



1.5.0 User Manual – Rev B

Overview

VK-1 Viking Synthesizer is a monophonic synthesizer. It has three variable wave oscillators, two filters for a Dual Lowpass or Highpass/Lowpass configuration, a multi-wave LFO, and two modulation busses. VK-1 has state of the art DSP technology to achieve a hardware-like sound without overworking your CPU.

Patches

VK-1 comes with 228 patches in the categories Bass, Bright Lead, Electro Bass by eXode, FX (Effects), Perc Lead (Percussive Lead), Soft Lead, and Synthwave by eXode. These categories are well suited to a monophonic instrument like VK-1.



Performance Control

Patches do not affect the Pitch and Mod Wheels. These performance controls are used in all patches. The Pitch Wheel affects the pitch of the three oscillators. The Mod Wheel controls the amount of modulation due to the Mod Wheel modulation bus. The Pitch Range sets the maximum number of semitones that the Pitch Wheel can adjust the oscillator pitch.

Oscillators

The middle three columns of the front panel control the three oscillators.



Octave

The Octave selector sets the octave of the oscillator. Note that the octave labeled 4' directly matches the keyboard pitch.

Frequency

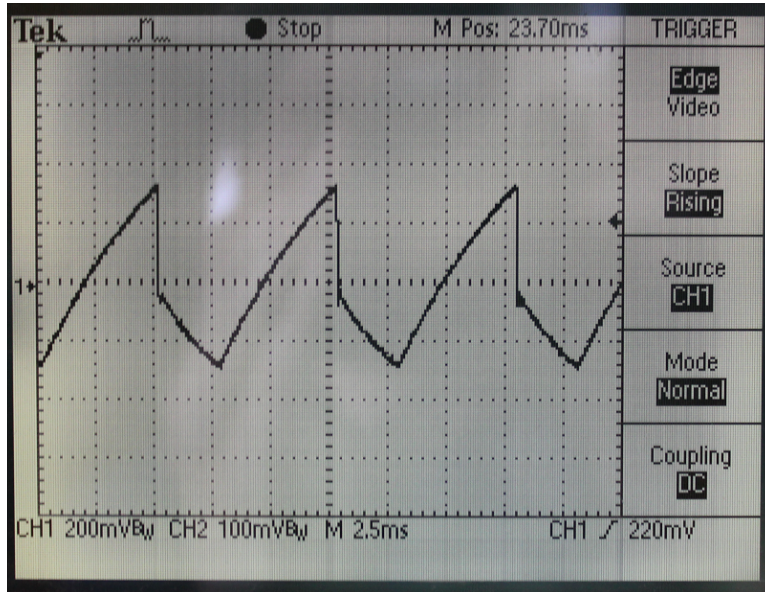
The Frequency knob adjusts the pitch of the oscillator. The knob adjusts the pitch in the range of -7 to +7 semitones away from the true pitch. When fine frequency adjustment is enabled in the programmer, the knob adjusts the pitch in the range of -0.7 to +0.7 semitones. The fine adjustments are useful for subtly fattening the sound of a patch.

Wave

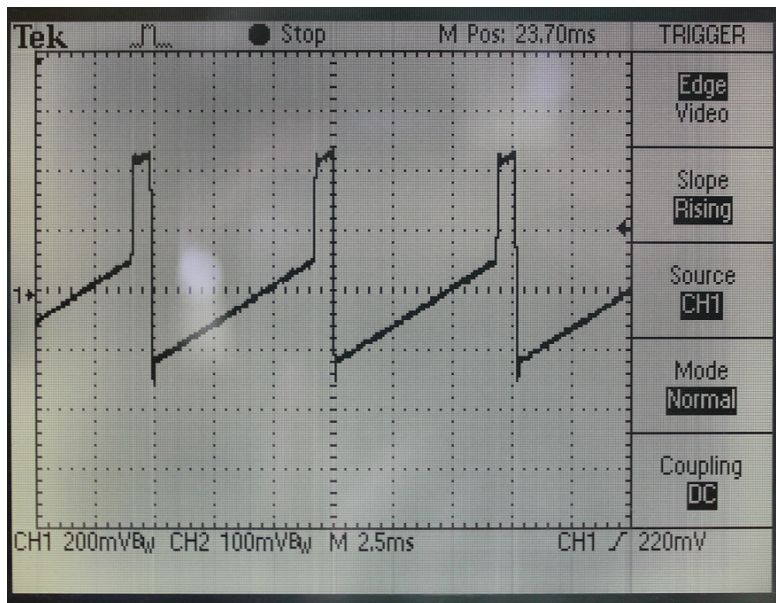
The Wave knob adjusts the waveform of the oscillator. The waveform changes from triangle to saw to square to PWM as the knob is swept from left to right. A triangle is useful as a mellow sound, a saw as a bright and buzzy sound, a square as a hollow digital sound, and a PWM as a

thin grainy sound. Since the knob is continuously variable, the in between sounds offer many possibilities.

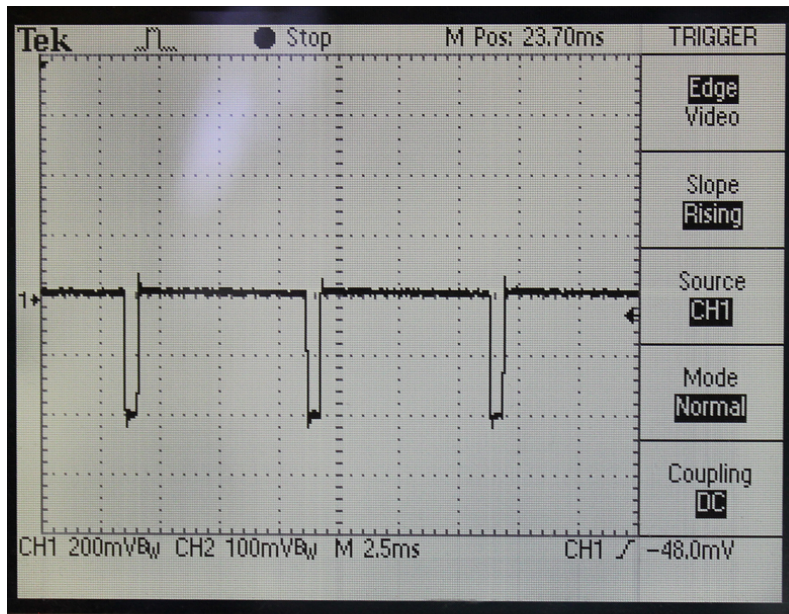
This image shows the oscillator with the Wave knob between triangle and saw. The downward slope of the triangle becomes shorter and lower as the knob moves toward saw.



This image shows the oscillator with the Wave knob slightly past saw toward square. As the waveform transitions from saw to square the pulse becomes wider and the ramp becomes lower and shorter.

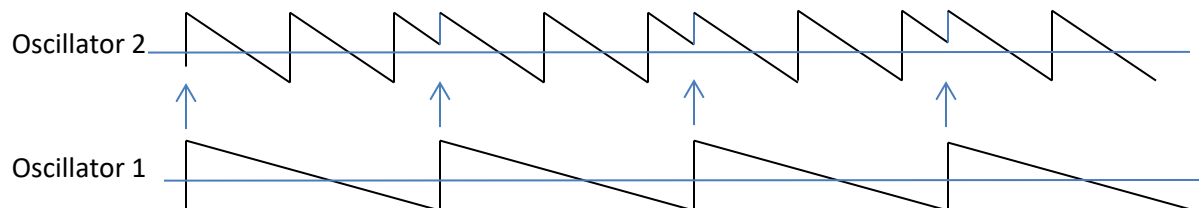


From square to PWM the waveform looks more typical. The pulse continues to widen past the square shape and the whole waveform shift downward. What used to be the saw ramp eventually ends up as a short negative pulse.



1-2 Sync Switch

The 1-2 Sync Switch locks oscillator 2 to the frequency of oscillator 1. This is done by resetting oscillator 2 to the beginning of its waveform whenever oscillator 1 repeats its waveform.



3-1 FM Switch

The 3-1 FM Switch hooks the output of oscillator 3 into the frequency control input of oscillator 1. Both the waveform and frequency of oscillator 3 can greatly affect the resulting sound.

3 KB Cont

The Oscillator 3 Keyboard Control Switch selects whether or not the keyboard controls the pitch of Oscillator 3. When set to on, Oscillator 3 tracks the keyboard. When set to off, Oscillator 3 is a C#3 pitch.

3 Freq

The Oscillator 3 Frequency Switch selects whether Oscillator 3 is high or low frequency. When it is set to high frequency, octave 4' matches the keyboard notes as usual. When it is set to low frequency, the pitch of Oscillator 3 is six octaves below what it would be in the high frequency setting.

Mixer

The mixer section is used to adjust the volume of the oscillators and external input. The mixer sources are summed and output to the filter.



External

The external audio input is available on the back of the device. The switch turns the input on and the knob adjusts the level.

Oscillators

The switches enable the audio of each oscillator and the knobs adjust their level.

Noise

The switch turns on the audio from the noise source and the knob adjusts its level.

At first it may seem like the switches enable the oscillators and noise source themselves. But actually the oscillators and noise are always available as modulation sources. These switches and knobs control the audio mix.

Filters

The filter in VK-1 is actually two filters. These filters are modeled after the classic transistor ladder filter. In Dual Lowpass mode the filters are in parallel in the left and right output channels. In HP/LP mode the filters are in series, one highpass and one lowpass. The number of poles is adjustable from 1 to 4. More poles create a steeper slope and a sharper cutoff.



Cutoff

The cutoff frequency is known by many names. It is often called the 3dB point, transition point, or knee of the filter. It is where the pass-band ends and the downward slope begins. In a lowpass filter the response slopes down at 6 dB per octave per pole above this frequency. You can consider frequencies above this frequency to be mostly rejected or “filtered out” by the filter. And in VK-1’s band-pass filter (HP/LP), the cutoff is at the high end of the pass-band since it is controlling the lowpass part of the bandpass, see Spacing for more detail.

Spacing

Spacing is where the two filters come into play. Spacing adjusts the frequency difference, in octaves, between the two filters. In Dual Lowpass mode, one filter is heard in the left channel and the other in the right. Spacing adjusts the cutoff frequency of the left filter with respect to the right.

In Highpass/Lowpass mode, Spacing also adjusts the difference in octaves. But in this case the two filters are in mono, and spacing adjusts the highpass filter with respect to the lowpass. The highpass filter is one octave below the lowpass when the knob is fully turned to the right, and decreases in frequency as the knob is turned to the left. So, turning the knob to the left widens the pass band.

Resonance

The resonance knob adjusts the gain of positive feedback from the output of the filter to the input. It creates a peak in the filter response at the cutoff frequency. This can be thought of as a very narrow “bandpass” filter created at the cutoff frequency resulting in a ringing sound.

Res Comp



The Resonance Compensation dial found on the back of the device boosts the volume as resonance is increased. This is useful because more resonance results in lower gain from the filter.

KB. Amount

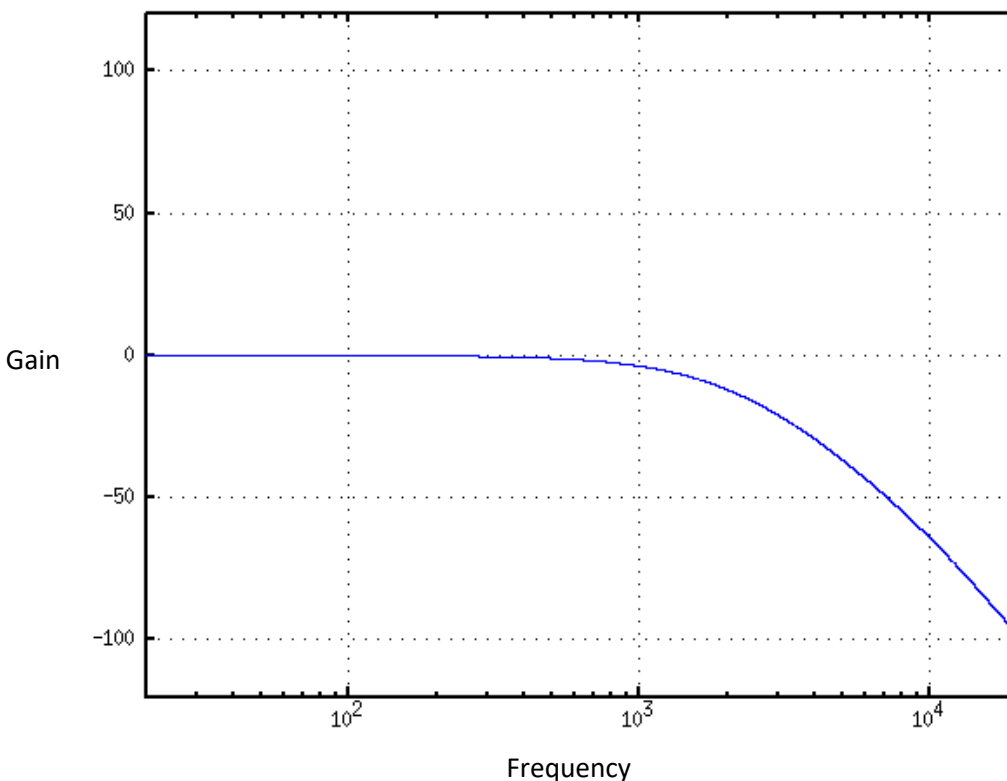
Keyboard Amount controls the tracking of the filter with respect to the keyboard notes. When Keyboard Amount is turned to zero, the filter cutoff frequency does not depend on the note being played. When Keyboard Amount is turned all the way up, the filter cutoff frequency moves one semitone per key and exactly tracks the keyboard.

Mode

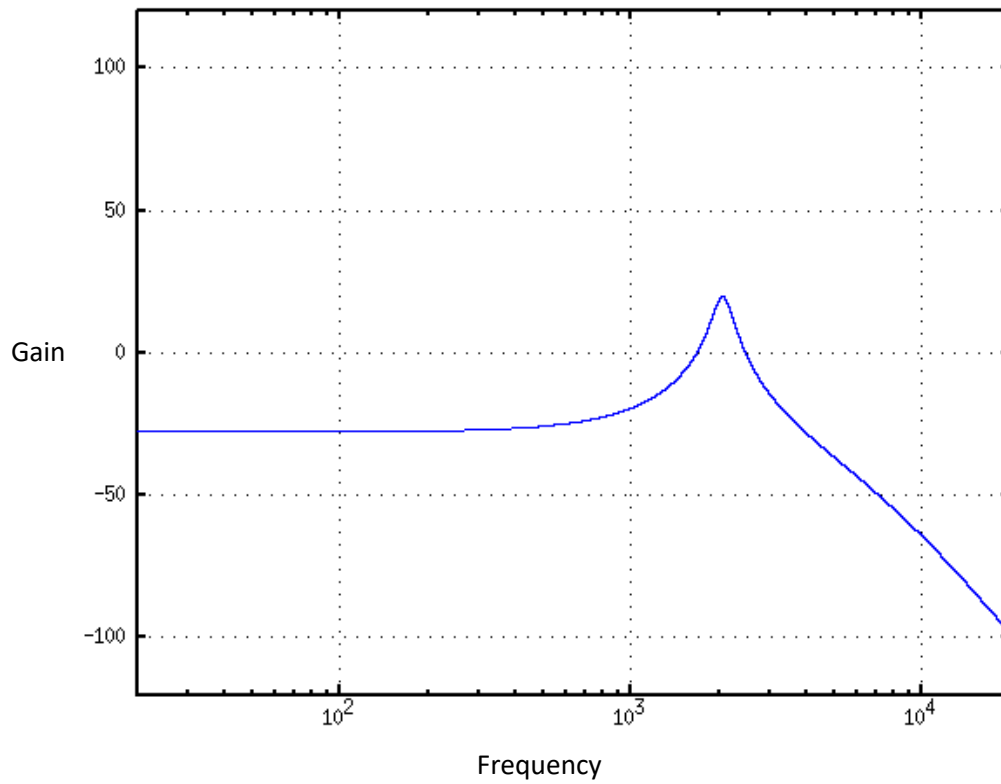
Mode selects whether the filter is Dual Lowpass, one filter in the left channel and the other in the right, or Highpass/Lowpass, a bandpass filter created by a highpass and lowpass in series.

Frequency Response

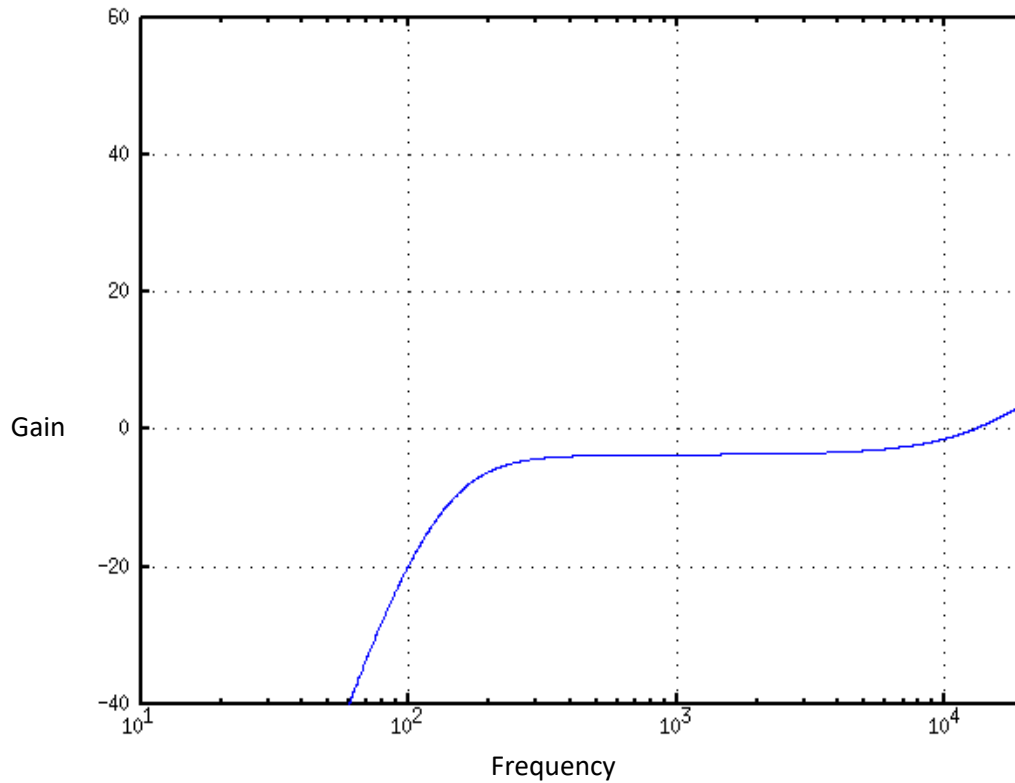
This image shows the frequency response of VK-1's 24 dB per octave lowpass filter. The low frequencies have a flat response and frequencies past the cutoff point are attenuated. When less the 4 poles are used, the slope is not as steep.



Now the resonance knob has been turned up. Notice the peak at the cutoff frequency.

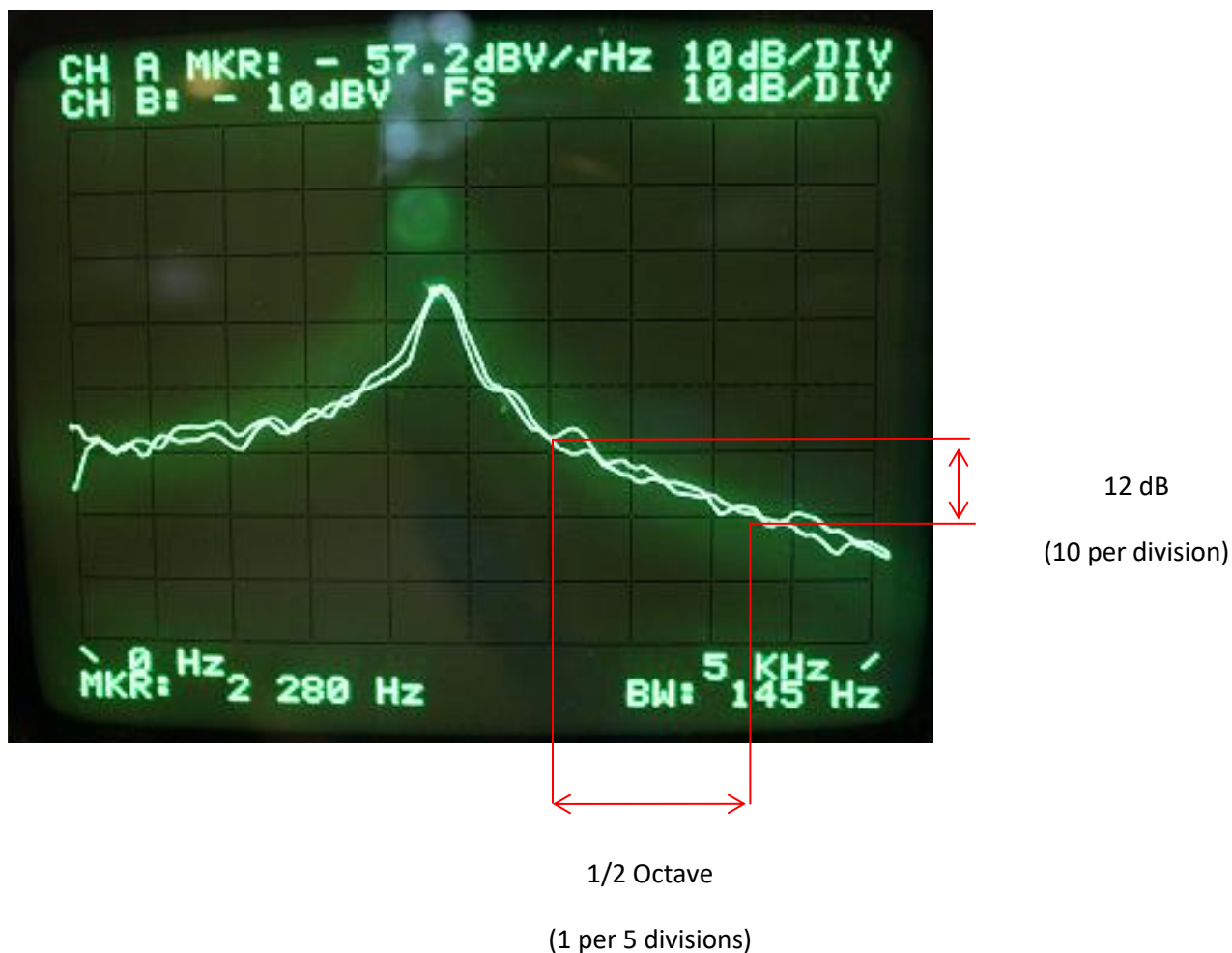


When in Highpass/Lowpass mode, one of the filters is a highpass filter. The two filters are connected in series to create a bandpass filter. Here is the highpass filter section.



Note that the lowpass filter is always the resonant filter. The highpass filter does not resonate.

This image shows a side by side comparison of an analog lowpass filter and VK-1's lowpass filter with a cutoff frequency of 2.2 kHz and a setting of 7 on the resonance knob. The left side of the curve shows the flat response, then a peak at the resonant frequency, followed by a steady downward slope of 24 dB per octave. Half an octave of downward slope is marked on the graph to show that the slope is truly 24 dB per octave.



Envelopes

The envelopes control the filtering and volume of the sound to create movement within a note. The filter envelope controls the filter cutoff frequency. The volume envelope controls the output amplitude of the sound.



Attack

Attack is a measurement of the time it takes the envelope to go from zero to full amount in the initial phase. The attack time ranges from 1 millisecond to 10 seconds.

Decay

Decay is a measurement of the time it takes the envelope to go from the maximum to the sustain level in the second phase. The decay time ranges from 1 millisecond to 10 seconds.

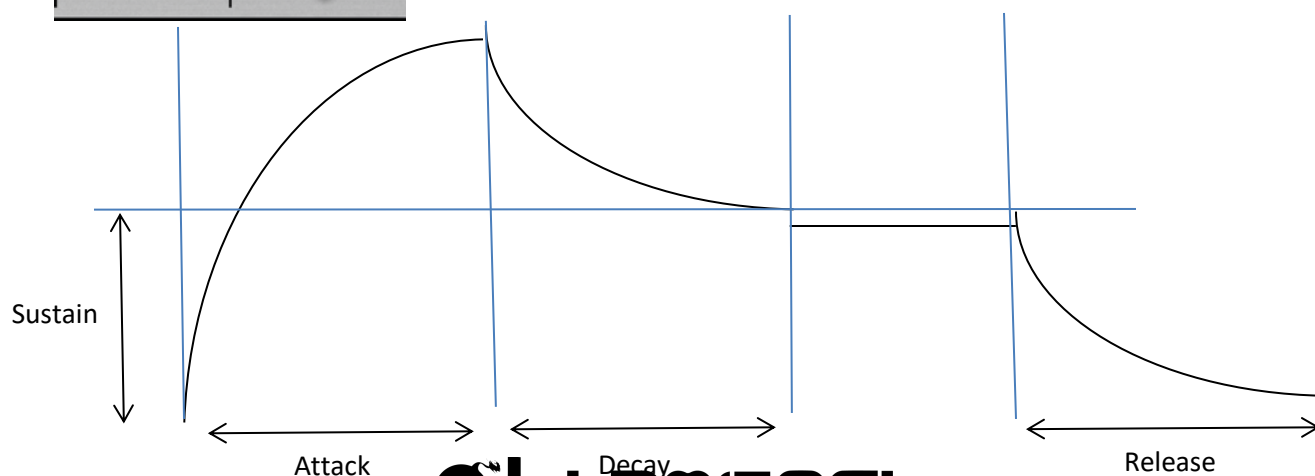
Sustain

Sustain is an amplitude measurement. It is the settling amplitude of the third phase of the envelope, while a key is held.

Release

Release is a measurement of the time it takes the envelope to go from the sustain level back to zero when a key is released.

When a key is pressed the first three phases occur. When the key is released the Release phase occurs.



Amount

The Amount knob controls how the filter cutoff is affected by the filter envelope. When it is set to zero the envelope has no effect on the cutoff. When it is set to +5 the filter cutoff will move seven octaves above its original value at the envelope maximum. When it is set to -5 it will move a maximum of seven octaves below its original value.

Volume

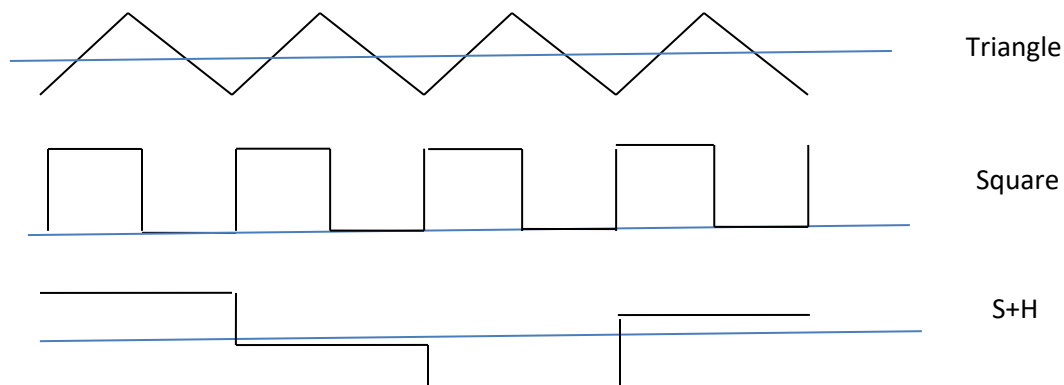
The Volume knob is the last stage of the synth. It controls the overall volume after mixing and enveloping has occurred.

Sustain Pedal

When the sustain pedal is depressed the envelope will stay in the sustain phase as if a key is held down.

LFO

The LFO is a low frequency oscillator used for modulation. Its output is a triangle wave, a square wave, and sample and hold.



Notice that the triangle wave is positive and negative while the square wave is only zero or positive. The Sample and Hold signal is positive and negative. The Sample and Hold signal gets its name because an input is sampled and then that value is held during one period of the LFO. Normally, this input is noise, so the held value is random. The Sample and Hold input signal may optionally come from a CV input.



Rate

The Rate knob controls the rate of the LFO. In free running mode the frequency ranges from 0.2 Hz to 50 Hz. In synced mode, rhythmic divisions of the current tempo are available.

LFO Sync

LFO Sync can be used to optionally reset the LFO or lock the LFO to the song tempo. When Free is selected the LFO is not locked to the tempo. When Gate is selected, the LFO waveform resets to the beginning of a period whenever the gate opens. This occurs when a key is pressed without another one held. When Keyboard is selected, the LFO waveform resets any time a key is pressed. Sync locks the LFO to the current tempo and changes the meaning of the Rate knob to beat divisions.

Tuning

There are many parameters that affect tuning in VK-1. Tuning is a very important factor in achieving an analog sound.

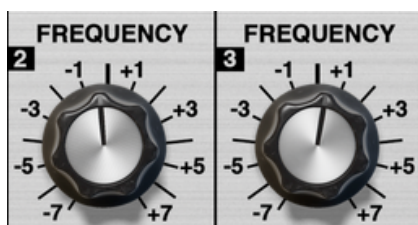


Fine Tune

Fine Tune adjusts the overall tuning, including all three oscillators. Generally, it would be used to transpose the instrument or adjust the pitch of the oscillators simultaneously. It is the only way to adjust the pitch of Oscillator 1.

Glide

Glide Rate, also known as portamento, adjusts how quickly the oscillator pitch changes to a new note. Turning the Glide Rate up makes the pitch transition smooth between notes.



Oscillator Frequency

Both Oscillators 2 and 3 have a frequency control for adjusting their pitch with respect to Oscillator 1. Detuning notes by semitones can create chords. Fine adjustments of these knobs can widen or fatten the sound of a patch.



Drift

Drift simulates the instability oscillators have in their frequency. Even when the tuning trim pots have been set very accurately the oscillator frequency of an analog oscillator drifts slightly up and down, causing it to be slightly out of tune. Turning this control down will fix the frequency at an exact rate. Turning it up magnifies the effect.

KB Stretch

Keyboard Stretch adjusts the tuning of the keyboard notes. Normally, each key is one semitone apart. Analog keyboards often go out of tune, and the keyboard spacing is no longer one semitone. The note spacing can be adjusted from 0.98 semitones to 1.02 semitones. C5 is at the center while the rest of the notes become detuned. If you don't want C5 to be in tune you can adjust the Fine Tune or the oscillator frequency controls.

Modulation Busses

The Modulation Busses allow you to route signals that can subtly or drastically impact aspects of the sound of a patch depending on how much or what is modulated. They allow for much more complex sounds than can be achieved with the oscillators and filters by themselves.

There are two modulation busses, MW for Mod Wheel, and On. The Mod Wheel bus has its final amount controlled by the Mod Wheel. The On bus is always on, its amount is set with the Amount knob.



Source

The busses can be thought of as electrical busses, or simply connections to a common circuit. The Source selects the input to be connected to the bus. The source can be one of the LFO waveforms, an external CV connection called Mod1/Mod2, or PGM which means that the option is selected in the programmer.

Destination

The Destination connects the bus to a control input of another part of the synth. It effectively connects the source to the destination. Pitch affects the pitch of all three oscillators. OSC 2 and OSC 3 affect only the pitch of Oscillator 2 and Oscillator 3 respectively. Filt, or Filter Cutoff, controls the Filter Cutoff frequency. Wave controls all three oscillator wave-shapers concurrently. And PGM means that the destination is selected in the programmer.

Shaping

Shaping can be used to increase the effect of the source on the destination, increasing the amount of modulation. Shaping values are in a positive range, zero or more. As the Shaping parameter increases the effect of the source increases. For example, if the shaping is set to Pressure, lightly holding down a key will result in the typical amount of modulation. But pushing the key down harder will increase the modulation. Filt Env uses the Filter Envelope as shaping. Velocity uses the MIDI velocity of the current note. Pressure uses MIDI aftertouch. And PGM mean the option is selected in the programmer.

Common Tricks

One common trick is to use filter envelope (Filt Env) shaping with the filter envelope (Filt Env) as the source and the filter (Filt) as the destination. This technique can greatly increase the filter cutoff movement. Note that the source would be selected in the programmer as Filt Env.

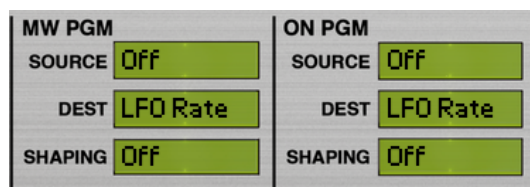
Another trick is to use velocity to control the filter cutoff. For this you can use Constant as the Source, filter (Filt) as the Destination and Velocity as the Shaping. In general, when you want to use the shaping as an effect you may want to choose Constant as the Source.

If you don't want to use a modulation bus, set its Amount to zero or choose the source as PGM with Off selected in the programmer.

See the Programmer section for an explanation of more modulation parameters.

VP-1 Viking Programmer

The VP-1 Viking Programmer is an optional unit that can be connected to the VK-1 through its bottom dock connector. See the installation guide to prevent damage while mounting it in the rack. The Programmer gives access to internal settings that would normally be fixed values. It allows the PGM settings on the modulation busses to be set to user programmable settings. It also allows for tweaking of other device settings in VK-1.



Modulation Bus Programming

The Mod Wheel and On busses have PGM settings on their Source, Destination, and Shaping knobs. When PGM is selected, the Programmer takes control of the routing based on the user's selection from a list of choices.

Source

- Off – Zero
- Constant, -Constant – A steady value
- Noise – A noise source
- Filt Env – The filter envelope
- Filt Env – Zero minus the filter envelope, or the envelope negated
- S - Filt Env – The filter sustain amount minus the filter envelope. This results in a positive value initially, going to a zero value during the sustain phase, then back positive
- Filt Env - S – The filter envelope minus the filter sustain amount. This results in a negative value initially, going to a zero value during the sustain phase, then back negative
- Vol Env – The volume envelope
- Volume Env – Zero minus the volume envelope, or the volume negated
- S - Vol Env – The volume sustain amount minus the volume envelope. This results in a positive value initially, going to a zero value during the sustain phase, then back positive
- Vol Env – S – The volume envelope minus the volume sustain amount. This results in a negative value initially, going to a zero value during the sustain phase, then back negative
- S+H Filt - The Sample and Hold waveform smoothed by a filter
- Osc 1 - Oscillator 1
- Osc 2 - Oscillator 2

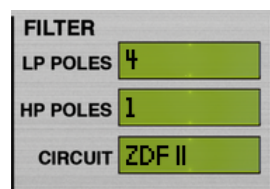
Destination

LFO Rate	– LFO Frequency
Resonance	– Filter Resonance Amount
Spacing	– Filter Spacing
Pan	- Output panning
Ext Amt	- External input volume level
Osc 1 Amt	- Oscillator 1 volume level
Osc 2 Amt	- Oscillator 2 volume level
Osc 3 Amt	- Oscillator 3 volume level
Noise Amt	- Noise volume level
Master Vol	- Master volume level

Shaping

Off	- Zero
Constant	- A steady value
PW	- Pitch Wheel
MW	- Mod Wheel
Note	- MIDI Note
Mod 1	- Mod 1 CV input signal
Mod 2	- Mod 2 CV input signal
MW Bus	- The other modulation bus
On Bus	- The other modulation bus

All of the other shaping values are simply knob settings with the same name.



Filter Programming

The filter configuration and DSP algorithm can be modified using these settings. The number of poles sets the steepness of the filter frequency response past the cutoff frequency. Each pole results in 6 dB per octave slope. Fewer poles results in a brighter less filtered, sound.

1 pole – 6 dB per octave

2 poles – 12 dB per octave

3 poles – 18 dB per octave

4 poles – 24 dB per octave

The Circuit setting chooses between various DSP algorithms. All of the algorithms are Zero Delay Feedback. The ZDF I and ZDF II modes have slightly different warmth. The algorithms have been tuned to simulate the frequency response and resonant behavior of an analog

transistor ladder filter. The Drive modes use the nonlinear algorithm to create more distortion than the standard ZDF settings. Drive I, II, and III progressively provide more gain into the filter causing it to soft clip and add a gritty overdrive to the sound.



Global

The Global section configures other various settings on the synth.

Noise – Choose classic for an old school sound, White for the typical noise, or Pink for another type of noise commonly used in audio.

Gate – This setting can be used to hold the gate open, which would be like always holding down a key. Usually, this is set to Keyboard so the envelopes are triggered by the notes.

Keyboard Mode – Various monophonic keyboard settings are available to choose from: Last – the last key pressed sets the pitch. Lowest – the lowest key pressed sets the pitch, Highest – the highest key pressed sets the pitch, Single – A key will set the pitch as long as it is held regardless of other key presses

OSC2 Frequency (Fine) – This button enables precise control over the frequency of Oscillator 2.

OSC3 Frequency (Fine) – This button enables precise control over the frequency of Oscillator 3.

It is easier to control the detuning the oscillators if Fine adjustment is enabled.

Release (On) – This button enables the release phase of the envelopes. Generally, this will be enabled, but if an abrupt note cutoff is desired, the release can be disabled.

Audio Connections



Input

The external audio input allows audio to be routed into the Mixer section. From there it can be filtered and enveloped. The External enable switch and mix knob are at the top of the Mixer section on the front panel.



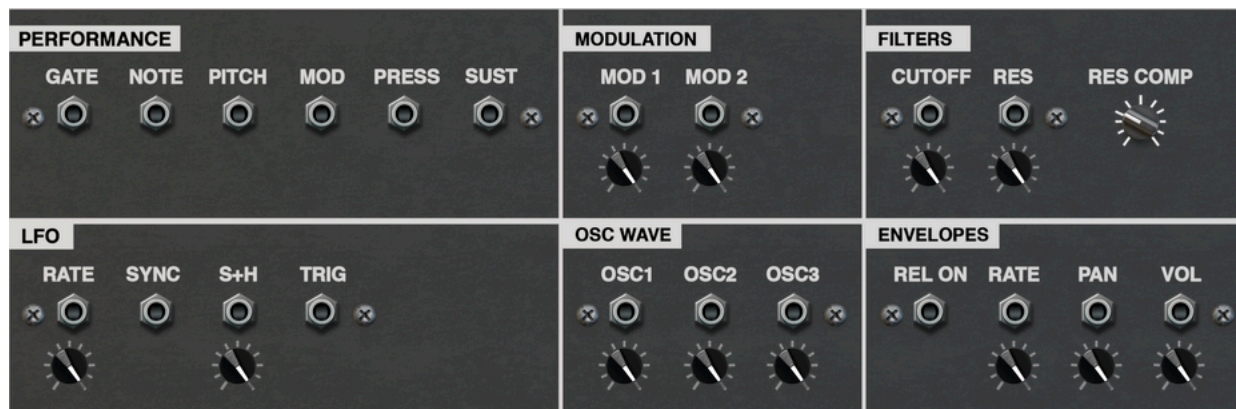
Outputs

The audio outputs provide mono or stereo capabilities that might not be obvious when using the Dual Lowpass filter configuration. When both jacks are connected one filter is used for the left channel and the other for the right. When only the left jack is connected, the stereo output is summed so that the output contains a mono signal with the two parallel filters. The right jack always has the same output, which is from one filter that is not affected by Spacing.

In Highpass/Lowpass mode, both jacks have the same mono output of the filters in series.

CV Inputs

The CV Inputs allow VK-1 to be controlled by other devices in the rack. CV inputs generally affect a current internal level by subtracting when they are negative and adding when they are positive.



Performance

- Gate – This signal triggers the envelopes
- Note – The MIDI note to be played
- Pitch – Controls the Pitch Wheel level
- Mod – Controls the Mod Wheel level
- Press – Controls the aftertouch/pressure level
- Sust – Sustain Pedal Input

Modulation

- Mod 1 – This signal can be selected as a source for the Mod Wheel bus
- Mod 2 – This signal can be selected as a source for the On bus

Filters

- Cutoff – Controls the cutoff frequency
- Resonance – Controls the resonance amount for the filters

LFO

- Rate – Adjusts the rate of the LFO with respect to the current rate
- Sync – A digital signal that on a rising edge causes the LFO waveform to reset
- S+H – A signal that will be used instead of noise for the LFO Sample and Hold circuit
- Trig – A signal that will be used instead of the LFO for triggering the Sample and Hold circuit

OSC Wave

- OSC1, 2, 3 – Adjusts the waveform setting for each oscillator. See Wave knob.

Envelopes

Rel On – A digital signal that controls whether the release phase of the envelopes will occur, or instead immediately go to zero when the gate is closed

Rate – Controls the rate of the attack, decay, and release portions of the envelopes simultaneously

Pan – Adjusts the panning of the output from left to right

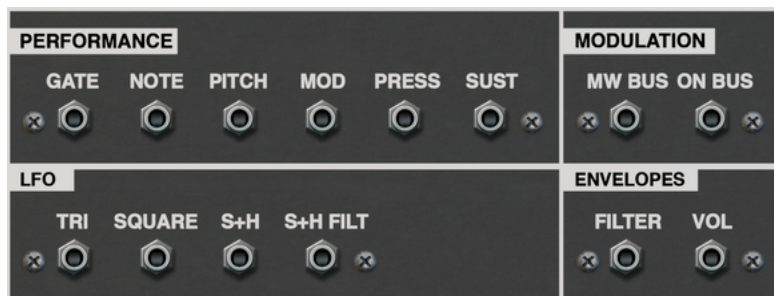
Vol – Adjusts the Master Volume amount.

Common Tricks

It is often confusing to guess whether CV will completely control a parameter or adjust a parameter based on its internal value. In VK-1, parameters are adjusted based on their internal value, so knobs on the front panel still have an effect. You may want to turn a knob on the panel fully down so unipolar CV will have the most impact. For bipolar CV, the parameter will move up and down from its internal level.

CV Outputs

The CV Outputs allow VK-1 to control other devices in the rack.



Performance (unipolar)

Gate – This signal is high when a note is on, low otherwise

Note – This is the MIDI note being played

Pitch – The current Pitch Wheel level

Mod – The current Mod Wheel level

Press – The current aftertouch/pressure level

Sust – The current Sustain Pedal state

Modulation (bipolar)

MW Bus – The Mod Wheel modulation bus output

On Bus - The On modulation bus output

LFO (mixed)

Tri – The LFO triangle wave (bipolar)

Square – The LFO square wave (unipolar)

S+H – The LFO Sample and Hold value (bipolar)

S+H Filt – The LFO Sample and Hold waveform smoothed by a filter (bipolar)

Envelopes (unipolar)

Filter – The filter envelope

Vol – The volume envelope

MIDI

midi_cc_chart:

- 4 - lfo_rate_normal
- 67 - lfo_sync
- 5 - glide_rate
- 68 - mw_source
- 69 - mw_destination
- 70 - mw_shaping
- 33 - mw_amount
- 71 - on_source
- 72 - on_destination
- 73 - on_shaping
- 8 - on_amount
- 34 - osc1_wave
- 77 - one_two_sync
- 10 - osc2_freq_normal
- 35 - osc2_wave
- 12 - osc3_freq_normal
- 13 - osc3_wave
- 78 - three_one_fm
- 14 - external_mix
- 81 - external_on
- 15 - osc1_mix
- 82 - osc1_on
- 16 - osc2_mix
- 83 - osc2_on
- 17 - osc3_mix
- 84 - osc3_on
- 18 - noise_mix
- 85 - noise_on
- 19 - cutoff
- 20 - spacing
- 21 - resonance
- 22 - kb_cont_amount
- 86 - mode
- 23 - filter_attack
- 24 - filter_decay
- 25 - filter_sustain
- 26 - filter_release
- 27 - filter_amount
- 28 - volume_attack
- 29 - volume_decay
- 30 - volume_sustain
- 31 - volume_release
- 7 - master_volume
- 36 - pitch_range
- 37 - lfo_rate_synced
- 39 - fine_tune
- 40 - osc1_octave
- 41 - osc2_freq_sensitive
- 42 - osc2_octave
- 43 - osc3_freq_sensitive
- 44 - osc3_octave

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45 - three_kb_control
46 - three_frequency
47 - mw_pgm_source
48 - mw_pgm_dest
49 - mw_pgm_shaping
50 - on_pgm_source
51 - on_pgm_dest
52 - on_pgm_shaping
53 - lp_poles
54 - hp_poles
55 - filter_circuit
56 - noise_circuit
57 - gate
58 - osc2_freq_sensitivity
59 - osc3_freq_sensitivity
60 - release_on
61 - kb_mode

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Remote

com.blamsoft.Viking

remote_implementation_chart:

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pitch_range - "Pitch Wheel Range", "Range", "PWR"
lfo_rate_normal - "LFO Rate", "Rate", "LFOR"
lfo_rate_synced - "LFO Rate Synced", "Synced", "LFOS"
lfo_sync - "LFO Sync", "LFO Sync", "LSyn"
fine_tune - "Fine Tune", "Tune", "Tune"
glide_rate - "Glide Rate", "Glide", "Glid"
mw_source - "Mod Wheel Source", "MW Src", "MSrc"
mw_destination - "Mod Wheel Destination", "MW Dest", "MDes"
mw_shaping - "Mod Wheel Shaping", "MW Shape", "MShp"
mw_amount - "Mod Wheel Amount", "MW Amt", "MAmt"
on_source - "On Source", "On Src", "OSrc"
on_destination - "On Destination", "On Dest", "ODes"
on_shaping - "On Shaping", "Shaping", "OShp"
on_amount - "On Amount", "On Amt", "OAmt"
osc1_octave - "OSC 1 Octave", "OSC1 Oct", "Oct1"
osc1_wave - "OSC 1 Wave", "OSC1 Wav", "Wav1"
one_two_sync - "OSC1-OSC2 Sync", "Sync 1-2", "OSyn"
osc2_freq_normal - "OSC 2 Frequency", "OSC2 Fre", "Fre2"
osc2_freq_sensitive - "OSC 2 Frequency Sensitive", "OSC2 Frs", "Frs2"
osc2_octave - "OSC 2 Octave", "OSC2 Oct", "Oct2"
osc2_wave - "OSC 2 Wave", "OSC2 Wav", "Wav2"
osc3_freq_normal - "OSC 3 Frequency", "OSC3 Fre", "Fre3"
osc3_freq_sensitive - "OSC 3 Frequency Sensitive", "OSC3 Frs", "Frs3"
osc3_octave - "OSC 3 Octave", "OSC3 Oct", "Oct3"
osc3_wave - "OSC 3 Wave", "OSC3 Wav", "Wav3"
three_one_fm - "OSC3-OSC1 FM", "FM 3-1", "FM"
three_kb_control - "OSC3 KB Control", "KB Cont", "KB 3"
three_frequency - "OSC3 Frequency Range", "Range 3", "Rang"
external_mix - "External Amount", "Ext Amt", "AmtE"
external_on - "External", "Ext On", "OnE"
osc1_mix - "Oscillator 1 Amount", "OSC1 Amt", "Amt1"

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osc1_on - "Oscillator 1 On", "OSC1", "On1"
 osc2_mix - "Oscillator 2 Amount", "OSC2 Amt", "Amt2"
 osc2_on - "Oscillator 2 On", "OSC2", "On2"
 osc3_mix - "Oscillator 3 Amount", "OSC3 Amt", "Amt3"
 osc3_on - "Oscillator 3 On", "OSC3", "On3"
 noise_mix - "Noise Amount", "Noise Am", "AmtN"
 noise_on - "Noise On", "Noise", "OnN"
 cutoff - "Cutoff", "Cutoff", "Peak"
 spacing - "Spacing", "Spacing", "Spac"
 resonance - "Resonance", "Resonanc", "Reso"
 kb_cont_amount - "Keyboard Control Amount", "KBConAmt", "KBAm"
 mode - "Mode", "Mode", "Mode"
 filter_attack - "Filter Attack", "Filt A", "Fila"
 filter_decay - "Filter Decay", "Filt D", "Fild"
 filter_sustain - "Filter Sustain", "Filt S", "Fils"
 filter_release - "Filter Release", "Filt R", "FilR"
 filter_amount - "Amount to Filter", "Filt Amt", "Amt"
 volume_attack - "Vol Attack", "Vol A", "VolA"
 volume_decay - "Vol Decay", "Vol D", "Vold"
 volume_sustain - "Vol Sustain", "Vol S", "Vols"
 volume_release - "Vol Release", "Vol R", "VolR"
 master_volume - "Master Volume", "Volume", "Vol"
 mw_pgm_source - "MW PGM Source", "MW PGM S", "MPS"
 mw_pgm_dest - "MW PGM Destination", "MW PGM D", "MPD"
 mw_pgm_shaping - "MW PGM Shaping", "MW PGM H", "MPH"
 on_pgm_source - "On PGM Source", "On PGM S", "OPS"
 on_pgm_dest - "On PGM Destination", "On PGM D", "OPD"
 on_pgm_shaping - "On PGM Shaping", "On PGM H", "OPH"
 lp_poles - "Low Pass Poles", "LP Poles", "LPP"
 hp_poles - "High Pass Poles", "HP Poles", "HPP"
 filter_circuit - "Filter Circuit", "Filter C", "FC"
 noise_circuit - "Noise Circuit", "Noise C", "NC"
 gate - "Gate Source", "Gate Src", "GSrc"
 kb_mode - "Keyboard Mode", "KB Mode", "KBMd"
 osc2_freq_sensitivity - "OSC2 Frequency Fine", "OSC2 /10", "2/10"
 osc3_freq_sensitivity - "OSC3 Frequency Fine", "OSC3 /10", "3/10"
 release_on - "Release", "Rel On", "Rel"