

ROOT STUDIO
SAMPLE LIBRARY

SYNCLAVIER™

PERFORMANCE INSTRUMENT

SYNCLAVIER

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Welcome

Congratulations on your purchase of Synclavier!

Does any synthesizer have a more glamorous name than the Synclavier? One of the rarest electronic musical instruments on the planet, the New England Digital Corporation Synclavier performance instrument™ was the first all-digital instrument to reach commercial production. Production stopped at Serial #13, however, before the much more famous Synclavier II was introduced. The earlier model featured FM synthesis which was previously only heard in labs, notably at Stanford University, long before Yamaha introduced their DX line of synthesizers.

Please take a moment to read this guide. It offers a detailed look at the library contents and technical details about this historic instrument.

We sincerely hope that our library will prove to be a great source of inspiration for your projects! If you have any questions, comments, or suggestions for future sample library projects, we'd like to hear from you. You can contact us at info@root-sounds.com.

Format and compatibility

The Synclavier instruments come in three formats. To use the library, you need to own at least one of these products (or one that can read/import one of their file formats).

- .exs format for the EXS24™ (Apple Logic Pro, Garageband)*
- .nki format for Native Instruments Kontakt™, v3.0 or higher¹
- .nki format with GUI for Native Instruments Kontakt, v5.1 or higher



Kontakt GUI, shown above, requires at least v5.1

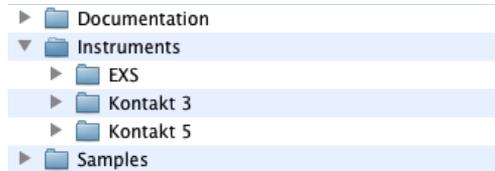
*All trademarks and trade names belong to their respective owners.

¹All Kontakt instruments require a full version of Kontakt. The free Kontakt player will only play the sounds in demo mode for a limited period of time.

Installation

After you downloaded the archives, you need to unpack them first. Depending on your system, this may happen automatically after downloading. Otherwise, simply double click the archives. After unpacking, you may delete the packed archives. Better yet, store them on a backup drive, should you wish to install the library again at a later date.

After unpacking, the master library folder should look something like this:



If you do not require all supported instrument formats, you may delete the extra sampler instrument definitions to keep the instruments folder easier to manage; however, they are small files and do not use much disk space.

It is highly recommended that you use a separate hard disk for audio files in addition to your system drive. If you have only a single hard drive, like on a portable computer, then of course you can also use that. You may not be able to play back as many tracks and instruments smoothly, however.

Installing for Logic Pro Sampler and EXS24 mkII on Macintosh

Logic Pros Sampler, and its predecessor, the EXS24 mkII, expect instrument definition files in this specific location:

HD/Library/Application Support/Logic/Sampler Instruments

You may store your instruments in another place (like an additional hard drive), but then you must place an alias or shortcut of the instruments folder only in the above location by dragging it while holding down cmd-alt (cmd-option), otherwise the Sampler will not find it. **Caution:** Avoid dragging the entire library folder (or an alias) to this location, otherwise Logic will scan all the samples on startup as well, significantly increasing scanning time. The best thing to do is to create a folder named **Synclavier** in the above location first, then cmd-option drag the instruments folders to this folder to create aliases or shortcuts. This will keep your hard disk organized and the drop down menu in the Sampler tidy and speed up scanning time when launching Logic. Avoid moving instruments and samples around inside the library folder, because this will break the link between them.

Installing for NI Kontakt (Macintosh and Windows)

Drag the library folder to where you keep your other Kontakt libraries. Avoid moving instruments and samples around inside the library folder, because this will break the link between them. You may then need to manually search for samples when you are trying to load an instrument inside Kontakt.

If Kontakt keeps asking you to locate the samples, please see our online video tutorial on how to fix this at root-sounds.com.

For maximum compatibility, the Kontakt instruments come in two formats.

- single instrument .nki files for backwards compatibility all the way back to Kontakt 3.0.
- a GUI powered instrument requiring Kontakt 5.1 minimum.

Synclavier - pure history!

When you read or hear about references to the Synclavier, in all likelihood it is about the Synclavier II, a much more famous (and much more capable) instrument that offered high quality sampling in addition to FM voices. The predecessor, by contrast, is so little known that most people have never heard or even seen a picture of it. A mere 13 units were built, one of which lacked the optional black and white keyboard. At root studio, we were fortunate to own one of these rarities for more than 30 years. It originally belonged to the University of Victoria in British Columbia.

The Synclavier Performance Instrument, as it was correctly called, offered a factory disk that turned the general purpose main frame computer into a ready-to-play synthesizer with 16 factory and 16 user presets, plus an on-board sequencer with 4 factory and 4 user sequences. It featured 8-voice polyphony with 2-operator FM synthesis. The waveforms were not restricted to sine waves, as employed later by the famous Yamaha DX line of synthesizers. Instead, complex wave shapes with up to 16 harmonics could be specified by the user, with or without an adjustable frequency modulation index and ratio. Arbitrary octave equivalent scales could quickly be dialed in and saved along with the user presets.

The flexibility of the instrument allowed it to boot from custom programmed system disks. This could completely transform the instrument into something else altogether. This option was exploited by several universities, who were the prime customers for the Synclavier.

At Brown University, for example, the FM voices were not used at all. Instead, the entire computing power was utilized for a

single voice with up to 255 harmonics, each with their own envelope control. Depending on the complexity, such finesse could sometimes lead to the processor choking.

At the University of Victoria, professor Doug Collinge* created a real time environment called Moxie which allowed users to completely tailor the hardware to their needs. This environment allowed algorithmic compositions with or without real time interaction, arbitrarily complex waveforms, 4 channel sound distribution, interfacing to analog synthesizers, random or fixed modulation of any parameter, CRT output for user interaction or monitoring, and much more with very little coding. If you want to listen to some excerpts of algorithmic compositions created on the Synclavier with Moxie, please visit [this link](#).

About the instruments

The Synclavier library is split into two sections: the factory presets and extra sounds.

Kontakt user interface

Note: this section only applies if you are using the Kontakt 5.1 GUI version of the library.

The operation of the Kontakt user interface is loosely modeled after the original Synclavier front panel. Use the 16 buttons labeled "Basic Instrument Selection" to choose a preset (except #2 as noted below). Choose a parameter for editing, then turn the large knob on the left to change its value. There are also four effects to enhance the presets. While not present on the original instrument, they are a welcome addition to spice up the otherwise somewhat dry sounds. When you select a different preset or parameter, the previous one becomes deselected. Latching is only possible with the effect on/off switches.

Each effect gives you access to the most important parameters. The signal chain follows the order of the effects as laid out on the panel:

Distortion	Drive/Damp control the intensity of the effect and rolloff for the high frequencies.
Chorus	Speed/Depth control the speed and depth of the chorus effect.
Delay	Time/Repeat control the delay time and feedback.
Reverb	Tail/Damp control the room size and high frequency damping.

The extra sounds are available in a separate Kontakt instrument. This offers a selection of 8 presets and additional controls for an ADSR envelope and filter to further tailor the presets to your needs.

Factory Presets

The presets were captured as full chromatic samples using 24-bit hardware. Some presets required many passes before acceptable recordings from the 40+ year old hardware were captured.

Remember that the Synclavier does not have a velocity sensitive keyboard. We believe there is something to be gained by adding velocity sensitivity to the presets, but if you want to be purist about playing the presets, just set your controller or DAW so that all notes are sent with the same velocity value (127 would be a good choice to maximize the signal to noise ratio). Also, the original 5-octave keyboard has been extended for full size MIDI controllers. Of course, notes beyond the original 5-octave range are obtained by simply stretching the outer notes, so you will lose some fidelity at the outer extremes.

Some original presets have a natural decay which was captured faithfully in the samples. Some presets sustain indefinitely. For these, the samples have been painstakingly looped to faithfully replicate the original sound. It's worth noting that some loops actually have rhythmic audible clicks and artifacts, but these are **not** from poor loop points, but rather they are contained in the original sound. Rest assured that the actual loop points are not noticeable. If you don't believe it, open the wave display on your sampler and watch the cursor while holding down a key!

Most presets just fade out or stop when a key is released, but #08 and #14 have release samples to reproduce the release behavior of the originals. A couple of presets cannot be adequately represented in a sampled environment, therefore, we

resorted to an alternative method:

Preset #11: this preset has a unique envelope behavior which changes the sound depending on how long the key is held. To approximate this, the preset was captured as a set with three velocities. Hitting the keys harder comes quite close to holding the keys longer on the original keyboard. This also means that hitting a chord with velocities that do not all belong to the same velocity layer will make some notes of the chord play longer than others, so be aware of that.

Preset #12: similar to Preset 11, this one uses 2 velocity layers to simulate the difference in envelopes.

Preset #16: the original preset sounds slightly different depending on how long the key is held. Since there is no way for a sampler to know how long a key will be held once a sample started playing, this preset uses key switches to switch between two different sets of samples, one taken with a short tap of the key and one with a longer key press. The difference is subtle, but enough to warrant an extra layer of samples. To make room for the key switches on C1 and D1, the lowest sounding note is F1.

What's up with Preset #2?

The button for preset #2 on the front panel kept failing even after much loving care and, as such, is missing from this set. This is shown in the interface by flashing a 'broken' button. The original instrument is supposed to undergo a complete overhaul by the new owner, so it is possible that this sound will become available in a future update, but this is out of our hands and therefore no promises can be made. Should the preset become available in an acceptable quality in the future, however, all registered owners of the library will receive it as a free upgrade.

Extra sounds

The extra sounds contain mostly unrelated, loosely organized bits and pieces. We wanted to give you a little more than just the factory presets and we do hope that you find some of these sounds interesting and useful. Even though there are not that many presets in this set, there is more to this than meets the eye, because some keyboard layouts have many different sounds. The name of the currently selected preset is also shown just above the preset buttons in the GUI.

- Chords These are a number of chords that were extracted from a finished composition. The lower two octaves play on a sine wave timbre, the upper octave plays on an organ-type timbre. The simplest chord in this set (the first one) is also available as an extra preset (Chord-single) across the keyboard and can be layered to create more complex chords or fill backing tracks in interesting ways.
- Complex FM Spectra A take on John Chowning's classic text "The Synthesis of Complex Audio Spectra by Means of Frequency Modulation", this is a collection of seven snips (spread across the keyboard) with textures so complex that the fundamental note cannot easily be heard, even though only a single note is playing.
- Darkness These are mostly low drones extracted from various pieces. Note: the sound between F#2 and B2 starts identical to the one between C3 and F3. The latter goes into a long FM sweep, however.
- FM Drums Well... not really - these are just some cutouts from existing tracks that can be used in a percussive way. You'll find a handful of samples, reminiscent of a kick, snare, hat, and two toms.

- Microtonals The possibility of creating arbitrarily complex tunings (not necessarily in octave equivalent scales) was one feature that attracted universities to this machine. The preset contains some microtonal sweeps down/up and up/down using layered voices, plus some low rumbling clusters that exhibit alias frequencies arising from the fact that the Synclavier does not have anti-aliasing filters.
- Sci-Fi Quite a mouthful, these are some rather cheesy sounds created with a few lines of code, reminiscent of the science fiction genre from about the same era as the instrument itself.
- Woody FM synthesis is good at simulating metallic and wooden hits. These notes were extracted from a random pitch sequence in A minor on a sound reminiscent of a xylophone. As such, there are only 15 samples that play at their original pitch - the remaining pitches were created by stretching neighboring samples.

License agreement

Usage of the samples in the library ("the sounds") is subject to this license agreement. By using the sounds, you agree to all the terms and conditions of this agreement.

The samples and sounds contained in this library are licensed, not sold to you. This non-exclusive, non-transferable license is granted only to the individual end user who has purchased a license from root-sounds. All samples remain the property of root-sounds and are licensed only for use in the creation of a recorded or live performance that includes the licensed samples as part of a derivative musical work.

Use of the sounds in multimedia or games is limited to use within original musical compositions ("derivative work").

You may:

- use the sounds in the context of musical works without paying any additional license fees ("license free").
- store a copy of the sounds on another medium (DVD, hard disk, flash drive etc.) for the sole purpose of a backup copy.

You may not:

- copy, give away, trade, lend, rent, redistribute or resell the sounds to another party.
- post the sounds to another person or group of persons over the Internet, or place them in a network that is accessed by multiple users.
- create another sample library that includes our sounds, whether in modified or unmodified form.

Credits

Producer:	Stefan Schramm
Assistant editor:	Constantin Altemeyer
Music Demos:	Jonathan Bridges, Anatol Locker
Graphic Design:	Stefan Schramm
Endless support:	Doug Collinge

*In grateful memory of Doug Collinge, my electronic music professor at the University of Victoria, B.C. who passed away unexpectedly in 2021. In his class, I learned how to code in XPL on the Synclavier. He not only fostered my interest in electronic music to the point where it became a living for me, but also remained a friend for years thereafter. As late as 2020, he helped me tackle the problems with the aging Synclavier hardware during the recording sessions for this library. Without Doug, I may have never become a composer and, most certainly, this library would not exist.

- Stefan Schramm