USER MANUAL

WURLI V

ARTURIA®
YOUR EXPERIENCE • YOUR SOUND

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1 INTRODUCTION

Arturia would like to thank you for purchasing our latest modeling electric piano, Wurli V. We are confident it will become a valuable addition to your music production studio.

If you've purchased our products before, you know we take great pride in recreating the sound and feel of the original instruments. And then we top it off with 21st century features the products might have had if the technology had been available at the time!

1.1 History of the original instrument

1.1.1 The electric piano

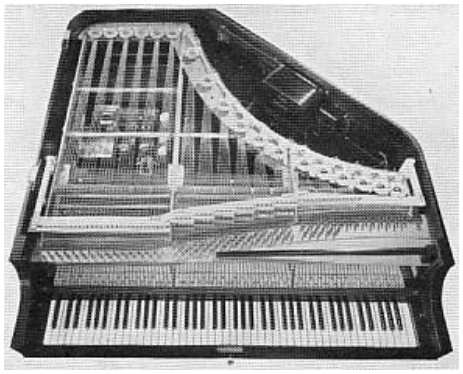
1.1.1.1 Terminology

An electric piano is an electromechanical musical instrument. Sounds are produced mechanically and then turned into electrical signals by using electronic pickups. This is quite different from an electronic piano, which simulates the timbre of a piano (or others instruments) using analog or digital circuitry.

1.1.1.2 At the beginning

The earliest electric pianos were invented in the late 1920s; the 1929 German *Neo-Bechstein* electric grand piano was among the first. Probably, the earliest model of electric piano was the *Vivi-Tone Clavier* created by the Gibson sound engineer and master luthier Lloyd Loar. When the instrument was discovered in 1994, amazingly, the instrument was still in perfect tune!

Neo-Bechstein Electric Grand Piano



ViViTone Clavier

1.1.1.3 Technologies

Different methods of tone production exist among electric pianos. They vary from one model to another, the most common are: struck strings (Yamaha, Baldwin, Helpinstill, Kawai), tuning-forks (Fender Rhodes, Hohner´s "Electra piano"), plucked

reeds (Hohner´s "Pianet" and "Cembalet", Weltmeister claviset) and struck reeds (original electric piano that inspired the Wurli V and Denon Elepian). We cannot say that one method is better than another; each of these technologies have their own tone and character.

1.1.1.4 Popularity

The goal at the beginning was to provide a piano which did not detune, and could be easier to transport than a real piano. The electric piano started as a product to be more convenient but then acquired a musical identity of its own. Musicians developed playing techniques with their instruments and created their own sounds using a variety of effects like phase shifters, delays and tremolos to enhance the possibilities of the sound. The popularity of the electric piano reached its height during the 70s; many legendary bands have used these instruments like The Beatles, the Doors, Herbie Hancock, Chick Corea, Pink Floyd, Led Zeppelin, Ray Charles, Queen, Supertramp, Elton John, etc.

The band SUPERTRAMP playing the original reed electric piano from 1972

Most electric piano players seem to be divided into two camps: Rod electric pianos or reed electric pianos. Tonally and attack-wise the ones with reeds seem to sit more comfortably with an amplified guitar-based rock band a than does the others. They could even replace a rhythm guitar quite successfully, whereas the rods-based ones were more of solo instruments, suited to fusion, acid jazz, other jazz styles, the truth is that both of them are real jewels!

These instruments were eventually replaced by synthesizers or electronic pianos capable of piano-like sounds without the disadvantages of moving mechanical parts. These were also lighter and smaller.

However, to our delight, electric pianos are coming back into fashion. Companies who went out of business years ago are back making new models again and the prices of vintage used instruments has climbed so that these are now out of reach of most people.

1.1.2 The original reed-based electric piano from 1972

1.1.2.1 History

For many years this legendary electric piano was a staple of the rock´n rollers keyboard players' arsenal. The previous models of the brand were first manufactured in the very early 60´s for domestic usage in the home environment. They were the first electric piano to be manufactured and sold. The sound and portability soon led to professional stage use as the piano proved a useful tool for musicians.

Originally conceived decades earlier by one B.F. Meissner, whose idea of removing the sound board of an ordinary acoustic piano and placing electromagnetic pickups on each string (like an electric guitar) met with some success. He sold this concept to the Everett piano company, who then produced the Orgatron. This utilized Meissner´s individual pickup arrangement, but instead of striking a string for a percussive attack, Everett´s system incorporated air blowing over flat reeds for an "electric" organ / harmonium effect.

Orgatron

The manufacturer at the origin of the instrument that inspired the Wurli V, realized that this concept could be made into an effective amplified piano by striking a metal reed with a hammer, and thus the reed electric pianos were born.

The first version of the instrument entered production in 1954 and continued to be produced in various forms until about 1982.

The inescapable reed electric piano that inspired the Wurli V established itself as the most popular model among collectors and players alike. It´s the latest of the reed-based pianos, the lightest in weight, and probably has the best action and sound amplification of all the models.

The original reed-based electric piano from 1972

1.1.2.2 Description

The original electric piano that inspired the Wurli V used a "bag of shot" genuine piano action with the hammers striking the flat reeds at around middle point, causing the reed to vibrate which was then in turn converted to electric energy by electrostatic pickups. It´s a 64-note instrument whose keyboard range was from A, an octave above the lowest note of a standard 88-note piano to the C, an octave below the top note of an 88-note piano. The plastic-body was only available in black and avocado green. It had an internal amplifier and two loudspeakers facing the player. A tremolo effect was incorporated, and the audio output allowed to connect the electric piano to a Guitar amp or a PA. The production started in 1972.

Inside the reed-based electric piano from 1972

1.1.2.3 Sound

Compared with its rival, the rod-based electric piano, this model has a brighter, more hollow sound. When played gently the sound can be quite sweet and vibraphone-like sounding very similar to the one of its former competitor; while becoming more aggressive with harder playing, producing a characteristic slightly overdriven tone usually described as a "bark". In a pop or rock band setting with guitar, bass and drums, the reed-based one has a distinctive and clear sound where electric pianos using rods tend to blend in. However, it has also been used successfully in MOR ballads and even country music.

1.1.2.4 Maintenance

The reed-based electric piano is an absolute nightmare to tune. On the end of each reed is a lump of solder, removing some makes the note sharper in pitch, while conversely, adding more solder flattens the pitch. Just loosening the reed and re-tightening it is enough to change the tuning. Should you dare try removing some of the solder whilst the reed is still in the pickup assembly, microscopic lead filing can cause havoc, shorting out between reed and pickup, and nasty sounds result when played. Also, if the actual overall shape of the lump of solder is altered too radically, the timbre of the note may start to change! Each note has its own exact reed size although it is possible to tune up or down 2 semitones without adversely affecting timbre or pitch.

1.1.2.5 Discography

It´s impossible to list all the records using the electric piano that inspired the Wurli V, but here is a suggested list of famous recording using this fantastic Wurlitzer.

The Archies – Sugar sugar

Beck – Where its At

Belle & Sebastian – The boy with the Arab strap

Bob Dylan – Til I fell in love with you

Chicago – Feelin stronger every day

Daft Punk – Digital love

The Doors – Queen on the highway

Eels – Agony

Elton John – Lady Samantha

George Harrisson – All those years ago

Jet – Bring it on back

John Lennon – How do you sleep

Justice – Valentine

The Mars Volta – Inertiatic ESP

Marvin Gaye – I heard it through the grapevine

Muse – Hate this and I´ll love you

Neil young – The old laughing baby

Norah Jones – What am I to you

Panic at the Disco – Mad as rabbits

Paul McCartney – Ram oh

Pink Floyd – Money

Queen – You´re my best friend

Ray Charles – What´d I say

Stereolab – Infinity girl

Stevie Wonder – Love having you around

Supertramp – The logical song

Tori Amos – Pancake

Van Halen – And the cradle will rock...

Wilco – I am trying to break your hear

Today it is quite hard to get a hold of this memorable electric piano in good condition. They are sadly not the most frequently used keyboard instrument in the music industry and are quite rare these days. Fortunately the Wurli V is here to give it a second life, and allowing us the relief of tuning troubles!

1.2 Physical modeling synthesis

When you want to create a sound, there are many methods of synthesis from which to choose:

- **Additive**, which creates a timbre by adding various waveforms together
- **Subtractive**, in which partials of an audio signal are attenuated by a filter to reduce the original harmonic content of the sound
- **Frequency Modulation (FM)**, where waveforms are used in carrier/modulator relationships and tuned according to the harmonic series to produce overtones in the carrier waves
- **Wavetable**, which offers a wide selection of digital waveforms and then allows them to be layered, filtered, and/or used as the crossfade targets of an X/Y controller or a looping envelope
- **Sample Playback**, where recordings of a sound are triggered by a playback device, and can be transposed by increasing the playback speed when different pitches are required
- **Granular**, which splits samples into very short "grains" and allows them to be manipulated through a myriad of playback options, and
- **Physical modeling**. In this method the output waveform is calculated according to a set of equations and algorithms derived through extensive analysis of a physical sound source.

1.2.1 Music and math: yet another link

A physical model attempts to codify the laws of physics that govern a particular form of sound generation. A model typically will have multiple parameters, some of which are constants that describe the physical materials and dimensions of the instrument, while others are time-dependent components representing the player´s interaction with the instrument, such as plucking a string, pressing a valve, or reducing the pressure of his embouchure, etc.

This idea has been around for a long time, but development has been hindered until recently because processors that were powerful enough to handle the computational complexity of the physical models either didn't exist or were too expensive.

But if you've been watching the technological trajectories, you know those days are in the past. And we're just as happy about that as you are.

1.2.2 A computational conundrum

Here's an example of what must be taken into account while developing a physical model. To recreate the sound of a drum, for instance, a formula must be in place to represent all of the ways the collision between a drum stick and a drum head sends shockwaves through a two-dimensional membrane. Among other things, the formula must incorporate:

- The properties of the striker: its rigidity, the velocity of the hit, the material, and how/where the strike happens
- The membrane: its mass density, elasticity, woven fabric vs. plastic vs. skin, etc.
- The sympathetic resonances of the membrane and the body of the drum
- The conditions at the membrane boundaries: is there a rigid termination to the drum´s body, or are there multiple, independently adjustable pressure points?
- The ancillary and perhaps lingering response of additional components, such as the snares under a snare drum.

Similar complexities can be found in instruments such as an acoustic guitar. A few years ago, a French scientist finally completed a comprehensive modeling of all acoustic guitar parameters. The calculations to produce the sound took three days!

The second-biggest challenge of physical modeling synthesis is to simplify the algorithms wherever possible without sacrificing the essential nature of the instrument being modeled. The goal is to achieve an efficient model which can be used interactively, in real time, without limiting the spontaneous paths a musician may take during a rush of creativity.

1.2.3 The endless revolution

There are several methods of physical modeling synthesis, including Karplus-Strong algorithms, digital waveguide synthesis, and formant synthesis. Each one uses a different paradigm to bring a modeled sound to its musical fruition.

The salient point here is that physical modeling synthesis is capable of recreating the character of a "real" instrument during performance, including its subtle nuances of expression, while using a thousand times less hard drive space than the "sampling" method would take to produce an inferior result.

Not to rub it in, but we really should mention the ability of physical modeling algorithms to combine parameters into instruments that have never existed. There is no limit to the types of sounds physical modeling synthesis can produce!

And when you gather a bunch of music fanatics who also possess a knowledge of the pertinent laws of physics and an in-depth understanding of the characteristics

of electronic circuits, you wind up with Arturia. And Arturia now offers you our latest brainchild, the Wurli V.

May it light the fires of creativity for you!

2 ACTIVATION AND FIRST START

2.1 Register and Activate

Wurli V works on computers equipped with Windows 7 or later and Mac OS X 10.7 or later. You can use the stand-alone version or use Wurli V as an Audio Units, AAX, VST2 or VST3 instrument.

Once Wurli V has been installed, the next step is to register the software.

The registration process will require you to enter the serial number and the unlock code you received with the product.

In order to proceed, go to this web page and follow the instructions:

http://www.arturia.com/register

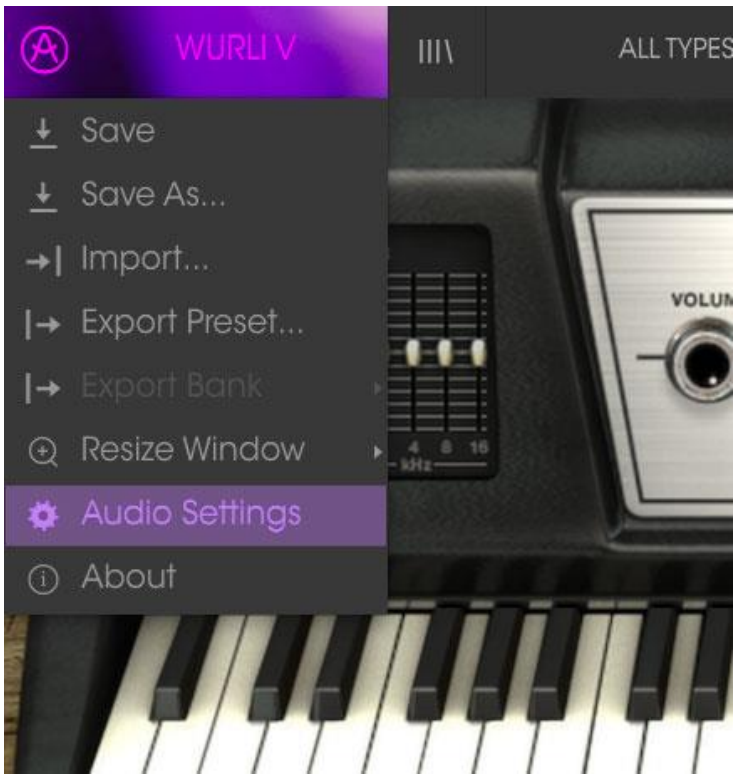
Note: If you don't have an Arturia account yet, you will need to create one. The process is quick, but it does require that you can access your email address during the registration process.

Once you have acquired an Arturia account you will be able to register the product.

2.2 Initial setup

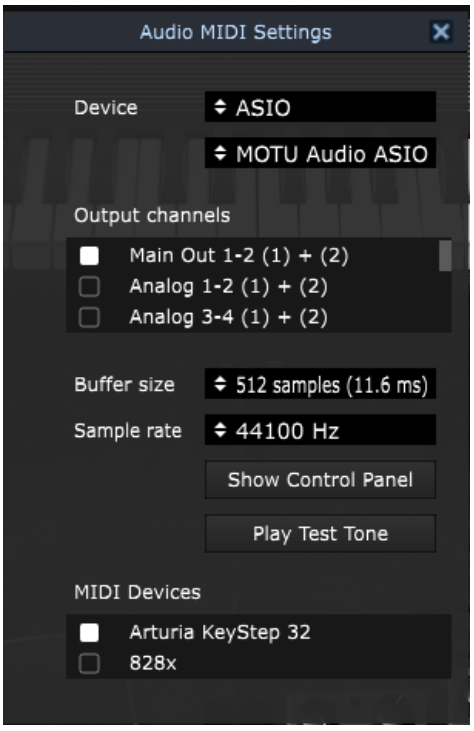
2.2.1 Audio and MIDI settings: Windows

At the top left of the Wurli V application is a pull-down menu. It contains various setup options. Initially you will need to go to the menu and choose the Audio Settings option to get sound and MIDI flowing in and out.



Wurli V main menu

You will then see the Audio MIDI settings window. This works in the same way on both Windows and Mac OS X, although the names of the devices available to you will depend on the hardware you are using.



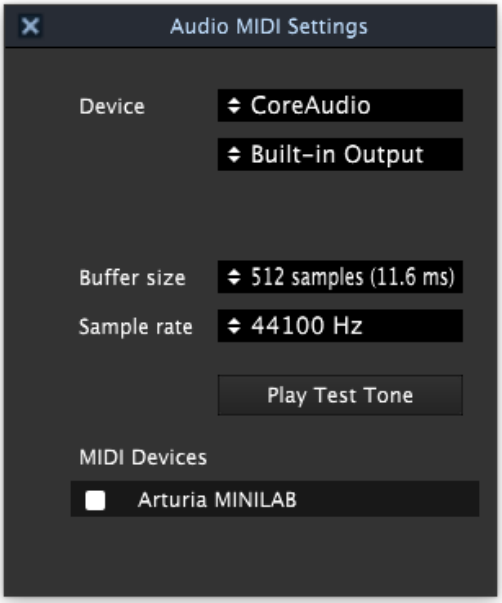
Audio and MIDI settings window

Starting from the top you have the following options:

- **Device** lets you choose which audio driver you want to use to route sound out of the instrument. This might be your computer's own driver like Windows Audio, or an ASIO driver. The name of your hardware interface may appear in this field.
- **Output Channels** lets you select which of the available outputs will be used to route audio out. If you only have two outputs, only two will appear as options. If you have more than two you can select a specific pair of outputs.
- The **Buffer Size** menu lets you select the size of the audio buffer your computer uses to calculate sound. A smaller buffer means lower latency between pressing a key and hearing the note. A larger buffer means a lower CPU load as the computer has more time to think, but can result in a small latency. Find the optimum buffer size for your system. A fast, modern computer should easily be able to operate at 256 or 128 sample buffer size without creating pops or clicks in the sound. If you are getting clicks, try raising the buffer a little. The latency is displayed on the right hand side of this menu.
- The **Sample Rate** menu lets you set the sample rate at which audio is sent out of the instrument. The options here will depend on the capability of your audio interface hardware though even most computers' own hardware can operate at up to 48kHz which is perfectly fine. Higher sample rates use more CPU power so unless you have a good reason to go up to 96kHz, then 44.1k or 48k is usually fine. The **Show Control Panel** button will jump to the system control panel for whatever audio device is selected.
- **Play Test Tone** helps you to troubleshoot audio issues by confirming whether sound can be heard through the correct device.
- Your connected MIDI devices will appear in the **MIDI Devices** area. Click the check box to accept MIDI from the device you want to use to trigger the instrument. In standalone mode, Wurli V listens for all MIDI channels so there's no need to specify a channel. You can specify more than one MIDI device at once.

2.2.2 Audio and MIDI settings: Mac OS X

The process is very similar to initial setup for Windows and the menu is accessed in the same way. The difference is that OS X uses CoreAudio to handle audio routing and the audio device selection is made in the second dropdown menu. Apart from that, the options work the same way as described in the Windows section.



2.2.3 Using Wurli V in plug-in mode

Wurli V comes in VST, AU and AAX plug-in formats for use in all major DAW software such as Cubase, Logic, Pro Tools and so on. You can load it as a plug-in instrument and its interface and settings work the same way as in standalone mode, with a couple of differences.

- You can automate numerous parameters using your DAW's automation system.
- You can use more than one instance of Wurli V in a DAW project. In standalone mode you can only use one at once.
- You can route Wurli V's audio outputs more creatively inside your DAW using the DAW's own audio routing system.

3 USER INTERFACE

Wurli V is packed with great features, and in this chapter we'll make sure you know what each one does. We think you'll be amazed by the huge range of sounds that can be made with this instrument.

And while Wurli V is very flexible, there's nothing complicated about it. That will always be the main focus of every Arturia product: to unleash your creativity while remaining easy to use.

3.1 The virtual keyboard

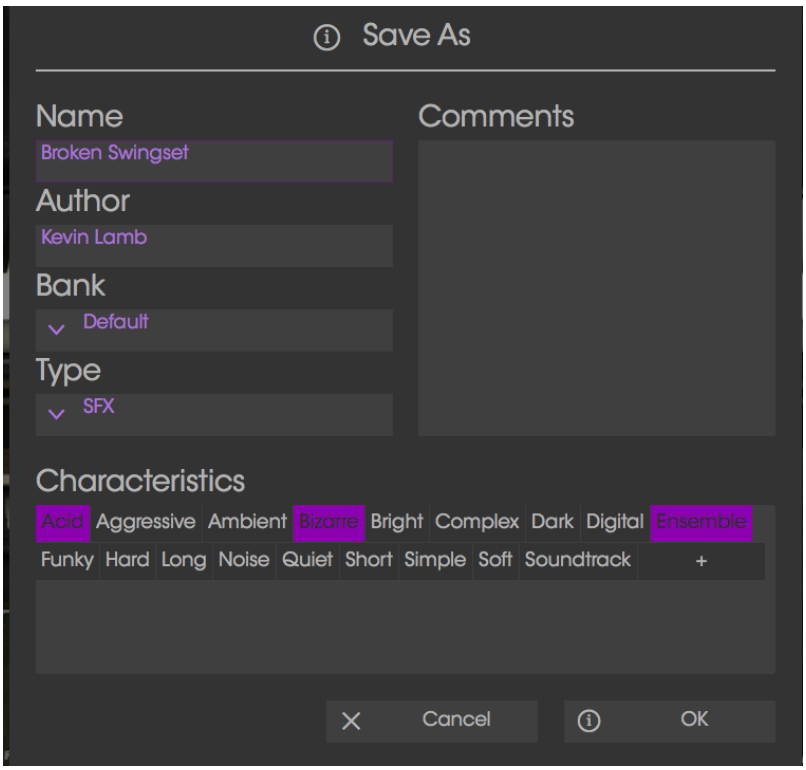
The virtual keyboards and pedal board in the main Wurli V window allow you to play a sound without the need for an external MIDI device. Just click on a virtual key to hear the corresponding sound. Drag the cursor across the keys to hear a glissando.

3.2 Toolbar

The toolbar that runs along the top edge of the instrument both in standalone and plug-in mode provides access to many useful features. Let's look at them in detail. The first seven of these options can be found by clicking on the Wurli V section at the very top left hand corner of the instrument window.

3.2.1 Save Preset

The first option lets you save a preset. If you select this, you are presented with a window where you can enter information about the preset. In addition to naming it you can enter the author name, select a bank and type and select some tags that describe the sound. This information can be read by the preset browser and is useful for searching the preset banks later. You can also enter freeform text comments in the Comments field, which is handy for providing a more detailed description.



The Save Preset window

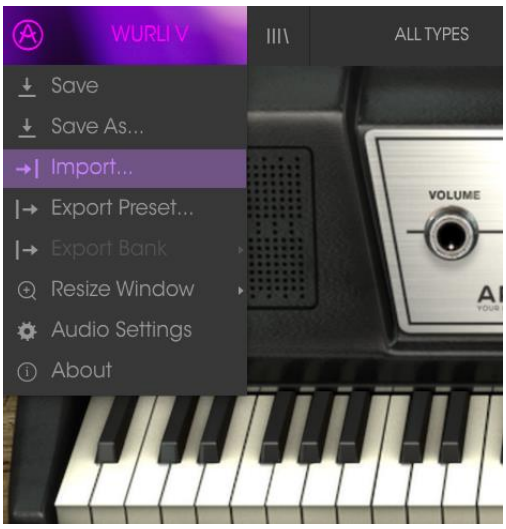
3.2.2 Save Preset As…

This works in the same way as the Save command, but lets you save a copy of the preset instead of saving over the original. It's useful for creating variations on patches but still keeping individual copies of each one.

3.2.3 Import preset

This command lets you import a preset file, which can be either a single preset or an entire bank of presets. Both types are stored in the .wurx format.

After selecting this option, the default path to these files will appear in the window, but you can navigate to whichever folder you are using.

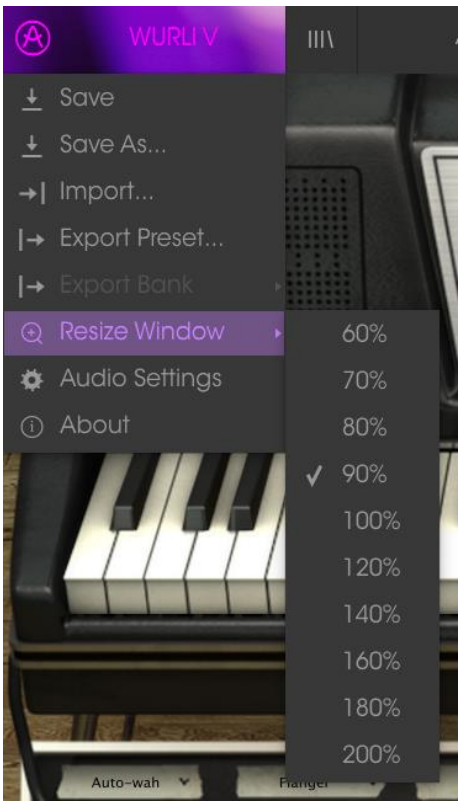


3.2.4 Export preset

You can export and share a single preset using this command. The default path to these files will appear in the window, but you can create a folder at another location if you like.

3.2.5 Resize window options

The Wurli V window can be resized from 60% to 200% of its original size without any visual artifacts. On a smaller screen such as a laptop you might want to reduce the interface size so it doesn't dominate the display. On a larger screen or a second monitor you can increase the size to get a better view of the controls. The controls work the same at any zoom level but the smaller ones can be harder to see at the smaller magnification values.



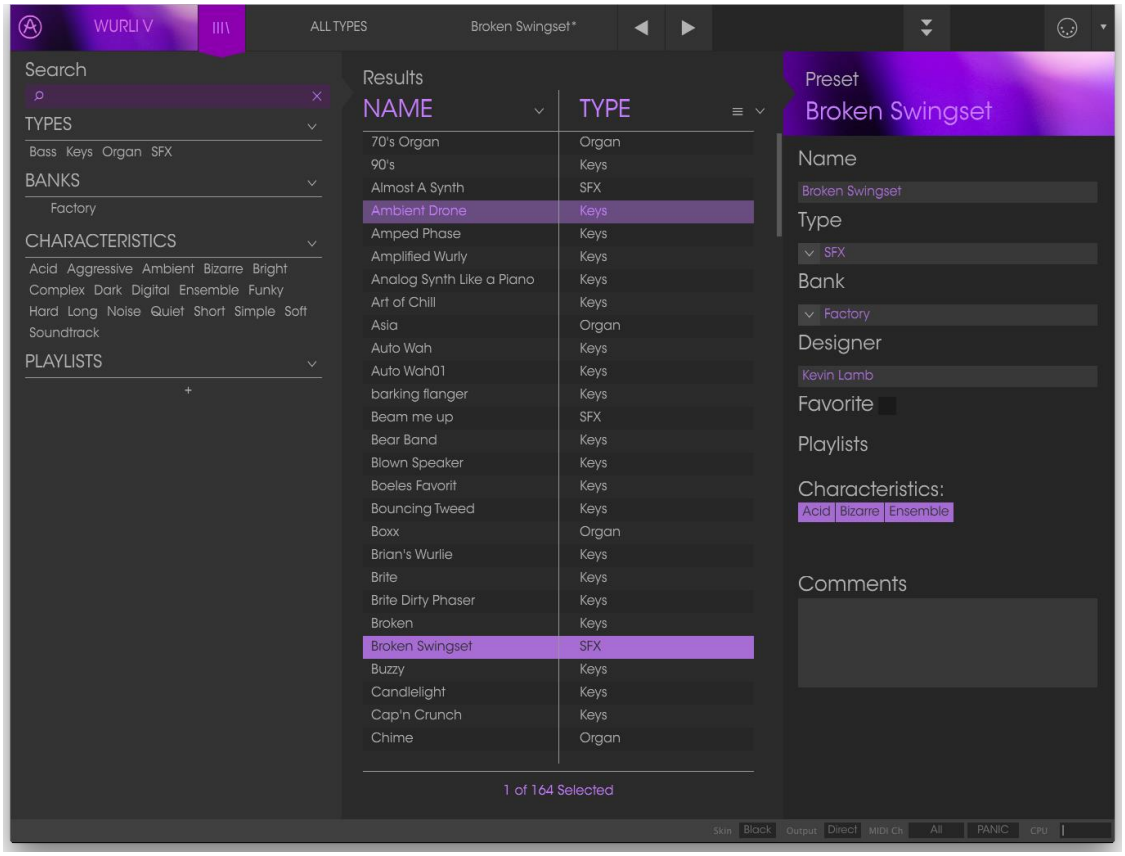
The Resize Window menu

3.2.6 Audio settings

Here you manage the way the instrument transmits sound and receives MIDI. See section 2.2 of the manual for full details on this.

3.2.7 Preset browser overview

The Preset browser is invoked by clicking the toolbar button that has four vertical lines. See section 3.3 of the manual for full details on this. The Filter, name field and left / right arrows in the toolbar all assist with preset selection.



The Preset Browser

3.2.8 Open and Close Advanced section

The Advanced section can be revealed by clicking on the button with the two downward arrows at the right of the toolbar. This lets you access the more advanced features of the instrument like. Click this button once to reveal the advanced section of the instrument and again to hide it. You can also click on the frame of the instrument to open and close it.

3.2.9 MIDI Learn assignment

The MIDI plug icon at the far right side of the toolbar places the instrument into MIDI learn mode. Parameters that can be assigned to MIDI controls will be shown in purple, and the idea is that you map physical buttons, knobs, faders or pedals from hardware MIDI controllers to specific destinations inside the instrument. A typical example might be to map a real expression pedal to the virtual volume pedal, or buttons on a controller to the effect switches so you can change the sound from your hardware keyboard.

MIDI Learn mode

3.2.9.1 Assigning / unassigning controls

If you click on a purple area you'll put that control into learning mode. Move a physical knob or fader and the target goes red, indicating that a link has been made between the hardware control and the software parameter. There's a popup window that displays which two things are being linked and a button to unassign the two from each other.

Flanger pedal rate selected and assigned

3.2.9.2 Min / Max value sliders

There are also minimum and maximum value sliders that you can use to restrict the parameter change range to something other than 0%-100%. For example, you might want the filter cut-off be controllable via hardware from 30% to 90%. If you made this setting (Min set to 0.30 and Max set to 0.90) your physical knob would be unable to alter the volume lower than 30% or higher than 90%, no matter how far you turned it. This is very useful for making sure you can't accidentally make the sound too quiet or too loud when performing.

In the case of switches which only have two positions (on or off), those would normally be assigned to buttons on your controller. But it is possible to toggle those with a fader or other control if you like.

3.2.9.3 Relative control option

The final option in this window is a button labelled "Is Relative". It is optimized for use with a specific type of control: one which sends only a few values to indicate the direction and speed at which a knob is turning, as opposed to sending a full range of values in a linear fashion (0-127, for example).

To be specific, a "relative" knob will send values 61-63 when turned in a negative direction and values 65-67 when turned in a positive direction. The turn speed determines the parameter response. Refer to the documentation of your hardware controller to see if it has this capability. If so, be sure to switch this parameter on when setting up its MIDI assignments.

When configured this way, movements of the physical control (usually a knob) will change the software parameter by starting at its current setting, rather than being an "absolute" control and snapping it to some other value as soon as you start to move it.

This can be a great feature when controlling things like volume, filter, or effect controls, since you won't usually want them to jump massively out of their current setting as soon as you start to modify them.

3.2.9.4 Reserved MIDI CC numbers

Certain MIDI Continuous Controller (MIDI CC) numbers are reserved and cannot be reassigned to other controls. These are:

- PitchBend
- AfterTouch
- Ctrl Expression (CC #11)
- Ctrl Sustain On/Off (CC #64)
- Ctrl All Notes Off (CC #123)
- Ctrl All Sounds Off (CC #120)
- Ctrl Omni Mode Off (CC #124)
- Ctrl Omni Mode On (CC #125)
- Ctrl PolyMode Off (CC #126)

- Ctrl Poly Mode On (CC #127)

All other MIDI CC numbers may be used to control any assignable parameter in Wurli V.

3.2.10 MIDI controller configuration

There's a small arrow at the far right hand side of the toolbar that deals with MIDI controller configurations. This allows you to manage the different sets of MIDI maps you may have set up for controlling the instrument's parameters from MIDI hardware. You can copy the current MIDI assignment setup or delete it, import a configuration file or export the currently active one. This is a quick way to set up different hardware MIDI keyboards or controllers with Wurli V without having to build all the assignments from scratch each time you swap hardware.

3.2.11 The lower toolbar

3.2.11.1 Current control value

At the left hand side of the lower toolbar you will see a readout showing the value or state of whatever control you are modifying. It will also display the current value of a parameter without editing it: just hover the cursor over the related control and the value will appear as pictured below.

3.2.11.2 *MIDI Channel setting*

At the right hand side of the lower toolbar are three small windows. The first one on the left indicates the current MIDI Channel setting. Click on it and it will expand to show the full range of values you can select (All, 1-16).

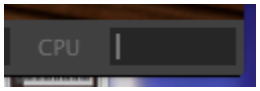
3.2.11.1 *Output mode*

The output button allows you to select the way by which the sound of the instrument is captured. This option plays an important role on the sound you will get and let you access to several specific parameters.

3.2.11.2 *Panic button and CPU meter*

The Panic button can be pressed to reset all MIDI signals in the event of stuck notes or other issues. The Panic button is also MIDI-assignable.

The CPU meter is used to monitor how much of your computer's CPU is being used by the instrument.



3.2.11.3 Skin color

Menu Setup > Wurlitzer color allows you to choose between two on-screen colors: black or white.

3.3 The Preset Browser

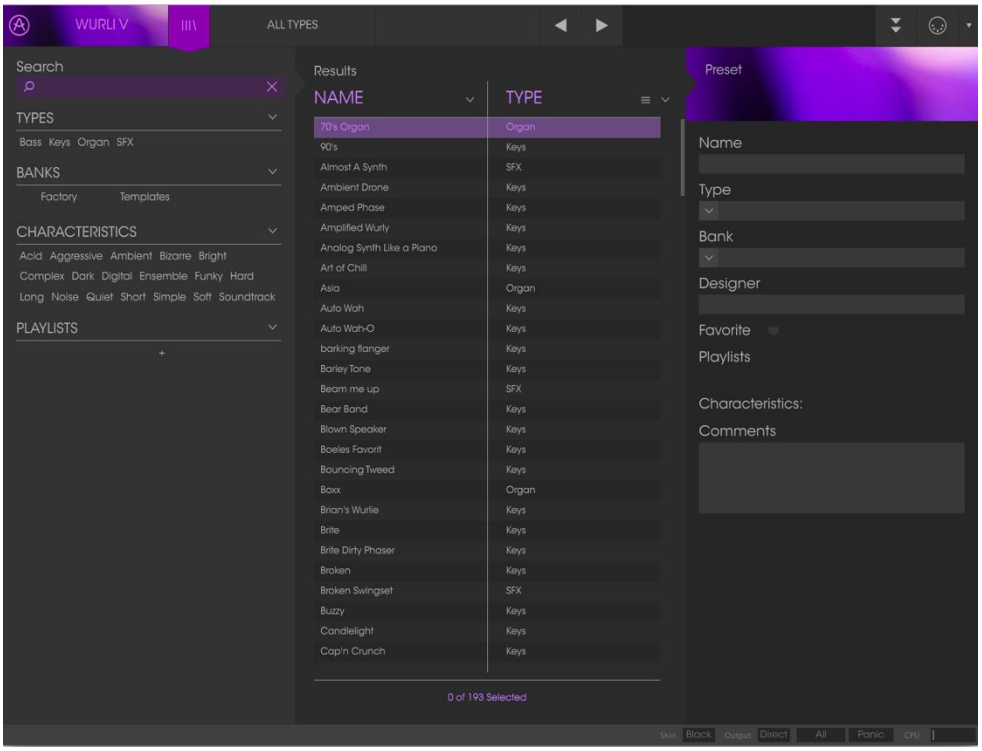
The preset browser is how you search, load and manage sounds in Wurli V. It has a couple of different views but they all access the same banks of presets.

To access the search view, click on the browser button (the icon looks a bit like books on a library shelf).

The Preset Browser button

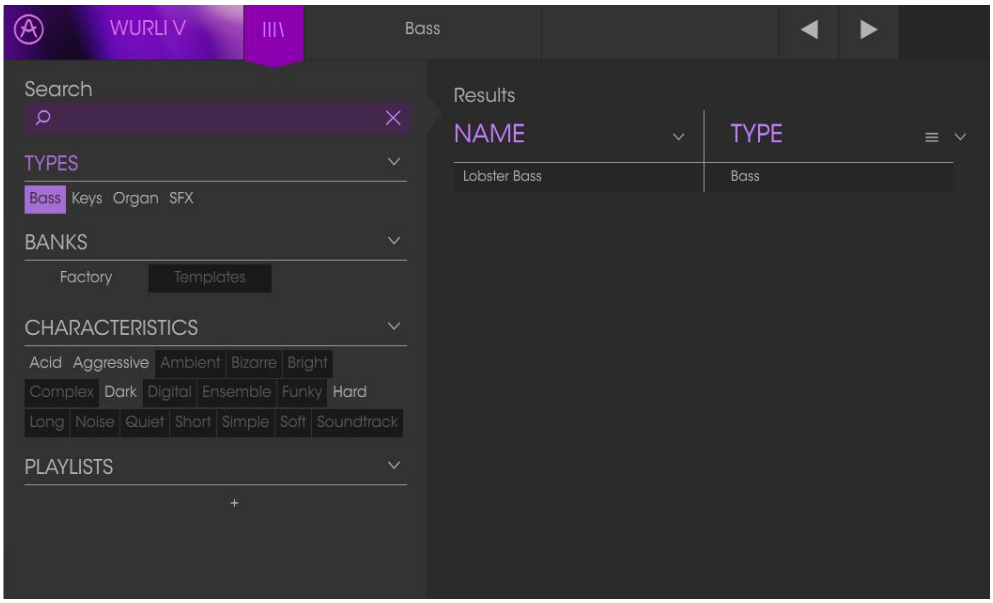
3.3.1 Searching presets

The Search screen has a number of sections. By clicking on the Search field at the top left you can quickly enter any search term to filter the preset list by patch name. The Results column is updated to show the results of your search. Press the X button in the search field to clear the search.



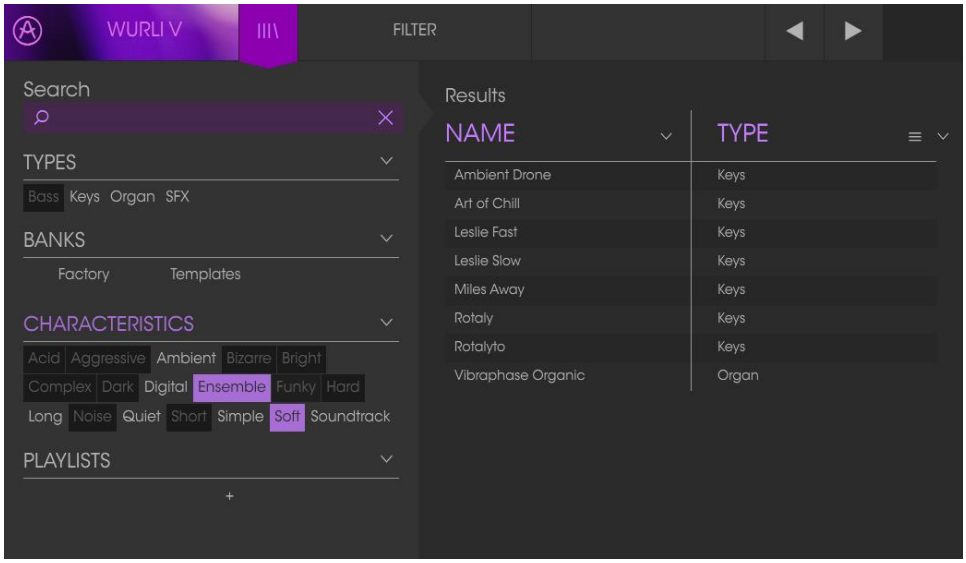
3.3.2 Using tags as a filter

You can also search using different tags. So for example by clicking on the Suitcase option in the Types field you can show only presets that match that tag. The tag fields can be shown or hidden by using the small down arrow buttons in their title fields. Results columns can be sorted by clicking the same arrow button in their own section.

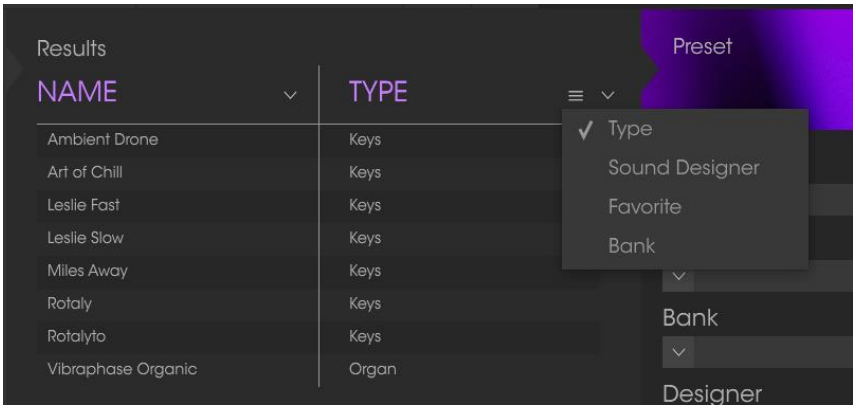


You can use multiple search fields to perform narrower searches. So by entering a text search and also specifying type, bank and characteristics options you could see only the presets that match those exact criteria. Deselect any tag in any area to remove that criteria and widen the search without having to go back and start

again. Using "Ctrl + click" (Windows) or "Cmd + click" (Mac) will allow you to select multiple elements in the same area.



The second Results column can be switched to show Type, Sound Designer, Favorite or Bank tags depending on how you like to search. Click on its options menu button just next to its sort arrow.

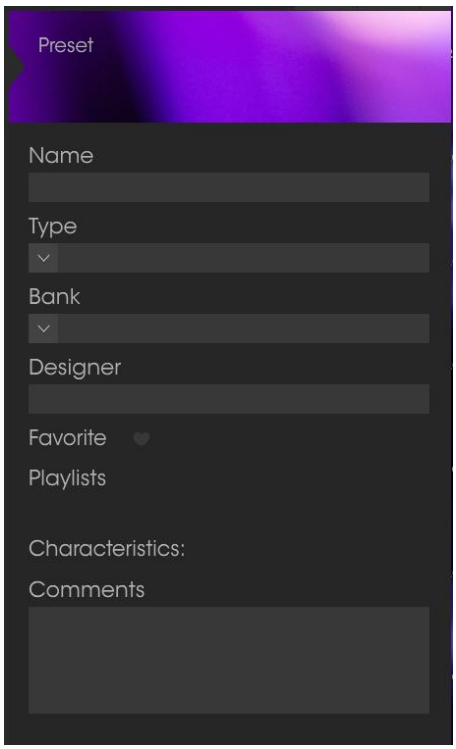


3.3.3 The Preset Info section

The Info column on the right of the search field shows you information about any preset. The information for User presets may be changed here: Name, Type, Favorite, etc.

However, if you want to alter the information for a Factory preset you must first use the Save As command to re-save it as a User preset. After this the Info section will gain Edit and Delete buttons at the bottom of the window.

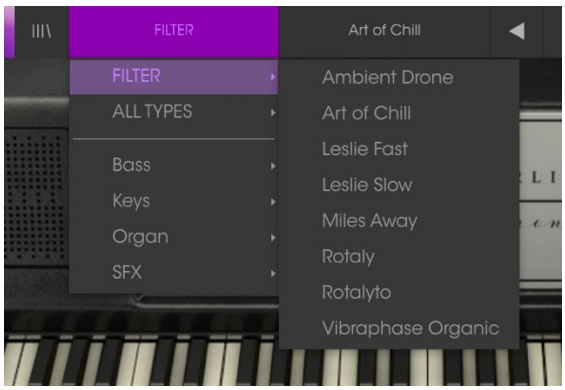
Click Edit and then make the desired changes, either by typing in one of the fields or by using a pull-down menu to change the Bank or Type. You can even add new Characteristics by clicking the + sign at the end of that list. Click Save when you are done.



3.3.4 Preset selection: other methods

The pull-down menu to the right of the Search menu provides a different way to select presets. The first option in this menu is called Filter, and it will display the presets that fit the search terms you used in the Search field. So if you searched for "Love" in the main search area, the results of that search will appear here.

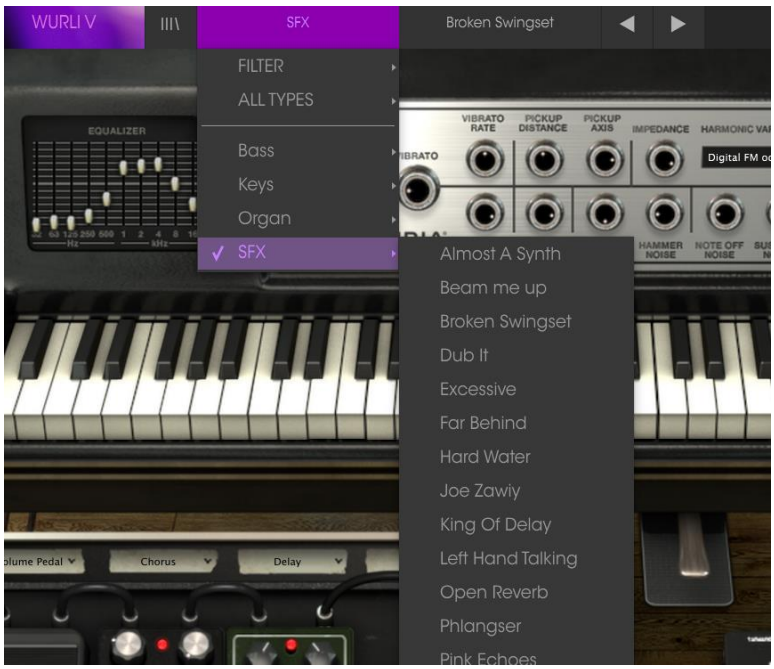
Similarly, if you previously selected a Type in the Search field you would see the results of that search in this area instead.



Filter results may differ based on Search criteria

Selecting the All Types option in the pull-down menu will bypass the Search criteria and show the entire list of presets.

The Categories below the line also ignore the Search criteria and display the presets based on their Type.



3.3.4.1 Selecting a preset by its Type

Clicking on the name field in the center of the toolbar will show you a list of all available presets. The list will also take into account any selections you have made in the Search field. So if you have pre-selected a Characteristic such as "Funky" this shortcut menu will only show you presets that match that tag.

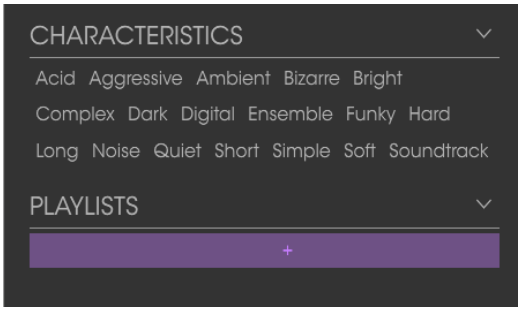
The left and right arrows in the toolbar cycle up and down through the preset list: either the full list, or the filtered list that resulted from the use of one or more search terms.

3.3.5 Playlists

In the lower left corner of the Preset Browser window is a feature titled Playlists. This is used to collect presets into different groups for different purposes, such as a set list for a particular performance or a batch of presets related to a particular studio project.

3.3.5.1 Add a playlist

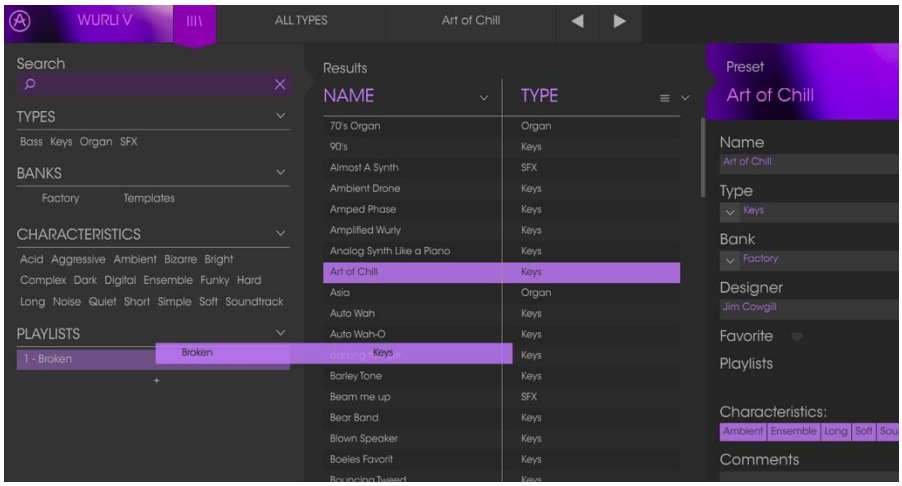
To create a playlist, click the plus sign at the bottom:



Give the playlist a name and it will appear in the Playlists menu. You can rename the playlist at any time; just click the pencil icon at the end of its row.

3.3.5.2 Add a preset

You can use all of the options in the Search window to locate the presets you want to have in your playlist. Once you have found the right preset, click and drag it onto the playlist name.



Click and drag from the Search Results list onto one of the playlists

To view the contents of a playlist, click on the playlist name.

3.3.5.3 Re-order the presets

Presets may be reorganized within a playlist. For example, to move a preset from slot 2 to slot 4, drag and drop the preset to the desired location.

This will copy the preset into the new location.

3.3.5.4 Remove a preset

To delete a preset from a playlist, click the x at the end of the preset row.

Click the X to remove a preset from a playlist

3.3.5.5 Delete a playlist

To delete a playlist, click the x directly to the right of the playlist name.

Click the X to delete a playlist.

3.4 Main controls

The basic operating mode of Wurlitzer V is to show the tool bar at top, and the simple Volume and Vibrato knobs. These were the only controls on a true Wurlitzer.

Volume: the volume is at 0 when the knob is facing the 9 o'clock position, like the real Wurlitzer.

Vibrato: the vibrato controls the tremolo effect intensity. It's off at the 9 o'clock position and is fully on when turned 270 degrees. The real Wurlitzer has a fixed rate of approximately 6.34Hz. It´s a mono tremolo (volume modulation).

3.5 Open mode

In open mode you will have access to a number of parameters that allow for many more sound design capabilities. You will be able to tailor the sound you are looking for in unique ways!

Equalizer: The 10 band graphic Equalizer provides control over the sound spectrum for the Wurlitzer V.

Vibrato Rate: Sets the speed of the vibrato.

Pickup Distance: Sets the distance between the tone source and the pickup. When the pickup is moved closer to the tone source, the sound becomes more distorted and the timbre between soft and loud increases.

Pickup Axis: In the real Wurlitzer, the pickup is not exactly in front of the tone source at rest. When it is exactly in front, due to the symmetry of the device, the note jumps one octave higher than the normal tone. Turning the pickup Axis knob clockwise makes the pickup move from an unsymmetrical position to a symmetric position, providing a wide range of timbres.

Impedance: Sets the mechanical impedance of the tines: the greater the impedance, the longer the sound becomes.

Dynamics: Controls the loudness level between pianissimo and fortissimo. Thanks to the fact that the effect is applied during calculating each note, dynamics feature

can be seen as the perfect compressor as it allows you to adjust the dynamics without any distortion.

Octave Stretch: Octave stretch allows you to simulate a stretch tuning. It can go from subtle to extreme.

Hammer Hardness: You can choose the hammer hardness. The harder the felt, the more brilliant the sound becomes.

Hammer Noise: You can adjust the hammer noise, that is, the weight of the hammer percussion sound. With a loud hammer noise, you will feel as though you are standing close to the piano.

Note Off Noise: Sets the level of key release noise.

Sustain Pedal Noise: On a Wurlitzer you can hear the mechanical action of the sustain pedal. You can set how loud or soft you want this mechanical noise.

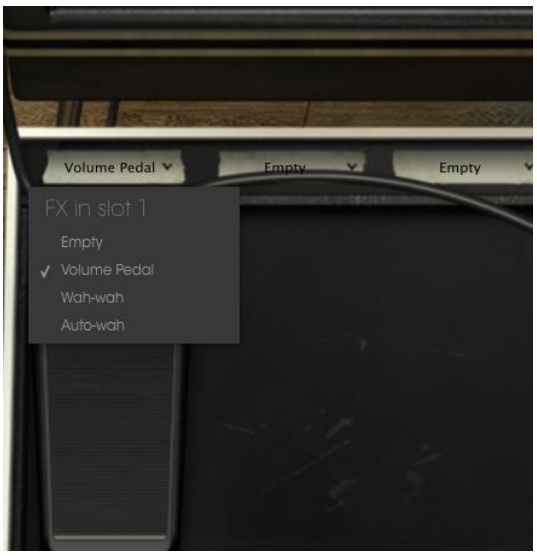
Velocity Curve: Allows you to adjust the response to your keyboard.

3.6 The effects

The effects section is located below the Wurlitzer V keyboard.

On each effect slot you have a drop down menu at the top that have a list of the available effects or Empty. When you click on a drop-down menu, and select an effect, it will appear on the pedal board below. They are 5 slots on the effects pedal board that allow for a wide variety of sound.

On the Slot 1, you can select between 3 pedal effects: the Wah-Wah, Auto-Wah and Volume pedal.



The others 4 slots provide various effects, though different from the Slot 1. Below is a list of the available effects on each effect drop down menu:

By choosing the Empty option on the drop down menu will close the effect pedal, only the drop down menu remains visible.

Each effect also has a bypass button. Bypassing the pedal will not remove the graphic and the parameters, the signal will be 100% dry. When the pedal is on, the red LED of the effect turns on, when you bypass the effect, the LED will turn off.

All effects parameters are MIDI assignable and learnable. You can easily assign a MIDI pedal controller to your Wurlitzer V and control your effects with it.

3.6.1 Slot 1: Wah-Wah/Auto-Wah/Volume pedal

This Slot provide 3 effects: Wah-Wah, Auto-Wah and Volume pedal.

3.6.1.1 Volume pedal

This works as a volume pedal that is assigned to MIDI CC #7. You can also click and drag on the pedal to change the volume amount.

3.6.1.2 Wah-Wah

This works as a standard wah-wah pedal. It defaults to being assigned to being assigned to MIDI CC #11 Expression. You can also click and drag on the pedal to change the wah-wah frequency.

3.6.2 Slots 2/3/4/5

3.6.2.1 Auto-Wah

In Auto-Wah mode, the wah-wah effect is triggered by the amplitude of the incoming sound.

Thresh: Sets the level at which the Auto-Wah is triggered. If the threshold is set to the extreme left, the effect will be disabled. The more you push it to the right, the lower the amplitude that starts triggering the wah-wah effect.

Mod Depth: Controls the amount of frequency shift of the wah-wah filter. Turn this up to get more of a filter sweep sound.

Freq: Control will set the center frequency of the filter effect.

AutoRate: Will automatically control the filter frequency. This control when set to 0 has no effect. When it is turned up, it will control the speed of the Auto-Wah effect.

3.6.2.2 Flanger

The Flanging effect is created by mixing two identical signals together with one signal delayed by a small and gradually changing period. Varying the Delay amount causes these to sweep up and down the frequency spectrum. Flanging can create both subtle and extreme effects, depending on the Rate and Depth of the

modulation. With high setting of Depth, you will hear pitch changes to the sound. This is due to the fact that we are modeling how the circuits, in an analog flanger, works. When the delay time is modulated, it changes the pitch in analog bucket brigade devices.

Delay: Sets the delay time which changes the harmonic content.

Depth: Sets modulation depth - set to less than 100% to limit build up of low frequencies with resonance.

Rate: Sets modulation rate (sine wave) - set to minimum for static comb filtering.

Res.: Add positive or negative feedback for harsher or "ringing" sound.

3.6.2.3 Phaser

The phase shifter was one of the most popular effects used with electric pianos in the 70´s. It works by splitting the incoming signal and changing the phase of it in reference to the dry signal. Doing this creates a filter that combs (with notches) the frequency spectrum. You can then change this phase to the rhythm of an oscillator which follows the frequency set with the Rate button. The Depth button sets the amplitude for the action of the filtering, while Feedback amplifies certain harmonics. Sonically, phasing is used to create whoosing, sweeping sounds that wander through the frequency spectrum.

Rate: Sets the speed of the phaser.

Depth: Sets the depth of the phaser action.

Feedback: Set the phaser resonance.

Stereo: Sets the stereo width.

3.6.2.4 Chorus

The chorus module makes it sound like there are multiple people playing the same instrument at about the same time. When two people play, there is always a slight tuning difference that results in a sound that is described as beating. The speed of this beating is set by the Rate knob, the amplitude by the Amount and the width with the Delay. The resulting frequency blurring is different for the left and right tracks. This allows us to get a stereophonic signal from a monophonic signal. The difference between the 2 tracks can be set with the Stereo width and the speed of the left right rotation with the Stereo rate knob.

A selector Type offers three different chorus engines: simple, medium, complex.

The Mix potentiometer sets the ratio between the input signal and the treated signal.

Type: Sets the 3 chorus types.

Rate: Sets the speed of the chorus.

Delay: Sets the delay applied to the input signal.

Amount: Sets the depth of the chorus action.

Mix: Sets the ratio between the input signal gain and processed signal gain.

Stereo Rate: Sets the speed of the stereophonic evolution.

Stereo Width: Sets the width of the stereophonic space.

3.6.2.5 Delay

A delay repeats a sound, like an echo, giving it more space and depth. This analog delay reproduces the sound of the old solid state units that used analog bucket brigade circuits. The Delay knob allows you to select a time between 12ms and 1000ms for the delay. The Feedback knob sets the feedback level. The FB Tone knob controls a feedback filtering effect, low-pass to left, high-pass to right. You can set the delay modulation by changing the LFO rate and LFO depth values. The Mix potentiometer sets the ratio between the original and modified signals.

Delay: Sets delay time (delay is mono for authenticity).

LFO rate: Sets modulation rate.

Feedback: Sets Feedback.

FB Tone: Sets feedback filtering.

Mix: Sets wet/dry mix.

LFO Depth: Sets the amount of delay time modulation (sine wave).

3.6.2.6 Compressor

A compressor evens out differences in gain, reducing dynamics (difference in volume between quiet sounds and loud sounds). This effect is often used to "fatten" a sound by making every individual element of the sound closer to the same volume. Every time a sound goes over a certain volume (Threshold), it is reduced by a specified amount (Ratio). Attack and Release determine how quickly the reduction is added and how quickly it disappears. Makeup boosts the compressed signals output level.

Input: Sets input gain level.

Threshold: Sets threshold level.

Ratio: Sets the amount of gain reduction.

Attack: Sets the attack time.

Release: Sets the release time.

Makeup: Sets the output gain level.

3.6.2.7 Overdrive

An overdrive effect saturates and distorts a sound by increasing the volume of a signal then clipping the excess. The Drive knob sets the amount of saturated sound. The Tone knob controls the distortion filtering. You can adjust the output level by setting the Output knob.

Drive: Sets the amount of distortion.

Output: Sets output trim level.

Tone: Sets the low-pass filter.

3.6.2.8 Vocal Filter

The Vocal filter is a formant filter. The LFO Rate knob and LFO On/Off selector set the LFO parameters. The Resonance knob sets the band width of the filter, when set all the way to the right, it results in a very thin audio signal close to a ringing sound.

The Dry/Wet potentiometer sets the ratio between the input signal and the treated signal.

The main interface of the Vocal filter, located on the central TV style screen, shows a series of five vowels (A,E,I,O and U).

The Vocal filter frequency can be set in real time:

- Manually by moving the red ball cursor between five vowels or moving the vowel letters by dragging them on the screen surface of the Vocal filter.
- An LFO is also available to modulate the cursor movements.
- You can set the radius amplitude of the LFO by clicking on the red ball cursor and moving it out of its initial central place. This action will set width of the circular ball movements.
- It´s also possible to re-arrange the order of the five vowels on the screen space. To do this, simply click on one of the 5 letters and drag it to the place you wish on the screen. Those changes will introduce some interesting variations when you modulate your five filters manually or with the LFO.

Rate: Sets the rate of the vocal filter LFO.

LFO On/Off: Starts or stop the LFO activity.

Res: Sets the band width of the 5 band pass filters of the vocal filter.

Mix: Sets the balance between the input level and the treated level.

3.6.2.9 Pitch Shift Chorus

The pitch shift chorus is a pitch shifter that allows you to create nice thick unison detune sounds. It is a different sound than you get from a standard chorus. You can set the detune amount (left channel is lowered in pitch, right channel is raised) setting the Detune knob. The Delay knob sets the delay time of the input signal, to offset the latency and low frequency response.

The Mix potentiometer sets the ratio between the input signal and the treated signal, and the Level knob sets the trim level of the mixed signal.

Delay: Sets a trade-off between latency and low frequency response.

Mix: Sets the ratio between the input signal gain and treated signal gain.

Detune: Sets Detune amount in cents.

Level: Sets the trim level.

3.7 Output mode

You can choose between 3 output signal path options; they simulate three different devices connected at the output (after the effects unit):

3.7.1 Reverb (Direct output)

The Wurlitzer V, and the effects are connected to a direct box, that will allow you to listen the pure sound on the output. There is a reverb that follows the direct box, just as it would be in a studio.

A reverb emulates the reflections of a sound in a different space (room, hall, etc). The material section (Damp and Brightness) sets the timber for the reverb (dark or bright sounding). The shape section (Diffusion and Decay) sets the size and duration of the reverb. The pre-delay section (Feedback and Time) adds a small delay to the reverb to emulate early reflections.

The Mix potentiometer sets the ratio between the input signal and the treated signal.

Input: Sets input gain.

Mix: Sets the ratio between the input signal gain and treated signal gain.

Time: Sets pre-delay time.

Fbk: Sets pre-delay feedback.

Damp: Sets high frequency damping.

Bright: Sets the brightness.

Diff: Sets the amount of diffusion.

Dec: Sets the decay time.

3.7.2 Leslie speaker simulator

The Leslie speaker, normally associated with the B3 organ, takes advantage of the Doppler Effect by using an electric motor to rotate an acoustic horn around a loudspeaker, sending its sound in a 360-degree circle. This results at the listener's ear in rapidly fluctuating frequencies of a keyboard note. Using a Leslie with a Wurlitzer allows for a unique sound not typically heard.

Speed: Sets rotor speed: stop/slow/fast.

High Depth: Sets high rotor frequency modulation (doppler).

High Width: Sets high rotor pan modulation.

High Shape: Sets high rotor amplitude modulation.

Low Width: Sets low rotor pan modulation.

Low Shape: Sets low rotor amplitude modulation.

Rate: Fine control for rotor speed.

Level: Sets output level.

3.7.3 Guitar amp simulator

This module digitally emulates a physical guitar amplifier. For many users, the original band experience with a Wurlitzer piano was taking the Wurlie and plugging it into a guitar amp. It gives the Wurlie a sound that many of us remember well.

Lo, Hi and Mid knobs allow you to sculpt the tone. These potentiometers boost or cut the energy of specific frequency bands.

The Drive knob sets the gain of saturation, the Reverb knob sets the reverb level.

Microphone option allows you to select between 4 types of microphones and positions (Dyna57 on Axis, Dyna57 Off Axis, SH421 Front or YOU87 Front). This is a simulation of the most common ways to mic up a guitar amplifier. You can select the type of microphone by clicking the drop down meu at the top left of the cabinet.

Cabinet option allows you to select between 4 types of guitar amp cabinet (1x12" Blackface, 2x12" Blackface, 4x10" Tweed or 4x12" HalfStack). Each of these classic cabinets have different tonal characteristics. You can select the type of cabinet by clicking the drop down menu at the bottom left of the cabinet.

Vol: Sets the volume level.

Drive: Sets the drive level.

Reverb: Sets the reverb level.

Lo: Sets low frequencies equalization.

Mid: Sets medium frequencies equalization.

Hi: Sets high frequencies equalization.

Microphone: Select between 4 types of microphones.

Cabinet: Select between 4 types of cabinet.

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