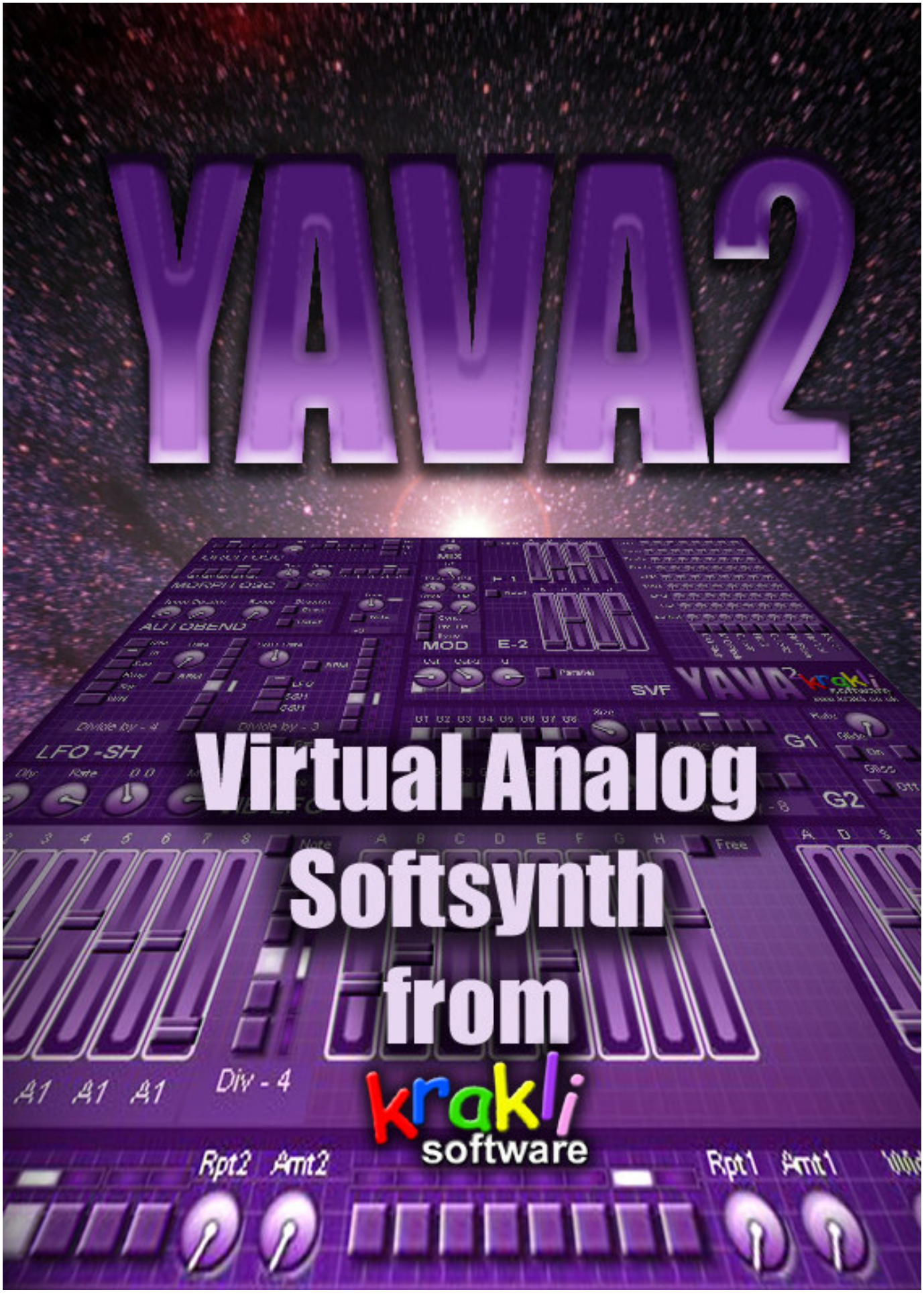

YAVA2
Virtual Analog
Softsynth
from
krakli
software

Operating Guide to YAVA 2 Softsynth

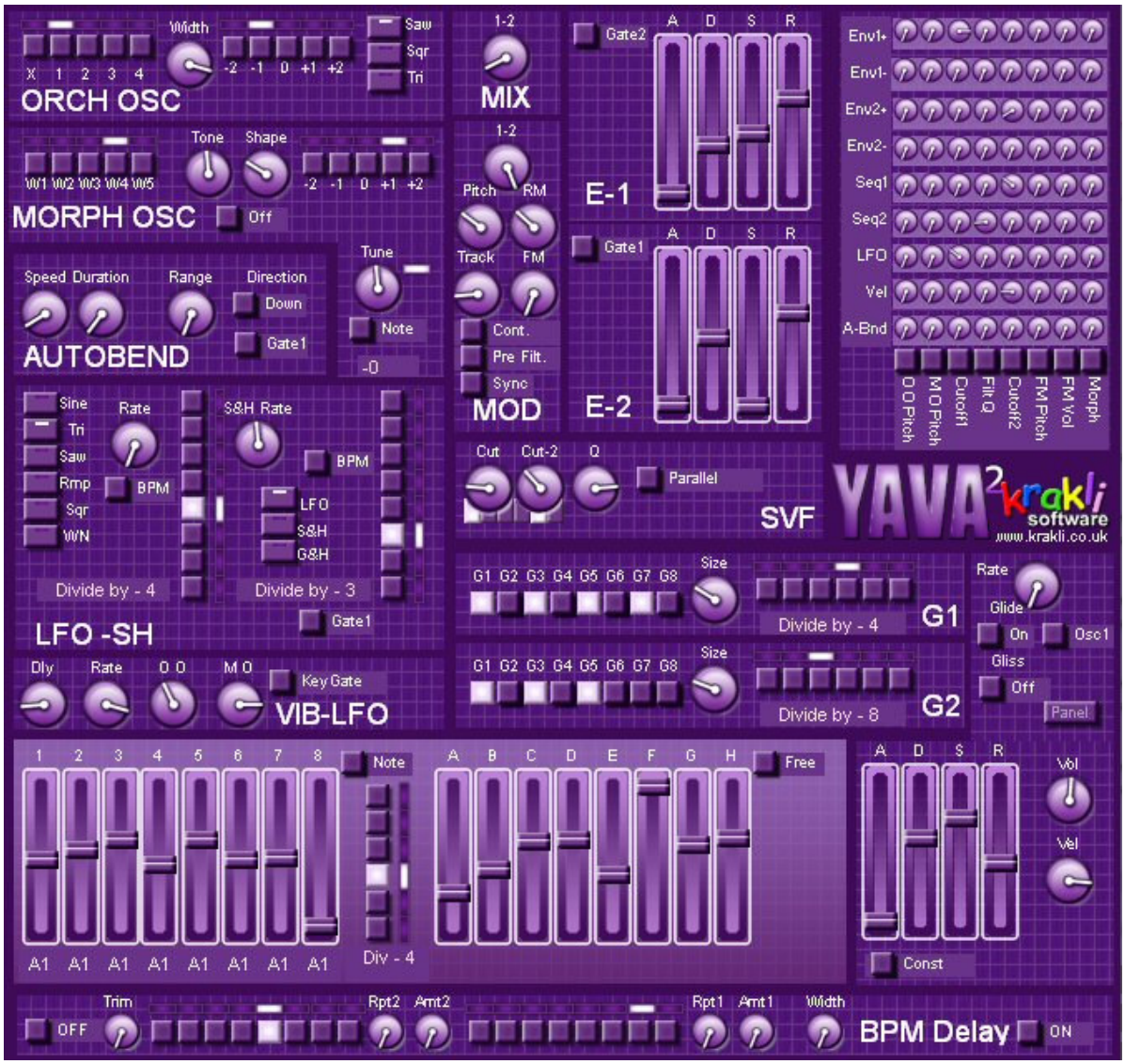
Krakli Software

http://www.krakli.co.uk

Krakli software are pleased to offer YAVA 2, a virtual analog synth designed to offer a flexible architecture and sonically and rhythmically charged sounds. YAVA 2 is supplied with a complete compliment of 128 preset sounds but we urge you to experiment and come up with sounds and tones of your own making.

This handbook seeks to help you to understand YAVA 2 and demystify some of its controls and the way that they interact. YAVA 2 is designed around separate modules, some of which are 'hard-wired' together internally, some of which are available as sources or destinations for the mod-matrix. YAVA 2 is also designed to integrate tightly with the tempo of your VST host. Many of its modules are available to be controlled by the host tempo, in turn these modules can then be used to trigger other modules, all of this will, hopefully, become clearer as you read through the detailed module descriptions within this Guide.

The YAVA 2 interface:



As you can see YAVA 2 is a very complex beast and offers very many controls, however to enable you to get to grips with it sooner we can break the controls down into a few common types:

The Rotary Control or Knob:
The most common control used in YAVA 2. You adjust the amount of effect of the control by clicking within the knobs perimeter and whilst holding down the mouse button down moving the mouse in a an up & down direction. Finer control can be achieved by holding down the CTRL key whilst moving the mouse.

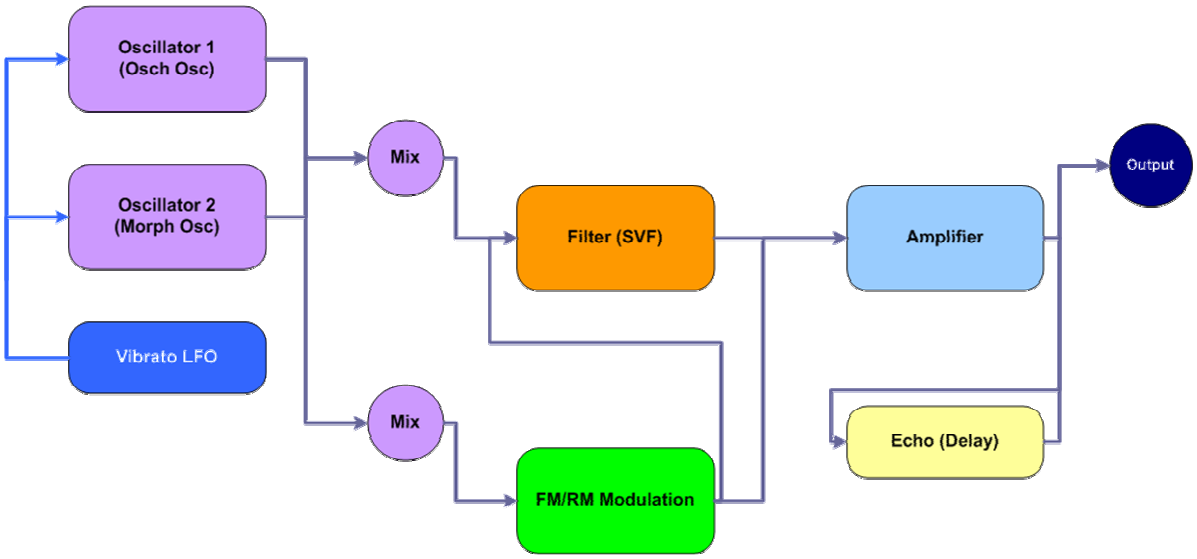
The Vertical Slider:
Used for the Envelopes and the sequencer row. The amount of the sliders effect is achieved by clicking on the slider handle and whilst holding down the mouse button moving the mouse in an up & down direction. Finer control can be achieved by holding down the CTRL key whilst moving the mouse.

Selector Buttons:
Are used to sequentially step through one or more options. This is achieved by clicking on the body of the selector with the left mouse button.

Large Toggle Selectors:
Used to choose between various options (e.g. Oscillator waveforms) Only one option is active at a time and the current selection is indicated by the indicator light on the control.

Small Toggle Selectors:
Used to choose between various options (e.g. LFO clock rates) Only one option is active at a time and the current selection is indicated by the indicator light beside or below the control.

How YAVA 2 works…
Although YAVA 2 is a complicated beast with lots of controls and interactions its basic audio architecture relies heavily on the classic analog structure of synths like the Moogs or the ARP series. The flow diagram below shows this flow in action.



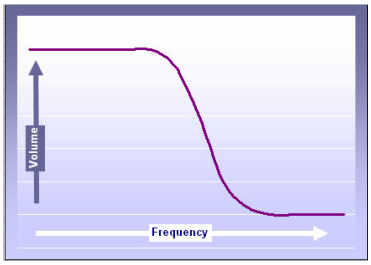
For those that are new to the world of synthesis we will take a little time to explain the basic concepts.

The Oscillators
These are the basic sound producers in a synth, their tone or quality of sound is established by the waveform that they produce. The names of these waveforms are derived from the shape that they describe when viewed on an oscilloscope.

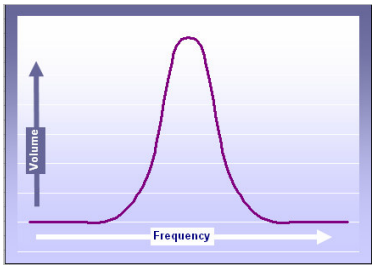
Sine: The 'purest' waveform. The sine wave can be very useful when played at low pitches to add power to bass sounds but generally is less useful in a subtractive synth like YAVA 2 as there are very few upper harmonics to effect later in the audio path.
Triangle: Very slightly harsher than the sine wave the triangle contains fractionally more upper harmonics.
Sawtooth & Ramp: Differing only in the direction of their slope, the sawtooth waveforms are potentially the most useful waveforms in a subtractive synth. The reason for this is that they have a naturally harsh or buzzy tone which lend themselves well to brass or traditional synth twangs. However, the harmonic richness of the sawtooth waveforms respond well to treatment by the filters etc.
Square or Pulse: This waveform is described as a square wave when the durations of its positive and negative state are equal, and a pulse wave when they are not equal. The square wave is useful for flute or clarinet like tones and the pulse wave for more reedy tones like the oboe.
Noise: A non musical tone most easily described as a harsh hiss, Noise is useful for rhythmic effects.

Low Frequency Oscillators (LFO)
Exactly the same in structure as the oscillators but playing at frequencies below the audio range, LFOs are used to modulate other modules. For example when applied to the pitch control of an Oscillator an LFO causes a vibrato (or pitch wobble) effect. The LFO can obviously be used to modulate may sources with cycle rates from very slow (>1 sec) to just below audio frequencies (20 hz).

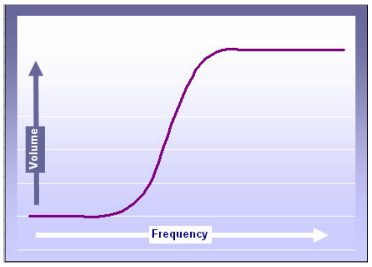
Filters
Filters are used to attenuate all frequencies above, below or either side of a cutoff point. The 3 most common types of filter are Low-pass, Band Pass and High Pass. The effect of the filter is described in terms of the amount of attenuation of the volume in decibel steps for each doubling of the signals frequency (octave) e.g. 12db or 24db. The point at which the cutoff starts can be accentuated by use of the resonance or 'Q' controls. These give a more peaky sound. When the cutoff of the filter is modulated by a control source such as the envelopes or LFOs you get the familiar twangy synthesizer tone so popular since synths were first used.



Low Pass Filter Slope



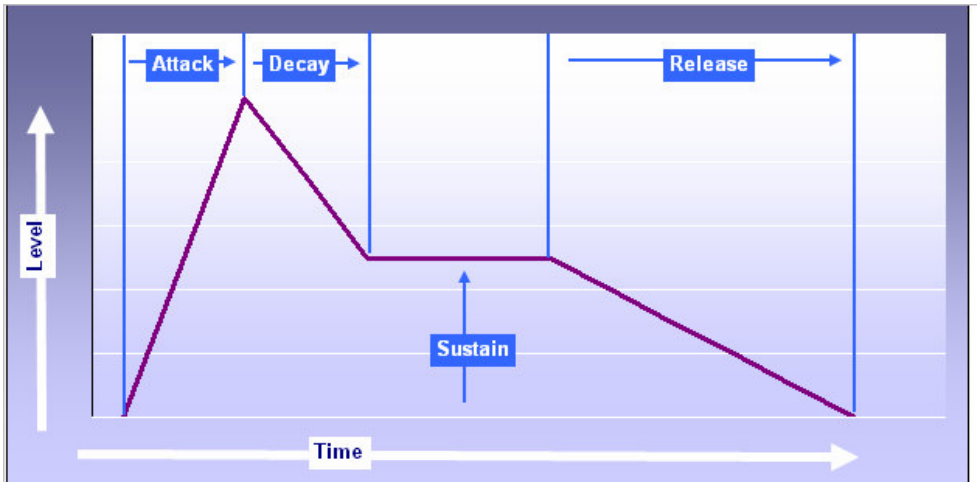
Band Pass Filter Slope



High Pass Filter Slope

Amplifiers
Used to control the volume or level of signals the Amp section of a synth comes into its own when modulated with an envelope. This means that the notes played can adopt the basic properties of percussive (e.g. piano) or sustained (e.g. organ) tone.

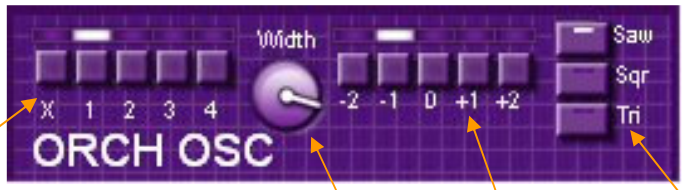
Envelope generators
The envelope generator or Env control does not produce any audio or effect any audio itself. Like the LFOs it is used to provide a control signal that can be used to modulate other sources: Filters Amps or Oscillator pitch, for example. Typically an envelope generator consists of 4 controls for Attack, Decay, Sustain & Release. This are often referred to as the ADSR controls.



- **Attack:** is used to control the time taken for the signal to rise from zero to its maximum.
- **Decay:** controls the rate of descent from its maximum to its sustain level
- **Sustain:** This is the level above zero that the signal decays to and is held for the duration of the envelopes trigger pulse or gate (typically a key-down on the midi keyboard).
- **Release:** is the time for the signal to 'die' away after the release of the trigger pulse or gate.

The YAVA 2 modules in detail.
Now it is time to go through each of the YAVA 2 modules in detail and examine the controls and features within each one. No matter how much detail this document went into it would never be possible to describe in detail every possible permutation of control interaction. Although experimentation is the key to success here, extremes of certain controls might mean that you get a situation where no audio can be heard. The trick is to move individual controls whilst playing a sequence of notes so that you can hear the results as you make the changes.

The Orch Oscillator.



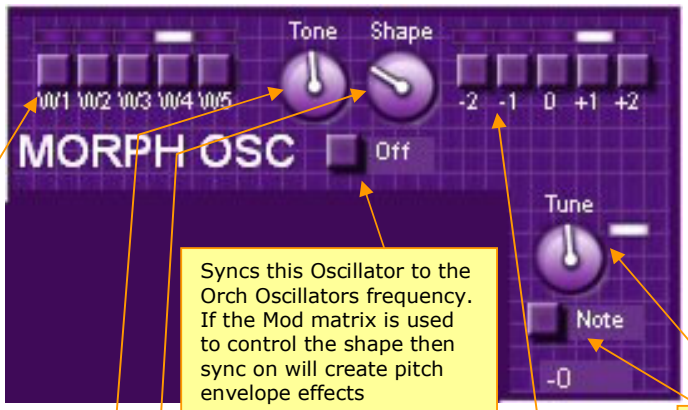
Used to control the various footages of the multiple oscillators within this module. Gives varying degrees of thickening to the sound.

Used to control the fine detuning of the modules internal oscillators. Creates a moving swirling nature to the sound.

Octave control for the module.

Waveform type for this module

The Morph Oscillator.



Used to control the basic waveform of the Oscillator

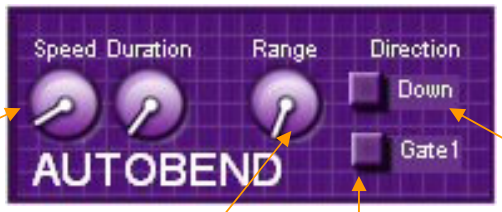
These two controls are used to shape the sound. Dependent upon the setting of the waveform selector. The Shape control morphs between the two basic wave-shapes, the Tone control adds upper harmonics

Syncs this Oscillator to the Orch Oscillators frequency. If the Mod matrix is used to control the shape then sync on will create pitch envelope effects

Octave control for the module.

Detunes The Morph Osc from The Orch Osc. The range can be note based with a display of semitone shift, or fine-tuned. In both cases a setting of 0 percent shift will light the LED alongside the control

AutoBend.



The Autobend creates a simple rising or falling control voltage at the start of each note-on or Gate-Array event. The Duration of the sweep and the time taken to rise to maximum is controlled by the Speed and Duration controls.

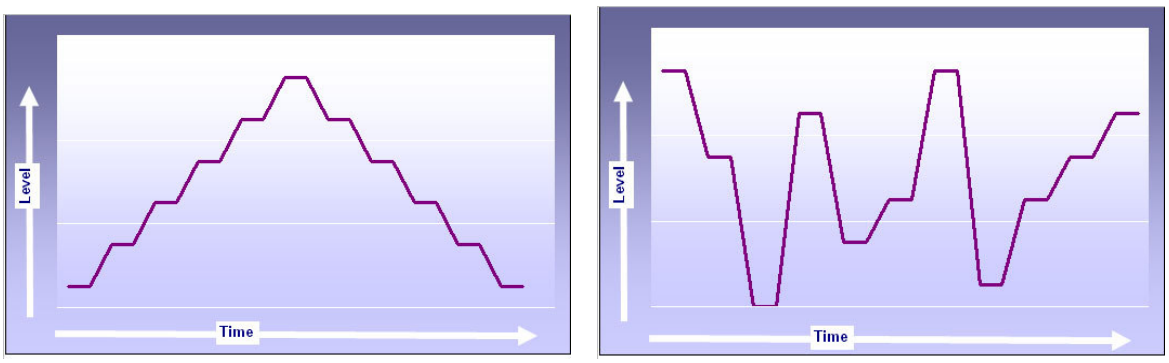
The Range control sets the maximum range of the autobend effect

The Autobend can be re-triggered from each key-press on the Midi Keyboard or by each pulse from gate arrays 1 or 2

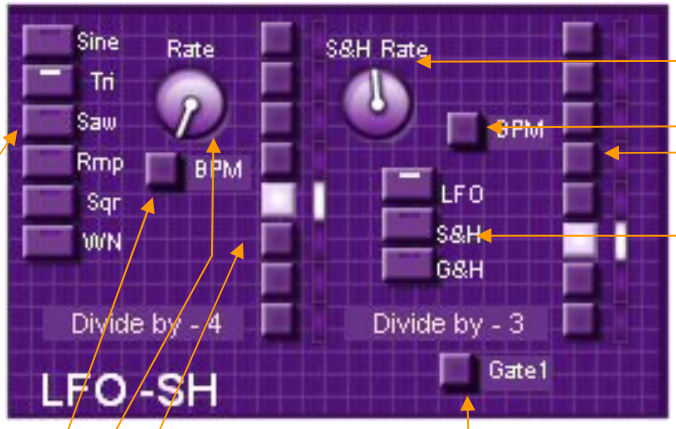
Sets whether the note bend up or down upon each trigger pulse

LFO-SH.

This module provides both LFO control voltages and Sample & Hold voltages. Sample and hold is when you pass a waveform through a circuit which takes a reading (sample) of the waveform at a point in time and maintains a constant (holds) of that waveforms value until the next clock cycle occurs when it takes another sample and so on. If you were to use a Sine wave as the sampled waveform you would get a ladder or staircase effect as illustrated below left:



The more familiar Sample and hold effect is to use White-noise as the sample waveform and that gives a random control voltage as illustrated above right: When used to modulate an oscillators pitch it gives the well known 'computer-working' noise.

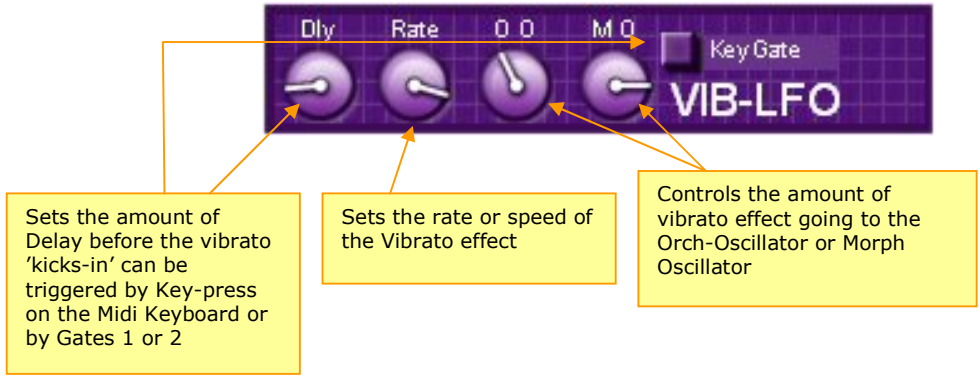


Used to control the waveform of the sampled oscillator

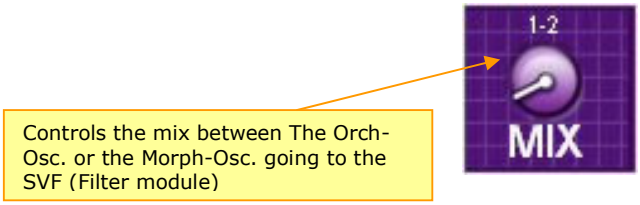
If the switch is set to BPM the speed of the cycle of the sampled waveform is controlled by the toggle switches, if the switch is set to free the rate of the sampled waveform is controlled by the Rate knob

If the Toggle switch is set to LFO the sampled waveform bypasses the Sample and hold circuit and passes as an LFO control voltage to the Mod matrix. If the Toggle switch is set to S&H the S&H clock rate is set by the divisor toggle switches if the BPM button is on, or by the S&H rate knob if the Free button is on. If the Toggle switch is set to G&H then the Sample & hold is triggered by either Gate 1 or Gate 2 depending on the setting of the Gate switch

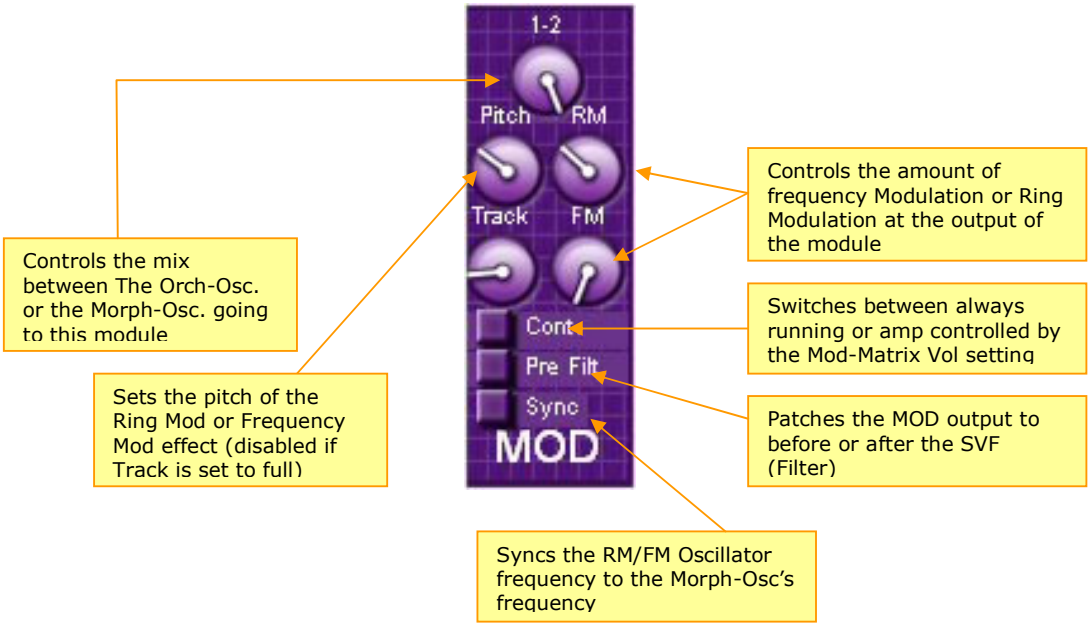
Vib-LFO.



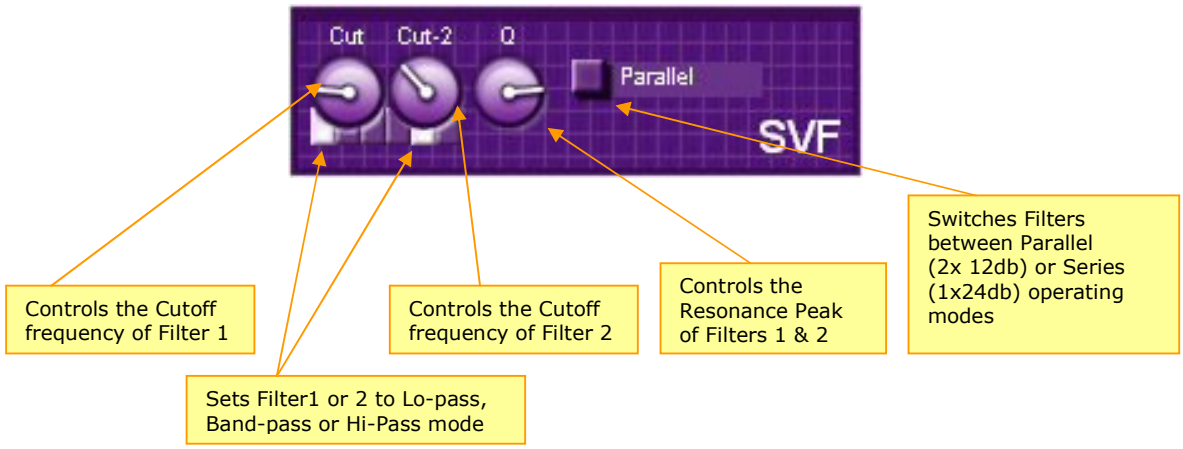
Oscillator Mix.



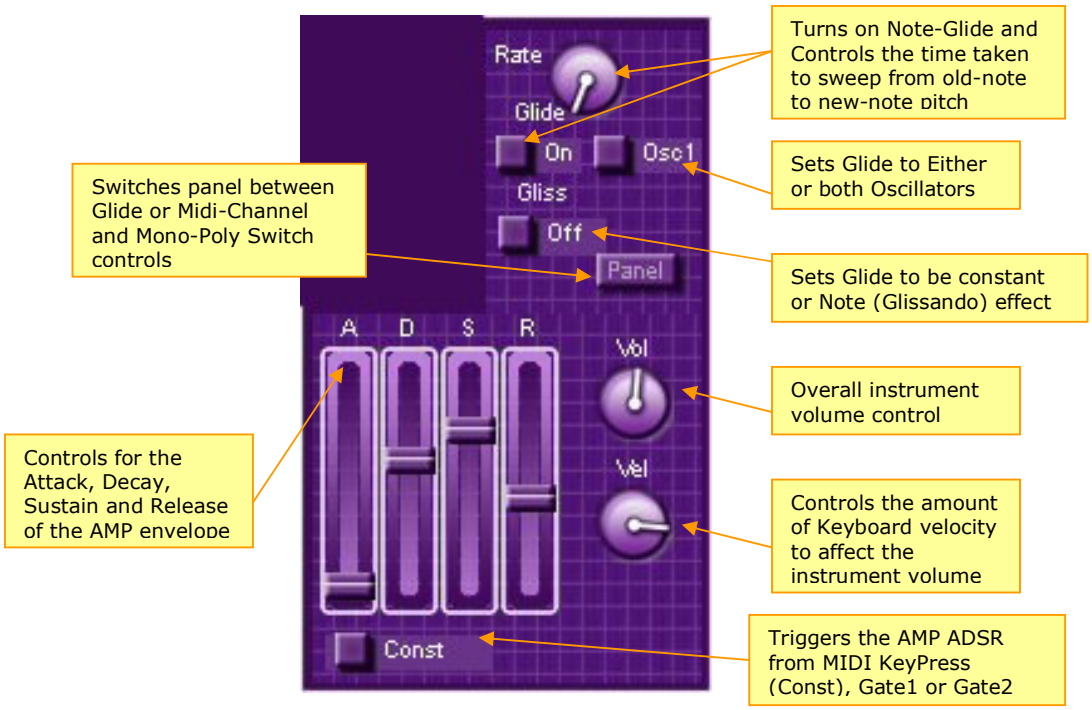
MOD.



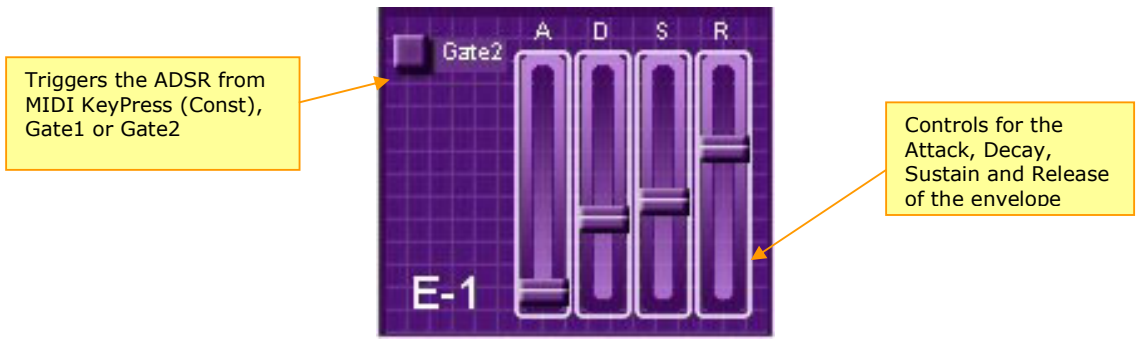
SVF. (State Variable Filter)



AMP (& Global Controls panel).



Envelopes 1 & 2.



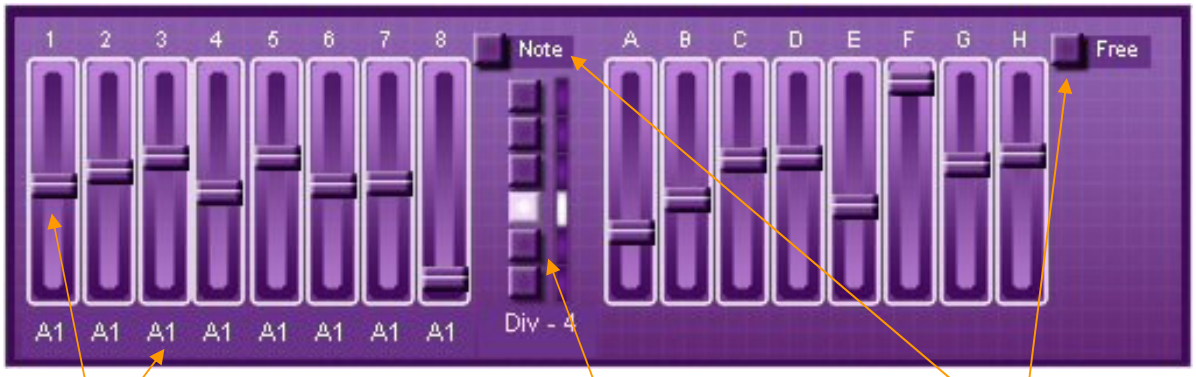
Gate Arrays 1 & 2.

Used to switch on a pulse at the beat determined by the clock divisor

Sets the Duration of the gate pulse

Divides the BPM frequency used to set the speed of the Gate effect

Sequencer Rows 1 & 2.



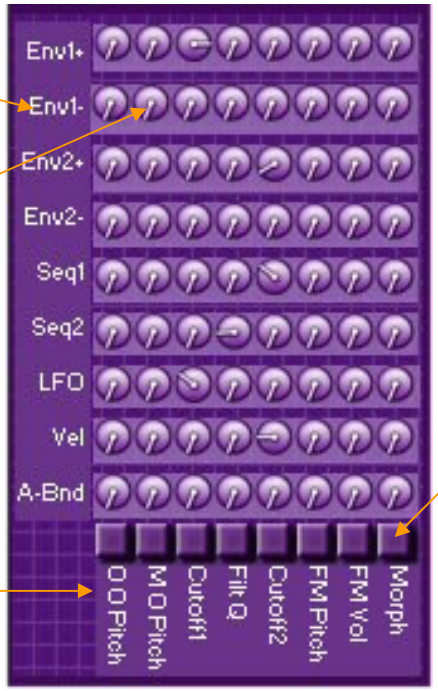
Used to set the Step Frequency. When Switch is set to note, the display below each slider will show the note pitch whilst editing

Sets the speed of the sequencer rows as a division of the Host BPM

Sets the Control sliders to continuous voltage change or Note values

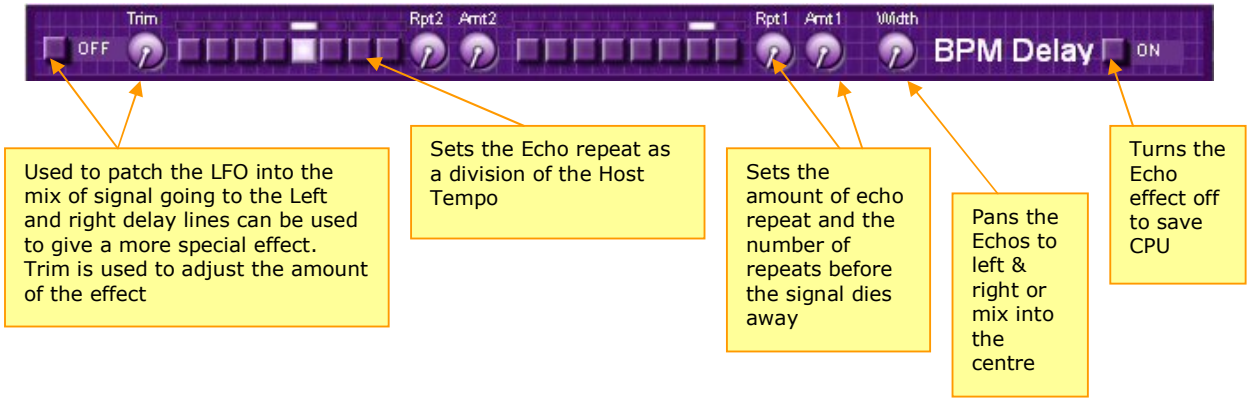
Mod matrix.

Used to 'connect' the inputs on the left of the grid with the outputs at the bottom of the grid. The amount of effect is determined by the setting of the control knob at the point of intersection



These switches changes the range of the effect by a factor of /10 for more subtle effects

BPM Delay lines.



Acknowledements...
YAVA 2 would not have been possible without the help and assistance of the following:

Jeff McLintock the creator of SynthEdit.
David Haupt. The provider of some truly excellent SE Modules
Chris Kerry. For providing the sensational Delay Module.

vurt, Steven West, Tim Conrardy, jtxx000 for Patch writing and Bug testing.

www.synthedit.com

www.krakli.co.uk