



## Wavelore American Zither

### 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, a script controlling the damping and voice overlap/polyphony conservation makes 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.



### About the Polyphony Conservation Script

#### Concept:

The Kontakt 2 version of the Wavelore American Zither uses a script which causes any repeated note to shut off any previous voices that are playing the same note, without interfering with other notes. This script is designed to do three things:

- 1) Conserve polyphony. If you play the same note repeatedly, the instrument will usually not use more than five voices of polyphony per pitch, unless your repetitions are extremely fast and the maximum release time is being used.
- 2) Allow a natural playing technique where keys are struck as strings on a zither would be struck with a mallet, but the notes will decay for their full duration, unless "damped" by pressing the keys again, but very gently. Therefore, repeating a note at a velocity of five or less will cut off any previously sounding voices that are playing the same note. This mimics the way in which a percussionist will sometimes perform a "secco" stroke by using a hand or mallet to stop an instrument from vibrating, either gently or abruptly.
- 3) Allow increased realism. Without this polyphony restriction, repetitions would quickly "pile up", resulting in a phased sound. A real mallet-percussion instrument would not behave this way. Rather, each time a note is struck, the string would be set in motion again, sounding a new note, and stopping the old one.

There is one exception to this rule, namely when a loud note is followed by a quiet one. In this scenario, the string continues to ring due to its intense vibration from the loud strike, but the new, quieter note will dampen it slightly. This theory is the basis for the

traditional "self mask" technique, where only louder notes shut off quieter ones, but not the other way around. However, self-masking does not take into account the way in which quieter notes interfere with louder notes. This script will allow quiet notes to gently take over louder ones. It accomplishes this task by fading original notes slowly when subsequent repetitions are played softly, and fading quickly when repetitions are played loudly.

Once the notes manipulated by the script are passed to Kontakt's convolution processor (using one of two included Impulse Responses taken from the body of the zither), damped and overlapped notes take on a further realism by creating sympathetic resonance. To hear this effect, play a high note (say, D#6) very loudly, and then again very softly. You'll hear the note fade out fairly quickly, but a ringing effect is left, as if other adjacent strings were set in motion by the mallet striking the instrument.

### Controls:



1                      2                      3

1) *Fade CC (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 (See 3), above). This user defined controller will change fade time between the specified minimum and maximum fade times (controls 2 and 3) when "damping" strings by playing notes with velocities of 5 or less.

2) *Min Fade Time (Range from 20 ms to 200 ms, Default value of 150 ms)*: Enter the desired minimum (fastest) fade time. This is the fade time that will be used for old notes when new notes are played at a velocity of 127, or when "damps" are performed with the Fade CC (e.g., the default CC#11, Expression controller) at a value of 0. For example, move CC#11 to a value of 0, play a note, then play the same note very gently. The original note cuts off in 150 ms. Lower Min Fade Time all the way to 20 ms and repeat the process - the note now cuts off very abruptly.

3) *Max Fade Time (Range from 250 ms to 1000 ms, Default value of 500 ms)*: Enter the desired maximum (slowest) fade time. This is the approximate fade time that will be used for old notes when new notes are played at a velocity of 6, or when "damps" are performed with the Fade CC (e.g., the default CC#11, Expression controller) at a value of 127. For example, move CC#11 to a value of 127, play a note, then play the same note very gently. The original note fades out over 500 ms. Raise Max Fade Time all the way to 1000 ms and repeat the process - the note now fades out much more slowly.

Once Min. and Max. Fade times are adjusted to taste, velocity will automatically interpolate these values for repeated notes, and Fade CC will interpolate when notes are "damped".

## About the Convolution Resonance

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 script to allow even more realistic results.

When loaded, the American Zither defaults to having the “WLAZ\_Open\_Res.wav” IR loaded:



Alternatively, you may want to experiment with the “WLAZ\_Damped\_Res.wave” IR, which can be found in the directory where you un-zipped your installation package. This will typically be something like:

*D:\Wavelore\_American\_Zither\_16\_Bit\WAVELORE AMERICAN ZITHER 16 Bit Samples\IR Samples\WLAZ\_Damped\Res.wav*

Once you find this file, simply drag and drop it into Kontakt’s convolution processor, and it will be active. The mix and envelope settings we made for the open resonance model will remain active, so you may want to adjust these to taste.

For either IR, you may want to experiment with adjusting the envelope, size, filter settings, pre-delay, or wet/dry settings. Please see your Kontakt documentation for instructions on doing so.

## 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](mailto: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

