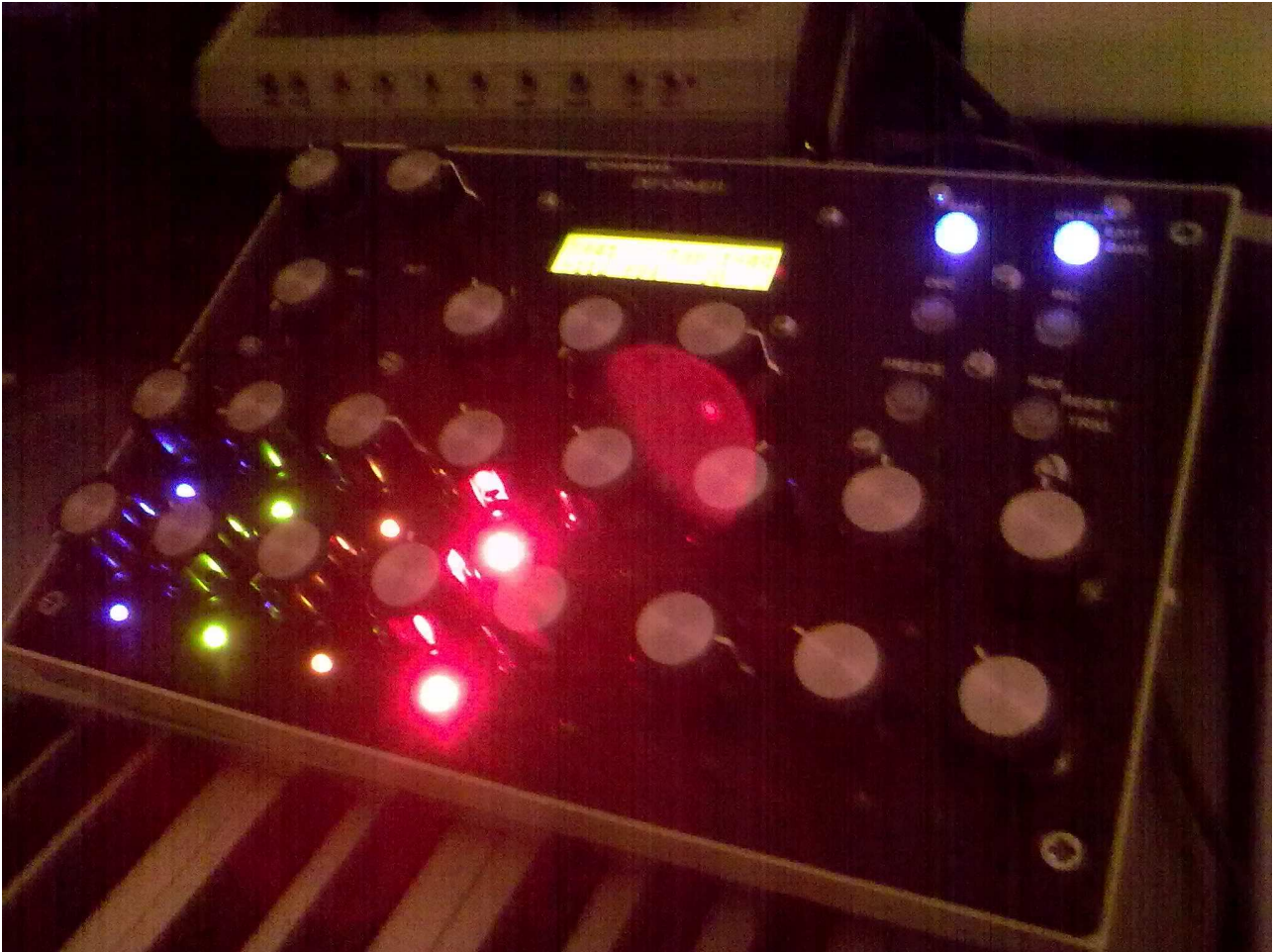


# Gotharman's deFormer



**User Manual**

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## **Main Features**

- Unique granular effect processor.
- Realtime live timestretch of incoming audio.
- Slice audio input up in small fragments, and move these fragments around in realtime.
- Granular step pitch shifter.
- Stereo delay.
- Compressor.
- Distortion.
- Build in synth.
- 4-note polyphonic Oscillators with continuously variable waveforms, wave-shape modulation, fm and pwm which works on all waveforms.
- 2 filterbanks with each 4 high quality unique sounding analog-modelled bpf/lpf/hpf filters.
- Oscillators and external inputs can be routed to the filterbanks.
- 4 LFO's with continuously variable waveforms, waveshape modulation and rate modulation.
- 2 envelopes.
- Filter random generator.
- Various control sources for every parameter.
- 4 MIDI note randomizer's.
- 32-step step sequencer which is MIDI-syncable, with 2 tracks that each has one note track, one velocity track and one controller track, has realtime transpose, and a keyboard (arpeggiator) mode, in which, you can gate and transpose the sequence via a connected MIDI-keyboard.
- Storage of 512 sounds, sequences and effects in eeproms. No need to worry about changing back-up batteries.
- 24 bit / 58 KHz high end audio system.

## **What is the deFormer?**

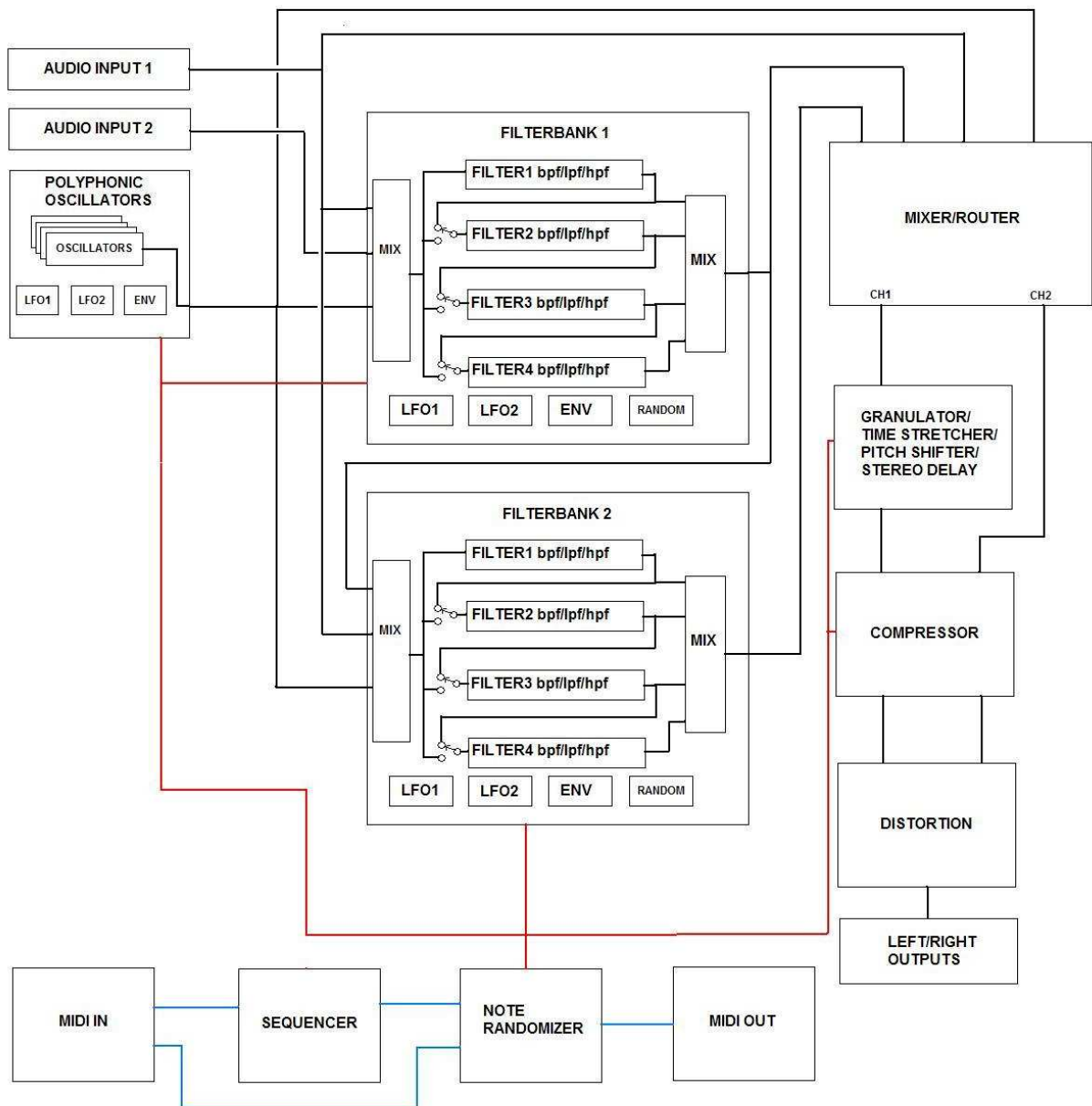
The deFormer were originally ment to be a unique granular effect processor only, but when the granulator part was finished, only a quarter of it's DSP power was used, so a synth section and some additional effects was added.

The idea behind the deFormer was to create a creative compositional tool, with which you should be able to create a new life to your musical pieces. When you have created a musical pattern, could it become more interesting if you could move around and re-pitch fragments of it, or add randomization to the notes? Or how would a single sound change, if you moved around small fragments of that sound?

With deFormers granulator and 4-channel midi note randomizer, it is really possible to experiment with your compositions in a different way than usual, and discover something new.

It is also an extremely useful tool for creating new versions of pre-recorded patterns, in a live or remix situation.

Other additions includes 2 filterbanks with each 4 multimode filters, a compressor which can be triggered from either the incoming audio signal or from selectable midi note on's, a distortion effect and a two-track analogue style midi sequencer.



**GOTHARMAN'S DEFORMER FLOW**

## DeFormer front



**In:** Adjusts the total input level from audio inputs 1 and 2.

**Out:** Adjusts the total audio output level.

**Mix:** Adjusts the mix between the original audio input signal and the signal processed by the granulator effect.

**Edit:** Enters the edit pages menu, for editing sounds, sequences and effects.

**Enter / Exit / Save:** When this blinks, it is required to be pushed, to confirm a preset change or a controller number change. When it's not blinking, pushing it enters the exit / save page. Pushing this button again exit's from the previous page, pushing "dec" button saves the current preset.

**Dec / Inc:** Decrements / Increments the preset number (must be confirmed by pushing enter), and navigates around on the edit pages.

**Freeze:** Freezes the granulator effect, so the audio held inside of it will play back repeated until freeze are released, by pushing freeze again.

**Run:** Starts and stops the two track sequencer.

**The 3 knobs right under the display:** Referred to as "**Edit knobs**" (Two potentiometers and one rotary encoder) Used for various editing function on the edit pages.

**The 16 knobs on the lower half of the front:** Referred to as "**Step knobs**", used for various editing functions like sequencer steps note numbers, velocity values and controller values, filterbanks cutoffs and levels, granulator step fragment numbers and step pitch shift values.

## **DeFormer back** **Connections**

**9VDC:** Connect the supplied power adaptor to this socket. The switch beside it are the power on/off switch.

**MIDI in:** Connect this to the MIDI out of a MIDI transmitting device (MIDI keyboard, sequencer, computer or whatever).

**MIDI out:** Connect this to the MIDI in of any MIDI gear, you want to control with deFormers sequencer and note randomizer.

**In 1:** Line level audio input 1.

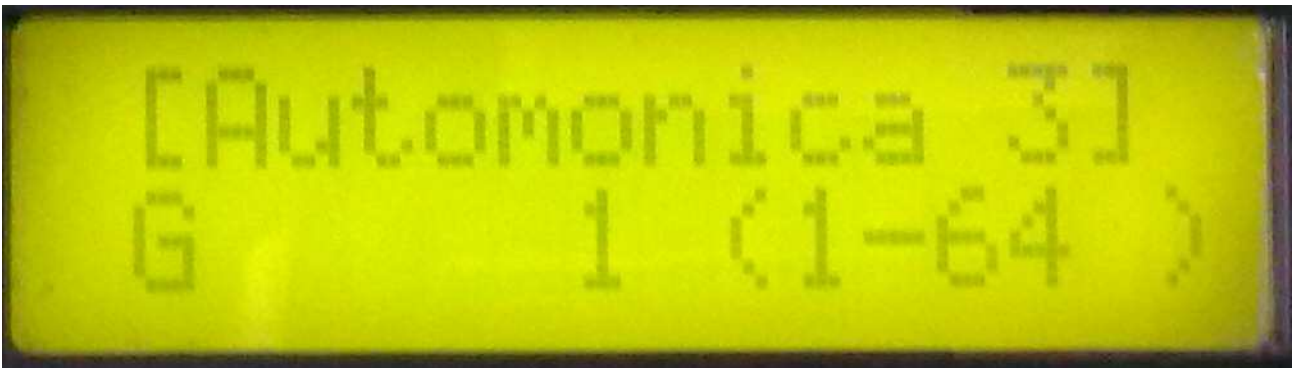
**In 2:** Line level audio input 2.

**Output L jack:** Left line level audio output. Connect to a mixer or amplifier.

**Output R jack:** Right line level audio output. Connect to a mixer or amplifier.



## The Preset select page



This is the deFormer main page. Every time you turn on your deFormer, it will for a short while write: "Gotharman's deFormer", and right after that, it will go to this screen.

On the top of the display it writes the name of the selected preset. It remembers what preset was selected, when it was turned off, and goes to that preset when it is turned on again.

On the bottom of the display it writes the selected preset bank and number. The deFormer has sixteen banks (A-P) with each 32 presets (512 in all). The number shown in paranthes, are the midi bank and program change number you will have to transmit to the deFormer, to select this preset, from an external midi-device.

To change preset: Push the Dec / Inc buttons or rotate the 2 potentiometers right under the display, to select a preset. The name and number of the selected preset will now show in the display, and the Enter/Exit/Save button will start to blink. Push the Enter/Exit/Save button to confirm the change to the selected preset.

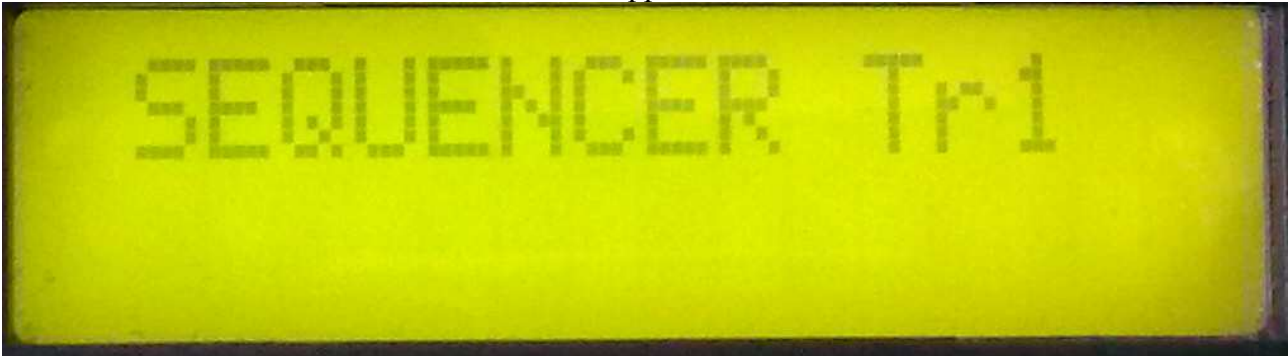
All preset are user-rewritable.

## The Edit pages

**NOTICE:** The edits you do, are not automatically stored in memory. If you would like to keep your creation, you will have to SAVE the preset. How to do that, are explained later in this section.

### How to enter the edit pages from the preset select page:

Push the "Edit" button. Now this screen should appear:



If you at this point wants to exit back to the preset select screen, push the Enter/Exit/Save button twice. The first time you push it, this screen will appear:



One more push, will exit to the Preset select page.

If you, on the other hand, wants to start editing some presets, use the Dec/Inc buttons to select an edit group, and push the edit button to enter/exit the edit parameters.

Inside an edit page, it might look like this:



When you enter an edit parameter page, use the Dec/Inc buttons to select the various parameters inside the group, and use the the knobs right under the display to edit the parameters. Sometimes the 16 knobs on the lower half of the front are also used for editing. That will be explained in the following sections.

### **Overview of the edit group pages:**

SEQUENCER Tr1	SEQUENCER Tr2	NOTE RANDOMIZER
OSCILLATOR	FILTER BANK 1	FILTER BANK 2
MIXER	GRANULATOR	COMPRESSOR
DISTORTION	MIDI	

## Explanation of the edit pages

### The Sequencer pages

The deFormer sequencer are a two-track analogue style type with a maximum of 32 steps for each track. Each track has separate subtracks for note, velocity and controller. Tracks are "recorded" by entering values for each step, using the 16 step knobs. It can be controlled from an external midi-keyboard in various ways. All parameters in both the sequencer, synth and effect section can be changed, even while the sequencer is running.

Each track can be set up to control either the internal synth or external MIDI devices.

The sequencer is started/stopped by hitting the Run button.





When on a sequencer edit page, and the sequencer is running, progression on the steps can be viewed on the 16 step LED's:

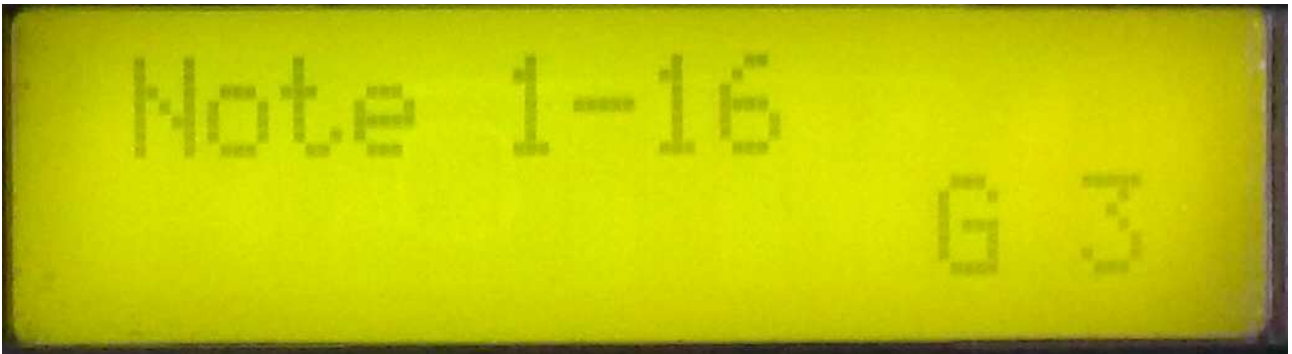


Push the Edit button to enter this page:

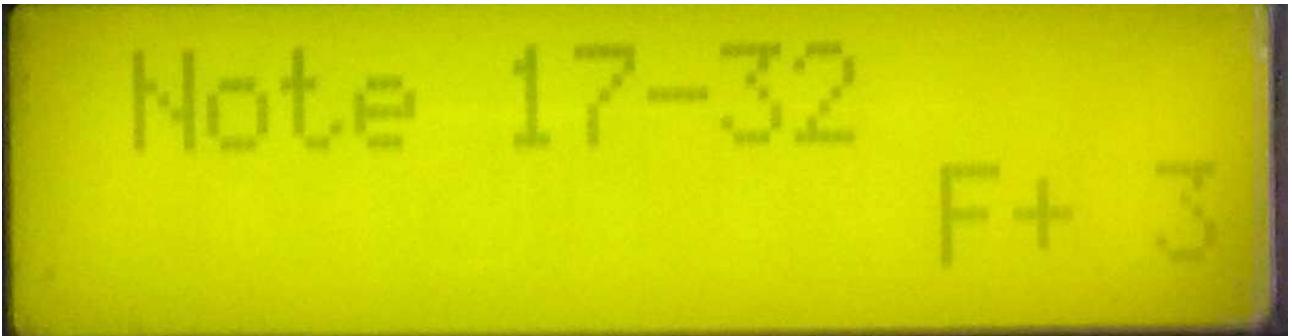


**Edit 1:** Track 1 on/off.

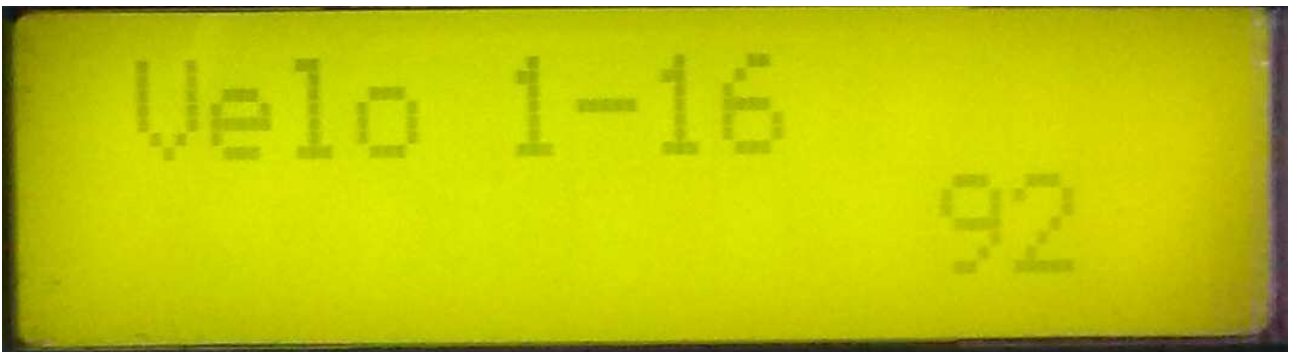
**Edit 2:** Track 2 on/off.



The 16 step knobs, selects a note value for step 1-16. The last selected note value are showed in the lower right corner of the display.



The 16 step knobs, selects a note value for step 17-32. The last selected note value are showed in the lower right corner of the display.



The 16 step knobs, selects a velocity value for step 1-16. The last selected velocity value are showed in the lower right corner of the display.

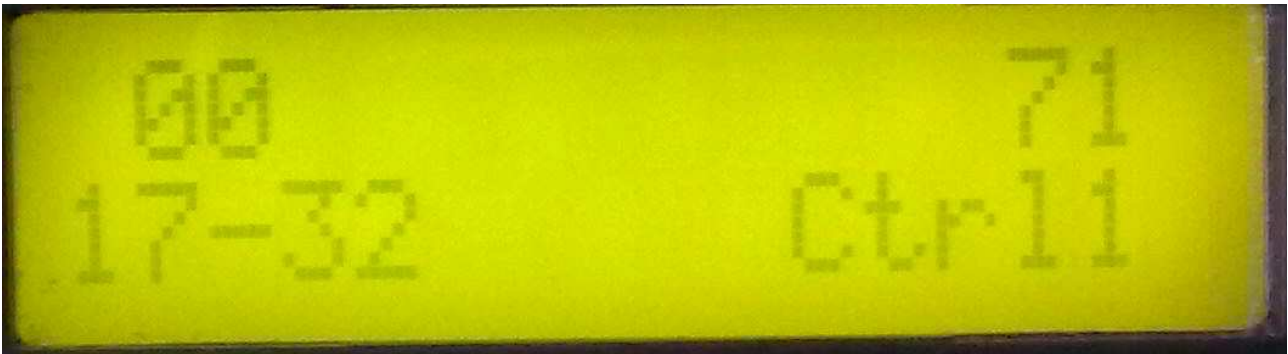


The 16 step knobs, selects a velocity value for step 17-32. The last selected velocity value are showed in the lower right corner of the display.



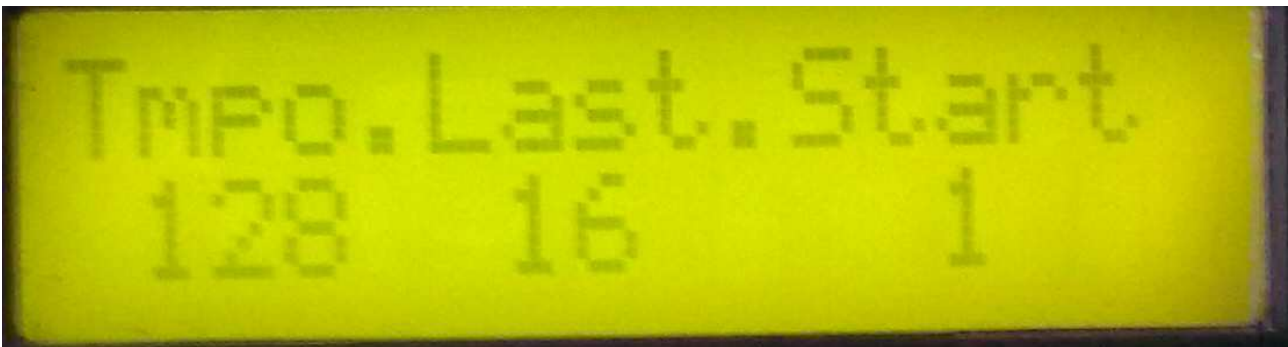
The 16 step knobs, selects a controller value for step 1-16. The last selected controller value are showed in the upper right corner of the display.

Edit knob 3 (the encoder) adjusts what controller number you want to control. This number is shown on the upper left of the display. Every time you change the controller number, the Enter/Exit/Save button will start to blink, and you will have to push it to confirm.



The 16 step knobs, selects a controller value for step 17-32. The last selected controller value are showed in the upper right corner of the display.

Edit knob 3 (the encoder) adjusts what controller number you want to control. This number is shown on the upper left of the display. Every time you change the controller number, the Enter/Exit/Save button will start to blink, and you will have to push it to confirm.

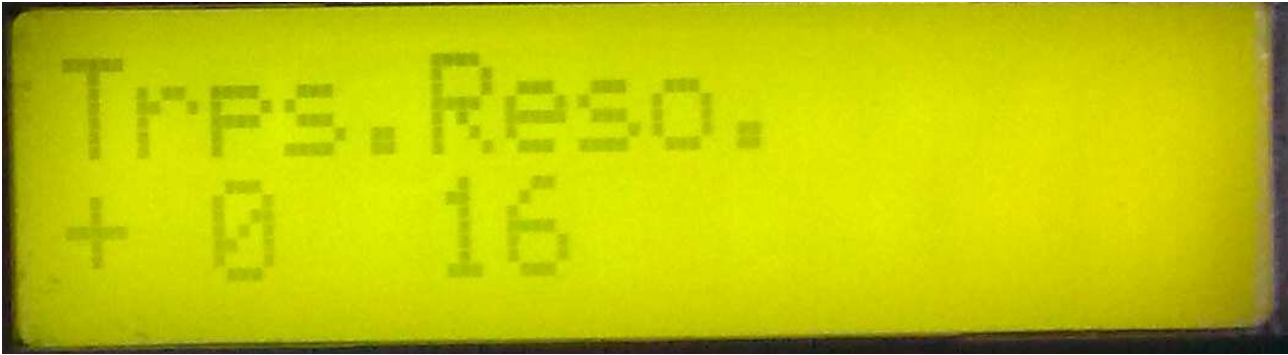


**Edit 1 – Tempo:** Adjusts the tempo of the sequence, unless sync in the midi section is set to "ext".

**Edit 2 – Last Step:** Sets the number steps the sequencer will run thru. Value can be from 1 to 32.

**Encoder – Start Step:** Selects at what step the sequencer will start, when you hit the Run button, or jumps from another sequence to this one.





**Edit 1 – Transpose:** Transposes the entire sequence in semi-tones in real-time. This can also be done from a midi-keyboard (explained later).

**Edit 2 – Resolution:** Adjusts the sequencer resolution. Choices are: 1/8, 1/16 or 1/32.



**Edit 1 – Track MIDI output channel:** Select what MIDI channel you want the track to control. Only active if control = ext.

**Encoder – Control Int/Ext:** Select if you want the sequencer track to control deFormer's internal synth (Int), or an external MIDI device (Ext), on the selected MIDI channel.

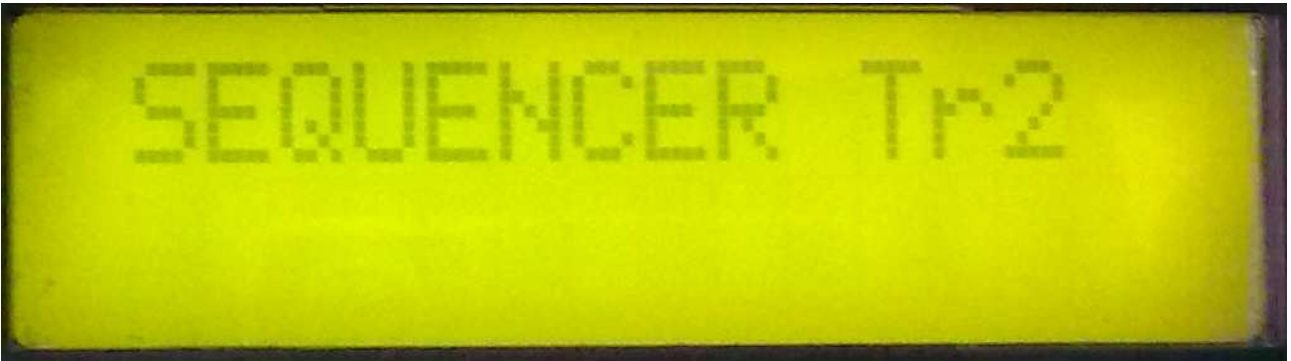


**Edit 2 – Key transpose:** If on, received midi note-on's will transpose the entire sequence in semi-tones in real-time.

**Encoder – Key trigger:** Selectable modes:

- Off:** The sequencer are in normal mode. When you hit the Run knob, it starts running, and when you hit it again, it stops.
- Gate:** When you hit the Run knob, the sequencer starts running, but you can't hear it. A midi note-on from an external midi device (on the track midi channel) will gate the sequencer, and cause it to output the track data.
- Rgat:** Same as gate, except that every time a midi note-on are received, the sequence will reset to the start step.
- Key:** Every time a midi note-on are received (on the track midi channel), the sequencer advance to the next step, and plays that step, until a note-off are received. This mode ignores the tempo and clock int/ext settings.

## Sequencer track 2



Has the same set of parameters as track 1. All parameters can be separately adjusted for each track.

## The Note Randomizer pages



The note randomizer treats incoming MIDI note on and off's and notes generated by the internal sequencer (if turned on). When it receives note data, it takes a look at a user adjustable probability parameter, and randomly decides if it will play that note or not. If it decides to play the note, it will have a look at a user adjustable random velocity parameter, and if this is higher than zero, it will randomize the note velocity value with the adjusted amount. This effect is very useful for creating variations in repeating patterns.

The deFormer has 4 note randomizers build in. MIDI channel and note range can be adjusted separately for each note randomizer. If a note randomizer MIDI channel are the same as deFormers global MIDI channel, that randomizer will treat notes sent to the internal synth.

**Probability:** Are adjusted with the first four of the 16 step knobs. Knob1 controls probability of randomizer 1, knob 2 controls probability of randomizer 2 and so on. When a randomizer has turned on one or more notes, the corresponding step LED will lit.

The probability value will show on the upper right corner of the display.

At high settings more notes will be passed thru, at lower settings less notes will be passed thru. At 255 all notes will get thru use this setting if you only wants the velocity to be randomized. At 0 no notes will get thru.



**Edit 1 – Randomizer 1 note range from:** The low note of randomizer 1 key range.

**Edit 2 – Randomizer 1 note range to:** The high note of randomizer 1 key range.

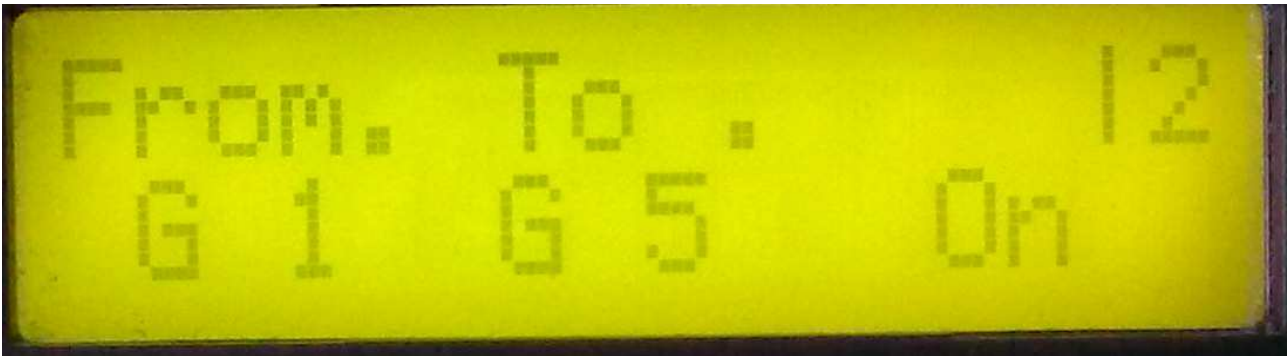
**Encoder:** Turns note randomizer 1 on and off.



**Edit 1 – Randomizer 1 MIDI channel:** The MIDI channel randomizer 1 will work on, in the selected key range. If this is set to the same as deFormers global MIDI channel, the randomizer will work on the internal synth.

**Edit 2 – Velocity amount:** Adjusts how much velocity will be randomized.

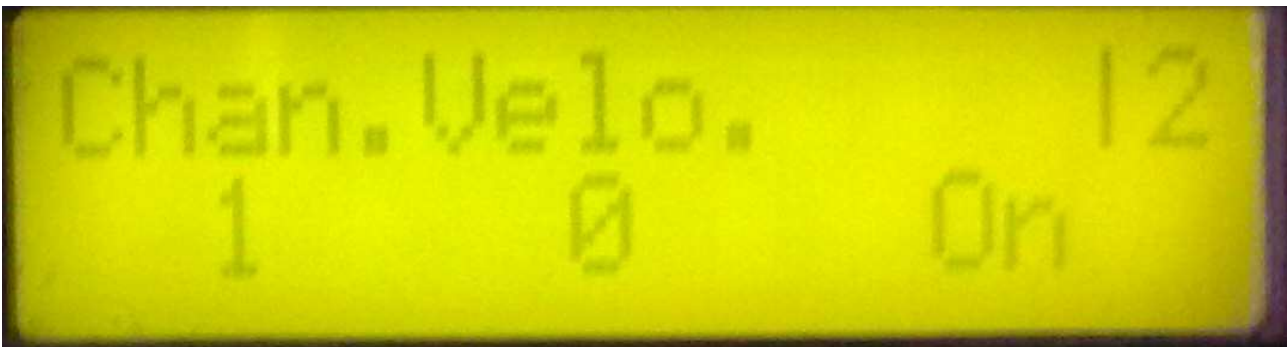
**Encoder:** Turns note randomizer 1 on and off.



**Edit 1 – Randomizer 2 note range from:** The low note of randomizer 2 key range.

**Edit 2 – Randomizer 2 note range to:** The high note of randomizer 2 key range.

**Encoder:** Turns note randomizer 2 on and off.

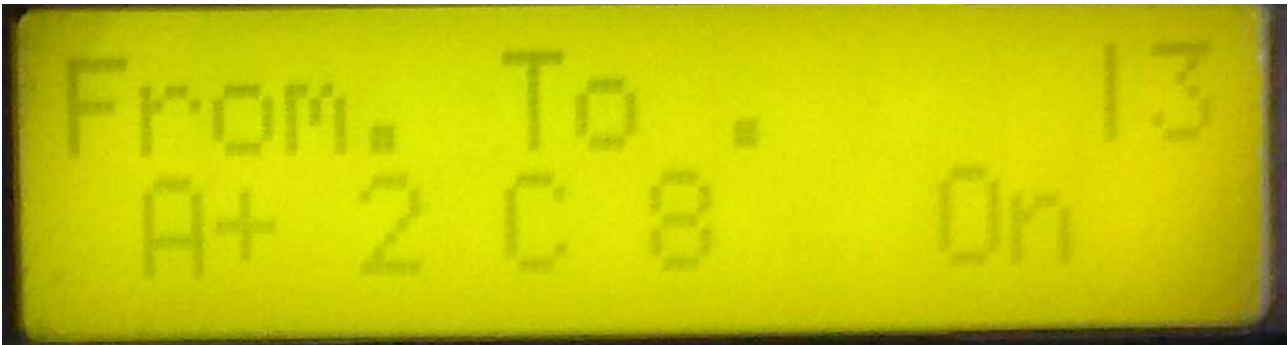


**Edit 1 – Randomizer 2 MIDI channel:** The MIDI channel randomizer 2 will work on, in the selected key range. If this is set to the same as deFormers global MIDI channel, the randomizer will work on the internal synth.

**Edit 2 – Velocity amount:** Adjusts how much velocity will be randomized.

**Encoder:** Turns note randomizer 2 on and off.





**Edit 1 – Randomizer 3 note range from:** The low note of randomizer 3 key range.

**Edit 2 – Randomizer 3 note range to:** The high note of randomizer 3 key range.

**Encoder:** Turns note randomizer 3 on and off.



**Edit 1 – Randomizer 3 MIDI channel:** The MIDI channel randomizer 3 will work on, in the selected key range. If this is set to the same as deFormers global MIDI channel, the randomizer will work on the internal synth.

**Edit 2 – Velocity amount:** Adjusts how much velocity will be randomized.

**Encoder:** Turns note randomizer 3 on and off.



**Edit 1 – Randomizer 4 note range from:** The low note of randomizer 4 key range.

**Edit 2 – Randomizer 4 note range to:** The high note of randomizer 4 key range.

**Encoder:** Turns note randomizer 4 on and off.



**Edit 1 – Randomizer 4 MIDI channel:** The MIDI channel randomizer 4 will work on, in the selected key range. If this is set to the same as deFormers global MIDI channel, the randomizer will work on the internal synth.

**Edit 2 – Velocity amount:** Adjusts how much velocity will be randomized.

**Encoder:** Turns note randomizer 4 on and off.

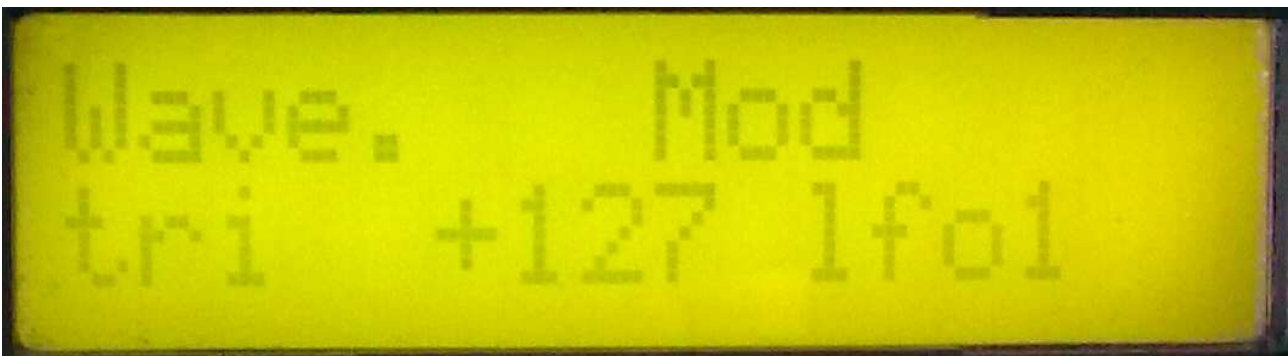


## The Oscillator Pages



The deFormer oscillator waveforms are continuously variable from triangle to saw to square or from triangle to saw to noise. The wave-shaping can be modulated from all sources, including the oscillator itself. All waveforms can be pulsewidth and pitch-modulated. The noise waveform can be pitched or unpitched. Unison mode with detune are available. The oscillator section has it's own two LFO's and one envelope. The LFO waveforms are continuously variable from triangle to saw to square to pulse. The LFO's can be both wave and rate-modulated.

On the output of each oscillator are an amplifier. This amplifier is always controlled by the oscillator envelope, so the oscillator envelope always controls the rise and fall of the output.



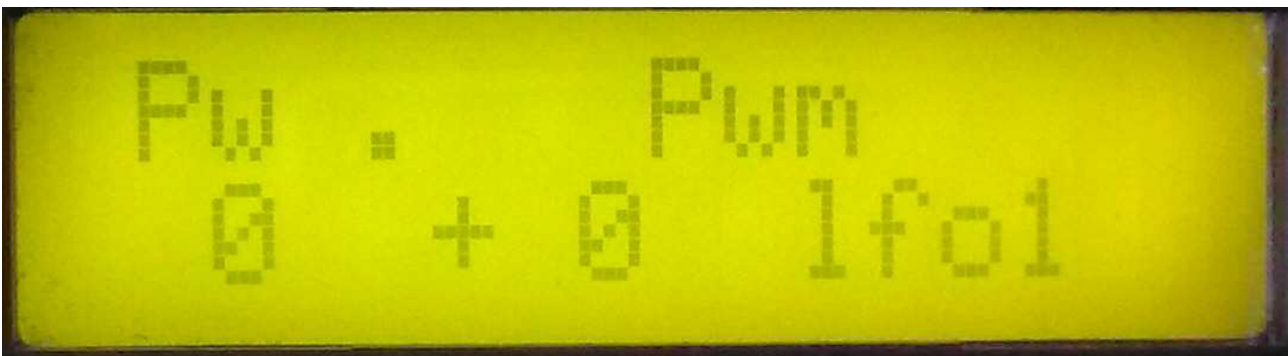
**Edit 1 – Oscillator wave shape:** Value 0 to 255, 0: triangle, 128: saw, 255: Square. If noise (on oscillator page 5) are any other value than off, 255 will be: noise instead of square.

**Edit 2 – Oscillator wave shape modulation:** Value –128 to +127. A negative value inverts the modulator.

**Encoder - Oscillator wave shape modulation source:** Value: lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2, ctr3.



**Encoder – Wave shape modulation level source:** Selects a source, that modulates the level of the wave shape modulation. Choices are: manu(al) – nothing modulates the modulation level, lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2.



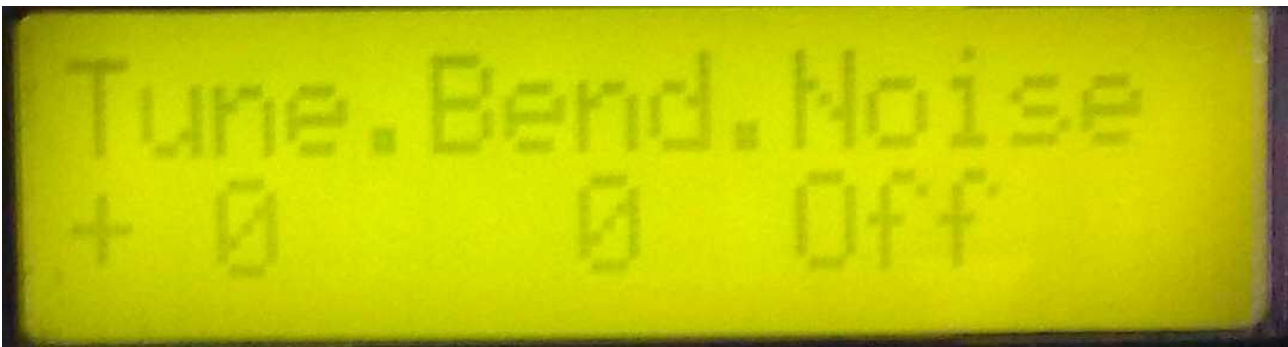
**Edit 1 – Waveform pulse width:** Value 0 to 255.

**Edit 2 – Pulse width modulation:** Value -128 to +127. A negative value inverts the modulator.

**Encoder – Pulse width modulation source:** Value: lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2, ctr3.



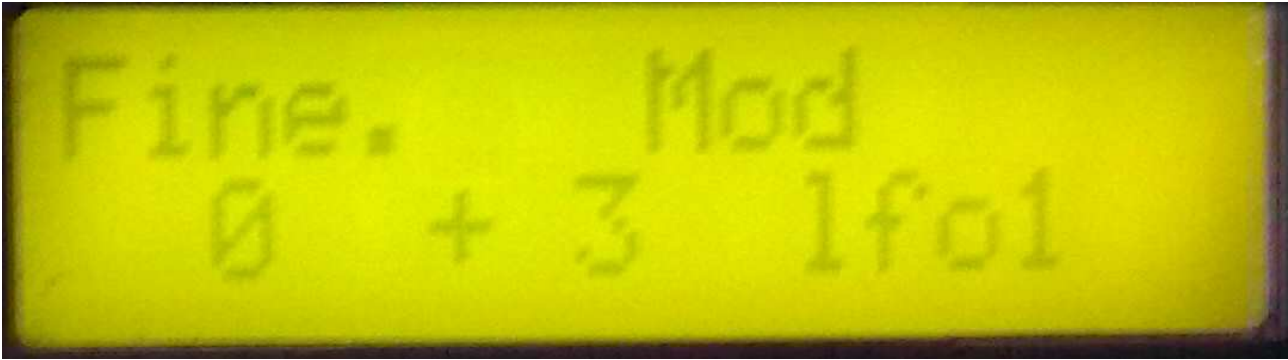
**Encoder – Pulse width modulation level source:** Selects a source, that modulates the level of the pulse width modulation. Choices are: manu(al) – nothing modulates the modulation level, lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2.



**Edit 1 – tune:** Tunes the oscillators in semitone steps.

**Edit 2 – Bend:** Adjusts how much incoming midi pitch bend messages will affect the oscillator pitch. From 0 to 255 (about 12 semitones).

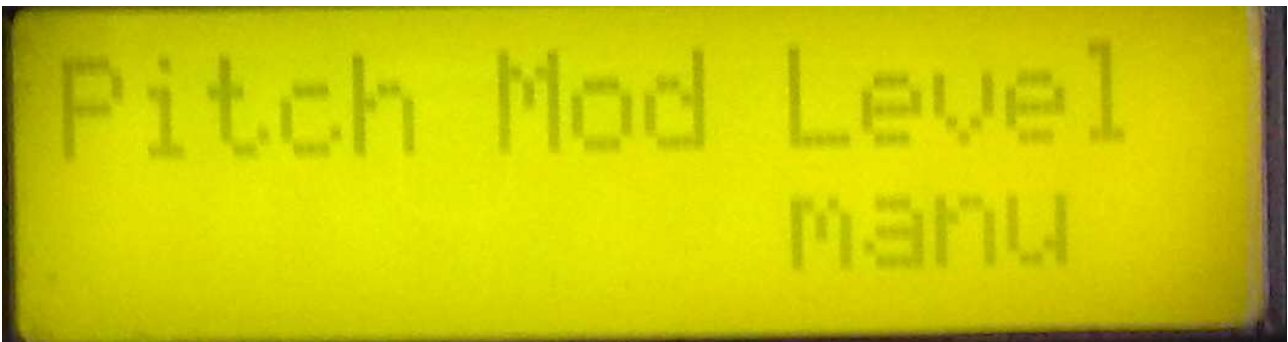
**Encoder – Noise: Off:** The waveshape parameter on oscillator page 1 will morph between triangle-saw-square. **On:** The waveshape parameter on oscillator page 1 will morph between triangle-saw-noise. **Pitch:** The waveshape parameter on oscillator page 1 will morph between triangle-saw-pitched noise.



**Edit 1 – Fine tune/unison detune:** If key mode: poly or mono it fine-tunes the oscillators. If key mode: unison this parameter adjusts the unison detune.

**Edit 2 – Pitch modulation:** Value –128 to +127. A negative value inverts the modulator.

**Encoder – Pitch modulation source:** Value: lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2, ctr3.



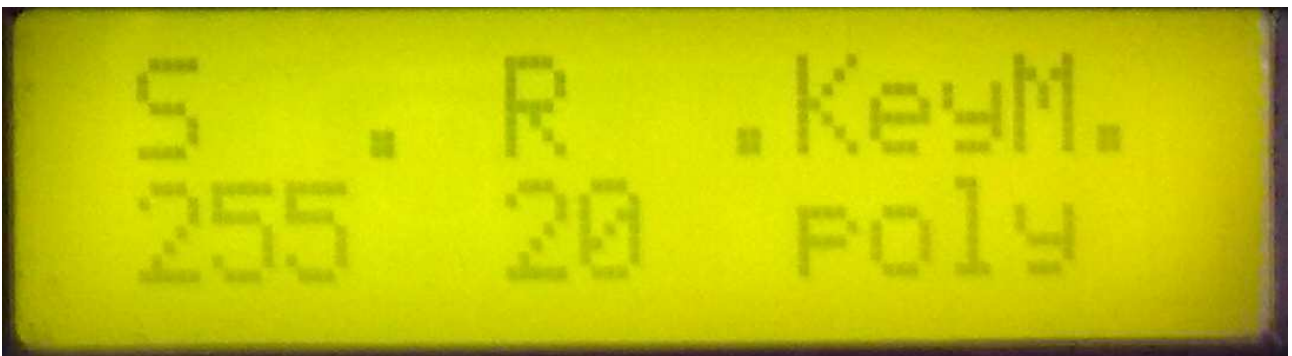
**Encoder – Pitch modulation level source:** Selects a source, that modulates the level of the pitch modulation. Choices are: manu(al) – nothing modulates the modulation level, lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2.



**Edit 1:** Oscillator output envelope attack time.

**Edit 2:** Oscillator output envelope decay time.

**Encoder:** Oscillator output envelope velocity on/off.



**Edit 1:** Oscillator output envelope sustain level.

**Edit 2:** Oscillator output envelope release time.

**Encoder:** Oscillators keyboard mode. Choices are: Mono, Poly, Unison.

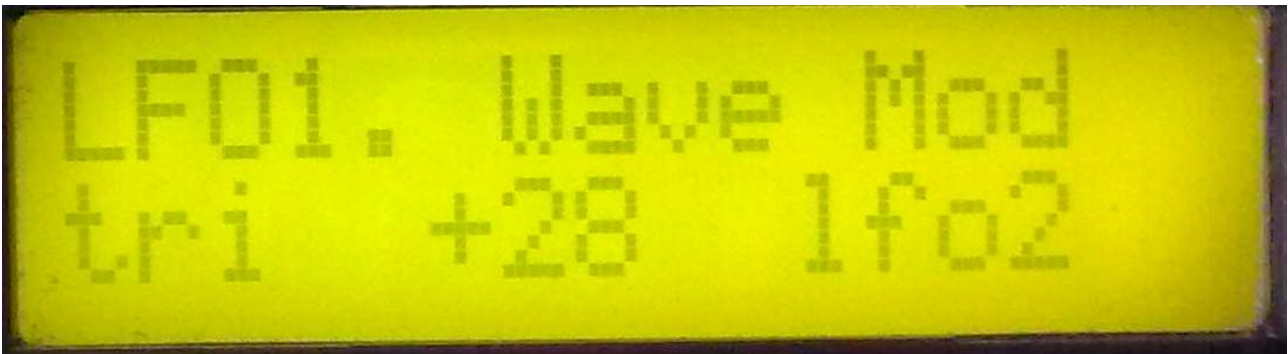




**Edit 1:** Oscillator LFO 1 frequency.

**Edit 2:** Oscillator LFO 1 frequency modulation. A negative value inverts the modulator.

**Encoder:** Oscillator LFO 1 frequency modulation source. Value: lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2, ctr3.



**Edit 1:** Oscillator LFO 1 waveshape. Value 0-255. 0: triangle, 64: saw, 128: square, 255: pulse.

**Edit 2:** Oscillator LFO 1 waveshape modulation. A negative value inverts the modulator.

**Encoder:** Oscillator LFO 1 waveshape modulation source. Value: lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2, ctr3.



**Edit 1:** Oscillator LFO 2 frequency.

**Edit 2:** Oscillator LFO 2 frequency modulation. A negative value inverts the modulator.

**Encoder:** Oscillator LFO 2 frequency modulation source. Value: lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2, ctr3.

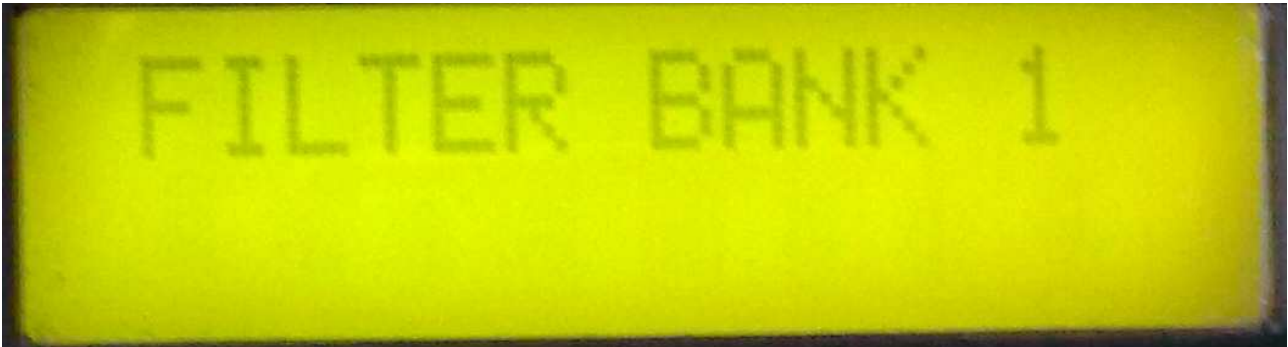


**Edit 1:** Oscillator LFO 2 waveshape. Value 0-255. 0: triangle, 64: saw, 128: square, 255: pulse.

**Edit 2:** Oscillator LFO 2 waveshape modulation. A negative value inverts the modulator.

**Encoder:** Oscillator LFO 2 waveshape modulation source. Value: lfo1, lfo2, env(elope), velo(city), osc(illator), ctr1, ctr2, ctr3.

## Filterbank 1 pages



The deFormer has 2 filterbanks with each four filters that are independently programable and each can be routed in serial or parallel to the others. Each filter can be set in lo-pass, band-pass or hi-pass mode. Cut-off and output levels can be modulated. The filter-section has it's own two LFO's , one envelope and a random-generator, that can be triggered from LFO1, LFO2 or midi note-on's.

Even though the envelope, LFO's and random-generator can be accessed in both filterbanks, it does not have separate modulators for each filterbank. It is the same set of modulators you access in each filterbank.



## The step knobs on the filterbank edit pages:



On the filterbank edit pages, the 16 step knobs are used to adjust two sets of filter 1-4 output levels and cutoff frequencies. On the upper row of 8 knobs (knob 1-8), you can adjust 1 set of levels and cutoffs, and on the lower row of 8 knobs (knob 9-16) you can adjust another set of levels and cutoffs.

With a morph function, it is then possible to morph between the upper and the lower sets.

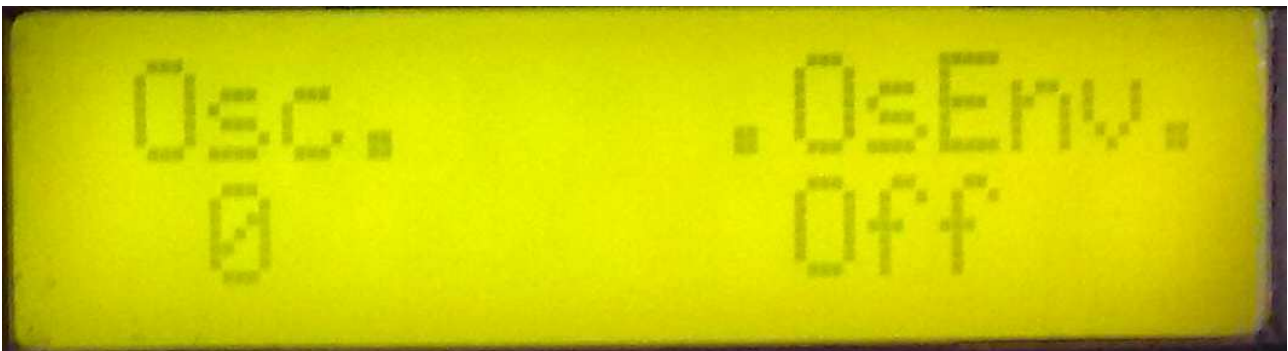
- Knob 1 and 9:** Filter 1 level.
- Knob 2 and 10:** Filter 1 cutoff.
- Knob 3 and 11:** Filter 2 level.
- Knob 4 and 12:** Filter 2 cutoff.
- Knob 5 and 13:** Filter 3 level.
- Knob 6 and 14:** Filter 3 cutoff.
- Knob 7 and 15:** Filter 4 level.
- Knob 8 and 16:** Filter 4 cutoff.



**Edit 1 – Audio input 1 to filterbank 1 level:** This adjusts the input of all filters that are in parallel connection mode at the same time. If this is set too high, digital clipping will occur.

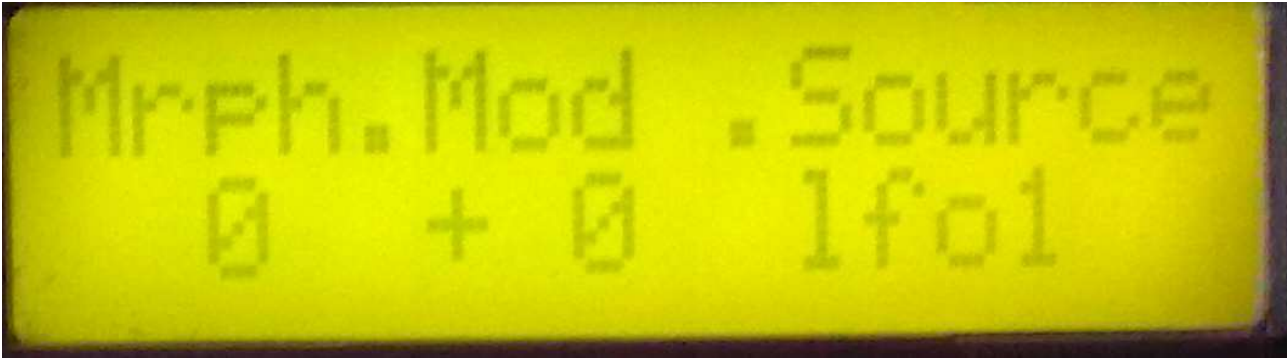
**Edit 2 – Audio input 2 to filterbank 1 level:** This adjusts the input of all filters that are in parallel connection mode at the same time. If this is set too high, digital clipping will occur.

**Encoder:** Turns Filterbank 1 on and off. When turned off, the signals will be bypassed to the output, without any filtering.



**Edit1 – Oscillators to filterbank 1 input level:** This adjusts the input of all filters that are in parallel connection mode at the same time. If this is set too high, digital clipping will occur.

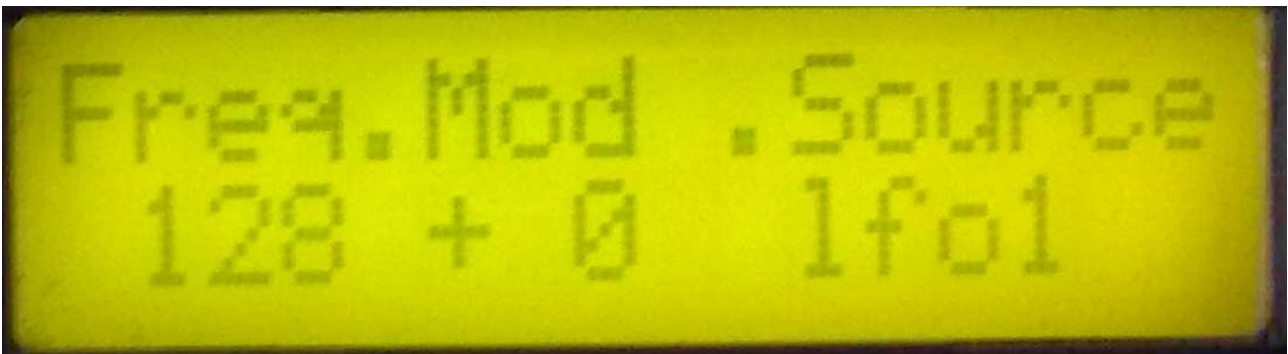
**Encoder – Oscillator envelope to filterbank 1 output control:** If this is on, the oscillator envelopes are controlling the output level of filterbank 1. When off, the output of filterbank 1 are always open. This should be on, when you are using filterbank 1 as a part of the internal synth (i.e. the oscillators are running thru it), and should be left off, when you are treating external audio signals.



**Edit1 – Morph:** Morphs between the settings of the upper row of the step knobs, and the settings of the lower row of step knobs. At setting zero, only the settings of the upper row are used, and at setting 255, only the settings of the lower row are used.

**Edit 2 – Morph modulation:** Value –128 to +127. A negative value inverts the modulator.

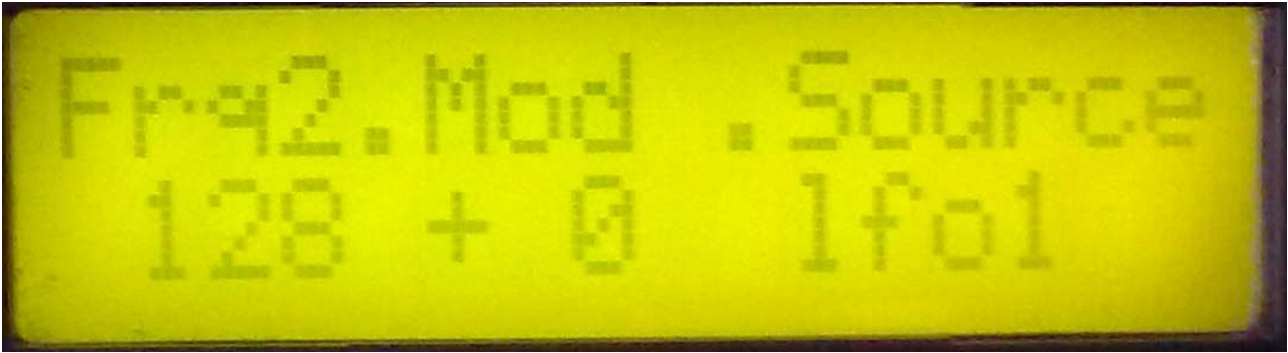
**Encoder – Morph modulation source:** Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Edit1 – Freq:** This adjusts a common cutoff frequency offset for all 4 filters at the same time.

**Edit 2 – Freq modulation 1:** Value –128 to +127. A negative value inverts the modulator.

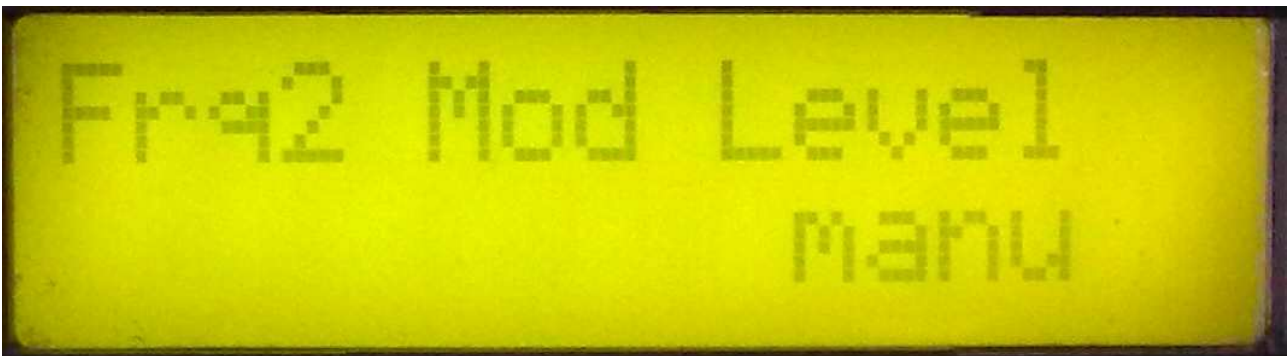
**Encoder – Freq modulation 1 source:** Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Edit1 – Frq2:** This adjusts a common cutoff frequency offset for all 4 filters at the same time. This parameter will always take the same value as the "Freq" parameter on the previous page. There are not two different frequency controls, but there are 2 modulation sources at the same time.

**Edit 2 – Freq modulation 2:** Value -128 to +127. A negative value inverts the modulator.

**Encoder – Freq modulation 2 source:** Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.

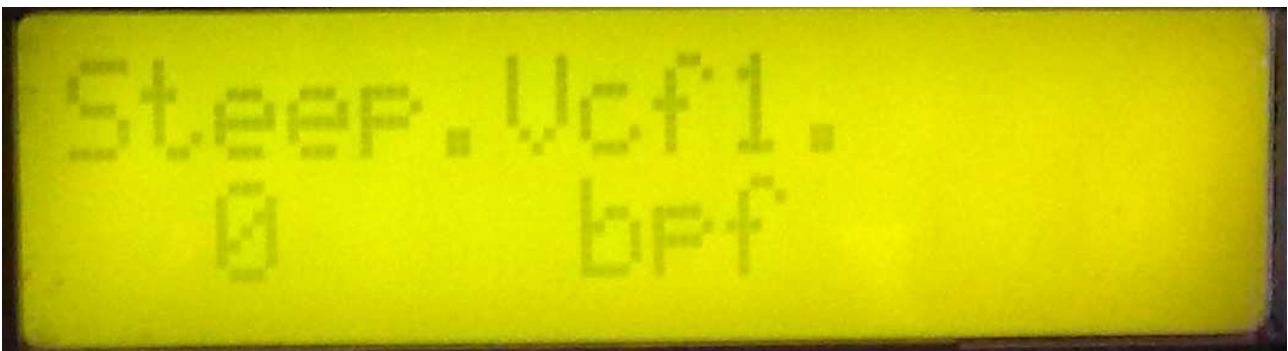


**Encoder – Freq modulation 2 level source:** Selects a source, that modulates the level of the Freq modulation. Choices are: manu(al) – nothing modulates the modulation level, lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2.





**Edit 1 – Filter feedback:** Value 0 to 255. The filter outputs can be feed'ed back to their inputs. That makes the steep (resonance) effect sounding sharper. This control works on all 4 filters at the same time.



**Edit 1 – Filter 1 Steep (resonance):** Value 0 to 255. The word "Steep" were used, because it seemed more technically correct at the time the deFormer was engineered, but it is actually resonance. Hope that this will not lead to any confusion.

**Edit 2 – Filter 1 type:** Choices are: BPF: band pass mode, LPF: low pass mode, HPF: high pass mode.



**Edit 1 – Filter 2 Steep (resonance):** Value 0 to 255. The word "Steep" were used, because it seemed more technically correct at the time the deFormer was engineered, but it is actually resonance. Hope that this will not lead to any confusion.

**Edit 2 – Filter 2 type:** Choices are: BPF: band pass mode, LPF: low pass mode, HPF: high pass mode.

**Encoder – Filter 2 connection: par:** the filter are connected in parallel to the other filters. The oscillators output goes straight into the filter.

**Ser:** The filter are in serial connection with filter 1.



**Edit 1 – Filter 3 Steep (resonance):** Value 0 to 255. The word "Steep" were used, because it seemed more technically correct at the time the deFormer was engineered, but it is actually resonance. Hope that this will not lead to any confusion.

**Edit 2 – Filter 3 type:** Choices are: BPF: band pass mode, LPF: low pass mode, HPF: high pass mode.

**Encoder – Filter 3 connection: par:** the filter are connected in parallel to the other filters. The oscillators output goes straight into the filter.

**Ser:** The filter are in serial connection with filter 2.

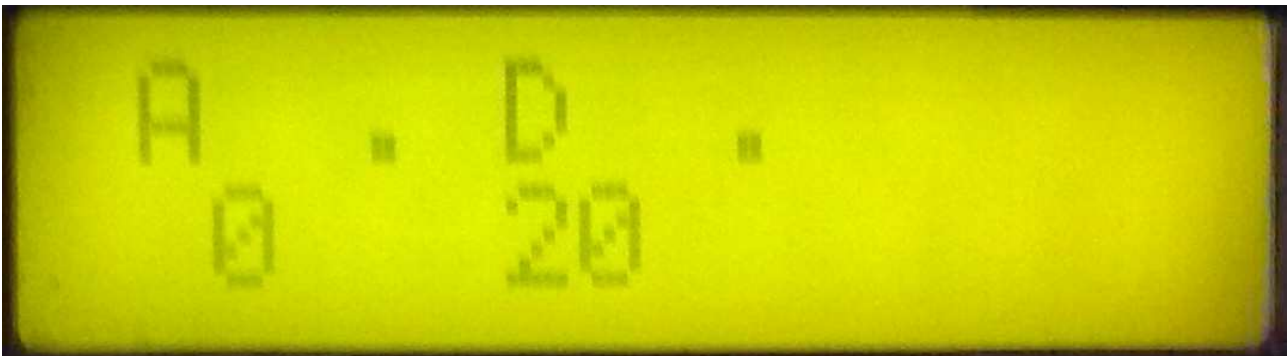


**Edit 1 – Filter 4 Steep (resonance):** Value 0 to 255. The word "Steep" were used, because it seemed more technically correct at the time the deFormer was engineered, but it is actually resonance. Hope that this will not lead to any confusion.

**Edit 2 – Filter 4 type:** Choices are: BPF: band pass mode, LPF: low pass mode, HPF: high pass mode.

**Encoder – Filter 4 connection: par:** the filter are connected in parallel to the other filters. The oscillators output goes straight into the filter.

**Ser:** The filter are in serial connection with filter 3.



**Edit 1:** Filterbank modulation envelope attack time.

**Edit 2:** Filterbank modulation envelope decay time.



**Edit 1:** Filterbank modulation envelope sustain level.

**Edit 2:** Filterbank modulation envelope release time.



**Edit 1:** Filterbank LFO 1 frequency.

**Edit 2:** Filterbank LFO 1 frequency modulation. A negative value inverts the modulator.

**Encoder:** Filterbank LFO 1 frequency modulation source. Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.





**Edit 1:** Filterbank LFO 1 waveshape. Value 0-255. 0: triangle, 64: saw, 128: square, 255: pulse.

**Edit 2:** Filterbank LFO 1 waveshape modulation. A negative value inverts the modulator.

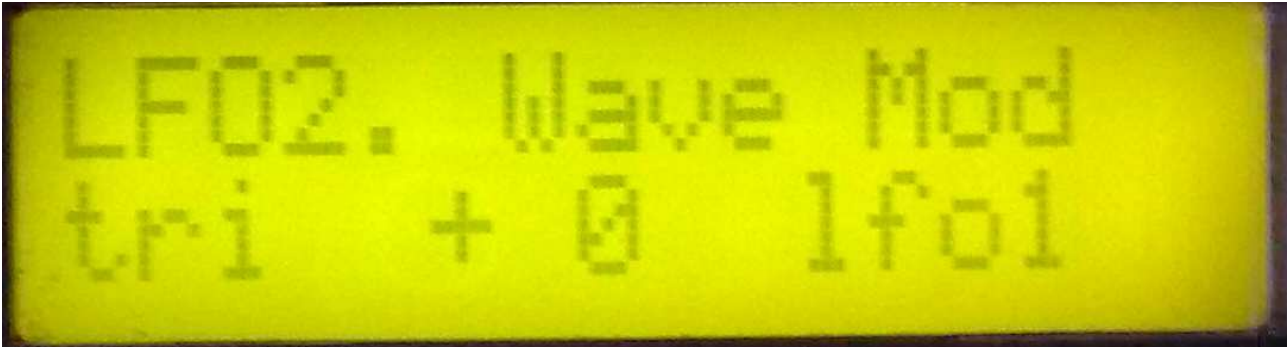
**Encoder:** Filterbank LFO 1 waveshape modulation source. Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Edit 1:** Filterbank LFO 2 frequency.

**Edit 2:** Filterbank LFO 2 frequency modulation. A negative value inverts the modulator.

**Encoder:** Filterbank LFO 2 frequency modulation source. Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



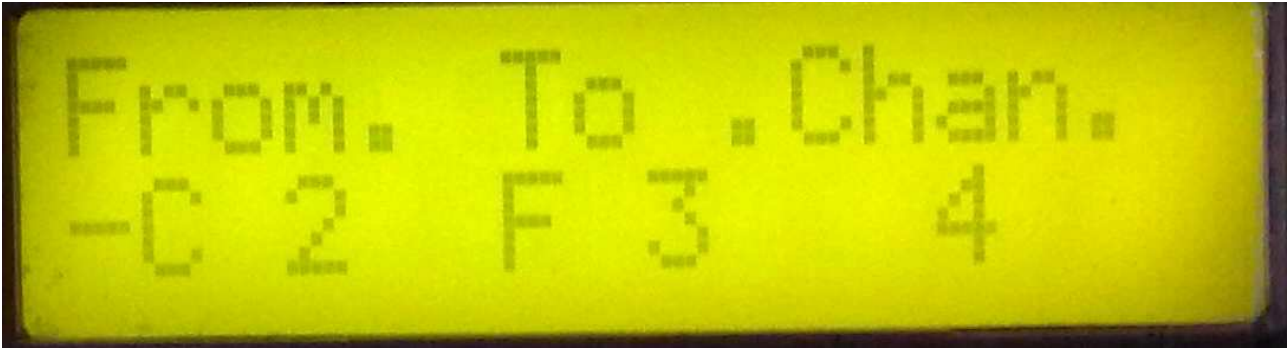
**Edit 1:** Filterbank LFO 2 waveshape. Value 0-255. 0: triangle, 64: saw, 128: square, 255: pulse.

**Edit 2:** Filterbank LFO 2 waveshape modulation. A negative value inverts the modulator.

**Encoder:** Filterbank LFO 2 waveshape modulation source. Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Encoder:** Selects the filter random generator trigger source. Choices are: LFO1, LFO2, MIDI (note-on's – Key range are set on the next page).



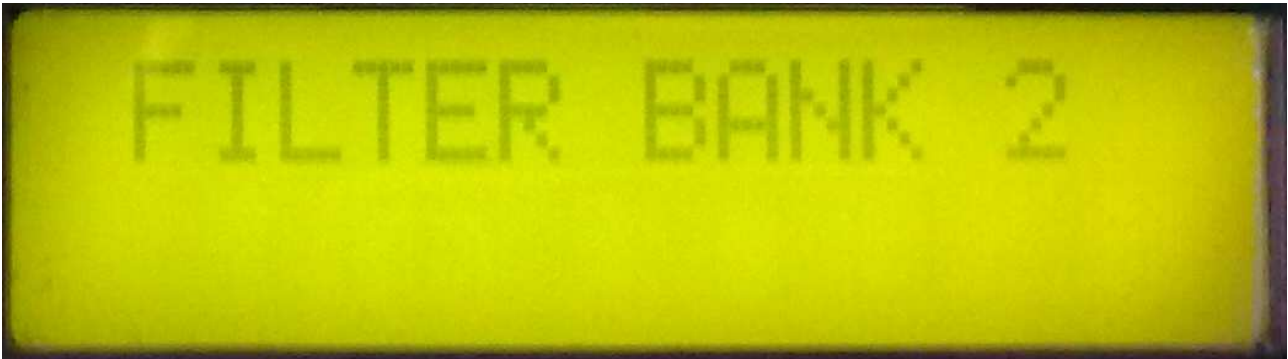
**Random trigger midi channel and key range, if random trig = MIDI.**

**Edit 1 – Key from:** The lowest trigger note.

**Edit 2 – Key to:** The highest trigger note.

**Encoder – Random trigger Midi channel.**

## Filterbank 2 pages



The deFormer has 2 filterbanks with each four filters that are indepenently programable and each can be routed in serial or parallel to the others. Each filter can be set in lo-pass, band-pass or hi-pass mode. Cut-off, steep (resonance) and output levels can be modulated. The filter-section has it's own two LFO's , one envelope and a random-generator, that can be trigged from LFO1, LFO2 or midi note-on's.

Even though the envelope, LFO's and random-generator can be accessed in both filterbanks, it does not have separate modulators for each filterbank. It is the same set of modulators you access in each filterbank.

## The step knobs on the filterbank edit pages:

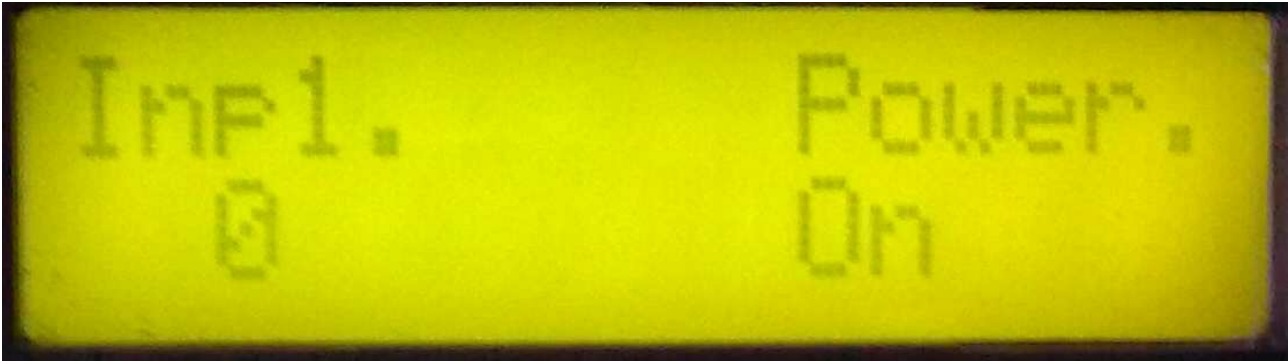


On the filterbank edit pages, the 16 step knobs are used to adjust two sets of filter 1-4 output levels and cutoff frequencies. On the upper row of 8 knobs (knob 1-8), you can adjust 1 set of levels and cutoffs, and on the lower row of 8 knobs (knob 9-16) you can adjust another set of levels and cutoffs.

With a morph function, it is then possible to morph between the upper and the lower sets.

- Knob 1 and 9:** Filter 1 level.
- Knob 2 and 10:** Filter 1 cutoff.
- Knob 3 and 11:** Filter 2 level.
- Knob 4 and 12:** Filter 2 cutoff.
- Knob 5 and 13:** Filter 3 level.
- Knob 6 and 14:** Filter 3 cutoff.
- Knob 7 and 15:** Filter 4 level.
- Knob 8 and 16:** Filter 4 cutoff.





**Edit 1 – Audio input 1 to filterbank 2 level:** This adjusts the input of all filters that are in parallel connection mode at the same time. If this is set too high, digital clipping will occur.

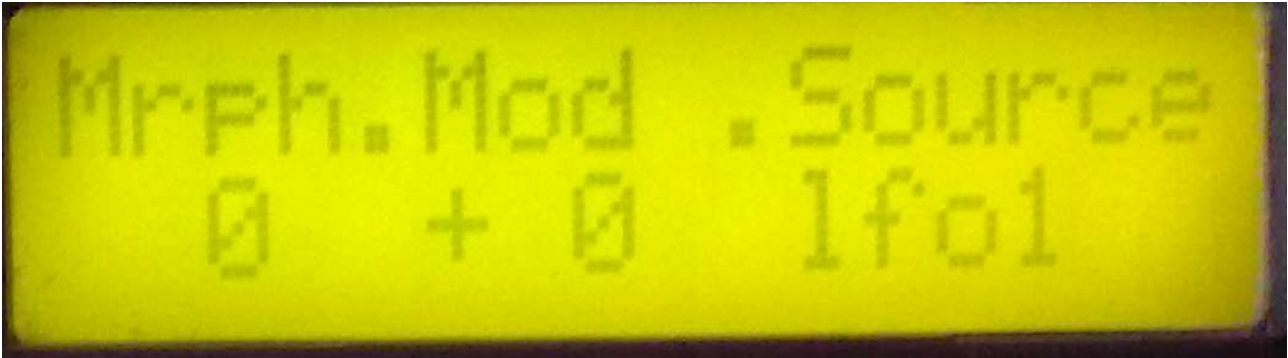
**Encoder:** Turns Filterbank 2 on and off. When turned off, the signals will be bypassed to the output, without any filtering.



**Edit1 – Oscillators to filterbank 2 input level:** This adjusts the input of all filters that are in parallel connection mode at the same time. If this is set too high, digital clipping will occur.

**Edit2 – Filterbank 1 output to Filterbank 2 input level:** When turning this up, the two filterbanks goes into serial connection.

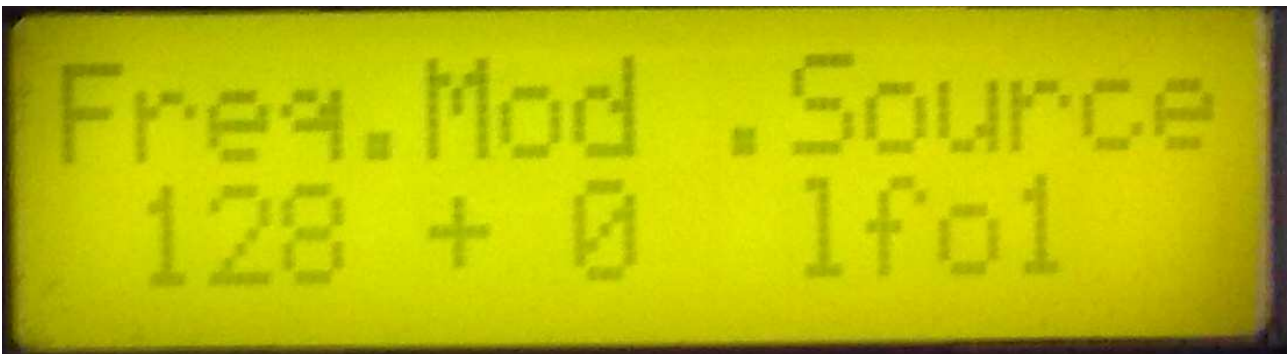
**Encoder – Oscillator envelope to filterbank 2 output control:** If this is on, the oscillator envelopes are controlling the output level of filterbank 2. When off, the output of filterbank 2 are always open. This should be on, when you are using filterbank 2 as a part of the internal synth (i.e. the oscillators are running thru it), and should be left off, when you are treating external audio signals.



**Edit1 – Morph:** Morphs between the settings of the upper row of the step knobs, and the settings of the lower row of step knobs. At setting zero, only the settings of the upper row are used, and at setting 255, only the settings of the lower row are used.

**Edit 2 – Morph modulation:** Value –128 to +127. A negative value inverts the modulator.

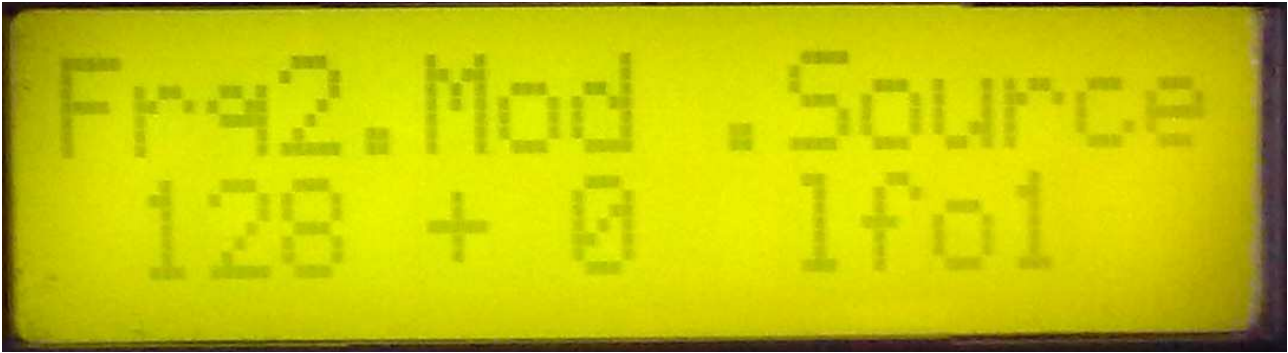
**Encoder – Morph modulation source:** Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Edit1 – Freq:** This adjusts a common cutoff frequency offset for all 4 filters at the same time.

**Edit 2 – Freq modulation 1:** Value –128 to +127. A negative value inverts the modulator.

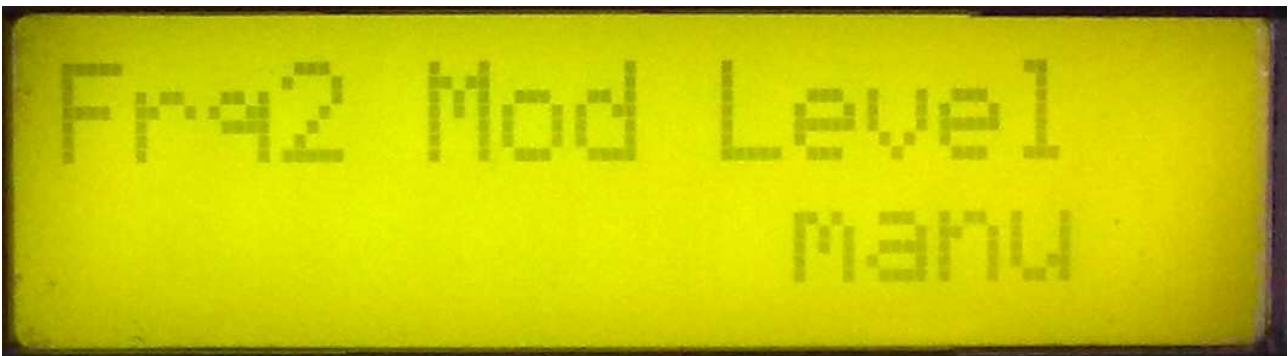
**Encoder – Freq modulation 1 source:** Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Edit1 – Frq2:** This adjusts a common cutoff frequency offset for all 4 filters at the same time. This parameter will always take the same value as the "Freq" parameter on the previous page. There are not two different frequency controls, but there are 2 modulation sources at the same time.

**Edit 2 – Freq modulation 2:** Value -128 to +127. A negative value inverts the modulator.

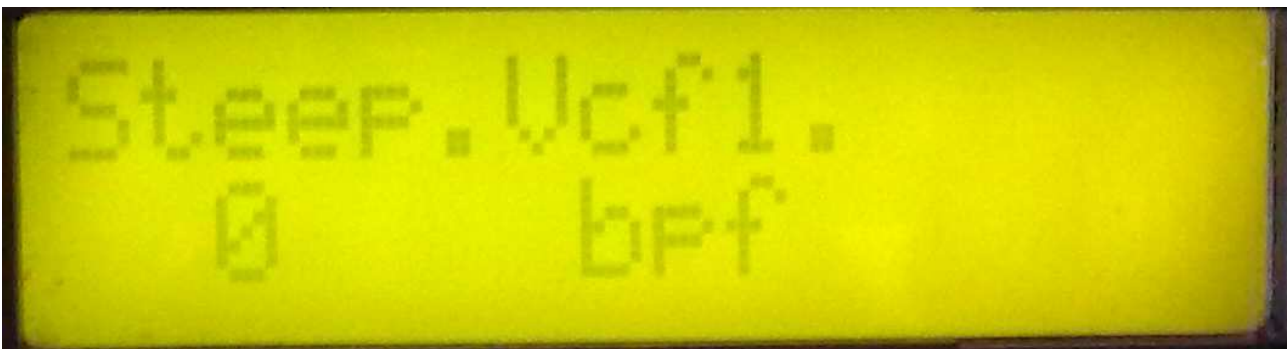
**Encoder – Freq modulation 2 source:** Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Encoder – Freq modulation 2 level source:** Selects a source, that modulates the level of the Freq modulation. Choices are: manu(al) – nothing modulates the modulation level, lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2.



**Edit 1 – Filter feedback:** Value 0 to 255. The filter outputs can be feed'ed back to their inputs. That makes the steep (resonance) effect sounding sharper. This control works on all 4 filters at the same time.



**Edit 1 – Filter 1 Steep (resonance):** Value 0 to 255. The word "Steep" were used, because it seemed more technically correct at the time the deFormer was engineered, but it is actually resonance. Hope that this will not lead to any confusion.

**Edit 2 – Filter 1 type:** Choices are: BPF: band pass mode, LPF: low pass mode, HPF: high pass mode.



**Edit 1 – Filter 2 Steep (resonance):** Value 0 to 255. The word "Steep" were used, because it seemed more technically correct at the time the deFormer was engineered, but it is actually resonance. Hope that this will not lead to any confusion.

**Edit 2 – Filter 2 type:** Choices are: BPF: band pass mode, LPF: low pass mode, HPF: high pass mode.

**Encoder – Filter 2 connection: par:** the filter are connected in parallel to the other filters. The oscillators output goes straight into the filter.

**Ser:** The filter are in serial connection with filter 1.



**Edit 1 – Filter 3 Steep (resonance):** Value 0 to 255. The word "Steep" were used, because it seemed more technically correct at the time the deFormer was engineered, but it is actually resonance. Hope that this will not lead to any confusion.

**Edit 2 – Filter 3 type:** Choices are: BPF: band pass mode, LPF: low pass mode, HPF: high pass mode.

**Encoder – Filter 3 connection: par:** the filter are connected in parallel to the other filters. The oscillators output goes straight into the filter.

**Ser:** The filter are in serial connection with filter 2.



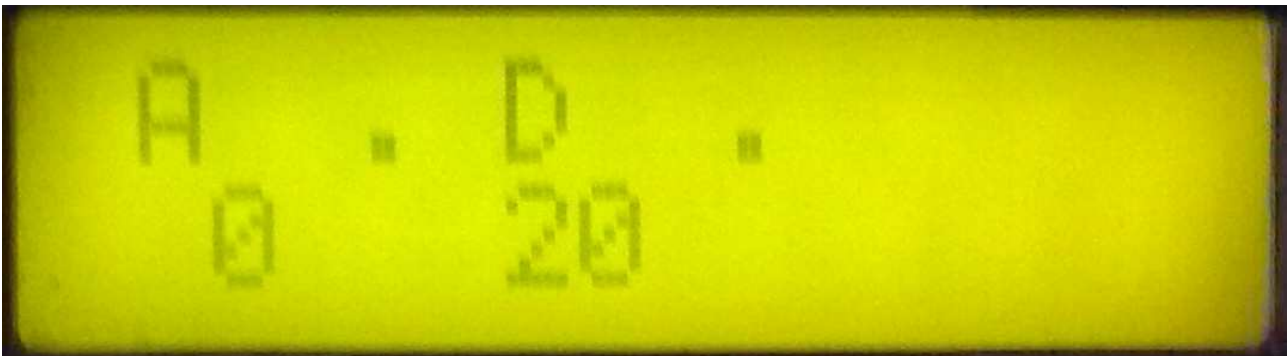


**Edit 1 – Filter 4 Steep (resonance):** Value 0 to 255. The word "Steep" were used, because it seemed more technically correct at the time the deFormer was engineered, but it is actually resonance. Hope that this will not lead to any confusion.

**Edit 2 – Filter 4 type:** Choices are: BPF: band pass mode, LPF: low pass mode, HPF: high pass mode.

**Encoder – Filter 4 connection: par:** the filter are connected in parallel to the other filters. The oscillators output goes straight into the filter.

**Ser:** The filter are in serial connection with filter 3.



**Edit 1:** Filterbank modulation envelope attack time.

**Edit 2:** Filterbank modulation envelope decay time.



**Edit 1:** Filterbank modulation envelope sustain level.

**Edit 2:** Filterbank modulation envelope release time.



**Edit 1:** Filterbank LFO 1 frequency.

**Edit 2:** Filterbank LFO 1 frequency modulation. A negative value inverts the modulator.

**Encoder:** Filterbank LFO 1 frequency modulation source. Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Edit 1:** Filterbank LFO 1 waveshape. Value 0-255. 0: triangle, 64: saw, 128: square, 255: pulse.

**Edit 2:** Filterbank LFO 1 waveshape modulation. A negative value inverts the modulator.

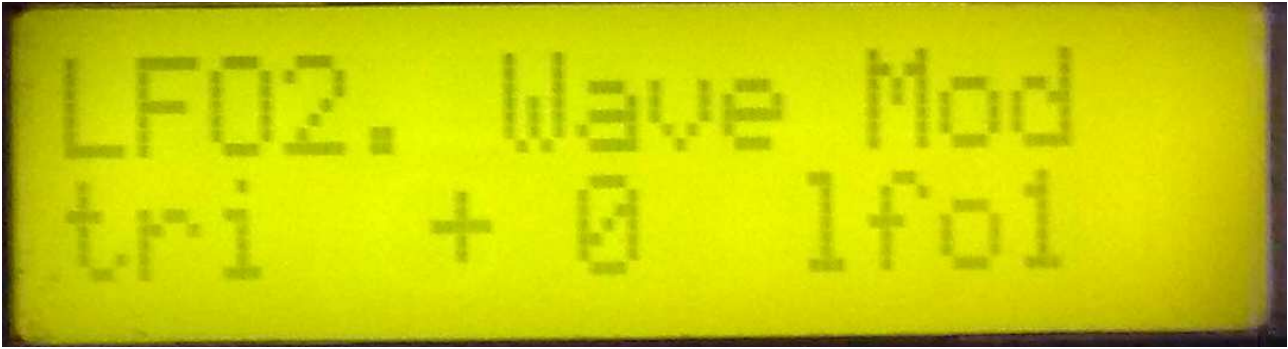
**Encoder:** Filterbank LFO 1 waveshape modulation source. Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Edit 1:** Filterbank LFO 2 frequency.

**Edit 2:** Filterbank LFO 2 frequency modulation. A negative value inverts the modulator.

**Encoder:** Filterbank LFO 2 frequency modulation source. Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



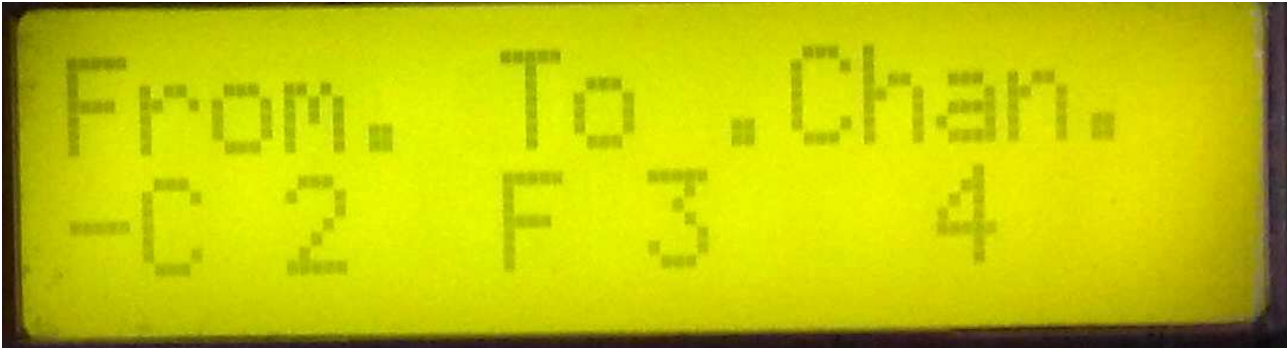
**Edit 1:** Filterbank LFO 2 waveshape. Value 0-255. 0: triangle, 64: saw, 128: square, 255: pulse.

**Edit 2:** Filterbank LFO 2 waveshape modulation. A negative value inverts the modulator.

**Encoder:** Filterbank LFO 2 waveshape modulation source. Value: lfo1, lfo2, random, env(elope), osc(illator), ctr1, ctr2, ctr3.



**Encoder:** Selects the filter random generator trigger source. Choices are: LFO1, LFO2, MIDI (note-on's – Key range are set on the next page).



**Random trigger midi channel and key range, if random trig = MIDI.**

**Edit 1 – Key from:** The lowest trigger note.

**Edit 2 – Key to:** The highest trigger note.

**Encoder – Random trigger Midi channel.**



## The Mixer Pages



The mixer section of the deFormer controls the routings and the levels of the oscillators, the external audio input signals and the 2 filterbanks. There are 2 output channels. The granulator effect are always assigned to channel 1, while the compressor and distortion are assignable to channel 1 or 2.



**Edit1 – Audio input 1 direct level:** Adjusts the level of audio input 1, going directly to the mixer, without any filtering.

**Encoder – Audio input 1 direct channel:** Assigns audio input 1 to mixer output channel 1 or 2.



**Edit1 – Oscillators direct level:** Adjusts the level of the oscillators, going directly to the mixer, without any filtering.

**Encoder – Oscillators direct channel:** Assigns the oscillators to mixer output channel 1 or 2.



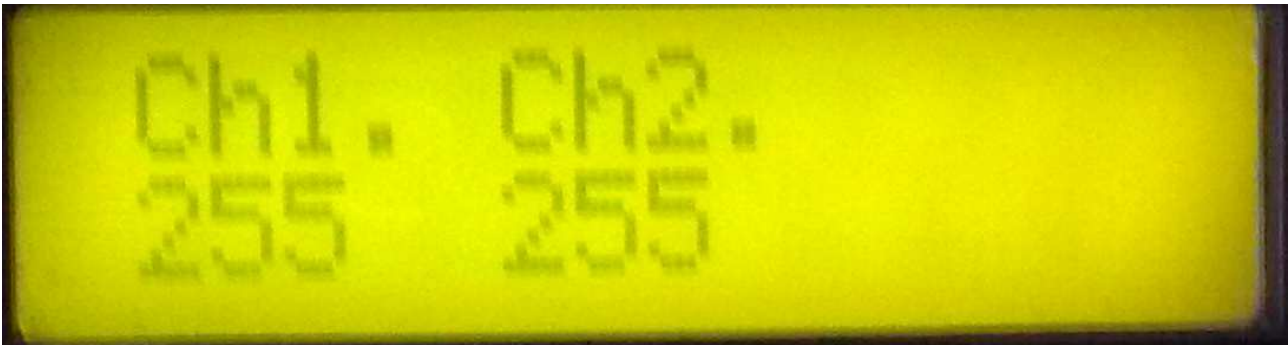
**Edit1 – Filterbank 1 level:** Adjusts the level of filterbank 1, going into to the mixer.

**Encoder – Filterbank 1 channel:** Assigns filterbank 1 to mixer output channel 1 or 2.



**Edit1 – Filterbank 2 level:** Adjusts the level of filterbank 2, going into to the mixer.

**Encoder – Filterbank 2 channel:** Assigns filterbank 2 to mixer output channel 1 or 2.



**Edit1 – Mixer output channel 1 total level.**

**Edit2 – Mixer output channel 2 total level.**

## The Granulator pages.



The deFormer granulator are a newly created and unique GotharMusic invention. It is a great tool for totally rearrange your musical phrases, and turn them in to something completely new. Unlike other granulators, that only always plays "step one", the deFormer granulator are fully programmable, and able to play back a user programmed granulator sequence. This sequence won't of course stay the same all the time (Unless you activate the Freeze knob), because it is dynamically treating the audio input signal, assigned to mixer output channel 1.

Sometimes the results can become very strange.

The Granulator:

- Cuts the incoming audio up in small fragments of adjustable size. Via the 16 step knobs you can rearrange these fragments in realtime.
- Each granulator step can be pitch shifted via the 16 step knobs.
- Time stretches the incoming audio in realtime.
- If you don't need to cut up and rearrange the audio signal, you can switch the granulator to stereo delay mode instead.

WITH THE MIX KNOB ON DEFORMERS FRONT, YOU CAN MIX BETWEEN THE GRANULATED AND THE UNGRANULATED SIGNAL.

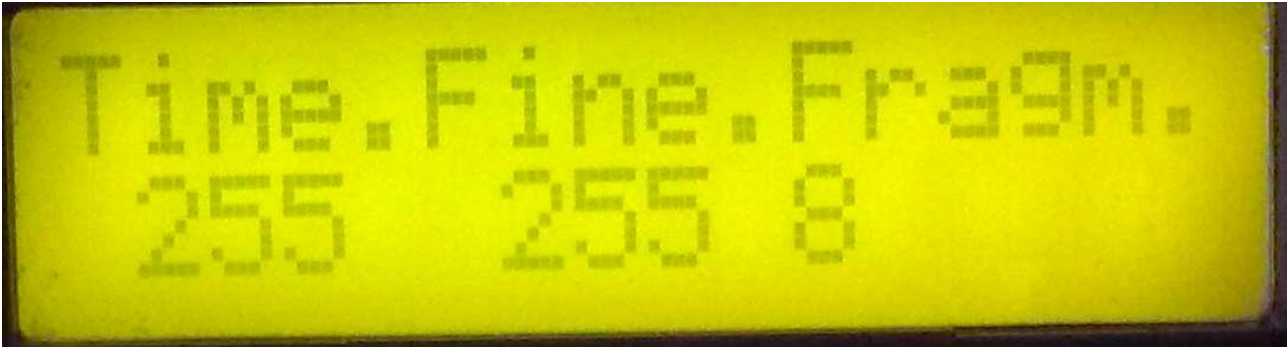


## The 16 step knobs on the granulator pages



The step LED's light up, depending on how many granulator steps you have chosen. For each LED that is lit, the corresponding step knob is active, for selecting what fragment number should be played back at that step. The steps are played back sequentially. On the granulator pitch page, the active step knobs are used to adjust the pitch shifting for each step. THESE CONTROLS ARE ONLY ACTIVE IN THE GRANULATOR MODES, NOT IN THE DELAY MODES!

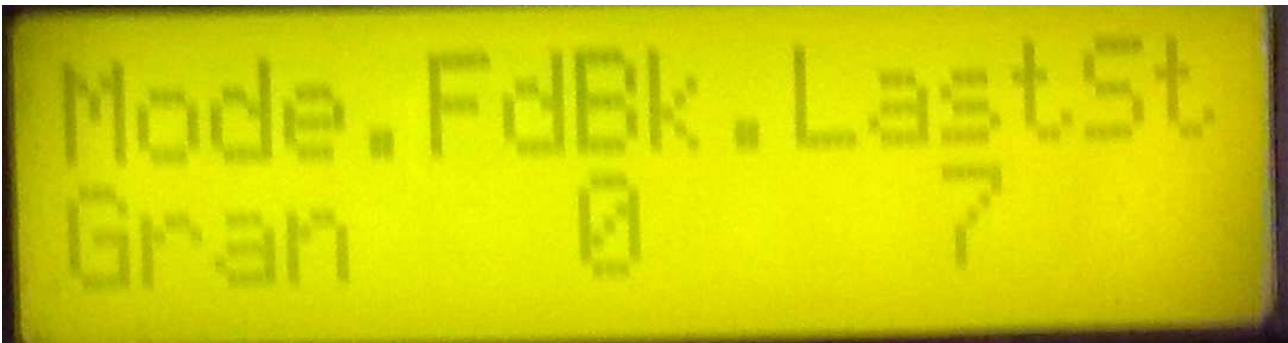




**Edit1 – Time:** In granulator mode: This adjusts the total granulator time. Max time are around 6 seconds. This means, that at max setting, the granulator sequence will start over every 6 seconds. In stereo delay mode: Adjusts the delay time. Max delay time are around 3 seconds.

**Edit2 – Fine:** Fine adjustment of time.

**Encoder - # of fragments:** Number of fragments, that the input signal are cutted up in. One granulator step, are time divided by the number of fragments. If this is set to 1, no rearranging is possible, but this mode can be used, if you just want to freeze the input signal with the freeze knob, or the auto freeze function, explained later in this section.

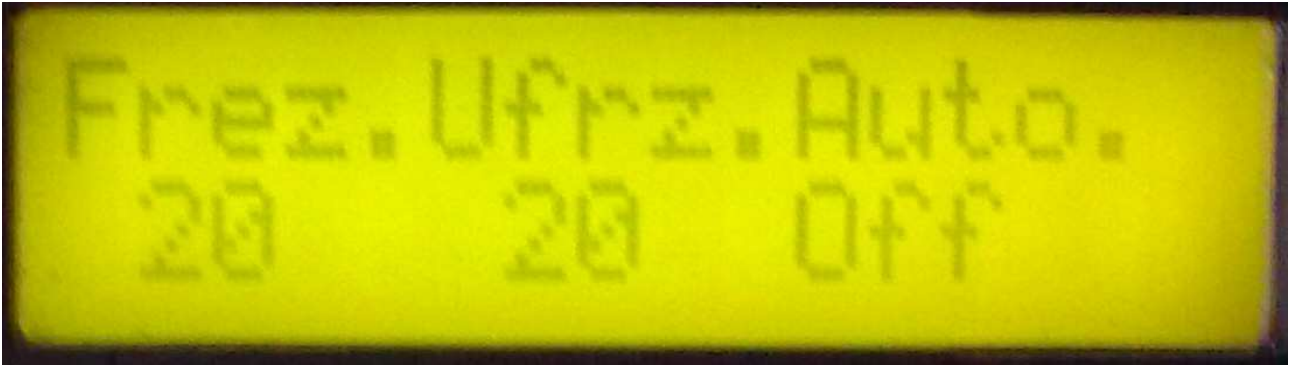


**Edit1 – Mode:** Selects what mode you want to use the Granulator in. Choices are:

- Gran – Normal granulator mode.
- Sgrn – Short granulator. Rearrange in milliseconds.
- Dly – Stereo delay.
- Sdly – Short delay. Great for reverb effects

**Edit2 – Feedback:** Feeds the output of the granulator back to the input. Especially useful for repeating delay, but also for weird granulator stuff.

**Encoder – Last step:** Granulator last step.

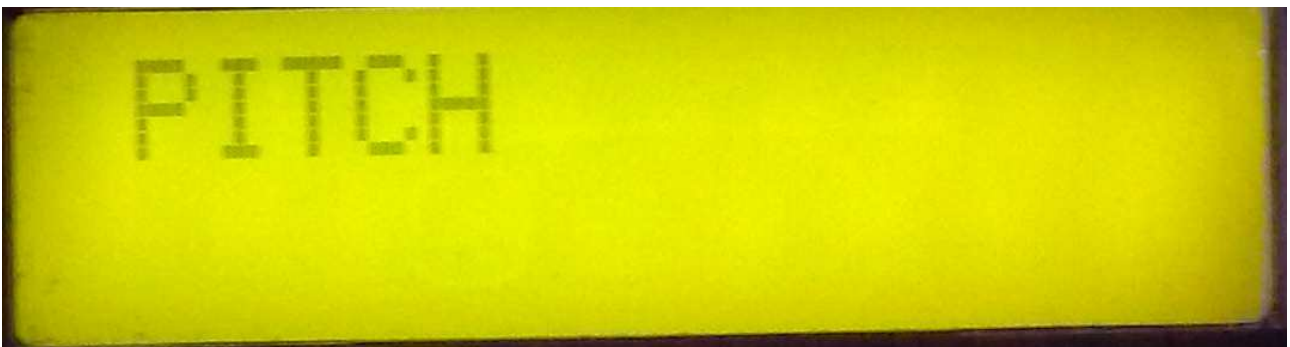


**AutoFreeze function.** When on, this freezes and unfreezes the input signal in adjustable time intervals. Very useful for very strange effects. The LED in the Inc button shows when it freeze, by lighting up.

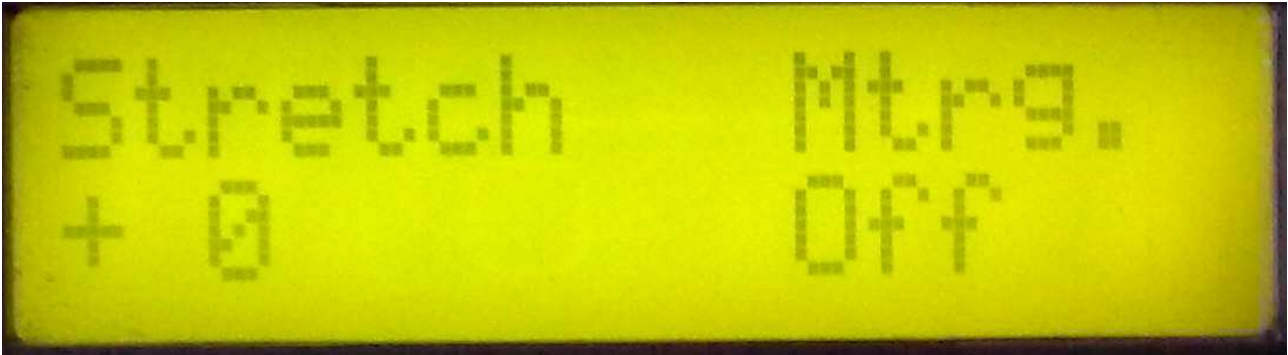
**Edit1 – Freeze time:** adjusts for how long it shall freeze the input signal.

**Edit2 – Unfreeze time:** adjusts for how long it shall release the freeze, after it has been freezing.

**Encoder:** Turns auto freeze on and off.



On this page, the 16 step knobs are used to adjust the pitchshifting for each granulator step. Only active in granulator mode.



**Edit1 – Realtime time stretch:** With this control, it is possible to time stretch the incoming audio signal, without affecting the pitch. Negative values slows the signal down, positive values speeds the signal up. Magic?

**Encoder – Stretch MIDI trigger on/off:** When this is on, the time stretching algorithm will reset every time it gets a trigger inside the range selected on the next page. If the MIDI triggers comes from the same source, that is treated by the stretch, it will give an illusion, that each sound in the sequence are stretched individually, instead of the whole sequence.



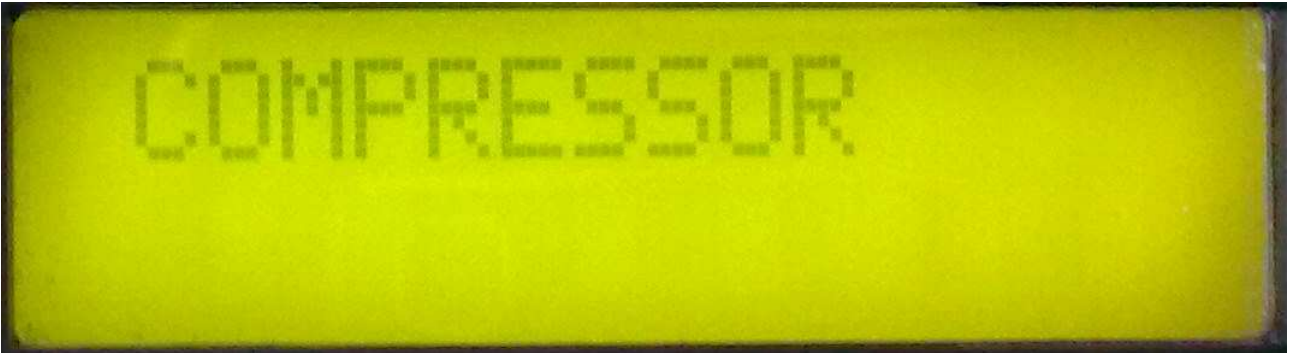
**Time stretch MIDI trigger note range and MIDI channel.**

**Edit1 – Note from:** The lowest note in the range.

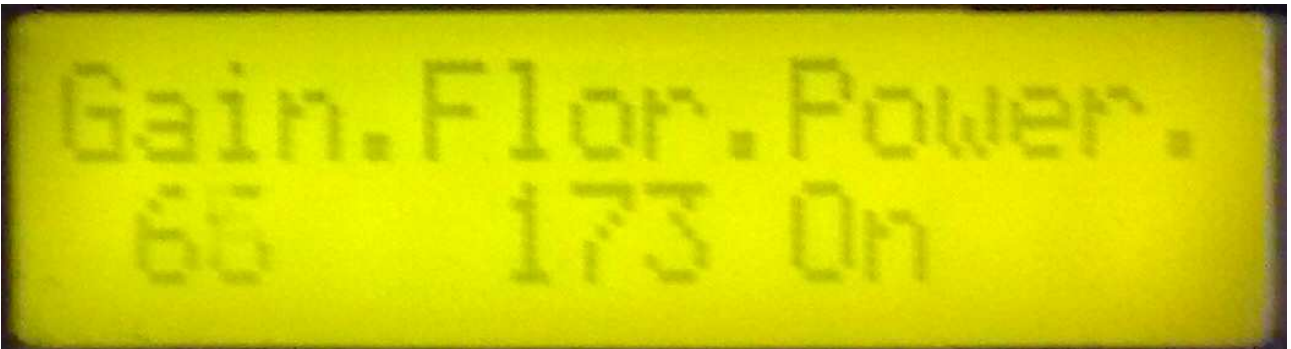
**Edit2 – Note to:** The highest note in the range.

**Encoder:** Trigger MIDI channel.

## The Compressor pages



The deFormer compressor are a great tool for giving sounds an extra punch, by making the attack sharper.



**Edit1 – Compressor gain:** Gains the input signal.

**Edit2 – Compressor floor:** Sets a minimum output level for the compressor output. At value 255 the signal is passed thru the compressor, with no compression.

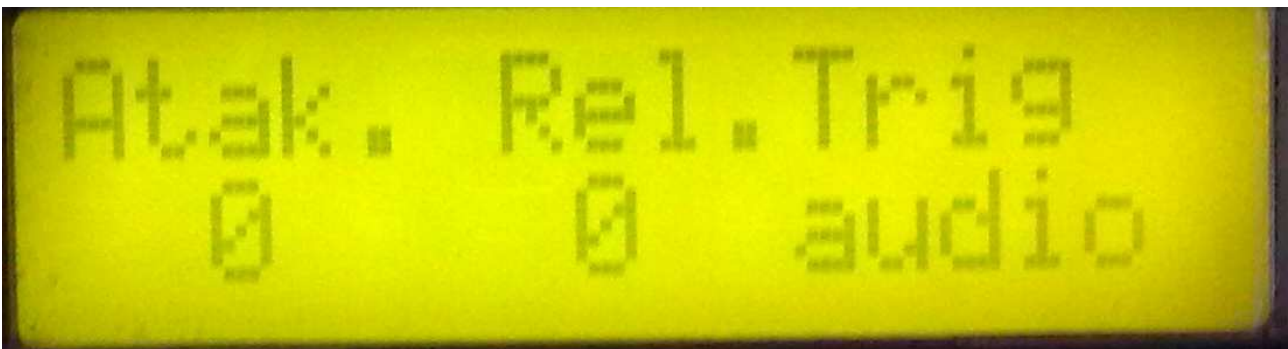
**Encoder:** Turns the compressor on and off.



**Edit1 – Compressor threshold:** Signal levels above threshold level, will trigger the compressor.

**Edit2 – Compressor gate time:** Adjusts the length of the compressor trigger gate. Prevents multi-triggering of signals with a high sustain level. If the compressor multi-triggers, turn this parameter up, until it stops.

**Encoder – Compressor output mixer channel:** Assigns the compressor to mixer output channel 1 or 2.



**Edit1 – Compressor attack time.**

**Edit2 – Compressor release time.**

**Encoder – Compressor trigger:** Choose if you want the compressor to be triggered by the incoming audio signal, or by MIDI note on's selected on the next page.





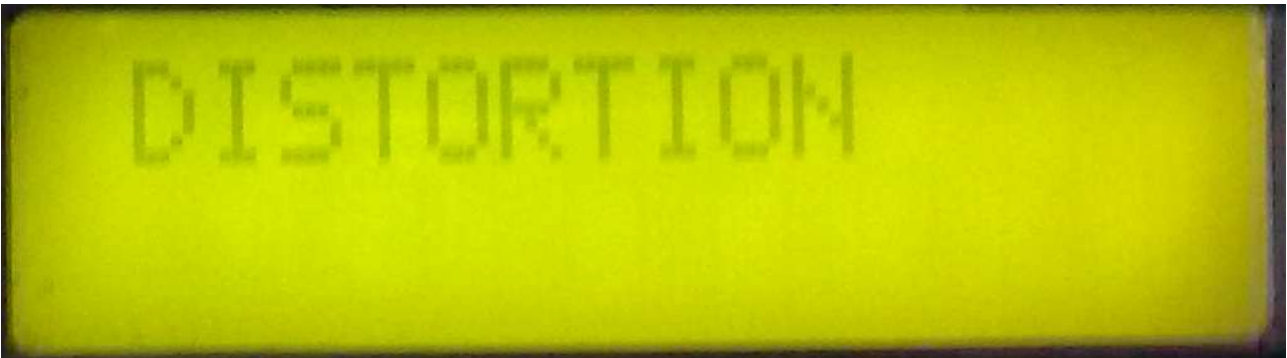
**Compressor MIDI trigger note range.**

**Edit1 – Note from:** The lowest note in the range.

**Edit2 – Note to:** The highest note in the range.

**Encoder:** Compressor trigger notes MIDI channel.

## The Distortion pages



**Edit 1 – Drive:** Adjusts the gain of the distortion effect.

**Edit 2 – Offset:** Signals below the offset level will not be distorted. Signals above the offset level will be distorted.

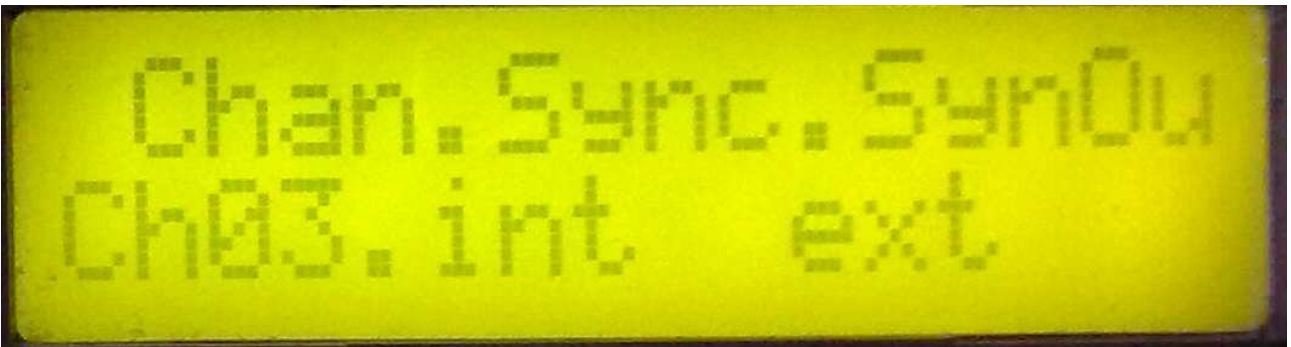
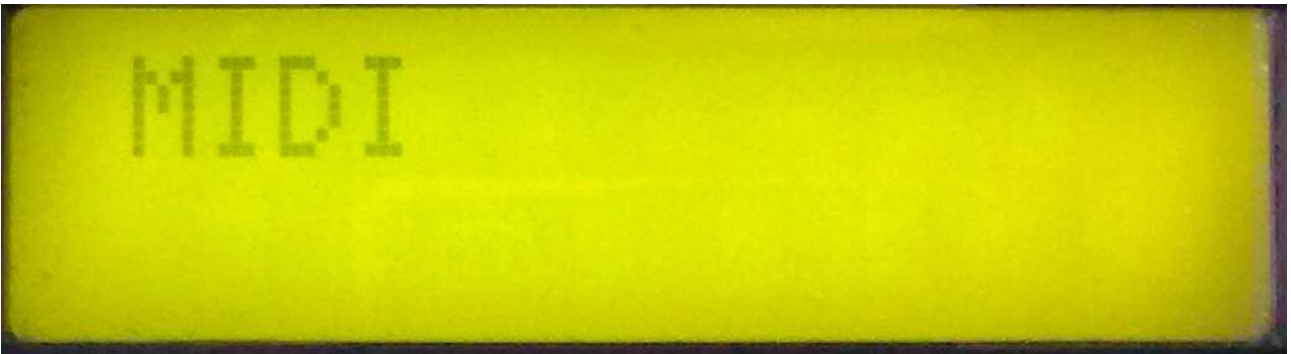
### **Encoder – Distortion mode:**

- GAIN:** Not really a distortion. Just gains the sound. It is possible to gain the sound so it clips.
- VALVE:** A digital model of a classic valve distortion.
- SINE:** Sine shape distortion. Strange!
- FUZZ:** A digital model of a classic fuzz distortion.
- XDIS:** INSANE!!! Destroys everything.



**Encoder – Distortion mixer channel:** Assigns the distortion effect to mixer output channel 1 or 2.

## The MIDI pages



**Edit 1 – MIDI ch:** The deFormer global midi channel. On the channel you select here, the deFormer will receive midi data for program change, and for the internal synth. It ts remembered after power off. Value 1-16.

**Edit 2 – Sync:** Adjusts wheteher the step-sequencer will use its internal clock source or an external midi clock source. Values: int(ernal), ext(ernal). . It ts remembered after power off.

**Encoder – Sync out:** Select if you want deFormer to re-transmit any MIDI sync clock present on it's MIDI input (ext), or if you want it to transmit it's internal sequencer clock as MIDI clocks (int). Values: int(ernal), ext(ernal). . It ts remembered after power off.

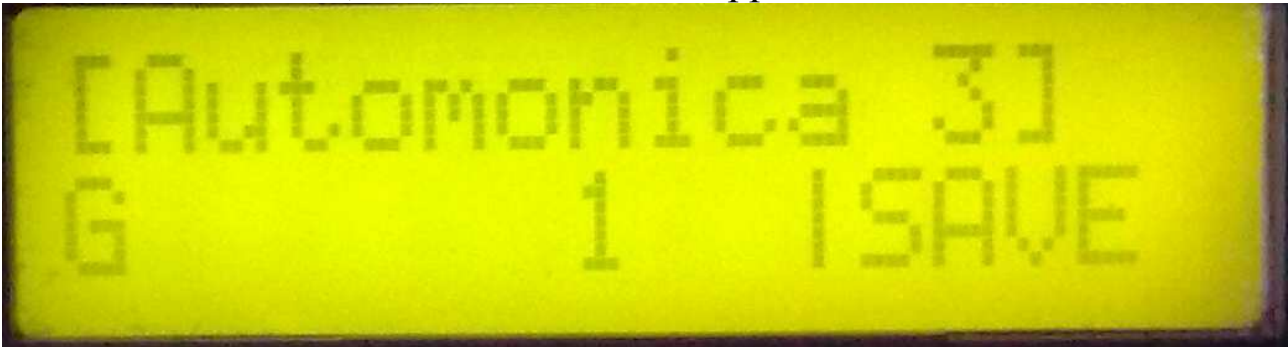
## How to Save a preset

Stores a complete preset, including sound, sequence and effect data from the current selected and edited preset.

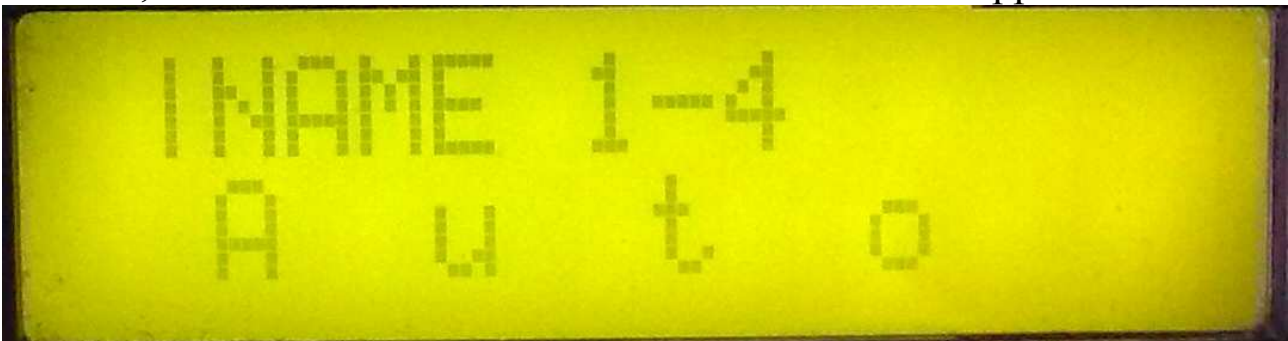
At any time, push the Enter/Exit/Save button. This screen will appear:



Push the Dec button, and this screen will appear:

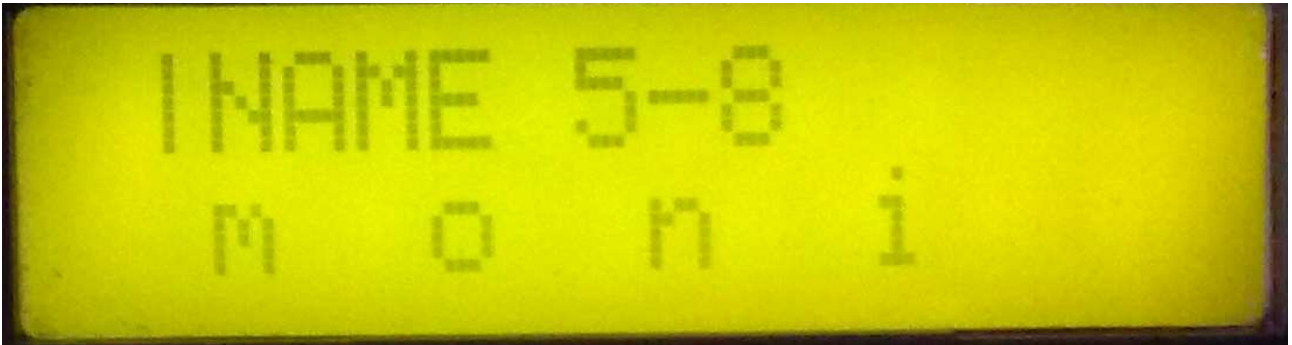


Use the Dec/Inc buttons or the 2 edit potentiometers to select the location, where you want to save your preset. When you have selected the right location, hit the Enter/Exit/Save button. This screen will appear:

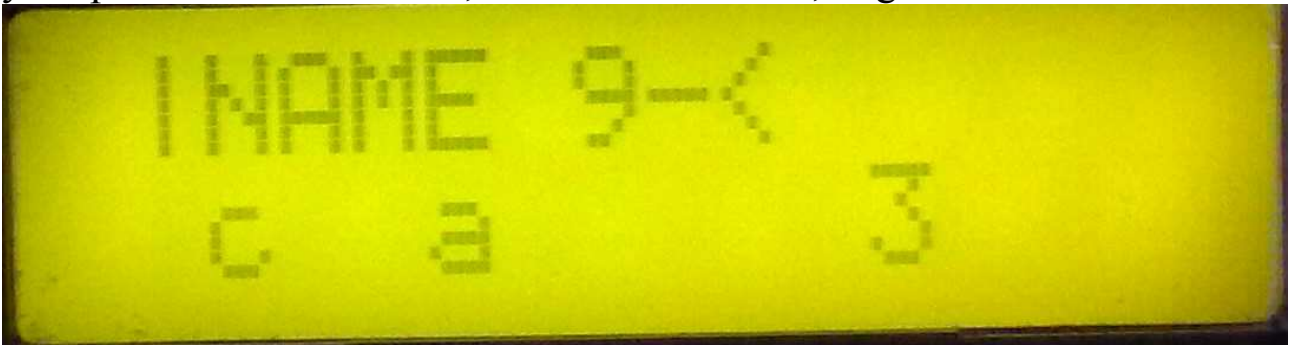




Use the first four of the 16 step knobs to select the first four letters in the name for your preset. When finished, hit Enter/Exit/Save, to go to this screen:



Use the first four of the 16 step knobs to select letters 5-8 in the name for your preset. When finished, hit Enter/Exit/Save, to go to this screen:



Use the first four of the 16 step knobs to select letters 9-12 in the name for your preset. When finished, hit Enter/Exit/Save. Your preset has now been saved on the selected location, and deFormer will return to the preset select page.

## **DeFormer MIDI-implementation**

**Note-on's and Note-off's** are received on the selected global midi ch by deFormers's sound engine, and by the respective MIDI trigger functions on the sequencer tracks, the midi note randomizer, the filterbanks random trigger, the time-stretch trigger and the compressor miditrigger.

Are transmitted from the sequencer tracks, when set to ext, and from the midi note randomizer.

Are re-transmitted from midi in to midi out, when no sequencer or note randomizer functions are active on the received channel.

**Pitch bend change** are received on the selected global midi ch by deFormer's oscillators, and are re-transmitted from the midi input to output.

**Program change** are received on the selected global midi ch.

**Controllers 1 to 3** are received on the selected global midi ch, and routed to the parameters, where these controllers are selected as a modulation source.

**Controller number 32** are used for bank change – value received: 0-3 – Bank 1-4.

**All controllers** are re-transmitted form midi in to midi out, and transmitted from the sequencer tracks, when they are set to ext.

**MIDI clocks** are received and transmitted according to the settings on the MIDI edit page.

**WEB: [www.gotharman.dk](http://www.gotharman.dk)**

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