GALAXY X

L i b r a r y   M a n u a l

GALAXYINSTRUMENTS   best service

1.   Welcome

Welcome and thank you for choosing GALAXY X.
This new virtual instrument is based on an exciting kind of sound design: FX convolution.
Galaxy X unites all of the elements of FX convolution for the first time in one integrated system, in one virtual instrument:

- The Sources (15 GB of source sounds: effects, loops and tonally playable instruments)
- The X-Engine (the convolution module of X, equipped with 1400 convolution X-Files and an intuitive way for dynamically controlling FX convolution)
- The Pre-X and Post-X engines (preparing and finalizing the sound before and after the X-Engine)

Over 1000 instrument layers give a huge range of ready-to-play presets with matched Sources, X-Files and all effects adjustments.
With the intuitive user interface, developed in every detail for Galaxy X, it's a snap to subtly or radically modify these presets or to build new sounds from scratch.
The ability to control convolution strength with the modulation wheel opens the door to a spontaneous dynamic real time modulation of every sound.
Finally, Pro Edit allows you to edit every single detail of a sound.
This manual will introduce you to FX convolution and the new world of Galaxy X!

Galaxy Instruments - Uli Baronowsky

💡 *Please be careful with the output volume especially when playing around with different X-Files. Convolution can create unpredictable resonances that amplify the source sounds significantly. Galaxy Instruments and Best Service cannot take the responsibility for any damage resulting from the use of convolution in Galaxy X.*

2.   Convolution

In mathematics, convolution is an operation involving two functions, producing a third one that is typically viewed as a modified version of one of the original functions. Translated to the audio world this means that two sounds are essentially 'multiplied' with each other or one sound is 'folded' over the other one.

As this operation applies to every single sample of the two sounds, sound convolution is quite a complicated process. With Galaxy X though, you will find that it can be used easily.

So far, convolution in music or sound design is primarily used for simulating acoustic spaces, in which case it is called "convolution reverb." For this purpose an acoustic snapshot is taken from a room. This basically works by setting up a couple of microphones to capture the room's reverb with an impulse, for instance a starter gun. The recorded result is accordingly called an 'impulse response' or "IR." In this case a reverb of a specific space is folded over the input signal creating the impression that the incoming sound is virtually relocated into the sampled room.

Now, convolution works not only with an IR of a sampled room, but basically with every other sound, resulting in a 'morph' of the incoming sound and the impulse response. Because, in this case, the second sound is not really an impulse response anymore, we chose to call it an X-File instead, which is folded over or morphed with the incoming sound, the Source.

We call this kind of convolution FX-Convolution. The interaction between Source and X-File refers to a couple of sound characteristics, which all work together at the same time:
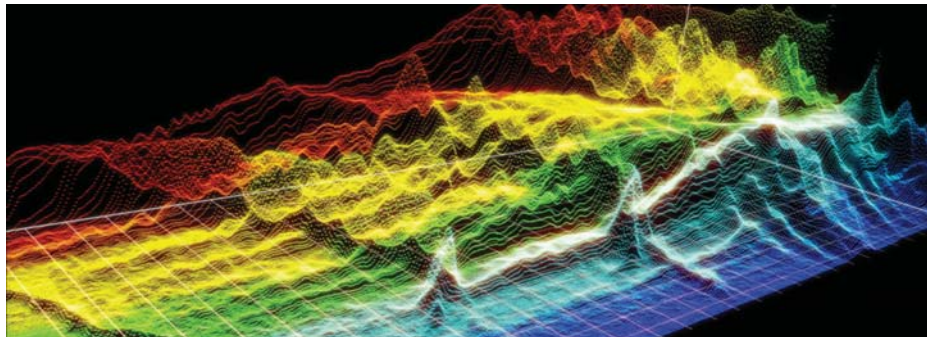
2.1.   Frequency

The frequency spectrum of the X-File puts its sound color on the Source like a fingerprint. This can enhance certain frequencies or cut them out, it can create weird sound colors or recreate the sound of vintage devices like old radios or telephones. It can create frequency progressions from slow modulations to radical filter sweeps.

2.2.   Volume Envelope

The envelope of the Source is 'shaped' by the X-File and the X-File's envelope is essentially triggered by the Source. This way a hard Source attack can be transformed intro a pad attack, an impulse-like Source can be lengthened to a long sustain, a short Source can come and go and re-emerge just the way the X-File determines it. A reverse X-File will create a reverse effect of the Source. And a loop, used as an X-File, projects its rhythmic structure onto the source sound.

2.3.   Position

Depending on the X-File, the stereo position and stereo width of the Source sound can either stay as it is, be carried over from the X-File or be a morph of both. This opens the door for great panning modulations, especially in combination with 'frequency-pannings'.

2.4.   Resonance

As the frequencies of both the Source and the X-File interact, the result can be frequency cancellation or resonance. Resonance can be disturbing, but also very exciting. As Galaxy X unites all the components of FX convolution in one virtual instrument, it is possible to use the good aspects of resonance and avoid the bad ones.

2.5.   Tonality

If the Source is tonal and the X-File noise-like, the resulting sound will keep the tonality of the Source. A little bit of the tonality of the X-File will create resonance. If the X-File is a tonal sound, though, this tonality will be triggered by and react with the Source. This way a drum loop can morph into a tonal sitar loop, a noisy effect can trigger a tonal phrase, a single source hit can create a tonal sustain, a drum kit can mutate into a 'flute-kit'.
All these parts of convolution work together simultaneously, creating endless possibilities of interaction and new sounds.

## 3.   Installation & Layers

Galaxy-X is based on Best Service's new Engine Player. The Engine Player is delivered free with Galaxy X.
The whole installation process of the Engine Player and Galaxy X is described in detail in the 'Engine Manual', which is accessible via the help page of the Engine Player.
After installing the Engine Player and Galaxy X, you can add three X libraries in the Preferences menu of the player:

X-FX (red)   featuring all kinds of effect sounds
X-Keys (blue)   for tonally playable instruments
X-Loops (grey)   with thousands of special effect loops.

After opening the Engine Player, a default layer shows up in the 'layer area' **(1)**, which is located in the left part of the Engine Player interface. If you go to the layer's dropdown menu, the three X-libraries **(2)** will appear:
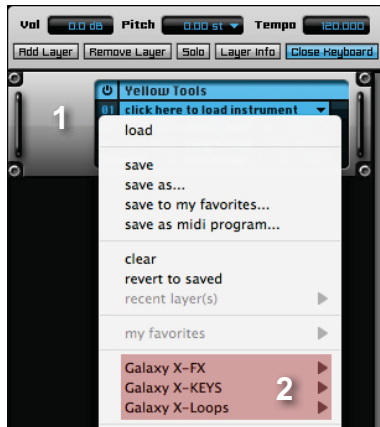
To load, choose a layer instrument from one of the dropdown menus.
To load another layer, click 'Add Layer' above the layer area. Go to the dropdown menu of the second layer and load another layer instrument, which by default will have another midi channel. This way you can use several layers at a time.

Just keep in mind that FX convolution can be a very CPU-intensive process and each layer has its own convolution module.

To the right of the layer area you will find the Quick Edit page **(1)** with the user interface of Galaxy X. To switch between the Quick Edit pages of different layers, simply click on the desired layer in the layer area.
On the top left of the Engine Player window you can save or load a Project **(2)**. A Project contains all Layers with all modifications, assignments like midi channels, key range … und all settings of the Mixer, including additional inserts or the output routing.

4.   User Interface

💡 *You will find all information you need about the user interface in this manual. It might be even easier, though, to go to the Interface Tour on* **www.galaxy-instruments.com/x-tour.html**

The user interface appears in the Quick Edit page after loading a layer from X. The user interface is divided into four sections, representing the signal flow counter-clockwise

- The **SOURCES** module, delivering sample sets to be processed within X
- The **PRE-X** engine, preparing the samples for the X-Engine
- The **X** engine, the convolution module of X, ready to completely transform the sound
- The **POST-X** engine, finalizing the X'ed sound

4.1. Sources

In the SOURCES section you can choose the source sounds to be processed within X. Three Sources can be layered over each other. Choose the source sounds from the dropdown menus **(3)** and adjust the volumes **(4)** for getting a good balance. Each Source can be switched on or off **(5)**.

💡 *Pretty much every detail of every Source like stereo position, envelope, inserts or modulations can be modified in the* **Pro Edit section.**

For easy and effective use, the Sources are mapped differently for the three instrument layer types:

• With X-Keys all sounds are mapped over the whole keyboard. This way all loaded source sounds are played on top of each other with every key you play.

• The X-FX Sources are divided into two categories. The main FX Sources feature different samples mapped from C3 upwards. This way you can use different samples of a type simultaneously, but also get an overview of all samples featured by this Source. Every FX Source has an associated folder of the same name and the appendix 'singles'. Here you'll find source sections for every sample. A lot of effect samples are cool when they are pitched way up or down. Our effect sounds are mapped over the whole keyboard, so you can achieve this easily.

• With X-LOOPS we wanted to give you the flexibility of using 36 loops at a time. We achieved this by assigning one octave of the keyboard to each of the three sources. Loop Source one can be played from C2 to B2, Loop Source two between C3 and B3 and Loop Source three between C4 and B4. This way you can layer and play three loop sources of up to 36 loop samples at a time.

4.2.   Pre-X

After the basic source sound has left the Sources module, it enters the Pre-X engine. The Pre-X engine features a set of effect modules designed to prepare the source sound for the X-Engine.

The first effect in the row is Dirt **(6)**, which can blast, crush and ruin the sound. The three Dirt modules contaminate the source in different ways.

Blast **(7)** represents a distortion effect, which crunches or extremely distorts the sound and enriches it with homogeneous distortion.

Crush **(8)** reduces the bitrate of the signal, which adds a quantization noise that may produce a harsh sound impression, depending on the amount of reduction.

Ruin **(9)** reduces the sample rate with a resulting noise addition that produces a "warmer" sound impression with a different noise than 'Crush'.

(Info: Noise has a special relevance for effect convolution: the more noise is part of the Source, the more of the original X-File's sound character gets through. So the addition of this quantization noise lets the X engine produce really different results.)

The second effect slot is different for X-FX and X-Keys on the one side and X-Loops on the other.

X-FX and X-Keys feature a combination of Sequence **(10)** and Groove **(11)** presets, which can be used in combination as well.

The dropdown menu of Sequence gives you access to different Arpeggio presets, dissolving a chord up, down, up and down, or around the played keys. It also features tonal sequences, breaking up a played chord in different scales.

As opposed to the sequences, which dissolve a played chord into its single notes, the Groove presets play the whole chord in a rhythm. Switch 'GROOVE' on, choose a groove preset and away you go.

Both modules, sequence and groove, can and should be used together, creating an endless number of groove combinations, which always remain in sync with your sequencer's host tempo.

As sequences and grooves don't really make sense with loops as a source material, we chose to replace them with a Pre-EQ **(12)** module for X-loops. This can really help to make loops work with certain longer or resonant X-Files.

The Pre-EQ offers a one-band equalizer with adjustable frequency and gain **(13)**, a low pass filter**(14)** and a high pass filter **(15)**.

The Contour **(16)** effect is based on a special compressor designed to shape the sound, increasing its presence and accenting it.

It's easy to use but effective: choose a preset **(17)** and adjust the contour strength **(18)**.

The end of the effect rows is filled by the Repeat **(19)** module, a filter delay. It's important to have a delay in the Pre-X engine to feed the echo into the X-Engine. The delay effect is always in sync with your host tempo. You can choose different note values **(20)** for the left and the right delay and adjust the echo feedback **(21)**.

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4.3.　X

The **X-Engine**, the convolution module, is the heart of X. The X-Files, the impulse responses, are the heart of the X-Engine.

X comes with 1400 X-Files of all kinds…

X-Filter: different filtering X-Files that do everything from changing the source's spectrum to creating radical up and down sweeps.

X-Gear: X-Files from different gear like telephones, old radios, tape delays or spring and vintage reverbs for great feedback and reverb-like effects.

X-Loops: over 600 loop files, creating tonal and effect loops from any source sound.

X-Morphs: morphing X-Files, designed to morph a source into electronic, natural or musical and orchestral sounds.

X-Resonance: resonant X-Files, designed to expand the spectral effects of the filtering X-Files with resonance.

X-Reverse: reverse X-Files, creating an endless number of reverse effects from any source.

X-Soundscapes: long X-Files, imaging different scenes like 'Emergency Room' or 'Scary'. Hitting one key or a slow succession of keys creates long exciting soundscapes.

X-Spheres: X-Files creating spherical sounds, deep and spaced out, emotional or tough, just for a short moment or endlessly.

X-Textures: great for changing the source's shape, creating new attacks, moving or panning flows, slow motions and spins or sustains and spreaders.

X-Timbre: short impulse responses, working mainly as an EQ.

X-Tonal: tonal X-Files, mixing their tonality with the tonality of the source.

The X-Engine is easy to handle: switch it on **(22)**, choose an X-File from the X-Engine's dropdown menu **(23)** and change the X-Factor **(24)**.

The **X-Factor** controls the amount of convolution, the dry/wet ratio between the original Source and the X'ed sound.

The amount of convolution is visualized by the X-Eye **(25)** in the center of the X user interface.

By default the X-Factor is controlled by the modulation wheel of your keyboard for easy access. Of course you can assign any additional midi controller to the X-Factor such as an expression pedal, if you want to keep both hands free for playing.

The next two knobs change the length of an X-File and therefore the length of the resulting final sound. The length and the release of the final sound, created by convolution, depends on the length of the X-File. So if you like the sound created by an X-File, but its the length does not fit, you can change it using X-Size or X-Time.
X-Size **(26)** actually changes the length of the X-File by time-stretching or time-compressing it. This way the whole X-File still alters the source sound, but with a faster or slower tempo.

💡 *There are quite a few X-Files, by the way, which are synced to the host tempo, including all of the loops. For those presets, the* Sync *knob* **(27)** *is switched on. In this case you don't have to bother with X-Size, as it does its job automatically in relation to the host's tempo.*

As opposed to X-Size, the X-Time **(28)** knob shortens the volume envelope of the X-File, reducing its effective length. This way only a part of the X-File affects the source.

X-Tune **(29)** changes the X-File's pitch. This can create weird but great-sounding effects on one side, but is also very useful for adjustin the tonal X-Files to a different key.

💡 *Loading a tonal X-File like "Angels in B major" for instance won't sound right if you are in D major. Simply adjust the X-tune 3 half-tones up and you are in the right key again.*

X-In **(30)** and X-Out **(31)** adjust the input and output level of the X-Engine. Depending on the level of the source sound and the interaction between source and X-File it's sometimes necessary to lower or raise the input and output levels.

💡 *The interaction between source sound and X-File can sometimes create high level resonances. So keep an eye on your volume knob.*

Finally, using the Reverse knob **(32)** opens the door to a world of reverse sounds. With Galaxy X you can create reversed sound effects with any of our 1400 X-Files applied to any one of thousands of original source sounds.

4.4. Post-X

After the X-Engine it's time for final finishing touches with the **Post-X** engine.

Rotate **(33)** features a lot of stereo and panning effects. Simply choose a preset from the dropdown menu and change the stereo intensity. Turning the intensity knob to the left side reverses the stereo motion.
Colour **(34)** provides a musical EQ for adjusting bottom end with 'Boom', mid frequencies with 'Growl' and the top end with 'Air'.
Filter **(35)** features 15 different filter types and a lot of modulation possibilities.
With Space **(36)** you get access to a second convolution module, this time mainly for creating reverbs and ambiences of different types and sizes.
By creating an Automation Preset **(37)** it's easy to customize X's controls to your midi controller. You can assign a midi controller to any knob on the Quick Edit page simply by right-clicking on the knob and choosing a midi controller number in the dropdown menu. After you have set up your midi system the way you like, save it as an automation preset and recall it with any other X-Layer.
And finally, Dynamic Range **(38)** gives you control over how the X-Layer reacts to velocity.
And finally, Output **(39)** controls the layer's final output volume.

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5. How To Use X

5.1. Instrument Layers

All in all, Galaxy X comes with over 1000 ready-to-play instrument layers for X-Keys, X-FX and X-Loops. If you are into presets, you've got a lot to listen to, and more layers will come over time.

You can load a layer either in the Layer Area (1) left of the Quick Edit page or in the browser window (2) of the Engine Player, accessible by clicking on the 'browser' button above the Quick Edit page.

In the "layer area" you'll find all layers organized in subfolders. The arrows (3) beneath the Layer dropdown menu serve to switch to the previous or the following layer.
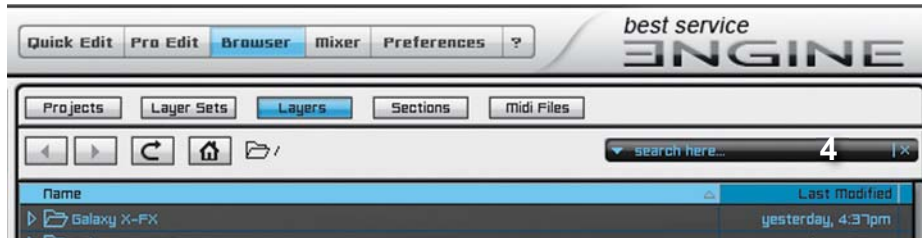
The Engine Player's main browser window features a word search function. Click on the browser button, navigate to the library you want to search and enter one or more keywords into the search field **(4)**. If entering more than one, the keywords should have a space between them, not a comma.

The keywords contain categories and attributes.

The categories correspond to the folder names of each library. A layer, assigned (for example) to the subfolder ‚Scary', can also belong to a couple of other categories like ‚Atmospheres' or , Reversed'. So if you are looking for 'scary' sounds, check not only the sounds in the library subfolder 'Scary', but use 'scary' as a keyword in the search function of the browser.

| X-KEXYS	X-FX	X-LOOPS
Atmospheres	Atmospheres	Beatbox
Beaten	Bells	Bells
Bells and Pots	Big Bottom	Blips Blops
Bottom End	Crystallizers	Bottom
Bowed	Devastation	Breakbeats
Cheap 'n Cheesy	Downers	Chop Stutter
Crystallizers	Electronics	Dance
Delayish	Filtered	Devastation
Devastation	Hits	Dirty
Electronics	Human	Drums Percussion
Filtered	Impacts	Echo
Fixed Tonality	Industrial	Electronics
Flutes	Loops	Filtered
Heavy	Phrases	FX
Loops	Piano Effects	Industrial
Organs	Real World	Morphing
Overtones	Reversed	Noisy
Pads	Scary	One Shots
Pianos	Sequences	Tonal
Plucked	Swells	Voice
Resonant	Swoshes	World
Reversed	Tonal	
Scary	Uplifters	
Sequences	Weird Instruments	
Soundeffects		
Soundscapes		
Strings		
Swells		
Synths		
Tremolos		
Voices		

Additionally you can use a couple of attributes to search for layers in the browser. Here is a list of possible attributes for the search function:

X-KEXYS	X-FX	X-LOOPS
short (release) - medium (release) - long (release) - sustain	*short (release) - medium (release) - long (release) - sustain*	*short (release) - medium (release) - long (release)*
percussive - smooth	*percussive - smooth*	*tight - spherical - spacey*
tight - spherical - spacey	*tight - spherical - spacey*	*nasty - nice - gloomy*
nasty - nice - gloomy	*nasty - nice - gloomy*	*dark - warm - midrange - bright - resonant*
dark - warm - midrange - bright - resonant - dissonant	*dark - warm - midrange - bright - resonant*	*narrow - wide*
narrow - wide	*narrow - wide*	*dense - light*
dense - light	*dense - light*	*dirty - clean - noisy*
dirty - clean - noisy	*dirty - clean - noisy*	
soft - hard	*soft - hard*	

5.2. X-Factor and Modulation Wheel

The X-Factor controls the ratio between the 'dry' source sound and the "X'ed" sound, created by the convolution module of X, the X-Engine. By default the modulation wheel is always connected to the X-Factor, giving you dynamic and easy access to the amount of convolution anytime. The amount of convolution is visualized by the X-Eye in the center of the X user interface.
After loading an instrument layer, always try out the mod wheel. Check out how the layer sounds dry, how it sounds wet, which ratio you prefer or play dynamically with it. There are also some instrument layers with an internal modulation of the X-Factor.
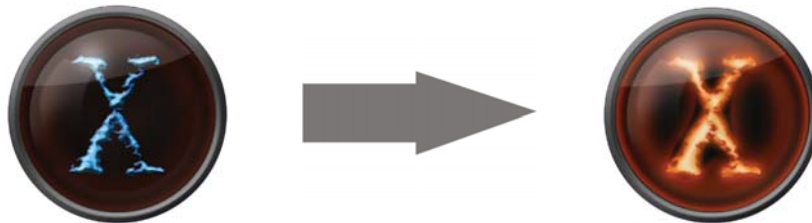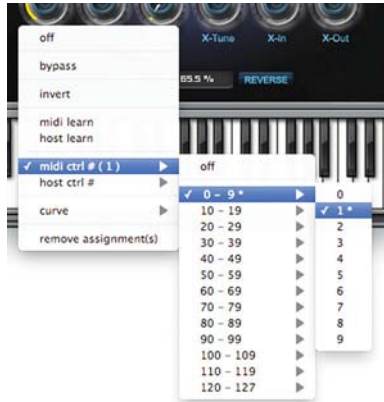
In case you want to use a midi controller other than the modulation wheel - for instance an expression pedal in order to keep both hands free - simply right-click on the X-Factor and change the midi controller.

5.3. Sources

After loading a layer, listen to the three "Sources," try changing their levels or changing the Sources themselves. Try different combinations of Sources and the X-File to get a sense for how X-Files react to different Sources. You can even drastically edit the Sources using **Pro Edit** (link).

5.4. X-Files

Change the X-File. The X-Files are the effects impulse responses, the heart of the X-Engine. Try different categories of X-Files to get a feeling for how they affect the Source. The effects of the X-Files range from a simple, but effective, timbre function to the creation of spheres, loops, reverse sounds, soundscapes, filter motion and a lot more. In combination with different Sources, the possibilities are endless. Try it out, and get a feeling for what is possible.

If the sound 'tail' created by the X-File is too long, use X-Time to shorten it or use X-Size to either shorten or stretch it for another world of convolution effects.

5.5. Layers from Scratch

If you want to create a layer from scratch, load a default layer.

Look for a source sound in one of the dropdown menus in the Sources area. Start layering other source sounds on top of it, change the levels of the three Sources until you like the combined Source.

Try different X-Files with different X-Factors to see which X-Files create something special with your own source sound. Or start with a combination of a single Source and an X-File and layer more Sources afterwards.

Check out the effects of the Pre-X engine to modify the Source to work well with the X-File. Especially using 'Crush' and 'Ruin' from the 'Dirt' section creates a more dominant portion of the X-File in the final sound. With X-Loops, the pre-EQ can be important to filter frequencies, which create resonance with the X-File, or to enhance a certain spectrum of the Source.

5.6. Pro Edit

Pro Edit opens the door to Galaxy X. In Pro Edit you can find and edit all functions, inserts, effects and modulations which can be used in X. This refers to the Sources and the instrument layer.

After opening Pro Edit with the appropriate button in the top menu bar of the Engine Player, you should click on 'content' to see which part of the X layer is visible **(5)**. Now you can switch between the layer and X-Source 1 to 3. When 'layer' is selected, all insert effects **(6)** used in this layer are shown in the bottom right area. Next to it on the left you will find the modulations **(7)** including Arpeggiator and Groove Sequencer. After clicking on 'Insert FX' **(8)**, the FX area switches to a detailed view of the modulation parameters. The top right area presents the volume envelope **(9)** and the top left area an additional filter **(10)**.

Insert effects can be added by the 'add insert fx' **(11)** dropdown menu, and modulations by using the 'modifier' **(12)** dropdown menu.

Detailed information about Pro Edit and all insert effects and modifier sources and destinations can be found in the Engine Player's manual.

5.7. Mixer

You can load several X-Layers into the Engine Player and they all come together in the mixer. Every layer has a separate channel in the mixer. This channel enables you to root a layer to a different output, send the layers output to a bus for another send effect or insert other effects into each layer channel.

The whole package, including all layers and the mixer adjustments, is called a 'project', which can be saved and reloaded with the project dropdown menu **(13)** on the top left of the Engine Player's interface. A more detailed description can be found in the Engine Player's manual.

5.8. Mapping user source samples

It is possible to map a maximum of 25 user source samples into an X Layer. These will be played additionally to the Sources which you choose on the X Quick Edit page.

For mapping your own sounds, go to 'options' in the layer dropdown menu and choose 'import audio files'. In the following dialog you will be asked how to map these samples. After doing so, your own samples will be routed through the X-Modules exactly like the factory Sources including Pre-X, X and Post-X Engine.

5.9. Using midi files in a layer

In the Engine Player it is possible to load a midi file into a layer and map it to a key. After choosing 'import midi file' in the options of the 'layer' dropdown menu, a key can be assigned to the midi file. This way you can play sequences using X sounds by just hitting a key. The midi file should be mapped beneath A-1 for X-Keys and X-FX and beneath C2 for X-Loops.

6.   Support and Feedback

Support for all questions regarding the Engine Player and Galaxy X is provided by Best Service:
support@bestservice.de (English or German)

support hotline +49 (0)89 4522892-22 (English or German)
Tuesday and Friday 10:00 a.m. – 2:00 p.m. (CET)

For feedback, please mail to feedback@galaxy-instruments.com

Special thanks for great performances, sound design and instruments:

Special thanks for supporting the making of X: