Written by Giuseppe Caiazzo
April 16th, 2024

Introduction

Nordic Folk Strings is a Kontakt library based on nordic traditional instrument **tagelharpa**. It is a collaboration with singer and tagelharpa expert **Alessandra Cognetta a.k.a Psamathes**, who has recorded all the source material of the library.

Nordic Folk Strings is a playable library featuring samples from **two different tagelharpa models (bass and standard)**. It features 8 Kontakt instruments based on an innovative **rhythmic legato functionality** which allows to create from scratch **endless tonal sequences and movements**.

Tagelharpa basics

The tagelharpa consists in **three strings mounted on a wooden body**, which are **played simultaneously with a custom bow**. The instruments in Nordic Folk Strings are based on **two distinct model of tagelharpa: a standard tagelharpa and a bass tagelharpa**. The bass tagelharpa features a lower and darker sound, whereas the standard sits in a higher range of the spectrumregister
Of the three strings, **the first two provide a droning background** whereas **the third one is the soloist string, where the melody is played**.
The tagelharpa is a simple yet versatile instrument, however its more distinctive use is for rhythmic material, for examples tonal **rhythmic backgrounds or phrases**. With its peculiar timbre, the tagelharpa immediately evokes a peculiar ancient northern aesthetics.
Conventionally, the first string and the third one (soloist) are tuned on the same note one octave apart, with the soloist being the higher, and the first two strings tuned 5 or 7 semitones apart.
For example, A-D-A is a typical tuning of the tagelharpa.
For each of the two different tagelharpa models, Nordic Folk strings features several tunings, as reported in the table below.

Bass Tagelharpa	C-F-C
	C#-F#-C#
	C-G-C
	C#-G#-C#
	D-A-D
	D#-A#D#
	E-B-E
Standard Tagelharpa	G-C-G
	G#-C#-G#
	A-D-A
	A#-D#-A#
	B-E-B

Each tuning corresponds to a different root key, normally coinciding with the highest string of the two droning strings. For example, in a D-A-D tuning the root key is A.

Sampling Strategy

The first sampling decision we made consisted in **recording entire rhythmic movements rather than long, individual notes**. A movement is a rhythmic loop that is synched to the master tempo. This is because we wanted to preserve the raw and authentic character of the instrument, which otherwise wouldn't have been emphasized with a traditional sampling approach. Despite this, Nordic Folk Strings features a rhythmic legato functionality which allows to play melodies on a given movement or combination of movements (more about this in the *Rhythmic Legato* section).

Another important choice consisted in **sampling separately the two droning strings and the soloist string**. The droning strings are called *Base Strings* in the GUI, the soloist is called *Solo String*. Simply put, this choice offers more versatility: for example, it is possible to turn-off the *Base Strings* samples and play the *Solo String* only polyphonically, instead than monophonically, creating interesting harmonizations. Or it is possible to juxtapose the Base and Solo strings within the composition, without necessarily having all of them playing together.

To summarize, you can both play the Base and Solo samples on the top of each other and recreate the effect of 3 strings playing together, or you can just keep them separated on the keyboard for more versatility (more about this in the *Mono Solo Str./ Poly Solo Str.* section).

The instruments in Nordic Folk Strings

Nordic Folk Strings features **8 Kontakt instruments**. They are equally divided in Bass Tagelharpa and Standard Tagelharpa. In turn, these are divided by bpm range (Slow: 80-110 bpm, Fast 110-130 bpm) and type of rhythm (Straight or Triplets).
The choice to differentiate the instruments by tempo range is because some movements work better on a slow or fast timing; however, nothing stops you rom using a "Slow" instrument at an higher tempo or vice versa, as the loops will stay locked to the master tempo regardless. Also, the High Quality time stretch engine we have used preserves the quality of the sound.

Bass Tagelharpa	80-110 bpm ; Straight rhythm
	110-130 bpm ; Straight rhythm
	80-110 bpm ; Triplets rhythm
	110-130 bpm ; Triplets rhythm
Standard Tagelharpa	80-110 bpm ; Straight rhythm
	110-130 bpm ; Straight rhythm
	80-110 bpm ; Triplets rhythm
	110-130 bpm ; Triplets rhythm

All the 8 rhythms feature nearly identical functionalities. The Straight Rhythm instruments for both Bass and Standard tagelharpa offer the choice of **5 different movements**, whereas the triplets instruments offer **3 different movements**. Also, the 8 instruments offer the choice between a **Clean and Gnarly tone selection for the soloist strings**. Whereas the former corresponds to a more conventional, rounder tone, the latter features slight imperfections like small

pitch swells and a rougher sound of the bow against the string.
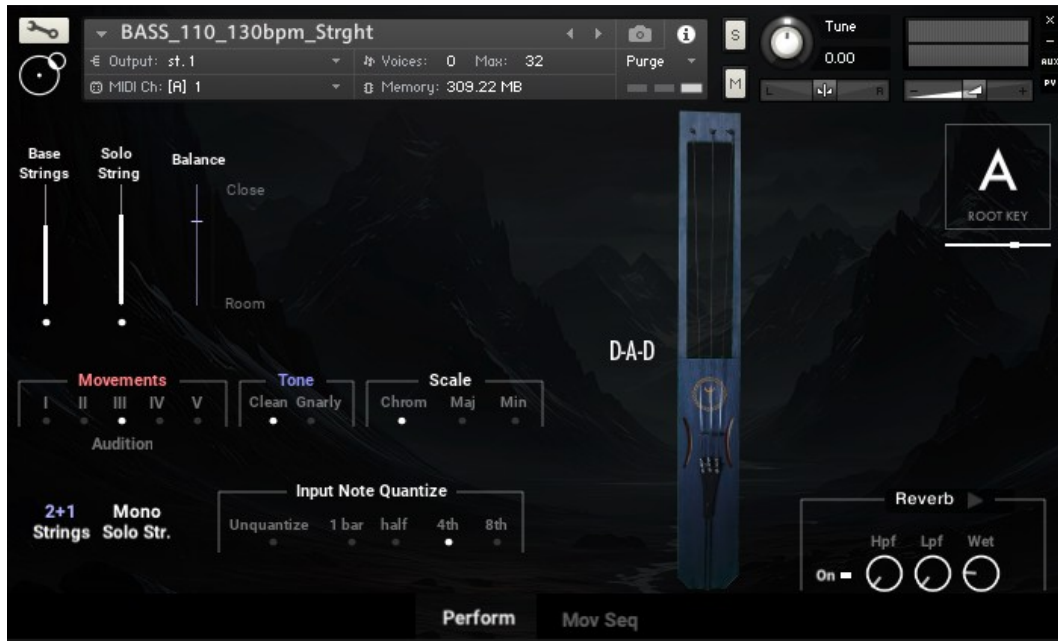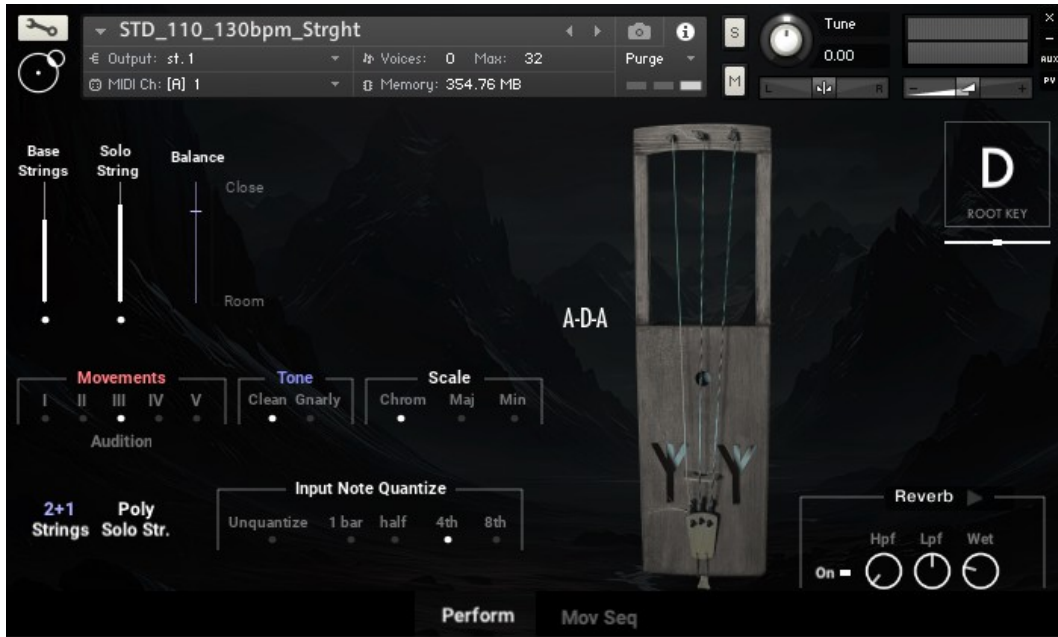
Additionally, the 8 instruments allow to **select the tuning of the tagelharpa by using the** *Root Key slider* in the top right of the GUI. **Each Root Key value corresponds to a different tuning**. Once the tuning/root key has been set, three different scales can be selected for the Solo String: *chromatic, major and minor*.

Rhythmic Legato: introduction

The instruments of Nordic Folk Strings are based on a **custom scripted rhythmic legato functionality**. We have created and implemented it in order combine the tagelharpa movements in a smart and efficient way, with the result of seamlessly "laying" a melody on a given movement or combination of movements.

In order to explain what this means, let's consider an old problem of working with loops. Let's imagine we have a number of cello ostinato loops, 2 bar length each, mapped in a sampler. Each of them is based on the same rhythmic movement (whatever this is), but "sitting" on a different individual note each(C3, C#3, D3 etc)
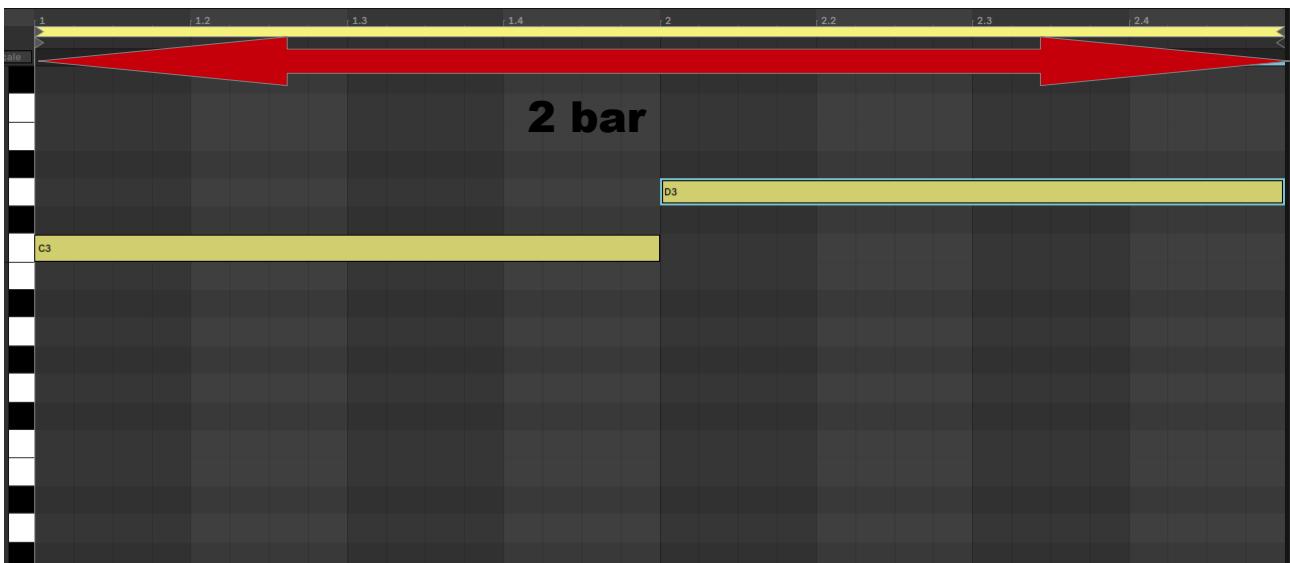
The problem we have here is that whenever we trigger a new note, the corresponding loop starts from the beginning of the sample, regardless of when said note is played. But what if we want the movement seamlessly going in background but populated by different notes, according to when said notes are played?

In the picture above, in order to achieve this result we need the D3 loop sample to start playing from half it's length, and not from the beginning.
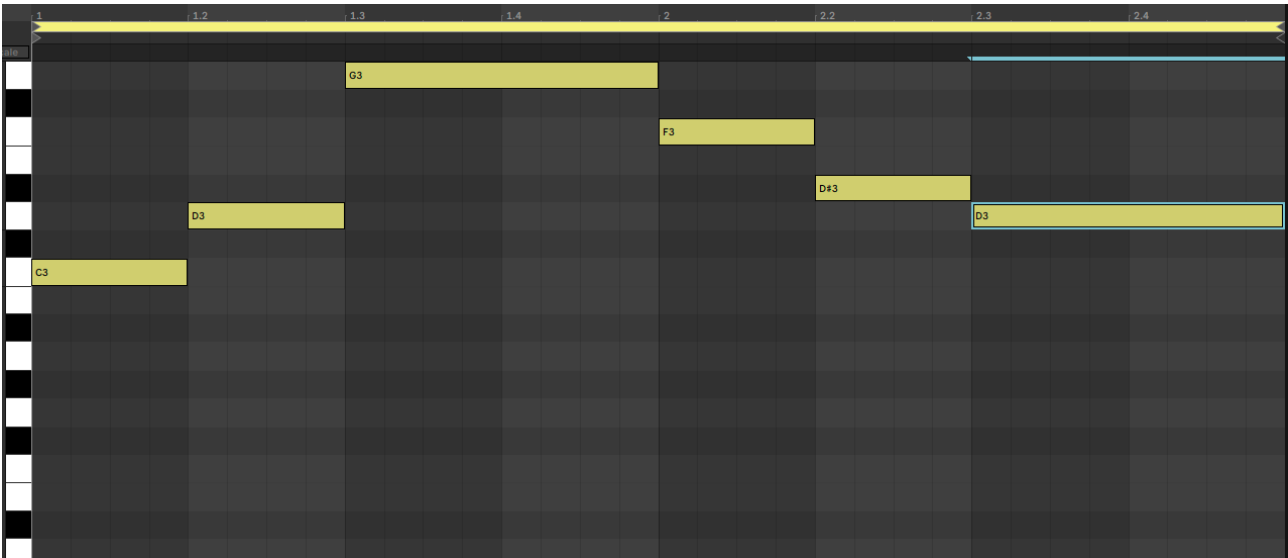
Same problem here: the D3 loop needs to start from a sample point corresponding to 1.2 in the grid, the G3 loop needs to start from a sample point corresponding to 1.3 etc.

In other words, what we need here is the **equivalent of comping audio files in the DAW**: we need the equivalent of offsetting the cello loop at a given point a point according to where it needs to be located in the DAW timeline/grid, in order to keep the movement going on seamlessly.

The Rhythmic Legato functionality in Nordic Folk Strings does that automatically and solves the problem. You can pick any of the tagelharpa rhythmic movements featured in the instruments, press Play in your DAW and the script will take care of offsetting the sample you've just played according to when you have played. Based on this, different loops can be combined in both a basic as an advanced way (more on this in the *Movements Sequencer* section).

IMPORTANT : the Rhythmic Legato won't work if you don't press Play in your DAW. Without going in the scripting details, the Rhythmic Legato script needs the timing reference from the DAW (or from the Kontakt master tempo in stand-alone), hence **the DAW needs to play**. You can still play the samples if the DAW is stopped, but you will not be able to use the Rhythmic Legato.

Rhythmic Legato: how it works

There's no additional action required on your end to have the Rhythmic Legato ready to work, except **hitting the PLAY button in your DAW and start playing some notes in a legato fashion**.


As mentioned in the previous section, the Rhythmic Legato needs the DAW playing in order to "receive" a reference timing to offset the tagelharpa loops according to when you play them against the grid.

For this reason, **all the notes you play are time-quantised in real time against the grid**: simply put, if you select *4th* from the *Input Note Quantize* box on the GUI (bottom), the notes you're going to play will be quantized to the beat. For example, even if you play a little before the beat, you will hear that the sample "waits" to the next beat to be played.

- *If your DAW allows negative delay compensation, you can draw the MIDI notes "on beat" (8th, 4th etc) and apply negative delay compensation of around -100 ms. Larger values are needed when using the Movements Sequencer.*

T h e *Input Note Quantize* box offers 5 options of the measure at which you want the quantization/comping to apply: **8th, 4th,2nd, 1 bar and Unquantized**.
The choice depends on what you want to play.
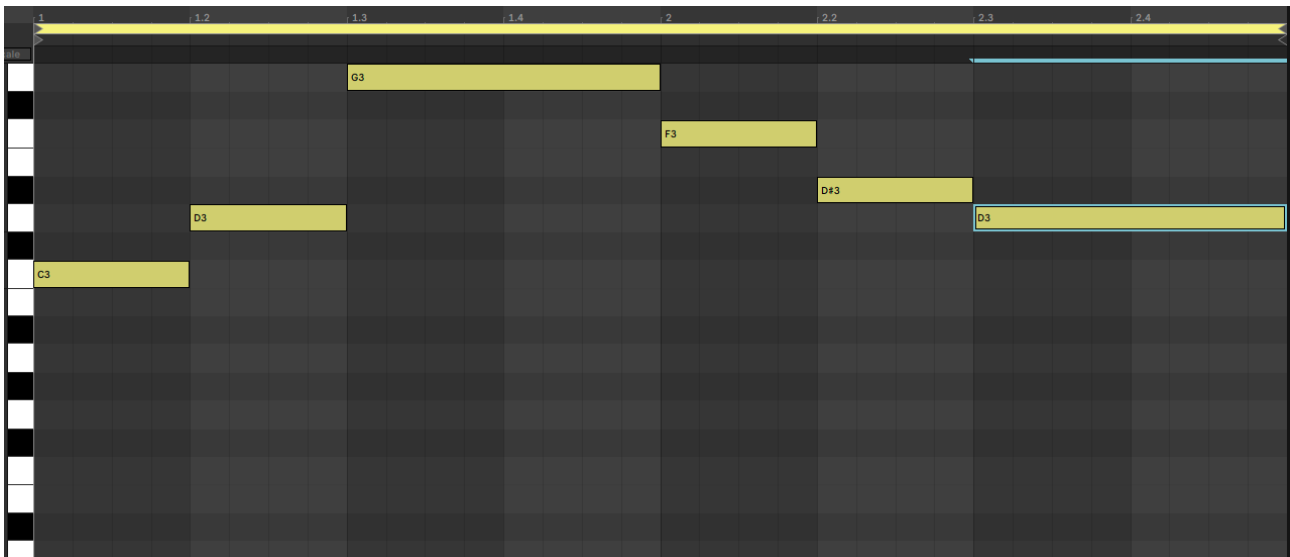
In this case, the 4th option is the optimal one, as the notes in the melody "drop" on the beat (specifically, at 1.1, 1.2, 1.3, 2.1, 2.2 and 2.3).
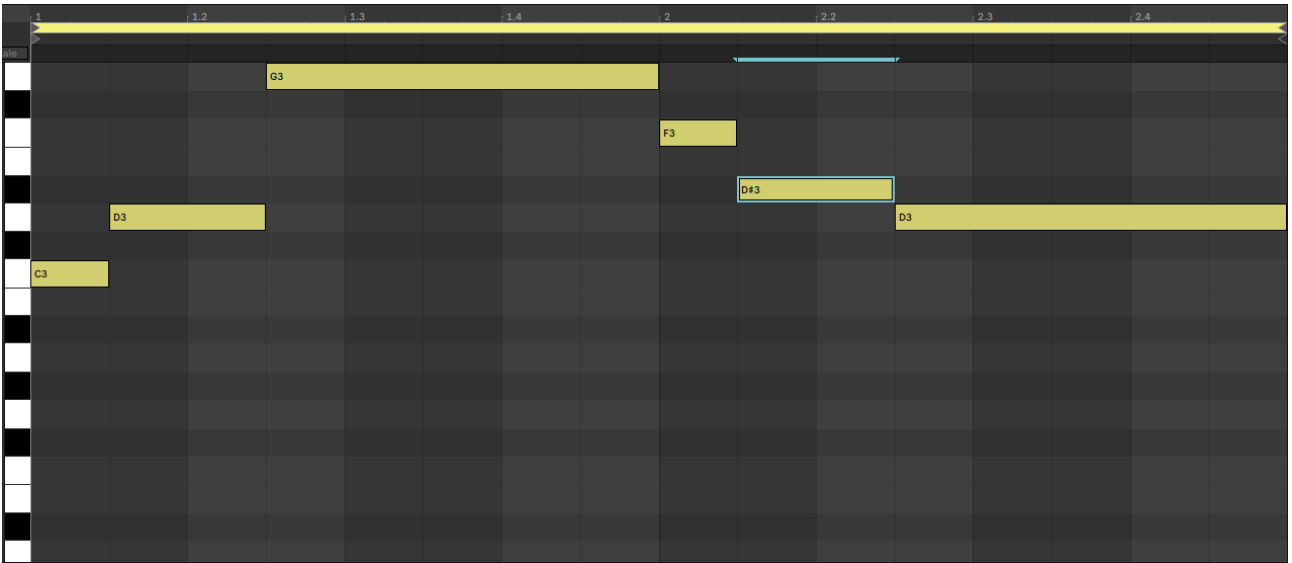
In the picture above, some of the notes drop on the 8th (D3 on 1.1.3, G3 on 1.2.3 etc), so in this case you want to use an input note quantization value of 8th. If you keep a larger quantization value, for example 4th, any note between two beats will be quantized to the next one.
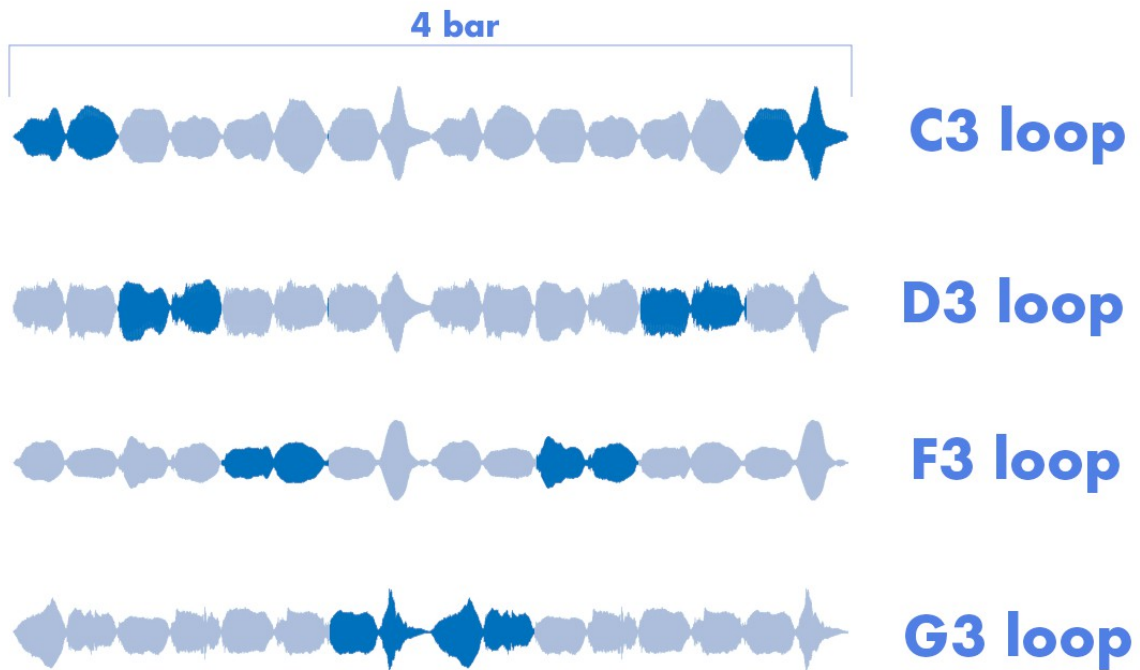
Let's report here a graphic example of the "live-comping" performed by the Rhythmic Legato functionality; here we have a simple ascending-descending melody of 4 bar length on the same movement, with the notes dropping on 2nd .

So let's summarize what you need to do to use the rhythmic legato in Nordic Folk Strings:

1) **Hit Play in the DAW** (or in the Kontakt , if you're using the standalone version)
2) Select an **Input Note Quantization value** (2nd, 4th, 8th etc)
3) Play a melody in a legato fashion - play the notes a little "before" before the beat, or **use negative delay compensation in the DAW if possible (e.g. Steinberg Cubase, Nuendo)**.

Movements Sequencer

At the bottom of the GUI, you can move to the *Movements Sequencer* page by simply clicking the *Mov Seq* button. This is what the Movement Sequencer looks like.
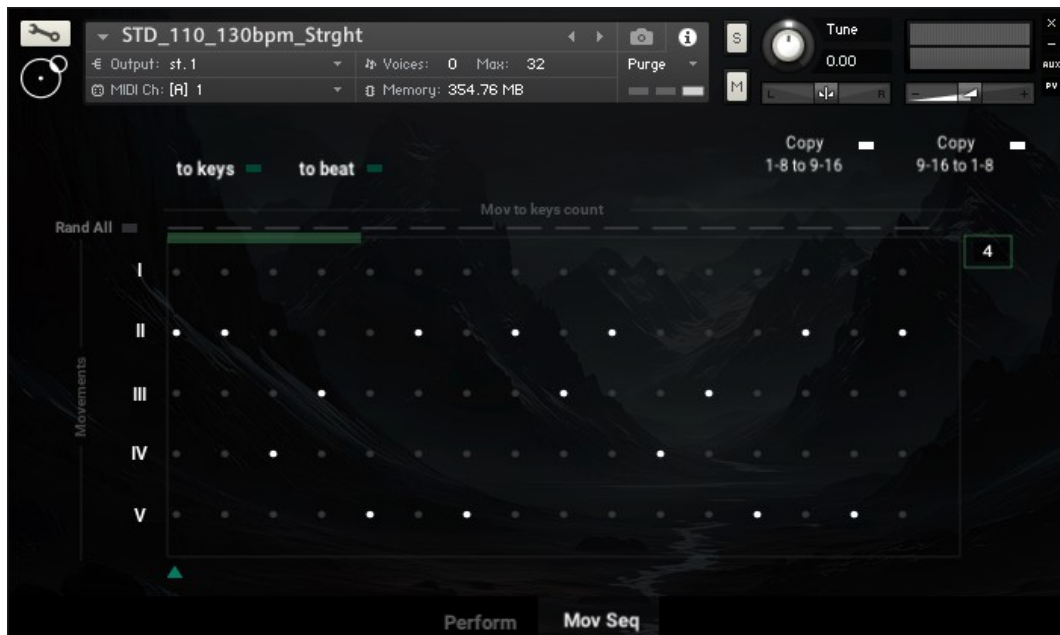
Simply put, the Movement Sequencer allows you to combine different movements , based on the same concept of the Rhythmic Legato explained in the previous section.

By default the Movement Sequencer is deactivated, but once it's turned on what you're going to hear is a "live-comping" between different movements.

As you see, the Movement Sequencer is organized in 5 rows , each one corresponding to a different movement (or 3 rows, for the Triplets instruments).
There are two options of activating the Movement Sequencer: *to keys* and *to beat*.

Let's start with *to beat.* In this case, the sequencer is driven by the beat, according with the value selected in the Input Note Quantization: for example, if 4th is selected the sequencer moves to the next step each 4th measure. If 8th is selected, it moves to the next step accordingly and so on.
At each step, the Movement Sequencer "comps" from one movement to the other, according with the movement selection in the sequencer grid (the small white dots).
The result is a completely new movement, obtained by combining chunks of the basic ones.
You can set the length of the new resulting movement by dragging the green bar upon the sequencer window. It can be extended up to 16 steps (the total length in bars depends on the Input Note Quantization value selected)

- *The Polyphonic Solo String option is not usable when using the Movements Sequencer. With either to keys or to beat, the selection will automatically be set to Mono Solo String.*

Also in this case, **you need the DAW playing in order to use the Movements Sequencer**.

Let's consider now the *to keys* option: in this case, the sequencer moves to the next step every time you play a new note. So, with this option the Movement Sequencer does not move necessarily at a regular timing, it only advances to the next step when you manually trigger a new note from your virtual keyboard or when a note is MIDI triggered from the DAW.

Either cases, let's see here a graphic representation of the "live-comping" obtained with the Movements sequencer and the rhythmic legato. Here we have the same simple ascending-descending sequence of notes shown in the previous section, but with the Input Notes Quantization set to 4th and with the following sequence of movements: I-III-IV-V.
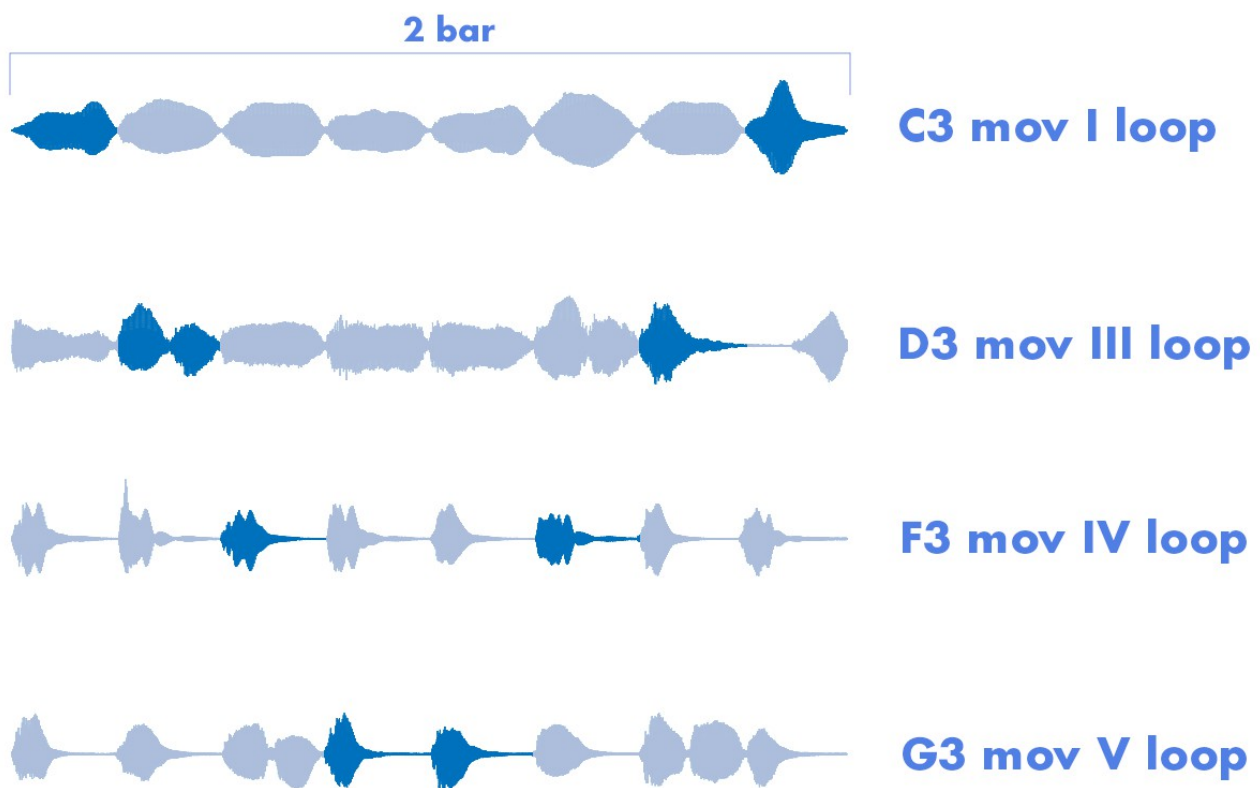
Finally, you can randomize the Movements selection in the Movement Sequencer. By clicking *Rand All*, all the Movements in the sequencer is randomized. By clicking on the small gray rectangular button upon each column (step) of the sequencer, only the selection corresponding to that step is randomized.

3 strings / 2+1 Strings Option

As mentioned in the *Sampling Strategy* section, in Nordic Folk Strings the *Base Notes* (droning strings) and the *Solo Notes* (soloist string) have been sampled separately.

By using the *3 strings / 2+1 Strings* button (bottom left of the GUI), you can switch from having Base and Solo notes stacked on the top of each other, or having them mapped separately on the virtual keyboard.

In this first case, the original tagelharpa sound is recreated, with the 3 strings played simultaneously. In the second case, the Base loop is mapped to C3, whereas the Solo loops are mapped from A3 to C4. You will notice a color change on the virtual keyboard when you switch from one option to the other one.

Mono Solo Strings / Poly Solo Strings.

If considered alone, the soloist string on a tagelharpa is obviously a monophonic sound. However, by using the *Mono Solo Str./Poly Solo Str.* button (bottom left of the GUI), you can set the Solo loops to be polyphonic.

This can be useful to create captivating harmonizations and sounds that otherwise would be impossible on a real tagelharpa.

A good tip could be to separate the Base and Solo notes (*3 Strings/2+1 Strings button*, previous section) and set the Solo notes to Poly.

- ***Poly Solo String is not available when the Movements Sequencer is on.***

Master Effects

All the instruments in Nordic Folk Strings feature a Master Effects section, featuring a *Convolution Reverb* and a *Delay*. You can browse between the two by using the small gray arrow in the Master Effects box (bottom right of the GUI).

The convolution reverb is based on the impulse response of an authentic ancient Roman tank environment (the same room where we have recorded our library *Maleventum Pompeii*).

GUI general description
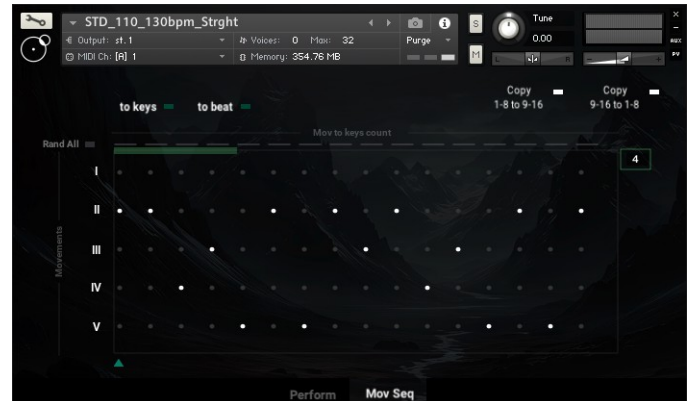
Base Strings, Solo Strings	Volume and on/off button for the Base Loops and Solo loops respectively.
Balance Close/Room	Volume fade between close microphone and room microphone.
Movements	Selection of the available tagelharpa rhythmic movements for each instrument.
Tone	Selection between Clean and Gnarly tone of the Solo loops.
Scale	Selection between Chromatic, Minor and Major for the Solo loops.
2+1 Strings/3 Strings	Selection between Base and Solo loops played together or mapped separately on the virtual keyboard.
Mono Solo Str. / Poly Solo Str.	Selection between monophonic Solo Loops or polyphonic Solo Loops.
Input Note Quantize	Selection of the rhythmic legato "comping" timing value.
Root Key	Sets the tuning of the Base Strings and the corresponding root key.
Audition	Opens a window where the available movements can be previewed, without selecting them from the Movements box.
Master Effects	Convolution Reverb and Delay, with the respective controls.
To keys	Sets the Movements Sequencer to move step by step when a new note is manually played
To beat	Sets the Movements Sequencer to move step by step according to the selection in the Input Note Quantize box.
Copy 1-8 to 9-16 / Copy 9-16 to 1-8	Copies the first halve of the steps value in the sequencer to the second and vice versa.
Rand All	Randomizes all the steps in the Movements Sequencer
Random per step (small gray rectangular boxes)	Randomized the Movements selection corresponding to that step
Movement Sequencer length (green bar upon the sequencer)	Sets the number of steps before the sequencer goes back to the first one.

Key-switches

Orange key-switches (D#2 to G2)	Movements selection
Purple key-switches (G#2 and A2)	Clean-Gnarly tone selection

Tagelharpa Movements Transcription

Nordic Folk Strings (Rhythm Guide)

* The notes that are in parentheses signify differences between the Bass Tagelharpa and Standard Tagelharpa.