Repro-1 SYNTHESIZER

OPERATION MANUAL

by Heckmann Audio

<u>1</u> INTRODUCTION

1-0 HISTORY

Repro-1 is a faithful component-level model of perhaps the most powerful-sounding monophonic keyboard ever built. When its 4-year production run started in the early 1980s, polyphonic synthesizers were almost within reach of the average musician. To be commercially viable, any new *monophonic* instrument had to be cheap but very capable. Fat drones, cutting leads, funky basses, quirky sci-fi sound effects – this synthesizer delivered on all counts.

The circuit design made good use of standard Curtis chips (3340 oscillator, 3320 filter and 3310 envelope) and the little onboard sequencer was more than just a welcome extra. Despite its molded plastic panel and the limitations of monophony, it sold surprisingly well and is generally recognized as an iconic piece of synthesizer history. Soaring prices guaranteed.

So here's our plug-in version, **Repro-1**: All the lovable quirks of this classic synth, but with a much more capable sequencer, lots of presets, several under-the-hood tweaks, more modulation options… plus a great collection of cute stomp-box effects.

Enjoy!

- Urs and the team

1-1 INSTALLATION

Go to the **<u>Repro-1</u>** web page, download the latest installer for Mac or Windows. Unzip the compressed file, open the Repro-1 folder and start the installer application.

The only demo restriction is a mild crackling at irregular intervals after about two minutes of use. The demo is otherwise fully functional. Those crackles disappear after you have purchased a license and entered the serial number. For more information, please refer to the *ReadMe* file included with the installer.

By default, Repro-1 uses the following directories on your hard disk:

Windows
Presets   …\VstPlugins\u-he\Repro-1.data\Presets\Repro-1\
Preferences   …\VstPlugins\u-he\Repro-1.data\Support\ (*.txt files)

Mac OSX | macOS
Presets   MacHD/Library/Audio/Presets/u-he/Repro-1/
(User)   ~/Library/Audio/Presets/u-he/Repro-1/
Preferences   ~/Library/Application Support/u-he/com.u-he.Repro-1... (*.* files)
Resources   MacHD/Library/Application Support/u-he/Repro-1/

To uninstall, delete the plugin files and Repro-1.data (PC) or Repro-1 folders (Mac).

1-2 RESOURCES

u-he online

For downloads, news and support, go to the <u>u-he website</u>
For heated debates about u-he products, go to the <u>u-he forum</u>
For friendship and informal news updates, go to our <u>facebook page</u>
For u-he presets (payware and free), go to <u>u-he preset library</u>
For video tutorials and more, go to our <u>youtube channel</u>

the u-he team

Urs Heckmann (boss code, vision)
Sascha Eversmeier (code, puns)
Jan Storm (framework, more code)
Sebastian Greger (GUI design, 3D stuff)
Rob Clifton-Harvey (interwebz & databases)
William Rodewald (student-life-support code)
Howard Scarr (presets, manuals, necessary grump)
Michael Pettit (videos, marketing, web development)
Viktor Weimer (support, presets, the voice)
Thomas Binek (QA / bug-hunting, presets)
Henna Gramentz (worldly supervision)
Oddvar Manlig (everything else)

…with thanks to Brian Rzycki for maintaining <u>PatchLib</u>

TO NAVIGATE, USE THE HYPERLINKS AT THE BOTTOM OF EACH PAGE

1-3 KNOBS AND SWITCHES

The knobs respond to vertical click & drag and to mouse wheel movement (no clicks required). You can **fine tune** most parameters, most often with a resolution of 0.01, by holding down SHIFT before clicking on the knob. How switches react depends on a global preference called *Switch Behaviour* – see the Configuration chapter.

The name and value of the control currently being edited appears in the **data display**, which you will find in the middle of the control bar (see below).

Parameter Locking: To prevent a value from changing when you switch presets, use the *Lock* function – right-click on any control and select the last entry in the menu.

1-4 THE CONTROL BAR

u-he Badge: Clicking on **u-he** opens a popup menu containing links to this user guide, to our homepage, to our support forum, and to various social networks.

SYNTH, TWEAKS, SEQUENCER, PRESETS: These buttons switch between Repro-1's four basic views. To ensure that each new instance will open in the current view, right-click anywhere within the row of buttons and select *set current as default*.

MIDI activity: An indicator which flashes whenever MIDI data is being received.

Data Display: Performs several duties: Normally, it shows the name of the preset. Clicking on the triangles steps through all presets, while clicking in the middle of the display lets you select any preset from the current folder. While editing, the name and value is displayed, and the preset name reappears after a few seconds.

UNDO / REDO: To the right of the data display is a pair of buttons you can use to fix any 'mistakes'. Although the number of steps in the undo-buffer is limited, you can even undo a change of preset – so switching presets doesn't mean losing your work!

SAVE button: Stores the preset in the current folder (see PRESETS below).

HQ button: The global *High Quality* option shouldn't be necessary for anything but extreme FM sounds. Circuit-level modeling requires lots of CPU anyway, and doubling the CPU usage should be carefully considered – let your ear be the judge!

zZz button: Activating the global *Sleepy* option reduces CPU consumption whenever Repro-1 isn't playing any notes. Note that *Sleepy* can cause artifacts not present in the original hardware – again, let your ear be the judge.

MASTER TUNE: Tunes the preset within a range of +/– 12 semitones. For fine tuning, hold down a SHIFT key on your computer keyboard while adjusting.

OUTPUT: Final volume control, after the amplifier and all effects.

Configuration button: Click on the cogwheel icon to access the <u>configuration</u> pages, which contain MIDI control options and various global settings.

1-5 PRESETS

In the control bar, click on the PRESETS button…
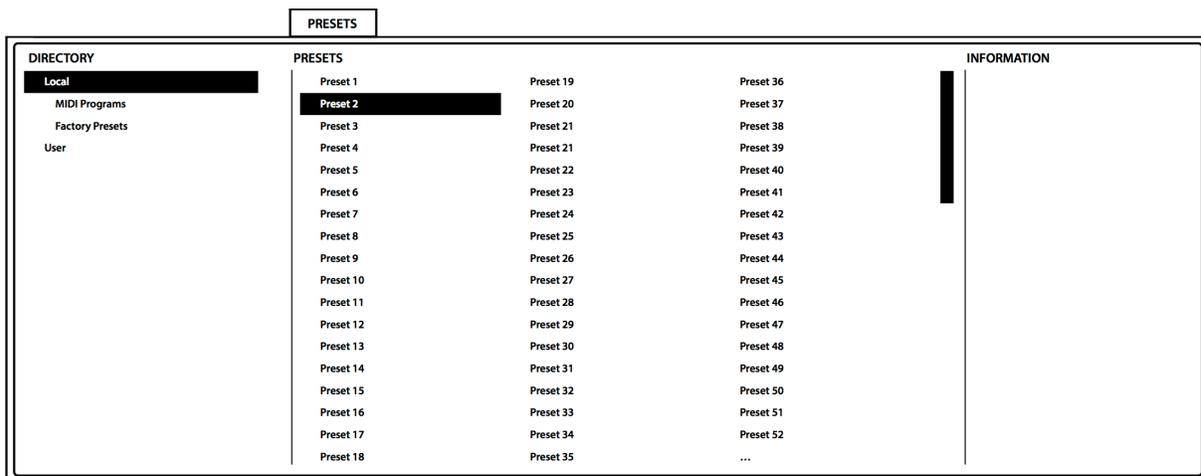
Categorized folders appear on the left, presets within those folders appear in the middle, and any information about the current preset appears on the right. If you can't see any folders, **Local** is probably closed – click on it to open the lists. Immediately after loading a preset, you can step through the others using your computer's cursor keys.

To start programming a new sound from scratch, open the '00 User' folder and load the -- INIT -- preset. Please remember to give it a different name while saving. If you happen to overwrite -- INIT -- by mistake, there's another in '1981 historic'…

1981 Historic: Named after the year the original synth appeared, this folder contains 20 presets meticulously copied from patch sheets in the printed manual.

MIDI Programs

As well as the categorized factory presets, 'Local' also contains a special folder called 'MIDI Programs', which is initially empty. When the first instance of Repro-1 starts, all presets in that folder will be loaded into memory. These presets (up to 128) are selected directly via MIDI *Program Change* messages. As they are accessed in alphabetical order, it's probably best to put a number at the beginning of the name e.g. '000 rest-of-name' to '127 rest-of-name'. But that's not all…

'MIDI Programs' can contain up to 127 sub-folders, each holding up to 128 presets. The sub-folders are switched via MIDI *Bank Select* messages (CC#0). Send *Bank Select* first, then *Program Change*. 'MIDI Programs' is bank 0, sub-folders are addressed in alphabetical order, starting with bank 1.

Important: 'MIDI Program' presets cannot be added, removed or renamed on the fly – any changes to that directory will only take affect after you have restarted the host.

Save your creations

Of course you will want to save your sounds. The best place is '00 User', which was created for this purpose. Please make sure that the folder where you want to store your preset is already selected (if not, please select it first). Then click on the **SAVE** button in the Control Bar, give your preset a suitable name and enter any other details you would like to appear in the INFORMATION area of the browser.

On loading, if Repro-1 sees a preset called simply *default* in the root folder ('Local'), it replaces the regular demo sound. Try this: Go into '00 User', load --INIT--, open the Local folder and save it under the name 'default', then restart Repro-1. To revert to the regular demo sound, simply delete 'default.h2p' and restart Repro-1.

Right-clicking the [SAVE] button opens a menu with a choice of preset formats. The *native* option is the basic plug-in format of your platform (.fxp for VST and AAX, .aupreset for Audio Units). The *h2p* option is our standard cross-platform format (editable text), while *h2p extended* includes extra information. Lastly, *nksf* enables Native Instruments' **NKS** format – see the final chapter.

Note: the following switches are global per instance i.e. their states aren't saved with each preset: **HQ**, **zZz**, **BYPASS FX**, arpeggio **LATCH**, sequencer **ON KEY / ALWAYS**.

The context menu

Refresh: Whenever the list needs refreshing (always necessary after folders or presets have been added or moved using Explorer / Finder), right-click in the folder list and select the first entry from the context menu. Note: Clicking on any folder name will also refresh the list.

Create new folder: Creates a new folder within the currently selected one.

Reveal in Finder / Open in Explorer: Repro-1's browser is mainly for loading presets and is otherwise fairly limited. This function opens a system window for the current folder so you can use regular OS file functions instead. Always *Refresh* after changing the contents of preset folders!

On open expand to: The submenu contains options which govern how deeply the browser will open subdirectories whenever the GUI is opened (or the Refresh function is used). The branch containing the current preset will always be visible.

Favourite or *Junk*? Right-clicking on a preset opens a context menu in which you can set the status to 'Favourite' or 'Junk'. Junked files disappear immediately, but can be made visible again by selecting 'show Junk' from the same context menu.

Multiple selection, drag & drop

Files can be moved between folders via drag & drop. Use the SHIFT etc. keys on your computer keyboard to highlight the files you want to manipulate, click and drag them from the files area and drop them onto the target folder. To deselect, either click on any unselected preset or choose *deselect* from the file context menu. The context menu also contains a *select all* function.

2 SYNTH

2-0 OVERVIEW

This section explains the various modules available on Repro-1's SYNTH panel. If you don't see this panel, click on the SYNTH button at the top left of Repro-1's window.
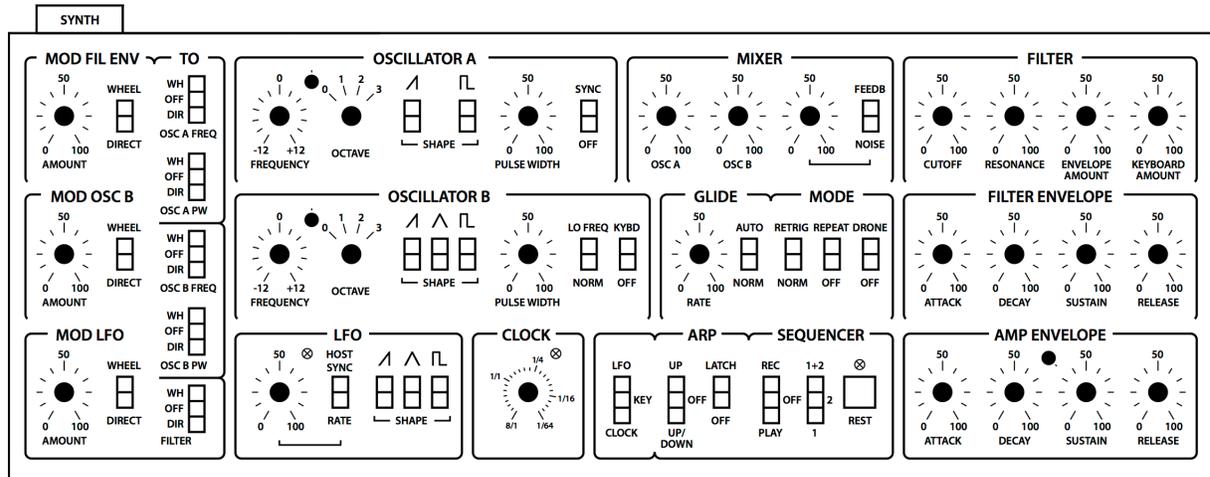
The PRESETS browser is described in the previous chapter, while the TWEAKS page and SEQUENCER functions are described in separate chapters later in this guide.

Due to its relatively simple architecture, you *can* operate Repro-1 without having to think about its structure. However, if you want to make the most of the available options, it's best to understand how signals are routed between those modules…

2-1 VOICE SIGNAL FLOW

On the next page is a flow diagram showing the audio signal paths as well as some keyboard control paths – you might like to print it out for future reference. A similar diagram of modulation signal paths appears later in this chapter.
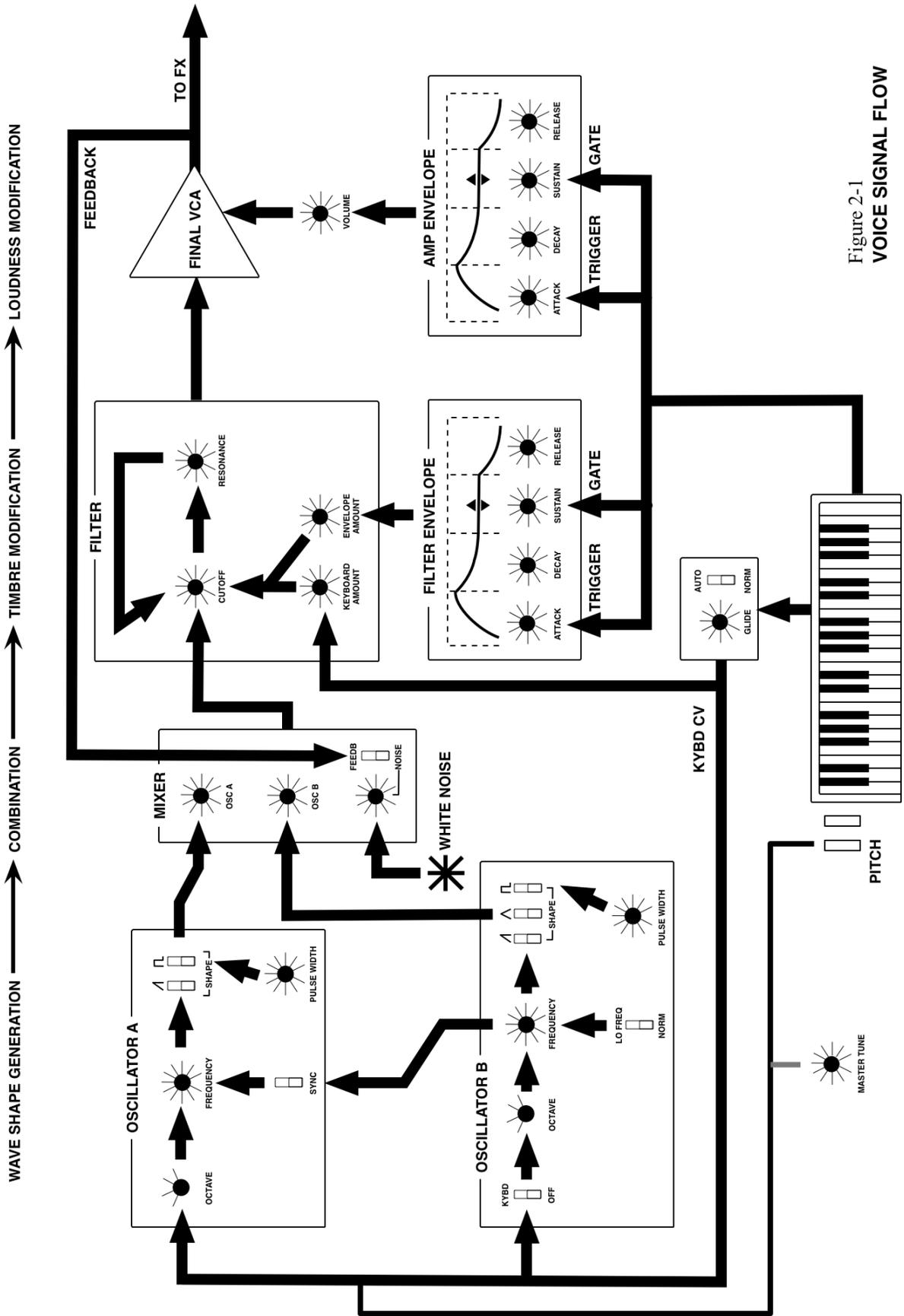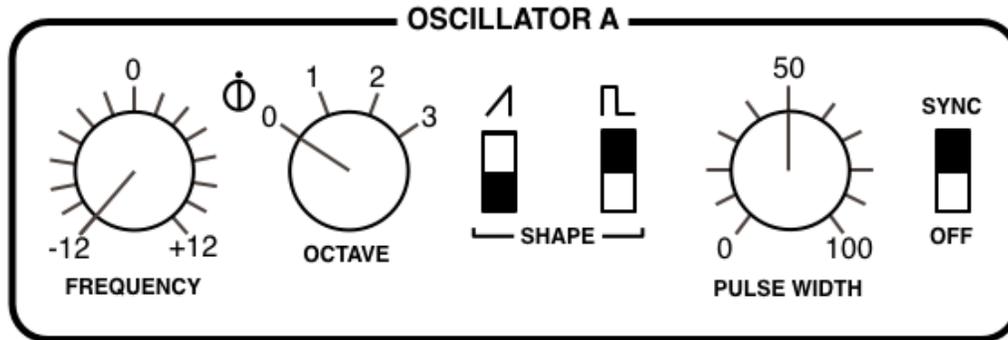
Figure 2-1
VOICE SIGNAL FLOW

WAVE SHAPE GENERATION → COMBINATION → TIMBRE MODIFICATION → LOUDNESS MODIFICATION

2-2 OSCILLATOR A

FREQUENCY knob: Adjusts pitch within a two-octave range (+/− 12 semitones).

FINE TUNING trimmer between FREQUENCY and OCTAVE: Adjusts pitch within a 40 cent range (+/− 20 cents). Its main purpose is to adjust the rate of beating between the two oscillators when they are tuned almost in unison.

OCTAVE rotary switch: Transposes oscillator pitch over a four-octave range.

SAWTOOTH SHAPE switch: The UP position activates the standard brassy waveform containing all harmonics (odd as well as even).

PULSE SHAPE switch: The 'up' position enables a waveform with a harmonic content that depends on the PULSE WIDTH setting but sounds generally more hollow than the sawtooth. If neither SHAPE is switched on, OSCILLATOR A is silent. If both SHAPEs are active, the mixture normally has a lower volume than each single shape due to the phase relationship between the saw and pulse. To remedy this effect, set the *P5* option (see Oscillator Tweaks on page 31).

PULSE WIDTH knob: Adjusts the harmonic content of the pulse wave by setting its "duty cycle". The range is from 0% to 100%. Double-click on the knob for a 50% pulse (a clean square wave which only contains odd-integer harmonics).

Notes: At extreme values, the signal gets so thin that it becomes inaudible (DC, direct current). The PULSE WIDTH knob has no effect on the sawtooth.

SYNC switch: Hard synchronization forces the waveform of OSC A to reset whenever OSC B hits zero. The frequency of OSC A generally needs to be higher than OSC B for this to work properly. Experiment: Intermediate FREQUENCY values can produce unusual timbres at the next lower harmonic of OSC B.

2-3 OSCILLATOR B
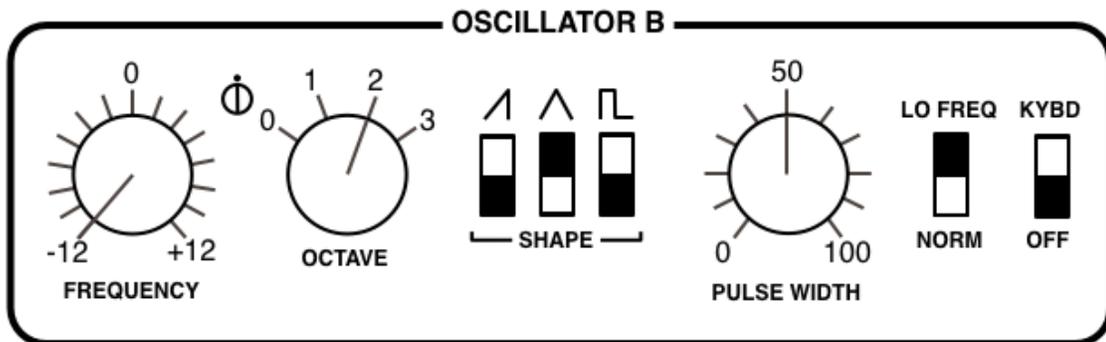
OSC B is basically the same as OSC A – without SYNC but with the following extras:

TRIANGLE SHAPE switch: This waveform is bipolar, so it doesn't add any DC to the modulation when used as an LFO. As an audio signal, the triangle has very little bite, but can be used to boost the fundamental frequency. The triangle is also good for driving the *wavefolder* effect (see EFFECTS chapter).

NORM | LO FREQ switch: Extends the range of oscillator B down to sub-audio frequencies suitable for use as an LFO. Note that the FREQUENCY range is 4 times greater than in NORM mode.

KYBD | OFF switch: Switching this to OFF disables keyboard follow, resulting in a constant pitch independent of the played note.

2-4 GLIDE & MODE
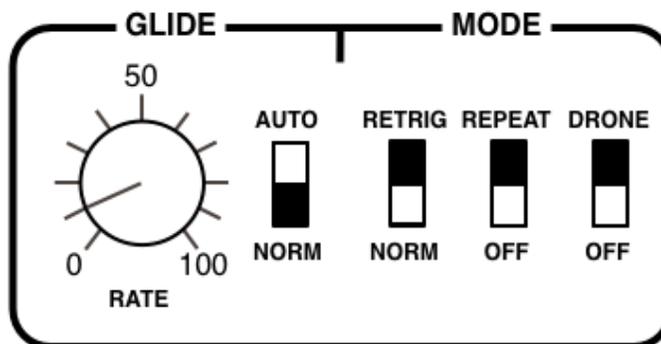
Also known as 'portamento', **glide** is the slurring of pitch between consecutive notes.

RATE knob: How long it takes to move from one note to the next. At zero, pitch changes are instantaneous, while they are very slow at values above 50.

AUTO switch: In the NORM position, all notes will glide. In the AUTO position, this only happens when a new key is hit while the previous one is still being held (**legato**).

RETRIG switch: In the NORM position, legato playing does not retrigger envelopes. In the RETRIG position, the envelopes are retriggered with each new note.

REPEAT switch: Retriggers the envelopes at the rate of either the LFO or the Clock, depending on the state of the LFO|KEY|CLOCK switch. Like in the hardware and in DRONE mode, notes repeat without you having to hold down a key...

DRONE switch: Keeps the AMP ENVELOPE sustaining indefinitely.

2-5 MIXER
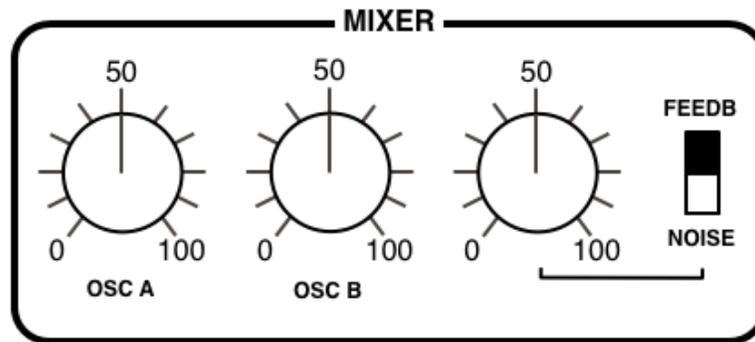
OSC A and **OSC B** knobs: The output levels of each oscillator.

FEEDB | NOISE knob and switch: With the switch in the NOISE position, the knob sets the output level of the noise generator (an unpitched audio source useful for wind and percussion effects etc.). With the switch in the FEEDB (feedback) position, the knob governs the amount of signal fed *from behind the amplifier* back into the MIXER (this can be used for e.g. bass boost).

2-6 FILTER
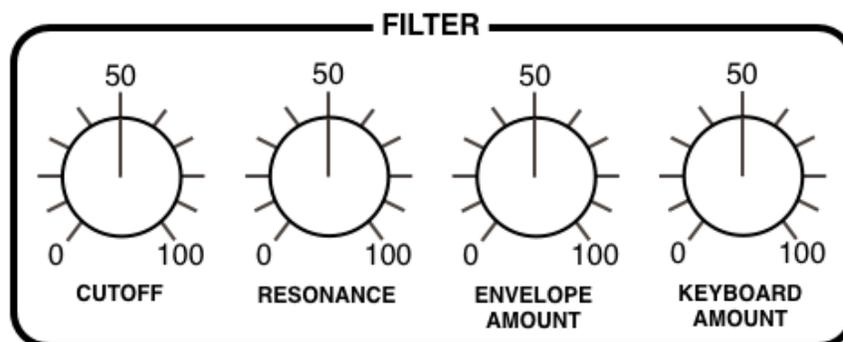
CUTOFF knob: Sets the cutoff frequency for the 24 db/octave (4-pole) lowpass filter, which works a bit like a tone control. The "Cutoff" point is the frequency below which all components of a signal are allowed to pass, while most of the higher frequency components are suppressed.

RESONANCE knob: Determines the amount of feedback within the filter circuit. The higher the resonance, the more the cutoff point will be accentuated. Somewhere above 60 the filter starts to self-oscillate – it becomes a sine-wave oscillator with pitch determined by the cutoff. Note that adding Resonance tends to lower the volume, in which case you should compensate by e.g. turning up the main OUTPUT.

ENVELOPE AMOUNT knob: Adjusts the amount of cutoff modulation from the filter envelope (see below).
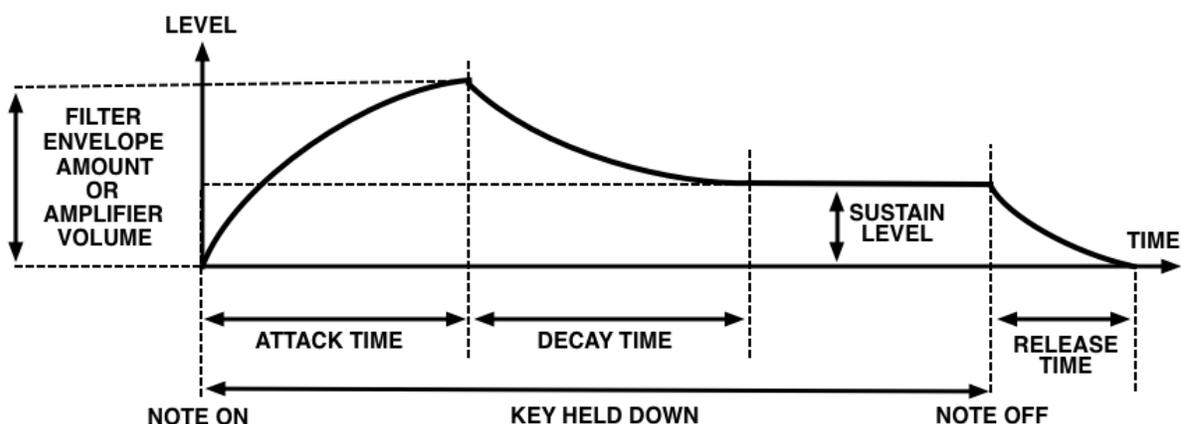
KEYBOARD AMOUNT knob: The amount of cutoff modulation from the keyboard – the higher the note, the higher the cutoff. Set to precisely 75.00, cutoff follows notes almost perfectly.

2-7 FILTER ENVELOPE

The filter envelope generator applies a contour to the cutoff frequency:

The envelopes are started whenever a note is played, and as long as the key is held down, the envelope proceeds through the ATTACK and DECAY stages. It then remains at the SUSTAIN level until the key is released, after which it drops to zero at a rate set by the RELEASE knob.

Note: The RELEASE stage is initiated as soon as all keys are released. If this happens during the ATTACK or DECAY, there is no SUSTAIN stage.
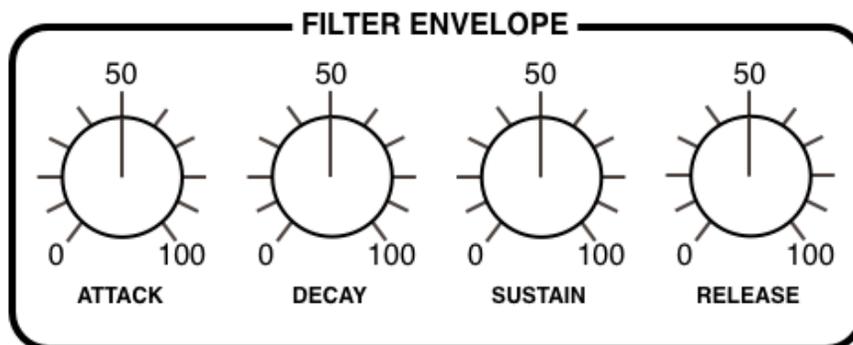
ATTACK knob: Varies the time for the envelope to rise from zero to maximum, within a range of 2 milliseconds to more than 6 seconds.

DECAY knob: Varies the time for the envelope to fall from maximum to the SUSTAIN level, also within a range of 2 milliseconds to more than 6 seconds.

SUSTAIN knob: The "hold" level, from zero to maximum. An interesting detail: while being adjusted, SUSTAIN always *decays* to the new level – the longer the DECAY, the longer it takes to reach the new SUSTAIN setting.

RELEASE knob: The time it takes for the envelope to fall from the current level (usually SUSTAIN) down to zero after the key is released. The range is 2 milliseconds to more than 6 seconds.

2-8 AMP ENVELOPE
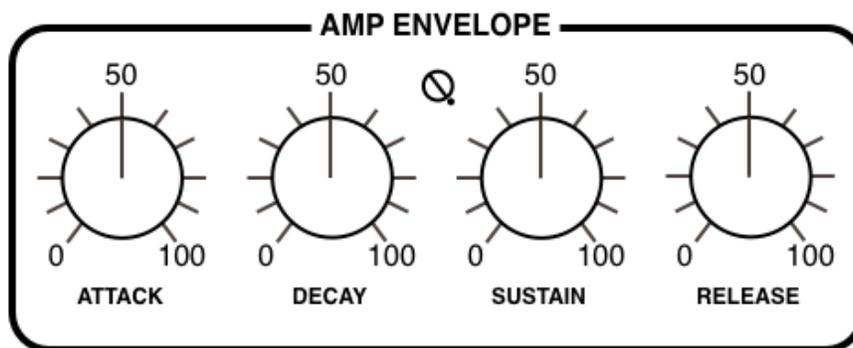
The AMP ENVELOPE controls shape the envelope applied to volume, pre-effects.

Volume Curve trimmer: In the original hardware, the VOLUME knob actually controls the amount of amp envelope modulating the final VCA. It also affects the **curvature** of the envelope – not by design, but as a side-effect of how it works.

As Repro-1's equivalent **OUTPUT** knob comes after all effects, the only feasible way to implement this quirk is as an independent control (the unlabelled "trimmer" between DECAY and SUSTAIN).

Here is how the attack and decay stages appear when *Volume Curve* is set to zero and 100. Note the punchy *s-curve* and shorter decay at minimum *Volume Curve*:

with trimmer set to minimum   *with trimmer set to maximum*
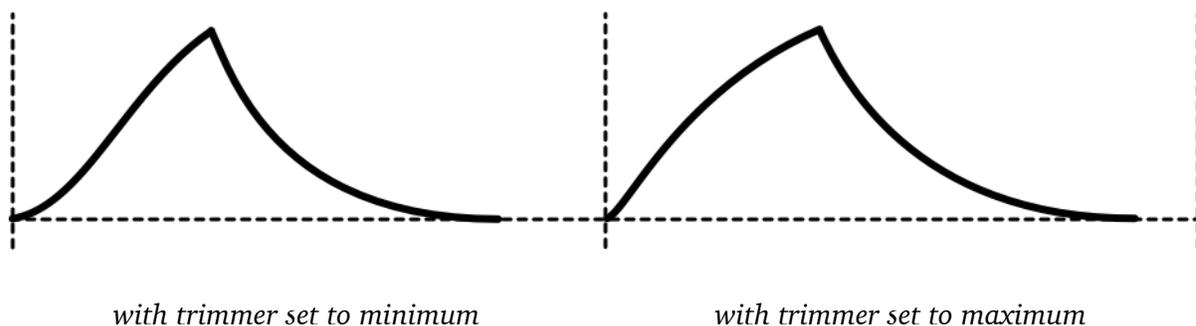
2-9 LFO

Two of the modulation sources – the filter envelope generator and oscillator B – are described above. The third source is the Low Frequency Oscillator (LFO):
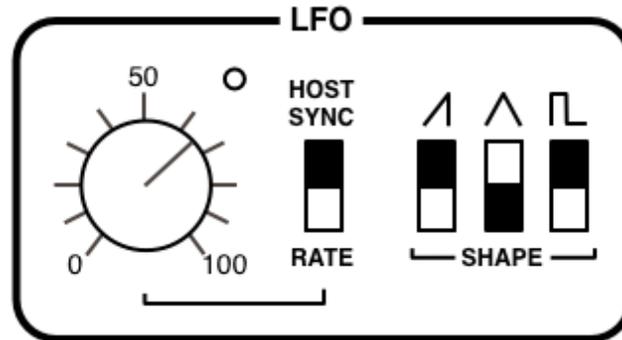
CLOCK | RATE switch: When set to CLOCK, the LFO follows the Clock setting (see <u>Clock / Sequencer</u> on page 21). The RATE option here allows LFO speed to be freely adjustable via the RATE knob…

RATE knob: Adjusts LFO speed within a range of about 0.1Hz to 30Hz.

SHAPE switches: The same options as in OSC B except that the LFO's pulse width is fixed at 50%. Remember that you can add the shapes here e.g. SAW + SQUARE.

2-10 MODULATION SIGNAL FLOW

Repro-1 offers three modulation sources which can be mixed and routed through two different paths to five modulation targets:
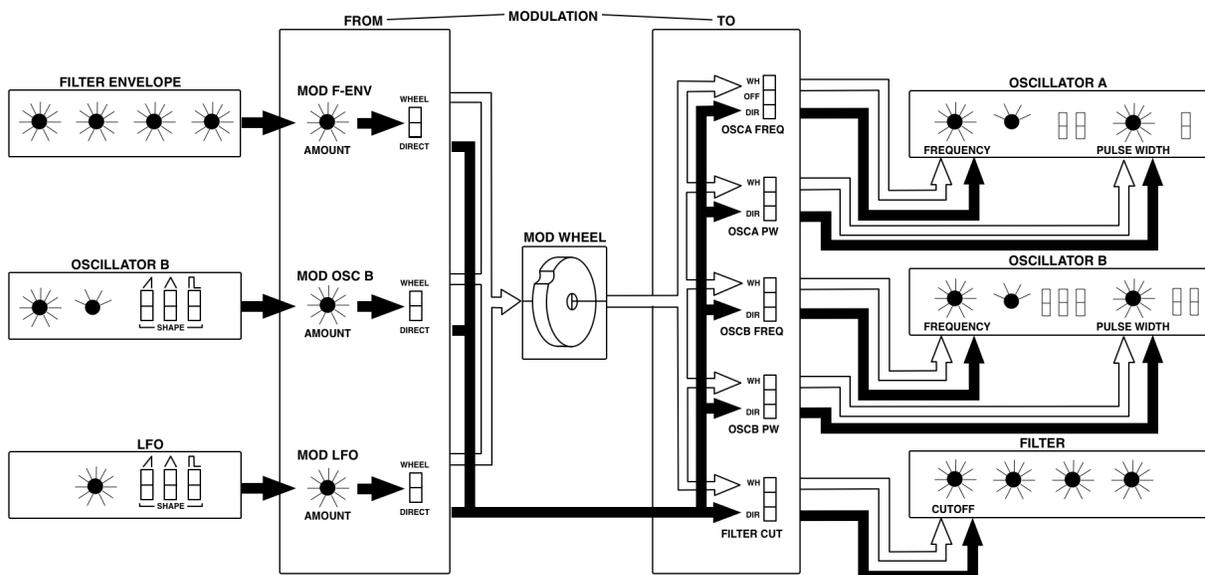
2-11 MODULATION SECTION

This panel is the one most likely to confuse beginners. After a few hours practice, however, it should become second nature – especially if you repeat this mantra!

"3 sources via 2 paths to 5 destinations"
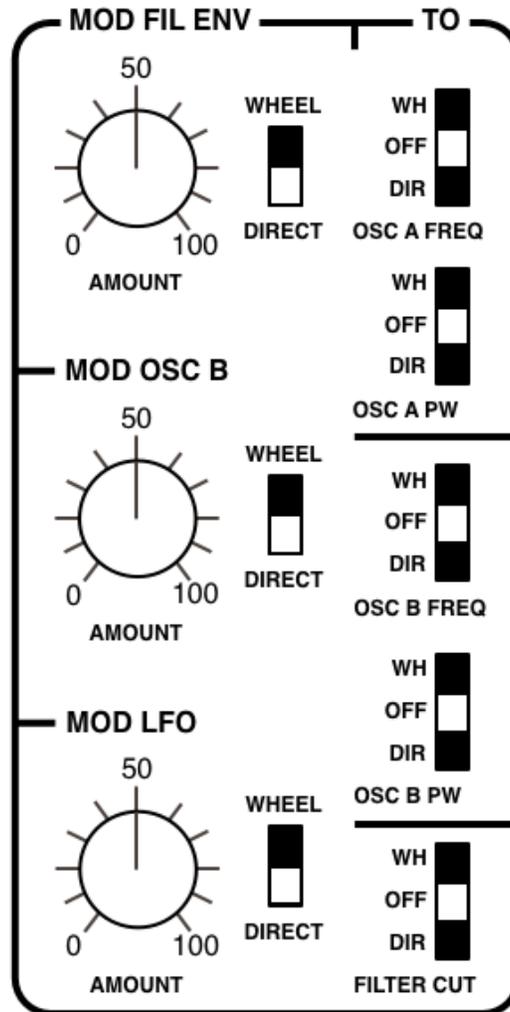
MOD FIL ENV, MOD OSC B and MOD LFO knobs: The amount of modulation mixed into the WHEEL or DIRECT paths. The depth of modulation routed into the WHEEL path is controlled by the modulation wheel (MIDI CC#01).

WHEEL | DIRECT switches: These route each of the 3 sources into one of two busses: the so-called WHEEL or DIRECT paths.

OSC A FREQ, OSC A PW, OSC B FREQ, OSC B PW, and **FILTER** switches: The vertical row of switches select either the WHEEL or DIRECT path for each destination.

Note: In the original hardware the signal at each PW input gets inverted – when the modulating signal goes up, the pulse width goes down. We decided to keep this quirk, so if you want to compensate for deep modulation by adjusting PULSE WIDTH, you need to compensate in what seems to be the wrong direction!

Modulation Section – Practical Examples

LFO vibrato via modulation wheel

Load the -INIT- preset and turn OSC B down to minimum in the MIXER section. Turn MOD LFO amount in the modulation section up to about 20% and switch its output to the WHEEL bus. In the TO column, select WH (wheel) as modulation input for OSC A FREQ (the uppermost switch). In the LFO panel, adjust the RATE knob to about 75.

We now have vibrato via mod wheel – try it. Lets add something else…

Sync sweep

Switch oscillator A SYNC on. Push the mod wheel – vibrato has become oddly shallow because oscillator A is "trying" to adopt the same pitch as oscillator B. In the TO column, select WH (wheel) as input for OSC B FREQ (the central switch). Vibrato is now back to normal.

Turn MOD FIL ENV amount up to maximum. The MOD FILE ENV output is set to the DIRECT bus, which is what we want here. Now switch OSC A FREQ source to DIR (direct). Turn the filter envelope SUSTAIN level down to minimum and increase the DECAY until the sweep effect sounds good.

LFO pulse width modulation (PWM)

Click on the data display and reload -INIT-. In the MIXER section, turn OSC B down to minimum. In oscillator A, switch the sawtooth off and the pulse on. Turn MOD LFO amount up to maximum. Its output is already set to the DIRECT bus – in the TO column, select DIR as modulation input for OSC A PW (the second switch from the top)…

Filter-FM

Turn MOD OSC B up to maximum and route it to WHEEL. In the TO column, select WH as modulation input for FILTER (the bottom switch). In the FILTER section, turn CUTOFF down to about 50. Push your modulation wheel and experiment with all the controls in oscillator B.

2-12 CLOCK

So that the LFO, arpeggiator and sequencer can be synchronized, we need a 'clock'...

This little panel contains a single rotary switch which sets the clock speed relative to host tempo, plus an indicator. All values are expressed as 4/4 bar divisions from 8/1 (slowest) to 1/64 (fastest).

The *trip* options are **triplets** (3 in the space of 2) and the *dot* options are **dotted** (2 in the space of 3 i.e. 50% longer than normal):

The order of values may appear strange at first (e.g. *1/4* then *1/8 dot* then *1/4 trip*), but you can rest assured that they have been sorted according to length.

2-13 ARP / SEQUENCER (basic access)

An arpeggiator plays back all held notes, one after the other.

LFO | KEY | CLOCK switch: This switch selects which signal will be used to drive the arpeggiator, sequencer and <u>REPEAT</u> function. In the CLOCK position they are all synchronized to host tempo via the CLOCK parameter (see the previous page), while in the LFO position they are synchronized to the LFO. With the KEY option, the sequence is played back one note per key-press (see **Design decisions** below).

UP | OFF | UP/DOWN switch: Activates the arpeggiator, either upwards only or upwards followed by downwards.

LATCH switch: The LATCH function in the original hardware (mis)used the sequencer memory. Repro-1 has a dedicated LATCH switch instead – try this:

While you are playing an arpeggio, slide the LATCH switch up. Take your hands off the keys and try adding some more notes. It will soon become apparent that these notes are temporary – they disappear as soon as you release them, while the latched notes continue.

Note: The **SEQUENCER** part of this panel contains just enough elements to let you record and play back sequences without switching pages. For the complete story, please read the next chapter.

Design decisions

In the original hardware, the arpeggiator/ sequencer rate is permanently tied to the LFO, with the option of using an external trigger signal to advance the arp/sequencer instead. As we don't expect users to feed an external trigger into Repro-1 just for the sake of authenticity, we decided to add a host-synced CLOCK and use MIDI *NoteOn* messages for the 'step through' option.

Interesting quirk: The arpeggiator will not repeatedly trigger a single held note – you have to play at least two notes for arpeggiation to start!

<u>3</u> SEQUENCER

3-0 INTRODUCTION

The sequencer in the original hardware may have been a minor stroke of genius, but these days we can expect something a bit more comfortable: Repro-1's sequencer lets you *step-record* two patterns of up to 32 notes each (they are saved with the preset):
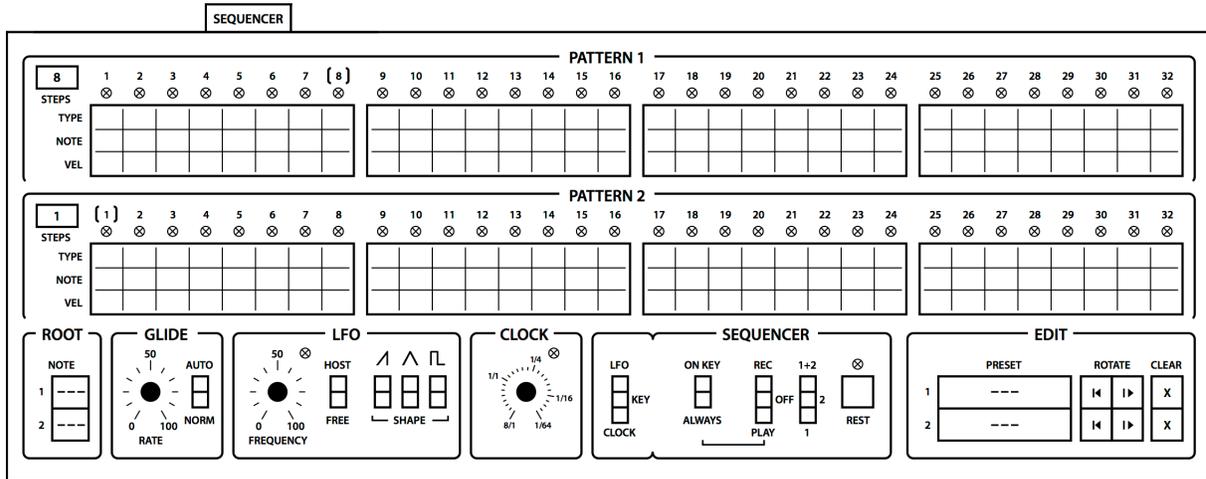
How to record: In the SEQUENCER sub-panel, select a pattern (1, 2, or 1+2) and slide REC/PLAY up to the REC position. Play some notes, inserting pauses by clicking on the REST button. The pattern can be as short as you like, even a single note – simply switch from RECORD to PLAY whenever you're finished.

How a sequence plays back is governed by the Clock settings (see the next page). Playing any note other than the specified ROOT transposes the pattern up or down.

Host buffer size: Repro-1's sequencer works best with a buffer size of at least 128 samples (most DAWs set larger buffer sizes by default). This doesn't mean it won't work with smaller buffers, but we did experience one or two glitches in certain hosts.

3-1 PATTERN data

A sequence consists of two patterns containing up to 32 steps each.

STEPS selectors: These specify the length of each sequence i.e. the number of steps to play before returning to step 1. Alternatively, click on one of the indices (1 to 32).

TYPE cells: Either click on a cell or use the mouse wheel to cycle between regular note (a filled circle), tied note (an arc) or pause (a faint 'X'). Perhaps unusually, a tied note extends its gate to the next note, not from the previous one.

**NOTE** cells: Semitone offsets from -36 (3 octaves down) to +36 (3 octaves up).

VEL cells: MIDI velocity data, from 1 to 127 (the default is 90). While the sequencer is running, this data is used instead of any other velocity source (e.g. from notes played on your keyboard).

ROOT selectors: These define NOTE '0' – the note set here will play the sequence at the same pitch as it was recorded. A lower ROOT actually transposes the sequence *upwards*, which is counterintuitive but logical.

Note: By default, the *Root* is automatically set to the first recorded note. This can be switched off – see the **Sequencer Root Note** option in the <u>Preferences</u> page.

3-2 SEQUENCER control

This panel is the same as the one on the SYNTH page, but without the arpeggiator:
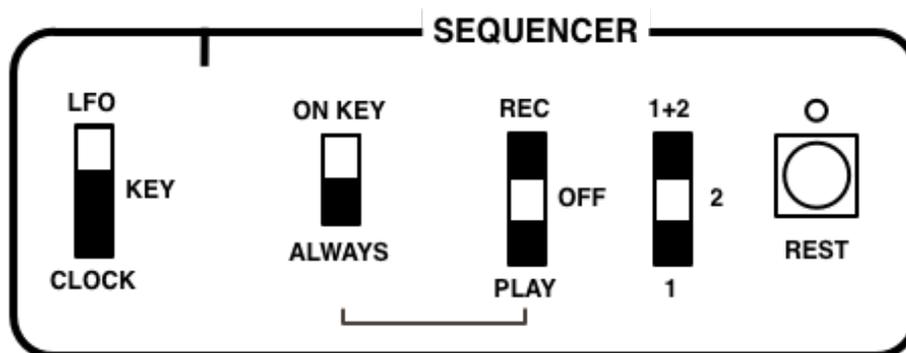
LFO | KEY | CLOCK switch: Selects which signal will be used to drive the arpeggiator and sequencer. In the CLOCK position they are both synchronized to host tempo, while in the LFO position they are synchronized to the LFO. With the KEY option, the sequence is played back one note per key-press.

ON KEY | ALWAYS switch: The ALWAYS option causes the sequence to continue playing even if all keys are released (simulating a hold pedal). ON KEY stops the sequence as soon as all keys are released, restarting it when a new key is pressed. Please note that this switch is global per instance of the plug-in: the status doesn't change, even when you load a different preset.

REC | OFF | PLAY switch: Primes the sequencer for recording. Recording commences when you play the next note and stops when you switch to OFF or play. Recording also stops automatically when step 32 has been reached (if the next selector is set to 1+2, it will only stop at step 32 of pattern 2).

1+2 | 2 | 1 switch: Selects the pattern(s) to be recorded or played back.

REST button: During recording, this inserts a pause at the current step.

3-3 EDIT

This panel gives you some tools with which you can manipulate the pattern data…
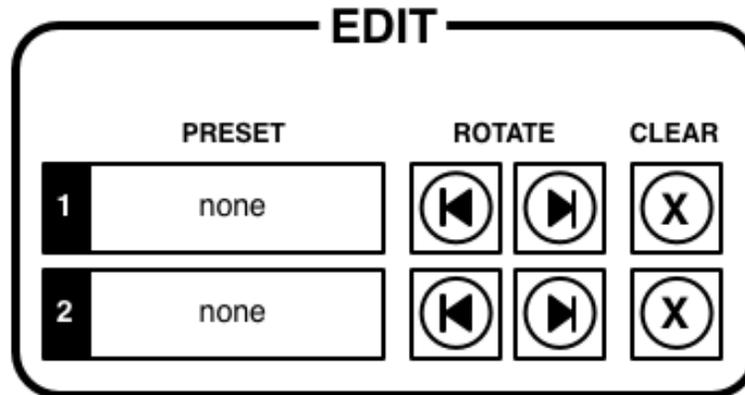
PRESET selectors: Click to open a menu containing pattern *Copy* and *Save* functions, as well as any sequencer patterns Repro-1 finds in the following location:

    Win   *…\VstPlugins\u-he\Repro-1.data\Support\Modules\Pattern*
    Mac   *MacHD/Library/Application Support/u-he/Repro-1/Modules/Pattern*

ROTATE buttons: This pair of buttons shifts the active portion of the sequence to the left or right. If, after listening for a while, step 1 doesn't seem to be the 'first note', you can use the Rotate buttons to fix that problem. Tip: Create new variations by rotating parts of existing sequences.

COPY and **PASTE** buttons: Clipboard functions for each pattern. Note that you can copy from one preset and paste into another.

CLEAR buttons: Deletes all data in the pattern and sets the current step to the start.

3-4 A FEW TRICKS

Start a sequence that contains ties as well as rests, then go to the SYNTH page and try performing with your sequence using only the MODE switches:

Switching on RETRIGGER transforms ties into regular notes.

Switching on REPEAT effectively removes rests. It doesn't use the pitch data, however, but repeats the pitch of the note immediately preceding the rest.

Switching on DRONE will lengthen the notes if amplifier Sustain is turned up, or the Decay time is longer than the Release time. Experiment!

4 KEYS / PERFORM

The pair of vertical buttons on the bottom left toggle between the EFFECTS and KEYS:
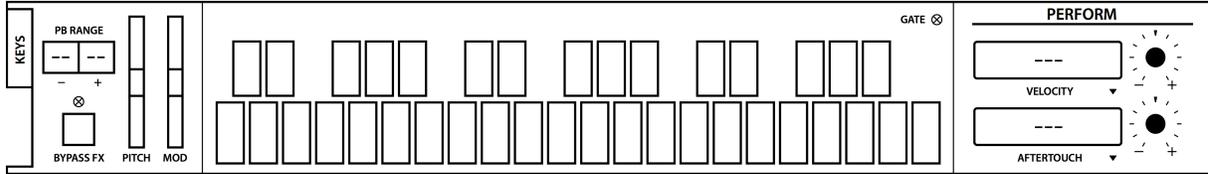
4-0 KEYS

Between those buttons and the keyboard are a few typical 'left-hand controls'…

PB RANGE selectors: You can choose pitchbend ranges separately for each direction (down and up). The options are 0 through 24 (2 octaves in semitone steps) then 3 or 4 octaves (36 or 48 semitones only).

BYPASS FX switch: Below PB RANGE is an effects bypass button you should find useful for comparing the treated and untreated sound. Please note that BYPASS FX is truly global: the status doesn't change, even when you load a different preset.

PITCH and **MODW**: The two on-screen wheels mirror incoming MIDI data, but you can also move them with the mouse.

Keyboard: Most of the panel is taken up by a 3-octave touchplate-style keyboard (the same range as the original synth) you can click on to fire off notes. Double-click on a key to sustain it until you click on another.

A note to users of **3-octave MIDI keyboards**: You might have to transpose your keyboard down an octave to match the range of Repro-1's touchplate.

4-1 PERFORM

To the right of the touch keyboard is a little modulation matrix you can use to extend Repro-1's modulation capabilities. To select a source, click on the **label** immediately below each **target selector**. (Where it says VELOCITY and AFTERTOUCH in the above image). Note that the list of sources includes the Wavefolder's own envelope.

Right-clicking on a target selector opens a menu where you can choose a destination for that modulation source. Note that effect parameters only appear in the menu if the corresponding effect is currently active.

Drag & Drop is a comfortable alternative (though not for effect parameters, which aren't visible in KEYS view). Left-click on the target selector, drag the crosshair onto any valid knob and release the mouse button.

See the next page for a list of all modulation sources and targets in Repro-1.

Modulation Sources		
Mod Wheel		
Pitch Wheel		
Breath		
Expression		
LFO		
Clock Phase		
Trigger		
Gate		
Key Follow 1		
Key Follow 2 (doesn't include pitchbend)		
Velocity		
Aftertouch		
Wavefolder AR		
Filter Envelope		
Amp Envelope		

| Modulation Targets	
LFO	Frequency (only works when LFO is in RATE mode)
MIDI *	Glide Master Tune
Filter Envelope	Attack Decay Sustain Release
Amplitude Envelope	Attack Decay Sustain Release
Oscillator A	Frequency ** Fine Tune Pulse Width
Oscillator B	Frequency ** Fine Tune Pulse Width
Modulation	LFO Amount Osc B Amount Filter Env Amount
Mixer	Osc A Osc B Noise/Feedback
Filter	Cutoff Resonance Keyboard Amount Envelope Amount
Jaws	Folds Bias Fold Mod Depth
Lyrebird	Delay Time Regeneration Mix
ResQ	Bass Frequency Bass Gain (EQ) Bass Vol (Res) Mid Frequency Mid Gain (EQ) Mid Vol (Res) High Frequency High Gain (EQ) High Vol (Res) Q/Resonance
Drench	Pre-Delay Decay Tone Dry/Wet Mix
Sonic Conditioner	Gain Stereo Width Transient

* There is a good technical reason for the MIDI label (which perhaps should read 'Tuning')

** Restricted to the FREQUENCY range, also for technical reasons

5 EFFECTS

5-0 INTRODUCTION

The buttons on the far left of the lower panel toggle between the keyboard and the effects. Click on the EFFECTS button for this view:
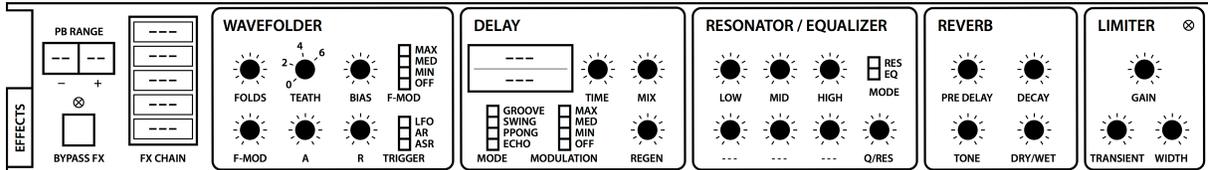
BYPASS FX

This is an effects bypass button you should find useful for comparing the treated and untreated sound. Please note that BYPASS FX is truly global: the status doesn't change, even when you load a different preset.

FX Chain

The block on the left is used for activating and ordering effects. The signal flows from the top of the block to bottom. Click to enable/disable effects, click and drag up or down to change the order. Tip: Placing LYREBIRD above JAWS can get… interesting!

5-1 JAWS wavefolder

Hardware wavefolders have already become quite popular in larger modular systems, especially amongst *West Coast* fans. A special kind of waveshaper, the wavefolder literally folds the waveform back on itself multiple times by mapping the signal onto a multi-toothed curve (see the image on the next page). When applied to a decaying signal, wave-folding can sound similar to FM.
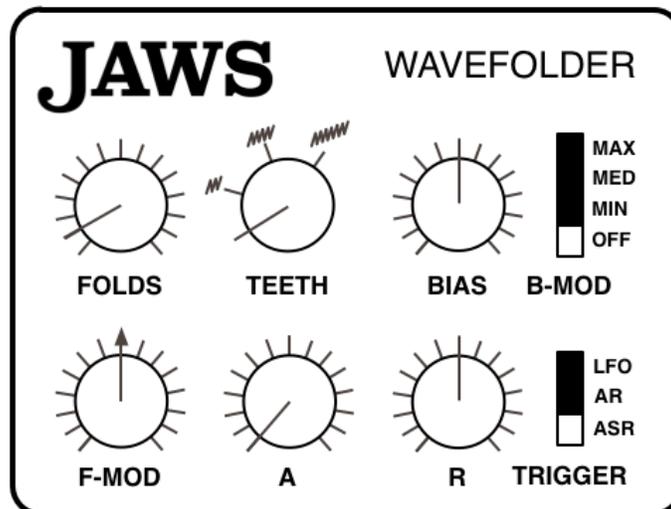
With its set of novel features, however, JAWS has no real world counterpart: Firstly, it includes an envelope to modulate the number of folds and an LFO to modulate the bias *out-of-phase* per audio channel (which results in a unique stereo effect). Secondly, JAWS can serve as a simple distortion unit by setting TEETH (the number of available folds) to zero. Here is a typical wavefolder setting:
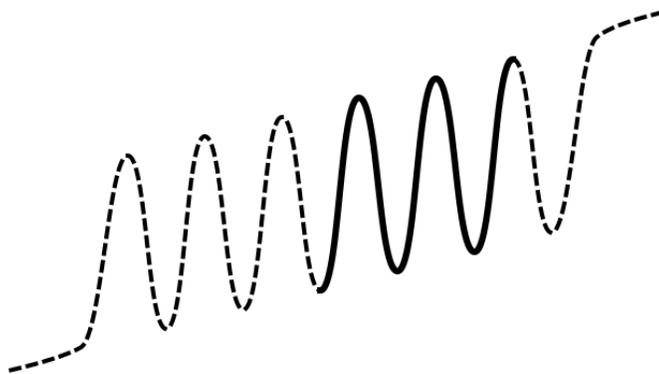
6 TEETH, about 25% FOLDS (the solid line) with some positive BIAS (shifted to the right)

FOLDS knob: How much of the wavefolder curve is being used. This is effectively an input volume control, so setting FOLDS and F-MOD both to zero will result in silence.

TEETH rotary switch: Sets the total number of folds in the wavefolder. Zero here means simple distortion, while 2 to 6 deliver more typical wavefolder effects.

BIAS knob: If B-MOD is *OFF*, this knob shifts the section of the wavefolder curve being used (in opposite directions for each stereo channel, hence the stereo effect). While B-MOD is set to MIN, MED or MAX, the BIAS knob adjusts the depth of modulation from the wavefolder's own LFO. Note: Extreme BIAS can result in silence, especially if FOLDS is set relatively low.

B-MOD switch: Bias modulation LFO rate. Setting this to *OFF* disables the LFO.

F-MOD knob: The depth of folds modulation from the wavefolder's own envelope…

A and **R** knobs: **A**ttack and **R**elease times for the wavefolder envelope.

TRIGGER switch: Determines how the envelope reacts, with the following 3 options: *ASR* stands for *attack-sustain-release* – the envelope proceeds through the attack stage and stays at maximum as long as a note is held, after which it releases. *AR* is a one-shot *attack-release* envelope with no sustain. Finally, the *LFO* option is similar to *AR* but is triggered by Repro-1's main LFO instead of the gate.

Tip: In general, wavefolders deliver more interesting effects when applied to relatively simple waveforms e.g. a pure triangle from oscillator B, a sine wave from the filter when self-resonating, or any other mellow sound.

Note: The sound of the Wavefolder is sensitive to minuscule differences in signal level and phase between the various sample rates. If you notice that your JAWS-based preset sounds very different when you switch sample rates, try adjusting the FOLDS settings to compensate, then save as "name-of-preset (96k)" or similar.

5-2 LYREBIRD delay
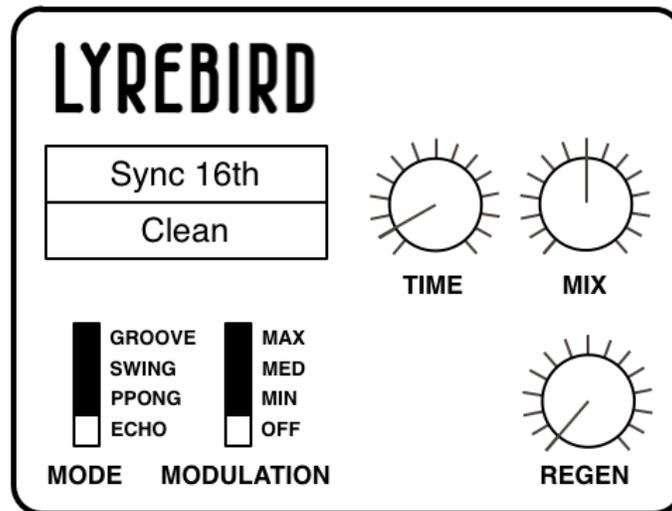
Lyrebird models an analogue (*bucket brigade* type) delay, capable of unsynchronized effects anywhere between flanging (i.e. modulated, very short delays) and 2 seconds, or host-tempo-relative delays between 1/16 and 8/1. In either mode, the delay time can be continuously fine-tuned.

Sync (upper selector): *Chorus/Short*, *Unsync/Long*, *Sync 1/16* or *Sync 1/4*. The first two options are absolute times, not relative to host tempo. As the name implies, the *Chorus/Short* option sounds especially rich with plenty of modulation (see below). *Unsync/Long* is usually the best choice for larger spaces and non-rhythmic effects.

Flavour (lower selector): Three different tonal characteristics for the decaying effect (*Clean, Bright* or *Dark*). Try them all out and compare results.

MODE switch: Affects the ratio between delays in the left and right channels: *Echo* has equal delay times in both channels (so the effect is monophonic unless modulated). *Pingpong* alternates evenly between the left and right channels, *Swing* creates triplets and *Groove* does dotted times.

MODULATION switch: Time modulation LFO rate. Switching to *OFF* disables the LFO.

TIME knob: Scales the Delay Sync value. For the synchronized delays this is literally a 1 to 8 multiplier, while for unsynchronized delays the range is much wider. Tip: Try turning REGEN up and modulating TIME – the pitch glides very smoothly, just like a real analogue or tape delay unit.

MIX knob: The volume ratio between unprocessed and processed signal.

REGEN knob: *Regeneration* determines how much of the processed signal is fed back into Lyrebird's input. At maximum, the feedback lasts longer than you will ever need!

5-3 RESQ resonator / equalizer

Depending on the status of the MODE switch, RESQ is either a semi-parametric EQ with two shelving filters surrounding a midrange band, or a triple bandpass resonator:
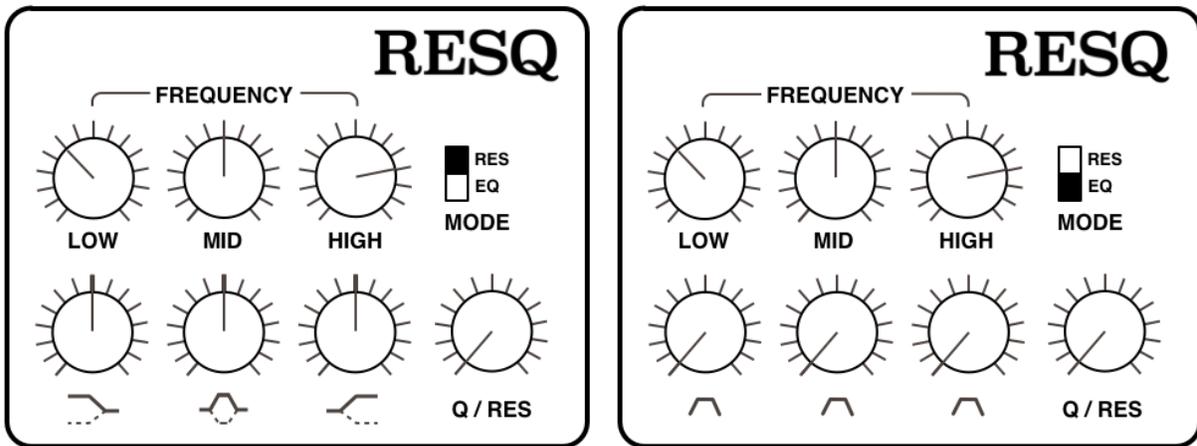
The **FREQUENCY** knobs adjust the cutoff for each band. The bands can seriously overlap or swap positions, so those labels shouldn't be taken too literally. The ranges of the knobs are approximately as follows:

LOW	=	45 Hz to 3 kHz
MID	=	55 Hz to 9 kHz
HIGH	=	130 Hz to 10 kHz

GAIN knobs **(EQ mode)**: Centre-zero controls for cutting or boosting the level of each band by up to 18dB. In EQ mode, LOW and HIGH are shelving filters (as indicated by the labels).

VOLUME knobs **(RES mode)**: The amplitudes of three resonant bandpass filters. The knobs are not centre-zero in RES mode, but positive only.

Q (quality) / **RES** (resonance) knob: The *Q-factor* of a filter band characterizes its width relative to its cutoff frequency. In EQ mode, Q only applies to the MID band.

5-4 DRENCH reverb

A typical lush plate reverb, but with pre-delay.
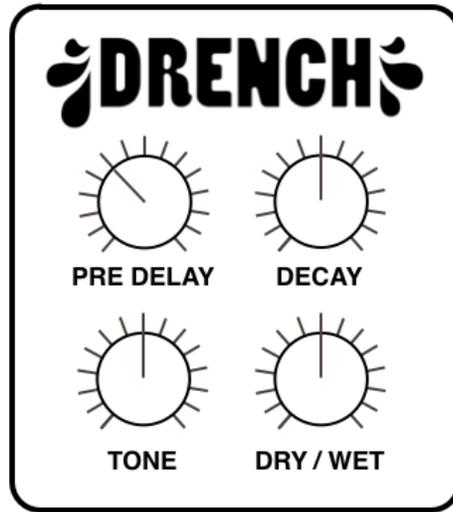
DRY/WET knob: The amount of reverb as a percentage of the total output.

PRE DELAY knob: A single delay before the reverberation appears. This is especially useful for retaining the presence of the dry signal while simulating larger spaces.

DECAY knob: The length of the reverb tail. At the maximum setting, it can take several minutes for the decay to reach silence!

TONE knob: A tilt filter, from very dark at -100 to very bright at +100. Simulates the softness / hardness of surfaces. Note: At those extremes, the wet signal almost (but not quite) disappears.

5-5 SONIC CONDITIONER

Is the signal too loud or too soft? Is the stereo too extreme? Is your bass sequence too clicky, or does it lack punch? Then you should try the SONIC CONDITIONER…
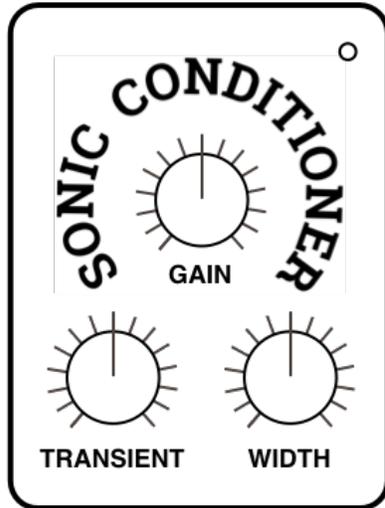
On the top right is a load indicator which gets brighter as the signal is saturated.

GAIN knob: Bipolar control for the output level. Settings above zero (the centre) will saturate the signal – a useful effect in its own right. You can compensate for high GAIN by turning Repro-1's main OUTPUT level down.

TRANSIENT knob: Bipolar control over the percussive elements within a signal. Try setting negative values to reduce clicks or positive values to add punch.

WIDTH knob: A stereo spread control. Especially useful for keeping delay or bias-modulated wavefolder effects more focussed in the centre of the stereo field.

6 TWEAKS

6-0 OVERVIEW

Apart from being unashamed eye-candy, the TWEAKS page is there to let you change the fundamental behaviour of individual modules. In the current version there are 5 user-adjustable **jumpers** (mini circuit connectors) and 5 **module tweak** selectors:
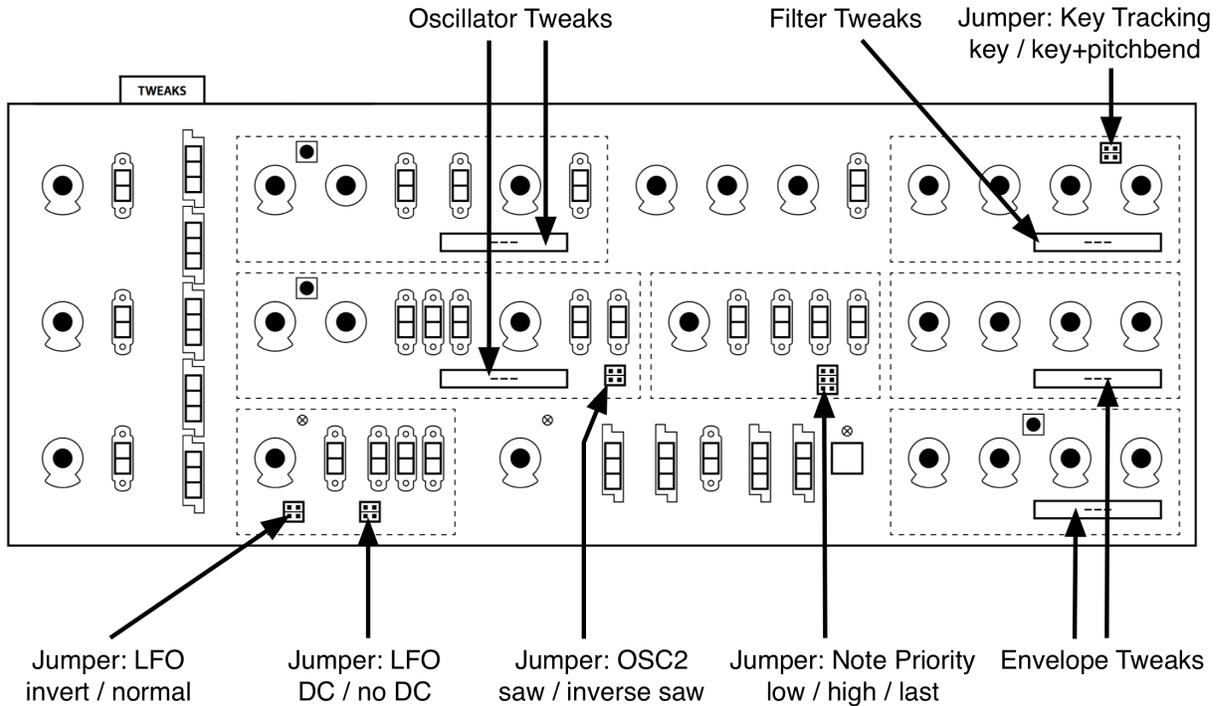
Although the knobs and switches do actually work, the labeling has been kept simple (or even cryptic) on purpose, in keeping with the 'circuit board' theme…

The TWEAKS page is meant to be eye-candy!

6-1 JUMPERS

LFO inversion: In the N (normal) position the LFO is a rising sawtooth, just like the audio oscillators, while in the INV position it is a falling sawtooth. The new option is arguably more useful than the original.

LFO DC offset: With the jumper in the DC position, both the square and saw waves are positive-only (unipolar). The NO DC option makes them both bipolar. Note that the LFO triangle wave is always bipolar, whatever the position of the jumper.

OSC2 saw inversion: With the jumper in the INV position, the sawtooth wave is inverted i.e. it becomes a regular sawtooth instead of the original ramp wave.

Note priority: This jumper sets how Repro-1 reacts when you play more than one note at a time. LOW plays the lowest note (like the original hardware as well as other USA-designs), HIGH plays the highest note (EMS and most Japanese synths), LAST plays the most recent note (modern, typical of digitally controlled synths).

Key Tracking Source: With this jumper in the KEY+PB position, cutoff also tracks the pitch bender (PB).

6-2 SELECTORS

Apart from the jumpers, the TWEAK page includes 5 selectors – one for each oscillator, one for the filter, and one for each envelope. Use these to change fundamental characteristics that would have been "overkill" on the main SYNTH page. Here's what we have so far:

Oscillator tweaks

Both '*P*' options are warmer than the standard *Ideal*. The most obvious difference between P1 and P5 is that the P5 pulse is inverted (that's why P5 is much louder than P1 if you use Saw and Pulse simultaneously). A less obvious difference is that OSC A in P1 mode always retains some of the fundamental frequency when SYNC is on.

A disadvantage of P5 is that self-PWM of oscillator B simply doesn't work. You already guessed that 'P5' was named after a closely related polyphonic synthesizer, right?

Finally, only available in OSC B: the *Bottom* option emphasizes the TRIANGLE shape.

Filter tweaks

Crispy, Rounded or *Driven*: The first two options accurately model the filters in the hardware synths we bought especially for Repro-1 analysis. Most obviously, the cutoff in *Rounded* is a few semitones lower than it is in *Crispy,* and there are also significant differences in the behaviour of the resonance. The *Driven* model is the result of balancing internal filter parameters in search of a novel 3320 flavour – we like it!

Envelope tweaks

Normal: Regular old ADSR.

High Sustain: Models an interesting fault (or is it a quirk?) in some versions of the original hardware: the end of the ATTACK doesn't quite reach SUSTAIN levels above about 85 – the envelope simply jumps up the last 15%.

One Shot: The gate is ignored, the Decay stage continues until it reaches the sustain level, which is immediately followed by Release. This type of envelope is particularly suitable for percussion sounds, fly-by effects etc..

Piano 1/2: These two modes were implemented according to a rather geeky article in the magazine *Electronics and Music Maker* (affectionately known as *E&MM*) all about the CEM 3310 envelope chip. In both *Piano* modes the Attack and Decay stages are the same as in *One Shot* mode. However, if the key is lifted during the Release stage there is an extra (true) release, which is longer in *Piano 1* than in *Piano 2* mode.

Tip: As the Attack and Decay stages are always completed, you can make an envelope appear to hold for a while before it releases.

7 CONFIGURATION

7-0 GENERAL

Clicking on the **cogwheel icon** at the top right of Repro-1's window opens the global configuration pages. This is where you can adjust e.g. window size and brightness, or connect Repro-1 parameters to MIDI controls:

| MIDI LEARN | MIDI TABLE | PREFERENCES | X |

You can make one particular page (e.g. PREFERENCES) open whenever you click on the configuration button: Right-click anywhere within this row of buttons and select *set current as default*.

7-1 ABOUT MIDI CC

CC, which officially stands for *Control Change* (not *Continuous Controller*) these days, is a multi-purpose message format used for editing and performing presets.

Note that CC isn't the only kind of MIDI performance data – for instance, there are different messages for note on/off (including velocity), pitch bend and two kinds of aftertouch.

Although the MIDI Manufacturers Association (MMA) was kind enough to leave most of the 128 CC numbers undefined, a few of them were given specific meanings that are also recognized by Repro-1:

01 = modulation wheel
02 = breath controller
11 = expression pedal
64 = sustain pedal

You don't actually need a physical breath controller or expression pedal to make use of control change messages – those names are just convention. You can use anything that can send a definable CC e.g. a couple of knobs on your MIDI keyboard, or a controller lane in your sequencer application.

Later MMA revisions even included a bunch of esoteric CC definitions such as 'Celeste Detune Depth', probably at the request of a home organ manufacturer or two. We can safely ignore all those definitions. However, although most CC are general purpose, it's best to avoid using controllers 120 through 127 as these are reserved for channel mode messages (e.g. Local Control On/Off).

For the official CC list, go to:
www.midi.org/specifications/item/table-3-control-change-messages-data-bytes-2

(Please contact us if that link becomes obsolete)

7-2 MIDI LEARN

The MIDI LEARN page is where you can connect MIDI CC (see above) to almost any Repro-1 parameters. The CC data can be generated by e.g. knobs or sliders on your hardware controller, or by a track in your sequencer.

Click on the cogwheel then select MIDI LEARN. All learnable elements appear as selectable outlines. Controls that are already connected appear filled, while the outline of the control waiting to be MIDI-learned is highlighted in white.

Try it: Click on the Cutoff knob (it gets highlighted) and send Repro-1 some MIDI CC data (i.e. move a knob or slider on your MIDI controller). Switch to the MIDI TABLE page to check that the new connection has appeared in the list, then exit via the [X] button. If you don't want to keep this new assignment, a double-click on the control will remove it again.

You can access all parameters without closing MIDI LEARN: Simply switch between the SYNTH, TWEAKS and SEQUENCER pages, or between the KEYS and EFFECTS.

7-3 MIDI TABLE

To open an editable list of all current MIDI CC assignments, click on the cogwheel button and select MIDI TABLE.

Parameter: The first field displays/selects one of Repro-1's parameters, sorted into sub-menus according to module. Click on the 'ADD' button at the bottom left and experiment with this field, then delete the assignment again by clicking on the small [X] to the right of the line you just created.

Channel / Controller: The next two fields are for the MIDI channel and CC number. Repro-1 is channel-sensitive – you can map up to 16 channels for a total of… well, more than enough assignments for Repro-1.

Mode: Specifies the range and/or resolution of values.

Normal ....full range, continuous
Integer ....full range, whole numbers only
Fine ....0.01 steps between the integers closest to the current value

Type: Specifies the type of hardware (by far the most common is *Continuous 7-bit*).

Encoder 127 ....unipolar encoder
Encoder 64 ....bipolar encoder
Continuous 7-bit ....7-bit MIDI CC (normal resolution, very common)
Continuous 14-bit ......14-bit MIDI CC (high resolution, less common)

Removing assignments: As mentioned above, the small [x] to the right of each line removes that assignment. You can remove all assignments at once by clicking on the [Delete All] button at the bottom of the window.

7-4 PREFERENCES

Click on the cogwheel icon, then select PREFERENCES for the following options:

Mouse Wheel Raster: If your mouse wheel is rastered (it clicks as you roll the wheel), set this option 'on' so that each little click increments the value in 'sensible' steps.

Switch behaviour: You can usually change the status of linear switches by clicking on the target position. In addition, the *drag* option lets you drag switches up/down while *toggle* lets you click anywhere on 2-way switches. The *iterate* option is like *toggle* except that it also applies to 3 and 4-way switches, with the downside that clicking on the target position no longer works. Irrespective of this setting, switches respond to rolling the mouse wheel just like the knobs – no clicks required!

Default Size: The GUI size for each new instance of the plug-in.

Default Skin: This option will only appear if Repro-1 finds at least one alternative skin when it loads. Change this to set the global default.

Gamma: Specifies the overall brightness of the Repro-1 window.

Text Antialiasing: Turns the smoothing of labels and values on or off. Usually left on!

Base Latency: Only disable this if you are sure that your audio system – hardware and software – uses buffers that are a multiple of 16 samples. Otherwise you should leave it at the default '16 samples'. This setting only takes effect when the host allows e.g. on playback, after switching sample rates, or after reloading Repro-1.

ABOUT THE REPRO-1 BUFFERS

Repro-1 processes audio in chunks of n x 16 samples. This *block processing* method significantly reduces the CPU load and memory usage of all our plug-ins.

If the number of samples to be processed is e.g. 41, Repro-1 processes the first 32 and keeps the remaining 9 in a small buffer (16 samples is large enough). Those 9 samples are then processed at the start of the next call… and so on.

The extra buffer is only necessary if either the host or audio driver processes 'unusual' buffer sizes. If your host application processes buffers of e.g. 64, 128, 256 or 512 samples (these are all multiples of 16), try setting Base Latency to *off* so that Repro-1 can process latency-free.

HQ default: Set whether *HQ* should be *on* for each new instance of the plug-in.

MIDI Control Slew: Adjusts the amount of 'smoothing' for Pitch Bend, Modulation Wheel, Breath, Expression and Aftertouch. While set to *Off*, Repro-1 responds more quickly to modulation wheel (for instance), but can become too grainy. The *Fast* setting is a good compromise between fast response and smoothness.

Sequencer Root Note: The default *auto* option here sets the pattern's *Root* to the first note you record. If you prefer setting the Root Note *manually*, select that option.

Sleepy default: Set whether *Sleepy* should be *on* for each new instance of the plug-in.

<u>8</u>   NKS and Preset Tagging

8-0 INTRODUCTION

Repro-1 supports *NKS extensions* so it can be integrated into the Native Instruments *Komplete Kontrol* software or Maschine environments. Repro-1's factory presets are optionally installed as tagged .nksf files. User presets can be tagged before saving, or .h2p files can even be batch-converted within Repro-1. A few pages of performance controls mapped to common parameters are automatically generated and saved together with each .nksf preset.

IMPORTANT: Presets saved in NKS format will not appear in Repro-1's browser!

Although the Repro-1 browser doesn't include search-by-tag functions yet, tags can be set already: Right-click on Repro-1's [SAVE] button and select *Tag this patch*.

CATEGORY		FEATURES		CHARACTER	
Basses	Acoustic	Mono	Slow Release	Bright	**Dark**
Pads	Analogue	Chord	Percussive	Dynamic	Static
Leads	Digital	Arpeggiated	**Sustained**	Constant	Evolving
Keys	**Distorted**	**Sequenced**	Modulated	Soft	Aggressive
FX	Evolving	Host Synced	CrossMod	Harmonic	Inharmonic
Drums	Formant	Dry	Osc Sync	**Rich & Phat**	Defined & Sparse
Sequences & Arps	FX Bass	Effects		Clean	Distorted
Plucks & Stabs	Plucked	Glide		Wide	Narrow
Other	Sub	Soft Attack		**Modern**	Vintage
	Wobble			Acoustic	Electric
	Lo–Fi			Natural	Synthetic

CATEGORY describes a preset by analogy to musical instrument types or classic synth sound genres. Each category has its own list of suitable subcategories. *Categories* are different from the *Type* tags in Komplete Kontrol / Maschine – we wanted to keep them as synthesizer-specific as possible. However, when presets are converted to NKS, Repro-1 automatically maps the *Categories* to the closest corresponding *Type*.

The FEATURE tags offer a more technical classification. CHARACTER tags are pairs of opposites from which you can choose just one.

Note: In Komplete Kontrol / Maschine, untagged presets only appear in *Synth Misc*.

Saving in NKS format

As mentioned on page 6, right-clicking the [SAVE] button offers you a choice of preset formats. While the options *native*, *h2p* and *h2p extended* allow Repro-1 to save presets into the currently selected preset directory, choosing the *nksf* option means that presets will be saved in the preset location used by NI Komplete Kontrol or Maschine (that's why they don't appear in the Repro-1 browser).

Batch conversion

First, set the desired target format: Right-click the [SAVE] button and choose e.g. nksf. If you have tagged a lot of presets, you can select them in Repro-1's preset browser: Use cmd+click (Mac) / alt+click (Windows) to select several presets at once. Then right-click any of the selected presets and choose *convert to nksf*. A text message appears telling you how many presets were converted and how to update the Komplete Kontrol database.

8-1 NKS Troubleshooting

Repro-1 doesn't appear in Komplete Kontrol / Maschine

Firstly, make sure you have Komplete Kontrol Software V1.5+ or Maschine V2.4 – the minimum requirements for our implementation of NKS.

Under Windows, Komplete Kontrol must register the location of Repro-1's VST file: Open the Komplete Kontrol preferences, go to *Locations* and add the directory that contains Repro-1(x64).dll or Repro-1.dll (as specified while installing Repro-1). Hit *Rescan* and check whether Repro-1 appears.

If the NKS preset folder is empty you will need to reinstall Repro-1 with the correct VST path and the NKS-option checked. Here are the preset folder locations:

Mac: *Macintosh HD/Library/Application Support/u-he/Repro-1/NKS/Repro-1/*
Win: *…\Vstplugins\Repro-1.data\NKS\Repro-1*

Or perhaps the XML-File is missing from this path:

Mac: *Macintosh HD/Library/Application Support/Native Instruments/*
Service Center/u-he-Repro-1.xml
Win: *C:\Program Files\Common Files\Native Instruments*
Service Center\u-he-Repro-1.xml

A re-install with the NKS-option checked should also resolve this issue.

Error message "Could not load plug-in (plug-in not found)"

Repro-1's VST file isn't in the directory specified by the Komplete Kontrol preference. Reason: Either Repro-1 wasn't installed as a VST at all, or it wasn't installed with the correct path. Note that the VST path is fixed in OSX but is user-definable in Windows:

Mac: *Macintosh HD/Library/Audio/Plug-Ins/VST/u-he/*
Win: *<User VST Folder>/* (path for the VST plug-in used during installation)

If the VST plug-in isn't in this directory you will need to reinstall Repro-1 with the VST option checked and the correct VST path.

u-he REPRO~1

www.u-he.com

OUTPUT — 0 200

MASTER TUNE — -12 +12

FILTER

CUTOFF — 0 50 100
RESONANCE — 0 50 100
ENVELOPE AMOUNT — 0 50 100
KEYBOARD AMOUNT — 0 50 100

FILTER ENVELOPE

ATTACK — 0 50 100
DECAY — 0 50 100
SUSTAIN — 0 50 100
RELEASE — 0 50 100

AMP ENVELOPE

ATTACK — 0 50 100
DECAY — 0 50 100
SUSTAIN — 0 50 100
RELEASE — 0 50 100

PERFORM 1 — - +
PERFORM 2 — - +

PRESET

NOTE

OSCILLATOR A

FREQUENCY — -12 +12
OCTAVE — 0 1 2 3 4
SHAPE
PULSE WIDTH — 0 50 100
SYNC / OFF

OSCILLATOR B

FREQUENCY — -12 +12
OCTAVE — 0 1 2 3 4
SHAPE
PULSE WIDTH — 0 50 100
LO FREQ / KYBD
NORM / OFF

LFO

RATE — 0 50 100
HOST SYNC
SHAPE

MIXER

OSC A — 0 50 100
OSC B — 0 50 100
FEEDB / NOISE — 0 50 100

GLIDE — MODE

RATE — 0 50 100
AUTO RETRIG REPEAT DRONE
NORM OFF NORM OFF

CLOCK

1/4 1/16 1/64 8/1 1/1

ARP

LFO KEY CLOCK
UP UP/DOWN
LATCH OFF

SEQUENCER

REC PLAY
1+2 OFF 2 1
REST

MOD FIL ENV — TO

AMOUNT — 0 50 100
WHEEL / DIRECT
WH OFF DIR — OSC A FREQ
WH OFF DIR — OSC A PW

MOD OSC B

AMOUNT — 0 50 100
WHEEL / DIRECT
WH OFF DIR — OSC B FREQ
WH OFF DIR — OSC B PW

MOD LFO

AMOUNT — 0 50 100
WHEEL / DIRECT
WH OFF DIR — FILTER