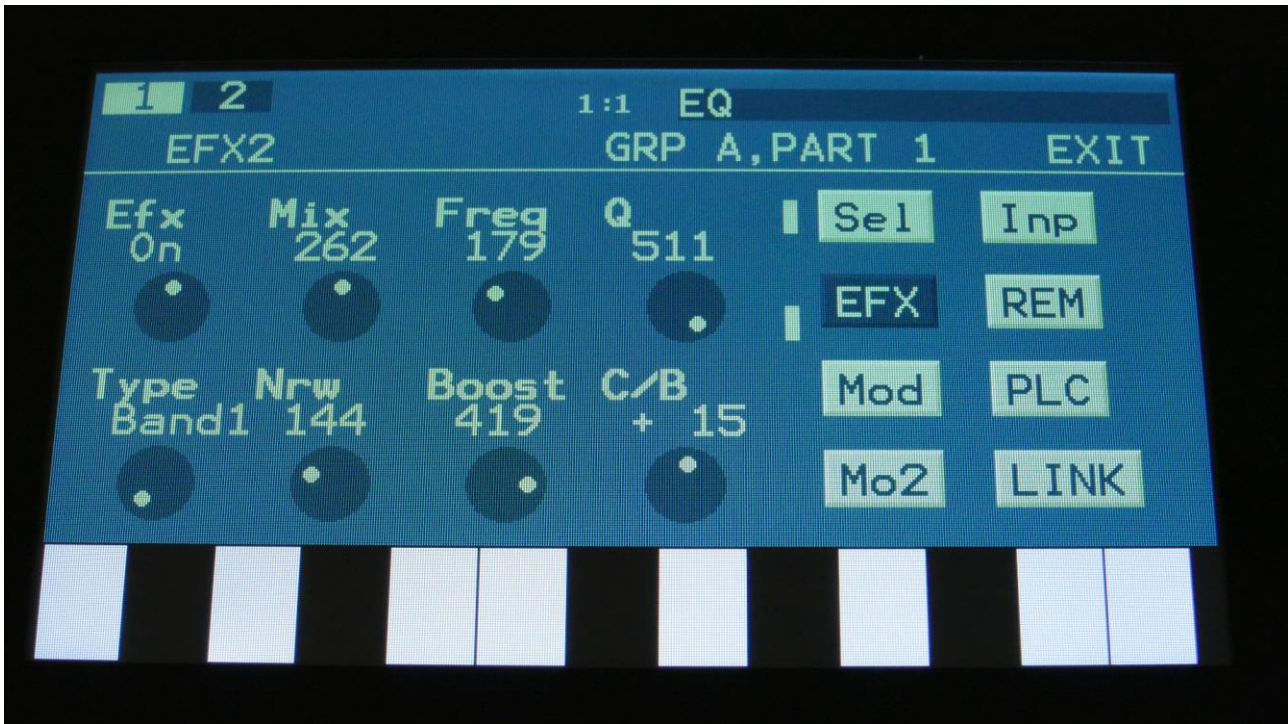
Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

**Efx:** Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output. The output of the EQ is inverted. This means, that when the Mix parameter is set to 256, the EQ is actually subbed from the audio input. Set the Mix parameter to different values, to obtain different EQ effects, or just turn it fully up to 511, to get a normal parametric EQ.

Freq: Sets the frequency, at which the EQ will cut or boost.

Q: Sets the width of the frequency band, that will be cutted/boosted.

Type: Sets the EQ characteristics. The types available are:

Band1: Cut/boost the frequency/range, selected by Freq/Q.

Band2: Like Band1, but with a slightly sharper sound.

Band3: Like Band2, but with an even sharper sound.

Low: Cut/boost the frequencies below the frequency selected by Freq.

High1: Cut/boost the frequencies above the frequency selected by Freq.

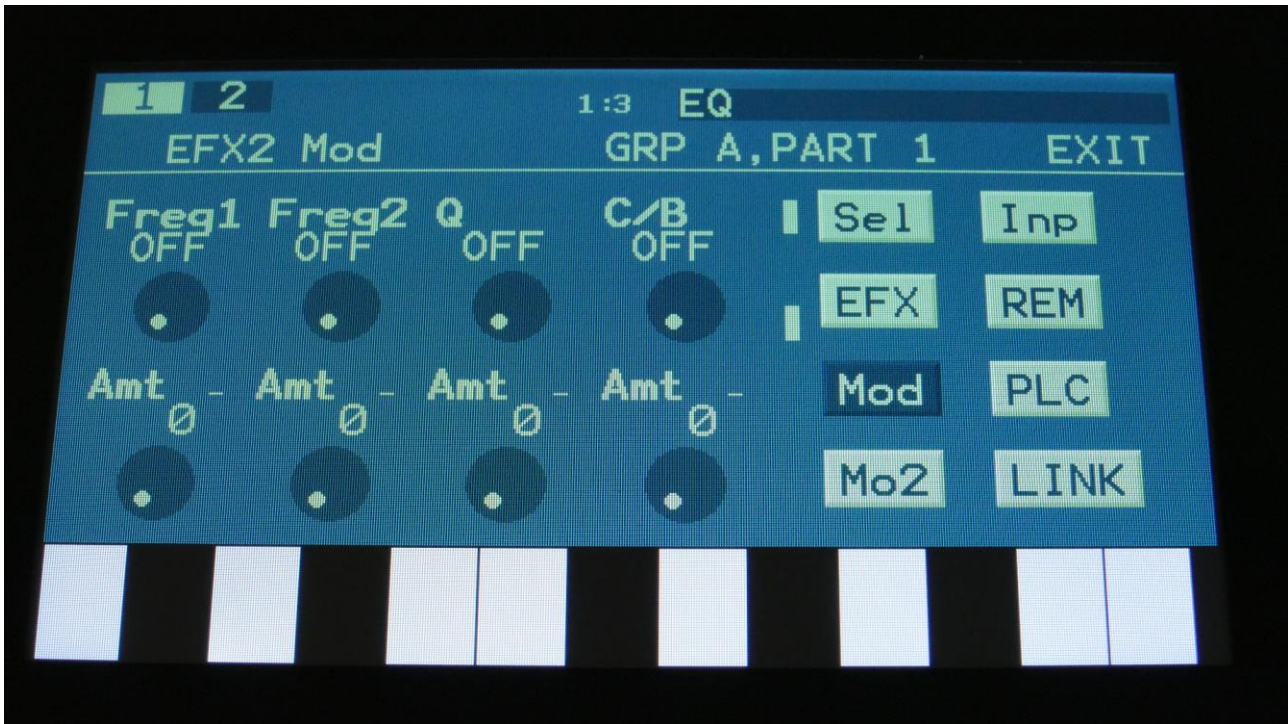**High2:** Like High1, but with a sharper sound.

FAT: Like Band3, but it fattens the sound a bit.

Nrw: Turning this up, will narrow the frequency band affected by the EQ.

Boost: Turning this up, will boost the output gain of the EQ.

C/B: Cut/Boost. Setting this to a negative value, will damp frequencies on the input signal. Setting it to a positive value, will boost frequencies on the input signal.

EQ Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Freq1/Freq2: Will modulate the EQ frequency.

Q: Will modulate the EQ frequency width.

C/B: Will modulate the cut/boost parameter.

EQ2

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Freq: Sets the frequency, at which the EQ will cut or boost.

Q: Sets the width of the frequency band, that will be cutted/boosted.

C/B: Cut/Boost. Setting this to a negative value, will damp frequencies on the input signal. Setting it to a positive value, will boost frequencies on the input signal.

EQ2 Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
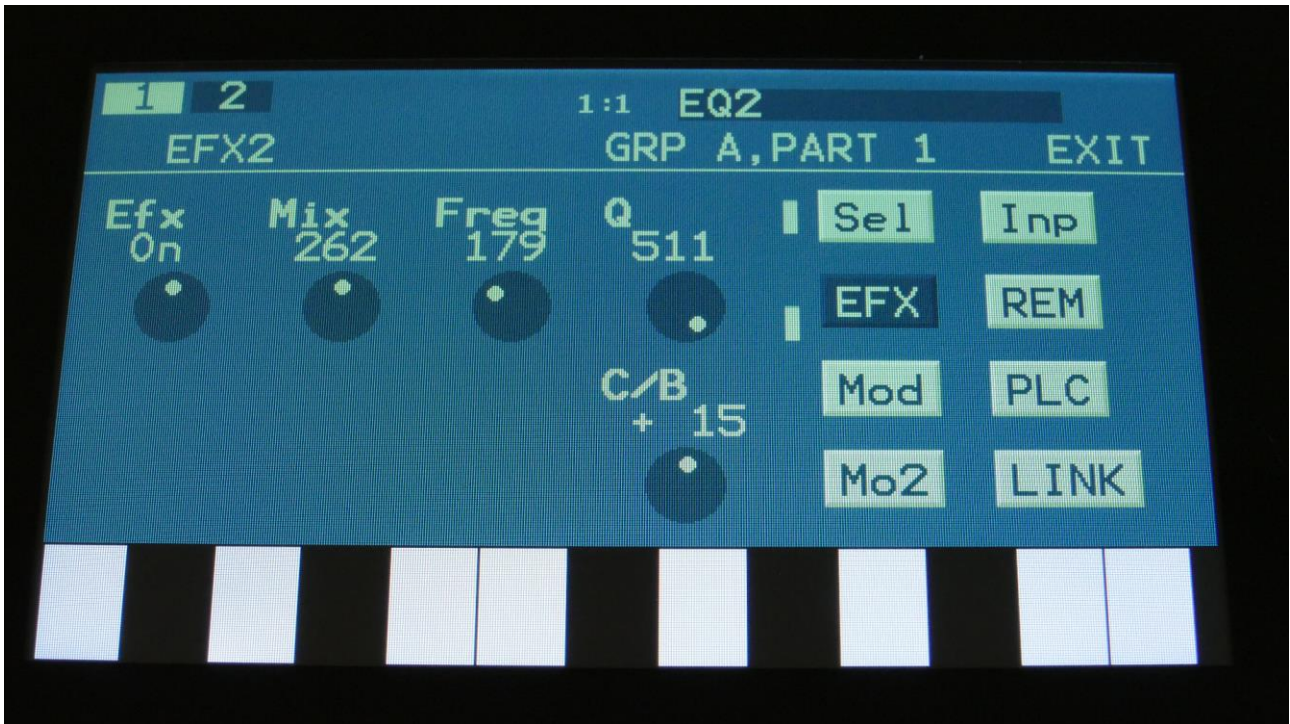
The parameters on this page:

Freq1/Freq2: Will modulate the EQ frequency.

Q: Will modulate the EQ frequency width.

C/B: Will modulate the cut/boost parameter.

OverShifter

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

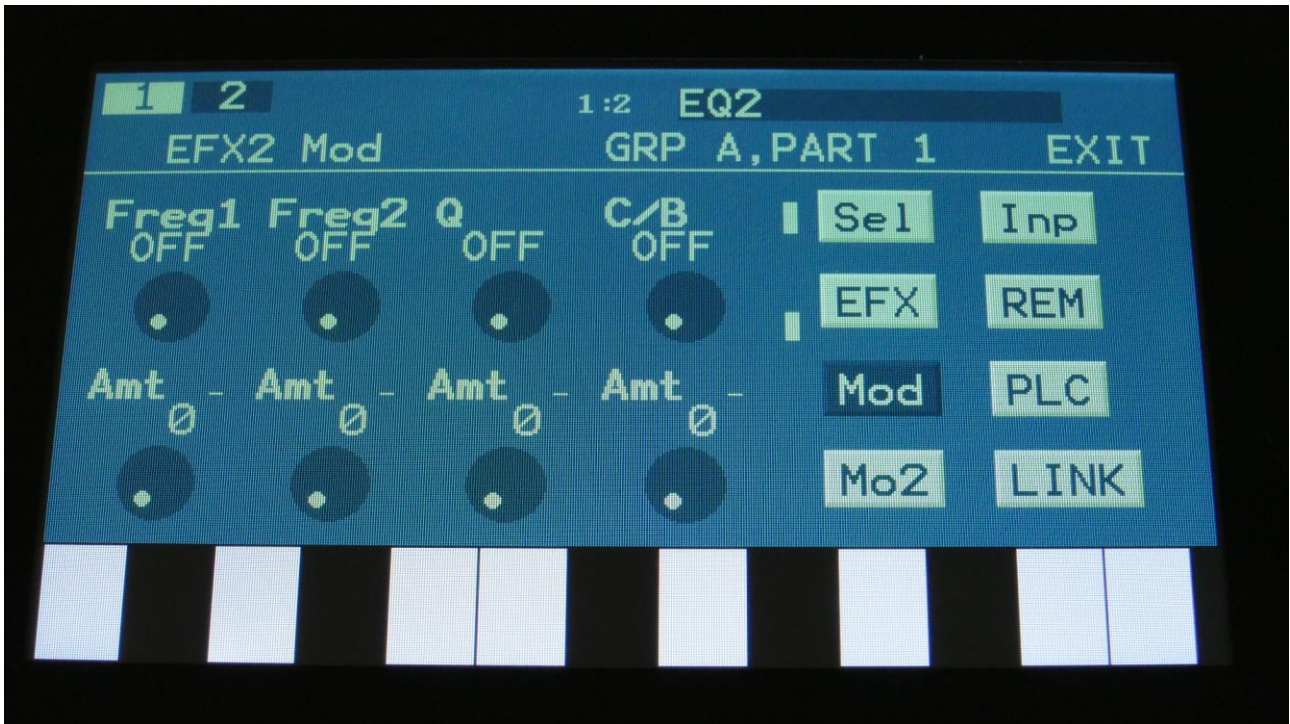**Efx:** Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Freq: Turning this up will shift the frequency spectrum of the input signal up.

Feed: Turning this up, will feed the output signal of the OverShifter back to its input. At certain settings, this can get really brutal!

Ring: Turning this up will add ringing/metal/noise to the signal.

Shape: Turning this up will alter the shape of the OverShifter, and add harmonics to the sound.

OverShifter Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
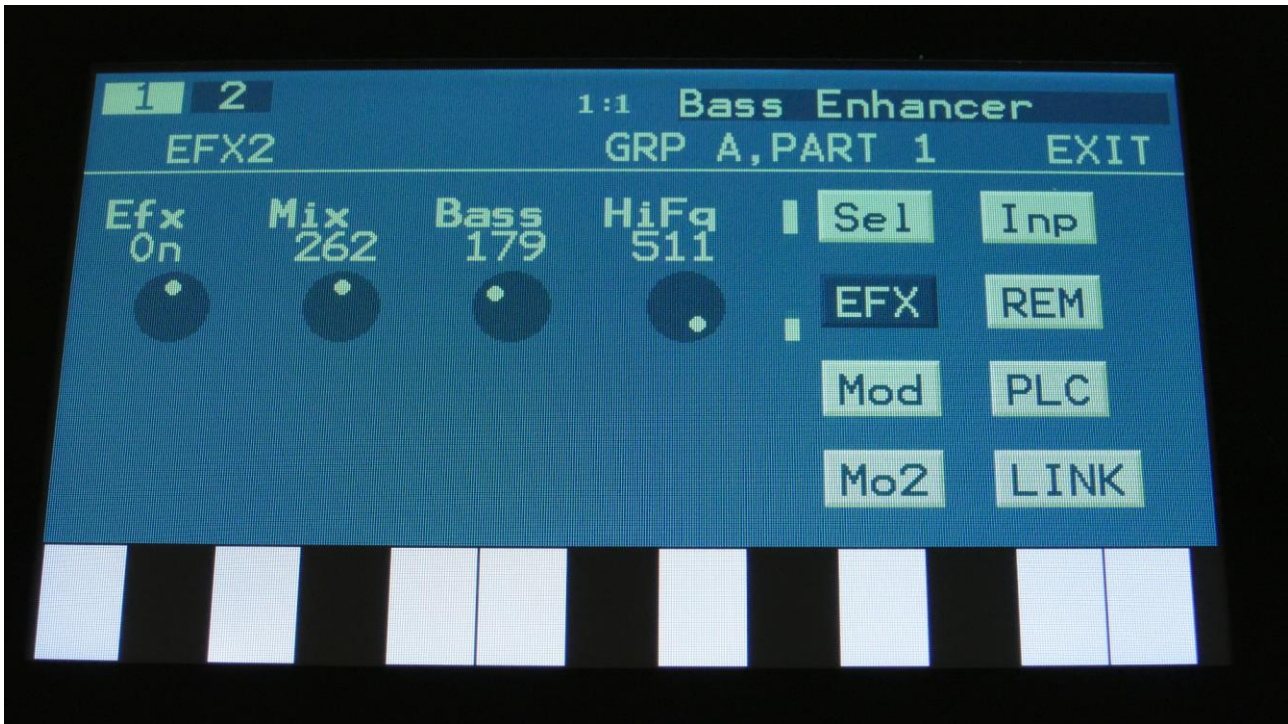
The parameters on this page:

Freq1 and Freq2: Modulates the frequency shift parameter.

Feed: Modulates the Feed parameter.

Shape: Modulates the Shape parameter.

Bass Enhancer

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Bass: 0 to 511. Sets the amount of bass enhancement. At zero no sound is going through the bass enhancer, at 511 it is bass enhancing so much, that it creates distortion.

HiFq: 0 to 511. High frequency attack content. When turning this up, a subtle attack will be added to the sound, that is going through the bas enhancer.

For optimal bass enhancement, and not too much distortion, it is best to keep the Mix and the Bass parameters below the middle value.

Bass Enhancer Modulation
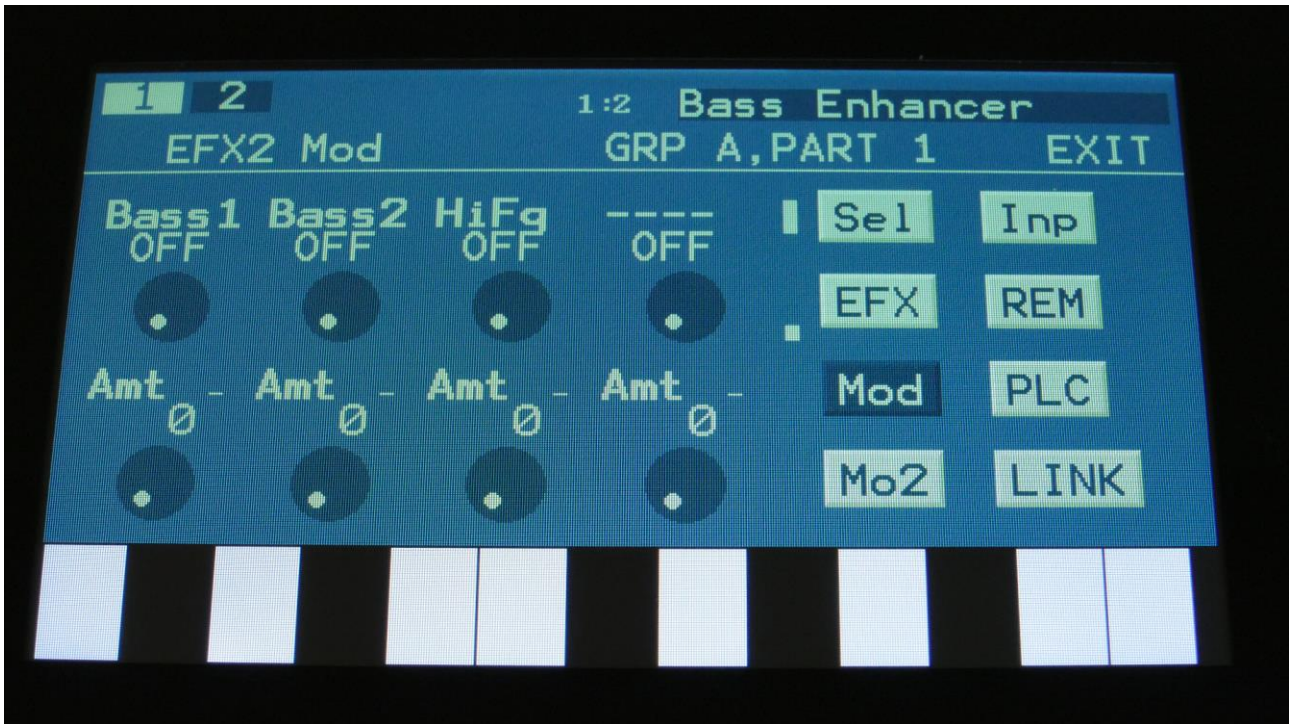
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Bass1 and Bass2: Modulates the amount of bass enhancement.

HiFq: Modulates the high frequency attack content.

Compressor

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

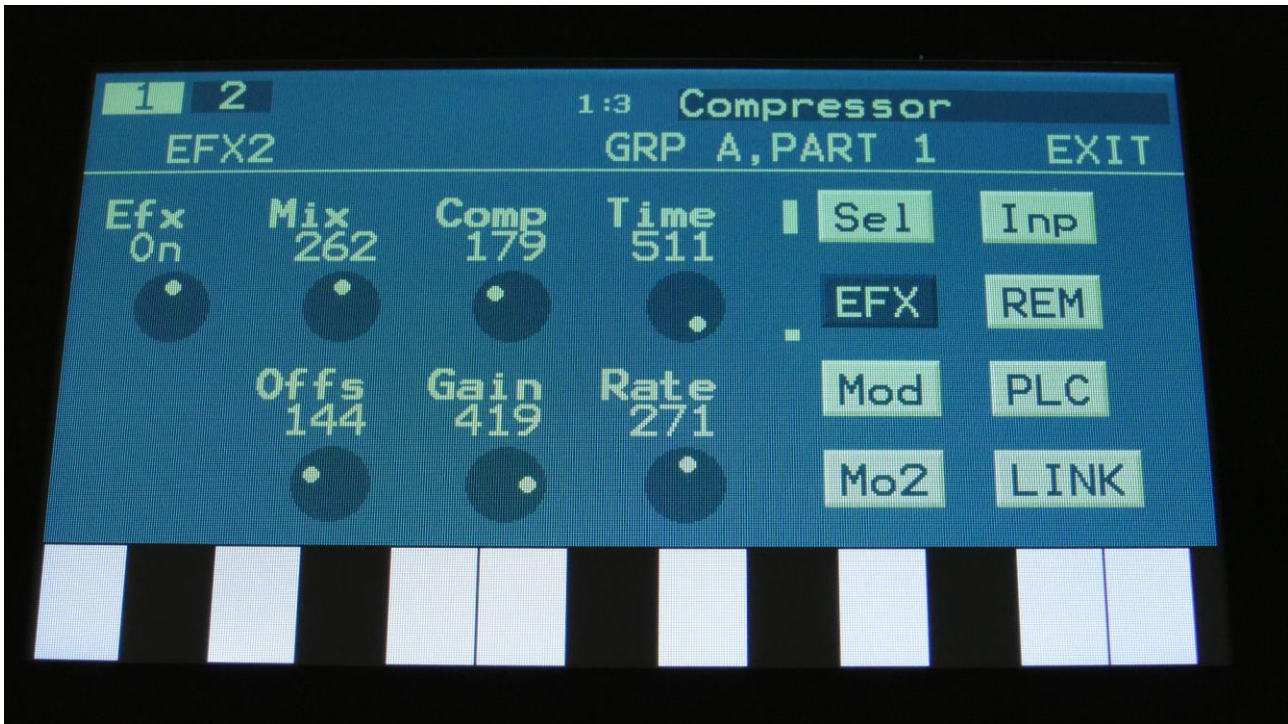**Efx:** Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Comp: 0 to 511. Compression amount. The more this is turned up, the more the portion of the signal, that are higher than the offset value, will be damped.

Offs: 0 to 511. Sets the level point where the compression will kick in. The more this is turned up, the higher the input signal will need to be, before it starts to compress.

Gain: 0 to 511. Sets the output gain of the compressor.

Time: 0 to 511. The more this is turned up, the longer time it will take, for the compression to kick in.

Rate: 0 to 511. This sets how fast the compressor will react to level changes of the input signal. The more it is turned up, the slower it will react.

Compressor Modulation
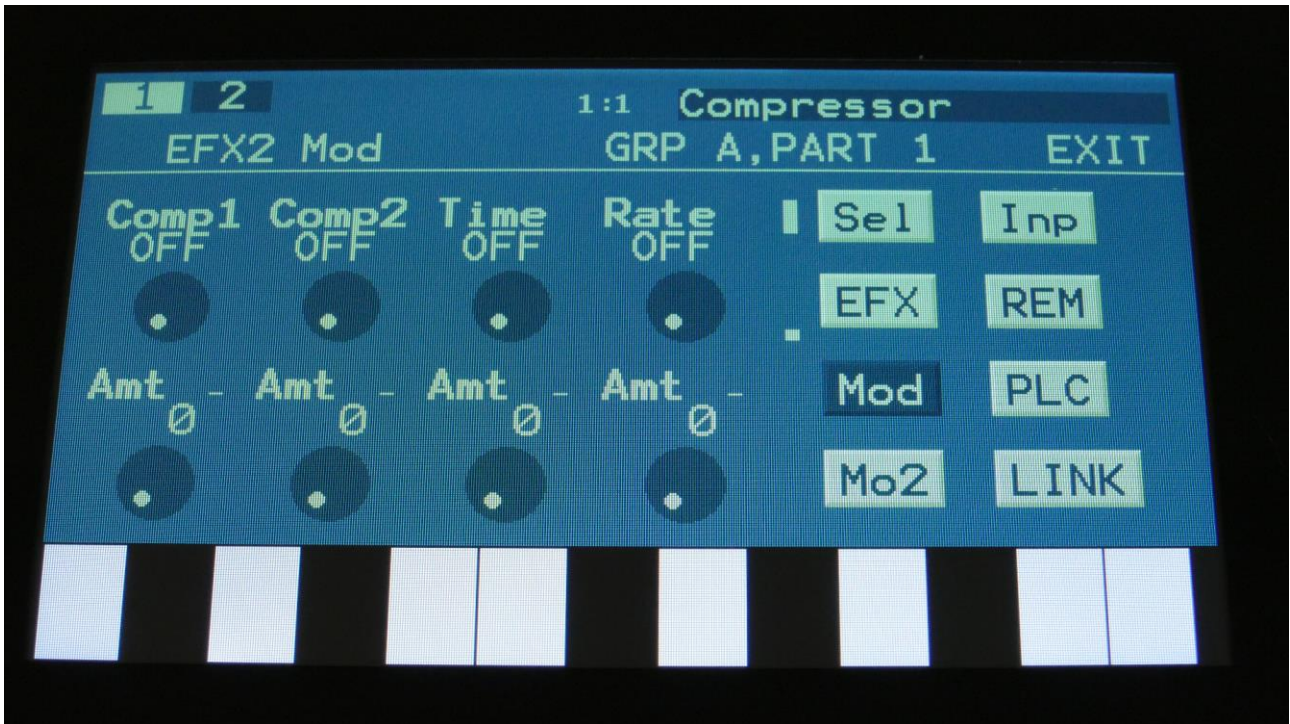
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Comp1, Comp2: Will modulate the compression amount.

Time: Will modulate the compression "kick in" time.

Rate: Will modulate the time it takes for the compressor to react to changes on the input signal.

Expandor

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Comp: 0 to 511. Compression amount. The more this is turned up, the more the portion of the signal, that are higher than the offset value, will be gained.
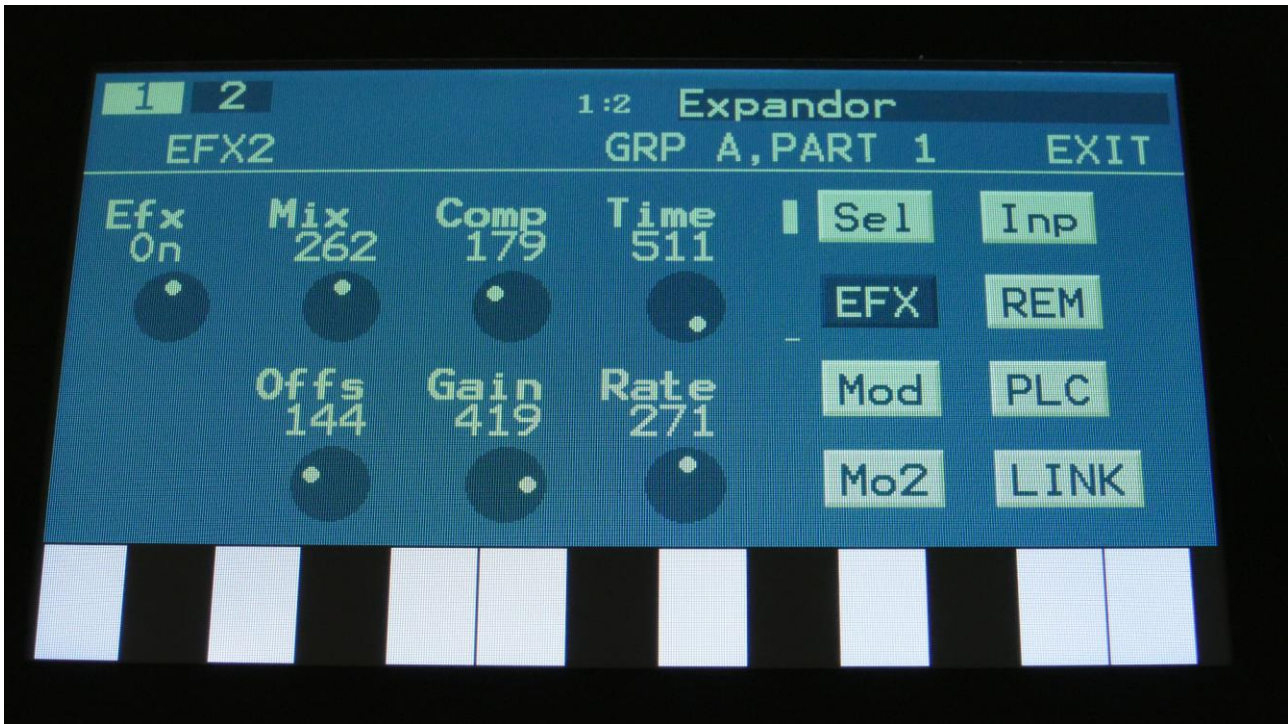
Offs: 0 to 511. Sets the level point where the expansion will kick in. The more this is turned up, the higher the input signal will need to be, before it starts to gain.

Gain: 0 to 511. Sets the output gain of the expandor.

Time: 0 to 511. The more this is turned up, the longer time it will take, for the expansion to kick in.

Rate: 0 to 511. This sets how fast the expandor will react to level changes of the input signal. The more it is turned up, the slower it will react.

Expandor Modulation
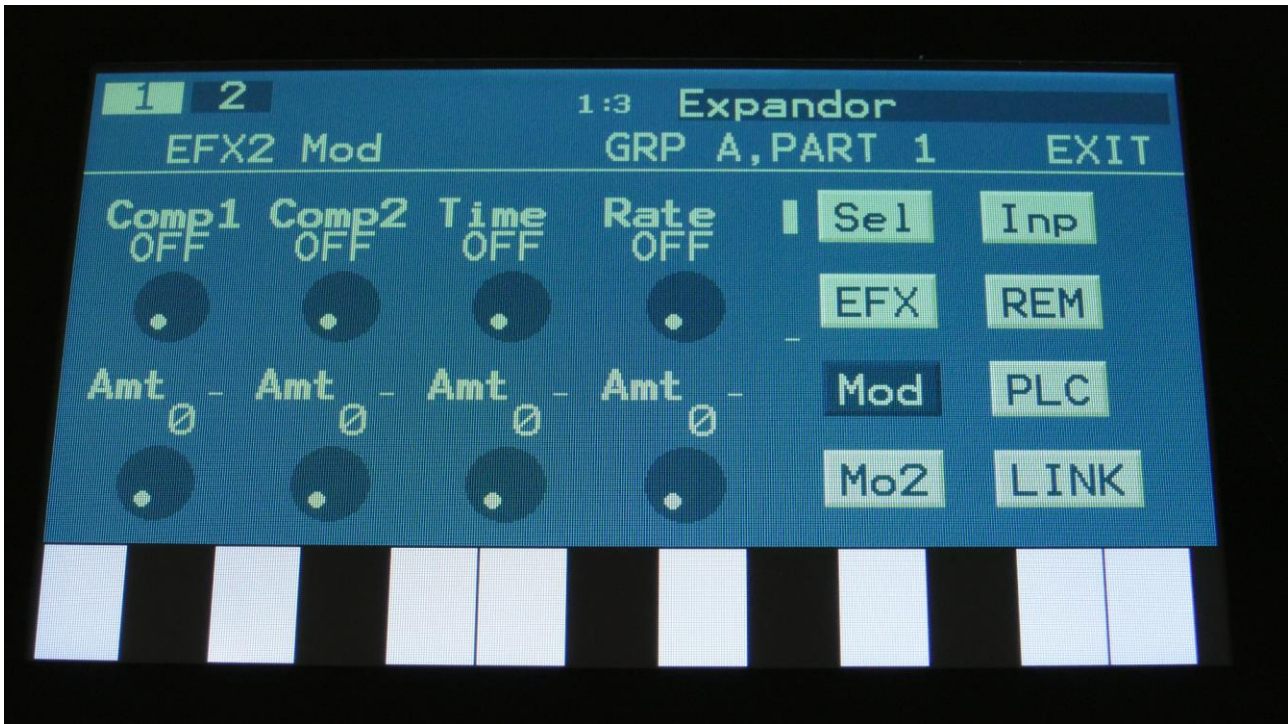
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
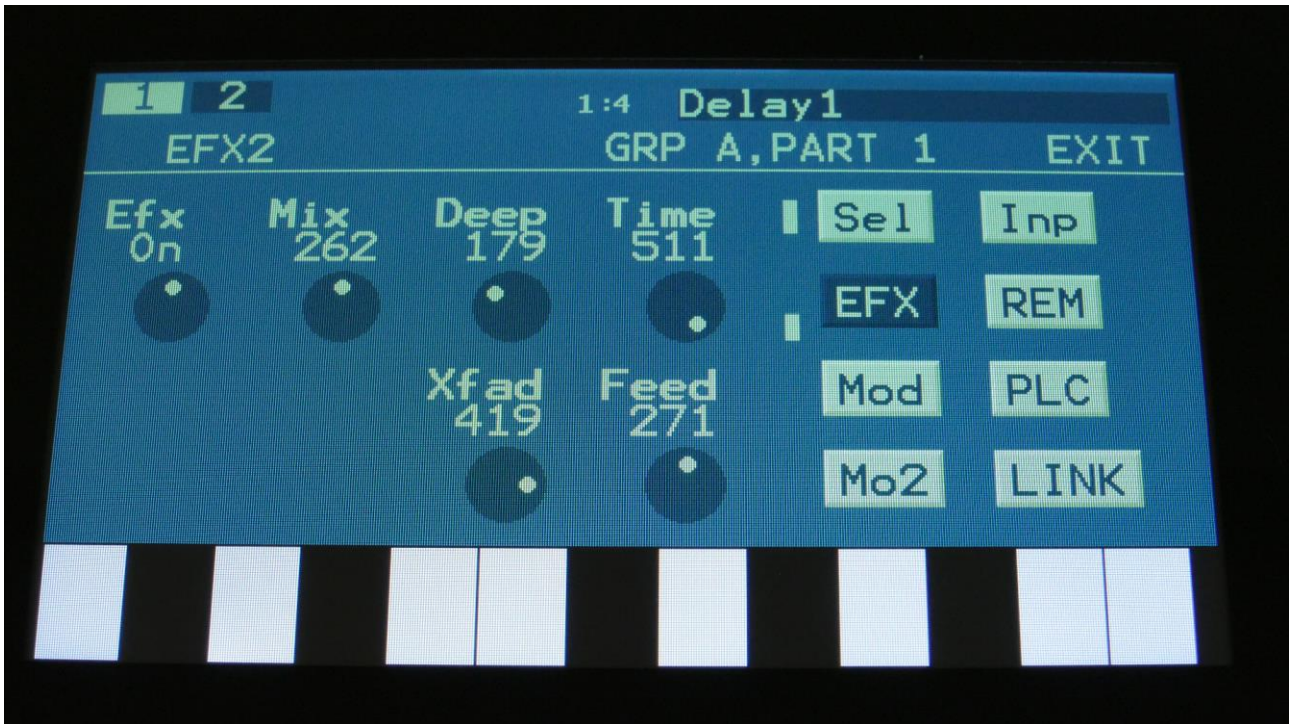
The parameters on this page:

Comp1, Comp2: Will modulate the expansion amount.

Time: Will modulate the expansion "kick in" time.

Rate: Will modulate the time it takes for the expandor to react to changes on the input signal.

Delay1, Roto delay, Bright Delay and Bright Roto Delay

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Deep: Simulates a delay box, with adjustable physical depth.

Time: Delay time.

Xfade: Crossfade. Makes the delay effect sound smoother, by crossfading the feedback repeats into each other.

Feed: Delay feedback amount. At values over middle, the feedback signal will be gained and create infinite feedback. This might cause some saturation.

Delay1, Roto delay, Bright Delay and Bright Roto Delay Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Deep1 and Deep2: Modulates the deep parameter.

Time: Modulates the delay time parameter.

Feed: Modulates the feed parameter.

Delay1_L , Roto delay_L , Bright Delay_L and Bright Roto Delay_L (Large –EFX2 only)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.
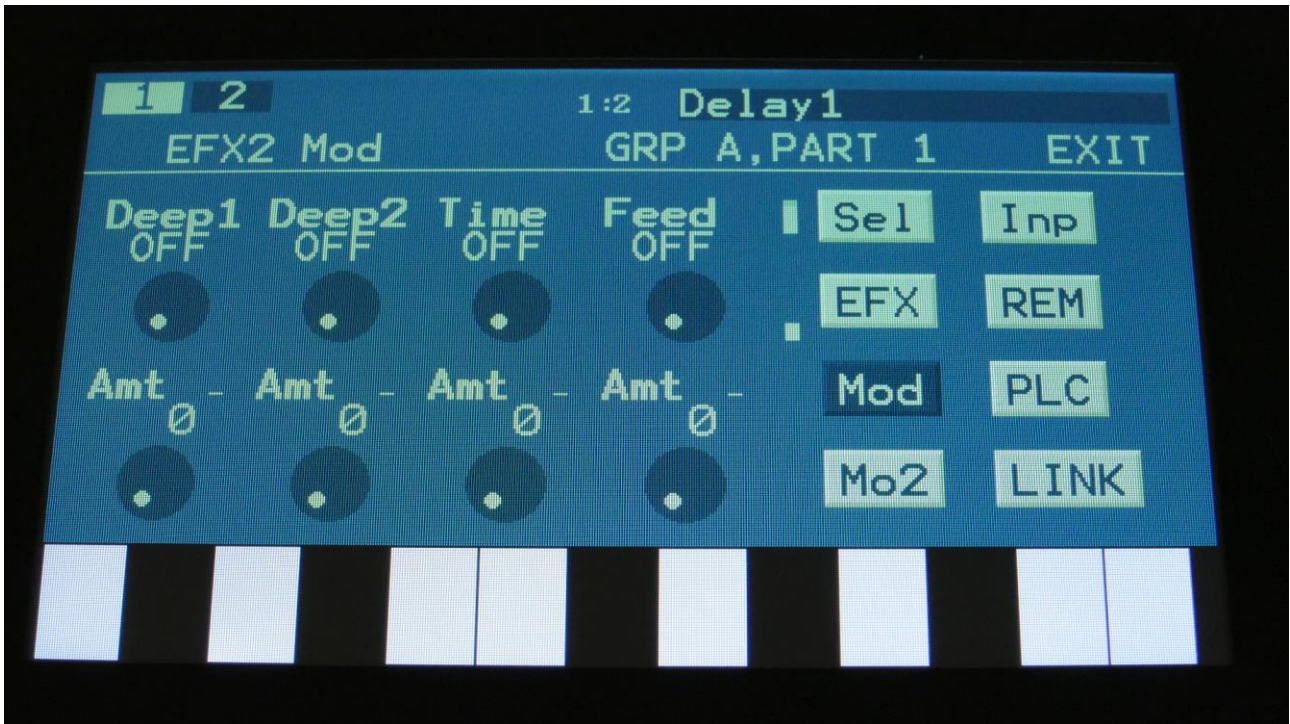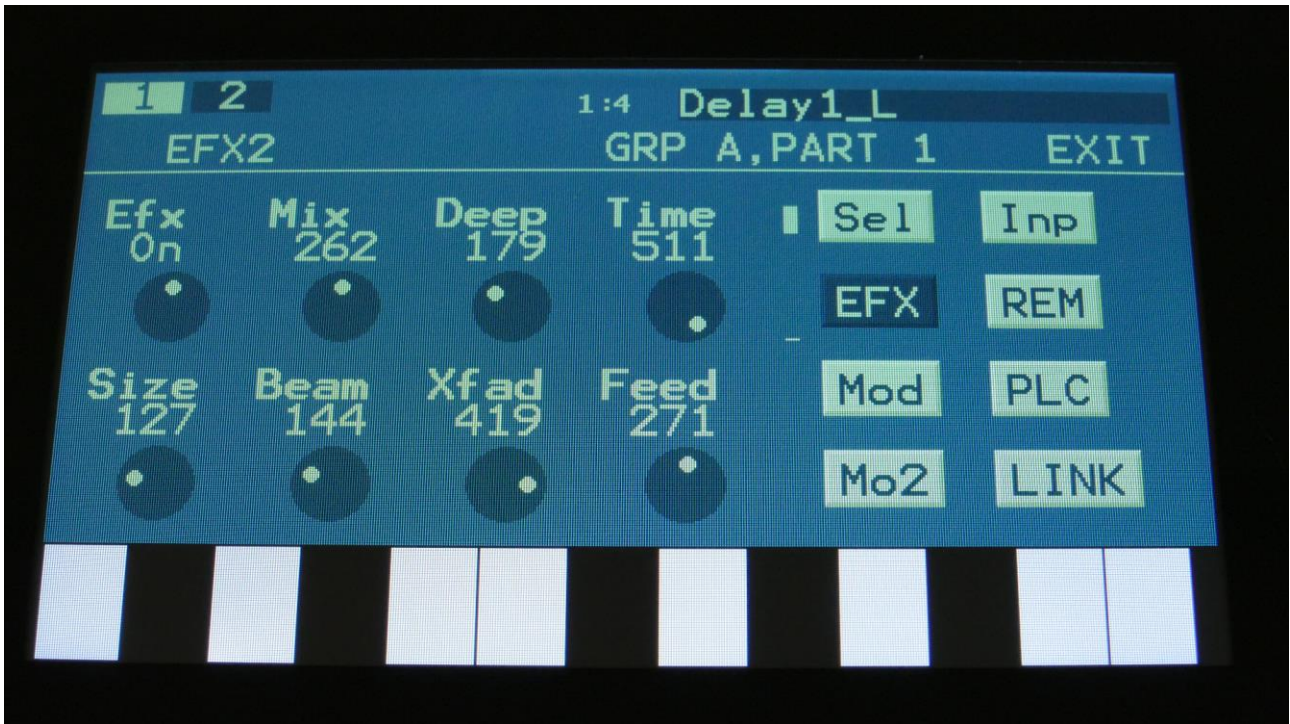
Deep: Simulates a delay box, with adjustable physical depth.

Time: Delay time.

Size: A granular parameter. The more this is turned up, the less space of the delay box is used, causing some echo's to repeat, and others not to sound at all.

Beam: A granular parameter, that "beams" some of the delay sound grains to another place.

Xfade: Crossfade. Makes the delay effect sound smoother, by crossfading the feedback repeats into each other.

Feed: Delay feedback amount. At values over middle, the feedback signal will be gained and create infinite feedback. This might cause some saturation.

Delay1_L , Roto delay_L , Bright Delay_L and Bright Roto Delay Modulation_L

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Deep1 and Deep2: Modulates the deep parameter.

Time: Modulates the delay time parameter.

Feed: Modulates the feed parameter.

Granulator SQ_L (Large –EFX2 only)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.
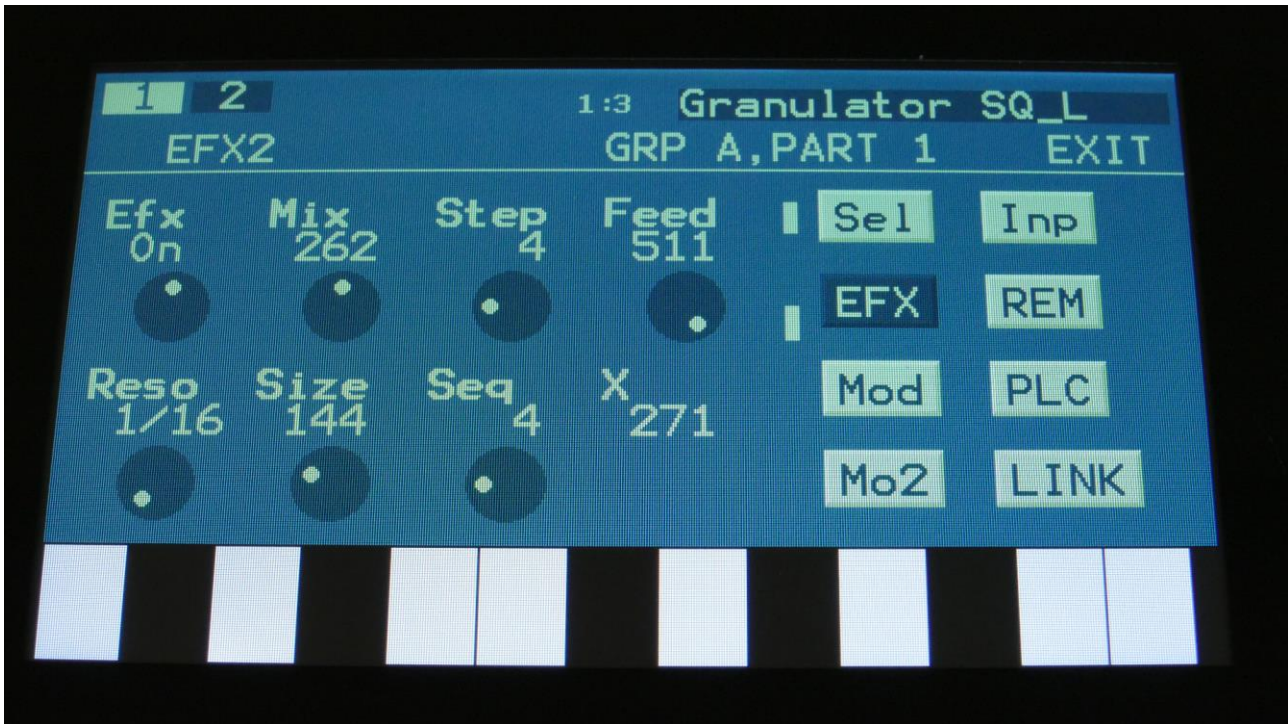
Step: Sets how many steps the granulator sequencers should go through, until they starts over again from step one. Range: 1 to 16.

Feed: Adjusts how much of the Granulator output signal should be fed back to its input.

Resolution: Adjusts the resolution of the sequencer track, that controls the granulator. The granulator only uses the controller values of the sequencer steps, so the controller track and the granulator can run in different resolutions.

Size: A granular parameter. The more this is turned up, the less space of each granulator step is used, causing the granulator to "stutter".

Seq: Selects which of the 16 sequencer controller tracks, the granulator should get it step values from. Each value selects a different portion of the granulator input, to be played back.

X: "X" intermodulation of the sound. Another Gotharman special ☺

Granulator SQ_L Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
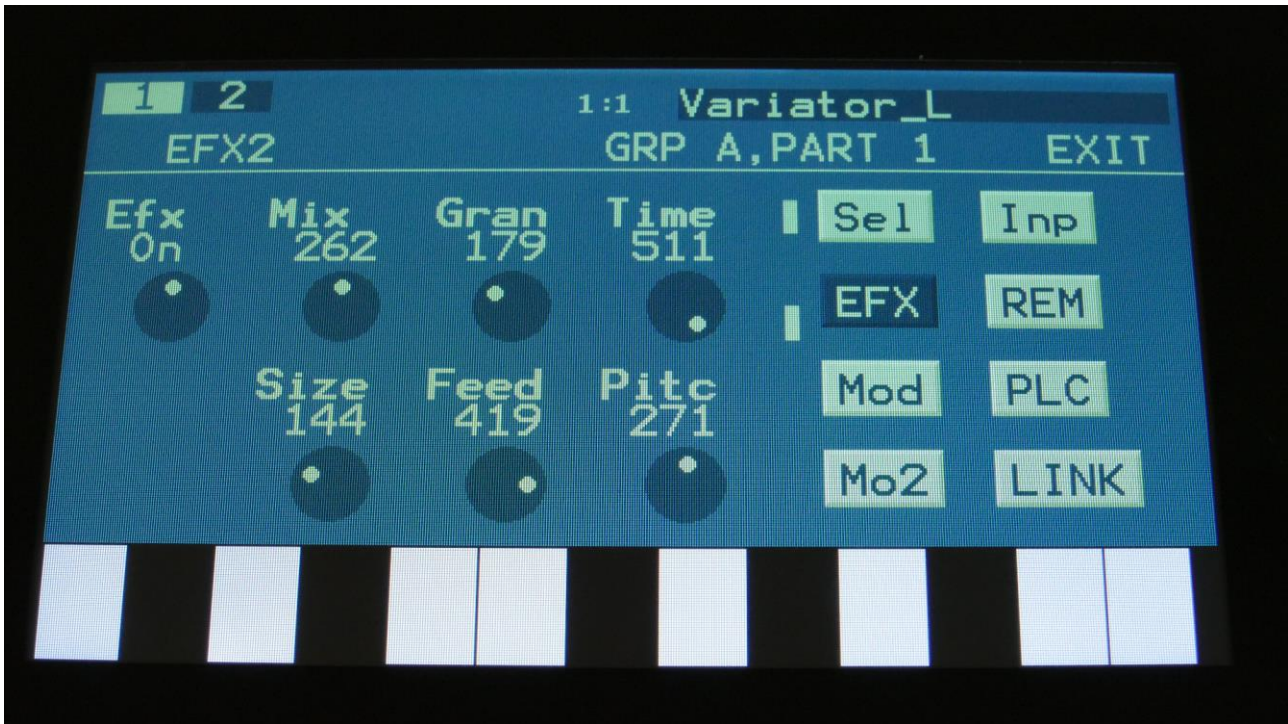
The parameters on this page:

Step1 and Step2: Modulates the number of steps parameter.

Feed: Modulates the feed parameter.

X: Modulates the "X" parameter.

Variator_L (Large –EFX2 only)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

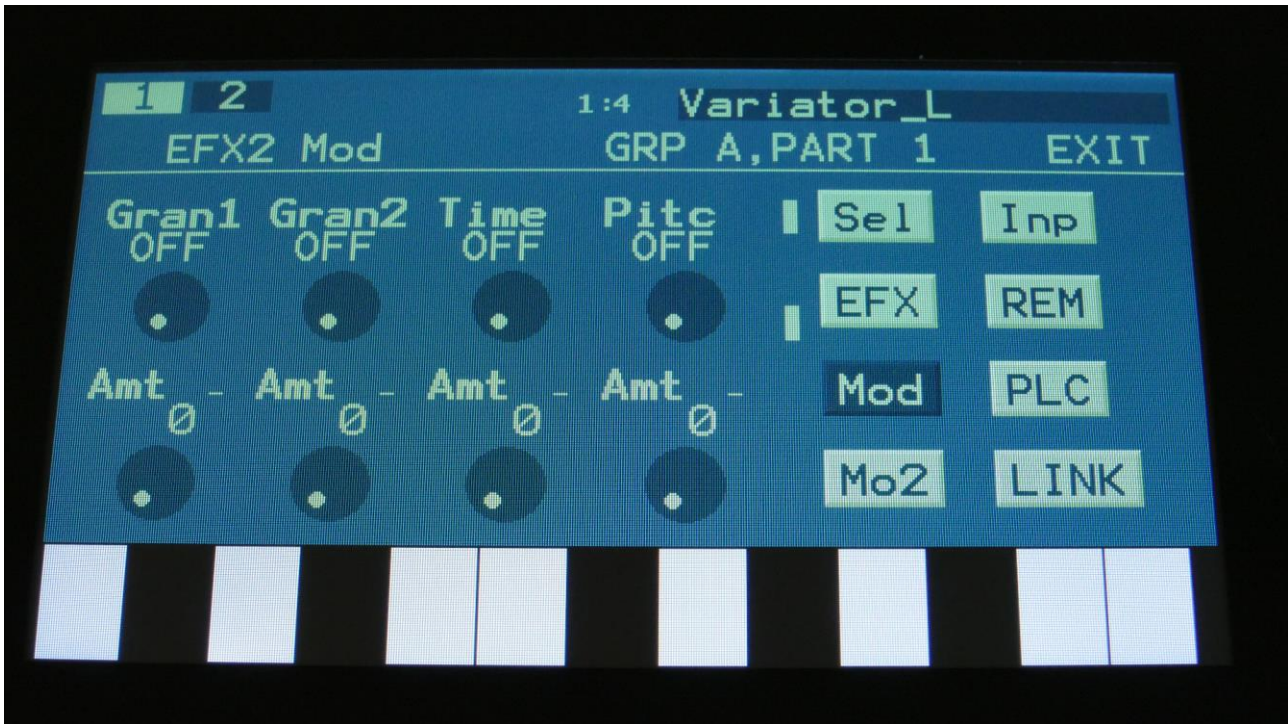**Gran:** Determines the variation pattern. Range: 0 to 511.

Time: The size of the RAM buffer used for the variator. . When this is set to zero, the Variator will use no RAM at all, and become quite unpredictable.

Size: The size of one grain.

Feed: Adjusts how much of the Variator output signal should be fed back to its input.

Pitc: The amount of Variator pitch shift.

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Variator_L Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Gran1 and Gran2: Modulates the gran variation pattern parameter.

Time: Modulates the time parameter.

Pitc: Modulates the pitch shift parameter.

Reverb_L (Large –EFX2 only)
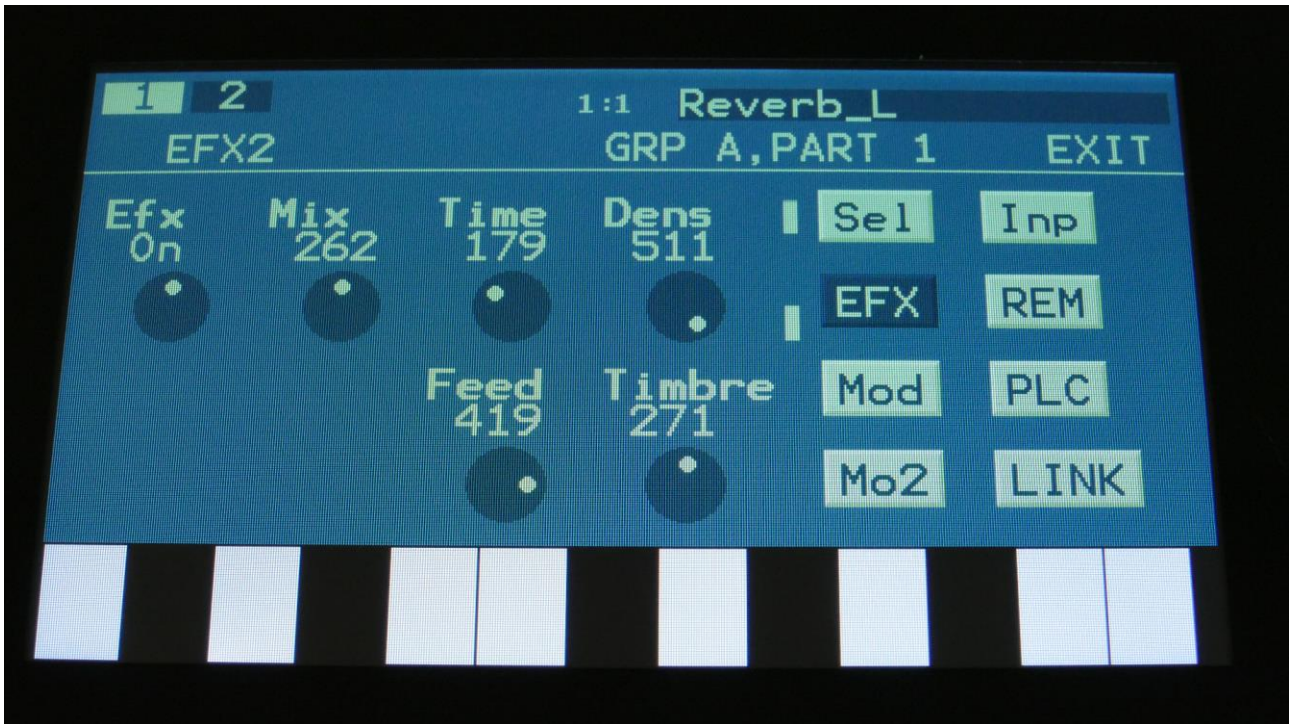
Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Time: Reverb Time. The higher this is turned up, the longer the reverb will last.

Dens: Reverb density. The higher this is turned up, the more dense the reverb effect will get.

Feed: Reverb feedback. Turning this up, will result in even longer reverb times.

Timbre: At different settings of this, the reverb effect will sound a bit different.

Reverb_L Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
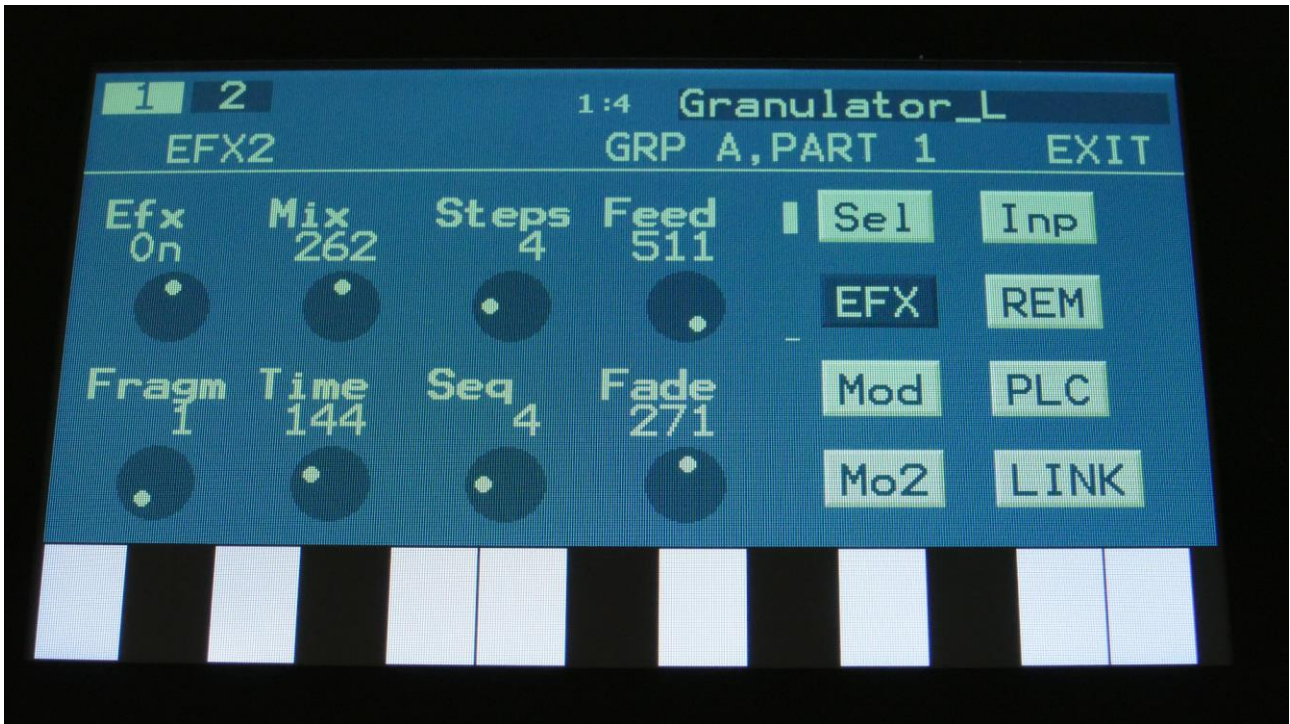
The parameters on this page:

Time1 and Time2: Modulates the Time parameter.

Dens: Modulates the Density parameter.

Timbre: Modulates the Timbre parameter.

Granulator_L (Large –EFX2 only) (unsynced)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Steps: Sets how many steps the granulator sequences should go through, until they starts over again from step one. Range: 1 to 16.

Feed: Adjusts how much of the Granulator output signal should be fed back to its input.

Fragm: Sets how many fragments (or grains) the input signal should be cutted up in. Possible values are 1, 2, 4, 8, 16, 32, 64 or 128.

Time: Sets the size of the input recording buffer. The higher the size, the bigger each grain will be.

Seq: Selects which of the 16 sequencer controller tracks, the granulator should get it step values from. Each value selects a different portion of the granulator input, to be played back.

Fade: When this parameter is turned up, each grain will fade in and out, to minimize clicks.

Granulator_L Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
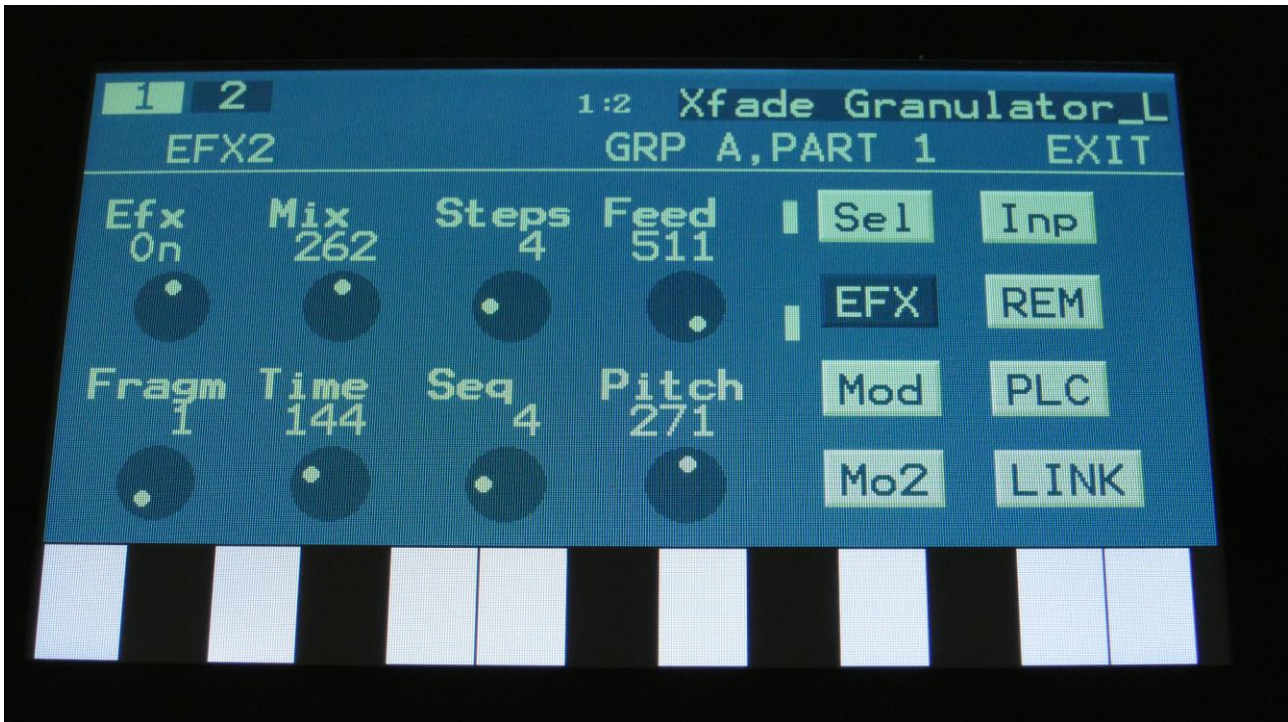
The parameters on this page:

Step1 and Step2: Modulates the number of steps parameter.

Feed: Modulates the feed parameter.

Fade: Modulates the Fade in and out times.

Xfade Granulator_L (Large –EFX2 only)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Steps: Sets how many steps the granulator sequences should go through, until they starts over again from step one. Range: 1 to 16.

Feed: Adjusts how much of the Granulator output signal should be fed back to its input.

Fragm: Sets how many fragments (or grains) the input signal should be cutted up in. Possible values are 1, 2, 4, 8, 16, 32, 64 or 128.

Time: Sets the size of the input recording buffer. The higher the size, the bigger each grain will be.

Seq: Selects which of the 16 sequencer controller tracks, the granulator should get it step values from. Each value selects a different portion of the granulator input, to be played back.

Pitch: Sets the playback pitch of the granular sequence. A value below 256 will pitch the signal down, a value above 256 will pitch it up.

Xfade Granulator_L Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
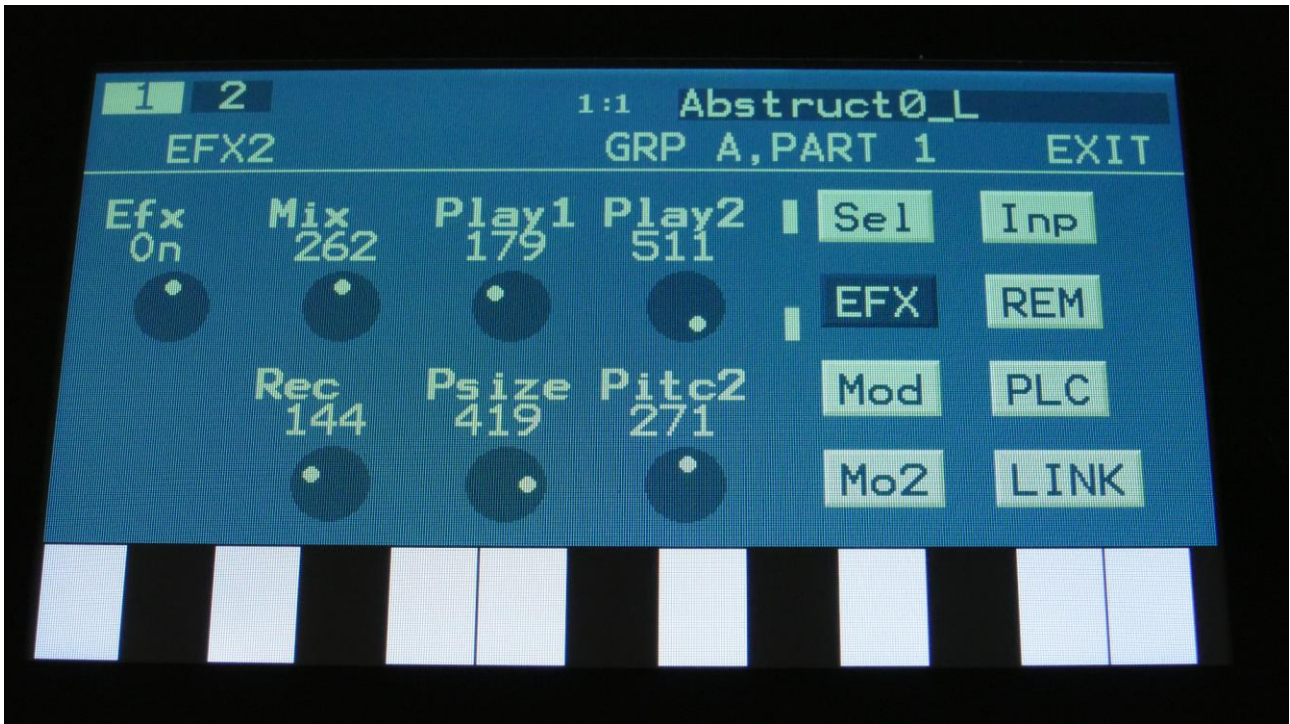
The parameters on this page:

Step1 and Step2: Modulates the number of steps parameter.

Feed: Modulates the feed parameter.

Pitch: Modulates the pitch of the granular sequence.

Abstruct0_L (Large –EFX2 only)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Play1, Play2: 0 (Off), 1 to 511. Sets for how long time each of the playback heads should play back, until it jumps to a new random location.

Rec: 0 to 511. Sets the record buffer size. Determines for how long time it should record the input, before it starts over again.

Psize: 0 (Off), 1 to 255. This parameter sets the total playback buffer size, independent of the record buffer size. If this parameter is 0, the Rec parameter determines the playback buffer size, but if it is at any other value, this parameter determines the playback buffer size. It can be used as a fast way of adjusting the playback length of both playback heads at the same time. At low settings, granular effects with very small grains can be obtained. If the value of this is higher than

the Rec parameter, it will play back areas of the record buffer, that is not being recorded, and create a "Freeze" effect.

Pitc2: 0 to 511. Sets the pitch of the playback for playhead 2. A value below 256 will pitch the signal down, a value above 256 will pitch it up.

Abstruct0_L Modulation
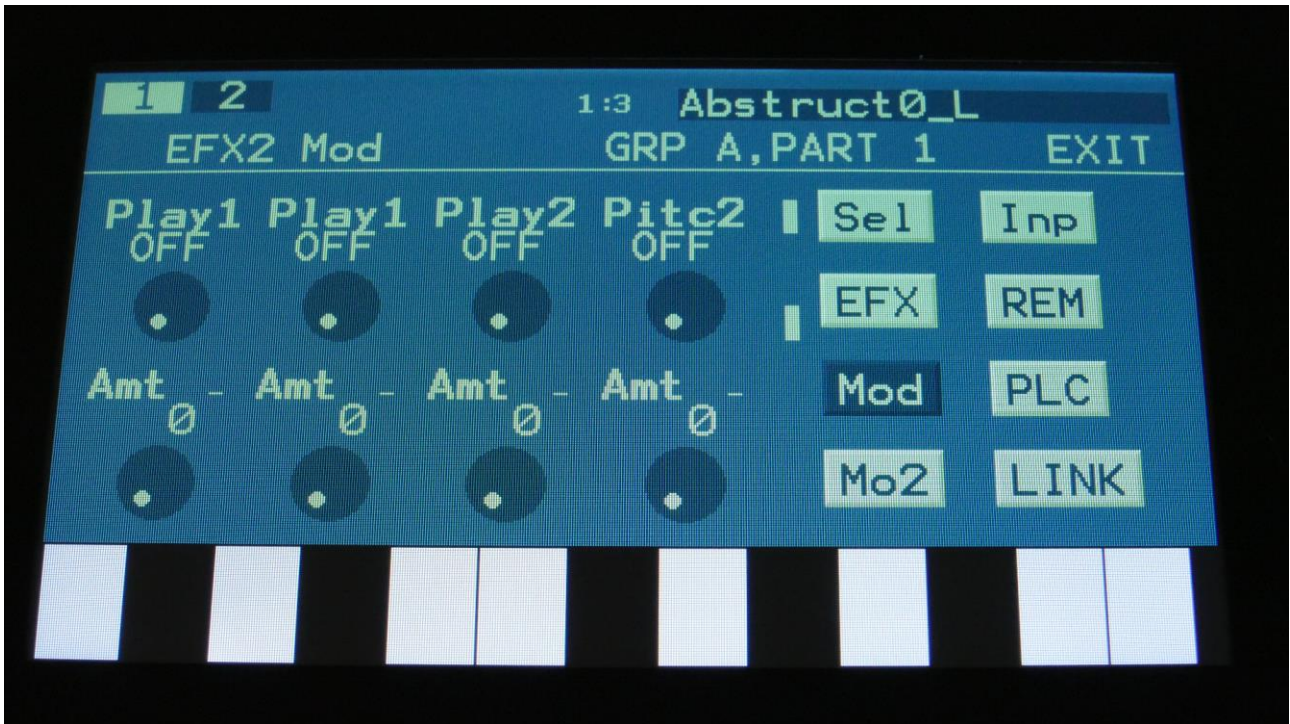
Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
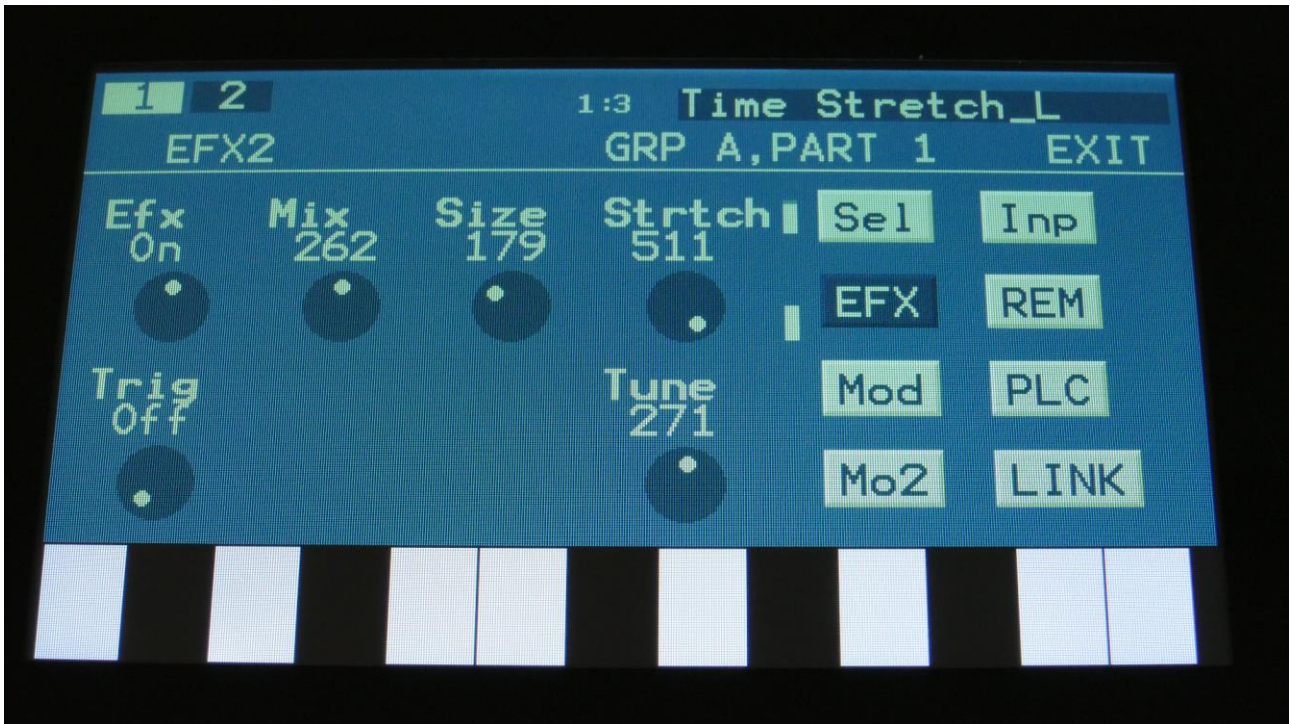
The parameters on this page:

Play1: Modulates the size of playback head 1.

Play2: Modulates the size of playback head 2.

Pitc2: Modulates the pitch of playback head 2.

Time Stretch_L (Large –EFX2 only)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Size: 0 to 511. The size of the RAM buffer used for the TimeStretcher.

Strtch: 0 to 511. Time stretch. A value below 256 will stretch the sound longer, a value above 256 will compress the sound to become shorter.

Trig: Off, 1 to 2. Determines if the time stretch effect should be trigged by a part or not.

Tune: Pitch Coarse. A value below 256 will pitch the signal down, a value above 256 will pitch it up.

Time Stretch_L Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Size: Modulates the size of the time stretch input buffer.

Strtc: Modulates the time stretching.

Tune: Modulates the pitch coarse.

Roto Pitch_L (Large –EFX2 only)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.
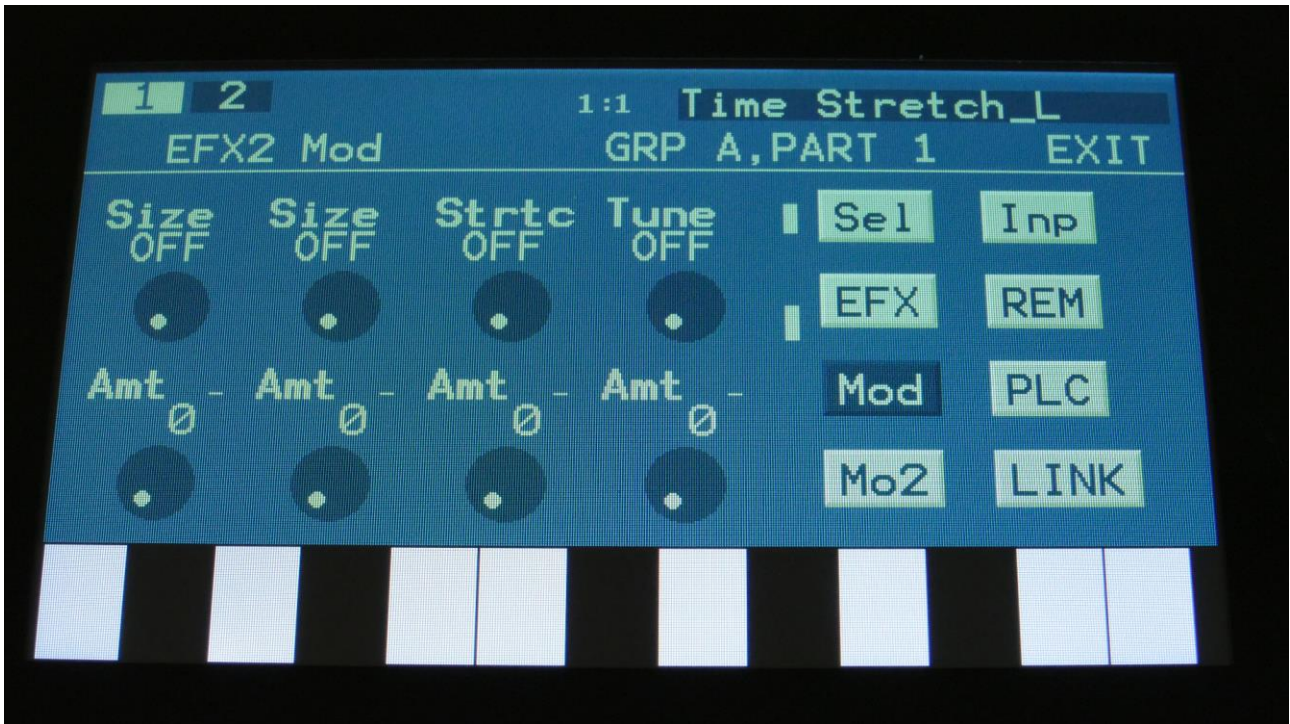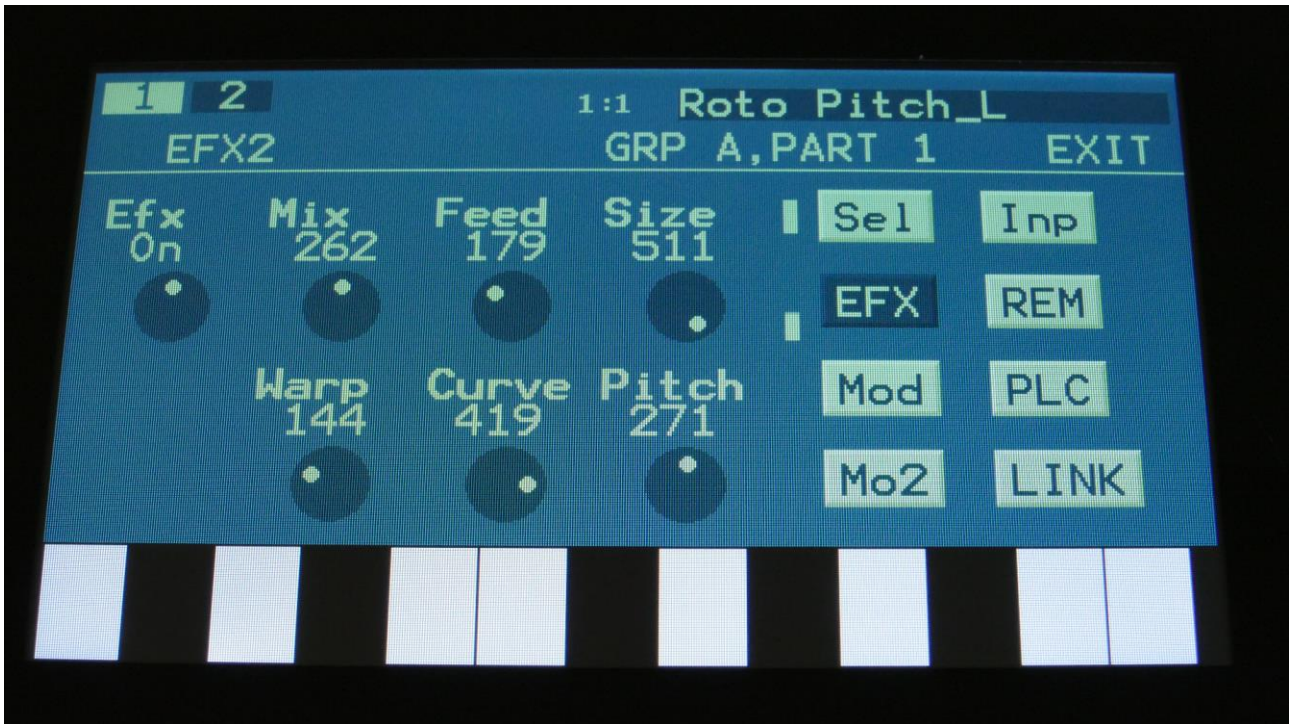
Feed: Adjusts the portion of the output signal, that is fed back to the input.
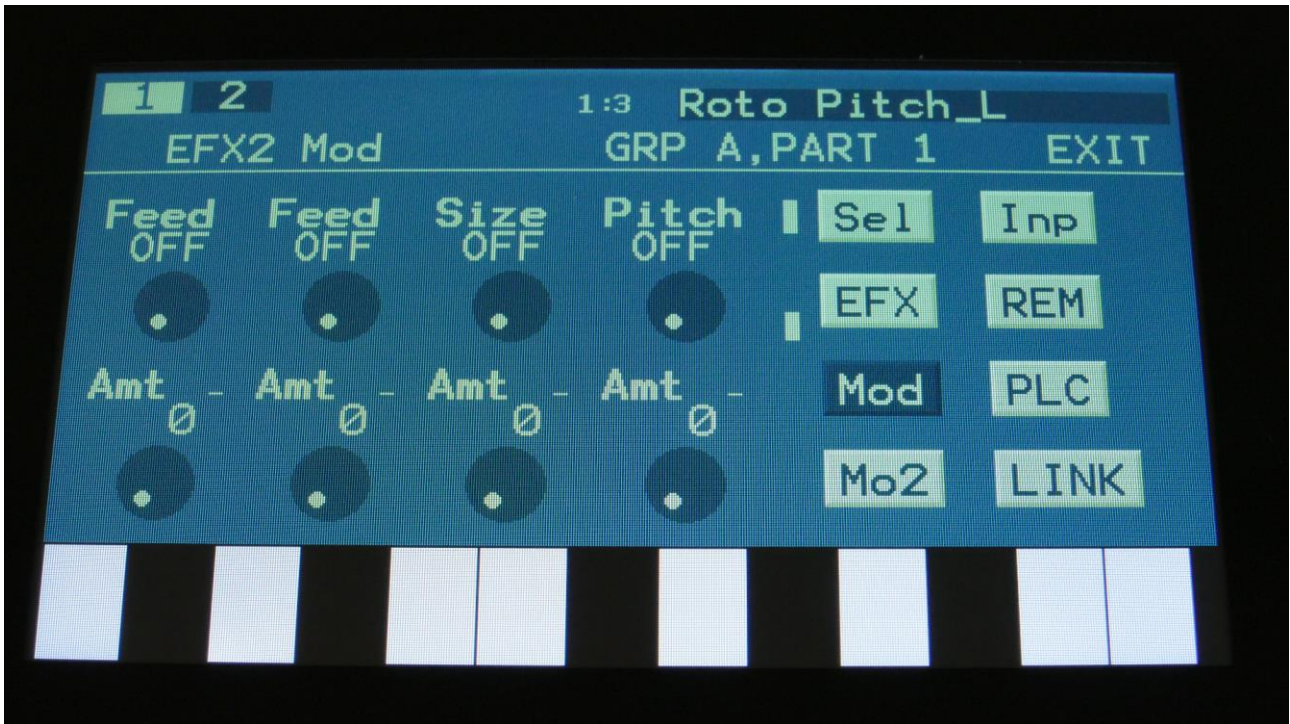
Size: Sets the size of the pitch shifting buffer. At higher values, this will create a pitch shifting delay.

Warp: Warps the signal over the edge, to make things sound really weird.

Curve: Set the curve for the pitch rotation. From logarithmic (0) to linear (256) to exponential (511).

Pitc: Sets the output pitch of the effect. Goes from minus one octave to plus one octave.

Roto Pitch_L Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.
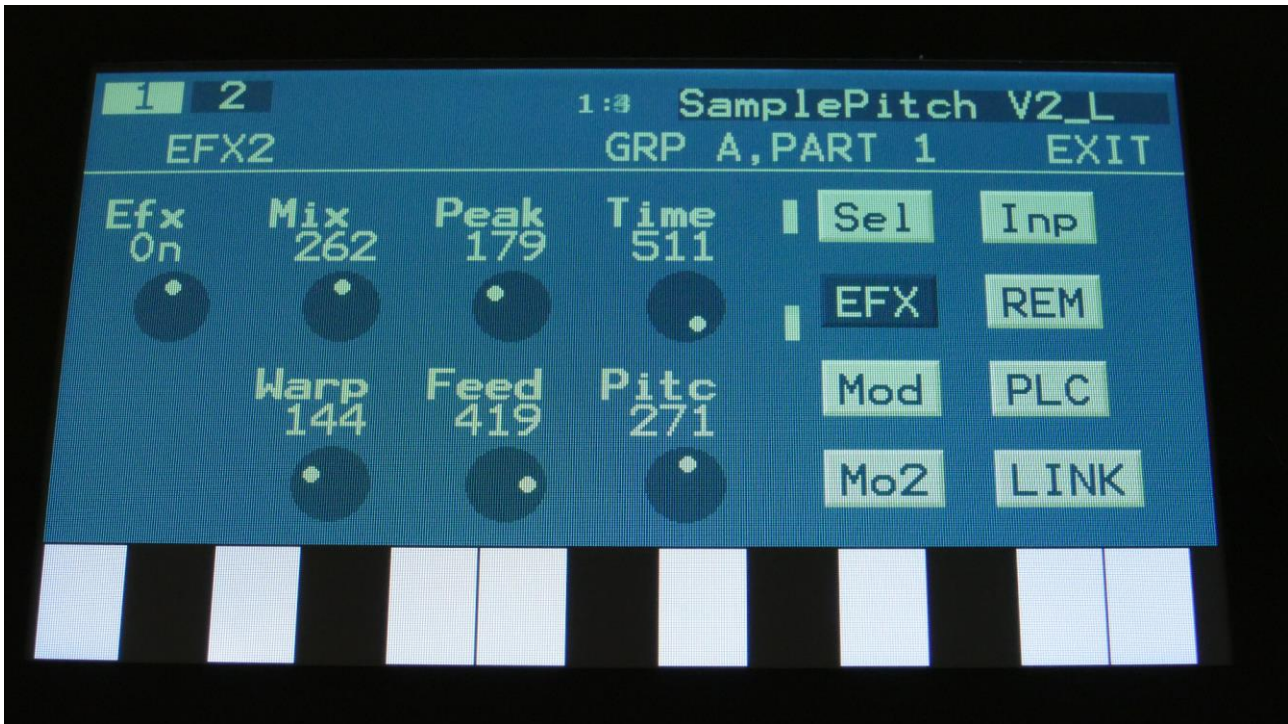
The parameters on this page:

Feed1 and Feed2: Modulates the Feed parameter.

Size: Modulates the Size parameter.

Pitch: Modulates the Pitch parameter.

Sample Pitch V2_L (Large –EFX2 only)

Touch the EFX touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output.

Efx: Off, on. When the effect is off, it is bypassed.

Mix: The mix between the un-effected signal on the effect input, and the effected signal on the effect output.

Peak: Adjusts the formant peaks of the sound. When set to zero, the formants of the sound are not altered.

Time: Sets the time base of the pitch shifting. When set to the maximum value, the relationship between time and pitch shifting is 1:1. When turned down, this relationship gets out of sync, and things starts to sound different.

Warp: Warps the signal over the edge, to make things sound really weird.

Feed: Adjusts the portion of the output signal, that is fed back to the input.

Pitc: Sets the output pitch of the effect. Goes from minus one octave to plus one octave.

Sample Pitch V2_L Modulation

Touch the Mod touch button, to access this page.

The 2 VU-meters at the right of the screen, shows the Effect input and output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

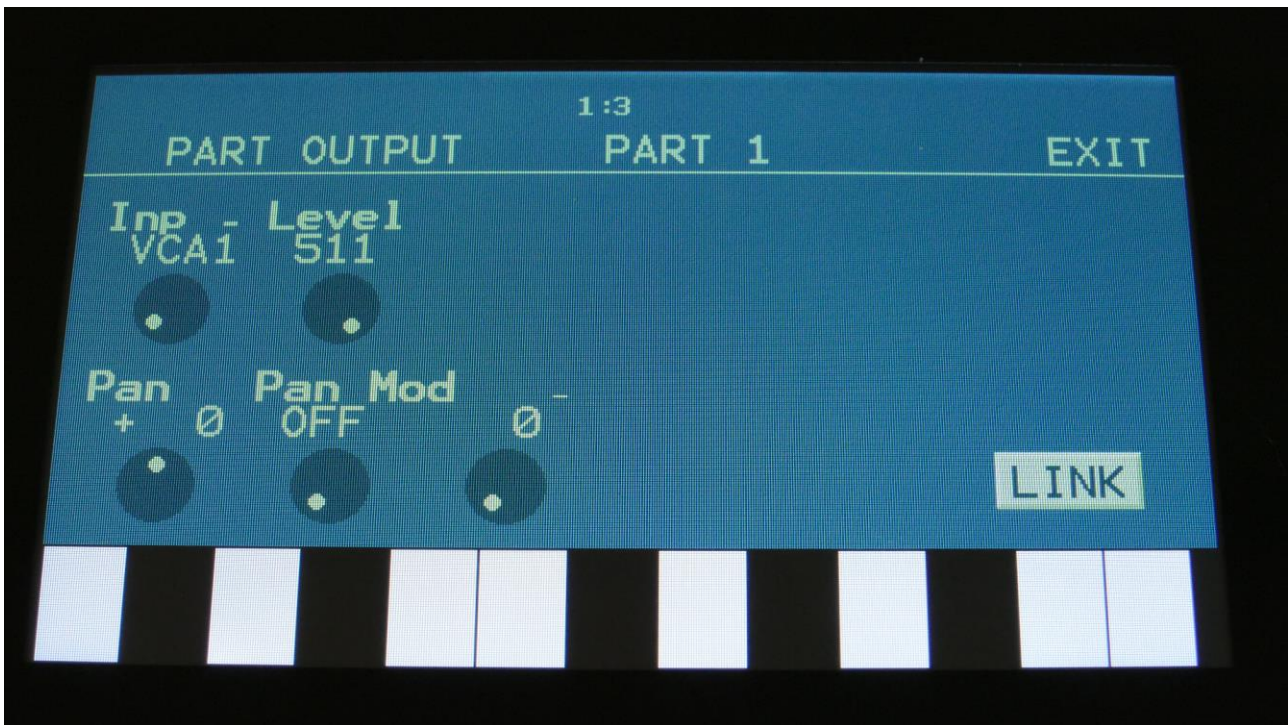The parameters on this page:

Peak1 and Peak2: Modulates the Peak parameter.

Time: Modulates the Time parameter.

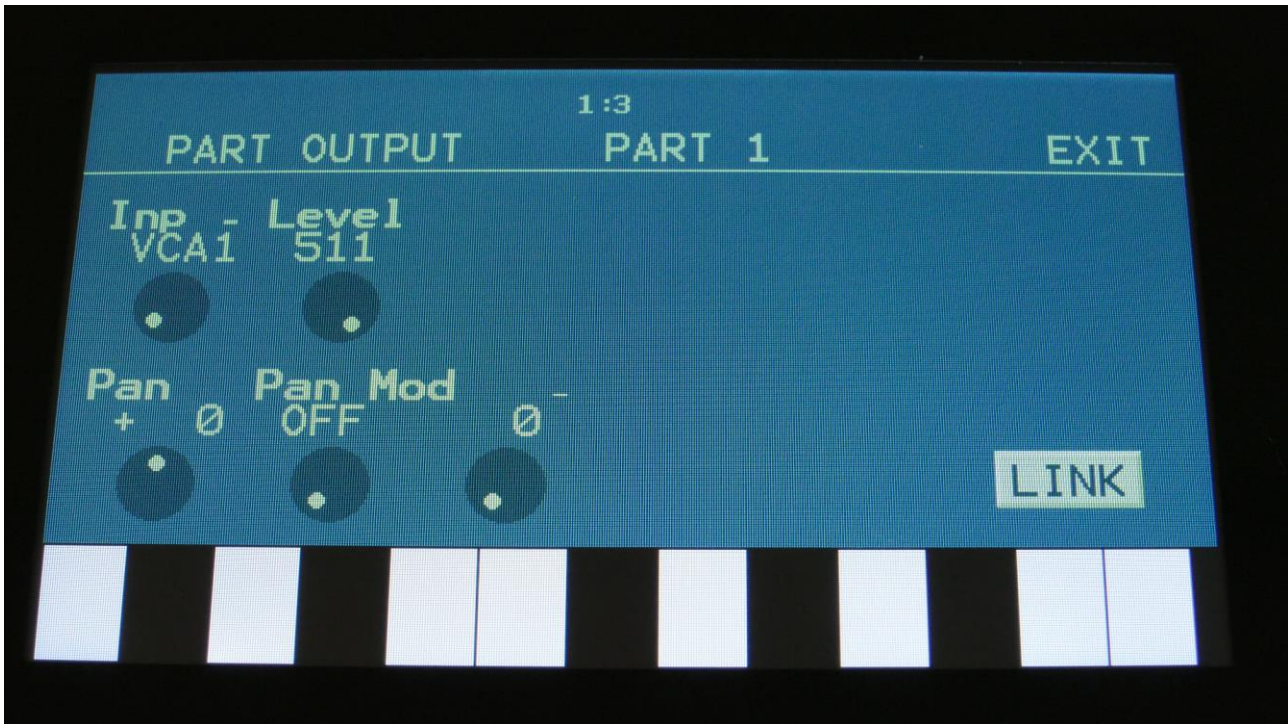**Pitc:** Modulates the Pitc parameter.

Outputs Module

In the output module, signals from any modules can be assigned and routed to the audio outputs. Panning of sounds and pan modulation is also done here.

Each part has its own output module (2 per group, 8 in total).

Output Module Parameters

Select the output module for the desired part, by pushing and holding the Steps/Part button, while pushing one of the 8 trigger buttons.

Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Inp: Selects the source for input of the output module. Any audio/modulation source can be selected. For a complete list of sources, please see the "Connecting Modules" chapter, later in this manual. The small VU-meter near the parameter name, show the activity of the selected input source.

Level: Sets the output level for the part.

Pan: Sets the output panning for the part.

Pan Mod (source and amount): Selects the pan modulation source and the pan modulation amount for the part . Any audio/modulation source can be selected. For a complete list of sources, please see the "Connecting Modules" chapter, later in this manual. The small VU-meter near the parameter name, show the activity of the selected pan modulation source.

Triggers

Each group has 2 triggers, one for each part. The triggers are activated, when a part is trigged by a note on, generated by the trigger buttons, the touchscreen keyboard, the sequencer or a MIDI device connected to MIDI in.

The triggers are numbered 1 and 2, regardless of the part/group selected, so when Group B is selected, Trigger 1 and 2 is generated by part 3 and 4, when Group C is selected, Trigger 1 and 2 is generated by part 5 and 6, and when Group D is selected, Trigger 1 and 2 is generated by part 7 and 8.

ENV – Envelopes
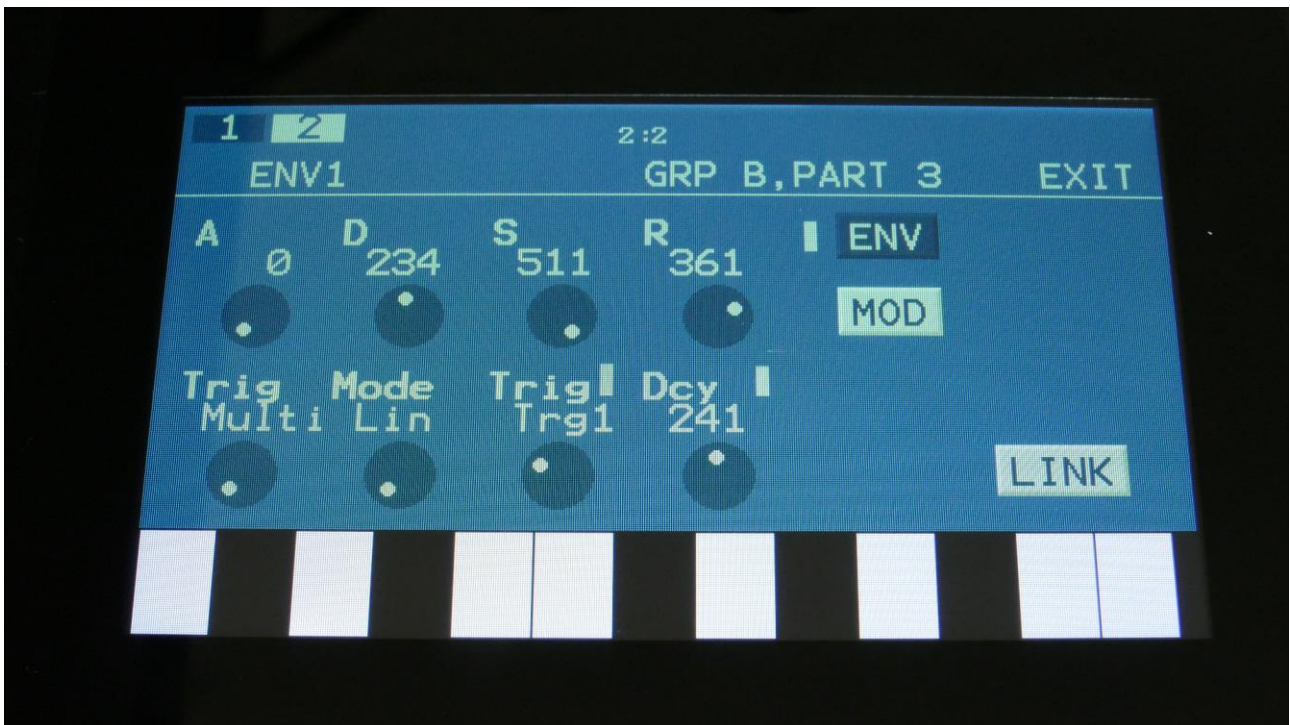
Each group has 2 envelope modules (8 in total), each with an ADSR envelope and a Decay envelope. The ADSR envelope can run in various linear and logarithmic modes, the envelope time can be timed by 4, for long envelope times, and the ADS segment can be looped. The envelopes can be trigged by any sources. The A, D, R and output amount parameters can be modulated. The extra decay envelope, is always linear. When the ADSR Envelope is looped, the Decay envelope is looped in sync with this.

Envelope Parameters

From the synth modules page, touch ENV to enter the envelope pages.
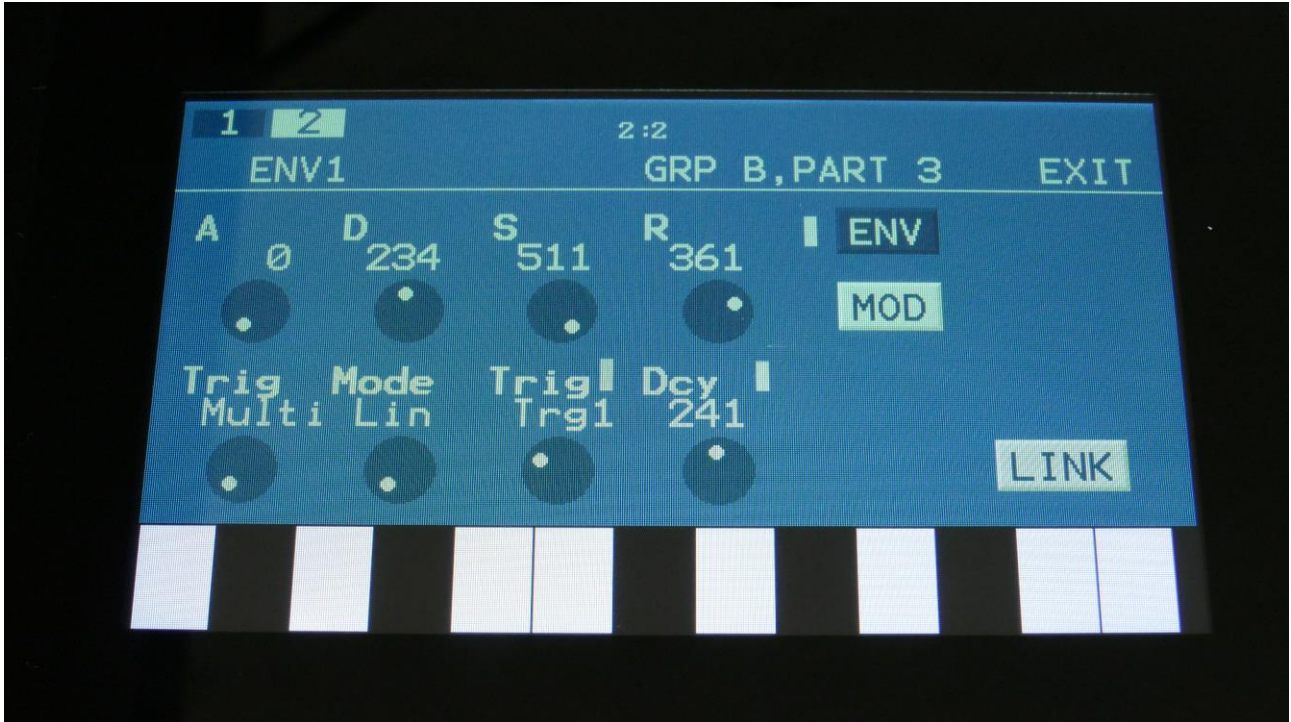
To select Effect 1 to 2, touch the numbers in the upper left corner.

Touch the ENV touch button, to enter the envelope parameters page.

The 2 VU-meters at the right of the screen, shows the Envelope and the Decay Envelope outputs.

Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

A: 0 to 511. ADSR Envelope attack time. The time it will take the envelope to rise from zero to its maximum value, when a note event is received and held down.

D: 0 to 511. ADSR Envelope decay time. When the envelope has reached its maximum value, in the time set by the attack parameter, it will decay, until it reaches the sustain level, and stay there, as long as the note that trigged it is held.

S: 0 to 511. ADSR Envelope sustain level. Explained under the "Dec" parameter.

R: 0 to 511. ADSR Envelope release time. The time it will take the envelope to decay from the value it is at, when a note off event are received, to zero.

Trig: Multi/Single trigger. When this parameter is set to multi, and the envelopes (both the ADSR and the Decay envelope) is trigged by an internal note source (trigger buttons, internal sequencer, touch screen keyboard), the envelopes will re-trigger every time a note on is received, regardsless of, if the trigger has ever been low. When this parameter is set to Single, the envelope trigger must go low, before it goes high again, to trigger the envelopes.
When triggering the envelopes from non-note sources (LFO's etc) or from external sources (the trigger or CV inputs), they will always act in single mode, and these triggers MUST go low, before they go high to trigger the envelopes.

**Mode:** Selects if the envelope curve should be linear **(Lin),** or logarithmic **(Log).** The logarithmic curve gives the envelope a softer and less "clicky" attack. The **Lin4 and Log4** modes sets the behaviors as mentioned above, but with envelope times, that are 4 times longer.
The **LinLp** and **LogLp** modes will make the attack, decay and sustain segment of the envelope loop, for as long as the part trigger is active. When the part trigger is released, the envelope will continue to the release segment, and fade out. When any of these loop modes are selected, the Decay envelope will also loop, in sync with the ADSR envelope. This is useful, if you, for instance, needs a trigger, every time the ADSR envelope loops.

Trig: Envelopes trigger. Any modulation/audio source can trigger the Envelopes. For a complete list of modulation sources, see the "Connecting Modules" chapter, later in this manual. For "normal" use, you would set this to "Trg1" or "Trg2", which is the part triggers.

Dcy: 0 to 511. Decay Envelope decay time. The time it will take the decay envelope to decay, after it has been trigged.

Envelope Modulation
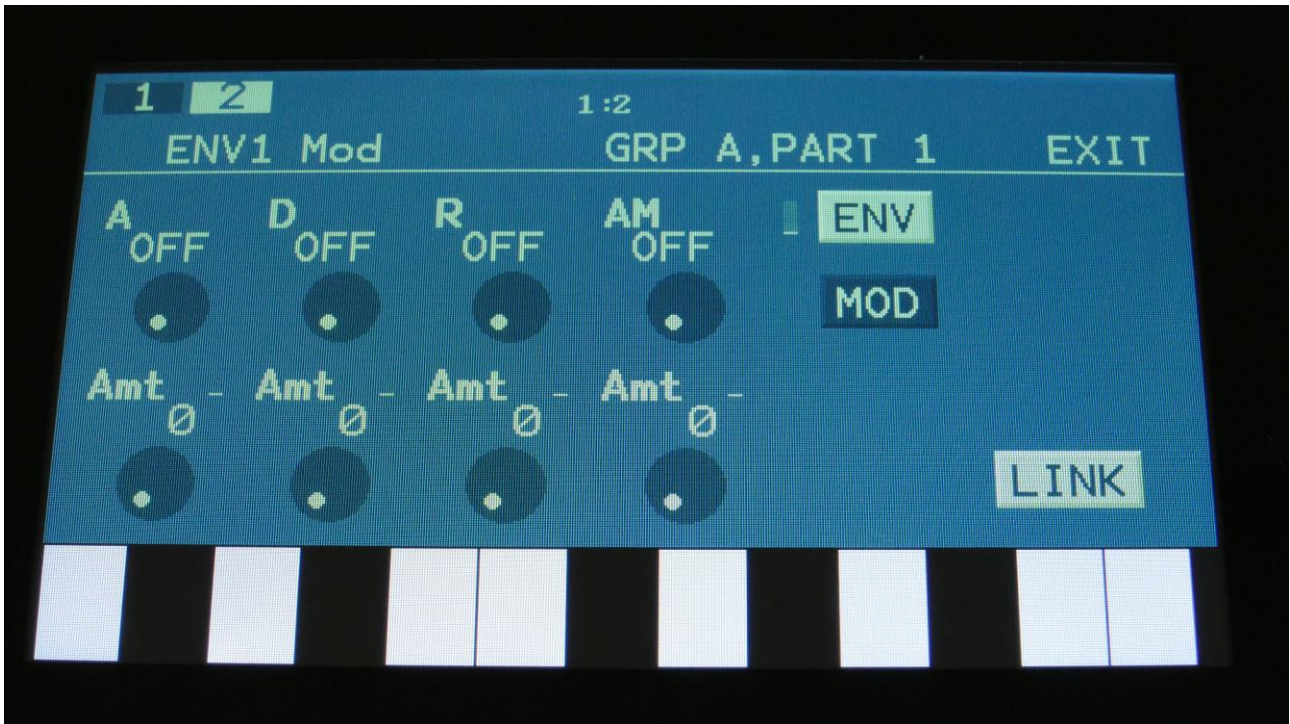
Touch the MOD touch button, to enter the envelope modulation page.

The VU-meter at the right of the screen, shows the Envelope output. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

A: Modulates the ADSR Envelope attack time.

D: Modulates the ADSR Envelope decay time.

R: Modulates the ADSR Envelope release time.

AM: Modulates the ADSR Envelope output amount.

LFO
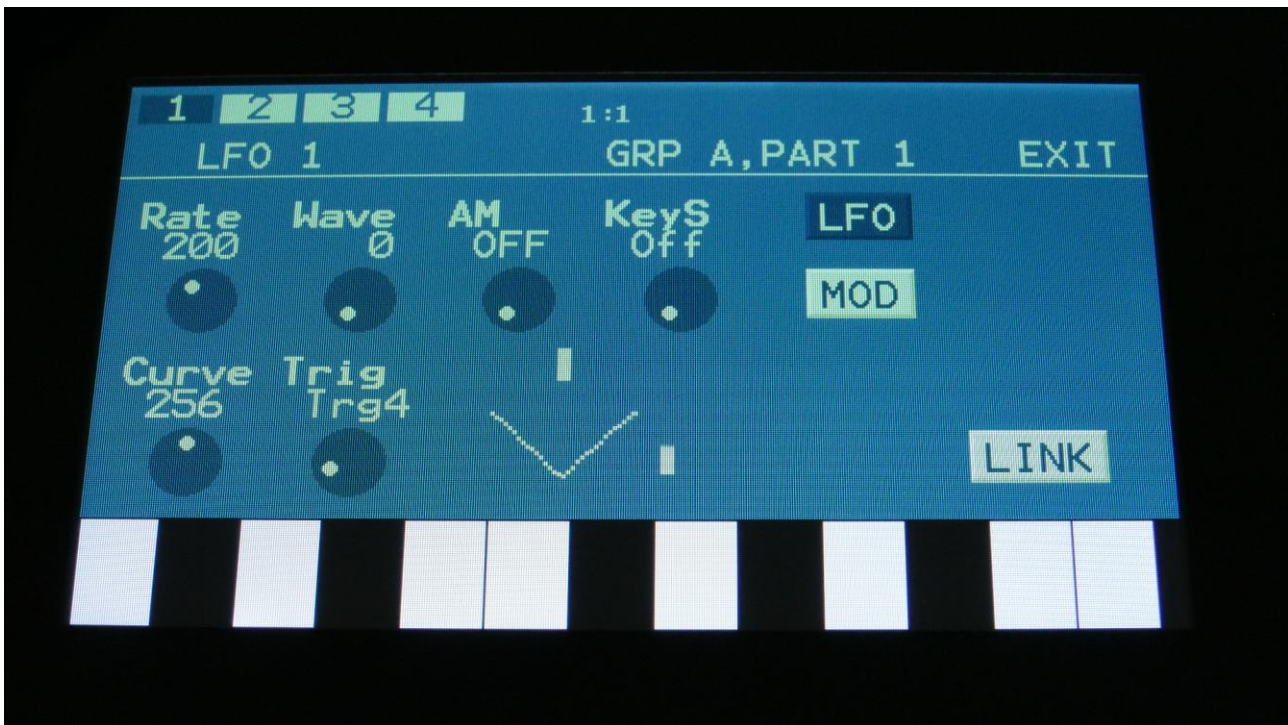
Each group has 4 LFO's (16 in total) with a waveform that morphs from triangle to sawtooth to pulse to FM waves. Curve can be adjusted from logarithmic to linear to exponential. The LFO's can be key synced, and a one-shot mode is available, for using the LFO's as envelopes. The Rate, Wave and Curve parameters can be modulated.

One LFO are shown at a time on the LFO pages. LFO 1 to 4 are selected by touching the numbers in the upper left corner.

LFO parameters

From the synth modules page, touch the LFO block, to enter the LFO pages.
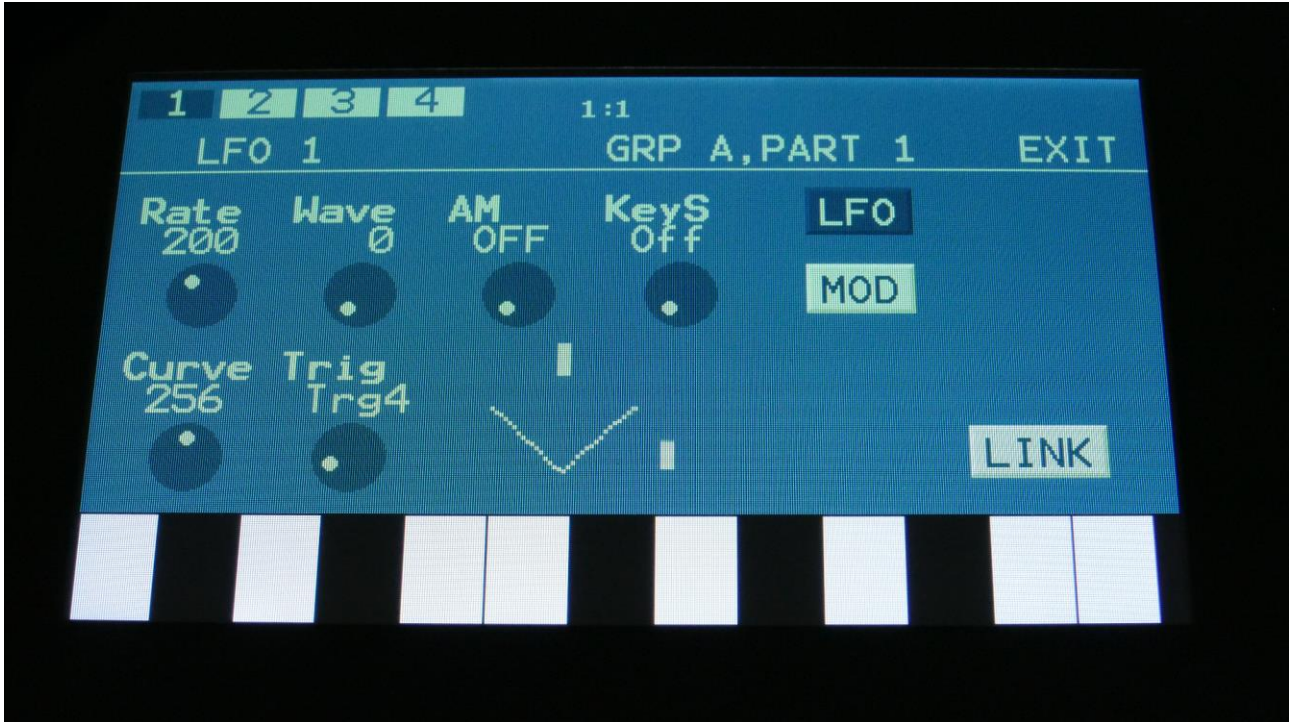
Touch the LFO touch button, to select this page.

To select LFO 1 to 4, touch the numbers in the upper left corner.

Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

At the bottom of this page, the current LFO waveform is shown, together with a small VU-meter, showing the LFO output activity.

Rate: 0 to 511. LFO rate. Sets the speed of the LFO.

Wave: 0 to 511. LFO output waveform. Morphs between triangle, sawtooth, square, pulse and FM waveforms. The FM waveforms are high frequency waves, that can be used for FM synthesis.

AM: Selects the modulation source, that will control the LFO output level. If "Off" is selected, no output level control will be applied to the LFO. Any modulation source can be selected. For a complete list of modulation sources, see the "Connecting Modules" chapter.

KeyS: Off, 1 to 8, 1s to 8s, 1q to 8q: LFO key sync. The number tells which part will make the LFO restart. When a number that has an "s" after it is selected, the LFO are in single cycle mode, and will only run one cycle, every time it is triggered.

Off: The LFO is free running.

1 to 8: Every time this Drum part is trigged, the LFO will reset to its initial value, and start over.

1s to 8s: Every time this Drum part is trigged, the LFO will reset, run for one cycle, and then stop.

1q to 8q: Every time this sequencer note track starts over from step 1, the LFO will reset.

Curve: 0 to 511. Sets the curve of the LFO output waveform from logarithmic (0) to linear (256) to exponential (511), and anything in between. To get "normal" linear LFO shapes, like triangle and saw tooth, keep this parameter at its initial value 256. This parameter will not affect square waves.

Trig: (only LFO 1 and 2). Will let the LFO trigger parts and the sequencer. The possible settings:

Off: Does nothing.

Trg1 to Trg 8: The LFO will trigger Part 1 to 8.

1/32, 1/24, 1/16, 1/12, 1/8, 1/6: The LFO will clock the internal sequencer. Every time the LFO raises above its center value, the sequencer will increment 1/32, 1/24, 1/16, 1/12, 1/8, 1/6 step, as selected. The internal sequencer clock, and any MIDI clock will be ignored. MIDI clock will still be transmitted, if the ClkOut parameter in the COMMON menu is set to on.

s/s: The LFO will make the sequencer start or stop every time its output raises above the center value.

Rst: The LFO will make all tracks of the sequencer reset to their respective start step every time its output raises above the center value.

LFO Modulation
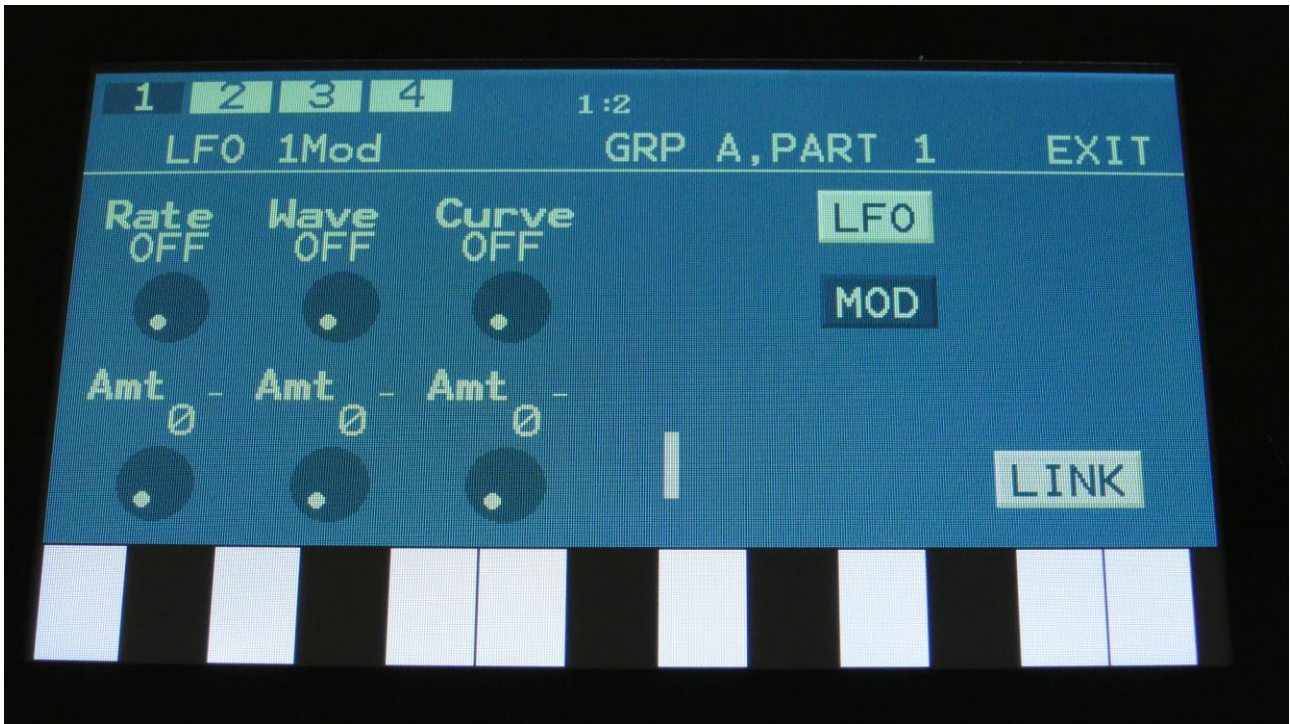
Touch the MOD touch button, to select this page.

The VU-meter at the bottom of the screen, shows the LFO activity. The small VU-meters next to the parameters, shows the activity of the selected modulation sources.

For each parameter, that can be modulated, it is possible to select a modulation source and to adjust the modulation amount. For a complete list of modulation sources, see the "Connecting Modules" chapter.

The upper row of parameters selects the modulation sources, **the lower row of parameters** (Labelled Amt) adjusts the modulation amount in the range 0 to 511.

The parameters on this page:

Rate: Modulates the LFO rate.

Wave: Modulates the LFO waveshape.

Curve: Modulates the LFO Curve parameter.

S/H Generators

Each group has 2 Sample/Holds (8 in total). Every time these are trigged, they put out a new value from the input source. Triggers and inputs can be any source. For a complete list of modulation sources, see the "Connecting Modules" chapter.
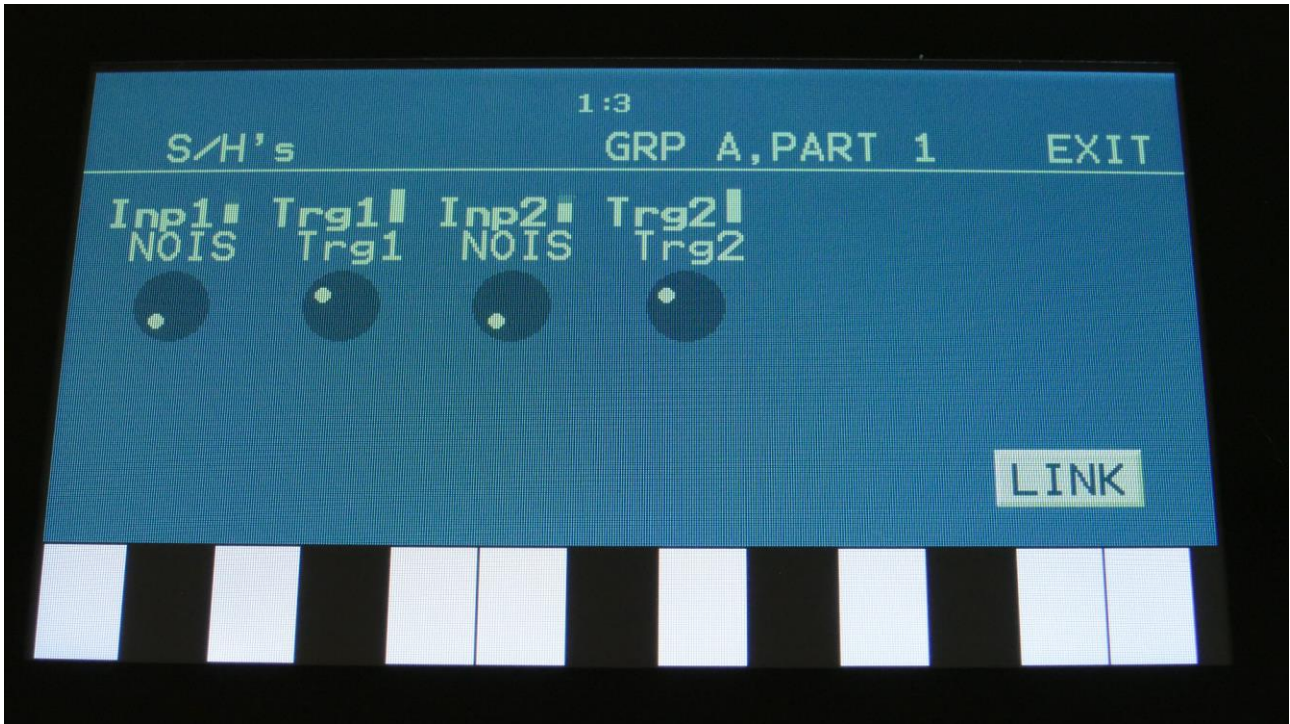
Activate **LINK** to make the same module in the other groups, using the parameters from group A, to get the same sound on each tone in polyphonic mode.

Inp1-Inp2: Selects the input source for each S/H.

Trg1-Trg2: Selects the trigger source for each S/H.

Parameter Randomizer
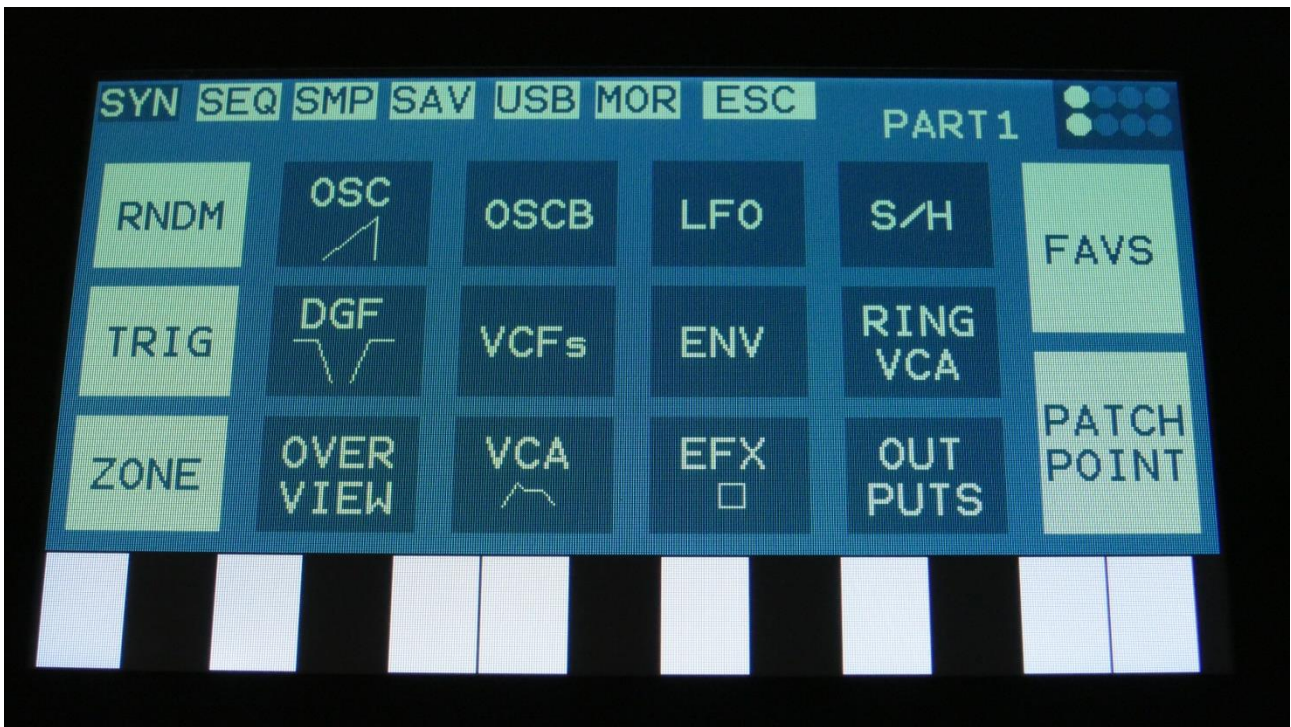
If you should ever need some new inspiration for sounds, or if you just want to surprise yourself with some sounds that you never even imagined, the Zaturn parameter randomizer might be exactly what you need.

Please notice that the Randomizer does not change the audio input settings of the modules, so the audio paths will not be changed, when randomizing.

To enter this, from the synth modules page, touch RNDM.

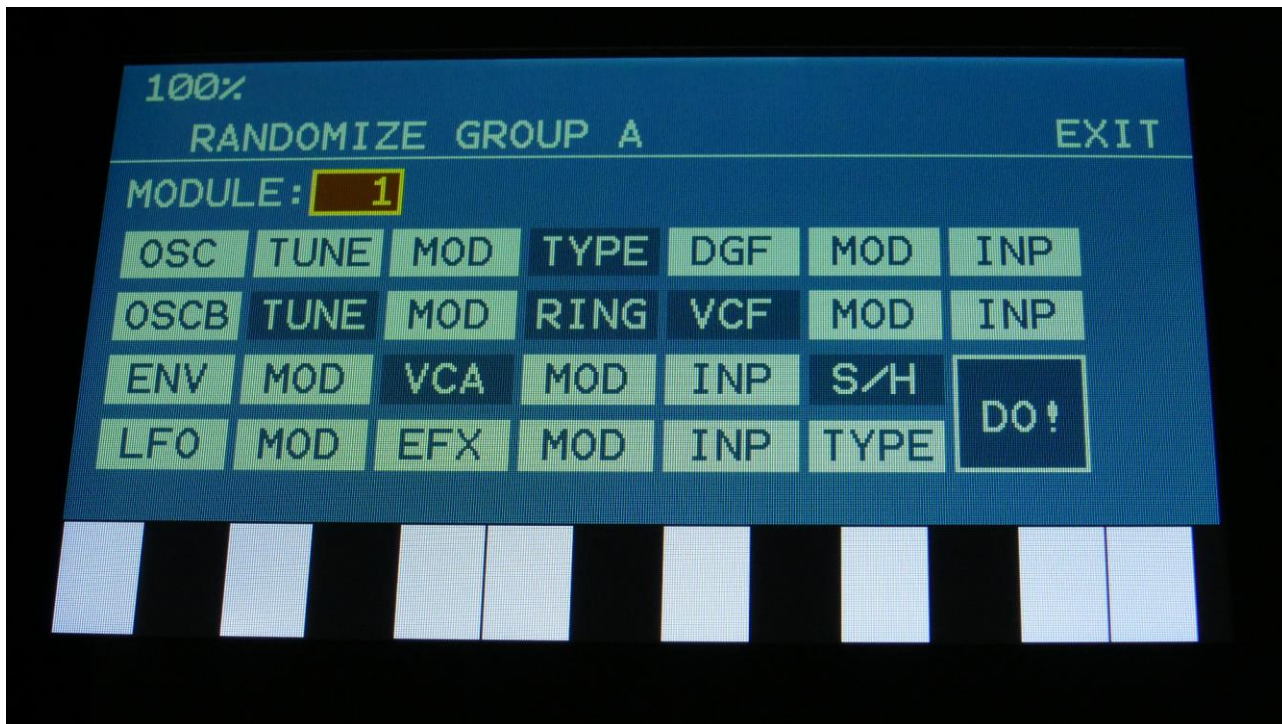You should now enter this page:

First, make sure that you have selected the right group, in which you want to randomize the parameter values. You can do that, by pushing and holding the Steps/Part button, while pressing one of the 8 step buttons. The selected group is shown at the top of this page.

Then switch the blocks on, which you would like to randomize, by touching these. If a block is blue, it means that the parameters for this module will be randomized. If a block is white, this module will not be randomized.

Since there are 2 of each of the oscillators, the VCA's, the effects and the envelopes, and 4 LFO's, you will have to select the module number, when randomizing any of these. You can do this with **Edit Knob 2**. It is also possible to select all modules at the same time (**AL** setting).

When things are set up, just set the desired randomize percentage, using **Edit Knob 1**, and hit "DO!".

Listen to the result.
If you like it, exit the randomizer page, and save the preset.

If you don't like the result, hit "DO!" again, and keep hitting it, until something comes up, that you like. Try with different percentage settings, and try to switch different blocks on and off.

When the Randomizer page is entered, all parameters are stored into a temporary buffer, that is used for the randomization. So if you, for instance, first randomizes with 50%, and then with 20%, the result will be maximum 20% away from the initial parameter settings, when the Randomizer page was entered. It does not first randomize 50%, and then randomize 20% on top of that. To randomize things further away, you must exit the Randomizer page, and re-enter it.

To get back to where you started, simply set the percentage to 0% and hit "DO!".

Part Trigger (Poly) Setup

In this block, you can set up the playback mode for each part (gate/toggle/poly), the pitch bend range, the note that will play pack, when pushing a trigger button, and if the part should be an internal or an external part.

From the synth modules page, touch TRIG to enter this page.
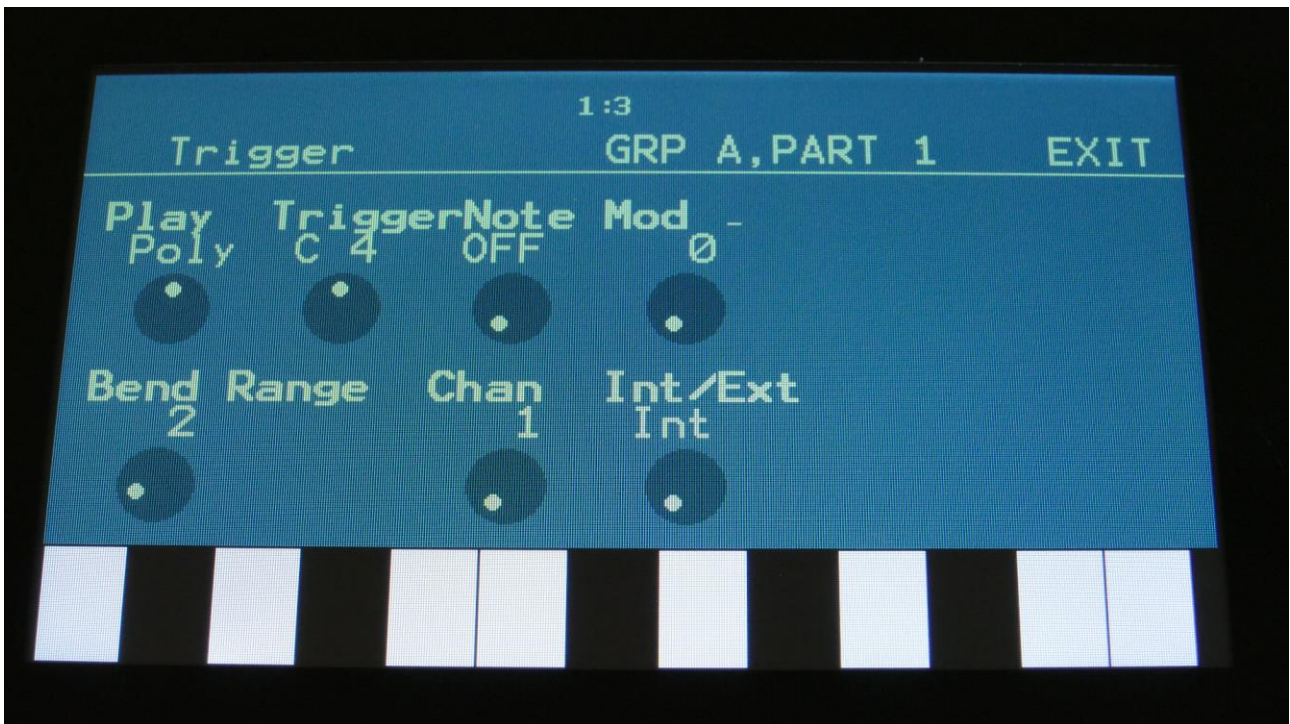
Play: Part Gate/Toggle/Poly mode. Choices are:

    Gate: Gated mode. This is the "normal" play mode. When a part is trigged, it will be trigged for as long as the key/trigger button is held, and released when the key/trigger button is released.

    Togl: Toggled mode. In this mode, the part gate will toggle, every time it gets a trigger. This is useful, if you have some loops or drones laid out, and you just want to switch these on and off, by hitting a trigger button. Please notice that this mode only works with the trigger buttons. When playing a part from the touch screen keyboard or an external MIDI device, the part will always play back in gated mode.

    Poly (only part 1 and 2): Polyphonic mode. When part 1 is set in polyphonic mode, it will sequentially toggle between part 1, 3, 5 and 7, every time you play a note.
When part 2 is set in polyphonic mode, it will toggle between part 2, 4, 6 and 8 every time you play a note.

Part 1 and 2 can independently from each other be in any trigger mode, so it is possible to have a Zaturn preset in 2 x 4 voice polyphonic mode, have 1 polyphonic part and 4 monophonic parts, or just to have 8 monophonic parts.

The sounds on each part used in a poly chain, can either be completely different sounds or the same sounds. To get the same sound on each part in a poly chain, simply activate "LINK" on each of the module, which you are using in the chain. When LINK is activated, the modules of group B, C and D will be forced to use the parameter settings of group A.
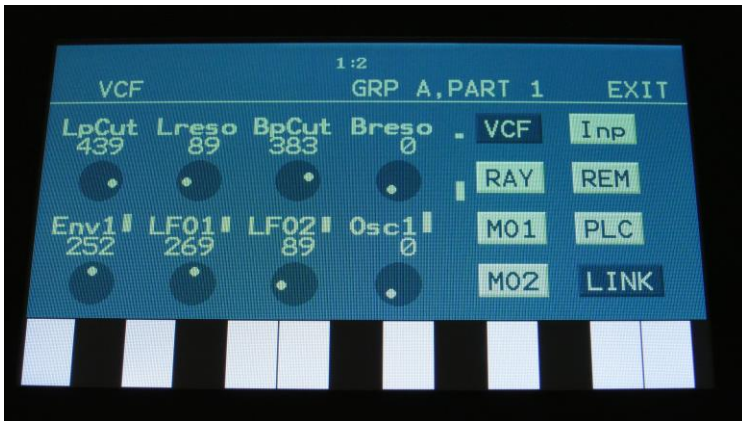
PolyR (only part 1 and 2): Same as Poly, except for that the parts in the poly chain are selected randomly instead of sequentially. Most useful, when you have different sounds on each part.

TriggerNote: C-1 to G9. The note that will play, when the step buttons are in trigger mode (when both the Func/Mute button, the Steps/Part button and the Modules/Bar Sel button are unlit), and you push the trigger button, for this part. This is also the note that is sent via MIDI out, when a part is set to external, and you hit the trigger button.

Trigger Note Modulation Source:
Any audio/modulation source can modulate the trigger note. Only the positive modulation sources, can be selected by the Edit Knob. To make a modulation source negative, touch the modulation source parameter. For a complete list of modulation sources, see the "Connecting Modules" chapter.

Mod: 0 to 512. Trigger Note Modulation amount

Bend Range: 0 to 12 notes. The pitch bend range for the selected part.

Chan: 1 to 16. The part output MIDI channel. This will also affect the part Sequencer Note Track. When the part is set to external, this is the MIDI channel that note data played by the trigger button, the touchscreen keyboard, on an attached MIDI device, and from the part sequencer note track are sent on, to the Zaturn MIDI out.

Int/Ext: Sets the part in internal (Int) or external (Ext) mode.

When a part is set to **internal** mode, all notes played by the part trigger button, the touchscreen keyboard, on an attached MIDI device, and from the part sequencer note track, controls the internal Zaturn part.

When a part is set to **external** mode, all notes played by the part trigger button, the touchscreen keyboard, on an attached MIDI device, and from the part sequencer note track, controls any MIDI device, that is connected to the Zaturn MIDI output, and that is set to the same MIDI channel, as set by the Chan parameter on this page.

Zone Setup/MicroTunings

In this block, it is possible to set up a key zone and a MIDI channel for each part, that will take effect, when Zaturn is set in multi-timbral mode, and is controlled from an external MIDI device. How to set Zaturn in multi-timbral mode is explained later in this manual, in the MOR>Common section.

In this section it is also possible to microtune each key in an octave for oscillator types 2 and Resonator.

From the synth modules, touch ZONE to enter this page.
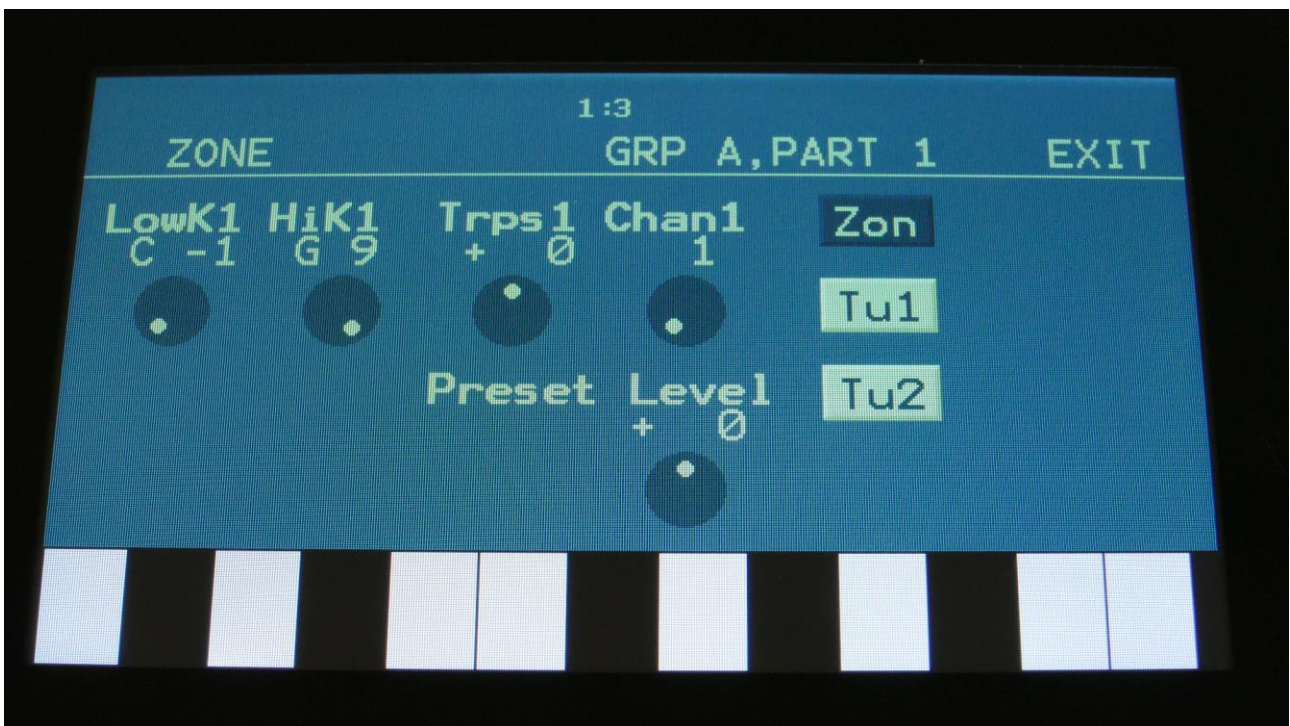
LowK1: C-1 to G9. The lowest key of the part zone.

HiK1: C-1 to G9. The highest key of the part zone.

Trps1: -64 to +63. The incoming MIDI notes, inside the key zone, are transposed up(+) or down(-), by the selected value.

Chan1: 1 to 16. The MIDI channel that will control this part.

Preset Level: Here it is possible to adjust the level for the whole preset, to make to make different presets match each other level vise. Negative values attenuates the levels, positive values gains the levels.

Touch Tu1 to enter the first Microtunings page:
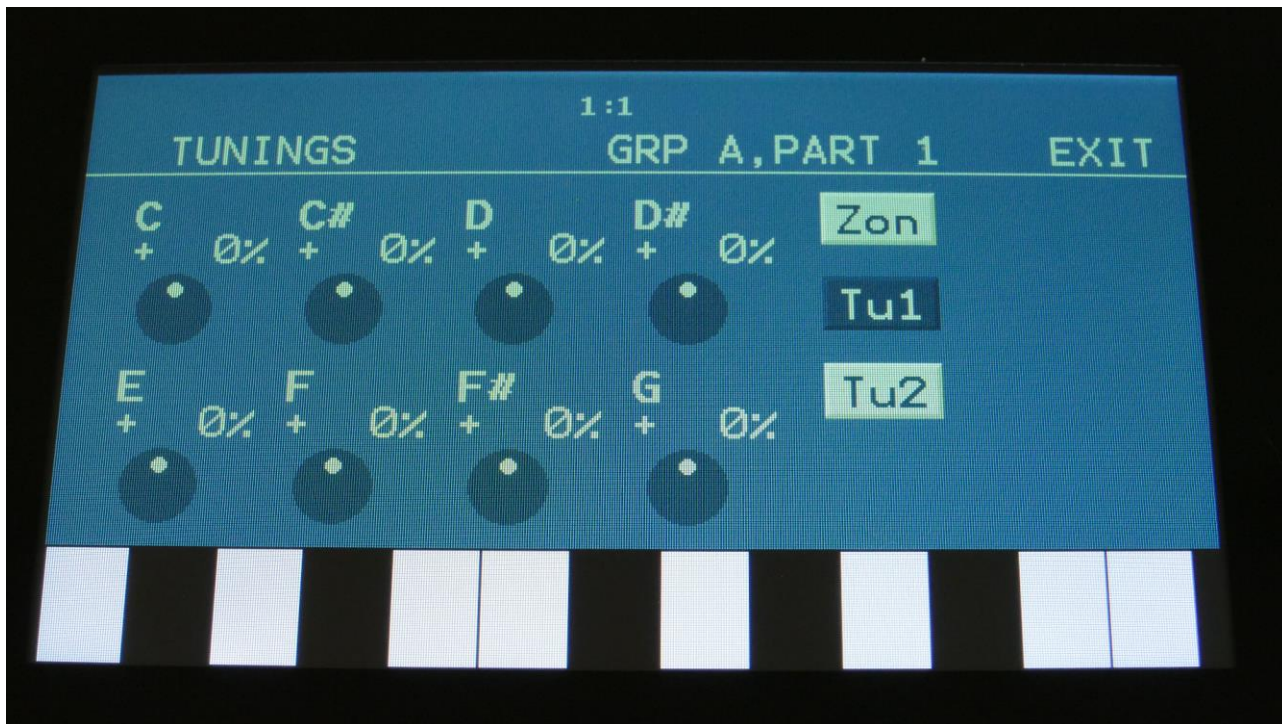
Here it is possible to microtune each note in an octave by up to +/- 50 percent. This is possible separately for each of the 8 parts, but it is only possible for the Type2 and Resonator oscillators. The Type1 oscillators, the samplers and the noise generators are not affected by these settings.

The microtune settings can easily be copied and pasted, using the existing copy/paste system, to easily set up multiple sounds with the same tunings.

On the Tu1 page, use Edit Knob 1 to 8, to set the tunings for the keys C to G. The range is +/- 50% of one note.

The tunings are morphable, so it can have different setting for Morph Layer A and B.

To set the tunings for the keys G# to B, touch Tu2, to go to the next tuning page:
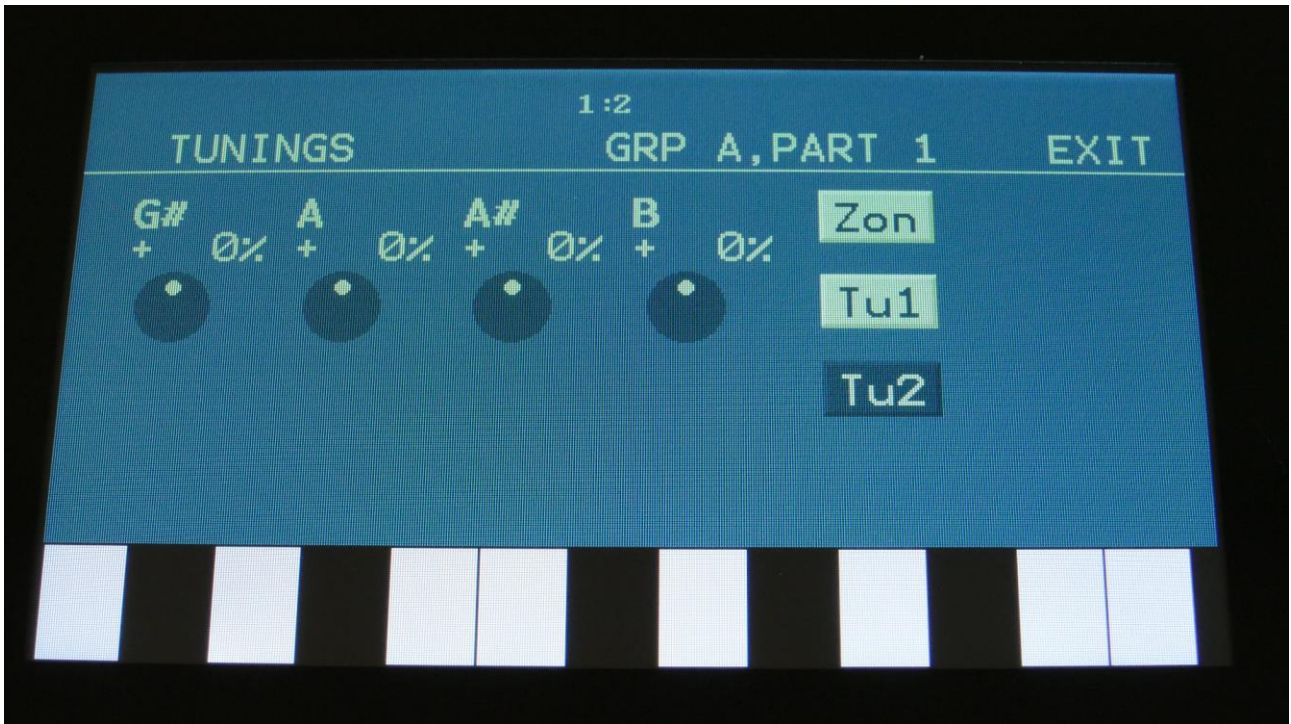
Connecting Modules

There are no specific rules, when connecting modules inside Zaturn. Any output can be connected to any input, inside a group. Zaturn does not differ between the audio and modulation sources. LFO's and Envelopes can run through an audio effect, if you like.

It is even possible to connect modules between different groups, using Patch Points. This is explained in the Patch Point chapter, later in this manual.

Connecting modules on Zaturn can be done in 3 different ways: Manually, via the module overview and automatically.

List Of Modulation/Audio Sources

OFF: The input is disconnected
OFF-: The input is disconnected
Osc1: Oscillator 1
Osc1-: Oscillator 1 inverted
Osc2: Oscillator 2
Osc2-: Oscillator 2 inverted
OscB: Oscillator B
OscB-: Oscillator B inverted
NOIS: White noise source
NOIS-: White noise source inverted
VCF: The output of the VCF
VCF-: The output of the VCF inverted
VCA1: The output of VCA 1
VCA1-: The output of VCA 1 inverted
VCA2: The output of VCA 2
VCA2-: The output of VCA 2 inverted
Ring: The output of the Ring VCA
Ring-: The output of the Ring VCA inverted
EFX1: The output of Effect 1
EFX1-: The output of Effect 1 inverted
EFX2: The output of Effect 2
EFX2-: The output of Effect 2 inverted
Env1: The output of ADSR Envelope 1
Env1-: The output of ADSR Envelope 1 inverted
Env2: The output of ADSR Envelope 2
Env2-: The output of ADSR Envelope 2 inverted
Dcy1: The output of Decay Envelope 1
Dcy1-: The output of Decay Envelope 1 inverted
Dcy2: The output of Decay Envelope 2
Dcy2-: The output of Decay Envelope 2 inverted
LFO1: The output of LFO 1
LFO1-: The output of LFO 1 inverted
LFO2: The output of LFO 2
LFO2-: The output of LFO 2 inverted
LFO3: The output of LFO 3
LFO3-: The output of LFO 3 inverted
LFO4: The output of LFO 4
LFO4-: The output of LFO 4 inverted

SqX1 (X=Group A,B,C,D): The output of Sequencer Group Controller Track 1

SqX1- (X=Group A,B,C,D): The output of Sequencer Group Controller Track 1 inverted

SqX2 (X=Group A,B,C,D): The output of Sequencer Group Controller Track 2

SqX2- (X=Group A,B,C,D): The output of Sequencer Group Controller Track 2 inverted

SqX3 (X=Group A,B,C,D): The output of Sequencer Group Controller Track 3

SqX3- (X=Group A,B,C,D): The output of Sequencer Group Controller Track 3 inverted

SqX4 (X=Group A,B,C,D): The output of Sequencer Group Controller Track 4

SqX4- (X=Group A,B,C,D): The output of Sequencer Group Controller Track 4 inverted

Knb1: The value of Edit Knob 1, when Qedit in COM2 is off

Knb1-: The inverted value of Edit Knob 1, when Qedit in COM2 is off

Knb2: The value of Edit Knob 2, when Qedit in COM2 is off

Knb2-: The inverted value of Edit Knob 2, when Qedit in COM2 is off

Knb3: The value of Edit Knob 3, when Qedit in COM2 is off

Knb3-: The inverted value of Edit Knob 3, when Qedit in COM2 is off

Knb4: The value of Edit Knob 4, when Qedit in COM2 is off

Knb4-: The inverted value of Edit Knob 4, when Qedit in COM2 is off

Knb5: The value of Edit Knob 5, when Qedit in COM2 is off

Knb5-: The inverted value of Edit Knob 5, when Qedit in COM2 is off

Knb6: The value of Edit Knob 6, when Qedit in COM2 is off

Knb6-: The inverted value of Edit Knob 6, when Qedit in COM2 is off

Knb7: The value of Edit Knob 7, when Qedit in COM2 is off

Knb7-: The inverted value of Edit Knob 7, when Qedit in COM2 is off

Knb8: The value of Edit Knob 8, when Qedit in COM2 is off

Knb8-: The inverted value of Edit Knob 8, when Qedit in COM2 is off

Ymod: Touch screen keyboard Y-axis position

Ymod-: Touch screen keyboard Y-axis position Inverted

S/H1: The output of Sample/Hold 1

S/H1-: The output of Sample/Hold 1 inverted

S/H2: The output of Sample/Hold 2

S/H2-: The output of Sample/Hold 2 inverted

Bend: The last received MIDI pitch bend value

Bend-: The last received MIDI pitch bend value inverted

Kyb1: The last received Group Part 1 Note value (via MIDI, touch screen keyboard, Sequencer, Trigger buttons)

Kyb1-: The last received Group Part 1 Note value (via MIDI, touch screen keyboard, Sequencer, Trigger buttons) inverted

Kyb2: The last received Group Part 2 Note value (via MIDI, touch screen keyboard, Sequencer, Trigger buttons)

Kyb2-: The last received Group Part 2 Note value (via MIDI, touch screen keyboard, Sequencer, Trigger buttons) inverted

Vel1: The last received Group Part 1 Velocity value (via MIDI, touch screen keyboard, Sequencer, Trigger buttons)

Vel1-: The last received Group Part 1 Velocity value (via MIDI, touch screen keyboard, Sequencer, Trigger buttons) inverted

Vel2: The last received Group Part 2 Velocity value (via MIDI, touch screen keyboard, Sequencer, Trigger buttons)

Vel2-: The last received Group Part 2 Velocity value (via MIDI, touch screen keyboard, Sequencer, Trigger buttons) inverted

Trg1: Group Part 1 Trigger. Every time this part is gated, this value is at maximum

Trg1-: Group Part 1 Trigger inverted. Every time this part is gated, this value is at zero

Trg2: Group Part 2 Trigger. Every time this part is gated, this value is at maximum

Trg2-: Group Part 2 Trigger inverted. Every time this part is gated, this value is at zero

Ain1-: Audio Input 1 inverted

Ain2: Audio Input 2

Ain2-: Audio Input 2 inverted

PPO1: Patch Point 1

PPO1: Patch Point 1 inverted

PPO2: Patch Point 2

PPO2: Patch Point 2 inverted

PPO3: Patch Point 3

PPO3: Patch Point 3 inverted

PPO4: Patch Point 4

PPO4: Patch Point 4 inverted

PPO5: Patch Point 5

PPO5: Patch Point 5 inverted

PPO6: Patch Point 6

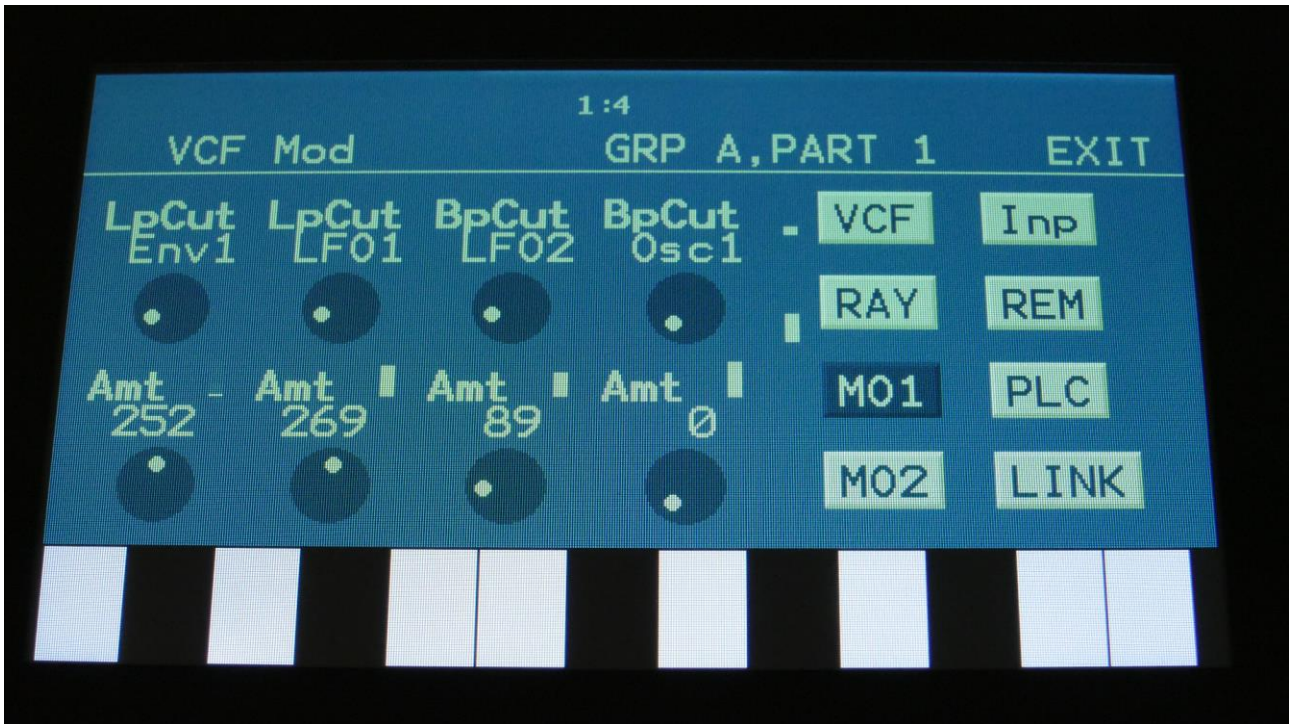**PPO6:** Patch Point 6 inverted

PPO7: Patch Point 7

**PPO7:** Patch Point 7 inverted

PPO8: Patch Point 8

PPO8: Patch Point 8 inverted

Connect Modules Manually

The "manual" way, is to go to a modules audio or modulation input pages, select the audio/modulation source, using Edit Knob 1 to 4, and adjust the amount/level, using Edit knob 5 to 8. Only positive sources can be selected this way. On modulation pages, you can touch the source select parameter, to change the source to negative.

Connect Modules Via The Module Overview Page
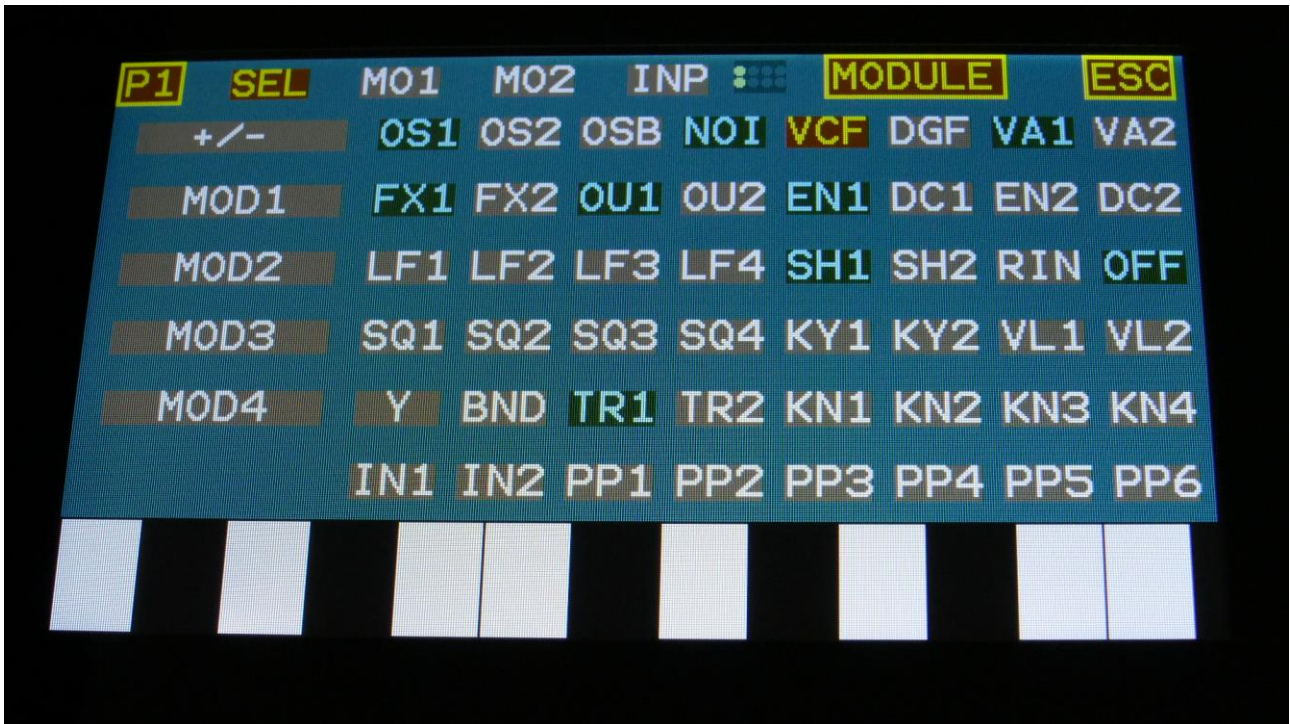
To connect modules on the overview page, first touch the SEL button in the top of this page. The SEL button should now turn brown. Then touch the module, for which you want to connect the modulation/inputs. This module will now turn brown. Then touch either the MO1 (modulation page 1), MO2 (modulation page 2) or INP (audio inputs) in the top of this page, depending on what you wish to connect.

For a complete description of the Overview page, please see the "Group Overview" chapter earlier in this manual.
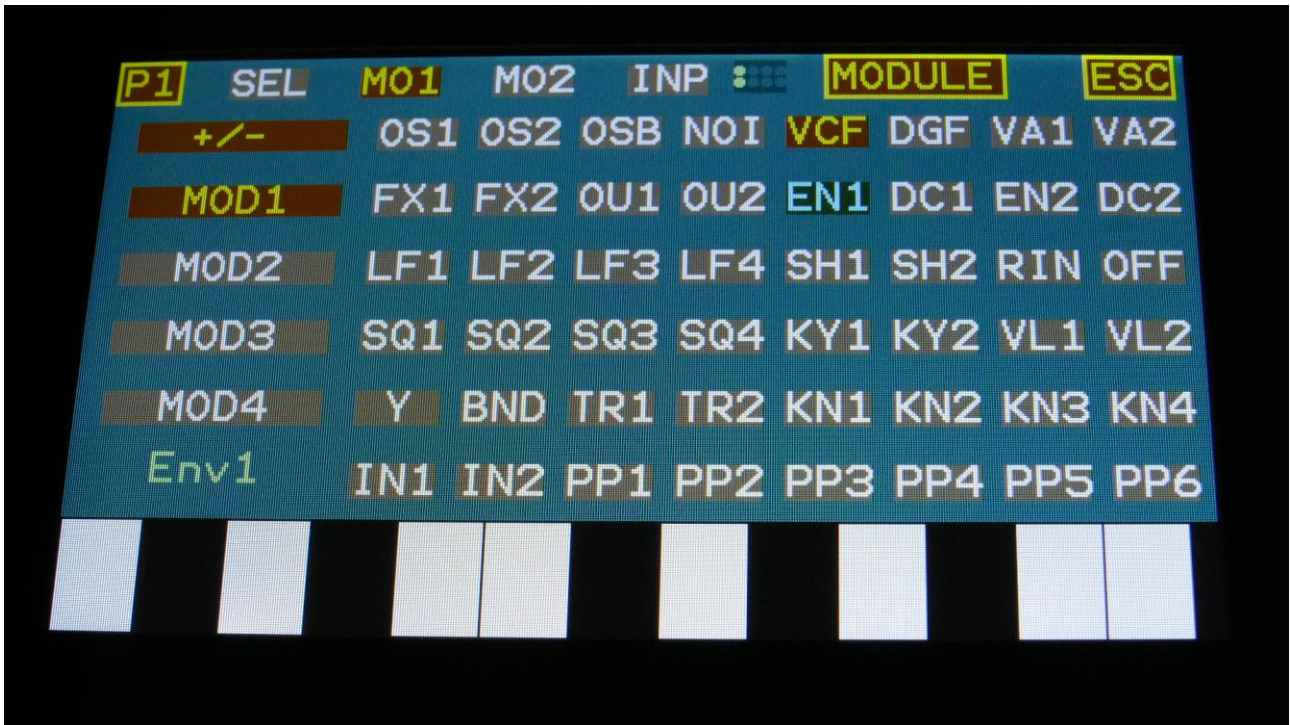
If you, for instance, touched MO1, MOD1 in the left side of the page will now also be selected, and the module which turn dark blue, is the module which is connected to the MOD1 (modulation source 1) of the MO1 page.

If you touch MOD2, MOD3 or MOD4, you will be able to see, which modules are connected to these inputs.

To change the input source for any input, simply touch any module. The module you selected will now turn dark blue, indicating that it is connected to the respective input of the selected module.

After connecting a module, you can touch the +/- button, if you wish to invert the source signal.

Please notice that OU1 and OU2 (Output 1 and 2) cannot be connected to any inputs.

By turning Edit Knob 5-8, it is also possible to adjust the modulation amount/input level of inputs 1-4.

On the MO2 and INP pages, the principles for connecting modules are the same as for the MO1 page.
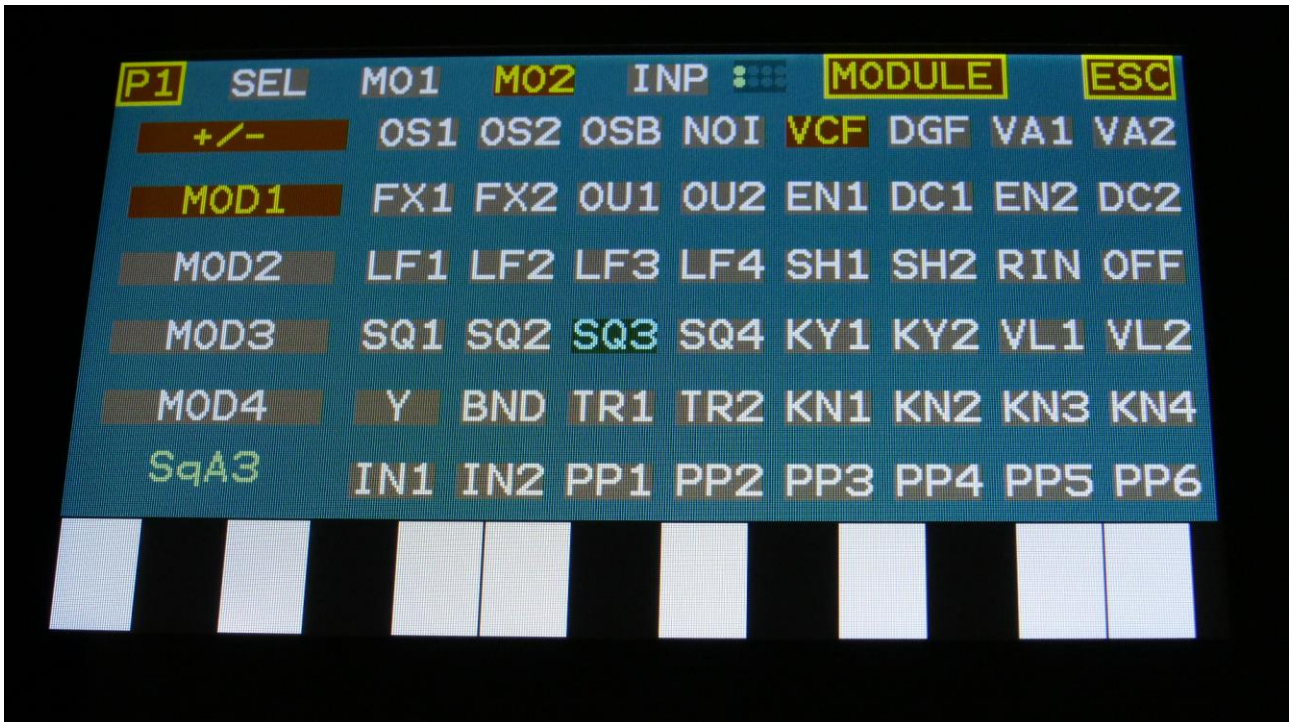
Connect Modules Automatically
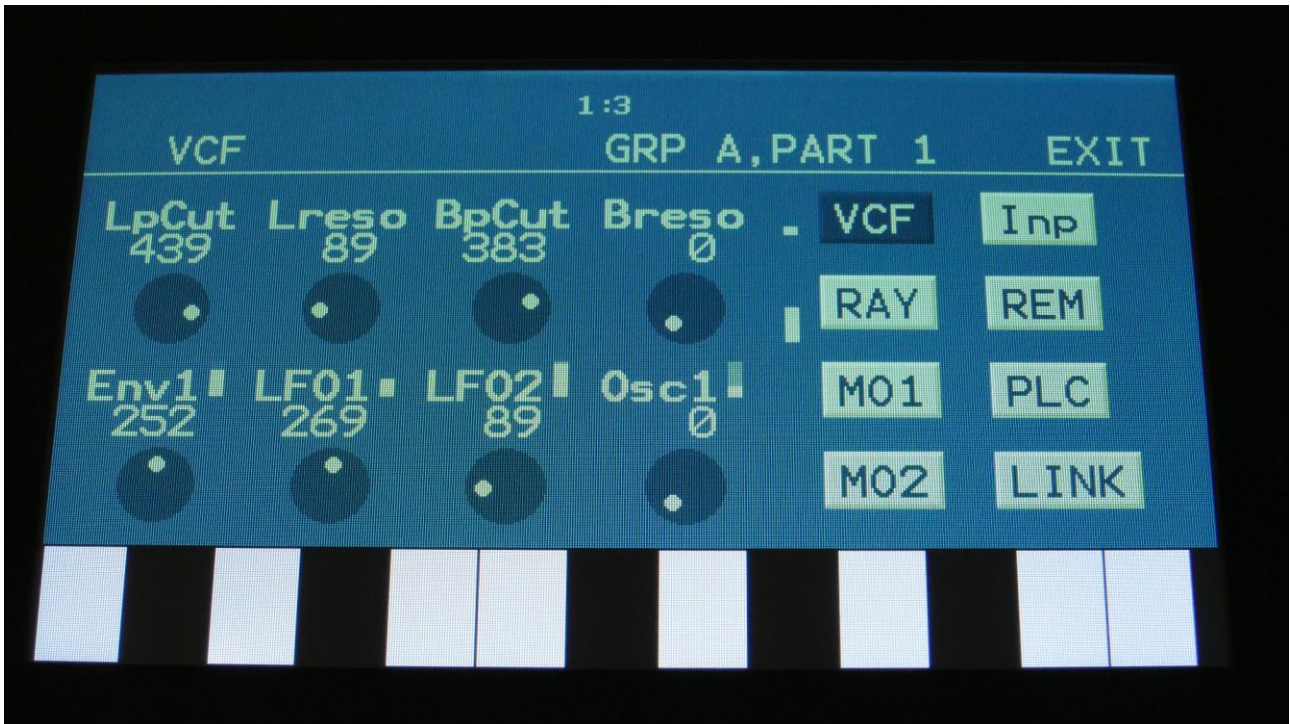
It is possible to automatically remove a module from and insert a module to an audio chain. This is only possible with modules, that have both audio inputs and outputs: DGF, VCF, VCA and EFX. To remove a module from an audio chain, select the module and jump to the module page. Touch the REM (remove) button. Zaturn will ask "Remove Module From Part?", and you can reply yes or no as desired. If you touched yes, Zaturn will now disconnect the selected module, and connect the module that was placed before this in the audio chain, to the module that was connected after the selected module.
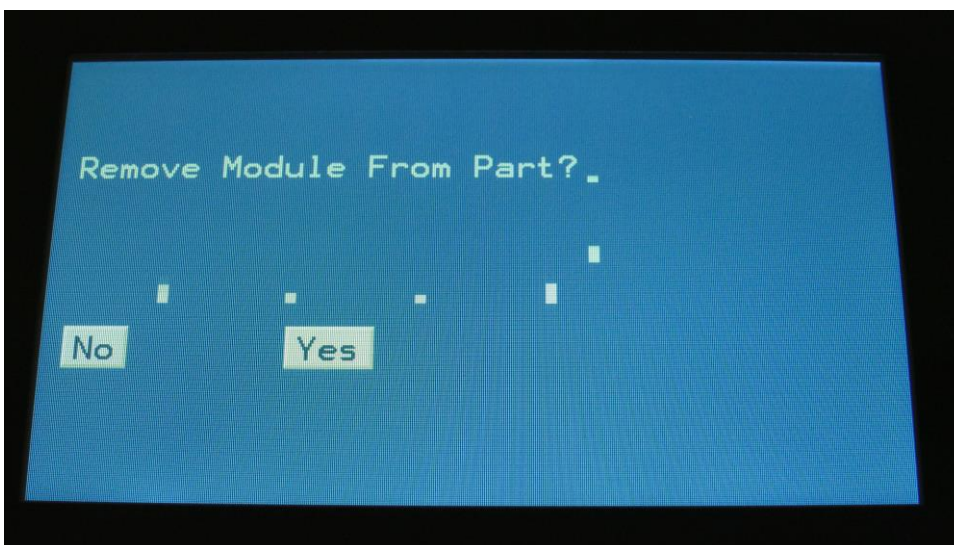
To insert a module in an audio chain, touch the modules PLC (Place) button. Zaturn will now jump to the Overview page and ask: "PLACE MODULE AFTER?". Now simply touch the module, that you would like the selected module to be placed after, and Zaturn will take care of all the connections.
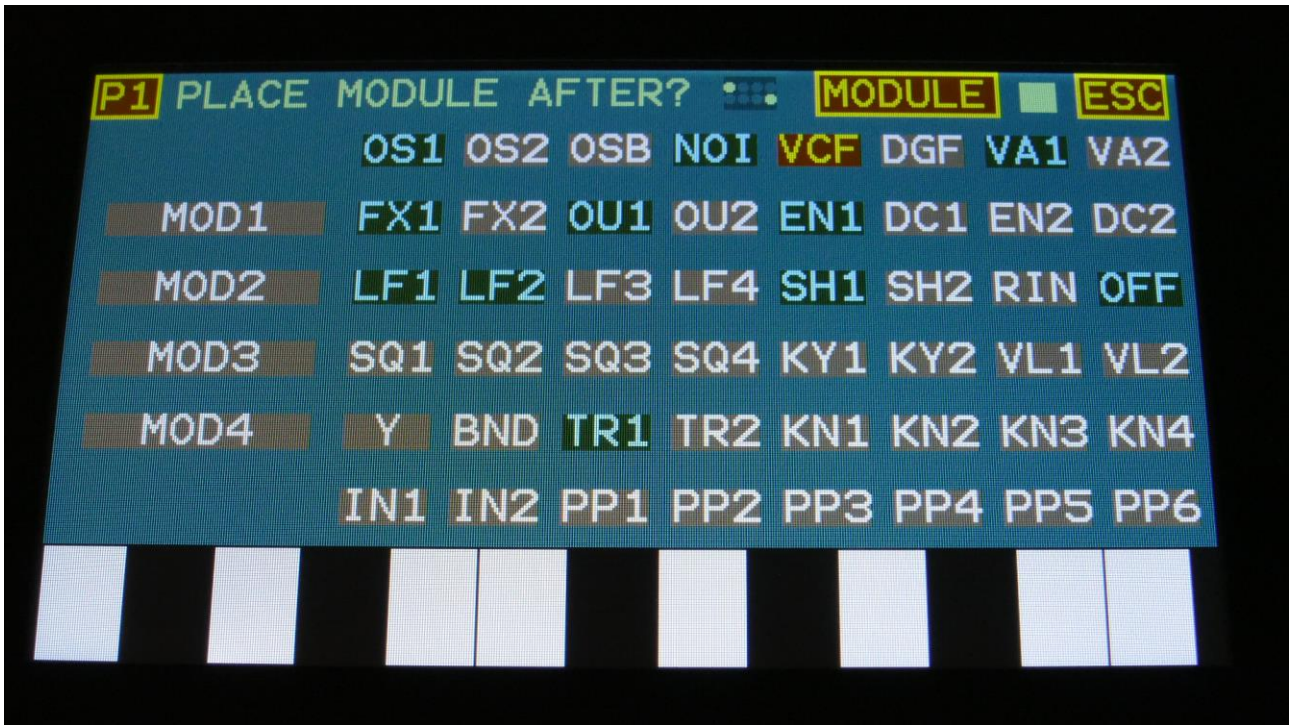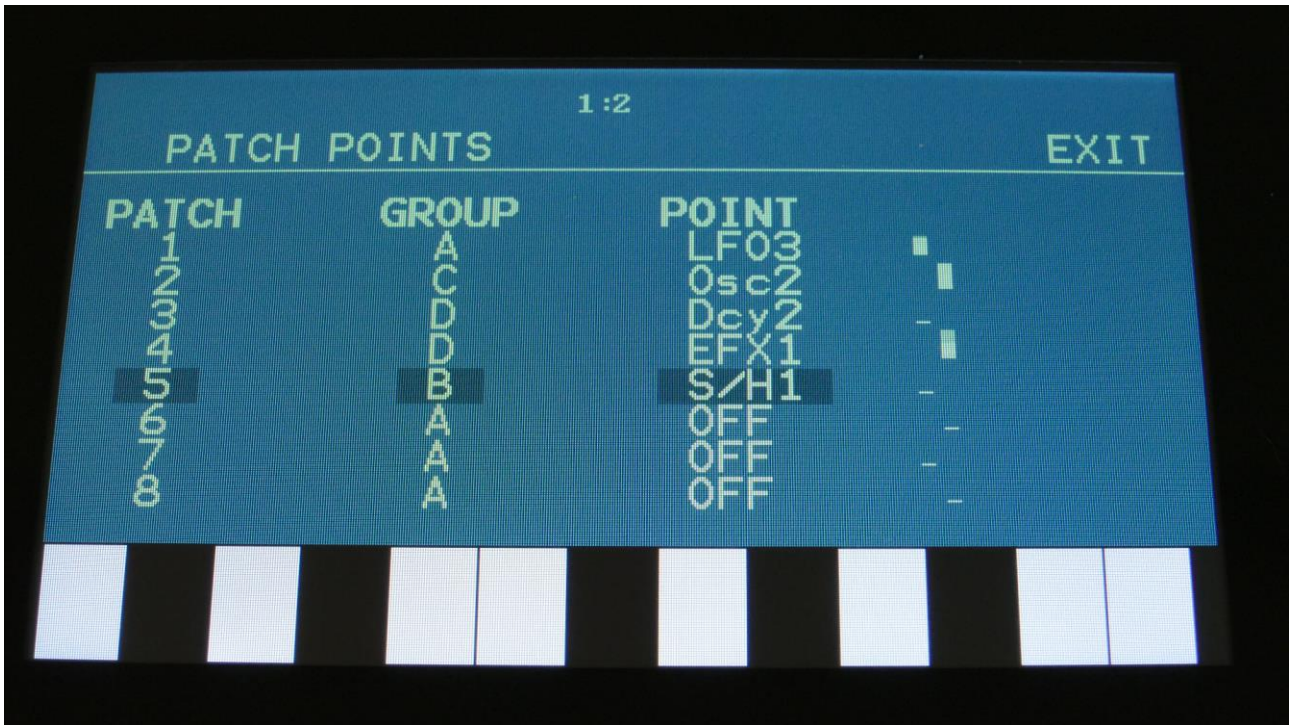
Patch Points

If your sound creation needs sometimes goes beyond the possibilities of the modules included in a Group, it is possible to inter-connect modules between the 4 Groups via 8 Patch Points.

You can do this on the Overview page, as described in the "Connecting Modules" chapter, earlier in this manual, but Zaturn also has a dedicated page for this purpose.
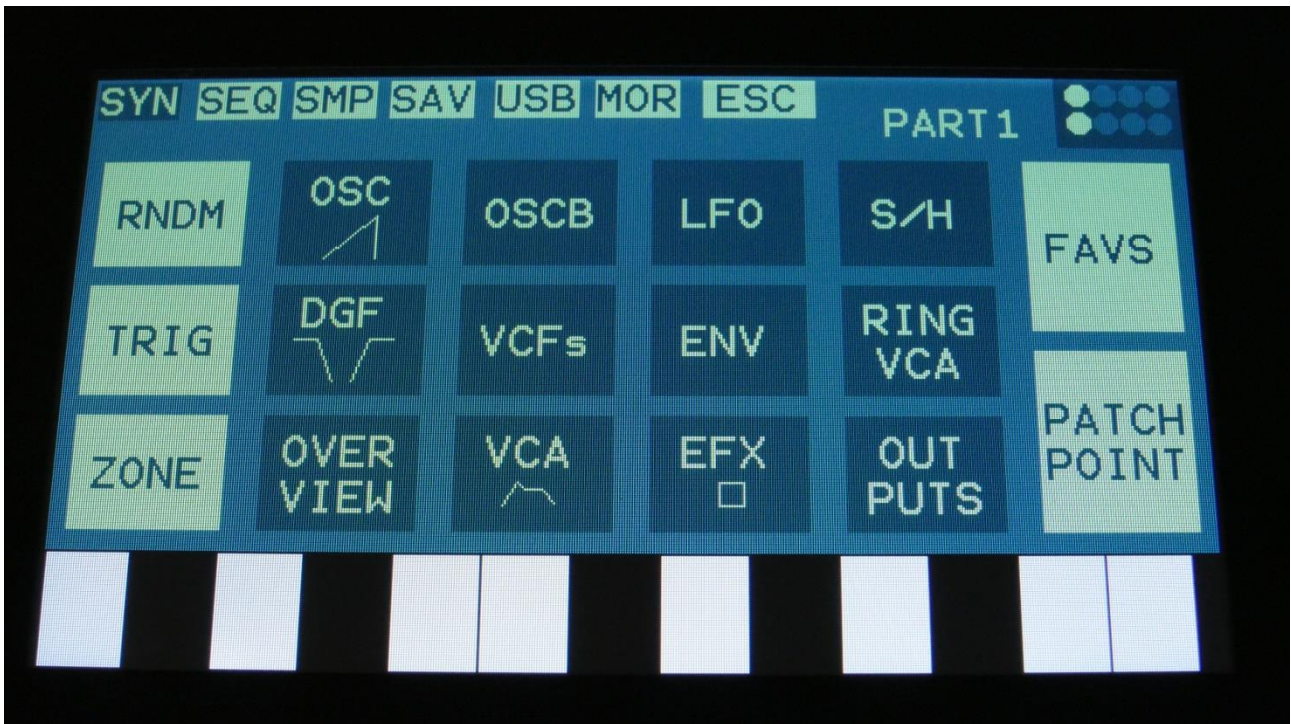
From the Synth Blocks page, touch the PATCH POINT field, to enter the Patch Points page.

On this page you can select 8 sources from any Group, to be sent to the 8 Patch Points. Each of the 8 Patch Points can be selected as modulation/audio sources by all Groups at the same time, making it possible to send signals between the module Groups. They show as PPO1 to PPO8 in the modulation/audio sources.

The small VU-meters to the right indicates the activity of the selected sources.

Select any of the 8 Patch Points, either by touching its line, or by rotating **Edit Knob 1**.

Set the **source Group A to D** by rotating **Edit Knob 2**.

Select the desired source by rotating **Edit Knob 3**.

Favorite Sounds

It is possible to store 64 favorite sound locations, for instant recall, when you are creating your presets.

These sounds are stored and recalled for each Group at a time (2 parts).

You can, for instance, use these for storing good starting points for new sounds/presets, or as a 64 sound copy/paste buffer!

The favorite sounds simply points to a location in the Zaturn preset memory, so if you change the sound of the original preset, the favorite sound will be changed as well. Sound that have already been loaded and saved into new presets, will not be changed. Only the sounds that are recalled on the Favorite Sounds page itself.
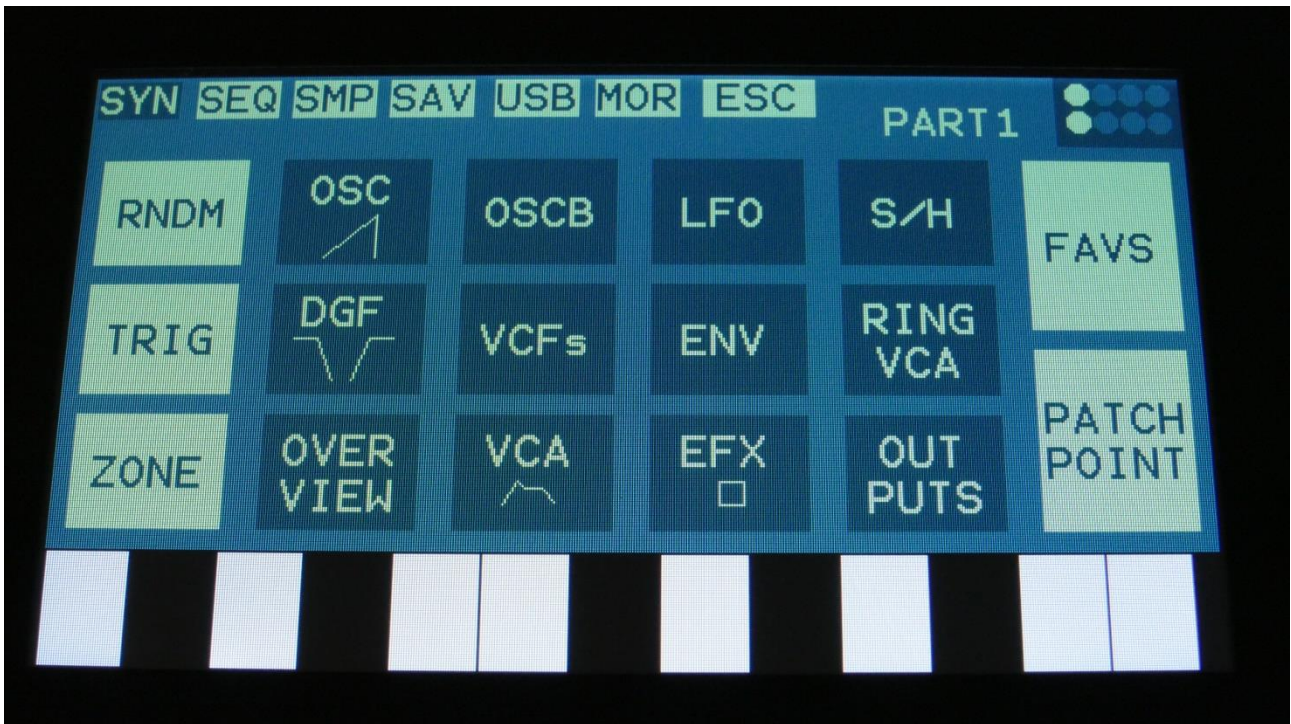
To access the favorite sounds page, from the Synth Blocks page, touch the FAVS field.
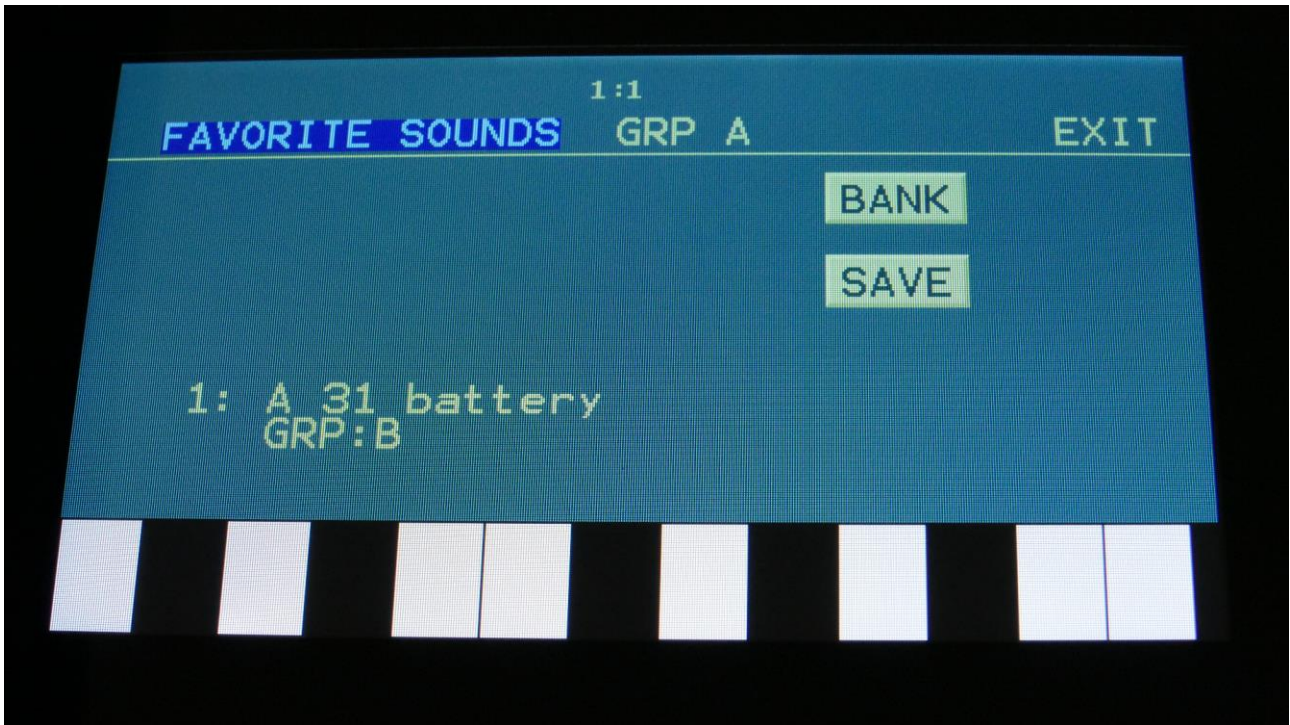
When on the favorite sounds page, pushing a step button will load a sound to the currently selected Group, while playing the sound back for auditioning, and showing the preset and group location on the display. Step buttons that has a favorite sound stored, will light up.

When a sound is loaded into a part, it can be edited, just like any other sound. Editing a favorite sound, that is loaded into a part, does not affect the preset, where the sound was loaded from. When you have selected and edited the sounds you need for each part, remember to save the preset, to keep your edits.

Selecting The Favorite sounds bank

Since Zaturn only has 8 step buttons, only 8 favorite sounds can be selected at a time. The rest of the favorite sounds can be accessed by selecting 8 banks.
To access a bank, touch the BANK touch button, so that BANK turns dark blue.

Now the selected bank will be shown on the step buttons, by one step button lighting up. Push a step button to select another bank.
When you have the desired bank selected, push the Edit button again, so that BANK turns white, to return to the favorite sound select.

Saving a Favorite Sound

Select the favorite sounds bank, in which you would like to store the sounds of the currently selected Group.

Touch the SAVE touch button, so that SAVE turns dark blue.

Push the step button, that equals the desired location.

SAVE will now turn white, and the sound has been stored.

Please notice that only the location of the sound is stored, not the sound itself. You will still have to save the preset, in order to keep an edited sound.

Sequencer

The Zaturn built in sequencer has 8 note tracks and 16 controller tracks. The note tracks are hard wired to the corresponding 8 parts. The controller tracks are divided into 4 groups with 4 tracks for each Group, and can be assigned as modulation and audio sources. Sequencer tracks can be recorded in real time, step time and in a TR way.

Each note track has a note number subtrack, a gate time subtrack, a velocity subtrack, a position subtrack, a sub-position subtrack and a step on/off subtrack. Note number, gate time, delay time, swing, velocity, position and repeats can be modulated. Swing can also be added to all 16 note tracks at the same time, by the "Swing All" function. All 8 note tracks can either control an internal part, or an external MIDI device. Each note track can be up to 64 steps long, and the resolution can be set from 1/64 to 1/2. Each step of a note track, can play back at any position of the sequence, allowing polyphonic step sequencing. A Repeats parameter has also been added, to repeat a note step up to 3 times.

A scale can be added on the output of a note track. This can be a harmonic scale, or a scale that swaps the keys of an octave, or a scale that swaps the black and the white keys.

Each controller track outputs their value to the audio/modulation sources bus and, if selected, to MIDI out (CC's and PitchBend). They can be up to 128 steps long, and resolution can be set from 1/64 to 1/2. A smooth parameter are available, that when on, will make a controller track slide from one step to the next. It is also possible to switch Smooth on or off for each step.

Templates are available, like ramp up, ramp down and randomize. The percentage of how much the template should affect the track is settable.
The position track has special templates for forwards, backwards, alternating, random, 2 note and 4 note sequences.

All tracks has separate last step, start step and resolution settings, so even polyrhythmic sequences are possible.

The tempo of the sequencer can be set between 51 and 306 BPM. It can sync to MIDI clock, and it is both possible to transmit and re-send MIDI clock to MIDI out.

Inputting of note number values can be done in analog/TR fashion, via the step buttons, via the touch screen, and it can be done by real time recording, either monophonic or polyphonic, and by step recording, either monophonic or polyphonic. To assist the real time recording, a metronome is present.

Inputting of controller track values can only be done via the touch screen, by real time or step recording.

It is possible to mute and edit each track separately.

Starting and stopping the Sequencer:
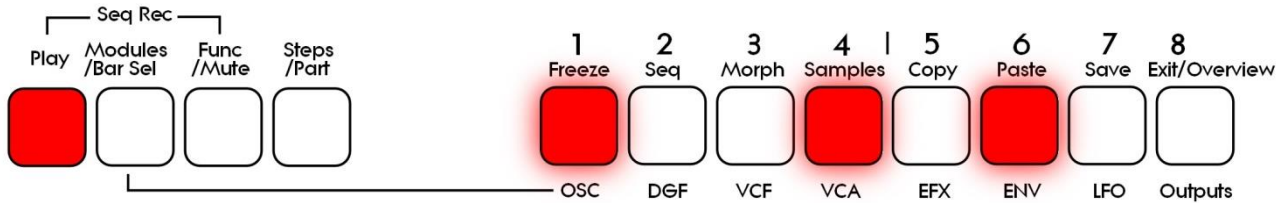
To start the sequencer playback, push and release the Play button, so that it lights up.

The sequencer will now start to play back. When the Modules/Bar Sel, the Func/Mute and the Steps/part buttons are not lighting up, every time a part is trigged to play back, the corresponding step button will light up shortly.

To stop the sequencer, simply hit the Play button again, so that it is no longer lighting up.

If you hit the play button to start the sequencer, and it doesn't start, please check in the "MOR>COMMON" section (described later in this manual), that it is not set up to external MIDI sync.

Selecting a track:
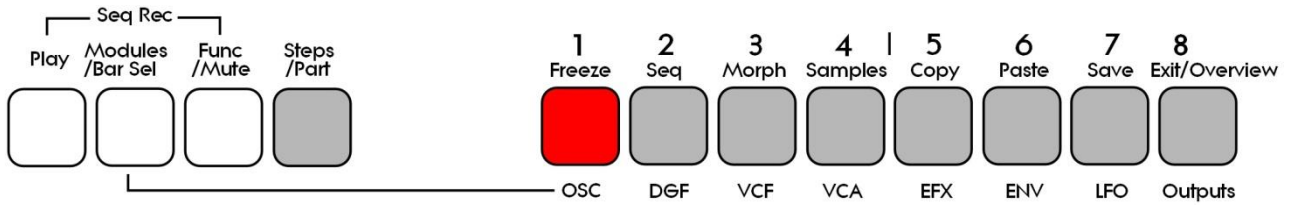
Push and hold the Steps/Part button.

The selected track number will now be shown, by one of the 8 step buttons lightning up. The number above the step button, is the track number that is currently selected.

To select another track, while still holding down the Steps/Part button, push any of the 8 step buttons.

The selected track, is the track which parameters will be shown on the display, when entering the edit pages.

When entering the Sequencer Controller tracks 9 to 16, 1 will equal 9, 2 will equal 10, and so on.

Note tracks are selected together with the part, while Controller tracks are selected separately.

Sequencer Note Track Steps view/edit:
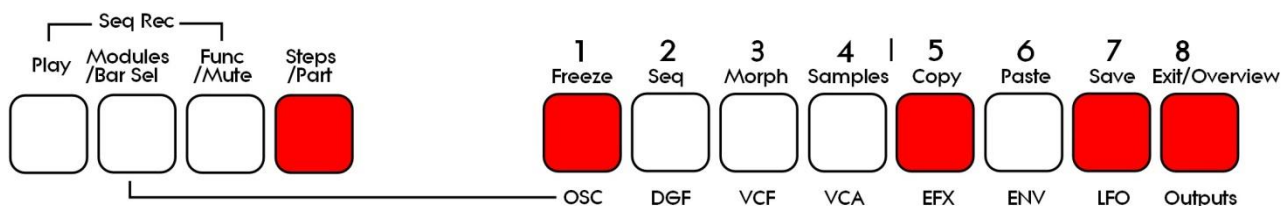
First, select the track, for which you would like to view/edit the note steps, as described on the previous page of this manual. You can, of course, select another part at any time, also after you have entered note step edit mode.

To enter note step edit mode, push and release the Steps/Part button. This should now light up. Any note sequencer steps that are switched on to play back, on the first half bar of the selected note track, will now also light up on the 8 step buttons.

If the sequencer is running, the light state of each step button will be reversed, when a step is playing back.
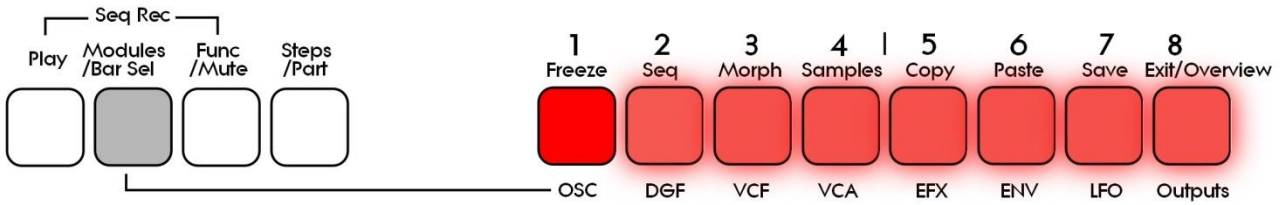
To switch a step on or off, simply hit the corresponding step button, at it will toggle its state.

When the sequencer are in recording mode (the Start/Stop button is flashing), pushing any of the step buttons, will set record mode to step mode, and select this step for recording. The step button will now flash.

When using the Zaturn sequencer as a usual step sequencer, the steps will play back from left to right. In this case, step 1 plays back at position 1, step 2 plays back at position 2 and so on.
On the Zaturn sequencer, it is though possible to break this pattern, and make each step play back on any position, using the position subtrack. It is even possible to make more steps playing back at the same position, for polyphonic step sequencing. But more on that in the final manual…

Only 8 steps (one half bar) are shown at a time. The note tracks of Zaturn has 64 steps. Please read on, to experience how to switch between half bars (step 1-8, 9-16, 17-24 and so on…).

Selecting a Note Track Half Bar and/or a controller track bar, to be viewed/edited:

Note tracks: When you are located on any other pages, than the sequencer controller tracks pages, a half bar is selected to be viewed for a note track. The selected half bar, is the half bar that is shown on the step buttons, and one half of the bar shown on the note track pages.
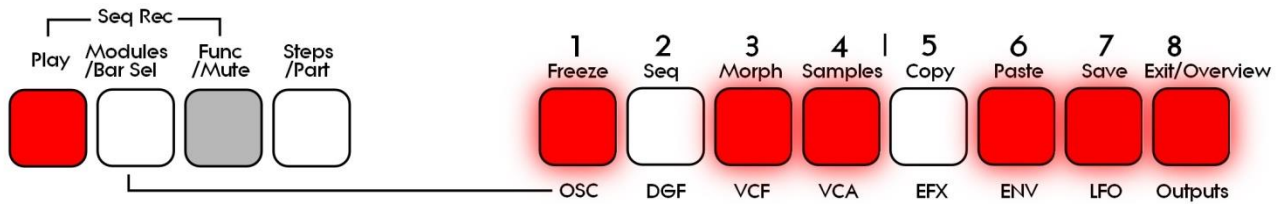Push and hold the Modules/Bar Sel button. The step button that indicates the selected half bar will now light up, while the other 7 step buttons will be flashing. Now push a step button, to select the desired half bar. Step button 1 will select the first half bar of bar one, step button 2 will select the second half bar of bar one, step button 3 will select the first half bar of bar 2 and so on…

Controller tracks: When you are located on any of the sequencer controller track pages, a bar can be selected to be viewed for the currently selected controller track. The selected bar, is the bar that is shown on the controller track pages.
While the note tracks have up to 64 steps divided into 4 bars, the controller tracks has up to 128 steps, divided into 8 bars. Each of these 8 bars can be selected, using the 8 step buttons.
Push and hold the Modules/Bar Sel button. The step button that indicates the selected bar will now light up, while the other 7 step buttons will be flashing. Now push a step button, to select the desired bar. Step button 1 will select bar 1, step button 2 will select bar 2, step button 3 will select bar 3 and so on…

Mute/Unmute Note Tracks, Start/Stop Seq/Song Recording:

To mute, unmute or view the mute state of the 8 note tracks, push and hold the Func/Mute button.

Unmuted tracks will now be shown by a step button that is lighting up, and shortly flashes off, every time the track is triggering.

Muted tracks are shown by a step button that is unlit, and that lights up shortly, every time the track would have triggered something, if it weren't muted.

To mute or unmute a track, simply hit the corresponding step button, while still holding down the Func/Mute button.
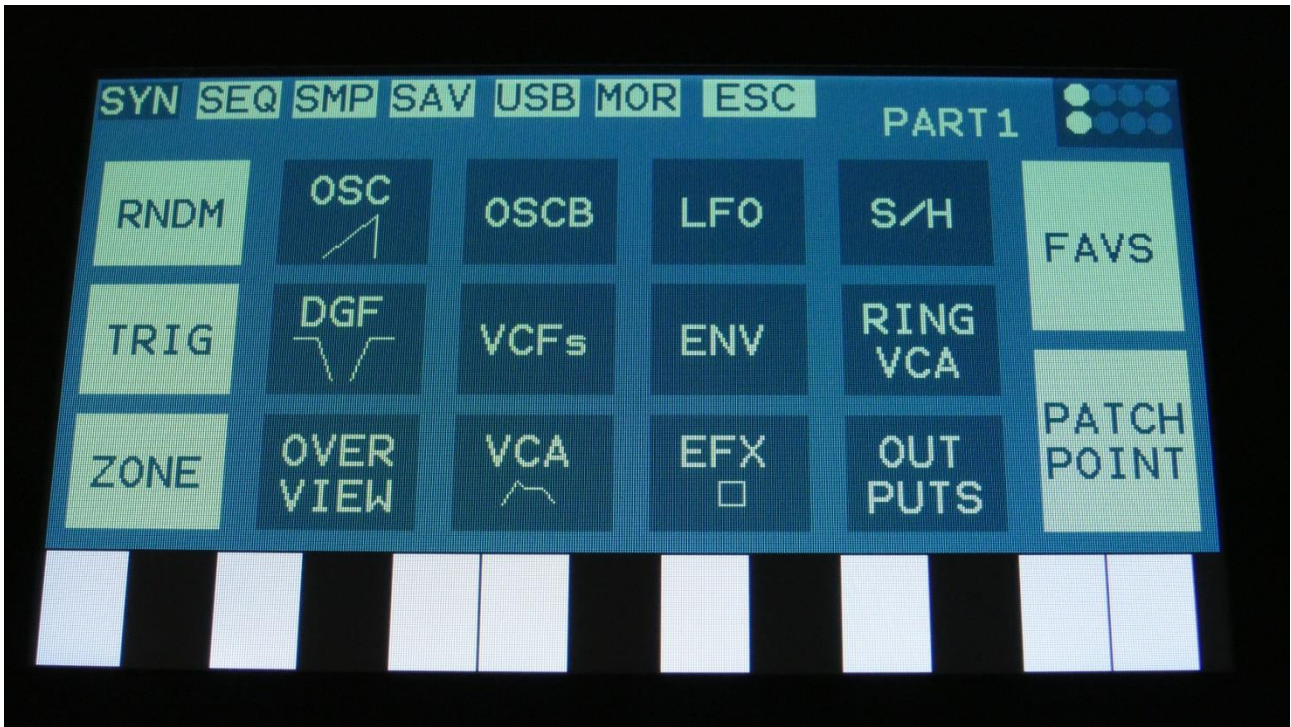
Toggling Sequencer Record On/Off

By pushing and holding the Func/Mute button, and then pushing the Play button, when the sequencer is not in Song mode, Sequencer realtime recording mode will be toggled on or off. When the sequencer is in recording mode, the Play button will flash.

When the sequencer is in Song mode, this button combination will toggle Song realtime recording on or off.
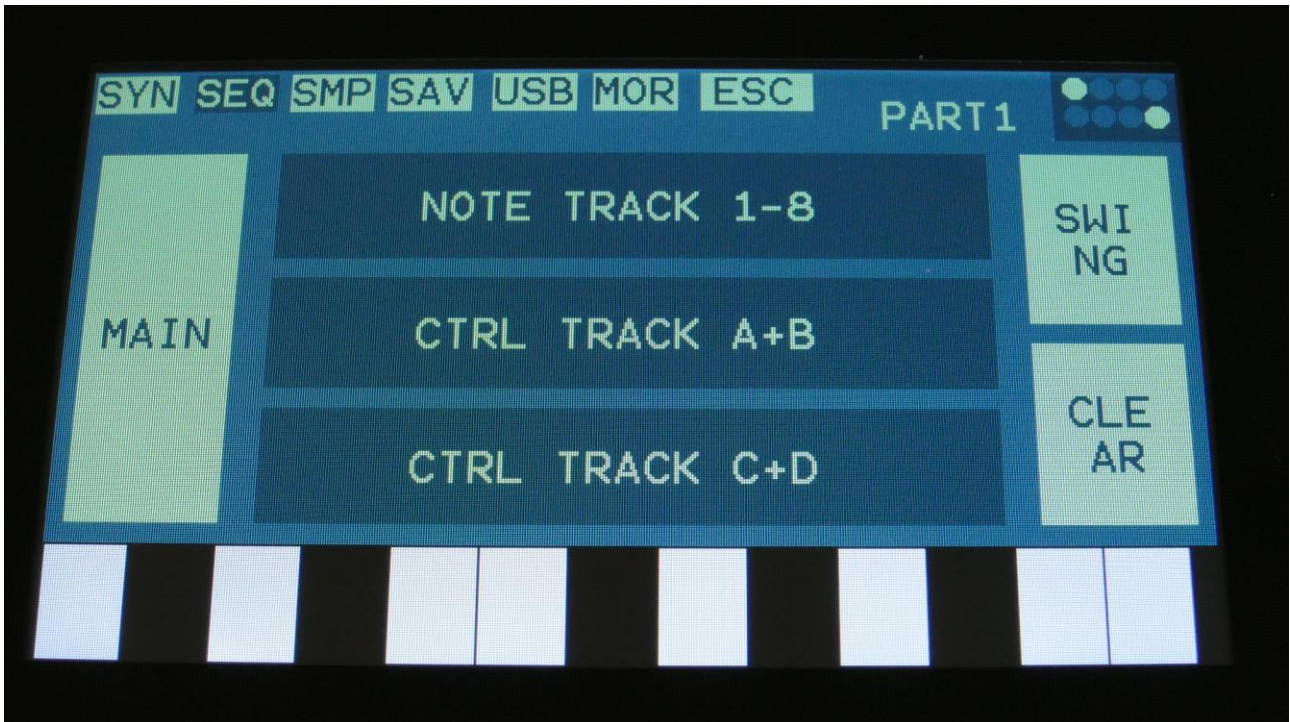
Entering the Sequencer

From the Preset Select Page, touch the EDIT field.

Touch SEQ on the navigation bar in the top of the screen.

This will bring you to the:

Sequencer Start Page

SEQ on the navigation bar has now changed it color to blue, indicating that you have entered the Sequencer pages.

From here you can jump to the Sequencer Main page, the note track and controller track edit pages and the Swing All page. It is also possible to clear the whole sequence from here.

To exit to the Preset Select page, touch "ESC".

Sequencer Main Page

The sequencer main page can be accessed by touching the MAIN field, from the sequencer start page, but it can also be accessed by touching the L.STEP/BPM field on the Preset Select page.

And, of course, it can be accessed by pushing the Seq function button.

On the sequencer Main page, it is possible to set the sequencer tempo, set the record mode to mono or poly (poly is only useful, when controlling external MIDI gear), switch the metronome on/off, set the track length, and set the step skip effect. Here it is also possible to double and clear the selected track.
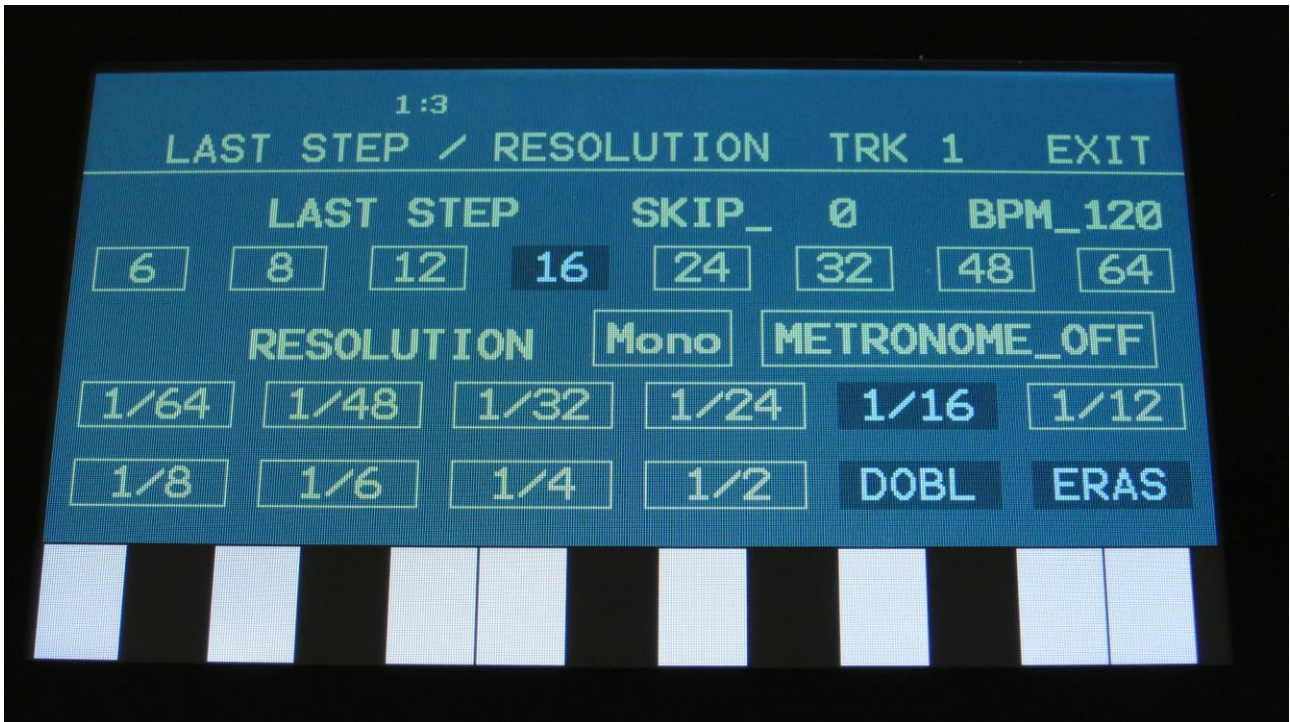
Setting the tempo: Turn Edit Knob 4 to set the tempo for the current sequence. The tempo is shown in BPM's (beats per minute) in the upper right corner of this page, and can be set between 51 and 306 BPM's.

Skip Effect: Turning up Edit Knob 3 will adjust the Skip parameter. This will cause the sequencer to randomly skip some beats here and there. The more it is turned up, the more it will skip.
This affects all sequencer tracks at the same time.

Setting the Last Step of the currently selected note track
Simply touch one of the number fields right below the LAST STEP text, in this case, numbered 6, 8, 12 and so on. This will immediately set the last step on the currently selected note track.
**Setting another Last Step, than the displayed ones**
Turn **Edit Knob 1**. This will set the first number field to a value between 1 and 64. When you have this set to the desired value, simply touch this field, to immediately change the last step.

Setting the resolution for the currently selected note track

Simply touch one of the fields right below the RESOLUTION text, named 1/64, 1/48, 1/32 and so on. This will immediately change the resolution of the currently selected note track.

Turning the Metronome on and off

Touch the field named METRONOME_OFF. It will now turn blue, and change its text to METRONOME_On. If you touch it one more time, it will say METRONOME_Rec, and the metronome will be on, every time the sequencer is in record mode. Touch it one more time, to switch the metronome off.
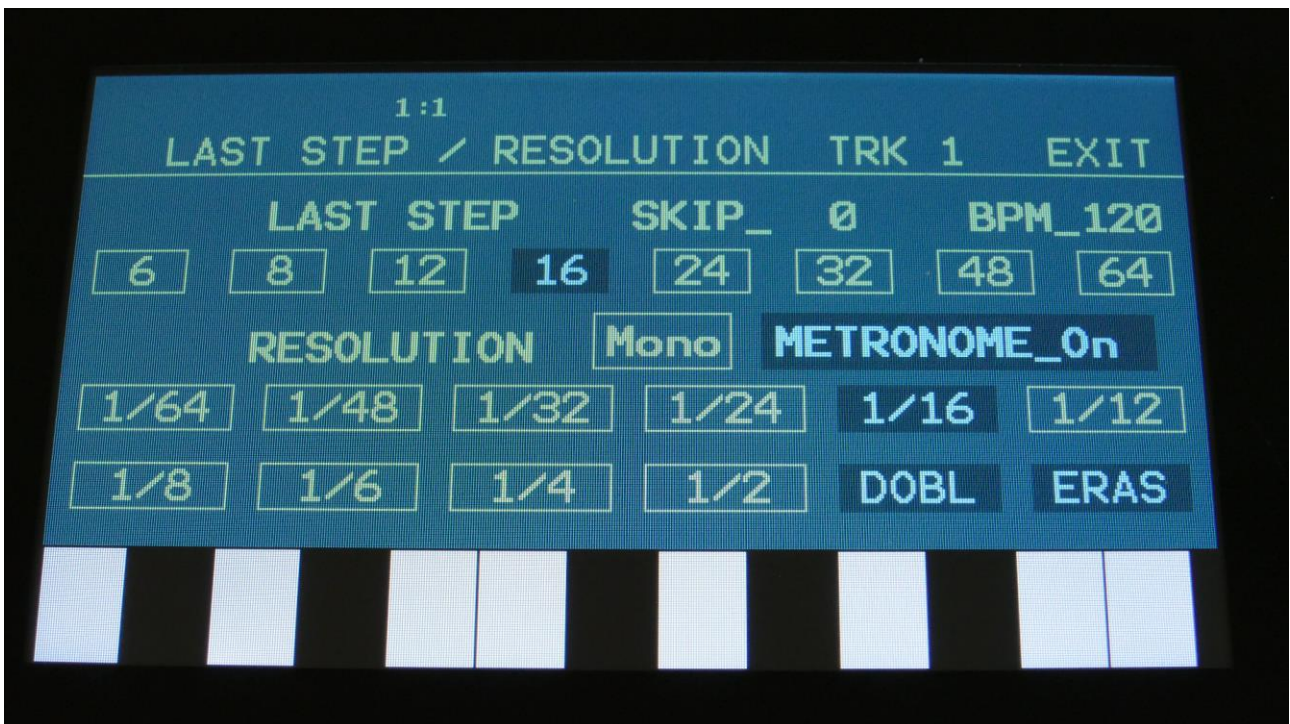
Setting the Sequencer Recording Mode

By touching the field named Mono, it is possible to switch the sequencer recording mode between Mono (monophonic) and Poly (polyphonic).
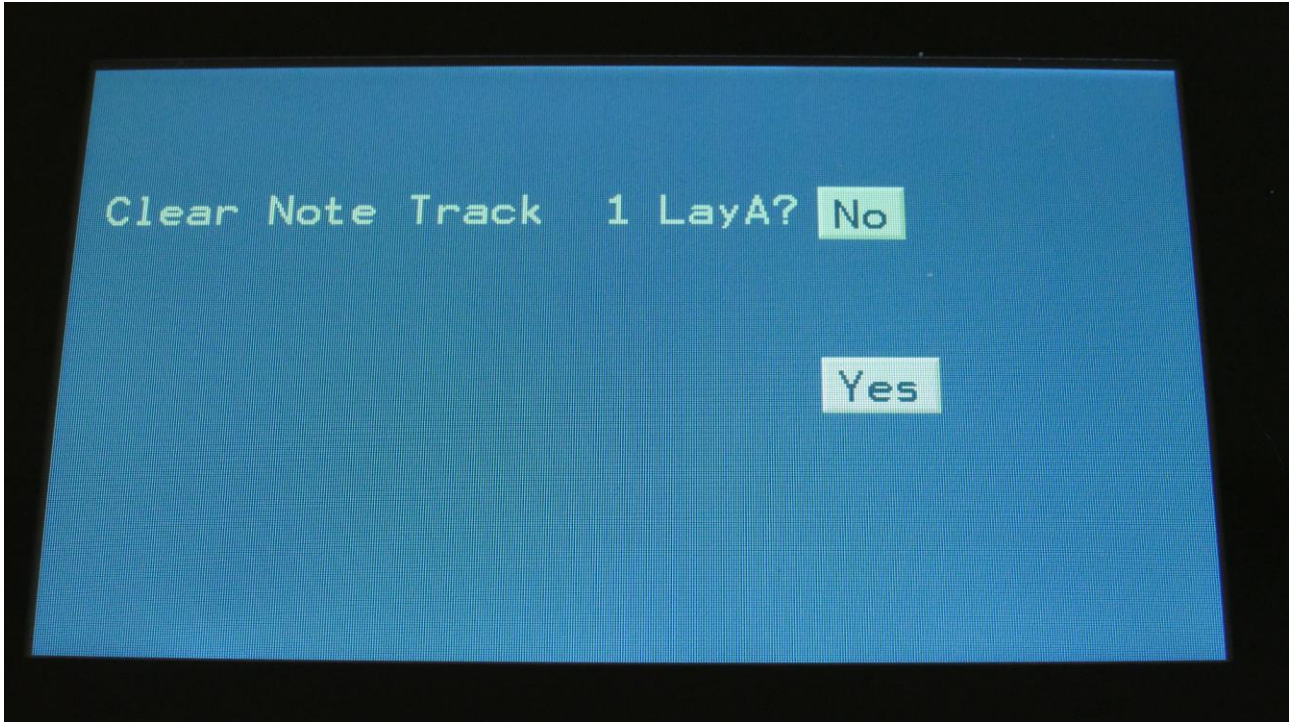
Double Note Track

Touch the "DOBL" touch button, to double the length of the track. All events from the original track, is copied to the new half. Useful if you need some extra variation in a track.

PLEASE NOTE: The track lengths cannot exceed 64 steps for the note tracks.

Clear Note Track

Touch the "ERAS" touch button, to enter this page:

Touching "Yes" from here, will initialize all step values and parameters on the selected Morph Layer of the currently selected note track, except for the Last Step parameter. Select the Morph Layer with the Morph function button.

If you would not wish to do this, touch "No", to exit back to the Seq Main page.

Note Tracks

Each note track can be up to 64 steps long, and resolution can be set from 1/64 to 1/2. Steps that are on, are indicated by dark blue bars, steps that are off, are indicated by crème white bars. The note numbers and other values can be recorded in real and step time, and adjusted by the Edit Knobs, and directly by touching the screen. The note tracks are divided into subtracks: Note number, gate time, velocity, position and sub position. Each note track has a note randomizer, on which you, via a random probability parameter, can set the probability for, how high the chance is, that each note will play back or not. The probability parameter can be controlled by a controller track, for probability per step. A random time parameter is also available.

A Rept (Repeats) parameter has been added to the note track. Turning this up will add 1, 2 or 3 extra notes between 2 steps.
Note value, gate time, note time delay, swing, position, position rotation and repeats can be modulated. Templates can be used, for faster setting of the values.

Note Subtrack

From the sequencer access page, touch NOTE TRACK 1-8, to enter the note steps edit page.
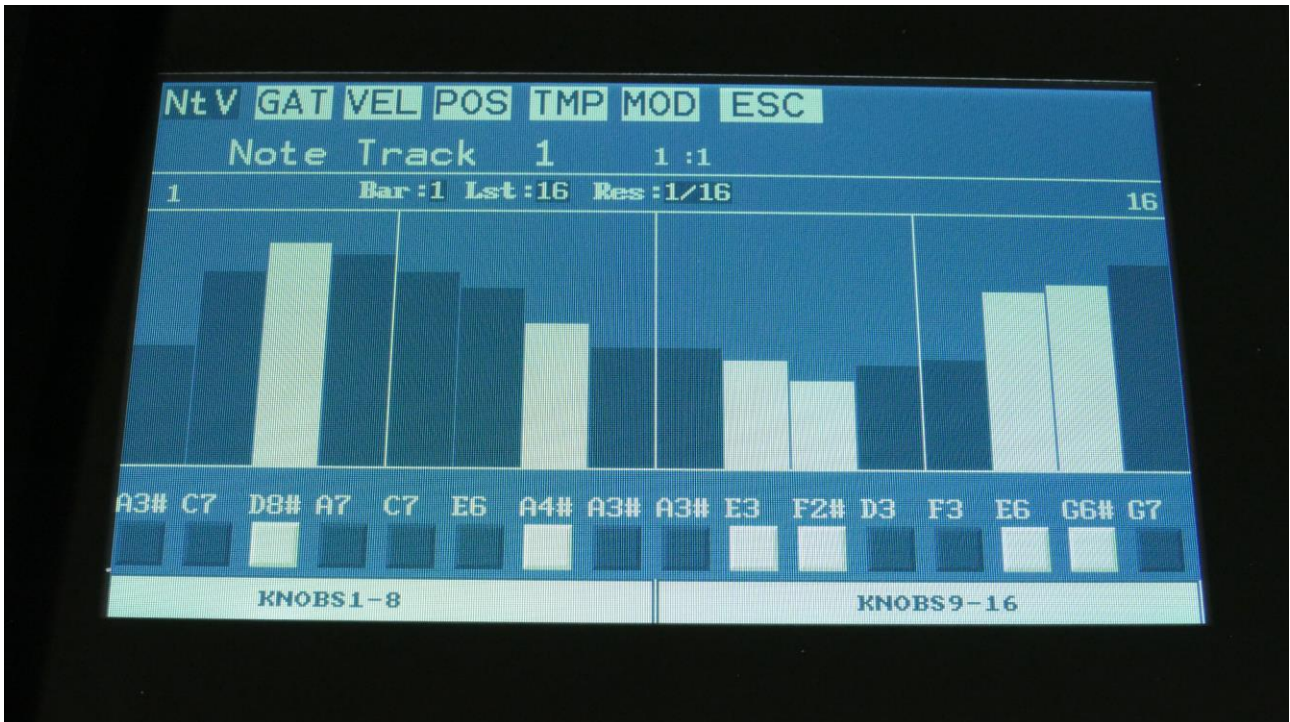
At most of this screen, you will see the note value bars. You can touch these, to change the note values. Right below these, you will find a row of boxes, indicating the on/off state of each step. You can touch these, to switch each step on(dark blue) and off (white). Right above the value bars, to the left and to the right, the first and last step numbers, of the steps that are currently shown by the note value bars, are indicated. Between these numbers, a few settable parameters are shown.
In the top left side, a small VU-meter is shown, that will indicate every time a note is played back.

Here, when neither KNOBS1-8 or KNOBS9-16 is dark blue:

Edit Knob 1: Has no function.

Edit Knob 2: Selects the bar to be viewed. 4 bars can be viewed, each showing 16 steps, for a total of 64 steps. The bar number is shown just above the note grid (marked **Bar**), and the first and the last step number viewed, is shown just above the note grid, to the right and the left.

Edit Knob 3: Sets the last step that will be played back on this track, before it loops back, and plays the track again. Range: 1 to 64 steps. Value is shown as **Lst**.

Edit Knob 4: Sets the track resolution. Values: 1/64, 1/48, 1/32, 1/24, 1/16, 1/12, 1/8, 1/6, ¼, ½. Value is shown as **Res**.

The note values for each step is shown right below the note value bars. Note values for each step can be changed, simply by touching the note value bars.

Values can also be changed, using edit knob 1 to 8. In the bottom of the page, touch the field named "Knobs 1-8", to edit the first 8 steps, using the edit knobs, or touch the field named "Knobs 9-16", to edit the last 8 steps, using edit knob 1 to 8.

The fields will turn dark blue, when they are active. Every time they are touched, they will toggle between active > All > Off. The All functionality is explained on the next page.

Each step can be turned on and off by touching the row of boxes below the value grid. If a box is dark blue, the step will play back. If a box is white, the step will skip, without playing back.
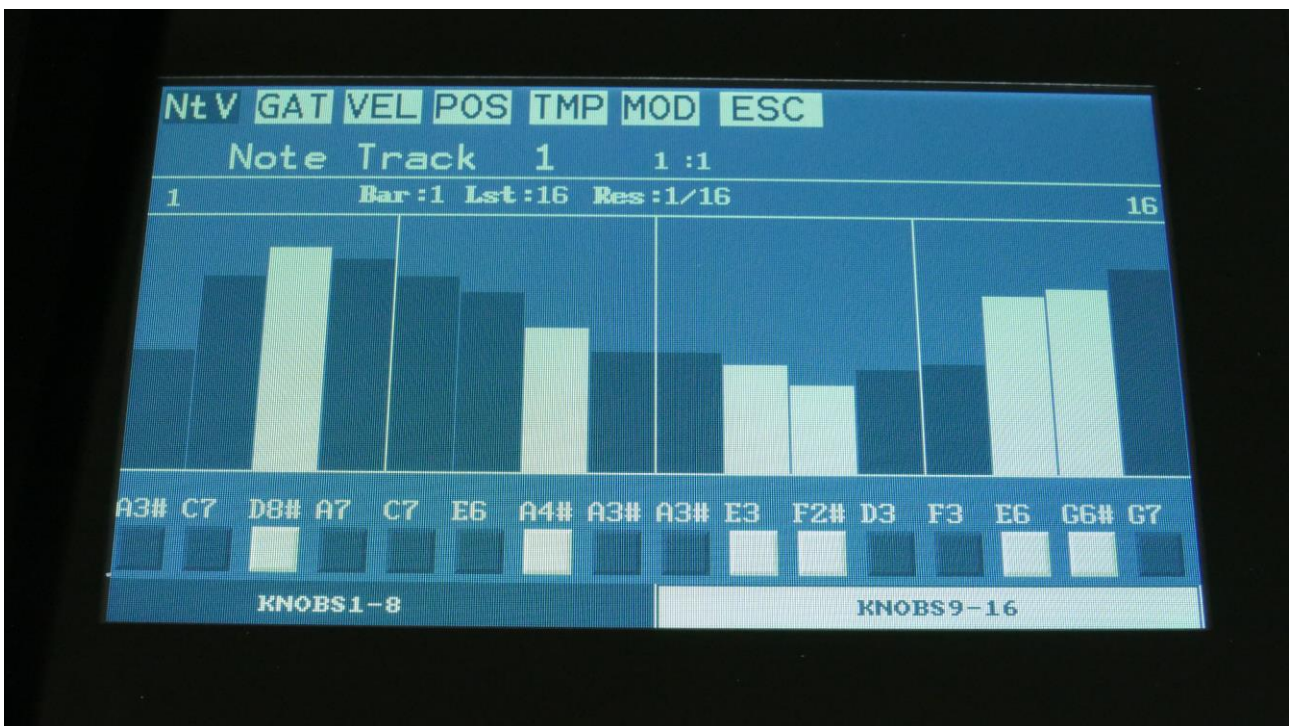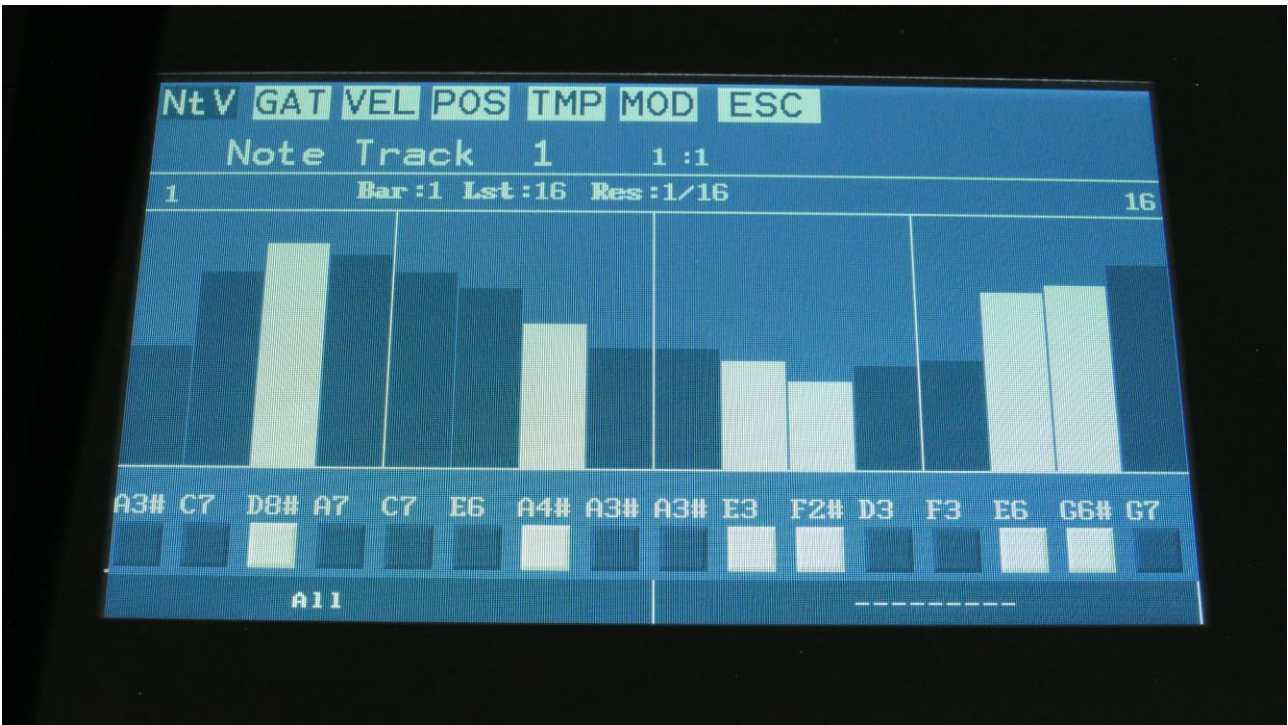
Adjusting the offset of all steps

This can be done on any subtrack, except for the sub position track.

When you have selected a group of steps, to be edited using the Edit Knobs, touch the active knob select bar one more time, and it will switch to "All".

You can now, by turning Edit Knob 1, adjust the offset of all steps at the same time. Middle position of Edit Knob 1 is zero, above middle will turn the offset up, below middle will turn the offset down.

SPECIAL NOTE FOR THE POSITION SUB TRACK:

When adjusting the offset of the step positions on the position sub track, the positions will "roll over" around the selected last step. This means, that if you are turning the offset up, the last steps before the last step, will now be placed on the first steps of the track. Likewise, if you turn the offset down, the first steps of the track, will now be placed on the last steps of the track.

SPECIAL NOTE FOR THE SUB-POSITION SUB TRACK:

Offsets can't be adjusted on this. If "All" is selected on the sub-position track, the offset of the position track will be adjusted, without any visualizing.

Gate Time Subtrack

Touch GAT in the top navigation bar, to enter the gate time steps page.
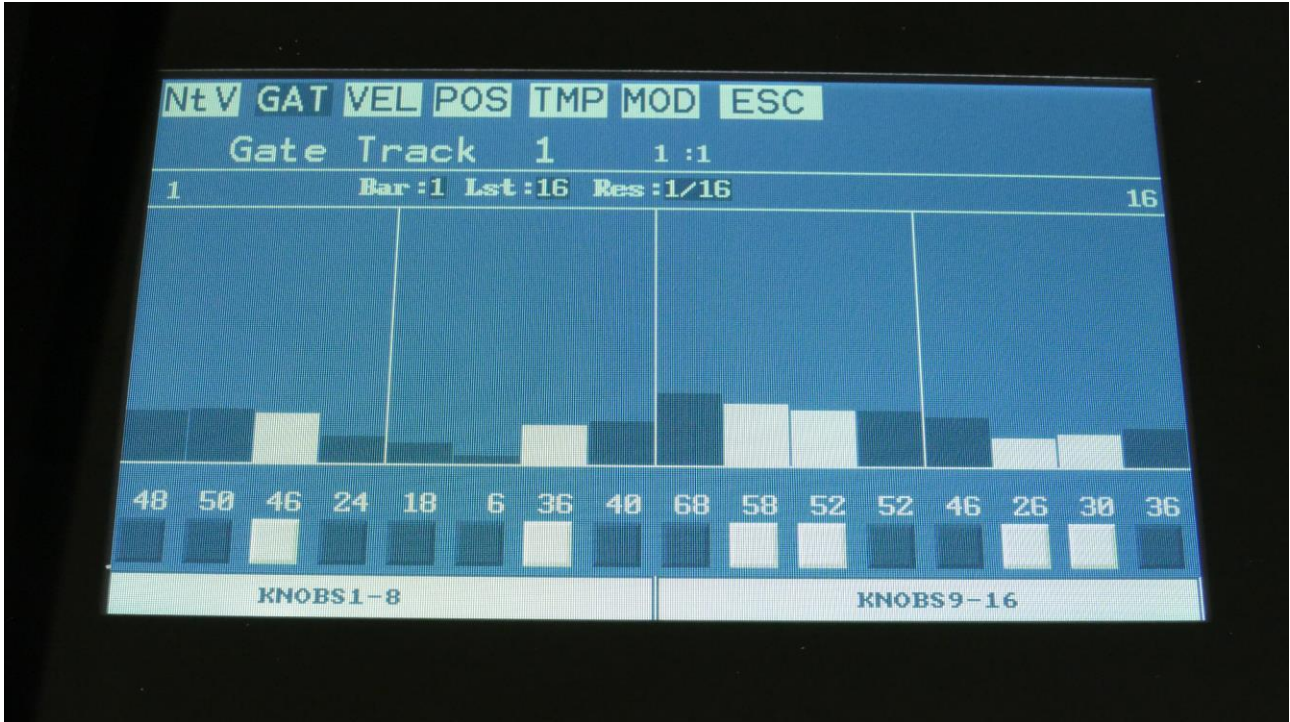
The gate time values for each step is shown as bars in the value grid, and as number right below the value grid. Gate time values for each step can be changed, simply by touching the value grid. Values can also be changed, using edit knob 1 to 8. In the bottom of the page, touch the field named "Knobs 1-8", to edit the first 8 steps, using the edit knobs, or touch the field named "Knobs 9-16", to edit the last 8 steps, using edit knob 1 to 8.

Each step can be turned on and off by touching the row of boxes below the value grid. If a box is dark blue, the step will play back. If a box is white, the step will skip, without playing back.

When neither KNOBS1-8 or KNOBS9-16 are dark blue:

Edit Knob 1: Has no function.

Edit Knob 2: Selects the bar to be viewed. 4 bars can be viewed, showing each 16 steps, for a total of 64 steps. The bar number is shown just above the note grid (marked **Bar**), and the first and the last step number viewed, is shown just above the note grid, to the right and the left.

Edit Knob 3: Sets the last step that will be played back on this track, before it loops back, and plays the track again. Range: 1 to 64 steps. Value is shown as **Lst**.

Edit Knob 4: Sets the track resolution. Values: 1/64, 1/48, 1/32, 1/24, 1/16, 1/12, 1/8, 1/6, ¼, ½. Value is shown as **Res**.

Touching "ESC" will exit you to the Sequencer access page.

Velocity Subtrack

Touch VEL in the top navigation bar, to enter the velocity steps page.

The velocity values for each step is shown as bars in the value grid, and as number right below the value grid. Velocity values for each step can be changed, simply by touching the value grid. Values can also be changed, using edit knob 1 to 8. In the bottom of the page, touch the field named "Knobs 1-8", to edit the first 8 steps, using the edit knobs, or touch the field named "Knobs 9-16", to edit the last 8 steps, using edit knob 1 to 8.

Each step can be turned on and off by touching the row of boxes below the value grid. If a box is dark blue, the step will play back. If a box is white, the step will skip, without playing back.

When neither KNOBS1-8 or KNOBS9-16 are dark blue:

Edit Knob 1: Has no function.

Edit Knob 2: Selects the bar to be viewed. 4 bars can be viewed, showing each 16 steps, for a total of 64 steps. The bar number is shown just above the values field (marked **Bar**), and the first and the last step number viewed, is shown just above the values field, to the right and the left.

Edit Knob 3: Sets the last step that will be played back on this track, before it loops back, and plays the track again. Range: 1 to 64 steps. Value is shown as **Lst**.

Edit Knob 4: Sets the track resolution. Values: 1/64, 1/48, 1/32, 1/24, 1/16, 1/12, 1/8, 1/6, ¼, ½. Value is shown as **Res**.

Touching "ESC" will exit you to the Sequencer Modules page.

Position Subtrack

Touch POS in the top navigation bar, to enter the position steps page:
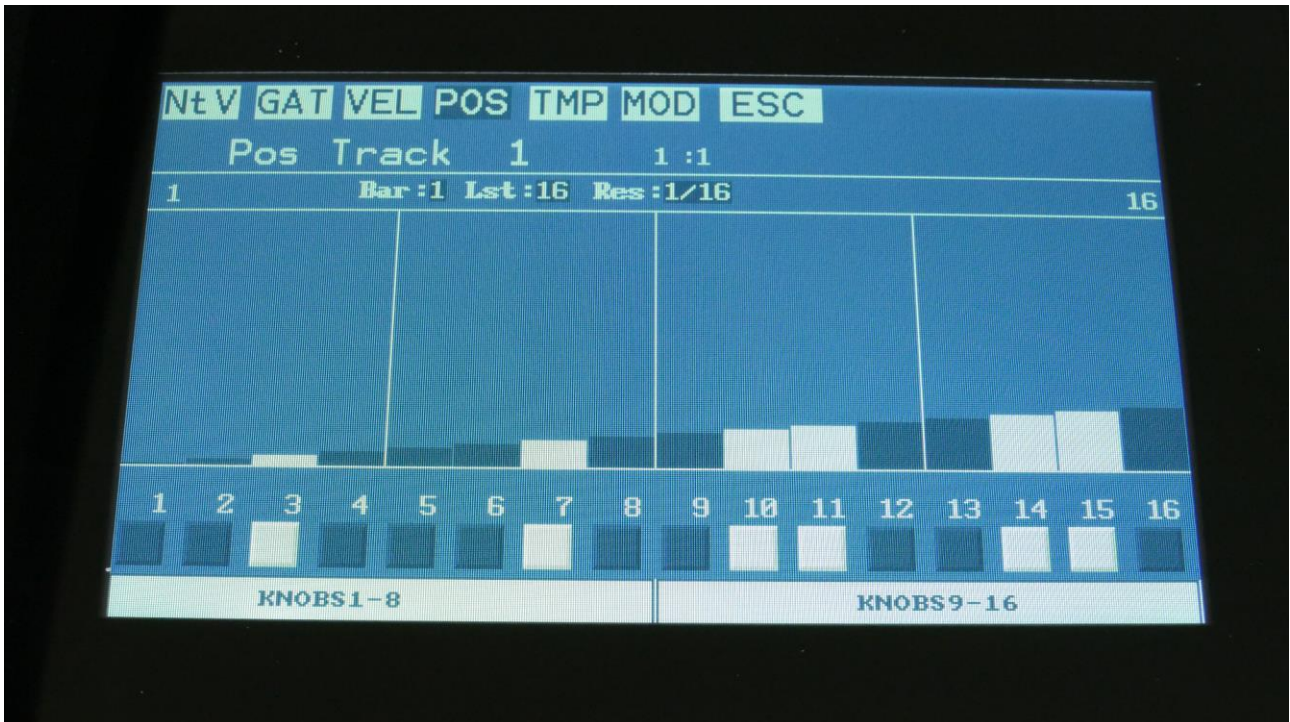
Unlike many other step sequencers, the position for each step on the Zaturn note tracks, can be set. For traditional step sequencing, you would leave it at its default setting, when step 1 is played back at position 1, step 2 is played back at position 2 and so on.

But the note sequencer in Zaturn can go further than that. Step 2 can be set to play back at position 31, if desired, just to deform a track, or experiment with it, or more steps can be set to play back at the same position, for polyphonic sequencing.

Templates (explained in the next section) are available, to force the position to make the track play forwards, backwards, random, alternating and in many other patterns, if you do not like to set this up yourself.

The position for each step is shown as bars in the value grid, and as number right below the value grid. Positions for each step can be changed, simply by touching the value grid.

Values can also be changed, using edit knob 1 to 8. In the bottom of the page, touch the field named "Knobs 1-8", to edit the first 8 steps, using the edit knobs, or touch the field named "Knobs 9-16", to edit the last 8 steps, using edit knob 1 to 8.

Each step can be turned on and off by touching the row of boxes below the value grid. If a box is dark blue, the step will play back. If a box is white, the step will skip, without playing back.

When neither KNOBS1-8 or KNOBS9-16 are black:

Edit Knob 1: Has no function.

Edit Knob 2: Selects the bar to be viewed. 4 bars can be viewed, showing each 16 steps, for a total of 64 steps. The bar number is shown just above the values field (marked **Bar**), and the first and the last step number viewed, is shown just above the values field, to the right and the left.

Edit Knob 3: Sets the last step that will be played back on this track, before it loops back, and plays the track again. Range: 1 to 64 steps. Value is shown as **Lst**.

Edit Knob 4: Sets the track resolution. Values: 1/64, 1/48, 1/32, 1/24, 1/16, 1/12, 1/8, 1/6, ¼, ½. Value is shown as **Res**.

Touching "ESC" will exit you to the Sequencer Modules page.

Sub Position Subtrack

When on the Position subtrack page, touch POS in the top navigation bar an extra time, to enter the sub position subtrack:
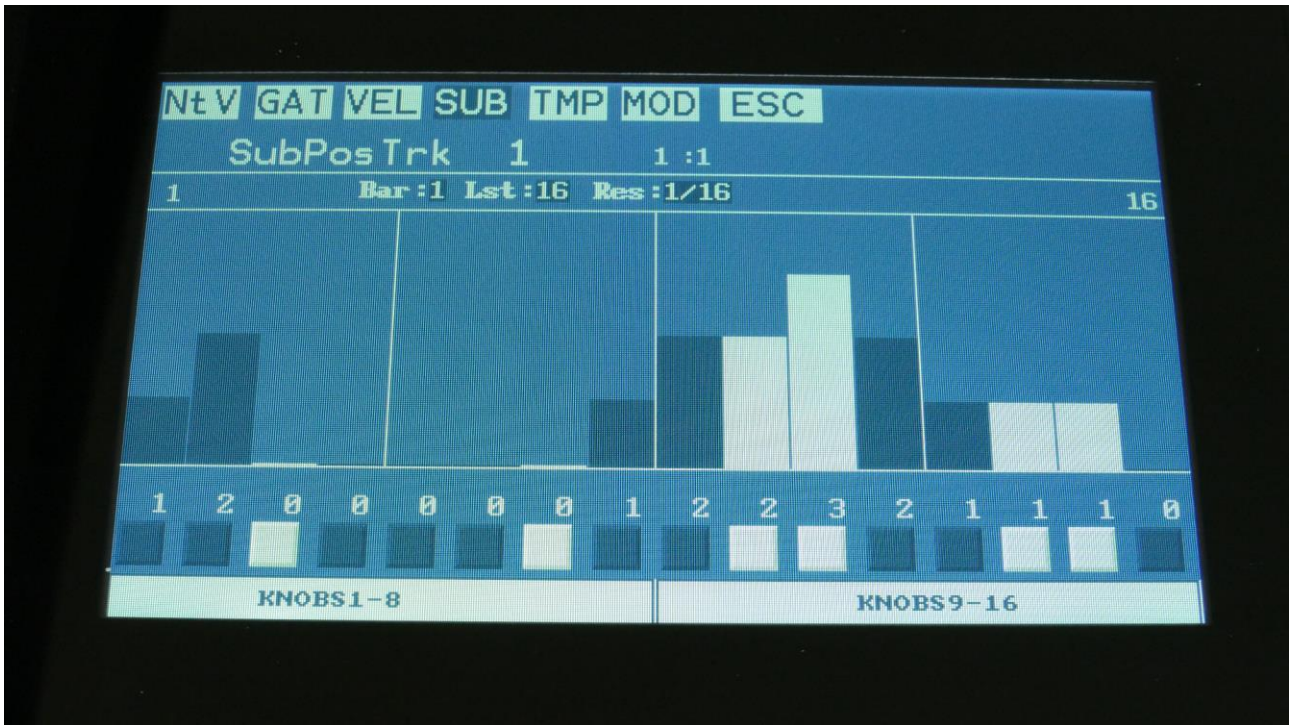
Here a value between 0 and 3 can be added to the step position for "micro-timing". A value of 0 will play back the step on the exact position. A value of 1 will delay the playback of the step by one quarter of the tracks resolution. A value of 2 will delay the playback of the step by one half of the tracks resolution. A value of 3 will delay the playback of the step by tree quarters of the tracks resolution.

The sub position for each step is shown as bars in the value grid, and as number right below the value grid. Sub positions for each step can be changed, simply by touching the value grid.
Values can also be changed, using edit knob 1 to 8. In the bottom of the page, touch the field named "Knobs 1-8", to edit the first 8 steps, using the edit knobs, or touch the field named "Knobs 9-16", to edit the last 8 steps, using edit knob 1 to 8.

Each step can be turned on and off by touching the row of boxes below the value grid. If a box is dark blue, the step will play back. If a box is white, the step will skip, without playing back.

When neither KNOBS1-8 or KNOBS9-16 are black:

Edit Knob 1: Has no function.

Edit Knob 2: Selects the bar to be viewed. 4 bars can be viewed, showing each 16 steps, for a total of 64 steps. The bar number is shown just above the values field (marked **Bar**), and the first and the last step number viewed, is shown just above the values field, to the right and the left.

Edit Knob 3: Sets the last step that will be played back on this track, before it loops back, and plays the track again. Range: 1 to 64 steps. Value is shown as **Lst**.

Edit Knob 4: Sets the track resolution. Values: 1/64, 1/48, 1/32, 1/24, 1/16, 1/12, 1/8, 1/6, ¼, ½. Value is shown as **Res**.

Touching "ESC" will exit you to the Sequencer Modules page.

Templates and Note Scales

Templates are available to make it easier to create ramps on a track, and to randomize things. For the position track templates are available for forwards, backwards, alternating, randomized and polyphonic playback setup.

On this page note scales are also available, for users that thinks that harmonic tones works, and for swapping around keys for experimentation.

When on either the Note, Gate, Velo or position subtracks, touch TMP on the top navigation bar, to enter the templates/note scales page.

If you enter the templates pages from the note, gate or velocity page, it will look like this:
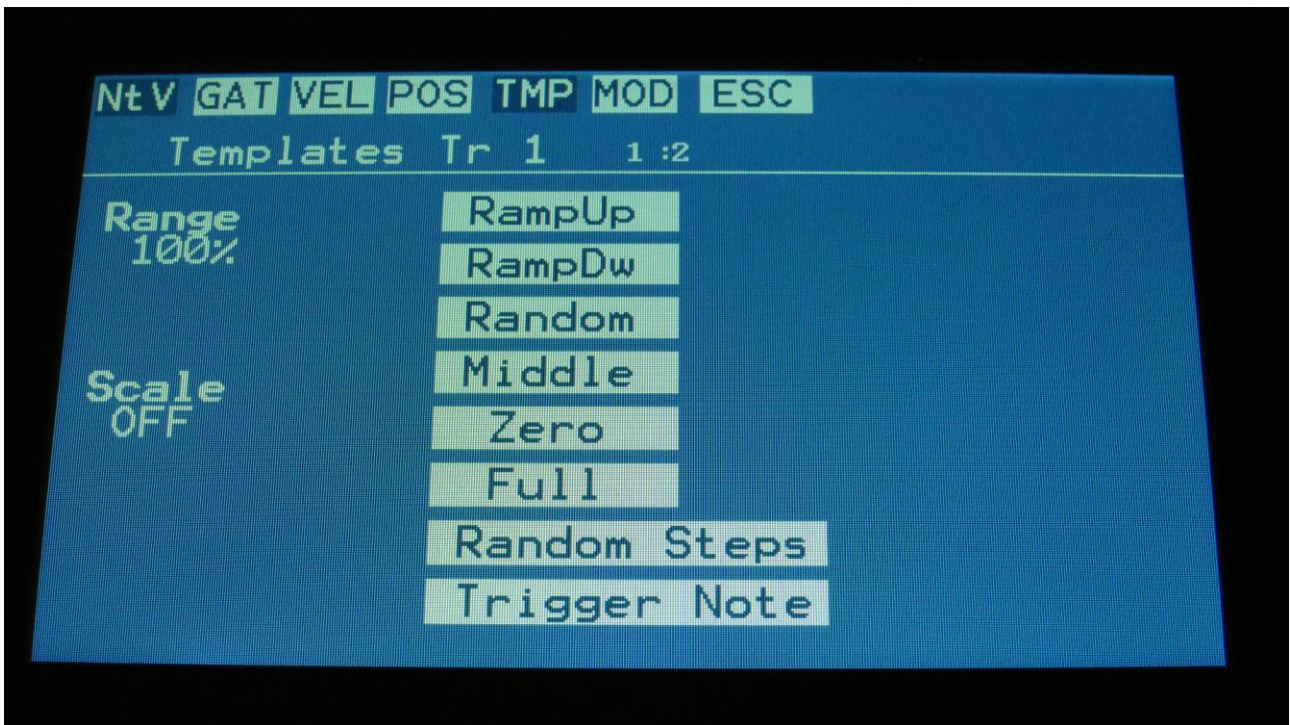
First turn Edit Knob 1, to set the range. This will set, how much the template routine will affect the values, that are already on the selected subtrack. When this is set to 100%, the template function will be absolute. Then touch any of the template boxes in the middle of the screen.

The templates work from step 1 to the last step that is set. Values after the last step are not affected.

Available templates:

-RampUp: Ramp Up. Will lower values on steps, that are placed before last step divided by 2, and raise values on steps, placed after last step divided by 2.

-RampDw: Ramp Down. Will raise values on steps, that are placed before last step divided by 2, and lower values on steps, placed after last step divided by 2.

-Random: Will randomize all steps between step 1 and last step, to a degree set by the range parameter.

-Middle: Will move any values closer to the middle value.

-Zero: Will lower any values. –Transpose a note track down.

-Full: Will raise any values. –Transpose a note track up.

Random Steps:

Will randomize the note steps on's/off's. The more that the Range parameter is turned up, the more notes it will set to on.

Trigger Note: Will set all note steps to the same note as the part trigger button plays.

Scale: Adds a scale to the note track output in realtime, when adjusting Edit Knob 5. Available scales are:

-Off: No scales are added to the note track.

-Cmaj: Forces all notes outputted from the track, to the Cmajor scale.

-Dmaj: Forces all notes outputted from the track, to the Dmajor scale.

-Emaj: Forces all notes outputted from the track, to the Emajor scale.

-Fmaj: Forces all notes outputted from the track, to the Fmajor scale.

-Gmaj: Forces all notes outputted from the track, to the Gmajor scale.

-Amaj: Forces all notes outputted from the track, to the Amajor scale.

-Bmin: Forces all notes outputted from the track, to the Bmajor scale.

-Cmin: Forces all notes outputted from the track, to the Cminor scale.

-Dmin: Forces all notes outputted from the track, to the Dminor scale.

-Emin: Forces all notes outputted from the track, to the Eminor scale.

-Fmin: Forces all notes outputted from the track, to the Fminor scale.

-Gmin: Forces all notes outputted from the track, to the Gminor scale.

**-Amin:** Forces all notes outputted from the track, to the Aminor scale.

-Bmin: Forces all notes outputted from the track, to the Bminor scale.

-Swap: Will swap notes below F inside an octave, with notes above F, and vice versa.

-BlWh: Will swap white keys with black and vice versa.

Templates for the Position Subtrack

When entering the templates page from the Position subtrack, it will look like this:
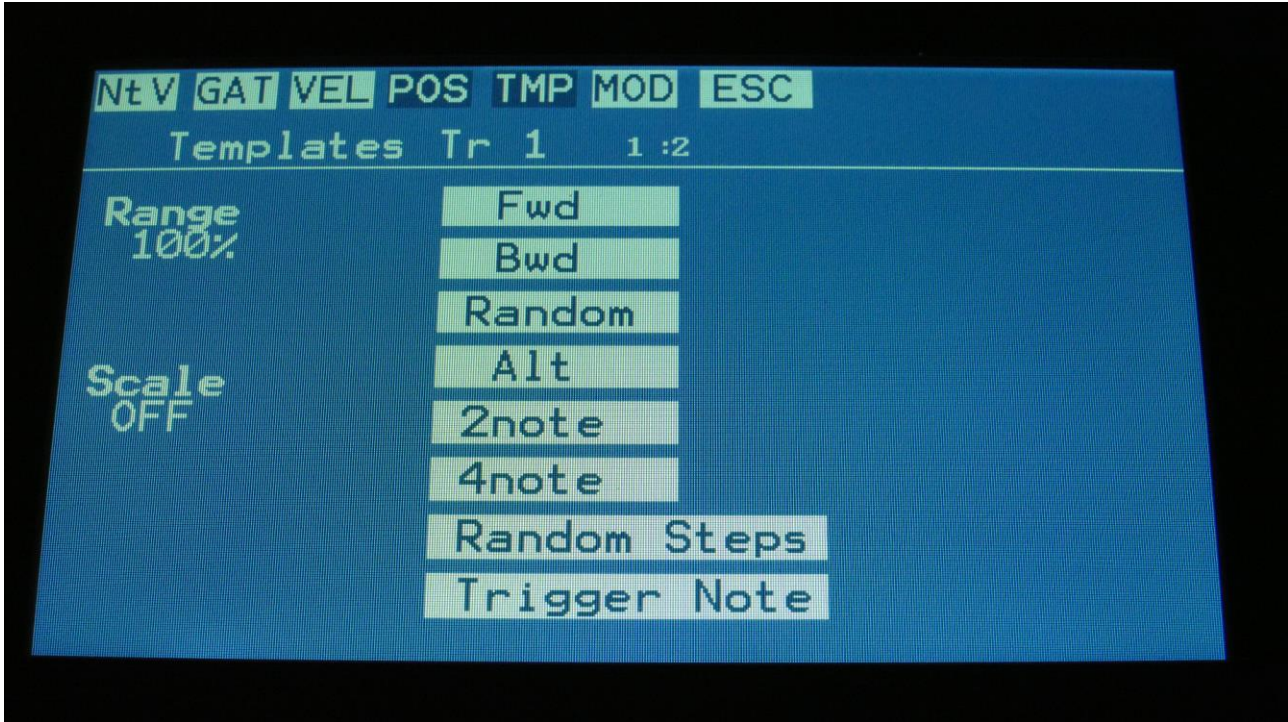
Turn Edit Knob 1, to set the range. This will set, how much the template routine will affect the values, that are already on the selected subtrack. When this is set to 100%, the template function will be absolute.

The templates work from step 1 to the last step that is set. Values after the last step are not affected.

Available templates:
-**Fwd:** Forwards. The more the Range parameter is turned up, when touching this, the more the track will be forced to play back forwards.
-**Bwd:** Backwards. The more the Range parameter is turned up, when touching this, the more the track will be forced to play back backwards.
-**Random:** Will randomize all steps between step 1 and last step, to a degree set by the range parameter.
-**Alt:** Alternate. The more the Range parameter is turned up, when touching this, the more the track will be forced to play back alternating.

-2note: 2 Note Poly. The more the Range parameter is turned up, when touching this, the more the track will be forced to play back 2 note polyphonic.
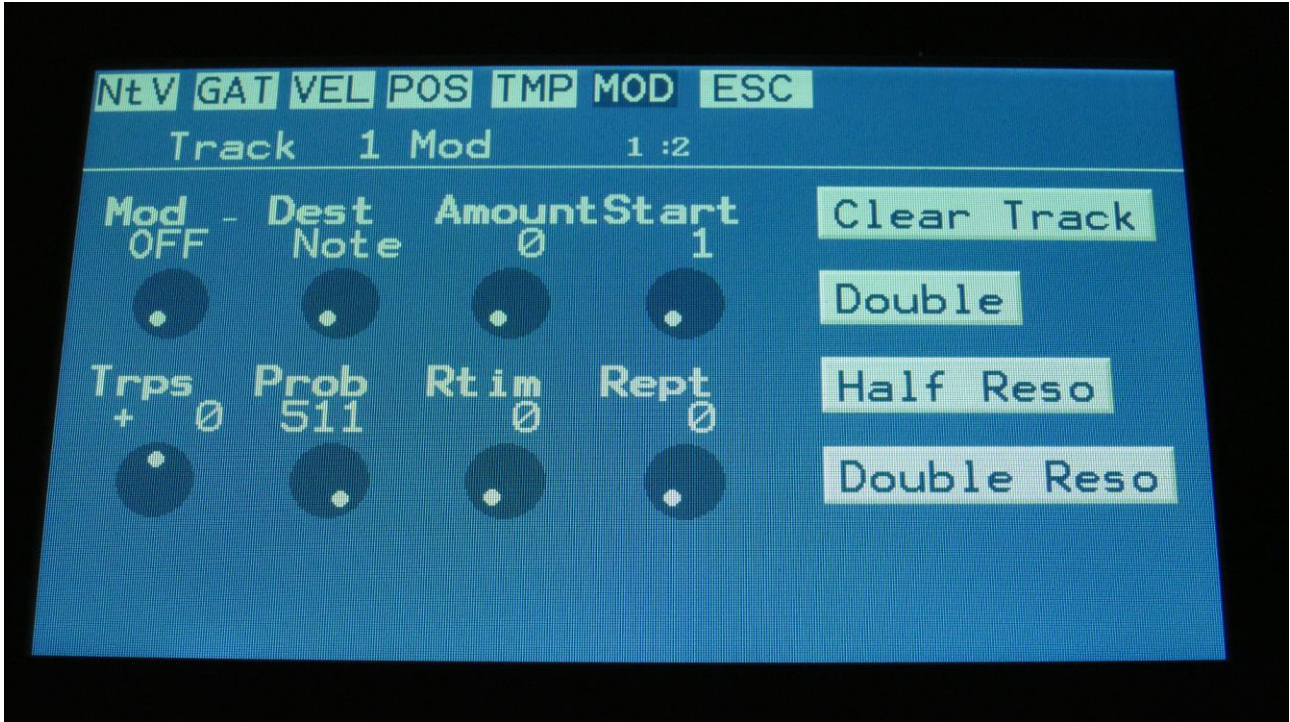
-4note: 4 Note Poly. The more the Range parameter is turned up, when touching this, the more the track will be forced to play back 4 note polyphonic.

Random Steps:

Will randomize the note steps on's/off's. The more that the Range parameter is turned up, the more notes it will set to on.

Note Track Mod Page

Touch MOD in the top navigation bar, to enter this page.

Here you can set up note track modulation, the track Note Randomizer, the start step, make step repeats, and transpose the track. It is also possible to clear or double the track, and it is possible to change the resolution of the track, without changing the timing.

The parameters of this page:

Mod: Note Track modulation source. Any Zaturn audio/modulation source can be selected to modulate the track. For a complete list of modulation sources, see the "Connecting Modules" chapter.

Dest: Track modulation destination. Selects what should be modulated on the track. Choices are:

-Note: The note numbers of the track will be modulated. If "Kybd" is selected as the modulation source, incoming MIDI notes, and notes played on the touchscrenn keyboard, will no longer play back notes. Instead they will transpose the note track. When the 2 middle notes, note number 64 (E4) and 65 (F4), are played, the note track will play back at its original pitch. When notes below these are played, the note track will be transposed down, and when keys above are played, it will be transposed up.

-Gate: The gate times of the track will be modulated.

-Dly: The delay times of the track will be modulated.

-Swing: Swing modulation will be applied to the track. This is a bit more fine than the delay time modulation.

-Velo: The velocity values of the track will be modulated.

-Pos: The position subtrack positions will be modulated.

-Rept: The Rept (Repeats) parameter will be modulated.

-Rota: Position Rotation Modulation. Will rotate the positions of the position subtrack around the selected last step.

Amount: Adjusts the amount of modulation that will be applied to the track.

Start: Sets the track start step. This will be the step, the track starts at, when hitting the Start/Stop button, or when entering this preset from another preset, while the sequencer is running. When selecting another preset, while the sequencer is running, the preset change will happen, when Note track 1 are at the step before the start step. Step 1 to 64 can be selected.
The Start step can be set globally for all tracks at the Seq Main page.

Trps: Track transpose. Will transpose the note numbers of the whole track up to 64 semitones up or down.


Prob: Track Note Randomizer Probability. When this is turned fully up, all programmed note steps of the track will play back. The more it is turned down, the less notes will play back. The notes the will not play back are selected randomly.

Rtim: Track Note Randomizer Time. When turned up, it will create random delays on the programmed note steps triggering.

Rept: When setting this to 1, 2 or 3, each step note will be repeated this number of times, in equally spaced steps, between the sequencer steps. Modulate this for some cool effects.

Clear Note Track

From the Mod page, touch the **"Clear Track"** button, to enter this page:
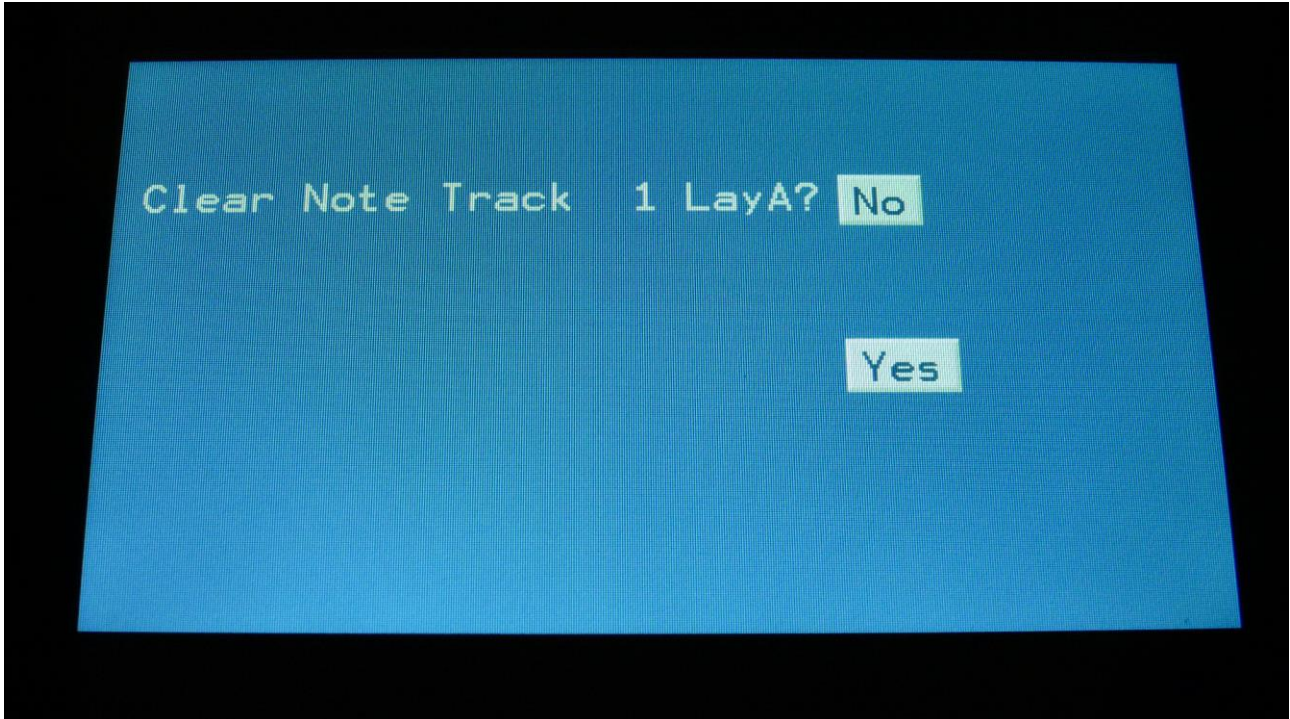
Touching "Yes" from here, will initialize all step values and parameters of the currently selected note track, on the currently selected Morph Layer (Morph function button selects the layer), except for the Last Step parameter.

If you would not wish to do this, touch "No", to exit to the track Mod page.

Double Note Track

Touch the "Double" touch button, to double the length of the track. All events from the original track, is copied to the new half. Useful if you need some extra variation in a track.

PLEASE NOTE: The track lengths cannot exceed 64 steps for the note tracks.

Half Or Double the Track Resolution

If you, for instance, have recorded a track with resolution set to 1/16, where you only have notes recorded on every second step, you might want to change the resolution of this track to 1/8, in order to make the track longer. If you just change the resolution parameter to 1/8, the timing of the track will slow down.
Instead touch the "**Half Reso**" field. Now Zaturn will automatically change the resolution to 1/8, and place the note positions, so that the timing will be kept.

If you, on the other hand, have recorded a track with resolution set to 1/16, and you would like to add some notes between the 1/16 note steps for faster rolls, the timing of the whole track will again be altered, if you just change the track resolution.
Instead simply touch the "**Double Reso**" field. Zaturn will now automatically change the resolution to 1/32, and insert extra steps between the original 1/16 steps, to keep the timing as it was.
PLEASE NOTE: This will double the track length in number of steps. The track lengths cannot exceed 64 steps for the note tracks.

Realtime recording of notes

You can, at any time, hit the Steps/Part button, and switch note steps on or off, but sometimes you might want to just record something, that you play on a connected MIDI device, like a keyboard or a drum pad, on the touch screen keyboard, or on Zaturns's trigger buttons. For this, realtime recording is usable.

You can start realtime recording by holding down the Func/Mute button, while pressing the Play button. If the sequencer is already running, it will immediate enter realtime recording mode, and any note you play will be recorded. If the sequencer is stopped, you will have to push the Play button, to start it. Before it starts realtime recording, it will count in for 2 bars with audible metronome.

When it is realtime recording, the Play button will flash in time with the beat.

To switch off realtime recording, simply hit the same button combination again, so that the Play button stops flashing.

Zaturn has two different note realtime recording modes: Mono and poly.

In mono recording mode, it records the notes in a linear time fashion, like a traditional step sequencer: One note per step. The notes you play are placed at the position where the sequencer was playing back, at the moment that you played the note. If you play more than one note on the same position, only the last note you play are recorded.
If you play several parts at the same time, each part will be recorded on separate tracks, so more parts can be recorded to sound at the same time.

In poly recording mode, the position subtrack is modified every time you play a note to be recorded. The first note you play, will be placed at step one, and the position of step one, will be set to the position, that the sequencer was playing back, when you played the note. The second note you play, will be placed at step two, and the position of step two, will be set to the position, that the sequencer was playing back, when you played the note. And so on, until you have played 64 notes. Any step can be at any position, and therefore polyphonic recording and play back is possible.

The realtime recording mode is set on the Sequencer Main page, by touching Mono/Poly field.
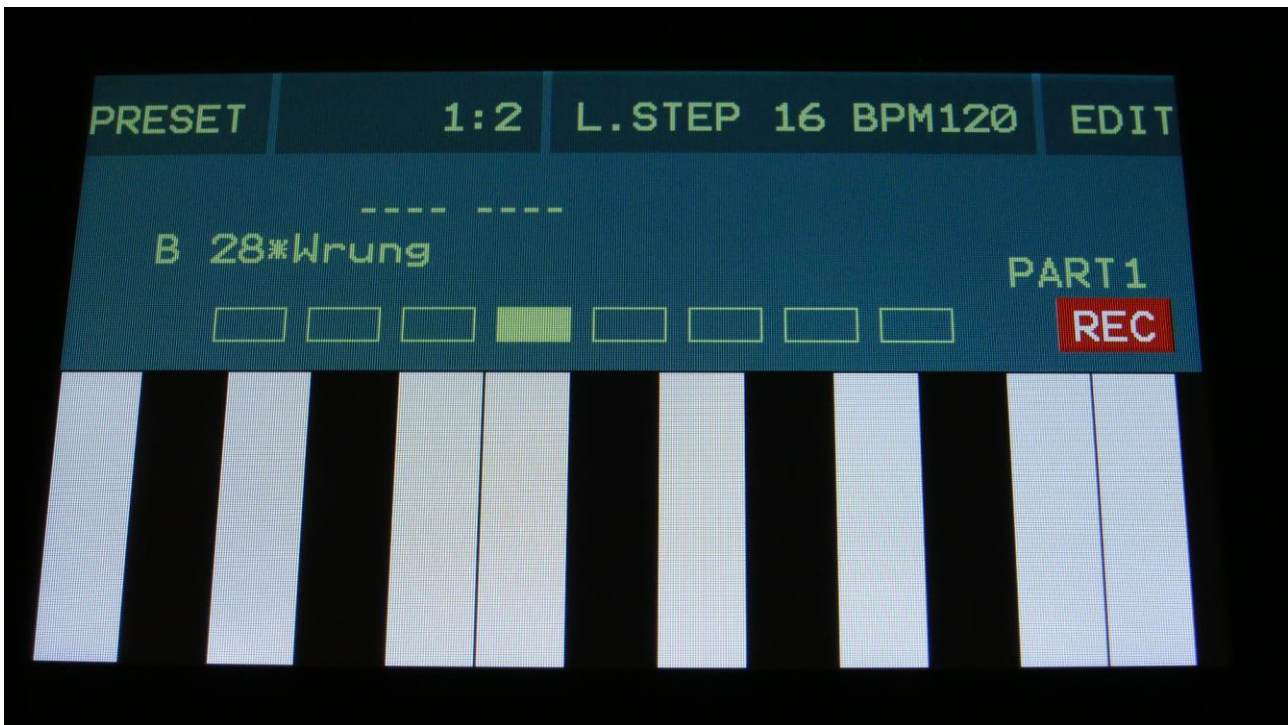
The choices are:

-Mono: Monophonic recording

-Poly: Polyphonic recording
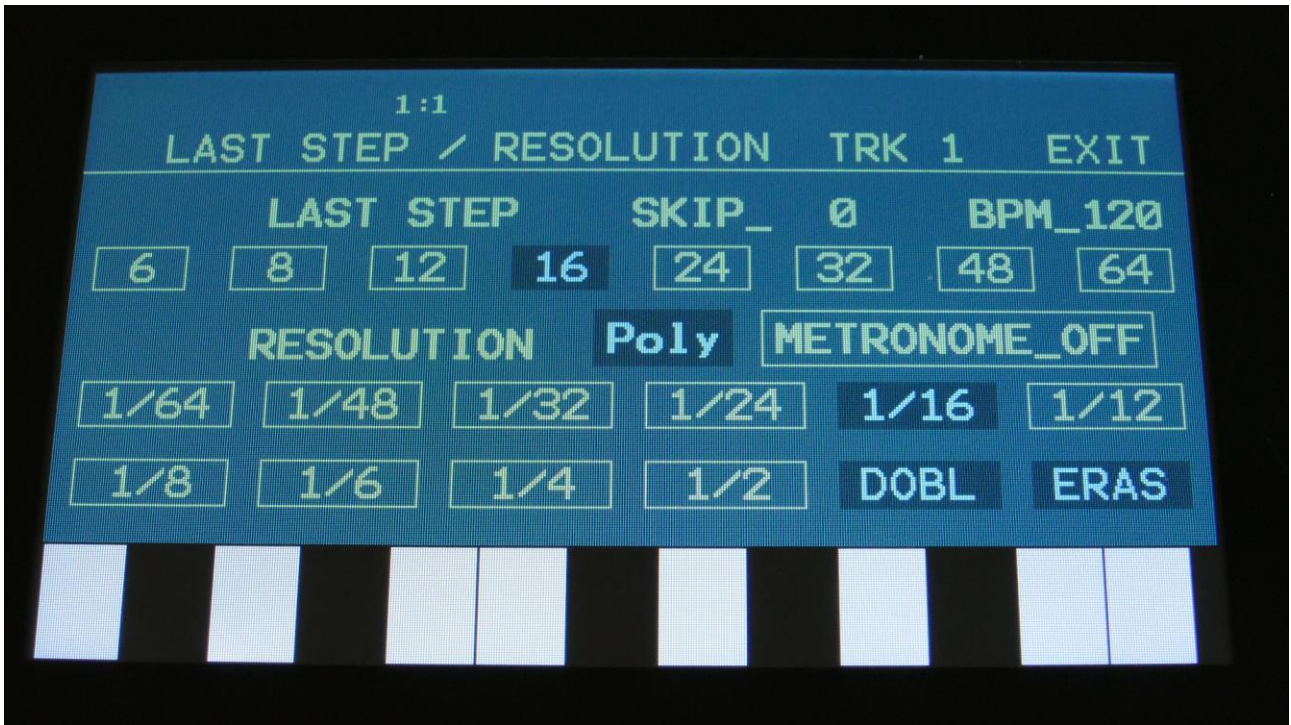
On the Preset Select page, it is also possible to switch realtime recording on and off, by touching the Rec touchbutton.
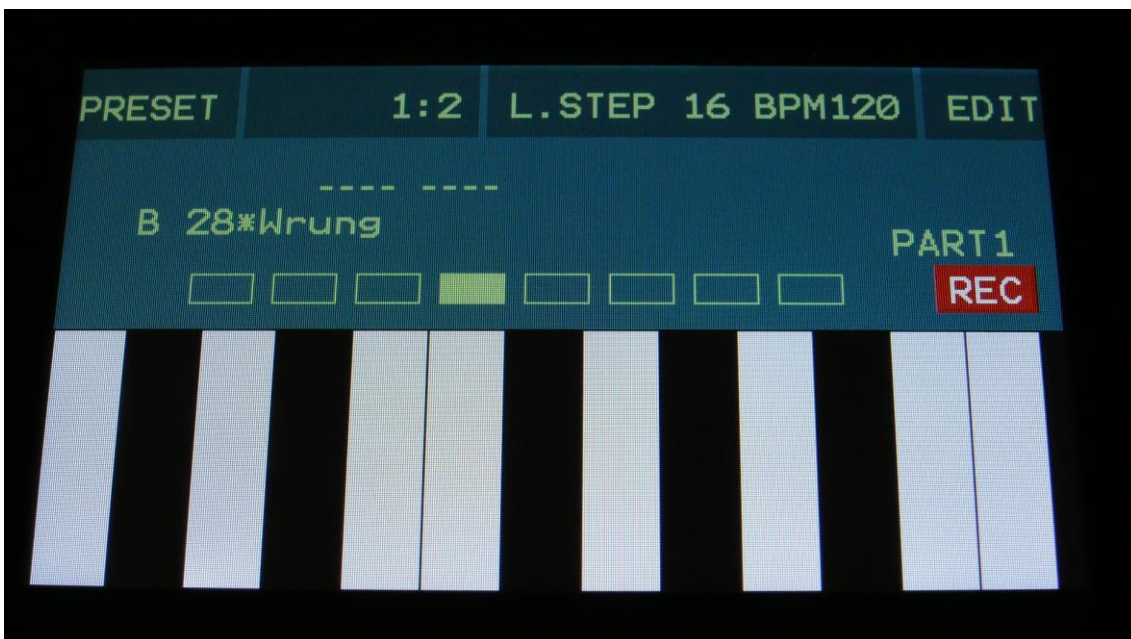
Step Recording of Notes

On top of the xox style and realtime recording methods, step recording of notes and controllers are also possible.
Rec mode can be set to either mono or poly.

To initiate step recording:
-Set Zaturn in sequencer recording mode, by touching the REC field on the Preset Select page, so that it turns red, or push and hold the Func/Mute button, while pressing the Play button.
-Start the sequencer playback, if desired. Step recording is possible no matter if the sequencer is running or not.
-Push and release the Steps/Part button, so that it lights up, and puts the 8 step buttons in step mode.
-Push the step button, that has the position for the step, that you would like to record. This will now flash.
-Play a note (or more in poly rec mode), on an attached MIDI device or on the touch screen keyboard. This will now be recorded. If any controller track is set in recording mode (explained in the next section), MIDI CC's and knob movements can also be recorded to specific steps this way.
-The Zaturn Sequencer will advance to the next step, every time it receives a note off.

If the sequencer is running, while step recording, the time you hold down a note, will be recorded. If the sequencer is stopped, resolution will determine the note length.

Setting up a track/part to internal or external operation

Each of the 8 Zaturn note tracks, can control either the internal part, that they are hard assigned to, or external MIDI gear.
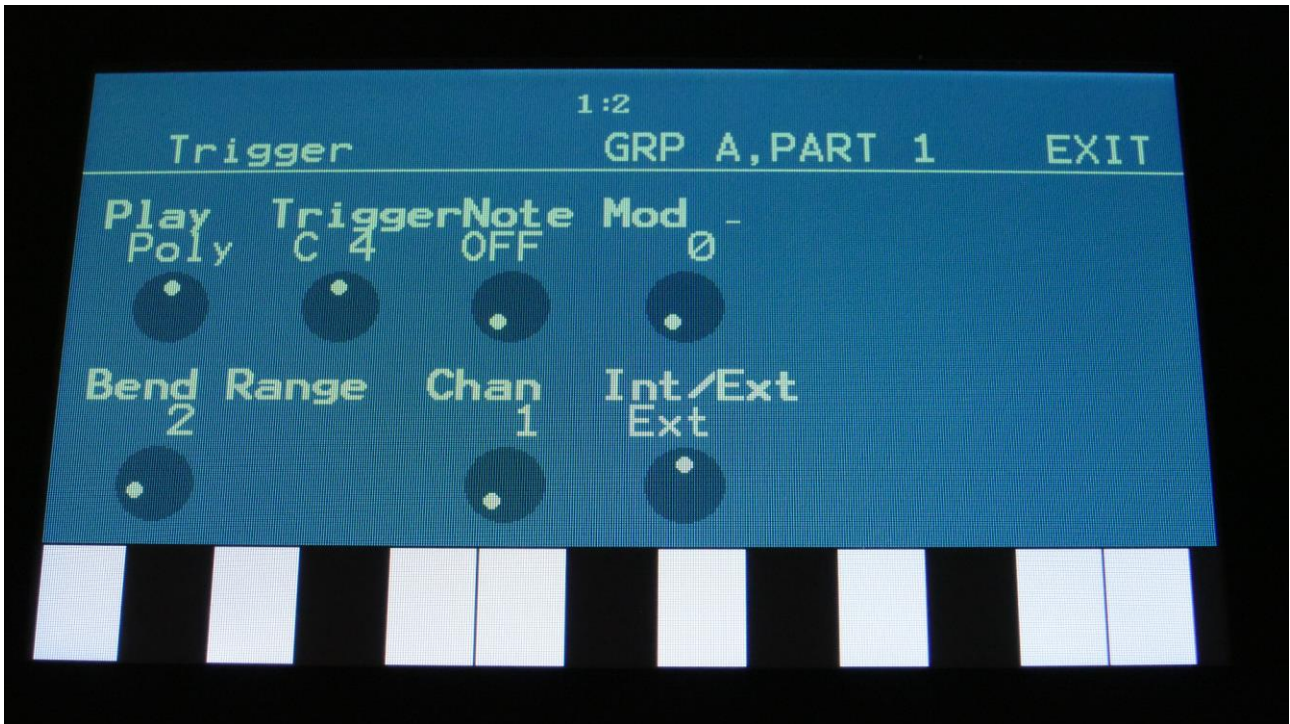

From the Preset Select page, touch the EDIT field, to enter the Synth Modules page.

On this page, touch TRIG.

Now you will enter this page:

Select the part, that you would like to set up as internal or external, by holding down the Steps/part button, while pushing the step button, that has the desired part number.

Set the Int/Ext parameter to Int (Internal) or Ext (External).

If you set the part to external, set the Chan parameter to a MIDI channel that matches the MIDI gear, that you would like to control.

Set other tracks up, if desired.

The Controller Tracks

Zaturn has 16 controller tracks, divided into 4 tracks for each of the 4 Groups. Each of these only has one subtrack: The controller track values. Each track can be on up to 128 steps long, and a Smooth function can be turned on, for all steps at once or individually for each step, that will automatically create values between the steps, from one step value to another, for smooth transitions between them. Resolution can be set from 1/64 to 1/2.

Step values are indicated by dark blue bars. The step values can be recorded in real and step time, adjusted by the Edit Knobs, and directly by touching the screen. The transition between each step can be either stepped or smooth. The controller tracks appear as modulation and audio sources, but they can also transmit MIDI CC's and pitch bend directly, both internally and externally. Program changes can also be transmitted. Templates can be used, for faster setting of the values.

Via the controller tracks, it is possible to realtime record MIDI CC's, pitch bends and knob movements.

Templates are available, for quick modification of the controller track values.

Controller track Step Values

From the sequencer start page, touch Controller Track A+B, to access the controller tracks for these 2 groups, or touch Controller Track C+D, to access the tracks for these 2 groups.

To access a specific track, push and hold the Steps/Part button, while pressing one of the step buttons.

This will be the first page you will enter, showing the controller values, that will be outputted for each sequencer step, when the sequencer is playing back.

At most of this screen, you will see the value grid. Right below the value grid, you will find the smooth on/off boxes for each step. Right above the value grid, to the left and to the right, the first and last step numbers, of the steps that is currently shown in the value grid, are indicated. Between these numbers, a few settable parameters is shown.
In the top left side, a small VU-meter is shown, that show the value currently being outputted by the track.

Here, when neither KNOBS1-8 or KNOBS9-16 are dark blue:

Edit Knob 1: Has no function.

Edit Knob 2: Selects the bar to be viewed. 4 bars can be viewed, showing each 16 steps, for a total of 64 steps. The bar number is shown just above the values field (marked **Page**), and the first and the last step number viewed, is shown just above the values field, to the right and the left.

Edit Knob 3: Sets the last step that will be played back on this track, before it loops back, and plays the track again. Range: 1 to 128 steps. Value is shown as **Lst**.

Edit Knob 4: Sets the track resolution. Values: 1/64, 1/48, 1/32, 1/24, 1/16, 1/12, 1/8, 1/6, ¼, ½. Value is shown as **Res**.

Touching "ESC" will exit you to the Sequencer Start page.

The controller values for each step is shown right below the value grid. Controller values for each step can be changed, simply by touching the value grid.
Values can also be changed, using edit knob 1 to 8. In the bottom of the page, touch the field named "Knobs 1-8", to edit the first 8 steps, using the edit knobs, or touch the field named "Knobs 9-16", to edit the last 8 steps, using edit knob 1 to 8.
If touching this field one more time, it will change to "All". Now it is possible to adjust the offset of all the track values, using Edit Knob 1.

Smoothing for each step can be turned on and off by touching the row of boxes below the value grid. If a box is dark blue, the transition from this step to the next will be smooth. If a box is white, the transition to the next step will be stepped.
If the Smooth parameter, explained on the Controller Track CC page, is set to On, the transition between all steps will be smooth, and the individual steps smoothing will be ignored.

Controller Tracks Templates

Templates are available to make it easier to create ramps on a track and to randomize things.

When on the Controller track step values page, touch TMP on the top navigation bar, to enter the templates page.
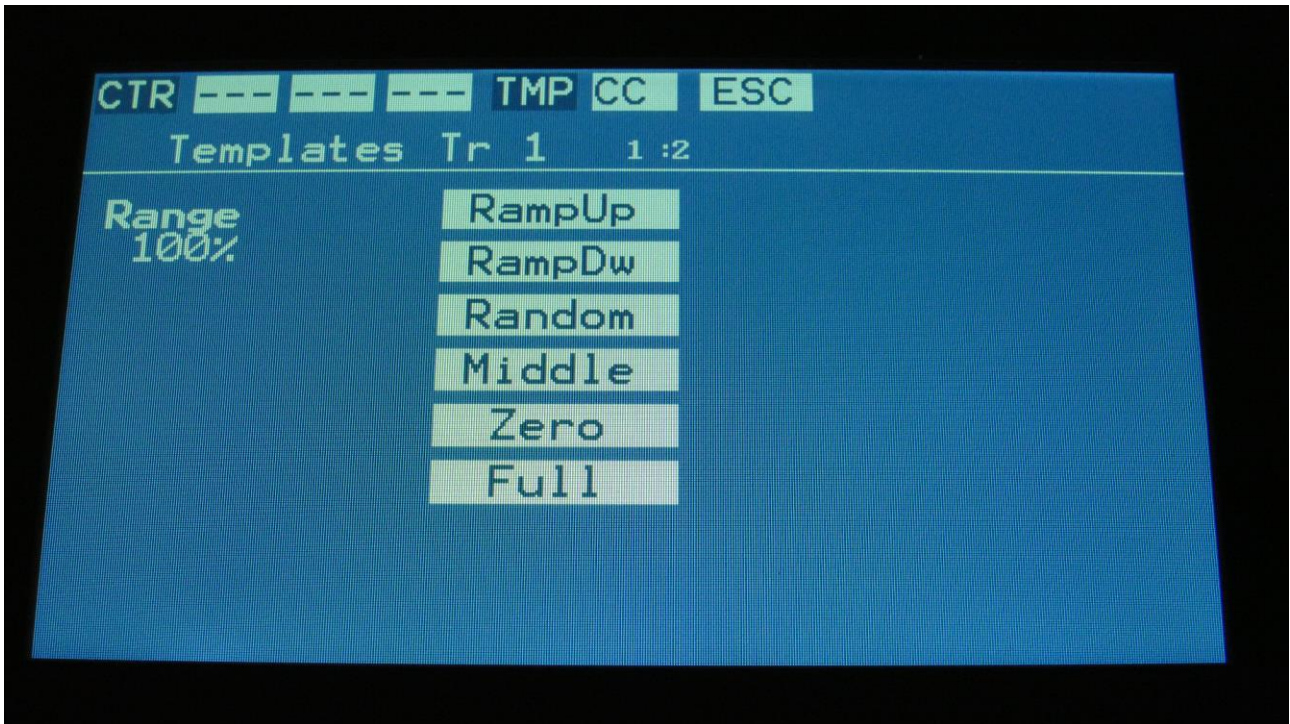
First turn Edit Knob 1, to set the range. This will set, how much the template routine will affect the values, that are already on the selected subtrack. When this is set to 100%, the template function will be absolute. Then touch any of the template boxes in the right side of the screen.

The templates work from step 1 to the last step that is set. Values after the last step are not affected.

Available templates:
-RampUp: Ramp Up. Will lower values on steps, that are placed before last step divided by 2, and raise values on steps, placed after last step divided by 2.
-RampDw: Ramp Down. Will raise values on steps, that are placed before last step divided by 2, and lower values on steps, placed after last step divided by 2.
-Random: Will randomize all steps between step 1 and last step, to a degree set by the range parameter.
-Middle: Will move any values closer to the middle value.

-**Zero:** Will lower any values.
-**Full:** Will raise any values.

Controller Tracks CC page

Touch CC in the top navigation bar, to enter this page.

The parameters of this page:

CC: Off, 1(Morph), 2(SeqMrp), 3, 4(Knob1), 5(Knob2), 6, 7(Knob8), 8(Knob3), 9(Knob4), 10(Knob5), 11(Knob6), 12(Knob7), 13 to 15, 16 (Y-Mod), 17 to 122, CV IN 1 to 4, Pitch Bend.
Setting this to any other value than "Off", will make the selected controller track output MIDI CC values or pitch bend values to MIDI out or internally, as set on the CCout parameter. When a number is set, this is the CC number that will be outputted. If any Zaturn Edit Knob are assigned to this CC, the knob name will be written in parenthesis. If set to Pitch Bend, this is what will be outputted. The CC/Pitch Bend set here, are also the event that the track will realtime/step record. Controller track realtime and step recording are explained a little bit later.

Chan: 1 to 16. Sets the MIDI channel, that the selected MIDI CC will be transmitted to, when CCout is set to External, or the internal Part number, that the CC's are sent to, when CCout is set to Internal.

CCout: Ext, Int. Sets if the controller track CC's/Pitch Bend's should be transmitted to an external MIDI device via MIDI Out (Ext), or to an internal Synth Part (Int). Regardless of this setting, the controller track are always available as internal modulation sources.

Start: 1 to 128. Sets the track start step. This will be the step, the track starts at, when hitting the Start/Stop button, or when entering this preset from another preset, while the sequencer is running.

PrCh: Off, 1 to 128. When setting the PrCh parameter to any value between 1 and 128, a program change message will be transmitted on MIDI out, on the MIDI channel selected by the Chan parameter, every time this preset is selected. The CCout parameter has no effect on this. Each of the 32 controller tracks can transmit its own program change.

Smooth: Off, On. When this is set to On, extra controller values will be added between the controller value steps, to ensure smooth transition between these. When this is on, individual steps smoothing will be ignored.

Clear Controller Track

From the track CC page, touch the **"Clear Track"** button, to enter this page:
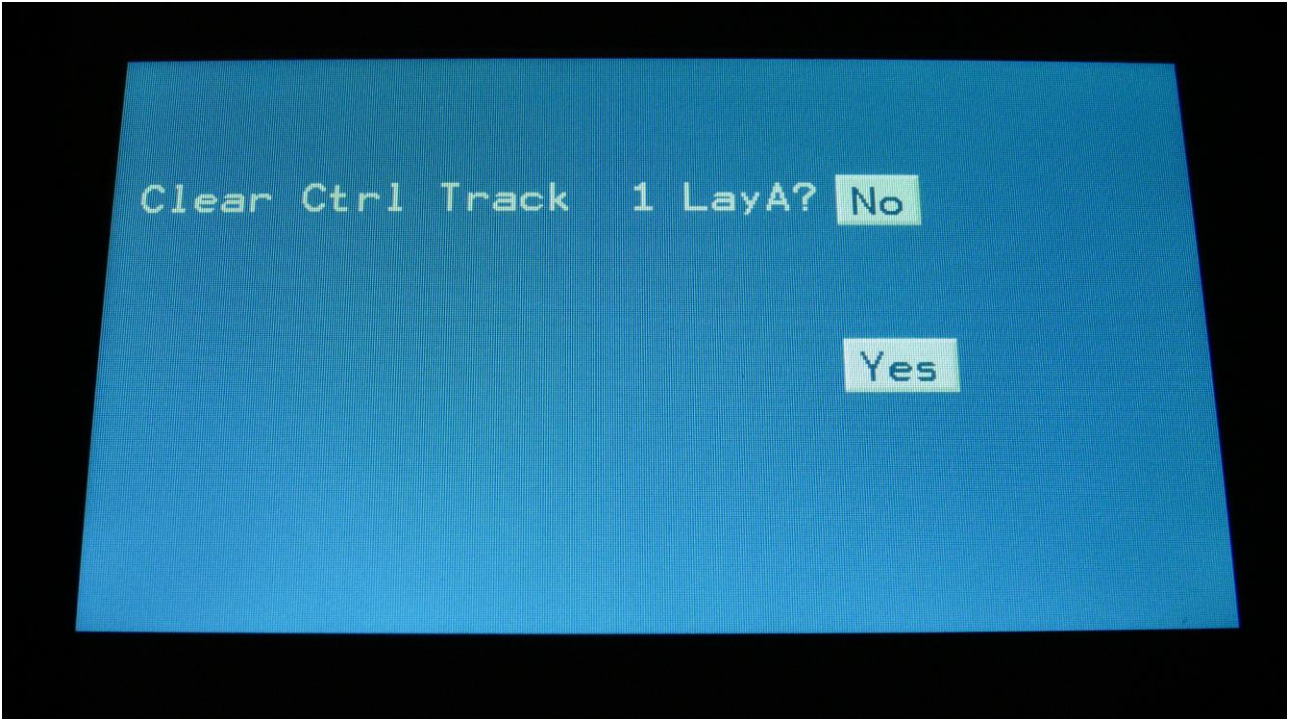
Touching "Yes" from here, will clear all step on's of the currently selected controller track, on the selected Morph Layer (morph layer is selected by the Morph function button)..

If you would not wish to do this, touch "No", to exit to the track main page.

Double Controller Track

Touch the "Double" touch button, to double the length of the track. All events from the original track, is copied to the new half. Useful if you need some extra variation in a track.

PLEASE NOTE: The controller track lengths cannot exceed 128 steps.

Controller Tracks Realtime Recording

MIDI CC's, Pitch Bend, CV Inputs and knob movements can be realtime recorded on the 16 controller tracks.

To do this, on the controller track CC page, set it to the event type, that you would like to record, using the CC parameter.
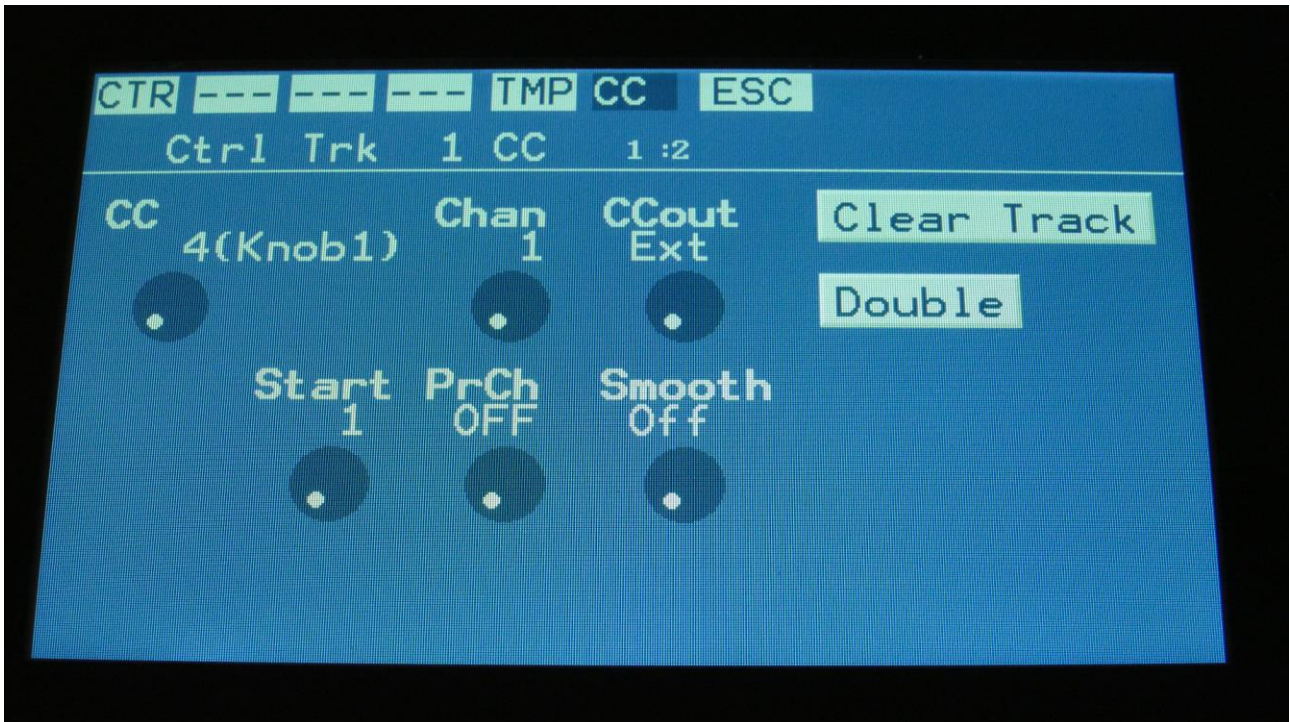
The CC parameter can be set to any MIDI CC between 1 and 126.
In the top position, you will find Pitch Bend, and at position 16 (CC16), you will find the touch screen keyboard Y-position.

The MIDI CC used for knob movement recording are named like this:
1(Morph)
2(SeqMrp)
4(Knob1)
5(Knob2)
7(Knob8)
8(Knob3)
9(Knob4)
10(Knob5)
11(Knob6)

12(Knob7)

For knob movement recording, you should select one of these.

Set the track to the desired MIDI channel, using the Chan parameter. If the track is set to internal operation, the channel number is the part number, that the track will output to.

Set CCout to Int (internal) or Ext (external), depending on, if you like the controller track to control Zaturn itself, or some external MIDI gear.

Now, if you would like to tweak the Edit Knobs, navigate back to the Preset Select (main) page, and make sure, that the Edit Knobs are controlling the right parameters.

Now start the sequencer.

Start sequencer recording, by pushing and holding the Func/Mute button, while pressing the Play button.

Now, when you start tweaking an Edit Knob, it will start recording this controller track. It will record the track for the number of steps, that the track is set up to. Then it will stop the recording of the track, and switch it to Smooth mode, and play back will start.

Knob tracks set to pitch bend, can be recorded by playing with the pitch bender on a MIDI device connected to Zaturn MIDI in. Knob tweaks can also be performed with external MIDI controllers.

Controller Tracks Step Recording

It is also possible to step record controller events.

To initiate step recording:
-Set the controller track in realtime recording mode, as described in a previous chapter.
-Start the sequencer playback, if desired. Step recording is possible no matter if the sequencer is running or not.
-Push and release the Steps/Part button, so that it lights up, and puts the 8 step buttons in step mode.
-Push the step button, that has the position for the step, that you would like to record. This will now flash.
-Set the Knob/MIDI Controller to the value, you would like this step to hold.
-Select another step to record.

Clear Sequence

From the Sequencer Start page, touch the Clear field. Zaturn will now ask:
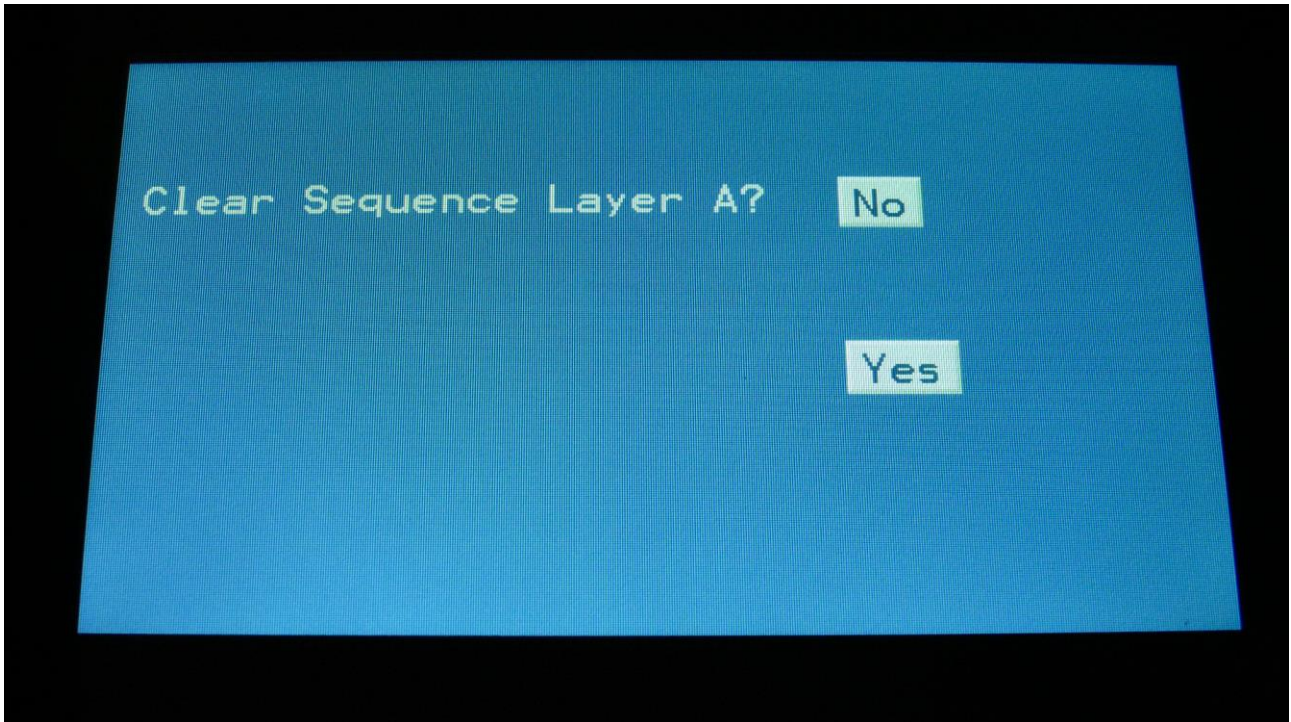
If you touch the "Yes" button here, Zaturn will clear all tracks on the selected Morph Layer (select Morph Layer with the Morph function button) of the current preset, and reset all values.

If you do not wish to do that, touch "No".

Swing All

From the Sequencer Start page, touch the SWING field, to enter the Swing All page.
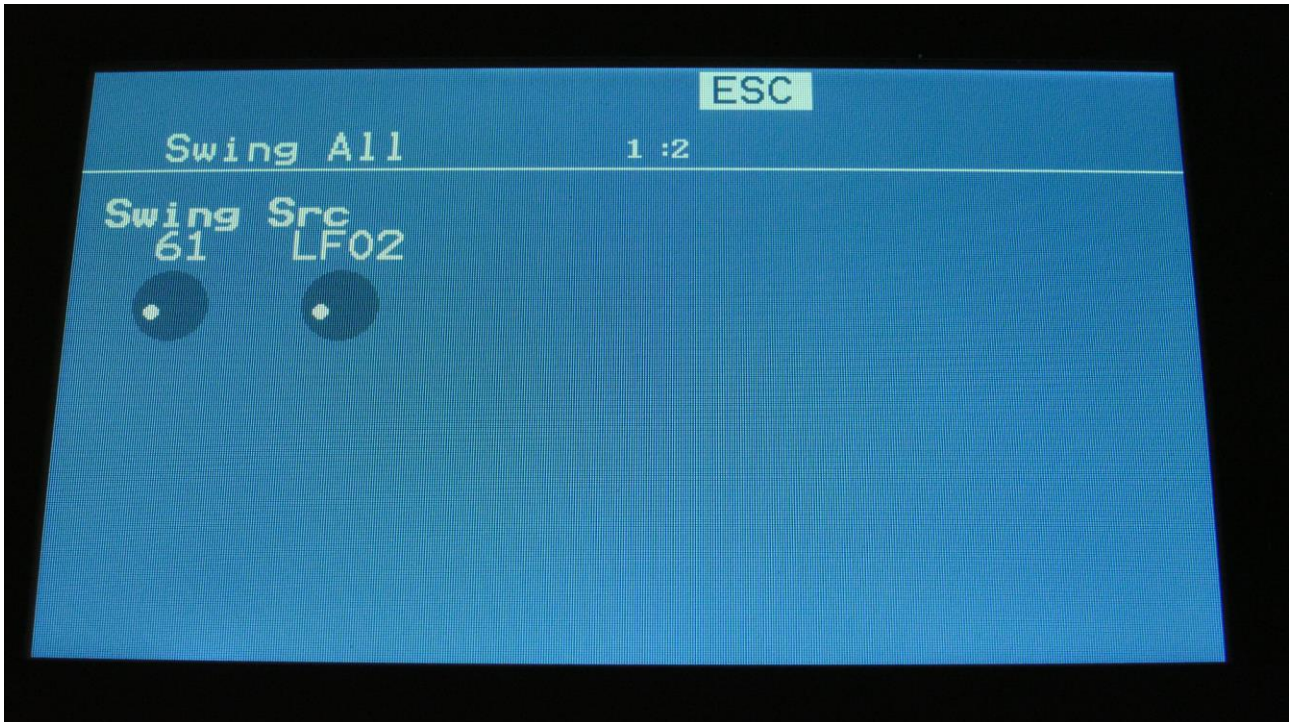
Swing All will let you add modulated swing to all 8 note tracks at the same time. For creating traditional swing, you should modulate with a controller track, and program the swing pattern on this, but on Zaturn, any modulation source can be used for swing, so there are quite a lot of possibilities to deform a sequence with this.

For separate swing on each track, please use the track modulation.

Set the amount of swing with the **Swing** parameter, and select the swing modulation source, using the **Src** parameter. Any Zaturn audio/modulation source can be selected.

Synth and Sequencer Morphing

On Zaturn it is possible to morph between 2 layers of parameters, layer A and B, by turning the Morph knob for the synth parameters, and the Seq Morph knob for the sequencer parameters. The Morph knob transmits and receives MIDI CC 1 (The Mod Wheel) via MIDI in and out, and the Seq Morph knob transmits and receives MIDI CC2.

To access the parameters of the second layers, on any synth and sequencer page, hit the Morph function button (Func/Mute>Step button 3 (Morph)), so it lights up. Now the parameters of layer B will be shown on the screen, and you can edit these, using Edit Knob 1 to 8, just like the layer A parameters.

All continuously adjustable parameters can be morphed. Switches are not morphed, except for the note tracks steps on/offs.

In the MOR section under MORPH, it is possible to set static Morph knob values, and to modulate the morph knobs.

TIP: In order to get a fast start point for morph layer B, you can copy morph layer A to B quickly, by pushing the function buttons Copy (step button 5) and then Morph (step button 3).

All morph settings are stored within each Preset. Remember to save the Preset, to not lose any great sounds.

Mor> preset parameters/Setup

From the Preset Select page, touch the EDIT field in the upper right corner.
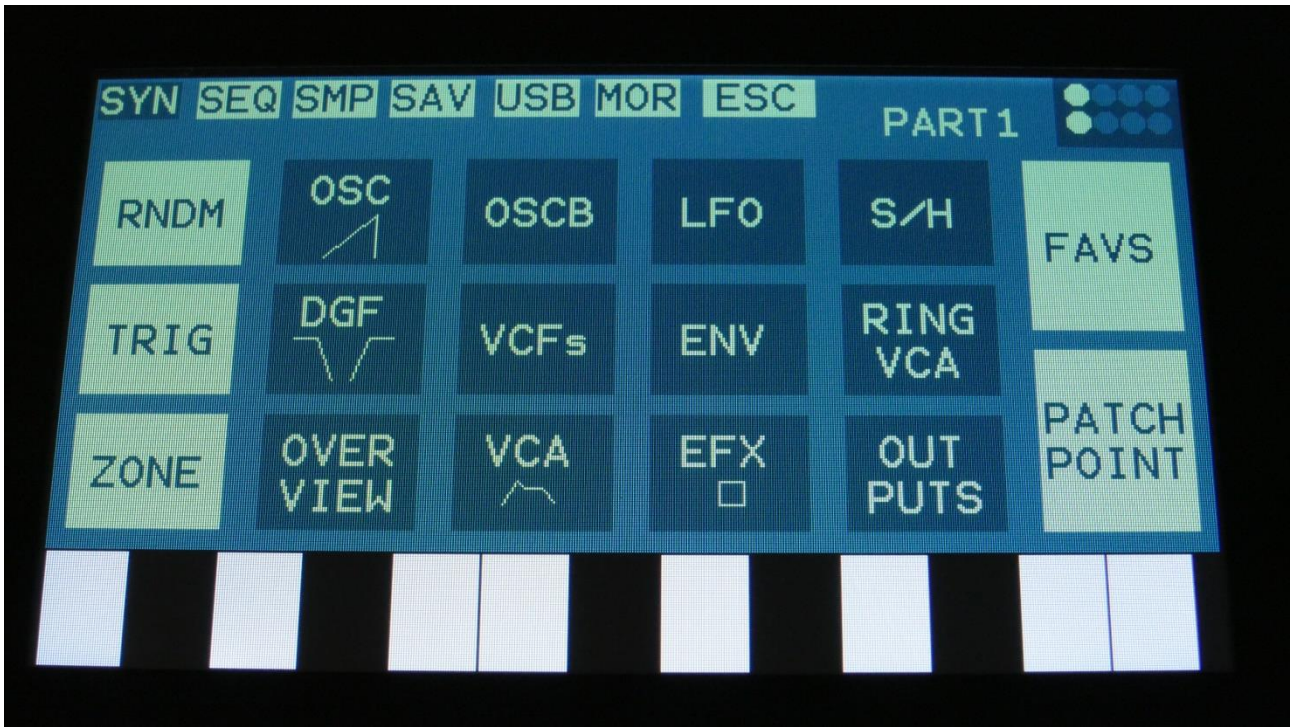
On the navigation bar at the top of this screen, touch MOR.

This will get you to the MOR page. Here you can set up all the basic Zaturn things, like global MIDI channel, morphing, tune the analog filters, check and erase the Zaturn memory, initialize the preset and change to song mode.

On the following pages, each section of the MOR page is described.

Common Settings

On this page, you can adjust the display contrast and MIDI settings and check the sample memory.

From MOR page, touch COMMON to enter this page:
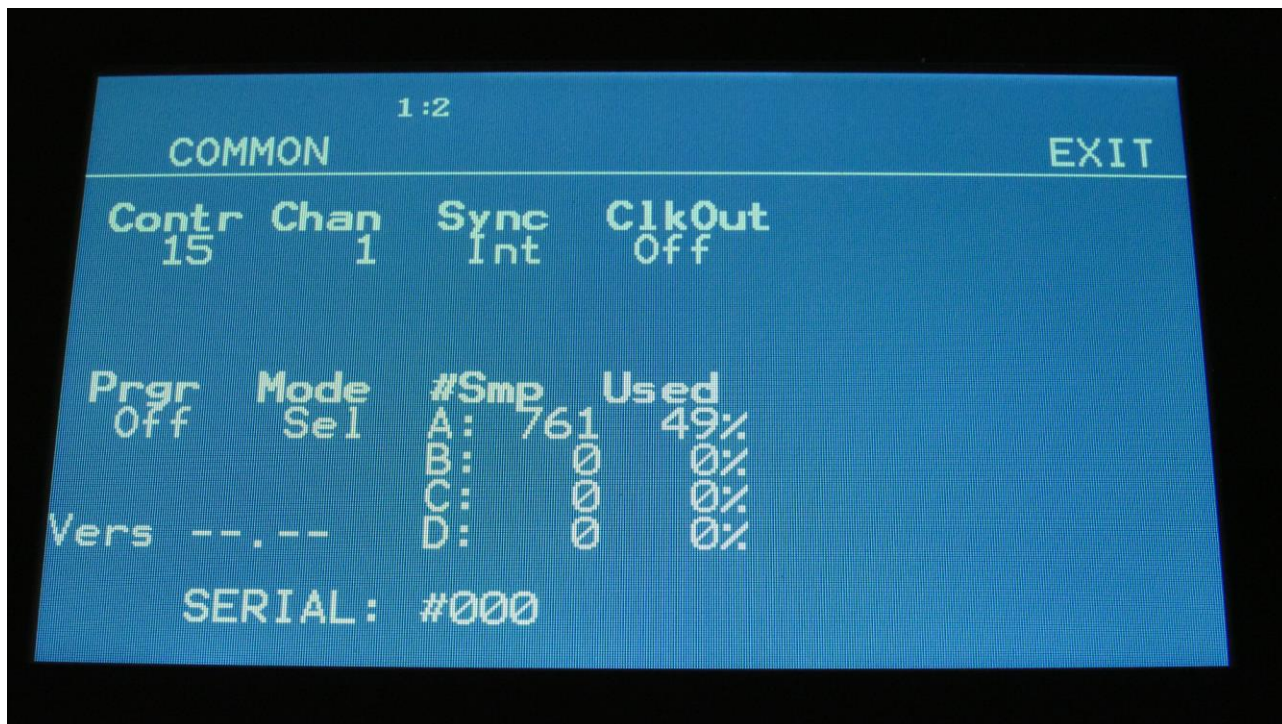
The following parameters can be adjusted on this page, using edit knob 1 to 8:

Contr: Adjusts the display contrast. This setting is automatically saved, and will be remembered after a power off.

Chan: The Zaturn global MIDI channel. All MIDI data to Zaturn will be received on this channel, if the Mode parameter is set to Sel (Explained in a moment). MIDI CC's from the Edit/Quick Edit Knobs and the Morph knob will be transmitted on this channel, if the Mode parameter is set to Sel. This setting is automatically saved, and will be remembered after a power off.

Sync: Sequencer syncronization. This setting is automatically saved, and will be remembered after a power off. Settings:
-Int: Zaturn's sequencer will be clocked internally at the rate set by the "Tempo" parameter in each preset.
-Ext: Zaturn's sequencer will be clocked externally, by MIDI clock events applied to MIDI in. Sequencer play and stop can also be controlled externally.

ClkOut: Settings: Off, On. Selects whether or not Zaturn will re-transmit MIDI clock and start/stop events to MIDI out. Even if Zaturn is syncing to an external MIDI clock source, it will re-transmit this, if this parameter is on. This setting is automatically saved, and will be remembered after a power off.

Prgr: On/Off. When switched on, Zaturn will receive MIDI program and bank changes. Bank change is MIDI CC 32.

Mode: Zaturn MIDI input mode. This setting is automatically saved, and will be remembered after a power off. Can be set to:
-Sel: The selected synth part is controlled on the Zaturn base MIDI channel.
-Omni: The selected synth part is controlled on any MIDI channel.
-OmTh: Omni Thru. The selected synth part is controlled on any MIDI channel. MIDI events are channelized to MIDI out on the MIDI channel selected on the Synth Part TRIG page.
-Mult: Multi timbral. All 16 parts works in multi timbral mode, and is controlled by the MIDI channel/key range set on each parts ZONE page.
-MuTh: Multi timbral/Thru. All 16 parts works in multi timbral mode, and is controlled by the MIDI channel/key range set on each parts ZONE page. MIDI events are channelized to MIDI out on the MIDI channel selected on the Synth Part TRIG page.

#Smp: Shows how many samples that are held in sample bank A, B, C and D.

#Used: Shows in percent how much of the sample memory of each sample bank is occupied by samplings.

In the bottom of this screen, the currently installed firmware version number is shown, and the serial number for your Zaturn.

Morph Setup

On the Morph Setup page, it is possible to set a permanent morph value, that will override the Morph knob, if you wish to always have a preset playing back in a certain morph position.

It is also possible to modulate the morph knobs, using any audio/modulation source.

From MOR page, touch MORPH to enter this page:
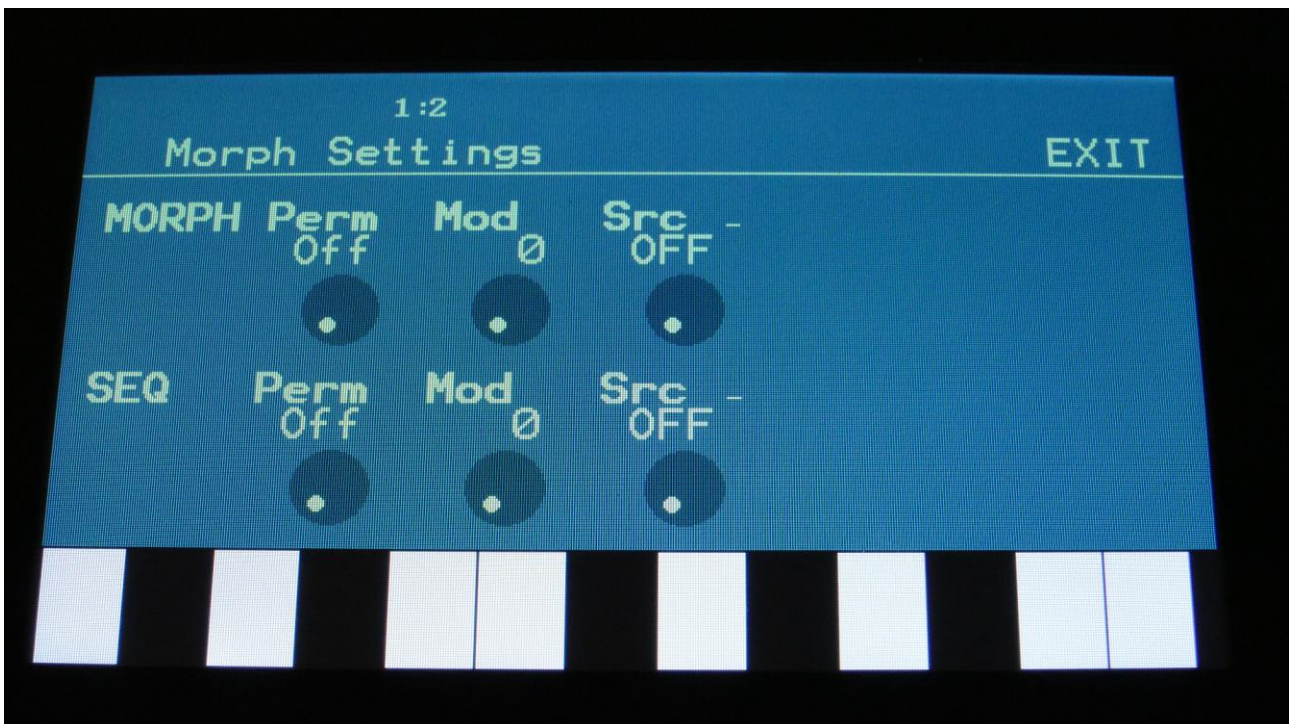
The upper row of parameters are the settings for the Morph knob, that affect the Synth Parts. The lower row of parameters are the settings for the Seq Morph knob, that affect the Sequencer tracks.

Parameters on this page:

Perm: Morph knob permanent value. Will override the value of the Morph knob, and keep morph on the permanent value plus modulation. Range: Off, 1 to 511.

Mod: Morph knob modulation amount. 0 to 511.

Src: Morph modulation source. Any available audio/modulation source can be selected.

Common Settings 2 (COM2)

On this page you can set if the part select and part mute buttons should latch or not, and a few other things.
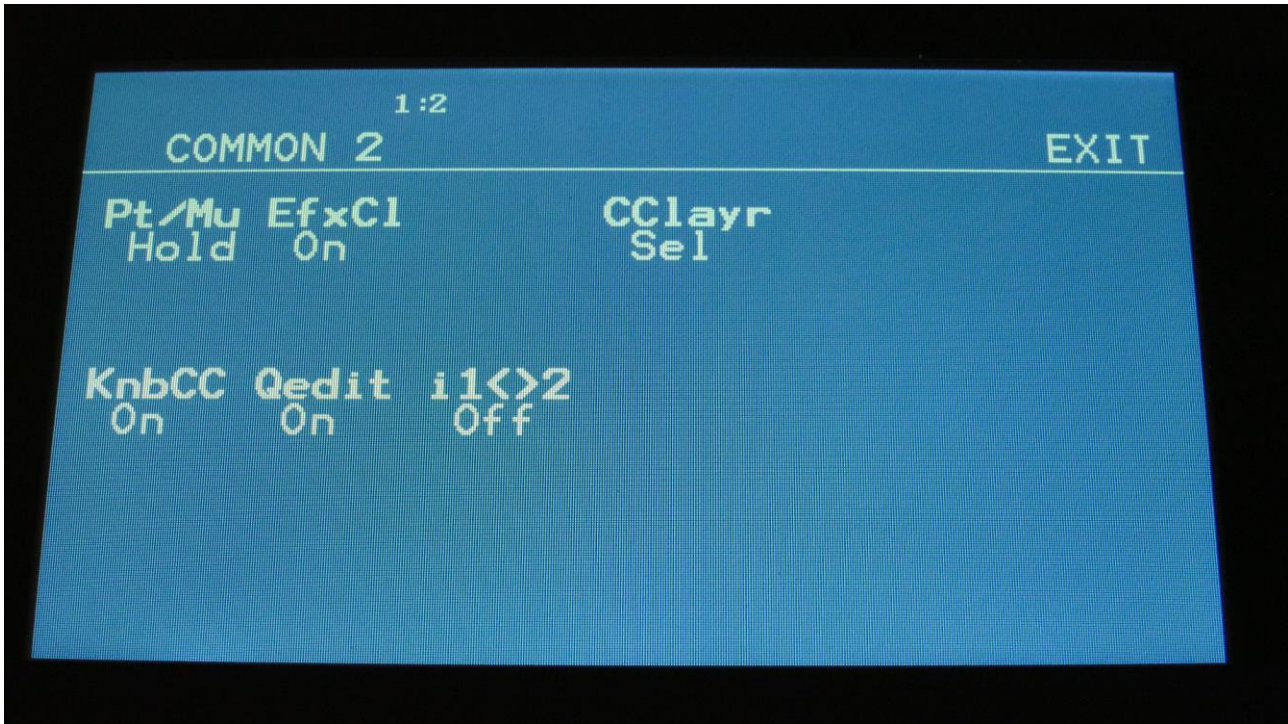
Here you can, by rotating Edit Knob 1 **(Pt/Mu)**, set the **Part/Mute** button to:
-Hold: You will have to hold the Func/Mute or Steps/Part buttons, while pushing a step button, to select or mute a part.
-Latch: When pushing and releasing either the Func/Mute or the Steps/Part buttons 2 times, the button will start to flash, and you can select or mute parts, by pushing the step buttons. It is still possible to select and mute parts, by holding any of these buttons.

EfxCL: Effects buffer clear. When Zaturn is shifting from one preset to the next, the effect RAM buffers are cleared, to avoid any fractures of the sounds from the previous preset, to sound in the new preset. This will give a tiny break in the effect processing. If you would like to avoid this tiny break, or if you do like effects like delay and granulators to keep the sounds from a previous preset, when shifting to a new one, please set this parameter to "off".

CClayr: CC control to Morph Layer. Sel, Both.
Sel: Only the Morph layer selected by the Morph Set button, will be affected by MIDI in and Sequencer CC control.
Both: Both Morph layers will be affected by MIDI in and Sequencer CC control, at the same time.

KnobCC: On, Off. When on, the 8 Edit Knobs and the 2 Morph knobs will transmit MIDI CC's to MIDI Out, when turned. When off, they will not transmit any MIDI CC's on MIDI out.

Qedit: Will switch the Quick Edit functionality of the Edit Knobs on or off. When this is set to off, the Edit Knobs can be assigned as modulation sources. When on, the Edit Knobs will not send their values to the modulation destinations.

i1<>2: When on, audio inputs 1 and 2 will be swapped.

Initialize Preset

If you would like to start out from scratch, with a completely clean preset, this is the function to use.

Please notice that the preset on the selected location are not immediately wiped out. It will not be overwritten until you save the new preset, so even though you have initialized it, it can still be recalled, if you should regret, by selecting another preset, and then select this one again, or by using the reload function.

From MOR page, touch INIT to enter this page:
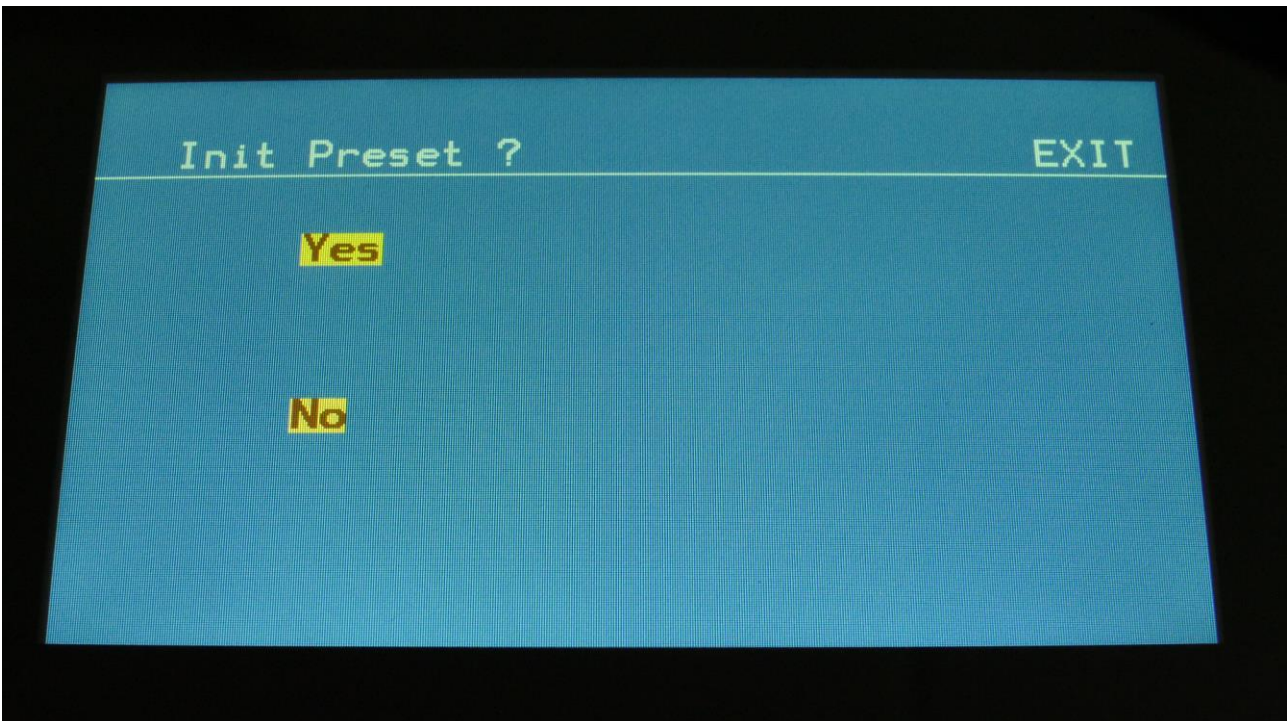
Zaturn will now ask you to confirm.

Press "Yes" to initialize the currently selected preset and return to the previous page, or press "No" just to exit, without initializing.

Parameter Snap Mode

A synth part parameters "Snap" mode are available. When this is set to "On", any synth parameter value will not be changed, when turning a knob, until it passes the original value, that the parameter was set to. This will avoid "jumps" in the sound.

On the MOR page, touch the "SNAP OFF" text. The text will now change to "SNAP ON", and the parameter snap feature will be turned on.

To turn it off, touch this text again.

Analog Filters Tune/Select

Here you can select the currently installed analog filter board, and tune these.

Selecting the installed analog filter board
If you have just exchanged the analog filter board, you might only need to tune it, if it is the first time, that you have this installed. zaTurn can remember the tunings of up to 4 different analog filter boards, so if you already have had the filter tuned, you will only have to select it.

To do this, select the installed filter board, using Edit Knob 5, touch the SEL touch button, and power cycle zaTurn.
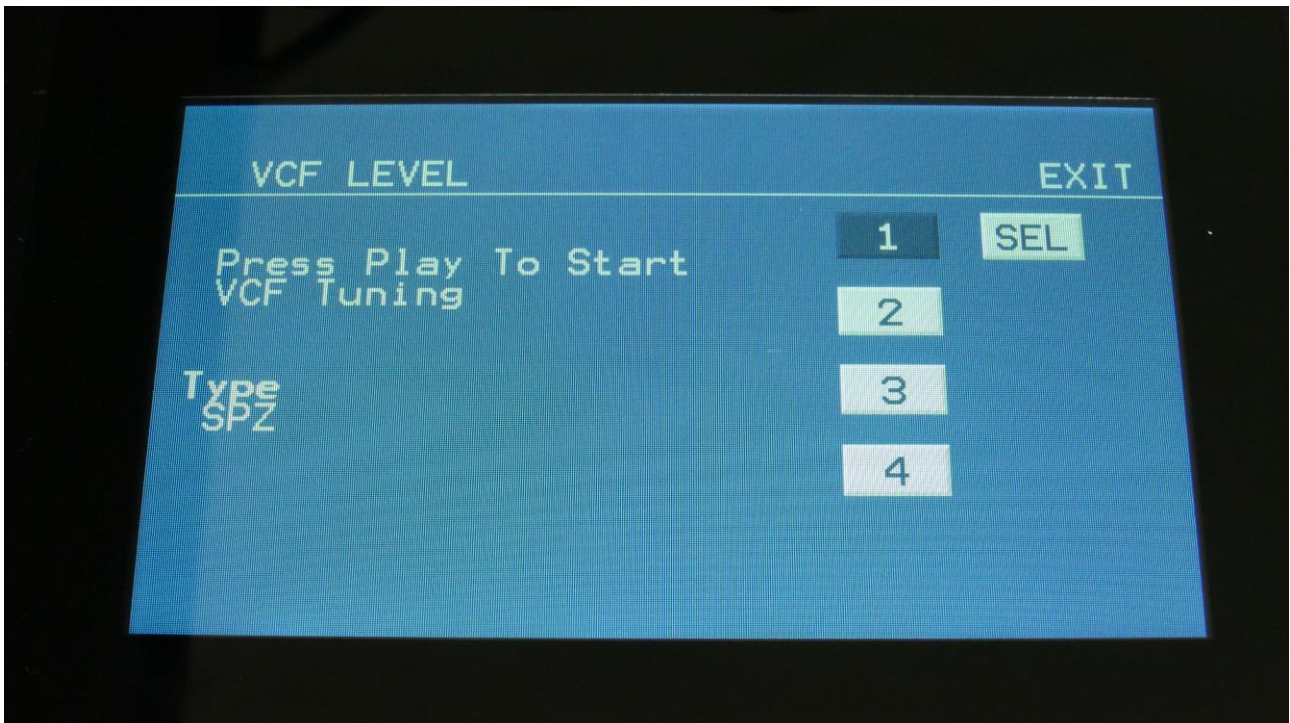
Tuning of the installed analog filter board
If it is the first time, that you have the current filter board installed, or if the presets of your Zaturn starts to sound very different from, what they are supposed to, its analog filters might need to be tuned.

Before you start the analog tuning process, you should leave your Zaturn on, for at least one hour, and then enter this page.

When you have entered this page, select the installed filter board, using Edit Knob 5, and then push the Play button, to start the tuning process.

Zaturn will now automatically perform the tuning process, and jump back to the Setup main page, when it is done.

The whole process will take a couple of hours. Please don't interrupt Zaturn while it is tuning. This might cause it to malfunction.

FLASH Memory Check

From MOR page, touch FLASH to enter this page:
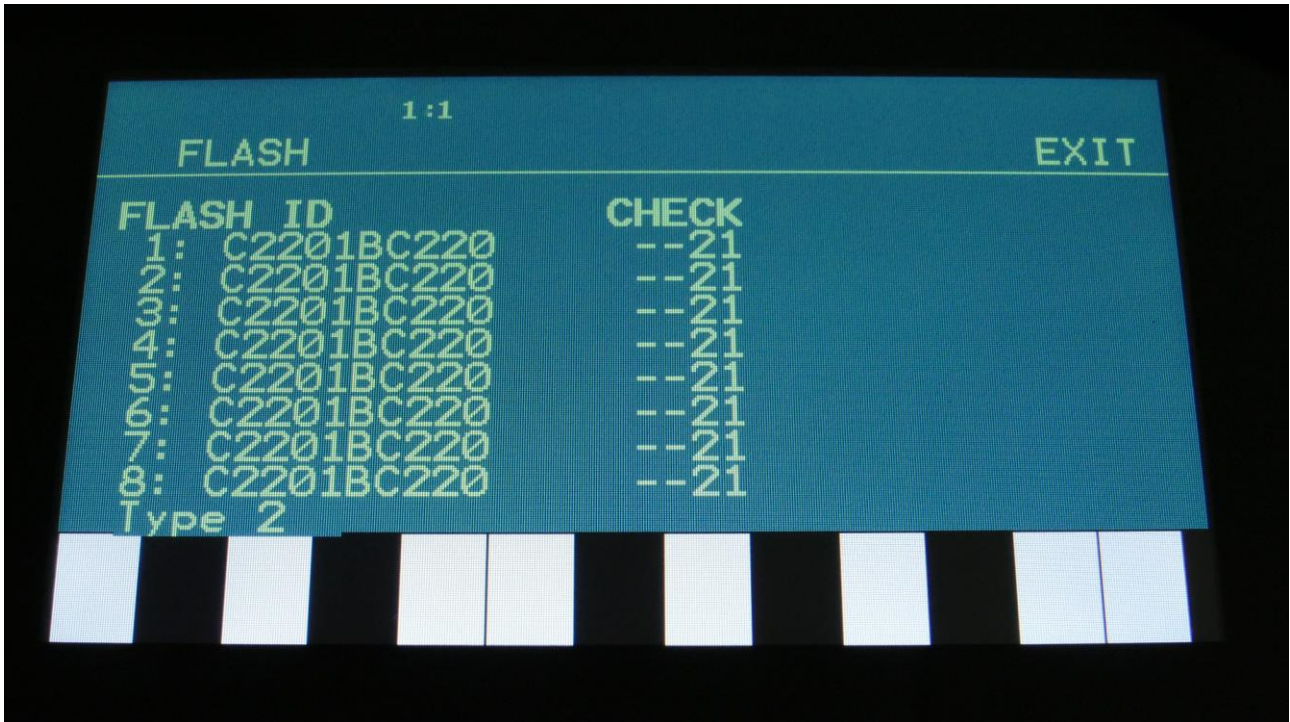
On the 193 min. model, this page should look exactly like on the picture. On models with less sample memory, the numbers will slightly differ, and it might say Type 3 in the bottom.
If you should ever experience any issues with missing samples or presets, please take a picture of this screen, and email it to Gotharman's.

Delete a Sample Bank

It is possible to completely erase the sample banks. Please think about it, before you do that, and back up your samplings as described in the USB section later in this manual, since if you don't have a backup, it will not be possible to recover your samplings again.

From MOR page, touch DEL SmpA, to erase sample bank A, or touch any of the 3 other choices, to erase the respective sample bank.

Zaturn will now ask:
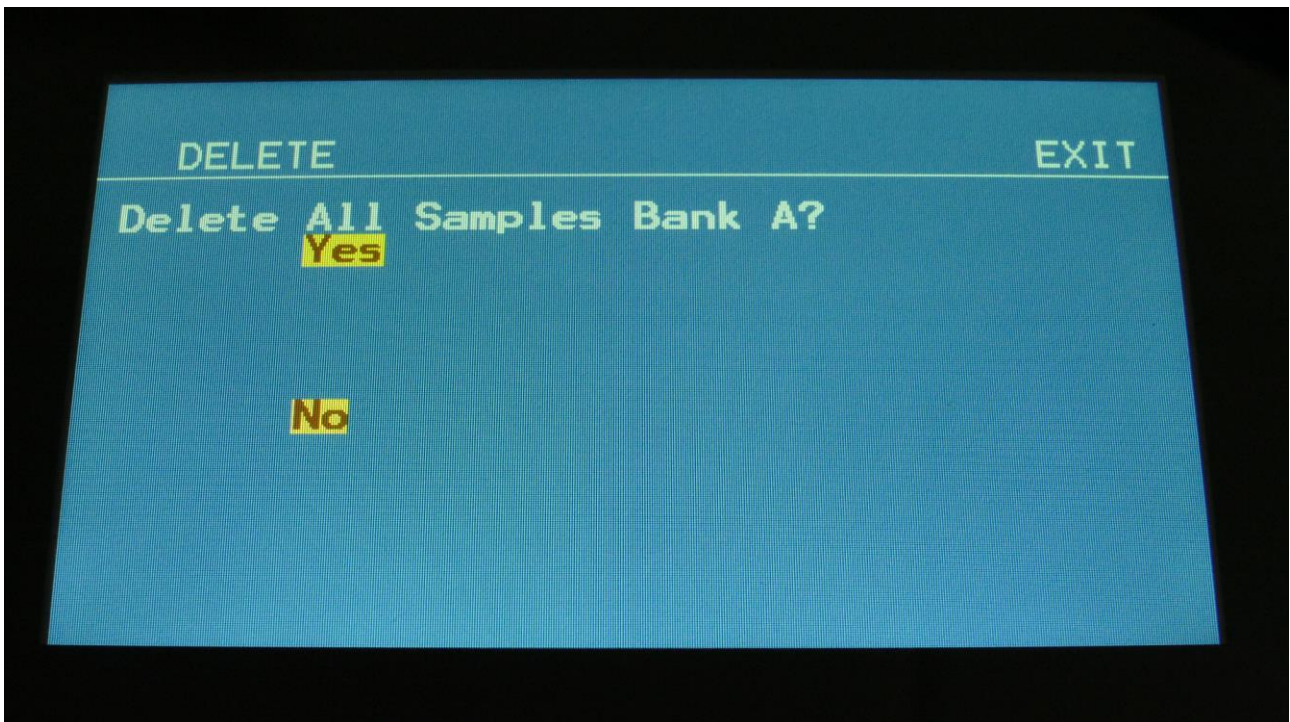
If you are really sure, that you absolutely have to do this, touch "Yes" to start the erase. The sample bank will now be completely wiped out. While it is being erased, Zaturn's 16 step buttons will run a sequence. When the step buttons shuts off, the erase has been done, and Zaturn will return to the MOR page.

If you don't want to do this anyway, touch "No" to exit.

Delete all Presets and Songs

It is possible to completely erase all presets and songs. To do that, if you are really sure, that you would like to, from the MOR page, touch DEL Prs.

Before you do this, please back up your presets as described in the USB section later in this manual, since if you don't have a backup, it will not be possible to recover your presets again.

Zaturn will now ask:
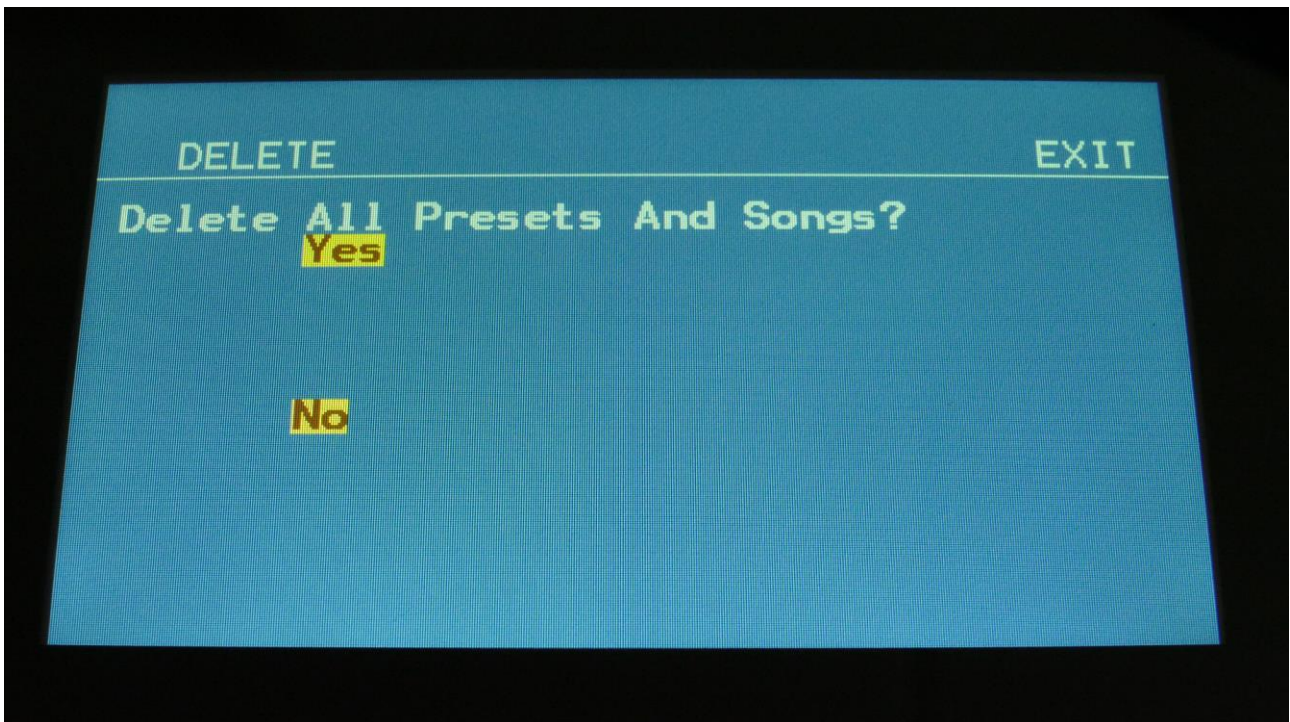
If you are really sure, that you absolutely have to do this, touch "Yes" to start the erase. All presets and songs will now be completely wiped out. While these are being erased, Zaturn's 16 step buttons will run a sequence. When the step buttons shuts off, the erase has been done, and Zaturn will return to the MOR page.

If you don't want to do this anyway, touch "No" to exit.

C.P.

From MOR page, touch C.P. to enter this page:

This is a service page, and does not really have any practical user functionality, except for the "CPU" touch button. If you touch this, so that it turn dark blue, Zaturn will show how much CPU power is used, on the Preset Select page.

Preset/Song Mode

Touch this to toggle between preset mode and song mode. Song mode is described later in this manual.

Display Update Rate

The display has been set to the maximum possible update rate. I have been testing this as much as possible, and did not discover any display freezes.

If you should discover any display freezes, go to the MOR page:

Touch the text: "DISP:FAST". It will now change to "DISP:SLOW" and go back to the slower display mode, as before.

Please report any display freezes to: info@gotharman.dk .

Save Preset

When you have created a new preset, it should be saved for later recall. If you do not save your presets, they will be lost forever, as soon as you select another preset, or turn off your Zaturn.

A preset that is saved on Zaturn contains all the data previously described in this manual:
-All sequencer data
-All synthesizer modules settings
-All effects settings

From the Preset Select screen, touch the EDIT field, to enter the Synth Modules page:
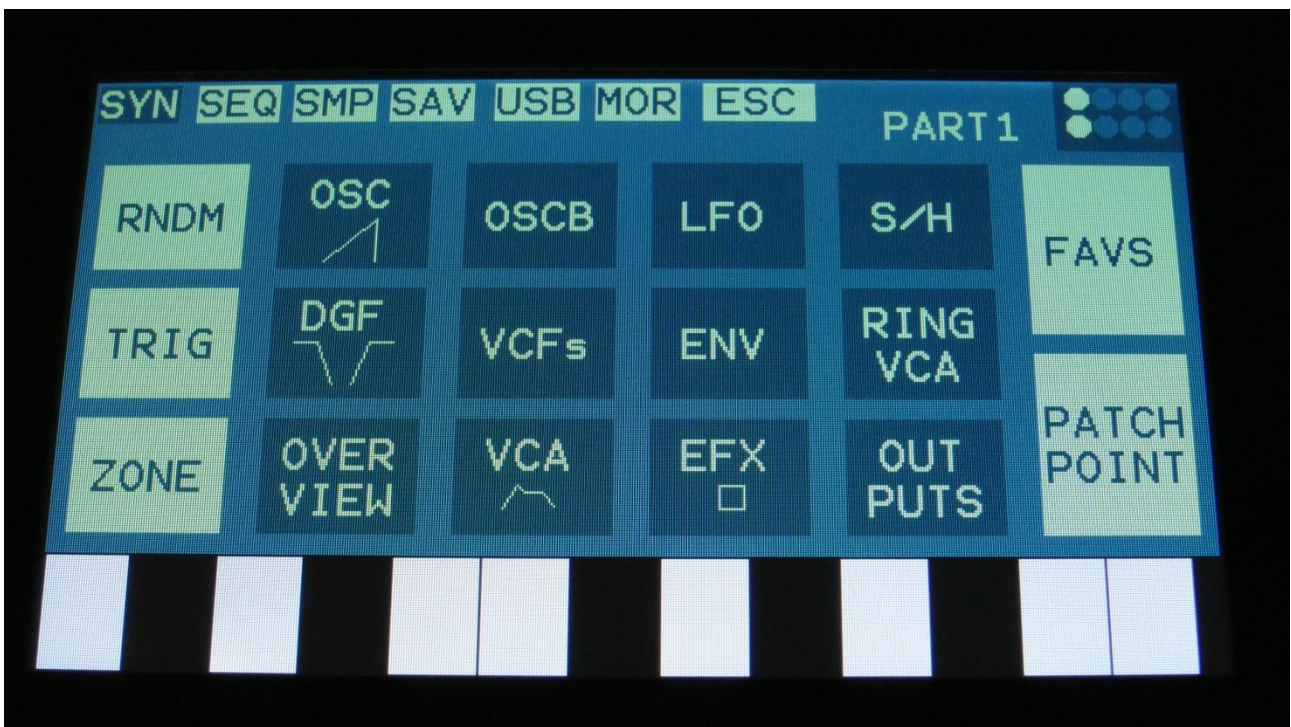
On the navigation bar at the top of this page, touch SAV.

OR: Hit the Func/mute button, so it lights up, and hit step button 7, marked "Save".

You should now enter this page:

Touch the preset location that you would like to save your new preset to. If it is not shown, touch PREV and NEXT to reach it.

Preset number and name is shown for presets that are already saved. If you save your new preset on such a location, the old preset will be overwritten. On preset locations, where a preset has not yet been saved, the name will be shown as "<empty>".

When you touch the preset location, that you would like to save your preset to, you will enter this page:
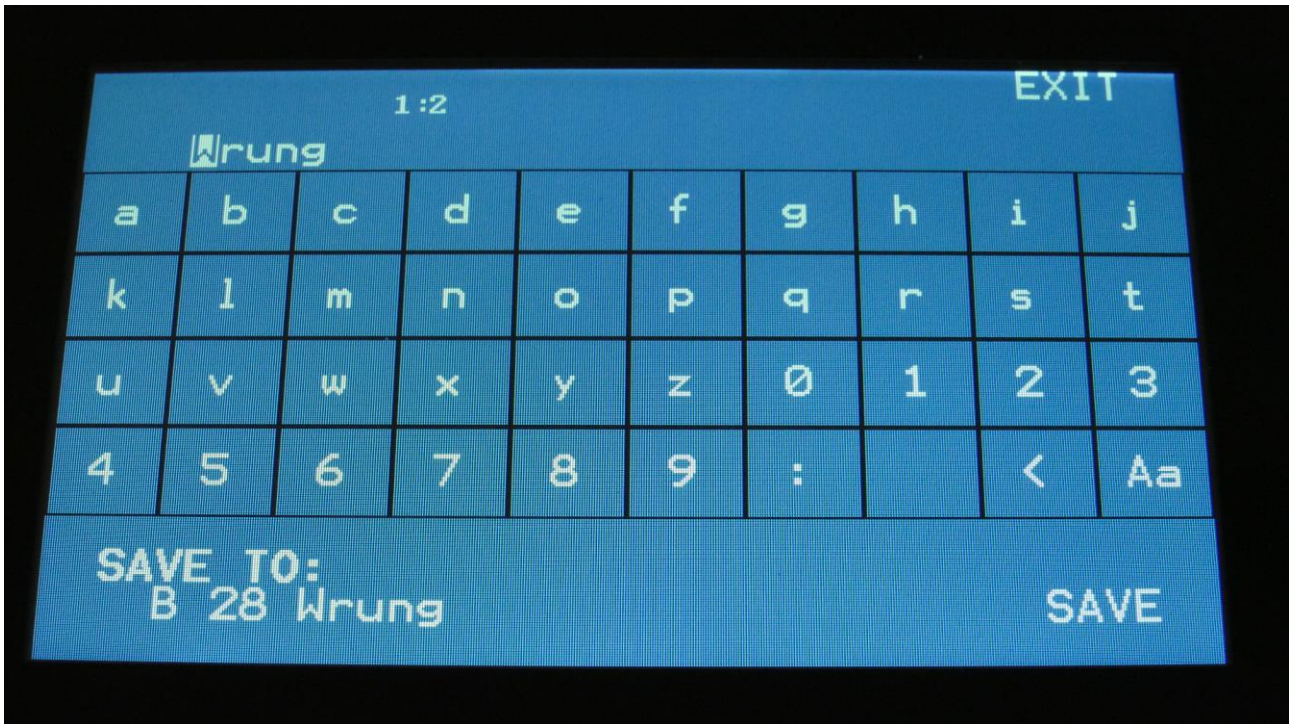
Type in the name for your preset. This can be up to 16 characters long.
"Aa" will switch between uppercase/lowercase letters, and numbers/signs:
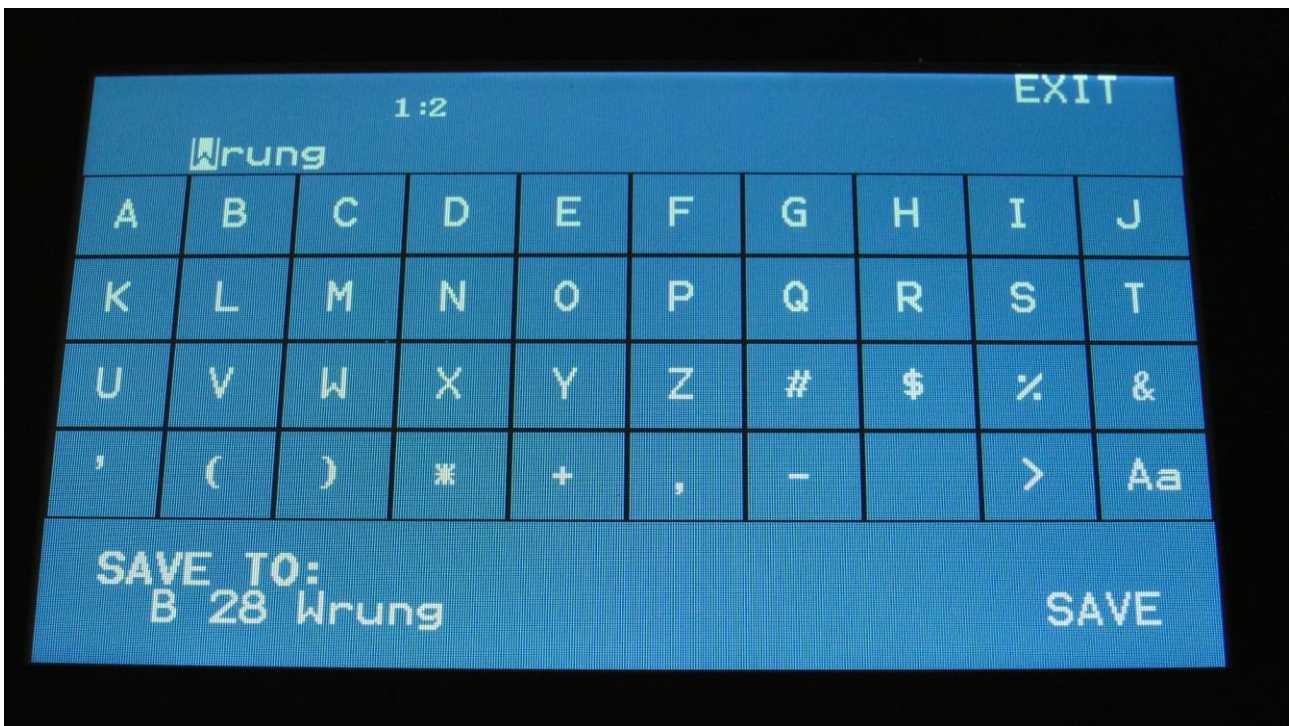
"<" will move the cursor back, for correcting characters, ">" will skip characters.

Touch SAVE when you are done. Your preset will now be saved, and Zaturn will exit from the save pages.

Song Mode

It is possible to arrange chained playback of Presets in 1024 Song locations.

Each Song can have up to 128 steps. For each Song step a Preset can be selected, it can be set how many times track one of the preset should play back, until it advances to the next song step, and tracks can be muted/unmuted.

If the last step of the Song is set to "End", playback will stop, when the Song has played back the last preset. If the last step of a Song is set to "Loop", it will jump back to step 1, and continue playback, after the last preset has played.

Songs can be realtime recorded, simply by hitting the "Rec" button on the song main page, then the "Play" button, and then play back the presets that you want in your song.

Songs can also be recorded/edited by putting the Preset numbers and number of times to play back, into a list.

Any presets can be used in any songs.

In song mode you still have access to edit all preset synth parameters, in the currently playing preset, but you can't immediately save any changes you make, since in song mode, you can only save the song.

Accessing Song Mode

If you would like to make a new song from scratch, it can be a good idea to select the preset you would like to have on the first song step, from the preset select page, before you enters song mode. This is not something you have to do, I have just experienced, when testing this, that it makes things a bit easier. When you select a non-recorded empty song, the last selected preset will automatically be placed on song step 1.

From the Preset Select page, hit the EDIT field.

On the navigation bar at the top of the screen, touch MOR.

In the far right row, you will find the text PRS. Please touch this, after making sure, that the sequencer is stopped.

```
SYN SEQ SMP SAV USB MOR ESC
COMMON  SNAP OFF        C.P.
MORPH   VCF TUNE        SONG
COM2      FLASH       DISP:FAST
          DEL SmpA   DEL SmpC
          DEL SmpB   DEL SmpD
INIT      DEL Prs    TJEK
```

Now PRS turns into SONG, and Zaturn are in song mode. If you would like to go back to preset mode, just touch SONG.

The Song Edit Page

To enter the Song Edit page, just touch SEQ on the navigation bar at the top of the MOR page:

On the Song Edit page, you have an overview of the programmed song steps, and the possibility of editing these.

By touching any of the song steps, you can select this step for editing. The selected step is shown, boxed in white. The little yellow square between the step number and the preset name, is showing what song step is currently being played back.

For each song step, the song step number is shown, the preset number and name, and the number of times track 1 will play back (under the X).

To edit a song step, turn edit knob 1 to select <End>, preset bank A to P, or <Loop>. <End> will make song playback stop, when it reaches that step, <Loop> will make it jump back to song step 1, and start all over again.

Turn edit knob 2 to select the preset number, and edit knob 3 to select the number of times, you want track 1 to play back, for that step.

Push and hold the Func/Mute button, to mute/unmute tracks on the selected song step, via the step buttons. Only tracks that are unmuted in the preset itself, can be muted by the song sequencer.

8 song steps are shown at a time. Touch the arrows to select the previous or next 8 song steps. The total number of song steps is 128.

Touch EXIT to exit from the Song Edit page, and touch REC to start song realtime recording. This will be explained very soon.

The Song Select Page
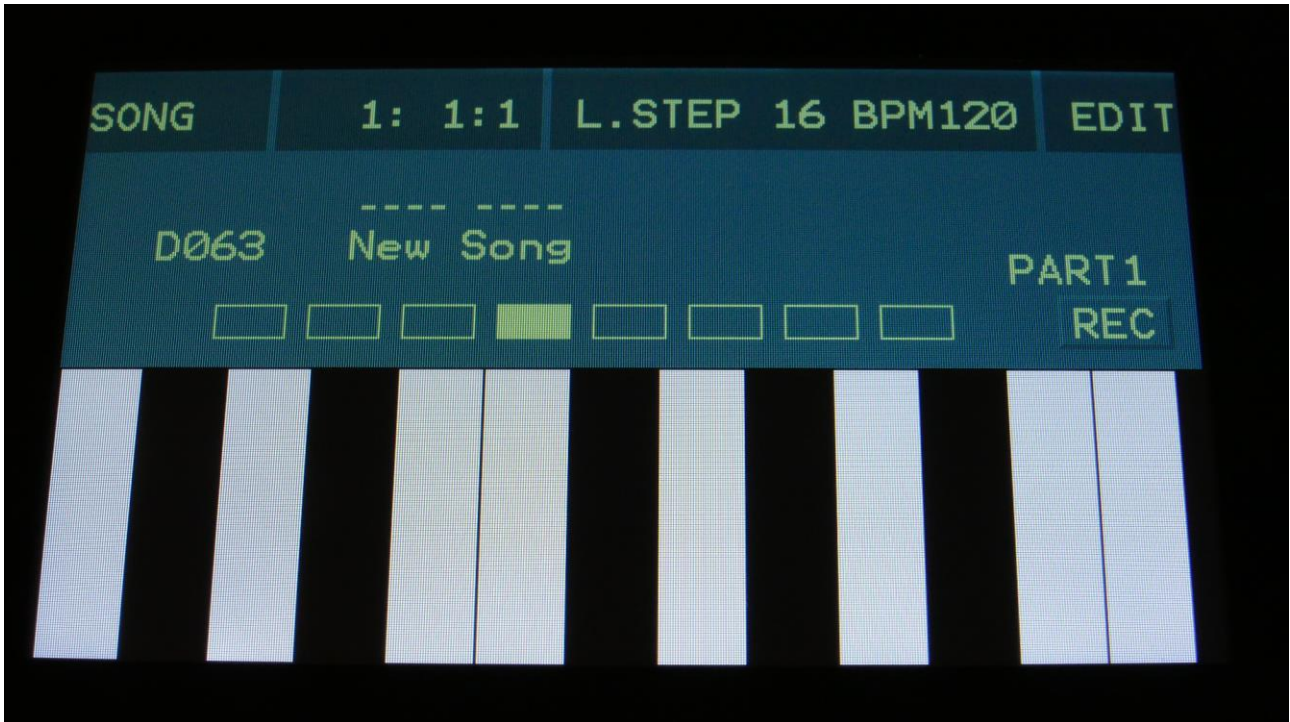
When you, in song mode, exit from the Edit Groups pages, you will exit to the Song Select page, instead of the Preset Select page. This reads out "Song" just above the song number and name, instead of the "Preset", to make sure that you know where you are.

On the top of the Song Select page, you might have noticed, that the sequencer position ruler has gained an extra digit. The first digit of this now shows the song step number, that is currently being played back. The 2 other digits is still showing the bar and the beat of the preset, that is currently playing back.

Other changes to this, compared to the Preset Select page, are that the field in the upper left corner, that was used to select preset with, now has been renamed to SONG, and is used to select song with. It is only possible to select another song, while the sequencer is stopped.

Besides from these changes, everything is the same as in preset mode. You can still edit the synth module parameters of the currently playing preset.

Selecting a song:

Make sure that the sequencer is stopped.

Touch the "SONG" field. A list of 5 songs near the currently selected song, will now appear:
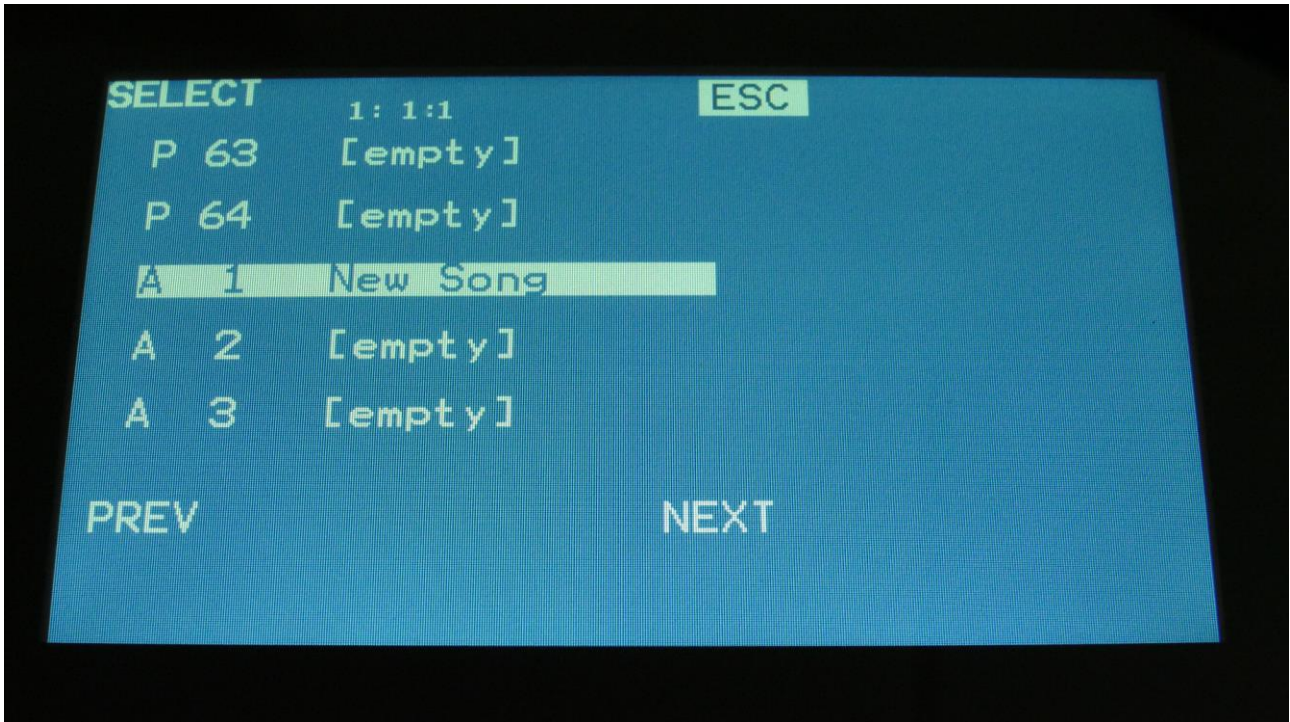
Touch "PREV" or "NEXT" to view the previous or next 5 songs, and finally touch the song name of the song you would like to select. 1024 songs can be selected, from A01 to P64.

Zaturn will now jump back to the main Song Select screen, and show the name of the newly selected song.

When Zaturn is turned off, it will remember which song was selected, and start up with this, when turned on again. It will also remember if it was in preset or song mode, and start up in the same mode.

Song Realtime Recording
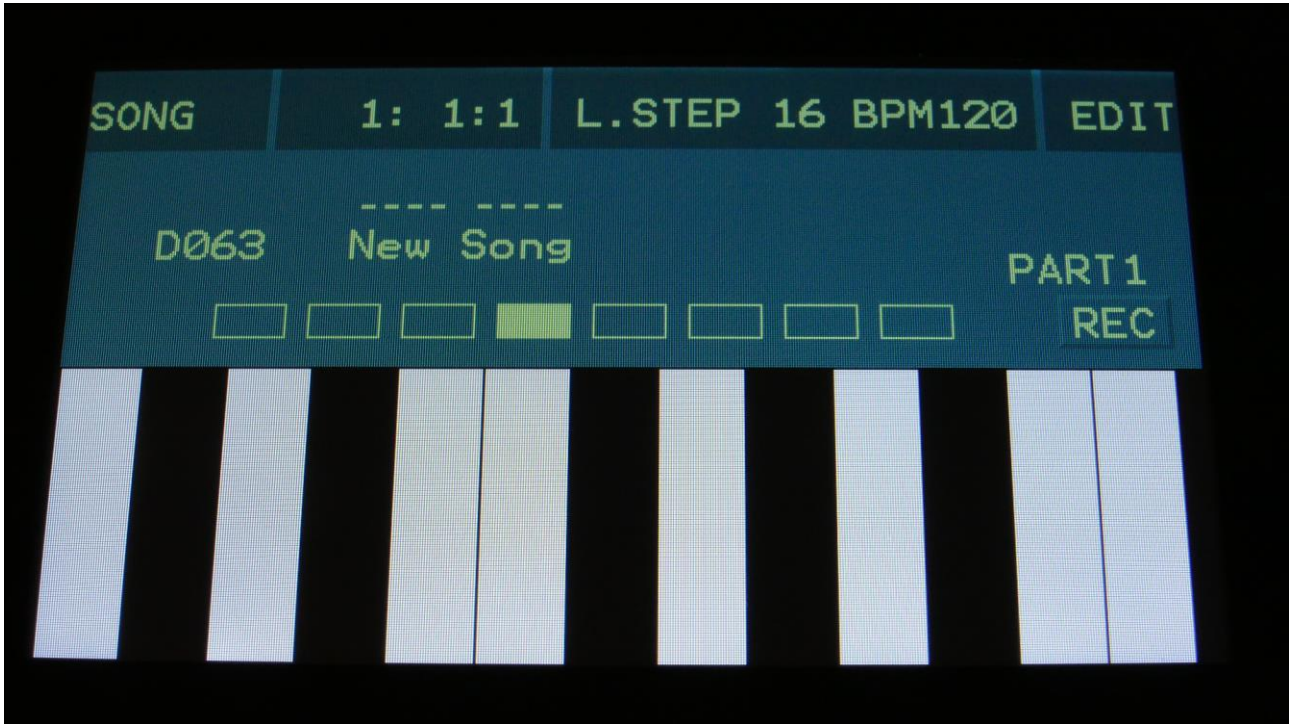
On the Song Select page, select the song you would like to record. 1024 songs are available, from A00 to P64.

Now go to the song edit page.

Make sure that the sequencer is stopped, and push the **"REC"** button, so it turns red.

Now exit to the Preset/Song select screen.

Zaturn will now show the Preset select page. The REC indicator on the preset select page, has now turned red, indicating that Zaturn is in recording mode. Song realtime recording can also be switched on or off, by touching the REC indicator.

If you selected an empty song, the last preset you selected, before you jumped to song mode, will be shown. If you selected a song that was already recorded, the preset on the selected step of this song will be shown.

Now, if the shown preset is the preset you would like to have on step 1 of your song, you can proceed recording your song, by pressing the Play button.

If you would like another preset on step 1 of your song, please select this, using the preset select field, and then push the Play button, to start the recording of the song.

The preset you selected will now start to play back.

From here you can now select other presets, at the time you want these to play back in your song.

Preset changes will only be registered and recorded, when track 1 of the currently playing preset reaches its end and starts over. When the changes has been registered, the song step number in the position ruler will increment by one.

While any preset is playing back, it is possible to mute/unmute the sequence tracks. Push and hold the Func/Mute button, and switch tracks on or off, using the step buttons.
To advance to the next song step, to have other tracks of the same preset muted/unmuted, simply reload the preset, by pushing and holding the Morph Set button, while pressing the Play button.

When you are done changing presets, and you think that your song is ready, hit the Play button to stop song recording.

Go back to the song edit page, and touch the REC button, so it turns grey again, to exit from song realtime recording, or simply exit to the preset/song select page, and touch the REC indicator.
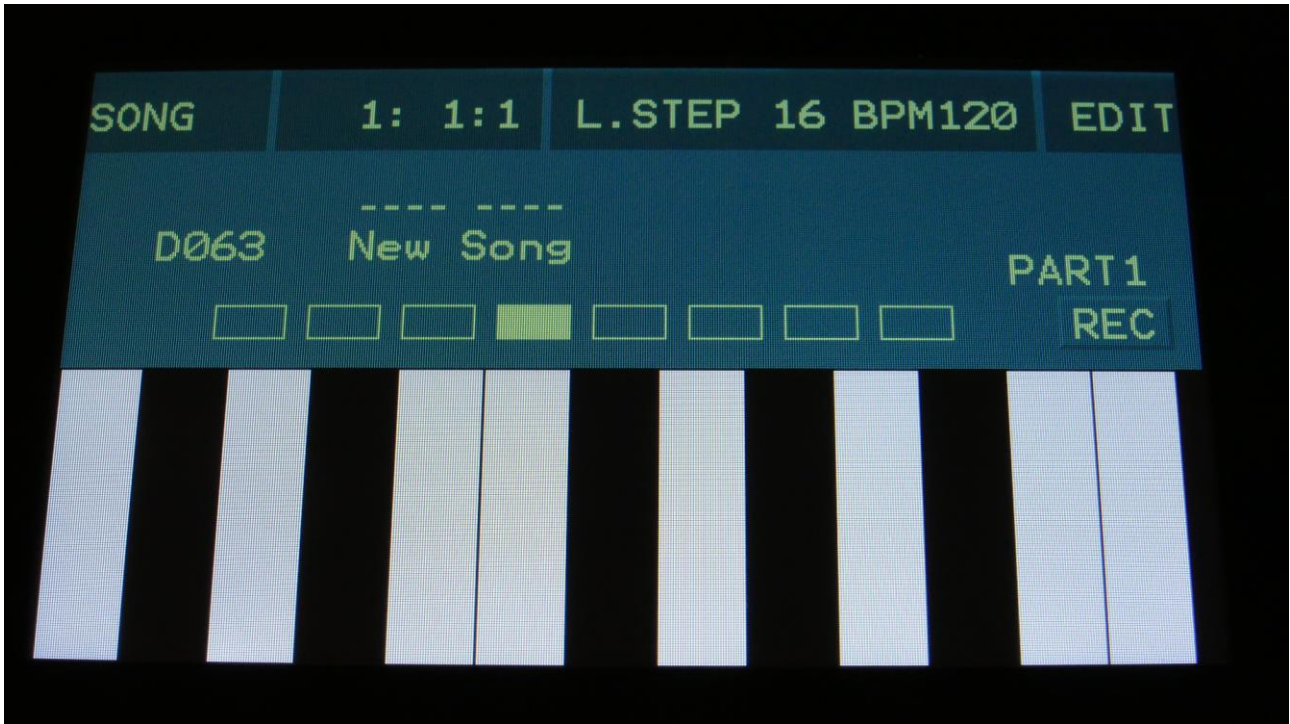
To listen to the song you have just created, just hit the Play button.

If there are anything you would like to edit, go to the Song Edit page, as described earlier.

If you would like to keep your work, you should save your new song.

Save Song

Zaturn songs are not saved within the presets, so they must be saved separately. To do so, when in song mode, from the song select page, touch the EDIT field to enter the Synth Modules page:
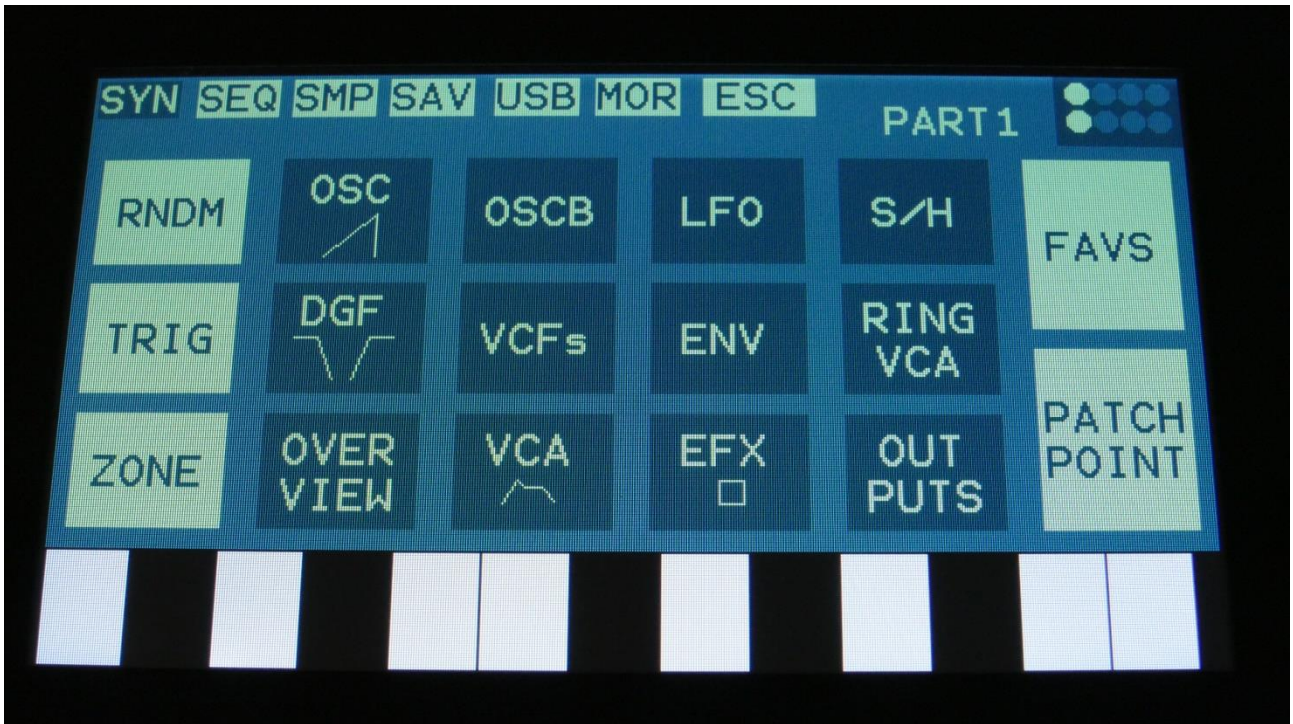
Touch SAV.

You should now enter this page:

Touch the song location that you would like to save your new song to. If it is not shown, touch PREV and NEXT to reach it.

Song number and name is shown for songs that are already saved. If you save your new song on such a location, the old song will be overwritten. On song locations, where a song has not yet been saved, the name will be shown as "<empty>".

When you touch the song location, that you would like to save your song to, you will enter this page:

Type in the name for your song. This can be up to 16 characters long.
"Aa" will switch between uppercase/lowercase letters, and numbers/signs:
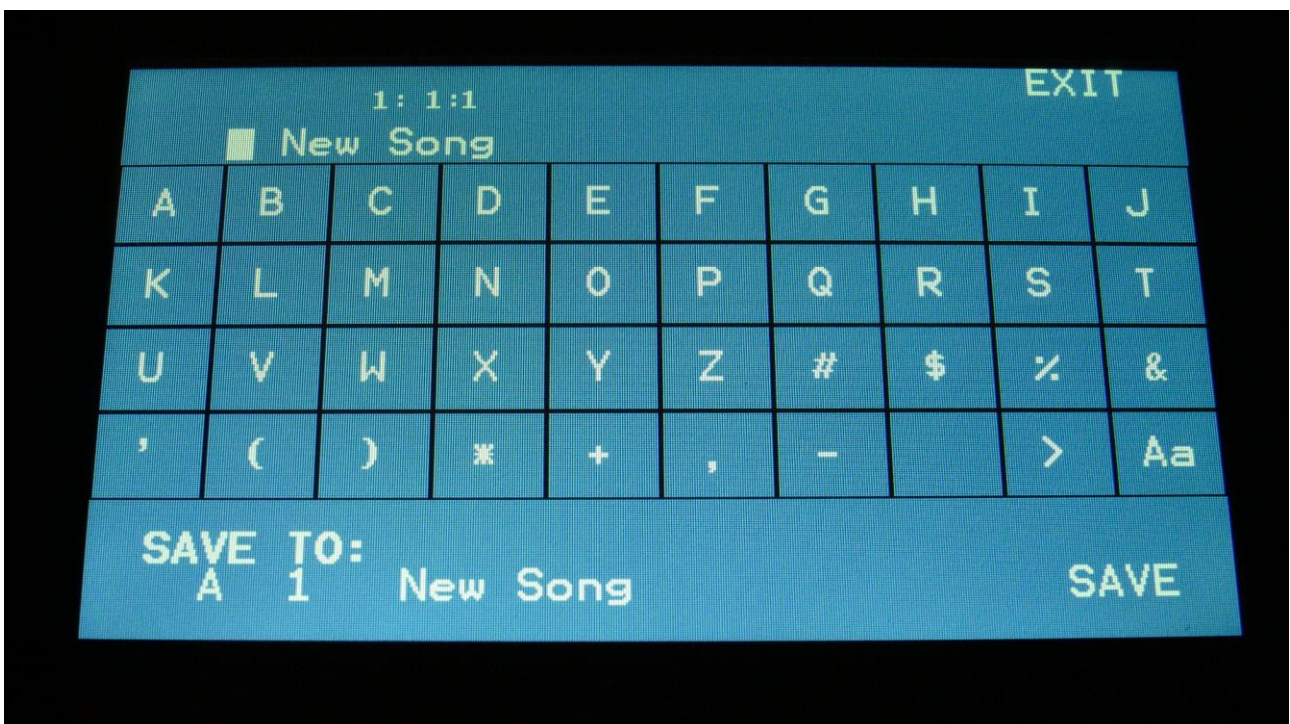
"<" will move the cursor back, for correcting characters, ">" will skip characters.

Touch SAVE when you are done. Your song will now be saved, and Zaturn will exit from the save pages.

Initializing a Song

If you would just like to start all over with an empty song, it is possible to initialize it.

To do so, in song mode, access the MOR page:

From here, touch INIT.
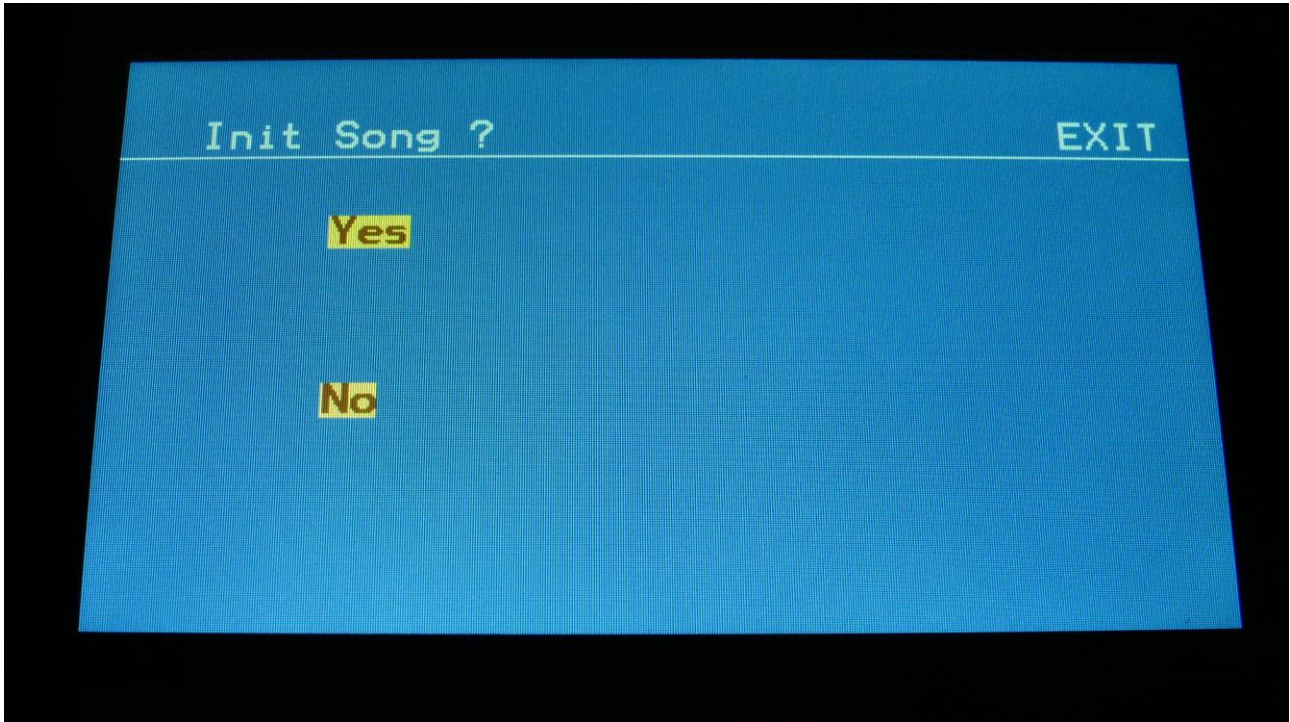
Zaturn will now ask you to confirm.

Press "Yes" to initialize the currently selected song and return to the previous page, or press "No" just to exit, without initializing.

Please notice, that when initializing a song, this is only done in Zaturn's temporary song RAM, NOT on the FLASH memory, so if you did this by mistake, or you regretted doing it, you can always recall the song, by selecting another song, and select this again. Then nothing will be lost. It is not until you save the song, that permanent changes is done.

Copy/Paste

On Zaturn it is possible to copy morph layer A, B or the parameter settings at the position of the Morph knob. It is possible to copy one or two layers of the whole preset.

Whatever is held in the copy buffer can then be pasted to another preset, as the whole preset, as a single group or as single modules.

If you, for instance, copy a whole preset, and then goes to a specific filter page to just paste the filter settings, you will be able to select which filter the settings should be copied from.

Copy: Pushing this function button, will make Zaturn copy the settings of the complete currently selected. It is then possible to Paste the settings of separate modules, using the Paste button.

Paste: When you are located at a page, for which the copy buffer is holding settings for, the paste function button will light up. If you are located on the synth module or sequencer pages, a page will pop up, asking where to paste from and to. If you are located on the Synths Blocks page or the Part Overview page, a whole selectable Group will be pasted. If you are located at any other pages, the whole copied preset will just be pasted to the currently selected one.
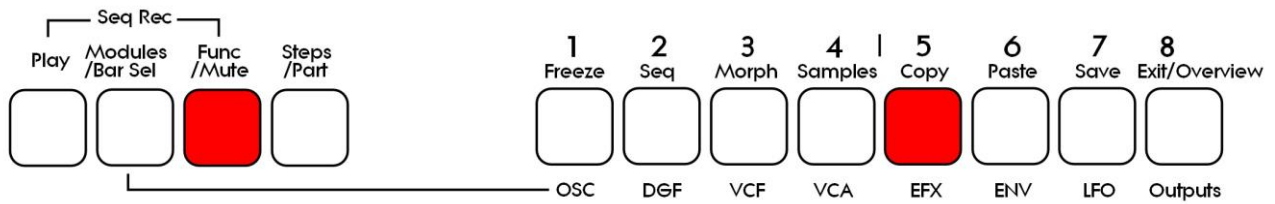
When you are located at any page, push and release the Func/Mute button, so that it lights up, to enter the function buttons. Now hit step button 5 (Copy).

The display will now show some instructions:
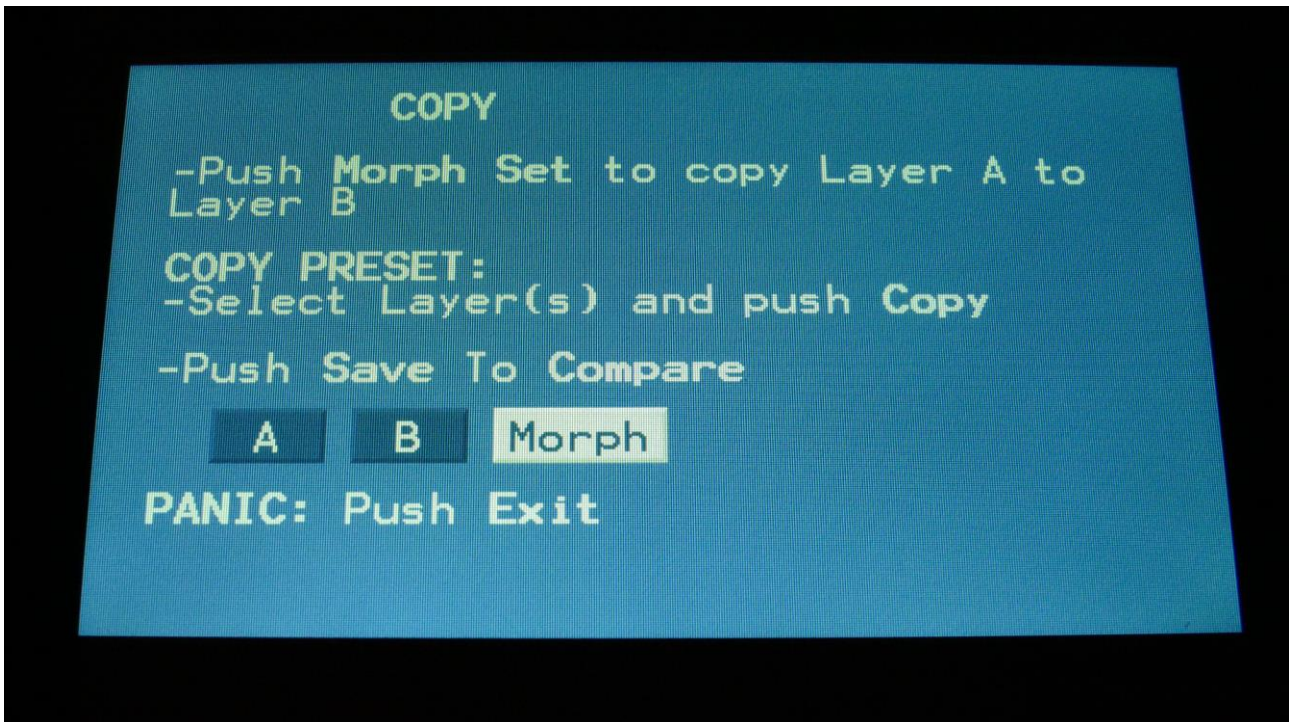
It will tell you how to copy layer A to layer B, and right below this, it will tell you, what it will copy. Zaturn will always copy the whole preset.

Now select/deselect the desired layers, by touching the "A", "B" and "Morph" touch buttons. If a layer button is dark blue, it means that this layer will be copied, if it is white, the layer will not be copied. It is only possible to copy either layer B or the morphed layer. It is not possible to copy both of these at the same time. Layer A can be switched on or off independently of the B/Morph selection. If 2 layers are copied, Zaturn will also paste to 2 layers. If only one layer is copied, Zaturn will paste to the layer selected by the Morph function button.
To copy, hit step button 5 (Copy) again.

Now, when the function buttons are active (the Func/Mute button lights up), every time you enter a page, where the copy buffer holds something that can be pasted, step button 6 (Paste) will light up.

To paste something, navigate to the desired page, where you would like to paste the settings. Make sure that step button 6 (Paste) lights up. Hit step button 6 (Paste).
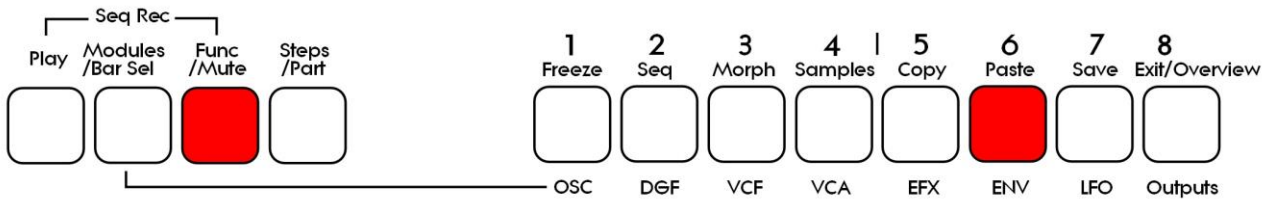
If you are located on any of the Synth Modules edit pages, a page will pop up, asking which module and Group to copy from (i.e. Group A to D). Select the desired module and Group, by rotating Edit Knob 5, and hit the Paste button again, to paste. It is only possible to select the module number, for modules which are represented by multiples, like Oscillator 1 and 2, LFO 1 to 4 etc. For other modules, it is only possible to select the source group.
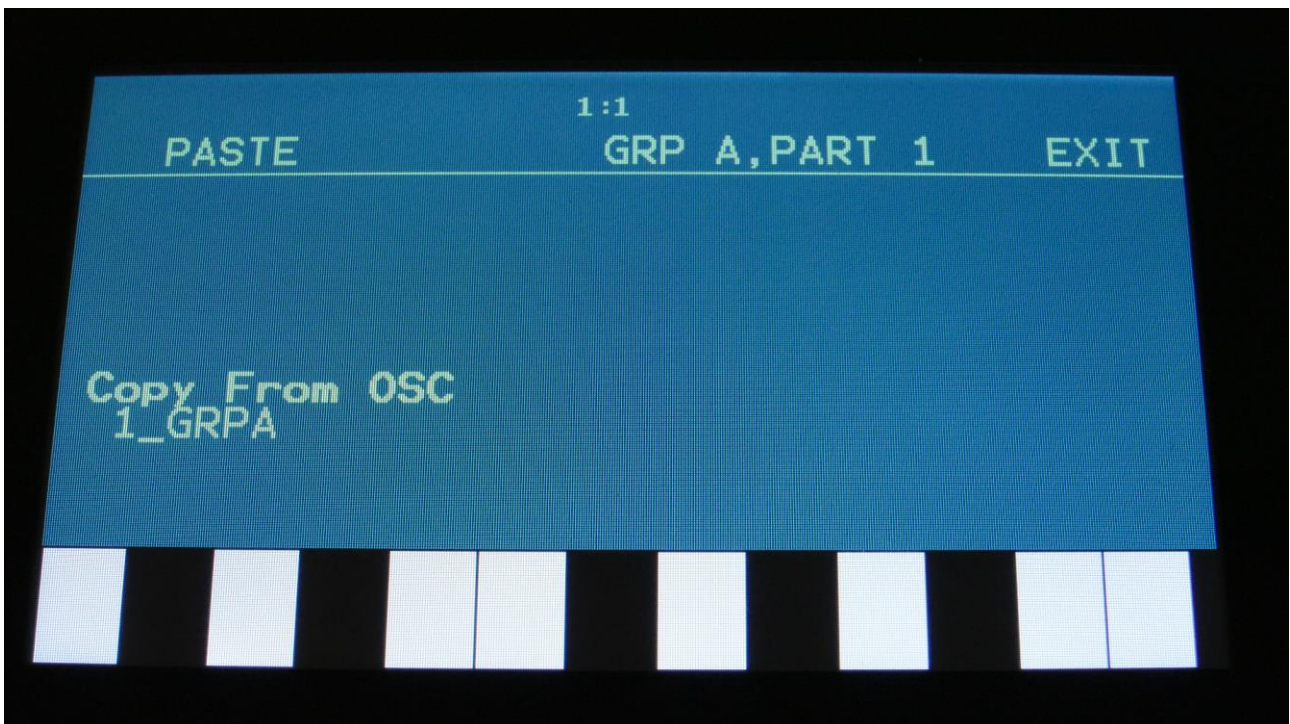
When pasting on the Synth Blocks page or the Part Overview page, a page will also pop up, asking which Group to copy from (i.e. Group A to D). Select the desired Group, by rotating Edit Knob 5, and hit the Paste button again, to paste.
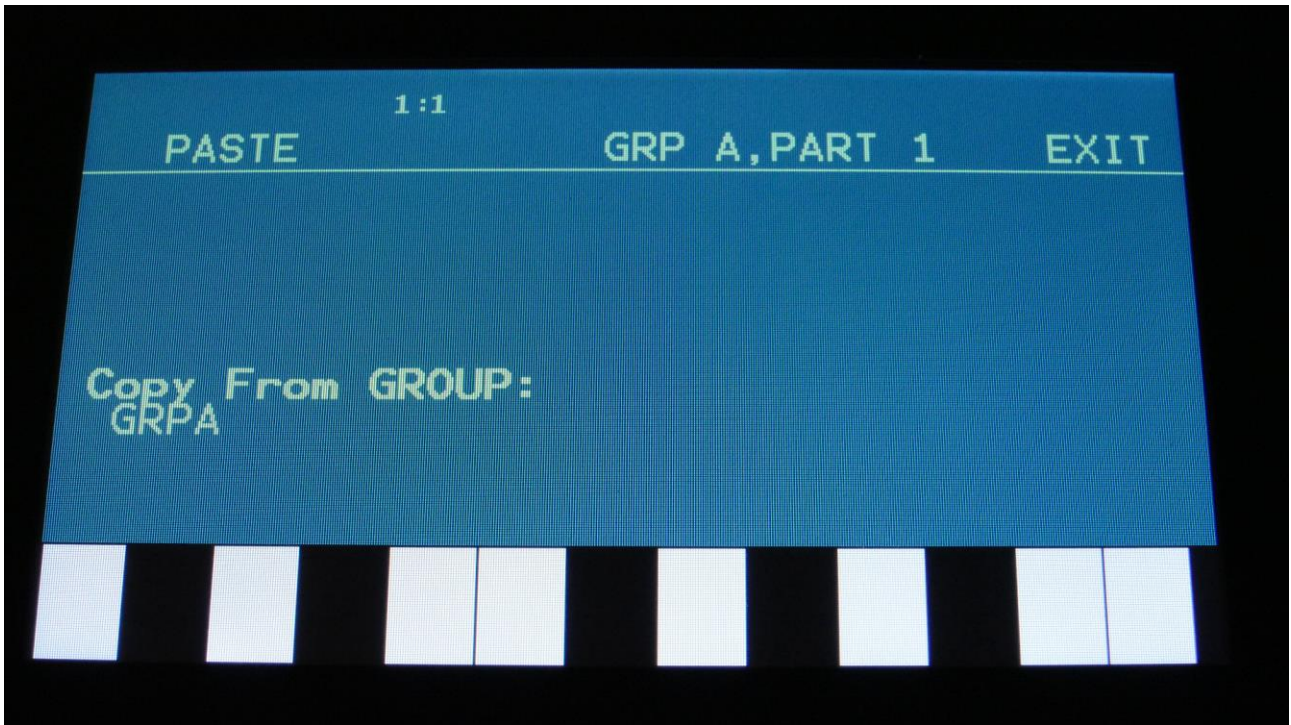
Sequencer Steps Copy/Paste

It is possible to copy/paste a specific range of steps, from any location of a sequencer track, to any location of any track.

From any page, push the Copy function button (step button 5), to copy the whole preset.
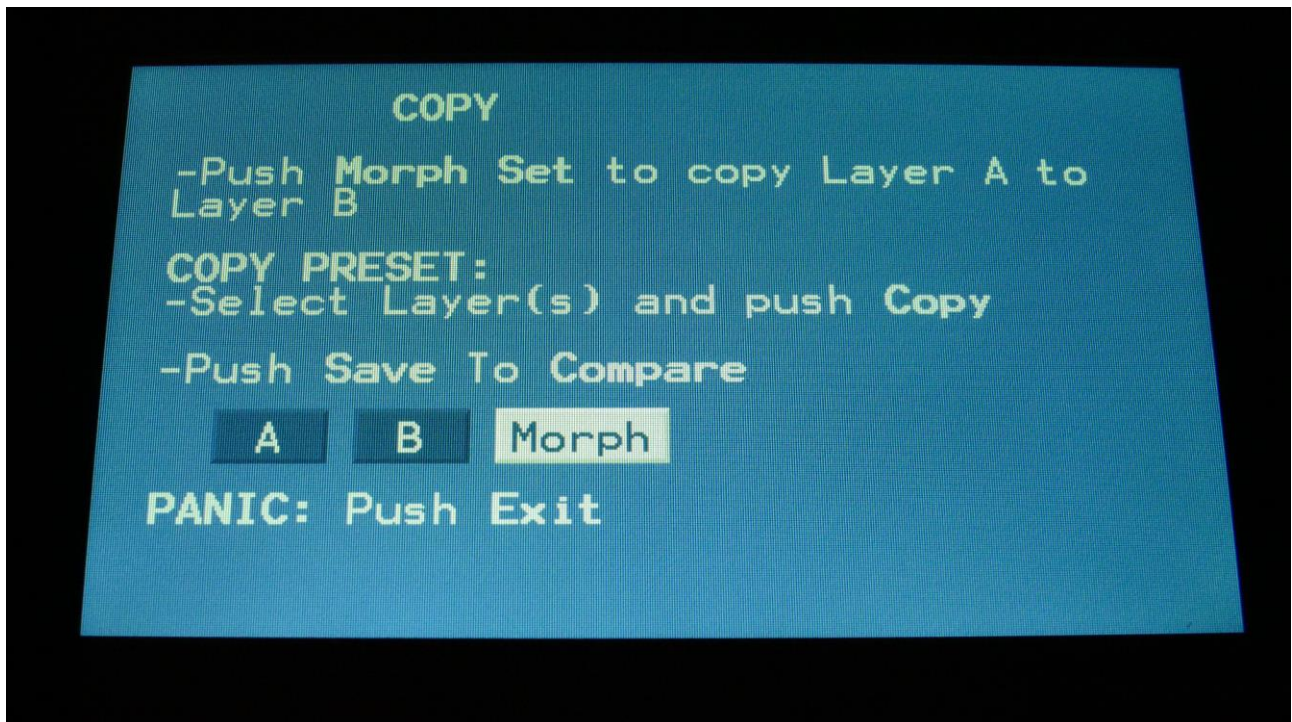
As usual, simply hit the Copy button again, to copy.

Now enter the destination sequencer track. It is possible to paste steps from the same track or from another track.

When you have navigated to the destination track, simply hit the Paste button, and this screen will pop up:
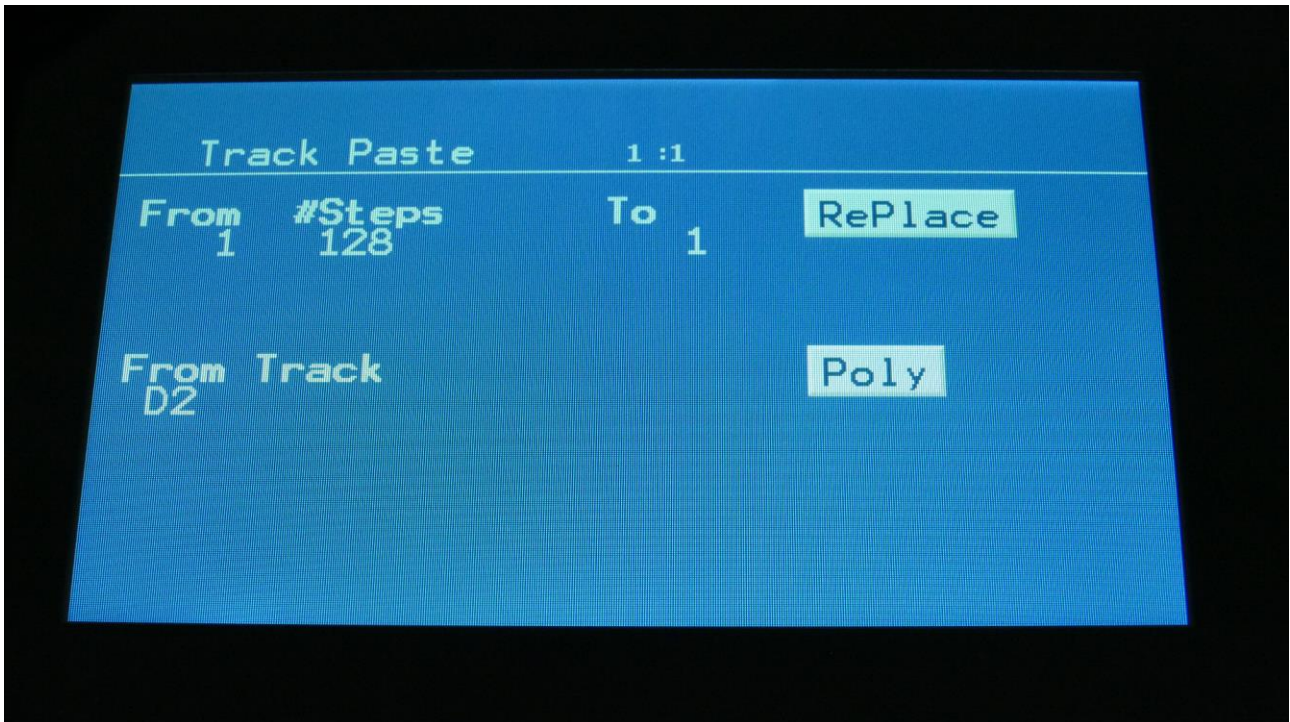
You can now set the following parameters:

From: The first step of the source track, that you would like to copy from. Range 1 to 64 on note tracks and 1 to 128 on controller tracks.

#Steps: The number of steps, that you would like to copy. Range 1 to 64 on note tracks and 1 to 128 on controller tracks.

#To: The step on the destination track, that you would like to paste the selected range of steps to. Range 1 to 64 on note tracks and 1 to 128 on controller tracks.

From Track: Select the source track.

Additional options, on note tracks only:

Clear Dest Steps: If you copy from or paste to a polyphonic track, or "Poly" (explained below) is on, switching this function on, will make Zaturn clear all steps, which position is inside the range of the steps to be pasted, before the pasting.

If this function is off, and "Poly" is on, the steps will be placed on top of each other, without any steps being cleared. A sort of "overdub" pasting.

If you copy from and paste to a monophonic track, and "poly" is off, steps will be overwritten anyway, so it doesn't really matter, if this function is on or off.

Poly: With this switched off, both the source and destination tracks will be treated as monophonic tracks, with a linear position track, going from position 1 to position 64, and steps will be copied 1 to 1 on the step locations, without altering the position track.

With this switched on, the destination track will be treated as a polyphonic track, and steps will only be pasted to steps, that are already off. The position track will be altered.

If "Clear Dest Steps" is off, no steps will be overwritten.

When entering the Track Paste Page, Zaturn will analyze both the source and destination tracks, and if any of these are polyphonic tracks, it will automatically switch Poly on. If both tracks are monophonic tracks, it will switch Poly off. You should only change this setting to deform things...

When you have done your settings, simply hit the Paste button again, and your steps has been copied.

Sample Record and Edit

Mono wav samplings can be recorded, imported, edited and played back by the oscillator modules. Stereo samplings can also be imported, but only the left channel will play back. Chop points can be imported or generated automatically and manually. A wavetable editor is also included in the Sample Edit section. Wavetables can be assembled from samplings. The wavetable oscillators can also play back samplings directly, but assembling them from samplings will give more control over each single wave.

To get samples into Zaturn, for using them in the synth modules samplers, you can either import .wav files from a USB drive, or record your own samples from Zaturn's audio inputs or outputs. This section will describe the latter. For how to import .wav files, please see the USB section of this manual.

Zaturn has up to 4 banks of FLASH memory for storing samples, Bank A, B, C and D. The 18 min. and 43 min. models only has Bank A. Bank A holds up to 43 minutes of mono samplings, maximum 2048 samplings, Bank B, C and D each holds up to 50 minutes of mono samplings, each maximum 2048 samplings – A total maximum of 8192 samplings/193 minutes. One sampling can maximum be 50 minutes long.

All samples that are imported or recorded, stays in Zaturn's FLASH memory, even after a power off. Since they are played back directly from the FLASH memory, there are no loading times. All Zaturn's samplings are immediately available, right after power on, and can be selected in the synth modules oscillator section, just like synth waveforms.

Recording a sampling

From the Preset Select screen, touch the EDIT field, to enter the Synth Modules page:
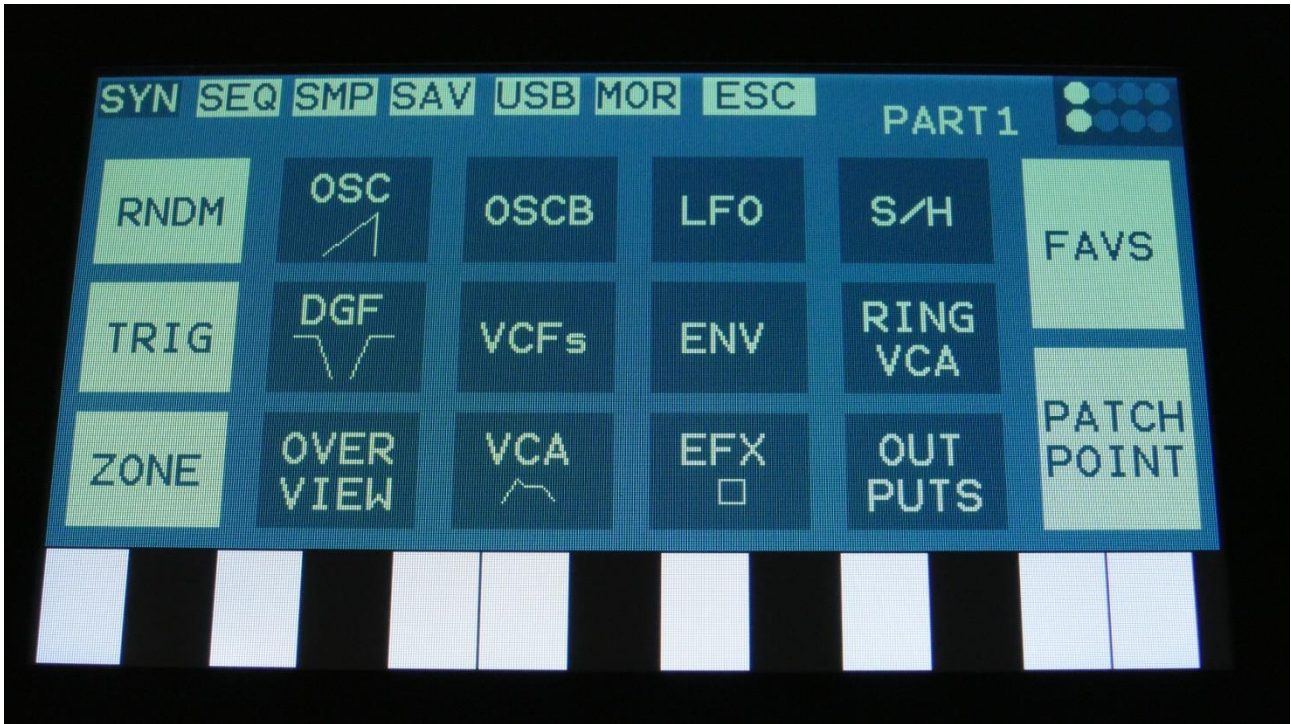
Touch SMP at the top navigation bar.
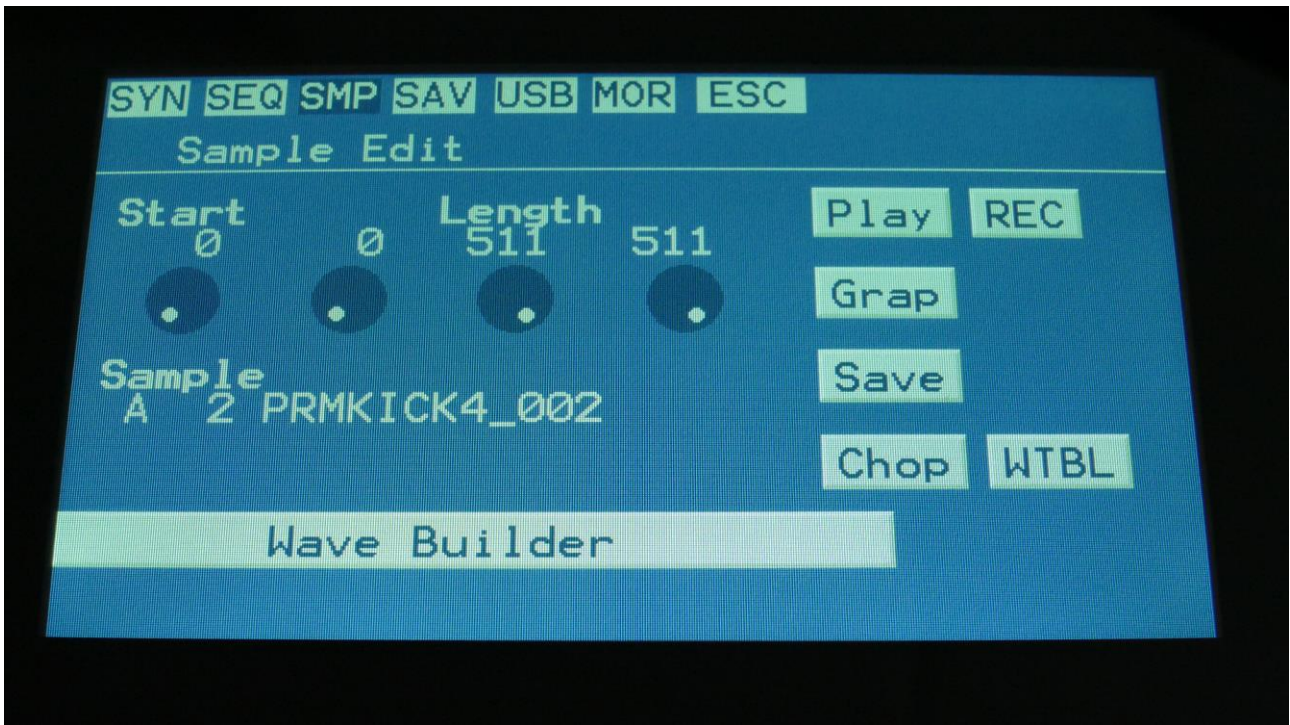
You will now enter the Sample Edit page.

Touch the REC touch button, to enter the Sample Rec page.

OR, from any page:

-Push and release the Func/Mute button, so it is lighting up.

-Push step button 4, marked "Samples".

This will also get you to this page, just much faster.

If you can already hear the source, that you would like to record, leave the Moni parameter Off. If you have the record source connected directly to any of Zaturn's audio inputs, and can't hear it now, switch the Moni parameter to On.

Select the record source, by setting the Sorc parameter.

Choices are:

InpL : Left audio input mono

InpR : Right audio input mono

OutpL : Left audio output mono

OutpR : Right audio output mono

Now select the sample bank, that you would like to record to, setting the Bank parameter to bank A, B, C or D.

When choosing a bank, the **#Smp** parameter will show how many sampling that the selected bank already holds, and the **Used** parameter will show how many percent of the sample bank, that are already in use.

For optimal results, set the level parameter to +0, and adjust the level of the record source, so that the 2 VU-meters in the bottom of the screen does not get red.
You should only adjust the level parameter, to other values than +0, if it is not possible to adjust the level directly on the source.

When you are ready to record the sampling, touch the "REC" button in the lower left corner.
If you have the **Auto** parameter set to anything else than Off, it will now write: "Waiting for trigger", until a signal that is loud enough to trigger the auto offset applied.

If the **Auto** parameter is turned fully up, it will show the value **Seq**. If **Auto** set to **Seq**, the sequencer must be started, in order to start sample recording, when it is waiting for a trigger.

Otherwise Zaturn will now start to record the new sampling:

When you are finished recording your sample, touch the "STOP" button.

Zaturn will now jump to this screen:
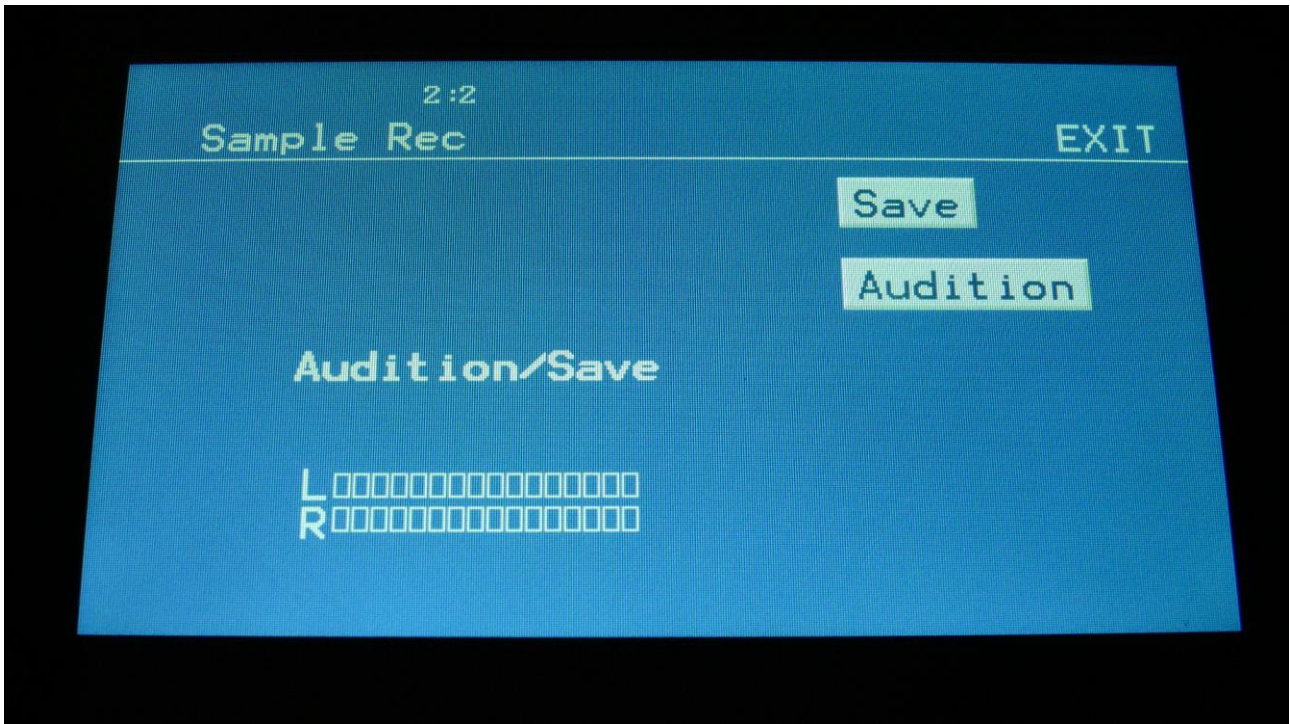
To audition the sample you have just recorded, touch the "Audition" button.

To name and save the sample, touch the "Save" button.

If you decide not to keep this sample, touch EXIT, and the new sample will be erased. While it is erasing the sample buffer, a sequence will run on the step buttons. Please wait for this to finish.

If you touch the "Save" button, Zaturn will jump to this page:
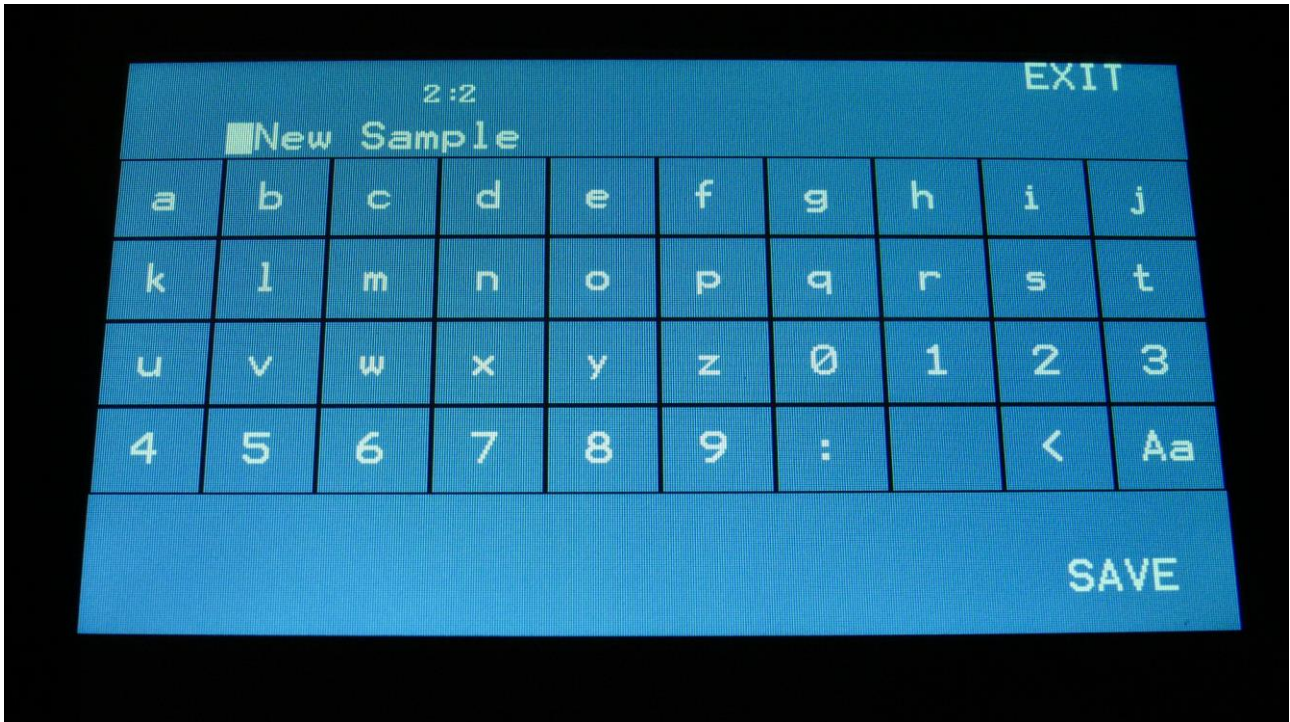
Type in the name for your sampling. This can be up to 16 characters long.
"Aa" will switch between uppercase/lowercase letters, and numbers/signs:
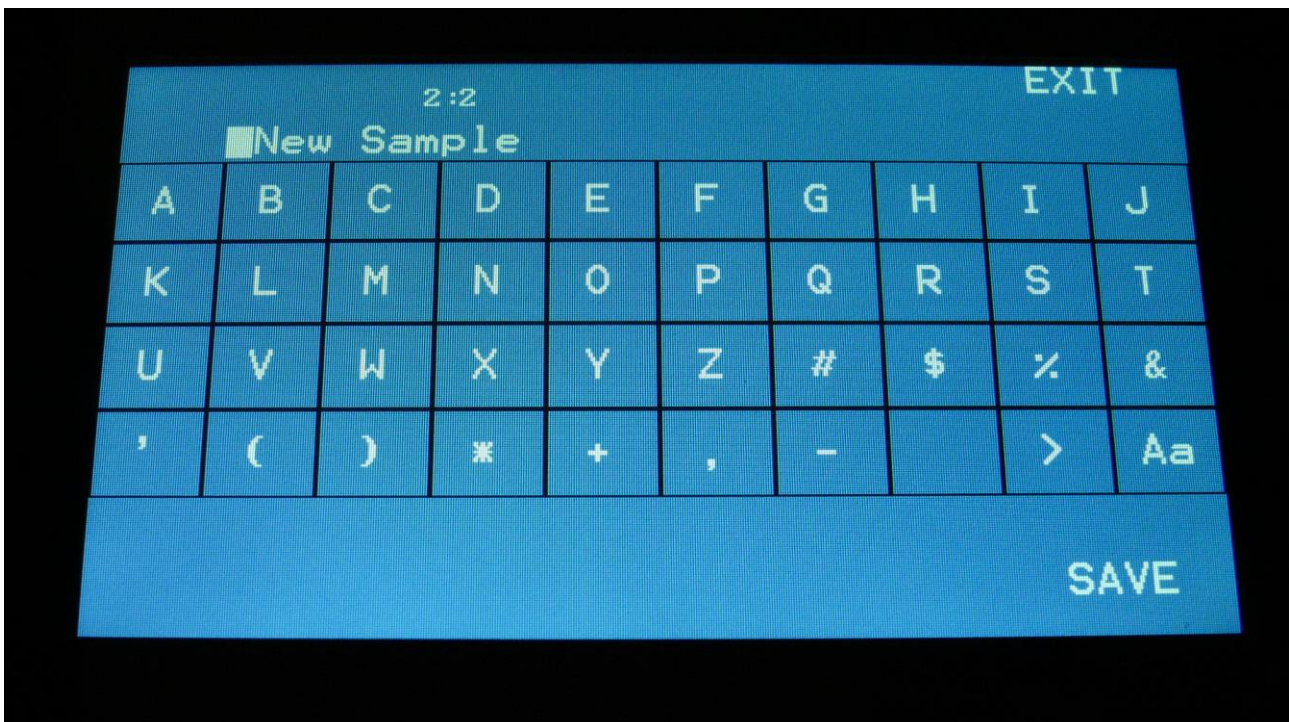
"<" will move the cursor back, for correcting characters, ">" will skip characters.
Touch SAVE, to save the new sample, and return to the Sample Rec page.

Edit A Sampling

From the Synth Blocks page, touch SMP at the top navigation bar., to enter this page:
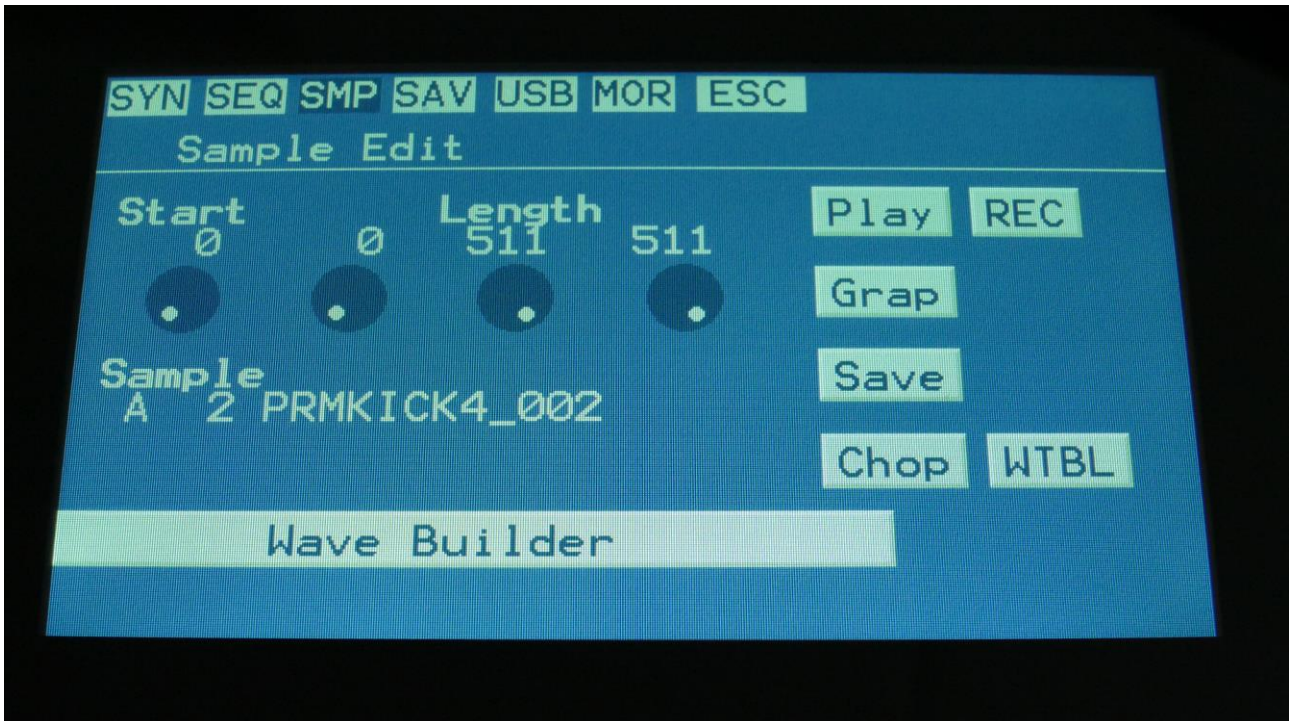
OR: Hit the Func/Mute button, so it lights up, hit step button 4 "Samples", and hit step button 8 "Exit/Overview".

On this page you can audition samples from the FLASH memory, adjust the samples start and end points, enter the sample chops editor, the graphical sample editor and the wavetable editor.

To audition the samples that your Zaturn holds, touch the **Sample** name, and the Sample Select screen will appear:

Touch A, B, C or D to select sample bank A, B, C and D, touch PREV and NEXT to view the previous or next 16 samplings.

To select a sampling, touch the sample name. To audition it, touch the Play touchbar in the bottom of this page.

When you have found the right sampling, touch OK to return to the Sample Edit page.

The Play touchbar on the sample select page re-triggers the sampling every time it is touched. If you should wish to start and stop sample playback, every time you hit play, exit to the Sample Edit page, and touch the Play button there.

Adjusting the start and end points of a sample

If a sample has silence at the start and/or end of it, or if there are parts of a sample you do not intend to use, it might be necessary to adjust the start and end points of it.

To do this, select the sample you would like to adjust.

Adjust the start point by turning edit knob 1, fine adjust by turning edit knob 2.

Adjust the end point by turning edit knob 3, fine adjust by turning edit knob 4.

Audition by touching the PLAY button.

When you are satisfied with the result, touch the SAVE button.

Zaturn will now write "Saving…" on the display.

Instead of searching manually for the sample start point, it is possible to use the Chop function for this. This is described in the "Sample Chops" section, that starts on the next page.

Sample Chops

On Zaturn it is possible to add chop points to a sampling, in order to make it play back a certain portion of the sampling at a time. Sample chops are generated in the Sample Edit section, to be used by the samplers in the Synth section.

This function could be used for the classical separating single drum hits from a beat, or to find the start point of a sampling in a fast way, if the chop function is set up for peak detection.

The chop function of Zaturn isn't though limited to this. On Zaturn it is also possible to make the chop function find "wave chops". This function will pick out single wave cycles of the sampling, and create chop points for these. In the samplers of the synth modules, it is then possible to select these wave cycles, loop them, and switch between other wave cycles of the sampling.
This can also be used as a super easy way for looping a sampling.

All chop points are non-destructive to the sampling. Only the positions of the chop points are stored, nothing is changed on the sampling itself. Chop points can, at any time, be moved, deleted and inserted.

Up to 64 chop points can be created for each sampling.

Another way to create chop point, are to use the "Import Samplings From Dir As Chop Points", described in the USB section of this manual.

If you have already created chop points on a sampling, in a computer program that uses cue points, like FL Studio, or any other gear that generates cue points, Zaturn will import these as chop/loop points. When you exports Zaturn samplings via USB, any generated chop points will also be exported as cue points, for use in other gear or computer programs.

Remember to save the chop points. Else they will be lost!

To create and/or edit sample chop points, from the Sample Edit page, touch the **Chop** touch button, to enter this page:
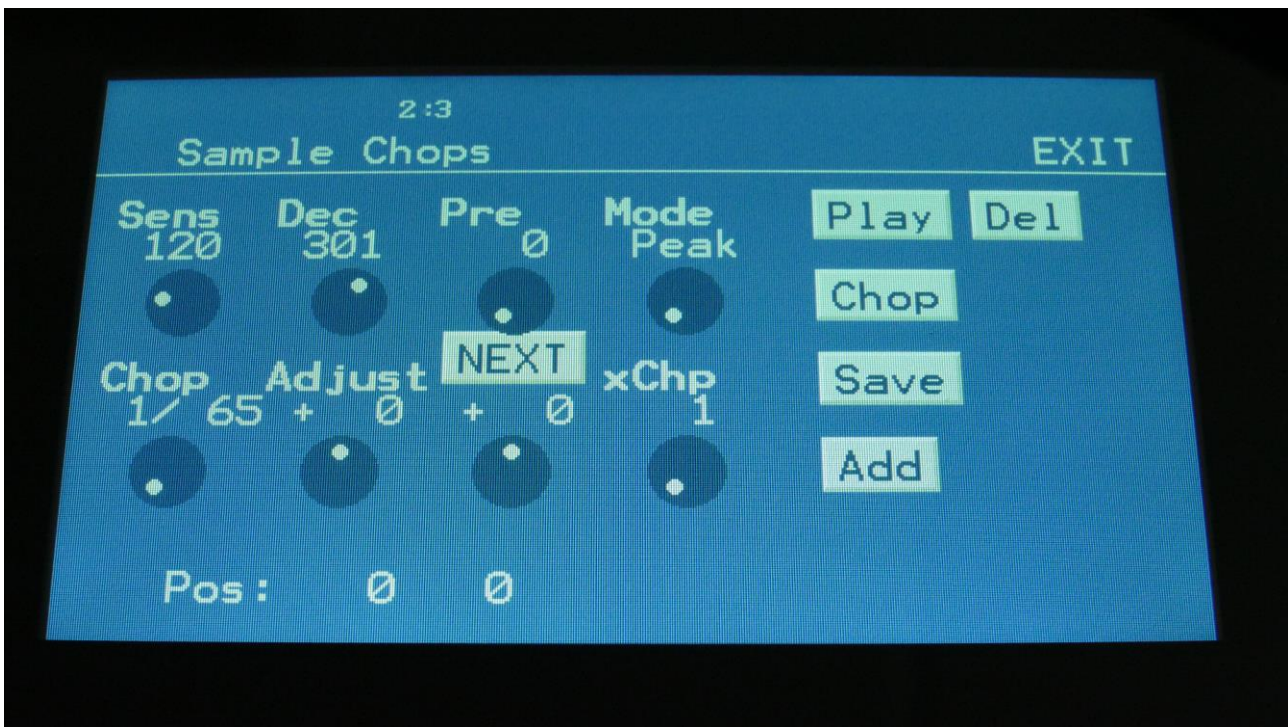
The parameters of this page:

Sens: Adjust how loud the level of the sample audio should be, before it detects a chop point. If it creates too many chop points, turn this parameter up a bit. If it creates too little or no chop points, lower this parameter.

Dec: Chop envelope decay. This adjusts the decay time of the chop detection envelope in a reverse manner. The lower the value, the slower the decay. If the sounds is recorded with very little or no silence between them, like in a beat, this needs to be set to a high value. If there's a good gap of silence between the sounds, set it to a low value.

Pre: If there are loud clicks in the start of many of the chop points, especially on low frequency sounds, turning up this parameter will make Zaturn set the chop points a little bit earlier, than it usually would. This will remove these clicks.

Mode: Different modes are available, for generating non-destructive chop points:
Peak: It will generate the chop points from peak detection, according to the settings of the Sens and Dec parameters.
Wave: It will generate the chop points from zero point detection, according to the settings of the Sens and Dec parameters. When auditioning chops in this mode, the playback will be looped.

A number between 2 and 64: It will divide the sample length by the selected number, and generate equally sized chop points from that, regardless of the settings of the Sens and Dec parameters.

Chop: Select a chop number for auditioning. Total number of chops is shown right after the /.

Adjust: (2 parameters). For adjusting the selected chop forward (positive values) or backwards (negative values).

xChp: Number of chops in each chop point. Turning this up, before generating chops, will make each chop contain a number of chops. Especially useful, when using the wave chop function for making sample loop points.

Generating Sample Chop Points

On the Sample Chops page, adjust the Sens, Dec, Pre and xChp parameters as desired, and switch wave mode on if desired.

Touch the **Chop** button.

Zaturn will now look for chop points, in the selected sampling, while putting out "Searching For Chop Points…" on the display.

When it is done, it will jump back to the Sample Chops screen:
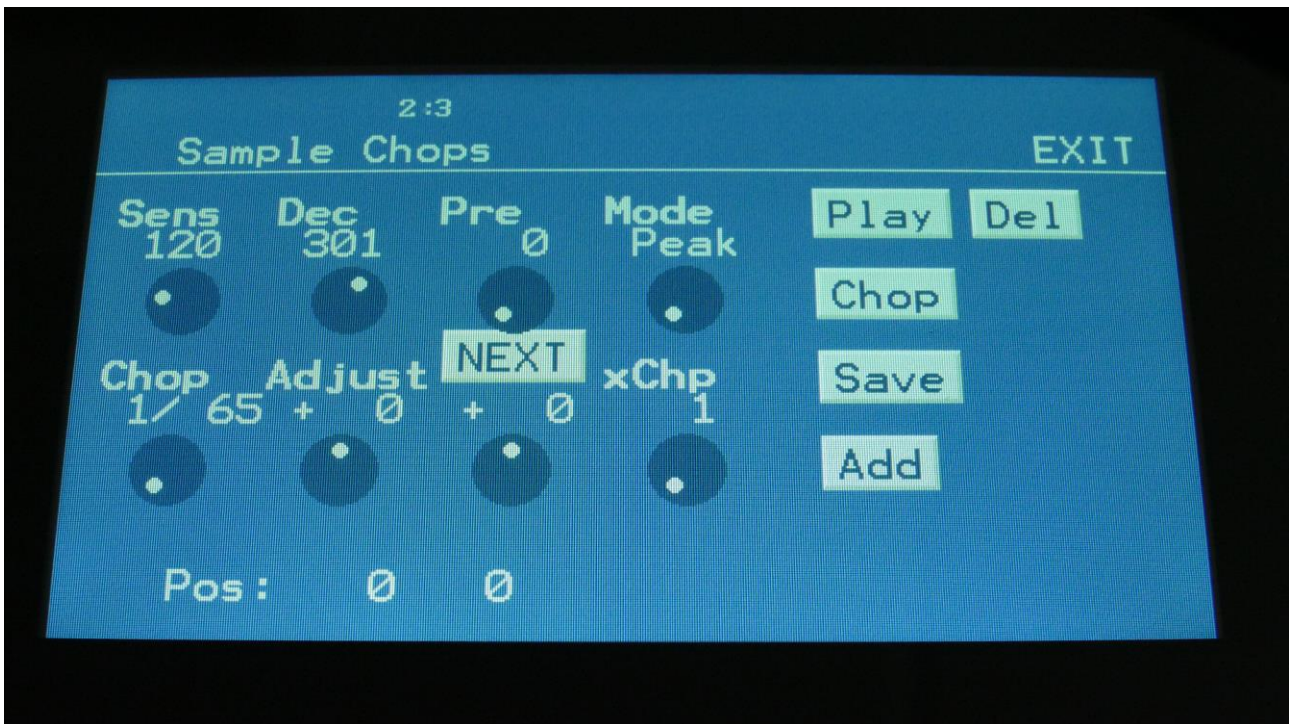
By adjusting the Chop parameter, it is now possible to select and audition the chop points that Zaturn has found.

Select a chop point by the Chop parameter. Audition the chop points by hitting the "Play" button. If some chop points are not exactly where you would like them to be, adjust them with the 2 Adjust parameters (coarse and fine). If some chop points shouldn't be there, delete them by hitting the "Del" button.

It is also possible to adjust the end point of the chop point. Simply touch the **NEXT** button. Now, while auditioning the selected chop point, you can adjust the next chop point, which is also the end point for the selected chop point, using the Adjust parameters.

To add chop points, first touch the "Play" button, to make the sample/chop point play back. While the sampling is playing back, hit the "Add" button when it is playing back the point, where you would like to add a chop point.

In the bottom of the screen, it shows the position of the selected chop, in the values that the **Sample Start** parameters would have to be adjusted to, to select this point of the sampling. So if you don't want to use the chop points anyway, but just wants the sample playback to start at this point, you can exit to the Sample Edit page, and set the Sample Start point to this value.

When you are satisfied with the chop points, remember to hit the "Save" button to keep them. The chop points are saved together with the sample data, and are also imported/exported via USB as cue points.

Wave Chop System

This system can take any of the samplings held in your Zaturn, and chop it up in, up to 64, single cycle waves.

If you already have a library of single cycle waves in .wav format, you can use the "Import Samples From Dir As Chops" function, to import the single cycle waves into one sampling with wave-chops.

When you have a sampling with the wavechops added, it is possible, in real time, to select which single cycle should play back, in the samplers in the synth section, using the "Chop" parameter.
It is also possible to select single cycle waves, using any modulation source.

How to wave chop a sampling:
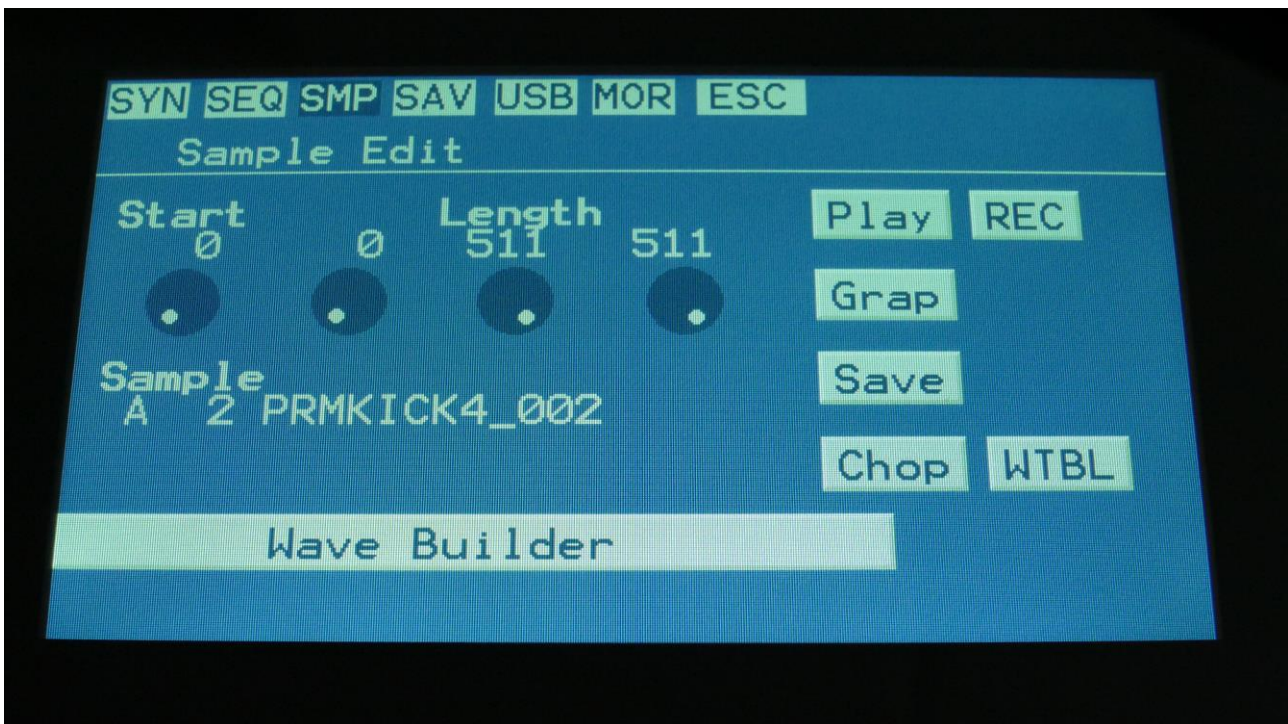
On the sample Edit page, select the sampling, you would like to wave chop, and touch "Chop".

That will get you to the Chop page:
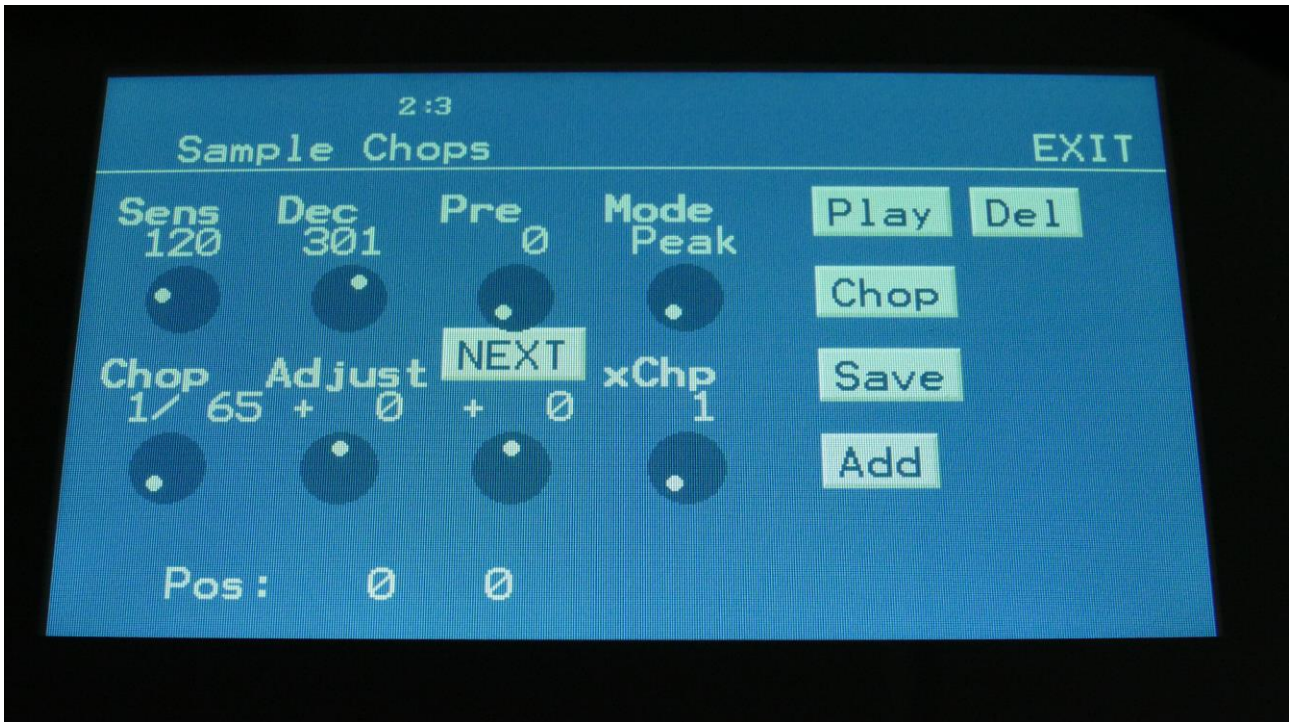
Set the Mode parameter to Wave.

When in Wave chop mode, the Dec parameter functions in the opposite way, as when in normal chop mode. The lower the value, the faster the decay.

A good startpoint for wave chopping is to set Dec to 1 and Sens to 128. If the wave chops gets too long (very few chop points), try first to adjust Sens down. If this makes things worse, adjust it up. On simple waveforrms, Sens should, in most cases, have a low value. On more complex waveforms, Sens should have a higher value.

If you wish your wavechops to be larger than single cycles, you can either turn Dec or xChp up.

The Pre parameter should be kept at zero.

When you have it set in Wave mode, and adjusted the settings, touch the "Chop" button.

Zaturn will now put out "Generating Chop Points…" on the display

When it has found some chop points, it will return to the Chop page:
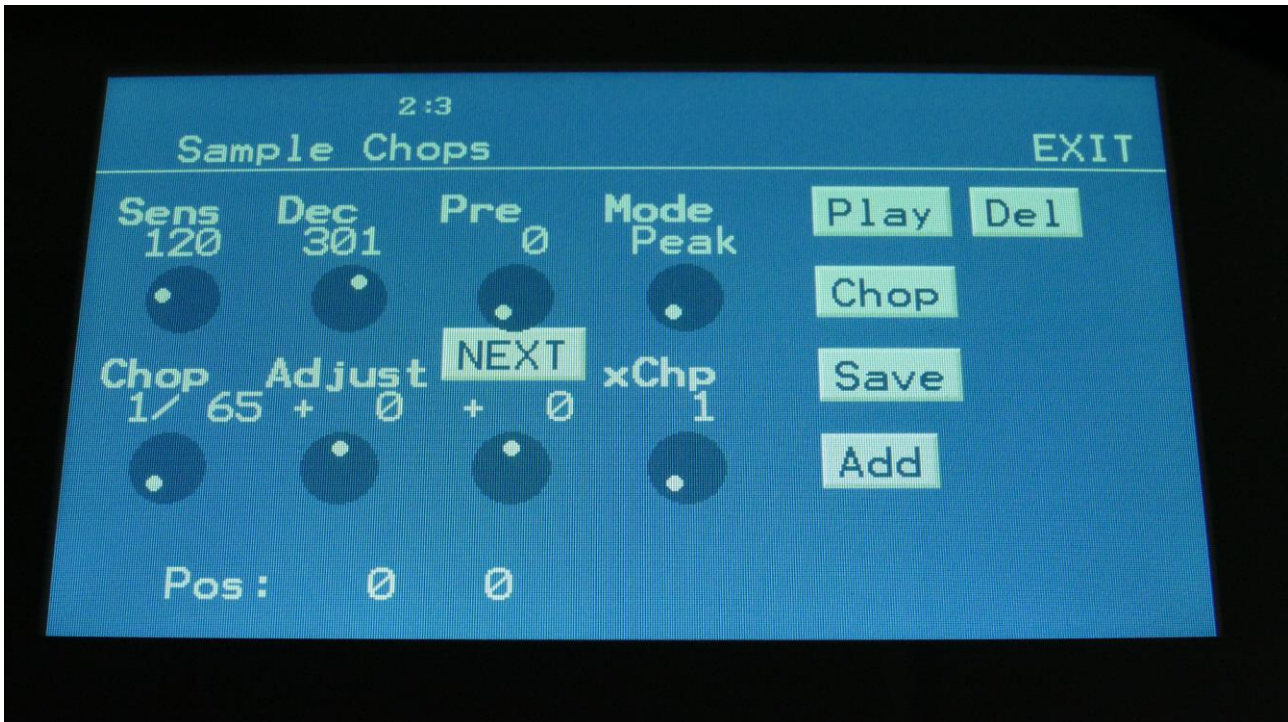
Now touch the play button, and select chops by adjusting the Chop parameter, to audition the result.

If you are not satisfied with the result, re-adjust Sens, and hit Chop again.
When you have found a result, that you are satisfied with, please remember to touch the "Save" button.

To use the wave chops for something, now exit Sample Edit, and go to an Oscillator module page.
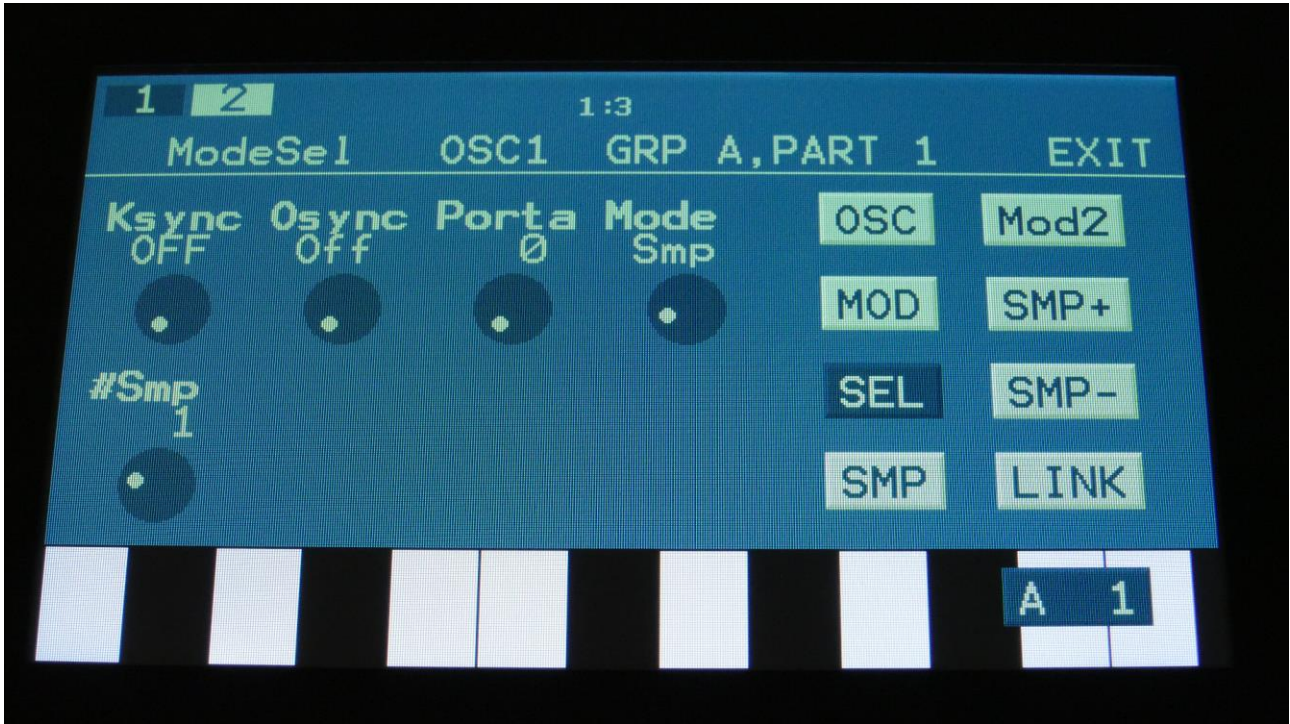
Set the Oscsillator in sampler mode, and touch the SMP touch button to select the sampling, that you just wave chopped (or any other sampling that you have wave chopped).
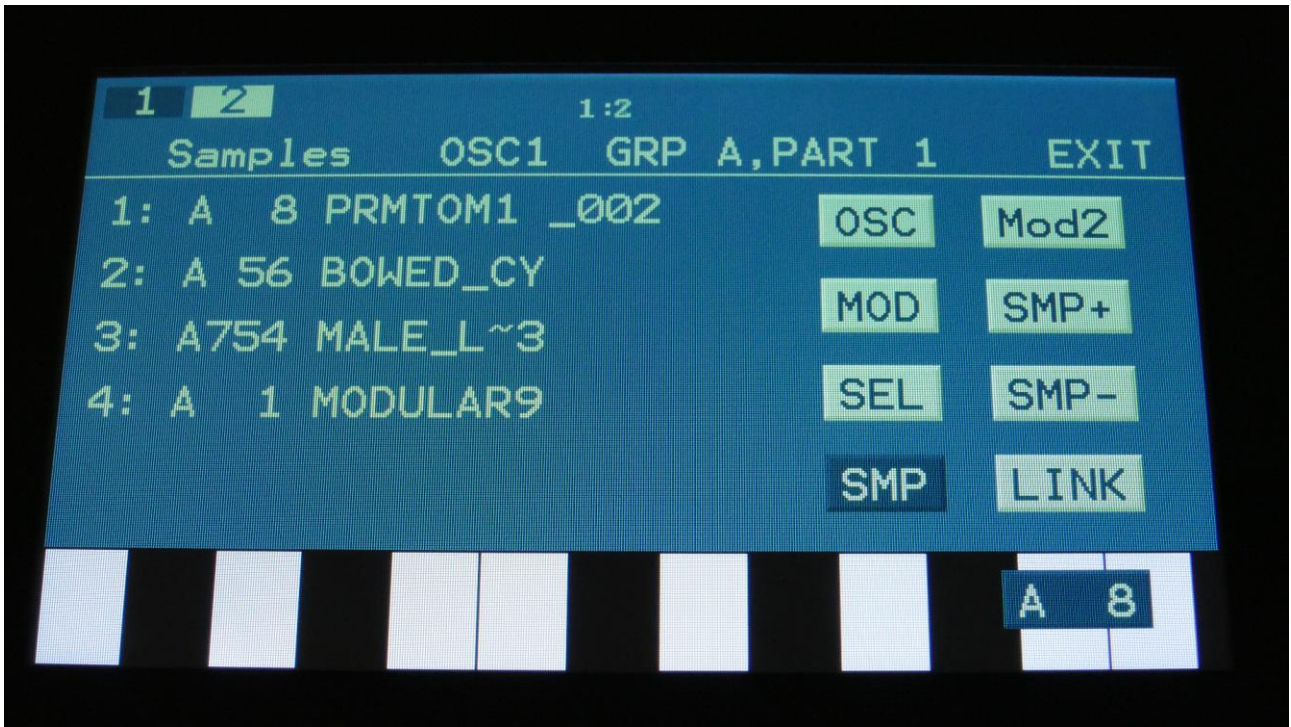
Touch the sample slot 1 name, to open the sample select page.
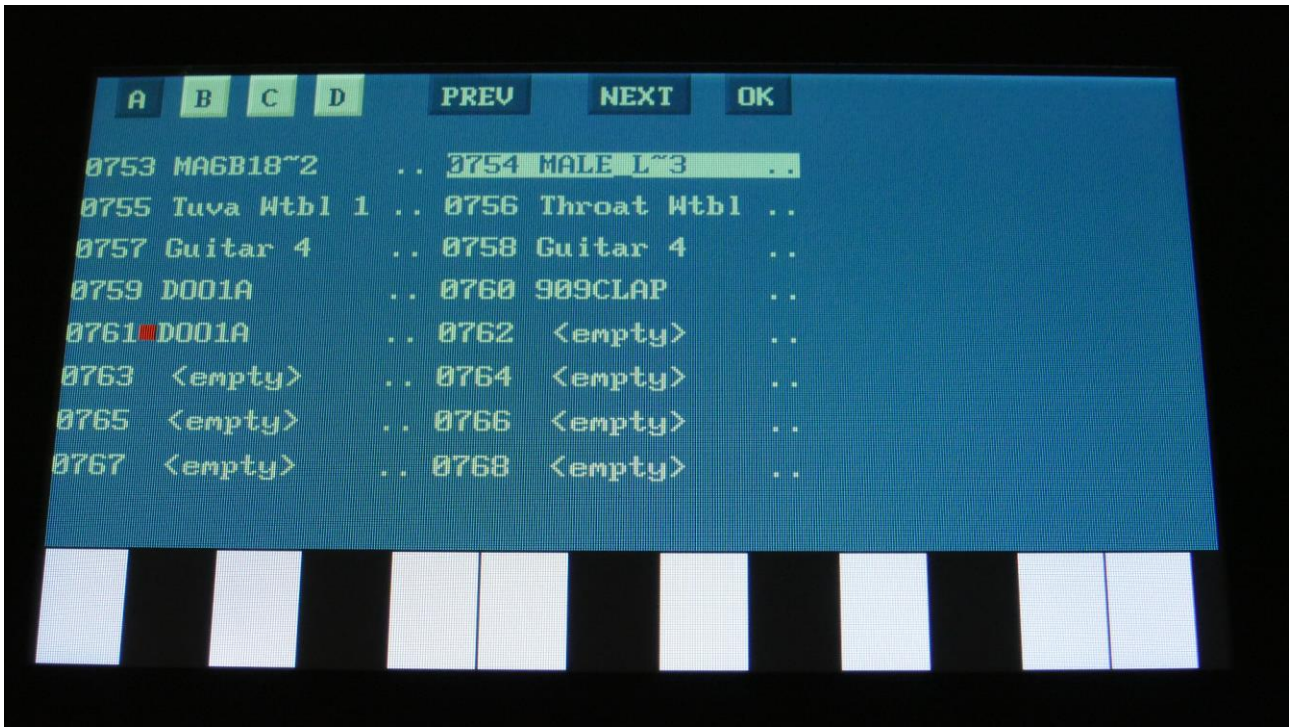
Select the sampling, touch OK, and touch the OSC touchbutton.

Set Loop mode to On, and adjust the Chop parameter, to select the single cycle waves. If you would like more single cycle waves to play back inside the loop, turn the #Chp parameter up.

Modulating the Chop parameter
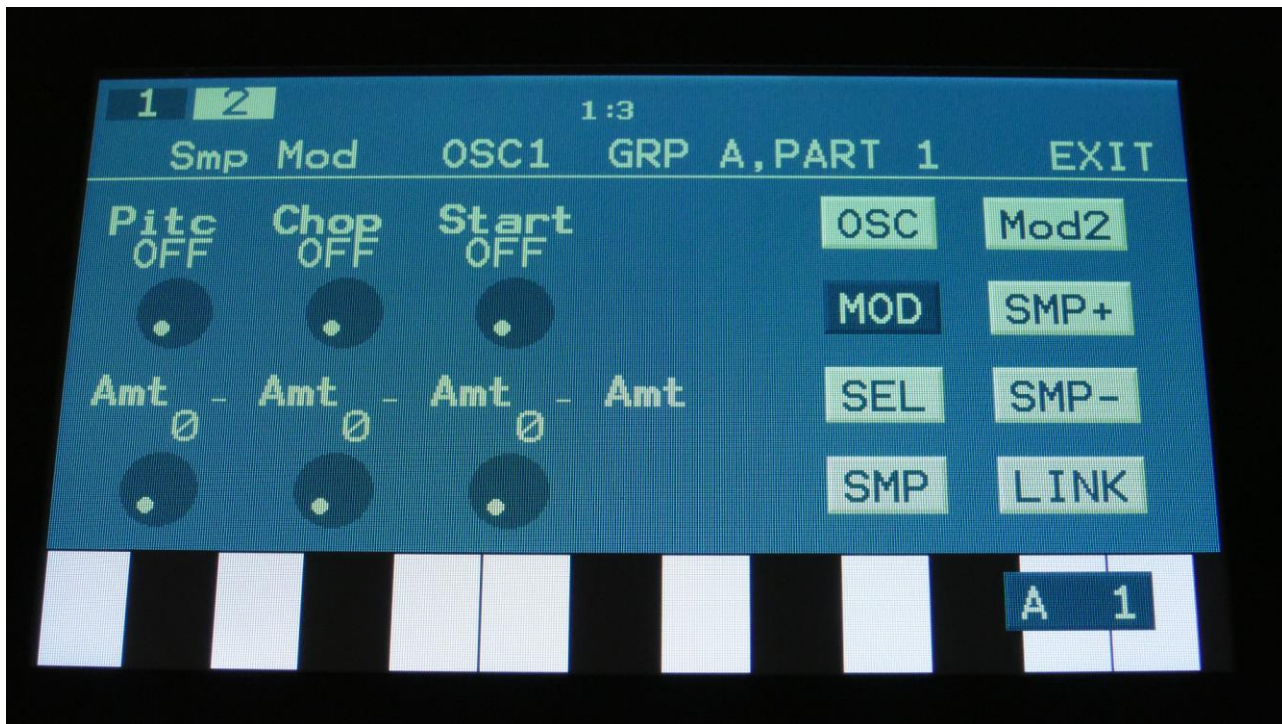
Unlike most other parameters in Zaturn, only positive modulation are applied to the Chop parameter.

So the Chop parameter selects the lowest possible chop to be played back.

Deleting last recorded sampling

On the Sample Select page, it is possible to delete the last recorded sampling in sample Bank A, B, C or D. On the sample select page, select the sample bank, from which you would like to delete a sampling.

Touch DEL.
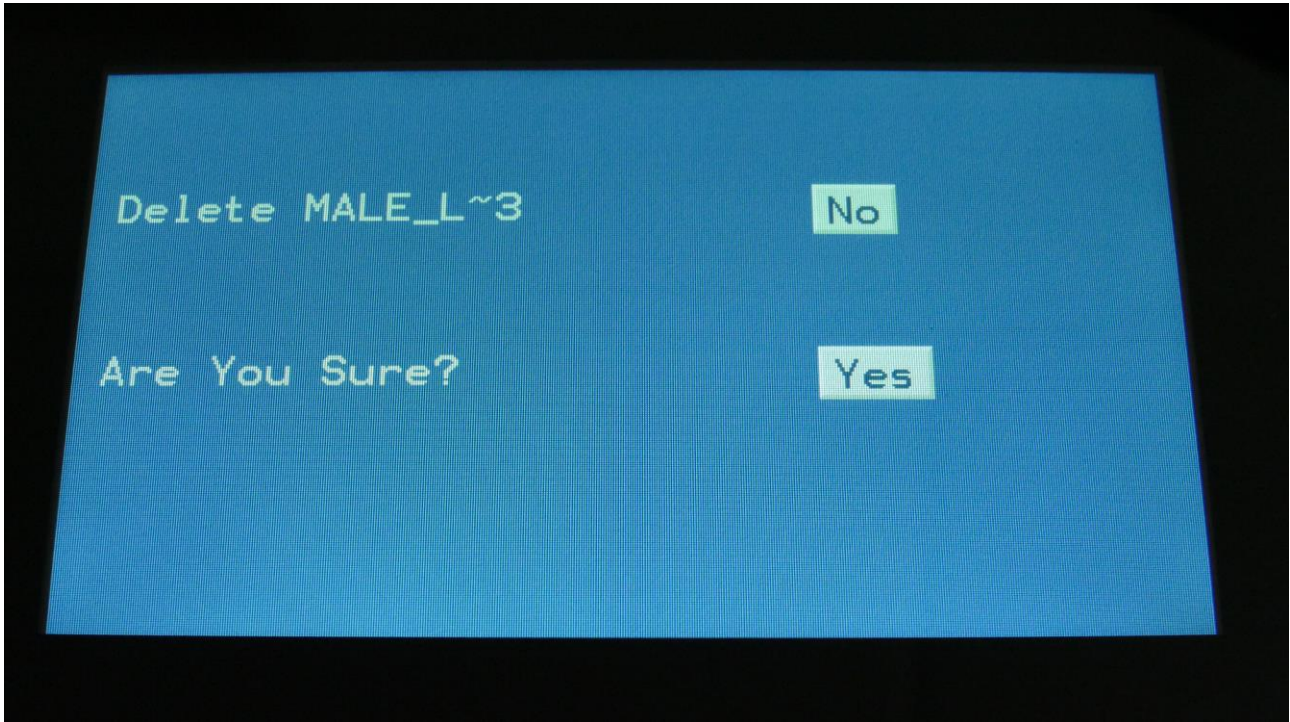
To delete the sample, touch "Yes".

If you regret, touch "No", to return to the Sample Edit page.

If you decided to delete the sampling, Zaturn will now run a light sequence on the step buttons 1-8, while it is deleting the sampling. Since this is FLASH memory, it might take some time.

DO NOT TURN Zaturn OFF, WHILE IT IS DELETING A SAMPLING. THIS WILL MAKE THE FLASH MEMORY MALFUNCTION.

Deleting other samplings, than the last recorded one

Because of some security features of the flash memory used in Zaturn, it is only possible to directly delete the last recorded sampling in each bank.

By using its USB functions (explained in the next chapter of this manual), it is though possible to delete other samplings.

To delete another sampling:
-Connect a USB drive, that you have tested to be working (try to import some samplings from it), to the Zaturn USB port.
-Create a new directory.
-Export all your samplings of the bank, where the sampling(s) you want to delete is located, to the USB drive, inside the new directory.
-Enter the directory, on the USB drive, and select the sampling(s), that you want to delete.
-Push "MD/del" on the USB page.
-Push "Del".
-Confirm.
-Leave the USB pages, go to the "MOR" section, and delete the whole sample bank.
-Go back to the USB page, and select the directory, holding your samplings.
-Push "Import", and then "Re-Load".
-Zaturn will now put your samplings back on the right place, except for the sampling(s), that you deleted.

Graphical sample editing

On the Sample Edit page, touch the "Grap" button to enter the graphical sample edit pages.

On the graphical sample edit pages you can add and remove chop/loop points, select a portion of a sampling, to be saved as a new sampling, and assemble wavetables.

It has also been made easier, to set loop points in long samplings, by making it possible, to save the selected end point as a chop/loop point.
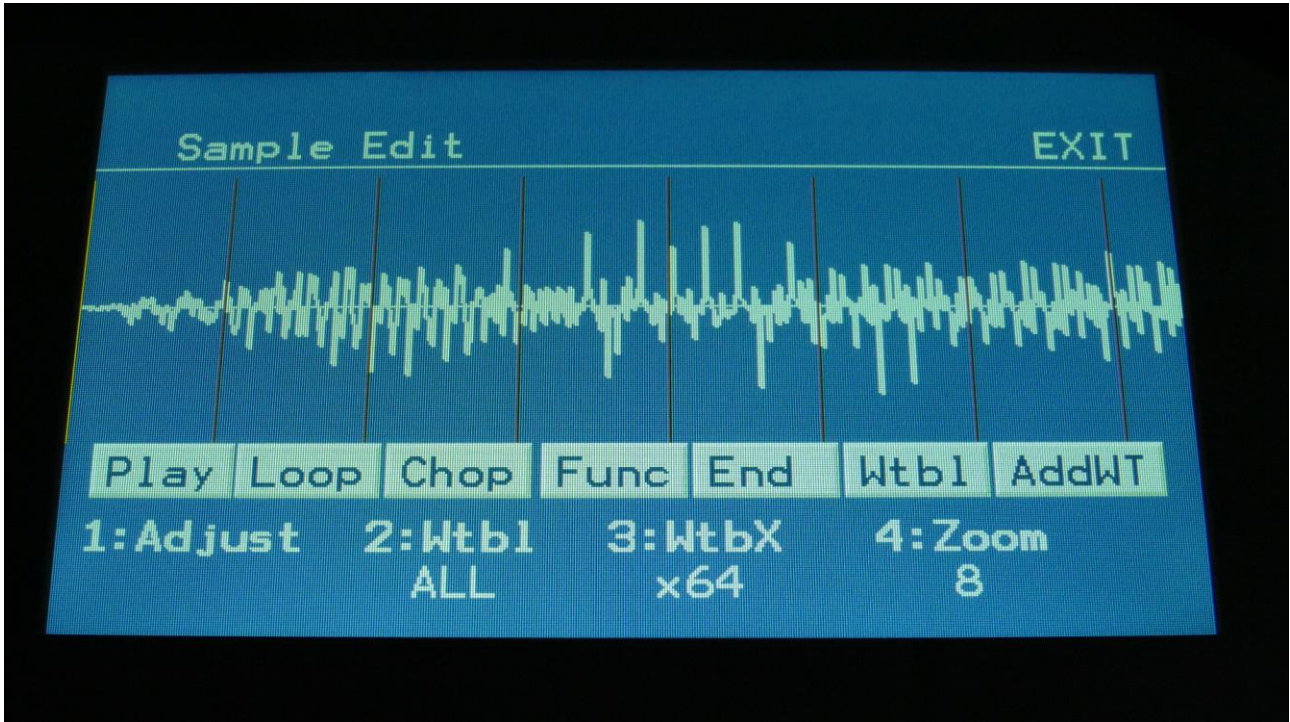
On this page, you will see a graphical presentation of the selected sampling. Chop points are indicated as vertical brown lines, and the sample zero point is indicated as a horizontal white line.

Sample Start Point
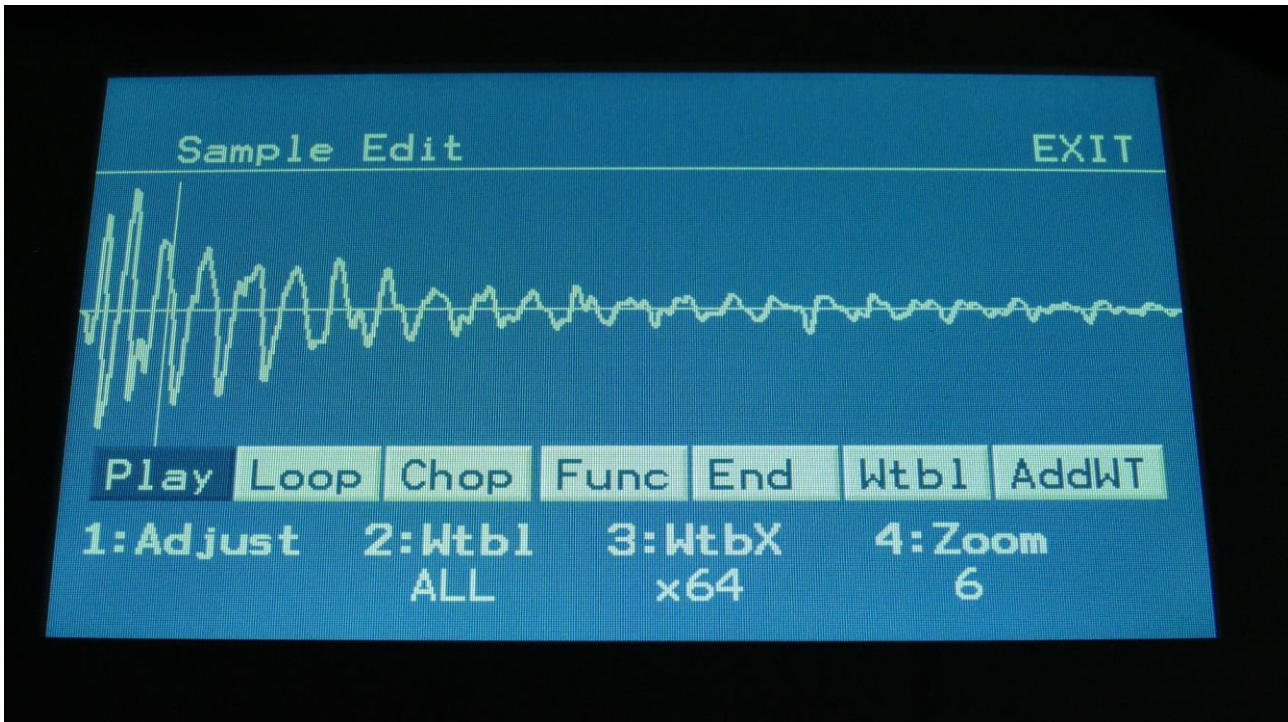
By touching anywhere on the screen, or by rotating Edit Knob 1, you can select a start point. This is indicated by a vertical white line.

By rotating Edit Knob 4, you can zoom in and out.

Sample End Point
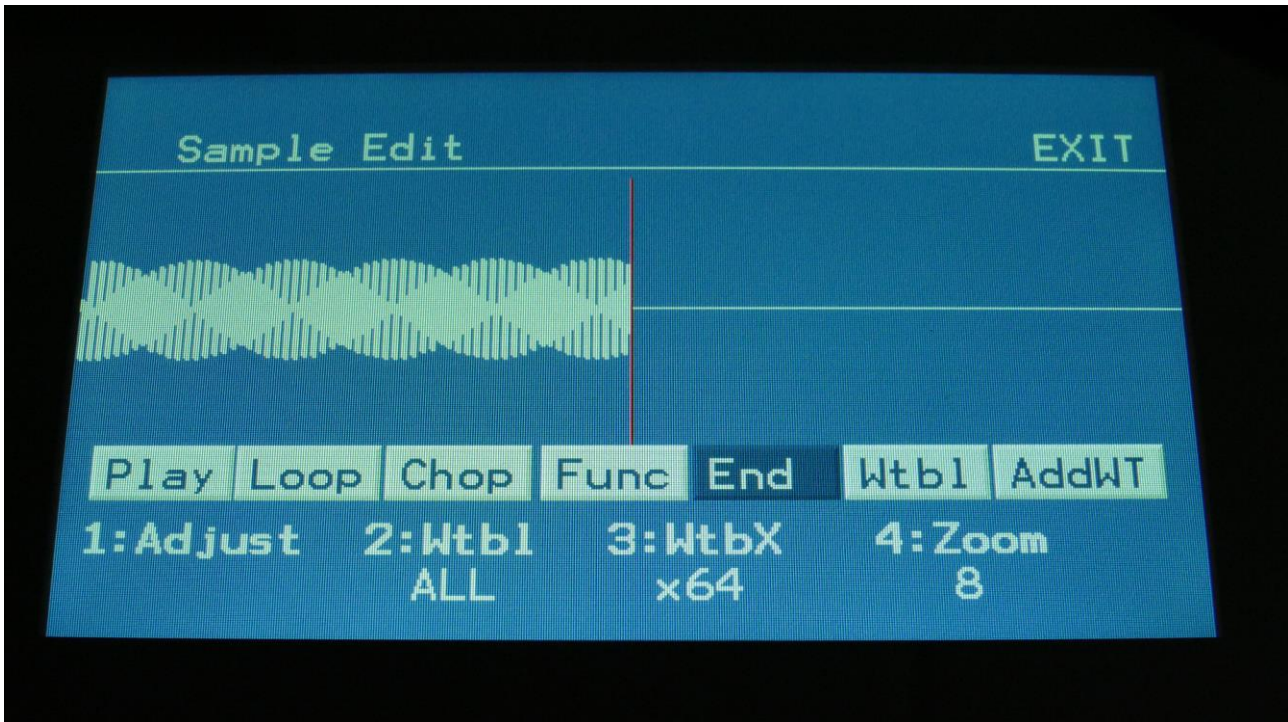
By touching the End touch button, so that it turns dark blue, the screen will now be focused on the end point, which is indicated as a vertical red line. When you touch the screen now, the red line will move, indicating that the end point is selected. It is also possible to change the end point, by rotating Edit Knob 1.

If you touch the Play touch button, the sample will play back from the start point to the endpoint, and then stop.

If you touch the Loop button, so that this turns dark blue, and then touch the Play button, the sample will play back from the start point to the end point, and then loop back to the start point, and play back the selected piece again, until Play or Loop is touched again, so that any of these turns white.

Selecting and edit chop points
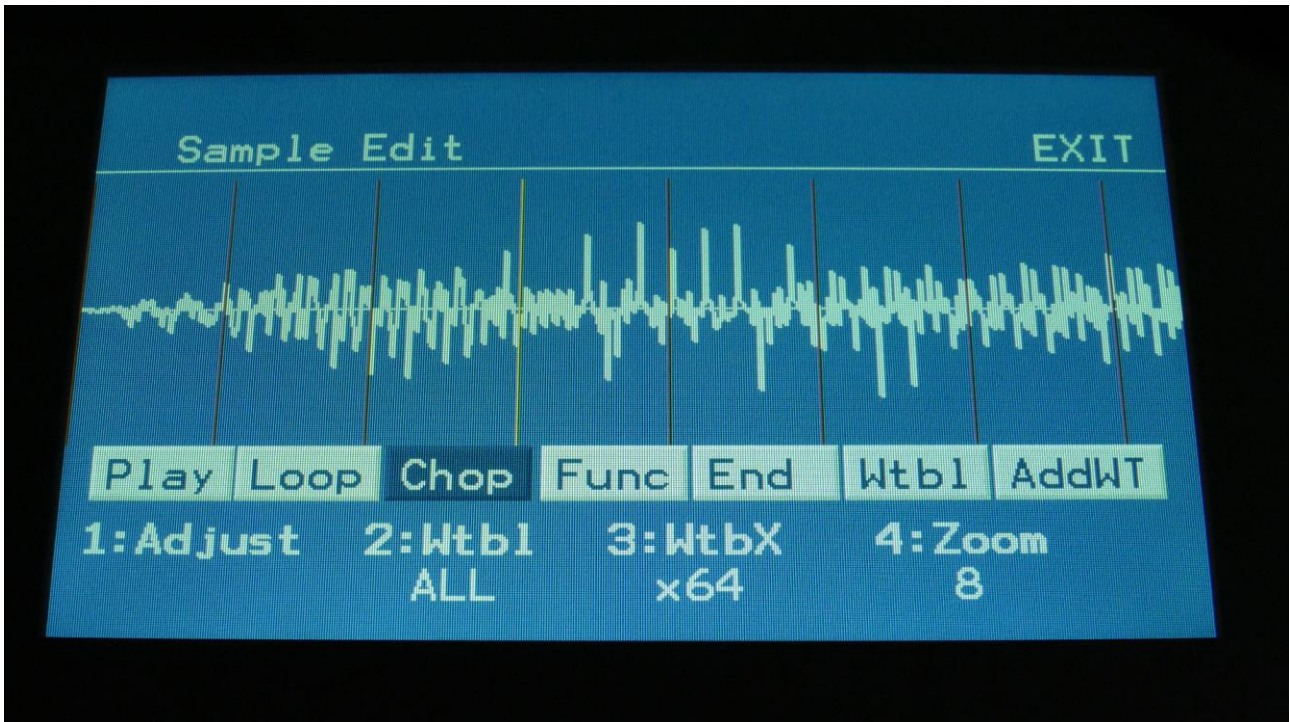
Touch the Chop touch button, so that this turns dark blue.

Now, when you touch the screen, you will select a chop point. The line indicating the chop point will turn yellow, when it is selected.

Rotate Edit Knob 1 to adjust the chop point. Rotate Edit Knob 4 to zoom in and out.

If you touch the Play touch button, the sample will play back from the selected chop point to the next chop point, and then stop.

If you touch the Loop button, so that it turns dark blue, and then touch the Play button, the sample will play back from the selected chop point to the next chop point, and then loop back to the selected chop point, and play back the selected piece again, until Play or Loop is touched again, so that any of these turns white.

By touching the End touch button, so that it turns dark blue, it is possible to adjust the next chop point, which is also the end point of the selected chop, by rotating Edit Knob 1.

Adding a chop point

Make sure that the Chop touch button is white.

Set the start point, where you want the chop point to be, either by touching the screen, or by rotating Edit Knob 1.
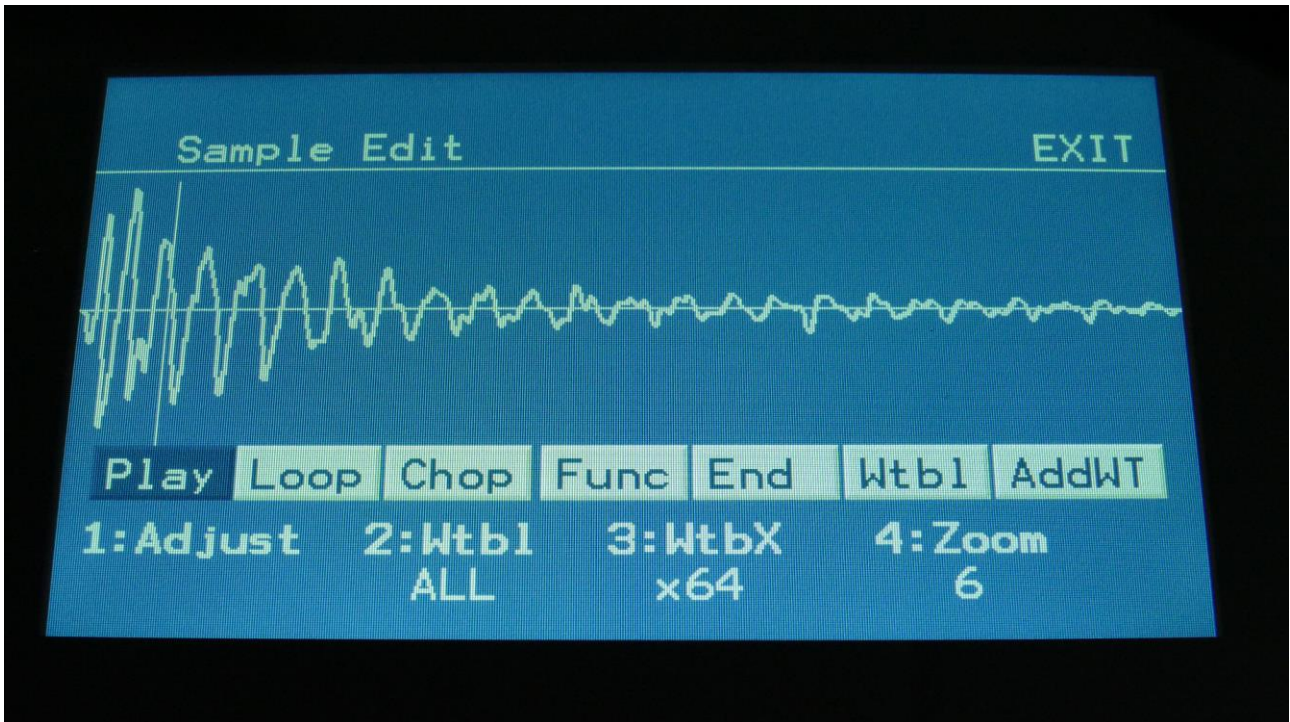
Touch the Func touch button.

Now you will enter the graphical function page:
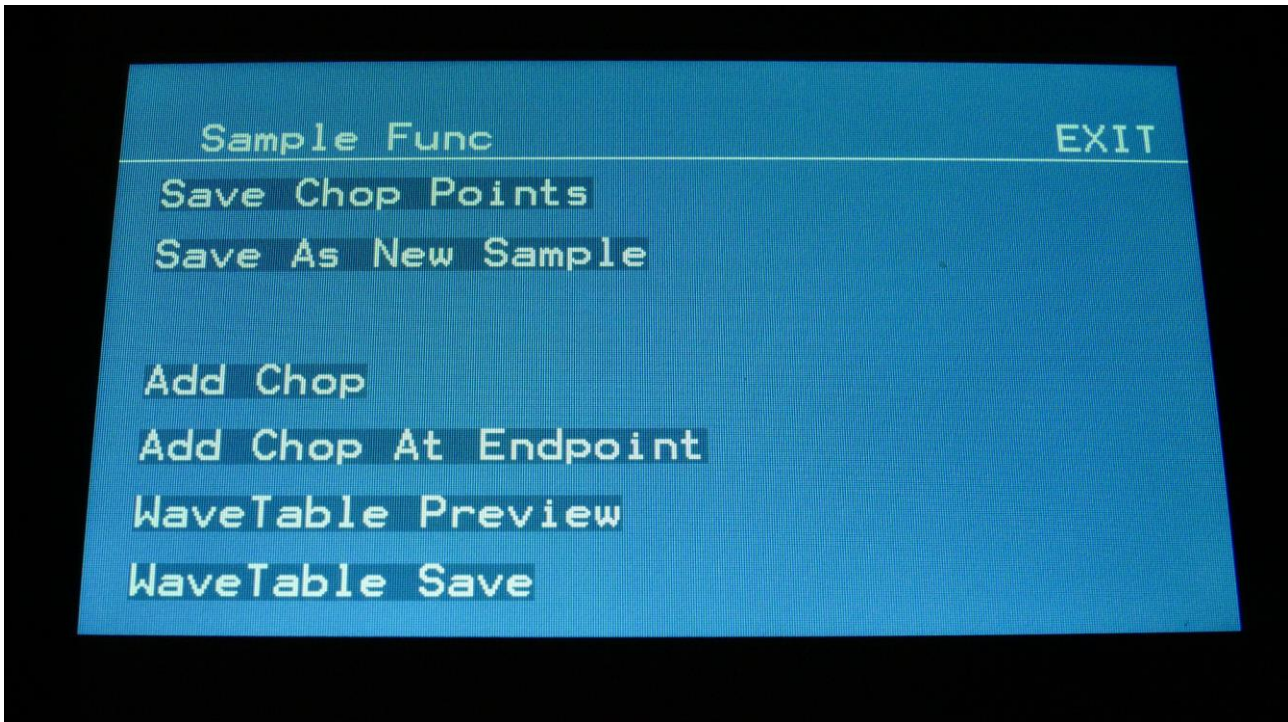
Touch "Add Chop". Zaturn will now jump back to the graphical edit page, and a chop point will be added at the selected start point.

Adding a chop point at the selected end point

If you wish to create a loop, for instance for use with the sustained loop feature, you will adjust the start and endpoints, until the loop sounds as intended.

Then you will save the start point as a chop point.

In order to make the loop work, you will though also need to save the selected end point as a chop point.

To do this, you must enter the graphical function page again:
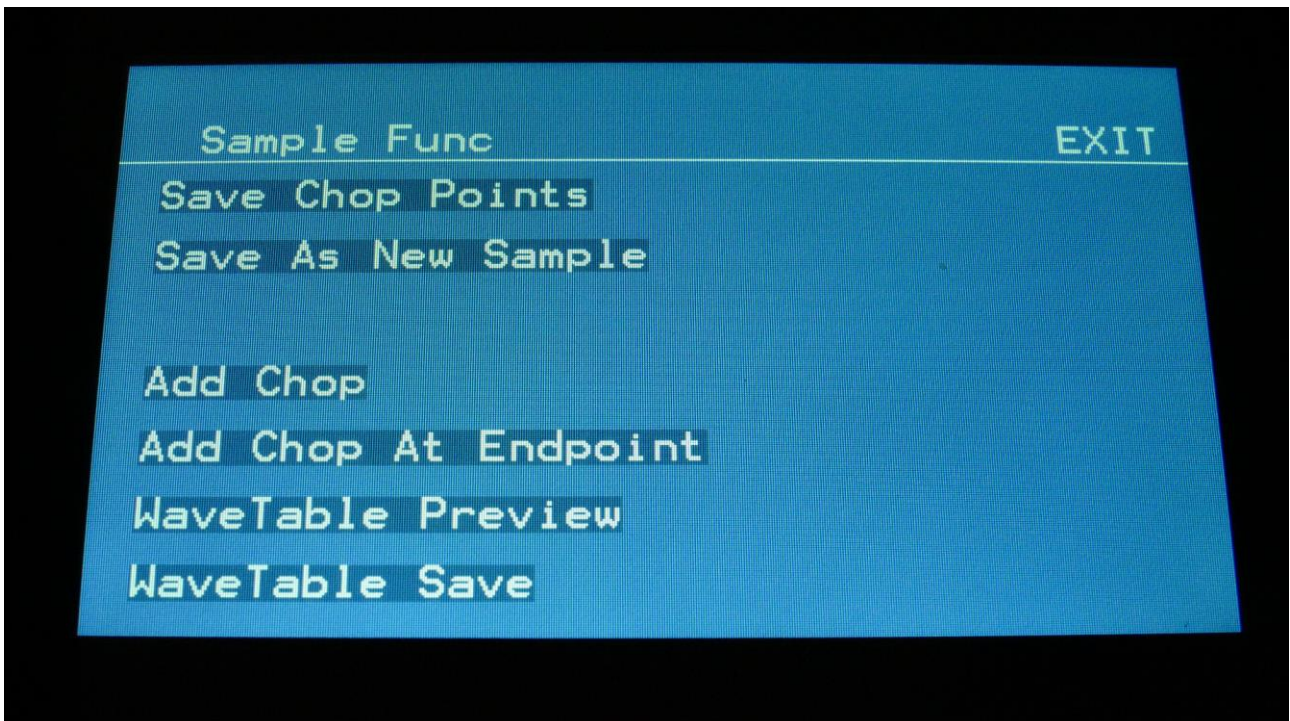
Touch "Add Chop At Endpoint". Zaturn will now jump back to the graphical edit page, and a chop point will be added at the selected end point.

Delete a chop point
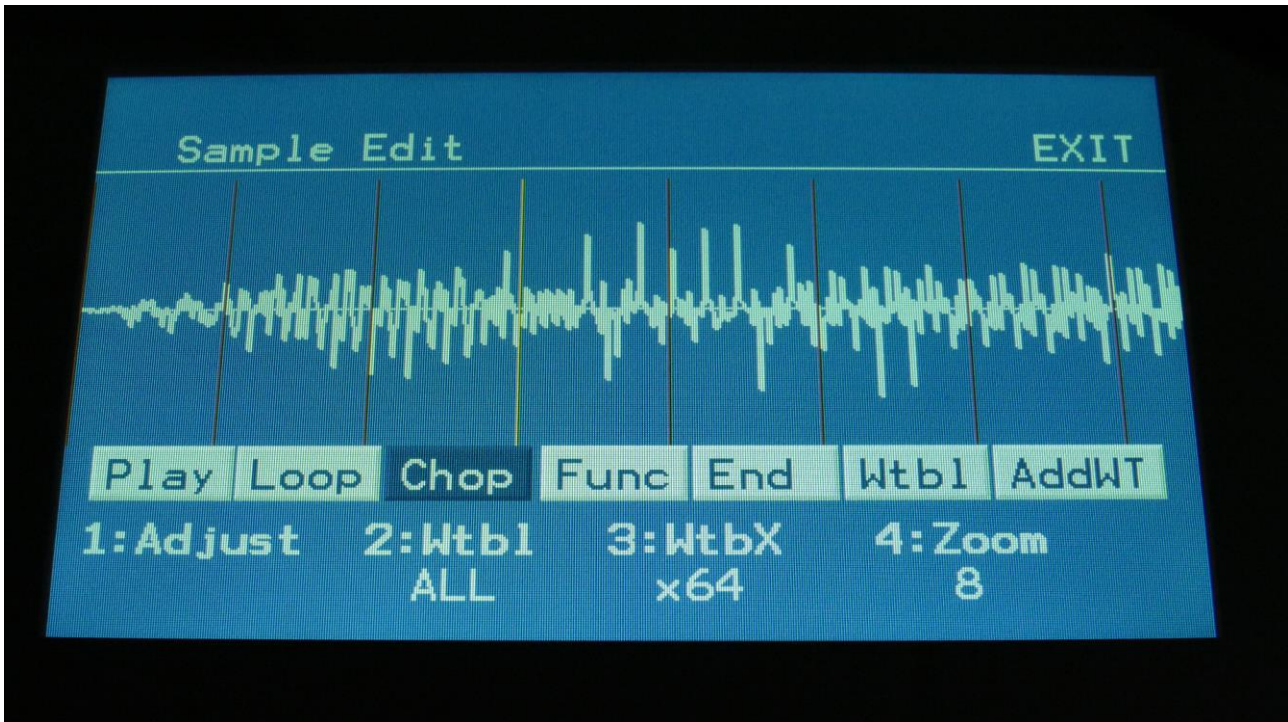
Make sure that the Chop touch button is dark blue, and that you have selected the chop point, which you want to delete.

Touch the Func touch button, to enter the graphical functions page.
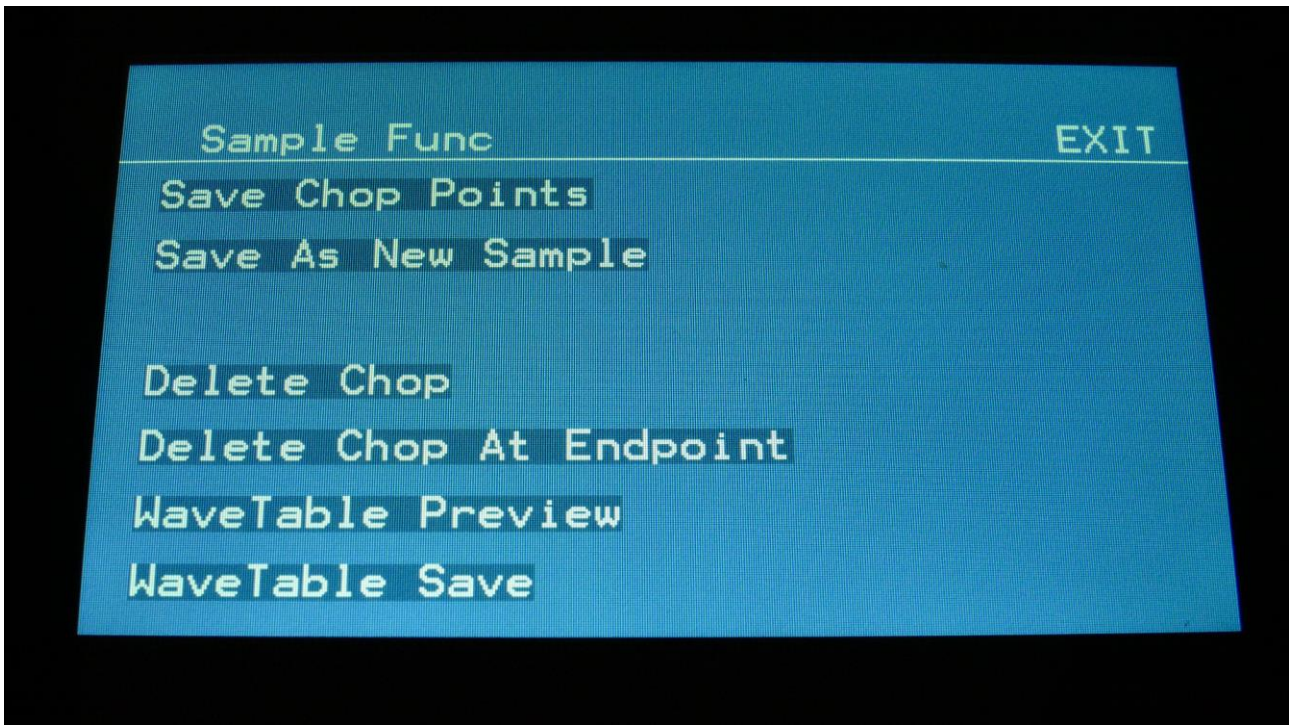
Now touch "Delete Chop". Zaturn will now jump back to the graphical edit page, and the previously selected chop point will have been removed.

To delete the next chop point, follow the same procedure, but touch "Delete Chop At Endpoint" on the functions page instead.

Saving the chop points

After you have edited, added and deleted chop points, you must save these changes, in order to keep them.

This is also done from the graphical functions page.
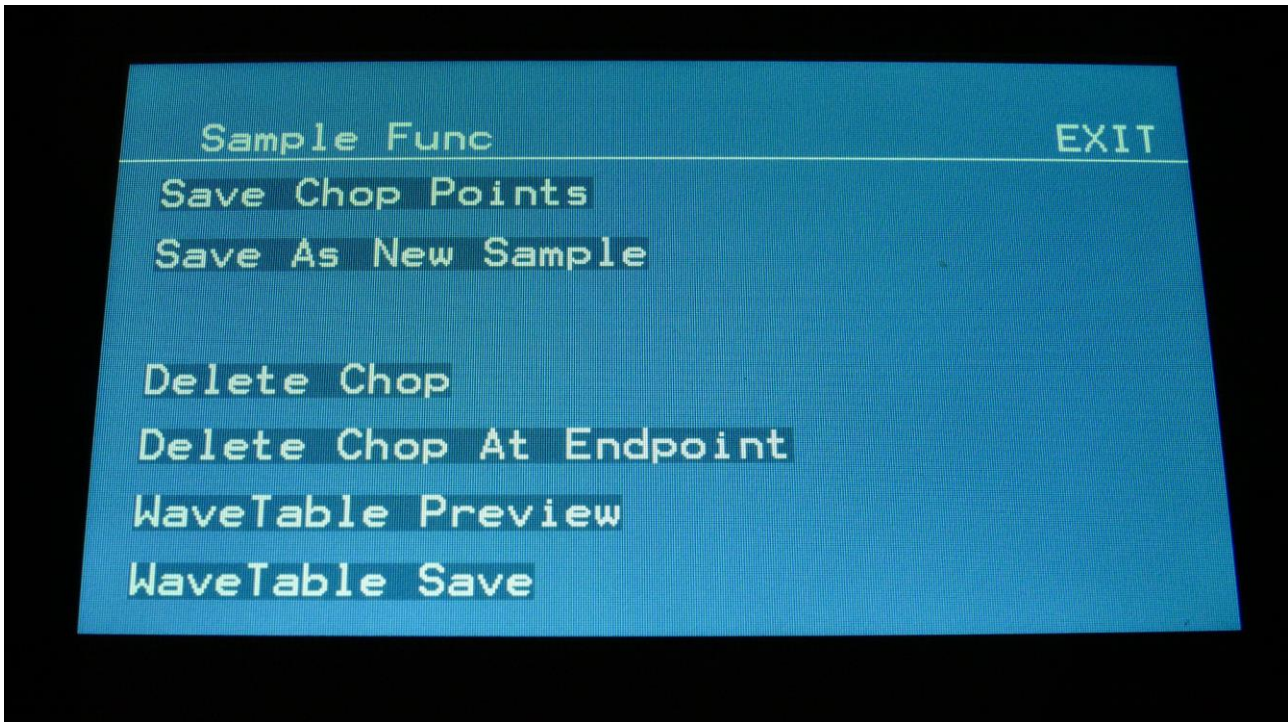
Simply touch "Save Chop Points". Zaturn will now save your edits, and return to the graphical edit page.

Creating a new sampling from a portion of the selected sampling

If you want to completely remove unused start and/or end portions of a sampling, use a portion of the sampling for a loop, or just wants to copy the whole sampling to another sample bank, you can use this function.
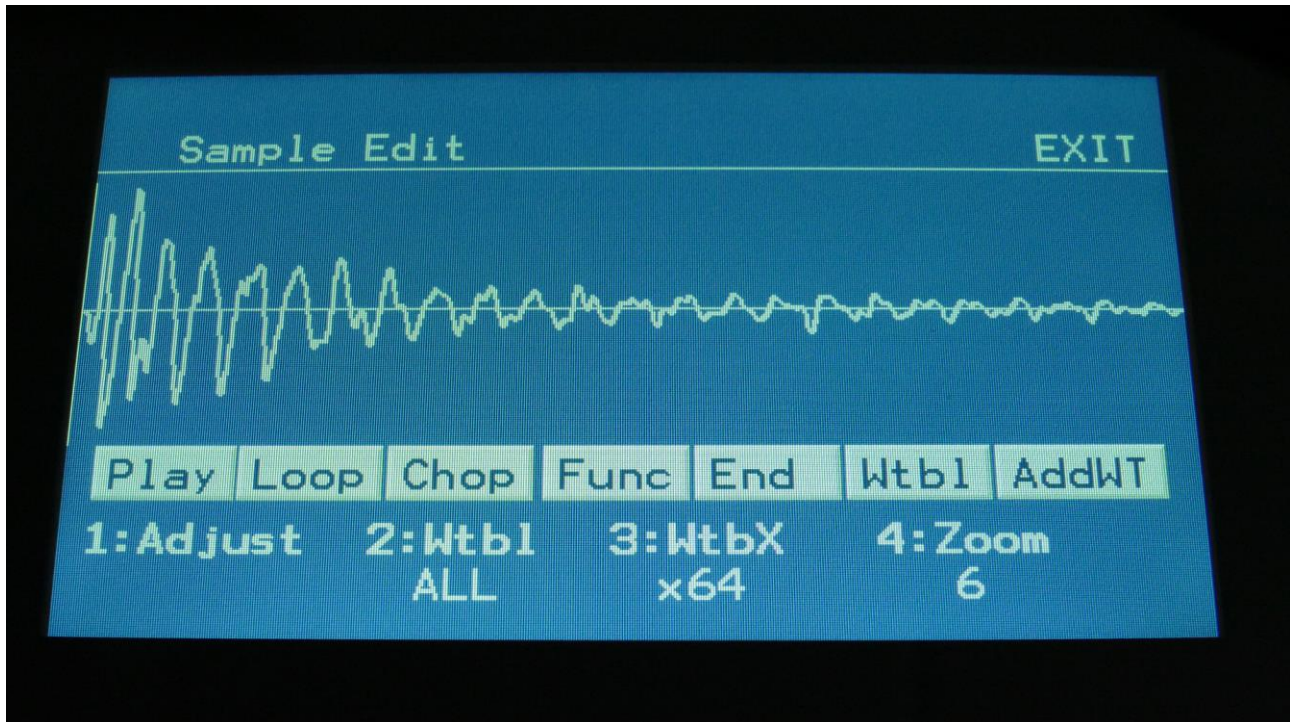
First, set the start and the end points, of the portion of the sampling, that you would like to copy, OR select a chop, it this is what you would like to copy.

Go to the functions page.
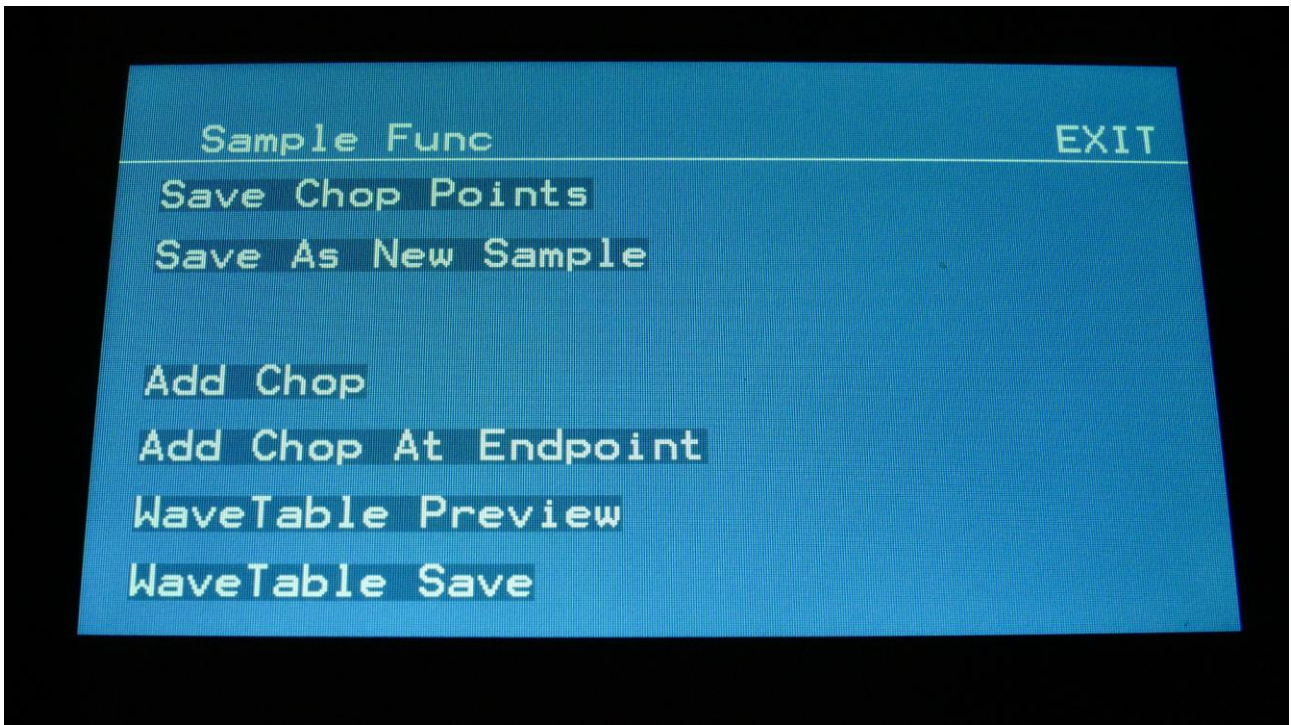
Touch "Save As New Sample". A new page will now open. Select the sample bank, that you would like to copy the sampling/portion of the sampling to, by touching the A, B, C or D touch button.
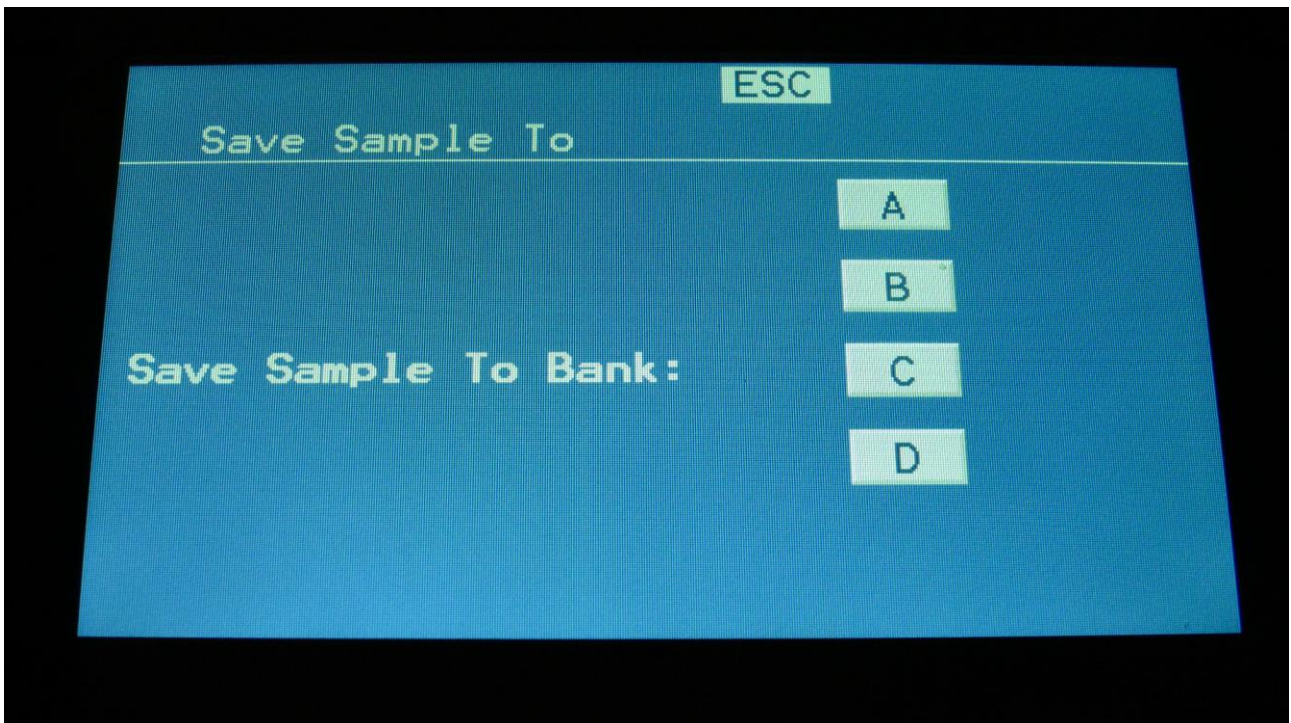
Zaturn will write "Saving Sample…" for some time, and then it will jump back to the functions page.

Assembling a Wavetable
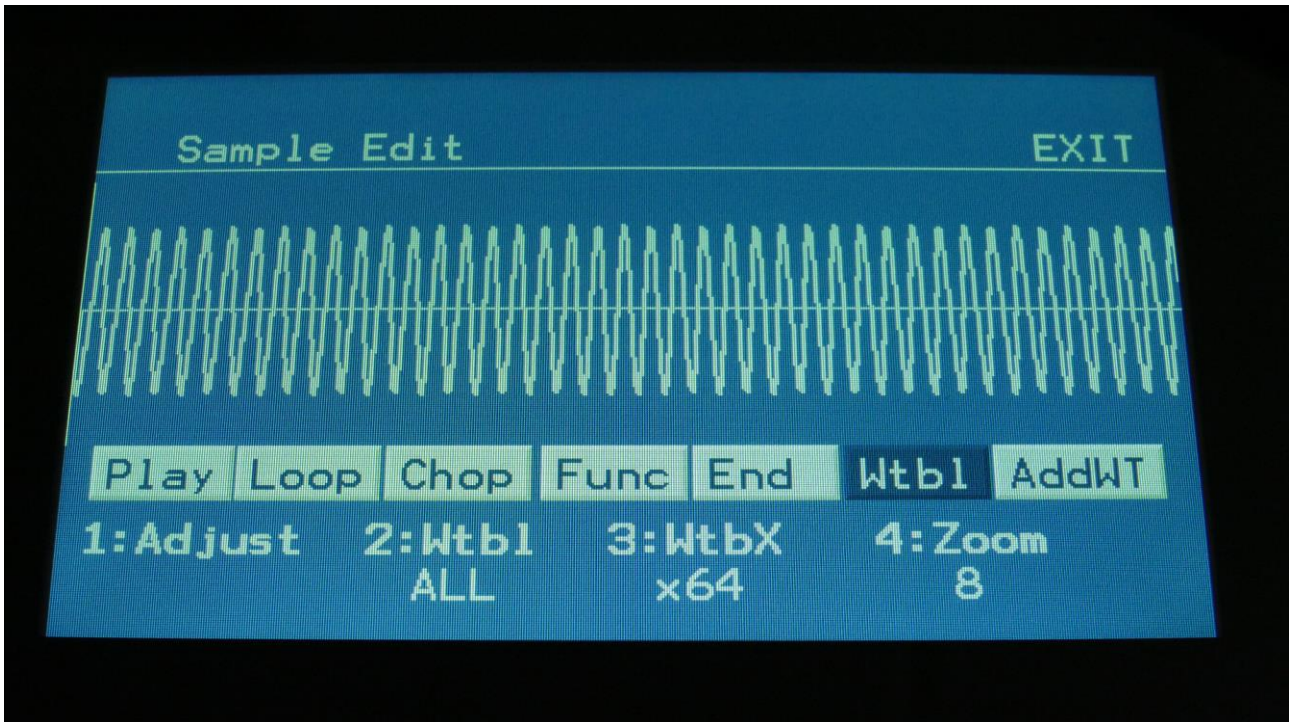
On the graphical sample edit page, with the sample, which you would like to build a wavetable from, selected, touch the Wtbl button, so that this turns dark blue. Zaturn will now create one wave for a table, consisting of 512 sample points, equally spaced between the selected start and end points. As soon as Wtbl mode is switched on, the currently generated wave will be audible.

Set if you would like your wavetable to have 8 or 64 waveframes, by the **WtbX** parameter (**Edit Knob 3**).

Select the wave, that you currently wants to generate by setting the **Wtbl** parameter (**Edit Knob 2**) between 1 and 8 or 1 and 64.

The **Wtbl** parameter **All** mode, will make it generate all 8 or 64 waves at one time, from the selected sample start point. The sample end point has no effect in this mode. In All mode, the wavetable will always play back in preview mode. Preview mode is explained on the next page.

Now, zoom in and out, and trim the sample start and end points, until you hear a result, that you like. Then select the wave number location on which you would like the current wave placed on, by setting the **Wtbl** parameter, and touch the **AddWT** touchbutton. The screen will update, to show that the wave was added.

Do the same procedure for each wave, until you have added all 8 or 64 waves to your new wavetable.

When you have assembled a wavetable, touch the Func button.
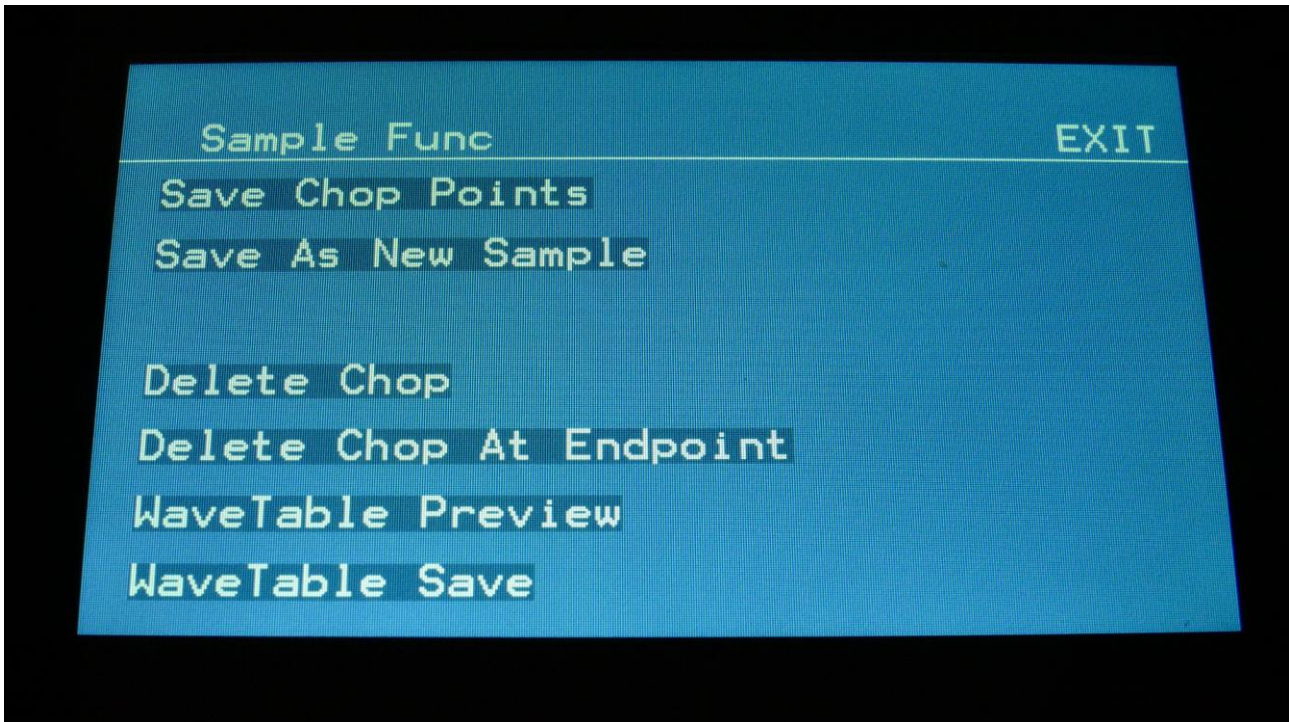

Touch **WaveTable Preview**, so that this turns white. Now you will hear your wavetable playing back. Adjust **Edit Knobs 1 and 2**, to scan through the waves (**Edit Knob 2** is only active at 64 waves).

When you are satisfied with the result, touch WaveTable Save, to save your new wavetable. Now this page will appear:
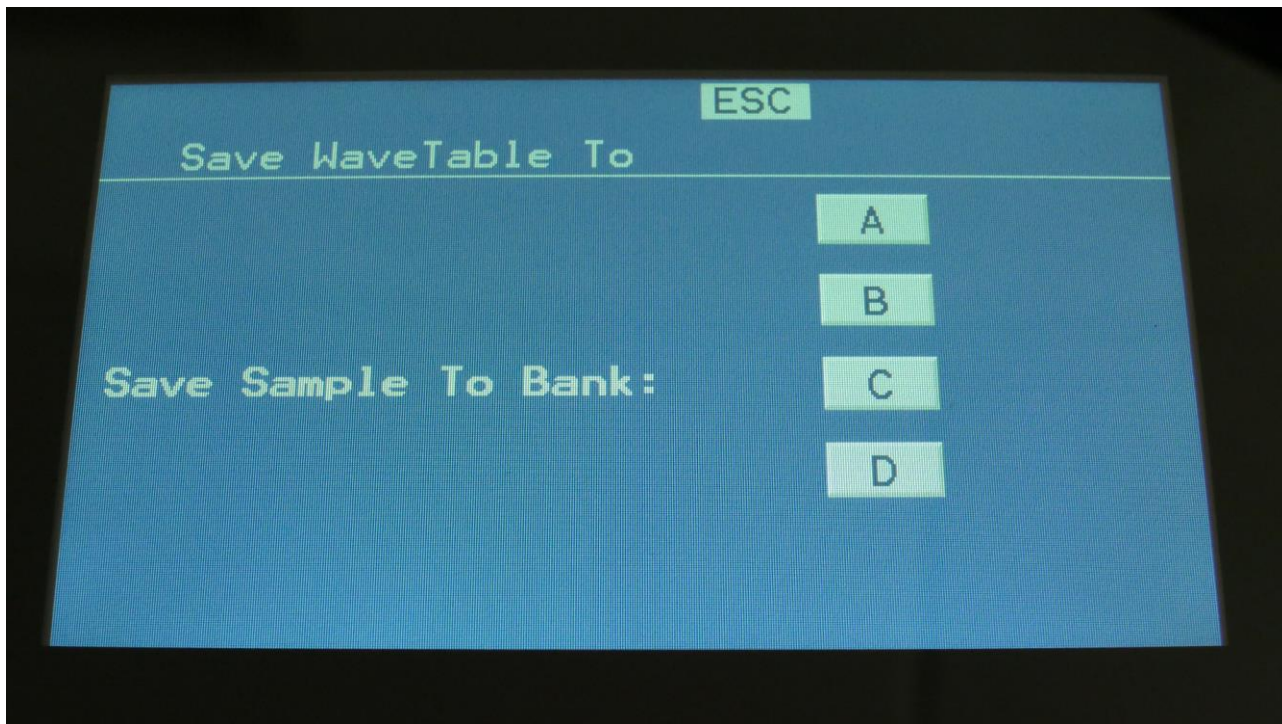
Select the sample bank, on which you would like to save the wavetable to, by touching the A, B, C or D field. 18 min. and 43 min. Zaturn's only has Bank A. Now the naming page will show:
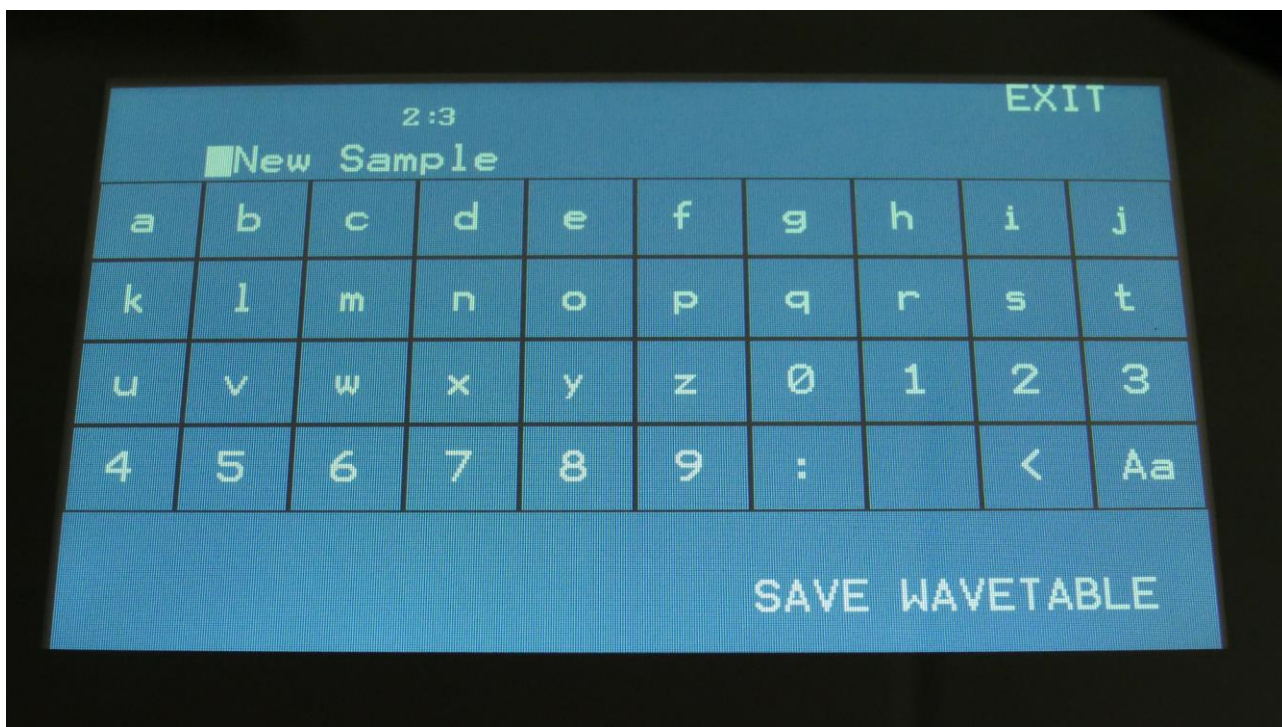
Type in the name of your wavetable, and touch SAVE WAVETABLE. The "Aa" button will switch between uppercase/lowercase letters, and numbers/signs.

WaveBuilder

The Zaturn WaveBuilder lets you combine up to 8 samplings, to create a wave sequence from these.
Whole samplings, parts of the samplings or chop points from the samplings, can be used to build a new wave sequence.
The wave sequence is saved as a new sampling, and a chop point is inserted, at the start point of each of the 8 waves, for easy selection of each partial, using the chop parameter.
WaveBuilder also lets you copy a sampling from one sample bank to another. Just select the sampling in WaveBuilder, set start to 0 and length to 511, and save it to the new bank.
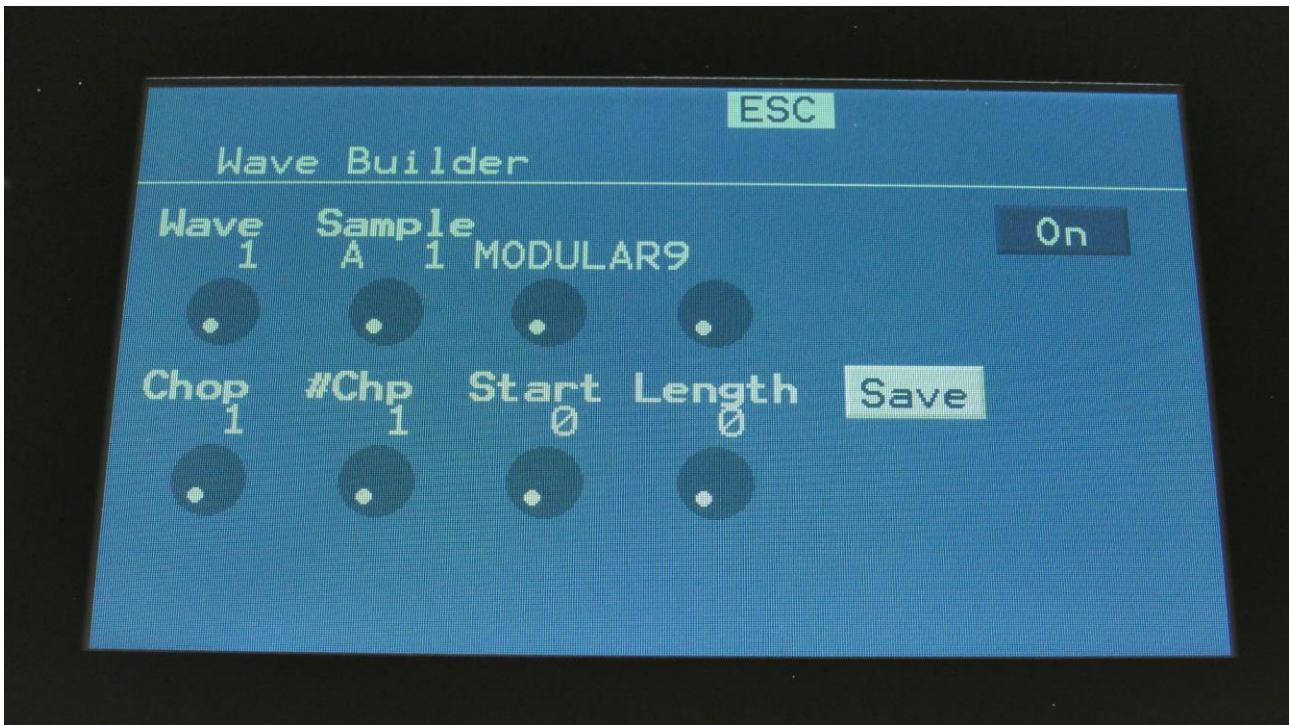
The WaveBuilder always outputs to the L and R outputs

Enter WaveBuilder:
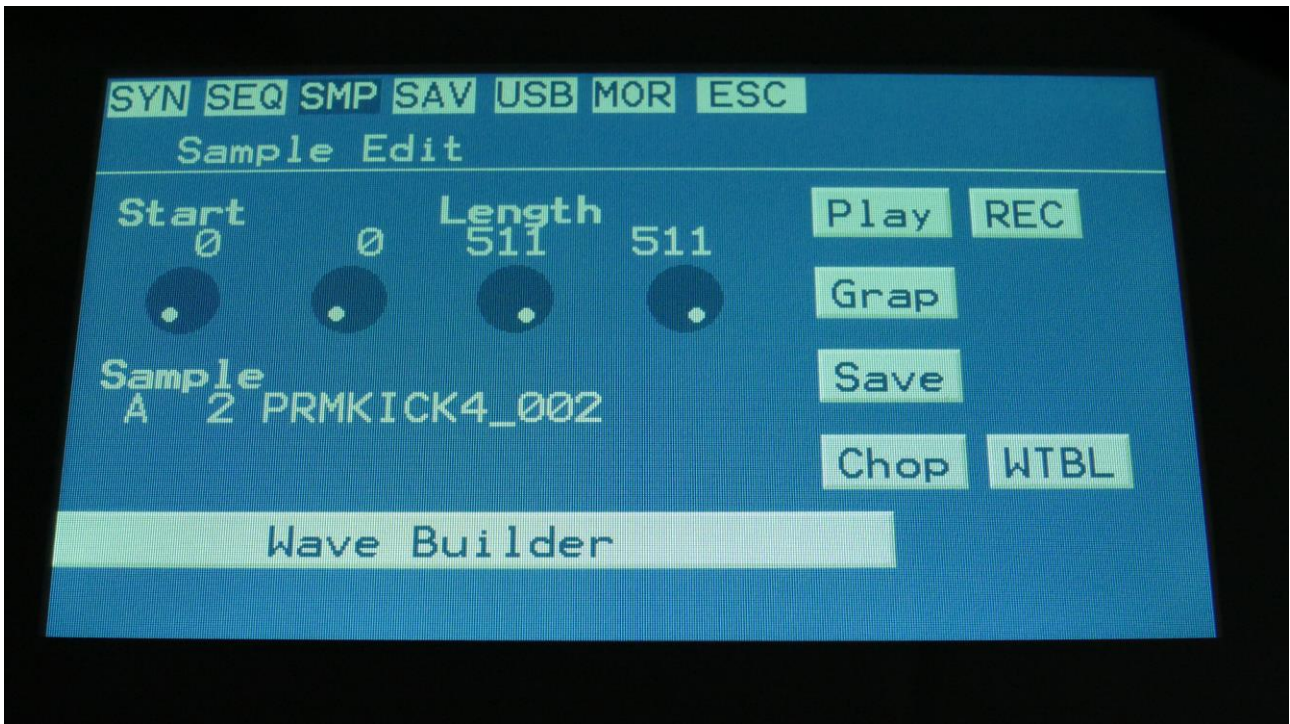
From the Sample Edit page, touch Wave Builder in the bottom of the page.

You will now enter this page:

Wave: 1 to 8. Selects wave 1 to 8 of the wave sequence to be generated.

Sample: A0 to D2048. Selects the sampling for the selected wave. Edit knob 2 selects the sample bank (A to D), edit knob 3 selects the 100's in the sample number, and edit knob 4 select the 10's and the 1's in the number.

Chop: 1 to 64. Selects the chop point of the selected sampling, to be included in the wave sequence, if the selected sampling holds any chops.

#Chp: 1 to 64. Selects the number of chops to play back, from the selected chop.

Start: 0 to 511. Sets the start point of the sampling, of the range, that should be included in the wave sequence. If the selected sampling holds chop points, the start point will be inside the selected chop range.

Length: 0 to 511. Sets the length of the sample range, that should be included in the wave sequence. If the selected sampling holds chop points, the maximum length will be inside the selected chop range.

On/Off touch button: Each of the 8 waves can be separately switched on or off. As soon as at least on wave is on, WaveBuilder will start playing back the sequence of the waves.

Any waves that are switched off, or has their length set to zero, will be skipped from the wave sequence.

Save touch button: As soon as you have selected samplings and chops, and adjusted the start and lengths, and you are satisfied with the result, you should touch this button, to save the new wave sequence.

This will get you to this page:
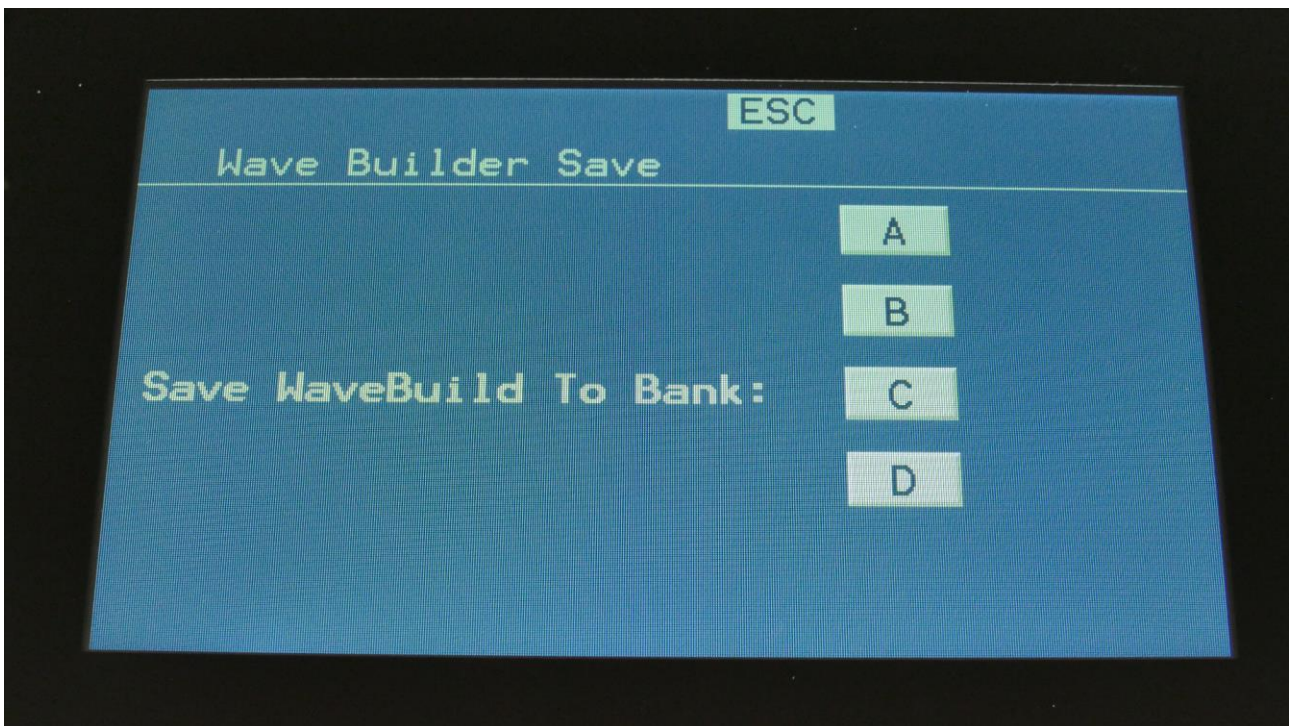
Now touch A, B, C or D, to save the wave sequence to the corresponding sample bank. The 18 min. and 43 min. models only has Bank A.

WaveTable Editor

In the wavetable editor, you can load an existing wavetable or sampling, and edit or even completely redraw each wave. You can edit each single cycle wave, by drawing with you finger on the touch screen. Two different draw modes are currently available: Nrm (normal) or Art (Artistic). In Nrm mode, the waveform drawing simply follows your finger, and you can draw any shapes easily. In Art mode, Zaturn will generate artistic waveform patterns, as you draw. The patterns will vary after how high you place your finger on the screen, and if you draw forwards or backwards. It is possible to copy and paste single cycle waves. It is also possible to audition the single cycle wave, as well as testing the whole wavetable, directly on this page. When saving a wavetable, it is possible to name it and select the destination sample bank. It is saved as a wav file.

To load a sampling or a wavetable for editing, simply select this on the Sample Edit page.
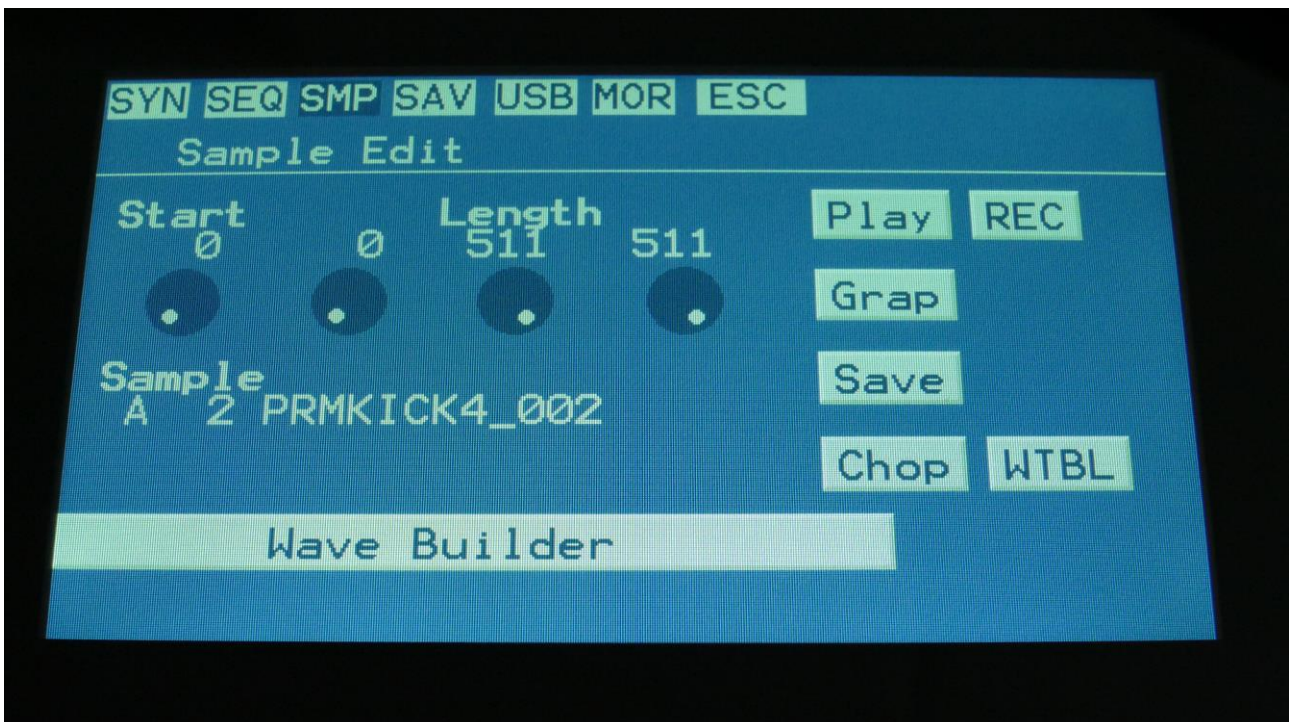
Then touch the WTBL button, to enter the wavetable editor.
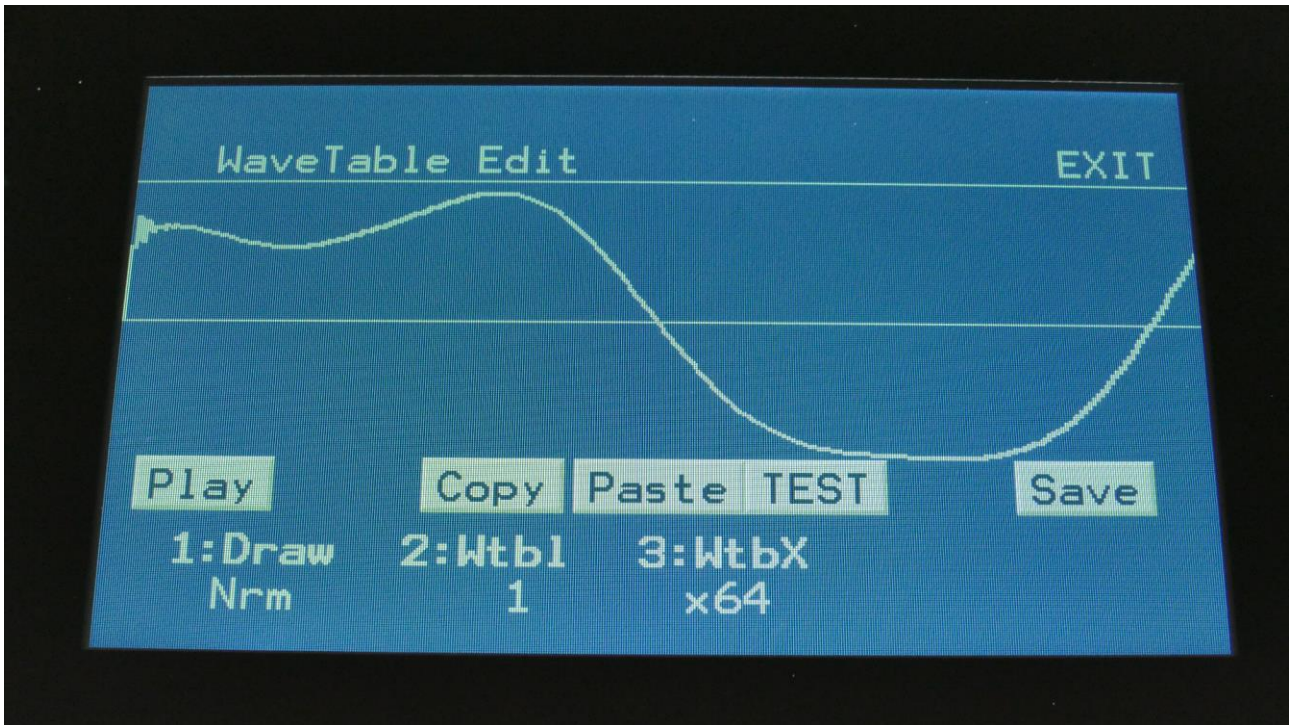
Here you can view and edit the wavetable one wave at a time. With **Edit Knob 2** you can select wave 1 to 8 or 1 to 64, depending on the wavetable mode. With **Edit Knob 3**, you can select the desired mode: **x8** (8 waves) or **x64** (64 waves).

You can edit each wave, simply by drawing with your finger on the touch screen. 2 different draw modes are available: **Nrm** and **Art**. The 2 modes can be selected by **Edit Knob 1**. **Nrm (Normal mode)** will simply follow your finger moves. **Art (Artistic mode)** will draw complex patterns. How the pattern will look like, depends on some factors: Whether you move your finger forwards or backward, and on how high in the wave field your finger are placed. Most of the time, it is though quite unpredictable.

To **audition** the currently selected wave, touch the **Play** button, so that this turns dark blue.

You can keep this turned on, while you are drawing. The output sound will change, according to the wave.

If you want to use a wave as a base for another wave, a **copy/paste** system has been included. Select the wave you want to copy, and touch the **Copy** button. Then select the destination wave location, using **Edit Knob 2**, and touch the **Paste** button.
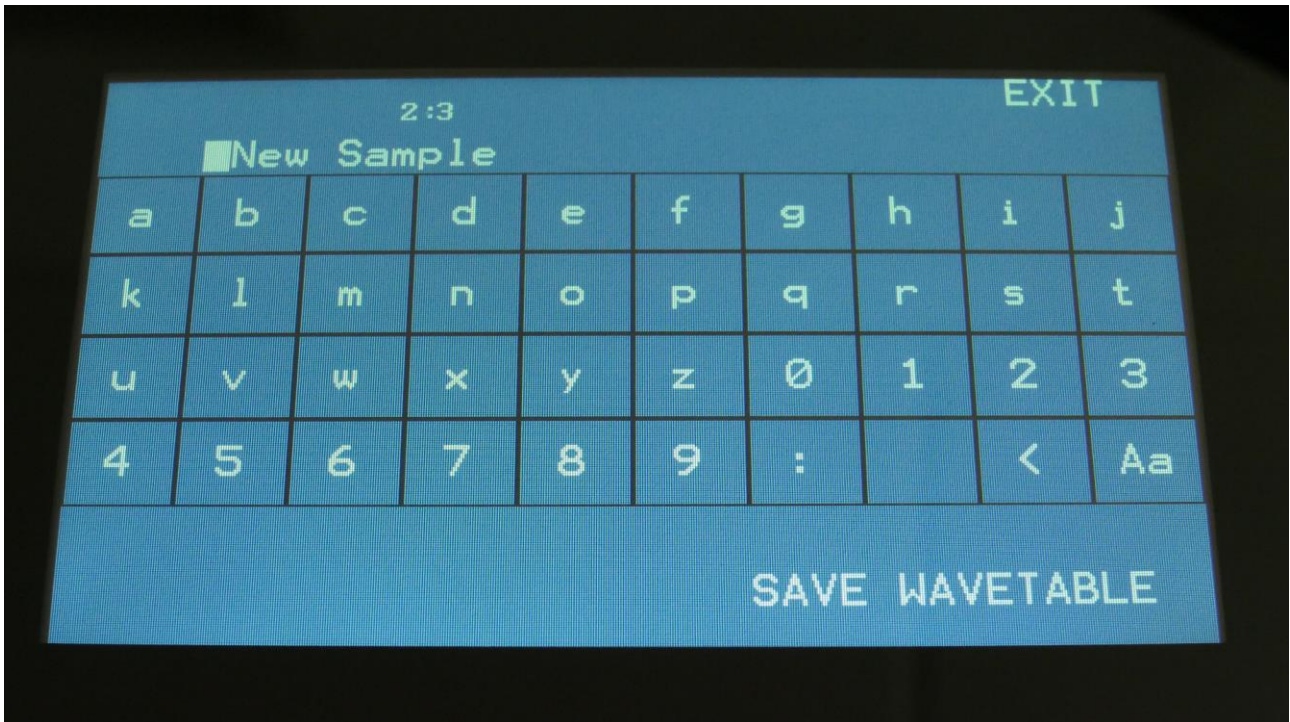
At any time under this process, it is also possible to test the wavetable. Touch the TEST button, so that this turns dark blue.
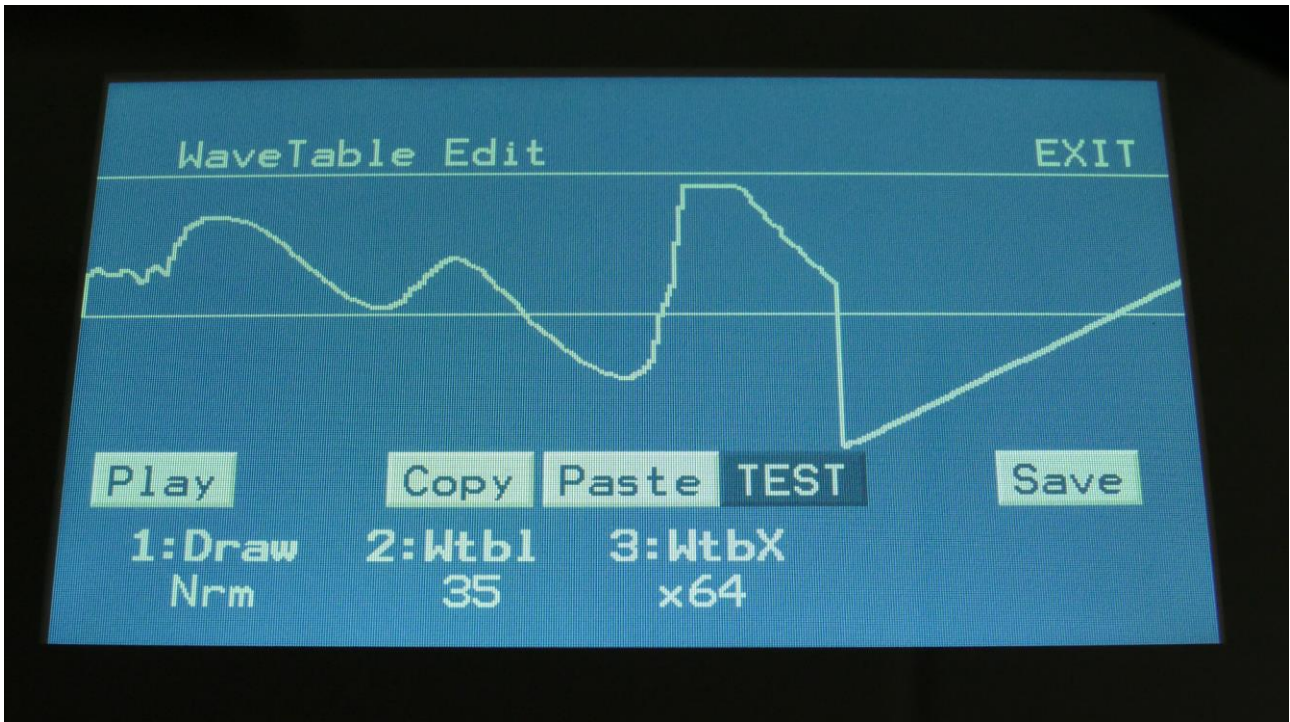
You will now hear the wavetable play back. Turn Edit Knob 1 and 2, to hear how the wavetable changes.
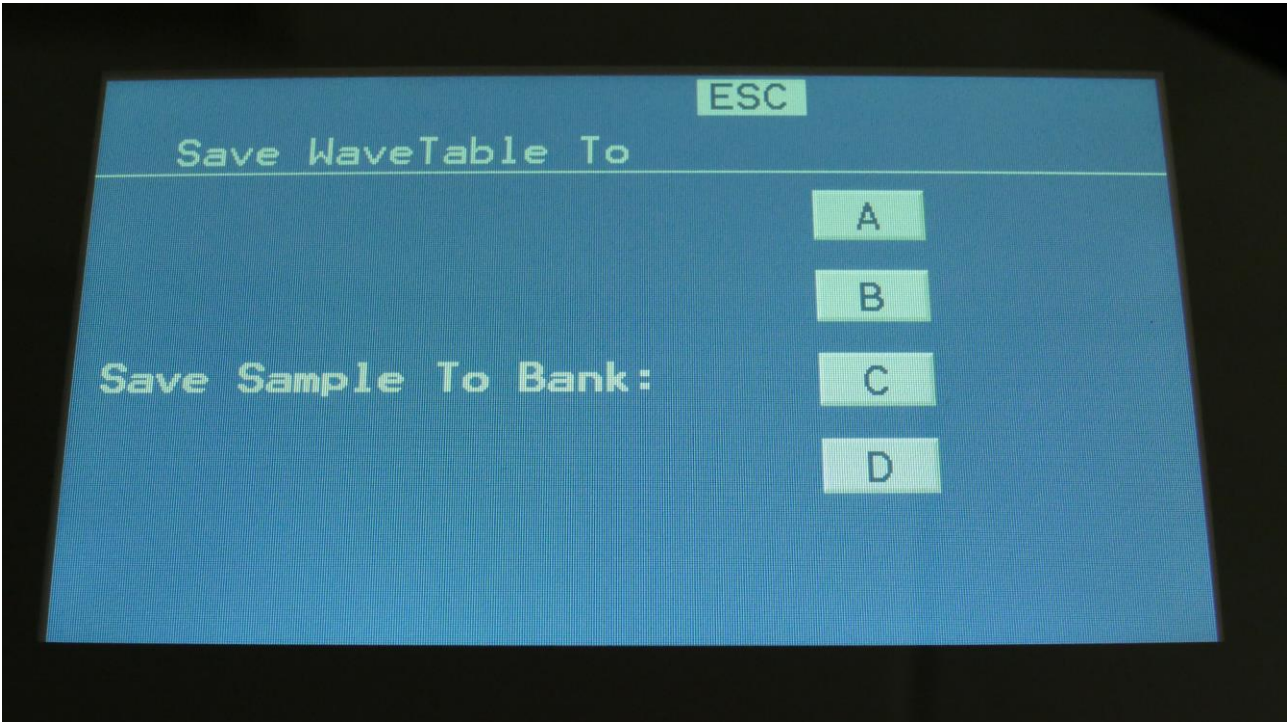
When you are satisfied with your new wavetable, you should save it to keep it.

Touch the Save button. You will now enter the name page.

Type in the desired name for your wavetable. The Aa button will shift between upper and lower case characters. When you are done, touch SAVE WAVETABLE.

You will now enter this page:

Now touch the letter A to D, which corresponds to the sample bank, where you want to save your new wavetable. The 18 min. and 43 min. models only have Bank A available.

USB

The USB pages lets you access the files and directories of a USB drive, attached to Zaturn's USB connector.

You can import and export samples as .wav files, import and export presets and songs, import and export user filter parameters, update the Zaturn firmware, and make new directories.

USB drives used with Zaturn should be:
-Maximum 32 GB
-FAT formatted

From the Preset Select screen, touch the EDIT field, to enter the Main Modules page:
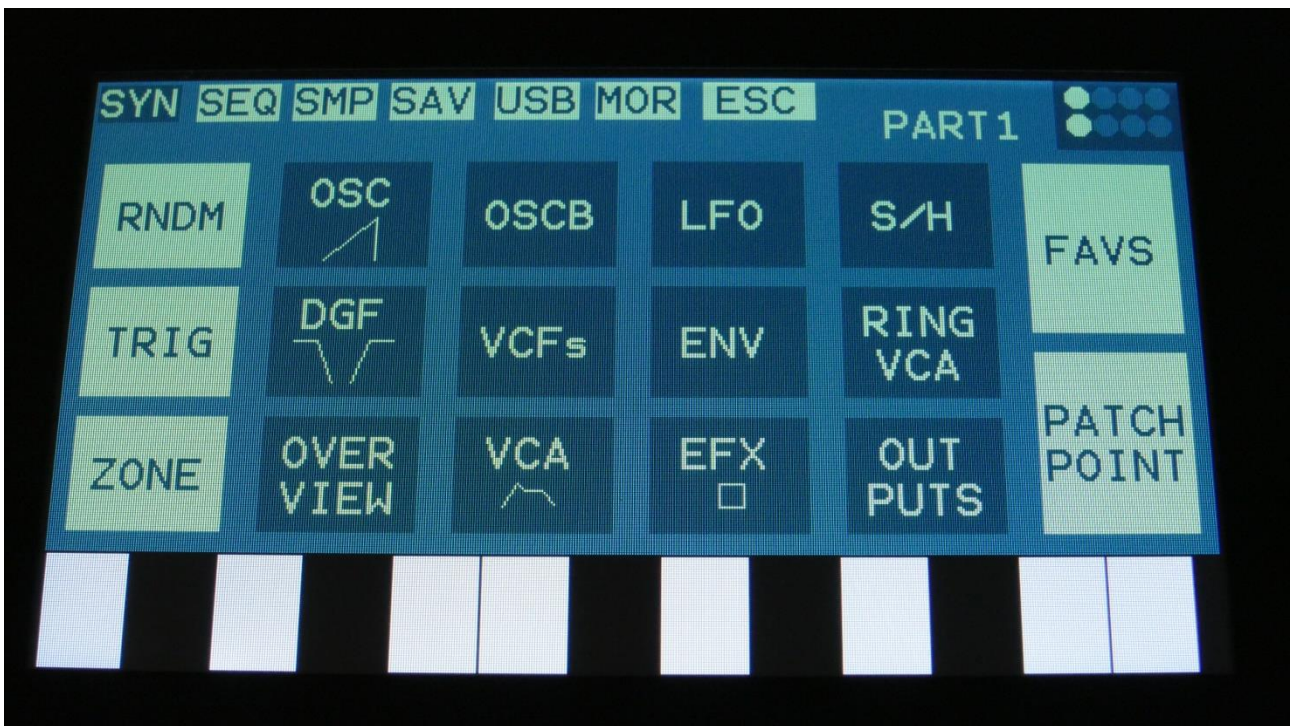
Touch USB on the navigation bar at the top of the screen.

On this first page that you will enter, the root directory of the connected drive is shown. You can see that it is the root directory, by the "D:" in the top of the page. If you have accessed a directory, the name of this will replace "D:".

If you do not see the root directory of the drive, make sure that it is connected properly, and that it is has the right specs, as described in the start of this section.

The names you see on the screen, are the names of the files and directories on the drive. File names are in black, and directory names are in purple. The currently selected file has a white box around it. To select a file, simply touch it.

Zaturn will show 7 files/directories at a time. By pushing the arrows, you can select the previous/next 7 files.

USB Sample Preview

Wav samples can be previewed directly from a USB drive.

Select the sampling, that you would like to preview, by touching the sample name, and touch the PREW touch button. This will first show LOAD, then PREW again, while playing back the first 6 seconds of the sampling.

Open a directory (or folder)

To open a directory, to see what's inside, or to import single files or sub-directories, simply select the directory you would like to open, by touching it, and then touch the "Open" button.

Zaturn will now open the directory, and show the first 7 files in it. The "D:" in the top of the screen, will now be replaced by the opened directory's name.

Importing files

Files that can be imported to Zaturn are:
-Samplings with the ending .WAV, including Zaturn generated chop points, and cue points generated by other gear/computer programs.
-Little deFormer samplings with the ending .LDS, including chop points.
-Presets with the ending .ZAP
-Songs with the ending .ZAO
-Sequencer data from LD3 and Tiny LD presets with the ending .XDP
-Sequencer data from SpazeDrum presets with the ending .SDP
-Sequencer data from Urano presets with the ending .URP

Files that are shown, but can't be imported directly are:
-Update files with the ending .HEX

Files with any other ending will not be shown on Zaturn's screen, regardless of if they are present on the drive.

To import a single sampling or preset/song, select the .WAV/.LDS/.URP/.URO file you would like to import, by touching it.
Samples are imported to the sample bank selected on the Sample Edit page.
When importing a single preset or song, it is only loaded to the preset/song buffer, and you will have to save it manually, to keep it.

Samples that were exported from a Gotharman instrument, can be imported either with the "LD" name (the imprinted sample name shown for the sampling on the sample pages), or the file name. To select this, see the next sub chapter of this manual "Importing Multiple Files".

Touch the "Import" button. Zaturn will now import the selected file, and show the progress on a progress bar:

Importing multiple files

To import multiple files at one time, select a directory, by touching it. Touch the "Import" button. Zaturn will now ask:
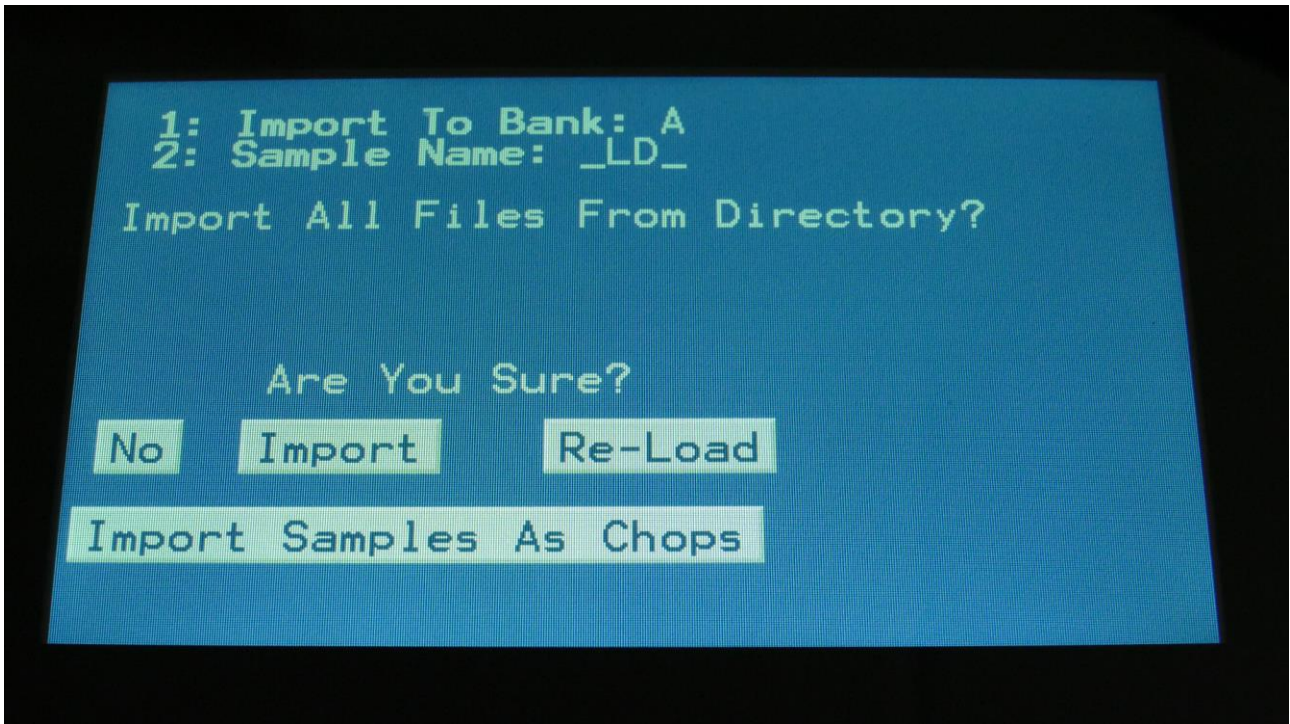
Touch "Import" to continue, or "No" to exit.

If you touched Import, Zaturn will now import all samples, presets and songs, that the selected directory holds. It will though not import files from any sub-directories.

Samples are imported to the sample bank selected by Edit Knob 1, that is shown in the top of the screen. Presets are imported to the selected preset and forwards, so make sure that you have not selected a preset that you planned to keep, before using this function. Songs are also imported to the selected song and forwards, so make sure that you have not selected a song that you planned to keep, before using this function.

Samples that were exported from a Gotharman instrument, can be imported either with the "LD" name (the imprinted sample name shown for the sampling on the sample pages), or the file name. To select this, turn Edit Knob 2, to select either "_LD_" or "File".
This setting will be valid until you turn your Zaturn off, or gets back here to change the setting. The setting is valid both when importing multiple samples, and when importing single samples.

Please note that User filter parameters can't be imported as multiple files.

Reload multiple files

A reload function is also available. This will only import presets, songs and samples that has been exported from Zaturn, or that has been renamed to to fit the Zaturn export standard –samples must be named: A0001.WAV, A0002.WAV…..A0220.WAV, B0001.WAV, B0002.WAV…..B0256.WAV,
 presets and songs must be named: A01.URP, A02.URP….A64.URP, B01.URP, B02.URP…..P64.URP .

This function will import presets and songs to the same locations as they were originally stored to.

Reload will also import samples to the exact same location, as they were placed when exporting. This will make sure, that samples used in your presets, will always be placed in the right locations. Sample locations that are already occupied, will be skipped by Reload, so make sure to erase sample bank A and B, if you want a complete reload.

To Reload multiple files, select a directory, by touching it. Touch the "Import" button. Zaturn will now ask:
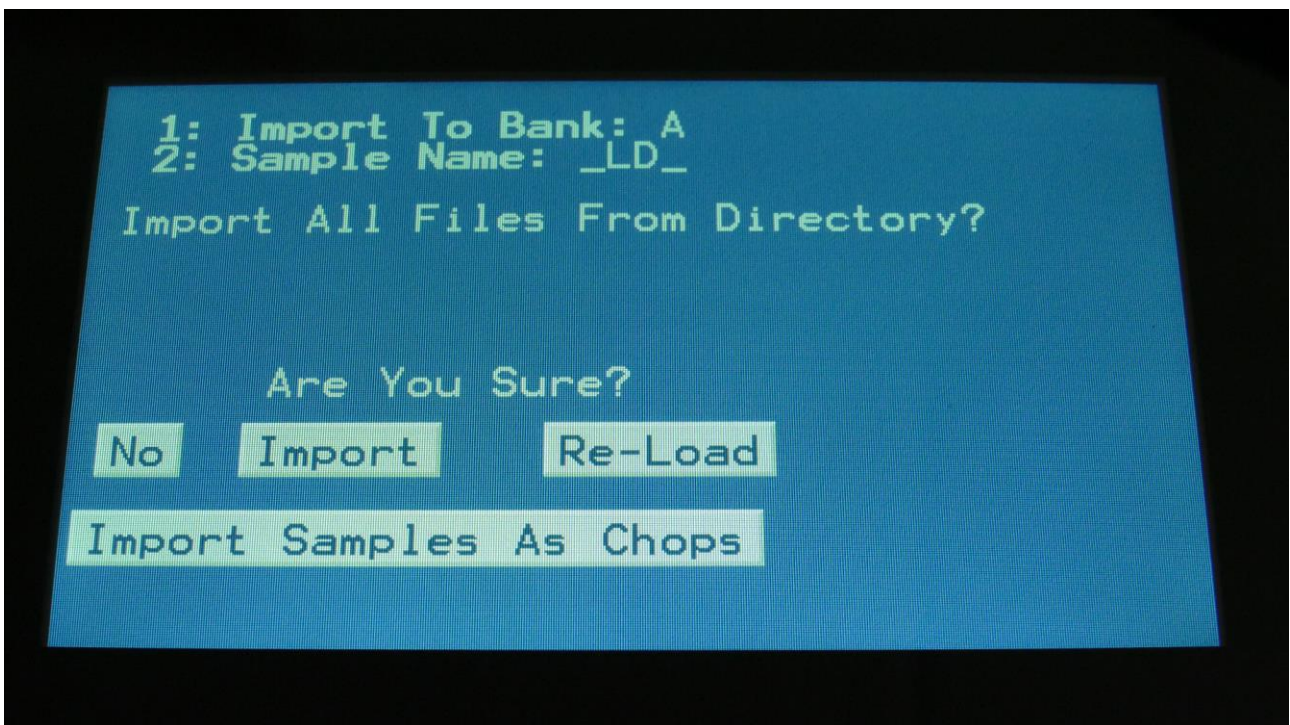
Touch "Re-Load" to continue, or "No" to exit.
If you touched Re-Load, Zaturn will now import all samples, presets and songs, that the selected directory holds, and that are correctly named. It will though not import files from any sub-directories.

Reload does also have other functions:

-On Zaturn itself, it is only possible to erase the last recorded sampling of bank A, B, C and D. By exporting all your samplings to a USB drive, and then delete sample bank A, B, C and D on Zaturn, delete the sample wav files you want to erase on the USB drive, from Zaturn itself or on a computer, and reload all the samples. Samples that are erased, will just be left blank.

-If you would like to import a number of wav files in a specific order, or in a specific sample bank, you can rename the samples on a computer to: A0001.WAV, A0002.WAV…..A0220.WAV, B0001.WAV, B0002.WAV…..B0256.WAV, and then import them using Reload.

-If you would like to rearrange the order of samples and/or presets, you can rename the files and reload them. Presets are named: A01.ZAP, A02.ZAP….A64.ZAP, B01.ZAP, B02.ZAP…..P64.ZAP .

Import Multiple Samplings From Directory As one sampling with Chop points

This function will make it easier than ever, to make your Zaturn hold more than 8.192 samplings, in an easy way! Without splicing samples on a computer!

On your computer:
Make a directory (or folder) on a Zaturn compatible USB drive. Name the directory with the name, that you want the sampling to have. Copy any single samplings you would like this sampling to contain, into the directory. Max 64 samplings.

Create multiple such directories, if desired.

Unmount the USB drive from your computer, and insert it in the Zaturn USB port.

Enter the USB menu, select the directory you just created, and push "Import".

This screen will now show:
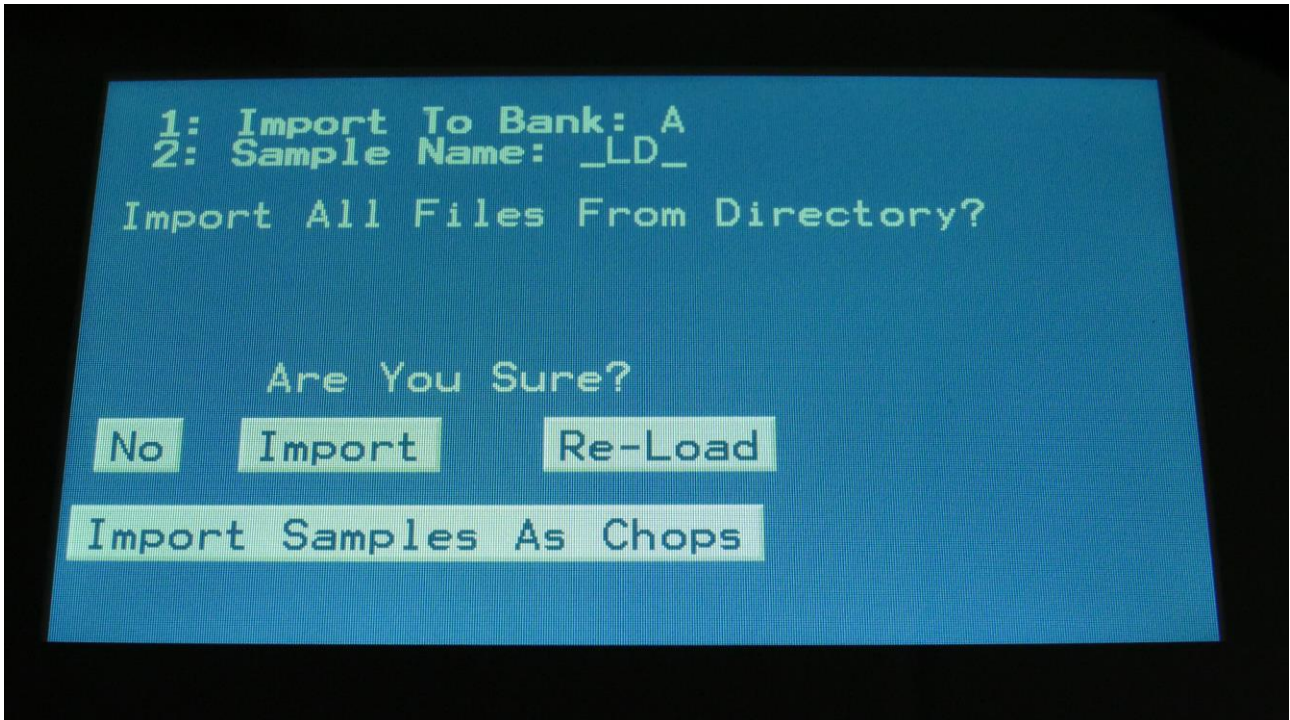
Touch "Import Samples As Chops".

Zaturn will now create one sampling from all of the samplings in the selected directory, and insert a chop point at the start point of each sampling.

Samples are imported to the sample bank selected by Edit Knob 1, that is shown in the top of the screen.

After the import is done, go to the sample edit page, select the sampling you just imported (named from the directory name), and enter the Chop edit page. You will now be able to hear each of the samplings, by selecting chops.

On the synth sampler pages, the procedure is the same. Select the sampling, and select the chop point. Modulate the chop point selection, to create great variation.

I have found this function especially useful, when working with acoustic drum samplings. There are many acoustic drum sample packs on the net, that has different variations of the same drum sound. Put all the variations of a sound in one directory, import as chops, and modulate the chop

selection with velocity, random or any other modulation source, to make some great dynamic acoustic drum beats.

Make a new directory

A new directory can be created in the root directory, or inside another directory.

To do this, touch the "MD/Del" button.
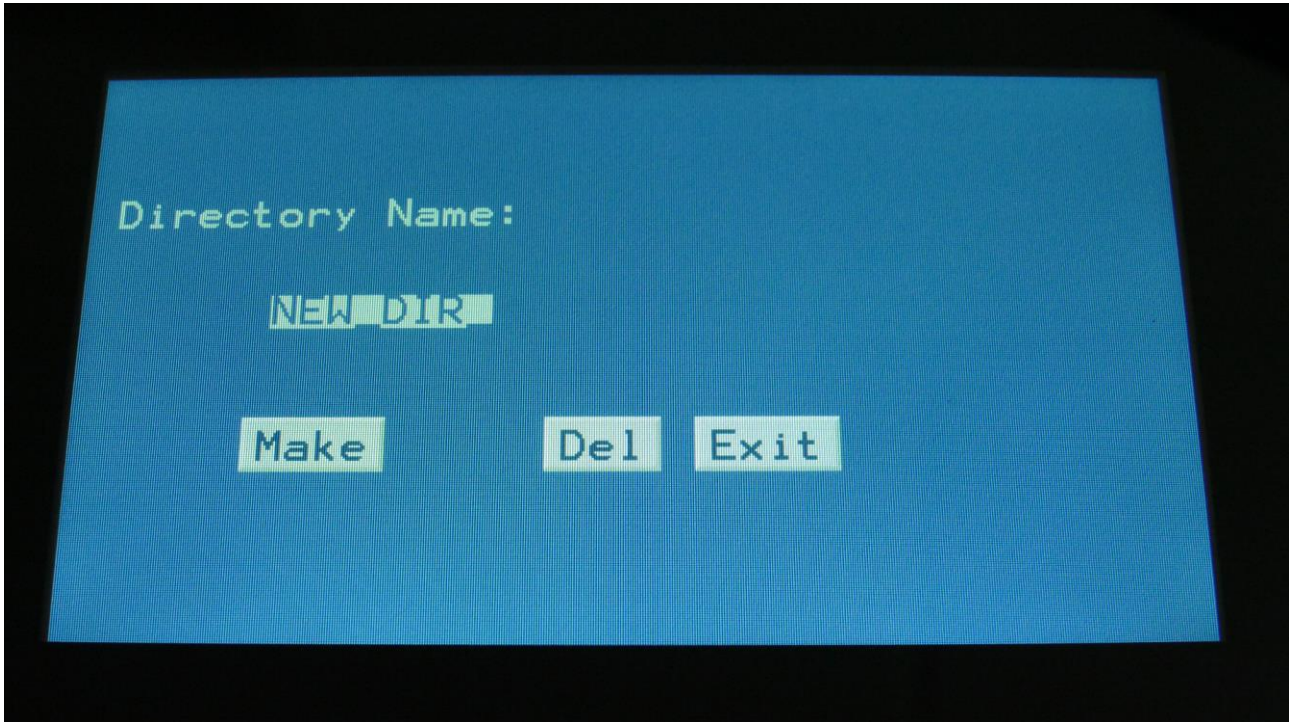
Turn the 8 edit knobs to select the 8 characters of the name for the new directory. When you are done with this, touch the "Make" button. The new directory will now be created.

You can, of course, also just touch "Exit", if you do not want to make a directory anyway.

Delete file from USB drive

It is possible to delete a file from the attached USB drive, directly from Zaturn.

To do this, select the file you would like to delete, and touch the "MD/Del" button.
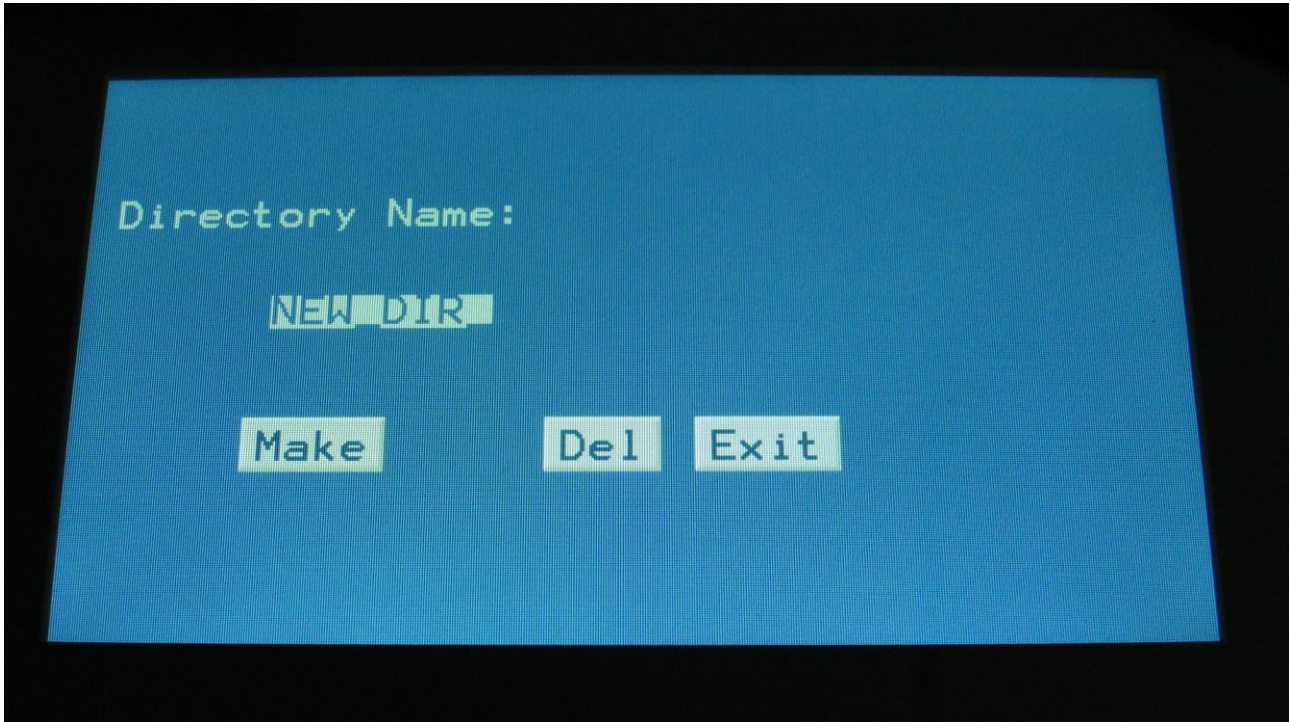
Now touch the "Del" button.

Export samples, presets, songs and User filter parameters to a USB drive

The samples, presets and songs held in Zaturn's FLASH memory can be exported to a USB drive, for back-up, or for use with other gear or computers. Zaturn exports samples as standard 16 bit, 44.1 KHz, native PCM .wav files, so they can be used with any other gear, that supports this format. Zaturn exports presets and songs in its own .urp/.uro format, so these can at writing moment only be used by Zaturn.

To enter the export page, touch the "Export" button:
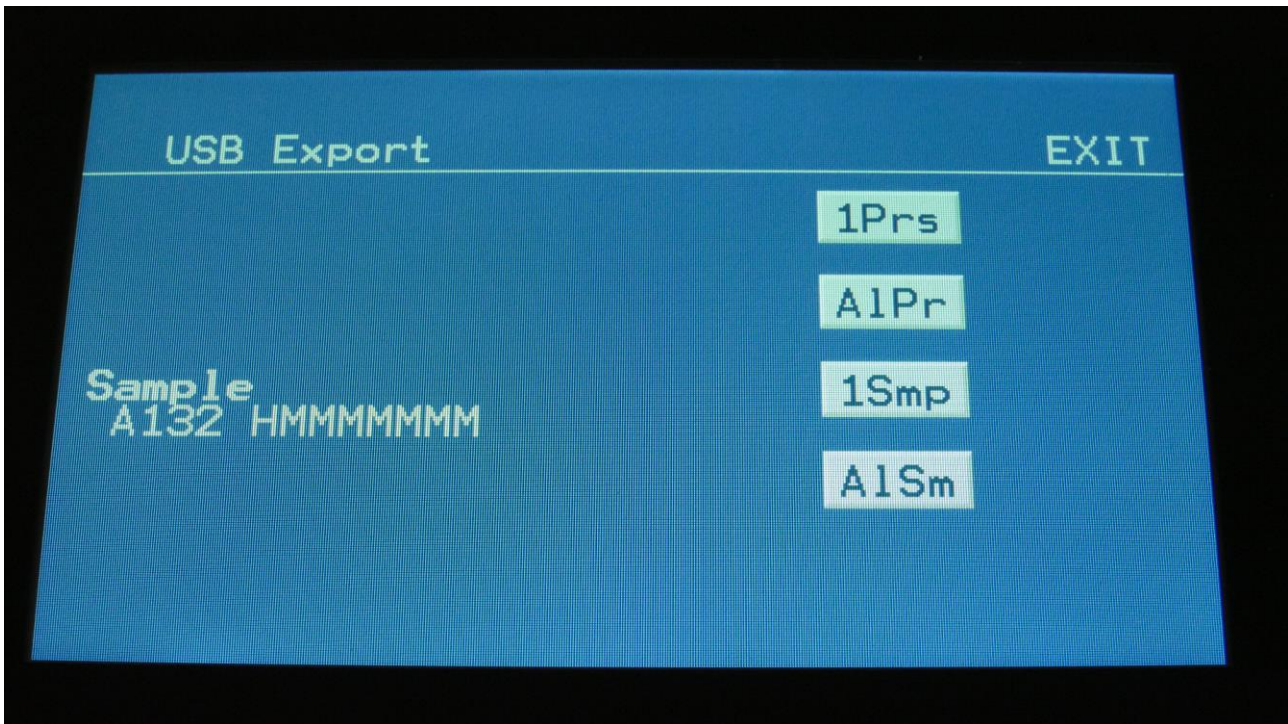
All exports are done to the currently open directory. There are 4 different possibilities for exporting:

"1Prs"
Export 1 preset (song). Touching this button will export the currently selected preset. If Zaturn are in song mode, it will export the selected song.

"AlPr"
Export All Presets/Songs . Touching this button will export all programmed presets. If Zaturn are in song mode, it will export all programmed songs.

"1Smp"

Export 1 Sample. Touching this button will export the selected sample. Turn Edit Knob 1 to select the sample bank of the sample to be exported, and turn Edit Knob 2 to select the "100's" of the sample number, and Edit Knob 3 to select the 10's and 1's.

"AlSm"

Export All Samples. Touching this button will export all samples of the selected sample bank. The Sample Bank can be selected, by turning Edit Knob 1.

"VCF"

Exports the saved User filter parameters.

Updating the Zaturn firmware

Now and then updates will be available for Zaturn, that adds new functionality and fixes bugs.
These will always be available for download at:
http://www.gotharman.dk

To update Zaturn, you must have a computer with an internet connection, and a Zaturn
compatible USB drive ready. Please see www.gotharman.dk for a list of recommended USB drives.
For something as important as an update, it is recommended to use a 16GB or 32GB drive, and to
test it first by importing some samplings.

Then you should follow these steps:

1. Download the update file of the latest update, from the Zaturn Updates site, to your computer,
and unzip it.

2. Connect the USB drive to your computer.

3. Make sure that the USB drive is FAT formatted.

4. Create a directory in the root directory of this USB drive, that is named "UPDATE".
If the USB drive already contains a directory called UPDATE, please delete all files inside this.

5. Copy the update file from your computer to the USB drive UPDATE directory. Make sure that no
other files are present in this folder, and please don't rename the files.

6. Eject and remove the USB drive from your computer, and connect it to Zaturn 's USB connector.

7. Turn Zaturn on, if it isn't already turned on.

8. From the preset select screen, touch the EDIT field.

9. Touch USB.

10. Wait for Zaturn to register the USB drive, so all files and folders are presented on the screen.

```
   FILES:      D:            ESC
001 NEW_DIR_.DIR
002 SYSTEM~1.DIR
003 POLYSPAZ.DIR
004 AVF_INFO.DIR
005 MPCX.DIR
006 RPI_BA~1.DIR
007 AVCHD.DIR

  Open    Import       <      >

 Export   MD/del   UPD   PREW
                 4
```

11. Touch the "UPD" button.

12. Zaturn will now search for the "UPDATE" folder and a valid update file. If it finds both, it will ask: "Update Firmware?"
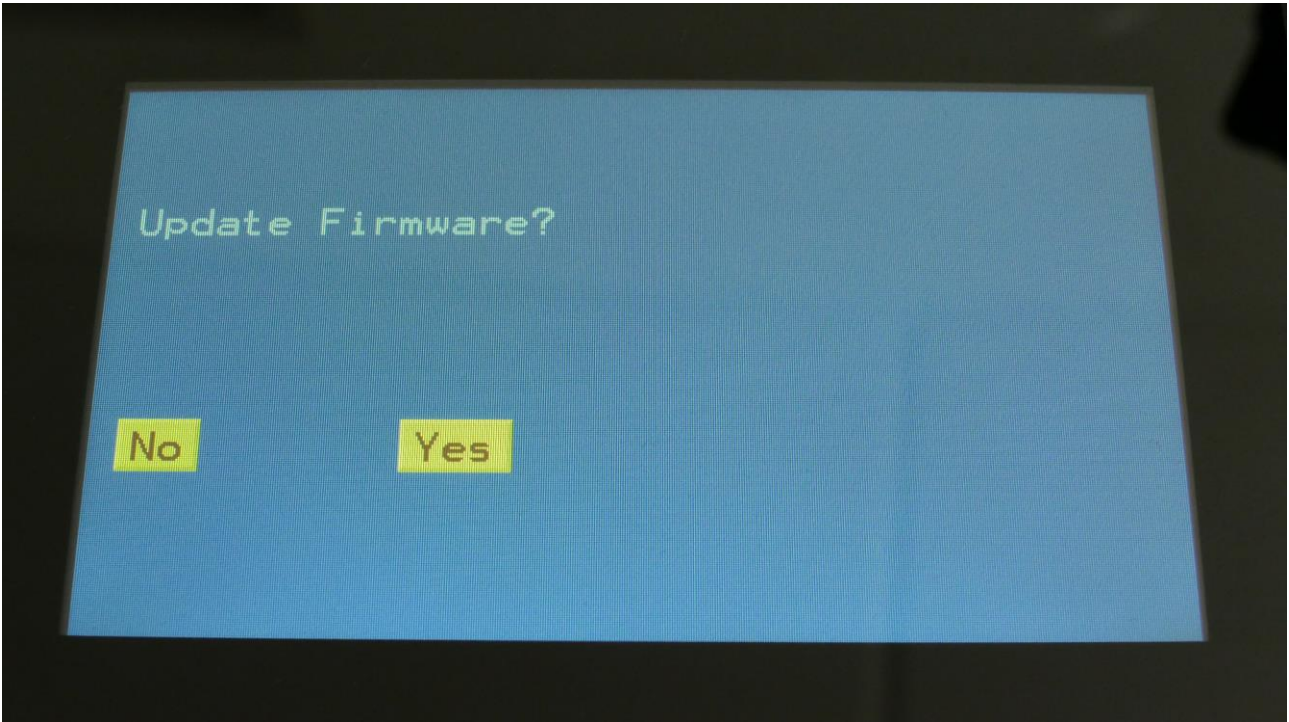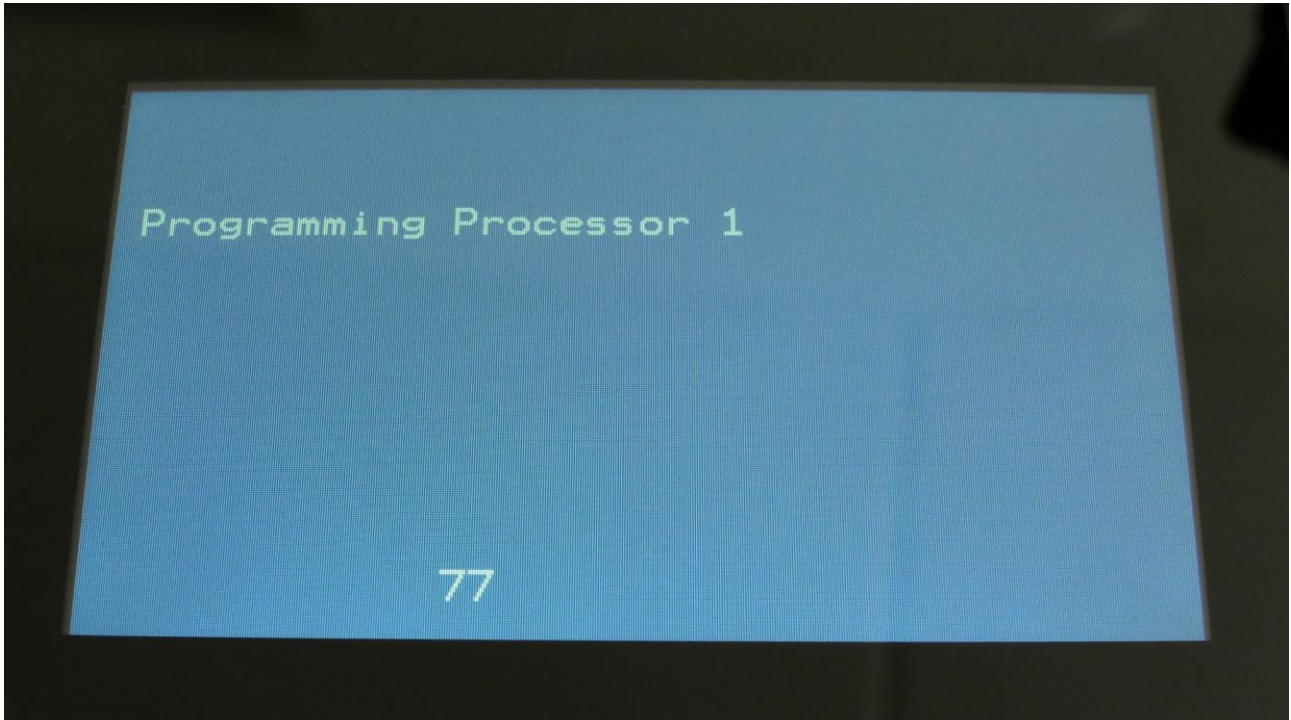

13. Touch "Yes" to proceed with updating, or "No" if you regret.

14. If you pushed Yes in step 13, Zaturn will now start to get the update file, and program its processor.

When it starts to program the processor, it will look like it halts for a couple of minutes. This is because it does halt, when erasing the program memory of a processor.
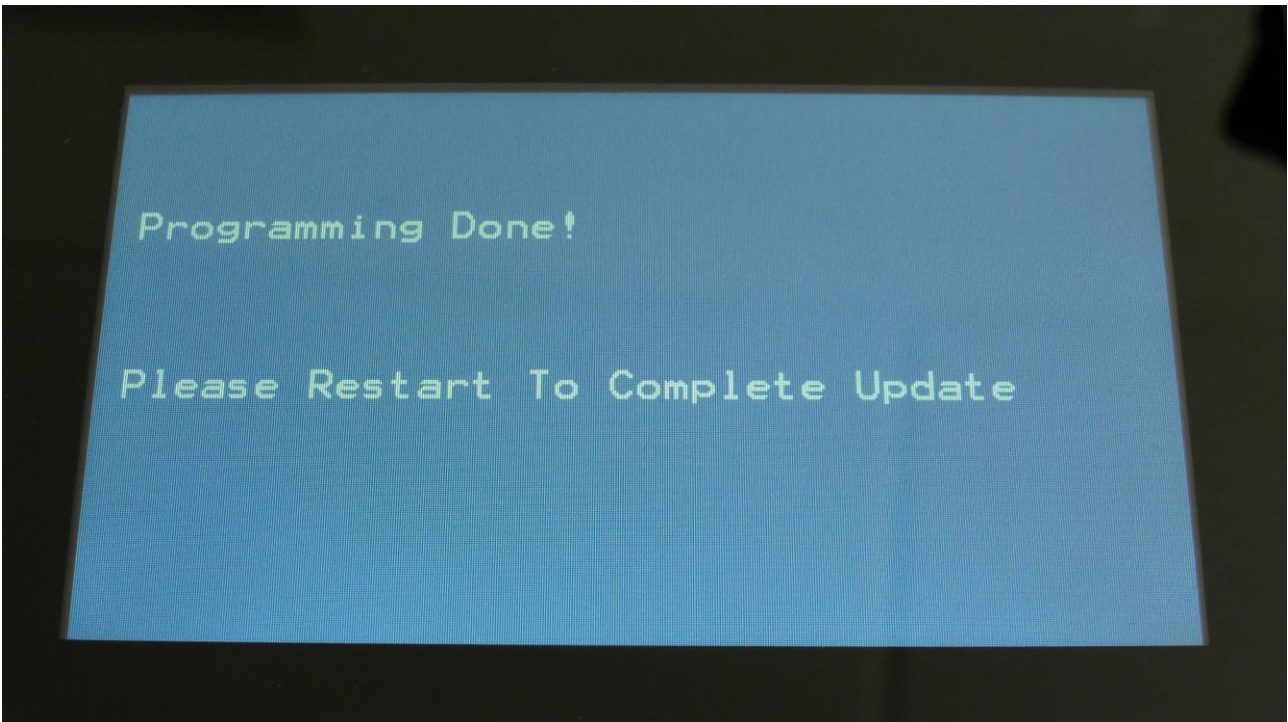
Erasing the program memory of the processor:

Programming processor (counter in the bottom counts up):
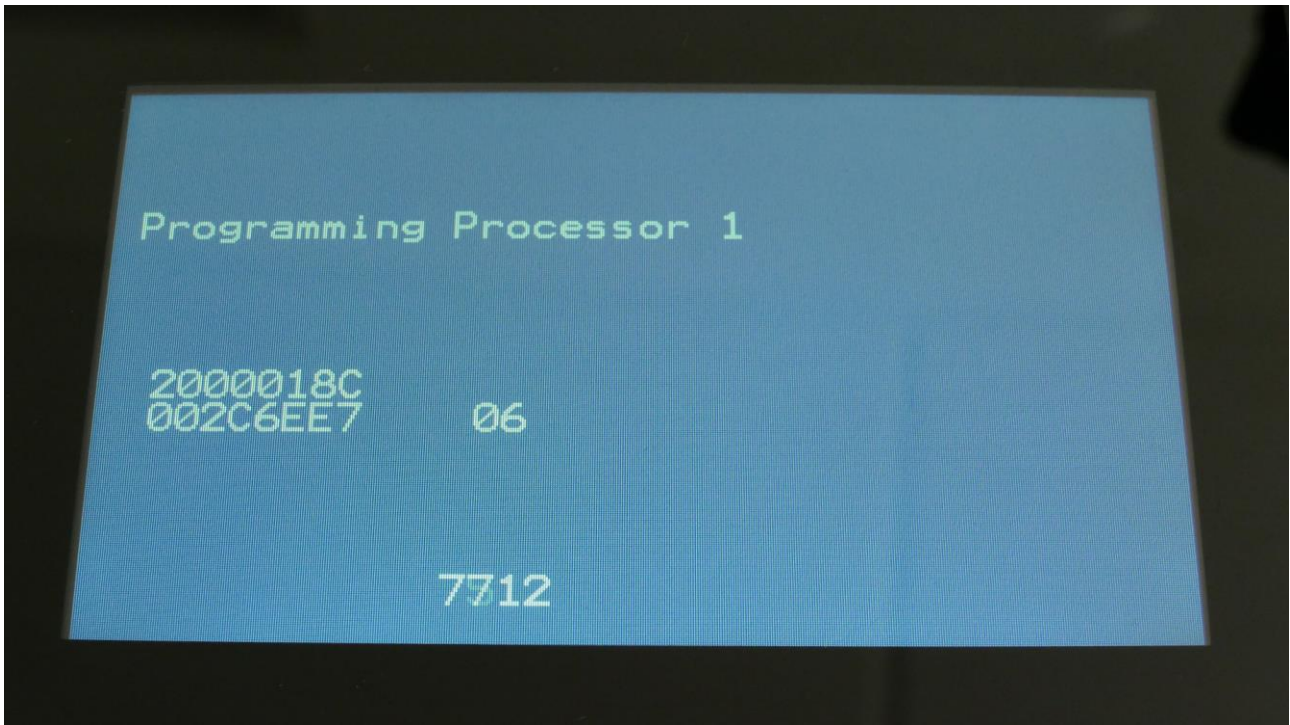
15. When programming is done, Zaturn will ask you to restart it. Please turn Zaturn off and then on again. Update is done!

If something goes wrong:
-If the power should go off, while Zaturn is getting the update from the USB drive, and programming the processors, simply start over again from step 7.
-If the power should go off, while Zaturn is finalizing the update (3 LED's turn on and off), simply turn Zaturn on again, and it will now finalize the update.

MIDI Specs

Receives:

-Note on/offs on the Zaturn global MIDI channel and on the individual part MIDI channels in Multi-timbral mode. These can trigger the parts and be recorded by the sequencer, when it is in reatime rec mode.

-MIDI CC 1, 2, 4, 5, 7, 8, 9, 10, 11 and 12 on the Zaturn global MIDI channel. All parameters that are set up to be controlled by Edit Knob 1 to 8, are also controlled by these MIDI CC's.
Morph Knob: CC1
Seq Morph Knob: CC2
Edit Knob 1: CC4
Edit Knob 2: CC5
Edit Knob 3: CC8
Edit Knob 4: CC9
Edit Knob 5: CC10
Edit Knob 6: CC11
Edit Knob 7: CC12
Edit Knob 8: CC7

CC16, touch screen keyboard Y-position on the global channel.

-Pitch Bend messages on the Zaturn global MIDI channel.

-MIDI clock and start/stop messages are received if the sequencer is in external sync mode.

-Program change and bank change (MIDI CC 32), if Prgr is switched on at the Common page.

Accepted bank changes:

0: Preset bank A and B.

1: Preset bank C and D.

2: Preset bank E and F.

3: Preset bank G and H.

4: Preset bank I and J.

5: Preset bank K and L.

6: Preset bank M and N.

7: Preset bank O and P.

Any other bank change messages will be ignored

Transmits:

- MIDI CC 1, 2, 4, 5, 7, 8, 9, 10, 11 and 12 on the Zaturn global MIDI channel, from the knobs on the Preset/Song Select screen, and on any other pages, that has no other Edit Knob functions.

CC16, touch screen keyboard Y-position on the global midi channel.

-Note on/off's on any MIDI channels from the sequencer/part system.

-MIDI CC's on any MIDI channel from the sequencer controller tracks.

Safe Boot Mode

If your Zaturn should ever refuse to start up, you should do this:

-Hold down trigger button 1, while turning your Zaturn on.

-Keep it pressed, until the main (preset select) screen appears.

-This will now look a bit different, saying SAFEMD instead of PRESET, in the upper left corner.

-In safe mode all audio are disabled. It is possible to switch preset and to update your Zaturn.

-Switch to the preset below the currently selected one. Turn your Zaturn off and on again, and see if it now boots up.

-If this does help: Please boot up in safe mode again, select the preset that caused the problem, export this to a USB drive, zip it, and send it via an email to info@gotharman.dk. Then I will inspect it.

-If this doesn't help: Get in touch with Gotharman's!

Exchanging the Polyphonic Analog Filter Board

zaTurn has a polyphonic analog filter board installed, which usually holds four equal dual analog filters. It is these, which mainly shapes the sound character of zaTurn, so sometimes it can be nice to try some other analog filters, with a different character.
Luckily the analog filters of zaTurn can be exchanged! So you are free to try out other filters! And it will remember the tunings of up to four different filter boards!

This chapter will describe how to install or exchange analog filter boards.

You will need the following tools:
-A Torx T10 screwdriver

Before you open your zaTurn, insert the power supply in a wall socket, and touch the metal on the connector. This will unload you from any static electricity, which might damage the electronics.

Place zaTurn in front of you, on a desk.

Remove the 4 hex screws, located on the front facing panel, using a T10 Torx. Place the screws in a safe place.
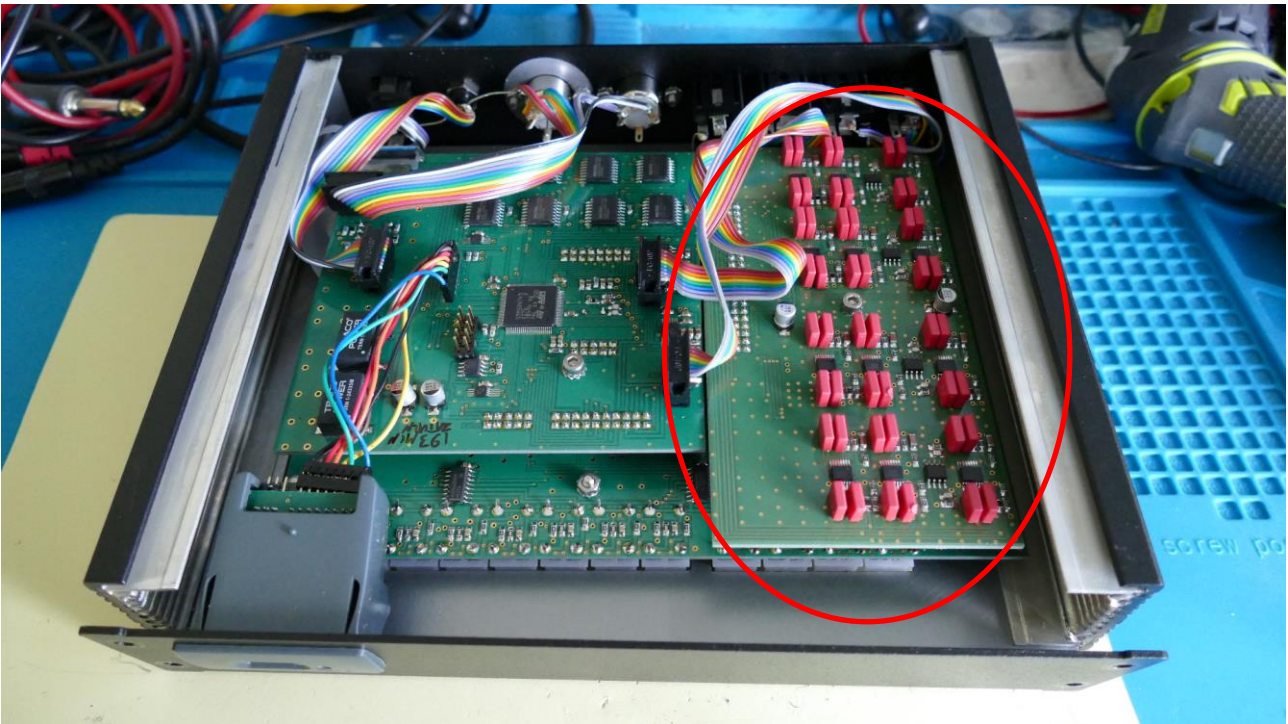
It should now look like this.

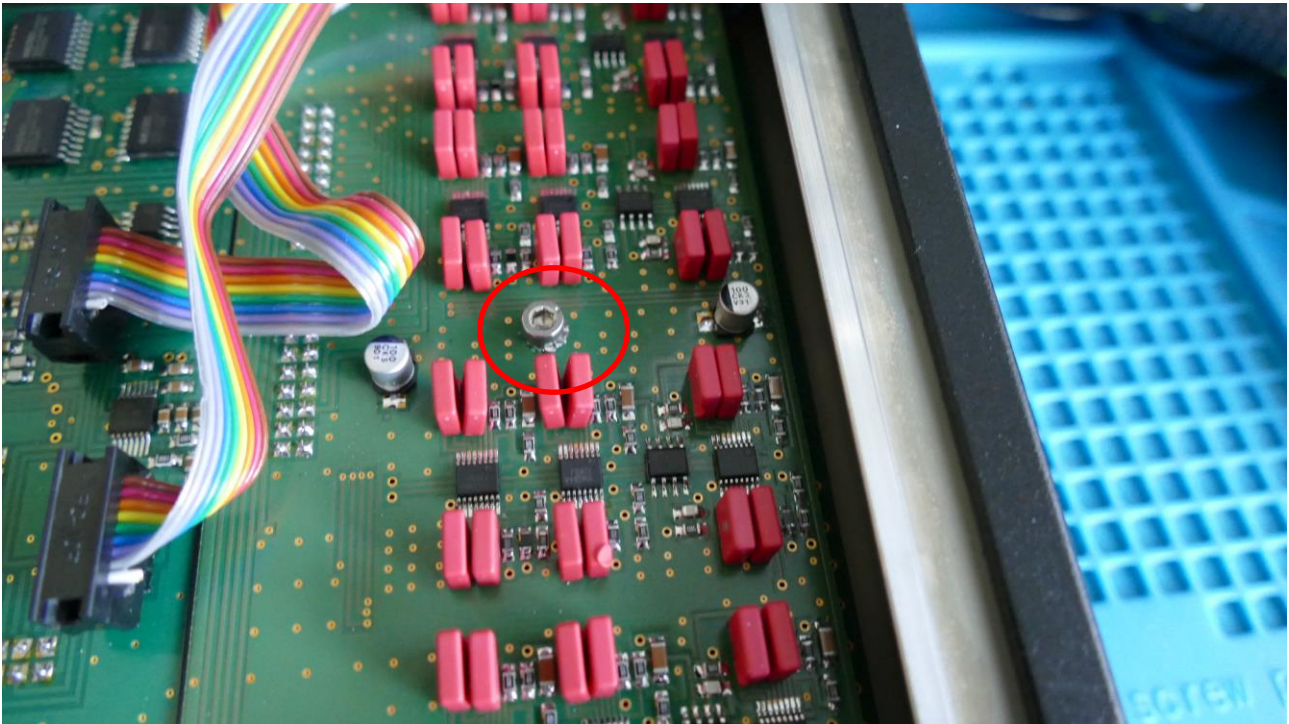Flip your zaTurn around, so that the bottom is facing upwards.

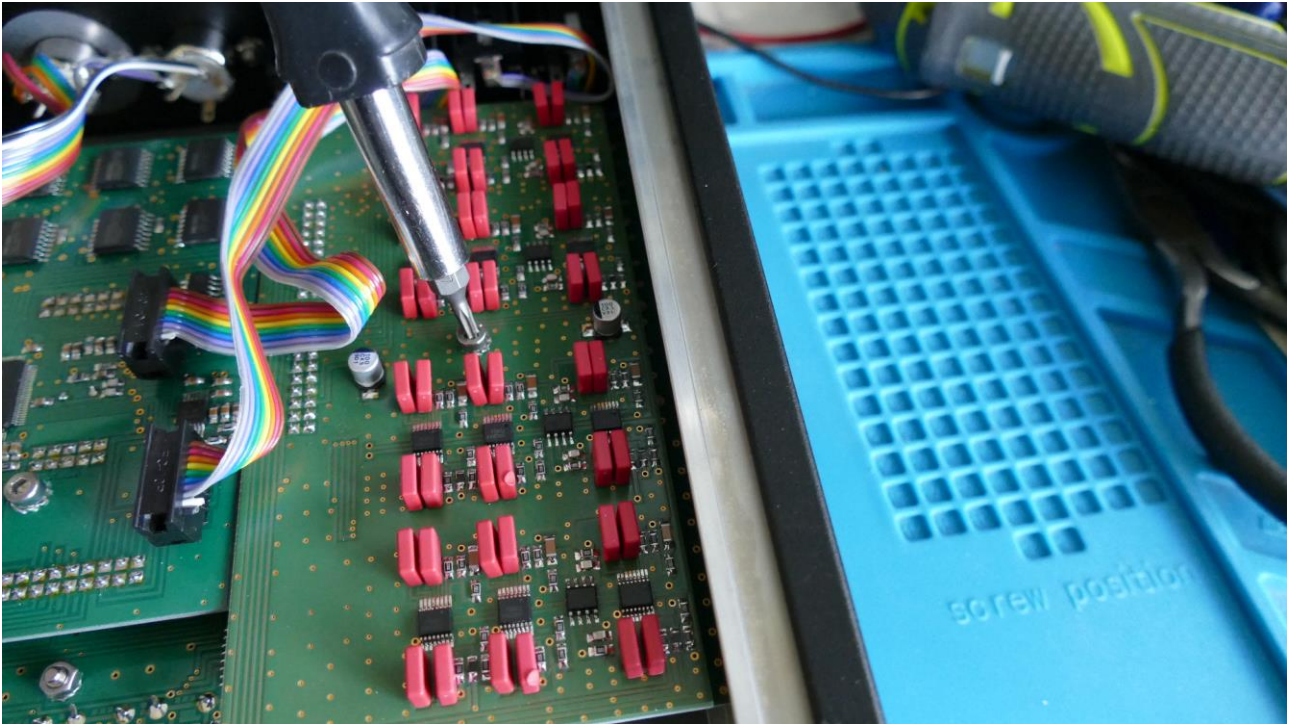Grab the bottom panel, slide it out very gently, and put it away.

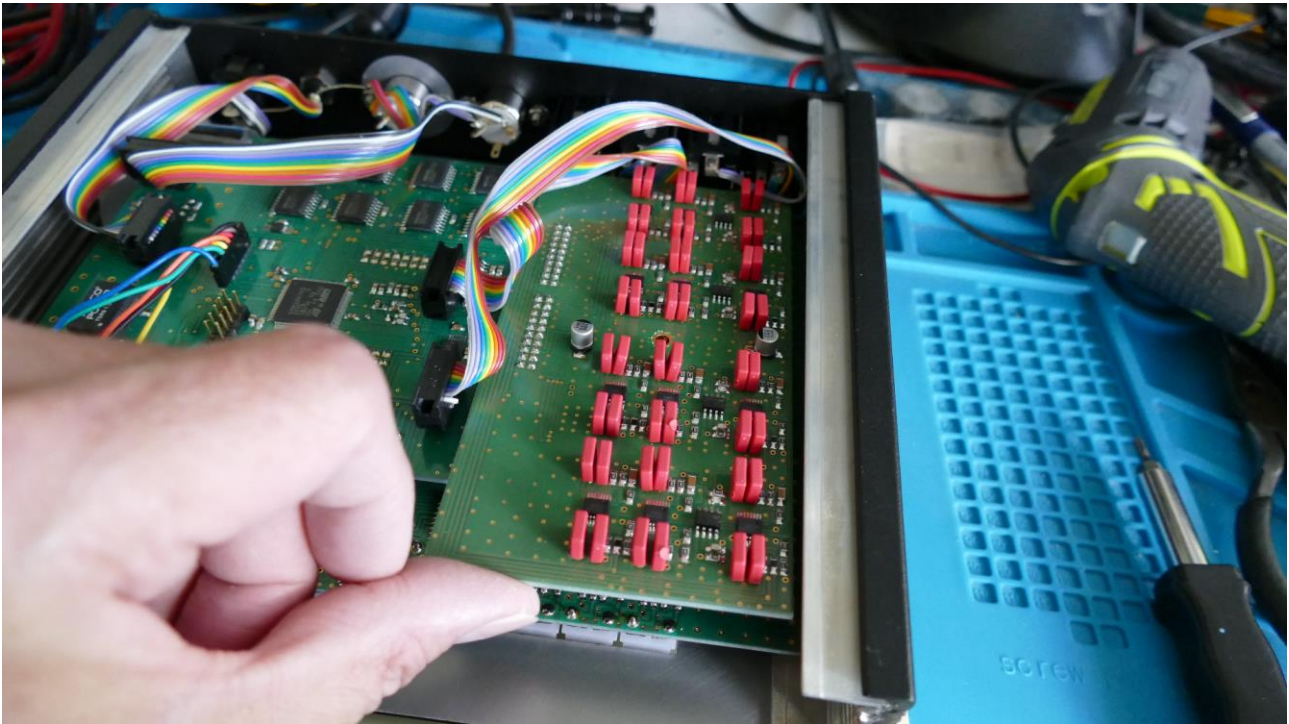You have now successfully entered the inside of zaTurn!

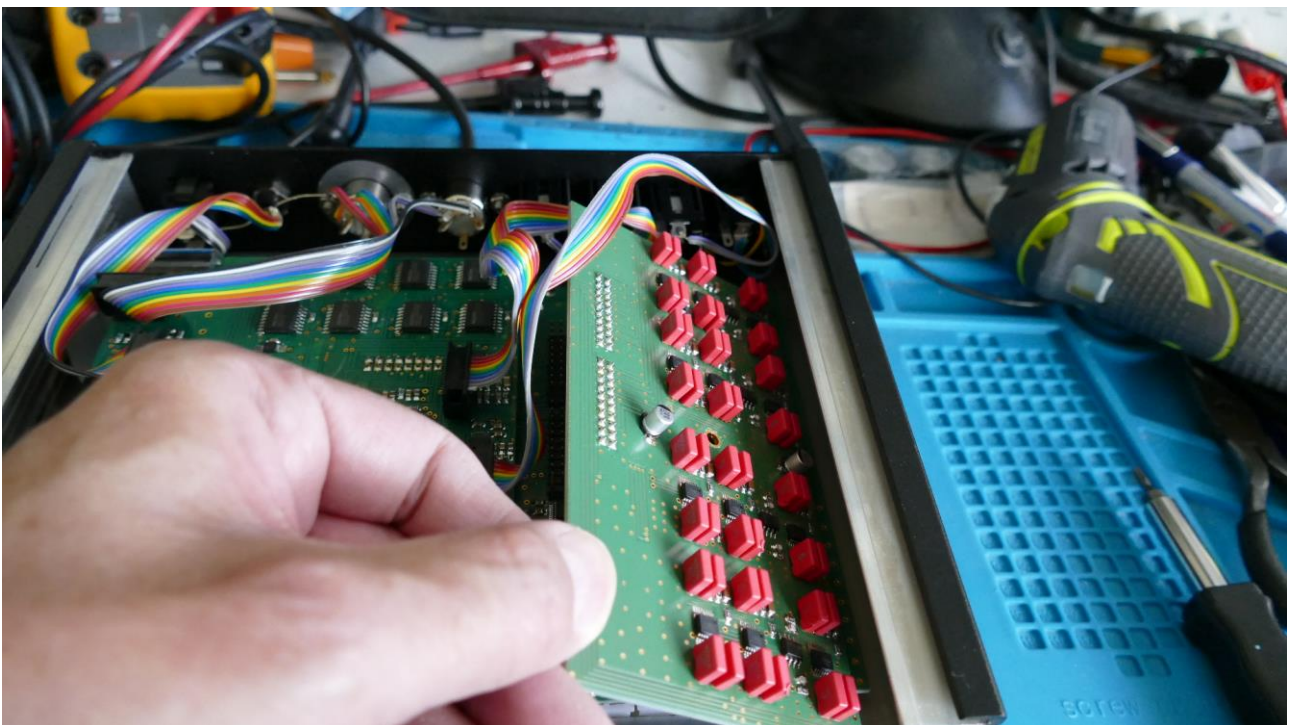The filter board is located to the right.

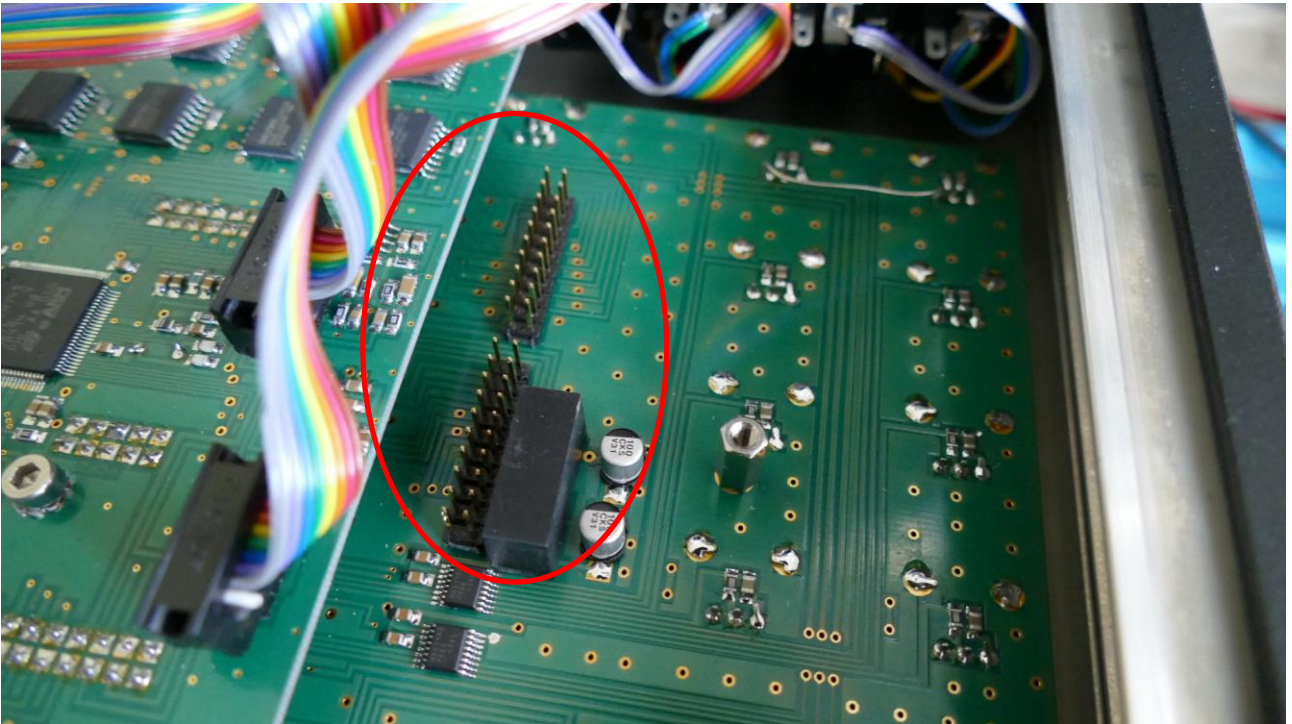A screw is holding the filter board in place.

Remove this screw with the T10 Torx screwdriver.

Grab the filter board in the side, and gently woggle it up and down, until it gets loose.
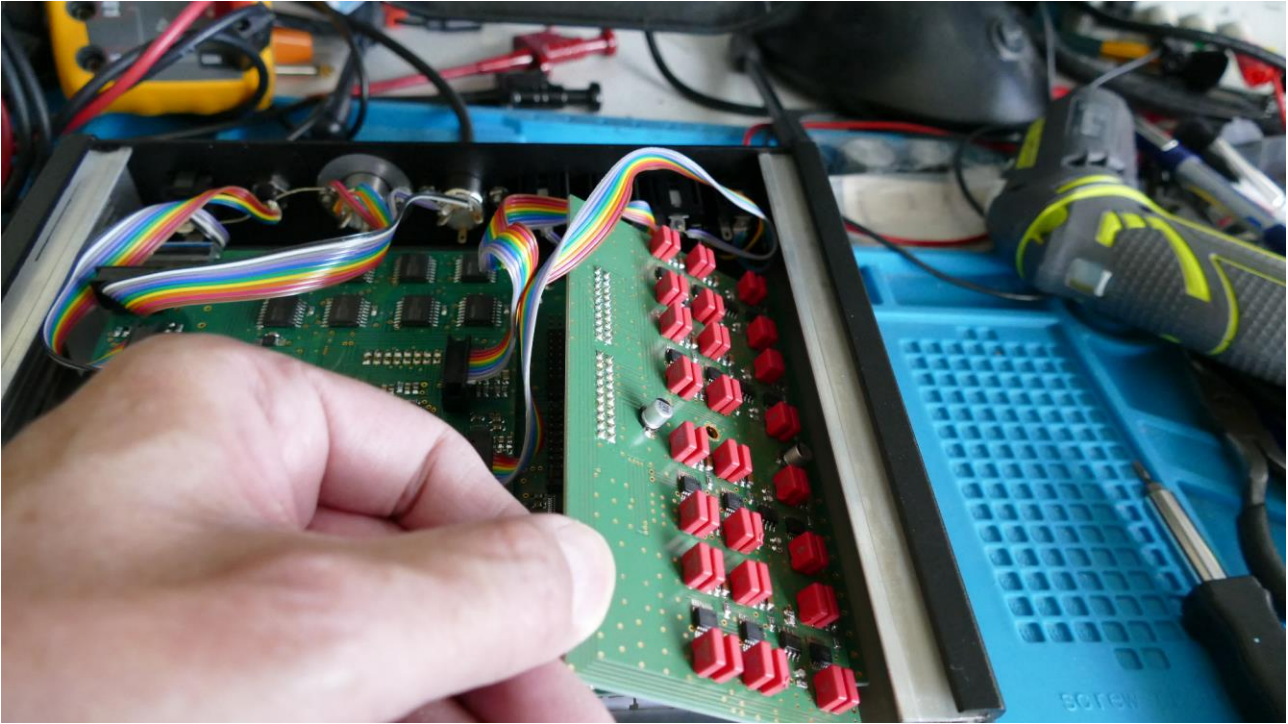

Lift the side of the filter board, which is pointing towards the middle of the casing, up a bit, and take the board out.
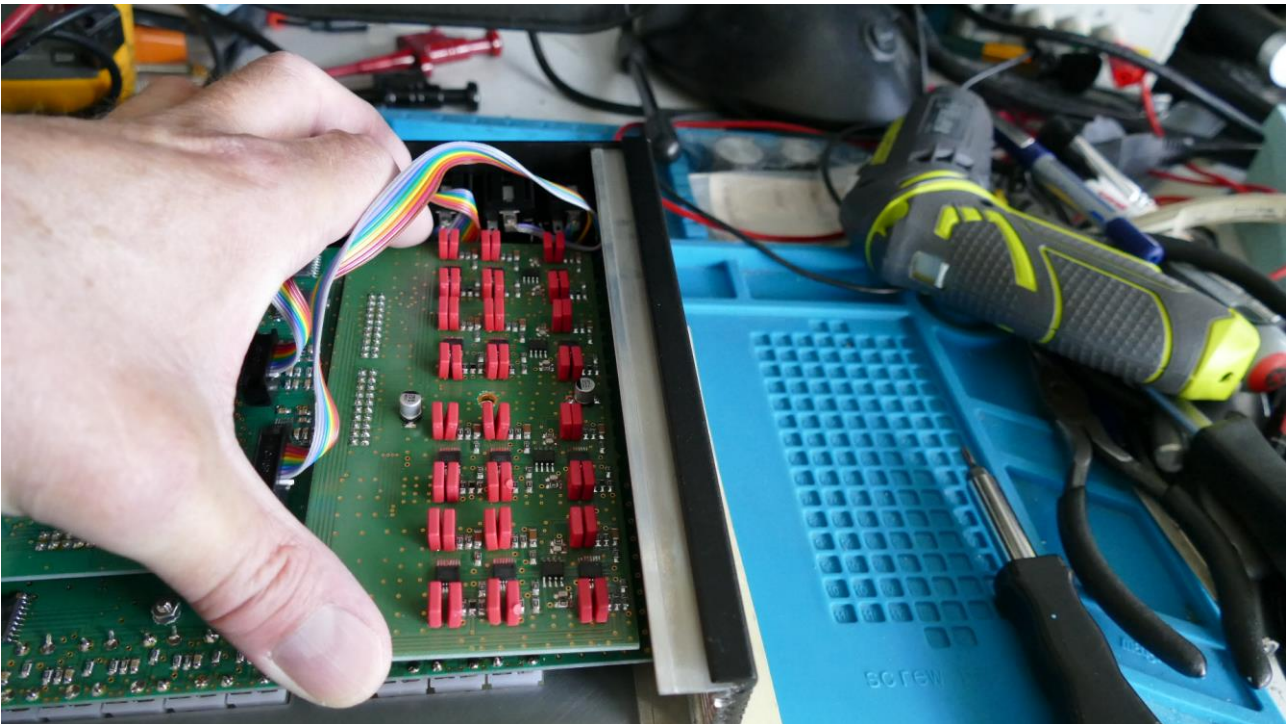
zaTurn without an analog filter board. Please notice the 2 connectors. You will now have to mangle the new filter board in, and connect it to these.
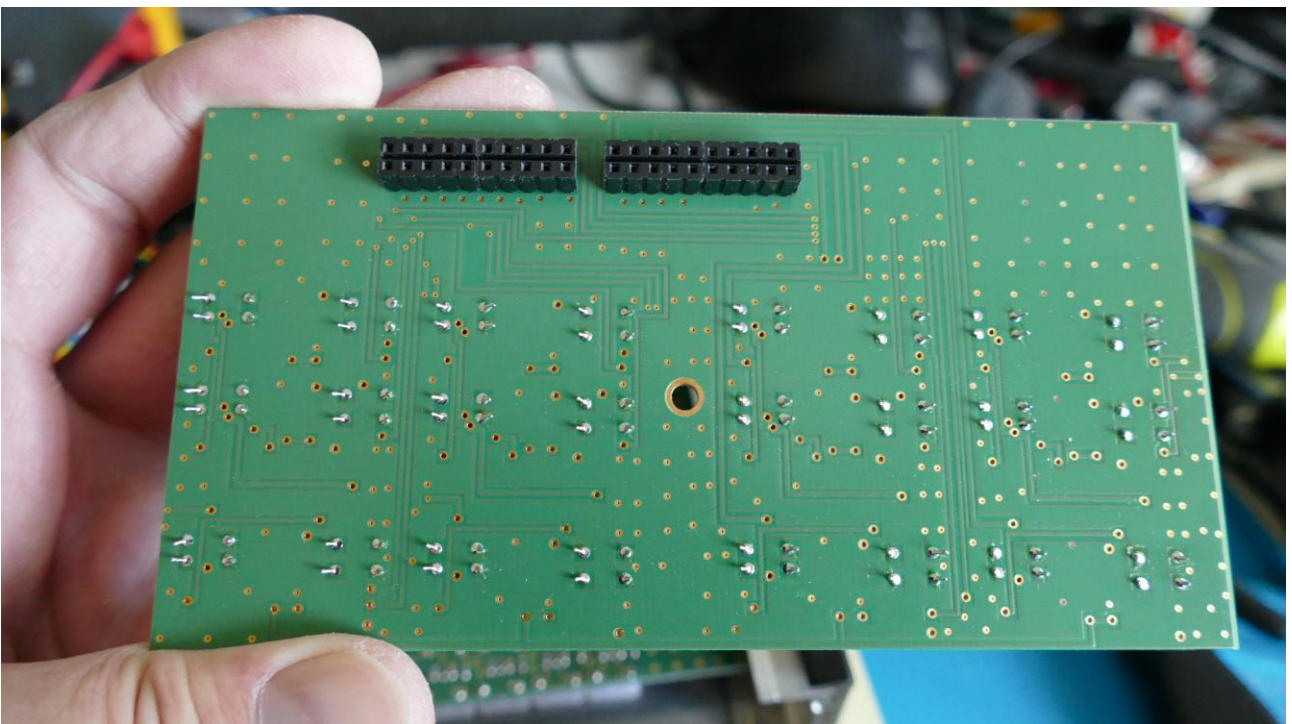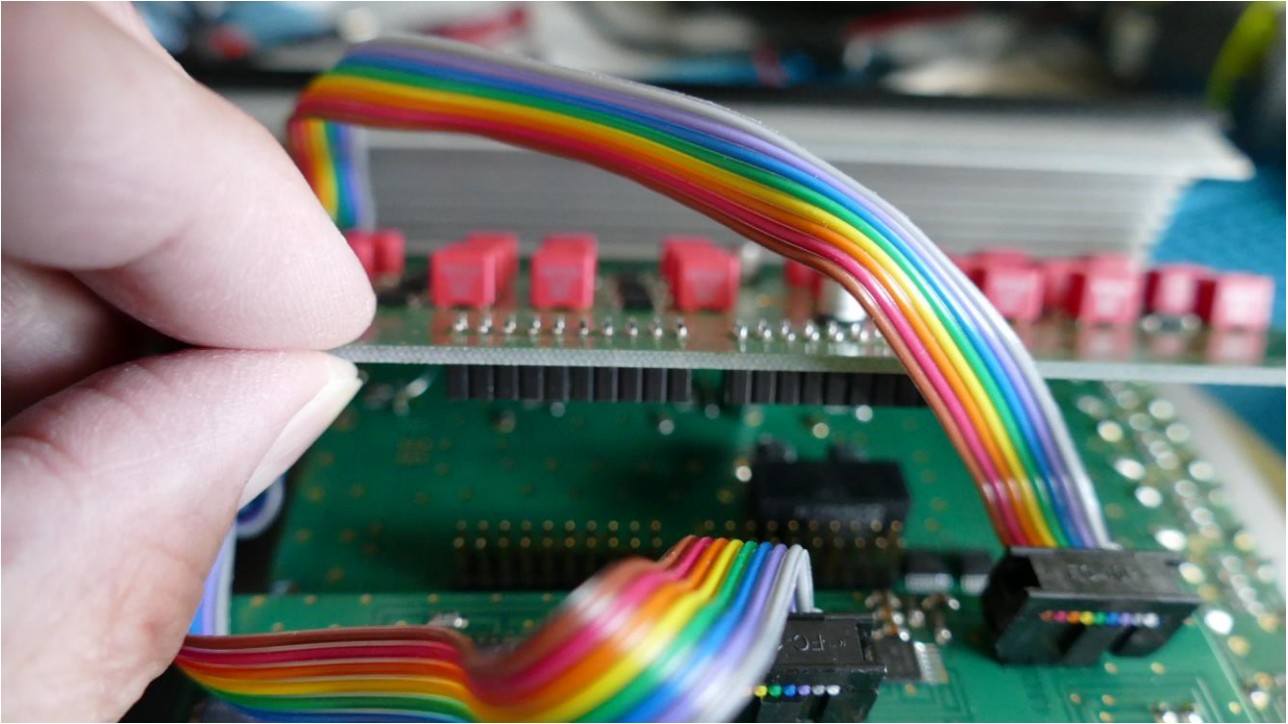

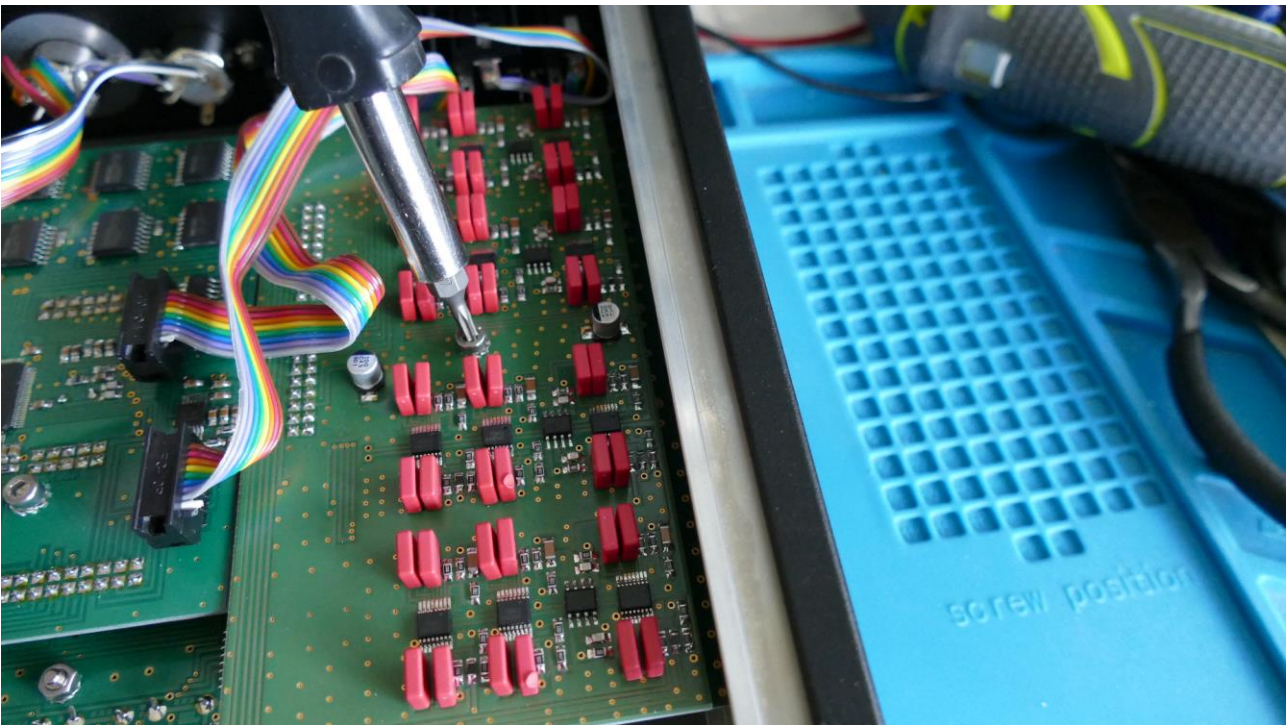The back of the filter board also has 2 connectors.

Put the new filter board in, with the connector side turning a bit upwards.

Place the board towards the connectors.

Before you push the filter board into place, inspect and make sure, that the connectors are perfectly aligned. Now push the board into place.

Mount the screw again.

Now, before you assemble your zaTurn, you might want to connect it, turn it on, and check there audio is going through all the analog filters. You can check this by selecting an empty preset, and check that there are audio from parts 1, 3, 5 and 7, when you push the part trigger buttons.

When you are sure, that this is working, it's time to put it back together.

Slide the bottom panel back in to place. Take care, that all cables are inside, and that they are not "ran over" by the panel.

Turn zaTurn over and mount the hex screws. You will need to hold the end panel in place, when you are mounting these screws.

After you have exchanged the analog filters, you will need to go to the MOR>VCF TUNE page, to either select the installed filters, if they have already been tuned, or to tune them. Please see the VCF TUNE chapter.

History

Just before the Christmas holidays in 2021, I managed to engineer a new 12db analog filter with a special sound. And it was able to self-oscillate.

And a new filter design must mean a new synth!

Like many times before, I ended up in the need of a new box, in the middle of the holidays, so I had to maltractate yet another Tiny LD casing.

And then I got some new ideas:
A modular synth where the modules were arranged in groups, SpazeDrum style, so that favorite sounds could be possible, and where it would be easier to copy parts.
And, like SpazeDrum, each group should have the same analog filter. This could also open up for a polyphonic modular synth!

I started working, and got the first casing made.

After playing with this for a bit, I realized that it should have more knobs.

Zaturn Specs

- 1024 user storable presets and 1024 user storable songs.

-8 parts . Modules can be assigned to the parts, for multiple sounds at the same time.

-76 modules:

- 8 Type A Oscillators - Waveforms (morph from sine to triangle to sawtooth to pulse to feedwave), resonator oscillator, noise, drum oscillators (3 x percussion, 2 x cymbal, clap), sample playback, wavetables.

-4 Type B Oscillators – Generates a sinewave, which can be shaped in various ways.

-4 dual analog filters . 12db self-resonating special filters or 24db Spaze filters. Each filter has both LPF and BPF or HPF available at the same time.

- 4 digital filters - 27 filter types. Standard filters, triple filters, sharp filters, tube filters...

- 8 VCA's - with ADSR envelope, 16 different characteristics and a clip parameter. Can be trigged by any source.

- 8 Effects Processors - Many of the LD effects plus a new reverb, a wavefolder and some new pitch effects.

- 16 LFO's - With variable waveform and curve. Key syncable.

- 8 Envelopes - ADSR + decay envelope with loop options. Can be trigged by any source.

-8 Sample/Hold Generators .

- 4 Ring VCA's/Logic modules.

-8 Output modules - Sends the audio from the modules to the main outputs, and handles panning.

-Sample time: Available with either 18 minutes (91MB) or 43 minutes (217MB), max 2.048 samplings, or 93 minutes (477MB) or 193 minutes (977MB) of mono samplings, max 8.192 samplings, kept in super reliable NOR FLASH memory. Samplings are immediately available when turning on -No loading time. Samplings are kept in 1 to 4 banks. Each bank holds up to 2048 samplings. Each sampling can hold up to 64 (non-destructive) chop points.

-8 sequencer note tracks . Can be set to internal or MIDI out. Up to 64 steps per track and settable resolution. Position subtrack makes it possible for any step to play back at any position.

-16 sequencer controller tracks . Can transmit MIDI CC's. Up to 128 steps per track and settable resolution.

-Synthesizer Morph Knob and Sequencer Morph Knob.

-USB: Connect a USB drive for importing and exporting of wav samplings, presets and songs, and for updating the firmware. Imports: Zaturn presets and songs, wav samplings, 44.1 KHz 16 or 24 bit, broadcast wavs, cue points (will be used as chop points or loop points). Exports: Zaturn presets and songs, wav samplings 16 bit, 44.1 KHz. Chop points are exported as cue points, for use with many computer programs.

Audio : Stereo in and out. Left output also functions as a headphone connector.
Audio system :
-Inputs and outputs: 24 bit, 44.1 KHz Cirrus Logic high end ADC/DAC.
-Internal: 32 bit, 44.1 KHz.
-Sampler: 16 bit, 44.1 KHz.
-Maximum audio latency : 1 sample - 22 uS (microseconds). 450 times faster than Linux based instruments!!!

-MIDI : In and out.

-High quality MultiMec pushbuttons that should be able to withstand 1.000.000 operations.
The knobs has solid metal shafts.
Box is made of steel and aluminium.

Size : 22 x 18 x 4.5 cm
Weight : 1.8 KG

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