DKS Pro
Professional Drums Synthesizer

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Introduction

DKS is a flexible and easy to use drums synthesizer.
DKS is born after three years of studying the classic analogue drum machines, which were able to produce convincing drums sounds with simple electronic means.

By joining the "classical" oscillator-based electronics drum synthesis approach with simple FM synthesis, physical modeling of the drum shell, a powerful set of effects, and a beautiful user interface DKS is an unique, easy to use, and incredibly versatile drums synthesizer.

DKS can accurately emulate some of the classic electronic drum machine sounds, but through its extra FM and physical drum shell modeling features can go much further, even giving an interesting acoustic touch to synthesized sounds.

DKS features 8 independent and fully programmable drums synthesizers, a complete and powerful mixer with built-in effects and filters, and three master busses with an integrated and complete effects section.

The Mixer

Let's start exploring the DKS from the built-in mixer!

The DKS offers a fully featured mixer, totally controllable via automation and MIDI, with pan, volume, 2 aux sends which can work pre or post-fader, mute, and solo functions.
Before you can use an aux bus, you must select if it should be pre or post-fader. If you don't use an aux bus it is strongly advised to turn it off to save CPU time.
Each mixer channel receives its input from a drums generator. By clicking the pad located in the mixer channel you will trigger the sound of the drums generator.

Selecting the drums generator to edit

To edit the drums generator parameters and the effects of a mixer channel you have to activate the mixer channel by pressing the channel number.

Midi Notes

On the right of the pad number you can find the MIDI note selector, which displays the MIDI note that triggers the drums generator connected to the mixer channel.
To assign a note to a drums generator you can either click and drag on the display with the MIDI note or press the little learn button, located below the MIDI note and, once activated, press the MIDI key on

your keyboard.

Choke groups

To the right of the MIDI note display you find is the choke group (also known as 'mute group') selector. This selector lets you decide how the pad should interact with the other drums pads or with himself.
By setting the choke group to "Self" the sound of the pad will be interrupted if the pad is triggered again.
By setting the choke group to "OFF" the sound of the pad will not be interrupted when the pad is re-triggered.
There are four choke groups (known also as mute groups): A, B, C, D. Drums pads belonging to the same mute group will interrupt the sound of each other in the group.
It is recommended to set the choke group to "Self" to avoid phase problems with sustained sounds and to reduce the CPU workload as well.

Activating the effects quickly

The four small buttons below can be used to activate or deactivate the insert effects.
There are four effects: **dist**ortion, **bit** reducer, **shell** physical model and **EQ**ualizer. Again, to reduce the CPU workload you should **use the effects only when necessary**.

Below the pad you will find a text label which you can edit by clicking on it. This way you can give a name to a sound (mixer channel).

Loading and saving individual sounds

A powerful sound browser is present below the sound name in the mixer.
You can Load or Save a sound simply by pressing the Load and Save icons (the save is the one with the two dots on it).
After you load a sound you can quickly cycle (using the next or the previous button) through all the sounds within the same folder.

Pad Effects

To edit the effects belonging to a mixer channel you have to activate the channel by clicking on the number located in the top-left of the channel.

The integrated effects offer a nice essential and powerful range of tools to spice up your sound.
Also, you can also turn on or off any of the four effects by clicking on the round button located in the top-left of the effect's display.

Dist

The first effect of the chain is a distortion unit. You can set the gain using the "level" control, or select the "fuzz" distortion type, which gives you a harsh digital sounding distortion.

Bit

The second effect is the "bit" reducer. With this effect you can simulate a 4, 8 or 12 bit sampler. In 8 and 4 bit modes you will hear a lot of harmonics and aliasing, especially when processing lower pitched sounds.

Shell

This effect simulates the shell of a drum. You can set the size of the shell and mix the direct sound with the one coming from the shell using the **level** control.
Note that this effect will make your synthetic sound "softer" and more natural.
Extremely interesting effects can be obtained by modulating the shell size using either the MIDI control change messages or the host automation.

EQ
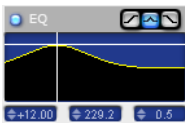
The equalizer section is a multi-mode filter selectable between peaking, low-pass and high-pass.
You can drag the filter frequency response display to set the filter frequency and/or the filter resonance. With many hosts, via automation, it is also possible to record the x/y movements from the display to obtain interesting effects.
The three displays, under the filter response graph, let you adjust the filter gain/resonance, the filter frequency and the filter Q (only when the filter is set in peaking mode). The values of these displays (note the up and down arrows on the left) can be changed by clicking the mouse on them and dragging the mouse up and down.

AUX and Master Sections

In the top-right area of the DKS interface you can find a selector with three buttons "aux 1", "aux 2" and "master". This selector will let you edit the effects of the corresponding output bus.

The Multitap Delay

The first effect you can see in the effects section is a powerful and flexible multitap delay.

To configure it quickly you can use the "FX Wizard", which offers you a range of effect presets.

The multitap delay offers up to 3 taps. The second and the third tap can be turned on or off, by pressing the button on the top-left of each tap section.

Each delay tap offers a pan and a gain control, the delay time and a band-pass filter with cutoff frequency and bandwidth controls.

You can also synchronize the delays to your song tempo by selecting the appropriate rhythmic division. When a rhythmic division is selected the delay time will show a number, which is a multiplier of time division unit selected.

Below the multitap delay DKS features a simple compressor and a small and simple reverberator unit.

DKS Synthesis Architecture

The architecture of the DKS is essential and easy to understand, and it can be used to produce several types of percussive sounds.

Each drums generator features three sound generators:

1 **The first generator (Osc1)** is an oscillator that can generate three types of waveforms: sinusoidal, triangular and saw-tooth.
2 **The second generator (Osc2)** is an oscillator that produces a sinusoidal wave, and it can also be used to modulate the pitch of the first oscillator. It can be used either as a pitch LFO or an FM modulator.
3 **The third generator (Noise)** generates white or pink noise.

Both the oscillators (**Osc1** and **Osc2**) share almost the same controls:
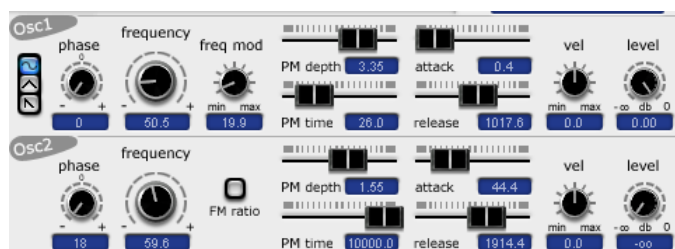
Phase

This parameter sets the initial phase of the oscillator when the sound is triggered.
The initial phase of the oscillator ranges from 0° to 359°.
When an oscillator starts with a phase close to either 90° or 270° it produces a click, because it creates a sudden discontinuity in the sound.
The Roland TR-808 drums machine, for example, makes use of this technique to enhance the attack of the sounds (kicks, claves, congas, snares, etc…).
The initial phase can be also set to a random value by setting the phase control to 360° (to its maximum value).

Frequency

This control sets the frequency of the oscillators, in other words the pitch of the sound that the oscillator will produce. The first oscillator can range from 8.2Hz to 12,544kHz, the second oscillator can range from 2Hz to 3,136kHz.

Attack and Release

These controls let you adjust the attack time (the time in which the generated sound reaches its maximum amplitude) and the release time (the time that the sounds takes to fade out).

PM Depth and PM Time

These controls lets you modify the initial pitch of the sound and specify the time (in milliseconds) in which the sound will reach its normal pitch (specified by the "Frequency" parameter).

The Roland TR-909 drums machine makes use of this trick to produce its classical kick sound.
By using just one oscillator and setting its parameters to:
1. Frequency about 50 or 60Hz
2. the PM time from 20ms to 60ms
3. the PM depth from +1 to +4 octaves
4. The attack time to 0
5. The release time from 300ms to 2000ms

you can easily create a huge variety of powerful kick sounds!
This trick can also come handy to give a more "percussive" impact to other sounds, and can also be used with a longer time to create interesting sweeps, or making the pitch of the sound decay slowly and slightly over time.

Freq Mod

The "Freq mod" control (**Osc1** only) lets you decide the amount of frequency modulation (pitch modulation) applied to the first oscillator. The source of this modulation is always the second oscillator (**Osc2**).

By setting the oscillator 2 to a subsonic frequency (5Hz, for example) you will hear the pitch of the first oscillator going up and down.

Setting the oscillator 2 to an audible frequency (100Hz for example) you will not hear changes in the pitch of the first oscillator, but you will hear additional harmonics.

FM Ratio

You can set the frequency of the second oscillator directly, or, when you turn on the FM ratio button, as a ratio of the first oscillator frequency.
This control comes handy when you want to change the first oscillator pitch and preserving the harmonics generated by the modulation of the second oscillator.

Vel

The Vel control lets you adjust the volume response curve of the oscillators in relation with the MIDI dynamics.
When set to the center, the volume will respond linearly to the MIDI velocity.
By moving this control to the right the oscillator volume will be more sensitive to the MIDI velocity (e.g. it will sound louder and with less dynamics). By setting it to the extreme right the volume will have no dynamics at all.
By moving this control to the left the volume will be less sensitive to the MIDI velocity.

Level

The last control, common to all the sound generators, is the output level.
This control simply lets you adjust the output level of each sound generator.
By setting it to zero the generator will be disabled, and it is recommended to turn off the generators you don't need to save some CPU time.
Note that the second oscillator will not turn off when you turn off the its output volume and you have some FM modulation applied on the first oscillator.

Noise Generator

The noise generator unit offers a selection between white or pink noise sources, which can be filtered by a multimode filter.
You can set the type of the filter (low-pass, band-pass and high-bass), set the filter cut-off frequency and filter resonance.
The noise generator also offers three types of envelope: linear (has shorter fade-in and fade-out times), logarithmic (the most common type of envelope) and crack.

The crack envelope generates a saw-tooth profile before its release. The attack time, in this case, determines the number of cracks that will be generated.

The Modulation Section
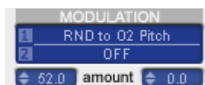
The modulation section lets you change several parameters of the sound generator module depending on the MIDI velocity, or randomly.

You can choose up to two parameters from the pull-down menu.

The modulations options that begin with "VELO to" are related to the MIDI velocity and those beginning with "RND" are related to the internal randomizer.

You can determine the amount of each modulator over the parameter chosen by changing the values in the display near the "amount" label.

Intelligent Randomizer

DKS comes with an intelligent randomizer.

You can instruct the DKS to create drum kits on the fly and experiment with them while listening to your song or to some MIDI drums pattern!

In the dropdown menu you can select the type of randomizer. For example if you want a kick-like sound you should choose the "Kick" preset. Each time you randomize the sound (RND sound) a new kick sound will be generated for the currently selected pad.

You can assign a randomizer to each sound generator and, by pressing the "RND drum kit" you will get a new, and almost ready to use, drum kit! To turn off a RND generator simply activate the sound generator and set the randomizer to OFF.

HINT:

To quickly create a new kit that may suit well within your song try the following procedure (give the chances a chance!):

1. Loop some measures of your song (or the rhythm pattern alone) in your host
2. Select the appropriate randomizer for each drums pad
3. Randomize the kit
4. When you find a pad sounding the way you like set the randomizer for that pad to OFF
5. Continue randomizing until you have a new kit you like

A nice tutorial about randomizers is available here: http://www.araldfx.com/dks/randomizertutorial.pdf

Midi Controllers

If you would like to use an hardware MIDI controller to control a parameter of the DKS all you have to do is associating the MIDI control change number sent by your hardware with a DKS control.

First, move a control on the DKS user interface. The name of the control will appear in the bottom bar.

Click on the learn "LEARN" button and move a control on your hardware.

To remove the association between a DKS control and a MIDI control touch the control on the DKS user interface and press the "FORGET" button.

To clear all the control associations use the "RESET" function.