



Anadrasi User's Manual

General info:

Anadrasi ('Feedback' in Greek) is a live performance instrument with two sections / sub-instruments: a semi-modular digital feedback synth and a granular synth. The instrument is fully hardware-software integrated, with most GUI parameters being controlled via the Behringer BCR2000 MIDI controller. **Anadrasi**, was conceived, designed and created by Stelios Manousakis for Gustavo H. Serpa.

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Synthesis

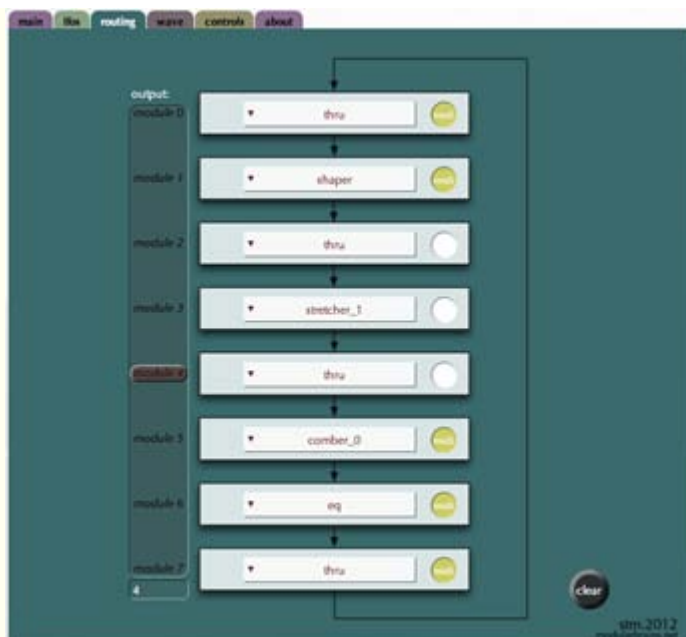
Digital feedback

Patchbay

The feedback portion of the instrument is a patch in which 8 modules are connected in series. The patch's configuration is set in the 'routing' tab. Signals flow from one module to the next according to their location in patch, and then back to the beginning; note that this loop will happen on the next control block, therefore there is always some inherent, unmodulatable delay between the sound coming out of 'module 7' and into 'module 0'. This delay is 64 samples by default.

It is possible to choose which module to listen to (i.e. which path to route to the output), by setting the 'output selector' to the appropriate path of the patch. While all modules are always active, this can make a big difference in the sound, timbre-wise, amplitude-wise, etc.

Commonly, you would enter different modules in each path of the feedback patch; however, note that you can actually enter the same module name in multiple places. This will create an identical copy of the module in question. Thus, all the modules with the same name, e.g. 'shaper' or 'comber_0', will be controlled together, by the same GUI and MIDI knobs and switches.



Parameters

- pop-up menus:** You can select which module occupies each slot using the slot's pop-up menu.
- midi:** Each slot contains a 'midi' button; if yellow, then the module in that slot will be controllable via MIDI. If white, it will not. This is useful as there is a limited number of MIDI knobs, therefore different modules may be sharing the same controls - something that is sometimes desirable, sometimes undesirable.
- output selector:** select which module to listen to, treating it as the instrument's output.
- clear:** the 'clear' button clears the patch.

Feedback Modules

All modules have an active/bypass' switch, which allows them to process an incoming signal, or let it pass through. This parameter can also be treated as a dry/wet mix option when controlled by an LFO.

Generator/Processor

- **1x shaper: a waveshaper with delay.**



The input signal is delayed and passed through a non-linear distortion transfer function. This module is the only one in the feedback patch that can generate an audio signal out of nothing, therefore it is necessary to include it when starting the instrument so as to create a seed audio. Once there is some signal in the chain, this module can be removed or bypassed. The way this works - and the seed for the entire feedback patch - is a single impulse (a one-sample click) passed through this module upon initialization. If the patch returns to silence, activating this module will bring back some sound.

Parameters

fdb: amplitude of internal feedback (i.e. feedback within the module itself). Negative and positive values are both possible; negative values will invert the signal

input: amplitude of input from outside the module, i.e. from the rest of the feedback patch. Negative and positive values are both possible; negative values will invert the signal

delay: delay the input signal for a defined time in seconds before waveshaping it

shape: choose between one of 128 different transfer functions (waveshape waveforms). The higher the number, the more complex the function will tend to be, producing noisier results. Changing this parameter will have drastic effect on the timbre, and will help create some sound if the feedback patch becomes silent.

amp: control the output amplitude of this module

Processors

Equalization

- **1x eq: a 4-band equalizer**



A simple 4-band equalizer, consisting of a LowShelf, Peak, Peak, and HiShelf filters.

Parameters

0db/kill: these buttons will bring the gain of the corresponding filter at 0 or -24dB

gain: adjust the gain for a filter in dB.

freq: adjust the center frequency of a filter

res (only for the Low-Mid and High-Mid peaking filters): adjust the Q or resonance of the filter.

Distortions

- **2x disintegrator: signal corrupter**



Disintegrates the signal by amplifying random half-cycles of its input (as defined by *prob_%*) by a multiplier (*mult*).

Parameters

prob_ %: probability of multiplication
mult: multiplication amount.

- **2x decimator: sample-rate and bit-rate signal reduction**



Decimates (reduces the effective sample rate), and reduces the bit depth of the input signal, allowing non integer values for smooth transitions between clean and lofi signals.

Parameters

rate: the sample rate in Hz that the signal will be resampled at
depth: The bit-depth that the signal will be reduced to.

- **2x edger: multi-mode distortion module**



Perform one of various distortion operations on the parts of a signal that exceed a threshold

Parameters

mode: set the mode to: [0: standard distortion, 1: soft clipping, 2: tube-like distortion, 3: arc-tangent distortion, 4: digital hard-clipping, 5: cosine distortion, 6: sine distortion, 7: foldover distortion, 8: wrap-around distortion, 9: white noise distortion, 10: pink noise distortion, 11: brown noise distortion, 12: gray noise distortion, 13: clip noise distortion, 14: hash-function distortion]

thresh: the threshold above which to distort the signal

Spectral processing

- **2x shifter: frequency shifter (single sideband modulation).**



Moves all the components of a signal by a fixed amount, thus not preserving the original harmonic relationships.

Parameters

shiftL: amount of shift in Hz for left channel

shiftR: amount of shift in Hz for right channel

- **2x comb: make a series of gaps in the spectrum**



FFT-based comb filtering, consisting of 32 filters.

Parameters

phase: starting phase of the comb pulse

width: width of the comb pulse

- **2x stretch: shrink or stretch the spectrum of a signal**



FFT-based bin-stretcher, shrinking or stretching the spectrum of a signal.

Parameters

stretch - scale bin location by factor.

Panning (sort of)

These modules can be very effective for routing the process of the left channel to the right and vice versa, creating complex spatial images

- **2x invert: simple panner**



Parameters

invert: at -1 what comes in goes out, at 0 the incoming stereo becomes mono, at 1, left channel is output on right and right on left

- **2x spread: single-channel delay line**



Useful for creating a wider spatial image by manipulating the time-difference of arrival between left and right channels. Can also do very interesting things when combined with an inverter.

Note that 'spread 0' delays the left channel and 'spread 1' delays the right channel.

Parameters

time: delay time in seconds.

- **2x splay: spectral stereo spreading/imaging**



A stereo imager, spreading the spectrum of a signal into the stereo field

Parameters

spread: amount of stereo imaging: 1 is full stereo, 0.5 is less wide, 0 is mono-center

Amplitude control

- **2x vca: simple amplitude control**



Control the amplitude after a process in the feedback path; especially useful when control with an LFO (hence the name: 'voltage-controlled-amplifier')

Parameters

amp: amplitude in dB

Granular
synthesis

Synth



This is a very powerful granular synthesis module, with some very special features. It reads a (mono) soundfile and loops from the start to the end position, reading the loop with a defined trajectory.

Parameters (from top to bottom)

on/off: use this to start/pause processing. Note that this is different from the play/mute, in that when in the 'off' position, no CPU is used by the synth. On the contrary, when muting the synth is still active, it just doesn't make any sound

soundfile selector popup menu: select a soundfile to process from those loaded in the pool. Notice that multichannel soundfiles have been split

waveform view & control: this is a fairly standard waveform view, that also allows you to set the start and end points of the granulation loop. Keep in mind that to avoid setting these accidentally, you need to press the 'yes' button, after having made a selection. A larger waveform view can be found under the 'wave' tab on the left. The two views are connected to each other.

waveform control buttons:

normalize: normalize the loaded soundfile

all: select to granulate the entire soundfile from beginning to end; must press 'yes' for the selection to be passed to the synth

none: remove current selection; must press 'yes' for the selection to be passed to the synth

yes: send the current selection to the synth

envelope (granular window) selector popup menu: select a shape to use as a window (micro-envelope for each grain). This plays a fundamental role in the type of timbre (e.g. close to the original or noisy) or the kind of action perceived to be generating the sound (e.g. percussion, electronic noise, etc). See below what waveforms correspond to the names in the menu.

trajectory selector popup menu: select a shape to define the trajectory with which to read the portion of the soundfile between the start and end point of the loop. E.g. 'line' will read it normally, while 'line_exp4' will start very slow and speed up, and all the 'rand_' ones will read it randomly. These shapes are stored on disk, so they will always sound the same. See below what waveforms correspond to the names in the menu.

pitch: pitch of the granulators; 0 is same as original, every ± 1 is a semitone up or down.

pitchR: define the bandwidth of pitch randomness per-grain; i.e. each grain will be set at the defined pitch, plus/minus a random value between 0 and the pitchR value.

dur: duration of each grain in seconds.

durR: define the bandwidth of duration randomness per-grain; i.e. each grain will be set at the defined duration, plus/minus a random value between 0 and the

durR value. The minimum grain duration is 0.01 seconds (10ms). Note that such small grains will often sound like clicks/glitches.

start: start position of the granulation loop in seconds. Note that the maximum value of this control is automatically adjusted to the length of the selected soundfile.

length: length of the granulation loop in seconds. Note that the maximum value of this control is automatically adjusted to the length of the selected soundfile.

pbSpeed: playback speed; 1 is normal, 0.5 is half speed, 2 is twice as fast, etc.

posR: random position of each grain within the loop; 0: no randomness, 1: fully randomized.

panR: each grain generator has a set position within the stereo field, such that all the grains together form an equally distributed line between the two speakers. If panR is not 0 however, the position will randomly vary per grain, depending on the value of panR; e.g. 0.1 means that each grain will fluctuate around its original position, whereas 1 means that a grain may appear anywhere in the stereo field.

ampR: define a random amplitude in dB on a grain-per-grain basis

prob: define a probability for each grain to play when it is supposed to; e.g. 0 means no grains will play (i.e. 0%), 0.5 means a grain will randomly play 50% of the time, and 1 means all grains will play all the time (i.e. 100%)

dir norm / dir rev: select the direction of reading through the soundfile loop: normal or reverse.

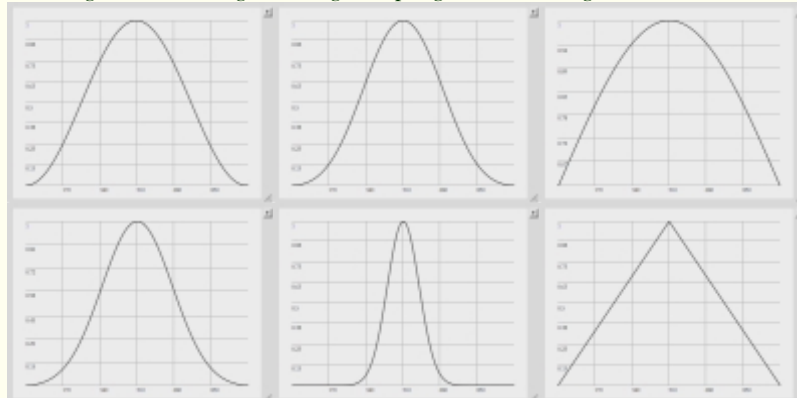
out: 1-2 / out: 3-4: send the output of the granular synth to channels 1-2, or channels 3-4. Note that on a MOTU Ultralite, channels 1-2 are the Left and Right outputs, and 3-4 are outs 1-2.

purge of buffers: this button may be useful for clearing up memory, if you are playing with the instrument at home and have loaded a lot of soundfiles that will not be used again. Once pressed, all the soundfiles that are not in use by the current preset bank will be removed from RAM. ATTENTION: it is possible that upon re-loading some of those buffers the granular synth will not produce sound. In this case, please press the 'reset grains' button to make sure everything works as expected.

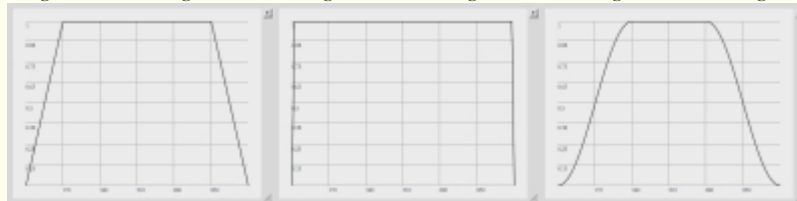
reset grains: this button allows resetting the granular synth.

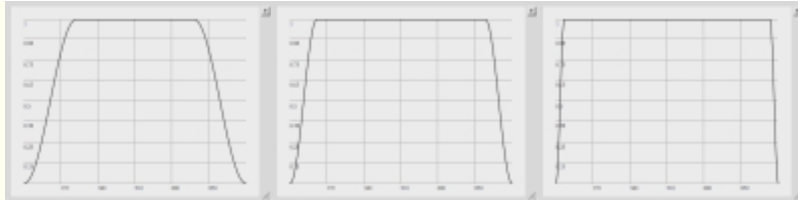
Windows shapes

hanning, blackman, gaus_1, gaus_pi, gaus_7, triangle,

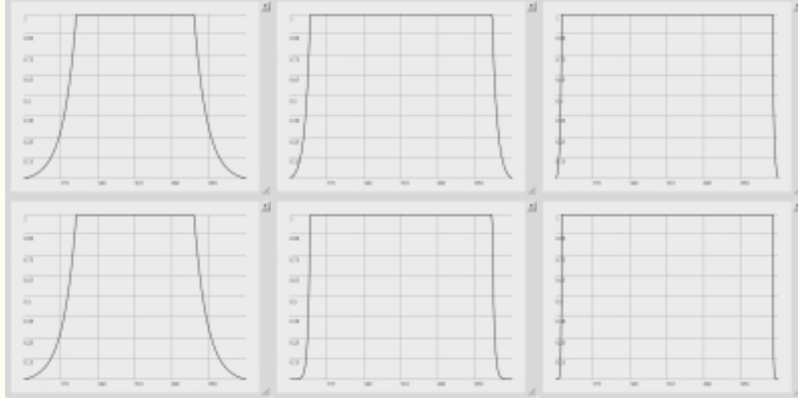


3stg_lin-20, 3stg_lin-95, 3stg_sin-10, 3stg_sin-15, 3stg_sin-25, 3stg_sin-50,



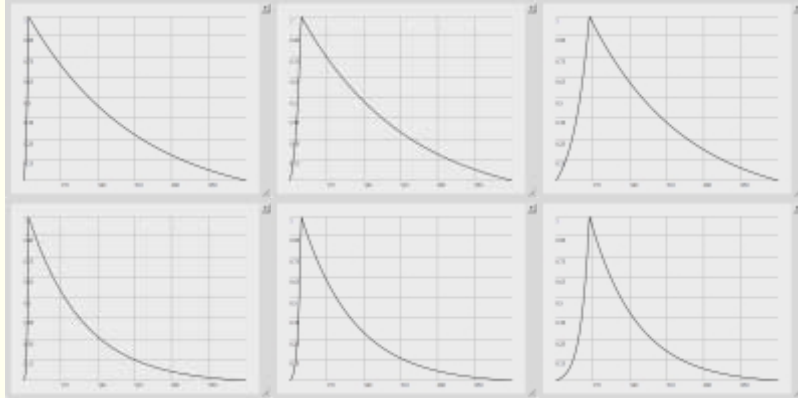


3stg_exp4-15, 3stg_exp4-30, 3stg_exp4-60, 3stg_exp10-15, 3stg_exp10-30, 3stg_exp10-60,

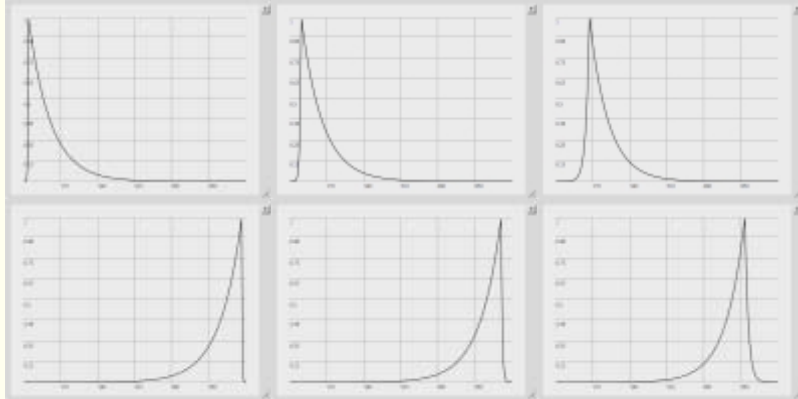


exp_2-5, exp_2-15, exp_4-15, exp_4-2, exp_4-5,

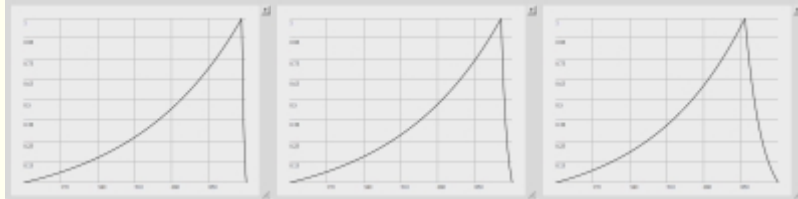
exp_2-2,

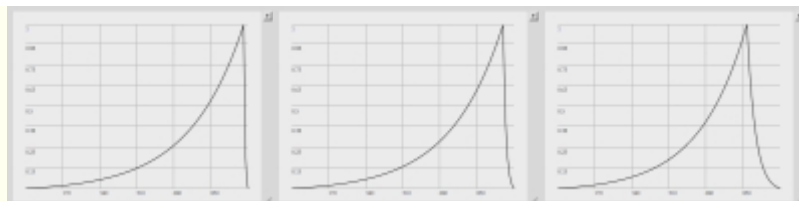


exp_10-2, exp_10-5, exp_10-15, rexp_2-2, rexp_2-5, rexp_2-15,

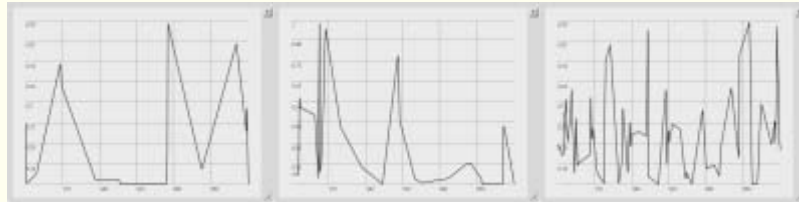


rexp_4-2, rexp_4-5, rexp_4-15, rexp_10-2, rexp_10-5, rexp_10-15,

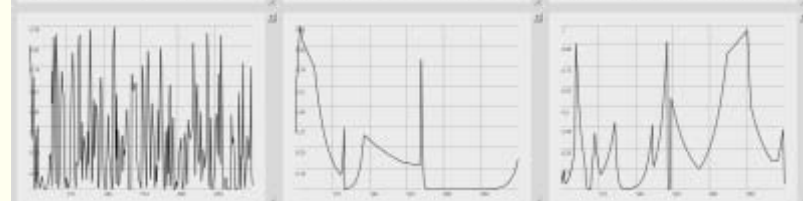
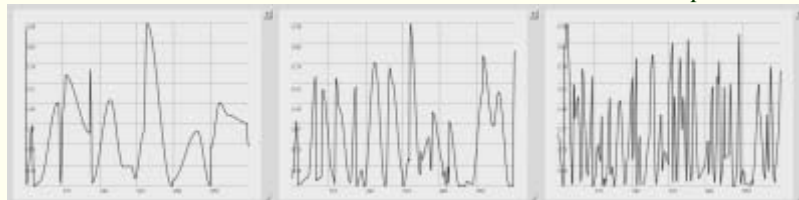




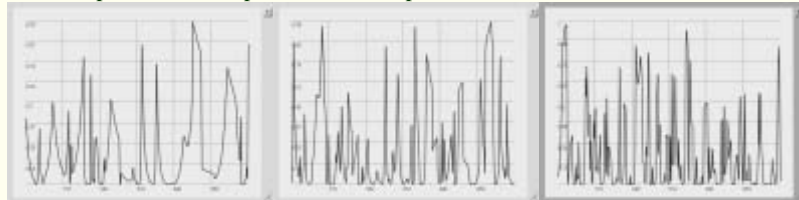
rand_lin16, rand_lin32, rand_lin64, rand_lin128, rand_lin256, rand_sin16,



rand_sin32, rand_sin64, rand_sin128, rand_sin256, rand_exp16, rand_exp32,

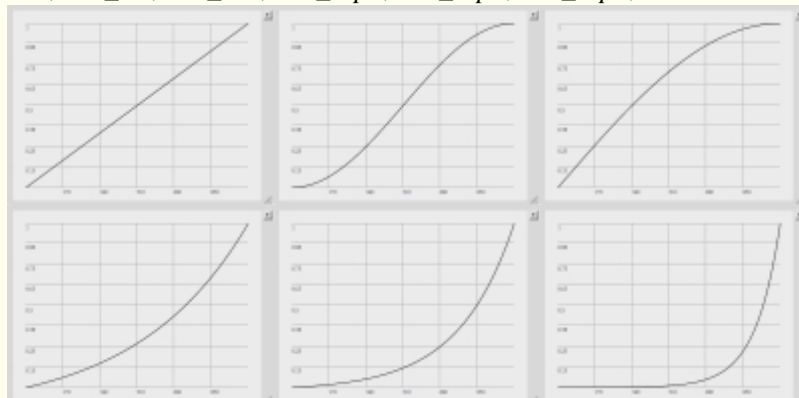


rand_exp64, rand_exp128, rand_exp256

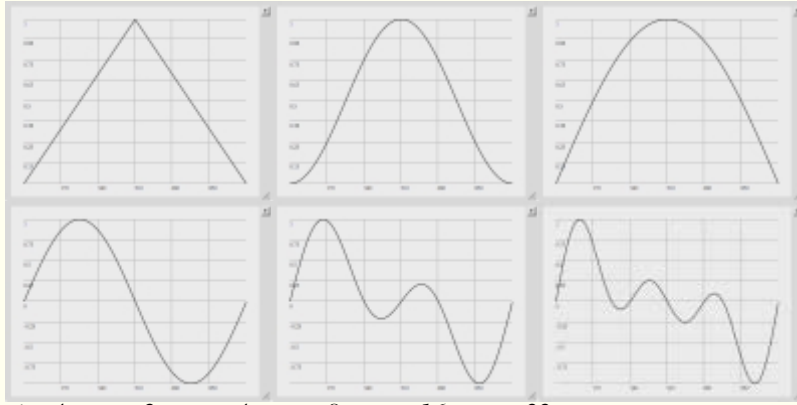


Trajectory shapes:

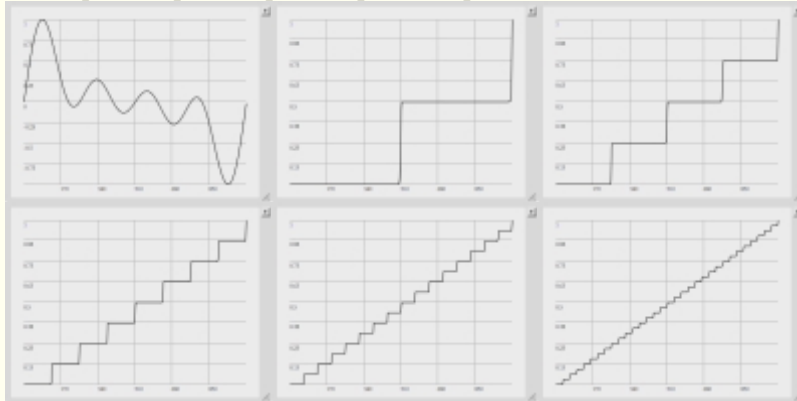
line, line_sin, line_wel, line_exp2, line_exp4, line_exp9,



triangle, cosine, welch, sine, sine2, sine3,



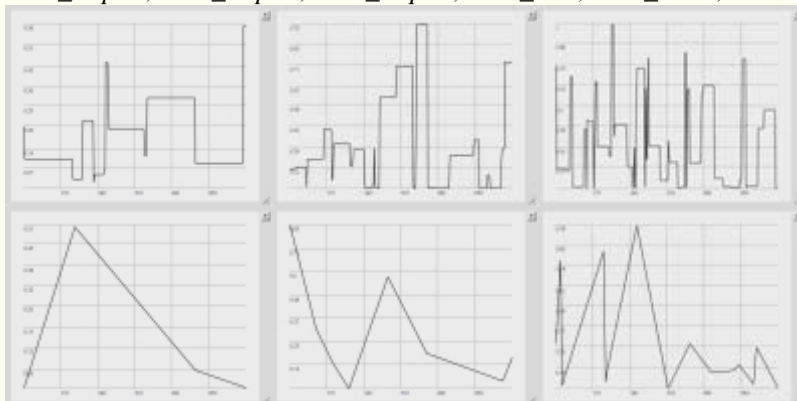
sine4, quant2, quant4, quant8, quant16, quant32,



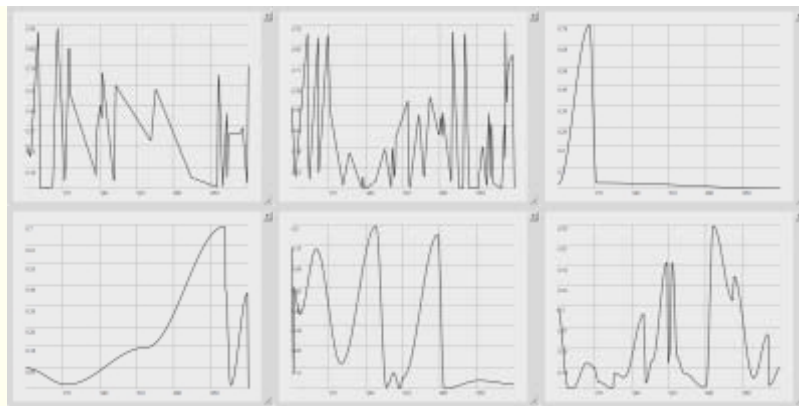
quant3, quant5, quant7, quant9, rand_step4, rand_step8,



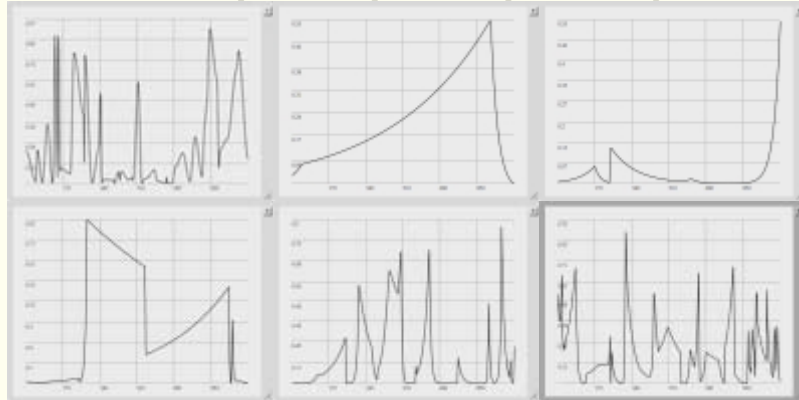
rand_step16, rand_step32, rand_step64, rand_lin4, rand_lin16,



rand_lin32, rand_lin64, rand_sin4, rand_sin8, rand_sin16, rand_sin32,



rand_sin64, rand_exp4, rand_exp8, rand_exp16, rand_exp32, rand_exp64



File browser



The file browser tab allows you to load sounds into the program for granulation, storing them into RAM.

You can **navigate** your computer in the top section. When you click on a file, you will see some information about it posted on the bottom of the tab: depth (bit-depth), frames (number of

individual samples), seconds (total duration), chans (channels), rate (sampling rate).

Double-clicking on a file will import it to the buffer pool. If the sound is multi-channel, *Anadrasi* will automatically split it into mono files, as only mono files can be granulated.

Click-and-drag an imported file (from the second table) to the field underneath it to remove it from the buffer pool. Note that if the soundfile is currently being granulated, it will not be removed, and a warning will be posted on the 'Anadrasi notifier' window.

LFOs

There are 6 LFO modules shared between the feedback and granular synths and residing in their own tab. The LFOs can be mapped to a parameter of any feedback module or of the granular instrument.



Parameters (from top to bottom)

on/off: a switch to turn the lfo on/off

mode: select the type of lfo generator to use (see below)

freq: frequency of the oscillator/noise generator

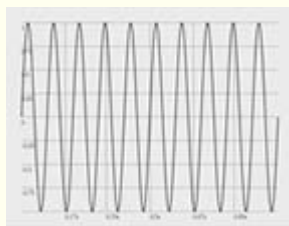
mod: amount of modulation applied to the receiving parameter. The upper and lower bounds are automatically adjusted to the parameter to be modulated.

module menu: select which module to modulate. This is only controllable through the GUI

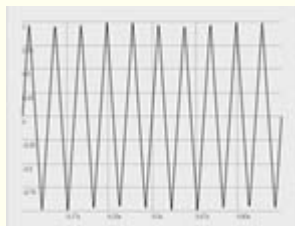
parameter menu: which parameter of a module to modulate. This is only controllable through the GUI

LFO generators:

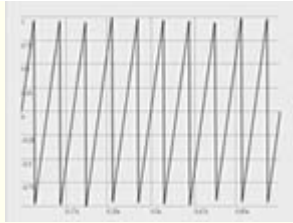
Sine oscillator



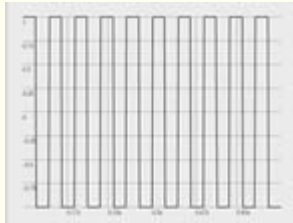
Triangle oscillator



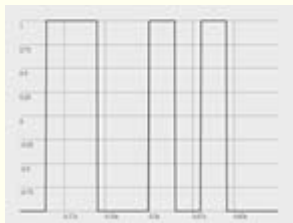
Sawtooth oscillator



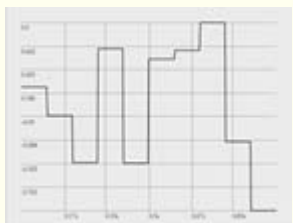
Squarewave oscillator



Clip-noise generator (producing a random square wave at the defined frequency)



Step-noise (producing random, uninterpolated values at the defined frequency)



Line-noise (producing random linear ramps at the defined frequency)



Sine-noise (producing random sinusoidal ramps at the defined frequency)



MIDI

Anadrasi is a fully integrated hardware-software instrument, meant to be played live using the Behringer BCR2000 control interface.

Static vs dynamic GUI controls

The BCR2000 has less controls than what the instrument needs, and than its GUIs. Therefore, while most of the midi knobs and switches always control the same parameters, a number of them dynamically switch to different modules on-the-fly, depending on which modules are currently being used.

Modules with permanent static controls:

shaper
eq
granular synth
all lfos
all vcas
main amplitude control modules

Also:

patchbay output selector: select previous/next
granular buffer from loaded buffers: select previous/next
preset from loaded preset bank: select previous/next

Modules with shared dynamic controls:

When any of the below modules are connected to the patchbay, they will be controlled via the MIDI knobs and switches assigned to their group. If more than one module in a group is active, the MIDI will affect all modules that are set to be MIDI-linked, which happens when the 'midi' button next to their name on the patchbay tab is yellow. Clicking on that button will unlink them from the MIDI. There are 4 groups with shared controls:

Feedback modules with two control knobs :

fdb processors a0: disintegrator_0, decimator_0, shifter_0,
comber_0, edger_0
fdb processors a1: disintegrator_1, decimator_1, shifter_1,
comber_1, edger_1

Feedback modules with one control knob:

fdb processors b0: stretch_0, spread_0, invert_0, splay_0,
fdb processors b1: disintegrator_1, decimator_1, shifter_1,
comber_1, edger_1

MIDI & GUI communication

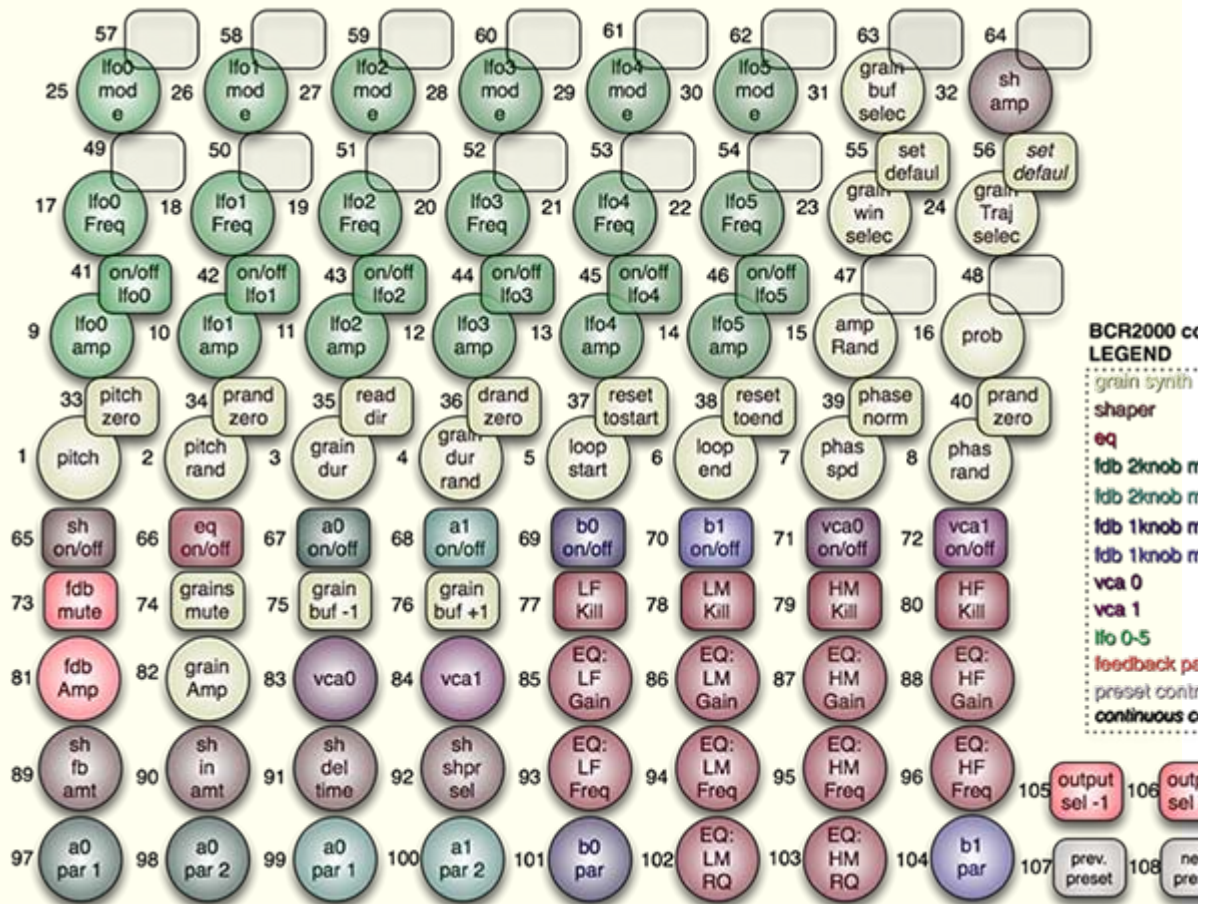
The MIDI and GUI controls are linked in a two-way communication. This means that movement of a MIDI control will be reflected on the GUI and movement of a GUI control will be reflected on the appropriate control of the MIDI device. Note that for shared dynamic controls, GUI states are reflected to MIDI only for modules that are currently patched.

Anadrasi without MIDI

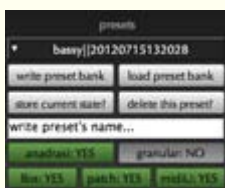
Upon starting the software, the instrument attempts to connect to the BCR. If it is not connected, a popup menu will appear before initializing the instrument as a reminder to connect the controller. Although it is possible to use the instrument without MIDI, keep in mind that

any presets that you have created in this GUI-only mode will not take into account the BCR2000; therefore, when you load those presets with the BCR2000, the device will not be set together with the GUI, thus you will not be able to take advantage of the 2-way communication when recalling presets.

BCR2000 control map



Presets



Anadrasi has a preset system that allows complete storing and recalling of the state of the instrument, the GUI, and the MIDI, including the soundfiles used by the granular synth.

Saving presets

There are two stages of saving presets.

1. Presets are stored on RAM simply by entering a name on the text field and clicking on 'store current state!'. The stored preset will appear in the popup menu, with its name including a date tag so that you can easily distinguish between presets with the same name. Once you have done this, you can keep storing however many new presets you wish, and they will all be accessible during the current session. You can remove any of those presets by selecting it on the popup

menu and pressing the 'delete this preset' button. Note that, as this saves the presets on RAM, it is only temporary; if you do not save those presets on disk, you will lose them!

2. You can save all those presets as a preset bank into your harddrive by clicking on the 'write preset bank' button. Please note that you cannot save presets in a folder that contains spaces! If writing fails, a notification will appear on the notification window.

Saving a preset bank will create a folder with the name you choose for the bank and a time-tag, so you can easily create multiple updated versions of a bank without the danger of accidentally overwriting valuable data. You can find each preset saved as an individual text file inside this folder. This allows you to move, add or delete any presets you want from a bank through Finder, if you wish to do so.

Loading presets

To recall a preset bank written on disk, use the 'load preset bank' button. A powerful feature of the preset system is that using the green buttons below the text field, you can choose which parts of the instrument to set to a preset's state, when loading a new preset. This is a very powerful feature, allowing partial retrieval of presets, mixing and matching between different states. Do keep in mind that the instrument may sound differently, if some parts of a preset have not been retrieved.

To recall a preset from the already loaded bank, simply select it from the popup menu. You can also go to a next/previous preset using two designated MIDI buttons, or by selecting the popup menu and using the keyboard's arrows.

Editing presets outside Anadras

As mentioned above, you can find each preset saved as an individual text file inside the folder of the preset bank, and you can move, add or delete any presets you want from a bank through Finder, if you wish to do so. You can also rename them by: a) opening the text file and changing the name that follows the 'metadata' field - but make sure you keep the double quotes (e.g. change 'metadata': "testPreset" to 'metadata': "great bass"). b) you can also change the name of the file on the Finder, so that it is the same as the name that will appear inside Anadras.

Preset Controls (from top to bottom)

popup-menu: select a preset from the currently loaded preset bank

write preset bank: save the preset bank to disk

load preset bank: load a preset bank from disk

store current state?: store the current state of the instrument as a preset in the current bank.

Note that this will NOT save it to disk, but only to RAM for temporary use

delete this preset?: remove the current preset

text field: write a name for the preset before storing. Press enter to save the name, and click on 'store current state?' to store it

anadras: YES/NO: retrieve the states of the feedback modules

granular: YES/NO: retrieve the state of the granular synth

lfos: YES/NO: retrieve the state of the LFOs

patch: YES/NO: retrieve the configuration of the feedback patchbay (i.e. how the modules are connected to each other)

midiU: YES/NO: retrieve the state of the midi-link buttons (yellow buttons labeled 'midi' on the patchbay)

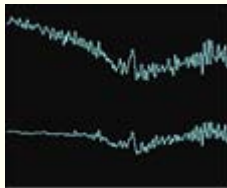
Scopes

Frequency analyzer



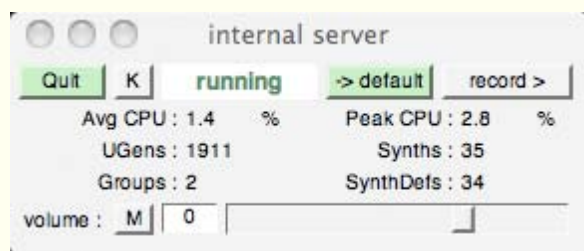
The frequency analyzer is located on the right of the preset module and shows a real-time plot of the spectrum of the first two channels of *Anadrasi* (this means that if the granular synth is routed to channels 3-4 it will not be seen there). The view is logarithmic, meaning that it corresponds to the human perception of pitch, rather than to the physical spacing of frequencies - therefore low frequencies take more space, though without having more resolution.

Waveform view (oscilloscope)



The oscilloscope is located on the right of the frequency analyzer and shows a real-time plot of the spectrum of the first two channels of *Anadrasi* (this means that if the granular synth is routed to channels 3-4 it will not be seen there).

Server window



The '**internal server**' window displays some information, and contains some GUI for overall control of the instrument. The most pertinent information is the '*Avg CPU*', which displays the average CPU consumption of the instrument at the moment, and the '*Peak CPU*', which displays the highest CPU consumption at the moment. Also, the server should appear as '*running*', not '*inactive*'.

There are also a few useful GUI elements on this window. Starting from the top-left:

Quit/Boot button: the server automatically boots itself when the instrument loads; this button should thus be green and displaying 'Quit' as the next option. You should not touch this button, as rebooting in this manner will only partially start the instrument. If you accidentally press it, you should recompile the instrument to start it again (see below).

k button: Kills the server, all sound, and the instrument. If you press it, you need to recompile the instrument to start it again (see below).

default button: you can ignore this

record button: This allows you to record the output of *Anadrasi*, saving it into a time-tagged file residing in a folder named 'recordings', in the same folder where the application resides. If this file gets accidentally deleted, *Anadrasi* will create a new one to store files into. The files will be 24-bit and in whatever sampling rate *Anadrasi* is running at the time of recording. If the granular synth is sent out through channels 1-2, i.e. together with the feedback patch, *Anadrasi*

will record a stereo file; if it is routed through channels 3-4 it will record a 4-channel file. You can find 'De-interleaver' a free software for splitting a multi-channel file into multiple mono files here: <http://www.birmingham.ac.uk/facilities/BEAST/research/mulch.aspx>

Volume row:

m button: general mute button for *Anadrasi*

volume number box and slider: general volume controls for *Anadrasi*

Notifier window

Some notifications and other information is posted here for the user. For example, letting you know that a preset was stored or loaded, that you are recording, that a soundfile (buffer) has been loaded or that it is already present in memory, etc.

Miscellaneous

Main Volume controls



Both the feedback synth and the granular synth have their own main volume control, consisting of a knob and an play/mute switch. These are controllable via their gui and via MIDI.

Stage limiter

Note that due to the brutal nature of the instrument, there's a final stage limiter to protect speakers and ears. Therefore increasing headroom via the volume knobs may result in not making the sound louder, but 'squashing' it / making it more distorted if it is already very loud.

High-pitch whine

Note that when the feedback synth is playing, once you turn off or bypass all processes a high-pitch whine may appear. This is due to the inherent delay between module7 and module0, which can retain some unprocessed sound circulating through the patch. Muting the synth will prevent this sound from going to the speakers.

Shortcuts for controlling GUI elements via the keyboard

To manipulate the Graphic User Interface you can use either your mouse or your keyboard.

knobs: click on one of the GUI knob elements to select it, and then use the following hotkeys:

<i>key press</i>	result
r	jump to random value
n	go to left end / minimum
x	go to right end / maximum

c	go to the center
[increment
]	decrement
up arrow	increment
down arrow	decrement
right arrow	increment
left arrow	decrement

number boxes: they can be incremented/decremented using the arrows or mouse, and set by entering a number and pressing return/enter on your keyboard

popup menus: use the mouse to select an item, or increment/decrement using the arrows on your keyboard

buttons & switches: can only be clicked with a mouse - no keyboard control

Failure to start: Attention! *Anadrasi* will not start if the sampling rate of the input and output devices are not the same

Application Menu items

Break

Stop, aka Cmd-Ctl-period, aka 'panic button'

Selecting *Break > Stop* from the application menu, or pressing Cmd-Ctl-period on your computer's keyboard. If you press this, all sound will stop; to recover the instrument you will have to either 'recompile' the instrument, the language, or restart the application.

Break > Hard Stop works in the same way, except it is even more drastic.

Compile Cmd-k, aka SuperCollider language recompile

Selecting *Break > Compile library* from the application menu, or pressing Cmd-Ctl-k on your keyboard allows you to recompile the SuperCollider language, and restart the instrument. It is one step short of restarting the application (and a bit faster), but more drastic than recompiling the instrument.

Recompiling the instrument

You can reset the instrument by selecting from the top application menu: *Recompile > Recompile Anadrasi!* This will allow you to restart the instrument without exiting the application. Most times, this will have the same effect as restarting, except it is much faster. The shortcut for this is Cmd-Ctl-r.

Help

You can launch this manual by selecting *Help > Anadrasi manual* from the application menu, or pressing Cmd-option-i on your keyboard

Quick Start

ATTENTION! turn the MOTU very soft (e.g. -36dB) before starting, as the instrument can be very loud! Once it is on, you can adjust the volume to your taste.

0. Launch the application

To start the feedback patch:

- A1. click on the 'routing' tab
- A2. click on one of the popup menus, adding the 'shaper' module
- A4. click on the 'main' tab
- A5. press the 'mute fdb/play fdb' switch to let the sound of the feedback patch through
- A6. turn on and adjust the 'shaper' parameters
...alternatively, you can skip steps A4-A6 and activate the feedback patch and the 'shaper' via MIDI
- A7+. add more modules to the patchbay, and turn them on.

To start the granular synth:

- B1. click on the 'browser' tab
- B2. browse to find a soundfile you want to granulate, and double-click on it
- B3. click on the 'grains' tab
- B4. turn on the granular synth
- B5. select your soundfile from the popup menu, so that it appears on the waveform view
- B6. press the 'mute grains/play grains' switch to let the sound of the granular synth through
...alternatively, you can do steps B5-B6 via MIDI
- B8+. adjust synth parameters and/or add more buffers through the 'browser' at will