

PolyKB III



User Manual

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1 Introduction

Thank you for choosing the **PolyKB III** !

The **PolyKB III** is a virtual instrument based on the architecture of a venerable vintage polyphonic synthesizer, which proposed a very unusual, advanced, and revolutionary waveform-morphing feature.



Waveform morphing allows you to change the sound of your oscillators in a continuous way. Of course this parameter can be modulated with a large amount of sources. This brings very new and special synthesis sound you have never heard before.

This synthesizer provides a wide range of modulation possibilities making it as a great performance instrument. But this goal wouldn't be achieved without the help of an arpeggiator and a polyphonic sequencer, which has its own dedicated presets.



Famous sound designers and artists have already made hundreds of presets for the PolyKB, so you can enjoy this instrument even if you do not have any knowledge of sound design!

2 Features

The **PolyKB III** offers:

- Three aliasing-free morphing oscillators: from triangle to pulse, through saw.
- Two 4 poles Low Pass, High Pass, Band Pass, self oscillating filter
- Three freely assignable envelope generators (ADSR) with 2/3/4 Multiplier
- Two Multi Waveform MIDI syncable LFO with Monophonic and Polyphonic action
- One MIDI synced Sample and Hold
- One 128 steps polyphonic sequencer
- One arpeggiator (monophonic or polyphonic)
- Chorus , Phaser, Delay, Reverb and EQ effects
- Mono/Unison/Poly playing mode with up to 16 voices of polyphony
- 3 independent Modulation Matrixes
- One exclusive fully configurable Dynamic Stereo Enhancer (SPACEXY) with Path mode
- One exclusive fully configurable Voices Modulation (VOICEXY) with Path mode
- All parameters are MIDI controllable

The **PolyKB III** is available in the following formats:

- **Mac OSX 10.7.0 and later:** VST, Audio Unit, AAX (Pro Tools 10.0 and later)
- **Windows 10,8, 7:** VST,AAX (Pro Tools 10.0 and later)



Minimum system requirements: 1 Gigabyte of RAM and a 2 GHz processor.

The PolyKB III is a plug-in and is not available as a standalone application

Notice : The screen resolution must be set at least to 1024 pixels width.

3 Installation

3.1 eLicenser drivers

The PolyKB uses an USB-eLicenser dongle. You must have this dongle connected to a USB port on your computer to make the PolyKB work.

Important : Please take care of your dongle: you need it to run the PolyKB and it carries your license!

Please Note: Even if you have already installed the eLicenser drivers for a previous product, please install the latest version of the eLicenser License Control.

To download the latest eLicenser Control Center (eLC), please go to:
<http://www.steinberg.net/en/company/technologies/elicenser.html>

You need a PolyKB Activation Code to load your license onto the dongle:

First, plug your dongle into a USB port of your computer. Then launch the eLicenser Control Center. Select **Enter authorization code**. Enter your **Activation Code** in the reserved field, and press Next.

Wait for the license to be downloaded and then check to see if the license is correctly loaded on the dongle in the main section of the License Control Center.

3.2 iLok drivers

With the iLok version of the PolyKB, you need to plug an iLok USB key into your computer or authorize the so-called soft-location (for not needing the USB hardware iLok device)

After downloading and installing the latest PACE drivers, please login and drag the PolyKB license to the location of your choice (computer or iLok device. Two independent locations are allowed)

To download the latest PACE drivers, please go to: <http://www.ilok.com>

3.3 Windows (Windows 7,8,10)

To install the PolyKB III on Windows 7 and later, launch the PolyKB III installer file `polykb_II_eLicenser_win_setup_VXXX.exe` or `polykb_II_ilok_win_setup_VXXX.exe`. Please download the latest version from the XILS-lab website (download->selected product->full installers)

Once you have accepted the license agreement, you will be asked to select the installation directory and provided with a default one. Presets and various files, like this manual, used by the PolyKB will be stored in this directory. Please note that this location is different from the VST install directory, which you will need to specify in the next step of the installer.

Once the installation directory is specified , you will be asked to select the VST plug-in directory, with a suggested default location. Keep this default directory if you do not use the VST version.

Important notice : be sure to use a folder owned by the user (do not use "c:/program files" for instance). Otherwise you will have to run your music application with "administrator rights". The default folder is c:/Users/Public/Documents/XILS-lab/PolyKB II

The AAX plug-in and its table control management ProTools are directly copied into the following directory:

C:\Program Files\Common Files\Avid\Audio\Plug-Ins

3.4 Mac (OSX 10.7 and later)

To install the PolyKB III on a computer equipped with Mac OSX 10.7 or later, double-click the file polykb_II_licenser_osx_setup_VXXX.dmg or polykb_II_ilok_osx_setup_VXXX.dmg. Please download the latest version from the XILS-lab website.

Then launch the install program, PolyKB III.pkg, and follow the instructions.

Warning: the install program will ask you for your system password.

The various files of the PolyKB will be copied into the following directories:

Library/Application Support/Avid/Audio/Plug-Ins

Library/Audio/Plug-Ins/Components

Library/Audio/Plug-Ins/VST

Library/Application Support/Documentation/XILS-lab/PolyKB II

4 Quick Start

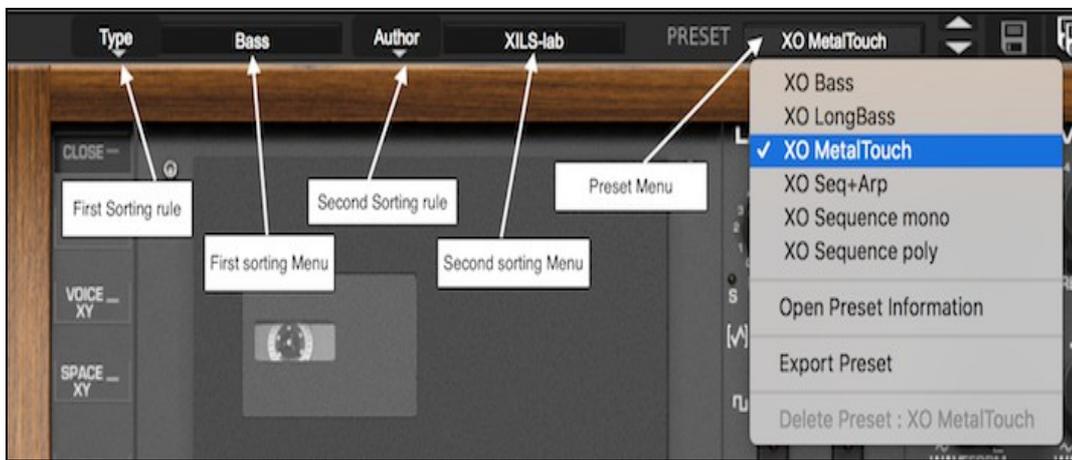
4.1 Launch, Play

When you open the PolyKB in your host, an Init preset is loaded.

You can directly use this preset, a simple one oscillator standard sound which can be seen as a basis for your sound design, or load one of the 250 factory presets provided.

To browse the factory-preset library, just select a category of instruments, using the bank drop down menu at the left of the PolyKB Tool Bar. (See Picture Below)

You can then use the up and down arrows located at the right of the preset name, or open the whole bank list by clicking on the preset name (See Picture Below)



Note: We have also provided different Init Patches, which can be seen as a good basis to begin to design new presets. All these presets can be found in the [-Init-] Type.

4.2 Toolbar



Note: The toolbar at the top of the interface allows you to load or save presets, make a comparison between settings A and B, or modify the options. These functions are described in detail later in this manual.

Click on the **PRESET** to show the available presets in the current sorted group. Please note that selecting a new preset without saving your current settings will erase any changes you have made to those settings.

Click on the **sort arrow** button to display the current sorted group and to choose the preset within it.

You can sort presets by: **Author, Feeling, Type, Style, Bank or Projects**.

Please note that the PolyKB will display presets by instruments categories (Type) by default.

Click on the sorting label over the sorted group name, to sort your preset according to your preferences

Please note that the PolyKB III powerful Preset management is fully detailed in chapter 6 of this manual.

4.3 Adjusting the instruments parameters (Knobs, switches)

On the PolyKB, most sound parameters, like the pitch of an oscillator, or the filter's Cut-Off frequency are controlled using Knobs.

To adjust the parameters of the PolyKB with the mouse, you have two axes: horizontal and vertical, which will give the same results.

To increase a parameters value, click and drag the knob to the right or to the top

To decrease a parameter value, click and drag the knob to the left or to the bottom.

If you right-click on a parameter, or if you hold shift while clicking, you can adjust the parameter with fine precision (the ? button of the toolbar displays a panel summarizing these shortcuts).

Keyboard shortcuts

In addition we have provided some soft keys combination to perform several very useful tasks:

Windows:

- CTRL+left click: reset parameter to its default value.
- CTRL+right click or CTRL+Shift+left click: initialize the default value of the parameter.
- Win+Alt+CTRL + click: open the MIDI Control panel, with the parameter already selected.

OSX:

- Apple+left click: reset parameter to its default value.
- Apple+Shift+left click: initialise the default value of the parameter
- Apple+Alt+CTRL + click : open the MIDI Control panel, with the parameter already selected.

Note: Other GUI elements and controls, like the Led Switches, or the dropdown menus, will be described in the following sections of this manual, when you'll need to use them.

The switches are simpler: just left click to change their state. A right click will change the state only while the button is pressed, and return to the previous state when it is released.

When a parameter is chosen thanks to a drop down menu, just click on the button or label and select the item.

5 Preset Management

5.1 Main Toolbar



In the toolbar you can find two buttons, displaying the category name (Bank, Author, Type, Style, Feeling or Project) which open the sort management menus.

The two first text fields show the current sorting group and the third shows the current preset.

Clicking on the category or preset names opens the corresponding menus.

Note: When a parameter is modified, the name of the preset is followed by a *, indicating that the current settings of the PolyKB III no longer matches the stored preset.

When you want to save a modified preset, click on the **Save or Save As** button.

In order to prevent you from erasing them, the Factory presets cannot be modified. When you edit a Factory preset, the **Save** button will be grayed, and you will have to use the Save As function to save it in another bank.

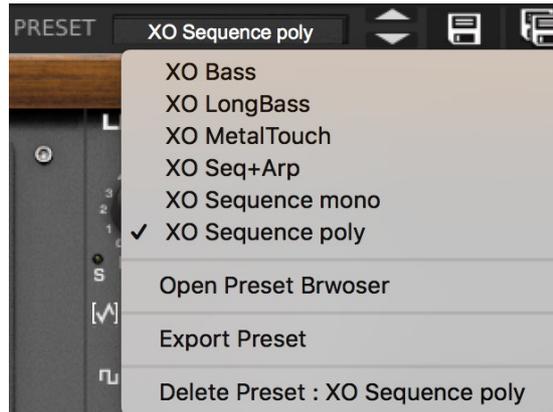
If you edit any other preset than a Factory one, the Save and Save As function will both be available.

The main difference is that the Save function will save the preset under its current name, and with its current tags, overwriting the previous incarnation of the preset, while the Save as function opens a dialog box where you can modify the name of the preset, the bank in which it will be stored, and all its tags

The settings of the PolyKB are then saved in the currently displayed preset, and the * disappears. Clicking on the **Save As** button to save this preset with another name and/or to other sorting groups.

5.2 Preset menu

Click the **Preset field** to open the preset menu. Here you can choose and load another preset from the current sort groups into the PolyKB.



In this menu, other actions are also available:

Delete Preset: use this to delete the current preset (a popup confirmation window appears). This option is only available if the current preset is not a factory one.

Export Preset: Use this function to export the current preset in an external file (.epkb format). This file can be imported later as a new bank. It always makes sense to back up your presets on external support like CD-ROMs, etc.

Open preset Browser: opens the preset Manager window in the Browser mode.

5.3 Sort menus

The sorting menus are a powerful and unique tool. Which will allow you to perform such sophisticated tasks as displaying in the preset list one of the following selections:

- All the Bases of your Sound Library
- All the Bases tagged with a given musical genre
- All the Pads made by a given Sound Designers
- All instruments for a musical genre like Electronica, or Funk
- All instruments that were recently imported in a bank (like additional sound-sets from Xils-Lab or 3rd party vendors)

There are indeed a lot of possibilities, and we're confident that you'll find the best way to customize it to your personal needs.

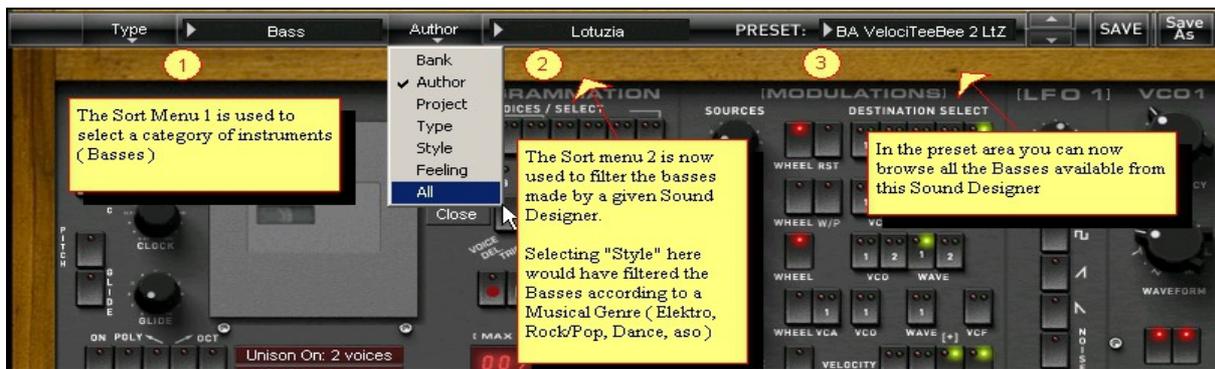
In order to perform such selections, all you have to do is to select an item in the first sort menu. This represents the first and main criteria for the search engine.

- **Author** (Your name, or a Sound Designer name for factory presets),
- **Type (Category)** of the instrument like Keys, Leads, Bases, etc)
- **Style** (Musical Genre),
- **Feeling** (Cold, warm, soft) and finally
- **Project** (My Song, My_Live_Project).

- **ALL** (this item is not used for sorting the preset)

Then these primary results can be filtered according to a second criteria, which you can choose in a similar list in the second sort menu.

Sometimes a picture is better than a lot of text, so you'll find below an example where you can find out how to select all the basses designed by a given Sound Designer.



Please note that, once you'll get familiar with this system, you can also perform some operations in a single click, by using the Sub Groups to choose a preset:

In the picture below the primary sort menu is used to browse the different banks. Then in a factory bank, the author Xils-Lab is selected, and finally the Preset XO Bass. In this example the preset is selected in a single click operation, and the presets available in the preset list will be all the Xils-Lab presets available in the entire Factory Sound Library.

Click on the **field** of the sorting button to open the menu used to manage this sorting group (or sub group). Here you can directly select and load any preset from any group or subgroup.



5.4 Sorting Menu: Additional Functions

In this menu, other actions are also available:

Delete: deletes all of the presets of the current group that are not factory ones. **IMPORTANT:** Use this

function with care: If the bank does not contain any factory presets, ALL PRESETS IN THIS BANK WILL BE PERMANENTLY DELETED.

Rename: modifies the current group name. Selecting this choice will open a window where the new name will be entered.

Use Factory: enables or disables the display of factory presets.

Sort By: sorts the presets according the bank, author, project, or shows all presets (**Bank Name, Author Name, Project Name, All Presets**). The preset menu will show presets of the same category (same author, same project or same bank).



Export Bank: exports a bank in the PolyKB's proprietary cross platform format, (Mac and PC). The selected bank (ie the bank which contains the currently active preset) will be exported to a user specified location on your hard drive.

Import Bank: allows you to browse your hard drives to select a file and imports a PolyKB bank.

These two choices are not available for the second **sort** menu.

This menu provides also the possibility to change the size of the interface. This feature is the same that the one provided in the **Option** menu.

5.5 Advanced Preset Manager



The preset manager provides two mode : **Current Preset Mode** and **Browser (or Tag) Mode**.

Current Preset Mode : This mode allows you to change any of the criteria of the current preset and save them as well as the current settings.

Click on a criteria and choose a new one in the menu. If you need a new criteria choose “New criteria” and submit the new name in the edit box. Click on the preset name for changing it.

When done, click on SAVE CURRENT (for replacing your preset) or SAVE AS CURRENT (for duplicating it)

Notice : When creating a new preset, this is the mode you need to go for saving your settings.

Preset Browser Mode : This mode allows you to easily sort your preset among multiple criteria for a fast selection.

Double click on a preset to launch it. Be careful, This will erase all the settings you could have done with the current preset.

Click on a criteria for displaying only the corresponding presets.

A grayed out criteria means that, according to the current selected criteria, there is no preset which this not available criteria.

The current preset and its associated criteria are **enlighten in green**.

There are two independent preset managers, one for the global preset (GLOBAL) and the other of the sequencer preset (SEQ).

Clicking on the Browser icon would open the Global Preset manager in Browser mode.

Clicking on the "Save As" icon would open the Global Preset manager in Current Preset mode. Selecting "Save As" in the Sequencer preset menu would open the Sequencer Preset manager in Current Preset mode.

On each criteria, right-clicking would open a contextual menu. You can then rename, delete, export a criteria. In this two later cases, all the preset which are not in the "Factory" bank, corresponding to that criteria will be deleted or exported.

Favorite: you can add each preset in your "Favorite" or "Hidden" selection. In that case, when clicking on the "Favorite" icon, only the preset in your favorite selection will be displayed. When clicking on the "Hidden" icon, all the preset in your "Hidden" selection will be removed from the list.

Factory: The preset in the factory bank can't be changed or removed (shown by a lock at the right of the preset). When clicking on the "Lock" icon, all the factory preset will be removed from the list.

Import: By clicking on the IMPORT button, you can import bank of preset created for the PolyKB II or III.

If the Global preset manager is selected, then the file contain global preset (.epkb files).

If the Sequencer preset manager is selected, the it must contain sequencer preset (.seqkb files)

Click on DONE for Closing the preset manager panel.

5.6 A/B comparison

You can store two different settings at the same time and instantly switch from one to the other to compare their settings. These two settings are stored in the **A** and **B** memories.

When you launch the PolyKB, the default-activated memory is A. When you load or modify a preset, this memory –A- is also modified in real time according to your edits. You can switch to B memory by clicking on the B button.

To copy the current active memory content to the other memory slot, just press the button labeled -> or <-, according to the current active memory.

With this A/B comparison system, you can easily have two settings and compare them in a convenient way.

Note: Please note that by default the B memory slot, until you copy settings into it or until loading a other preset within the other memory slot, contains the same init patch loaded in the A memory when you first launch the PolyKB.

6 PolyKB modules description

The PolyKB contains two main cabinets: the first one is dedicated to the synthesis part, which brings the controls to set oscillators, filters, envelopes etc. The other one is used to set the sequencer & arpeggiator controls, and to open and operate additional panels.

6.1 Synthesis

6.1.1 Oscillators

FREQUENCY: This knob set the frequency – tuning- of the oscillator. When tuning with the left mouse button, it sets the frequency by semitone steps. When tuning with the right mouse button, it fine-tunes the frequency with more precision. Depending on a setting that can be found in the Option dialog box (see below, the Option menu), the oscillator frequency can be displayed by semi-tone or in Hz.

WAVEFORM: This knob sets the Waveform of the oscillator. It can be anything between a pure triangle when turn left to a narrow pulse when turn right, in a perfectly smooth continuous way, you can set it to a saw, double saw or square wave form with all the intermediary settings. Moreover, the scrolling between the waveform can be modulated by a lot of sources, via the 3 different Modulation Matrix

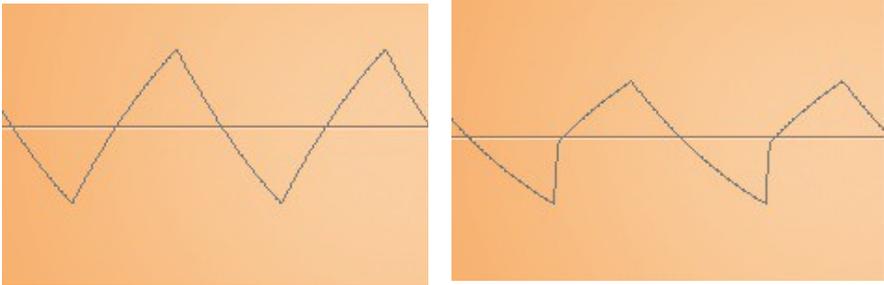
VOLUME of Oscillator 3, 2 and 1: The Big Volume knobs controls the output level of the Oscillators 2 and 3 in a continuous way while the two Volume switches are used to set the level of the oscillator 1 in three fixed values (1/3, 2/3 or 1, Muted if no switch is lit (Red Light)).

Note: Oscillators frequencies, waveforms and levels can all be modulated with controls or audio signal thanks to the modulation section (see below) of the PolyKB.

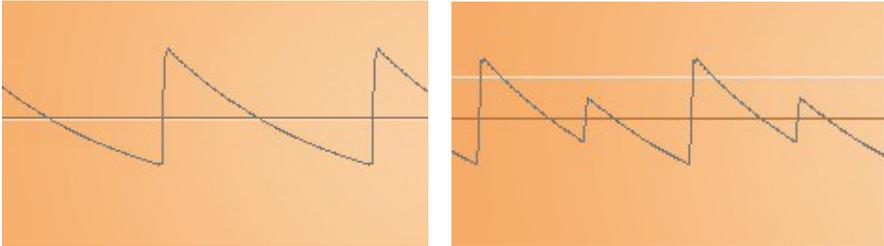


Below is a view of the various available waveforms through the waveform setting

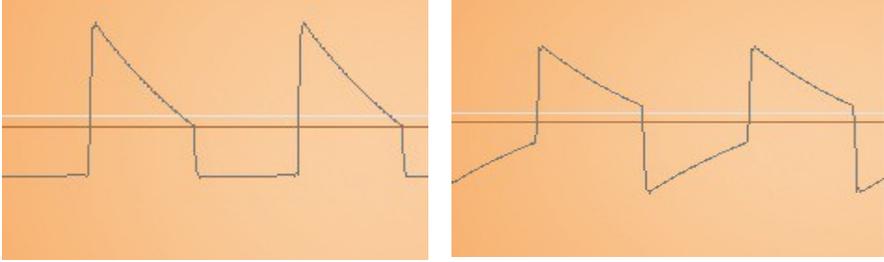
Triangle - Saw



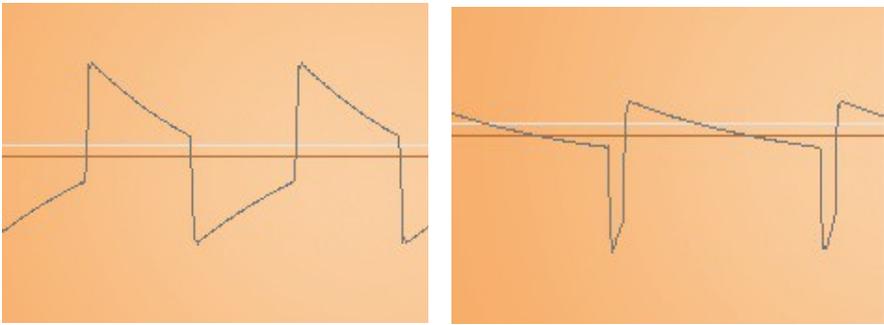
Saw- double Saw



Saw - Square



Square-Pulse



6.1.2 Oscillator 2 or 3 Special features. Optional Noise Oscillator

The oscillator 2 or 3 can be used in various ways according to the state of the following switches:

SYNC: Active when the red diode is lit. Hard synchronization between oscillator 1 and oscillator 2. Each time the oscillator 1 begin its cycle, it forces the oscillator 2 to begin its cycle too.

KB : Keyb Off, Active when the red diode is lit. The oscillator 2 is no longer connected to the keyboard and its pitch doesn't follow it any more.

LOW (Only for Osc2): for Lower, Active when the red diode is lit. In that case, the oscillator 2 works at a very low frequency rate (.Hz) You can think of it as an additional LFO, with the difference that its frequency will vary according to the pitch of the note played. (Except if the Key Off switch is on)

Audio Noise VOLUME: Adds white noise to the audio path with three fixed levels (1/3, 2/3, 1, Muted if no switch is active (red diode off on both switches))

TUN : The VCO2 is detuned by a little factor for increasing te phasing with VCO1

[White Noise]: clicking on the noise label will change its type, white or pink.

Noise Filter LED: You can activate the Led located under the Noise Switches to activate a Band Limited Noise Mode, which will eliminate harsh high frequencies noise content.

 <p>A control panel for Oscillator 2 featuring a black rotary knob labeled 'VOLUME' with a white indicator dot. Below the knob are four toggle switches labeled 'TUN', 'SNC', 'KB', and 'LOW'. Each switch has a red LED indicator.</p>	 <p>A control panel for Noise featuring a green LED indicator on the left. To its right are two toggle switches labeled 'HF' and 'VOLUME', each with a red LED indicator. Above the switches is the text '[WHITE NOISE]'.</p>	 <p>A control panel for Oscillator 3 featuring a black rotary knob labeled 'VOLUME' with a white indicator dot. Below the knob are three toggle switches labeled 'TUN', 'SNC', and 'KB'. Each switch has a red LED indicator.</p>
Oscillator 2	Noise	Oscillator 3

6.1.3 Filters

The PolyKB's filter is an accurate dynamic 4 poles self-oscillating low pass High Pass or Band pass filter, according to the following switches :



Each filter has its own input selector switches and a mixer allows to finely set their relative level. With these switches every audio paths are possible, parallel, serial or both, using Osc1, Osc2, Osc3 or Noise are independent inputs.

Filter 1 input	Filter 2 input	Filter mixer knob

FREQUENCY: This knob sets the cut-off frequency of the filter.

RESONANCE: This knob sets the resonance (or quality factor) of the filter. When set to the maximum the filter self oscillates. That means that it outputs a kind of sine wave even without any audio signal feeding its input. (Ie even if both Oscillators are muted)

KEYB CTRL: set the amount of the keyboard follow Cut Off modulation.

ADSR2 CTRL: Set the amount of the second envelope (ADSR2) applied to the Cut Off modulation.

DRV PRE: Set the level of the overdrive emulation circuit. Turning totally left disables it while turning totally clockwise gives a strong driving effect. Depending where this stage is placed, pre or post filtering you can get a subtle low-end enhancement or a sort of saturation effect.

[DRV Pre/Post]: Clicking on the label [DRV PRE] or [DRV POST] selects where the driving stage will stand, before or after the filter.



6.1.4 Envelopes

The PolyKB features two envelope generators (EG). The first one is dedicated to the control of the output level stage (VCA) while the second is hardwired to control the filter's Cut Off value.

Thanks to the modulation section, they can also be used for a wide range of other purposes.

An envelope generator is a classic electronic module that outputs a command signal, built on four parts : ADSR (**A**ttack-**D**ecay-**S**ustain-**R**elease)

When the envelope is triggered (generally by hitting a note on the keyboard, or from the output of a sequencer or an arpeggiator) it begins with the “Attack” part : From zero to the maximum level, the EG outputs a signal which increases in a time depending on the **Attack** setting. Then follows the “Decay” part, while the output decreases to a level specified by the **Sustain** setting, during a time specified by the **Decay** setting. It stays to this “sustain” level as long as the EG is gated (ie as long as the note is

hold). Then when the note is off, it goes into the “release” stage, while the output continuously decreases to zero, depending to the **Release** setting.

ATTACK: set the time over which the output increases.

DECAY: set the time the output decreases to the sustain level.

SUSTAIN: set the sustain level, maintains while the EG is gated (the note is held)

RELEASE: set the time the output decrease to zero after the note is released.

While knobs control the last 4 parameters, there are additional features, which are all controlled by switches. As always a function is active when the diode is lit.

KB : Key track, Connect keyboard follow to the EG's parameter modulation. The highest the note played, the shortest the attack will be.

LO : Loop, set the ADSR 2 or 3 in a loop mode. This means that as long as the note is held, the EG cycles from attack to release, while bypassing the sustain stage

MUL : Multiplies the ADSR parameters by a factor 2, 3 or 4. This parameter is especially handy when you need very long attack times, or decays (Example : Pads)



6.1.5 LFO1/2

The PolyKB proposes two Low Frequency Oscillators, which can be used as modulation sources.

RATE: sets the frequency of the LFO

Waveforms : The various switches select the different available LFO waveform(s)

Please note that you can select different waveforms simultaneously, and can therefore build unusual and very complex LFO waveforms when cumulating several waveforms.

Tip : This is especially handy if you wish to add some subtle movements and modulations to an instrument. Adding several waveforms to an LFO will avoid the repetitive feel of the LFO.

Note : You can click on the sine/triangle label to change the waveform associated to this switch, a sine or a triangle waveform. The triangle waveform is the default choice.

Noise Waveform : Noise Sample and Hold at the LFO rate

DELAY: set the delay time between a note ON and the beginning of the fade in.

FADE: set the time for the output to rise from zero to the maximum level.

S: Click on this led to synchronize the LFO rate to the tempo of the application host. Please note that the rates will be displayed in musical notation if the sync is engaged. (Led On)

In this picture, you're editing the LFO 1 & 2

The default Asymmetrical Triangle Waveform is selected for LFO1. By clicking on the waveform display toggle pictogram to the Symmetrical Triangle (as in this picture) or Sine waveform.

The LFO2 uses a square waveform. By clicking on any other waveform, you can add them to the LFO output.



6.1.6 Matrix Modulation sections

The PolyKB features four complete modulation sections allowing a very large sound palette. The Modulation matrix is used to connect sources (or modulators) to different synthesizer parameters, like the volume, or the cut off, which are in this context called destinations, or targets. The sources are then used to modify the target parameters value, with a certain amount.

In the PolyKB2 this amount is specified by a knob, while sources and destinations can be activated by switches, or freely assigned using drop down menus, depending on the matrix you're working on.

The main switch matrix is hardwired and uses switches to connect predefined sources and targets. The Drop Down matrixes offers freely assignable sources and destinations via drop down menus.



The VoiceXY matrix also offers assignable sources and destinations via drop down menus, but here the settings are controlled by the dynamic polyphony allocation, independently for each voice

In all Modulation Matrixes knobs control the amount of modulation

We'll now see what the Main Switch Matrix (Hardwired) has to offer

6.1.6.1 The hardwired Modulation Matrix



This section has five fixed modulation sources, the LFO1, the Noise (or LFO2), the ADSR2, the VCO2 and Velocity, and different targets for these sources, like the pitch of the Oscillators, the Filter Cut Off, or the Waveform settings. In this section the assignment use switches, like on the original PolyKB synthesizer. This kind of Modulation Matrix is called hardwired, as the sources and destinations are predefined and can't be changed. This is the original vintage PolyKB matrix, which in the 80s might have been one of the most powerful ones provided in a hardware synth.

Programming the modulation is very easy: a switch connects a source to a destination, while a knob sets the level of the source signal, and therefore the amount of modulation applied to the destination.

Important : The switches have three states allowing positive (Green Led On) or negative (Red Led On) modulation.

When no led is lit, either green or red, no modulation occurs, and the path between the source and the destination is broken. (Which is the default state of the switches)

Tip : Modulating the wave parameter of the oscillators is very specific to the PolyKB. A large amount of modulation can act as a morphing between waveforms (from triangle to pulse). While a small

amount, of modulation is quite close to the standard pulse width modulation if you choose the Square Waveform, and will give you special results with other waveforms.

ROW ONE

LFO 1 (Knob) : set the level of the LFO1 output used for the modulation

RST (Switch) : Allow the LFO to be reset on each newly triggered note.

The possible targets for the LFO1 modulation source are : Pitch of VCO 1,2&3, Waveform morphing for VCO 1,2&3, and Filter1&2's Cut Off

ROW 2

NOISE (Knob) : set the level of the noise (or LFO2) output used for the modulation.

Note Clicking on the [Noise]/[LFO2] label will change the source of the modulation : LFO2 or noise.

W/P : allows the choice of the type of the noise when the Noise is chosen as the source of the modulation. (White Noise or Pink Noise)

The possible destinations for Noise/LFO 2 modulation source are : : Pitch of VCO 1, 2 & 3, Waveform morphing for VCO 1 , 2&3, and Filter1&2's Cut Off

ROW 3

ADSR2 (Knob) : set the amount of the ADSR2 signal which will be used for the modulation

The possible destinations for ADSR 2 modulation source are : : Pitch of VCO 1,2&3, Waveform morphing for VCO 1,2&3 and Filter2's Cut Off.

Please note that the Cut Off Filter1 is not available as a target because the ADSR 2 is already hardwired to the Filter's Cut Off.

ROW 4

VCO2 (Knob) : set the amount of the VCO2 signal which will be used for the modulation

The possible destinations for ADSR 2 modulation source are : : Pitch of VCO 1&3, Waveform morphing for VCO 1&3 and Filter1&2's Cut Off.

Tip : This row is especially useful when the OSC 2 acts as a sophisticated LFO with the Lower switch activated (See the OSC2 additional features section of this manual for more details about this) as the LFO rate will vary according to the pitch of the note played.

ALL ROWS : The WHEEL Switch

All the previous modulations can also be controlled by the MOD WHEEL: when the WHEEL diode is on (Green Led On) , the level of the selected modulation is controlled by the modulation wheel action No Mod Wheel means that no modulation will occur, while the maximum modulation set by the Amount knob of a row will be achieved if the Mod Wheel is fully engaged.

6.1.6.2 VELOCITY to VCA, VCF, and Envelopes Assignment :

Here you can assign the velocity to several important parameters like Global Volume, Filter Cut Off, or to control certain envelope segments.

The label [+] allows selecting the way the velocity is applied to the VCA. The modulation can be additive (+) or multiplicative (x).

Pressure ON: When on, the level of the polyphonic after touch is added to the modulation wheel.

ATTK: When on, the velocity modulates the attack of the envelope generators. The level of the velocity is set in the Keyb/Arp panel.

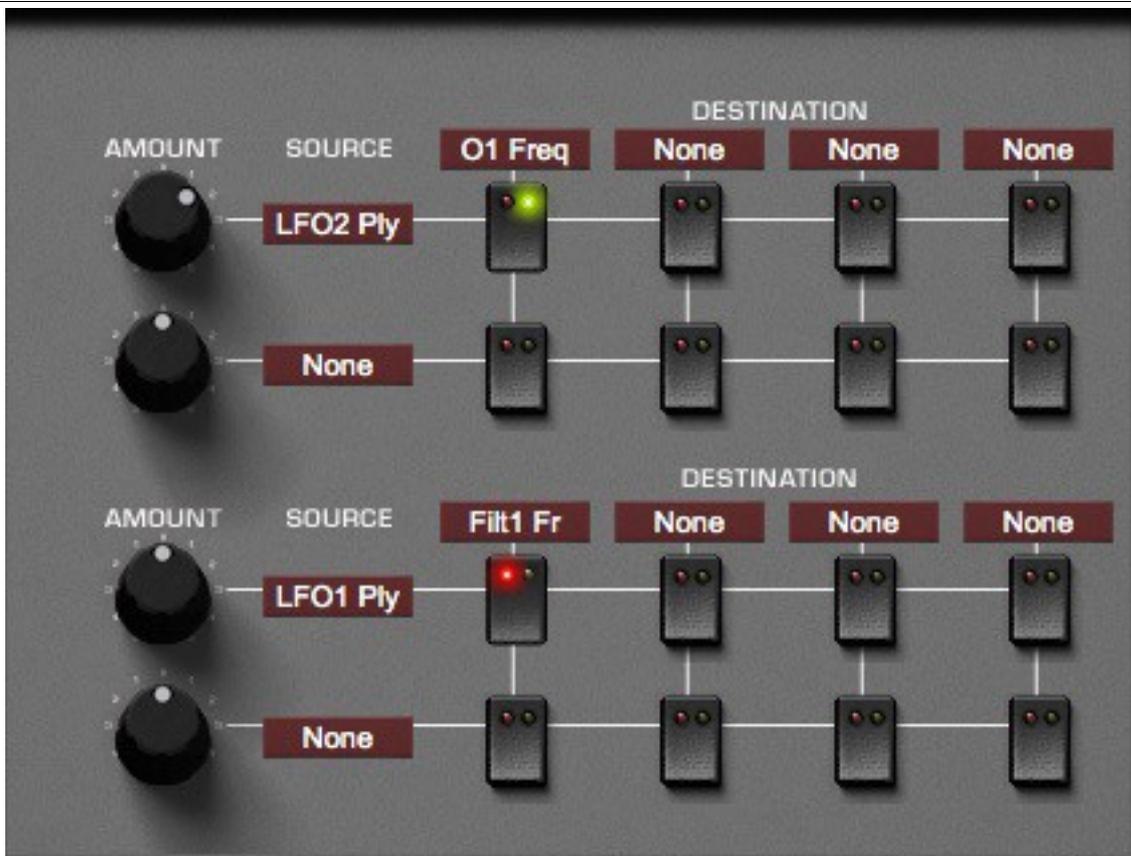
DEC: When on, the velocity modulates the decay and the release of the envelope generators. The level of the velocity is set in the Keyb/Arp panel.

VCF1&2: When on, the velocity modulates the Filter1&2 cutoff. The level of the velocity is set in the Keyb/Arp panel.

IMPORTANT : Please Note that the velocity assignments performed in this section are also dependent from the MAIN velocity setting, which can be found in the Keyb/Arp panel. (See section 7.1.6 below) If the MAIN velocity knob is set to zero, no modulation will occur. With the MAIN velocity knob turned fully clockwise, the maximum modulation will occur.

Example : To fully control the VCA and get a huge dynamic range, just turn fully clockwise the Main Velocity knob, then click on the switch till its green (Positive modulation), and finally set the Velocity control on [x] rather than [+].

6.1.6.3 The Dropdown Matrix Modulation



The two other modulation section offers freely assignable sources and modulations. It is not hardwired and is located in the “User Mod” panel

As stated before this particular Modulation Matrix allows both customs sources and destinations, making it a very powerful sound design tool.

Lets see how it works in detail :

Two user selectable sources are available.

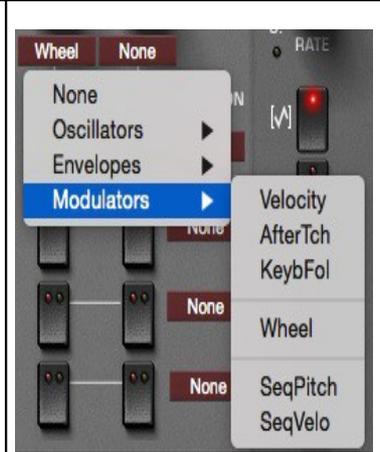
Source Menu: allows selecting two different sources via a drop down menu. The sources can be chosen within a wide range of modules.

Available Modulation Sources :

Most sources like ADSR 1, 2, Velocity, Pressure (After-touch), LFO1 and 2, or Mod Wheel are self-explanatory.

Seq Pitch means that the pitch of the note played by the PolySequencer will determine the modulation. The Higher the note, the more modulation. Same with Sequencer Velocity.

LFO 1 & 2 M means that you can use the LFO 1 and 2 in a Monophonic mode. In such a mode the LFOs are the same for all the voices played, as opposed to a Polyphonic LFO, where each note played triggers a new instance of the LFO. Please note that you can combine Mono and Poly incarnations of a LFO in the SAME patch, allowing both very subtle and more straightforward LFO modulations simultaneously.



These two sources can then modulate up to four selectable Synth parameters.

Destination Menu: select which parameter source 1 or source 2 will modulate. The available destinations can again be chosen from a wide range of module

All these target parameters are detailed in the other sections of this manual

A few tips and tricks :

You can choose to modulate the Decay of the envelopes in arpeggios, this will give similar results as controlling the gate parameter of the Arpeggiator.

The envelopes can be used for inverted modulations, which is not the case in the main panel. You can use it to emulate some famous vintage patches like those of the legendary Jupiter synth. The VCO2 only modulation option is very helpful for Synced sounds. Try it with the mod wheel while the OSC 2 sync is engaged.

Slight modulation of the Chorus or Phaser rate will provide very subtle modulations, and might prove to be very useful for all ensemble, symphonic, or heavy chorus effects.

Modulating the Glide parameter will provide crazy TeeBee patches for example.

Finally, modulating the delay times can lead to glorious Spring Reverb like ambiences



Please note that the serigraphy (the little lines, which can cross themselves, on the Gui for the Dropdown Modulation Matrix) will indicate you the different paths which rely the sources and destinations.

Finally, The two knobs located under pressure are used to specify the amount of modulation used by the sources in their respective rows to modulate their destinations.

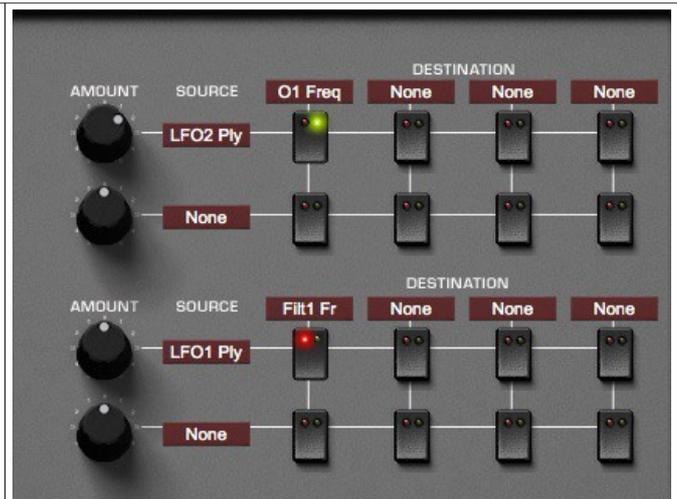
Please note that here again the green and red diodes are used to specify positive or negative modulations :

The switches have three states allowing positive (Green Led On) or negative (Red Led On) modulation. When no diode is lit, either green or red, no modulation occurs, and the path between the source and the destination is broken. (Which is the default state of the switches)

A simple example of what you can achieve using the dropdown Modulation Matrix :

The LFO2 (polyphonic) control Osc1 pitch with a 60% amount and a positive modulation.

The LFO1 (polyphonic) control Filter1 Cutoff with a 50% amount and a negative modulation.



Please note that the last Modulation Matrix, the VoiceXY is fully described in section 7.5.3 of this manual.

6.1.6.4 Preset Compatibility with Version 1

A bank exported by the **PolyKB** (1.0.0 or 1.0.1 version released before December 2010) can be imported to the **PolyKB II**. The presets are compatible but a few differences in the sound will eventually be noticeable.

Please note that, to ensure the best possible compatibility, the label “**MODULATION V1**” should be displayed.

To enable all the new modulation enhancements available on V2, just click on this label, which will switch to the standard V2 “**MODULATION**” display.



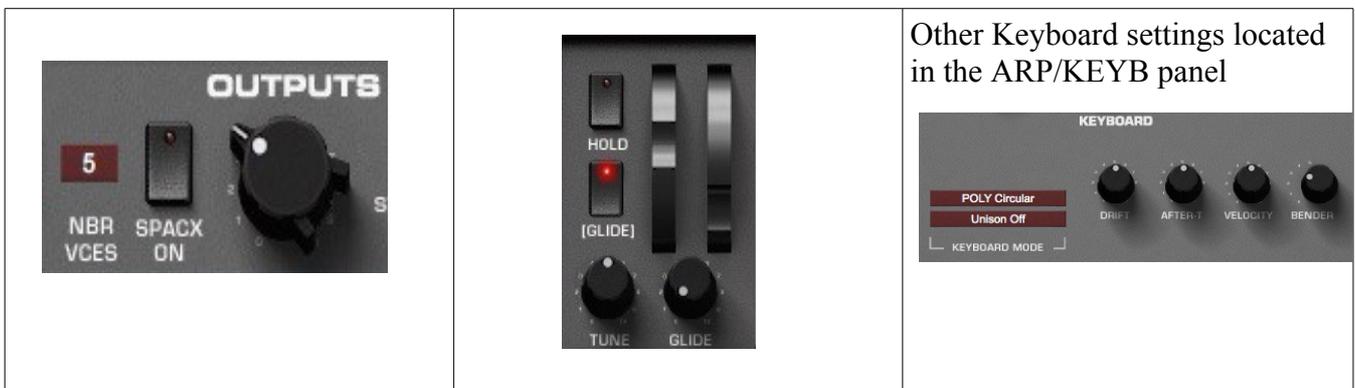
Modulations Version 2



Modulations Version 1

Please consult our 9.1.3 section at the end of this manual to get more detailed information about compatibility modes.

6.1.7 Main level and keyboard settings



OUTPUTS: The knob **Outputs** beneath the arpeggiator section controls the general output level of the PolyKB,

SPACX ON: This switch enables or disables the SPACE XY voice spacing effect (see below).

BENDER: set the amount of the pitch bend in semi-tone.

[GLIDE] : Select Glide (continuous) or Glissendo (by semi-tone) and set the Polyphonic glide (each voice is independent for a huge glide effect).

VELOCITY: set the level of the velocity used by the Main Matrix Modulation section.

AFTER: Set the level of the polyphonic after touch used by the modulation section.

DRIFT: Each voice gets differences in their settings depending to this knob: Turn left, all the voices are set with the same values. Turned right, the voices are set with a random noise, emulating what we might find in an analogue synthesizer where voices are built with different components.

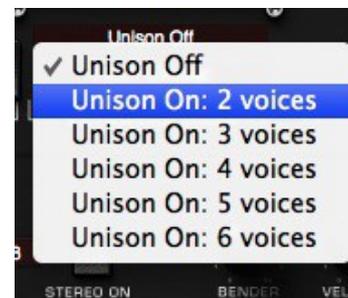
NBR VCES : The available number of voices can be set thanks to the menu displayed on the right of the OUPUTS knob. This number, from 1 to 16 is useful to limit the CPU usage when long decay or release is needed.



Please note that this number also determines and affects the settings of the SPACEXY and VOICEXY tools. (These functions are detailed later in this manual) and can therefore affect the Stereo Scene and/or the VOICEXY Modulation Matrix features.

The keyboard playing mode is set, thanks to the two display menus over this section

The first menu allows the user to choose the number of unison voices. This means that each time a note is triggered (from a MIDI message or from the virtual keyboard) the corresponding number of voices will be triggered. Of course, for a correct use of this setting, the available number of voices must be greater than the number specified in the Unison settings (an available number of voice multiple of the unison number should be the correct value).

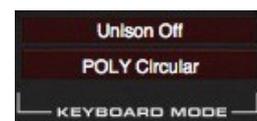


Warning : This setting, added to long release and a high available voice number is very CPU intensive.

The second menu allows choosing between playing in polyphonic or monophonic mode.

POLY circular: polyphonic, each voices are selected one after each other

POLY reset: polyphonic mode, each voices are selected from the voice number 1.



MONO low priority: Monophonic mode with low priority (when two notes are ON at the same time, the lower is played) (Emulates the Moog Synthesizers mode)

MONO high priority: Monophonic with high priority (when two notes are ON at the same time, the higher is played)

MONO last priority: Monophonic with last priority (when two notes are ON at the same time the first which was activated is played)

6.2 Arpeggiator

The PolyKB features a simple but very powerful arpeggiator.

When on, this module reads the note hold on the keyboard and, instead playing them at the same time, it will play each note after the other. There are three modes available: **Up**, the notes are played from the lower to the higher. **Down**, the note are played from the higher to the lower and **Up/Down** for which they are played backward and forward. If none of these there modes are selected, then the notes are played in a random order. The cycle can also play through another octave before restarting when the **Oct** switch is selected. Selecting the Polyphonic mode allows chord to be played according to a specific sequence, modified easily by the user.



ON: enable or disable the arpeggiator

Poly: enable the polyphonic mode

Up : play notes ascending mode

Down: play notes descending mode

Oct: enable octave cycles before restart.

Other parameters, controlling the arpeggiator, can be found in the panel under the cassette.

Octave number : select the number of octaves applied when the switch **Oct.** is ON

Playing mode : select the way the new notes are managed. **Free** will updates the arpeggiator immediately, but you can choose also “After Each Note” or “After Each Cycle”.

Chord Sequences : The chord sequences transposition played in polyphonic mode can be edited there. Each number, from 0 to 12 stands for the base of the chord, and must be separated by a space, comma or semi-colon. Up to 32 numbers can be entered.

SWING : set a swing value to the arpeggio. Turn right to get no swing, turn left to get maximum swing. A 66% value gives you typical jazz swing.

GATE : set the time a note (or a chord) is hold by the arpeggio, from zero to the clock period.



6.3 Sequencer

The PolyKB has a powerful polyphonic sequencer that can help you to create complex sequences and incredible special effects.

As the output values of the PolyKB's sequencer are hidden, it can perhaps be a little confusing at first. But the power and versatility of this concept, in contrast to most other analogue sequencers of the time, is a good reason to get to know it!

First to know, this sequencer is polyphonic. That means that you can record/play up to 8 voices with different sequences. The switch **Voices Select** allow you to choose which voices will be recorded or played. When both record and play are selected, then you will hear all the already recorded voices while record only the selected voice.



Voices select: select the voices to be recorded or played.

VCE DEL : (Voice delete) delete all the selected voice. A confirmation panel opens, but be careful, there is no undo.

STP DEL : (Step delete) delete the current step of the voices selected. Be careful, there is no confirmation panel.

TRG : (Triggered) When on, this switch will start the sequencer (in play mode only) when a note is held. It stops when the note is released.

TUN : (Tuned) When on, this switch allows the tuning of the sequences according to the lowest note played on the keyboard.

Step/Run: When on, this switch allows the sequencer to run step by step (record or play). Each note recorded increments the step by one.

Next: go to the next step

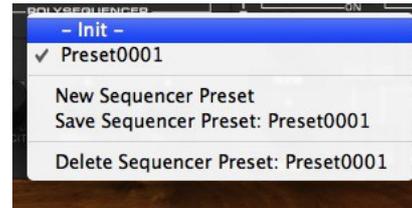
Prev: go to the previous step

Max/Current display: The digital display beneath the Max current label shows the current number of steps and the maximum number the sequencer will reach before looping. Click on the label to see the sequencer's preset name. In this mode you can click into the display to edit and change the name.

Clicking on the maximum step number will increase (left click) or decrease (right click). Clicking on the current step number will increase or decrease it which means that the sequence will begin from that point.

To help with your creative workflow, independent sequencer presets can be saved and recalled.

Preset: This button opens a menu that shows you the available sequencer presets for recall:



6.3.1 Sequencer display module

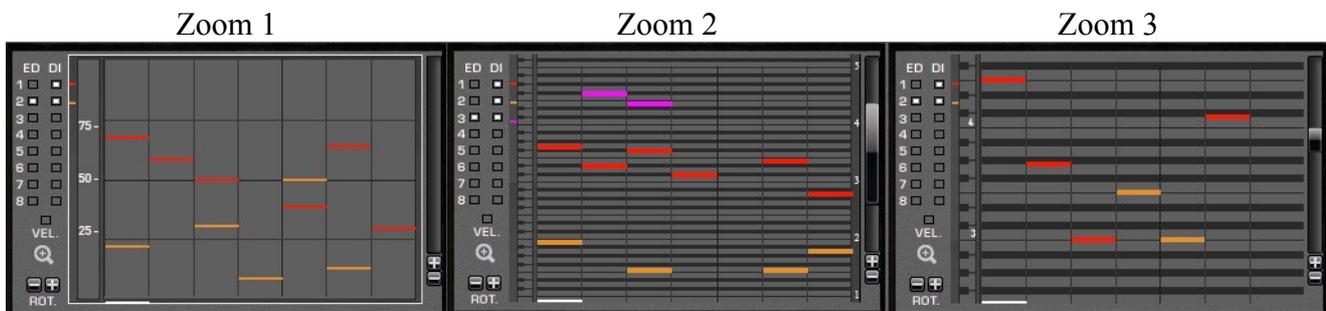
The PolyKB's sequencer display panel makes it easy to create, verify and modify your sequences.

Three zoom modes can be used to display the internal values, selected by the '+' and '-' buttons. Zoom 1 shows the entire range of values, useful when using the sequencer to modulate parameters such as filter frequency, oscillator level or shape. Zoom 2 and Zoom 3 show four and two octaves respectively. The slider allows you to move the displayed part inside the whole range.

The current time slot is shown as a white cursor line at the bottom of the view.

Each of the current sequences is displayed in a different color. The sequences can be highlighted or hidden by checking or un-checking the corresponding colored boxes to the left of the event display.

You can also modify the sequencer with the mouse: select the sequence you want to adjust (**Ed** check boxes) with the left button, click on the panel to add or modify a step, with the right button, click to erase a step.



Clicking on the + or – changes the display view, while the slider on the right allows you to browse inside this view.

Clicking on the +/- rotate allows to scroll the sequence from 1 step left or right.

Clicking on the loop opens a window with a bigger screen for the sequencer.

The sequencer memorizes the pitch but also the velocity of the entered note.

So you can use the sequencer just for creating pitched sequences, but using the velocity (or the pitch) through the modulation section gives you endless design possibilities.

To display or edit the velocity instead of the recorded pitch click into the check box **Velocity**



6.4 Virtual keyboard

The PolyKB's keyboard lets you play notes that are sent to synthesizer. The keyboard also highlights the MIDI note information that the PolyKB receives. To the left of the keyboard are two dedicated wheels, one for the modulation and the other for the pitch bend.



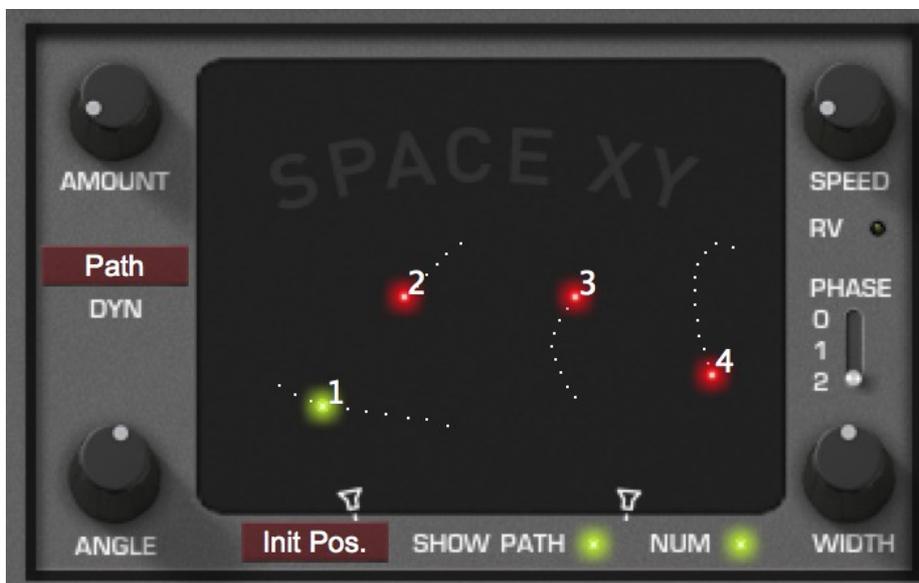
The output of the modulation wheel and details of which modules it modulates are set in the modulation section of the PolyKB

The pitch bend wheel is directly connected to the keyboard follow circuits and modifies the pitch they calculate when connected to the oscillators. The pitch bend range can be set from one semi-tone to four octaves in the output section.

6.5 Special Effect and Stereo modules. Additional modulation tools and settings panels

By clicking on the button at the left of the user interface, you can access to some very fun and useful display and modulations modules. We have already seen the sequencer display module where you can see and edit the sequences, but you will find the **SPACE XY**, a powerful Dynamic Stereo Modulation YX pad, and the **VOICE XY**, a Polyphonic Modulation YX pad.

6.5.1 SPACE XY



This module, the Dynamic stereo Modulation YX pad, allows you to position each available voice inside the stereo space. Click on a voice inside the 2-D positioning screen and move it. You can put it left, right, but also far or close to the two simulated microphones. These microphones have a cardioid pick-up pattern and can be oriented thanks to the **Mic** knob. They can also be moved to get a wider or narrower stereo effect.

WIDTH: Change the stereo field width. Turn left to get a very wide field, right a smaller. Notice that with a wide field, there is a noticeable time for the sound to go from its source to the microphone. It could be annoying, but can be a good way to add some groove to your sequences.

Init Pos.: This opens a menu to set voices in pre-recorded places. “Random Wide” puts them randomly within all the available space while “Random Tiny” in a smaller space, keeping the voices close to each other.

DYN: This button opens a menu to select the way voices will be dynamically moved. **Aquarium**, for a random effect, **Magnet** for exchanging the position of each voice, **Path** for the voice to follow a recorded path.

PATH mode: In that dynamic mode, each voice is following a recorded path. The path is creating by right-clicking on a dot and drawing on the pad. Double clicking on a dot would delete a path. When clicking on a dot, the voice number is displayed. When several dots are displayed at the same place, each click would go through the next dot, allowing you choosing the one you want to change. You can select several dots by clicking outside a dot and drawing a rectangle : all the dots inside it would be selected and changed accordingly.

For copying a path from a dot to an other one, selected a dot by drawing a rectangle, then use CTRL-C for memorizing the path. Select one or several other dots and use CTRL-V.

In that mode **RV** allows you to reverse the path.

The number of the selected voices, as well as the position are displayed.

SPEED: This knob set the speed of the dynamic process (Aquarium, Magnet or Path mode)

PHASE : change the way of the internal algorithm uses the phasing effect of this tool

AMOUNT : this knob sets the amount the voices are moved dynamically

SHOW PATH: For displaying the path.

SHOW NUMBER: For displaying the voice number of each dot.

Some rules explaining how this effect works:

In this effect, voices are placed in the “room” (for the moment this room as no effect on the sound, that means no reverb, no phasing effect). There are two microphones to record what happens in the room. There is a correction in order to remove the level and the delay for the shorter path between a voice and a microphone.

In that way, there is no delay for the shorter path.

This means that:

- If the microphones are at the same place, there is no Left/right difference between voices; the level of the voice only is affected.
- If all the voices are at the same place, there are no differences between voices: The stereo effect takes CPU without any effects.

6.5.2 VOICE XY

The VOICEXY is the 4th Modulation Matrix available in the PolyKB III

6.5.2.1 VOICE XY Modulation Sources

In this matrix the sources are fixed, as they are fixed by the order in which the notes are played on the Keyboard, or triggered by the Arpeggiator or the Polyphonic sequencer.

Therefore this module will offer dynamic modulation if the Polyphonic Circular or Polyphonic Reset modes are selected, and static modulation for all other monophonic modes.

The VOICEXY is an XY Pad type. You can freely drag/move the points position on it.

A point (red circle) represents a note played on the keyboard. The number of points is related to the polyphony settings. (ie A polyphony of 8 notes will generate 8 points)

When the Polyphony is set to "Circular mode", the first note played will activate the first point, the second note the second point, etc until the last point, then a new cycle is initiated. So each incoming note is associated with a point.

Please note that the VOICEXY is also affected by the Unison settings. If the Unisson is set to two voices, each incoming note will activate TWO points.

This makes the VOICEXY a truly unique and fascinating tool that is able to offer both very predictable modulations, used combined with an arpeggio or a simple sequence in the Polyphonic Sequencer, where the order of the notes played is repeated in a predictable way, and totally unpredictable ones when playing on the keyboard natural chords progressions or chorus, licks etc.

The modulations can be everything from very subtle to thoroughly wild and devastating, as the amount of modulation across the two XY axes is fully controlled by four dedicated knobs.

6.5.2.2 VOICE XY Destinations

The points on the four axis can control the same destination parameters than described in the User-modulation panels (section 6.1.6.3)

6.5.2.3 Operating the VOICE XY :



Each voice is represented by a Red Circle, just move the points across the Pad to give them the position you wish.

Please note that you can monitor each voice in real time when playing, as the status of the current voice will change from a red circle to a green one when this voice is active.

Please note that the Polyphony assignation mode works together with the Unison mode: If a Unison of two voices have been selected, each note pressed on the keyboard will trigger TWO voices, and therefore two circles will become green. (So a 4 notes chord will make 8 circles or voices become active and turn to the green status).

This module, Polyphonic Modulation YX pad, allows you to position each available voice inside the modulation space. Click on a voice inside the 2-D positioning screen and move it. You can put it left, right, but also up or down.

The X or Y axis are used to modulate two destinations according to their dedicated amount level, specified by the 4 amount knobs located at the corners of the XY Pad.

Init.Pos.: This opens a menu to set voices in pre-recorded places. “Random Wide” puts them randomly within all the available space while “Random Tiny” in a smaller space, keeping voices close to each other.

DYN: **Path** for the voice to follow a recorded path, **OFF** for not moving the dots

PATH mode: In that dynamic mode, each voice is following a recorded path. The path is creating by right-clicking and drawing on the pad. Double clicking would delete a path.

When clicking on a dot, the voice number is displayed. When several dots are displayed at the same place, each click would go through the next dot, allowing you choosing the one you want to change.

You can select several dots by clicking outside a dot and drawing a rectangle : all the dots inside it would be selected and changed accordingly.

For copying a path from a dot to an other one, selected a dot by drawing a rectangle, then use CTRL-C for memorizing the path. Select one or several other dots and use CTRL-V.

The number of the selected voices, as well as the position are displayed.

In that mode **RV** allows you to reverse the path.

SPEED: This knob set the speed of the Path mode process

SHOW PATH: For displaying the path.

SHOW NUMBER: For displaying the voice number of each dot.

6.6 Effects modules



6.6.1 Delay

Dry/Wet: set the mix level between the initial signal and the processed signal

Time: set the time delay (right or left)

Feedback: set the amount of the delayed signal which is reused (left and right)

Sync: set the time delay according to the tempo (the time will change each time the current tempo of the host application changes)

6.6.2 Chorus

Dry/Wet: set the mix level between the initial signal and the processed signal

Rate: set the rate of the internal low frequency oscillator of the chorus.

Amount: set the amount of the effect.

Type: select the type of the chorus within three different treatments.

6.6.3 Phaser

Dry/Wet: set the mix level between the initial signal and the processed signal

Speed: set the rate of the internal low frequency oscillator of the phaser.

Amnt: set the amount of the effect, meaning how deep the sweep of the internal filter will be.

Freq: set the middle frequency around which the sweep is done.

Res: set the amount of the internal audio feedback.

Stereo : set the difference of phase between the right and the left channel.

6.6.4 EQ

The EQ section provides two High/Low shelf filters, designed to avoid any artifacts near the Nyquist frequency, allowing an analog feeling and a very clear sound.

Freq: set the cutoff frequency.

Res: set the quality on the filter.

Gain: set the level of the shelf. (Centered knob, turning it clockwise will increase the frequency content specified, while turning it anti clockwise will lower the specified frequency content)

ON Led : enables the filter. (When Lit = Green)

Please note that to be active, both the EQ switch diode (Red) and at least one of the two EQs ON diodes (Green) should be lit. Then at least one of the two Gain knobs should have a value different than center.

6.6.5 Reverb

DELAY: Set the time before the reverberated signal occurs

LEVEL: Set the output level of the Reverberation unit

DAMP: Set the amount for damping (Hi frequencies level roll-off)

TY: Use the three positions selector to choose your Reverb algorithm. The three Reverb algorithms are (from bottom to top) : Large, Medium and small

HP: Insert a high pass filter for the input. The cutoff of this filter is 110 Hz.

7 Option menu

This menu allows to choosing the global settings. These settings are defined for all the instances of the PolyKB. Each time an option is changed, the related option file is saved.

7.1.1 Main

In the toolbar, the **Options** button opens a menu for selecting various options for the PolyKB. This menu shows the following options settings:

PolyKB About: displays information about the XILS 3 (version, build date and credits).

Open MIDI settings panel: opens a popup where you can assign MIDI controllers for each of the PolyKB's parameters. Click on the parameter label to select the parameter you want assign, then enter the MIDI controller number (from 0 to 127), or switch on the learning switch and send a MIDI command with the correct MIDI controller number. The PolyKB will memorize it. This setting popup can also be opened by CTRL+ALT+Apple+Left-click (Mac) or CTRL+Win+ALT+Left-click (Win) on the desired PolyKB parameter.

7.1.2 Display

Display low frequency as BPM: allows displaying the low frequency (LFO, oscillator 2 in low mode, clock rate in BPM instead of Hz)

GUI follows presets: When checked, this option allows the GUI to follow the presets. That means that the special display modules are refreshed following the preset settings. Otherwise it keeps the same view.

Output level follows presets: When checked, this option allows the output level to follow the presets. That means that the output level is programmed with the value saved in the preset. Otherwise it keeps its value.

Popup On: shows a popup window while modifying the value of a knob.

Popup Over On: shows a popup window when the mouse is over a switch.

Popup Name On: the name of the current modified parameter is displayed.

GUI update: low: slow refresh rate for the GUI. Useful when it is necessary to save CPU power.

GUI update: middle: standard refresh rate for GUI.

GUI update: fast: fast refresh rate for GUI. Useful when it is necessary to precisely follow the sequencer's led for instance.

Reduced GUI medium (width 1200p) : Select the 1200 pixels width graphic interface. This option

will take upon the next launch of the PolyKB.

Reduced GUI small (width 1000p) : Select the 1000 pixels width graphic interface. This option will take upon the next launch of the PolyKB.

7.1.3 Misc

Init settings from current settings: initializes the default values of the PolyKB from the current settings. All the new presets will be created from these settings, when the **init settings** choice is selected. These parameters will also be used when setting a control to its default value. (Win: CTRL+click, OSX: ALT+Apple+Click).

Wheel Incr: 0.01: parameter increment of 0.01 when using of the mouse wheel.

Wheel Incr: 0.05: parameter increment of 0.05 when using of the mouse wheel.

Wheel Incr: 0.1: parameter increment of 0.1 when using of the mouse wheel.

8 Special tips

8.1.1 Voices management

Here are some rules about the voices management, which could change the sound without understanding why.

Available voices number: This is the number of voice the synthesizer can manage. But the sequencer always gets priority. This means that if this number is 1 and there are 3 selected voices within the sequencer, three voices will be play. But no voices will be assigned to the keyboard.

On the other hand, if this number is 5, then there will be 2 available voices for the keyboard.

The unison is managed as if there was another note activated. That means that if there are not enough available voices, then the unison won't be done as wanted (see examples below).

The Arpeggio is managed as if the keyboard did the Note ON/Note OFF.

For instance:

Polyphony Number: 3
Sequencer selected voices: 1
Unison: 1
Available voices for the keyboard: 2

When using the keyboard in polyphonic circular mode, the note ON will be assigned to voice 2, then 3, then 2, the 3, while the sequencer is playing on voice 1.

Example:

Polyphony Number: 6
Sequencer selected voices: 2
Unison: 2
Available voices for the keyboard: 2

There are 4 voices for the keyboard. When using the keyboard in polyphonic circular mode, the note ON will be assigned to voice 3 and 4 (for the unison), then 5 and 6, then 3 and 4, the 5 and 6, while the sequencer is playing on voice 1 and 2.

Example:

Polyphony Number: 3
Sequencer selected voices: 0
Unison: 2
Available voices for the keyboard: 3

There are 3 voices for the keyboard. When using the keyboard in polyphonic circular mode, the note ON will be assigned to voice 1 and 2 (for the unison), then 3 and 1, then 2 and 3, the 1 and 2, The unison is not correctly done because there are not enough voices available.

8.1.2 Sequencer and Arpeggio synchronization

How to synchronize the Sequencer and the Arpeggio each other or within your music software application could be difficult when you don't understand some of the following rules.

Synchronization of the two modules :

The Arpeggio and the Sequencer are sharing the same clock system only when they are MIDI synced or when the sequencer is triggered by the keyboard. Otherwise, their clocks are independent.

When the MIDI sync switch is ON, the sequencer and the arpeggio are sharing the same clock system, and so, output their content at the same moment. But this doesn't mean they are totally synced: When a note is entered on the keyboard, the arpeggio will output it only at the next clock step. So if the sequencer is running, you have to enter the note exactly when the new step is output, otherwise you will feel that they aren't synced.

To be sure the two modules are totally synced you need to switch ON the MIDI sync control and to switch ON the sequencer "trigger" control. In that way the arpeggio will output the note at the same time you enter it on the keyboard while the sequencer restart its clock and reset its sequence. The two modules are totally synced.

Synchronization of two instances:

To synchronize two instances of the PolyKB within your music software application, you need to switch ON the MIDI sync control on the both instances, but also the switch ON the sequencer "trigger" on the both instance too, even if the arpeggio instance doesn't use the sequencer.

8.1.3 How to modify a preset to make it V2 compatible

The differences between version 1 (old version before 2010) and version 2 of the PolyKB stand in the way the modulation are applied especially for the VCA. For instance, it is now possible to mute a VCO with an envelope, which was not the case previously.

The **VOICEXY** (see above) has also been changed; the amount can be set positively or negatively, which was not the case previously.

If you want to modify a preset created with a previous version you need to tune the following parameters :

- ! Set the Noise modulation amount to 50%
- ! There is a difference in the noise spectrum with the version 2 (when the new modulation mode is enable). This change remove some bad digital frequencies in the upper high of the spectrum, but this implies that you have to increase a little the amount when it is the source of a modulation (for instance when the destination is the filter frequency, change the amount from 50% to 60-65%)

- ! Set the amount of the VOICEXY according to the following rule : replace an amount of x% by $(x\%+100)/2$
- ! Click on the [+] over the velocity. This will allow the velocity to be multiplied and so being more accurate when controlling the VCA
- ! When a VCA is used as a destination (Oscillators, noise, output levels), you have to tune its level (oscillator or noise) and the amount: The rule used to apply the modulation has been changed to allow a total mute of the module thanks to the source (LFO, wheel or envelope for instance). This also allows the level of the module to be set independently of the amount, which wasn't the case.

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