

HERCs Music Systems



'Abakos' VST Instrument Instruction Manual

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VST Plug-In Technology by Steinberg

What is Abakos?

Abakos is a VST software synthesizer that will work in VST compatible hosts like Cubase, FL Studio, Tracktion, Energy XT and many others.

The VST layer of Abakos is based on technology developed by Steinberg. However, Abakos is much more than a simple everyday VST plug-in. The VST layer of information is built on a powerful and flexible synthesis engine called HERCs. The communication between the HERCs core, the VST layer and the VST host means that you can make some pretty cool noises !

Abakos is, by design, a Virtual Analogue synth. It is inspired by older hardware synthesizers and workstations and its signal path is quite simplistic, but capable of a wide range of interesting sounds.

You can read more about the history of the HERCs synthesis project by visiting our Website: www.hercsmusicsystems.com

Will my Computer be able to run it OK?

Minimum system requirements:

- Processor Intel Pentium II or AMD Duron
- Microsoft Windows 98/NT/2000/XP operating system

Recommended system requirements:

- Processor Intel Pentium 4 or AMD AthlonXP or 64 Bit
- Microsoft Windows XP operating system

Please be aware that HERCs Abakos will use a reasonable amount of CPU. Older computers may struggle to run multiple instances of Abakos. The HERCs synthesis engine produces high quality sound and the sacrifice for this quality is some of your computers CPU. But on modern, fast machines, we have found that Abakos will run smoothly and with few problems.

We believe in using the power of modern computers to power our products.

How do I install this?

Assuming that you have just downloaded the compressed zip file containing the HERCs Abakos program, you will first need to unzip it to a folder with an appropriate decompression program like WinZip. Now, locate the 'setup.exe' file in the folder and double click it. Follow the installation instructions and make sure you install Abakos to your VST plug-ins directory. This will mean that your VST hosts can scan and find it.

Text Files Everywhere !

If you dig into the directory folder where you installed Abakos you will soon notice that apart from binaries there are literally hundreds of text files everywhere. They store configuration information and preset sounds. Every time you store your preset a text file is created or modified. Every time you select a preset sound, a text file is read by the HERCs core.

Now, you may be pleased to know that you can edit them using a simple Text Editor. However, before you do so, please make a safety copy.

Here is something else interesting...

Every HERCs synthesizer understands these preset files. As a result you can freely exchange those files between different HERCs virtual instruments. Yes, we know it seems unbelievable, but you can swap files between any of our synthesizers and they will sound identical! The only difference will be that the GUI on your screen may work a little oddly ! Imagine importing a VA stored preset into a HERCs FM synth and trying to use the FM buttons to control analogue values ! Ouch...weird fun...

The Benefits of Text

You may be wondering, why everything is stored in a text file? Here are some benefits:

1. Text files are easy to edit.
2. Text files can be created by hand without any sophisticated software.
3. All CONFIG changes can be done by hand.
4. You can easily install a new preset sound from someone else. Simply copy and paste text files.
5. They are very familiar to computer users everywhere !

Credits

HERCs Music Systems would like to thank Vera Kinter, www.artvera-music.com, for her fantastic interface design for Abakos.

We would also like to thank all of our initial phase Beta testers for their patience with bug fixes and for sending useful feedback and bug reports.

So, how can I make sounds?

1. Playing Notes

To play Abakos an external MIDI keyboard is recommended. However, in some cases, using an external keyboard may be impractical or simply impossible (i.e. MIDI interface is not present). In such cases you can easily play some notes using your computer mouse.



To play a note using your computer mouse simply click somewhere on the keyboard picture.

If you want the sound to play continuously, click the "HOLD" button.

If several notes are playing together and you want to switch them off, click the "ALL OFF" button.

You can also transpose the keyboard using the five transpose buttons: "-24", "-12", "+0", "+12", "+24"

IMPORTANT INFORMATION!

Transpose and Hold buttons are not sound parameters and therefore can neither be stored nor automated. They also do not affect the behaviour of any external MIDI keyboard.

2. Selecting Preset Sounds and Storing User Sounds

Abakos has a section dedicated to selecting preset sounds. It contains the following elements:

1. Knob for selecting sound
2. Digital display showing the number of the preset sound
3. Alpha-numeric display showing the name of the selected sound
4. "INC" and "DEC" buttons
5. "STORE" and "ESC" button
6. "BANK" switch to cycle between banks A,B,C and D. Each bank can store 128 presets.



To select a preset sound simply turn the knob (alternatively use "INC"/"DEC" buttons) and to select a bank, just press the BANK switch.

The storing procedure is a little more complicated. It is designed primarily to protect the user against non-intentional modifications to the preset sound library. *If you have created a sound to store, it is highly recommended that you use this internal preset management system instead of the one offered by your VST host.* To store your own sound, please follow the instructions:

1. Click inside the display with the name of the sound and enter the name you wish to call your sound.
2. Click "STORE" button. This will cause the "STORE" button and the "CANCEL" button to light.
3. Using the knob or "INC"/"DEC" buttons, select the desired program number (the previously stored sound at this location will be erased).
4. You have a chance to cancel your operation by clicking the "CANCEL" button.
5. To proceed with store operation, click the "STORE" button again.
6. A dialog box will appear, asking you to confirm store operation again.
7. Depending on your choice your sound will be stored or the operation will be canceled.

3. LFO

One of the modules present on most synthesizers is the "Low Frequency Oscillator". Its operation is relatively straight forward and it is controlled by several parameters:

1. **SPEED** determines the speed of the oscillation
2. **VIBRATO** controls the amount of oscillation affecting VCO frequency
3. **TREMOLO** controls the amount of oscillation affecting amplitude
4. **WAH WAH** controls the amount of oscillation affecting filter cutoff frequency
5. **WAVE** selects the shape of the oscillation
6. **PULSE** modifies the shape of the oscillation



4. Delay

Abakos features a very simple delay effect. However, it is capable of creating very good results. The delay effect is controlled by three parameters:

1. **DRY/WET** determines the balance between original sound and affected sound
2. **FEEDBACK** controls the overall length of the effect
3. **TIME** controls the time between sound reflections

There are two additional parameters controlling the output:

1. **PAN** apart from positioning the sound in 2D space, controls reflections between Left and Right channels
2. **VOLUME** controls the output volume of the synthesizer



5. Envelope Generator or ADSR 1 / 2

Like most synthesizers, Abakos has a complete Envelope section with the following parameters:

1. **ATTACK** controls the time necessary for the sound to reach the full volume after pressing a key
2. **DECAY** The time of the extra fade determined by "SUSTAIN" is controlled by the "DECAY" parameter
3. **SUSTAIN** After the sound reaches the maximum level it starts fading to the "SUSTAIN" level
4. **RELEASE** controls the time necessary for the sound to fade out after releasing the key



Note: On Abakos there are two Envelope Generators: "ADSR-1" and "ADSR-2". The second one affects frequency of the filter and oscillators instead of controlling the volume.

To apply ADSR-2 to filter or oscillators you have to turn "ADSR-2" knob located on filter of VCO modules.

6. Filter

The Abakos filter module consists of several parameters:

1. **CUTOFF** controlling the threshold cutoff frequency.
2. **RESO** controlling the resonance.
3. **FOLLOW** which controls the filter's response to the keyboard.
4. **ADSR-2** controlling the amount of Envelope signal applied to the cutoff frequency.
5. **MODE** this is switchable between Digital and Analogue filter states. When the Mode button is off (dull red) it is in Digital mode. When the Mode button is On (bright red) it is in Analogue Mode. The Digital filter mode features a slightly harder sound while the Analogue filter mode is a little smoother.



By turning the "CUTOFF" knob you can make the sound "brighter" or "duller". If you are not satisfied with the effect, simply apply more resonance using "RESO" knob.

The "FOLLOW" knob is especially useful when you want to control noise with keyboard (**remember to set "RESO" knob to at least 120**). Setting the "FOLLOW" to 8 causes the cutoff frequency to shift in accordance with keys played. Other settings can produce more dramatic changes to the sound or even reverse them (negative values).

When you want to synthesize sea waves or similar sound the best choice is to apply some "ADSR-2".

Note: You must turn "ADSR-2" knob if you want to apply Envelope signal to the cutoff frequency.

7. Oscillators or VCO (Voltage Controlled Oscillators)

1. **WAVE** selects that shape of the oscillation.
2. **PORTA** knob controls portamento time and on Abakos it appears inside the "KEYBOARD" section
3. **FREQ** and **DETUNE** determine the frequency of the oscillation.
4. **FOLLOW** controls the VCO's response to the keyboard (please, observe that in most cases it is set to 8).
5. **ADSR-2** controls the amount of Envelope signal applied to VCO.
6. **RING MOD** engages or disengages the "Ring Modulator" (present only between two VCOs).
7. **EXTERNAL MIXER MODULE** controls the balance between VCO-1, VCO-2, NOISE and overall volume.



Hints for setting VCO's parameters

If you intend to play high notes, select sine wave. If you intend to play in mid-range or low-range of the keyboard use sawtooth or square waves. Sine waves are hardly audible below 220 Hz while sawtooth and square waves tend to alias at high frequencies.

When you want the sound to appear more "artificial" or "synthetic" use square wave. If your intention is to achieve more "realistic" or "natural" effect, use sawtooth wave. For emulating sounds of nature (i.e. sea waves, winds, etc.) use noise and instead of VCO signal.

To achieve mechanical or metallic sounds (like various bells, various engines) engage "Ring Modulator". Please note, that you will hear silence, if one of the VCO is muted on the "Mixer" section. To achieve string type of sounds, mix the two VCOs at slightly detuned frequencies.

8. Pitch and Modulation Wheels

1. **PITCH WHEEL** shifts the frequency up or down.
2. **MODULATION WHEEL** applies vibrato effect.
3. **PITCH KNOB** controls how much the "pitch wheel" can shift the frequency.
4. **MODULATION KNOB** controls how much vibrato you can apply using "modulation wheel"



Can you give me some help making sounds?

Abakos is quite a versatile sound maker despite a seemingly simple architecture. Many different sounds can be created with it. Here are several diverse walkthrough examples to get you started:

HELICOPTER

This is one of the simplest sound effects.

*In this example you will learn how to generate noise and how to apply LFO signal to amplitude (**TREMOLO EFFECT**).*

First of all, load up Abakos in your VST host of choice and then select one of the 'ABAKOS RESET' patch slots.

1. Engage the "HOLD" button and play any note.
2. In the "Mixer" section set both "VCO" knobs to 0 and "Noise" knob to 128 (this will cause the synthesizer to generate noise).
3. Gradually turn the "Tremolo" knob clockwise to reach 128.
4. Make sure that on the "LFO" section the "triangle" wave is selected (second from the top).
5. Now increase the speed by gradually turning the "Speed" knob clockwise until you hear helicopter type of noise.
6. To polish the sound nicely set "Attack" to 67 and "Release" to 90.
7. Now disengage the "HOLD" button and try playing some notes.

HEART BEAT

A very good sound to increase the "dramatism" in your arrangement.

*This example will expose you to the **DELAY** effect.
It will also introduce **FILTER** module and **ADSR** section ("**Attack Decay Sustain Release**").*

First of all, load up Abakos in your VST host of choice and then select one of the 'ABAKOS RESET' patch slots.

1. In the "Mixer" section set "VCO" knob to 0 and "Noise" knob to 128 (this will cause the synthesizer to generate noise).
2. Set the "Attack" knob to 47. This will cause the sound to reach a maximum level after a fraction of a second (instead of immediately).
3. Set the "Sustain" knob to 0. This will cause the volume to drop (to 0 level) after it reaches the maximum volume.
4. To increase slightly the time of this sudden drop, set the "Decay" knob to 50.
5. Now give some character (or resonance) to the noise by setting the "Reso" knob to 107.
6. And filter out high frequencies by setting the "Cutoff" knob to 20.
7. Now this is the time to add the "Delay" section. Set the "Dry/Wet" knob to 49. This will add some echo. Observe that the first reflection is actually stringer than the original sound. This is because "Dry/Wet" is set to the positive value. When set to 0, the original sound has exactly the same volume as the first reflection.
8. As you may expect, we do not need many sound reflections. By setting the "Feedback" knob to 0, you will effectively remove all reflections except the first one.
9. To add more dramatism, reduce time between the original and reflected sound. Set the "Time" knob to 49.

SEA WAVES

A very nice relaxing sound. This is the perfect choice for relaxation music.

*In this example you will learn how to control filter using **KEYBOARD**.*

First of all, load up Abakos in your VST host of choice and then select one of the 'ABAKOS RESET' patch slots.

1. In the "Mixer" section set "VCO" knob to 0 and "Noise" knob to 128 (this will cause the synthesizer to generate noise).
2. On the "Filter" section set the "Follow" knob to 8. Try playing some notes and observe that filter's cutoff frequency "FOLLOWS" your keyboard.
3. Now set the "Attack" knob to 64. This will cause the sound to reach a maximum level after some time of a second (instead of immediately).
4. Set the "Sustain" knob to 0. This will cause the volume to drop (to 0 level) after it reaches the maximum volume.
5. To increase the time of this sudden drop, set the "Decay" knob to 99.
6. To avoid unnecessary distortions set the "Release" knob to 99 as well.
7. Now let's turn one wave into multitude of them. Set the "Dry/Wet" knob to 0 and increase the "Time" knob to 105.
8. To finish the sound, set the "Pan" knob to 64 (full right). This will add some space to the sound.

STRINGS

You are just about to create one of the warmest and nicest artificial sounds ever created.

In this example you will experience dual-vco synthesis.

First of all, load up Abakos in your VST host of choice and then select one of the 'ABAKOS RESET' patch slots.

1. On the "Mixer" set both VCO amplitudes to 128.
2. Make sure that both VCO generate sawtooth waves by engaging appropriate "WAVE" button.
3. On the "VCO-1" set "Detune" to +4.
4. On the "VCO-2" set "Detune" to -4.
5. On the "ADSR-1" set "Attack" to at least 57.
6. On the "ADSR-1" set "Release" to at least 79.
7. Using modulation wheel apply some vibrato.
8. Add some space by setting the "Delay Dry/Wet" to -54 and "Delay Feedback" to 86.

Now, play a chord, any chord ! Can you hear how the detuning of the VCO can give the sound a certain richness? It's lovely isn't it?

You can play around with it now. Try adding more delay or even messing around with the Detuning.

BELL TREE

This is the most complex sound included in this manual. It simulates a percussion "gadget" called a "bell tree". It is made of many metal sticks hung closely together on a frame. You play on the bell tree by "disturbing" its balance. On a keyboard you will play it in a very similar fashion by pressing keys "en masse".

In this example you will use "Ring Modulator" and tune VCOs to micro-tonal scale.

Once again, load up Abakos in your VST host of choice and select an 'ABAKOS RESET' patch slot.

Step one: creating a single metal bar sound.

1. On the "Mixer" set both VCO amplitudes to 128.
2. Make sure that both VCO generate sawtooth waves by engaging appropriate "WAVE" button.

3. On the "VCO-1" set "Freq" to 47.
4. On the "VCO-2" set "Freq" to 27.
5. Engage the "Ring Mod" button.
6. On the "ADSR-1" set "Sustain" to 0.
7. On the "ADSR-1" set both "Decay" and "Release" to 94.

Step two: making bell tree from single metal bar sound.

1. On both VCOs change the "Follow" parameter from 8 to 2. This will cause the metal bars to be tuned in micro-tonal scale.
2. Try playing some melodies and experience micro-tonal scale.
3. Apply "Delay" effect by setting "Dry/Wet" parameter to +19.
4. Decrease the time between metal bar reflections by turning the "Time" knob to 26.
5. Make the reflection lasting longer by turning "Feedback" knob to at least 91.
6. Apply some "space" by setting "Pan" knob to -64 (full left). This will cause the reflections to appear between left and right channels.
7. Play "glissando" on the keyboard.

Can you hear what a difference the application of the Ring Modulator makes to the sound? It is the Ring Mod function that creates metallic and often, quite strange noises. A lot of experimentation can be done using just this button in conjunction with various settings.

What are you waiting for?

We hope that you have found this instruction manual useful and interesting. There are a lot of different sounds that can be made with Abakos and just when you think you have explored every aspect of its sound capabilities, you will suddenly discover more!

We try to make our software as stable and bug free as possible, but the nature of software and systems is that they can be a little fuzzy at times ! If you have any problems with Abakos, please get in touch with us and let us know. We are always trying to make our products better and more interesting.

If you have any feedback or any thoughts on how our instruments can be improved feel free to get in touch.

All contact details can be found on our website:

www.hercsmusicsystems.com