

wavelore®



Clavichord

Electric/Acoustic Keyboard Instrument for Kontakt 4

User's Guide



Welcome!

This help file contains an overview of the Wavelore Clavichord virtual instrument for Kontakt 4. Reading it carefully and familiarizing yourself with the interface and parameters offered will allow you the most control possible when using this highly versatile and flexible instrument.

Enjoy!

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Before you Start: The Concept and Design of the Wavelore Clavichord

The Wavelore Clavichord consists of a collection of instrument samples, a collection of impulse response samples (“IR’s”), and a Kontakt instrument with extensive scripting to allow you a ridiculous degree of control over the playability and sound of the product. The instrument samples include the notes of the instrument, the sound of the release of each string (a slight buzz or click), and the sound of each key returning to its rest position (a thumping or knocking sound, which we call, “keynoise”) after release. The IR samples include a bank of responses from the cabinet of the instrument for acoustic sounds, and a bank of amp-simulation IR’s for electric sounds. The instrument itself contains all the programming necessary to make easy changes to the sound and behavior of the instrument, and all the important aspects of the acoustic clavichord have been included, as well as several features and capabilities not present in the real instrument.

I) What is a Clavichord, and How Does It Work?

As the picture on the title page of this document makes painfully clear, the clavichord is a keyboard instrument. It dates from as early as the late medieval period, but despite falling out of fashion during the 19th century, has remained popular amongst period music enthusiasts.

The clavichord involves a simple mechanical key lever mechanism, where a player’s depression of a key causes the rear side of the lever to rise, striking a small brass blade (called a “tangent”) against the string. The tangent does two things: It a) starts the vibration of the string, producing the note, and b) sets the sounding length of the string. So a tangent acts like a hammer in a piano’s construction, but also like a fret on a guitar. It differs from the piano in that a note will only sound as long as the tangent is in contact with the string, where a piano’s hammer rebounds immediately. There is no sustain pedal (though our virtual version adds the comfortable aid as a bonus!), so releasing a key always stops a note.

One unique aspect of this construction is that it puts the player’s finger in a relatively direct from of contact with the string; Given the “lever” type construction of the key, and the constant contact of the tangent with the string during a note, the player can actually control tuning of notes with the pressure they exert on the key after striking it! The most common application of this pressure is to create vibrato, which, on the clavichord, is known as “Bebung”.

Most clavichords are double-strung, meaning there are two strings per note. There are “fretted” and “unfretted” varieties, “fretted” meaning that more than one note is produced by the same pair of strings, making certain note combinations impossible. Since that’s a rather cumbersome way to play, we sampled an “unfretted” clavichord, on which any note combination can be played at once. Our instrument is single-strung, but you can double string it “virtually” and control the tuning of both pairs of strings separately.

Ancient music for keyboard instruments made common use today of what we call “unequal temperaments”, which are tuning schemes that differ variably from our modern equal temperament. We’ve covered the capability to do so for those who wish to play the instrument in period temperaments, but most users will not want to bother with this feature. For the most part, modern ears simply find period tunings out-of-tune-sounding!

Now on to the modern side: There have been electric versions of this instrument made that have found there way into modern music. The Hohner Clavinet is basically a clavichord with electromagnetic pickups, and the capability to plug into all sorts of effects and amplifiers. The funky sound of the Clavinet has partially defined the sound of 70’s era funk and r+b records, and has also been featured on a great number of tunes from other genres.

While this is *not* a Clavinet sample set, we did find that our dry acoustic samples were very satisfying when processed through an amp simulator with variable combinations of effects. So we went ahead a programmed a boatload of controllable, automatable “electric” features, including six IR’s from three amplifiers, two types of wah, two types of distortion, and compression. All effects are keyswitchable, and you can also keyswitch between acoustic and electric mode.

II) How Does All of That Translate to MIDI and the Kontakt?

Ultimately, this is a keyboard instrument, so all you need to worry about is playing the keyboard. But to geek out on it for a minute:

Vibrato (Bebung): Some MIDI keyboards offer a feature called Polyphonic Aftertouch, which means the keyboard can send data for each key pressed that says how much pressure the player's finger is exerting. If you have a controller with PAT, you can use the included K4 multiscript together with the instrument to play with true bebung technique. Since PAT is a rare feature on MIDI controllers, we also offer a more traditional approach: An assignable controller can start a vibrato on the last note played, and the depth and speed of the vibrato are variable and can be randomized to your taste (for humanization purposes).

Tuning, Stringing, Temperament, and "Tangent Slope": The script allows you to choose the stringing of the instrument, and whether any string pairs are tuned at a unison or an octave. It then allows detuning of individual notes for both the single string set and the doubled set. Using these features, you could have certain notes of the keyboard detuned, or have some pairs slightly out of tune while other pairs are more noticeably out of tune. The effect is scalable, so a wide range of variations are possible, from "perfect", to "ouch!". A related feature is "Tangent Slope". This feature emulates the angle at which the tangent strikes a string pair, and thus the time difference between the sounding of the two strings. At full velocity pairs will sound together, and a minimum velocity they will sound at noticeably different times. It is also scalable and adjustable on a string-by-string basis. A variety of period and modern temperaments are included for users who wish to play music in tunings commonly used by period composers.

Release Samples and Keynoise: The clavichord is quite likely the quietest keyboard instrument in existence. In fact, it may be the quietest of any instrument of any kind! For this reason, even an accomplished player on a fine instrument will produce some noises that are not a "pure" part of the clavichord. We included the very characteristic sound of the tangent buzzing slightly against the string during a release, as well as the thumping sound of the key lever returning to its rest position. All these sounds are configured with great detail so you can control when and how they sound.

Effects: All effects have their controls easily accessible on the instrument panel, and each can be keyswitched on and off on the fly. Further, effects settings are retained for acoustic and electric mode separately, so switching modes will always recall the correct effects setup for that mode. For example, once can use drastically different eq settings for the two modes, and switch modes with the two settings preserved. There is an "FX" monitor page where one can view the current state of all effects, as well as individual setup pages for fine tuning of each effect.

1) Quick Start

1.1) The Instrument at a Glance

When you load the Wavelore Clavichord into Kontakt, you will see the main page of its user interface:



This page gives you immediate access to some of the most common settings, and the “Page” menu at the top-left allows navigation into deeper areas of the instrument's setup. For detailed info on all the controls, please see [Section 2, “Editing the Instrument”](#). For now, the curious may get a lot from knowing that the controls have all been labeled and organized for intuitive navigation and use, so this document may only be necessary if you find something in the interface to be less-than-clear.

Here are the factory settings for MIDI controllers used (these are re-assignable – again, see [Section 2, “Editing the Instrument”](#), for details):

CC#1 (Mod-Wheel): Vibrato for electric mode.

CC#11 (Expression Pedal): Vibrato for acoustic mode. This choice was made because acoustic mode is more likely to feature two-handed playing, wherein the player does not have a hand free to use the mod-wheel! CC#11 is the default controller for the “Wah” effects when in electric mode, as well as the realtime volume control for keynoise in acoustic mode (disabled by default).

CC#64 (Sustain Pedal - Optional): Performs the traditional function of a sustain pedal on, e.g. a piano. A real clavichord does not have a pedal, so if you're playing period music, you may not need it!

Keyswitches:

If you look at the keyboard view at the bottom of Kontakt's interface, you'll see several color-coded keys below the playing range of the instrument:



- A0: Keynoise Off (Acoustic Only)
- A#0: Keynoise Random (Acoustic Only)
- B0: Keynoise On (Acoustic Only)
- C1: Compression Off (Electric Only)
- C#1: Compression On (Electric Only)
- D1: Distortion Off (Electric Only)
- D#1: Distortion 1 On (Electric Only)
- E1: Distortion 2 On (Electric Only)
- F1: Wah Off (Electric Only)
- F#1: Wah 1 On (Electric Only)
- G1: Wah 2 On (Electric Only)
- G#1: Single Stringing
- A1: Double Stringing
- A#1: Electric Mode
- B1: Acoustic Mode

We've Placed the keyswitches in logical order: The most commonly used functions are closest to the playing range of the instrument, with minimum settings at lower notes. For example, the red distortion keys (shown in red) have their “off” key at the lowest of the red notes (D1), and the maximum setting at the highest of the red notes (E1). This is true of all keyswitches.

1.2) Acoustic Mode

By default, when you first load the Wavelore Clavichord into Kontakt, the instrument is in “Acoustic Mode”, which is a virtual representation of an acoustic clavichord, with no effects other than optional reverb, equalization, and cabinet resonance. That is, you cannot put compression, distortion, or wah on the instrument while in this mode – the keyswitches and interface controls for these features are disabled unless in electric mode. The keyswitches that do work in acoustic mode are: A0-B0 (Key Noise) , G#1-A1 (Single/Double Stringing), and A#1 (Switch to Electric Mode).

While in acoustic mode, the Wavelore Clavichord has a sound that is reminiscent of a harpsichord. Indeed, it is easy to confuse the two unless you are familiar with their differences.

Other than keyboard velocity, the main real-time controls for this mode have to do with vibrato techniques:

- 1) Use the controller assigned on page 6 (“Vibrato”) to apply a vibrato to the last note played. Since clavichord players are mostly using the bebung technique on the last note of a phrase or passage, the instrument is set to respond to this controller only for the last note played. However, if vibrato is in use on a new note while a newer note is sounded, the note originally being affected will continue to do so until the assigned controller is reset to a zero value. This ensures that the player has control over which note is being affected.
- 2) On the same page, there are options for using polyphonic or channel aftertouch to “bend” the pitch of particular notes. If you are using channel aftertouch, the pitch of all notes being played will rise with increased pressure on the keyboard. When using polyphonic aftertouch, you have control over each note's aftertouch pressure, and hence it's pitch, but you must have a) a MIDI controller with polyphonic aftertouch, and b) The instrument loaded on a multi with the Wavelore Clavichord PAT multiscript running. See [Section 2.6](#) and [Appendix A](#) for detailed instructions on vibrato and aftertouch use.

Also be aware that you can switch the string doublings on or off using A1 and G#1 respectively. You can also keyswitch between three modes of keynoise playback: A0 - Keynoise Off, A#0 – Keynoise Random (default average 4 of ten notes will cause a keynoise when released), and B0 – Keynoise On. These options allow for a natural random feel, or to force or prohibit keynoise for certain passages. For Example, you may want a certain phrase in a MIDI recording to play keynoises randomly, while also forcing them to play unconditionally on the release of the last note.

1.3) Electric Mode

Hit A#1 to activate electric mode. Hit B1 to return to acoustic mode.

Electric Mode has some things in common with acoustic mode, but adds a number of effects. Basically, be aware that with the exception of the keyswitches for keynoise (Keynoise is disabled in the electric version), all the keyswitches outlined above are available. Vibrato works the same way, but is assigned to the modwheel, since the electric version is more likely to be played single-handed, like a synthesizer. Also the default controller for wah is CC#11 (Expression pedal), which makes it convenient to have the vibrato on a different controller. Review the chart above to learn which keyswitches do what, and start playing!

2) Editing the Instrument's Setup

There is always a possibility that a given instrument configuration will not behave in the way you may prefer. Given the enormous number of possible opinions on how any instrument should be configured, we've done everything possible to offer the best out-of-the-box programming we can in this library, but you may still have certain reservations or differences of opinion. These differences could be about a wide variety of choices, including:

- Choice of assigned controllers: Many may want, for example, to have the instrument use the same controllers for vibrato and wah, where our configuration uses two different ones.
- Vibrato style: Our choice was one of a medium average speed vibrato (In acoustic mode). You may find a need for a more aggressive vibrato.
- Wah sweep ranges: Each of the two types of included wah effects have their own ranges over which the assigned controller will sweep the filter that causes the effect. Your tastes may differ!

In addition to these variables, there are countless other ways in which the instrument could be different, and some of those ways could be better, at least for certain people or projects. This section contains instructions on some of the many ways that you can customize the sounds in the library to suit different needs or tastes.

2.1) About the Main Page (Default View)



Concept:

In the screen-shot above, the various knobs and buttons allow you to configure the Stringing, release sample volume, keynoise randomization, attack time, and round-robin behavior. You can also conveniently switch between electric and acoustic modes, as well as use the page menu to navigate to other pages (described over the course of this section).

Controls:

- 1) *Page Menu*: This control is always visible, and allows you to view the main page, EQ settings, convolution/reverb, fine tuning controls, keynoise configuration, vibrato settings, or parameters for wah, distortion, or compression. You can also view the about box for the credits and copyright date, or the convenient "FX Monitor" page, which is useful for viewing the state of all effects on one page.
- 2) *Acoustic/Electric Button*: Sets which mode is currently active for the instrument. Changing modes will recall the effects and settings used when the new mode was last active.
- 3) *Attack Time*: Allows a softening of the instrument's attack; Clavichords being as quiet as they are, we recorded our samples with a close microphone on the instrument's soundboard. A player's perspective, however, has the

very beginning of a note's attack considerably softened by the air between the string and the player's ear. We found the default setting to be more true-to-life than an immediate attack. Adjust to taste.

- 4) *Reset Round-Robin Menu*: Contains three options: "Never", means that samples are always advancing through the chain of provided alternate samples for a natural feel when repeating phrases notes, etc. Choosing "Now", will reset all samples to the first take (the first take of the round-robin chain is the best one, technically, but they're basically indistinguishable!) Choose "After:" to set a time threshold. When this mode is active, a note will reset to round-robin position one only if it has not been played for the duration specified in the value field below (Next Item). This ensures the best take is played in passages which are not repetitive, and that round-robins are used where any repetitions happen within the specified time frame.
- 5) *Reset Round-Robin Time Threshold*: Set to the maximum amount of time a note should be unused before its round-robin chain is reset to the first take. Setting to zero effectively turns round-robin behavior off. Ten seconds is the highest practical limit. Beyond that value, the behavior is basically "never", which is an option in the menu (Item 4, above).
- 6) *Single/Double Stringing*: When set to "Single", each note will play only one sample (that note!). When set to "Double", each key pressed will play the main note plus an alternate sample, which, depending on the pitch and other settings, will be either an octave above, or at the same pitch. See [Section 2.4](#) for more details.
- 7) *Octave/Unison Mix*: This knob sets the volume in dB (Decibels) of the second set of strings in relation to the first. It is only applicable when stringing is set to double.
- 8) *Release Volume*: Sets the overall volume boost or cut of the release samples, or the slight buzz that occurs when a key is released, separating the tangent from the vibrating string. The default is near zero for acoustic mode and +10dB for electric mode. Adjust to taste.
- 9) *Keynoise Triggering Menu*: Sets the average frequency of keynoise triggering. For example, when set to the default 4/10, an average of 4 randomly chosen notes out of every ten notes released will trigger a keynoise. Also contains options for "Always" and "Never". Keynoises are a big part of the intimate sound of a clavichord, but we want you to have options for their use or non-use! See [Section 2.5](#) for more details on configuring and switching keynoise.

2.2) About the EQ Page



Concept:

The EQ page lets you shape the tone of the clavichord's samples to complement your choice of other effects. Included are low- and high- pass filters, as well as two specific "notch" filters, which attenuate particularly problematic frequencies. Use these controls with the Cabinet/Amp/Room controls (Described in Section 2.3) to give the instrument a wide variety of possible tonal characters.

Controls:

- 1) *Page Menu.*
- 2) *Acoustic/Electric Button.*
- 3) *High-Pass Filter:* Use this knob to remove low frequencies from the instrument samples. Extreme settings will make the instrument sound “thinner”, which can be useful for removing unwanted cabinet resonance prior to processing the samples through one of the more resonant acoustic IR's.
- 4) *Notch 1 @ 185 Hz:* This is the strongest frequency in the cabinet of the instrument. If we let you boost this band and you used acoustic IR #6, the instrument would almost definitely distort on every note. This control can be lowered to taste for combination with the more resonant acoustic IR's.
- 5) *Notch 2 @ 3 kHz:* This control can be used to reduce an unwanted “Nasal” aspect of the sound. Particularly useful when processing through the electric IR's.
- 6) *Low-Pass Filter:* Use this knob to remove high frequencies from the instrument samples. Good for removing the very highest overtones when a mellower tone is needed.

2.3) About the Cabinet/Amp/Room Page



Concept:

This page is basically the core of the hybrid electric/acoustic concept in this library. A menu lets you choose an impulse response, which will depend on whether it is an “acoustic” IR or an “electric” IR, place the instrument in the corresponding mode where effects and settings relevant to that mode become available. For example, choosing “Amp 2 – Reverb Off”, will place the instrument in electric mode, wherein the instrument sounds as if it's being played through an amplifier in a room. Once in this mode, the keyswitches for the electric effects (distortion, compression, etc) become available, as do their corresponding buttons on other pages of the instrument panel. All other settings (e.g., EQ) will also be restored to the last settings used when electric mode was active. Switching back to acoustic mode (either with a keyswitch, the “acoustic/electric” button, or by choosing another IR from the “mode” menu) will restore the last acoustic settings.

There is also a master reverb section and a master volume button, each of which also has its own recall function, remembering its previous setting each time you change modes.

Controls:

- 1) *Page Menu.*
- 2) *Acoustic/Electric Button.*

- 3) *IR Size*: Adjust the length of the currently active IR. A good example of the use of this feature is for the Amps with “reverb on”. Boosting this value to 150% will make the reverb tails from the amps longer and more “washy”, while pulling it down to 50% will tighten up their sound. It can also be used creatively with all IR’s, and together with the EQ and other effects offers great flexibility of sound.
- 4) *IR Wet/Dry*: Use this to mix the wet (convolved) and dry samples to taste.
- 5) *IR Damping*: Values above zero will apply increasing amounts high-pass filtering to the wet (convolved) signal, resulting in a brighter tone. Values below zero will apply increasing amounts low-pass filtering, resulting in a darker tone.
- 6) *Mode*: Choose the type and specific IR to use: Options are Off (Acoustic), Off (Electric), Acoustic 1-6, each with a more substantial cabinet resonance than the last, Amps 1 + 2, Reverb On + Off, and Amp 3, Close mics or Distant mics. Switching between an “Acoustic” IR and an “Amp” will switch the instrument into the relevant mode.
- 7) *Reverb On/Off*: Switches on or off the included reverb module.
- 8) *Reverb Size*: Sets the decay time of the reverb.
- 9) *Reverb Wet/Dry*: Blends the unprocessed signal with the reverberated one. Set to taste. Note that this is the last effect in the signal chain; When in electric mode, for instance, all other effects will apply as set. i.e, The wet/dry only controls the level of the reverb effect in relation to the signal after the other effects (convolution, wah, etc) have all been applied.
- 10) *Reverb Damping*: Applies a low-pass filter to the wet signal, allowing control over the tone of the reverberation.
- 11) *Reverb Pre-Delay*: Sets the wait time before the wet signal “kicks in”.
- 12) *Master Volume*: Sets the master volume for the current mode. Once all desired eq and effects settings are found for each mode, this control can be used to balance the output volumes of both modes in case you are keyswitching between them in a live situation.

2.4) About the Tuning Page



Concept:

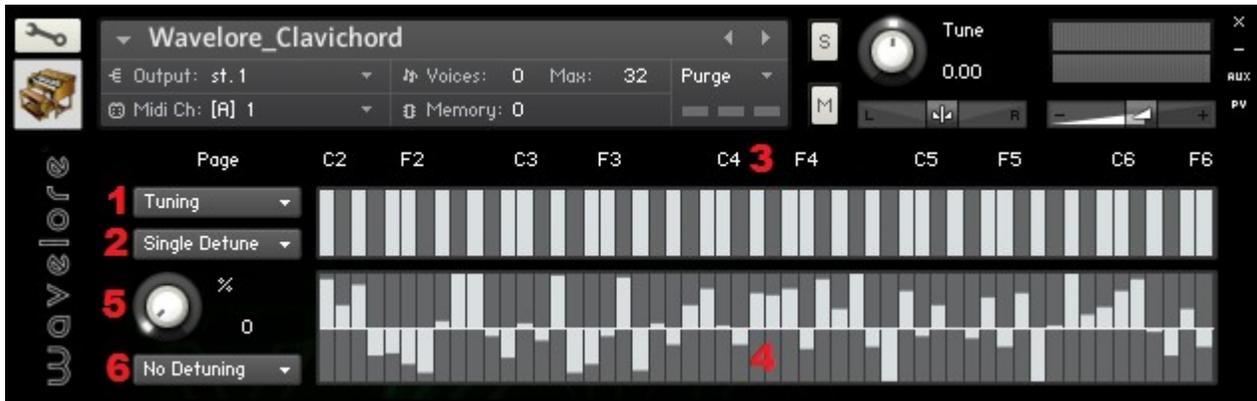
In the screen-shot above, the various knobs and buttons allow you to configure the stringing of the instrument, the mix of the double-strings (if used), the use of octave-doubling vs. unison doubling, the temperament of the instrument, and the fine-tuning of both sets of strings. The electric/acoustic button is also included for quick comparisons between settings for the two modes.

Controls:

- 1) *Page Menu*.
- 2) *Acoustic/Electric Button*.
- 3) *Single/Double Stringing (Same as 2.1.6)*: When set to “Single”, each note will play only one sample (that note!). When set to “Double”, each key pressed will play the main note plus an alternate sample, which, depending on the pitch and other settings, will be either an octave above, or at the same pitch.
- 4) *Octaves Limit*: Notes up to and including this MIDI note name/number will be doubled at the octave. Notes above this pitch will be doubled at the unison. Set to max for all octaves (The highest octave will still be unisons), set to min for all unisons.
- 5) *Unison Color*: If set to “Dark Unisons”, this button will cause all unison doublings to sound with a mellower tone than the main sample. If set to “Bright Unisons”, the unison doublings will sound brighter than the main sample.
- 6) *Octave/Unison Mix (Same as 2.1.7)*: This knob sets the volume in dB (Decibels) of the second set of strings in relation to the first. It is only applicable when stringing is set to double.
- 7) *Temperament Menu*: Most applications will call for the default equal temperament, but period music enthusiasts may enjoy using any of the included variety of period tunings.
- 8) *Temperament Starting Note*: Sets the note from which tempering of the instrument begins, influencing the location of the “wolf tone” e.g. in $\frac{1}{4}$ comma mean tone.
- 9) *Fine Tuning Menu*: This menu will reveal a set of controls that can be used to fine-tune, on a per-note basis, either of the strings of any pair, as well as to determine the timing of the members of each string pair. Entries include:
 - *Single Detune*: View setting for the detuning of the main samples (the “single” strings) of the instrument.
 - *Double Detune*: View setting for the detuning of the octave/unison doubling samples (the “double” strings) of the instrument.
 - *Tangent Slope*: View settings for applying a velocity-sensitive timing difference between members of each string pair.

Either Choice will bring up a page that looks like the image on the following page:

2.4.1) About the Fine Tuning Page

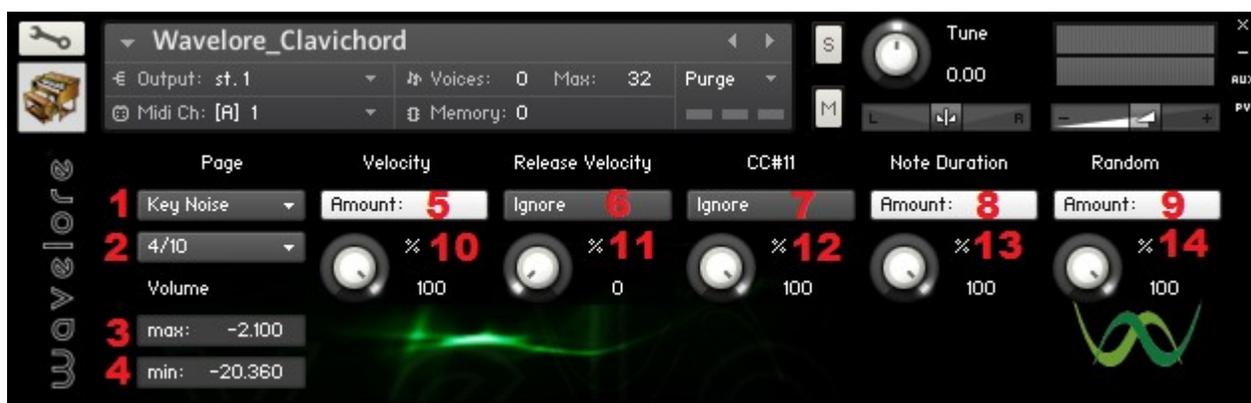


Controls:

- 1) *Page Menu*. Use to return to main tuning page, or to view any other page.
- 2) *Fine tuning menu*: Select which fine-tuning parameter are being edited – single de-tune, double de-tune, or tangent slope.
- 3) *Keyboard Display*: A visual aid in seeing which notes' parameters are being edited when setting values in the table below (Next item). The keyboard display will also highlight which notes are being played on your controller.
- 4) *Per-Note Table*: Drag the bars vertically to set the active fine-tuning parameter for the given note (check the keyboard display to be sure you're editing the right note!!)
- 5) *Scaling factor*: Scale the values set in Item 4 to a percentage between 0 and 100.
- 6) *Presets*: This menu allows quick setting of a variety of possible setups:
 - *None*: clears the table.
 - *All Minimum*: Sets all values as low as possible.
 - *All Maximum*: Sets all values as high as possible.
 - *Randomize*: Sets each value to a random number between min and max.
 - *Randomize Low*: Sets each value to a random number between min and zero.
 - *Randomize High*: Sets each value to a random number between zero and max.
 - *Lock All*: Allows you to drag all values at once, eg, if you wanted to set all to "2" without setting them all individually.
 - *Unlock*: Disables the lock function, allowing individual adjustment.

Note: When the fine tuning parameter being set is the tangent slope, sub-zero values in table mean that the "single" strings will sound earlier than "double" strings, and above-zero values mean the opposite! Also, keep in mind that the effect is always greater in lower velocities; If you want to hear an extreme example, select the "All Minimum" preset, set the scaling to 100%, and play a note with a very soft touch. Once you've done this, you can scale and adjust to taste.

2.5) About the Keynoise Page



Concept:

Keynoise is a part of the sound of a clavichord because the actual notes the instrument produces are so quiet as to be easily surpassed by other, usually unwanted sounds. We've included a deeply configurable keynoise page that allows randomized triggering of keynoises when notes are released. There are both automated and real-time control methods of managing their volume and frequency. Note that keynoise is disabled while the instrument is in electric mode, since, in theory, magnetic pickups do not "hear" the thumping of wooden keys!

Controls:

- 1) *Page Menu*
- 2) *Keynoise Triggering Menu (Same as 2.1.9)*: Sets the average frequency of keynoise triggering. For example, when set to the default 4/10, an average of 4 randomly chosen notes out of every ten notes released will trigger a keynoise. Also contains options for "Always" and "Never". Keynoises are a big part of the intimate sound of a clavichord, but we want you to have options for their use or non-use!
- 3) *Minimum Keynoise Volume*: The instrument will calculate the appropriate volume based on this setting, Maximum Keynoise Volume (Next item), and the settings explained in items 5 through 14.
- 4) *Maximum Keynoise Volume*: The instrument will calculate the appropriate volume based on this setting, Minimum Keynoise Volume (Previous item), and the settings explained in items 5 through 14.
- 5) *Use Velocity for Keynoise Volume*: When active, the velocity of the note when it was struck will determine the volume of the keynoise, based on the volume range specified in items 2 and 3, averaged with any other active keynoise volume controls.
- 6) *Use Release Velocity for Keynoise Volume*: When active, the release velocity of the note will determine the volume of the keynoise, based on the volume range specified in items 2 and 3, averaged with any other active keynoise volume controls. Note that your controller must transmit release velocity data in order for this control to function.
- 7) *Use CC#11 for Keynoise Volume*: When active, the value of CC#11 (Expression Pedal) will determine the volume of the keynoise, based on the volume range specified in items 2 and 3, averaged with any other active keynoise volume controls.
- 8) *Use Note Duration for Keynoise Volume*: When active, the duration a note is held will determine the volume of the keynoise, based on the volume range specified in items 2 and 3, averaged with any other active keynoise volume controls. The longer the note is held, the greater the attenuation.
- 9) *Randomize Keynoise Volume*: When active, the value of a randomly generated number will determine the volume

of the keynoise, based on the volume range specified in items 2 and 3, averaged with any other active keynoise volume controls.

- 10) *Items 10 through 14* will scale the keynoise volume controllers named directly above them, so you can set, e.g, velocity to have 100% effect, with randomization only to a slight extent.

Note: When no keynoise volume controls are active, a master volume control will appear in the place previously occupied by the minimum and maximum keynoise volume fields. All triggered keynoises will be set to this volume.

2.6) About the Vibrato Page



Concept:

A clavichord player has a degree of control over the pitch of individual notes on the instrument; Because of the way the clavichord is constructed, the player can exert extra pressure on the key after it has been struck in order to raise its pitch slightly. This technique is normally used to produce a type of vibrato called “bebung”. We've included a method by which the exact same technique can be applied, but in order to use it, you must have a MIDI controller with polyphonic aftertouch – being that these models are rare and expensive, we've also included a way to easily apply vibrato to the most recently played note with any standard MIDI controller. This CC-based vibrato includes both speed and width randomization which greatly improves the “human-ness” of the sound.

Controls:

- 1) *Page Menu.*
- 2) *Acoustic/Electric Button.*
- 3) *Maximum Vibrato Width:* In hundredths of a semitone (cents). Actual width during playing is determined by the value of the controller set in item 7 and the randomization factor described in the next item.
- 4) *Randomize Vibrato Width:* With setting above a zero value, actual vibrato width as determined by item 3 and the value of the controller in item 7 (default: CC##11 – Expression Pedal) will be offset by a random percentage between zero and this value. Each time the vibrato completes one cycle (when pitch is back to unity), the randomizer will readjust for the next cycle.
- 5) *Maximum Vibrato Speed:* In cycles per second (Hertz). Actual speed during playing is determined by the value of the controller set in item 7 and the randomization factor described in the next item.
- 6) *Randomize Vibrato Speed:* With setting above a zero value, actual vibrato speed as determined by item 5 and the value of the controller in item 7 (default: CC##11 – Expression Pedal) will be offset by a random percentage between zero and this value. Each time the vibrato completes one cycle (when pitch is back to unity), the randomizer will readjust for the next cycle.

- 7) *Vibrato Controller*: Default CC#11 (Expression Pedal). This CC# can be reassigned by either setting the knob as desired, or by moving it all the way up to 128 to activate “Learn Mode”. Once in Learn Mode, simply move the desired control source on your MIDI hardware and click “OK” or play a note to accept your assignment. After setting the controller, set it to a non zero value during a note to start vibrato on that note. No other note can be affected until the controller is set back to zero, at which time whichever note was most recently played becomes the “target” for vibrato.
- 8) *Bebung Controller Menu*: Contains three options: Off (No Aftertouch Response), Channel Aftertouch (All Notes), and Polyphonic Aftertouch (True Bebung). The second option can use channel aftertouch to bend all sounding notes. The width of the pitch bending will be the value assigned in the next item scaled by the incoming aftertouch value. The third option sets the instrument to respond on a note-by-note basis to polyphonic aftertouch, which is similar to the feel of “true bebung” on a real clavichord. Choosing this option will bring up a warning to the effect that you need to load the PAT multiscript to use the feature. Please see [Appendix A](#) for detailed instructions on using polyphonic aftertouch.
- 9) *Bebung Width*: Sets the potential width of pitch bending available when using either of the two types of aftertouch. It can be set up to one octave, but is best set (for realism of the bebung effect) to around 20 cents.

2.7) About the Wah Page



Concept:

One of the things that make a clavinet (an electric clavichord) so funky sounding is its “quacky” sound. Because of the clicking sound produced by its tangents when notes are released, clavinet players can actually produce a similarly percussive sound to the muted strings of an electric guitar, which - as any funk music fan knows – lends itself very well to the effect of a wah pedal. When we first heard the Wavelore Clavichord through an amp simulator, including some configurable wah setting became a must! Note that wah is only available in electric mode.

Controls:

- 1) *Page Menu*.
- 2) *Wah On/Off Button*: Displays the current on/off status of the wah effect.
- 3) *Wah Type*: There are two different filters included for wah: One that give a traditional type of sound, comparable to a classic Dunlop Crybaby or Vox wah sound (Type 1), and another that is set to sound more like a sweeping synth filter (Type 2). While wah is active, click this button to toggle the two different types.
- 4) *Minimum Sweep Range*: The lowest frequency cutoff for the active wah type.
- 5) *Maximum Sweep Range*: The highest frequency cutoff for the active wah type.

- 6) *Wah Controller*: Default CC#11 (Expression Pedal). This CC# can be reassigned by either setting the knob as desired, or by moving it all the way up to 128 to activate “Learn Mode”. Once in Learn Mode, simply move the desired control source on your MIDI hardware and click “OK” or play a note to accept your assignment. After setting the controller, move it over its range to hear the wah in action.
- 7) *Compensation*: An extra volume boost for the active wah type which compensates for volume lost to the filter.

2.8) About the Compression/Distortion Page



Concept:

Distortion and compression are two more commonplace effects that we have included as options for the electric mode of the Wavelore Clavichord. With them, the instrument can sound fuzzy, punchy, smooth, or downright nasty! We used the default settings of the compressor to add sustain, and the two included types of distortion offer a choice between a mild fuzz and a strong overdrive. Adjust to taste.

Controls:

- 1) *Page Menu*.
- 2) *Compression On/Off Button*: Displays the current on/off status of the compressor.
- 3) *Distortion On/Off Button*: Displays the current status of the distortion effect.
- 4) *Distortion Type*: Selects between “Amp” distortion (lighter fuzz) and “Stompbox” distortion (a heavier variety). Either type can range from subtle to devastating by using a combination of the “Distortion” control (Item 10) and the output gain of the compressor (Item 9), but we recommend using just the distortion if possible, since high output gain on the compressor can result in very loud sound when the distortion is turned off!
- 5) *Threshold*: Sets the compressor's threshold, or level at which signal is attenuated.
- 6) *Ratio*: Sets the compressor's ratio, or amount of attenuation when threshold is reached/exceeded.
- 7) *Attack*: Determines how quickly the compressor “kicks in” and attenuates the signal when the threshold is reached/exceeded.
- 8) *Release*: Determines how quickly the compressor “cuts out” and brings the signal back to its normal level after it falls below the threshold.
- 9) *Output*: Master Volume for the output of the compressor.
- 10) *Distortion Amount*: Sets the amount of distortion for the active distortion type. Generally speaking, type 2 is better

for more over-driven sounds.

11) *Distortion Tone*: Basically attenuates higher frequencies in the distorted signal.

12) *Distortion Gain*: Output gain for the active distortion type. Use this to prevent distorted signals from clipping!

2.9) About the FX Monitor Page



Concept:

The FX Monitor page is simply a place where one can view the status of all major effects on one page. This could be handy in live situations, where for example, you want to be aware of just which effects are on or off, as well as whether you're in acoustic mode or electric mode. All controls have been covered in other sections, and are labeled quite clearly. Of course, to edit any effect in detail, you'd want to use the page menu to navigate to the relevant section!

2.10) Saving Your Changes

If you've gotten this far in the manual, you're probably familiar with all the controls available for this instrument and how to use them, and you probably discovered some sounds you like (We sure hope you have!). Once you've made changes that you like, you need to save the instrument in order to recall them! Saving the instrument is best done under a new filename (so you keep the factory settings, just in case), and is done from the "files" menu at the top of Kontakt's interface. Choose "Save As...", type a new filename, and make sure you select "patch only" from the save mode option at the bottom of the save dialog – if you choose patch + samples, Kontakt will write a redundant set of identical samples to a new samples folder, doubling the size of the library.

Once you've saved the instrument, all your effects and performance configuration tweaks will be instantly recall-able!

3) Where to Get More Help

At Wavelore, we consider it our duty to ensure that you have the best possible experience with our products and support.

If you're having trouble, e-mail us and we'll help you!! We're at:

support@wavelore.com

There is also a support section on our website which will contain updates to the product as they become available, and currently contains links to a number of useful resources.

Appendix A: How to use Polyphonic Aftertouch with the Wavelore Clavichord

The Wavelore Clavichord comes with a set of tools that can allow you to use polyphonic aftertouch (PAT) for true bebung technique, in case you have a MIDI controller that generates and transmits this type of data; such controllers are rare and expensive, so we also included a more accessible method based on standard MIDI controllers. This section is included for those who have polyphonic aftertouch and wish to use it.

There are two main situations in which you may decide to use this feature:

- 1) You are just starting a project, and intend to load the Wavelore Clavichord with PAT into your Kontakt multi at some point during the project. Lets call this situation "Starting Out".
- 2) You are already in the middle of a project, and have just decided to add the Wavelore Clavichord, or to add the PAT capability to the instrument. Let's call this situation "Project-in-Progress".

In both scenarios, you must have use of the included Wavelore Clavichord PAT Multiscript in order for the instrument to respond to PAT. The difference between them is the method required in order to load the script into your multi.

Case 1: Starting Out

If you are just starting your project, the most convenient way to use the multiscript is to load the included multi, "Wavelore_Clavichord_PAT.nkm", and then proceed to load the instruments you intend to use from there. This can be done from the Kontakt "Files" menu or Kontakt's internal browser. You can also drag and drop the multi from a Windows Explorer or Mac Finder window to load it. From there, follow the same preferred method for loading instruments.

Note: The Wavelore Clavichord is not pre-loaded into the "Wavelore_Clavichord_PAT.nkm", multi: You must still load the instrument!

Case 2: Project-in-Progress

If you have already loaded and configured a bunch of instruments just the way you like them for a project, and then decide you want to load the Wavelore clavichord with PAT, or if the Clavichord is already loaded, but you decide you want to add the PAT capability to it, follow these steps:

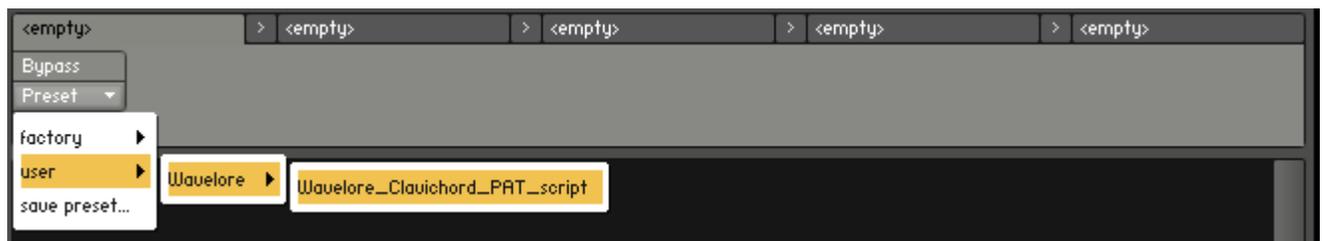
- 1) Find the folder labelled "Wavelore" in your installation folder. This folder was under the root directory created when you unzipped your original Wavelore Clavichord zip file, and contains a multiscript preset that you can add to your existing multi.
- 2) Copy the folder described above to the Kontakt 4 multiscript presets directory. This is typically:

C:\Documents and Settings\MyName\My Documents\Native Instruments\Kontakt 4\presets\multiscripts

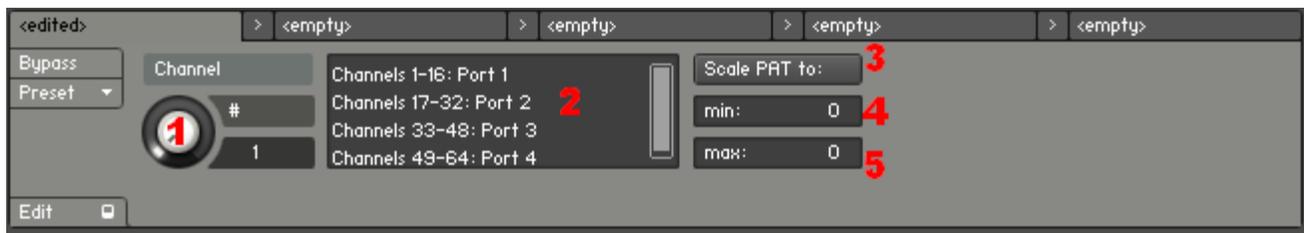
- 3) Click the multiscript button in Kontakt 4's multi header bar:



- 4) You will see a group of empty multiscript slots and some menu buttons. Follow the "preset" menu as follows:



Clicking “Wavelore_Clavichord_PAT_script” will bring up the following interface:



Of course, the red numbers are only included here to explain the functions of each part of the interface. Here are explanations of each part:

- 1) Channel Assignment Knob: Set this knob to the channel on which the Wavelore Clavichord is loaded.
- 2) Channel Assignment Legend: Kontakt can use 16 channels on up to 4 ports. This key shows the ranges of channel numbers used on each port. If you have the instrument loaded on Port 1, use channels 1-16 for the Channel Assignment Knob. For port 2, use channels 17-32, etc.
- 3) Scale/Clip PAT to: When set to “Scale PAT to:”, the following two items (items 4 and 5, below) will represent the minimum and maximum values of PAT sent to the instrument when PAT is at a value of 0 and 127 respectively, with all intervening values being scaled proportionally within these boundaries. When set to “Clip PAT to:”, items 4 and 5 will represent the minimum and maximum values sent to the instrument, with all intervening values being passed to the instrument as received, and all exceeding values being discarded. These options will allow you to set the PAT to behave in ways that are comfortable and controllable for your sense of touch on your keyboard.
- 4) Min: The smallest PAT value for any key that will be sent to the instrument.
- 5) Max: The largest PAT value for any key that will be sent to the instrument.

Once these controls are set as desired, you're ready to use PAT to control the pitch of individual notes! Please note that you may need to review your settings on the vibrato page before the feature behaves exactly as intended!

Appendix B: Credits

The following people played important roles in the creation of this software instrument:

The recordings for this library were created at The Sound Solution Studios, St. John's, NL, Canada.

Jason Whelan, Owner – <http://www.jasonwhelan.com>

Mark Belbin - Performance, audio editing, instrument design, documentation.

Justin Merdsoy - Audio engineering, quality assurance. <http://www.myspace.com/justinmerdsoy>

Luke Merdsoy, Mertz Creative Communications Inc. - Wavelore logos and visual concept. <http://www.mertz.ca>

Mary O'Keeffe – Instrument Owner - <http://www.mun.ca/music/people/facpage/sess/okeeffe.php>

Also, this library would not have been possible without the help of:

-Memorial University of Newfoundland's School of Music - <http://www.mun.ca/music/home>

Tom Gordon, Director - <http://www.mun.ca/music/people/staffpage/gordont/index.php>

Richard Blenkinsopp, Music Technonolgy Specialist - <http://www.mun.ca/music/people/staffpage/blenkinsoppr/index.php>

Keith Matthews, Manager, Administration and Finance

-Peter Bavington, and his wonderful book Clavichord Tuning and Maintenance, published by Keyword Press.

<http://www.bavington.nildram.co.uk/>

<http://www.keyword-press.co.uk/>

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