



Wavelore American Zither Version 2.0



About the Instrument

The Wavelore American Zither was sampled across a range of three-and-a-half octaves (A#2-E6, sampled every third semitone) and is programmed with a range of A2-F6. There are six velocity layers, plus a special "virtual" layer that allows damping of ringing notes. Together with optional convolution modeling of the instrument's sympathetic string vibrations, scripts to add real-time controllable tremolo (rolls), portamento, panning, and string damping/polyphony conservation make for a realistic, expressive, and haunting virtual instrument. Realistic rolls can be programmed or performed thanks to a full 12-way round robin sampling of every note and an extra script which tracks the round-robin state of each unique note and velocity layer. Additionally, version two allows the performance of rolls by means of key-switchable release-triggered repetitions.

Quick Start

To play the American Zither v.2.0, you can simply load the instrument into Kontakt 2 or 3 and start playing your keyboard. Here are some quick tips to allow you to use the many features:

-Holding a note and moving your mod-wheel will cause a tremolo to start. Repetition speed is determined by the wheel's value, with faster speeds caused by higher wheel values. The dynamic of the roll at any given time is determined by the value of CC#11.

-Playing and releasing a note within a time-span of about 70 milliseconds will cause the note to repeat. Holding the note any longer than this will bypass the repetition behavior.

-Use these key-switches to turn features on or off:

- 1) C2: Release-triggered repetitions.
- 2) C#2: Portamento – With portamento enabled, you can bend notes by simply playing legato. The default settings are for a maximum upward bend of three semitones, and a maximum downward bend of one semitone. Portamento time is controlled by CC#5, but the velocity of the target note of a given bend will also heavily impact the speed, meaning you can play bends across a wide range of speeds without having to move CC#5.
- 3) D2: Portamento Octaves – When activated, this key-switch will couple any notes in the specified portamento range at one octave higher.
- 4) D#2: Non-Portamento Octaves: – When activated, this key-switch will couple any notes outside the specified portamento range at one octave higher, without affecting the portamento range.

-Repeating a note at a velocity of six or less will shut off the previous sounding sample of that note, allowing you to damp notes individually. To damp all sounding notes, tap your sustain pedal. In both cases, the fade time of the damped notes will be controlled by the position of CC#11.

-All assignable controllers feature “MIDI Learn Mode”. Simply set the knob you're adjusting to 128 (max) and move the controller you want to use for that parameter. Click “OK”, or hit a note to turn Learn Mode off. The same is true of the key-switches, except that you must click OK to accept a key-switch change. You can't turn key-switch's Learn Mode off with a note, since these controls are “listening” for notes.

-Please browse the menus and controls in the instrument to find all the cool and detailed controls we've added!

-For more detailed info on all of the instrument's expressive capabilities, read on!

Advanced Controls

The rest of this manual discusses the five pages of controls included in the American Zither 2.0's interface. The individual pages are accessed by clicking the "Page" menu (see number 1 in the labeled illustration below). The many controls allow you to customize the behavior of the instrument to suit your musical needs and keyboard style.

About the Portamento Page



Concept:

The American Zither features extensive programming designed to allow many different pitch bending techniques through the use of keyed portamento. Basically, portamento is the bending of one pitch to another when the keyboard is played with legato fingering; After hitting the portamento key-switch (C#2), play one note, and hold it down while playing another note close by. You'll hear the first pitch bend up to the second. If you then release the second note, it will bend back down to the first. That's the basic concept, but....

This feature goes way deeper than that: bent intervals can be limited, such that playing wider intervals will bypass the bending behavior and allow a new note to sound, which can then be bent as well. The default behavior is a maximum upward bend of three semitones and a maximum downward bend of one semitone. These limits can be adjusted from one semitone to unlimited. There is also a time-based threshold available, which allows notes that follow each other in quick succession to sound together, regardless of the interval played. Finally, you can restrict the range of notes in which portamento is possible, allowing full polyphonic playing in one part of the keyboard's range, and monophonic playing in another.

Controls:

In the screen-shot above, each of the controls for portamento playing are numbered. Here is a description of the functions of each control.

- 1) *Page Menu*: This control is not portamento specific; It allows navigation of all the features and controls of the American Zither, and is present regardless of which page you are viewing.
- 2) *Portamento Speed Controller (Defaults to CC#5)*: Choose your preferred portamento speed controller, or set to 128 to activate Learn Mode. Once in Learn Mode, you can simply move the hardware control that you wish to use for portamento speed, and click "OK" or play a note on your keyboard to accept your changes.
- 3) *Minimum and Maximum portamento time*: These are the durations that a pitch bend will take to complete when the portamento speed controller is at its minimum and maximum values respectively. The controller gives real-time access to any speeds between the minimum and maximum. Set to taste.
- 4) *Speed Control Source Menu*: Choose whether the portamento speed is to be calculated based on the chosen CC#, target note velocity, velocity + scale control, or by a combination of CC# and velocity + scaling.
- 5) *Velocity to Speed Scaling Factor*: Set to one, velocity has no effect on portamento time. Set to 100, the entire range of speeds can be covered using target note velocity, with the selected CC#'s value biasing the calculation toward faster or slower bends.
- 6) *Maximum Downward Interval*: Playing descending legato intervals less than or equal to this number of semitones will cause a pitch-bend. Exceeding this value will sound a new note, which can then be bent according to the same rule. Setting this value to zero means there is no limit.

- 7) *Maximum Upward Interval*: Playing ascending legato intervals less than or equal to this number of semitones will cause a pitch-bend. Exceeding this value will sound a new note, which can then be bent according to the same rule. Setting this value to zero means there is no limit.
- 8) *Downward Interval Limit Mode*: Set to “from first”, the limit on a downward portamento is set to the maximum downward interval from the *first* note of a legato phrase. Set to “from current”, the limit is set to the maximum downward interval from *whichever note is currently held* in a legato phrase. For example, with the maximum downward interval set to one, one could play a descending chromatic scale with the first option, and only every other note would bend. With the second option, every note would bend.
- 9) *Upward Interval Limit Mode*: Set to “from first”, the limit on an upward portamento is set to the maximum upward interval from the *first* note of a legato phrase. Set to “from current”, the limit is set to the maximum upward interval from *whichever note is currently held* in a legato phrase. For example, with the maximum upward interval set to one, one could play an ascending chromatic scale with the first option, and only every other note would bend. With the second option, every note would bend.
- 10) *Lower Portamento Range Limit (Defaults to A2, or MIDI note #45)*: Notes below this range cannot use portamento. Useful for playing straight parts with the left hand while right hand parts use bending. Set to zero to reset to A2, set to 128 to assign a controller; A new knob for the controller number will appear, as well as an “OK” button. You can place this knob in learn mode, like any other assignable control, by setting it to 128.
- 11) *Upper Portamento Range Limit (Defaults to F6, or MIDI note #89)*: Notes above this range cannot use portamento. Useful for playing straight parts with the right hand while left hand parts use bending. Set to zero to reset to F6, set to 128 to assign a controller; A new knob for the controller number will appear, as well as an OK button. You can place this knob in learn mode, like any other assignable control, by setting it to 128.
- **PLEASE NOTE: The upper and lower portamento range limits will also extend the reach of the portamento beyond the actual playing range of the instrument, if set that far. That is, setting maximum downward interval to zero (no limit) and lower portamento range limit to ten will allow a portamento from any note to bend down to pitches even beyond the lower limits of the instrument's range.*
- 12) *Portamento Mode*: Set portamento behavior to “Off”, “Mono”, or “Poly”. Set to “Off”, portamento is bypassed altogether. Set to “Mono”, portamento will always occur when intervals adhere to the limitations explained in 6) through 11). Set to “Poly”, and the “Threshold” control appears (See below).
- 13) *Polyphonic Threshold*: Allows polyphonic playing (simultaneous notes) within any desired interval by sensing whether two or more notes are played within a certain time restriction. For example, if the threshold is set to 80 milliseconds, when C4 and C#4 are played within that time-frame of one another, they will both sound, instead of the strict mono mode behavior in which the C would bend to the C#. Play the C# more than 80 milliseconds after the C, and the portamento will be activated.

About the Tremolo Page



Concept:

The American Zither was sampled with twelve alternate takes of each sample so that it can be played or programmed to perform repetitions at any speed without exhibiting the “machine gun effect” (the choppy, unnaturally repetitive sound that is typical of most sample libraries and synths when played with fast repetitions). We have added a script in version 1.1 which allows the performance or programming of tremolos (rolls) that sound very natural. The included controls allow you to customize the behavior of this feature to your liking. The default setup uses the mod-wheel to switch rolls on and off, as well as to control speed between a minimum and maximum. The default dynamics controller for rolls is CC#11 (Expression), although note-on velocity is an option. Also available are several presets which allow performance of fast repetitions by using release triggers (notes played when a finger is lifted from the keyboard) together with intelligent performance detection that is customizable to your keyboard technique and style.

Controls:

In the screen-shot above, each of the controls for tremolo playing are numbered. Here is a description of the functions of each control.

- 1) *Speed Control (defaults to CC#1 or mod-wheel)*: This is the MIDI controller used for switching rolls on and off, and for controlling roll speed. Set to 128 to activate Learn Mode.
- 2) *Minimum/Maximum Tremolo Speeds (displayed in milliseconds)*: Set to taste. Actual repetitions per second can be viewed on the dynamics display (see below) in real time.
- 3) *Tremolo Dynamics Control*: This is the MIDI controller used for controlling the dynamics of the tremolo in real time. Set to zero to have dynamics dictated by note-on velocity only, or set to 128 to activate Learn Mode.
- 4) *Minimum/Maximum Tremolo Dynamics*: Set to taste. These parameters will limit the dynamics of the tremolo within the chosen velocity values.
- 5) *Speed Display*: Shows the current speed of repetition as determined by the min/max speed parameters and the speed controller. The button toggles between showing the value of the MIDI speed controller, or repetitions per seconds (Hz).
- 6) *Dynamics Display*: Shows the current dynamic as determined by the min/max dynamic parameters and the dynamics controller. The button toggles between showing the value of the MIDI dynamics controller, or the percentage of the full range specified in the min/max dynamics fields.
- 7) *Release Trigger Rolls (Defaults to “Repeat Fast”)*: This menu allows the choice of a number of presets:
 - a) Never Repeat: Bypasses all release-triggered rolls completely.
 - b) Repeat Fast: Notes will repeat if keys are released within 70 ms of the time they are depressed. The result is that rolls are played only when notes are struck and released very quickly. Ideal for playing rolls using the fingers of both hands in an alternating fashion, much as a percussionist would do with a pair of mallets. Pressing and releasing more slowly will bypass the repetitions. To adjust response, click in the “Max. Thresh” value field and enter the desired time in ms.
 - c) Repeat Med: Notes will repeat if keys are released within the range of 60-200 ms of the time they are depressed. The result is that rolls are played only when notes are struck and released moderately quickly. Also ideal for playing rolls using the fingers of both hands in an alternating fashion, this preset will bypass the repetitions if keys are struck and released very quickly, and also if they are struck and released more

slowly. To adjust response, click in the “Min. Thresh” and “Max. Thresh” value fields and enter the desired times in ms.

d) Repeat Slow: Notes will repeat if keys are released within the range of 175 ms-10 seconds of the time they are depressed. The result is that repetitions are played only when notes are struck and released more slowly. This preset will bypass the repetitions if keys are struck and released moderately quickly. To adjust response, click in the “Min. Thresh” value field and enter the desired time in ms.

e) Always Repeat: This preset will cause any note, regardless of duration, to repeat on release of the key.

8) *Min/Max. Threshold (Displayed in milliseconds): These fields determine the amount of time you can hold a key for the release of that key to trigger a new repetition of the same note. Holding the key less than the Min. Thresh value or longer than the Max. Thresh value will bypass the release-trigger roll behavior.*

About the Voicing Page



Concept:

The Kontakt version of the Wavelore American Zither contains extra features to allow control over octave coupling, expression control (for swells), polyphony conservation, and management of when and how voices are shut off. Octave coupling can be turned on or off for each of the portamento and non-portamento ranges independently. Expression control allows notes to swell or fade by moving CC#11, and this volume control can be set to effect the sound before or after the convolution resonance effect. Polyphony conservation keeps repeated notes from accumulating excessive voices and adds realism, and sustain pedal damping allows the muting of all sounding notes in the portamento or non-portamento ranges independently.

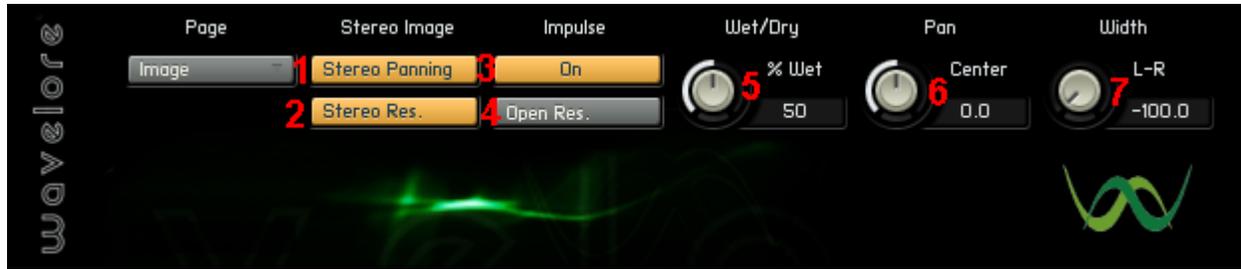
Controls:

- 1) *Expression on/off*: Enable this button to activate CC#11 as a volume controller.
- 2) *Pre/Post*: Set to "pre", this button will cause the Expression pedal to affect sound levels *before* the convolution resonance. As a result, sympathetic resonance sounds generated by the convolution will continue to sound even after the pedal is lowered to the zero position. Set to "post", this button will cause the expression pedal to affect the overall output level of the instrument, including convolution resonance. It is recommended that if you use the expression pedal in "post" mode, you disable the convolution, since it is likely to serve little purpose in this context.
- 3) *Normal/Porta Octaves On/Off*: Use these buttons to enable octave coupling in the non-portamento range and/or the portamento range of the instrument. Note that when octaves are enabled, the range of the instrument is shifted from A2-F6, to E2-C6.

****PLEASE NOTE:** Because enabling octave coupling changes the playing range of the instrument, you may need to adjust the upper and/or lower portamento range limits to compensate for any changes made to these parameters.

- 4) *Damp Speed Controller (Defaults to CC#11, at a value of 64)*: Use this control to choose the MIDI Controller you will use to control the fade time of old notes. The script will automatically use velocity as the fade time controller when repeating notes with velocity above 5. This user defined controller will change fade time between the specified minimum and maximum fade times (control 5) when "damping" strings by playing notes with velocities of 5 or less, or when damping all sounding strings using the sustain pedal.
- 5) *Min/Max Fade Time*: Enter the desired minimum (fastest) and maximum (slowest) fade times. These values give a range that will be used to calculate fade time for old notes when new notes are played, or when "damps" are performed. The actual fade time is calculated based on velocity if the new note is played at a velocity of 6 or greater, and is based on the position of the damp speed controller if the new note is played at a velocity of 5 or less, or if the old note is damped using the sustain pedal. i.e., Once min. and max. fade times are adjusted to taste, velocity will automatically interpolate these values for repeated notes, and the damp speed controller will interpolate when notes are "damped".
- 6) *Damp Porta/Non-Porta*: These buttons enable/disable damping of all notes in either or both of the two keyboard ranges using the sustain pedal. With both buttons enabled, tapping the sustain pedal at any time will stop all sounding notes, with the fade time of the samples being determined by the min/max fade times and the position of the damp speed controller.

About the Image Page



Concept:

We created two stereo impulse responses of the American Zither: One with all the strings un-dampened, and one with the strings about half dampened. These "IR's", when used within Kontakt's convolution processor, allow your choice of two levels of resonance. These resonances can be further adjusted using the convolution processor's internal controls, offering a wide variety of choices. These resonance models interact with the output of the repetition, portamento, and damping effects to allow even more realistic results. The impulses can also be switched to mono or bypassed, and there are additional panning controls for the placement of the Zither's strings within the stereo field.

Controls:

- 1) *Panning Mode*: Determines whether the zither's strings are all panned to the same location in the stereo field (mono), or whether they are "spread" across it (stereo).
- 2) *Resonance Image*: Switches the active impulse response between mono and stereo.
- 3) *Impulse On/Off*: Bypasses or activates the convolution resonance.
- 4) *Open/Damped Resonance*: Switches the active impulse response between open resonance and damped resonance. Open resonance allows unimpeded sympathetic vibration of the instrument's strings, while damped resonance uses mostly instrument body resonance with minimal sympathetic vibrations.
- 5) *Wet/Dry*: Used to adjust the ratio of resonance to dry samples in your mix. Higher values raise the level of convolution while lowering the level of the dry signal.
- 6) *Pan control*: If panning mode is set to "mono panning", this control determines the placement of the entire instrument's sound in the stereo field. If panning mode is set to "stereo panning", it determines the center point of the instrument's stereo spread.
- 7) *Width control (hidden if panning mode is set to "mono panning")*: This control spreads the range of the instrument across a portion of the stereo field: If set to -100, the notes of the instrument are panned from low to high, left to right. If it is set to +100, the strings are panned from high to low, left to right. If width is set to zero, all strings are panned to the value specified in the pan control. Also, for example, one could set width to -50, and pan to -25. This would spread the strings, from low to high, from 75% left to 25% right. A variety of images can be created.

****PLEASE NOTE:** The values of the pan and width controls are to some degree interdependent. That is, if pan is set to -100, width will be "forced" to "center". This is because you can't have a stereo spread with all strings at hard left. Similarly, if you then pull the width control to -100, pan will be forced to center. This is for a similar reason; to have a full stereo spread means the center point must be the exact center of the stereo field.

About the Key-Switch Page



Concept/Controls:

On this page of controls, you can assign MIDI keys which will act as toggle switches for release triggers, portamento, and octave coupling in the portamento and non-portamento ranges. Simply set them manually, or set any control to 128 to activate learn mode. Once in learn mode, you can simply play in the note you wish to use for key-switching that feature on and off, and click "OK" to accept your choice.

Additionally, each knob alternately displays the note name and status of the key-switch; Once per second, the text in the label will change to show "on" or "off", indicating whether that feature is currently active, and then change back to display the note name.

****PLEASE NOTE:** Key-switch statuses are not recalled when saving a patch of a MIDI sequencer's project file, so your project will need to begin with the key-switches necessary for the instrument to perform your sequence correctly.

Where to Get More Help

If you have any difficulties using this software instrument, or even if you'd just like to share your thoughts or make suggestions, please don't hesitate to contact us at:

support@wavelore.com

Also, please check our site (<http://www.wavelore.com>) regularly for updates to our products and product line.

For information on editing this instrument, please consult your Kontakt 2/ Kontakt 3 documentation.

Credits

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

- Mark Belbin - Performance, audio editing, instrument design, KSP Scripting, documentation.
- Steven Miller - Audio engineering, quality assurance.
- David Harvey - Design concept, design.
- Nils Liberg – KSP scripting

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